SM No. CSTP000803041

PROPOSAL AND CONTRACT DOCUMENTS

FOR THE CONSTRUCTION OF

(EXEMPT)

1
Construction necessary to build a new Rest Area Building, Guard Booth, Sewage Treatment Facility and other improvements to the Rest Area on Highway 49 at Pocahontas, known as Federal Aid Project No. STP-0008-03(041) / 103975, in the County of Hinds, State of Mississippi.
Project Completion: March 31, 2008

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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HAUL PERMIT FOR BRIDGES WITH POSTED WEIGHT LIMITS.

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 901 - ADVERTISEMENT

Sealed bids will be received by the Mississippi Transportation Commission in the Office of the Contract Administration Engineer, Room 1013, Mississippi Department of Transportation Administration Building, 401 North West Street, Jackson, Mississippi, until 9:30 o'clock A.M., Tuesday, September 26, 2006; thereafter, bids will be received in the First Floor Auditorium of the Mississippi Department of Transportation Adminstration Building, Jackson, Mississippi, until 10:00 o'clock A.M., Tuesday, September 26, 2006, and shortly thereafter publicly opened for

Construction necessary to build a new Rest Area Building, Pre-Fabricated Guard Booth, Sewage Treatment Facility and make other improvements to the existing Rest Area Site on Highway 49 at Pocahontas, known as Federal Aid Project No. STP-0008-03(081) / 103975, in the County of Hinds, State of Mississippi.

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 87-58 1, 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.

The award of this contract will be contingent upon the Contractor satisfying the DBE requirements.

Bid proposals must be acquired from the MDOT Contract Administration Division, Room 1013, MDOT Administration Building, 401 North West Street, Jackson, Mississippi, 39201, Telephone (601) 359-7744 or FAX (601) 359-7940. These proposals are available at a cost of Ten Dollars ($10.00) per proposal. Specimen proposals are also available at the MDOT Contract Administration Division at a cost of Ten Dollars ($10.00) per proposal, or can be viewed or downloaded at no cost at www.gomdot.com.

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

Plans will be shipped upon receipt of payment.

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 Subsection 102.07 pertaining to irregular proposals and rejection of bids.

LARRY L. "BUTCH" BROWN
EXECUTIVE DIRECTOR

(FAP)

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 1 **CODE: (IS)**

DATE: **05/03/2004**

SUBJECT: **Governing Specifications**

The current (2004) Edition of the Standard Specifications for Road and Bridge Construction adopted by the Mississippi Transportation Commission is made a part hereof fully and completely as if it were attached hereto, except where superseded by special provisions, or amended by revisions of the Specifications contained herein. Copies of the specification book may be purchased from the MDOT Construction Division.

A reference in any contract document to controlling requirements in another portion of the contract documents shall be understood to apply equally to any revision or amendment thereof included in the contract.

In the event the plans or proposal contain references to the 1990 Edition of the Standard Specifications for Road and Bridge Construction, it is to be understood that such references shall mean the comparable provisions of the 2004 Edition of the Standard Specifications.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2 **CODE: (IS)**

DATE: **05/03/2004**

SUBJECT: **Status of Right-of-Way, Utility Adjustments and Potentially Contaminated Sites**

Although it is desirable to have acquired all rights-of-way and completed all utility adjustments and work to be performed by others prior to receipt of bids, it is not considered to be in the public interest to wait until each and every such clearance has been obtained. The bidder is hereby advised of unacquired rights-of-way, relocatees and utilities which have not been completed.

The status of right-of-way and utility adjustments and potentially contaminated sites are set forth in attachments entitled "Status of Right-of-Way", "Status of Utility Adjustments" and "Status of Potentially Contaminated Sites."

In the event right of entry is not available to ALL parcels of right-of-way and all work complete that is to be accomplished by others on the date set forth in the contract for the Notice to Proceed, the Department will issue a restricted Notice to Proceed upon written request of the Contractor.

STATUS OF RIGHT-OF-WAY
STP-0008-032(041)
103975/301000
HINDS COUNTY
June 26, 2006

All rights of way and legal rights of entry have been acquired, **except:**

NONE.

ASBESTOS CONTAMINATION STATUS OF BUILDINGS
TO BE REMOVED BY THE CONTRACTOR
STP-0008-03(041)
103975/301000
HINDS COUNTY
June 26, 2006

Reference is made to notices to bidders entitled "Asbestos National Emission Standards for Hazardous Air Pollutants (NESHAP)" and "Removal of Obstructions".

The following pertinent information is furnished concerning asbestos containing materials (ACMs), if any, found in buildings to be removed by the Contractor.

There is no Right of Way required for this project. There are no buildings to be removed by the contractor.

STATUS OF POTENTIALLY CONTAMINATED SITES
STP-0008-03(041)
103975/301000
HINDS COUNTY
June 26, 2006

THERE IS NO RIGHT OF WAY REQUIRED FOR THIS PROJECT. NO INITIAL SITE ASSESSMENT WILL BE PERFORMED. IF CONTAMINATION ON EXISTING RIGHT OF WAY IS DISCOVERED, IT WILL BE HANDLED BY THE DEPARTMENT.

UTILITY STATUS REPORT
STP-0008-03(041) / 103975301000
Hinds County
June 26, 2006

No utilities were found that will conflict with construction.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 12 **CODE: (IS)**

DATE: **05/03/2004**

SUBJECT: **Federal Bridge Formula**

Bidders are hereby advised that Federal Highway Administration Publication No. FHWA-MC-94-007, **BRIDGE FORMULA WEIGHTS**, dated January 1994, is made a part of this contract when applicable.

Prior to the preconstruction conference, the Contractor shall advise the Engineer, in writing, what materials, if any, will be delivered to the jobsite via Interstate route(s).

Copies of the **BRIDGE FORMULA WEIGHTS** publication may be obtained by contacting:

Federal Highway Administration
400 7th Street, SW
Washington, DC 20590
(202) 366-2212

or

http://ops.fhwa.dot.gov/freight/regulate/sw/

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 13 **CODE: (IS)**

DATE: **05/03/2004**

SUBJECT: **Submission of Form OCR-485**

Bidders are hereby advised that Form OCR-485 will be completed by **ALL BIDDERS** submitting a bid proposal and **must be included in the bid proposal package**. Failure to include Form OCR-485 in the bid proposal package will cause the Contractor's bid to be considered **irregular**.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 586 **CODE: (SP)**

DATE: **07/13/2006**

SUBJECT: **Storm Water Discharge Associated with Construction Activity (≥ 5 Acres)**

PROJECT: **STP-0008-03(041) / 103975 -- Hinds County**

A Construction Storm Water General NPDES Permit to discharge storm water associated with construction activity is required.

The Department has acquired Certificate of Permit Coverage MSR-104207 under the Mississippi Department of Environmental Quality's (MDEQ) Storm Water Construction General Permit. Projects issued a certificate of permit coverage are granted permission to discharge treated storm water associated with construction activity into State waters. Copies of said permit, completed Large Construction Notice of Intent (LNOI), and Storm Water Pollution Prevention Plan (SWPPP) are on file with the Department.

Prior to the execution of the contract, the successful bidder shall execute and deliver to the Executive Director an original signed copy of the completed Prime Contractor Certification (Form No. 1).

Failure of the bidder to execute and file the completed Prime Contractor Certification (Form No. 1) shall be just cause for the cancellation of the award.

The executed Prime Contractor Certification (Form No. 1) shall be prima facie evidence that the bidder has examined the permit, is satisfied as to the terms and conditions contained therein, and that the bidder assumes the responsibility for meeting all permit terms and conditions and for performing permit requirements including, but not limited to, the inspection and reporting requirements. For this project, the Contractor shall furnish, set up and read, as needed, an on-site rain gauge.

The Contractor shall make inspections in accordance with condition No. S-4, page 14, and shall furnish the Project Engineer with the results of each weekly inspection as soon as possible following the date of inspection. A copy of the inspection form provided with the packet completed shall be sufficient. The weekly inspections must be documented monthly on the Inspection and Certification Form. The Contractor's representative and the Project Engineer shall jointly review and discuss the results of the inspections so that corrective action can be taken. The Project Engineer shall retain copies of the inspection reports.

An amount equal to 25 percent (25%) of the total estimated value of the work performed during each period in which the Contractor fails to submit monthly the completed Inspection and

Certification Form to the Project Engineer will be withheld from the Contractor's earned work. Thereafter, on subsequent successive estimate periods, the percentage withheld will be increased at the rate of 25 percent per estimate period in which the non-conformance with this specification continues. Monies withheld for this non-conformance will be released for payment on the next monthly estimate for partial payment following the date the monthly submittal of the completed Inspection and Certification Form is brought back into compliance with this specification.

Upon successful completion of all permanent erosion and sediment controls for a covered project, accepted and documented by the Engineer, a completed Notice of Termination (NOT) of Coverage form shall be submitted to the Office of Pollution Control. If no sediment and erosion control problems are identified, the prime contractor will receive a termination letter from the Office of Pollution Control.

In summary, prior to the execution of the contract, the successful bidder shall execute and deliver to the Executive Director an original signed copy of the completed Prime Contractor Certification (Form No. 1). Also, prior to the commencement of construction on the project, the Contractor shall transmit by letter an original signed copy of the completed Prime Contractor Certification (Form No. 2) to the Office of Pollution Control, P.O. Box 10385, Jackson, Mississippi 39289-0385. Copies of the completed Prime Contractor Certification (Form No. 2) and letter of transmittal shall be furnished the Project Engineer as proof of the required filing with the Office of Pollution Control. At project completion, when accepted and documented by the Engineer, a Notice of Termination of Coverage will be submitted to the Office of Pollution Control.

Securing a permit (s) for storm water discharge associated with the Contractor's activity on any other regulated area the Contractor occupies, shall be the responsibility of the Contractor.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 640 **CODE: (IS)**

DATE: 09/26/2005

SUBJECT: Fiber Reinforced Concrete

Bidders are hereby advised that synthetic structural fibers meeting the requirements of Subsection 907-711.04 may be used in lieu of wire mesh in some items of construction. Substitution of fibers for wire mesh will be allowed in the construction of paved ditches, paved flumes, paved inlet apron, driveways, guard rail anchors and pile encasements. Substitution in any other items of work must be approved by the State Construction Engineer prior to use.

SUPPLEMENT TO NOTICE TO BIDDERS NO. 696

DATE: 04/06/2006

The goal is 3 percent for the Disadvantaged Business Enterprise. The low bidder is required to submit Form OCR-481 for all DBEs. Bidders are advised to check the bid tabulation link for this project on the MDOT website (http://www.gomdot.com/bidsystem/) for results. Bid tabulations are usually posted by 3:00 pm on Letting Day.

Form OCR-481 is available at http://www.gomdot.com/business/dbe/pdf/OCR_481.pdf or by calling 601-359-7466.

All OCR-481s must be returned within 10 days following the bid letting to the MDOT Office of Civil Rights, P.O. Box 1850, Jackson, MS 39215-1850.

For answers to questions, contact the MDOT Office of Civil Rights at (601) 359-7466.

The bidder's execution of the signature portion of the proposal shall constitute execution of the following assurance:

> The bidder hereby gives assurance pursuant to the applicable requirements of "Safe, Accountable, Flexible, Efficient Transportation Equity Act, A Legacy For Users (SAFETEA-LU)" and "Part 26, Title 49, Code of Federal Regulation" that the bidder has made a good faith effort to meet the contract goal for DBE participation for which this proposal is submitted.

A pre-bid meeting will be held in the first floor auditorium of the Mississippi Department of Transportation Administration Building, 401 North West Street, Jackson, Mississippi at 2:00 P.M. on the day preceding the date of the bid opening.

This meeting is to inform DBE firms of subcontracting and material supply opportunities. Attendance at this meeting is considered of prime importance in demonstrating good faith effort to meet the contract goal.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 696 **CODE: (IS)**

DATE: **12/20/2005**

SUBJECT: DISADVANTAGED BUSINESS ENTERPRISES IN FEDERAL-AID HIGHWAY CONSTRUCTION

This contract is subject to the "Safe, Accountable, Flexible, Efficient Transportation Equity Act, A Legacy For Users (SAFETEA-LU)" and applicable requirements of "Part 26, Title 49, Code of Federal Regulations." Portions of the Act are set forth in this Notice as applicable to compliance by the Contractor and all of the Act, and the MDOT DBE Program, is incorporated by reference herein.

The Department has developed a Disadvantaged Business Enterprise Program that is applicable to this contract and is made a part thereof by reference.

Copies of the program may be obtained from:

Office of Civil Rights
Mississippi Department of Transportation
P. O. Box 1850
Jackson, Mississippi 39215-1850

POLICY

It is the policy of the Mississippi Department of Transportation to provide a level playing field, to foster equal opportunity in all federally assisted contracts, to improve the flexibility of the DBE Program, to reduce the burdens on small businesses, and to achieve that amount of participation that would be obtained in a non-discriminatory market place. In doing so, it is the policy of MDOT that there will be no discrimination in the award and performance of federally assisted contracts on the basis of race, color, sex, age, religion, national origin, or any handicap.

ASSURANCES THAT CONTRACTORS MUST TAKE:

MDOT will require that each contract which MDOT signs with a subrecipient or a Contractor, and each subcontract the Prime Contractor signs with a Subcontractor, includes the following assurances:

"The Contractor, subrecipient or Subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR 26 in the award and administration of federally assisted contracts. Failure by the Contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as MDOT deems appropriate."

DEFINITIONS

For purposes of this provision the following definitions will apply:

"Disadvantaged Business" means a small business concern: (a) which is at least 51 percent owned by one or more socially and economically disadvantaged individual(s) or in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more socially and economically disadvantaged individual(s); and (b) whose management and daily business operations are controlled by one or more of the socially and economically disadvantaged individual(s) who own it. It is important to note that the business owners themselves must control the operations of the business. Absentee ownership or title ownership by an individual who does not take an active role in controlling the business is not consistent with eligibility as a DBE under CFR 49 Part 26.71.

CONTRACTOR'S OBLIGATION

The Contractor and all Subcontractors shall take all necessary and reasonable steps to ensure that DBE firms can compete for and participate in the performance of a portion of the work in this contract and shall not discriminate on the basis of race, color, national origin, religion or sex. Failure on the part of the Contractor to carry out the DBE requirements of this contract constitutes a breach of contract and after proper notification the Department may terminate the contract or take other appropriate action as determined by the Department.

When a contract requires a zero percent (0%) DBE goal, the Contractor still has the responsibility to take all necessary and reasonable steps to ensure that DBE firms can compete for and participate in the performance of the work in the contract. In this case, all work performed by a certified DBE firm is considered to be a "race neutral" measure and the Department will receive DBE credit towards the overall State goals when the DBE firm is paid for their work. If the Prime Contractor is a certified DBE firm, the Department can receive DBE credit only for the work performed by the Prime Contractor's work force or any work subcontracted to another DBE firm. Work performance by a non-DBE Subcontractor is not eligible for DBE credit.

CONTRACT GOAL

The goal for participation by DBEs is established for this contract in the attached Supplement. The Contractor shall exercise all necessary and reasonable steps to ensure that participation is equal to or exceeds the contract goal.

The percentage of the contract that is proposed for DBEs shall be so stated on the last bid sheet of the proposal.

The apparent lowest responsive bidder shall submit to the Contract Administration Division Form OCR-481, signed by the Prime Contractor and the DBE Subcontractors, no later than the 10th day after opening of the bids.

FORMS ARE AVAILABLE FROM THE CONTRACT ADMINISTRATION DIVISION

The OCR-481 Form must contain the following information:

The name and address of each certified DBE Contractor / Supplier;

The Reference Number, percent of work and the dollar amount of each item. If a portion of an item is subcontracted, a breakdown of that item including quantities and unit price must be attached, detailing what part of the item the DBE firm is to perform and who will perform the remainder of the item.

If the DBE Commitment shown on the last bid sheet of the proposal, does not equal or exceed the contract goal, the bidder must submit, with the proposal, information to satisfy the Department that adequate good faith efforts have been made to meet the contract goal.

Failure of the lowest bidder to furnish acceptable proof of good faith efforts, submitted with the bid proposal, shall be just cause for rejection of the proposal. Award may then be made to the next lowest responsive bidder or the work may be readvertised.

The following factors are illustrative of matters the Department will consider in judging whether or not the bidder has made adequate good faith effort to satisfy the contract goal.

(1) Whether the bidder attended the pre-bid meeting that was scheduled by the Department to inform DBEs of subcontracting opportunities;

(2) whether the bidder advertised in general circulation, trade association, and minority-focus media concerning the subcontracting opportunities;

(3) whether the bidder provided written notice to a reasonable number of specific DBEs that their interest in the contract is being solicited;

(4) whether the bidder followed up initial solicitations of interest by contacting DBEs to determine with certainty whether they were interested;

(5) whether the bidder selected portions of the work to be performed by DBEs in order to increase the likelihood of meeting the contract goal;

(6) whether the bidder provided interested DBEs with adequate information about the plans, specifications and requirements of the contract;

(7) whether the bidder negotiated in good faith with interested DBEs and did not reject them as unqualified without sound reasons based on a thorough investigation of their capabilities; and

(8) whether the bidder made efforts to assist interested DBEs in obtaining any required bonding or insurance.

DIRECTORY

Included with this Bid Proposal is a list of "Certified DBE Contractors" which have been certified as such by the Mississippi Department of Transportation and other Unified Certification Partners (UCP).

The DBE firm must be on the Department's list of "Certified DBE Contractors" that is attached to this proposal and approved by MDOT to count towards meeting the DBE goal.

REPLACEMENT

If a DBE Subcontractor cannot perform satisfactorily, and this causes the OCR-481 commitment to fall below the contract goal, the Contractor shall take all necessary reasonable steps to replace the DBE with another certified DBE Subcontractor or submit information to satisfy the Mississippi Department of Transportation that adequate good faith efforts have been made to replace the DBE. The replacement DBE must be a DBE who was on the Department's list of "Certified DBE Contractors" when the job was awarded, and who is still active. All DBE replacements must be approved by the Department.

Under no circumstances shall the Prime or any Subcontractor perform the DBE's work (as shown on the OCR-481) without prior written approval from the Department. See "Sanctions" at the end of this document for penalties for performing DBE's work.

When a Contractor proposes to substitute/replace/terminate a DBE that was originally named on the OCR-481, the Contractor must obtain a release, in writing, from the named DBE explaining why the DBE Subcontractor cannot perform the work. A copy of the original DBE's release must be attached to the Contractor's written request to substitute/replace/terminate along with appropriate Subcontract Forms for the substitute/replacement/terminated Subcontractor, all of which must be submitted to the DBE Coordinator and approved, in advance, by MDOT.

GOOD FAITH EFFORTS

To demonstrate good faith efforts to replace any DBE that is unable to perform successfully, the Contractor must document steps taken to subcontract with another certified DBE Contractor. Such documentation shall include no less than the following:

(a) Proof of written notification to certified DBE Contractors by certified mail that their interest is solicited in subcontracting the work defaulted by the previous DBE or in subcontracting other items of work in the contract.

(b) Efforts to negotiate with certified DBE Contractors for specific items shall include as a minimum:

(1) The name, address, and telephone number of each DBE contacted;

(2) A description of the information provided about the plans and specifications for those portions of the work to be subcontracted; and

(3) A statement of why agreements were not reached.

(c) For each DBE contacted that was rejected as unqualified, the reasons for such conclusion.

(d) Efforts made to assist each DBE that needed assistance in obtaining bonding or insurance required by the Contractor.

Failure of the Contractor to demonstrate good faith efforts to replace a DBE Subcontractor that cannot perform as intended with another DBE Subcontractor, when required, shall be a breach of contract and may be just cause to be disqualified from further bidding for a period of up to 12 months after notification by certified mail.

PARTICIPATION / DBE CREDIT

Participation shall be counted toward meeting the goal in this contract as follows:

(1) If the Prime Contractor is a certified DBE firm, only the value of the work actually performed by the DBE Prime can be counted towards the project goal, along with any work subcontracted to a certified DBE firm.

(2) If the Contractor is not a DBE, the work subcontracted to a certified DBE Contractor will be counted toward the goal.

(3) The Contractor may count toward the goal a portion of the total dollar value of a contract with a joint venture eligible under the standards of this provision equal to the percentage of the DBE partner in the joint venture.

(4) Expenditures to DBEs that perform a commercially useful function may be counted toward the goal. A business is considered to perform a commercially useful function when it is responsible for the execution of a distinct element of the work and carries out its responsibilities by actually performing, managing, and supervising the work involved.

(5) The Contractor may count 100% of the expenditures for materials and supplies obtained from certified DBE suppliers and manufacturers that produce goods from raw materials or substantially alters them for resale provided the suppliers and manufacturers assume the actual and contractual responsibility for the provision of the materials and supplies. The Contractor may count 60 percent of the expenditures to suppliers that are not manufacturers, provided the supplier performs a commercially useful function in the supply process. Within 30 days after receipt of the materials, the Contractor shall furnish to the DBE Coordinator invoices from the certified supplier to verify the DBE goal.

(6) Any work that a certified DBE firm subcontracts or sub-subcontracts to a non-DBE firm will not count towards the DBE goal.

(7) Only the dollars actually paid to the DBE firm may be counted towards the DBE goal.

AWARD

Award of this contract to the low bidder will be contingent upon the following conditions:

(1) Concurrence from Federal Highway Administration, when applicable.

(2) Bidder must submit to the Contract Administration Division for approval, Form OCR-481 (DBE Commitment) no later than the 10th day after opening of the bids, or submit information with the bid proposal to satisfy the Department and that adequate good faith efforts have been made to meet the contract goal.

(3) Bidder must submit **with the bid proposal** a list of all firms that submitted quotes for material supplies or items to be subcontracted. This information must be submitted on form OCR-485 in the back of the contract proposal.

Prior to the start of any work, the bidder must notify the Project Engineer, in writing, of the name of the designated "DBE Liaison Officer" for this project. This notification must be posted on the bulletin board at the project site.

DEFAULT

The contract goal established by MDOT in this proposal must be met to fulfill the terms of the contract. The Contractor may list DBE Subcontractors and items that exceed MDOT's contract goal, but should unforeseen problems arise that would prevent a DBE from completing its total commitment percentage, the Contractor will meet the terms of the contract as long as it meets or exceeds MDOT's Contract Goal. For additional information, refer to "Replacement" section of this Notice.

DBE REPORTS

(1) OCR-481: Refer to "CONTRACT GOAL" section of this Notice to Bidders for information regarding this form.

(2) OCR-482: At the conclusion of the project the Contractor will submit to the Project Engineer for verification of quantities and further handling Form OCR-482 whereby the Contractor certifies to the amounts of payments made to each Contractor / Supplier. The Project Engineer shall submit the completed Form OCR-482 to the DBE Coordinator (Office of Civil Rights). Final acceptance of the project is dependent upon Contract Administration Division's receipt of completed Form OCR-482 which they will receive from the Office of Civil Rights.

(3) OCR-483: The Project Engineer/Inspector will complete Form OCR-483, the Commercially Useful Function (CUF) Performance Report, in accordance with MDOT S.O.P. No. OCR-03-09-01-483. Evaluations reported on this form are used to determine whether or not the DBE firm is performing a CUF. The Prime Contractor should take corrective action when the report contains any negative evaluations. DBE credit may be disallowed and/or other sanctions imposed if it is determined the DBE firm is not performing a CUF. This form should also be completed and returned to the DBE Coordinator (Office of Civil Rights).

(4) OCR-484: Each month, the Contractor will submit to the Project Engineer OCR-484 certifying payments to all Subcontractors.

(5) OCR-485: The bidder must submit **with the bid proposal** a list of all firms that submitted quotes for material supplies or items to be subcontracted.

(6) OCR-487: Only used by Prime Contractors that are certified DBE firms. This form is used in determining the exact percentage of DBE credit for the specified project. It should be returned to MDOT with the OCR-481 form, or can also be returned with the Permission to Subcontract Forms (CAD-720 or CAD-725).

SANCTIONS

The Department has the option to enforce any of the following penalties for failure of the Prime Contractor to fulfill the DBE goal as stated on the OCR-481 form or any violations of the DBE program guidelines:

(1) Disallow credit towards the DBE goal

(2) Withhold progress estimate payments

(3) Deduct from the final estimate an amount equal to the unmet portion of the DBE goal

(4) Recover an amount equal to the unmet contract goal

(5) Debar the Contractor involved from bidding on Mississippi Department of Transportation projects.

(6) Deduct from the Contractor's final estimate all or any combination of the following.

Offense	Percentage of the monetary amount disallowed from (1) above	Lump Sum
# 1	10%	$ 5,000 or both
# 2	20%	$ 10,000 or both
# 3	40%	$ 20,000 & debarment

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 777 **CODE: (IS)**

DATE: 04/13/2006

SUBJECT: On-The-Job Training Program

Payment for training hours will be handled as outlined in Special Provision 906-6. A pay item for trainees will not be included in individual construction projects. Payment for training individuals will be processed in accordance with the conditions in MDOT's ON-THE-JOB TRAINING PROGRAM (Special Provision 906-6).

On Federal-Aid projects, failure on the part of the Contractor to carryout the terms of the Alternate Training Special Provision (Special Provision 906-6) will be considered grounds to preclude the Contractor from participating in the Alternate On-The-Job Training Program. In the event the Department is required to preclude the Contractor from participating in the program, the Contractor will be required to adhere to the requirements of the Training Special Provision (Special Provision 906-3), for which purpose the special provision is also made a part of this proposal.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 882 **CODE: (IS)**

DATE: **04/06/2006**

SUBJECT: **DBE Participation and Payment**

Bidders are hereby advised that the participation of a DBE Firm can not be counted towards the Prime Contractor's DBE goal until the amount being counted towards the goal has been paid to the DBE.

Form OCR-482 has been developed to comply with this requirement. Bidders are hereby advised that at the end of the job, the Prime Contractor will submit this form to the Project Engineer before the final estimate is paid and the project is closed out. This form certifies payments to all DBE Subcontractors over the life of the contract.

Form OCR-484 has also been developed to comply with this requirement. Bidders are hereby advised that each month, the Prime Contractors will submit this form to the Project Engineer no later than the 20th of each month. This form certifies payments to all Subcontractors and shows all firms even if the Prime Contractor has paid no monies to the firm during that estimate period (negative report). The Project Engineer will attach this form to the monthly estimate before forwarding the estimate to the Contract Administration Division for processing.

Forms OCR-482 and OCR-484 can be obtained from the Office of Civil Rights Division, MDOT Administration Building, 401 North West Street, Jackson, MS, or at www.gomdot.com under the *Business Section, DBE Information, Applications and Forms for the DBE Program, Monthly Certification Of Payment To Subcontractors (OCR-484)(MDOT).*

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 883 **CODE: (IS)**

DATE: **04/28/2006**

SUBJECT: **Payroll Requirements**

Bidders are hereby advised that the Contractor and Subcontractor(s) are required to submit payroll information to the Project Engineers on a weekly basis.

On Federal-Aid Projects, CAD-880, CAD-881 and certified payroll submissions are required each week the Contractor or a Subcontractor performs work on the project. This is addressed in Section V, page 6 of Form FHWA-1273.

On State-Funded Projects, CAD-880 is required each week the Contractor or a Subcontractor performs work on the project.

When no work is performed on either Federal-Aid and State-Funded Projects, the Contractor should only submit CAD-880 showing no work activities.

The Contractor shall make all efforts necessary to submit this information to the Project Engineer in a timely manner. The Engineer will have the authority to suspend the work wholly or in part and to withhold payments because of the Contractor's failure to submit the required information. Submission of forms and payrolls shall be current through the first full week of the month for the estimate period in order for the Project Engineer to process an estimate.

Bidders are advised to review the requirements regarding payroll submissions in Section 110 of the Standard Specifications.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 935 **CODE: (IS)**

DATE: 06/22/2006

SUBJECT: ERRATA AND MODIFICATIONS TO THE 2004 STANDARD SPECIFICATIONS

Page	Subsection	Change
101	201.01	In the second sentence of the first paragraph, change “salvable” to “salvageable”.
107	202.04	In the fourth sentence of the fourth paragraph, change “yard” to “feet”.
107	202.05	In the list of units measurements for 202-B, add “square foot”.
132	211.03.4	In the second sentence of the second paragraph, change “planted” to “plated”.
200	307.03.7	In the fourth sentence of the second paragraph, change “lime-fly ash” to “treated”.
236	401.01	Change the header from “Section 403” to “Section 401”.
242	401.02.3.2	In the first sentence of the third full paragraph, add “1/8” in the blank before the inch mark.
250	401.02.6.3	In the second sentence of the first paragraph on page 250, change “rutting over ” ” to “rutting over 1/8" ”.
253	401.02.6.4.2	In the paragraph preceding the table, change “91.0” to “89.0”.
259	401.03.1.4	In the first paragraph, change “92.0 percent” to “the specified percentage (92.0 or 93.0)”.
269	403.03.2	In the table at the top of page 269, change the PI requirement from “ = ” to “ ≤ ”.
278	404.04	In the second sentence, change the subsection from “401.04” to “403.04”.

283	409.02.2	Change "PG 64-22" to "PG 67-22".
294	413.02	In the first sentence of the second paragraph, change "707.02.1.3" to "Subsection 707.02.1.3".
340	511.04	In the second sentence of the second paragraph, change "412" to "512".
349	601.03.3	In the first sentence, change "804.03.2" to "804.03.5".
355	603.02	Change the subsection reference for Joint mortar from "707.03" to "714.11".
369	604.04	In the first sentence, change "601.04" to "Subsection 601.04".
427	619.04	Delete the second paragraph.
442	625.04	In the third paragraph, change "626.04" to "Subsection 626.04".
444	626.03.1.2	Delete the third sentence of the first paragraph.
464	631.02	Change the subsection reference for Water from "714.01.0" to "714.01.1".
570	682.03	Change the subsection number from "682-03" to "682.03".
575	683.10.4	Change the subsection number from "683.10.4" to "683.04".
575	683.10.5	Change the subsection number from "683.10.5" to "683.05".
596	701.02	In the table under the column titled "Cementations material required", change Class F, FA" to "Class F FA,".
603	702.11	In the first sentence, change "702.12" to "Subsection 702.12".
612	703.04.2	In the fifth paragraph, delete "Subsection 703.11 and".
616	703.07.2	In the Percentage By Weight Passing Square Mesh Sieves table, change the No. 10 requirement for Class 7 material from "30 - 10" to "30 - 100".
618	703.13.1	In the first sentence of the first paragraph, change "703.09" to "703.06".
618	703.13.2	In the first sentence, change "703.09" to "703.06".

671	712.06.2.2	In the first sentence, change "712.05.1" to "Subsection 712.05.1".
689	714.11.2	In the first sentence, change "412" to "512".
741	720.05.2.2	In the last sentence of this subsection, change "720.05.2.1" to "Subsection 720.05.2.1".
827	803.03.2.3.7.5.2	In the first sentence of the second paragraph, change "803.03.5.4" to "803.03.2.3.4".
833	803.03.2.6	In the first sentence, change "803.03.7" to "803.03.2.5".
854	804.02.11	In the last sentence of the first paragraph, change "automatically" to "automatic".
859	804.02.13.1.3	In the last sentence, change Subsection "804.02.12.1" to "804.02.12".
879	804.03.19.3.2	In the first sentence of the third paragraph, change "listed on of Approved" to "listed on the Approved".
879	804.03.19.3.2	In the last sentence of the last paragraph, change "804.03.19.3.1" to "Subsection 804.03.19.3.1".
962	814.02.3	In the first sentence, change "710.03" to "Subsection 710.03".
976	820.03.2.1	In the first sentence, change "803.02.6" to "803.03.1.7".
976	820.03.2.2	In the first sentence, change "803.03.9.6" to "803.03.1.9.2".
985	Index	Change the subsection reference for Petroleum Asphalt Cement from "702.5" to "702.05".
985	Index	Change the subsection reference for the Definition of Asphaltic Cement or Petroleum Asphalt from "700.2" to "700.02".
985	Index	Change the subsection reference for Automatic Batchers from "501.03.2.4" to "804.02.10.4".
986	Index	Delete "501.03.2" as a subsection reference for Batching Plant & Equipment.
988	Index	Change the subsection reference for the Central Mixed Concrete from "501.03.3.2" to "804.02.11".

988	Index	Change the subsection reference for the Concrete Batching Plant & Equipment from "501.03.2" to "804.02.11".
999	Index	Delete "501.03.3.3" as a subsection reference for Truck Mixers.
1001	Index	Change the subsection reference for Edge Drain Pipes from "605.3.5" to "605.03.5".
1002	Index	Change the subsection reference for Metal Posts from "713.05.2" to "712.05.2".
1007	Index	Change the subsection reference for Coarse Aggregate of Cement Concrete Table from "703.3" to "703.03".
1007	Index	Change the subsection reference for Composite Gradation for Mechanically Stabilized Courses Table from "703.8" to "703.08".
1009	Index	Delete "501.03.3.3" as a subsection reference for Truck Mixers and Truck Agitators.
1010	Index	Delete reference to "Working Day, Definition of".

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 963 **CODE: (SP)**

DATE: **07/06/2006**

SUBJECT: **Project Number Change**

PROJECT: **STP-0008-03(041) / 103975 -- Hinds County**

Anywhere in the plans, proposal and specifications for the above Project that reference is made to Federal Aid Project No. **STP-0008-03(081) / 103975,** it is understood that Federal Aid Project No. **STP-0008-03(041) / 103975** is the correct project number.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 – NOTICE TO BIDDERS NO. 1019 **CODE: (SP)**

DATE: **7/10/2006**

SUBJECT: **Petroleum Products Base Prices For Contracts Let in August, 2006**

REFERENCE: **Subsection 109.07**

The following base prices are to be used for adjustment in compensation due to changes in costs of petroleum products:

FUELS

	Per Gallon	Per Liter
Gasoline	$2.7295	$0.7211
Diesel	$2.7783	$0.7339

MATERIALS OF CONSTRUCTION

ASPHALT CEMENT	Per Gallon	Per Ton	Per Liter	Per Metric Ton
Viscosity Grade AC-5	$1.5927	$377.86	$0.4207	$416.51
Viscosity Grade AC-10	$1.6077	$381.43	$0.4247	$420.45
Viscosity Grade AC-20	$1.5987	$379.29	$0.4223	$418.09
Viscosity Grade AC-30	$1.5912	$377.50	$0.4203	$416.12
Grade PG 64-22	$1.5957	$378.57	$0.4215	$417.29
Grade PG 67-22	$1.5686	$372.14	$0.4144	$410.21
Grade PG 76-22	$1.9845	$470.83	$0.5243	$518.99
Grade PG 82-22	$2.1454	$509.00	$0.5668	$561.07

EMULSIFIED ASPHALTS

Grade EA-4, SS-1, AE-P	$1.3826	$0.3652
Grade RS-2C, CRS-2	$1.3570	$0.3585
Grade CRS-2P	$1.6355	$0.4321

PRIMES

Grade EA-1, MC-70	$1.7695	$0.4675

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 1065 **CODE: (SP)**

DATE: **06/26/2006**

SUBJECT: **Contract Time**

PROJECT: **STP-0008-03(081) / 103975 -- Hinds County**

The calendar date for completion of work to be performed by the Contractor for this project shall be **March 31, 2008**, which date or extended date as provided in Subsection 108.06 shall be the end of contract time. the date for issuing the Notice to Proceed / Beginning of Contract Time will be **no later than November 9, 2006**. Should the Contractor request a Notice to Proceed earlier than **November 9, 2006**, the date the Notice to Proceed is issued will also be the Beginning of Contract Time date.

A progress schedule as referenced to in Subsection 108.03 will not be required for this contract. A Construction Schedule as described in Section 01320 of Special Provision No. 907-242-7 will be required.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 1066 **CODE: (SP)**

DATE: 07/05/2006

SUBJECT: Specialty Items

PROJECT: STP-0008-03(041) / 103975--HINDS COUNTY(IES)

Pursuant to the provisions of Section 108, the following work items are hereby designated as "Specialty Items" for this contract. Bidders are reminded that these items must be subcontracted in order to be considered as specialty items.

CATEGORY: PAVEMENT MARKING

Ref No	Pay Item	Description
1320	626-A	6" Thermoplastic Traffic Stripe, Skip White
1330	907-626-B	4" Thermoplastic Traffic Stripe, Continuous White
1340	626-C	6" Thermoplastic Edge Stripe, Continuous White
1350	907-626-G	Thermoplastic Detail Stripe, Blue-ADA
1360	626-G	Thermoplastic Detail Stripe, White
1370	626-H	Thermoplastic Legend, White
1380	907-626-H	Thermoplastic Legend, Blue-ADA

CATEGORY: TRAFFIC CONTROL

Ref No	Pay Item	Description
1290	619-G4	Barricades, Type III, Single Faced
1300	619-G5	Free Standing Plastic Drums
1310	619-G6	Warning Lights, Type "A"

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 1068 **CODE: (SP)**

DATE: **6/28/2006**

SUBJECT: **Special Provision No. 907-242-7**

PROJECT: **STP-0008-03(041) / 103975 -- Hinds County**

Bidders are hereby advised that the contents included in Special Provision No. 907-242-7 apply only to the work required in constructing the Rest Area Building and the Guard Booth.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 1073 **CODE (SP)**

DATE: **07/06/2006**

SUBJECT: **Pre-Bid Meeting**

PROJECT: **STP-0008-03(041) / 103975 -- Hinds County**

Bidder are hereby advised that a Pre-Bid Meeting will be held in the Conference Room at the MDOT District 5 Whitfield Project Office Building located at 3769 Highway 468, Pearl, Mississippi, telephone (601) 961-4097, at **10:00 A.M. on Tuesday, September 5, 2006.** Prospective bidders are encouraged to attend this meeting 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 as a group after the meeting.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 1107 **CODE: (SP)**

DATE: **07/17/2006**

SUBJECT: **Environmental Considerations**

PROJECT: **STP-0008-03(041) / 103975 -- Hinds County**

Because of environmental concerns in the area of this project, the Contractor shall abide by the following conditions when performing the work on this project.

1. No sub-surface excavation will be allowed when constructing the walking trails and a minimum of six inches (6") for clearing and grubbing. The Contractor shall advise the Project Engineer five (5) calendar days prior to starting this work construction. The Project Engineer will advise the Environmental Division so a representative can be present during construction.
2. Steps on the south side of the mound shall be removed by hand (non-mechanical means only). Areas of removal shall be backfilled and sodded by hand (non-mechanical means).
3. Sidewalk leading to the mound shall be removed by hand (non-mechanical means) without disturbing the subsurface. Areas of removal shall be backfilled with topsoil and sodded by hand (non-mechanical means).
4. A Management Plan shall include non-invasive moving practices and procedures for handling fallen trees shall be established. The Contractor shall have a licensed tree surgeon make an assessment of the trees on the mound and site for recommendation for upkeep and maintenance. Prior to performing any maintained on the mound site, a permit will be required from the Mississippi Department of Archives and History. Removal of fallen trees shall be performed by hand (non-mechanical means). The grass in this area shall be cut to a height of five inches (5").
5. The Mississippi Department of Archives and History historical marker at the base of the mound shall be removed by the Contractor, stored by the Contractor and replaced as per the plans by the Contractor.
6. Undesirable undergrowth foliage and grass on the north-end of the median area shall be removed by non-invasive means to enhance the visibility and site security.

SUPPLEMENT TO FORM FHWA-1273

The following MINIMUM HOURLY WAGE RATES have been predetermined by the Secretary of Labor in Wage Determination Decision No. MS20030026 dated June 13, 2003.

AREA 3-A COUNTIES :

HINDS, MADISON & RANKIN

PAYROLL CODE	CLASSIFICATION	MIN. HOURLY WAGE RATE
100	Air Tool Operator (Jack Hammer/Air Comp.)	$6.33
105	Asphalt Raker	6.55
108	Mason Tender (Cement Mason Helper)	7.27
110	Carpenter	8.70
120	Cement Mason (Finisher)	8.14
130	Electrician	12.15
131	Mechanic (Heavy Equipment)	9.20
135	Oiler-Greaser	7.71
140	Form Setter	7.47
145	Grade Checker (Asphalt Crew)	8.00
150	Ironworker, Reinforcing (Tie Steel)	9.67
155	Ironworker, Structural	7.30
160	Laborer, Unskilled	6.37
165	Pipelayer	7.31
175	Painter (Structural Steel)	12.00
180	Piledriverman	8.50
185	Truck Driver (All Types)	6.77
190	Joint Filler	5.15
195	Joint Setter	5.15
197	Welder	11.00
	POWER EQUIPMENT OPERATORS	
205	Aggregate Spreader Operator	6.53
212	Asphalt Broom (Sweeper) Operator	6.51
214	Asphalt Paving Machine/Spreader Operator	7.40
215	Asphalt Distributor Operator	7.30
216	Asphalt Plant Operator	8.65
220	Backhoe (Shovel) Operator	8.50
225	Bulldozer Operator	8.70
235	Concrete Finishing/Curing Machine Operator	9.00
240	Concrete Paving Machine Operator (Spreader)	8.75
250	Concrete Saw Operator	8.24
255	Concrete Breaker & Hydro-Hammer Operator	7.22
270	Loader (All Types)	8.46
275	Milling Machine Operator	7.01
280	Mixer Operator (All Types)	6.04
285	Motor Patrol (Grader) Operator	8.96
290	Mulcher Machine Operator	5.17
295	Earth Auger Operator	8.00
300	Piledriver Machine Operator	8.71
305	Roller Operator (Self-Propelled)	6.66
310	Scraper Operator (All Types)	6.50
315	Striping Machine Operator	15.00
320	Tractor Operator (Track Type)	9.24
325	Tractor Operator (Wheel Type)	5.92
330	Trenching Machine Operator	8.01
350	Crusher Feeder Machine Operator	5.50
360	Crane (Dragline) Operator	10.20
365	Guardrail Post Driver	10.00

Authorized Payroll Code may be used in lieu of classification titles on weekly payrolls submitted to this Department. Codes or classification titles not conforming to those listed will not be acceptable.

SUPPLEMENT TO FORM FHWA-1273

DATE: 6/15/94

SUBJECT: Final Certificate and Contract Provisions for Subcontracts

All subcontracts shall be in writing and contain all pertinent provisions and requirements of the prime contract.

Each "Request for Permission to Subcontract" (Mississippi Department of Transportation Form CAD-720) shall include a copy of subcontract for review by the Mississippi Department of Transportation. The federal contract provisions may be omitted from the subcontract copy submitted for review provided the Contractor certifies that the provisions will be physically incorporated into the agreement furnished to the Subcontractor.

In lieu of submitting a copy of the subcontract for review, the Contractor may certify that the subcontract agreement is in writing and that it contains all the requirements and pertinent provisions of the prime contract.

Each Subcontractor will be required to provide a copy of the subcontract agreement for contract compliance reviews, along with physical evidence (copy of FHWA-1273) that requirements and pertinent provisions have been provided for review and adherence.

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

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ATTACHMENTS

A. Employment Preference for Appalachian Contracts (included in Appalachian contracts only)

I. GENERAL

1. These contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

2. Except as otherwise provided for in each section, the contractor shall insert in each subcontract all of the stipulations contained in these Required Contract Provisions, and further require their inclusion in any lower tier subcontract or purchase order that may in turn be made. The Required Contract Provisions shall not be incorporated by reference in any case. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with these Required Contract Provisions.

3. A breach of any of the stipulations contained in these Required Contract Provisions shall be sufficient grounds for termination of the contract.

4. A breach of the following clauses of the Required Contract Provisions may also be grounds for debarment as provided in 29 CFR 5.12:

Section I, paragraph 2;
Section IV, paragraphs 1, 2, 3, 4, and 7;
Section V, paragraphs 1 and 2a through 2g.

5. Disputes arising out of the labor standards provisions of Section IV (except paragraph 5) and Section V of these Required Contract Provisions shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the U.S. Department of Labor (DOL) as set forth in 29 CFR 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the DOL, or the contractor's employees or their representatives.

6. **Selection of Labor:** During the performance of this contract, the contractor shall not:

a. discriminate against labor from any other State, possession, or territory of the United States (except for employment preference for Appalachian contracts, when applicable, as specified in Attachment A), or

b. employ convict labor for any purpose within the limits of the project unless it is labor performed by convicts who are on parole, supervised release, or probation.

II. NONDISCRIMINATION

(Applicable to all Federal-aid construction contracts and to all related subcontracts of $10,000 or more.)

1. **Equal Employment Opportunity:** Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630 and 41 CFR 60) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The Equal Opportunity Construction Contract Specifications set forth under 41 CFR 60-4.3 and the provisions of the American Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the State highway agency (SHA) and the Federal Government in carrying out EEO obligations and in their review of his/her activities under the contract.

b. The contractor will accept as his operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, preapprenticeship, and/or on-the-job training."

2. **EEO Officer:** The contractor will designate and make known to the SHA contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active contractor program of EEO and who must be assigned adequate authority and responsibility to do so.

3. **Dissemination of Policy:** All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant

of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minority group employees.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. **Recruitment:** When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minority groups in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minority group applicants. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority group applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, he is expected to observe the provisions of that agreement to the extent that the system permits the contractor's compliance with EEO contract provisions. (The DOL has held that where implementation of such agreements have the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Executive Order 11246, as amended.)

c. The contractor will encourage his present employees to refer minority group applicants for employment. Information and procedures with regard to referring minority group applicants will be discussed with employees.

5. **Personnel Actions:** Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly takecorrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with his obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of his avenues of appeal.

6. **Training and Promotion:**

a. The contractor will assist in locating, qualifying, and increasing the skills of minority group and women employees, and applicants for employment.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision.

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of minority group and women employees and will encourage eligible employees to apply for such training and promotion.

7. **Unions:** If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use his/her best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and to effect referrals by such unions of minority and female employees. Actions by the contractor either directly or through a contractor's association acting as agent will include the procedures set forth below:

a. The contractor will use best efforts to develop, in cooperation with the unions, joint training programs aimed toward

qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.

b. The contractor will use best efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the SHA and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of minority and women referrals within thetime limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minority group persons and women. (The DOL has held that it shall be no excuse that the union with which the contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority employees.) In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the SHA.

8. **Selection of Subcontractors, Procurement of Materials and Leasing of Equipment:** The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment.

a. The contractor shall notify all potential subcontractors and suppliers of his/her EEO obligations under this contract.

b. Disadvantaged business enterprises (DBE), as defined in 49 CFR 23, shall have equal opportunity to compete for and perform subcontracts which the contractor enters into pursuant to this contract. The contractor will use his best efforts to solicit bids from and to utilize DBE subcontractors or subcontractors with meaningful minority group and female representation among their employees. Contractors shall obtain lists of DBE construction firms from SHA personnel.

c. The contractor will use his best efforts to ensure subcontractor compliance with their EEO obligations.

9. **Records and Reports:** The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the SHA and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women;

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees; and

(4) The progress and efforts being made in securing the services of DBE subcontractors or subcontractors with meaningful minority and female representation among their employees.

b. The contractors will submit an annual report to the SHA each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data.

III. NONSEGREGATED FACILITIES

(Applicable to all Federal-aid construction contracts and to all related subcontracts of $10,000 or more.)

a. By submission of this bid, the execution of this contract or subcontract, or the consummation of this material supply agreement or purchase order, as appropriate, the bidder, Federal-aid construction contractor, subcontractor, material supplier, or vendor, as appropriate, certifies that the firm does not maintain or provide for its employees any segregated facilities at any of its establishments, and that the firm does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The firm agrees that a breach of this certification is a violation of the EEO provisions of this contract. The firm further certifies that no employee will be denied access to adequate facilities on the basis of sex or disability.

b. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, timeclocks, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive, or are, in fact, segregated on the basis of race, color, religion, national origin, age or disability, because of habit, local custom, or otherwise. The only exception will be for the disabled when the demands for accessibility override (e.g. disabled parking).

c. The contractor agrees that it has obtained or will obtain identical certification from proposed subcontractors or material suppliers prior to award of subcontracts or consummation of material supply agreements of $10,000 or more and that it will retain such certifications in its files.

IV. PAYMENT OF PREDETERMINED MINIMUM WAGE

(Applicable to all Federal-aid construction contracts exceeding $2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural minor collectors, which are exempt.)

1. **General:**

a. All mechanics and laborers employed or working upon the site of the work will be paid unconditionally and not less often than once a week and without subsequent deduction or rebate on any account [except such payroll deductions as are permitted by regulations (29 CFR 3) issued by the Secretary of Labor under the Copeland Act (40 U.S.C. 276c)] the full amounts of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment. The payment shall be computed at wage rates not less than those contained in the wage determination of the Secretary of Labor (hereinafter "the wage determination") which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor or its subcontractors and such laborers and mechanics. The wage determination (including any additional classifications and wage rates conformed under paragraph 2 of this Section IV and the DOL poster (WH-1321) or Form FHWA-1495) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers. For the purpose of this Section, contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act (40 U.S.C. 276a) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of Section IV, paragraph 3b, hereof. Also, for the purpose of this Section, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in paragraphs 4 and 5 of this Section IV.

b. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein, provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed.

c. All rulings and interpretations of the Davis-Bacon Act and related acts contained in 29 CFR 1, 3, and 5 are herein incorporated by reference in this contract.

2. **Classification:**

a. The SHA contracting officer shall require that any class of laborers or mechanics employed under the contract, which is not listed in the wage determination, shall be classified in conformance with the wage determination.

b. The contracting officer shall approve an additional classification, wage rate and fringe benefits only when the following criteria have been met:

(1) the work to be performed by the additional classification requested is not performed by a classification in the wage determination;

(2) the additional classification is utilized in the area by the construction industry;

(3) the proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination; and

(4) with respect to helpers, when such a classification prevails in the area in which the work is performed.

c. If the contractor or subcontractors, as appropriate, the laborers and mechanics (if known) to be employed in the additional classification or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the DOL, Administrator of the Wage and Hour Division, Employment Standards Administration, Washington, D.C. 20210. The Wage and Hour Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

d. In the event the contractor or subcontractors, as appropriate, the laborers or mechanics to be employed in the additional classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. Said Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary

e. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 2c or 2d of this Section IV shall be paid to all workers performing work in the additional classification from the first day on which work is performed in the classification.

3. **Payment of Fringe Benefits:**

a. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor or subcontractors, as appropriate, shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly case equivalent thereof.

b. If the contractor or subcontractor, as appropriate, does not make payments to a trustee or other third person, he/she may consider as a part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, provided, that the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

4. **Apprentices and Trainees (Programs of the U.S. DOL) and Helpers:**

a. Apprentices:

(1) Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the DOL, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau, or if a person is employed in his/her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State apprenticeship agency (where appropriate) to be eligible for probationary employment as an apprentice.

(2) The allowable ratio of apprentices to journeyman-level employees on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any employee listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate listed in the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor or subcontractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman-level hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

(3) Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level ofprogress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator for the Wage and Hour Division determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

(4) In the event the Bureau of Apprenticeship and Training, or a State apprenticeship agency recognized by the Bureau, withdraws approval of an apprenticeship program, the contractor or subcontractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the comparable work performed by regular employees until an acceptable program is approved.

b. Trainees:

(1) Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the DOL, Employment and Training Administration.

(2) The ratio of trainees to journeyman-level employees on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

(3) Every trainee must be paid at not less than the rate specified in the approved program for his/her level of progress, expressed as a percentage of the journeyman-level hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman-level wage rate on the wage determination which provides for less than full fringe benefits for apprentices, in which case such trainees shall receive the same fringe benefits as apprentices.

(4) In the event the Employment and Training Administration withdraws approval of a training program, the contractor or subcontractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Helpers:

Helpers will be permitted to work on a project if the helper classification is specified and defined on the applicable wage determination or is approved pursuant to the conformance procedure set forth in Section IV.2. Any worker listed on a payroll at a helper wage rate, who is not a helper under a approved definition, shall be paid not less than the applicable wage rate on the wagedetermination for the classification of work actually performed.

5. **Apprentices and Trainees (Programs of the U.S. DOT):**

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

6. **Withholding:**

The SHA shall upon its own action or upon written request of an authorized representative of the DOL withhold, or cause to be withheld, from the contractor or subcontractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements which is held by the

same prime contractor, as much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the SHA contracting officer may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

7. **Overtime Requirements:**

No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers, mechanics, watchmen, or guards (including apprentices, trainees, and helpers described in paragraphs 4 and 5 above) shall require or permit any laborer, mechanic, watchman, or guard in any workweek in which he/she is employed on such work, to work in excess of 40 hours in such workweek unless such laborer, mechanic, watchman, or guard receives compensation at a rate not less than one-and-one-half times his/her basic rate of pay for all hours worked in excess of 40 hours in such workweek.

8. **Violation:**

Liability for Unpaid Wages; Liquidated Damages: In the event of any violation of the clause set forth in paragraph 7 above, the contractor and any subcontractor responsible thereof shall be liable to the affected employee for his/her unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory) for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer, mechanic, watchman, or guard employed in violation of the clause set forth in paragraph 7, in the sum of $10 for each calendar day on which such employee was required or permitted to work in excess of the standard work week of 40 hours without payment of the overtime wages required by the clause set forth in paragraph 7.

9. **Withholding for Unpaid Wages and Liquidated Damages:**

The SHA shall upon its own action or upon written request of any authorized representative of the DOL withhold, or cause to be withheld, from any monies payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 8 above.

V. STATEMENTS AND PAYROLLS

(Applicable to all Federal-aid construction contracts exceeding $2,000 and to all related subcontracts, except for projects located on roadways classified as local roads or rural collectors, which are exempt.)

1. **Compliance with Copeland Regulations (29 CFR 3):**

The contractor shall comply with the Copeland Regulations of the Secretary of Labor which are herein incorporated by reference.

2. **Payrolls and Payroll Records:**

a. Payrolls and basic records relating thereto shall be maintained by the contractor and each subcontractor during the course of the work and preserved for a period of 3 years from the date of completion of the contract for all laborers, mechanics, apprentices, trainees, watchmen, helpers, and guards working at the site of the work.

b. The payroll records shall contain the name, social security number, and address of each such employee; his or her correct classification; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalent thereof the types described in Section 1(b)(2)(B) of the Davis Bacon Act); daily and weekly number of hours worked; deductions made; and actual wages paid. In addition, for Appalachian contracts, the payroll records shall contain a notation indicating whether the employee does, or does not, normally reside in the labor area as defined in Attachment A, paragraph 1. Whenever the Secretary of Labor, pursuant to Section IV, paragraph 3b, has found that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section 1(b)(2)(B) of the Davis Bacon Act, the contractor and each subcontractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, that the plan or program has been communicated in writing to the laborers or mechanics affected, and show the cost anticipated or the actual cost incurred in providing benefits. Contractors or subcontractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprentices and trainees, and ratios and wage rates prescribed in the applicable programs.

c. Each contractor and subcontractor shall furnish, each week in which any contract work is performed, to the SHA resident engineer a payroll of wages paid each of its employees (including apprentices, trainees, and helpers, described in Section IV, paragraphs 4 and 5, and watchmen and guards engaged on work during the preceding weekly payroll period). The payroll submitted required to be maintained under paragraph 2b of this Section V. This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose and may be purchased from the Superintendent of Documents (Federal stock number 029-005-0014-1), U.S. Government Printing Office, Washington, D.C. 20402. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors.

d. Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his/her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) that the payroll for the payroll period contains the information required to be maintained under paragraph 2b of this Section V and that such information is correct and complete;

(2) that such laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned,

without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in the Regulations, 29 CFR 3;

(3) that each laborer or mechanic has been paid not less that the applicable wage rate and fringe benefits or cash equivalent for the classification of worked performed, as specified in the applicable wage determination incorporated into the contract.

e. The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 2d of this Section V.

f. The falsification of any of the above certifications may subject the contractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 231.

g. The contractor or subcontractor shall make the records required under paragraph 2b of this Section V available for inspection, copying, or transcription by authorized representatives of the SHA, the FHWA, or the DOL, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the SHA, the FHWA, the DOL, or all may, after written notice to the contractor, sponsor, applicant, or owner, take such actions as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

VI. RECORD OF MATERIALS, SUPPLIES, AND LABOR

1. On all Federal-aid contracts on the National Highway System, except those which provide solely for the installation of protective devices at railroad grade crossings, those which are constructed on a force account or direct labor basis, highway beautification contracts, and contracts for which the total final construction cost for roadway and bridge is less than $1,000,000 (23 CFR 635) the contractor shall:

a. Become familiar with the list of specific materials and supplies contained in Form FHWA-47, "Statement of Materials and Labor Used by Contractor of Highway Construction Involving Federal Funds," prior to the commencement of work under this contract.

b. Maintain a record of the total cost of all materials and supplies purchased for and incorporated in the work, and also of the quantities of those specific materials and supplies listed on Form FHWA-47, and in the units shown on Form FHWA-47.

c. Furnish, upon the completion of the contract, to the SHA resident engineer on Form FHWA-47 together with the data required in paragraph 1b relative to materials and supplies, a final labor summary of all contract work indicating the total hours worked and the total amount earned.

2. At the prime contractor's option, either a single report covering all contract work or separate reports for the contractor and for each subcontract shall be submitted.

VII. SUBLETTING OR ASSIGNING THE CONTRACT

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the State. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635).

a. "Its own organization" shall be construed to include only workers employed and paid directly by the prime contractor and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor, assignee, or agent of the prime contractor.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph 1 of Section VII is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the SHA contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the SHA contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the SHA has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

VIII. SAFETY: ACCIDENT PREVENTION

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provideall safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the SHA contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary,

hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333).

IX. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, the following notice shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

NOTICE TO ALL PERSONNEL ENGAGED ON FEDERAL-AID HIGHWAY PROJECTS

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false represen-tation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended andsupplemented;

Shall be fined not more that $10,000 or imprisoned not more than 5 years or both."

X. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

(Applicable to all Federal-aid construction contracts and to all related subcontracts of $100,000 or more.)

By submission of this bid or the execution of this contract, or subcontract, as appropriate, the bidder, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any facility that is or will be utilized in the performance of this contract, unless such contract is exempt under the Clean Air Act, as amended (42 U.S.C. 1857 et seq., as amended by Pub.L. 91-604), and under the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq., as amended by Pub.L. 92-500), Executive Order 11738, and regulations in implementation thereof (40 CFR 15) is not listed, on the date of contract award, on the U.S. Environmental Protection Agency (EPA) List of Violating Facilities pursuant to 40 CFR 15.20.

2. That the firm agrees to comply and remain in compliance with all the requirements of Section 114 of the Clean Air Act and Section 308 of the Federal Water Pollution Control Act and all regulations and guidelines listed thereunder.

3. That the firm shall promptly notify the SHA of the receipt of any communication from the Director, Office of Federal Activities, EPA, indicating that a facility that is or will be utilized for the contract is under consideration to be listed on the EPA List of Violating Facilities.

4. That the firm agrees to include or cause to be included the requirements of paragraph 1 through 4 of this Section X in every nonexempt subcontract, and further agrees to take such action as the government may direct as a means of enforcing such require-ments.

XI. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

1. **Instructions for Certification - Primary Covered Transactions:**

(Applicable to all Federal-aid contracts - 49 CFR 29)

a. By signing and submitting this proposal, the prospective primary participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective primary participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the department or agency determined to enter into this transaction. If it is later determined that the prospective primary participant knowinglyrendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause of default.

d. The prospective primary participant shall provide immediate written notice to the department or agency to whom this proposal is submitted if any time the prospective primary participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the department or agency to which this proposal is submitted for assistance in obtaining a copy of those regulations.

f. The prospective primary participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective primary participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the nonprocurement portion of the "Lists of Parties Excluded From Federal Procurement or Nonprocurement Programs" (Nonprocurement List) which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph f of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Primary Covered Transactions

1. The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

b. Have not within a 3-year period preceding this proposal been convicted of or had a civil judgement rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph 1b of this certification; and

d. Have not within a 3-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

2. Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

2. **Instructions for Certification - Lower Tier Covered Transactions:**

(Applicable to all subcontracts, purchase orders and other lower tier transactions of $25,000 or more - 49 CFR 29)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "primary covered transaction," "participant," "person," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive

Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Covered Transactions:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XII. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

(Applicable to all Federal-aid construction contracts and to all related subcontracts which exceed $100,000 - 49 CFR 20)

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

3. The prospective participant also agrees by submitting his or her bid or proposal that he or she shall require that the language of this certification be included in all lower tier subcontracts, which exceed $100,000 and that all such recipients shall certify and disclose accordingly.

NOTICE OF REQUIREMENTS FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY (EXECUTIVE ORDER 11246)

1. The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.

2. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Timetables	Goals for female participation in each trade (percent)
From April 1, 1978 until March 31, 1979	3.1
From April 1, 1979 until March 31, 1980	5.1
From April 1, 1980 until March 31, 1981	6.9

Until further notice	Goals for minority participation for each trade (percent)
SHSA Cities:	
Pascagoula - Moss Point	16.9
Biloxi - Gulfport	19.2
Jackson	30.3
SMSA Counties:	
Desoto	32.3
Hancock, Harrison, Stone	19.2
Hinds, Rankin	30.3
Jackson	16.9
Non-SMSA Counties:	
George, Greene	26.4
Alcorn, Benton, Bolivar, Calhoun, Carroll, Chickasaw, Clay, Coahoma,Grenada, Itawamba, Lafayette, Lee, Leflore, Marshall, Monroe,Montgomery, Panola, Pontotoc, Prentiss, Quitman, Sunflower,Tallahatchie, Tate, Tippah, Tishomingo, Tunica, Union, Washington, Webster, Yalobusha	26.5
Attala, Choctaw, Claiborne, Clarke, Copiah, Covington, Franklin, Holmes, Humphreys, Issaquena, Jasper, Jefferson, Jefferson Davis, Jones Kemper, Lauderdale, Lawrence, Leake, Lincoln, Lowndes, Madison, Neshoba, Newton, Noxubee, Oktibbeha, Scott, Sharkey, Simpson, Smith, Warren, Wayne, Winston, Yazoo	32.0
Forrest, Lamar, Marion, Pearl River, Perry, Pike, Walthall	27.7
Adams, Amite, Wilkinson	30.4

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the contractor also is subject to the goals for both its federally involved and nonfederally involved construction.

The Contractor's compliance with the Executive Order and the regulations in CFR Part 60-4 shall be based on its implementation of the Equal Opportunity clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of $10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor, employer identification number of the subcontractor, estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed.

4. As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is to the county and city (if any), stated in the advertisement.

5. The notification required in Paragraph 3 shall be addressed to the following:

Contract Compliance Officer
Mississippi Department of Transportation
P.O. Box 1850
Jackson, Mississippi 39215-1850

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-104-1 **CODE: (IS)**

DATE: **05/03/2004**

SUBJECT: **Partnering Process**

Section 104, Scope of Work, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-104.01--Intent of Contract. At the end of Subsection 104.01 on Page 24, add the following:

907-104.01.1--Partnering Process.

COVENANT OF GOOD FAITH AND FAIR DEALING:

This contract imposes an obligation of good faith and fair dealing in its performance and enforcement.

The contractor and the Department, with a positive commitment to honesty and integrity, agree to the following mutual duties:

A. Each will function within the laws and statutes applicable to their duties and responsibilities.

B. Each will assist in the other's performance.

C. Each will avoid hindering the other's performance.

D. Each will proceed to fulfill its obligations diligently.

E. Each will cooperate in the common endeavor of the contract.

VOLUNTARY PARTNERING:

The Mississippi Department of Transportation intends to encourage the foundation of a cohesive partnership with the contractor and its principal subcontractors and supplier. This partnership will be structured to draw on the strengths of each organization to identify and achieve reciprocal goals. The objectives are effective and efficient contract performance and completion within budget, on schedule, and in accordance with plans and specifications.

This partnership will be bilateral in make-up, and participation will be totally voluntary. Any cost associated with effectuating this partnering will be agreed to by both parties and will be shared equally.

To implement this partnering initiative prior to starting of work in accordance with the requirements of Subsection 108.02 Notice to Proceed and prior to the preconstruction conference, the contractor's management personnel and MDOT's District Engineer, will initiate a partnering development seminar/team building workshop. The Contractor working with the assistance of the District and the State Construction Engineer will make arrangements to determine attendees for the workshop, agenda of the workshop, duration, and location. Persons required to be in attendance will be the MDOT key project personnel, the contractor's on-site project manager and key project supervision personnel of both the prime and principal subcontractors and suppliers. The project design engineers, FHWA and key local government personnel will be also be invited to attend as necessary. The contractors and MDOT will also be required to have Regional/District and Corporate/State level managers on the project team.

Follow-up workshops may be held periodically throughout the duration of the contract as agreed by the contractor and Mississippi Department of Transportation.

The establishment of a partnership charter on a project will not change the legal relationship of the parties to the contract nor relieve either party from any of the terms of the contract.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-105-3 **CODE: (IS)**

DATE: 02/14/2006

SUBJECT: Cooperation By Contractor

Section 105, Control of Work, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is modified as follows:

907-105.05--Cooperation by Contractor. In the third sentence of the second paragraph of Subsection 105.05 on page 35, change "Notice to Proceed" to "Notice of Award".

Delete the fourth paragraph of Subsection 105.05 on page 35, and substitute the following.

The Contractor shall also designate a responsible person whose primary duty shall be to monitor and maintain the effectiveness of the erosion control plan, including NPDES permit requirements. This responsible person must be a Certified Erosion Control Person certified by an organization approved by the Department. Prior to or at the pre-construction conference, the Contractor shall designate in writing the Certified Erosion Control Person to the Project Engineer. The designated Certified Erosion Control Person shall be assigned to only one (1) project. When special conditions exist, such as two (2) adjoining projects or two (2) projects in close proximity, the Contractor may request in writing that the State Construction Engineer approve the use of one (1) Certified Erosion Control Person for both projects. The Contractor may request in writing that the Engineer authorize a substitute Certified Erosion Control Person to act in the absence of the Certified Erosion Control Person. The substitute Certified Erosion Control Person must also be certified by an organization approved by the Department. A copy of the Certified Erosion Control Person's certification must be included in the Contractor's Protection Plan as outlined in Subsection 907-107.22.1. This in no way modifies the requirements regarding the assignment and availability of the superintendent.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SUPPLEMENT TO SPECIAL PROVISION NO. 907-107-1

DATE: 03/21/2006

SUBJECT: Liability Insurance

In the first sentence of the first paragraph of Subsection 907-107.14.2.1 on page 1, change "$300,000 each occurrence" to "$500,000 each occurrence".

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-107-1 **CODE: (IS)**

DATE: **05/03/2004**

SUBJECT: **Liability Insurance**

Section 107, Legal Relations and Responsibility to Public, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-107.14.2--Liability Insurance. Delete in toto Subsection 107.14.2 beginning on page 60 and substitute:

907-107.14.2.1--General. The Contractor shall carry Contractor's liability, including subcontractors and contractual, with limits not less than: $300,000 each occurrence; $1,000,000 aggregate; automobile liability - $500,000 combined single limit - each accident; Workers' Compensation and Employers' Liability - Statutory & $100,000 each accident; $100,000 each employee; $500,000 policy limit. Each policy shall be signed or countersigned by a Mississippi Resident Agent of the insurance company.

The Contractor shall have certificates furnished to the Department from the insurance companies providing the required coverage. The certificates shall be on the form furnished by the Department and will show the types and limits of coverage.

907-107.14.2.2--Railroad Protective. The following provisions are applicable to all work performed under a contract on, over or under the rights-of-way of each railroad shown on the plans.

The Contractor shall assume all liability for any and all damages to work, employees, servants, equipment and materials caused by railroad traffic.

Prior to starting any work on railroad property, the Contractor shall furnish satisfactory evidence to the Department that insurance of the forms and amounts set out herein in paragraphs (a) and (b) has been obtained. Also, the Contractor shall furnish similar evidence to the Railroad Company that insurance has been obtained in accordance with the Standard Provisions for General Liability Policies and the Railroad Protective Liability Form as published in the Code of Federal Regulations, 23 CFR 646, Subpart A. Evidence to the Railroad Company shall be in the form of a Certificate of Insurance for coverages required in paragraph (b), and the original policy of the Railroad Protective Liability Insurance for coverage required in paragraph (a).

All insurance herein specified shall be carried until the contract is satisfactorily complete as evidenced by a release of maintenance from the Department.

The Railroad Company shall be given at least 30 days notice prior to cancellation of the Railroad Protective Liability Insurance policy.

For work within the limits set out in Subsection 107.18 and this subsection, the Contractor shall provide insurance for bodily injury liability, property damage liability and physical damage to property with coverages and limits no less than shown in paragraphs (a) and (b). Bodily injury shall mean bodily injury, sickness, or disease, including death at anytime resulting therefrom. Property damage shall mean damages because of physical injury to or destruction of property, including loss of use of any property due to such injury or destruction. Physical damage shall mean direct and accidental loss of or damage to rolling stock and their contents, mechanical construction equipment or motive power equipment.

(a) **Railroad Protective Liability Insurance** shall be purchased on behalf of the Railroad Company with limits of $2,000,000 each occurrence; $6,000,000 aggregate applying separately to each annual period for lines without passenger trains. If the line carries passenger train(s), railroad protective liability insurance shall be purchased on behalf of the Railroad Company with limits of $5,000,000 each occurrence; $10,000,000 aggregate applying separately to each annual period.

Coverage shall be limited to damage suffered by the railroad on account of occurrences arising out of the work of the Contractor on or about the railroad right-of-way, independent of the railroad's general supervision or control, except as noted in paragraph 4 below.

Coverage shall include:

(1) death of or bodily injury to passengers of the railroad and employees of the railroad not covered by State workmen's compensation laws,

(2) personal property owned by or in the care, custody or control of the railroads,

(3) the Contractor, or any of the Contractor's agents or employees who suffer bodily injury or death as a result of acts of the railroad or its agents, regardless of the negligence of the railroads, and

(4) negligence of only the following classes of railroad employees:

(i) any supervisory employee of the railroad at the job site

(ii) any employee of the railroad while operating, attached to, or engaged on, work trains or other railroad equipment at the job site which are assigned exclusively to the Contractor, or

(iii) any employee of the railroad not within (i) or (ii) above who is specifically loaned or assigned to the work of the Contractor for prevention of accidents or protection or property, the cost of whose services is borne specifically by the Contractor or Governmental authority.

(b) **Regular Contractor's Liability**, including subcontractors, XCU and railroad contractual with limits of $1,000,000 each occurrence; $2,000,000 aggregate. **Automobile** with limits of $1,000,000 combined single limit any one accident; **Workers' Compensation and Employer's Liability** - statutory and $100,000 each accident; $100,000 each employee; $500,000 policy limit. **Excess/Umbrella Liability** $5,000,000 each occurrence; $5,000,000 aggregate. All coverage to be issued in the name of the Contractor shall be so written as to furnish protection to the Contractor respecting the Contractor's operations in performing work covered by the contract. Coverage shall include protection from damages arising out of bodily injury or death and damage or destruction of property which may be suffered by persons other than the Contractor's own employees.

In addition, the Contractor shall provide for and on behalf of each subcontractor by means of a separate and individual liability and property damage policy to cover like liability imposed upon the subcontractor as a result of the subcontractor's operations in the same amounts as contained above; or, in the alternative each subcontractor shall provide same.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-107-2 **CODE: (IS)**

DATE: **08/12/2005**

SUBJECT: **Permits, Licenses and Taxes**

Section 107, Legal Relations and Responsibility to Public, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-107.02--Permits, Licenses and Taxes. Delete in toto Subsection 107.02 on page 49 and substitute the following:

The Contractor or any Subcontractor shall have the duty to determine any and all permits and licenses required and to procure all permits and licenses, pay all charges, fees and taxes and issue all notices necessary and incidental to the due and lawful prosecution of the work. At any time during the life of this contract, the Department may audit the Contractor's or Subcontractor's compliance with the requirements of this section.

The Contractor or any Subcontractor is advised that the "Mississippi Special Fuel Tax Law", Section 27-55-501, et seq. and the Mississippi Use Tax Law, Section 27-67-1, et seq., and their requirements and penalties, apply to any contract or subcontract for construction, reconstruction, maintenance or repairs, for contracts or subcontracts entered into with the State of Mississippi, any political subdivision of the State of Mississippi, or any Department, Agency, Institute of the State of Mississippi or any political subdivision thereof.

The Contractor or any Subcontractor will be subject to one or more audits by the Department during the life of this contract to make certain that all applicable fuel taxes, as outlined in Section 27-55-501, et seq., and any sales and/or use taxes, as outlined in Section 27-67-1, et seq. are being paid in compliance with the law. The Department will notify the Mississippi State Tax Commission of the names and addresses of any Contractors or Subcontractors.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-107-3 **CODE: (IS)**

DATE: **02/14/2006**

SUBJECT: **Contractor's Protection Plan**

Section 107, Legal Relations and Responsibility to Public, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-107.22.1--Contractor's Protection Plan. After item number 3 in Subsection 107.22.1 on page 65, add the following:

4. A copy of the certification for the Contractor's Certified Erosion Control Person for monitoring and maintaining the effectiveness of the erosion control plan, including NPDES permit requirements.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-108-11 **CODE: (IS)**

DATE: **04/21/2006**

SUBJECT: **Prosecution and Progress**

Section 108, Prosecution and Progress, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-108.01--Subletting of Contract.

907-108.01.1--General. At the end of the last paragraph of Subsection 108.01.1 on page 73, add the following:

The Engineer will have the authority to suspend the work wholly or in part and to withhold payments because of the Contractor's failure to make prompt payment within 15 calendar days as required above, or failure to submit the required OCR-484 Form, Certification of Payments to Subcontractors, which is also designed to comply with prompt payment requirements.

907-108.02--Notice To Proceed. Delete the fourth paragraph of Subsection 108.02 on page 75 and substitute the following:

Upon written request from the Contractor and if circumstances permit, the Notice to Proceed may be issued at an earlier date subject to the conditions stated therein. The Contractor shall not be entitled to any monetary damages or extension of contract time for any delay claim or claim of inefficiency occurring between the early issuance Notice To Proceed date and the Notice to Proceed date stated in the contract.

907-108.06.1.2--Contract Time Assessment. At the end of the eighth paragraph of Subsection 108.06.1.2 on page 81, add the following:

When the approved progress schedule indicates that a controlling phase(s) is to be completed prior to December 1 and the physical features of the phase(s) have not been satisfactorily completed, beginning on December 1 the miscellaneous phase will be shown as the only active phase during the months of December, January, and February. Under this condition, time units, monthly time units divided by monthly calendar days, will be assessed in accordance with the applicable column in the TABLE OF TIME UNITS. If the physical features of the phase(s) have not been completed by March 1, the phase will resume as a controlling phase and time assessment will be made accordingly.

Delete the fourth and fifth sentence of the thirteenth paragraph of Subsection 108.06.1.2 on page 82, and substitute the following:

In the event mutual agreement cannot be reached, the Contractor will be allowed a maximum of 25 calendar days following the Contractor's receipt of the monthly report in question to file a protest Notice of Claim in accordance with the provisions of Subsection 105.17. Otherwise, the Engineer's assessment shall be final unless mathematical errors of assessment are subsequently found to exist.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-109-3 **CODE: (IS)**

DATE: 04/06/2006

SUBJECT: Partial Payment

Section 109, Measurement and Payment, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-109.04--Extra and Force Account Work. Delete the first sentence of the second paragraph of Subsection 109.04 under (d) on page 92 and substitute the following:

In the event an agreement cannot be reached for a particular piece of equipment, the book entitled "Rental Rate Blue Book For Construction Equipment" as published by EquipmentWatch® and is current at the time the force account work is authorized will be used to determine equipment ownership and operating expense rates.

907-109.06--Partial Payment.

907-109.06.1--General. In the fourth sentence of the third paragraph of Subsection 109.06.1 on page 94, change “15 calendar days” to “25 calendar Days”.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-222-1 **CODE: (SP)**

DATE: **05/11/2004**

SUBJECT: **Wildflower Seeding**

Section 907-222, Wildflower Seeding, is hereby added to and made a part of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows:

SECTION 907-222 -- WILDFLOWER SEEDING

907-222.01--Description. This work shall consist of furnishing the specified kind(s) of wildflower seeds, herbicide material for site preparation and mulch material; planting the seeds in a prepared and approved seedbed; compacting the planted area(s); and providing plant establishment, all in accordance with these specifications and in reasonable close conformity with the locations shown on the plans or established by the Engineer.

907-222.02--Materials.

907-222.02.1--Seeds. Wildflower seeds shall be furnished in containers labeled or tagged with the scientific and common names of each kind along with the percent/pounds of each to make up the mixture. The Contractor shall acquire the seed or seed mixture from a commercial seed supplier. The Contractor shall have the supplier furnish a certified letter to the Engineer that the seeds furnished are from the current seed crop.

The Contractor shall protect the seeds from damage until planted. Seed containers that appear, by visual inspection, to be damaged will not be acceptable.

The seed or seed mixtures to be planted shall be specified on the plans.

907-222.02.2--Herbicides. The herbicide material used in preparing the site to kill the existing vegetation shall be 41% Isopropyl Amine Salt of Glyphosphate. The rate of glyphosphate shall be five (5) quarts in twenty-five (25) to thirty (30) gallons of potable water per acre.

907-222.02.3--Fertilizers. All fertilizers shall be uniform in composition, free flowing and suitable for application with approved equipment. Fertilizers shall be delivered to the site fully labeled according to applicable state fertilizer laws and shall bear the name, trade name or trade-mark and warranty of the producer/manufacturer.

Fertilizer application rates shall be determined by soil tests. A minimum of one soil test sample per every 10,000 square feet will be required. Tests shall then be combined and averaged for determining application rates.

Fertilizer shall be distributed uniformly over the entire area to receive wildflower seed.

907-222.02.4--Lime. Low pH Correction Materials: Lime material shall be ground limestone (hydrated or burnt lime may be substituted) which contains at least 50% total oxides (calcium oxide plus magnesium oxide). Ground limestone shall be ground to such fineness that at least 50% will pass through a 100-mesh sieve and 98% to 100% will pass through a 20-mesh sieve.

Lime application rates shall be determined by soil tests. A minimum of one soil test sample per every 10,000 square feet will be required. Tests shall then be combined and averaged for determining application rates.

Lime shall be distributed uniformly over the entire area to receive wildflower seed.

High pH Correction Materials: Materials and application rates shall be determined by appropriate soil tests performed by an approved laboratory. If leaching or special management is necessary, final grading will be delayed as specified.

907-222.03--Construction Requirements.

907-222.03.1--Construction Methods. Prior to planting the seeds, ground preparation, herbicide application, fertilization and liming shall have been satisfactorily performed in accordance with the contract and the area approved by the Engineer for planting.

Tillage: Soil amendments such as lime and fertilizer shall be uniformly mixed into the top four inches of soil by discing, harrowing or other approved method.

Final Grading: Any undulations or irregularities in the surface resulting from fertilization, liming, tilling, or other causes shall be smoothed prior to wildflower seed installation. Flooded, washed out areas damaged or otherwise, shall be reconstructed and all grades re-established by the Contractor in accordance with the applicable specifications, or site conditions that existed prior to wash-out if grades are not specified.

The rates of application and the planting dates of seed shall be as set out in the plant material schedule on the plans. Seed quantities that are required per wildflower planting area, are indicated on the planting plans.

Herbicide applications for site preparation shall be performed to kill existing vegetation on designated areas to receive wildflower seed. The herbicide shall be uniformly applied, conforming to the manufacturer's recommendation, a minimum of ten days, or until all vegetation appears to be dead, prior to seedbed preparation in an approved manner at the rate specified in Subsection 907-222.02.2.

When designated by the Engineer, the dead vegetation shall be cut, raked and removed from the seedbed areas, and disposed of in an approved manner.

Light ground preparation shall be performed for seedbed preparation on designated areas. This work shall consist of discing and/or tilling the soil as required to provide a uniform and thoroughly pulverized soil to a depth of approximately four (4) inches with approved equipment to the satisfaction of the Engineer.

The seeds shall be uniformly sown on the prepared seedbed, in an approved manner, immediately after the ground preparation is completed and approved by the Engineer.

Upon completion of the seeding operation, the seeded area shall be compacted with an approved cultipacker to the satisfaction of the Engineer.

Upon completion of the seeding and cultipacking operation, the seeded area shall be mulched as indicated on the plans. The application of the mulch shall conform to Section 215 of the Standard Specifications, except that anchoring will not be required. Mulch shall be required unless indicated otherwise on the plans or so directed by the Engineer.

907-222.03.2--Plant Establishment. The Contractor shall be required to provide plant establishment on all areas where wildflower seeds are planted, until release of maintenance.

Plant establishment shall consist of preserving, protecting, watering, reseeding, controlling obnoxious vegetation by approved methods, and such other work as may be deemed necessary to keep the planted area(s) in a satisfactory condition.

The Engineer may require reseeding on area(s) which, for any cause, is (are) deemed to be unsatisfactory. Unless otherwise directed by the Engineer, these areas shall be prepared and seeded as if the reseeding was the initial seeding.

The Contractor shall be responsible for any damage to the vegetation outside the wildflower area(s) and shall repair or replace such damaged vegetation, as directed by the Engineer, at no additional cost to the State.

907-222.03.3--Water. Potable water shall be furnished by the Contractor and applied to the wildflower areas in adequate quantities to insure the healthy growth of the plants, until final acceptance of the project by the State. The Contractor shall make, at no additional costs to the State, whatever arrangements may be necessary to insure an adequate supply of water to meet the needs. The Contractor shall also furnish all necessary hose, equipment, attachments and accessories as may be necessary to complete the work specified.

907-222.04--Method of Measurement. Wildflower seeding will be measured by the acre as indicated on the plans and in the bid schedule of the contract.

907-222.05--Basis of Payment. Wildflower seeding, measured as prescribed above, will be paid for at the contract unit price bid per acre, which price shall be full compensation for furnishing all seeds; herbicide and mulch; water; for all site preparation; seedbed preparation and

compaction; for all plant establishment until release of maintenance; and for all equipment, tools labor and incidentals necessary to complete the work.

Payment will be made under:

907-222-A: Wildflower Seeding - per acre

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-226-1 **CODE: (IS)**

DATE: 06/23/2004

SUBJECT: Temporary Grassing

Section 907-226, Temporary Grassing, is hereby added to and made part of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows:

SECTION 907-226 -- TEMPORARY GRASSING

907-226.0l--Description. This work consists of furnishing, transporting, placing, plant establishment and all work necessary to produce rapid-growing grasses, grains or legumes to provide an initial, temporary cover of grass. This work includes ground preparation, fertilizing, seeding and mulching necessary to establish a satisfactory growth of temporary grass.

The Engineer or the plans will designate areas to be temporarily grassed. Any other areas the Contractor desires to grass will be measured for payment on if agreed upon by the Engineer.

907-226.02--Materials.

907-226.02.1--Fertilizers. Fertilizers for purposes of these specifications shall be understood to include standard manufactured products consisting of single or combination ingredients and agricultural limestone.

All fertilizer shall comply with the State fertilizer laws and the requirements of these specifications.

Fertilizers shall meet the requirements of Subsection 715.02.

907-226.02.2--Seeds. Seeds shall meet the requirements of Subsection 715.03, subject to the provisions of this subsection. The Contractor shall acquire seed from persons registered with the Mississippi Department of Agriculture and Commerce.

Except for the germination requirements, bags of seeds properly labeled or tagged according to law and indicating characteristics meeting or exceeding the requirements of Subsection 715.03 will be acceptable for planting.

The Contractor should provide adequate dry storage facilities for seeds, and shall furnish access to the storage for sampling stored seed.

907-226.02.3--Mulching. The vegetative materials for mulch shall meet the requirements of Subsection 715.05.

When used, bituminous material for mulch shall be Emulsified Asphalt, Grade SS-1, meeting the requirement of Subsection 702.07.

907-226.03--Construction Requirements. When the payment for temporary grassing is made using individual pay items, the rate of application shall not exceed the rate shown on the temporary vegetation schedule, unless otherwise approved by the Engineer. Any unauthorized overage due to increased application rates will not be measured for payment.

907-226.03.1--Ground Preparation.

907-226.03.1.1--General. Any equipment used for ground preparation shall be approved units suitable to perform the work and subject to the requirements of Subsection 108.05.

Light ground preparation should be used on areas where seeding is required to improve the coverage of partially vegetated areas.

907-226.03.1.2--Light Ground Preparation. Light ground preparation consists of scratching the surface with a close-tooth harrow, disk-harrow, or similar equipment. The depth of scratching should be at least three-quarters inch but not deep enough to damage existing grasses of the type being planted.

Aerating, moistening, or otherwise bringing the soil to a suitable condition for ground preparation shall be considered as incidental to the work and will not be measured for separate payment.

907-226.03.2--Fertilizing. The Contractor shall furnish all equipment necessary to properly handle, store, uniformly spread, and incorporate the specified application of fertilizer.

The Contractor shall incorporate fertilizer at a rate of 500 pounds per acre of 13-13-13 commercial fertilizer. The equivalent rate of other type fertilizers will be allowed if the equivalent percentages of Nitrogen, Phosphorus and Potassium are obtained. Fertilization shall be applied uniformly on the areas to be planted or seeded and uniformly incorporated into the soil.

Fertilizers should be applied on individual areas of not more than three acres.

All fertilizer should be incorporated within 24 hours following spreading.

907-226.03.3--Seeding.

907-226.03.3.1--General. Prior to planting the seeds, ground preparation and fertilizing should have been satisfactorily performed.

The required type of seeds, recommended rates of application and recommended planting dates of seeds are shown in the vegetation schedule on the plans. It is the Contractor's responsibility to apply an ample amount of each type of seed to produce a satisfactory growth of grass and of the seed type required.

Legume seeds should be treated in accordance with Subsection 715.03.4 immediately before sowing. Seeds should be uniformly sown over the entire area with mechanical seeders. Seeds of different sizes may necessitate separate sowing. When legume seeds become dry, they should be reinoculated.

Seeding should not be done during windy weather or when the ground is frozen, extremely wet, or in an untillable condition.

All seeds should be covered lightly with soil by raking, rolling, or other approved methods, and the area compacted with a cultipacker.

907-226.03.3.2--Plant Establishment. Plant establishment shall consist of preserving, protecting, watering, reseeding, and other work necessary to keep the seeded areas in satisfactory condition.

Areas requiring reseeding should be prepared and seeded and all other work performed as if the reseeding was the initial seeding. The types and application rates of fertilizer will be at the discretion of the Contractor.

907-226.03.3.3--Growth and Coverage. It shall be the Contractor's responsibility to provide satisfactory growth and coverage of grasses, legumes, or combination produced from the specified seeding.

Growth and coverage on seeded areas will be considered to be in reasonably close conformity with the intent of the contract when the type of vegetation specified, exclusive of that from seeds not expected to have germinated and shows growth at that time, has reached a point of maturity where stems or runners overlap adjacent similar growth in each direction over the entire area.

907-226.03.4--Mulching.

907-226.03.4.1--Equipment. Mulching equipment should be capable of maintaining a constant air stream which will blow or eject controlled quantities of mulch in a uniform pattern. If asphalt is used, a jet or spray nozzle for applying uniform, controlled amounts of asphalt to the vegetative material as it is ejected should be located at or near the discharge spout.

Mulch stabilizers should consist of dull blades or disks without camber and approximately 20 inches in diameter. The disks should be notched, should be spaced at approximately 8-inch intervals, and should be equipped with scrapers. The stabilizer should weigh approximately 1000 to 1200 pounds, should have a working width of no more than eight feet, and should be equipped with a ballast compartment, so that weight can be increased.

907-226.03.4.2--Placement of Vegetative Mulch. If required, mulching should be placed uniformly on designated areas within 24 hours following seeding unless weather conditions are such that mulching cannot be performed. Placement should begin on the windward side of areas and from tops of slopes. In its final position, the mulch should be loose enough to allow air to circulate but compact enough to partially shade the ground and reduce erosion.

The baled material should be loosened and broken thoroughly before it is fed into the machine to avoid placement of unbroken clumps.

907-226.03.4.3--Rates of Application and Anchoring Mulch. The recommended rate of application of vegetative mulch shall be as shown in the vegetation schedule in the plans. The mulch should be anchored by either the use of a mulch stabilizer or by tacking with bituminous material. If a mulch stabilizer is used, the mulch should be punched into the soil for a minimum depth of one inch. If bituminous material is used, the rate of application should be 150 gallons per acre.

Where steep slopes or other conditions are such that anchoring cannot be performed satisfactory with a mulch stabilizer, the Contractor may elect to use bituminous material applied at the time or immediately following the mulch placement.

When mulch stabilizers are used, anchoring the mulch should be performed along the contour of the ground surface.

907-226.03.4.4--Protection and Maintenance. The Contractor should take every precaution to prevent unnecessary foot and vehicular traffic.

907-226.04--Method of Measurement. When a pay item for temporary grassing is included in the plans, temporary grassing will be measured by the acre. Acceptance will be based on a satisfactory growth and coverage of seeds planted. When a pay item for temporary grassing is not included in the plans, temporary grassing shall be measured for payment using the appropriate pay items in the contract.

907-226.05--Basis of Payment. When a pay item for temporary grassing is included in the plans, temporary grassing, measured as prescribed above, will be paid for at the contract unit price per acre, which will be full compensation for all required materials, equipment, labor, testing and all work necessary to establish a satisfactory growth of grass.

Payment will be made under:

907-226-A: Temporary Grassing - per acre

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-230-4 **CODE: (SP)**

DATE: 09/19/2005

SUBJECT: Tree and Shrub Planting

Section 230, Tree and Shrub Planting, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-230.2--Materials. Delete Subsection 230.02.14 on page 165 and substitute the following:

907-230.02.14--Mulch. Tree Bark Mulch shall meet the requirements of Subsection 907-233.02.

907-230.02.15--Bed Edging. Bed edging shall be steel edging, 3/16-inch by 4-inch in size, green in color with steel stakes, manufactured by Ryerson, Gardener's Supply Company, Sure-loc Edging, or approved equal.

907-230.03--Construction Requirements.

907-230.03.7--Planting, Backfilling, and Watering. After the first paragraph of Subsection 230.03.7 on page 166, add the following:

Plant pits are plant bed areas which are bound all around by bed edging and/or paving, or as noted on the drawings. Bed preparation shall be required within plant pits, which shall consist of stripping the proposed bed area of existing grass or plant material, unless designated to remain; removal and disposal of existing soil in order that finished grade of bed, not including surface mulch, is no higher than surrounding grades/pavement edges unless noted otherwise on the drawings; spreading a 4-inch layer of Tree Bark Mulch, Type III throughout the area, and tilling in the Tree Bark Mulch, Type III to a depth of six inches uniformly throughout the area; and excavating plant holes in accordance with this special provision. The entire bed area shall receive Tree Bark Mulch, Type V as a surface mulch.

Within plant pits, additional Tree Bark Mulch, Type III for each tree, shrub and groundcover plant hole is not necessary beyond the uniform layer of application tilled into the soil as noted on the vegetation schedule. Within each tree and shrub plant hole within a plant pit, backfill with a 50/50 mix of existing soil amended with Type III mulch and topsoil. Groundcover plant holes do not require any other backfill material other than the amended existing soil with Type III mulch incorporated.

Backfill for tree and shrub plant holes outside of plant pits shall be a 50/50 mix of existing soil and topsoil, after applying the 4-inch layer of Tree Bark Mulch, Type III.

907-230.04--Method of Measurement: Delete the last five paragraphs of Subsection 230.04 on pages 169 & 170 regarding the sequence for measurement of payment and substitute the following:

Measurement for payment will be made in the following sequence:

When plants have been planted and are in a healthy condition in accordance with the contract, seventy-five percent (75%) of the bid price for that species of plant material meeting the requirements of the contract will be allowed.

When the inspection of plants at the end of the growing season has been conducted and the replacement of any dead or unsatisfactory plant material has been made, ninety percent (90%) of the bid price for that species of plant material meeting the requirements of the contract will be allowed.

When the final inspection of the project has been conducted and the replacement of any dead or unsatisfactory plant material has been made, and upon final release of maintenance, one-hundred percent (100%) of the bid price will be allowed for plant material meeting the requirements of the contract.

The Plant Establishment Period shall begin upon the date that the Engineer determines plant material installation has been acceptably completed, including staking/ guying and mulching, and continues through the dates noted below:

PLANT ESTABLISHMENT PERIOD

Date of Installation Completion, From and Including	Establishment Period Beyond Installation Completion, (Growing Season) To and Including
August 2nd - November 1st	240 calendar days
November 2nd - January 1st	180 calendar days
January 2nd - May 1st	120 calendar days
May 2nd - August 1st	90 calendar days

Where feasible in the opinion of the Engineer, the Contractor may install plant material well in advance of project completion, in order that the Plant Establishment Period may run concurrent with the Contract Time. However, no matter what date the Plant Establishment Period conclude, the Contractor will be required to maintain healthy plants until final inspection of the entire project.

No contract time or liquidated damages will be charged during the plant establishment period if, and only if, all items of work on the project have been completed.

Bed edging, complete in place and accepted, will be measured per linear foot. Excavation, backfilling, and miscellaneous fittings will not be measured for separate payment.

Bed preparation within plant pits, complete in place and accepted, will be measured per square foot. Stripping of existing vegetation, excavation of existing soil, providing and incorporating the designated layer of Tree Bark Mulch Type III, Tree Bark Mulch Type V as a surface mulch, and weeding will not be measured for separate payment.

Tree Bark Mulch will be measured for payment in accordance with Subsection 907-233.04.

907-230.05--Basis of Payment. After the first paragraph of Subsection 230.05 on page 170, add the following:

Accepted quantities for bed edging and bed preparation will be paid for at the contract unit price per linear foot and square foot, respectively. Prices paid shall be full compensation for completing the work.

Add the "907" prefix to the pay items numbers listed on page 170.

After the last pay item listed on page 170, add the following:

907-230-C: Bed Edging	- per linear foot
907-230-D: Bed Preparation	- per square foot

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-233-1 **CODE: (SP)**

DATE: **02/01/2005**

SUBJECT: **Tree Bark Mulch**

Section 233, Mulch for Woody Plant Material, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-233.02--Materials. After the first paragraph of Subsection 233.02 on page 176, add the following:

Tree Bark Mulch, Type III used for plant pits (multiple plants in one bed area) and plant holes outside of plant pit areas shall meet the requirements of Subsection 715.07. Tree Bark Mulch, Type V used for the surface mulching plant holes and plant pits shall be shredded cedar, cypress, pine, or hardwood bark strip (pole peelings), commercial type, with no pieces larger than 1½ inches across the surface. Once or twice hammered material is not acceptable for Tree Bark Mulch, Type V. The Contractor shall submit samples of all mulches to the Engineer and receive approval prior to delivery to site.

907-233.04--Method of Measurement. After the first paragraph of Subsection 233.04 on page 176, add the following:

Tree Bark Mulch, Type III, complete in place and accepted, will be measured per cubic yard for tree plant holes and for shrub plant holes outside of plant pit areas.

Tree Bark Mulch, Type V, complete in place and accepted, will be measured per cubic yard for tree and shrub plant holes outside of plant pit areas requiring bed preparation; and in unplanted areas where the mulch is utilized as a surface treatment. Tree Bark Mulch, Type V within plant pit areas will not be measured for payment.

907-233.05--Basis of Payment. After the first paragraph of Subsection 233.04 on page 176, add the following:

Accepted quantities for Tree Bark Mulch, Type V used as a surface mulch for tree and shrub plant holes not within plant pit areas, and in unplanted areas as a surface treatment will be paid for at the contract unit price per cubic yard. Prices paid shall be full compensation for completing the work.

Delete the first pay item listed on page 176, and substitute the following:

907-233-A: Tree Bark Mulch, Type - per cubic yard

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-242-7 **CODE: (SP)**

DATE: JUNE 15, 2006

SUBJECT: Pocahontas Rest Area

PROJECT: STP-0008-03(081) 103975 -- HINDS COUNTY

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DESCRIPTION B: (Pay Item 907-242-B) This Work shall consist of minor site work and to construct a Pre-Fabricated Guard Booth on Highway 49 at Pocahontas in Hinds County, Mississippi.

It is the intention of these Specifications to provide the necessary items and instruction for a complete Rest Area Facility including all code compliance; however, omission of items or instruction necessary or considered standard good practice for the proper installation and construction of the building, Guard House and Sewage Treatment Facility shall not relieve the Contractor of furnishing and installing such items and conforming to the building codes having jurisdiction.

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MISSISSIPPI DEPARTMENT OF TRANSPORTATION

PRE-BID MEETING
DOCUMENT 00150

PROJECT: **REST AREA ON HIGHWAY 49 AT POCAHONTAS IN HINDS COUNTY, MISSISSIPPI**

PROJECT NUMBER: **STP-0008-03(081) 103975**

DATE: **JUNE 15, 2006**

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 Conference Room at the MDOT District 5 Whitfield Project Office Building located at 3769 Highway 468, Pearl, Mississippi, telephone (601) 961-4097, at **10:00 A.M. on Tuesday, September 5, 2006.** Prospective bidders are encouraged to attend this meeting 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 as a group after meeting.

PART 2 PRODUCTS
Not Used

PART 3 EXECUTION
Not Used

END OF DOCUMENT

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.

AIA® Document A201™ – 1997

General Conditions of the Contract for Construction

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

REST AREA AT POCAHONTAS
HIGHWAY 49 IN HINDS COUNTY, MISSISSIPPI

THE OWNER:
(Name and address):

THE ARCHITECT:
(Name and address):

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

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

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

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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).

§ 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

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.

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§ 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 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 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.

ARTICLE 2 OWNER

§ 2.1 GENERAL

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

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

§ 2.2 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

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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 Section 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 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 Section 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 Section 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.

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

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Work, as well as the information furnished by the Owner pursuant to Section 2.2.3, shall take field measurements of any existing conditions related to that portion of the Work and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating 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 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 Sections 3.2.1 and 3.2.2, the Contractor shall make Claims as provided in Sections 4.3.6 and 4.3.7. If the Contractor fails to perform the obligations of Sections 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.

§ 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.

§ 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.

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§ 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;
- **.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 Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner 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

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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.

§ 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 Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals 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.

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§ 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 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 Section 3.12.10, the Architect will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance 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.

§ 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.

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§ 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 Section 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 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 Section 3.18.

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

ARTICLE 4 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 Section 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

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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 Section 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, 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 Sections 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.

§ 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 Sections 3.3, 3.5 and 3.12. The Architect's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may authorize minor changes in the Work as provided in Section 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.

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§ 4.2.11 The Architect will interpret and decide matters concerning performance under and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If no agreement is made concerning the time within which interpretations required of the Architect shall be furnished in compliance with this Section 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 Section 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 Section 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 proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 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 Section 4.3.

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§ 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 Section 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 Sections 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 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.

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§ 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 Sections 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.

§ 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 Sections 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 Section 4.5.

§ 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 Sections 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 Section 13.7.

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§ 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.

§ 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.

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§ 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 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 Section 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.

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 Section 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 Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces, 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

§ 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.

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§ 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 Section 10.2.5.

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

§ 6.3 OWNER'S RIGHT TO CLEAN UP

§ 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
- **.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 Section 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.

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

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

§ 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 Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.6 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.

§ 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.

§ 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.

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ARTICLE 8 TIME

§ 8.1 DEFINITIONS

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

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

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

§ 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.

§ 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 Section 4.3.

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

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 CONTRACT SUM

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

§ 9.2 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

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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 Section 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 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 Section 9.5.1.

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

.1 defective Work not remedied;

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.2 third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;

.3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;

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

.5 damage to the Owner or 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 Sections 9.6.2, 9.6.3 and 9.6.4.

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

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

§ 9.7 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 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.

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§ 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 Section 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 Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

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

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

§ 9.10 FINAL COMPLETION AND FINAL PAYMENT

§ 9.10.1 Upon receipt of 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

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the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

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

§ 9.10.3 If, after 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;
- **.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.

§ 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.

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

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

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

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

§ 10.2.7 The Contractor shall not 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.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) 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 Section 10.3 for materials and substances brought to the site by the Contractor unless such materials or substances were required by the Contract Documents.

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§ 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 Section 4.3 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 CONTRACTOR'S LIABILITY INSURANCE

§ 11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations 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 Section 3.18.

§ 11.1.2 The insurance required by Section 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from 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 Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. 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 Section 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 Sections 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 Section 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 Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.4 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

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

§ 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 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.

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§ 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 Section 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.

§ 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 Section 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 Section 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 Section 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 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 Section 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 Sections 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.

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§ 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.

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 Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.4.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after 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 Section 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 Section 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 Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract

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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 Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to an institutional lender providing construction financing for the Project. In such event, the lender 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.

§ 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 Section 13.5.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner's expense.

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

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

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

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

§ 13.6 INTEREST

§ 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 Section 3.5, the date of any correction of the Work or failure to correct the Work by the Contractor under Section 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.

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 Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- **.4** the Owner has failed to furnish to the Contractor promptly, upon the Contractor's request, reasonable evidence as required by Section 2.2.1.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, repeated suspensions, delays or interruptions of the entire Work

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by the Owner as described in Section 14.3 constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed 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 Section 14.1.3.

§ 14.2 TERMINATION BY THE OWNER FOR CAUSE

§ 14.2.1 The Owner may terminate the Contract if the Contractor:

- **.1** 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 Section 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 Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

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

§ 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 Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent:

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

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§ 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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PAGE 1

REST AREA AT POCAHONTAS
HIGHWAY 49 IN HINDS COUNTY, MISSISSIPPI

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I, James W. Vinson, hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 15:30:42 on 06/01/2006 under Order No. 1000237945_1 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A201™ – 1997 - General Conditions of the Contract for Construction, as published by the AIA in its software, other than those additions and deletions shown in the associated Additions and Deletions Report.

James W. Vinson

(Signed)

MDOT Architect

(Title)

06-06-06

(Dated)

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User Notes:

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, the Contractor shall discharge and shall not re-employ on the Project, any person who commits trespass or who is, in the opinion of the Project Engineer, dangerous, disorderly, insubordinate, incompetent, or otherwise objectionable.

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. 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 the representative for the MDOT Architectural Services Unit 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 twelve percent (12%) 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, or by any employee or either, or by changes ordered in the Work, or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or any causes beyond the Contractor’s control, or by any other causes which the Project Engineer determines may justify the delay, then the Contract time may be extended by Change Order for such reasonable time as the Engineer 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:

Regardless of the value of the earned work based on the value of work scheduled for completion by the approved progress schedule, no deduction for retainage will be made from payments and the advancement of materials due to the Contractor. Likewise, the Contractor shall not withhold any retainage from any payments due to a Subcontractor or Supplier.

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.

.3 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:

The definition of Substantial Completion shall be changed to mean the following: Substantial Completion shall be when the Project Engineer determines 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 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 11.4.1.3 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 as one (1) Contract to improve the Mississippi Department of Transportation site at Pocahontas in Hinds County, Mississippi. Separate Lump Sums as described in these Specifications and Drawings are to be given for each of the following separate descriptions, plus unit prices for the Pay Items.

1.	Description:	907-242-A.	Rest Area Building.	Lump Sum
2.	Description:	907-242-B.	Pre-Fabricated Guard Booth.	Lump Sum

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

C. Contractor's Duties:

1. Except as specifically noted, provide and pay for:
   a. Labor, materials, equipment.
   b. Tools, construction equipment, and machinery.
   c. Other facilities and services necessary for proper execution and completion of the Work.

2. Pay legally required sales, consumer, use, payroll, privilege and other taxes.
3. Secure and pay for, as necessary for proper execution and completion of Work, and as applicable at time of receipt of bids:
   a. Permits
   b. Government Fees
   c. Licenses

4. Give required notices.
5. Comply with codes, ordinances, rules, regulations, orders and other legal requirements of public authorities that bear on performance of Work.
6. Promptly submit written notice to Project Engineer of observed variance of Contract Documents from legal requirements. Appropriate modifications to Contract Documents will adjust necessary changes. Assume responsibility for Work known to be contrary to such requirements, without notice.
7. Enforce strict discipline and good order among employees. Do not employ on Work, unfit persons or persons not skilled in assigned task.
8. Schedule of Values: Submit 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 SUB-CONTRACT for each subcontractor before they are allowed to perform any Work.
10. Coordination: The Contractor is responsible for the coordination of the total Project and protection of existing structures to remain. 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
4. Contract Documents
5. Owner

B. The site is a Historical Landmark. No excavation shall be done to existing site grades, including the Indian Mound, without prior written permission of the Project Engineer.

C. Do not unreasonably encumber site with materials or equipment. Materials and Equipment storage areas shall be approved by the Project Engineer.

D. Do not load structure with weight that will endanger structure.

E. Assume full responsibility for protection and safekeeping of products stored on premises.

F. Move any stored products which interfere with operations of MDOT or other Contractors.

G. Obtain and pay for use of additional storage of work areas needed for operations.

H. Limit use of site for work and storage to the area indicated on the Drawings.

1.03 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Format: The Specifications are organized into Divisions and Sections using the 16-division format and CSI/CSC's "MasterFormat" numbering system.

1. Division 1: Sections in Division 1 govern the execution of the Work of all Sections in the Specifications.

B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.

    a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

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

C. Submittal Procedures:

1. Submit 6 copies of each Application for Payment to the Project Engineer.
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 STATEMENTS AND PAYROLLS

A. The Contractor and subcontractors shall submit weekly two copies of all payrolls to the Project Engineer and meet the requirements of U. S. Department of Transportation Form FHWA 1273, on projects constructed in whole or in part with Federal funds.

B. The Contractor and Subcontractors shall submit Form CAD-880, “Weekly Summary of Wage Rates” and CAD-881, “Weekly Statement of Compliance”, each week to the Project Engineer. The forms may be obtained from the Contract Compliance Officer, Contract Administration Division, Mississippi Department of Transportation, Jackson, Mississippi. Custom forms, approved by Contract Administration Division, may be used in lieu of CAD forms.

C. When no work is performed on Federal-Aid Projects, the Contractor should only submit CAD-880 showing no work activities

D. The Contractor shall make all efforts necessary to submit this information to the Project Engineer in a timely manner. The Engineer will have the authority to suspend the work wholly or in part and to withhold payments because of the Contractor's failure to submit the required information. Submission of forms and payrolls shall be current through the first week of the estimate period in order for the Project Engineer to process an estimate.

1.04 WAGE RATES

A. All persons employed or working upon the site of the Work will be paid at wage rates not less than those contained in the wage determination decision of the Secretary of Labor in effect at time of Advertisement for Bids and/or contained in the Contract.

1.05 CLASSIFICATIONS

A. The Department Contract Compliance Officer shall require that any class of laborers or mechanics, including apprentices and trainees, which is not listed in the wage determination and which is to be employed under the Contract, shall be classified or reclassified conformably to the wage determination.

1.06 BASIS OF PAYMENT

A. This Work will be paid for by Contract Sum for the construction in District Five. The Work includes Rest Area Building, Guard House and Sewage Treatment Facility on Highway 49 (Southbound) at Pocahontas in Hinds County, Mississippi. The Contract Sum shall be full compensation for all minor site work, for furnishing all materials, and all other Work and effort of whatever nature in the construction of the new weight enforcement administration building, the new 3-platform static scale 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: (Pay Item 907-242-7A) MDOT Project No. STP-0008-03(081) 103975 Rest Area Building on Highway 49 at Pocahontas in Hinds County, Mississippi..	lump sum
2.	DESCRIPTION B: (Pay Item 907-242-7B) MDOT Project No. STP-0008-03(081) 103975 Pre-Fabricated Guard Booth on Highway at Pocahontas in Hinds County, Mississippi.	lump sum
	TOTAL SP 907-242-7 CONTRACT SUM	**LUMP SUM**

PART 2 PRODUCTS & PART 3 EXECUTION (Not Used)

END OF SECTION

SECTION 01295 SCHEDULE OF VALUES

PART 1 GENERAL

1.01 DESCRIPTION

A. Scope: Submit 8 copies of the Schedule of Values to the MDOT Architectural Services Unit at least 10 days prior to submitting first Application for Payment. When this submittal is approved, a copy will be transmitted to Construction Administration to be used to review and compare to amounts submitted on the CAD-720 form. Other copies will be kept by Architectural Services Unit and distributed to Project Engineer, MDOT Consultants, and Contractor. 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.

4. Group line items to show subtotal of Description A and subtotal of Description B with the same amounts indicated on the Bid Forms and a total equal to the Contract amount indicated on the Bid Form.

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 as described above.

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.

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 Executive Director with copies to the Construction Engineer, Contract Administration Engineer, District Engineer, Project Engineer and Architectural Services Unit Director. 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. The superintendent shall advise the Project Engineer of an intended absence fro the work and designate a person to be in charge of the Work during such absence.
7. Permits: Assist in obtaining building and special permits required for construction.

B. Interpretations of Contract Documents
1. Consultation: Consult with Project Engineer to obtain interpretations.
2. Assistance: Assist in resolution of 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.
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 & 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 prior to commencement of the Work.

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

C. Attendance: Attending shall be the Project Engineer and MDOT representatives associated with the Project, the MDOT Architect and Consultants (if requested by the District), 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: Project Engineer’s 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 and Consultants (if requested by the District), 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 within 15 days after date of Notice to Proceed.
2. Submit to the Project Engineer periodically updated schedules accurately depicting progress to first day of each month.
3. Submit 2 copies to the Project Engineer.

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 MDOT Architectural Services Unit shop drawings, product data, and samples required by Specification Sections. Faxed submittals will **not** be accepted. Do **not** submit Material Safety Data Sheets for approval. Refer to Section 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: 9 Prints.
5. Shop drawings shall be stamped and signed by the Contractor certifying accuracy, completeness and compliance with Contract requirements prior to submitting to the MDOT Architectural Services Unit.

C. Product Data: Provide 9 copies each. 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 MDOT Architectural Services Unit.

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 Department 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 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.

1. Construct each sample or mock-up complete, including Work of all trades required in the finished Work. Field Samples are used to determine standards in materials, color, texture, workmanship, and overall appearance.
2. Work shall not be allowed using these materials until the mock-up is approved.
3. The mock-up shall not be destroyed, until after the Work it represents is finished, without permission of the Project Engineer. This mock-up shall be used as a standard to compare to the Work it represents for color, craftsmanship, overall appearance, and how the different materials make up the whole system.

F. 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 MDOT Architect's / Consultant's review of submittals.
5. Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved by review of submittals unless written acceptance of specific deviations is given.
6. Notify the Project Engineer 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 / Consultant's stamp and initials indicating review.
8. After MDOT Architect / Consultant's review, distribute copies.

G. Submission Requirements:

1. Schedule submission with ample time given to review submittals prior to being needed.
2. Submit 9 copies of shop drawings and product Data with additional number of copies, if required, by Contractor 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. **EACH COPY** of submittals shall include the following:
   a. Date and revision dates.
   b. Project title and number.
   c. The names of Project Engineer, Consultant, 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 Consultant'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 the Consultant.
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 / Consultant's stamp to: Project Engineer's File, Architectural Services Unit File, Architect's File(as required) / Electrical / Mechanical / Structural Engineer's File (as required), Materials' File (if concrete), Contractor's File, Job Site File, and Subcontractor, Supplier and/or Fabricator as necessary.
2. Distribute samples as directed. The Project Engineer, MDOT Architect and Consultant (as required) shall retain one of each.

J. MDOT Architect / Consultants' 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 Architectural Services Unit, which will forward one copy to the Project Engineer, one copy to the Materials Engineer (if concrete), and the remainder to the Contractor.
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 Project Engineer, that manufacturer cannot make scheduled delivery of accepted item, or;
2. Item delivered has been rejected and substitution of a suitable item is an urgent necessity, or;
3. Other conditions became apparent which indicates acceptance of such substitute item to be in the best interest of the Owner.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

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 Project Engineer’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.

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. 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

PART 1 GENERAL

1.01 GENERAL: Establish and initiate use of each temporary facility 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 will not be required to provide a temporary field office and storage shed(s).

A. Copies of Construction Documents: It shall be the responsibility of the Contractor to maintain storage files suitable to keep duplicates of all correspondence, shop drawings, plans, Specifications, samples, etc. required to administer the Project. These duplicates will be permanently kept as reference on site and shall not be used in the field. Contractor is to provide the Project Engineer 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 FURNISHING AND MAINTENANCE OF EQUIPMENT: Furnish and maintain all equipment such as temporary stairs, ladders, 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

1.04 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.

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

1.06 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.

1.07 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.

1.08 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(s).

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.

1.09 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.

1.10 POWDER ACTUATED TOOLS: The use of powder actuated tools shall be prohibited from use during all phases of the construction, unless explicitly approved in writing, prior to construction, by the Project Engineer.

1.11 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.

1.12 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
Not Used

PART 3 EXECUTION
Not Used

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. Selected Products.
2. 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 Project Engineer'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 / Engineer 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 Project Engineer's judgment, is equal to the level of excellence established by the product(s) selected as Architect's / Engineer'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 / Engineer'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 / Engineer, 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 / Engineer 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 / Engineer'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 / Engineer 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 Project Engineer 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 Project Engineer 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 Project Engineer 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 Project Engineer’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.

C. In addition to Contract requirements, upon Project Engineer's written instructions:

1. Uncover work for observation of covered work.

2. Remove samples of installed materials for testing.

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's Inspection: The Contractor shall make written request for a Final Inspection to the Project Engineer. 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. 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 judgment, the Project is not ready for an Inspection, the Project Engineer may schedule another inspection.

B. Owner's Inspection: After the Project Engineer has 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 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, 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 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. Product Data List: Legibly list by each Specification Section to record manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed. The list shall include the supplier / subcontractor's name, contact person, street address, e-mail address, telephone and fax numbers.

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 Product Data list with name and address of each subcontractor and material supplier shall be listed in front of each binder.

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 02315 EXCAVATION, FILLING AND GRADING FOR BUILDING

PART 1 GENERAL.

1.01 SECTION INCLUDES: The extent of excavation, filling and grading is shown on the Drawings. Preparation of subgrade for building slabs is included as part of this Work. Backfilling of trenches within the building lines is included as part of this Work.

1.02 RELATED SECTIONS

A. Section 01455 – Testing Laboratory Services.

B. Section 02300 – Earthwork.

1.03 SUBMITTALS: Notification shall be provided to Project Engineer indicating source of borrow material in advance of start of Work and certification provided that proposed soil material is satisfactory for specified use.

1.04 QUALITY ASSURANCE

A. Perform excavation Work in compliance with applicable requirements of governing authorities having jurisdiction.

B. Compaction density shall be 95 percent of the maximum dry density value as determined by ASTM D 698 (Standard Proctor Test) of AASHTO T-99.

C. Soils compaction control tests shall be performed as specified herein and under Section 01455-Testing Laboratory Services. Stability is defined as absence of significant yielding or pumping of soils under compaction effort.

D. Number of Tests: Make test(s) in accordance with AASHTO T-99 for each class of material. Make in-place density tests in accordance with AASHTO T-238 (Nuclear Method) for density tests, as the fill and backfill work progresses. At least one test per lift of any isolated portions and each footing.

E. Work on Non-Tested Areas: Placing permanent construction over fill that has not been tested and approved may require removal of permanent Work, recompacting the fill and replacing the Work at no additional cost to the Owner.

1.05 EXISTING UTILITIES

A. Locate existing underground utilities in the areas of Work. If utilities are to remain in place, provide adequate means of protection during earthwork operations. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult the Utility Owner immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.

B. Do not interrupt existing utilities serving facilities occupied and used by Owner or others except when permitted in writing by Project Engineer and then only after acceptable temporary utility services have been provided. Demolish and completely remove from site existing underground utilities indicated “To Be Removed”. Coordinate with utility companies for shut off of services if lines are active.

1.06 PROTECTION OF PERSONS AND PROPERTY: Barricade open excavations occurring as part of this Work and post with warning lights. Operate warning lights as recommended by authorities having jurisdiction. Protect structures, utilities, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

1.07 USE OF EXPLOSIVES: The use of explosives is not permitted.

PART 2 PRODUCTS

2.01 BACKFILL AND FILL: Select fill shall be an approved select material free from trash, debris, stones larger than 3 inches, roots and other organic matter.

2.02 GRANULAR FILL

A. Below existing natural grade line: Sandy clay with a liquid limit less than 45 and PI in range of 10 to 22, or clayey sand with PI not less than 7 and liquid limit not greater than 35.

B. Above existing natural grade under slabs and footings: Silty or sandy clay as above or clayey-sand with LL less than 35 and PI of 3 to 15.

PART 3 EXECUTION

3.01 INSPECTION: Examine the areas and conditions under which excavating, filling, and grading are 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 an acceptable manner.

3.02 EXCAVATION

A. Excavation consists of removal and disposal of material encountered when establishing required grade elevations.

B. Earth excavation includes removal and disposal of pavements and other obstructions visible on ground surface, underground structures and utilities indicated to be demolished and removed, material of any classification indicated in data on subsurface conditions, and other materials encountered that are not classified as rock excavation or unauthorized excavation.

C. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of Project Engineer. Unauthorized excavation, as well as remedial Work directed by the Project Engineer, shall be at the Contractor's expense. Under footings, foundation bases, or retaining walls, fill unauthorized excavation by extending the indicated bottom elevation of the footing or base to the excavation bottom, without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position, when acceptable to Project Engineer.

D. Elsewhere, backfill and compact unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed by Project Engineer.

E. Additional Excavation: When excavation has reached required subgrade elevations, notify the Project Engineer who will make an inspection of conditions. If unsuitable bearing materials are encountered at the required subgrade elevations, carry excavations deeper and replace the excavated material as directed by the Project Engineer. Removal of unsuitable material and its replacement as directed will be paid on the basis of contract conditions relative to changes in work.

F. Stability of Excavations. Slope sides of excavations to comply with local codes and ordinances having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated. Maintain sides and slopes of excavations in a safe condition until completion of backfilling.

G. Shoring and Bracing: Provide materials for shoring and bracing, such as sheet piling, uprights, stringers and cross braces, in good serviceable condition. Establish requirements for trench shoring and bracing to comply with local codes and authorities having jurisdiction. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Carry down shoring and bracing as excavation progresses.

H. Dewatering: Prevent surface water and subsurface or groundwater from flowing into excavations and from flooding project site and surrounding area. Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability of subgrade and foundations.

1. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.
2. Convey water removed from excavations and rainwater to collecting or run-off areas. Establish and maintain temporary drainage ditches and other diversions outside excavation limits for each structure. Do not use trench excavations as temporary drainage ditches.

3.03 MATERIAL STORAGE: Stockpile satisfactory excavated materials where directed, until required for backfill or fill. Place, grade and shape stockpiles for proper drainage. Locate and retain soil materials away from edge of excavations. Dispose of excess soil material and waste materials as herein specified.

3.04 EXCAVATION FOR STRUCTURES: Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10 feet, and extending a sufficient distance from footings and foundations to permit placing and removal of concrete formwork, installation of services, other construction, and for inspection. In excavating for footings and foundations, take care not to disturb bottom of excavation. Excavate by hand to final grade just before concrete reinforcement is placed. Trim bottoms to required lines and grades to leave solid base to receive concrete.

3.06 EXCAVATION FOR TRENCHES: Dig trenches to the uniform width required for the particular item to be installed, sufficiently wide to provide ample working room. Excavate trenches to the depth indicated or required. Carry the depth of trenches for piping to establish the indicated flow lines and invert elevations. Beyond the building perimeter, keep bottoms of trenches sufficiently below finish grade to avoid freeze-ups.

A. Grade bottoms of trenches as indicated, notching under pipe bells to provide solid bearing for the entire body of the pipe. Backfill trenches with concrete where trench excavations pass within 18 inches of column or wall footings and which are carried below the bottom of such footings, or which pass under wall footings. Place concrete to the level of the bottom of adjacent footings.

B. Do not backfill trenches until tests and inspections have been made and backfilling authorized by the Project Engineer. Use care in backfilling to avoid damage or displacement of pipe systems.

3.07 COLD WEATHER PROTECTION: Protect excavation bottoms against freezing when atmospheric temperature is less than 35 degrees F.

3.08 COMPACTION: Control soil compaction during construction providing minimum percentage of density specified for each area classification. Building Slabs: Compact top 12 inches of subgrade and each layer of backfill or fill material at 95 percent maximum dry density.

3.09 MOISTURE CONTROL: Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade, or layer of soil material, to prevent free water appearing on surface during or subsequent to compaction operations. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.

3.10 BACKFILL AND FILL: Place acceptable soil material in layers to required subgrade elevations, for each area classification listed below.

A. Under buildings use sub-base material, or satisfactory excavated or borrow material, or combination of both. Backfill excavations as promptly as work permits, but not until completion of the following:

1. Acceptance by Project Engineer of construction below finish grade including, where applicable, dampproofing, waterproofing, and soil treatment.
2 Inspection, testing, approval, and recording locations of underground utilities.
3. Removal of concrete formwork, shoring and bracing, and backfilling of voids with satisfactory materials.
4. Removal of trash and debris.

3.11 GROUND SURFACE PREPARATION: When existing ground surface has a density less than that specified under "Compaction" for the particular area classification, break up the ground surface, pulverize, moisture condition to the optimum moisture content, and compact to required depth and percentage of maximum density.

3.12 PLACEMENT AND COMPACTION

A. Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

B. Before compaction, moisten or aerate each layer as necessary to provide the optimum moisture content. Compact each layer to required percentage of maximum dry density for each area classification. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

C. Place backfill and fill materials evenly adjacent to structures, to required elevations. Take care to prevent wedging action of backfill against structures by carrying the material uniformly around structure to approximately same elevation in each lift.

3.13 GRADING: Uniformly grade areas within limits of grading under this section, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.

A. Grading Outside Building Lines: Grade areas adjacent to building lines to drain away from structures and to prevent ponding. Finish surfaces free from irregular surface changes, and as follows:

B. Grading Surface of Fill Under Building Slabs: Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of 1/2 inch when tested with a 10-foot straightedge.

3.14 COMPACTION: After grading, compact subgrade surfaces to the depth and percentage of maximum density for each area classification.

3.15 MAINTENANCE

A. Protect newly graded areas from traffic and erosion. Keep free of trash and debris. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.

B. Reconditioning Compacted Areas: Where subsequent construction operations or adverse weather disturbs completed compacted areas, scarify surface, re-shape, and compact to required density prior to further construction.

3.16 DISPOSAL OF EXCESS AND WASTE MATERIALS: Remove waste materials, including unacceptable excavated material, trash and debris, and dispose of it off the Owner's property.

END OF SECTION

SECTION 02365 SOIL TREATMENT FOR TERMITE CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES: Soil treatment for termite control.

1.02 SUBMITTALS

A. Submit manufacturer's technical product data and application instructions prior to application for Project Engineer's approval.

B. Submit sample copies of the Termite Soil Treatment Guarantee form prior to application for Project Engineer's approval.

C. Quality Control: Submit identification of at least 3 projects of similar scope along with name, address, and telephone number of the Architect, Owner and General Contractor.

1.03 QUALITY ASSURANCE: In addition to the requirements of these Specifications, comply with manufacturer's instructions and recommendations for the Work, including preparation of substrate and application.

A. Engage a professional pest control operator, licensed by the State of Mississippi, Mississippi Department of Agriculture and Commerce, Bureau of Plant Industry, and in accordance with regulations of governing authorities for application of soil treatment solution. The pest control operator is to have the aforementioned valid license, the company technician is to have a valid identification card for pest control, and the company vehicle is to be clearly marked with the company name.

B. The professional pest control operator specializing in Soil Treatment for Termite Control, with 5 years minimum experience, shall have completed work similar to that indicated for this Project and have a record of successful in-service performance.

C. Comply with Mississippi Regulations Governing Pest Control Operators in following the labels of the termiticide.

1.04 PROJECT CONDITIONS

A. Do not apply soil treatment solution until excavating, filling and grading operations are completed, except as otherwise required in construction operations.

B. To insure penetration, do not apply soil treatment to frozen or excessively wet soils or during inclement weather. Comply with other handling and application instructions of the soil toxicant manufacturer.

C. Remove all non-pressure treated wood contacting soil. Remove grade stakes prior to applying horizontal barrier and all form boards, stakes and concrete over pour prior to applying vertical soil treatment.

1.05 GUARANTEE: Furnish 3 copies of written guarantee certifying that the applied soil poisoning treatment will prevent the infestation of subterranean termites and, that termite contractor will re-treat the soil and also repair or replace any damage caused by termite infestation without expense to the Owner. Provide guarantee for a period of 5 years from the date of treatment, signed by the Applicator and the Contractor.

PART 2 PRODUCTS

2.01 SOIL TREATMENT SOLUTION

A. Use an emulsible concentrate insecticide for dilution with water specially formulated to prevent infestation by termites as recommended by the Southern Forest Experiment Station, Forest Insect Laboratory at Gulfport, Mississippi, and registered by the Bureau of Plant Industry for use in structural pest control work. Fuel oil will not be permitted as a diligent. Provide a working solution of one of the following chemical elements:

1. Horizontal barrier: Cypermethrin, Prevail or Talstar.
2. Vertical barrier: Fipronil.

B. Other solutions may be used as recommended by Applicator and if acceptable to local and state governing authorities. Use soil treatment solutions that are not injurious to plants.

PART 3 EXECUTION

3.01 INSPECTION: Applicator must examine the areas and conditions under which soil treatment for termite control 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 Applicator.

3.02 APPLICATION: Remove foreign matter, which could decrease effectiveness of treatment on areas to be treated. Loosen, rake, and level soil to be treated, except previously compacted areas under slabs and foundations. Toxicants may be applied before placement of compacted fill under slabs, if recommended by toxicant manufacturer.

A. Application Rates: Under slab-on-grade, suspended slab, foundation footings and other similar structures, treat the soil before concrete slabs are poured using either power sprayer or tank-type garden sprayer. Apply soil treatment solution, using color dye marking agent to insure the area is treated, as follows:

1. Termiticide applied for the prevention of termites shall comply with the manufacturer's label and shall not be applied at concentrations or volumes less than specified on the label.

2. Reapply soil treatment solution to areas disturbed by subsequent excavation or other construction activities following application.

B. Allow a minimum of 12 hours for drying after application, before beginning concrete placement or other construction activities.

3.03 PROTECTION

A. Prior to each application, the applicator shall notify the Contractor of the intended application and instruct the responsible person to notify construction workers and other site individuals to leave the treated area and not to return until chemical has been installed into the soil.

B. Post signs in the areas of application warning workers that soil poisoning has been applied. Remove signs when areas are covered by other construction.

END OF SECTION

SECTION 02826 ORNAMENTAL FENCES AND GATES

PART 1 GENERAL

1.01 SECTION INCLUDES: Ornamental fencing and cantilevered gates where indicated on the drawings with related items, complete. See drawings for specifics.

1.02 RELATED WORK

A. Requirements for concrete manufacture, transportation, and installation are specified in Division 3 - Concrete.

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 GENERAL

A. Dimensions and gauges of material are subject to accepted industry tolerance standards.

B. If necessary, field touch-up shall be in compliance with manufacturer's instructions.

2.02 FENCE SYSTEM

A. Complete fencing system including double leaf gates consisting of hot dip galvanized material, polyester powder coated finish, having a panel design with no rivets, screws, or welds, consisting of a Forerunner Rail (double walled “U” channel), Internal retaining rod to secure pickets with finials, panel bracket, and panel fastener, as the Majestic 3 rail style, Aegis II - Industrial Ornamental Fence as manufactured by Ameristar, Tulsa, OK., or approved equal. Color shall be black.

B. Gate shall be equipped with heavy duty hardware, drop rod, gate keepers (one for each leaf), and shall be capable of being padlocked without the use of a chain.

2.03 POST FOOTINGS: 3,500 PSI concrete at 28 days.

PART 3 EXECUTION

3.01 GENERAL: Installation shall be by skilled and experienced fence erectors on lines and grades designated on the drawings.

3.02 POSTS, PANELS, AND GATES

A. Posts:
1. Install plumb and vertical.
2. Locate end, corner and gate posts where noted on the Drawings.

B. Top of fence shall generally be horizontal, but it can flow to a certain degree the contour of the ground, except at drop offs.

C. Panels and Gates: Install in strict accordance with manufacturer's written instructions.

3.03 CLEAN-UP: Site shall be cleared of excess spillage of concrete, cut wires, etc., and post hole excavation scattered uniformly away from posts.

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. Lap all bars 24 bar diameters at corners, splices and intersections.

F. 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

D. Section 09900 – Paints and Coatings

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. Concrete mix design proportioning shall be by a certified MDOT Class III technician and submitted to the Project Engineer prior to placing concrete. Mix proportions shall meet the requirements of the 804.02.10 Section of the MDOT's Standard Specifications, 2004 Edition, except concrete requiring a trowel finish shall not be air entrained. Concrete shall be sampled according to ASTM C 172 and compression test cylinders made and cured according to ASTM C 31. Control of mixes is to be maintained at the Ready-Mix Plant and on the job site. Adjustments of the mix proportions shall meet the requirements of Section 804.02.10.4 of MDOT's Standard Specifications, 2004 Edition.

C. The Owner will provide testing as specified in Section 01455 – Testing Laboratory Services. Cylinders, 3 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 two at 28 days for acceptance. Owner is to make at lease one strength (average of two cylinders) for each class of concrete placed on any one day and an additional 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 to the ready mixed concrete producer and 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 approvals from the floor-covering installer and the floor-coating applicator are required for slab finish receiving floor covering and floor coating/sealer.

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 3,500-psi minimum compressive strengths at 28 days, unless noted otherwise.

C. Maximum slump for normal weight concrete shall be 4 inches. Sump may be increased to 6 inches with an approved mid-range water reducer and up to 8 inches with an approved high-range water reducer.

2.02 CONCRETE MATERIALS

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

B. Water: From an approved source.

C. Structural Concrete Aggregate: Nominal maximum aggregate size67 shall be used and shall meet the requirements of MDOT Standard Specifications, 2004 Edition.

D. Admixtures: Admixtures shall be from the MDOT Approved List. Non-uniform addition of mixtures that result in erratic setting of the concrete will cause rejection of the concrete with subsequent removal from the structure at the concrete producer's expense.

2.03 RELATED MATERIALS

A. Preformed Expansion Joint Fillers: Provide pre-molded, asphalt impregnated board in widths and thickness required by conditions (1/2-inch minimum). Joint fillers shall conform to ASTM D994, D1751 or D1752.

B. 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. Sealer shall not interfere with floor finish.

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. Slump tolerances given in ASTM C 94 apply. Calcium chloride shall not be used.

B. Failure of concrete to meet the specified requirements may result in rejection with subsequent removal and replacement or re-testing (including coring, load test, etc.) at the supplier's expense. 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 Architect, 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. See Finish Schedule for areas to receive scored and stained concrete.

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 03365 CONCRETE FLOOR SEALER AND STAIN

PART 1 GENERAL

1.01 SECTION INCLUDES

A Concrete floor stain and sealer.

1.02 RELATED SECTIONS

A. Section 03300 - Cast-in-Place Concrete.

B. Section 09910 - Stains and Transparent Finishes.

1.03 SUBMITTALS

A. Comply with Section 01330 - Submittal Procedures.

B. Product Data: Submit manufacturer's product data, including surface preparation and application instructions.

C. Color Samples: Submit manufacturer's standard color chart.

D. Installer's Project References: Submit list of successfully completed projects, including project name and location, name of architect, and type and quantity of concrete floor stain applied.

E. Maintenance Instructions: Submit manufacturer's maintenance and cleaning instructions.

1.04 QUALITY ASSURANCE

A. Single Source Responsibility: Concrete floor stain materials shall be products of a single manufacturer.

B. Installer's Qualifications:

1. Successful experience in application of similar concrete floor stains.
2. Employ persons trained for application of concrete floor stains.

C. Preinstallation Meeting: Convene a preinstallation meeting before start of application of concrete floor stain. Require attendance of parties directly affecting work of this section, including Contractor, Architect, and applicator. Review surface preparation, application, protection, and coordination with other work.

1.05 DELIVERY, STORAGE, AND HANDLING

A Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying manufacturer, product name, and concrete floor stain color.

B Storage: Store materials in a clean, dry area indoors in accordance with manufacturer's instructions. Keep containers sealed until ready for use.

1. Concrete Floor Sealer: Keep away from ignition sources. Do not allow freezing.

C. Handling: Protect materials during handling and application to prevent damage or contamination.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Do not apply concrete floor stain when air or surface temperature is below 40 degrees F.

B. Concrete Floor Sealer: Do not apply when air or surface temperature is below 55 degrees F.

C. Exterior Surfaces: Do not apply materials in wet weather.

1.07 SEQUENCING

A. Prepare surface and apply concrete floor stain after other interior finish work is completed and before baseboards are installed.

PART 2 PRODUCTS

2.01 MANUFACTURER

A. Drawings and Specifications are based on products manufactured by Kemiko Concrete Products, PO Box 1109, Leonard, Texas 75452. Phone (903) 587-3708. Fax (903) 587-9038. Web Site www.kemiko.com. E-Mail sales@kemiko.com.

B. Equivalent products by the following manufacturers are acceptable:

1. Increte Systems, Inc., Odessa, FL. Tel. (800) 752-4626.
2. L.M. Scofield Company, Douglasville, GA. Tel. (770) 920-6000.
3. Specialty Concrete Products, Inc., West Columbia, SC. Tel. (800) 955-4702.

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

2.02 CONCRETE FLOOR STAIN

A. Concrete Floor Stain: Equal to Kemiko Stone Tone Stain.

1. Description: Combination of acid solution, wetting agents, and metallic ions. When mixed with water, chemically combines with Portland cement to form permanent colors.
2. Colors: Malay Tan and Cola (or as Selected by Project Engineer / MDOT Architect from manufacturer's standard colors).

2.03 ACCESSORIES

A. Concrete Floor Sealer: Kemiko Stone Tone Sealer.

1. Acrylic water-based urethane clear sealer.
2. Solids Content: 30 percent.
3. Non-yellowing.
4. Resistant to blush.
5. Satin finish.
6. VOC compliant.
7. Quick drying.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine surfaces to receive concrete floor stain. Notify Architect if surfaces are not acceptable. Do not begin surface preparation or application until unacceptable conditions have been corrected.

3.02 SURFACE PREPARATION

A. Protection:

1. Protect walls and surrounding surfaces not to receive concrete floor stain.
2. Do not allow stain to come in contact with wood or metal surfaces.

B. Prepare concrete surface in accordance with manufacturer's instructions.

C. Concrete shall be as specified in Section 03300. Ensure concrete is a minimum of 28 days old.

D. Ensure concrete surface is clean, dry, structurally sound, and free from dirt, dust, oil, grease, solvents, paint, wax, asphalt, concrete curing compounds, sealing compounds, surface hardeners, bond breakers, adhesive residue, and other surface contaminants.

E. Do not acid wash or use heavy alkali cleaners.

3.03 APPLICATION

A. Apply concrete floor stain in accordance with manufacturer's instructions at locations indicated on the drawings.

B. Control depth of color by adjusting volume of stain applied to floor.

C. Apply 2 coats of concrete floor stain. Allow floor to completely dry after each coat. Do not scrub clean between coats.

D. After floor has completely dried, scrub off stain residue in accordance with manufacturer's instructions. Allow floor to completely dry.

E. Concrete Floor Sealer: Apply concrete floor sealer over concrete floor stain in accordance with manufacturer's instructions.

F. Keep material containers closed when not in use to avoid contamination.

3.04 PROTECTION

A. Protect stained concrete floor from damage during construction.

B. Avoid washing concrete surfaces for a minimum of 48 hours.

END OF SECTION

SECTION 04200 MASONRY UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES: Masonry work as shown on the Drawings and schedules.

1.02 RELATED SECTIONS

A. Section 07100 – Dampproofing and Waterproofing

B. 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 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 8 inches down both sides of walls and anchor securely in place to prevent water intrusion.

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.

PART 2 PRODUCTS

2.01 ACCEPTABLE CONCRETE MASONRY UNIT MANUFACTURERS

A. Equivalent products by the following manufacturers are acceptable:

1. Block USA, Jackson, MS 39215, Tel: (601) 355-0691.
2. Tupelo Concrete Products, Tupelo, MS 38801, Tel: (800) 748-8703.
3. Southern Concrete Products, Sardis, MS 38666, Tel: (662) 487-1635.

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 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.

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 inches, use aggregate graded with 70 to l00 percent passing the No. 16 sieve.

2.06 MASONRY ACCESSORIES: Provide welded wire units prefabricated in straight lengths of not less than l0 feet, 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 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. 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 (for exterior walls). Interior wall application shall be mill galvanized.

A. 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.

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., Springvale, ME. Tel: (800) 252-2306.
2. AFCO Products, Inc., Somerville, MA. Tel: (617) 623-7700.
3. Fiberweb Div., Clark / Hammerbeam, Corp., Dedham, MA. Tel: (781) 461-1946.
4. York Manufacturing, Inc., Sanford, ME. Tel: (800) 551-2828.

D. 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. Do not wet concrete masonry units.

D. Frozen Materials and Work: Do not use frozen materials or materials mixed or coated with ice or frost. For masonry, which is specified to be wetted, comply with the BIA recommendations. Do not use calcium chloride in mortar or grout.

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

F. Layout walls in advance for accurate spacing of surface bond patterns with uniform joint widths and to properly locate openings, movement type joints, returns and offsets. Avoid the use of less-than half-size units at corner, jambs and wherever possible at other locations. Lay-up walls plumb and true and with courses level, accurately spaced and coordinated with other work.

G. 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.

H. 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 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.

C. 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.

D. Remove masonry units disturbed after laying; clean and relay in fresh mortar. Do not pound corners at jambs to fit stretcher units that have been set in position. If adjustments are required, remove units, clean off mortar, and reset in fresh mortar.

3.04 HORIZONTAL JOINT REINFORCING

A. 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.

B. Space continuous horizontal reinforcing as required by code but not less than l6 inches on center vertically.

3.05 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 location of control joints is not shown, place vertical joints spaced not to exceed 25'-0" on center. Locate control joints at points of natural weakness in the masonry work.

3.06 FLASHING OF MASONRY WORK

A. Provide concealed flashing in masonry work as shown. Prepare masonry surfaces smooth and free from projections, which might puncture flashing. Place through-wall flashing on bed of mortar and cover with mortar. Seal flashing penetrations with mastic before covering with mortar. Terminate flashing 1/2 inch from face of wall, unless otherwise shown. Extend flashing beyond edge of lintels and sills at least 4 inches and turn up edge on sides to form pan to direct moisture to exterior. Provide weep holes in the head joints of the first course of masonry immediately above concealed flashing, spaced 24 inches on center, unless otherwise shown.

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

3.07 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 masonry by dry brushing at the end of each day's work and after final pointing to remove mortar spots and droppings. Protect the base of the wall from mud splashes and mortar droppings. Should additional cleaning be required apply chemical (muriatic acid is **not** acceptable) or detergent cleaning solutions in accordance with the masonry and chemical manufacturers' recommendations.

C. Remove temporary coverings and protection of adjacent work areas. Remove construction debris from the site and legally dispose of debris.

END OF SECTION

SECTION 05120 STRUCTURAL STEEL

PART 1 GENERAL

1.01 SECTION INCLUDES: Structural steel framing members, support members, with required bracing, welds, fasteners, base plates, bearing plates, anchor bolts and other related items necessary to complete Project indicated by Contract Documents unless specifically excluded.

1.02 RELATED SECTIONS

A. Section 09050 – Color Design.

B. Section 09900 – Paints and Coatings.

1.03 SUBMITTALS

A. Shop drawings shall conform to requirements of current AISC Specifications. Indicate sizes, spacing, connections, and location of structural members. Indicate net weld lengths and welded connections with AWS welding symbols.

B. Mill Test Reports shall be furnished; certifying that each shipment meets specified structural strength.

C. Welders' Certificates indicating that all welders employed on the Work are qualified operators, verifying AWS qualifications within the previous 12 months.

1.04 QUALITY ASSURANCE

A. Structural steel shall be furnished in accordance with current edition of the American Institute of Steel Construction "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings".

B. Qualification of Welders: All welding shall be in accordance with the "Code of Arc and Gas Welding in Building Construction" of the American Welding Society. Certification that each welder is qualified in accordance with American Welding Society Code D1.1 shall be provided.

PART 2 PRODUCTS

2.01 STRUCTURAL STEEL MATERIALS: All structural steel shall conform to ASTM A-36, domestic manufacture, except tube sections, which shall conform to ASTM A-501. Unless shown otherwise on Drawings, all bolts shall conform to ASTM Specification A307. Where indicated on Drawings, high strength bolts shall conform to ASTM Specification A 325.

A. Welds shall be E70XX Series electrodes for manual arc welding and grade SAW-1 for submerged arc process.

B. All bolts not indicated otherwise on the plans are 3/4 inch. All connections not noted otherwise on the Drawings shall be framed connections.

C. Grout for base plates shall be precision, premixed, non-shrink and non-metallic in conformance with ASTM C827. Grout shall be easily workable as well as being made flowable with an initial setting time of not less than 45 minutes and shall meet the requirements of ASTM C191. Grout shall have a 14-day compressive strength of 6000 psi when mixed to its flowable state.

2.02 PAINT MATERIALS: Shop coat paint, 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.

PART 3 EXECUTION

3.01 FABRICATION AND ERECTION: Fabricate and erect steel in accordance with the latest requirements of the American Institute of Steel Construction and the approved shop drawings. Fabrication shall not proceed until Project Architect's approval is obtained.

A. Shop connections shall be welded. Field connections shall be bolted, unless welded connections are detailed. Welded connections shall be detailed consistent with requirements of the American Welding Society. Bolted connections shall be proportioned as shown in AISC Manual, using 3/4 inch unfinished bolts (A307), unless shown otherwise on Drawings.

1. Shop and field welders shall have been recently certified as qualified structural welder according to requirements of the American Welding Society.
2. Any splices not shown on the drawings shall be indicated clearly on the shop drawings and shall be made only with the Project Architect's approval.

B. Members shall be straight, plumb, and level so that the error does not exceed 1 to 1,000. During erection provide guys, stays, and braces to hold steel in position until the frame is permanently secured.

C. Neatly miter joints, weld full and grind welds smooth where steel shapes are used as finish members.

3.02 PAINTING

A. Apply one shop coat of paint to all structural steel. After erection, touch up joints and abraded areas with the same brand of paint.

B. Areas around welded joints and members to be encased in concrete shall not be painted in the shop. Thoroughly clean scale and loose rust from steel prior to painting. Steel shall be dry when painted and paint shall be allowed to dry before material is handled.

C. All steel exposed to view shall be painted additional coats as specified in Section 09900.

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, brass footrails, steel lintels, Soffit vents 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.

2.04 Brass Footrails: Equal to R & B Wagner, Inc. (800) 786-2111 model T5122, 2 inch diameter brass tubular rail with model 142061 combination brackets at 36 inches on center maximum. Other acceptable manufacturers include Lawrence Metal Products (800) 441-0019 and Tubular Specialties Manufacturing (800) 225-5876.

2.05 LOOSE LINTELS: Provide loose 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.

2.06 SOFFIT VENTS: Majestic No. 225, aluminum with insect screen, size as indicated on Drawings. Finish shall be Powder Coated. Color as selected be the Project Engineer / MDOT Architect to match Soffit color.

2.07 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.

C. 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.

D. Framing above soffit vents to be painted black.

E. When splicing footrail, place the splice within the footrail bracket to hide the seam. Use End Caps of Ball Finials at ends of tubing. Securely attach bracket to substrates according to manufacturer's recommendations.

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 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; framing lumber, 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 Engineer / MDOT Architect.

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

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

2.05 ANCHORAGE AND FASTENING MATERIALS: For each use, select proper type, size, material and finish complying with the applicable Federal Specifications and manufacturers' recommendations. Zinc electroplated steel fasteners unless noted otherwise. Provide stainless steel fasteners for high humidity and treated wood locations. All nails shall be coated.

2.06 TREATED WOOD

A. Complete fabrication of treated items prior to treatment, wherever possible. If cut after treatment, coat cut surfaces with heavy brush coat of same fire-retardant chemical used for treatment. Inspect each piece of lumber or plywood after drying and discard damaged or defective pieces.

B. Preservative Treatment: Where lumber or plywood is indicated as "Treated", or is specified herein to be treated, comply with the applicable requirements of the American Wood Preservers Institute (AWPI). Mark each treated item to comply with the AWP Quality Mark requirements for the specified requirements.

1. Pressure-treat aboveground items with water-borne preservatives complying with AWPI P-2. After treatment, kiln-dry to maximum moisture content of 15 percent. Treat indicated items and the following:

a. Wood cants, nailers, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers and waterproofing.
b. Wood sills, sleepers, blocking, furring stripping and similar concealed members in contact with masonry or concrete.

C. Fire-Retardant Treatment: Where "PR-S" lumber or plywood is shown or scheduled, comply with the AWPI Specification C-208 for pressure impregnation with fire-retardant chemicals to achieve a flame-spread rating of not more than 25 when tested in accordance with UL Test 723, ASTM E A4, or NFPA Test 355. Where treated items are indicated to receive a transparent or paint finish, use a fire-retardant treatment that will not bleed through or adversely affect bond of finish.

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

A. Provide wherever shown and where required for screeding or attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be attached. Set true to line and level, plumb with intersections true to required angle. Coordinate location with other Work involved.

B. Attach to substrates securely with anchor bolts and other attachment devices as shown as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise shown. Building into masonry; anchor to formwork before concrete placement.

C. Provide grounds of dressed, preservative treated, key-beveled lumber not less than 1-1/2 inch wide and of the thickness required to bring face of ground to exact thickness of finish material involved. Remove temporary grounds when no longer required.

3.04 WOOD FURRING

A. Install plumb and level with closure strips at all edges and openings. Shim with wood as required.

B. 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.

END OF SECTION

SECTION 06175 WOOD TRUSSES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Single plane, metal connected wood trusses fabricated from conventional dimensional lumber.

B. Design and fabricate wood trusses where shown on the Drawing and as needed for a complete and proper installation.

1.02 REFERENCES: The applicable portions of the current editions of the following standards are a part of these Specifications:

A. National Design Specifications for Wood Construction published by the National Forest Products Association.

B. Design Specifications for Metal Plate Connected Wood Trusses published by The Truss Plate Institute.

C. American Society for Testing and Materials (ASTM).

1. ASTM A446 Grade A.
2. ASTM A525 Coating Destination G60.

D. Timber Construction Manual published by American Institute of Timber Construction.

1.03 SUBMITTALS

A. Shop Drawings: Submit shop drawings indicating all truss types, connections, framing members and accessories. Shop drawings shall bear the seal of a professional Engineer registered in the State of Mississippi.

1.04 QUALITY ASSURANCE

A. Provide the services of a structural engineer registered to practice in the State of Mississippi to design the wood trusses and applicable temporary and permanent bracing to sustain the indicated loads for the spans, profiles and arrangements needed to complete the Work.

B. Comply with provisions of all applicable standards and codes and the 1994 Standard Building Code.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Trusses, if stored prior to erection, shall be stored in a vertical position and protected from the weather. Handle with care to avoid damage.

B. Erect and install trusses in accordance with Truss Manufacturer's approved shop drawings and installation instructions.

C. Temporary construction loads that cause member stresses beyond design limits are not permitted.

PART 2 PRODUCTS

2.01 MATERIALS

A. All truss members - No. 2 kiln dried Southern Yellow Pine having a maximum moisture content of 19 percent. Top and bottom chords members shall be 2 inches by 6 inches minimum.

B. Dimensional joist and truss lumber shall have the following minimum properties, unless noted otherwise on the Drawings:

1. Bending stress ---------- 1,000 psi
2. Horizontal shear stress ---------- 80 psi

C. Connector plates shall be a minimum thickness of 0.036 inches and shall be manufactured from steel meeting the requirements of ASTM A446 Grade A, and shall be hot dipped galvanized according to ASTM A525 Coating Designation G60.

D. Hurricane clips shall be equal to 18 gage galvanized steel framing anchor Type TA-4as manufactured by Cleveland Steel Specialty Company or approved equal by Simpson Strong – Tie or USP Structural Connectors

2.02 DESIGN LOADS

A. The dimensional wood roof framing shall be designed for the following loads, unless noted otherwise on the Drawings:

1. Live load ---------- 20 psf
2. Top chord dead load ---------- 10 psf
3. Bottom chord bottom load ---------- 10 psf

2.03 FABRICATION

A. Trusses shall be manufactured by a company established to perform this Work. Manufacturing Company must have the Project Engineer / MDOT Architect's prior approval.

B. Size, stress and arrangement shall be determined by dimensions indicated on the Drawings. Each truss shall be custom designed to fit the dimensions indicated on the Drawings. Complete design calculations showing internal layout, member forces, and stress control points are to be furnished for each truss design. Design Calculations shall bear the seal of a professional Engineer registered in the State of Mississippi.

2.04 OTHER MATERIALS: Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the MDOT Architect.

PART 3 EXECUTION

3.01 ACCEPTABLE INSTALLERS: Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and methods needed for proper performance of the Work.

3.02 EXAMINATION: Examine the areas and conditions under which Work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.03 PREPARATION: Erection bracing in addition to specified bridging is to be provided to keep the trusses straight and plumb as required to assure adequate lateral support for the individual truss and entire system until the sheathing material has been applied. The Contractor will give one week notification prior to enclosing the trusses to provide opportunity for inspection of the installation by the manufacturer's representative and the MDOT Architect.

3.04 INSTALLATION

A. Coordinate as required with other trades to assure proper and adequate provision in the Work of those trades for interface with the Work of this Section.

B. Install the Work of this Section in strict accordance with the original design, pertinent requirements of agencies having jurisdiction, the Truss Plate Institute, and manufacturer's recommended installation procedures. Anchor all components firmly into position.

C. Hoist the trusses into position with proper bracing secured at designated lifting points. Exercise care to keep out-of-place bending of trusses to a minimum. Install temporary horizontal and cross bracing to hold trusses plumb and in safe condition until permanent bracing is installed. Install permanent bracing and related components prior to application of loads to trusses. Do not cut or remove any truss members

D. Roof truss 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 truss bearing point. Where an anchored truss bears on an intermediate point, a truss anchor shall be installed at that bearing point.

E. Trusses to be set 24 inches on center maximum spacing.

F. Brace temporary and permanently to sustain a vertical position under construction and design loads. Block eaves and ridges to provide straight alignment of trusses

.

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 or stained finish, Countertops, Shelving, and Miscellaneous work.

1.02 RELATED SECTIONS

A. Section 09050 – Color Design.

B. Section 09900 – Paints and Coatings

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

A. The Installer shall examine the substrates and conditions under which the work is to be installed; and notify the Contractor in writing of unsatisfactory conditions. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

B. 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.

C. 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

A. Except as otherwise indicated, comply with the following requirements for architectural woodwork not specifically indicated as pre- fabricated or pre-finished standard products.

B. Wood Moisture Content: Provide kiln-dried lumber and maintain optimum 8 to 13 percent range (damp region) moisture content in solid wood (hardwood and softwood) through fabrication, installation, and finishing operations of interior Work.

C. Wood for Painted Finish: Comply with quality standards for selection of species, grade and cut (fabricator's option, except as otherwise indicated). Wood for trim shall be maple or other closed-grain hardwood subject to Project Engineer / Architect's prior approval.

D. Wood for Stained Finish: Comply with AWI quality standards for selection of species, grade and cut.

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

F. 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

G. 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.

H. 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.

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

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

D. 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.

2.03 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 exposed to view will be brass or bronze unless otherwise approved by Project Engineer / 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

A. Install the work plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8-inch in 8 feet for plumb and level (including countertops); and with 1/16-inch maximum offsets in revealed adjoining surfaces. Scribe and cut work to fit adjoining work, and refinish cut surfaces or repair damaged finish at cuts.

B. Secure woodwork with anchors or blocking built-in or directly attached to substrates. Attach to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. 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.

C. 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.

D. 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.

E. 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

A. Repair damaged and defective woodwork wherever possible to eliminate defects functionally and visually; where not possible to repair properly, replace woodwork. Adjust joinery for uniform appearance.

B. Clean 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.

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

D. Protection: The Installer of architectural woodwork shall advise the Contractor of final protection and maintenance conditions necessary to ensure that the Work will be without damage or deterioration at the time of acceptance.

END OF SECTION

SECTION 07100 DAMPPROOFING AND WATERPROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES: Dampproofing the exterior face of exterior concrete block walls.

1.02 SUBMITTALS: Submit manufacturer's technical product data, installation instructions and recommendations for product specified.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Drawings and specifications are based on products manufactured by Sonneborn-Chemrex Inc., 889 Valley Park Drive; Shakopee, MN 55379; Tel. (800) 243-6739.

B. Equivalent products by the following manufacturers are acceptable:

1. Barrett Company, Millington, NJ. Tel: (800) 647-0100.
2. Grace Construction Products, Cambridge, MA. Tel: (800) 444-6459.
3. Karnak Corp., Clark, NJ. Tel: (800) 526-4236.

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

2.02 DAMPPROOFING: Provide a fibrated asphalt-emulsion type dampproofing on the outside face of the exterior wall back-up material equal to Hydrocide 700B, meeting ASTM D 1227-87, Type IV, and ASTM D 1187, Type 1 Test Methods.

PART 3 EXECUTION

3.01 SURFACE PREPARATION: Surface shall be free of oil, grease, dirt and loose material. Dry surfaces shall be dampened with water prior to application. Keep surface damp ahead of application.

3.02 INSTALLATION: Apply the dampproofing material with brush, roller, or spray equipment in accordance with the rates and methods recommended by the manufacturer. All surfaces shall be completely covered and areas around penetrations shall be double coated.

END OF SECTION

SECTION 07210 BUILDING INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES: Building insulation for interior walls, exterior walls and ceilings as shown on the Drawings and specified herein.

1.02 SUBMITTALS: Submit manufacturer's product and technical data for each type of insulation describing location, extent, material and method of fastening prior to installation for Project Architect's approval.

1.03 PRODUCT HANDLING: Protect the materials of this section before, during and after installation and to protect the installed work and materials of all other trades. In the event of damage, immediately make all repairs or replacements as necessary.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Equivalent products by the following manufacturers are acceptable:

1. CertainTeed Corporation, Valley Forge, PA, Tel. (800) 233-8990.
2. Dow Chemical Company, Midland, MI, Tel. (800) 441-4369.
3. Johns Manville Corp, Denver, CO, Tel. (303) 978-2531.
4. Knauf Insulation, Shelbyville, IN, Tel. (800) 825-4434.
5. Owens Corning, Toledo, OH, Tel. (800) 438-7465.

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

2.02 BATT INSULATION: Provide glass fibers and resinous binders formed into flexible batts conforming to ASTM C 665, Type III, Class B with density not less than 1.5 lbs. Per cubic foot and an R value of 3.17 per inch of thickness at 75 degrees F. mean temperature, with aluminum foil and asphalt vapor barrier laminated to one face. Thickness of insulation shall be as shown on the Drawings.

2.03 SOUND ATTENUATION INSULATION: Similar to above specified insulation except manufacturer's standard unfaced batt insulation manufactured for sound attenuation.

2.04 RIGID INSULATION: Provide 1 inch thick rigid (extruded) polystyrene insulation board, equal to Dow Chemical Company "Styrofoam™" Scoreboard with square edge, conforming to the following:

1. Thermal Resistance: R of 5.0 per inch per ASTM C 518.
2. Board size: 48 inches by 96 inches. Scored longitudinally on 24 inches on center.
3. Compressive Strength: Minimum 25 psi per ASTM D 1621.
4. Water Absorption: In accordance with ASTM C 272, 0.2 percent by volume max.

2.05 ACCESSORIES

A. Adhesives for Insulation: Adhesives or cements for installing insulation to masonry walls shall be water-resistant types as recommended by the insulation manufacturer for each of the various uses and locations.

B. Fasteners for Batt Insulation: Fasteners, anchors, spindles and other metal devices required for installing insulation in walls shall be galvanized steel, and as recommended by the insulation manufacturer for each of the various uses and locations. Spindle fastening devices shall be equal to "Stuk-Clips" made by Miracle Adhesives or "Stik-Klip" made by Stik-Clip Mfg. Co.

C. Tape: Bright aluminum, self-adhering type, mesh reinforced, two inches wide.

PART 3 EXECUTION

3.01 INSPECTION: Examine the areas and conditions where building insulation is to be installed and notify the Project Architect 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 Project Architect.

3.02 INSTALLATION: Comply with manufacturer's instructions for the particular condition of installation in each case. If printed instructions are not available, or do not apply to the project conditions, consult the manufacturer's technical representative for specific recommendations before proceeding with the work.

A. Extend insulation full thickness as shown over entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections, which interfere with placement.

B. Apply a single layer of insulation to the required thickness, unless a double layer is required, to make up the total thickness shown.

C. Set vapor barrier faced units with vapor barrier to inside of construction, except as otherwise shown. Do not obstruct ventilation spaces. All joints at vapor barriers shall be sealed with 4 inches wide, foil faced duct tape to prevent vapor and air migration.

D. Tape joints and ruptures in vapor barriers, using tape specified above, and seal each continuous area of insulation to surrounding construction so as to ensure vapor tight installation of the units.

E. Where insulation is impaled on stick clips, provide clips not less than 3 inches from corners or edges and not more than 12 inches on center.

F. Adhesive Application - per manufacturer's printed directions. Apply adhesive over entire back of insulation and on edges of insulation, except as noted below.

G. Fastener Installation - per manufacturer's printed directions. Install fasteners 12 inches on center each way. Use adhesive as specified herein per fastener manufacturer's recommendations.

3.03 BATT INSULATION: Install blanket fiberglass insulation with edges closely butted. Cut and fit insulation to closely fit intersecting or penetrating surfaces.

A. Walls: Install sound batt insulation between the studs at all interior partitions. Attach to studs with staples, adhesive or method as recommended by manufacturer. Tape and seal small joints and punctures and replace insulation where large tears occur.

B. Ceilings: Install above ceilings continuous with vapor barrier down. Lay above gypsum board at bottom chord of wood trusses in method recommended by manufacturer. Tape and seal small joints and punctures and replace insulation where large tears occur.

3.04 RIGID INSULATION: Install the insulation boards vertically between wood furring strips after application of dampproofing. Secure the insulation to the exterior face of the masonry units.

A. Board should be tightly abutted.

B. Cut and shape insulation with a knife, handsaw or other cutting tool as required to fit around wall penetrations, projections or openings and to accommodate conduit or other services. Seal around cutouts with construction adhesive.

END OF SECTION

SECTION 07260 VAPOR RETARDERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Vapor retarder under concrete floor slab.

B. Concrete curing paper on top of freshly poured concrete floor slab. .

C. Floor protection paper used for positive protection of finished floors.

1.02 RELATED SECTIONS: Section 07650 - Flexible Flashing.

1.03 SUBMITTALS: Submit manufacturers technical product data, installation instructions and recommendations for products specified.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Drawings and specifications are based on products manufactured by Fortifiber Corporation, 300 Industrial Drive, Fernley, NV 89408. Tel. (800) 773-4777.

B. Equivalent products by the following manufacturers are acceptable:

1. Grace Construction Products, Cambridge, Ma. Tel: (800) 444-6459.
2. Griffolyn ® Division, Reef Industries, Inc., Houston, TX. Tel: (800) 231-6074.
3. Stego Industries LLC, San Juan Capistrano, CA. Tel: (877) 464-7834.

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

2.02 VAPOR RETARDER: Membrane shall be a 15 mil polyolefin film meeting ASTM E-1745-97 Class A Test Method, equal to Moistop® Ultra™ “A”.

2.03 CONCRETE CURING PAPER: Laminated tri directional glass fiber reinforced long fibered kraft curing papers with double coating of high-melting-point asphalt, meeting ASTM C-171 Test Method, equal to “Orange Label Sisalkraft®”.

2.04 FLOOR PROTECTION PAPER: Non-staining reinforced floor protection paper consisting of two heavy kraft sheets and glass reinforcing fibers laminated with a non-staining adhesive, meeting ASTM D 828 and ASTM D 781 Test Methods, equal to “Seekure®”.

PART 3 EXECUTION

3.01 PREPARATION: Ensure items that pass through building paper / membrane are properly and rigidly installed, substrate is free of projections and irregularities that may be detrimental to proper installation of building paper / membrane.

3.02 INSTALLATION

A. The underslab vapor retarder shall be unrolled over the thoroughly compacted subgrade and turned down at the inside perimeter of grade beams. Joints shall be sealed, watertight, with a pressure sensitive tape as recommended by the manufacturer, allowing a minimum overlap of 6 inches. Apply tape evenly over seams and rub out any wrinkles formed during application. Where pipes and conduits pass through the membrane, it shall be sealed with Moistop boot and tape. Inspect the membrane thoroughly and repair all punctures immediately before placing concrete. Equipment, tools, and procedures that might puncture the membrane shall not be used while placing and finishing the concrete. Comply with manufacturer's recommendations and installation procedures as outlined in ASTM E-1643.

B. The concrete curing paper shall be unrolled over the entire surface once the concrete has set sufficiently hard to permit application without marring the surface. All joints shall be lapped 4 inches and sealed with a pressure sensitive tape. Apply tape evenly over seams and rub out any wrinkles formed during application. Ensure that all tears or penetrations are repaired.

C. The floor protection paper shall be applied immediately after the floor covering is installed and until final completion and acceptance by the Project Architect. The paper shall be laid in the widest practical width with 6-inch laps to provide complete coverage of flooring. Joints shall be sealed with minimum 2 inch wide pressure sensitive tape

3.03 CLEANING: Inspect vapor barrier membrane thoroughly and keep clean. Remove any dirt, oils, mud, debris, etc. prior to placing concrete.

END OF SECTION

SECTION 07317 WOOD SHAKES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes the following:

1. Wood shake roofing.
2. Felt underlayment.
3. Self-adhering sheet underlayment.
4. Ridge vents.

B. Related Sections include the following:

1. Division 6 Section "Rough Carpentry" for wood roof sheathing.
2. Division 7 Section "Sheet Metal Flashing and Trim" for metal flashings not part of this Section.

1.03 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definitions of terms related to roofing work in this Section.

1.04 SUBMITTALS

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

B. Samples for Initial Selection: For each type of wood shake, hip and ridge unit and ridge vent indicated. Include similar Samples of trim and accessories involving color selection.

C. Samples for Verification: For the following products, of sizes indicated, to verify color selected.

1. Wood Shakes: Full size.
2. Wood shingle panels.
3. Hip and Ridge Unit: Full size.
4. Ridge Vent: 12-inch-long Sample.
5. Self-Adhering Underlayment: 12 inches square.

D. LEED Submittals:

1. Credit MR 7: Certificates of chain-of-custody signed by manufacturers certifying that wood used to produce shakes was obtained from forests certified by an FSC-accredited certification body to comply with FSC 1.2, "Principles and Criteria." Include evidence that factory is certified for chain-of-custody by an FSC-accredited certification body.

a. Include statement indicating costs for products containing certified wood.

E. Qualification Data: For Installer.

F. Research/Evaluation Reports: For wood shakes.

G. Maintenance Data: For wood shakes to include in maintenance manuals.

H. Warranties: Special warranties specified in this Section.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who is an approved affiliate member of CSSB.

B. Grading Agency Qualifications: An independent testing and inspecting agency recognized by authorities having jurisdiction as qualified to label wood shakes for compliance with referenced grading rules.

C. Source Limitations: Obtain wood shakes through one source from a single manufacturer.

D. Fire-Test-Response Characteristics: Provide wood shakes and related roofing materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

1. Exterior Fire-Test Exposure: Class B; UL 790 or ASTM E 108 with ASTM D 2898, for application and roof slopes indicated.

E. Certified Wood Materials: Provide shakes made from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC 1.2, "Principles and Criteria."

F. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Approval of mockups is also for other material and construction qualities specifically approved by Architect in writing.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless such deviations are specifically approved by Architect in writing.
3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

G. Pre-Installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store underlayment rolls on end on pallets or other raised surfaces. Do not double-stack rolls.

1. Handle, store, and place roofing materials in a manner to avoid significant or permanent damage to roof deck or structural supporting members.

B. Protect unused underlayment from weather, sunlight, and moisture when left overnight or when roofing work is not in progress.

1.07 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing to be performed according to manufacturer's written instructions and warranty requirements.

1. Install self-adhering sheet underlayment within the range of ambient and substrate temperatures recommended by manufacturer.

1.08 WARRANTY

A. Special Warranty: CSSB's standard form in which CSSB agrees to repair or replace wood shakes that fail in materials within specified warranty period. Material failures include manufacturing defects that result in leaks.

1. Material Warranty Period: 20 years for shakes and 20 years for manufactured hip and ridge units, from date of Owner acceptance.

B. Special Project Warranty: Roofing Installer's warranty, on warranty form at end of this Section, signed by roofing Installer, covering Work of this Section, in which roofing Installer agrees to repair or replace components of wood shake roofing that fail in materials or workmanship within the following warranty period:

1. Warranty Period: Five years from date of Owner acceptance.

1.09 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Wood Shakes: 100 sq. ft. of each type, in unbroken bundles.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
2. Products: Subject to compliance with requirements, provide one of the products specified.
3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
4. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.02 ROOF SHAKES

A. Cedar Roof Shakes: Handsplit and resawn western red cedar shakes; split face and sawn back.

1. Grading Standard: CSSB's "Grading Rules for Certi-Split Handsplit and Resawn Shakes."
2. Grade: No. 1 and starter courses of No. 1.
3. Length: 24 inches with 15-inch-long starter course.
4. Thickness: 3/4 inch at butt.

B. Ridge and Hip Units: Manufactured units of same grade as shake, 9 inches (230 mm) wide; beveled, alternately overlapped, and nailed.

1. Type: Handsplit and resawn.
2. Length: 24 inches.
3. Thickness: 3/4 inch at butt.

2.03 WOOD TREATMENTS

A. Fire-Retardant Treatment: Exterior type, pressure-treated units.

B. Preservative Treatment: AWPA C34, chromated copper arsenate pressure-treated units, minimum 0.40 lb/cu. ft.

C. Identification: Attach a label to each bundle of shingles or shakes; identify manufacturer, references to model-code approval, type of product, grade, dimensions, and approved grading agency.

1. Include chemical treatment, method of application, purpose of treatment, and warranties available.

2.04 UNDERLAYMENT MATERIALS

A. Roof Felt Underlayment: ASTM D 226, Type II, asphalt-saturated organic felt.

B. Roof Felt Interlayment: ASTM D 226 Type II, asphalt-saturated organic felt.

C. Self-Adhering Sheet Underlayment, Polyethylene Faced: ASTM D 1970, minimum of 40 mils thick; slip-resisting, polyethylene-film-reinforced top surface laminated to SBS-modified asphalt adhesive, with release-paper backing; cold applied.

1. Available Products:

a. Grace, W. R. & Co.; Grace Ice and Water Shield.
b. Henry Company; Perma-Seal PE.
c. Johns Manville International, Inc.; Roof Defender.
d. Owens Corning; WeatherLock M.

2.05 RIDGE VENTS

A. Flexible Ridge Vent: Manufacturer's standard compression-resisting, three-dimensional, open-nylon or polyester-mat filter bonded to a nonwoven, nonwicking geotextile fabric cover for use under ridge shakes.

1. Available Products:

a. GAF Materials Corporation; Cobra.
b. Obdyke, Benjamin Incorporated; Roll Vent.
c. TAMKO Roofing Products, Inc.; Roll Vent.

2.06 ACCESSORIES

A. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.

B. Drainage Mat: Manufacturer's standard compression-resisting, three-dimensional, nonwoven, entangled filament, nylon mat designed to permit air movement and drain incidental moisture by gravity.

C. Roofing Nails: ASTM F 1667; stainless-steel wire nails, sharp-pointed, and of sufficient length to penetrate a minimum of 3/4 inch into sheathing.

1. Use box-type nails for wood shakes.
2. Where nails are in contact with metal flashing, use nails made from same metal as flashing.

D. Felt Underlayment Nails: Stainless-steel steel wire nails with low-profile capped heads or disc caps, 1-inch minimum diameter.

2.07 METAL FLASHING AND TRIM

A. Sheet Metal Flashing and Trim: Comply with requirements in Division 7 Section "Sheet Metal Flashing and Trim."

1. Sheet Metal: Copper

B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item.

1. Drip Edges: Fabricate in lengths not exceeding 10 feet with 2-inch roof-deck flange and 1-1/2-inch fascia flange with 3/8-inch drip at lower edge.

C. Vent-Pipe Flashings: ASTM B 749, Type L51121, at least 1/16 inch thick. Provide lead sleeve sized to slip over and turn down into pipe, soldered to skirt at slope of roof and extending at least 4 inches from pipe onto roof.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.

1. Examine roof sheathing to verify that sheathing joints are supported by framing and blocking or metal clips and that installation is within flatness tolerances.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored; and that provision has been made for flashings and penetrations through roofing.
3. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.

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

3.02 ROOF UNDERLAYMENT INSTALLATION

A. Single-Layer Roof Felt Underlayment: Install single layer of roof felt underlayment on roof deck perpendicular to roof slope in parallel courses. Lap sides a minimum of 2 inches over underlying course. Lap ends a minimum of 4 inches. Stagger end laps between succeeding courses at least 72 inches. Fasten with felt underlayment nails.

1. Install felt underlayment on roof deck not covered by self-adhering sheet underlayment. Lap sides of felt over self-adhering sheet underlayment not less than 3 inches in direction to shed water. Lap ends of felt not less than 6 inches over self-adhering sheet underlayment.

B. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free, on roof deck. Comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install at locations indicated below, lapped in direction to shed water. Lap sides not less than 3-1/2 inches. Lap ends not less than 6 inches staggered 24 inches between courses. Roll laps with roller. Cover underlayment within seven days.

1. Eaves: Extend from edges of eaves 24 inches beyond interior face of exterior wall.
2. Hips: Extend 18 inches on each side.
3. Ridges: Extend 36 inches on each side without obstructing continuous ridge vent slot.

3.03 METAL FLASHING INSTALLATION

A. General: Install metal flashings and other sheet metal to comply with requirements in Division 7 Section "Sheet Metal Flashing and Trim."

1. Install metal flashings according to wood roofing recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."

2. Secure hemmed flange edges into metal cleats spaced 12 inches apart and fastened to roof deck.

B. Eave Drip Edges: Install eave drip edge flashings below underlayment and fasten to roof deck.

C. Pipe Flashings: Form flashing around pipe penetrations and wood roofing. Fasten and seal to wood roofing.

3.04 ROOF SHAKE INSTALLATION

A. Install wood shake roofing according to manufacturer's written instructions, recommendations in CSSB's "Design and Application Manual for New Roof Construction," and recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."

B. Install drainage mat perpendicular to roof slope in parallel courses, butting edges and ends to form a continuous layer, and fasten to roof deck.

C. Install double-layer wood shake starter course along lowest roof edge. Extend starter course 1-1/2 inches over fascia.

1. Offset joints of double-layer starter course a minimum of 1-1/2 inches.

D. Install first course of wood shakes directly over starter course and in continuous straight-line courses across roof deck. Install second and succeeding courses of wood shakes in continuous straight-line courses across roof deck.

1. Install 18-inch-wide strip of roof felt interlayment over top portion of first and each succeeding course. Set bottom edge of roof felt interlayment at a distance of twice the weather-exposure dimension above the shake butt. Stagger fasten to roof deck with felt underlayment nails.
2. Offset joints between shakes in succeeding courses a minimum of 1-1/2 inches. Limit alignment of vertical joints in every third course to not exceed 10 percent of joints.
3. Space shakes a minimum of 3/8 inch and a maximum of 5/8 inch apart.
4. Fasten each shake with 2 nails spaced 3/4 to 1 inch from edge of shake and 1-1/2 to 2 inches above butt line of subsequent course. Drive fasteners flush with top surface of shakes without crushing wood.
5. Maintain weather exposure of 10 inches for 24-inch-long shakes.

E. Ridge Vents: Install continuous ridge vents over wood shakes according to manufacturer's written instructions. Fasten with roofing nails of sufficient length to penetrate sheathing.

F. Ridge and Hip Units: Install units over wood shakes trimmed at apex. Maintain same exposure dimension of units as roof shake exposure. Lap units at ridges to shed water away from direction of prevailing winds. Alternate overlaps of units and fasten with concealed roofing nails of sufficient length to penetrate sheathing.

1. Install concealed strip of roof felt underlayment over apex shakes and fasten with felt underlayment nails.
2. Fasten ridge units to cover ridge vent without obstructing airflow.

3.05 ROOFING INSTALLER'S WARRANTY

A. WHEREAS _____ of (Address)_____, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:

1. Owner:
2. Address:
3. Building Name/Type:
4. Address:
5. Area of Work:
6. Acceptance Date:
7. Warranty Period:
8. Expiration Date:

B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.

D. This Warranty is made subject to the following terms and conditions:

1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:

a. lightning;
b. peak gust wind speed exceeding 100 mph;
c. fire;
d. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
e. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
f. vapor condensation on bottom of roofing; and
g. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.

2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.

3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
5. During Warranty Period, if original use of roof is changed, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

E. IN WITNESS THEREOF, this instrument has been duly executed this _____ day of _____, 20__.

1. Authorized Signature:
2. Name (print or type):
3. Title:

END OF SECTION

SECTION 07317 WOOD SHAKES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes the following:

1. Wood shake roofing.
2. Felt underlayment.
3. Self-adhering sheet underlayment.
4. Ridge vents.

B. Related Sections include the following:

1. Division 6 Section "Rough Carpentry" for wood roof sheathing.
2. Division 7 Section "Sheet Metal Flashing and Trim" for metal flashings not part of this Section.

1.03 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definitions of terms related to roofing work in this Section.

1.04 SUBMITTALS

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

B. Samples for Initial Selection: For each type of wood shake, hip and ridge unit and ridge vent indicated. Include similar Samples of trim and accessories involving color selection.

C. Samples for Verification: For the following products, of sizes indicated, to verify color selected.

1. Wood Shakes: Full size.
2. Wood shingle panels.
3. Hip and Ridge Unit: Full size.
4. Ridge Vent: 12-inch-long Sample.
5. Self-Adhering Underlayment: 12 inches square.

D. LEED Submittals:

1. Credit MR 7: Certificates of chain-of-custody signed by manufacturers certifying that wood used to produce shakes was obtained from forests certified by an FSC-accredited certification body to comply with FSC 1.2, "Principles and Criteria." Include evidence that factory is certified for chain-of-custody by an FSC-accredited certification body.

a. Include statement indicating costs for products containing certified wood.

E. Qualification Data: For Installer.

F. Research/Evaluation Reports: For wood shakes.

G. Maintenance Data: For wood shakes to include in maintenance manuals.

H. Warranties: Special warranties specified in this Section.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who is an approved affiliate member of CSSB.

B. Grading Agency Qualifications: An independent testing and inspecting agency recognized by authorities having jurisdiction as qualified to label wood shakes for compliance with referenced grading rules.

C. Source Limitations: Obtain wood shakes through one source from a single manufacturer.

D. Fire-Test-Response Characteristics: Provide wood shakes and related roofing materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

1. Exterior Fire-Test Exposure: Class B; UL 790 or ASTM E 108 with ASTM D 2898, for application and roof slopes indicated.

E. Certified Wood Materials: Provide shakes made from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC 1.2, "Principles and Criteria."

F. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Approval of mockups is also for other material and construction qualities specifically approved by Architect in writing.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless such deviations are specifically approved by Architect in writing.
3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

G. Pre-Installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store underlayment rolls on end on pallets or other raised surfaces. Do not double-stack rolls.

1. Handle, store, and place roofing materials in a manner to avoid significant or permanent damage to roof deck or structural supporting members.

B. Protect unused underlayment from weather, sunlight, and moisture when left overnight or when roofing work is not in progress.

1.07 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing to be performed according to manufacturer's written instructions and warranty requirements.

1. Install self-adhering sheet underlayment within the range of ambient and substrate temperatures recommended by manufacturer.

1.08 WARRANTY

A. Special Warranty: CSSB's standard form in which CSSB agrees to repair or replace wood shakes that fail in materials within specified warranty period. Material failures include manufacturing defects that result in leaks.

1. Material Warranty Period: 20 years for shakes and 20 years for manufactured hip and ridge units, from date of Owner acceptance.

B. Special Project Warranty: Roofing Installer's warranty, on warranty form at end of this Section, signed by roofing Installer, covering Work of this Section, in which roofing Installer agrees to repair or replace components of wood shake roofing that fail in materials or workmanship within the following warranty period:

1. Warranty Period: Five years from date of Owner acceptance.

1.09 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Wood Shakes: 100 sq. ft. of each type, in unbroken bundles.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
2. Products: Subject to compliance with requirements, provide one of the products specified.
3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
4. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.02 ROOF SHAKES

A. Cedar Roof Shakes: Handsplit and resawn western red cedar shakes; split face and sawn back.

1. Grading Standard: CSSB's "Grading Rules for Certi-Split Handsplit and Resawn Shakes."
2. Grade: No. 1 and starter courses of No. 1.
3. Length: 24 inches with 15-inch-long starter course.
4. Thickness: 3/4 inch at butt.

B. Ridge and Hip Units: Manufactured units of same grade as shake, 9 inches (230 mm) wide; beveled, alternately overlapped, and nailed.

1. Type: Handsplit and resawn.
2. Length: 24 inches.
3. Thickness: 3/4 inch at butt.

2.03 WOOD TREATMENTS

A. Fire-Retardant Treatment: Exterior type, pressure-treated units.

B. Preservative Treatment: AWPA C34, chromated copper arsenate pressure-treated units, minimum 0.40 lb/cu. ft.

C. Identification: Attach a label to each bundle of shingles or shakes; identify manufacturer, references to model-code approval, type of product, grade, dimensions, and approved grading agency.

1. Include chemical treatment, method of application, purpose of treatment, and warranties available.

2.04 UNDERLAYMENT MATERIALS

A. Roof Felt Underlayment: ASTM D 226, Type II, asphalt-saturated organic felt.

B. Roof Felt Interlayment: ASTM D 226 Type II, asphalt-saturated organic felt.

C. Self-Adhering Sheet Underlayment, Polyethylene Faced: ASTM D 1970, minimum of 40 mils thick; slip-resisting, polyethylene-film-reinforced top surface laminated to SBS-modified asphalt adhesive, with release-paper backing; cold applied.

1. Available Products:

a. Grace, W. R. & Co.; Grace Ice and Water Shield.
b. Henry Company; Perma-Seal PE.
c. Johns Manville International, Inc.; Roof Defender.
d. Owens Corning; WeatherLock M.

2.05 RIDGE VENTS

A. Flexible Ridge Vent: Manufacturer's standard compression-resisting, three-dimensional, open-nylon or polyester-mat filter bonded to a nonwoven, nonwicking geotextile fabric cover for use under ridge shakes.

1. Available Products:

    a. GAF Materials Corporation; Cobra.
    b. Obdyke, Benjamin Incorporated; Roll Vent.
    c. TAMKO Roofing Products, Inc.; Roll Vent.

2.06 ACCESSORIES

A. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.

B. Drainage Mat: Manufacturer's standard compression-resisting, three-dimensional, nonwoven, entangled filament, nylon mat designed to permit air movement and drain incidental moisture by gravity.

C. Roofing Nails: ASTM F 1667; stainless-steel wire nails, sharp-pointed, and of sufficient length to penetrate a minimum of 3/4 inch into sheathing.

    1. Use box-type nails for wood shakes.
    2. Where nails are in contact with metal flashing, use nails made from same metal as flashing.

D. Felt Underlayment Nails: Stainless-steel steel wire nails with low-profile capped heads or disc caps, 1-inch minimum diameter.

2.07 METAL FLASHING AND TRIM

A. Sheet Metal Flashing and Trim: Comply with requirements in Division 7 Section "Sheet Metal Flashing and Trim."

    1. Sheet Metal: Copper

B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item.

    1. Drip Edges: Fabricate in lengths not exceeding 10 feet with 2-inch roof-deck flange and 1-1/2-inch fascia flange with 3/8-inch drip at lower edge.

C. Vent-Pipe Flashings: ASTM B 749, Type L51121, at least 1/16 inch thick. Provide lead sleeve sized to slip over and turn down into pipe, soldered to skirt at slope of roof and extending at least 4 inches from pipe onto roof.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.

    1. Examine roof sheathing to verify that sheathing joints are supported by framing and blocking or metal clips and that installation is within flatness tolerances.

2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored; and that provision has been made for flashings and penetrations through roofing.
3. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.

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

3.02 ROOF UNDERLAYMENT INSTALLATION

A. Single-Layer Roof Felt Underlayment: Install single layer of roof felt underlayment on roof deck perpendicular to roof slope in parallel courses. Lap sides a minimum of 2 inches over underlying course. Lap ends a minimum of 4 inches. Stagger end laps between succeeding courses at least 72 inches. Fasten with felt underlayment nails.

1. Install felt underlayment on roof deck not covered by self-adhering sheet underlayment. Lap sides of felt over self-adhering sheet underlayment not less than 3 inches in direction to shed water. Lap ends of felt not less than 6 inches over self-adhering sheet underlayment.

B. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free, on roof deck. Comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install at locations indicated below, lapped in direction to shed water. Lap sides not less than 3-1/2 inches. Lap ends not less than 6 inches staggered 24 inches between courses. Roll laps with roller. Cover underlayment within seven days.

1. Eaves: Extend from edges of eaves 24 inches beyond interior face of exterior wall.
2. Hips: Extend 18 inches on each side.
3. Ridges: Extend 36 inches on each side without obstructing continuous ridge vent slot.

3.03 METAL FLASHING INSTALLATION

A. General: Install metal flashings and other sheet metal to comply with requirements in Division 7 Section "Sheet Metal Flashing and Trim."

1. Install metal flashings according to wood roofing recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."

2. Secure hemmed flange edges into metal cleats spaced 12 inches apart and fastened to roof deck.

B. Eave Drip Edges: Install eave drip edge flashings below underlayment and fasten to roof deck.

C. Pipe Flashings: Form flashing around pipe penetrations and wood roofing. Fasten and seal to wood roofing.

3.04 ROOF SHAKE INSTALLATION

A. Install wood shake roofing according to manufacturer's written instructions, recommendations in CSSB's "Design and Application Manual for New Roof Construction," and recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."

B. Install drainage mat perpendicular to roof slope in parallel courses, butting edges and ends to form a continuous layer, and fasten to roof deck.

C. Install double-layer wood shake starter course along lowest roof edge. Extend starter course 1-1/2 inches over fascia.

1. Offset joints of double-layer starter course a minimum of 1-1/2 inches.

D. Install first course of wood shakes directly over starter course and in continuous straight-line courses across roof deck. Install second and succeeding courses of wood shakes in continuous straight-line courses across roof deck.

1. Install 18-inch-wide strip of roof felt interlayment over top portion of first and each succeeding course. Set bottom edge of roof felt interlayment at a distance of twice the weather-exposure dimension above the shake butt. Stagger fasten to roof deck with felt underlayment nails.
2. Offset joints between shakes in succeeding courses a minimum of 1-1/2 inches. Limit alignment of vertical joints in every third course to not exceed 10 percent of joints.
3. Space shakes a minimum of 3/8 inch and a maximum of 5/8 inch apart.
4. Fasten each shake with 2 nails spaced 3/4 to 1 inch from edge of shake and 1-1/2 to 2 inches above butt line of subsequent course. Drive fasteners flush with top surface of shakes without crushing wood.
5. Maintain weather exposure of 10 inches for 24-inch-long shakes.

E. Ridge Vents: Install continuous ridge vents over wood shakes according to manufacturer's written instructions. Fasten with roofing nails of sufficient length to penetrate sheathing.

F. Ridge and Hip Units: Install units over wood shakes trimmed at apex. Maintain same exposure dimension of units as roof shake exposure. Lap units at ridges to shed water away from direction of prevailing winds. Alternate overlaps of units and fasten with concealed roofing nails of sufficient length to penetrate sheathing.

1. Install concealed strip of roof felt underlayment over apex shakes and fasten with felt underlayment nails.
2. Fasten ridge units to cover ridge vent without obstructing airflow.

3.05 ROOFING INSTALLER'S WARRANTY

A. WHEREAS _____ of (Address)_____, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:

1. Owner:
2. Address:
3. Building Name/Type:
4. Address:
5. Area of Work:
6. Acceptance Date:
7. Warranty Period:
8. Expiration Date:

B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.

D. This Warranty is made subject to the following terms and conditions:

1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:

   a. lightning;
   b. peak gust wind speed exceeding 100 mph;
   c. fire;
   d. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
   e. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
   f. vapor condensation on bottom of roofing; and
   g. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.

2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and

void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.

5. During Warranty Period, if original use of roof is changed, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

E. IN WITNESS THEREOF, this instrument has been duly executed this _____ day of _____, 20__.

1. Authorized Signature:
2. Name (print or type):
3. Title:

END OF SECTION

SECTION 07468 WOOD SIDING

PART 1GENERAL

1.01 SUMMARY

A. This Section includes the following:

1. Cedar bevel siding.
2. Cedar running trim and molding.

B. Related Sections include the following:

1. Division 06 Section "Rough Carpentry" for furring, blocking, and other carpentry work not exposed to view.
2. Division 07 Section "Wood Shakes."

1.02 DEFINITIONS

A. Lumber grading agencies, and the abbreviations used to reference them, include the following

1. NLGA: National Lumber Grades Authority.
2. RIS: Redwood Inspection Service.
3. WRCLA: Western Red Cedar Lumber Association.

1.03 SUBMITTALS.

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials, dimensions, profiles, textures, and colors and include construction and application details.

B. Samples for Initial Selection: For each type of siding indicated. QUALITY ASSURANCE

C. Forest Certification: For the following wood products, provide materials produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC 1.2, "Principles and Criteria":

1. Exterior cedar siding.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Protect materials against weather and contact with damp or wet surfaces. Stack flat with spacers between each bundle to provide air circulation. Provide for air circulation within and around stacks and under temporary coverings.

1.05 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit work to be performed and at least one coat of specified finish can be applied without exposure to rain, snow, or dampness.

B. Do not install materials that are wet, moisture damaged, or mold damaged.

1. Indications that materials are wet or moisture damaged includes, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 PRODUCTS.

2.01 STANDING AND RUNNING TRIM

A. Lumber Trim for Painted Finish:

1. Species and Grade: Western red cedar, Grade A; NLGA, WCLIB, WRCLA or WWPA.
2. Maximum Moisture Content: 15 percent with at least 85 percent of shipment at 12 percent or less.
3. Finger Jointing: Not allowed.
4. Face Surface: as selected by Architect.

B. Moldings for Painted Finish: WMMPA WM 4, P-grade wood moldings. Made from kiln-dried stock to patterns included in WMMPA WM 12.

1. Species: Western red cedar
2. Finger Jointing: Not allowed
3. Brick-Mold Pattern: WM 180, 1-1/4 by 2 inches.
4. Drip-Cap Pattern: WM 197, 11/16 by 1-5/8 inches.
5. Bed-Mold Pattern: WM 75, 9/16 by 1-5/8 inches.
6. Screen-Bead Pattern: WM 144, 1/4 by 3/4 inch.

2.02 LUMBER SIDING

A. Provide kiln-dried lumber siding complying with DOC PS 20**,** factory coated with exterior alkyd primer.

B. Species and Grade: Clear VG (Vertical Grain) Heart western red cedar; NLGA, WCLIB, WWPA or WRCLA.

C. Pattern: Bevel siding, S1S2E, actual overall dimensions of 5-1/2 by 11/16 inch measured on the face and thick edge at 15 percent moisture content.

2.03 MISCELLANEOUS MATERIALS

A. Fasteners for Exterior Finish Carpentry: Provide nails or screws, in sufficient length to penetrate not less than 1-1/2 inches into wood substrate.

1. For face-fastening siding, provide ringed-shank siding stainless steel nails.

B. Flashing: Comply with requirements in Division 07 Section "Sheet Metal Flashing and Trim" for flashing materials installed in exterior finish carpentry.

C. Sealants: Latex, complying with ASTM C 834, Type P, Grade NF and with applicable requirements in Division 07 Section "Joint Sealants," recommended by sealant manufacturer and manufacturer of substrates for intended application.

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

a. Bostik Findley; Chem-Calk 600.
b. Pecora Corporation; AC-20+.
c. Schnee-Morehead, Inc.; SM 8200.
d. Sonneborn, Division of ChemRex Inc.; Sonolac.
e. Tremco; Tremflex 834.

2.04 FABRICATION

A. Back out or kerf backs of standing and running trim wider than 5 inches except members with ends exposed in finished work.

B. Ease edges of lumber less than 1 inch in nominal thickness to 1/16-inch radius and edges of lumber 1 inch or more in nominal thickness to 1/8-inch radius.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Examine materials before installation. Reject materials that are wet, moisture damaged, and mold damaged.

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

3.02 PREPARATION

A. Clean substrates of projections and substances detrimental to application.

B. Prime lumber to be painted, including both faces and edges. Cut to required lengths and prime ends. Comply with requirements in Division 09 Section "Paints and Coatings."

3.03 INSTALLATION, GENERAL

A. Do not use materials that are unsound, warped, improperly treated or finished, inadequately seasoned, or too small to fabricate with proper jointing arrangements.

1. Do not use manufactured units with defective surfaces, sizes, or patterns.

B. Install material level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.

1. Scribe and cut material to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
2. Install to tolerance of 1/8 inch in 96 inches for level and plumb.
3. Coordinate cedar siding and running trim with materials and systems in or adjacent to it. Provide cutouts for mechanical and electrical items that penetrate this work.

3.04 STANDING AND RUNNING TRIM INSTALLATION

A. Install flat grain lumber with bark side exposed to weather.

B. Install trim with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 24 inches long except where necessary.

1. Use scarf joints for end-to-end joints.
2. Stagger end joints in adjacent and related members.

C. Fit exterior joints to exclude water. Cope at returns and miter at corners to produce tight-fitting joints with full-surface contact throughout length of joint. Plane backs of casings to provide uniform thickness across joints, where necessary for alignment.

D. Unless otherwise indicated, countersink fasteners, fill surface flush, and sand where face fastening is unavoidable.

3.05 SIDING INSTALLATION.

A. Install siding to comply with manufacturer's written instructions.

B. Horizontal Lumber Siding: Apply starter strip along bottom edge of sheathing or sill. Install first course of siding with lower edge at least 1/8 inch below starter strip and subsequent courses lapped 1 inch over course below. Nail at each stud. Do not allow nails to penetrate more than one thickness of siding

C. Flashing: Install metal flashing as indicated on Drawings and as recommended by siding manufacturer.

D. Finish: Apply finish within two weeks of installation.

3.06 CLEANING

A. Clean material on exposed and semi-exposed surfaces. Touch up finishes to restore damaged or soiled areas.

3.07 PROTECTION

A. Protect installed products from damage from weather and other causes during construction.

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

1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

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. Embedded masonry cavity wall flashing.

C. Gutters and downspouts.

1.02 RELATED SECTIONS: 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 cold rolled 16 ounce copper sheet.

2.02 EMBEDDED MASONRY 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., Springvale, ME. Tel: (800) 252-2306.
2. AFCO Products, Inc., Somerville, MA. Tel: (617) 623-7700.
3. Fiberweb Div., Clark / Hammerbeam, Corp., Dedham, MA. Tel: (781) 461-1946.
4. York Manufacturing, Inc., Sanford, ME. Tel: (800) 551-2828.

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

2.03 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., Mableton, GA. Tel: (800) 554-1097.
2. Berger Bros. Co., Feasterville, PA. Tel: (800) 523-8852.
3. Copper Craft, Keller, TX. 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, 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 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., Tulsa, OK, Tel. (800) 879-8000.
2. International Protective Coatings Corp, , Hatfield, PA , Tel. (800) 334-8796.
3. 3M Fire Protection Products, Saint Paul, MN, Tel. (800) 328-1687.
4. United States Gypsum Company, Chicago, IL, Tel. (880) 874-4968.

B. Substitutions shall fully comply with specified requirements and Section 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 pavement and 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 and pavement 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 08100 METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Hollow metal Work, including but not limited to, the following:

1. Exterior hollow metal doors and frames.
2. Preparation of metal doors and bucks to receive finish hardware, including reinforcements, drilling and tapping necessary.
3. Factory prime painting of Work in this Section.

1.02 RELATED SECTIONS

A. Section 08710- Door Hardware.

B. Section 09050-Color Design.

C. Section 09900- Paints and Coatings.

1.03 QUALITY ASSURANCE: In addition to complying with all pertinent codes and regulations, manufacture labeled doors in accordance with specifications and procedures of Underwriters' Laboratories, Inc. In guarantee and shop drawings, comply with nomenclature established in American National Standards Institute publication A123.1, latest edition, "Nomenclature for Steel Doors and Steel Door Frames".

A. Work is subject to applicable portions of the following standards:

1. ANSI A115 "Door and Frame Preparation for Door Locks and Flush Bolts", American National Standards Institute.
2. ANSI A123.1 "Nomenclature for Steel Doors and Steel Door Frames", American National Standards Institute.
3. NFPA 80 "Fire Doors and Windows", National Fire Protection Association.
4. NFPA 101 "Life Safety Code", National Fire Protection Association.

B. Hollow metal doors and frames shall comply with the specifications for Custom Hollow Metal Doors and Frames, National Assoc. of Architectural Metal Manufacturers (NAAMM) Standard CHM 1-74, and the Steel Door Institute, SDI 100-80.

1.04 SUBMITTALS

A. Product Data: Submit schedule and manufacturer’s technical product data / literature.

B. Shop Drawings: Shop drawings shall indicate door and frame elevations, frame configuration, anchor types and spacing, reinforcement, location of cut-outs for hardware.

1.05 PRODUCT IDENTIFICATION: Deliver doors and frames and other work of this section properly tagged and identified.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store and handle all metal doors and frames in a manner to prevent damage and deterioration.

B. Provide packaging, separators, banding, spreaders, and individual wrappings as required to completely protect all metal doors and frames during transportation and storage.

C. Store doors upright, in a protected dry area, at least 4 inches off the ground and with at least 1/4 inch air space between individual pieces, protect all pre-finished and hardware surfaces.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Drawings and specifications are based on products manufactured by Steelcraft Manufacturing Company, 9017 Blue Ash Road, Cincinnati, OH 45242 Tel. (513) 745-6400.

B. Equivalent products by the following manufacturers are acceptable:

1. Amweld Building Products, Inc., Garrettsville, OH. Tel. (330) 527-4385.
2. Ceco Door Products, Brentwood, TN. Tel. (615) 661-5030.
3. Republic Builders Products, McKenzie, TN. Tel. (901) 352-3383.

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

2.02 FABRICATION: Fabricate hollow metal units rigid, neat in appearance and free from defects, warp or buckle. Accurately form metal to required sizes and profiles. Weld exposed joints continuously, grind, dress, and make smooth, flush and invisible. Metallic filler to conceal manufacturing defects is not acceptable. Unless otherwise indicated, provide countersunk flat Philips or Jackson heads for exposed screws and bolts.

A. Prepare hollow metal units to receive finish hardware, including cutouts, reinforcing, drilling and tapping per final Finish Hardware Schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI A115 "Specifications for Door and Frame Preparation for Hardware".

B. Locate finish hardware in accordance with approved shop drawings.

2.03 FRAMES: Frames for exterior openings shall be made of commercial grade 14 gage minimum cold rolled steel conforming to ASTM A366-68 with a zinc coating conforming to ASTM A653, with a coating designation of A60 or G60 and a minimum coating thickness of 0.60 oz. per sq. ft. minimum

A. Design and Construction: Frames shall be custom made welded units with integral trim, of the sizes and shapes shown on approved shop drawings. Knocked-down frames will **NOT** be accepted. Finished work shall be strong, rigid, and neat in appearance, square, true and free of defects, warp or buckle. Molded members shall be clean cut, straight and of uniform profile throughout their lengths. Jamb depths, trim, profile and backbends shall be as shown on Drawings. Corner joints shall have contact edges closed tight, with trim faces mitered and continuously welded, and stops mitered. The use of gussets will not be permitted.

1. Stops shall be 5/8 inch deep.

2. Hardware reinforcements: Frames shall be mortised, reinforced, drilled and tapped at the factory for fully templated mortised hardware only, in accordance with approved hardware schedule and templates provided by the hardware supplier. Where surface-mounted hardware is to be applied, frames shall have reinforcing plates. Frames shall be reinforced for closers. Minimum thickness of hardware reinforcing plates shall be as follows:

   a. Hinge and pivot reinforcements - 7 gage, 1 1/4 inches by 10 inches minimum.
   b. Strike reinforcements - 12 gage.
   c. Flush bolt reinforcements - 12 gage.
   d. Closer reinforcements - 12 gage.
   e. Reinforcements for surface-mounted hardware - 12 gage.

5. Floor anchors: Floor anchors shall be securely welded inside jambs for floor anchorage. Where required, provide adjustable floor anchors, providing not less than 2 inches height adjustment. Floor anchors shall be 14-gage minimum.

B. Finish: After fabrication, tool marks and surface imperfections shall be removed, and exposed faces of welded joints shall be dressed smooth. Frames shall be chemically treated to insure maximum paint adhesion and coated on accessible surfaces with rust-inhibitive primer complying with FS-TT-P-57 (Type II) or FS-TT-P-659 with 2.0 mils minimum thickness. Fully cure before shipment.

2.04 HOLLOW METAL DOORS: Doors shall be made of commercially quality, level, cold rolled steel conforming to ASTM A366-68 and free of scale, pitting or other surface defects. Face sheets for exterior doors shall be 16-gage minimum with zinc coating conforming to ASTM A653, with a coating designation of A60 or G60 and a minimum coating thickness of 0.60 oz. per sq. ft. minimum

A. Design and Construction: Doors shall be custom made, of the types and sizes shown on the approved shop drawings, and shall be fully welded seamless construction with no visible seams or joints on their faces or vertical edges. Door thickness shall be 13/4 inches unless otherwise noted. Doors shall be strong, rigid and neat in appearance, free from warp or buckle. Corner bends shall be true, straight and of minimum radius for the gage of metal used.

B. Stiffen face sheets with continuous vertical formed steel sections spanning the full thickness of the interior space between door faces. These stiffeners shall be 22 gage minimum, spaced 6 inches apart and securely attached to face sheets by spot welds 5 inches on center. Spaces between stiffeners shall be sound-deadened insulated full height of door with an inorganic non-combustible batt-type material.

C. Join door faces at their vertical edges by a continuous weld extending full height of door. Welds shall be ground, filled and dressed smooth to make them invisible and provide a smooth flush surface.

D. Top and bottom edges of doors shall be closed with a continuous recessed 16 gage minimum steel channel, extending the full width of the door and spot welded to both faces. Exterior doors shall have additional flush closing channel at top edges and, where required for attachment of weather-stripping, a flush closure at bottom edges. Provide openings in bottom closure of exterior doors to permit escape of entrapped moisture.

E. Edge profiles shall be provided on both vertical edges of doors as follows:

   1. Single-acting swing doors - beveled 1/8 inch in 2 inches.
   2. Double-acting swing doors - rounded on 2-1/8 inch radius.

F. Hardware reinforcements: Doors shall be mortised, reinforced, drilled and tapped at the factory for fully templated hardware only, in accord with the approved hardware schedule and templates provided by the hardware supplier. Where surface-mounted hardware (or hardware, the interrelation of which is to be adjusted upon installation - such as top and bottom pivots, floor closures, etc.) is to be applied, doors shall have reinforcing plates. Minimum gages for hardware reinforcing plates shall be as follows:

1. Hinge and pivot reinforcement - 7 gage.
2. Reinforcement for lock face, flush bolts, concealed holders, concealed or surface-mounted closers - 12 gage.
3. Reinforcements for all other surface mounted hardware - 16 gage.

G. Finish: After fabrication, tool marks and surface imperfections shall be dressed, filled and sanded as required to make all faces and vertical edges smooth, level and free of all irregularities. Doors shall be chemically treated to ensure maximum paint adhesion and shall be coated, on all exposed surfaces, with manufacturer's standard rust-inhibitive primer. Fully cure before shipment.

H. Flatness: Doors shall maintain a flatness tolerance of 1/16 inch maximum in any direction, including a diagonal direction.

2.05 HARDWARE LOCATIONS

A. Hinges:

1. Top – 5 inches from head of frame to top of hinge.
2. Bottom – 10 inches plus 1 inch from finished floor to bottom of hinge.
3. Intermediate, centered between top and bottom hinges.

B. Unit and integral type locks and latches – 3’- 2” to centerline of knob.

2.06 CLEARANCES

A. Edge clearances:

1. Between doors and frame, at head and jambs - 1/8 inch.
2. At door sills: where no threshold is used - 1/4 inch maximum above finished floor; where threshold is used - 3/4 inch maximum above finished floor.

B. Finished floor is defined as top surface of floor, except when resilient tile or carpet is used, when it is top of concrete slab.

2.07 PREPARATION FOR FINISH HARDWARE

A. Hardware supplier shall furnish hollow metal manufacturer approved hardware schedule, hardware templates, and samples of physical hardware where necessary to ensure correct fitting and installation. Include preparation for mortise and concealed hardware.

B. Provide reinforcements for both concealed and surface applied hardware. Drill and tap mortise reinforcements at factory, using templates. Install reinforcements with concealed connections designed to develop full strength of reinforcements.

2.08 REJECTION: Hollow metal frames or doors which are defective, have hardware cutouts of improper size or location, or which prevent proper installation of doors, hardware or work of other trades, shall be removed. Replace rejected materials.

PART 3 EXECUTION

3.01 INSPECTION: Examine areas and conditions where hollow metal Work is to be installed and notify Project Engineer of conditions detrimental to proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install hollow metal units and accessories in accordance with approved Shop Drawings, manufacturer's data, and Specifications.

B. Provide masonry anchorage devices where required for securing hollow metal frames to in-place concrete or masonry construction. Set anchorage devices opposite each anchor location, in accordance with details on final shop drawings and anchorage device manufacturer's instructions. Leave drilled holes rough, not reamed, and free from dust and debris.

C. Placing frames: Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.

1. Remove spreader bars only after frames or bucks have been properly set and secured.
2. Door installation: Fit hollow metal doors accurately in their respective frames, with the following clearances:

a. Jambs and head: 3/32 inch.
b. Bottom at threshold: 1/8 inch.

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.

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.

B. Equivalent products by the following manufacturers are acceptable:

1. Fibertec Window & Door Manufacturing, Ontario, Canada. Tel. (888) 232-4956.
2. Vistawall Architectural Products, Terrell, TX. 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 (as required) 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., Dallas, TX. Tel. (800) 887-3667.
2. Windsor Door, Little Rock, AR. 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 clear 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, required on both sides of door. 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.

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, Bayport, MN. Tel. (800) 426-7691 ext. 2427.
2. Eagle Window & Door, Inc, Dubuque, IA. Tel. (800) 453-3633.
3. JELD-WEN, INC., Klamath Falls, OR. Tel. (877) 535-3936.
4. Marvin Windows & Doors, Warroad, MN. Tel (800) 346-5128.

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 Project Engineer / 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 Project Engineer / 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. Baldwin Hardware Corporation, Reading, PA. Tel (800) 566-1986.
3. Corbin Russwin Arch't. Hardware. Berlin, CT. Tel: (800) 543-3658.
4. Dorma Door Controls, Inc. Reamstown, PA. Tel: (800) 523-8483.
5. Hager Companies. Saint Louis, MO. Tel: (800) 325-9995.
6. LCN. Princeton, IL. Tel: (800) 526-2400.
7. Markar Architectural Products, Inc., Lancaster, NY. Tel. (800) 866-1688.
8. McKinney Hinge. Scranton, PA. Tel: (800) 346-7707.
9. National Guard Products, Memphis, TN. Tel. (800) 647-7874.
10. Pemko. Ventura, CA. Tel: (800) 283-9988.
11. Rockwood Manufacturing Co. Rockwood, PA. Tel: (800) 458-2424.

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 Project Engineer / 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 AMP Doors to Toilets)
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 3PF (Mounted push side)
1 – W/Strip	N. Guard	160VB (MTD. HD & Jamb)
1 – Threshold	N. Guard	896BR X Baldwin Lifetime Finish

HW2 (For Exterior AMP Doors to Entrances)
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 AMP Doors to Toilet Rooms)
Each Opening Shall Have:

1 – Cont. Hinge	Markar	FM100 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
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 (For Interior Office Wood Door to Storage)
Each Opening Shall Have:

1 – Cont. Hinge	Markar	FM100 MPPC2 “Custom”
1 – Lockset	Baldwin	6077 LS X 6921 X 003
1 – Stop	Rockwood	440 X 605
1 – Closer	LCN	P4040 / 4040 X 605
1 – Kickplate	Rockwood	8 x 2 LDW 0.050 X 3PF (Mounted push side)

HW5 (For Exterior Hollow Metal Door @ Chase)
Each Opening Shall Have:

3 – Each Hinges	Hager	BB1279 4 1/2 X 4 1/2 X 632
1 – Deadlock	Baldwin	8555 X 003
1 – Cyl. Ring Pull	Rockwood	90 X 3PF
1 – Threshold	Pemko	181 DW X Required Length
1 – Set W/Strip	Pemko	303 DV (Head & Jambs)
1 – Stop	Rockwood	473 X 605
3 – Silencers		

HW6 (for Exterior AMP Door @ Storage Room)
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 – Kickplate	Rockwood	8 x 2 LDW 0.050 X 3PF (Mounted push side)
1 – W/Strip	N. Guard	160VB (MTD. HD & Jamb)
1 – Stop	Rockwood	473 X 605
1 – Threshold	N. Guard	513 BR X Baldwin Lifetime Finish

HW7 (for Exterior Dbl Hollow Metal Doors @ Electrical Equip. Room)
Each Opening Shall Have:

6 – Each Hinges	Hager	BB1279 4 1/2 X 4 1/2 X NRP X 632
1 – Deadlock	Baldwin	8555 X 003
1 – Cyl. Ring Pull	Rockwood	90 X 3PF
2 – Flushbolts	Rockwood	555-12” X 605
1 – Threshold	Pemko	181 DW X Required Length
1 – Set W/Strip	Pemko	303 DV (Head & Jambs)
2 – Stops	Rockwood	473 X 605
3 – Silencers		

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., Atlanta, GA. Tel. (800) 766-2343.
2. Guardian Industries Corp., Carleton, MI. Tel. (800) 521-9040.
3. Pilkington Libbey-Owens-Ford, Toledo, OH. Tel. (419) 246-6078.
4. PPG Industries, Inc., Pittsburgh, PA. Tel. (800) 377-5267.
5. Visteon Float Glass Operations, Allen Park, MI. 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 Project Engineer / 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
• 03300 - Conc. Floor (Lobby)	Kemiko – Cola	(brown)
• 04200 - Conc. Block Walls	ICI#2010 Shell White (P4)	(light beige)
• 04200 - Mortar (Conc. Block)	Standard Gray	(gray)
• 05500 - Miscellaneous Steel	ICI #1178 Tavern Green (P1)	(dark green)
• 06400 - Architectural Woodwork	ICI #485 Eldorado Tan (P5)	(dark tan)
• 06400 – Bead Board Paneling	ICI WP Stain - Old Hickory	(medium brown)
• 06400 - Architectural Woodwork	ICI WP Stain - Old Hickory	(medium brown)
• 06400 - Solid Plastic (SS #1)	Formica Surell - Spanish Paprika	(brown)
• 06400 - Door, Window & Trim (int.)	ICI #485 Eldorado Tan (P5)	(dark tan)
• 06400 - Windows & Sidelights (ext.)	ICI #649 Oyster White (P2)	(med. beige)
• 06400 - Dr & Window Trim (ext.)	ICI #431 Antique Bisque (P3)	(tan)
• 06400 - Crown Molding & Trim (ext.)	ICI #431 Antique Bisque (P3)	(dark tan)
• 06400 - Crown Molding & Trim (int.)	ICI #485 Eldorado Tan (P5)	(dark tan)
• 06400 - Soffit & Porch Ceiling	ICI#2010 Shell White (P4)	(light beige)
• 07317 - Wood Shakes	Color to be Selected	

• 07468 - Wood Siding	ICI WP - Rustique Veneer Semi-Transparent Stain	
• 07610 - Copper Gutters & DS	Copper	(real copper)
• 07920 - Joint Sealants	Pecora (Match adjacent lighter color)	
• 08210 - Wood Doors (Interior)	ICI #485 Eldorado Tan (P5)	(dark tan)
• 08235 - AMP Doors (Interior)	Match ICI #1178 Tavern Green (P1)	(dark green)
• 08235 - AMP Doors (Exterior)	Match ICI #1178 Tavern Green (P1)	(dark green)
08334 - Rolling Counter Doors	Overhead Door - Clear Anodized	(aluminum)
• 08710 - Door Hardware	Brass	(dark brown)
• 09250 - Gypsum (Walls)	ICI#2010 Shell White (P4)	(light beige)
• 09250 - Gypsum (Ceilings)	ICI#2010 Shell White (P4)	(light beige)
• 09310 – Ceramic Tile Floor #1	Daltile #2009 Almond (8”x8”)	(light beige)
• 09310 – Ceramic Tile Floor #2	Daltile #2112 Timberline(8”x8”)	(dark green)
• 09310 – Ceramic Tile Cove	Daltile #2112 Timberline(8”x8”)	(dark green)
• 09310 - Ceramic Tile Wall #4	Daltile #K165 Almond (4 ¼”x4 ¼”)	(off white)
• 09310 - Ceramic Tile Wall #5	Daltile #K112 Timberline (4 ¼”x4 ¼”)	(dark green)
• 09310 - Grout (Floors & Walls)	Laticrete #61 Parchment	(tan)
• 10100 - Visual Display Board	Claridge #1692 Wheat	(tan)
• 10170 - Toilet Partition	Comtec #D406-Sand Castle	(beige)
• 10400 - Specialty Signs (Bkground)	Mohawk (Forrest Green)	(green)
• 10400 - Specialty Signs (Letters)	Mohawk (Tan)	(off white)
• 10670 - Storage Shelving	Penco #012 Tawny Tan	(tan)
• 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)
• 13046 - Guard House (Roof)	Match ICI #485 Eldorado Tan (P5)	(dark tan)
• 13046 - Guard House (Walls)	Match ICI WP-Rustique Veneer Semi-Transparent Stain	
• 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 Project Engineer / 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

A. Gypsum board work with a tape-and-compound joint treatment system known as "drywall finishing" work.

B. The types of Work required include the following:

1. Gypsum board applied to wood framing and furring.
2. Gypsum backing boards for application of other finishes.
3. Drywall finishing (joint tape-and-compound treatment).

1.02 SUBMITTALS: Submit manufacturer's technical product data, installation instructions and recommendations for products specified.

1.03 QUALITY ASSURANCE

A. Where work is indicated for fire resistance ratings, including those required to comply with governing regulations, provide materials and installations identical with applicable assemblies which have been tested and listed by recognized authorities, including UL and A.I.A.

B. Industry Standard: Comply with applicable requirements of GA-216 "Application and Finishing of Gypsum Board" by the Gypsum Association, except where more detailed or more stringent requirements are indicated including the recommendations of the manufacturer.

C. Allowable Tolerances: 1/8 inch offsets between planes of board faces, and 1/4 inch in 8 ft. for plumb, level, warp and bow.

D. Manufacturer: Obtain gypsum boards, framing and fasteners, trim accessories, adhesives and joint treatment products from a single manufacturer, or from manufacturers recommended by the prime manufacturer of gypsum boards.

1.04 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 GYPSUM BOARD PRODUCTS

A. To the extent not otherwise indicated, comply with GA-216, as specified and recommended.

B. Exposed gypsum board shall be Type X, fire rated type with tapered long edges and as follows:

1. Edge Profile: Special rounded or beveled edge.
2. Sheet Size: Maximum length available that will minimize end joints.
3. Thickness: 5/8 inch, except where otherwise indicated.
4. Water-resistant Type (WR-1): Provide where indicated; 5/8 inch thick.
5. Cement Board: Provide water-resistant cement based backer board, 1/2 inch thick Durock, as a base for ceramic tile walls only where indicated on Drawing.

2.02 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.

2.03 JOINT TREATMENT MATERIALS

A. General: ASTM C 475; type recommended by the manufacturer for the application indicated, except as otherwise indicated.

B. Joint Tape: Perforated type.

C. Joint Compound: On interior work provide chemical hardening type for bedding and filling, ready-mixed vinyl-type or non-case in-type for topping. On exterior work provide water- resistant type.

2.04 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 Install supplementary framing, runners, furring, blocking and bracing at opening and terminations in the Work, and at locations required to support fixtures, equipment, services, heavy trim, furnishings and similar work which cannot be adequately supported directly on gypsum board alone.

3.02 GENERAL GYPSUM BOARD INSTALLATION REQUIREMENTS

A. Meet at the project site with the installers of related work and review the coordination and sequencing of work to ensure that everything to be concealed by gypsum drywall has been accomplished, and that chases, access panels, openings, supplementary framing and blocking and similar provisions have been completed. In addition to compliance with GA-216, comply with manufacturer's instructions and requirements for fire resistance ratings (if any), whichever is most stringent.

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. Install sound attenuation blankets and insulation as indicated, prior to gypsum board unless readily installed after board has been installed.

D. 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.

E. Space fasteners in gypsum boards in accordance with manufacturer's recommendations.

3.03 SPECIAL GYPSUM BOARD APPLICATIONS: 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

A. Where feasible, use the same fasteners to anchor trim accessory flanges as required to fasten gypsum board to the supports. Otherwise, fasten flanges by nailing or stapling in accordance with manufacturer's instructions and recommendations.

B. Install metal corner beads at external corners of drywall work.

C. Install metal edge trim whenever edge of gypsum board would otherwise be exposed or semi-exposed. Provide type with face flange to receive joint compound except where semi-finishing type is indicated. Install L-type trim where work is tightly abutted to other work, and install special kerf-type where other work is kerfed to receive long leg of L-type trim. Install U- type trim where edge is exposed, revealed, gasketed, or sealant-filled (including expansion joints.) Install metal control joint (beaded type) where indicated or required for proper installation.

3.05 INSTALLATION OF DRYWALL FINISHING

A. Apply treatment at gypsum board joints (both directions), flanges of trim accessories, penetrations, fastener heads, surface defects and elsewhere as required to prepare Work for decoration. Pre-fill open joints and rounded or beveled edges, using type of compound specified herein and recommended by manufacturer.

B. Apply joint tape at joints between gypsum boards, except where a trim accessory is indicated.

C. Apply joint compound in 3 coats (not including pre-fill of openings in base), and sand between last 2 coats and after last coat.

D. Base for Ceramic Tile: Do not install drywall finishing where ceramic tile and similar rigid applied finishes are indicated.

E. Unless otherwise indicated, install drywall finishing at all gypsum board exposed to view and to receive finishes as specified. Where not exposed to view and above ceilings, sanding is not required.

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: 6 inches by 8 inches by 5/16 inch, cushioned edge, unglazed, 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 Project Engineer / 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 Project Engineer / 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 Project Engineer / 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. Paint Systems: Comply with Article 2.04 indicating each type of primer and top coat required for each substrate by product name and number.

C. Samples: Submit color samples for selection by Project Engineer / MDOT Architect from manufacturer's full range of colors. Indicate submitted manufacturer's closest **standard** colors that match colors specified in Section 09050.

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 Cleveland, OH. Tel. (888) 265-6753.
2. Benjamin Moore & Company, Montvale, NJ. Tel. (800) 344-0400.
3. Farrell-Calhoun Paint, Memphis, TN. Tel. (901) 526-2211.
4. PPG Architectural Finishes, Inc., Pittsburgh, PA. Tel. (800) 441-9695.
5. Sherwin-Williams Company, NW, Cleveland, OH. Tel. (800) 321-8194.
6. Anvil Paints & Coatings, Inc., Largo, FL. Tel. (800) 822-6776

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 Project Engineer / 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 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 and 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
   (First coat may not be required on items that are shop primed – check for compatibility.)
   Not less than 2.5 mils dry film thickness.

2. 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.
3. Stained Lap Siding
   1st Coat – Acrylic Latex – ICI Wood Pride Semi-Transparent Siding Stain
   2nd Coat – Acrylic Latex – ICI Wood Pride Semi-Transparent Siding Stain
4. Concrete Floor Stain & Sealer
   Follow Manufacturer's recommendations described in Section 03365 and coordinate with sidewalk colors and methods of application.

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. Ferrous Metal and 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
   (First coat may not be required on items that are shop primed – check for compatibility.)
   Not less than 2.5 mils dry film thickness.
5. 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.
6. 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

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 parts, 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 Project Engineer / 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 Project Engineer / 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 Architect.

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.

B. Equivalent products by the following manufacturers are acceptable:

1. General Partitions, Erie, PA. Tel. (814) 833-1154.
2. Knickerbocker Partition Corp, Freeport, NY. Tel. (516) 546-0550.
3. The Mills Company, Willoughby, OH. Tel. (440) 951-8877.
4. Rockville Partitions, Pisgah, AL. Tel. (256) 451-1300.
5. Santana Products Co., Inc., Scranton, PA. 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

5.01 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.

5.02 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.

5.03 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. Project Engineer / MDOT Architect's review of samples will be for color and texture only. When requested, furnish full-size samples of specialty sign materials.

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., Dallas, TX. Tel. (800) 274-7732.
2. Best Sign Systems, Montrose, CO. Tel. (970) 249-2378.
3. Scott Sign Systems, Inc., Sarasota, FL. 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.

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 / MDOT Architect.

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: Not required.

C. Sign Type 3: Not required.

D. Sign Type 4: 36 inches wide by 6 inches high wall mounted informational sign, with 2 changeable insert panels. (INFORMATION – Two required). 12 inches wide by 2 inches high changeable insert panels (8 a.m. – 5 p.m.; two required; 8 a.m. – 7 p.m.; two 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 – 2 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 cabinets, 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.

B. Equivalent products by the following manufacturers are acceptable:

1. Amerex Corp., Trussville, AL. Tel. (205) 655-3271.
2. Larsen's Mfg. Co., Minneapolis, MN. Tel. (612) 571-1181.
3. Potter-Roemer, Santa Ana, CA. Tel. (800) 366-3473.

C. Substitutions shall fully comply with specified requirements and Section 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 Cabinet 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.

2.04 EXTINGUISHER CABINETS: Equal to J.L. Industries Cosmopolitan 1032F12 with ADAC option. Provide Fire-FX option where located in a fire rated wall. Cabinet shall accommodate the Cosmic 10E extinguisher. Provide black die-cut letters, vertical.

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 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 three units are required unless additional units are indicated otherwise. Units shall be within 20' of all Mechanical Rooms and exits.

C. Check all cabinets for scratched, nicked, and other surface defects. Cabinets with these conditions shall be repaired or replaced.

END OF SECTION

SECTION 10670 STORAGE SHELVING

PART 1 GENERAL

1.01 SECTION INCLUDES: Metal shelving as show on the Drawings.

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, Aurora, IL. Tel. (603) 892-8941.
2. Stanley Storage Systems, Allentown, PA. 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 closed type prefinished metal shelving complete with hardware, end kit, label holder and closed base. Equal to Penco Model No. 1H8087, 48 inches wide, 18 inches deep, and 87 inches high with 7 shelves.

B. Color: Color to be selected from standard color chart by Project Engineer / 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 types of toilet accessories required include the following:

1. Mirrors
2. Toilet Paper Dispenser
3. Grab Bars
4. Mop Holder
5. Waste Receptacle
6. Diaper Changing Station
7. Hand Dryer
8. Toilet Seat Cover Dispenser
9. Napkin Disposal Unit

1.02 SUBMITTALS: Submit manufacturer's 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, New Windsor, NY. Tel. (845) 562-3332.
2. Bobrick Washroom Equipment, Inc., Jackson, TN. Tel. (901) 424-7000.
3. Bradley Washroom Accessories Division, Menomonee Falls, WI. Tel. (414) 354-0100.
4. Kimberly-Clark Corp., Roswell, GA. Tel. (888) 346-4652.
5. Koala Corp., Denver, CO. Tel. (800) 985-6252.
6. World Dryer, Berkeley, IL. 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. 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 consists 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.

E. 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.

F. 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.

G. 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 amps, 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.

H. 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.

I. 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, Louisville, KY. Tel. (800) 626-2000.
2. Magic Chef Co., Cleveland, TN. Tel. (423) 472-3371.
3. Sears Contract Sales, Hoffman Estates, IL. Tel. (847) 286-2994.

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

2.02 REFRIGERATOR: 17.9 cu. ft. capacity equal to GE Model GTS18ICMWW with automatic icemaker and reversible door, White.

2.03 MICROWAVE: 1.4 cu. ft. oven cavity, 950 watts, over-the-range vented type, equal to GE Model JVM1440WD with Re-circulating Charcoal Filter Kit Model JX81A, White.

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. Modify (if required) swing of refrigerator door to open toward adjacent base cabinets. Coordinate with cabinets for proper fit.

C. 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.

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., Saint Paul, MN. Tel. (651) 631-1607.
2. Balco / Metalines, Wichita, KS. Tel. (316) 945-9328.
3. R. C. Musson Rubber Co., Akron, OH. 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 Project Engineer / MDOT Architect from full range of standard colors.

C. Rails: Extruded aluminum 6063-T52 in standard color.

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.

2.03 CARPET FLOOR MAT: Equal to C/S Carpet Mat, Model PWPT-C-M-907.

A. Size: Approximately 7'-0" wide by 7'-0" long. Field verify dimensions; adjust size shown to fit space.

B. Carpet Color: As selected by Project Engineer / 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 13046 PRE-FABRICATED GUARD BOOTH

PART 1 GENERAL

1.01 SECTION INCLUDES: Purchase and install pre-fabricated guard booth at location as shown on Drawings.

1.02 RELATED SECTIONS

A. Section 03100 – Concrete Forms & Accessories
B. Section 03200 – Concrete Reinforcing
C. Section 03300 – Cast-in-Place Concrete
D. Section 09050 – Color Design
E. Section 09900 – Paints and Coatings
F. Division 16000 – Electrical

1.03 COORDINATION: Concrete foundation for guard house to be coordinated to provide anchorage for guard house for accurate fit. Correlate location of required anchorage, blocking, and connectors to allow secure and proper attachment.

1.04 DELIVERY, STORAGE AND PROTECTION: Follow manufacturer's recommendations for delivery, storage, and protection of guard house.

1.06 PROJECT CONDITIONS: Installer must examine all parts of the guard house structure and the conditions under which the prefabricated structure 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 PREFABRICATED GUARD HOUSE

A. Drawings and Specifications are based on product manufactured by Big Enterprises, Inc. 97-2 E. Rush Street, S. El Monte, CA 91733. Provide 6 ft. x 6 ft. Leesburg Guard Booth #DOP46A or approved equal.

PART 3 EXECUTION

3.01 INSTALLATION: Securely attach pre-fabricated unit to substrates by anchoring and fastening as required by recognized standards.

3.02 Paint any exposed parts of this pre-fabricated guard house that does not come factory finished.

3.03 ELECTRICAL CONNECTIONS: Insure electrical outlets, lights, switches, heating unit, and through-the-wall mechanical unit work properly.

3.04 CLEANING AND PROTECTION: Protect pre-fabricated guard house from damage during construction. Prior to final acceptance, remove all protective film, tape, and other temporary protective materials. Clean inside and outside all surfaces.

END OF SECTION

SECTION 15010 GENERAL PROVISIONS

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, plumbing and fire protection 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 and 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

A. 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 chilled and hot water piping, standpipes, 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. Valve tag charts and diagrams specified elsewhere herein.

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. Four (4) 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 for a period of not less than three (3) days. 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 over a period of two (2) days 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, plumbing, and fire protection submittal data shall be bound into separate HVAC, plumbing, and fire protection 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 submitted 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
Air Handling Units
Cleanouts
Condensing Units
Cooling Coils
Disconnect Switches
Ductwork Accessories and Details (min. 1/4"=1'0" scale)
Fans
Grilles, Registers and Diffusers
Insulation
Manholes
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 (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 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, plumbing and fire protection 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 15016 CODES AND REGULATIONS

PART 1 GENERAL

1.01 DESCRIPTION

A. This division and the accompanying drawings cover furnishing of all labor, equipment, appliances and materials and performing all operations in connection with the installation of complete air conditioning, ventilating, heating, plumbing and kitchen hood fire protection systems as specified herein and as shown on the drawings.

B. The general provisions of the Contract including the Conditions of the Contract (General, Supplementary and other conditions) and other divisions as appropriate, apply to work specified in this Division.

1.02 CODES, ORDINANCES AND PERMITS

A. All heating, ventilating and air conditioning materials and workmanship shall comply with the following codes and standards as applicable:

1. The International Building Code (2003)

2. The International Mechanical Code (2003)

3. The National Electric Code (2002)

B. All plumbing materials and workmanship shall comply with the following codes and standards as applicable:

1. The International Plumbing Code (2003)

2. The National Electric Code (2002)

C. Applicable Publications: The publications listed below form a part of this specification to the extent referenced and are referred to in the text by the basic designation only.

1. Air-Conditioning and Refrigeration Institute Standards (ARI)

2. American National Standards Institute, Inc. Standards (ANSI)

3. American Society for Testing and Materials Publications (ASTM)

4. American Society of Mechanical Engineers Code (ASME)

5. Factory Mutual Underwriters (FM)

6. National Fire Protection Association Standard (2003)

7. Sheet Metal and Air Conditioning Contractor's National Association, Inc. (SMACNA)

8. Underwriters Laboratories, Inc. (UL)

PART 2 PRODUCTS

2.01 COORDINATION: Any modification to the mechanical systems and their components, the electrical systems, the building structure and architecture, or any other portion of the building that results from the use of any other than the basis of design equipment shall be coordinated with all plans and codes. Such coordination shall occur 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.

PART 3 EXECUTION

3.01 GENERAL

A. This Contractor shall conform to standards prescribed by City, County, State and Federal regulations or ordinances having jurisdiction. Execution of the Contract Documents indicates Contractor's knowledge of above regulations or ordinances and any changes that may be necessary to conform to such regulations or ordinances shall be made by this Contractor without extra cost to the Owner.

B. Permits required for the installation of the work, as well as all authorized code inspections, construction fees, meters and assessments shall be arranged for and paid for by the Contractor.

C. The contractor shall comply with all applicable provisions of the William-Steiger Occupational Safety and Health Act O.S.H.A.).

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 provision of Section 15010.

B. All piping in mechanical spaces, in unfinished space, such as store rooms and above lift out ceiling, shall be identified with pressure-sensitive pipe markers with color bands of the proper size. Markers shall have proper legend and meet OSHA Specifications. Where pipes are too small for such application, a 1-1/2" brass tag shall be used. Do not identify piping in the finished areas, such as offices.

C. Markers shall be placed so as to be easily read. Arrows shall be applied to indicate direction of flow.

PART 2 PRODUCTS

2.01 PIPE MARKINGS

A. Pipe marking shall be applied by using stencils and spray on stencil ink. Band and letter sizes and identification shall be as indicated in PART 3 - EXECUTION. Direction of flow arrows shall be placed next to color bands. A white background of stencil ink shall be provided where black letters are used on pipe or pipe covering material that is already black.

B. In lieu of painted markings, manufactured, preprinted markings may be used in accordance with the following:

1. No tape or self-adhering markers will be allowed.

2. Snap on pipe markers, W. H. Brady Co. or approved equal 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: Band and letter sizes shall conform to ASHRAE standards of the following table:

O.D. of Pipe or Covering	Width of Color Band	Size of Letter/Numbers
1¼" and smaller	8"	1/2"
1½" to 2"	8"	3/4"
2½" to 6"	12"	1¼"
6" to 10"	24"	2½"
over 10"	32"	3½"

2.03 IDENTIFICATION: Band legend and color and letter color shall conform to the following table:

Piping Band	Legend Letters	Band Color	
Cold Water (Domestic)	CW (Dom)	White	Green
Hot Water (Domestic)	HW (Dom)	Black	Yellow
Drain	D	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 through walls and floors.

4. At or near 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. If manufactured preprinted markers are used they 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. All mechanical work specified shall be in accordance with Section 15000.

B. All motors shall be provided.

C. All motor starters shall be provided by Division 15 for each motor including package units. 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 and thermostats by Division 16 work.

G. Smoke detectors for HVAC equipment shall be furnished by Division 16 and installed by Division 15.

PART 2 PRODUCTS

2.01 MOTOR STARTERS

A. The Electrical Contractor shall furnish and install all manual starters as required. Where magnetic starters, reversing starters, multiple speed starters, etc., are required, they shall be furnished by the Mechanical Contractor. All poly-phase motors and all motors which are automatically controlled shall be furnished with magnetic starters, full voltage, non-reversing type, complete with necessary auxiliary contacts for controls unless otherwise noted. Heaters shall be of the melting alloy type, sized to the exact nameplate running current of the motor. Overloads shall have visual trip indicators and shall be trip-free with reset button held in. All magnetic motor starters or controllers shall be equipped with one overload element in each phase. Manually operated motors with magnetic controllers shall be provided with oil-tight pushbutton stations and automatically controlled motors shall be provided with oil-tight, "hand-off" automatic switches. All magnetic starters shall be provided with red bull's eye pilot light in cover. Energy for controlled circuits shall be taken through auxiliary contacts, and shall not be taken from the load contacts from the starters. All power wiring and control wiring shall be run in rigid conduit in damp locations or electrical metallic tubing in dry locations and shall conform to NEC Standards.

B. All motor starters, push buttons and pilot lights shall be of the same manufacture as the switchboard.

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, firestat 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 removal of 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 15030 MECHANICAL SYSTEMS SCHEDULE

PART 1 - GENERAL

1.01 APPLICABILITY: The work specified herein shall include all labor, materials, equipment, tools, supplies and supervision required to install and place in operation the mechanical systems and appurtenances specified herein and/or indicated on the drawings or reasonably implied as necessary for completion of the various systems.

PART 2 - SCOPE OF WORK

2.01 SCOPE: Furnish and install heating, air conditioning and ventilating equipment and systems as shown on drawings and described herein.

PART 3 EXECUTION

3.01 WORK BY OTHERS

A. The Electrical Contractor shall bring adequate power to and make final connections to all equipment furnished under this Contract. All control wiring shall be by Controls Contractor.

B. The General Contractor shall provide prepared openings for ducts and other mechanical work as required in walls, roof, ceilings, etc.; shall do all painting as required; and shall assist Mechanical Contractor with installation of all mechanical equipment in exterior walls and on roof.

C. All items of labor, materials and equipment not specifically stated herein or on drawings to be by others and required to make the system complete and operative shall be by this Contractor.

D. The Contractor shall so coordinate the work of the several various trades that it may be installed in the most direct and workmanlike manner without hindering or handicapping the other trades. Piping interferences shall be handled by giving precedence to pipe lines which require a stated grade for proper operation. For example, sewer lines and condensate piping shall take precedence over water lines in determination of elevations. Where there is interference between sewer lines and condensate lines, the sewer lines shall have precedence and provisions shall be made in the condensate lines for looping them around the sewer lines. In all cases, lines requiring a stated grade for their proper operation shall have precedence over electrical conduit and ductwork.

E. All piping and ductwork in finished areas, except where noted to the contrary, shall be installed in chases, furred spaces, above ceilings, etc. In all cases, pipes and ducts shall be installed as high as possible. Runs of piping shall be grouped whenever it is feasible to do so.

F. Piping, equipment, or ductwork shall not be installed in electrical equipment rooms or elevator machine rooms except as serving <u>only</u> those rooms. Outside of electrical equipment rooms, do not run piping or ductwork, or locate equipment, with respect to switchboards, panelboards, power panels, motor control centers, or dry type transformers:

1. Within 42" in front (and rear if free standing) of equipment; or
2. Within 36" of sides of equipment.
3. Clearances apply vertically from floor to structure.

4. Provide safe access to equipment and apparatus requiring operation, service or maintenance within the life of the system. This includes, but is not limited to, motors, valves, filters, dampers, shock absorbers, etc. Equipment located above lay-in type ceilings is considered accessible.

END OF SECTION

SECTION 15050 BASIC MATERIALS AND METHODS

PART 1 GENERAL

1.01 RELATED DOCUMENTS: The general provisions of the contract including the conditions of the contract (general, supplementary and other conditions) and other divisions appropriate, apply to work specified in this Division.

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 GENERAL: The mechanical plans do not give exact elevations or locations of lines, nor do they show all the offsets, existing lines, or other installation details. The Contractor shall carefully lay out his work at the site to avoid all obstructions, and provide as-built drawings as described in Section 15011 of specifications.

3.02 EXCAVATION, TRENCHING AND BACKFILLING

A. Excavate trenches for underground pipe lines to required depth and provide a separate trench for each utility sewer, gas and water line except where otherwise noted on drawings. Lay all pipe in open trench unless given permission for tunneling. Excavate trenches of sufficient width for proper installation of the work.

B. Sheet and brace trenches and remove water as necessary to permit proper installation of the work. Under no circumstances lay pipe in water. Keep the trench free from water until pipe joint material has hardened. The presence of ground water in the soil or the necessity of sheeting or bracing trenches shall not constitute a condition for which any increase may be made in the contract price.

C. Grade the bottom of trenches evenly and excavate bell holes to ensure uniform bearing for the full length of all pipes. Cut holes as necessary for joints and joint making. Excavate all hard material to at least four inches (4") below the pipe at all points. Refill such space and all other cuts below grade with sand or fine gravel firmly compacted.

D. After pipe lines have been tested, inspected and approved by the Architect and prior to backfilling, remove forms and clean excavations of trash and debris to prepare for backfill.

E. When proper time has elapsed for joint hardening, if necessary, initial backfilling shall be performed by hand, together with tamping until fill has progressed to an elevation at least one foot above the top of pipes. During the initial backfilling, approved granular material (where required) or loose soil free from lumps, clods, frozen material or stones shall be deposited in layers of approximately six inch (6") thickness and compacted by hand or with manually operated machine tampers actuated by compressed air or other suitable means. From the point one foot above the top of pipe in unimproved areas (outside limits of buildings, parking areas, driveways, alleys, streets and the like) backfill may be deposited by bull-dozer, drag line, or other suitable means in layers with sufficient surplus material neatly rounded over the trench to compensate for settlement after backfill. All surplus excavated materials shall be disposed of by the Contractor at his expense unless otherwise directed by the Architect. Trench filling from the point one foot above the pipes under

improved areas (buildings, driveways, parking areas, streets and the like) where danger from settlement exists: Backfill shall proceed in layers and compacted to the Proctor density as specified in the Architectural specifications governing the project. Compaction tests as specified therein shall be observed as if repeated herein. Backfill and compaction shall be approved by the Architect prior to pouring of concrete, paving, etc.

3.03 GENERAL PIPING INSTALLATIONS

A. Arrange, install piping approximately as indicated straight, plumb, and as direct as possible; form right angles or parallel lines with building walls. Keep pipes close to walls, partitions, ceilings; offset only where necessary to follow walls as directed. Locate groups of pipes parallel to each other; space them at distance to permit applying full insulation and to permit access for servicing valves.

B. Install horizontal piping as high as possible without sags or humps. Grade drainage piping at uniform slope of 1/4" per foot minimum; where this is impossible, maintain slope as directed but in no case less than 1/8" per foot.

C. Locate valves for easy access and operation where concealed; provide access doors of the proper type for the construction into which they are installed. Do not locate any valves with the stems below horizontal.

D. Provide water supply, drain, vent and gas connections to equipment specified in other sections requiring such services. Indicated locations and sizes of equipment connections are approximate; exact locations and sizes of piping and valves shall conform to approved shop drawings and printed installation directions furnished by equipment manufacturer. Connection sizes shall not be smaller than equipment outlets for same.

E. Drains shall be provided at all coils, receivers, pump suction lines, pump plates where facilities are provided and at all low points of the systems. Such drains shall consist of the necessary pipe, valves and fittings required in the opinion of the Architect to permit servicing of equipment, systems, etc.

3.04 PIPE EXPANSION

A. In the installation of all pipe runs where shown or where necessary, install swing joints, flexible couplings, turns, expansion loops or long off-sets to allow for expansion. Broken pipe or fittings due to rigid connections must be removed and replaced at no additional cost to the Owner.

B. All lines shall be securely anchored where required. Where such anchors occur, they shall be securely fastened to the steel or concrete structure of the building in a manner approved by the Architect. Shop drawings shall be submitted before installation.

3.05 PIPE SLEEVES

A. Pipe sleeves of cast iron or zinc coated Schedule 10 steel pipe shall be provided for all pipes passing through exterior walls, and slabs on grade, which do not have membrane waterproofing. Sleeves may be omitted where pipes pass through exterior walls above ground to lawn faucets, wall hydrants and down-spout nozzles.

B. Sleeves passing through floors and exterior walls which are provided with membrane waterproofing shall be of threaded steel pipe fitted with companion flanges and arranged to secure membrane. Companion flanges shall be drilled and tapped in such a manner that bolting is effected from the outer (or upper) face only.

C. Sleeves for pipes passing through potentially wet floors that do not have membrane waterproofing such as in toilet rooms, utility cores, mechanical equipment rooms, etc., shall be zinc coated steel pipe and shall project two inches (2") above the finished floors, and shall be caulked watertight.

D. Sleeves shall be provided for all pipes passing through all other floors and walls, and shall be constructed of zinc coated sheet steel not lighter than No. 18 gage, moisture resistant fiber, or plastic.

E. On new work, sleeves shall be built into the walls and floors as the work progresses.

F. Sleeves through exterior walls below grade shall be not less than two inches (2") greater in inside diameter than the outside diameter of the pipe it serves; all other sleeves shall be large enough to provide approximately 1/4" clear annular space between the sleeve and pipe or between the sleeve and insulation where insulation is required. Except as hereinbefore specified for wet area floors, sleeves shall be of sufficient length to terminate flush with the finished floor or wall.

G. Spaces between pipes and sleeves passing through exterior walls, slabs on grade and over crawl spaces, and water-proofed floors shall be caulked watertight. Spaces between pipes and sleeves passing through floors, walls, and ceilings of machine spaces, such as mechanical equipment, refrigeration, boiler, pump, fan, and machinery rooms, shall be packed and sealed at both ends of sleeve to provide an airtight acoustical barrier.

H. Sleeves passing through fire walls or partitions or pipes passing from floor to floor shall have annular space between sleeve and pipe or insulation packed tight with non-combustible fibrous glass to within one-half inch of either end of sleeve and caulked with non-combustible, permanently plastic, waterproof, non-staining caulking compound finished smooth on both sides as manufactured by 3M or Hilti.

3.06 FLOOR AND CEILING PLATES: Furnish and install chrome-plated type floor and ceiling plates or escutcheons on all exposed pipe passing through floors, walls and ceilings. Inside diameter shall fit around insulation or around pipe; when not insulated, outside diameter shall cover sleeve. Where sleeve extends above finished floor, escutcheon shall clear sleeve extension. Secure escutcheons or plates to pipe or sleeve but not to insulation.

3.07 ROOF FLASHING: Vent pipes passing through roof shall be flashed with four (4) pound lead sheet or 16 oz. copper, at least twenty inches (20") square, and shall be extended up and turned down at least 1" inside pipe, with pipe at least twelve inches (12") above roof at center line. Vents shall off-set in roof joist area or ceiling cavity if necessary so that no vent shall be closer than 4'-0" from outside wall line.

3.08 SYSTEMS CLEANING AND TREATMENT

A. All potable water lines shall be thoroughly flushed and then sterilized with a solution containing not less than 50 ppm available chlorine for eight (8) hours. During sterilization operate all valves, faucets, etc., so that all portions of system are reached. Flush system with clear city water until concentration drops to 0.5 ppm. Obtain bacteriological certificate from local health department for water sample and submit with final documents at completion.

B. After the above described cleaning and flushing of piping systems has been completed, the Contractor shall notify the Architect in writing that the procedure has been completed. On the next visit to the site by the Architect's representative, the Contractor shall draw one (1) gallon samples from each system to verify compliance and if necessary shall have samples tested by appropriate laboratory to substantiate compliance.

3.09 FILTER CLEANING

A. Air handling equipment on this project shall not be operated during any stage of construction, clean-up or testing without design efficiency filters.

B. Where operation of equipment is permitted by the Architect for finished painting, plaster curing or the like, disposable filters of design efficiency shall be used and replaced with new filters at time of acceptance. Where permanent cleanable filters are specified, such filters may not be used, but must be installed new and clean at the time of acceptance.

3.10 IDENTIFICATION: All starters, controllers, panels, units of equipment shall be identified with self adhesive engraved phenolic markers of an approved type indicating the equipment designation used on the drawings - RTU-1, etc. A list of markers shall be submitted for approval prior to ordering.

3.11 TESTS: This Contractor shall conduct such tests as required to determine that systems and equipment which he installs conforms to specifications. Contractor shall supply all labor, materials, instruments, operations, etc., required to facilitate testing. Gages, thermometers, and instruments used in testing shall be accurate, recently calibrated and approved by the Architect prior to test. Instruments installed permanently in systems, as specified here in before, may be used in testing when approved by the Architect. Tests shall be as follows:

1. Water Piping (Domestic Systems): 150 PSI hydrostatic, with no discernable pressure loss for a period of eight (8) hours.
2. Sanitary: Minimum ten feet (10') hydrostatic test and as required by ASA-A40.8 or local code.
3. Safety Controls: Test water heater and other equipment safety controls such as high temperature limit and high pressure limit, for proper operation prior to acceptance. Furnish certification of such tests prior to request for final payment.
4. Thermometers, Gauges, Etc.: Contractor shall remove, recalibrate and/or replace any instrument installed in the system, as directed by the Engineer when accuracy is questionable, mercury columns are separated or other such conditions exist.

3.12 TESTING AND ADJUSTING OF EQUIPMENT: Each and every phase of the air conditioning, heating and ventilating system shall be operated for a sufficient period of time to demonstrate to the entire satisfaction of the Architect the ability of the system to meet the capacity and performance requirements.

3.13 PROTECTIVE DEVICES: All couplings, motor shafts, gears, belt drives, or other rotative or moving parts shall be fully guarded, in accordance with ANSI B15.1 Safety Code for Mechanical Power Transmission Apparatus. Guards shall be steel and expanded metal or sheet metal as approved. Guards shall be rigid, suitably secured and readily removable for maintenance without disassembly of the guarded unit.

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.

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: 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.

3.04 OPERATING TESTS: 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 MECHANICAL SUPPORTING SYSTEMS

PART 1 GENERAL

1.01 GENERAL: Provide adequate pipe and equipment foundations and suspension systems in accordance with recognized engineering practices, using, where possible, standard, commercially accepted hangers and accessories.

1.02 CODES

A. All pipe hangers and supports shall conform to the latest requirements of the Code for Pressure Piping, Refrigeration Piping ANSI-ASME B31.5-74 and Manufacturers' Standardization Society of Valve & Fittings Industry Documents MSS-SP-58-75 and MSS-SP-69-76.

B. All auxiliary steel necessary for the installation of the pipe hangers and supports shall be designed in accordance with the AISC 1978 Specification.

1.03 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 and provide for safety of installing personnel and safety of personnel to operate, maintain, repair and replace 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 PRODUCTS: Numbers refer to Fee & Mason. Equal devices by Grinell or B-line will be acceptable.

2.02 CONCRETE INSERTS: Inserts shall be Figures 186, 2570 or FAMET 9000 where a continuous insert is required.

2.03 BEAM & STEEL JOIST CLAMPS: Clamps shall be Figures 249, 254, 282, 252, or 253.

2.04 RISER CLAMPS: Riser clamps shall be Figures 238 or 241, for steel pipe or Figure 368 for copper tubing. For riser loadings in excess of the maximum recommended loads shown for the above items, clamps shall be designed in accordance with Figures 395 or 396.

2.05 HANGER RODS

A. Hanger rods shall be Figures 267A and 263. Eye rods shall be Figures 228 and 228 WL.

B. All rods shall be galvanized coated.

2.06 PIPE HANGERS

A. All hangers for piping 2" or larger shall be provided with means of vertical adjustment.

B. On uninsulated steel pipe, hangers shall be Figures 199, 236, or 239.

C. On uninsulated copper tubing, hangers shall be Figures 307 or 364.

D. On hot insulated steel pipe, hangers shall be Figure 261 or welded attachments, Figures 90, 92, 94, or 96. Where thermal movement causes the hanger rod to deviate more than 5 Degrees from the vertical, or where longitudinal expansion causes a movement of more than 1/2" in the piping supported from below, roller hangers Figures 160, 161, 162, 170 or 272 shall be used in conjunction with a protective saddle sized to suit the insulation thickness. On insulated steel pipe for chilled or hot water or similar service the hanger must be placed on the outside of the insulation.

E. On insulated copper tubing, hangers shall be Figures 199 or 239 and shall be placed on the outside of the insulation.

F. Insulated pipe and tubing supports shall be Pipe Shields, Inc. A1000, A2000, A3000, A4000, A5000, A6000, A7000 or A8000.

G. Base supports shall be Figures 259 or 291.

2.07 BRACKETS AND RACKS: Welded steel brackets shall be Figures 151 and 155. Multiple pipe racks or trapeze hangers shall be fabricated from FAMET channel, clamps, and accessories.

2.08 ANCHORS, GUIDES AND SLIDING SUPPORTS: Pipe anchors shall be Figures 141 or 159. Guides shall be Figures 120, 121, 122 or 165. Sliding supports shall be Figures 143 or 145.

PART 3 EXECUTION

3.01 ATTACHING TO STRUCTURE

A. Where equipment or piping is supported off a concrete structure, inserts shall be used. Where support rod sizes exceed 7/8" diameter or where the pipe load exceeds the recommended load for the insert, use 2 inserts with a trapeze type connecting member below the concrete. In cases where pipes are supported from existing slab, use Phillips' "RED HEAD" or equal, sized for Safety Factor 4.

B. Where equipment or piping is supported from building steel beam, clamps or welded beam attachments shall be used. Holes drilled in building steel for hanger support rods will not be permitted.

C. All vertical runs of piping shall be supported at each floor.

3.02 HANGER RODS AND SPACING

A. Where hanger rod sizes are catalog-listed for a specified hanger, this size shall govern. Where hanger rod sizes are not catalog-listed, the load on the hanger shall be the determining factor and the maximum recommended hanger rod load, as catalog-listed, shall govern.

B. Pipe hangers shall be at each change in direction, not more than 2'-0" from end of run, and on straight runs the spacing shall not exceed whichever is closer: at each joint, or as follows:

PIPE SIZE	STEEL PIPE	COPPER PIPE
To 3/4"	7'-0"	5'-0"
1" to 2"	10'-0"	8'-0"
2-1/2" to 4"	12'-0"	10'-0"
5" to 8"	16'-0"	10'-0"

C. Provide supports at concentrated loads such as equipment, in-line pumps, valves and other piping specialties, to prevent line sag and/or excess stress in the piping systems.

D. For cast iron pipe provide hanger at each joint or fitting with a maximum spacing of 5'-0" on center.

E. Where distance between riser clamp and hanger exceeds 10'-0" in height, intermediate clamps shall be installed to provide support or alignment at a maximum of every 10'-0".

3.03 AUXILIARY STEEL

A. Furnish all miscellaneous structural members necessary to hang or support pipe or mechanical equipment. Material of members shall be consistent with that of the main structural system.

B. All auxiliary steel shall receive one shop coat of primer paint prior to installation.

C. Notify Architect of any adjustment necessary in main structural system for proper support of major equipment and provide for personnel safety for maintenance, repair and replacement of equipment.

3.04 CONCRETE PADS: Provide concrete pads where indicated on drawings under floor-mounted equipment and apparatus.

END OF SECTION

SECTION 15180 MECHANICAL SYSTEMS INSULATION

PART 1 GENERAL

1.01 Furnish and install all insulation for HVAC piping and duct and plumbing piping.

1.02 Insulations specified are intended to set a standard. Insulations by other manufacturers will be considered provided that samples of each substitute item are submitted for approval.

1.03 Specifications apply to supply and associated return system unless specifically specified otherwise.

1.04 All insulation shall have surface burning characteristic ratings as tested by ASTM E-84, UL 723, or NFPA 255 not exceeding:

Flame Spread	25
Smoke Developed	50

Composite shall include insulation, jacketing and adhesive used to secure jacketing or facing. All accessory items such as PVC jacketing and fittings, adhesive, mastic, cement, tape and cloth shall have the same component ratings as specified above.

1.05 Insulation shall include all insulating materials, their applications, bands, tie wire, and weather protection for all pipe, fittings, valves, and equipment as indicated and as specified herein.

1.06 Pipe insulation on cold surfaces shall pass full thickness through hanger with galvanized iron sheet metal saddle at each hanger as per schedule below:

Through 3"	16 ga. x 12"
4" - 6"	16 ga. x 18"

1.07 Insulation at supports on 4" pipe and larger shall be foamglas on hot water and cold pipe. Hangers on domestic hot water, hot water heating and other hot surfaces where fiberglass insulation is used shall bear on the pipe and insulation shall be applied over hangers in a neat and workmanlike manner.

PART 2 PRODUCTS

2.01 HVAC DUCTWORK:

A. ALL RECTANGULAR DUCTWORK RETURN & EXHAUST WILL BE EXTERNALLY WRAPED: Owens-Corning 1-1/2" thick fiberglas faced duct wrap with factory-applied flame-retardant foil-reinforced Draft Facing (FRK). Type FRK 25, Series ED-100.

B. ALL SUPPLY ROUND AND OVAL DUCT WORK EXHAUST AND RETURN WILL BE EXTERNALLY WRAPED: Owens-Corning 1-1/2" thick 3/4 lb. density fiberglas duct wrap with factory-applied flame-retardant foil-reinforced Kraft Facing (FRK). Type FRK 25, Series ED-100. Round or oval ductwork in attic shall have 2" thick 3/4 lb. density fiberglas duct wrap.

C. ALL SUPPLY RECTANGULAR DUCTWORK SHALL BE INTERNALLY LINED: Refer to Section 15840.

PART 3 EXECUTION

3.01 GENERAL:

A. The application of all insulation shall be performed by experienced mechanics, regularly employed in the trade, in a neat and workmanlike manner. Unless otherwise specified to a greater quality, the application of all insulation shall be in accordance with the manufacturer's recommendations.

B. Omit insulation from the following items:

1. Exposed plated plumbing pipe.

2. Vents to atmosphere, discharge from safety and relief valves, overflow pipes, and hot only drain pipes.

3. Valves, unions, flanges, traps, strainers, and devices in HOT ONLY piping.

4. Exhaust discharge ducts.

C. Foil-Faced (FF) duct insulation shall be acceptable to NFPA Standards 90A and 90B.

D. All exposed ends of pipe insulation shall be pointed up neatly with appropriate insulating cement, or use premolded PVC end caps on cold only piping and preformed aluminum end caps on dual-temp, hot or steam piping.

E. Piping systems shall be tested and cleaned before insulation is applied.

3.02 FIBERGLASS DUCT WRAP TYPE INSULATION: (To be used on round or oval duct only or on rectangular duct with a maximum dimension less than 36.) Adhere insulation tightly wrapped to duct surface with approved adhesive applied in strips approximately 4" wide on approximate 8" centers. In addition, secure insulation to the bottom and/or sides of rectangular duct work with a dimension of 24" and above with mechanical fasteners at not more than 18" on center. Butt circumferential edges of insulation and seal joints with staples at 6" o.c., adhering the flange over each joint, and seal at lap of longitudinal joints. Tape all joints and punctures with 3" wide foil reinforced Kraft tape.

3.03 ARMAFLEX PIPE INSULATION: Apply in accordance with latest edition of Armstrong's "INSULATION INSTRUCTIONS TO THE CONTRACTOR". On outdoor or underground application, apply four coats of Armstrong's Weatherproof Plastic, reinforced with glass mesh.

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:

15011 Submittals
15020 Identification of Piping Systems
15100 Mechanical Supporting Systems
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 International Plumbing Code (2003 edition); 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 beneath building slab to 5’-0” outside building: Service weight (SV) cast iron hub and spigot soil pipe and fittings, ASTM A-74 with neoprene compression gasket, joints, ASTM C-564.

C. Drainage piping all sizes beyond 5’-0” outside building: Polyvinyl chloride pipe (PVC) ASTM D-2665, 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 to 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: Type "L" copper tubing with tin-antimony soldered joints and wrought copper socket fittings. Underground piping 3" and smaller: Type "K" hard drawn copper tubing, with 95-5 silver soldered joints and wrought copper socket fittings.

B. Underground piping 3" and smaller beneath bldg. slab to 5’-0” outside bldg.: Type "K" hard drawn copper tubing, with 95-5 silver soldered joints and wrought copper socket fittings.

C. 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.

D. Underground piping 1" and smaller below building slab: Below slab Type "L" soft drawn copper tubing, with no joints.

2.04 COMPRESSED AIR PIPING:

A. Aboveground piping 3" and smaller: Type "L" copper tubing with tin-antimony soldered joints and wrought copper socket fittings. Underground piping 3" and smaller: Type "K" hard drawn copper tubing, with 95-5 silver soldered joints and wrought copper socket fittings.

B. Underground piping 3" and smaller beneath bldg. slab to 5’-0” outside bldg.: Type "K" hard drawn copper tubing, with 95-5 silver soldered joints and wrought copper socket fittings.

2.05 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. 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 walls shall be sealed with a fire rated sealant as manufactured by 3M or Hilti.

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 ¾ inch diameter, and permitting lateral adjustment.

D. 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.

2.06 WATER HAMMER ARRESTORS:

A. Water hammer arrestors shall be piston operated, type "K" copper, pressure rated for 250 psi, tested and certified in accordance with PDI standard WH-201; Precision Plumbing Products, Inc., or approved equal.

2.07 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.

C. Class 150 valves meeting the above specifications may be used where pressure requires; NIBCO S-134 or approved equal.

D. 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.

E. 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.

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.

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.

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.

I. Check valves 2-1/2" and larger shall be iron body, bronze mounted, with body and cap conforming to ASTM A-126 Class B cast iron, flanged ends, swing type disc; NIBCO F-918-B or approved equal.

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 pipelines 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 degree F. Insulation shall be Manville Fiberglass Micro-Lok AP-T Plus 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 or equal.

INSULATION THICKNESS IN INCHES FOR PIPE SIZES

	Temperature Up to	**Up to 1”**	**1 ¼” to 2”**	**2 ½” to 4”**	**4” & Over**
Cold Water	50º-65ºF	½”	1”	1”	1”
Hot Water	200ºF	½”	1”	1”	1 ½”

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.

2.12 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 degrees 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 manufacturer's 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 extending through roof shall terminate at 1'-0" above roof and shall be minimum size of 3” diameter.

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.

3.03 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.

3.04 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 gravity 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 compressed air piping at 175 psi for a minimum of two (2) hours. No drop in air pressure will be permitted after air temperature has stabilized.

D. 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.

3.05 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.

3.06 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.

3.07 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 15410 SEWAGE TREATMENT PLANT

PART 1 GENERAL

1.01 DESCRIPTION:

A. This work shall consist of furnishing all materials and labor for the installation two new 1500 gallon per day sewage treatment units and related components. All work and materials shall be in accordance with the requirements of the contract drawings and specifications, the Mississippi Air and Water Pollution Control Commission, U. S. Environmental Protection Agency Standards and/or regulations, and in reasonably close conformity with the lines, grades, and dimensions specified on the drawings. Units shall be ANSI/NSF International, Standard 40, Class 1 approved.

It is the intention of these contract documents to provide the necessary items and instructions for the installation of a complete and operable sewage treatment plant; however, omission of any items or instructions necessary for the proper installation and construction of the system shall not relieve the Contractor of furnishing and installing such items.

1.01 GENERAL PROVISIONS:

A. The requirements of Section 15010 apply to this work.

1.02 MATERIALS:

A. General: Unless otherwise stipulated, the materials used in this construction, in addition to the general requirements of these Specifications, shall conform to the provisions and requirements prescribed in applicable sections of the Standard Specifications, Commercial Standards, the National Sanitation Foundation, the National Electrical Code and the International Plumbing Code (latest editions).

All materials shall be new and of good quality and advanced proven design throughout the project. All units of any one (1) item shall be made by the same manufacturer unless otherwise approved, in writing, by the Engineer.

All materials required to make system functional, whether specifically covered herein or incidental in nature, shall be subject to approval by the Engineer. All materials listed herein are minimum acceptable Standards. Products conforming to or exceeding the requirements stated herein when certified will be considered for approval. All materials will require a written certification of quality and design by the supplier, as a basis for acceptance prior to approval by the Engineer.

B. Product Submittals and Shop Drawings: Submit eight (8) copies of brochures, descriptive data, and shop drawings showing all materials and components necessary for a complete and operational treatment plant to the Project Engineer for approval, prior to beginning any work.

Approval of data, etc. does not necessarily indicate approval of material; but only type, design, etc. Only after proper installation of application to the satisfaction of the Project Engineer will approval be granted.

Samples shall be submitted to the engineer for approval when descriptive data cannot be furnished.

PART 2 PRODUCTS

2.01 SEWAGE TREATMENT PLANT :

A. Description: The work described in this Section consists of furnishing and installing two (2) aerobic sewage treatment units as shown in the drawings and in accordance with the Specifications. The treatment plant shall be a complete system consisting of two (2) 1,500 GPD units combined with equipment capable of treating a total of 3,000 gallons of per day average daily flow (ADF) of domestic raw sewage waste with a total organic loading of 7.50 pounds of BOD per day. A minimum of 2,100 cubic feet of aeration capacity shall be provided for each pound of BOD.

The principal items of equipment shall include: pretreatment tank, aeration tanks with stationary drop diffusers; clarifiers, in-line chlorinator with contact chamber, aeration blowers, piping, and controls. All necessary air, sewage, transfer piping, and pipe supports, shall be furnished and installed by contractor.

B. Construction: The treatment plant's main tank shall be constructed of ¼ inch minimum thickness fiberglass. The tank shall be molded of fiberglass reinforced polyester resin.

C. Aeration Tank: The aeration tank shall be sized to provide a minimum of 24 hour hydraulic detention time at the average daily flow (ADF). Tank design shall be such as to provide efficient mixing and aeration, and to maintain hydraulic velocities sufficient to prevent deposition of solids.

D. Pretreatment tank: A 1000 gallon pre-cast concrete pretreatment tank shall be provided where shown on the drawings to receive the incoming flow. The inlet tank shall be designed to collect large incoming solids. This shall be accomplished by extending the inlet pipe downward below the trash floatable zone and above the settling zone. The discharge pipe shall also be extended downward so as to draw pretreated sewage from the median zone, keeping both floatable and settle-able solids out of the aeration tank.

E. Clarifier: The clarifier shall be designed so as to provide optimum liquid-solid separation and shall be sized to provide eight hours of hydraulic detention at the ADF rate. The clarifier shall be installed in the main tank.

F. Chlorinator: An in-line chlorinator with a 180 gallon contact chamber shall be included in the treatment system to achieve disinfection by chlorination of the final effluent. The effluent from the treatment plant shall gravity flow through the tablet type chlorinator.

G. Aeration Blower: Provide an aeration bower system with sufficient capacity to furnish the treatment plant air requirements. The blower(s) shall be capable of delivering a minimum of 2,100 cubic feet per pound of BOD influent at the required discharge pressure.

H. Air Diffusion System: Air diffusion pipe drops of 3/4 inch schedule 40 PVC pipe shall be provided to supply air to diffuser. Each pipe shall be slotted for proper air diffusion and designed for non-clogging.

I. Piping: All necessary piping and valves inside the plant shall be PVC and shall be provided by the plant manufacturer. At the exterior of the plant the manufacturer shall provide properly sized inlet and outlet connections as shown on the drawings. The contractor shall provide and install all necessary piping and valves located outside the plant.

J. Controls: An electrical control panel equal to Delta Environmental Products, Inc. Model CP-40 shall be furnished with each 1,500 GPD unit that will protect the compressor(s) from overload and failure to start. Included in the panel shall be a pressure switch alarm system that will sound an alarm upon loss of sir supply as well as a high water alarm. System shall be ANSI/NSF International certified utilizing UL rated components in an indoor/outdoor NEMA 3R painted steel enclosure.

K. The sewage treatment plant(s) shall be the product of as experienced manufacturer actively engaged in the manufacturing of sewage treatment facilities and shall be listed as an approved manufacturer by the Mississippi State Department of Health. Treatment plants shall be Delta Environmental Products, Inc. Model DF150-FF or approved equal.

PART 3 EXECUTION

3.01 CONSTRUCTION REQUIREMENTS:

A. General: All workmanship and materials shall be of the highest quality. The method of construction, unless otherwise stipulated, shall conform to the provisions and requirements where applicable, prescribed in the Standard Specifications for the several items, which constitute the complete work, with the additions shown hereafter. All work shall be performed in a good workmanlike manner, in accordance with the best practices of the trade and to the satisfaction of the Project Engineer. Work shall conform with all the rules, regulations and requirements of the Mississippi Air and Water Pollution Control Commission, the National Electrical Code, the International Plumbing Code, good sanitary engineering practices, these Specifications, and in reasonable close conformity with the lines, grades, and dimensions specified on the drawings.

B. Excavation: Excavation for all installation and construction shall be in reasonably close conformity with the grades and lines as shown on the drawings or as designated. The excavation shall be kept to a minimum width necessary to construct the sewage treatment plant so as not to disturb more of the terrain than is necessary. Care shall be taken to excavate no deeper than is necessary. All unused excavation material shall be removed from the site by the contractor.

The bottom of the excavated area shall be to proper grade and shall be clean and devoid of all lumps, irregularities, and free of all rocks, roots, and other obstructions. Where the bottom of excavated area is unstable material, the material shall be excavated to firm soil and backfilled with suitable material and compacted to form a firm footing.

C. Plant Installation: The plant tanks shall be placed on the prepared site in an approved manner, taking care not to disturb more of the adjacent terrain than is necessary. All lines shall be run to the plant as required and connections made. All necessary tests shall be performed on the lines and tanks of the plant. Upon approval of these tests, the backfill operation shall be performed.

The mechanical equipment shall be installed in an approved manner as recommended by the manufacturer. Care shall be taken to ensure that all equipment is installed properly and securely. All electrical items shall be installed in strict accordance with the National Electrical Code and properly grounded.

D. Backfilling: Backfilling shall be performed as soon as practical after tanks and lines have been installed and tested to the satisfaction of the Project Engineer. All objectionable matter such as roots, rocks, etc. shall be removed from the backfill; and all undesirable lumps or clods shall be broken up or removed prior to backfilling.

The backfill material shall be deposited in level uniform layers and be compacted around the lines and tanks to the grades shown on the drawings, or established in an approved manner to the satisfaction of the Project Engineer. Care shall be taken to ensure a smooth and neat finished grade. Excess excavation shall be disposed of as directed.

When the backfill operation has been completed, all areas that have been disturbed by the construction operation shall be dressed up as directed by the Project Engineer.

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 provisions of Section 15010 "Mechanical General".

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 Pipe Hangers and Supports
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: Refer to schedule on drawings 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 strength reinforced plastic housing. Heating coils shall be flow switch activated and thermostatically controlled.

B. Provide flow control fitting at inlet of heater. Provide ball valve at inlet and outlet of heater.

C. Contractor shall coordinate space requirements of instantaneous heater and compatibility between heater and multi-lavatory unit being furnished on this project. Instantaneous heater shall be Eemax or approved equal.

PART 3 EXECUTION

3.01 INSTALLATION OF WATER HEATERS:

A. Install water heaters where indicated on drawings, 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. Provide dielectric isolation at all heater connections.

C. Identification - Provide sign securely attached to water heater identifying equipment number, service and capacity. 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.

H. 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:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

B. All work specified in this Section is subject to the provisions of Section 15010 "Mechanical General".

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 bathtub 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. 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
   Crane Plumbing Co.
   Bradley Corp.
   Acorn

2. Plumbing Trim
   American Standard, U.S. Plumbing Products
   Eljer Plumbingware Division, Wallace-Murray Corporation
   Kohler Company
   Delta Commercial Faucet Company
   T & S Brass and Bronze Works, Inc.
   Eastman Brasscraft
   McGuire Manufacturing Co.

3. Flush Valves
   Coyne & Delaney Company
   Sloan Valve Company
   Zurn Industries, Inc., Hydromechanics Div.
   Toto

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. Mop Sinks
   American Standard, U.S. Plumbing Products
   Eljer Plumbingware Div., Wallace-Murray Corp.
   Fiat Products, Unit of Mark Control Corp.
   Kohler Co.
   Stern-Williams Co., Inc.

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 shall be judged by Architect. Remove cracked or dented units and replace with new units.

3.04 EXTRA STOCK:

A. 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 15660 SPLIT SYSTEMS AND CONDENSING UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Condensing unit package.

B. Charge of refrigerant and oil.

C. Controls and control connections.

D. Refrigerant piping connections.

E. Motor starters.

F. Electrical power connections.

1.02 RELATED SECTIONS

A. Section 03300 - Cast-in-Place Concrete: Equipment bases.

B. Section 15535 - Refrigeration Piping and Specialties.

C. Section 15855 - Air Handling Units with Coils.

D. Section 15952 - Controls and Instrumentation.

E. Section 15242 - Vibration Isolation - Placement of Vibration Isolators

1.03 REFERENCES

A. ANSI/ASHRAE 15 - Safety Code for Mechanical Refrigeration.

B. ANSI/ASHRAE/IES 90 A - Energy Conservation in New Building Design Standard.

C. ARI 210/240 - Unitary Air-Conditioning Equipment and Air-Source Heat Pump Equipment, (units less than 135,000 Btuh).

D. ARI 360 - Commercial and Industrial Unitary Air Conditioning Equipment testing and rating standard (condensing units greater than 135,000 Btuh).

E. ARI 340 - Commercial and Industrial Unitary Heat Pump Equipment, (heat pumps greater than 135,000 Btuh).

F. ANSI Z21.47/UL1995 - Unitary Air Conditioning Standard for safety requirements.

G. California Energy Commission Administrative Code - Title 20/24 - Establishes the minimum efficiency requirements for HVAC equipment installed in new buildings in the State of California.

H. ARI 270 - Sound Rating of Outdoor Unitary Equipment, (units less than 135,00 Btuh).

I. ARI 370 - Sound Rating of Large Outdoor Refrigerating and Air Conditioning Equipment (equipment above 135,000 Btuh).

1.04 SUBMITTALS

A. Submit unit performance data including: capacity, nominal and operating performance.

B. Submit Mechanical Specifications for unit and accessories describing construction, components and options.

C. Submit shop drawings indicating overall dimensions as well as installation, operation and service clearances. Indicate lift points and recommendations and center of gravity. Indicate unit shipping, installation and operating weights including dimensions.

D. Submit data on electrical requirements and connection points. Include recommeded wire and fuse sizes or MCA, sequence of operation, safety and start-up instructions.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Comply with manufacturer's installation instructions for rigging, unloading, and transporting units.

B. Protect units on site from physical damage. Protect coils.

1.06 WARRANTY

A. Provide parts warranty for one year from start-up or 18 months from shipment, whichever occurs first.

B. Provide parts warranty on compressors for 2nd thru 5th years.

1.07 REGULATORY REQUIRMENTS

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.

PART 2 PRODUCTS

2.01 SUMMARY

A. The contractor shall furnish and install air-cooled condensing units and indoor air handling units as shown as scheduled on the contract documents. The unit(s) shall be installed in accordance with this specification and perform at the specified conditions as scheduled.

B. APPROVED MANUFACTURERS

1. Trane

2. Johnson Contractor

2.02 GENERAL UNIT DESCRIPTION (CONDENSING UNITS)

A. Provide self-contained, packaged, factory-assembled and pre-wired 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).

B. Performance Ratings: Energy Efficiency Rating (EER) [and Coefficient of Performance (COP)] not less than prescribed by ANSI/ASHRAE 90A.

C. See equipment schedules on plans for performance

2.03 CASING (CONDENSING UNITS)

A. 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.

B. Mount controls in weatherproof panel provided with removable panels and/or access doors with quick opening fasteners.

2.04 CONDENSER COILS

A. 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.

B. Entire condenser coil shall be protected with fully louvered coil guard.

2.05 FANS AND MOTORS (CONDENSING UNITS)

A. Vertical discharge direct driven propeller type condenser fans with fan guard on discharge. Fans shall be statically and dynamically balanced.

B. 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.

2.06 COMPRESSORS

A. Compressor(s): Provide direct-drive hermetic, scroll 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.

2.07 CONTROLS (CONDENSING UNITS)

A. 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. Division 16 Contractor to provide field installed unit mounted disconnect switch. Units shall have single point power connections.

B. Provide factory-wired units with 24-volt electro-mechanical control circuit with control transformers, contactors pressure lugs or terminal block for power wiring. Contractor to provide [DISCONNECT DEVICE]. Units shall have single point power connection as standard. Field wiring of zone controls to be NEC Class II.

1. Provide 24-volt,time delay relay with four minute delay between compressor staging on dual compressor units.

2. Provide 24-volt, either 5 or 7 minute fixed-off timer that will prevent compressor short cycling upon shutdown.

3. Provide factory installed evaporator defrost control to prevent compressor slugging by interrupting compressor operation when low evaporator coil temperatures are encountered.

2.08 STAGING CONTROLS (CONDENSING UNITS)

A. Provide auto changeover 24 volt electromechanical thermostat with the following characteristics:

1. System selector switch (auto-heat-off-cool)

2. Locate thermostat in room as shown on plans

2.09 MISCELLANEOUS FEATURES (CONDENSING UNITS)

A. Spring Isolators: Provide field-installed vibration isolators.

B. Low Ambient Control: Electronic head pressure control that allows operation to 0 degress F outdoor ambient.

C. Condenser Coil guard: Fully louvered condenser coil guard.

2.10 GENERAL UNIT DESCRIPTION (AIR HANDLING UNITS)

A. Air Handling Units shall be completely factory assembled including coil, condensate drain pan, fan, motor, filters and controls in an insulated casing that can be applied in horizontal or vertical configuration. The “F” model indicates an “Air-Tite” model with 4.2 “R” value insulation and additional sealing systems.

B. Units provided shall be compact with simple 6-way convertibility in sizes up to 5 tons. Simple coil rotation shall provide downflow and horizontal applications.

C. Performance Ratings: Energy Efficiency Rating (EER) [and Coefficient of Performance (COP)] not less than prescribed by ANSI/ASHRAE 90A.

D. See equipment schedules on plans for performance

2.11 CASING (AIR HANDLING UNITS)

A. Units shall have a rugged sheet metal and steel frame construction and shall be painted with an enamel finish. Casing shall be insulated and knockouts for electrical power and control wiring.

2.12 REFRIGERANT CIRCUITS (AIR HANDLING UNITS)

A. Units shall have a single refrigerant circuit and shall be controlled by a factory-installed non-bleed thermal expansion valve.

B. Coils: Aluminum fin surface shall be mechanically bonded to 3/8-inch OD copper tubing. Coils are factory pressure and leak tested.

2.13 FANS (AIR HANDLING UNITS)

A. Forward curved, dynamically balanced and statically balanced with 3-speed direct drive shall be standard, fan motor bearing shall be permanently lubricated.

2.14 CONTROLS (AIR HANDLING UNITS)

A. Low voltage pig tails, fan contactor, and plug-in module for accessory electric heat control shall be included. Check valves shall also be included.

2.15 FILTERS (AIR HANDLING UNITS)

A. Filter bases shall be provided external to the air handling units that will accept 2” thick filters. Filters shall be 2” thick, 30% eff. pleated media.

2.16 ELECTRIC HEATERS (CONDENSING UNITS)

A. Shall be available in a wide range of capacities and voltages with various staging options, and plug-in control wiring. Heaters shall fit inside the internal compartment.

B. Electric Heaters for this project are duct mounted. See equipment schedules for capacities, sizes, etc.

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 15840 DUCTWORK AND ACCESSORIES

PART 1 GENERAL

1.01 DESCRIPTION:

A. All work specified in this Section is subject to the provisions of Section 15000.

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.

D. No ductwork shall be fabricated until fabrication shop drawings have been prepared, submitted and reviewed.

PART 2 PRODUCTS

2.01 DUCTWORK - GENERAL:

A. SMACNA Standards indicated shall mean standard published by 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 as follows:

1. From air handling unit to all terminal units: Medium Pressure - 6" static pressure, Class A seals.

2. From terminal units to diffusers, toilet exhaust ductwork: Low Pressure - 1" static pressure, Class B seals.

B. Ductwork shall be constructed of G90 galvanized sheet steel, unless otherwise specified herein. All return and outside air ductwork shall be lined with duct liner. Ductwork shall be round, oval or rectangular as indicated. Sizes given shall be considered to be the minimum, and any conversion from the given shape shall be made without increasing air velocity or friction losses. All duct dimensions indicated are net clear inside dimensions.

C. Liner for first 20'feet from air handling equipment shall be 1" thick, 3 lb. per cubic foot density fiberglass duct liner. All other internally insulated ductwork shall be 1" thick, 1-1/2 lb. cubic foot density fiber glass duct liner. Secure liner with spray-on adhesive and stick pins and clips. Liner shall have black neoprene face in contact with the air stream. Liner shall meet all requirements for Flame Spread and Smoke Developed ratings; i.e., NFPA 25/50. Thermal conductivity for duct liner insulation shall be K = 0.24 Btu-in. per sq. ft. per ? F per hour at 75? F mean temperature.

D. Ductwork fabrication shop drawings shall be submitted as part of the shop drawing submittal.

E. 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.

F. All branch takeoffs in medium pressure ductwork shall be made with conical, bellmouth, or lateral fittings.

G. Low pressure round ducts up to and including 12" in diameter shall be longitudinal lock seam construction. Low pressure round ducts larger than 12" and all medium pressure round ducts 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 fastened with a minimum of 3 sheet metal screws in each joint.

H. Duct hangers and supports shall be in accordance with Section IV (pages 4-1 through 4-13) **HANGERS AND SUPPORTS** of the referenced SMACNA Standard, except:

1. Hangers shall be spaced <u>not</u> 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 4-1 (page 4-8) for strap hangers and Table 4-3 (page 4-10) 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.

2. Single blade butterfly dampers shall be constructed of not less than 16 gauge galvanized steel blade 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. Dampers shall be Ruskin or approved equal by Air Balance, Price, or American Warming and Ventilating.

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. The maximum allowable length of medium pressure flexible ductwork shall be 1'-0" and shall be limited to short run-outs connecting FPB and VAV units to medium pressure sheet metal ductwork.

E. Flexible ductwork shall be designed for pressures up to 4" W.G. for low pressure ductwork and 10" W.G. for medium pressure ductwork.

F. Low pressure flexible ductwork shall be Clecon Model Flex 28 VF Series or Genflex Type SLS-181 or Wiremold type WGC and medium pressure flexible ductwork shall be Clecon Model FLEX 28 VF Series, Genflex 1HPL-181 or Wiremold type WGC.

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 FIRE DAMPERS:

A. Fire dampers (FD) shall be provided at all penetrations through fire rated walls and partitions. Fire dampers shall be UL labeled and shall be Type B (blades out of the air stream) or Type C (round or oval duct). Damper shall be Ruskin Model 1BD2 or approved equal.

1. Hat channel frame shall be 16 gauge (1.5 mm) minimum galvanized steel with tabbed corners for reinforcement. Bearings shall be stainless steel sleeve. Blades shall be airfoil shaped double skin construction with 14 gage (1.9 mm) equivalent thickness. Blade edge seals shall be silicone rubber and galvanized steel mechanically locked in blade edge (adhesive or clip fastened seals not acceptable) and shall withstand 450 F (232 C). Jamb seals shall be flexible metal compression type.

2. Each damper shall be 1-1/2 hour rated under UL555, and shall further be classified by Underwriters Laboratories as a Leakage Rated Damper for use in smoke control systems. Leakage rating under UL555S shall be Class 1 (4 cfm/sq. ft. at 1" w.g. and 8 cfm/sq. ft. at 4" w.g.).

3. Dampers shall operate (open and close) under HVAC system operating conditions with pressures of at least 8" w.g. in the closed position and 4000 fpm air velocity in the open position.

4. In addition to the leakage ratings, the dampers and their actuators shall be qualified as a single entity under UL555S to 350 F (177 C) elevated temperature. Actuators shall be installed at time of damper fabrication. Dampers shall be equipped with factory supplied caulked sleeve. All wiring or piping material required to interconnect the actuator with detection and/or alarm or other systems shall be furnished by others. Damper shall be Model FSD60 or approved equal.

5. Electric actuator shall be 120 volts ac, 70 watts running and 25 watts while in the holding mode. The actuator shall be designed to spring the damper closed upon loss of power in less than 20 seconds. Stall type actuators are unacceptable. Damper actuators shall be factory installed on the damper and tested to verify cycle timing.

B. Acceptable manufacturers of fire dampers are: Prefco, Ruskin, or Air Balance provided, the equipment meets or exceeds the requirements of the Contract Documents.

2.06 ACCESS DOORS:

A. Provide a duct access door at each fire and/or smoke damper where required for access. Access doors 18" x 18" and larger shall have a continuous hinge on one side with latch on the other side. Access door shall be designed for five (5) times the pressure of the duct in which it is mounted. Access doors shall be of sufficient size to provide access to the dampers for resetting or replacing thermal links. Access doors shall be double metal faced, internally insulated same as duct, and provided for gasket seal. Access doors downstream of fire dampers in medium pressure ductwork shall be the implosion type.

B. Coordinate the location of access doors above inaccessible ceilings with the Architect.

2.07 AIR EXTRACTORS: Provide in duct mounted supply outlets and takeoff or extension collars to supply outlets. Air extractors shall be factory-fabricated and factory or field assembled units consisting of curved turning vanes or louver blades for uniform air distribution and change of direction with minimum turbulence and pressure loss. Where adjustable devices such as air deflectors or extractors are inaccessible they shall be provided with means for adjustment and position lock external to the duct in which they are located. Similar to Young Regulator Model No. 1.

2.08 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. Also, at duct mounted coils and electric duct heaters provide one (1) on either side of the coil or duct heater.

2.09 REGISTER AND GRILLE CONNECTION:

A. Where take-offs are on side of 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.

PART 3 EXECUTION

3.01 INSTALLATION:

A. Install all ductwork and accessories as shown and in accordance with applicable SMACNA standards.

B. All joints in ductwork shall be sealed with a fire retardant duct sealant. Tape is <u>not</u> acceptable.

C. 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. All leading and trailing edges shall be secured with sheetmetal airfoils.

D. Sound Proof Construction for Duct Penetrations is required for openings between ductwork and interior spaces. The method for sound proofing shall be as follows:

1. Fill openings with fibrous glass blanket or board for full depth of penetration.

2. Caulk each side of opening with non-hardening, non-aging caulking compound equal to Johns-Manville "Duxeal".

3. Penetrations through fire-rated partitions and shafts shall be sealed with Dow-Corning RTV fire-retardant foam.

4. Duct system sound levels shall be maintained at such a level as to not exceed a maximum of NC 35 for all spaces. Duct fabrication and installation shall be altered, if noise levels are exceeded, at no cost to the Contract.

5. All exterior kitchen exhaust ductwork shall be painted with rust inhibiting primer.

6. Unavoidable obstruction: Where structural elements or pipes must pass through a duct, provide two-piece streamliners, and enlarge duct to compensate for net loss of area. Round pipes and rods smaller than three (3) inches need not have special treatment. Note: This provision will not be used to justify obstructions which can be avoided.

E. Splitter Dampers:

1. Provide where shown on drawings. 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.

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 escutcheon.

END OF SECTION

SECTION 15841 FILTERS

PART 1 GENERAL

1.01 GENERAL: All work specified in this Section is subject to the provisions of Section 15010.

1.02 COORDINATION: The filters of one manufacturer (Farr) have been used as the basis of design. Any modifications to ductwork, 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 cost to the Owner.

1.03 ACCEPTABLE MANUFACTURERS:

A. Manufacturers listed below are acceptable: Farr.

B. All devices selected must meet or exceed all the requirements of the Contract Documents.

PART 2 PRODUCTS

2.01 FILTER: Filter media shall have an average efficiency of 35-35% on ASHRAE Test Standard 52-76. It shall have an average arrestance of not less than 97% on that standard. Filters shall be listed by Underwriter's Laboratories as Class 2.

PART 3 EXECUTION

3.01 SPARES: Provide one (1) complete set of replacement filters as recommended by the manufacturer.

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, shall meet all constraints of construction.

1.02 COORDINATION: The grilles, registers and diffusers of one manufacturer 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 listed below are acceptable. Approved equal products which are ADC tested, rated and certified may be Price, Krueger, or Titus.

B. All devices selected must meet or exceed all the requirements of these contract documents.

PART 2 PRODUCTS

2.01 DESCRIPTION:

A. Color of all grilles, registers and diffusers are to be selected by Architect. Also, ceiling mounted items shall be selected to fit the ceiling in which they are applied.

B. Air distribution devices shall be as scheduled on drawings.

C. The Contractor shall verify that all air distribution devices are suitable for the ceiling and wall types in which they are installed.

D. All air distribution devices shall be shown in grille, register and diffuser schedule.

PART 3 EXECUTION

3.01 INSTALLATION:

A. Grilles, registers and diffusers shall be installed as indicated in conformance with the manufacturer's recommendations. Coordinate the actual units to be provided with all trades.

B. All grilles, registers and diffusers shall be selected and submitted at an NC level of 35 or less.

C. The grilles, registers and diffusers shall be tested and adjusted to provide the scheduled capacities.

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. 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.

C. Smoke detectors shall be provided under Division 15 and installed by Division 15 in the supply air path (s) from each air handling unit. Detectors shall be ionization duct-mounted types. 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 if one is provided.

1.02 ACCEPTABLE MANUFACTURERS: The following manufacturers are acceptable on this project: Trane or Johnson Contractors.

PART 2 PRODUCTS

2.01 MATERIALS AND COMPONENTS: All electrical components of the control systems shall conform to the requirements of Division 16.

2.02 Custom Application Controllers

A. Custom application controllers shall be mounted in enclosures appropriate to the project environmental conditions.

1. Controllers used in conditioned ambient shall be mounted in NEMA type-1 enclosures, and shall be rated for operation at 0 C to 50 C (32 F to 120 F).

2. Controllers used outdoors and/or in wet ambient shall be mounted within NEMA type-4 waterproof enclosures, and shall be rated for operation at -40 C to 70 C (-40 F to 158 F).

B. Enclosures shall include a line voltage to 24 VAC transformer. Transformer shall be fused or circuit-breaker protected within the enclosure.

C. Enclosures shall have multiple access locations for wire and conduit to enter the cabinet, and an isolated high voltage section. All control wiring shall be electrically terminated inside the cabinet. The controller in enclosure shall be UL-listed.

D. The controllers shall be software configurable for the types of input/output points required per the points list, and for future expansion.

E. The controllers shall receive signals from industry standard sensors and input devices and directly control analog and binary control devices. The controllers shall have the capability to monitor and control the following types of inputs and outputs:

1. Analog Inputs

a. Current: 0 to 20 mA

b. Voltage: 0 to 10 Vdc
c. Thermistor
d. Linear resistance
e. Resistance temperature detectors (RTD)

2. Binary Inputs

a. Isolated dry contact closure
b. Pulse inputs for metering

3. Analog Outputs

a. Current: 0 to 20 mA
b. Voltage: 0 to 10 Vdc

4. Binary Outputs

a. 24 VAC, relay controlled. Each output shall include an indicator light providing on/off status of the associated binary output.

F. Each controller enclosure shall include a 18-24 Vdc power supply capable of supplying sufficient dc power for all transmitting (e.g. 4-20 mA) sensors connected as specified, and for all unused analog inputs.

G. All binary and analog output points shall be provided with a manual override, with local feedback indication that an output is presently overridden.

H. Each controller shall have a real-time clock which shall remain active during power failure for up to seven (7) days under normal operating conditions. When the controller is used with a higher level system, the time clock shall be automatically synchronized with the system controller.

I. Custom application controllers shall communicate using LonTalk. Controllers shall use FTT-10 transceivers. All communications shall be with the use of LonMark-approved standard network variable types (SNVT).

J. The custom application controller shall include an operator display allowing the user to perform basic daily operations tasks. At a minimum this operator display shall:

1. Be installed on the custom application controller and require no additional power source.
2. Consist of a one-quarter VGA touch screen with 320 x 240-pixel resolution. The touch screen shall be backlit. The brightness and contrast shall be adjustable to allow for easy reading of information on the screen.
3. Provide on-screen graphical icons to identify common user functions including viewing point data, alarms, scheduling, output overrides, and controller setup.
4. Be capable of having unique user identification and passwords that can be programmed to limit access to the system and operator functions.
5. Display the current state of all input/output points connected to the controller.
6. Allow for up to 24 individual custom display screens that allow 24-character English descriptions of controller data.
7. Give the operator the ability to override the current state of all binary and analog output points connected to the controller. The controller shall have this capability prior to any on-site programming.
8. Include a time clock which shall maintain correct time for at least 7 days during a power loss to the controller.

9. Allow the operator to modify the start and stop times of the time-of-day schedule within the controller. Scheduling function shall provide for 7-day control, with 2 start and stop events per day.
10. Provide a unique visual alarm indicator such as a flashing LED, separate from the display screen.
11. Automatically update displayed system information every 10 seconds.

K. The controller operating system and programming shall be stored in non-volatile memory.

L. Each controller shall monitor all analog inputs and control analog outputs, utilizing 12-bit analog-to-digital and digital-to-analog conversion.

M. Each controller shall be capable of executing proportional, integral, and derivative (PID) control loops and custom logic control routines.

N. PID loops shall be programmable to operate at user-defined intervals, as frequently as one second.

O. The custom application controllers shall include a communications data port for connection to a personal computer for upload, download, and editing of data and programs.

P. The controller shall provide the following diagnostic information via light or LED:

1. Status (power) indication
2. LonTalk communications status
3. Indication of the loss of controller function, or network problems

2.03 CUSTOM APPLICATION CONTROLLER PROGRAMMING TOOL

A. ATC contractor shall provide a software programming tool to be used for set-up, programming, and editing of the controller functions.

B. Edit Software shall run on a laptop computer with the following requirements:

1. Microsoft Windows 98, or 2000 Professional operating system
2. CD-ROM drive for program installation
3. 64 MB RAM
4. 20 MB hard drive space
5. 800 x 600 screen resolution
6. PCMCIA slot for a network interface card

C. Edit software shall incorporate graphical function and logic blocks linked pictorially to create custom application programs meeting the sequence(s) of operation.

D. Edit software shall include PID control loop setup functions.

E. Edit software shall facilitate controller database save and restore functions.

F. Edit software shall have a print function to provide pictorial printed representations of the graphical programs.

G. The service tool using the edit software, and connected to one local controller shall have full access to all local controllers on the same communications link.

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.

PART 4 SEQUENCE OF OPERATIONS

4.01 SEQUENCE OF OPERATION

A. Smoke Detectors:

1. Units shall be started and stopped, subject to safety thermostats and smoke detectors, and by a controller mounted as shown on plans.

2. Install ionization type smoke detectors in the supply air stream. 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 furnace 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.

4.02 AIR HANDLING UNIT WITH APPLICATION SPECIFIC CONTROLLER

A. Each Air Handling Unit shall have an application specific controller (ASC) which shall monitor and control the Air Handling Unit in a stand-alone mode.

B. The Air Handling Unit shall consist of:

1. Main Direct Expansion Cooling Coil

2. Electric Heat Elements (Duct Mounted)

4. Air Filter

5. Air Supply Fan

C. The application specific controller (ASC) shall perform the following Air Handling unit control strategies, provide the points listed on the point list and provide the specified monitoring and diagnostics.

1. Fan Operation - The supply fan shall operate at the necessary speed in the occupied mode unless the unit is controlled otherwise. With a two position outside air damper, the damper shall be closed when the unit fan is off.

a. Fan Speed Cycling - The fan shall cycle between on & off. When capacity is obtained, the fan shall be turned off.

2. Heating/Cooling setpoint and mode - The space temperature setpoint (controlled from the return/exhaust air or space) shall be determined either by a local hardwired of a setpoint knob or the ASC default setpoint value.

   a. Local Hardwired Adjustable Setpoint - A hardwired, adjustable setpoint located in the zone sensor is connected to the ASC. Local setpoints are enabled in the unit configuration. No communicated setpoint is present.

   b. Default Setpoints - The ASC uses the locally stored default setpoints when neither a local hardwired setpoint nor communicated setpoint is present. The ASC always uses the stored default (unoccupied) setpoints in unoccupied mode.

3. The Heating/Cooling Setpoints shall be limited by adjustable parameters in the ASC to prevent them from being set too low or high. These setpoint limits do not apply in the unoccupied mode. The ASC automatically determines its heating or cooling mode by integrating over time between the active setpoint and the space temperature. In the unoccupied mode, the setpoints shall be widened to accommodate night setback and shall be adjustable.

4. Cooling with Primary Electric Heat - In the heating mode the condensing unit shall be off and the electric heat shall be cycled to maintain the space temperature setpoint. In the cooling mode, the condensing unit shall be on and if necessary, the electric heat shall be cycled to maintain the space temperature setpoint.

5. Dehumidification – The application specific controller (ASC) shall monitor the return/exhaust or space air humidity. If the relative humidity (RH) rises above setpoint (65% adj.), the controller shall cause the system to go into a dehumidificatioin mode. In this mode the cooling shall be cycled on and the electric heat shall cycle to maintain space temperature.

6. Unit Protections:

   a. Condensate Overflow - When the condensate overflow switch trips, the ASC shall close all valves, shut off the unit fan, and close the outdoor air damper (if present).

   b. Low Temperature Detection - When low temperature is detected (using a low limit switch) the ASC shall shut down the unit fan, valves shall open, and the outdoor air damper shall close (if present).

   c. Smart Reset (Standard) - The ASC shall automatically try to reset the unit that is locked out on a Low Temperature detection. This will occur 30 minutes after the diagnostics and if the unit runs successfully the diagnostic is cleared. If the unit undergoes the same diagnostic within a 24 hour period the unit is locked-out until it is manually reset.

D. Zone Sensor Operation

1. Each zone sensor shall use a thermistor element to measure the actual zone temperature. If the zone sensor has a setpoint knob, the setpoint shall only be used by the ASC if there is no communication value being passed from a BAS.

2. Fan Switch - A five-position fan switch (off, low, medium, high, auto) shall be used to control the fan speeds of the fan coil. The fan speeds shall only be used by the ASC if there is no communicated value being passed from a BAS.

4.03 POINTS LIST:

A. System Points List shall be as follows:

1. Analog Input:

a. Zone Temperature
b. Setpoint Temperature
c. Fan Mode Switch (High/Medium/Low)
d. Humidity

2. Binary Input:

a. Low Air Temperature Detection (Status)

3. Binary Output:

a. Fan (Off/On)
b. Cooling Output (Off/On)
c. Heating Output (Off/On)
d. Damper Output (Off/On)

END OF SECTION

SECTION 16010 ELECTRICAL GENERAL

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 a complete and operational electrical system.

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. The exact locations of apparatus, fixtures, equipment and raceways shall be ascertained from all concerned and the work shall be installed accordingly. In addition, coordinate with all equipment suppliers and other trades to verify the actual installation requirements prior to rough-ins.

C. The plans and specifications are considered cooperative and complimentary. Where one contradicts the other the specifications shall govern the Architect for clarification prior to any installation.

D. All applicable portions of the General and Specific Conditions are included herein by reference.

1.02 DEFINITIONS:

A. Install: Receive, store, place, fix in position, secure, anchor, etc., including necessary appurtenances and labor so the equipment or installation will function as specified and intended.

B. Furnish: Purchase and supply equipment and components, including shipping and receiving.

C. Provide: Furnish, install, connect, test, demonstrate and leave operational.

D. Wiring: Wire or cable installed in raceway with all required boxes, fittings, connectors, etc.

E. Work: Materials completely installed, including the labor involved.

F. Or approved equal: Equal in type, design, quality and appearance, as determined by the Architect.

G. Raceway: Galvanized rigid steel conduit (GRC), electrical metallic tubing (EMT), intermediate metal conduit (IMC), schedule 40 Polyvinyl Chloride (PVC), flexible steel (FLX), sheathed flexible steel (SLT), code gauge wireway (WW).

1.03 CODES AND REGULATIONS:

A. All work shall comply with all local laws, ordinances and regulations applicable to the electrical and fire alarm/life safety system installation, NFPA, OSHA, ANSI, SBC, municipal ordinances governing electrical work, and with the requirements of the latest edition of the National Electrical Code.

B. Where different sections of any of the aforementioned codes and regulations, the specifications or the plans require different materials, methods of construction, or other requirements, the most restrictive or stringent 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 Architect, city, county, state and other local authorities having jurisdiction (LAHJ) and present certificates of approval to the Architect or his designated representative.

D. Under no circumstances will asbestos, or asbestos related materials, be allowed on this project.

E. Communicate with all required utility offices to meet utility schedules and regulations. Coordinate the local utility requirements with the requirements of these contract documents. Should conflicts arise, notify the Architect immediately. Acquire services to avoid project delays. Conform to regulations of the local utility company with respect to metering, service entrance and service access.

1.04 SITE VISIT:

A. All parties shall visit the site and thoroughly familiarize themselves with the local conditions and existing conditions which may affect the cost of the Work prior to any project activity or submission of bids.

B. Where work under this Division requires extension, relocation, reconnection or modifications to the existing equipment or systems, the existing equipment or systems shall be restored to their original condition prior to completion of this Project.

C. No allowances will be made for lack of knowledge of existing job conditions which could reasonably be identified during site visit.

D. Verify the service entrance voltage and short circuit contribution with the serving power utility and provide written confirmation of same to the Architect prior to submitting shop drawings or ordering any materials for use in the building served. Provide service entrance equipment fully rated to interrupt the available fault current from the serving utility.

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, fire sealant, couplings or other such elements except where dimensions are noted. Provide all required offsets, extensions or pull boxes required for a fully coordinated and operational system.

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, notify the Architect/Engineer for clarification prior to installation.

D. Refer to the Architectural {Interiors), Structural, Mechanical, Civil, and Kitchen plans in conjunction with other project construction and shop drawings for dimensions, and properly fit the work to conform to the details of building construction.

E. Review the drawings for door swings, cabinets, millwork, counters and other built-in equipment. Coordinate installation of the electrical equipment with structural systems and mechanical systems such that full maintenance access is provided.

F. The right is reserved to shift any switch, receptacle, ceiling outlet or other outlet which has been roughed-in 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. In addition, refer to the Architectural Drawings for exact location of devices and equipment.

G. All conduit and wiring shown on the Electrical Drawings shall be provided under this Division regardless of its function.

H. Review the drawings and specifications provided for other systems such as Elevator Equipment, Sound System, Computer, Landscape, etc., for additional work which may be required under this Division. Provide service to and make connections to all such equipment requiring electrical service.

I. Equipment configuration is based upon one manufacturer's product. Where the equipment selected by the Contractor for use on this Project differs from the configuration shown, the Contractor shall be responsible for coordinating space requirements, connection arrangements, interfaces with mechanical and plumbing equipment and all other affected trades and providing access for future maintenance and repair. Submit proposed revisions for approval by the Architect.

1.06 DEVIATIONS:

A. No deviations from the drawings and specifications shall be made without the full knowledge and consent of the Architect.

B. If it is found that existing conditions make desirable a modification in requirements covering any particular item, report such item to the Architect for their review and instructions.

1.07 EQUIPMENT CONNECTIONS:

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 required for the actual equipment installed, when equipment varies from that specified on the drawings, without increase or additional costs. In no case shall these items be of smaller capacity than permitted by EQUIPMENT NAMEPLATE/NATIONAL ELECTRIC CODE.

B. Coordinate with other trades and review the drawings of other divisions and provide suitable control equipment and feeders/branch circuits so that the above requirements shall be met without incurring additions to the Contract in time or cost. Conform with UL Listing and nameplate requirements for equipment furnished. Such adjustments shall be subject to the approval of the Architect.

C. Provide suitable overcurrent protection and 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. Coordinate said requirements with equipment furnished and with applicable trades.

D. Branch circuits supplying control panels and other equipment master and local unit locations and quantities shall be coordinated at the submittal stage and provided under Division 16. Provide emergency power where required to accomplish emergency equipment operations in accordance with Division 15 requirements. All control wiring for plumbing and heating, ventilation and air conditioning systems shall be installed under Division 15. Review Division 15 specifications and shop drawings for control systems to assure system compatibility between equipment furnished under Division 16 and system wiring and controls furnished under Division 15.

E. Motor controllers shall be furnished and installed by Division 16 where automatic control of equipment is required, unless specified to be furnished as an integral part of packaged equipment. Provide the number and type of auxiliary contacts and relays necessary to interlock the equipment and provide the specified control sequence, reserving spare NO and NC contacts for future use. Power wiring to all motors and motor controllers and between motors and controllers shall be furnished under Division 16.

F. Where drawings indicate or specifications require equipment to be controlled by line voltage interlock, safety device or control, provide line voltage control wiring in Division 16.

G. For each electrical connection required, provide pressure connectors, terminals (lugs), electrical insulating tape, heat-shrinkable insulating tubing, cable ties, solderless wire connectors, and other items required to complete splices and terminations of the necessary types. Cover splices or terminations with electrical insulation equivalent to insulation of conductors terminated.

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), Underwriters' Laboratories (UL), Electrical Testing Laboratories (ETL), American National Standards Institute (ANSI), Institute of Electrical and Electronic Engineers (IEEE), Insulated Cable Engineers Association (ICEA), National Fire Protection Association (NFPA), Occupational safety Health Association (OSHA) and the American Society for Testing and Materials (ASTM) shall govern and apply where such have been established for the particular material in question.

C. Specified catalog numbers and trade or manufacturers names are intended to describe the material, devices, or apparatus desired for type, construction features, electrical characteristics, ratings, operating functions, style and quality. Similar materials of other manufacturers, not less than specified quality, capacity or character may be substituted in conformity with the provisions of the General and Supplementary Conditions. Materials of the same type shall be the product of one manufacturer. Refer to Shop Drawing requirements.

D. Furnish all materials specified herein or indicated on the drawings.

E. All work shall be installed in a practical and workmanlike manner by competent workmen, licensed and skilled in their trade.

2.02 SHOP DRAWINGS:

A. Provide complete electrical characteristics for all equipment. Submit for approval data of the materials and equipment to be incorporated into the Work. Submittals shall include descriptive materials, catalog cuts, diagrams, performance characteristics, and charts published by the manufacturer indicating conformance to the specification and drawing requirements; model numbers alone will not be acceptable. Submittals shall be made by Specification section number, tabbed, within three ring binders, grouped and submitted in packages as indicated below. Submittals for lighting fixtures shall include full photometric data. Shop drawings shall be submitted for the following equipment and items suitably bound, and marked:

Package I:
Section 16110 Raceways
Section 16120 Wires and Cables
Section 16130 Boxes and Fittings
Section 16140 Wiring Devices

Package II:
Section 16145 Busways
Section 16150 Motor Controls
Section 16160 Panelboards
Section 16165 Distribution Panelboards

Section 16170 Motor and Feeder Disconnect Switches
Section 16460 Dry Type Transformers
Section 16480 Switchboards
Section 16430 Emergency Power System
Section 16420 UPS System

Package III:
Section 16505 Lighting
Section 16560 Lighting Controls

Package IV:
Section 16720 Life Safety System

Package V:
Section 16610 Lightning Protection
Section 16620 Surge Protection
Section 16115 Cable Tray

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 as indicated by Architect. Do not submit equipment or materials not requested in the Specifications.

C. All material lists and shop drawing submittals shall include a stamped indication by the Contractor signifying that the submittals have been previously reviewed for complete compliance with the Contract Documents, that all coordination required between trades 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 Architect’s review, which requires 10 working days from the date the shop drawings are received by the Architect.

D. All pricing is to be based upon the products, manufacturers, and processes described in the Contract Documents. Requests for approval of substitutions shall be written and delivered to the Architect's/Engineer's office in conformity with the provisions of the General and Supplemental Conditions. Do not submit any shop drawing or product data that does not conform with the contract documents.

E. Resubmittals, if necessary, shall be made as specified above. Resubmittals will highlight and indicate any and all revisions made there to and will include the following text "Resubmittal #___", typed in a prominent location on the cover sheet.

F. The Contractor shall provide with the shop drawing submittal dimensioned layouts of all electrical rooms and spaces using the equipment he intends to furnish. Switchboard, panelboards, distribution panels, etc., will be rejected without dimensioned room layouts.

G. Samples of all materials proposed for use shall be presented to the Architect/Engineer for his approval when requested.

H. Submittals shall be noted with any deviations, alterations or limitations of product from the specified materials. The product will be rejected upon failure to indicate this information. Any conflict or failure to perform comparably to the originally specified materials will result in product rejection. It will be the Contractor's responsibility to replace the alternate material or equipment with the originally specified one and to demolish, replace, repair and retest the equipment, including repair or replacement of any component of the building, finishes or other systems affected by said replacement, at no additional costs to the Owner.

2.03 SUPPORT FASTENER DEVICES:

A. Anchors for post tensioned concrete applications shall be cast in place continuous or spot insert channel providing a safety factor of 3 in 3000 lb hard rock concrete.

B. Anchors for cast in place concrete shall be insert type expansion shields and bolts, lead shields and bolts or self drilling expansion shields and bolts. Powder actuated pins of 1500 pound pull out strength may be utilized in concrete.

C. Anchors for wood construction shall be lag bolts or power driven wood screws.

D. Anchors in hollow masonry shall be toggle bolts.

E. Anchors for steel attachment shall be machine screws, bolts, or beam clamps.

F. Equipment mounted to drywall construction shall be secured to power channel (13/16” x 1 5/8” minimum). Secure channel to a minimum of two (2) dry wall studs with drywall screws and washers.

2.04 SUPPORTS: Furnish and install under this contract all angle iron, channel iron, rods, threaded rod, supports or hangers required to install or mount all electrical equipment, material or related devices. Conduit shall not be supported from steel decking, roof decking, bridging, ceiling or ceiling support wires.

2.05 IDENTIFICATION:

A. All equipment or devices specified in Division 16 shall be identified with an engraved plastic nameplate. Identification of flush equipment shall be on the inside of the cover. Surface equipment shall be identified on the outside. Plastic nameplates shall be multicolored laminated plastic with engraved lettering. Nameplates shall be provided as scheduled:

1. 480/277 volt normal power equipment shall be black faceplate/white core(1 ½” x 6” with 3/8” high letters).
2. 480/277 volt emergency power equipment shall be red faceplate/white core(1 ½” x 8” with ½” high letters). Faceplate shall read “Emergency - 480 Volts”.
3. 208/120 volt normal power equipment shall be white faceplate/black core(1 ½”x 6” with 3/8” high letters).
4. 208/120 volt emergency power equipment shall be white faceplate/red core (1 ½” x 8” with ½” high letters). Face plate shall read “Emergency - 120 Volts”.
5. Computer power equipment (ie UPS, isolated ground, etc.) shall be orange faceplate/white core (1 ½: x 8” with 3/8” Faceplate shall read “Computer - _____ Volts”.
6. Provide 3” high x (length as required) for electrical switchboards.
7. Junction boxes for emergency power, lighting, fire alarm systems, etc. shall have circuit numbers indicated and labeled as required.
8. Junction boxes for general power, lighting and mise, systems etc. shall have circuit numbers indicated and voltage (system) labeled as required.

2.06 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. This set shall be utilized for no other purpose. Include any addenda, change orders, field orders, project 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. Show exact locations of underground cable and conduits, both interior and exterior, fully dimensioned from building column lines or permanent exterior structures. These drawings shall be available for reference at the time of final inspection.

C. At the completion of construction, the Contractor shall purchase a set of reproducibles from the Architect/Engineer at cost of printing and shipping. All changes noted above shall be incorporated thereon by the Contractor. The reproducible drawings, with one set of blueline prints thereof and the original sketches and marked-up "As-Built" prints shall be presented to the Owner.

2.07 MAINTENANCE AND INSTRUCTION MANUALS:

A. Submit to the Architect/Engineer/Owners Representative upon completion of the work and prior to final inspection, copies of maintenance and instruction manuals for equipment provided as outlined below:

1. Three sets of the following data are required:
   a. Operating and maintenance instructions.
   b. Spare parts list.
   c. Copies of approved submittal data.
   d. Copies of panelboard circuit directories reflecting all field changes.
   e. Test reports of all tests performed.
   f. Contact names and phone numbers for parts suppliers of submitted equipment.

B. Arrange each set of data in a orderly way and bind each set in a separate 3-ring hard-cover binder with appropriate label identifying the Project, Architect, Engineer, Contractor, Subcontractor and Date.

2.08 SUBMISSION OF DRAWINGS: Submission of Architect's drawings for shop drawings and unaltered Architect's drawings for "As-Built" will not be acceptable.

2.09 SPARE PARTS STOCK:

A. Prior to final inspection, turn over to the Owner the following materials of the type and quantity specified. Material shall be new, in original shipping containers or cartons, of the same manufacture and type as installed on the Project. Obtain receipt for all materials turned over to the Using Agency.

1. Lamps - Ten percent of each lamp type.
2. Fuses - Ten percent of each size.
3. Ballasts - Ten two-lamp ballasts and ten one-lamp ballasts.

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. Coordinate the installation of recessed electrical equipment with concealed ductwork, piping, insulation, structural appurtances and wall thickness.

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.

D. Do not scale drawings. Obtain dimensions for layout of equipment from the Architectural drawings unless noted on the Electrical drawings.

E. Contractor for work under this division shall be fully responsible for determining in advance of purchase that proposed equipment and materials for installation shall fit into the confines indicated and allow sufficient clearance for maintenance and service of all equipment including other trades.

F. Clearances in front of electrical switchboards, panelboards, motor starters, bus plugs etc. (equipment requiring maintenance while energized) shall be installed in accordance with N.E.C. 110-162 condition number 2.

3.02 PROTECTION OF MATERIALS:

A. Refer to the general requirements section of the Specifications for storage, protection and handling requirements.

B. Provide dry, weather-tight staging and storage for materials and equipment requiring protection from weather and moisture per manufacturer's recommendations. Install temporary lighting or heat sources to prevent moisture accumulation. Provide protection against direct sunlight, precipitation, wind, ice, fire or excessive heat. Store materials in original undamaged packaging with manufacturer's labels and seals intact. Containers which are broken, damaged or watermarked are not acceptable and are subject to rejection.

C. Materials and equipment will not be installed until the environmental conditions of the project are suitable to protect same per manufacturer's recommendations. Equipment or materials damaged or subjected to moisture, precipitation, direct sunlight, cold or heat are not acceptable and shall be removed from the project and replaced at no additional costs to the Owner.

D. All conduit and other openings shall be kept protected to prevent entry of foreign matter or construction debris. Fixtures, equipment, and apparatus shall be kept covered for protection against dirt, water, chemical or mechanical damage before and during construction.

E. 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: 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 CLEANING AND PAINTING:

A. Remove foreign materials, drywall compound, overspray, oil, dirt and grease from all raceway, fittings, supports, boxes, cabinets, pull boxes, panelboard trims and equipment to provide clean surfaces for painting. Remove surface oxidation and restore galvanized surfaces with cold process galvanizing compounds. Touchup marred or scratched surfaces of fixtures, panelboard and cabinet trims, motor control centers, switchboards, cabinets, and equipment enclosures with paint furnished by the equipment manufacturer specifically for that purpose. When touchup is required, provide one base coat over imperfection and subsequent coat over entire side or surface of equipment.

B. Do not paint trim hinges, latches, clamps, locks, device covers or trim covers. Mask or remove such items prior to finishing.

C. Unless otherwise noted herein, all painting shall conform to the "Painting" section of the specifications.

D. Where plywood backboards are utilized to mount electrical or electronic equipment provided under Division 16, finish same with two (2) coats of light gray semi-gloss paint.

3.06 ACCESS TO ELECTRICAL ITEMS: Install all concealed electrical equipment, junction and pull boxes, apparatus, or devices so as to maintain access for maintenance, operations and replacement. Access doors or covers shall be provided where required by NEC or LAHJ and shall be installed in accordance with manufacturer's instructions. Refer to the Architect for approved types, means, methods and appearance. Locate each access unit accurately in relation to electrical work requiring access.

3.07 ELECTRICAL ROOMS AND CLOSETS:

A. Manufacturer's equipment shall not be larger than that dimensioned, or scaled, on plans. Conflicts shall be brought to the attention of the Architect, for resolution prior to ordering equipment.

B. Clear working space in electric rooms and closets shall be no less than required by the N.E.C.

C. Submit for review, prior to construction or purchase of any equipment, scaled drawings of electrical rooms, closets, or spaces showing, in detail, planned installation locations of the equipment. These shall clearly show compliance with A and B above.

3.08 EQUIPMENT CONNECTIONS:

A. Review all divisions of specifications, where equipment requiring electrical service is specified, to determine the complete scope of work under this division of the specifications. Provide electrical connections and service to all equipment specified elsewhere requiring such connections or service.

B. Connect all equipment requiring electrical connections, in accordance with the equipment manufacturer's requirements. Where equipment connections require specific locations, determine and coordinate same with submittals. Provide concealed service to central plant equipment locations and pads.

3.09 NAMEPLATES AND IDENTIFICATION:

A. Provide and install nameplates for transformers, switchboards, switchgear, power and lighting panels, disconnect switches, time switches, pull boxes, junction boxes, fire alarm equipment, contactors, relays and other unit equipment. Nameplates shall be affixed with epoxy cement. Refer to 16010-2.5 for additional requirements.

B. Install nameplates plumb and level.

C. Provide and install sleeve type wire markers on all conductors at all termination points and access points. Branch circuit identification (as LP-21”) shall be installed on hot and neutral conductors. Dedicated circuits and isolated ground technical power circuits shall have wire markers installed on ground conductor. Label junction and pull box covers with all circuit numbers contained therein.

3.10 EXCAVATION AND BACKFILLING:

A. Provide and perform all excavation required to install conduit, ductbanks and manholes indicated on the drawings and/or specified. Trenches shall be of uniform width required with minimum 8" clearance on both sides. Remove and dispose of all materials not to be used for backfill. Maintain dry excavations for electrical work, by removing water. Grade areas to prevent surface water from entering excavation. Remove any accumulated water by pumping. Perform all excavation by open cut. Excavate with vertical-sided excavations where possible. Where necessary, provide sheeting and cross-bracing to sustain sides of excavations. Provide materials for shoring and bracing, such as sheet piling, uprights, stringers and cross-braces, in good serviceable condition. Establish requirements for trench shoring and bracing to comply with local codes and LAHJ. No tunneling shall be permitted.

B. The bottom of all trenches and excavation shall be graded to provide uniform bearing surface for conduits or ductbanks on undisturbed soil at every point along entire length. Tamp overexcavation with specified backfill materials. Remove unstable materials unsuitable for supporting equipment or installation and replace with specified materials for a minimum of twelve (12) inches below invert of equipment or installation.

C. Specified materials shall be utilized for backfilling, in not more than six (6) inch layers and tamped until the installation has cover of not less than the adjacent grade and not more than two (2) inches above same. Remove sheeting and cross-bracing during backfilling wherever such removal would not endanger the work or other property. Equalize backfilling operation to avoid shifting of materials and equipment installed. Compaction of backfill materials shall be at least equal to surrounding undisturbed material. Backfill trenches with concrete where excavations pass within 18" of footings or other utility lines. Do not settle backfill with water. Conform to compaction requirements and methods specified elsewhere.

D. Electrical duct shall be installed a minimum of 24” below finished grade with bottom of duct below geographic frost line. Duct cark shall not be in direct contact with building structure (slab) except for vertical riser supports.

3.11 TESTS AND CERTIFICATIONS:

A. Upon completion of the electrical work and prior to final inspection, conduct an operating test in the presence of the Architect 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 Architect shall be removed, repaired or replaced as directed without incurring additions to the Contract in time or cost. All electrical systems shall be tested for compliance with the specifications.

C. Furnish all instructions, tools, test equipment and personnel required for the test. Have sufficient tools and personnel available to remove equipment covers, coverplates, etc., as required for review of internal wiring and proper inspection. Provide hand tools, flashlights, ladders, outlet testers, VOM, meters and keys required to access and observe system operation and characteristics. Turn circuits on and off as directed and demonstrate operation of equipment as directed.

D. Contractor shall test all wiring and connections for continuity and grounds by megger testing. Upon indication of defective insulation, Contractor shall remove and replace the defective conductor and demonstrate by testing that the new conductor is acceptable. Record feeder load currents and line voltages measured at each transformer, switchboard and panelboard after installation of all equipment and lighting. Adjust transformer taps as required to provide optimum voltage levels. Adjust single phase load connections to balance feeder load and document on as-built drawings. Provide the Owner with full documentation of all testing for future reference.

E. Refer to the individual specification sections and the electrical systems testing section of the specifications for specific testing requirements.

F. The authorized manufacturer's service representative shall review systems and equipment for correct operation, conformance with specification requirements and manufacturer's requirements and submit certification indicating above mentioned conformances for the following systems:

1. Life Safety System
2. Emergency Generator Set
3. Automatic Transfer Switches
4. Fire Communications System
5. Interfaces to Mechanical & Building Systems

3.12 DEMONSTRATION AND INSTRUCTION:

A. Present to the Owner and the Architect/Engineer or his designated representative a physical demonstration and oral instructions for proper operation and maintenance of each of the electrical equipment and systems installed. Authorized manufacturer's representatives familiar with the specified equipment shall conduct training for the following systems:

1. Life Safety System
2. Emergency Generator Set
3. Automatic Transfer Switches
4. Fire Communications System
5. Interfaces to Mechanical & Building systems

3.13 TEMPORARY WIRING: Provide a temporary electrical lighting and power distribution system of adequate size to properly serve the construction requirements, including adequate feeder sizes to prevent excessive voltage drop. Temporary work to be installed in accordance with the National Electrical Code, Article 305, and as required by OSHA or applicable local safety codes, rules and regulations.

3.14 WARRANTY:

A. All systems and components shall be provided with a one-year warranty from the time of final acceptance. The warranty shall cover all defects in materials, design and workmanship. During this warranty period, all defects in materials and workmanship shall be corrected without incurring additions to the Contract. The correction shall include removing the defective part(s), replacing and installing the new parts (including shipping and handling), 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 warranty, entirely at the expense of the Contractor.

B. In addition to this general warranty, present to the Architect any other guarantees or warranties from equipment or system manufacturers. These supplemental guarantees or warranties shall not invalidate the general warranty.

END OF SECTION

SECTION 16015 RENOVATION/DEMOLITION

PART 1 - GENERAL

1.01 SCOPE:

A. Attention is called to the fact that this is a renovation and/or addition to an existing facility which is required to remain in operation during construction. Contractor shall visit the site to become aware of existing conditions.

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. The exact locations of apparatus, fixtures, equipment and raceways shall be ascertained from all concerned and the work shall be laid out accordingly. In addition, coordinate with all equipment suppliers and other trades to verify the actual installation requirements prior to rough-ins.

C. The plans and specifications are considered cooperative and complimentary. Where one contradicts the other, notify the Architect/ Engineer for clarification prior to any installation.

D. All applicable portions of the General and Specific Conditions are included herein by reference.

1.02 DEFINITIONS:

A. Install: Receive, store, place, fix in position, secure, anchor, etc., including necessary appurtances and labor so the equipment or installation will function as specified and intended.

B. Furnish: Purchase and supply equipment and components, including shipping and receiving.

C. Provide: Furnish, install, connect, test, demonstrate and leave operational.

D. Wiring: Wire or cable installed in raceway with all required boxes, fittings, connectors, etc.

E. Work: Materials completely installed, including the labor involved.

F. Or approved equal: Equal in type, design, quality, appearance, etc. as determined by the Architect/Engineer.

G. Raceway: Galvanized rigid steel conduit (GRC), electrical metallic tubing (EMT), intermediate metal conduit (IMC), schedule 40 Polyvinyl Chloride (PVC), flexible steel (FLX), sheathed flexible steel (SLT), code gauge wireway (WW).

1.03 CODES AND REGULATIONS:

A. All work shall comply with all local laws, ordinances and regulations applicable to the electrical and fire alarm/life safety system installation, NFPA, OSHA, ANSI, [SBC,] [BOCA,] [UBC,] municipal ordinances governing electrical work, and with the requirements of the 1993 National Electrical Code or latest edition approved by the local authority having jurisdiction (LAHJ).

B. Where different sections of any of the aforementioned codes and regulations, the specifications or the plans require different materials, methods of construction, or other requirements, the most restrictive or stringent 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 Architect, city, county, state and other local authorities having jurisdiction (LAHJ) 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.

F. Communicate with all required utility offices to meet utility schedules and regulations. Coordinate the local utility requirements with the requirements of these contract documents. Should conflicts arise, notify the Architect/Engineer immediately. Acquire services to avoid project delays. Conform to regulations of the local utility company with respect to metering, service entrance and service access.

1.04 SITE VISIT:

A. All interested parties shall visit the site and thoroughly familiarize themselves with the local conditions and existing conditions which may affect the cost of the Work in advance of any project activity or submission of bids.

B. Where work under this Division requires extension, relocation, reconnection or modifications to the existing equipment or systems, the existing equipment or systems shall be restored to their original condition prior to completion of this Project.

C. No allowances will be made for lack of knowledge of job conditions which could reasonably be identified during site visit.

D. Verify the service entrance voltage and short circuit contribution with the serving power utility and provide written confirmation of same to the Architect prior to submitting shop drawings or ordering any materials for use in the building served. Provide service entrance equipment fully rated to interrupt the available fault current from the serving utility.

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, fire sealant, couplings or other such elements except where dimensions are noted. Provide all required offsets, extensions or pull boxes required for a fully coordinated and operational system.

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, notify the Architect/Engineer for clarification prior to installation.

D. Refer to the Architectural {Interiors), Structural and Mechanical plans, Civil, Kitchen and other project construction and shop drawings and details for dimensions, and fit the work to conform to the details of building construction.

E. Review the drawings for door swings, cabinets, millwork, counters and other built-in equipment. Coordinate installation of the electrical equipment with structural systems and mechanical systems such that full maintenance access is provided.

F. The right is reserved to shift any switch, receptacle, ceiling outlet or 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. In addition, refer to the Architectural Drawings for exact location of devices and equipment.

G. All conduit and wiring shown on the Electrical Drawings shall be provided under this Division regardless of its function.

H. Review the drawings and specifications provided for other systems such as Elevator Equipment, Sound System, CATV, Computer, Landscape, etc., for additional work which may be required under this Division. Provide service to and make connections to all such equipment requiring electrical service.

I. Equipment configuration is based upon one manufacturer's product. Where the equipment selected by the Contractor for use on this Project differs from the configuration shown, the Contractor shall be responsible for coordinating space requirements, connection arrangements, interfaces with mechanical and plumbing equipment and all other affected trades and providing access for future maintenance and repair. Submit proposed revisions for approval by the Architect/Engineer.

1.06 DEVIATIONS:

A. No deviations from the drawings and specifications shall be made without the full knowledge and consent of the Architect/Engineer.

B. If it is found that existing conditions make desirable a modification in requirements covering any particular item, report such item to the Architect/Engineer for their decision and instructions.

1.07 EQUIPMENT CONNECTIONS:

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 required for the actual equipment installed, without increase or additional costs. In no case shall these items be of smaller capacity than permitted by National Electrical Code.

B. Coordinate with other trades and review the drawings of other divisions and provide suitable control equipment and feeders/branch circuits so that the above requirements shall be met without incurring additions to the Contract in time or cost. Conform with UL Listing and nameplate requirements for equipment furnished. Such adjustments shall be subject to the approval of the Architect/Engineer.

C. Provide suitable overcurrent protection and 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. Coordinate said requirements with equipment furnished and with applicable trades.

D. Branch circuits supplying control panels and other equipment master and local unit locations and quantities shall be coordinated at the submittal stage and provided under Division 16. Provide emergency power where required to accomplish emergency equipment operations in accordance with Division 15 requirements. All control wiring for plumbing and heating, ventilation and air conditioning systems shall be installed under Division 15. Review Division 15 specifications and shop drawings for control systems to assure system compatibility between equipment furnished under Division 16 and system wiring and controls furnished under Division 15.

E. Motor controllers shall be furnished and installed by Division 16 where automatic control of equipment is required, unless specified to be furnished as an integral part of packaged equipment. Provide the number and type of auxiliary contacts and relays necessary to interlock the equipment and provide the specified control sequence, reserving spare NO and NC contacts for future use. Power wiring to all motors and motor controllers and between motors and controllers shall be furnished under Division 16.

F. Where drawings indicate or specifications require equipment to be controlled by line voltage interlock, safety device or control, provide line voltage control wiring in Division 16.

G. For each electrical connection required, provide pressure connectors, terminals (lugs), electrical insulating tape, heat-shrinkable insulating tubing, cable ties, solderless wire connectors, and other items required to complete splices and terminations of the necessary types. Cover splices or terminations with electrical insulation equivalent to insulation of conductors terminated.

1.08 ELECTRICAL OUTAGE SCHEDULING: Electrical work requiring interruption of electrical power which would adversely affect the Owner's operation shall be done at times other than normal working hours. Coordinate with Owner to establish normal working hours for this facility.

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), Underwriters' Laboratories (UL), Electrical Testing Laboratories (ETL), American National Standards Institute (ANSI), Institute of Electrical and Electronic Engineers (IEEE), Insulated Cable Engineers Association (ICEA), National Fire Protection Association (NFPA) and the American Society for Testing and Materials (ASTM) shall govern and apply where such have been established for the particular material in question.

C. Specified catalog numbers and trade or manufacturers names are intended to describe the material, devices, or apparatus desired for type, construction features, electrical characteristics, ratings, operating functions, style and quality. Similar materials of other manufacturers, not less than specified quality, capacity or character may be substituted in conformity with the provisions of the General and Supplementary Conditions. Materials of the same type shall be the product of one manufacturer. Refer to Shop Drawing requirements.

D. Furnish all materials specified herein or indicated on the drawings.

E. All work shall be installed in a practical and workmanlike manner by competent workmen, skilled in their trade.

2.02 SHOP DRAWINGS:

A. Provide complete electrical characteristics for all equipment. Submit for approval data of the materials and equipment to be incorporated into the Work. Submittals shall include descriptive materials, catalog cuts, diagrams, performance characteristics, and charts published by the manufacturer indicating conformance to the specification and drawing requirements; model numbers alone will not be acceptable. Submittals shall be made by Specification section number, tabbed, within three ring binders, grouped and submitted in packages as indicated below.

Submittals for lighting fixtures shall include full photometric data. Shop drawings shall be submitted for the following equipment and items suitably bound, and marked:

Package I:

Section 16110 Raceways
Section 16120 Wires and Cables
Section 16130 Boxes and Fittings
Section 16140 Wiring Devices

Package II:

Section 16145 Busways
Section 16150 Motor Controls
Section 16160 Panelboards
Section 16165 Distribution Panelboards
Section 16170 Motor and Feeder Disconnect Switches
Section 16460 Dry Type Transformers
Section 16480 Switchboards
Section 16430 Emergency Power System

Package III:

Section 16505 Lighting
Section 16560 Lighting Controls

Package IV:

Section 16720 Life Safety System

Package V:

Section 16610 Lightning Protection
Section 16620 Surge Protection

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. Do not submit equipment or materials not requested in the Specifications.

C. All material lists and shop drawing submittals shall include a stamped indication by the Contractor signifying that the submittals have been previously reviewed for complete compliance with the Contract Documents, that all coordination required between trades 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, which requires 10 working days from the date the shop drawings are received by the Engineer.

D. All pricing is to be based upon the products, manufacturers, and processes described in the Contract Documents. Requests for approval of substitutions shall be written and delivered to the Architect's/Engineer's office in conformity with the provisions of the General and Supplemental Conditions. Do not submit any shop drawing or product data that does not conform with the contract documents.

E. Resubmittals, if necessary, shall be made as specified above. Resubmittals will highlight and indicate any and all revisions made thereto and will include the following text " Resubmittal #___", typed in a prominent location on the cover sheet.

F. The Contractor shall provide with the shop drawing submittal dimensioned layouts of all electrical rooms and spaces using the equipment he intends to furnish. Switchboard, panelboards, distribution panels, etc., will be rejected without dimensioned room layouts.

G. Samples of all materials proposed for use shall be presented to the Architect for his approval when requested.

H. Submittals shall be noted with any deviations, alterations or limitations of product from the specified materials. The product will be rejected upon failure to indicate this information. Any conflict or failure to perform comparably to the originally specified materials will result in product rejection. It will be the Contractor's responsibility to replace the alternate material or equipment with the originally specified one and to demolish, replace, repair and retest the equipment, including repair or replacement of any component of the building, finishes or other systems affected by said replacement, at no additional costs to the Owner.

2.03 SUPPORT FASTENER DEVICES:

A. Anchors for post tensioned concrete applications shall be cast in place continuous or spot insert channel providing a safety factor of 3 in 3000 lb hard rock concrete.

B. Anchors for cast in place concrete shall be insert type expansion shields and bolts, lead shields and bolts or self drilling expansion shields and bolts. Powder actuated pins of 1500 pound pull out strength may be utilized in concrete.

C. Anchors for wood construction shall be lag bolts or power driven wood screws.

D. Anchors in hollow masonry shall be toggle bolts.

E. Anchors for steel attachment shall be machine screws, bolts, or beam clamps.

F. Equipment mounted to drywall construction shall be secured to power channel (13/16” x 1 5/8” minimum). Secure channel to a minimum of two (2) dry wall studs with drywall screws and washers.

2.04 SUPPORTS: Furnish and install under this contract all angle iron, channel iron, rods, threaded rod, supports or hangers required to install or mount all electrical equipment, material or related devices. Conduit shall not be supported from steel decking, roof decking, bridging, ceiling or ceiling support wires.

2.05 IDENTIFICATION:

A. All equipment or devices specified in Division 16 shall be identified with an engraved plastic nameplate. Identification of flush equipment shall be on the inside of the cover. Surface equipment shall be identified on the outside. Plastic nameplates shall be multicolored laminated plastic with engraved lettering. Nameplates shall be provided as scheduled:

1. 480/277 volt normal power equipment shall be black faceplate/white core.

2. 480/277 volt emergency power equipment shall be red faceplate/white core.

3. 208/120 volt normal power equipment shall be white faceplate/black core.

4. 208/120 volt emergency power equipment shall be white faceplate/red core.

5. Computer power equipment (ie UPS, isolated ground, etc.) shall be orange faceplate/white core.

B. Refer to electrical details for lettering size and nameplate requirements.

2.06 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. This set shall be utilized for no other purpose. Include any addenda, change orders, field orders, project 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. Show exact locations of underground cable and conduits, both interior and exterior, fully dimensioned from building column lines or permanent exterior structures. These drawings shall be available for reference at the time of final inspection.

C. At the completion of construction, the Contractor shall purchase a set of reproducibles from the Architect/Engineer at cost of printing and shipping. All changes noted above shall be incorporated thereon by the Contractor. The reproducible drawings, with one set of blueline prints thereof and the original sketches and marked-up "As-Built" prints shall be presented to the Owner.

2.07 MAINTENANCE AND INSTRUCTION MANUALS:

A. Submit to the Architect/Engineer, upon completion of the work and prior to final inspection, copies of maintenance and instruction manuals for equipment provided as outlined below:

1. Three sets of the following data are required:

a. Operating and maintenance instructions.

b. Spare parts list.

c. Copies of approved submittal data.

d. Copies of panelboard circuit directories reflecting all field changes.

e. Test reports of all tests performed.

f. Certificates of inspection from LAHJ.

g. Contact names and phone numbers for parts suppliers of submitted equipment.

B. Arrange each set of data in a orderly way and bind each set in a separate 3-ring hard-cover binder with appropriate label identifying the Project, Architect, Engineer, Contractor, Subcontractor and Date.

2.08 SUBMISSION OF DRAWINGS: Submission of Engineer's drawings for shop drawings and unaltered Engineer's drawings for "As-Built" will not be acceptable.

2.09 SPARE PARTS AND ATTIC STOCK:

A. Prior to final inspection, turn over to the Owner the following materials of the type and quantity specified. Material shall be new, in original shipping containers or cartons, of the same manufacture and type as installed on the Project. Obtain receipt for all materials turned over to the Owner.

1. Lamps

2. Fuses

3. Ballasts

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. Coordinate the installation of recessed electrical equipment with concealed ductwork, piping, insulation, structural appurtances and wall thickness.

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.

D. Do not scale drawings. Obtain dimensions for layout of equipment from the Architectural drawings unless noted on the Electrical drawings.

3.02 PROTECTION OF MATERIALS:

A. Refer to the general requirements section of the Specifications for storage, protection and handling requirements.

B. Provide dry, weathertight staging and storage for materials and equipment requiring protection from weather and moisture per manufacturer's recommendations. Install temporary lighting or heat sources to prevent moisture accumulation. Provide protection against direct sunlight, precipitation, wind, ice, fire or excessive heat. Store materials in original undamaged packaging with manufacturer's labels and seals intact. Containers which are broken, damaged or watermarked are not acceptable and are subject to rejection.

C. Materials and equipment will not be installed until the environmental conditions of the project are suitable to protect same per manufacturer's recommendations. Equipment or materials damaged or subjected to moisture, precipitation, direct sunlight, cold or heat are not acceptable and shall be removed from the project and replaced at no additional costs to the Owner.

D. All conduit and other openings shall be kept protected to prevent entry of foreign matter or construction debris. Fixtures, equipment, and apparatus shall be kept covered for protection against dirt, water, chemical or mechanical damage before and during construction.

E. 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: 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 CLEANING AND PAINTING:

A. Remove foreign materials, drywall compound, overspray, oil, dirt and grease from all raceway, fittings, supports, boxes, cabinets, pull boxes, panelboard trims and equipment to provide clean surfaces for painting. Remove surface oxidation and restore galvanized surfaces with cold process galvanizing compounds. Touchup marred or scratched surfaces of fixtures, panelboard and cabinet trims, motor control centers, switchboards, cabinets, and equipment enclosures with paint furnished by the equipment manufacturer specifically for that purpose. When touchup is required, provide one base coat over imperfection and subsequent coat over entire side or surface of equipment.

B. Do not paint trim hinges, latches, clamps, locks, device covers or trim covers. Mask or remove such items prior to finishing.

C. Unless otherwise noted herein, all painting shall conform to the "Painting" section of the specifications.

D. Where plywood backboards are utilized to mount electrical or electronic equipment provided under Division 16, finish same with two (2) coats of light gray semi-gloss paint.

3.06 ACCESS TO ELECTRICAL ITEMS: Install all concealed electrical equipment, junction and pull boxes, apparatus, or devices so as to maintain access for maintenance, operations and replacement. Access doors or covers shall be provided where required by NEC or LAHJ and shall be installed in accordance with manufacturer's instructions. Refer to the Architect for approved types, means, methods and appearance. Locate each access unit accurately in relation to electrical work requiring access.

3.07 ELECTRICAL ROOMS AND CLOSETS:

A. Manufacturer's equipment shall not be larger than that dimensioned, or scaled, on plans. Conflicts shall be brought to the attention of the Architect, for resolution prior to ordering equipment.

B. Clear working space in electric rooms and closets shall be no less than required by the N.E.C.

C. Submit for review, prior to construction or purchase of any equipment, scaled drawings of electrical rooms, closets, or spaces showing, in detail, planned installation locations of the equipment. These shall clearly show compliance with A and B above.

3.08 EQUIPMENT CONNECTIONS:

A. Review all divisions of specifications, where equipment requiring electrical service is specified, to determine the complete scope of work under this division of the specifications. Provide electrical connections and service to all equipment specified elsewhere requiring such connections or service.

B. Connect all equipment requiring electrical connections, in accordance with the equipment manufacturer's requirements. Where equipment connections require specific locations, determine and coordinate same with submittals. Provide concealed service to central plant equipment locations and pads.

3.09 NAMEPLATES AND IDENTIFICATION:

A. Provide and install nameplates for transformers, switchboards, switchgear, power and lighting panels, disconnect switches, time switches, pull boxes, junction boxes, fire alarm equipment, contactors, relays and other unit equipment. Nameplates shall be affixed with epoxy cement.

B. Install nameplates plumb and level.

C. Provide and install sleeve type wire markers on all conductors at all termination points and access points. Branch circuit identification (as LP-21”) shall be installed on hot and neutral conductors. Dedicated circuits and isolated ground technical power circuits shall have wire markers installed on ground conductor. Label junction and pull box covers with all circuit numbers contained therein.

3.10 EXCAVATION AND BACKFILLING:

A. Provide and perform all excavation required to install conduit, ductbanks and manholes indicated on the drawings and/or specified. Trenches shall be of uniform width required with minimum 8" clearance on both sides. Remove and dispose of all materials not to be used for backfill. Maintain dry excavations for electrical work, by removing water. Grade areas to prevent surface water from entering excavation. Remove any accumulated water by pumping. Perform all excavation by open cut. Excavate with vertical-sided excavations where possible. Where necessary, provide sheeting and cross-bracing to sustain sides of excavations. Provide materials for shoring and bracing, such as sheet piling, uprights, stringers and cross-braces, in good serviceable condition. Establish requirements for trench shoring and bracing to comply with local codes and LAHJ. No tunneling shall be permitted.

B. The bottom of all trenches and excavation shall be graded to provide uniform bearing surface for conduits or ductbanks on undisturbed soil at every point along entire length. Tamp overexcavation with specified backfill materials. Remove unstable materials unsuitable for supporting equipment or installation and replace with specified materials for a minimum of twelve (12) inches below invert of equipment or installation.

C. Specified materials shall be utilized for backfilling, in not more than six (6) inch layers and tamped until the installation has cover of not less than the adjacent grade and not more than two (2) inches above same. Remove sheeting and cross-bracing during backfilling wherever such removal would not endanger the work or other property. Equalize backfilling operation to avoid shifting of materials and equipment installed. Compaction of backfill materials shall be at least equal to surrounding undisturbed material. Backfill trenches with concrete where excavations pass within 18" of footings or other utility lines. Do not settle backfill with water. Conform to compaction requirements and methods specified elsewhere.

3.11 TESTS AND CERTIFICATIONS:

A. Upon completion of the electrical work and prior to final inspection, conduct an operating test in the presence of the Owner and the Architect/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 Architect/Engineer shall be removed, repaired or replaced as directed without incurring additions to the Contract in time or cost. All electrical systems shall be tested for compliance with the specifications.

C. Furnish all instructions, tools, test equipment and personnel required for the test. Have sufficient tools and personnel available to remove equipment covers, coverplates, etc., as required for review of internal wiring and proper inspection. Provide hand tools, flashlights, ladders, outlet testers, VOM, meters and keys required to access and observe system operation and characteristics. Turn circuits on and off as directed and demonstrate operation of equipment as directed.

D. Contractor shall test all wiring and connections for continuity and grounds by Megger testing. Upon indication of defective insulation, Contractor shall remove and replace the defective conductor and demonstrate by testing that the new conductor is acceptable. Record feeder load currents and line voltages measured at each transformer, switchboard and panelboard after installation of all equipment and lighting. Adjust transformer taps as required to provide optimum voltage levels. Adjust single phase load connections to balance feeder load and document on as-built drawings. Provide the Owner with full documentation of all testing for future reference.

E. Refer to the individual specification sections and the electrical systems testing section of the specifications for specific testing requirements.

F. The authorized manufacturer's service representative shall review systems and equipment for correct operation, conformance with specification requirements and manufacturer's requirements and submit certification indicating above mentioned conformances for the following systems:

1. Life Safety System

2. Emergency Generator Set

3. Automatic Transfer Switches

4. Fire Communications System

5. Interfaces to Mechanical & Building Systems

3.12 DEMONSTRATION AND INSTRUCTION:

A. Present to the Owner and the Architect/Engineer or his designated representative a physical demonstration and oral instructions for proper operation and maintenance of each of the electrical equipment and systems installed. Authorized manufacturer's representatives familiar with the specified equipment shall conduct training for the following systems:

1. Life Safety System

2. Emergency Generator Set

3. Automatic Transfer Switches

4. Fire Communications System

5. Interfaces to Mechanical & Building Systems

3.13 TEMPORARY WIRING: Provide a temporary electrical lighting and power distribution system of adequate size to properly serve the construction requirements, including adequate feeder sizes to prevent excessive voltage drop. Temporary work to be installed in accordance with the National Electrical Code, Article 305, and as required by OSHA or applicable local safety codes, rules and regulations.

3.14 WARRANTY:

A. All systems and components shall be provided with a one-year warranty from the time of final acceptance. The warranty shall cover all defects in materials, design and workmanship. During this warranty period, all defects in materials and workmanship shall be corrected without incurring additions to the Contract. The correction shall include removing the defective part(s), replacing and installing the new parts (including shipping and handling), 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 warranty, entirely at the expense of the Contractor.

B. In addition to this general warranty, present to the Architect any other guarantees or warranties from equipment or system manufacturers. These supplemental guarantees or warranties shall not invalidate the general warranty.

END OF SECTION

SECTION 16110 RACEWAY SYSTEMS

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 complete interior and exterior conduit and raceway systems.

PART 2 - PRODUCTS

2.01 CONDUIT:

A. Galvanized rigid steel conduit (GRC) shall be low carbon, hot-dipped zinc galvanized steel to meet U.L. 6 Standards, ANSI C80.1 and shall have NPT (ANSI B1.20.1) full cut threaded joints, galvanized after forming. IMC shall carry U. L. Label. Conduit with integral couplings may be utilized for 2.5 inch sizes and above provided it conforms to U. L. Safety Standard #514-B.

B. Intermediate metal conduit (IMC) shall be premium hardened steel conforming to ASTM-A568, hot galvanized with zinc chromate exterior with polymer sealcoat to meet U.L. 1242 and ANSI C80.6 standards. Interior to be finished with corrosion inhibiting organic coating. Both coatings shall conform to ANSI C80.6 requirements. IMC shall have NPT (ANSI B1.20.1) full cut threaded joints, galvanized after forming. Conduit with integral couplings may be utilized for 2.5 inch sizes and above provided it conforms to U. L. Safety Standard #514-B. IMC shall carry U. L. Label.

C. Electrical metallic tubing (EMT) shall be high grade mild ductile steel, hot galvanized exterior with a clear organic polymer topcoat to meet U.L. 797 Standards and ANSI C80.3. Interior to be finished with corrosion inhibiting clear organic coating. Conduit with integral set screw couplings may be utilized for 2.5 inch sizes and above provided it conforms to U. L. Safety Standard #514-B.

D. Plastic conduit (PVC) shall be schedule 40 PVC heavy wall type for 4" and smaller, Schedule 20 for 5" and larger. PVC shall be U.L. Listed, NEMA TC 2, sunlight resistant and suitable for use with 90 degree C conductors.

E. Flexible metal conduit (FLX) shall be extra flexible, extra strength galvanized steel conduit tubing and shall meet U. L. Standard for Flexible Steel Conduit and U.L. Standard for Safety #1. The use of aluminum flexible conduit is not permitted.

F. Liquid-tight flexible metal conduit (WFX) shall be UL Listed with galvanized steel core of square locked or interlocked design, integral ground conductor and thermoplastic PVC (polyvinyl chloride) cover. The use of aluminum core or non-metallic types is not permitted.

G. Electrical non-metallic tubing (ENT) shall be UL Listed and manufactured to the requirements of NEMA TC-13. This raceway is permitted to be utilized with concrete encasement or unexposed installations only. Do not install exposed in plenums or other open areas. Utilize steel outlet boxes in all partition construction. Utilize plastic boxes only in concrete encasement.

H. Steel conduit approved manufacturers are Allied, Triangle, Republic, Wheatland and Pittsburg.

I. Flexible conduit approved manufacturers are Anamet (Anaconda) and Republic.

J. PVC conduit approved manufacturers are Carlon, Triangle, and Johns-Manville.

K. PVC coated metallic conduit approved manufacturers are Robroy, Permacote and Occidental.

2.02 CONDUIT FITTINGS:

A. GRC and IMC conduit fittings shall be zinc-coated, ferrous metal and taper threaded type, U. L. Labeled.

B. EMT fittings shall be zinc-coated steel and shall be Type 1 or 2 (raintight compression or concrete tight set-screw type). EMT connectors shall have insulated throats. Die cast, malleable iron or pressure cast material will not be accepted. Fittings shall bear U. L. Label. Two (2) inch and larger fittings shall be compression type or shall utilize dual set screws for each side of fitting.

C. PVC fittings, elbows and cement shall be NEMA TC3, 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 shall have 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. Expansion fittings shall be provided in all conduits which crosses an expansion joint either in, across, or through same. Fittings shall be U.L. 467 and 514 Listed. Fittings shall contain an internal flexible metal braid to maintain system ground continuity.

G. Flexible conduit fittings shall be cast malleable iron or stamped steel type with integral fastener. Fittings shall be U.L. Listed for the application. The use of “squeeze” type cast or stamped steel connectors is not permitted.

H. Liquidtight flexible metal conduit fittings shall be liquidtight with neoprene bushing, nylon gland, tapered hub threads and outlet bushing. Fittings shall be U.L. Listed for the application. The use of non-metallic or thermo-plastic insert connectors is not permitted.

1. EMT conduit fittings approved manufacturers are Raco, Steel City, Crouse-Hinds, O.Z Gedney, Thomas & Betts, Efcor and Appleton.

2. GRC and IMC fittings approved manufacturers are Appleton, Crouse-Hinds, O.Z. Gedney or Thomas & Betts.

2.03 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 or cable or internally shall have heat activated intumescent material which expands to fill all voids and shall be O.Z./Gedney "FIRE-SEAL" or Dow Corning silicone RTV 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. Penetration of any fire rated wall, floor, or ceiling shall use Through-Penetration Firestop Systems described in the current Underwriters Laboratories Building Materials Directory.

2.04 RACEWAY SUPPORTS:

A. Raceways and systems shall be supported independent of any other equipment or appurtances except the building structure. Suspended ceiling systems will not be considered as structure for support purposes, even if so rated by the manufacturer.

B. All support components shall be zinc-coated or have equivalent corrosion protection. Unprotected components shall be removed and replaced at no additional costs to the Owner.

C. Conduit support straps shall be single hole cast malleable iron or dual hole stamped steel type with zinc coating sized for type of raceway used. Conduit clamps for single conduit support shall be stamped steel with bolt & nut fastener and threaded rod support. Multiple conduit support channel straps shall be galvanized stamped steel two piece clamps with bolt & nut fasteners.

D. Conduit support channel shall be minimum 1 5/8” x 1 5/8” x 12 gauge rollformed pre-galvanized steel or painted steel conforming to ASTM A-570 Grade 33 or ASTM A-446 Grade A requirements. Channel cross section shall be increased to provide higher load bearing capability, if required by this installation. Channel shall have elongated holes at two (2) inch centers.

E. Drop wire type hangers will not be permitted. Any hanger which may distort the ceiling support structure will not be permitted. Lathers channel and chain are not acceptable for conduit hangers.

F. Furnish and install under this contract all angle iron, channel iron, rods, threaded rod, supports or hangers required to install or mount all electrical equipment, material or related devices. Conduit shall not be supported from steel decking, roof decking, bridging, ceiling or ceiling support wires.

G. 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. Coordinate the installation of recessed electrical equipment with concealed ductwork, piping, insulation, structural appurtances and wall thickness.

H. Support branch circuit conduits and raceways at intervals not exceeding ten (10) feet and within three (3) feet of each termination. Support feeder conduit and raceway at intervals not exceeding twelve (12) feet and within three (3) feet of each termination.

I. 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.

J. Raceway installed within reinforcing steel of elevated or slab on grade concrete construction shall be tied to the re-steel at intervals not exceeding three (3) feet.

2.05 SUPPORT FASTENER DEVICES:

A. Anchors for post tensioned concrete applications shall be cast in place continuous or spot insert channel providing a safety factor of 3 in 3000 lb hard rock concrete.

B. Anchors for cast in place concrete shall be insert type expansion shields and bolts, lead shields and bolts or self drilling expansion shields and bolts. Powder actuated pins of 1500 pound pull out strength may be utilized in concrete.

C. Anchors for wood construction shall be lag bolts or power driven wood screws.

D. Anchors in hollow masonry shall be toggle bolts.

E. Anchors for steel attachment shall be machine screws, bolts, or beam clamps.

F. Equipment mounted to drywall construction shall be secured to power channel (13/16” x 1 5/8” minimum). Secure channel to a minimum of two (2) dry wall studs with drywall screws and washers.

G. Under no circumstance will nylon or composition type tie wraps or straps be permitted for use in supporting electrical raceway. Utilize galvanized tie wire or prefabricated steel clips for such support.

PART 3 - EXECUTION

3.01 CONDUIT:

A. Rigid galvanized conduit or intermediate metal conduit shall be used for service entrance and all feeders and branch circuits where exposed to damage or moist conditions.

B. EMT shall be used for feeders, branch circuits, fire alarm and telephone when not underground or in concrete in contact with the earth. Raceway underground or in concrete in contact with the earth shall be rigid galvanized conduit, intermediate metal conduit or Schedule 40 PVC. Conduit exiting elevated slabs or slab on grade shall be IMC. PVC conduit exiting slab is not permitted.

C. 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 box or conduit fittings. Conduit connections to any box which has no threaded hub shall be double locknutted and bushing installed.

D. Provide junction boxes or pull boxes where shown and where necessary to avoid excessively long runs or too many bends between outlets. The conduit sizes shown may be increased if desired to facilitate the pulling of cables.

E. 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 malleable iron or stamped steel 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 minimum six (6) inches above ceiling structure to permit removal of ceiling panels and lighting fixtures.

F. Use threaded rods and hangers consisting of double-nutted threaded rods and channel or angles of 12 gauge minimum steel for supporting multiple conduit. Refer to drawing details.

G. Minimum size conduit for exposed branch circuits shall not be smaller than 1/2". Raceway installed in concrete slabs shall be minimum 3/4”. 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".

H. Type GRC and IMC conduit shall be cut and threaded with similar die heads. Deburr outside of all cuts prior to cutting threads. Cut threads one thread short so that they meet in the coupling and all threads are covered when wrench tight. Deburr inside of end after cutting threads. Right and left hand couplings shall not be used; conduit couplings of the Erikson Type shall be used at locations requiring such joints. Utilize only rigid type hand benders, “Chicago” type benders or power benders with required IMC shoes. DO NOT attempt to bend IMC with “hickey” type hand benders. Any such bends will be replaced at no additional costs to the Owner. Utilize only U.L. Listed conduit fittings, elbows and junction boxes (IMC or GRC types).

I. All conduit for future use and for special systems such as telephone, data or TV wire shall be left with No. 16 gauge wire or approved pull cord pulled in them.

J. Expansion fittings shall be installed in all conduit penetrations through, around or in expansion joints, and all straight runs in excess of 150 feet. Watertight flexible metallic conduit, connectors and couplings may be utilized for exposed transitions. U.L. 467 & 514 Listed fittings are required in slab.

K. Provide non-hardening elastic type duct seal compound, Neer No. DC, 3M Co. "Scotchfil," or Gardner Bender duct seal, for each conduit entering the building from outside, for each conduit entering refrigerated spaces, for each conduit entering exterior equipment and for each conduit passing from one space into another which is normally at a lower temperature. Conduits entering refrigerated spaces shall be IMC.

L. Provide intermediate metal conduit and watertight conduit hubs on conduit terminating in a box or cabinet exposed to the weather or damp locations.

M. 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 U.L. labeled fire resistive material, or provide mechanical fire stop fittings that will maintain the rating of the barrier penetrated. Conform with local authority requirements and UL Building Materials Directory.

N. Coordinate the conduit routing and installation location with the actual electrical equipment furnished. Review submittals for termination locations. Coordinate with all Specification Divisions and submittals to determine termination and access locations. Coordinate installation sequence with all other trades to avoid conflicts and provide the fastest overall installation schedule.

O. Dented, misformed or flattened conduits are not permitted and shall be removed and replaced.

P. Protect conduits against dirt, plaster, and construction debris with the use of conduit plugs. Tape is not acceptable. Plugs shall remain in place until all masonry or/and drywall construction is complete. Protect conduit stubups during construction from damage, and replace any bent conduits.

Q. Conduits serving roof mounted equipment shall pass through roof curb where such is provided. Roof penetrations outside this equipment will not be permitted.

R. Separate raceway systems shall be provided for power systems and for control, signal and communications systems. Do not install above systems cables in the same raceway as branch circuit or feeder cables.

S. Service entrance and fire pump feeders shall be installed “Outside” of the building as defined by NFPA and the N.E.C. Provide concrete encasement where required to conform with Code requirements.

T. All conduits installed exposed shall be IMC to a minimum elevation of ten (10) feet AFF. Exposed boxes shall be type FS cast metal.

U. Where hazardous locations, as classified by the National Electrical Code, exist, all raceway and fittings and the installation of these materials shall comply with Article 500 requirements.

V. All conduits for interior wiring systems operating above 600 volts shall be galvanized rigid conduit, painted red at access points and labeled per OSHA requirements..

W. Maintain minimum three (3) inch clearance when raceway crosses piping and/or systems operating above 75˚F and provide twelve (12) inches separation when installed parallel to hot piping, flues or appliances operating above 75˚F.

X. Nonmetallic fittings shall be applied with compatible solvent welding cement and shall be fitted while solvent is liquid. Overwrap all fittings used in concrete encasement with suitable tape. Provide o-rings at terminal points to provide watertight seal.

3.02 FLEXIBLE CONDUIT:

A. Watertight flexible metallic conduit shall be used in making short flexible connections to all motors, transformers, bus duct switches, kitchen equipment and 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". Flexible metallic conduit shall be used in making connections to heaters, fixed equipment or flush mounted light fixtures.

B. A green stranded bonding jumper shall be installed inside 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

3.03 CONDUIT PROTECTION:

A. All threaded joints in galvanized rigid conduit that is encased in concrete shall have a U.L. listed joint compound applied. All conduit installed outside the building underground shall be buried a minimum of 30" below finished grade but in no case shall be buried deeper than 48". Where conduit inside 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. Submit conduit layout to structural consultant for review and approval prior to rough-in.

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 with suitable caps (not tape) 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. Identify all underground and underslab conduit locations on as-built drawings for future reference.

D. Damaged, oxidized, warped or improperly stored raceway will be removed from the jobsite and replaced with new materials. Non-metallic conduit stored on site prior to installation shall be stored on a flat surface off the ground and shall be protected from direct sunlight and debris.

3.04 CORING, CUTTING AND PATCHING:

A. Perform all coring, cutting and patching of existing walls and floors in order to install the work. 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.

3.05 BELOW GRADE RACEWAY INSTALLATION:

A. Provide and perform all excavation required to install conduit, ductbanks and manholes indicated on the drawings and/or specified. Trenches shall be of uniform width required with minimum 8" clearance on both sides. Remove and dispose of all materials not to be used for backfill. Maintain dry excavations for electrical work, by removing water. Grade areas to prevent surface water from entering excavation. Remove any accumulated water by pumping. Perform all excavation by open cut. Excavate with vertical-sided excavations where possible. Where necessary, provide sheeting and cross-bracing to sustain sides of excavations. Provide materials for shoring and bracing, such as sheet piling, uprights, stringers and cross-braces, in good serviceable condition. Establish requirements for trench shoring and bracing to comply with local codes and LAHJ. No tunneling shall be permitted.

B. The bottom of all trenches and excavation shall be graded to provide uniform bearing surface for conduits or ductbanks on undisturbed soil at every point along entire length. Tamp overexcavation with specified backfill materials. Remove unstable materials unsuitable for supporting equipment or installation and replace with specified materials for a minimum of twelve (12) inches below invert of equipment or installation.

C. Specified materials shall be utilized for backfilling, in not more than six (6) inch layers and tamped until the installation has cover of not less than the adjacent grade and not more than two (2) inches above same. Remove sheeting and cross-bracing during backfilling wherever such removal would not endanger the work or other property. Equalize backfilling operation to avoid shifting of materials and equipment installed. Compaction of backfill materials shall be at least equal to surrounding undisturbed material. Backfill trenches with concrete where excavations pass within 18" of footings or other utility lines. Do not settle backfill with water. Conform to compaction requirements and methods specified elsewhere.

D. Concrete encased underground ductbanks shall be installed where indicated on the drawings. Ductbank conduits shall be non-metallic type EB, thin wall PVC with concrete encasement.

1. Stagger couplings of adjacent conduit runs by a minimum of two (2) feet. Provide pre-fabricated conduit supports installed per manufacturer's recommendation. Anchor ductbank assembly in trench to avoid "floating" during concrete pour.

2. Changes in direction shall be made by the installation of long sweep bends of minimum twenty-five (25) foot radius. All 90 degree ells shall be long sweep type of minimum twenty-four (24) inch radius.

3. Below all paving and traffic areas, all ductbank shall be reinforced with the installation of No. 5 rebar six (6) inches on center at each corner and on all sides, parallel to duct, and with continuous No. 3 rebar perpendicular to duct on sixteen (16) inch centers. Concrete cover for reinforced ductbanks shall be minimum six (6) inches with at least three (3) inches above rebar. Reinforcing of duct bank shall continue at least ten (10) feet to each side of required areas.

4. All ductbanks shall be sloped to drain toward manholes and shall be laid with minimum grade of four (4) inches per hundred feet.

END OF SECTION

SECTION 16115 CABLE TRAY

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 installation of cable tray throughout the facility and associated hangers and supports as indicated on the drawings.

1.02 SUBMITTALS:

A. Submittals shall include tray type, dimensions, support points, and finishes as well as layout coordinated with other trades to avoid interferences.

1.03 MANUFACTURER:

A. System shall be as manufactured by Atlas; Mono-Systems, Inc.; B-Line Systems, Inc. or approved equal.

PART 2 - PRODUCTS

2.01 CONSTRUCTION:

A. Cable tray shall be of the ventilated, ladder type with center support rail and of the dimensions as indicated on the drawings.

B. Tray shall be constructed of a center rectangular T606 aluminum tube which forms a spine to which square/rectangular/triangular cross rungs are attached on 6” centers. The cross rungs shall be bent up at their ends to a height of 3” and 18” wide to form a center supported, open sided, ladder like assembly. The tray shall not have side rails. Cross rungs shall emanate at right angles from the top of the spine.

2.02 FITTINGS:

A. Splice connectors shall be utilized to join all sections of tray which consist of a rectangular splice connector which telescopes into the tray to allow for expansion and contraction of the tray. The splice connector shall be provided with a vertical hole to accept a ½” threaded rod which is used to support the tray in an overhead application.

B. Horizontal and vertical quick connections shall be used for all 90 degree elbows, tees and crosses by clamping to the spine without the need for drilling or cutting this component.

C. Angle connectors shall be used for all angles of 90 degrees to 30 degrees and fasten into the spine in the same manner as the above splice connectors.

2.03 SUPPORTS:

A. Tray shall be supported on maximum of 12’ centers by a single ½” threaded rod which passes through the vertical hole in the splice connector and fastens directly to the center spine using a ½” nut and washer on the top and bottom of the spine. When shorter spans are needed, then a 5/8” hole should be drilled through the top and bottom walls of the spine, at support points only, and a single ½” threaded rod should be inserted also using a ½” nut and washer on the top and bottom of spine.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. The entire assembly shall be installed straight and level except where offsets are required due to building structure or equipment which does not allow a continuous and unobstructed path. The tray shall be suspended to a height of 10'-0" to the bottom of the trays support rods.

B. Tray shall be installed in accordance with manufacturer's recommendations. Provide supports at each connection point, at the end of each run, and at other points to maintain spacing between supports of 12ft maximum.

C. Use expansion connectors where required.

D. Ground and bond cable tray under provisions of Section 16170.

1. Provide continuity between tray components.

2. Use anti-oxidant compound to prepare aluminum contact surfaces before assembly.

3. Provide 2 AWG bare [copper] [aluminum] equipment grounding conductor through entire length of tray; bond to each component.

4. Connections to tray may be made using mechanical or exothermic connectors.

E. Install warning signs at 50 ft centers along cable tray, located to be visible.

END OF SECTION

SECTION 16120 WIRES AND CABLES

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 furnishing, installation and connections of the building wiring system. Interior wiring, power distribution, lighting, appliance and equipment, motor and exterior wiring systems extending beyond the building are included. The wiring system shall be complete from electrical service entrance to every electrical device requiring an electrical connection.

PART 2 - PRODUCTS

2.01 CONDUCTORS:

A. Conductors shall be copper of 98% conductivity, soft temper, 600 volt insulation. Sizes specified are American Wire Gage (AWG) for No. 4/0 and smaller and thousand circular mils (kcmil) for all sizes larger than No. 4/0. Service entrance conductors shall be 600 volt, type XHHW.

B. Conductors No. 10 and smaller shall be solid and type "THHN" / THWN" insulation. No. 8 and larger shall be stranded and type "THHN" / "THWN" or “XHHW” insulation.

C. All wire and cable shall be U. L. Listed and shall bear the U. L. Label.

D. All conductors shall have size, grade of insulation, voltage and manufacturer’s name permanently marked on the exterior at maximum 24 inch intervals.

E. Conductor size shall be a minimum of No. 12 AWG. Conductor size shall be not less than indicated on the drawings. The minimum size of all emergency circuits shall be No. 10 AWG.

F. Fixture wire shall be No. 14 AWG silicone rubber insulated, stranded fixture wire, Type THAN (90 degrees C.).

G. Control conductors for use on 120 volt control wiring shall be No. 14 AWG stranded Type THHN/THWN, unless indicated otherwise on the drawings or as required for compliance with voltage drop requirements.

H. Where cables are used for switch leg, the white conductor shall be permitted to supply the switch, but not as a return to the switchboard outlet for 277 volt lighting switch legs and phase conductor shall be.

2.02 PREFABRICATED CABLE ASSEMBLIES: Metal clad cable type MC may be utilized for concealed branch circuit wiring only as permitted by local authority having jurisdiction. Insulated ground conductor shall be provided.

2.03 CONNECTORS:

A. Terminations and connections shall be made with U. L. Listed connectors applied per manufacturer’s recommendations.

B. Connections of #10 AWG and smaller size power and lighting branch circuit conductors shall be made with insulated spring steel wire nut connectors. Size #8 AWG and larger connections shall be made with hydraulically applied compression type connectors with insulated covers.

C. Connections of special system conductors shall be made via dedicated terminal strips labeled to indicate wire number and system type. Wire nut connections in system junction box are not acceptable.

2.04 ALTERNATE MATERIAL DESCRIPTION: (OPTIONAL)

A. Where permitted by local authority having jurisdiction, aluminum conductors may be utilized for conductor sizes No. 4/0 and larger in lieu of copper conductors specified and indicated on the drawings. Insulation of aluminum conductors shall be identical to insulation specified and indicated for copper conductors. Aluminum conductor's sizes shall be based upon not less than equivalent copper ampacities (NEC Table 310-16) and voltage drop characteristics. Submit table of proposed substitution for review and approval in accordance with submittal requirements.

B. Fittings utilized to terminate aluminum conductors shall be compression type, U. L. Listed for the application.

C. Where aluminum conductors are utilized, raceways shall be increased in size in accordance with the conduit fill limitations of the National Electrical Code. Derating factors of NEC Article 310-10 or note 8/ NEC 310-16 shall be applied, where applicable. As-built drawings shall reflect the size of aluminum conductors and raceway installed.

2.05 ACCEPTABLE MANUFACTURERS:

A. Wire and Cable products:

1. Southwire Co.
2. Rome Cable
3. Alcan Cable
4. Carol Cable
5. AFC Cable Systems
6. American Insulated Wire
7. Cerro Wire & Cable
8. General Cable
9. Triangle PWC
10. Cabelec
11. Okonite

B. Signal Cable products:

1. Belden
2. Continental
3. Dekoron
4. West Penn

C. Connector products:

1. AMP
2. Burndy
3. Eagle
4. Gould
5. Ideal
6. Joslyn
7. O-Z Gedney
8. Thomas & Betts
9. Ilsco
10. Buchanan
11. King

D. Wire management products:

1. AMP
2. Thomas & Betts
3. Panduit
4. Wieland

E. Wire & Cable identification products:

1. Thomas & Betts SM series
2. Wieland C type
3. Brady type XC

F. Wire Pulling lubrication products:

1. Ideal Yellow 77
2. Electro Y ER EAS
3. Burndy Silkon

PART 3 - EXECUTION

3.01 WIRING:

A. All conductors shall be installed in conduit, unless noted otherwise. All conductors shall be pulled in at the same time. No conductors shall be pulled into the conduit until the conduit system is complete and plaster/drywall construction has dried. Clean, swab and evacuate conduit system before pulling in conductors. Do not exceed the manufacturer's maximum pulling tension.

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 proper U. L. Listed connectors. Where connection is made to any terminals of more than 30 amperes capacity and where conductors larger than No. 10 are connected to any terminal, copper terminal lugs shall be secured 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 three (3) 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. Grounding conductors are not shown in wire count, but are required from circuit origin to last device.

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 through the entire job as follows:

208/120 Volt Systems		Type	480/277 Volt Systems
Black	Phase A		Brown
Red	Phase B		Orange
Blue	Phase C		Yellow
White	Neutral		Gray
Green	Ground		Green/tracer
White/Green Stripe		IG Neutral	Black w/ Black Stripe
Green/White Stripe		IG Ground	Green

E. The feeder and service entrance conductors shall be color coded by the use of one (1) inch wide colored plastic tape applied within 6" of each conductor end.

F. Branch circuit conductors shall not be smaller than No. 12 and where the home run from panel to first device exceeds 60'-0", the conductors from home run outlet to panel shall be No. 10 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 all access points, terminals, junction boxes and at panelboards within 6" of conductor ends.

J. Special systems conductors shall be color coded in accordance with system manufacturer’s recommendations or in a manner approved by the Engineer.

K. Furniture system branch circuits shall have minimum #10 neutral home run conductors pulled to system junction box.

L. Maintain phase rotation established at service entrance point throughout entire project.

M. Taps and splices, where permitted by these specifications, shall be performed with an encapsulating watertight connection kit which insulates and moisture seals the connection.

N. Grounding conductors are not indicate in the wire count shown on the drawings, but are required in all branch circuit and feeder installations. Provide insulated ground conductor (sized per NEC requirements) in all raceways.

3.02 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 push-button, 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. Control wiring, conduit etc. shall be coordinated with division 15 and provided as required.

3.03 CONNECTIONS:

A. All connectors shall be U.L. Listed and shall be utilized in full accordance with manufacturer's requirements.

B. Splices shall be made only where specifically approved by the Engineer. Conductors shall be continuous from origin to first outlet box or manhole. Splices made exterior to the structure, or below grade, shall be compression type connections with insulated, waterproof covers. Submit splicing requests for review and approval prior to installation.

C. Termination lugs shall be applied to all single cables #8 and larger, and shall be compression type fittings. The use of mechanical type lugs, kerneys or other pressure type connections will not be permitted.

D. All compression connections shall be long barrel type installed using hydraulic tools designed for the purpose.

E. Insulated spring steel wire nut connectors shall be used for branch circuit connections of #10 and smaller conductors. Connections of #8 and larger sizes shall be made with compression type connections with insulated covers. Where exposed to moisture or corrosion spring steel wire nut connectors shall be silicone filled.

F. Control and special system riser and junction boxes shall be fitted with terminal strips and all conductors shall be labeled per system requirements. The installation of wirenuts in special system riser and junction boxes is not acceptable.

G. Phase rotation at service equipment shall be maintained throughout entire project, color coding of conductors shall be consistent for feeders and branch circuits through out entire project.

3.04 IDENTIFICATION:

A. All conductors shall be identified with full circuit number at all access points, boxes, and at panelboards within 6 inches of conductor end. Identification shall be permanently marked PVC split sleeve or tubing type

B. Tape or laminated type wire markers are not acceptable

C. Permanently mark the junction box cover with the circuit numbers for all conductors contained within. Utilize black marker for normal power and red marker for emergency power and fire alarm.

3.05 WIRE MANAGEMENT:

A. Power and control wiring within all special system cabinets and enclosures, and within switchboards and electrical equipment shall be bundled or routed within slotted wiring duct in a workmanlike manner.

B. Any knockout, cutout or slot containing wiring shall be fitted with bushing or continuous grommet strip to avoid fraying or abrasion.

C. Train and lace all conductors within panelboard or control enclosures with cable ties or spiral wrapping.

D. Spare conductors installed shall be identified and capped.

END OF SECTION

SECTION 16121 MEDIUM VOLTAGE CABLE

PART 1 GENERAL

1.01 DESCRIPTION

A. All work specified in this Section shall comply with the provisions of Section 16010.

B. This Section specifies requirements for wires, cables, splices, terminations and appurtenances for electrical systems of medium voltage: 601 volt to 34,500 volts, inclusive.

1.02 REFERENCES:

A. The following is a listing of the publications referenced in this section:

1. American Society for Testing and Materials. (ASTM)

a. ASTM B 1 Hard-Drawn Copper Wire.
b. ASTM B 2 Medium-Hard-Drawn Copper Wire.
c. ASTM B 3 Soft or Annealed Copper Wire l.
d. ASTM B 8 Concen tric-Lay-Stranded Copper Conductors, Hard, Medium Hard, or Soft.
e. ASTM B 33 Tinned Soft or Annealed Copper Wire for Electrical Purposes.
f. ASTM B 189 Lead-Coated and Lead-Alloy-Coated Soft Copper Wire for
g. Electrical Purposes.
h. ASTM D 1373 Medium-Voltage Rubber Insulating Tape.
i. ASTM D 2802 Ozone-Resistant Ethylene-Propylene-Rubber Insulation for Wire and Cable.

2. Association of Edison Illuminating Companies. (AEIC)

a. AEIC CS 6 Ethylene-Propylene-Rubber Insulated Shielded Power Cable Rated 5 through 69 KV.

3. Federal Specifications. (FS)

a. JJ-I-553 Insulation Tape, Electrical (Rubber, Natural and Synthetic)

4. Insulated Cable Engineers Association. (ICEA)

a. ICEA S-68-516 Ethylene-Propylene-Rubber Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.

5. Institute of Electrical and Electronics Engineers. (IEEE)

a. IEEE 48 High Voltage AC Cable Terminators, Test Procedure and Requirements.
b. IEEE 383 Type Test of Class 1E Electric Cables, Field Splices and Connections for Nuclear Power Generating Stations.
c. IEEE 404 Standard for Type Test of Cable Joints for Use with Extruded Dielectric Cable Rated 5,000 through 46,000 Volts, and Cable Joints for Use with Laminated Dielectric Cable Rated 2,500 through 500,000 Volts.

d. IEEE 837 Standard for Qualifying Permanent Connections Used in Substation Grounding.

6. National Fire Protection Association. (NFPA)

a. NFPA 70 National Electrical Code.
b. NFPA 258 Standard Research Method for Determining Smoke Generation of Solid Materials.

7. Underwriters Laboratories, Inc. (UL)

a. U: 44 Rubber -Insulated Wires and Cables.
b. UL 467 Grounding and Bonding Equipment.
c. UL 510 Insulation Tape.
d. UL 1581 Reference Standard for Electrical Wires, Cables, and Flexible Cords.

1.03 QUALITY ASSURANCE:

A. Wires and cables which have been manufactured more than two years prior to installation shall not be used in the Work of this Section.

B. Tapes for splices or termination's shall be dated by the tape manufacturer to indicate that they have been manufactured no longer than six months prior to use in the Work of this Section.

1.04 DELIVERY, STORAGE, AND HANDLING:

A. Where multi-conductors are to be installed as one cable, single conductor cables shall be paralleled by cable manufacturer prior to shipment. Cable assembly overall diameter shall be kept to a minimum.

B. Store material in a clean, dry space and protect from weather.

1.05 SUBMITTALS:

A. Submit the following in accordance with the requirements of "Shop Drawings, Catalog Cuts, and Samples" of DIVISION 1 - GENERAL PROVISIONS:

1. Shop drawings:

a. Submit shop drawings for the installation sequence, pulling tensions and sidewall pressure of all wire and cable pulls, including identification of manhole locations with splices and manholes which will be "pulled-through" without splicing.

2. Catalog Cuts:

a. Medium voltage cable(s).
b. Ground wire(s).
c. Terminators.
d. Splices.
e. Pulling devices and end seals.

B. Submit certified shop test reports for wires and cables.

C. Submit field test results for wires and cables, including all test data and methodology.

PART 2 - PRODUCTS

2.01 MANUFACTURER:

Subject to compliance with requirements of this Section, provide wires, cables, wire and cable splicing and terminating of one of the following manufacturers, or approved equal:

A. Wire and Cables:

1. American Insulated Wire Corporation.
2. Pirelli Cable Corporation.
3. The Okonite Company.
4. BIW Cable Systems, Inc.
5. Rome Cable Corporation.
6. Triangle PWC, Inc.

B. Splicing and Terminating:

1. Square D Company.
2. Thomas and Betts Corporation.
3. Burndy Corporation.
4. Cadweld (Erico Products, Inc.)
5. Raychem Corporation.
6. Minnesota Mining and Manufacturing Company (3M)
7. MAC Products Inc.
8. The Okonite Company.

2.02 WIRES AND CABLES:

A. General:

1. Locations, types, sizes and numbers of wires and cables are shown on the Contract Drawings.
2. Unless otherwise shown on the Contract Drawings, solid conductors shall be soft or annealed copper, conforming to ASTM B 33 (tinned), ASTM B 189 (lead-coated or lead alloy coated), or ASTM B 3 (uncoated).
3. Pulling Devices and End Seals:

   a. Wires and cables shall be provided with factory fitted pulling devices and end caps unless otherwise shown on the Contract Drawings. Shop drawings showing the pulling devices and end caps to be used shall be submitted to the Engineer for Approval.
   b. For pulling tensions up to 1000 pounds per grip, basket grips may be utilized.
   c. All wires and cables shall be end-sealed, at both end of each length, with either a solder-wiped seal or a heat-shrinkable cap, to prevent the entrance of moisture.

4. Wires and cables shall be identified in accordance with AEIC CS 6. Outer jacket shall be printed with manufacturer's identification, type of insulation, size of

conductor, rated voltage, year of manufacture, insulation thickness and UL listing. Each reel shall carry a tag identifying manufacturer, cable type, voltage and length of cable on reel.

B. Grounding Wires and Cables: Unless otherwise shown on the Contract Drawings, grounding conductors shall be as follows:

1. Insulated:

a. Solid for sizes #8 AWG and smaller, Class B stranded for sized #6 AWG and larger, 600 volt rated, XHHHW or RHW.
b. Covering shall be a continuous green color and conform to ASTM B 33 and UL 44.

2. Uninsulated:

a. Solid for sizes #8 SWG and smaller, Class B stranded for sized #6 AWG and larger.
b. In raceways. Soft-drawn and conforming to ASTM B 3.
c. Direct buried or encased in concrete. Soft-drawn, medium-hard-drawn or hard-drawn and conforming to ASTM B 1, B 2, or B 3, respectively.

C. Medium Voltage Cables:

1. Jacketed, Single Conductor Cable.

a. Voltage ratings shall be as shown on the Contract drawings.
b. Insulation - Ethylene-propylene-rubber (EPR) insulated cables shall conform to AEIC CS 6, ASTM D 2802 and ICEA S-68-516, 133 percent insulation level.
c. General Construction: In cross section from center to circumference, jacketed, single conductor cable shall consist of the following:

1. Copper conductor, lead or tin coated, Class B stranded or compact strand or sector, as shown on the Contract Drawings.
2. Extruded conductor shielding.
3. Insulation.
4. Extruded EPR, semi-conducting, insulation shielding.
5. Jacket of black polyethylene, polyvinyl chloride, or as shown on the Contract Drawings.

d. Maximum outside diameter shall be as shown on the Contract Drawings.

D. Cable Tags: Stainless steel metal tags, No. 28 gauge and ¾ inch wide, embossed with letter and numbers 5/16 inch high, fastened to the cable at both ends of tags with nominal 1/16-inch diameter monel metal wire or stainless steel cable ties.

2.03 SPLICING, TERMINATING AND ARCPROOFING MATERIALS:

A. General:

1. All splicing, terminating and arcproofing materials shall be compatible so that no one material will adversely affect the physical or electrical properties of any other, or of the wire cable itself.

2. All materials for making splices and termination's shall be specifically designed for use with the type of wire or cable, insulation and installation and operating conditions of the specific application.

B. Subject to compliance with requirements of this Section, provide connectors of the following types:

1. Split-sleeve, solder, high conductivity, corrosion resistant connectors.
2. Solderless, uninsulated, high conductivity, corrosion resistant, compression connectors conforming to UL 467 and IEEE 837.
3. Welded type connectors.

C. Terminals: Subject to compliance with requirements of this Section, provide terminals of the following types:

1. Solder terminals shall be high conductivity, corrosion resistant type.
2. Solderless, uninsulated, high conductivity, corrosion-resistant compression terminals conforming to UL 467 and IEEE 837.
3. Welded type terminals.

D. Shrinkable Tubing: Subject to compliance with requirements of this Section provide shrinkable tubing of the following types:

1. Either irradiated modified polyvinyl chloride or irradiated modified polyolefin heat shrinkable tubing.
2. Cold shrinkable tubing.

E. Tapes and Sealers:

1. Vinyl Tapes. Flame-retardant, cold and weather-resistant, ¾ inch and 1 ½ inches wide, as required, and conforming to UL 510 and ASTM D 3005.

   a. For interior, dry locations, provide 7 mils conforming to ASTM D 3005 (Type I); Scotch (3M) No. 33, or approved equal.
   b. For exterior or damp and wet locations, provide 8.5 mils conforming to ASTM D 3005 (Type II); Scotch (3M) No. 88, or approved equal.

2. Rubber Tapes:

   a. Ethylene-propylene, rubber-based, 30-mil splicing tape, rated for 130 degrees C operation; ¾ inch and wider (1, 1 ½, 2 inches) as shown on the Contract drawings or approved by the Engineer, conforming to ASTM D 1373 and Federal Specification HH-I-553 (Grade A); Scothch (3M) No. 130C, or approved equal.

3. Insulating Putty:

   a. Rubber based, 125-mil elastic filler putty; 1 ½ inches wide; Scotch (3M) Scotchfil, or approved equal.

4. Silicone Rubber Tapes:

a. Inorganic silicone rubber, 12-mil 130 degrees c rated, anti-tracking, self-fusing tape; 1 inch wide; Scotch (3M) No 70, or approved equal.

5. Sealer:

a. Liquid applied, fast-drying sealant; scotch (3M) scotchkote or approve equal.

F. Binding wire shall be uninsulated, tinned copper.

G. Solder:

1. Solder used on the shielding braids of any cable shall be 50 Tin/50 Lead.
2. Flux used when soldering conductor connectors or shielding tapes and shielding braids shall be of a non-corrosive and non-acid type.

H. Insulating compound shall be installed in all splices and all potheads.

I. Arcproofing Material:

1. Fire resistant tape shall be Scotch (3M) No. 77, or approved equal.
2. Glass cloth binding tape shall be Scotch (3M) No. 69, or approved equal.

J. Ground Straps:

1. Flexible, tinned copper braid, equivalent to #6 AWG.

K. Special splicing materials and methods shall be as shown on the Contract Drawings.

2.04 SHOP TESTS:

A. For quantities as shown on the Contract drawings, regular dielectric-withstand and insulation-resistance in water tests for wires and cables shall be performed in accordance with UL 44.

B. The following tests for wires and cables shall be performed and certified reports of these tests shall be submitted to the Engineer:

1. Flame tests in accordance with IEEE 383.
2. Jacket tests in accordance with ICEA 5-68-516.
3. Cable tests in accordance with AEIC C 56.

C. The test results shall be certified for each reel/coil/box of wire or cable.

D. Factory inspection and witnessing of tests by the Engineer shall be required for all wires and cables furnished under this Contract. The Engineer reserves the right to require additional testing, or to waive factory inspection or witnessing of tests. The Contractor shall notify the Engineer 14 days in advance of the scheduling of such factory tests.

2.05 INDEPENDENT LABORATORY TEST:

A. For quantities as shown on the Contract Drawings, the following tests shall be performed in accordance with AEIC and ICEA standards:

1. A.C. Voltage Breakdown Tests.
2. Adhesion of Insulation Shield to Insulation.
3. Volume Resistivity of Conductor Shield to Insulation Shield.
4. Dissection and Dimensional Analysis.
5. Microscopic examination for voids, contaminants, and protrusions.
6. Hot Creep Test to determine state of cure of insulation.
7. Partial Discharge (DC) measurements.
8. Dissipation factor of cable insulation.
9. Impulse breakdown tests.

PART 3 - EXECUTION

3.01 PREPARATION:

A. Prior to pulling wires and cables clean raceway systems of all foreign matter and perform all operations necessary so as not to cause damage to wires and cables while pulling.

B. Prior to pulling wires and cables into underground conduit systems, place a feeding tube approved by the Engineer at the entrance end of such systems.

3.02 INSTALLATION:

A. Wire and Cable Installation.

1. General:

a. Keep wires and cables dry at all times.
b. Seal wire and cable ends with watertight end seals if splicing or terminating does not follow at once.
c. Before splicing or terminating wires and cables, make a thorough inspection to determine that water has not entered the wires and cables or that the wires and cables have not been damaged.
d. Use adequate lubrication when installing cables in conduits or raceways. Any pulling compounds shall be compatible with the finish of the wires and cables furnished.

B. Splices and Termination's.

1. General:

a. All medium voltage wires and cables shall be spliced in each manhole through which they pass, unless otherwise specified in this Section or otherwise shown on the Contract Drawings, or unless the Contractor submits pulling tension and sidewall pressure calculations and they are approved by the Engineer. Sufficient slack shall be provided for several re-splicings.
b. Any splicing or terminating methods other than those required by this Section, for which the components are in accordance with the

requirements of this Section, shall be submitted to the Engineer for approval.

2. Insulated Wires and Cables:

   a. Splices and termination's shall be completed by workmen trained and experienced in the type of cable and the voltage class specified in this Section, with not less than 3 years experience in this specialty type of work.
   b. Where required by the Engineer, sample splices shall be demonstrated to the Engineer by each splicer performing the Work of this Section. The sample shall be provided to the Engineer after completion of the demonstration.
   c. Termination using stress-relief cones, which conform to class 1, IEEE 48 shall be made in accordance with the cable manufacturer's recommendations.
   d. Splices shall conform to IEEE 404 and shall:

      1) Meet the full electrical and physical integrity of the wire and cable construction, including voltage rating, ampacity, BIL, and type of waterproofing.
      2) Conform to the wire and cable manufacturer's requirements and recommendations.

   e. Where splices or termination's are on the Utility side of incoming service equipment, the splices or terminations shall be of the type and style approved by the Utility and shall be submitted to the Utility for approval.

3. Grounding Wires and Cables:

   a. Splices and terminations shall be installed in accordance with the manufacturer's written recommendations.
   b. In hazardous or classified locations, splices and terminations shall be solderless, high conductivity, corrosion-resistant, compression type connectors.
   c. All underground connections shall be covered with two coats of asphalt base paint. Each splice shall be bonded to ground, using a flexible ground strap, 2 feet long, not less than #6 AWG or equivalent size.

C. Arcproofing.

   1. Arcproof all wire and cables operating at greater than 600 volts (Line-to-Line).
   2. Arcproofing, which has been disturbed for any reason, shall be reinstalled as soon as possible after the disturbance.
   3. Arcproofing shall be installed as follows:

      a. Wires and cables shall be grouped by circuit and arcproofing applied over the group of cables comprising one circuit. Splices shall be arcproofed individually and the taping shall join with and be overlapped by the group taping.
      b. Arcproofing shall be applied in two wrappings of half-lapped tape, bound with glass cloth tape applied at the ends of the fire resistant tape and at intervals not to exceed 24 inches along the entire length of the cables. The two wrappings shall be wrapped with opposing-lays.

c. Arcproofing shall be extended into the conduit opening or end bell of the raceway entering a handhole, manhole or box.
d. Arcproofing tape shall be 1 ½ inches wide where the diameter of the individual cable, or the circumscribed circle for the circuit group, is less that 1 ¾ inches. For larger diameters, the tape shall be 3 inches long.

D. Identification of Wires and Cables.

1. Each wire and cable shall be identified by its circuit in all cabinets, boxes, manholes, handholes, wire ways, and other enclosures, and at all terminal points.
2. The circuit designations shall be as shown on the Contract Drawings. Tags shall be attached to wires and cables in such a manner as to be readily visible.
3. The tag ties shall be wrapped around all conductors comprising the circuit or feeder to be identified.
4. Wires and cables which are arcproofed shall be identified outside the applied arcproofing.

3.03 FIELD TESTS:

A. Medium Voltage Shielded Cables.

1. After installation and before they are placed in service, run direct current voltage tests in accordance with AEIC CS 6, paragraphs K.2 and K.3, on all shielded cables.
2. A copy of all test reports, together with an outline of the test method used, shall be submitted to the Engineer for review.
3. Should the test results reveal any defects, promptly correct such defects and rerun the tests until the entire installation is satisfactory to the Engineer in all aspects.

B. Ground Wires and Cables:

1. Ground wires and cables shall be tested to prove continuity and proper connections to equipment and ground rods
2. The Contractor shall certify all field testing and shall submit the test results to the Engineer for approval.

END OF SECTION

SECTION 16130 BOXES AND FITTINGS

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 installation of all outlet boxes, pull boxes, junction boxes and wiring troughs or other boxes throughout the wiring system, including supports.

C. Outlets are located diagrammatically on the drawings. Outlets shall be located so as to be symmetrical with Architectural details.

PART 2 - PRODUCTS

2.01 GENERAL MATERIAL REQUIREMENTS:

A. All boxes shall be U. L. Listed and labeled.

B. Boxes shall be of one-piece construction, fabricated from NEC gauge galvanized steel, unless rustproof cast metal boxes are specified or required by NEC, or unless otherwise shown on the drawings.

2.02 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.

B. Outlet boxes for flush mounted light fixtures shall be four inch square boxes 1 1/2” deep, with blank cover, installed adjacent to fixture served. Connection to fixture shall be with flexible steel conduit and fixture wire.

C. Flush ceiling outlets for surface or pendant mounted lighting fixtures shall be one-piece 4" square or octagonal pressed steel boxes, minimum two (2) inch depth.

D. Boxes for devices in unfinished masonry walls or stud walls shall be 4" square boxes with a square cornered tile wall cover (plaster ring), set flush with masonry or drywall construction. Where only one conduit enters box or one wiring device is provided, 2 3/4” deep box may be used. Outlet boxes for dimmers, GFI outlets, and all other conditions shall be full depth. Use multigang boxes where more than one device is mounted together under common coverplate. Do not use sectional switch boxes.

E. Boxes in concrete ceiling slab shall be octagonal, concrete-tight two (2) inch deep concrete boxes. Welded boxes are not acceptable.

F. All outlet boxes in plaster, drywall, stucco or masonry walls or ceiling shall be provided with plaster rings.

G. 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.

H. Outlet boxes exposed to the weather, under raised floor, used in exterior wiring system and outlet boxes for vaportight lighting fixtures and devices shall be of cast corrosion resistant type.

I. In special "Fire Rated" partitions, outlets shall comply with ASTM No. E119 and maintain fire barrier ratings.

J. Utility (handy) boxes with matching covers may be used in mechanical and electrical spaces for switches and 15A/120V receptacles.

K. Where special purpose devices are utilized and require larger outlet box than specified herein, provide outlet box suitable for specific device. These outlet boxes shall be of the same type as specified herein for the installation required. Coordinate requirements prior to rough-in installation.

2.03 JUNCTION AND PULL BOXES:

A. Dimensions of pull boxes and junction boxes shall not be less than those dimensions required by the National Electrical Code (NEC) article 370-18 for the number, size and position of conductors and raceway entering the box. Only a single extension ring shall be permitted on a box to increase the volume.

B. Pull boxes required in finished spaces shall be installed out of sight lines and located per Architect's direction. Box shall be flush mounted cabinets provided with trim, hinged door and flush latch and lock to match panel trim for flush mounted electrical panelboard.

C. Pull boxes for installation of vertical riser conductors shall be provided with red seal type VVC or approved supports for all conductors as required by the NEC.

D. Pull boxes for horizontal feeders containing more than one feeder (not including parallel conductors) shall be provided with reinforced flange shall be compartmented by barriers (or feeder conductors shall be fire-taped) and provided with minimum 1 5/8" x 1 5/8" fiberglass channel strut (removable) for support of conductors. Wood supports within pull boxes are not acceptable.

E. Provide box covers for all junction and pull boxes of same materials and construction as box. Identify feeder or branch circuit conductors contained within on outside of cover for surface mounted boxes and within cover on flush mounted boxes.

2.04 EXTERIOR PULL BOXES & HANDHOLES:

A. Exterior pull boxes shall be Quazite "PC" style Gasketed boxes, resistant to sunlight exposure, weathering and chemicals, with solid base, penta-head security bolts, heavy duty rated cover with logo to suit purpose, with compressive strength of 11,000 psi, or approved equal. Size shall be minimum 12"w x 18"d x 12"h unless noted otherwise. Set assembly at final finished grade elevation.

B. Exterior handholes shall be Quazite "PG" style stackable service box assemblies resistant to sunlight exposure, weathering and chemicals, with solid base, penta-head security bolts, heavy duty rated cover with logo to suit purpose, with compressive strength of 11,000 psi, or approved equal. Size shall be minimum 24"w x 36"d x 18"h unless noted otherwise. Provide extensions as required to bring assembly to final finished grade elevation.

2.05 CONDUIT BODIES & FITTINGS: Conduit bodies and fittings shall be NEMA FB-1 zinc coated steel or malleable iron, taper threaded type, of material matching conduit type with gasketed cover containing captive screws.

2.06 WIRING TROUGH: Wiring trough shall be NEMA 1, unless noted otherwise, hinged cover with captive screws, grey enamel finished inside and outside, 16 or 14 gauge steel as per NEC requirements. Size of trough based on NEC requirements.

2.07 PULL BOXES & ENCLOSURES:

A. Pull boxes for feeder and power conductors shall be NEMA 1 with 14 or 12 gauge galvanized steel bodies and 12 or 10 gauge galvanized steel screw covers. Seams shall be continuously welded and ground smooth. Cover screws shall be captive, stainless steel type. Provide oil-resistant gasket and adhesive. Size pullboxes as specified.

B. Enclosures for termination of special systems wiring shall be NEMA 1 panel enclosures with 14 gauge steel bodies and removable hinged doors. Provide back panel of 14 gauge steel construction and wiring terminal blocks. Enclosures shall be painted ANSI 61 and panels shall be white enamel. Size enclosures for quantity of terminations required plus 25% spare capacity.

2.08 ACCEPTABLE MANUFACTURERS:

A. Outlet boxes:

1. Steel City
2. Hubble/RACO
3. Crouse-Hinds
4. Appleton

B. Floor boxes:

1. Steel City
2. Walker
3. Hubbell
4. American Electric

C. Poke-through devices:

1. Hubbell
2. Walker
3. Raceway Components
4. Thomas & Betts

D. Exterior junction boxes & handholes:

1. Quazite
2. Nelson
3. Killark
4. Associated Plastics

E. Conduit bodies & fittings:

1. Adalet-PLM
2. Myers
3. O-Z Gedney
4. Appleton
5. Efcor
6. Crouse-Hinds

F. Wiring troughs:

1. Electromate
2. Square D
3. Universal
4. Hoffman
5. Wiegmann
6. General Metals
7. Keystone

G. Pull boxes & enclosures:

1. Hoffman
2. Electromate
3. Wiegmann
4. Universal
5. American Electric
6. Crouse-Hinds
7. Square D

PART 3 - EXECUTION

3.01 INSTALLATION:

A. Provide galvanized steel or cast type boxes for all outlets, and for junction or pull boxes. All boxes shall be accessible and sized per NEC requirements. Provide access panels in any non-accessible spaces to allow access to boxes installed.

B. Provide an UL listed outlet box for each ceiling mounted fan assembly shown.

C. Where outlet boxes are used to support lighting fixtures, as junction boxes, or device outlet boxes, the box shall be anchored to the structural members of the building per NEC 370-13.

D. Outlet boxes shall be flush mounted unless they are specifically shown as being used with exposed conduit or are located above a ceiling.

E. 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.

F. 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 Architect's approval, so that the outlet box, top or bottom, will occur at a masonry joint.

G. 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. Provide box extensions as required to permit the above. Coordinate fabric panels, finishes and woodwork provisions in order to determine exact requirements.

H. 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.

I. Electrical outlet boxes may be installed in vertical fire resistive assemblies classified as fire/smoke and smoke partitions without affecting the fire classification, provided such openings occur on one side only in each framing space and that openings do not exceed sixteen square inches. All clearances between such outlet boxes and the gypsum board shall be completely filled with joint compound or approved fire-resistive compound. The wall shall be built around outlet boxes larger than sixteen square inches so as not to interfere with the wall rating.

J. Where low voltage device is to be installed in common boxes with line voltage device (or devices of different operating voltage), provide insulated barrier within boxes to establish separate compartments.

K. Remove only knockouts required and plug all unused openings per NEC 370-18/373-4 requirements.

L. Extend branch circuit grounding conductor to each box. Provide grounding pigtail via dedicated fastener.

M. Outlet boxes in the same wall shall not be mounted back-to-back but shall be offset a minimum of six (6) inches, except in acoustical rated walls where 24” is required.

N. Install pull boxes only in unfinished spaces or concealed above accessible ceilings. Provide pull boxes when any of the following conditions apply:

1. Where indicated on the drawings.
2. Where conduit run exceeds 150 feet from access point to access point.
3. Where conduit run contains in excess of 360 degrees bend or offset.
4. To facilitate conductor installation or to insure that manufacturer’s maximum pulling tension is not exceeded.
5. Where requirements of the special system or telephone installer/vendor dictate raceway access or provisions.

O. Do not splice conductors in pull boxes. Splices are not permitted in pull boxes except where specifically approved in writing by the Engineer. Where splices are permitted, make splices as specified in Wire & Cable Specifications.

P. Where pull boxes are required, multiple circuits within pull box shall:

1. Circuit conductors and feeders shall be individually laced with nylon straps and nylon identification tabs. Conduits shall enter pull box in such manner that conduits enter and exit in the same plane (both horizontal and vertical).
2. Feeder circuits shall be separated by full height and length sheet metal (NEC gage) or polyester resin barrier secured with angle brackets.

Q. Where exterior junction or pull boxes are required, install in the following manner:

1. Exterior junction or pull boxes shall be mounted flush with finished grade, unless noted otherwise. Coordinate with the final grade elevation.
2. Heavy traffic rated covers shall be provided in sidewalks, paved areas or within six (6) feet of same.
3. Seal conduit entries into boxes with duct seal to prevent entrance of water, after conductors are installed.
4. Taps and splices, where permitted by these specifications, shall be performed with an encapsulating watertight connection kit which insulates and moisture seals the connection.

R. After completion, clean all work of dirt, construction debris, paint and refuse.

3.02 COVERS:

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 elsewhere unless designated otherwise.

B. Coverplates shall be mounted vertically unless designated otherwise.

C. Permanently mark each junction box and pull box cover with the circuit numbers for all conductors contained within. Utilize indelible ink black marker for normal power and red marker for emergency power and fire alarm.

D. All junction boxes and pull boxes for wiring systems above 600 volts shall be painted red and identified with high voltage warning labels in accordance with OSHA standards. Raceway shall be identified with the same labels installed every twenty (20) linear feet.

3.03 EQUIPMENT ANCHORING:

A. Support all boxes from structure:

1. Secure to wood with wood or sheet metal screws.
2. Secure to hollow masonry with toggle bolts.
3. Secure to light gage metal with sheet metal screws.
4. Secure to heavy gage metal with bolts or clamps.
5. Anchors for solid masonry and concrete shall be self-drilling or insert expansion shields with bolts or powder actuated drive pin studs (except in post-tension construction).
6. Secure outlet boxes to dry wall studs with steel mounting bracket screwed into stud having support leg to restrain box.
7. Where box is suspended below structure, support from structure with threaded steel rod secured with double nuts. Pull boxes larger than 18” x 18” x 8” shall be supported from power strut and threaded steel rod suspension. Provide seismic bracing where required by local authority.

B. All items of electrical equipment, such as enclosures, panels, troughs, pull boxes, 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.

END OF SECTION

SECTION 16140 WIRING DEVICES

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 wiring devices and cover plates including receptacles, switches, dimmer controls, plugs, plug connectors, floor outlets, concealed service floor outlets and poke-through device assemblies.

PART 2 - PRODUCTS

2.01 MANUFACTURED WIRING DEVICES:

A. Provide manufactured wiring devices and cover plates, in types, colors, and electrical ratings for applications indicated and complying with NEMA Standard WD 1. Where types and grades are not indicated, provide specification grade selection as determined to fulfill wiring requirements, and complying with NEC and NEMA standards for wiring devices. Provide white color devices and cover plates except as noted otherwise. Color selection shall be verified with the Architect prior to purchase and installation.

B. The devices specified herein are the products of one manufacturer. Provide heavy-duty specification grade devices selected from approved manufacturer listing.

2.02 WALL SWITCHES:

A. Wall switches shall be Institutional, heavy-duty specification grade, plastic body, nylon or lexan toggle, totally enclosed base & cover, quiet type, self-grounding, back wired, 277 volts AC and 20A rating.

1. Single Pole: Hubbell No. 1221
2. Double Pole: Hubbell No. 1222
3. Three-way: Hubbell No. 1223
4. Four-way: Hubbell No. 1224

B. Flush motor switches shall have a red pilot light and overload protection for actual fractional horsepower motors furnished. Square D FSJ-1P or approved equal.

2.03 WALL DIMMERS:

A. Wall dimmer switches shall be totally enclosed, solid state type, self-grounding, vertical slide type, semi-flush mounted, with square law dimming characteristics. Lamp debuzzing coils shall be provided for each circuit.

B. Dimmers shall be sized to continuously carry the indicated maximum loads shown and shall be rated to serve the load. Dimmers shall not require de-rating when gang mounted.

C. Where wiring devices are indicated adjacent to, and mounted with wall dimmers, provide wiring devices matching dimmer in appearance and by same manufacturer under common cover plate.

D. Dimmers indicated on the drawings to serve low voltage incandescent lamps shall be the same as specified for incandescent lamps and, in addition, shall be specifically rated for the low voltage (transformer or solid state type as required) loads. Dimmer shall be UL Listed for use with low voltage fixtures.

2.04 RECEPTACLES:

A. Duplex receptacles shall be heavy-duty specification grade, plastic base, nylon face, two-pole, three wire, self-grounding, back/side wired, 125 volts AC and NEMA 5-15R (15A) or NEMA 5-20R (20A) rating as indicated on drawings.

1. Duplex NEMA 5-15R Hubbell CR5262

2. Duplex NEMA 5-20R Hubbell CR5362

B. Isolated ground duplex receptacles shall be orange heavy-duty specification grade, plastic base, nylon face, two-pole, three wire, self-grounding, back/side wired, 125 volts AC and NEMA 5-15R (15A) or NEMA 5-20R (20A) rating as indicated on drawings.

1. Duplex IG NEMA 5-15R Hubbell IG5262

2. Duplex IG NEMA 5-20R Hubbell IG5362

C. Ground fault circuit interrupting (GFCI) duplex receptacles shall be heavy-duty, specification grade, plastic base, nylon face, two-pole, three wire, supplied with pre-stripped wire leads, feed-through protection, 125 volts AC and NEMA 5-15R (15A) or NEMA 5-20R (20A) rating as indicated on drawings.

1. Duplex GFCI NEMA 5-15R Hubbell GFR5262

2. Duplex GFCI NEMA 5-20R Hubbell GFR5362

D. Single receptacles shall be heavy-duty specification grade, plastic base, nylon face, two-pole, three wire, self-grounding, back/side wired, 125 volts AC and NEMA 5-20R (20A) rating.

1. Single NEMA 5-20R Hubbell 5361

E. Clock outlets shall be specification grade, plastic base, phenolic face, two-pole, three wire, side wired, stainless steel plate with recessed outlet, 125 volts AC and NEMA 5-15R (15A) rating.

1. Clock outlet NEMA 5-15R Hubbell 5235

F. Special purpose outlets shall be heavy-duty specification grade, plastic base, nylon face, poles as noted, wires as noted, grounding type, back/side wired, with voltage and capacity rating noted. Conform to NEMA configuration requirements.

G. Exterior flush-mounted duplex outlets shall be GFCI heavy-duty, industrial specification grade, plastic base, nylon face, two-pole, three wire, supplied with pre-stripped wire leads, feed-through protection, 125 volts AC and NEMA 5-15R (15A) recessed mounted in TayMac gasketed enclosure model Masque 72206 or approved equal. Unit assembly shall protrude no more than 1/2” and shall be rainproof in use per NEC 410-57. Provide color as specified by the Architect.

H. Receptacles for use in hospitals and other health care facilities shall be rated “HOSPITAL GRADE”. The cover plates for the electrical receptacles and the receptacles themselves supplied from the emergency system shall be red in color (or other distinctive color as defined by the hospital officials). The cover plates shall have the panelboard and branch circuit suppling each receptacle engraved on the plated in white letters.

2.05 COVERPLATES:

A. Cover-plates for flush mounted devices shall be one piece standard size high impact smooth nylon surface. Color shall match wiring device finishes. Device plates for masonry walls shall be jumbo type.

B. Telephone/data outlet cover-plates shall be the same finish as above and have two (2) modular jack openings with blank fillers as required. All Computer Lab cover-plates shall have four (4) modular jack openings.

C. Cover-plates for flush mounted GFCI devices shall be engraved “GFCI PROTECTED”.

D. Cover-plates for flush mounted IG devices shall be engraved “ISOLATED GROUND”.

E. Cover-plates for flush mounted EMERGENCY POWER devices shall be engraved “EMERGENCY” and additionally shall have the panel name and circuit engraved on it.

F. Cover-plates for flush mounted UPS POWER devices shall be engraved “COMPUTER ONLY”.

2.06 PLUGS & CONNECTORS: Plugs and connectors shall be of nylon construction, heavy duty specification grade, brass contacts and terminations, conforming to UL 94 & 498, with cord grips, 600 VAC working range, straight blade or locking type and NEMA type as noted.

2.07 FLOOR OUTLETS:

A. Where installation of floor mounted device box requires penetration of a fire rated floor slab, the installation shall be made with a fire rated floor fitting, U. L. Listed for use in this specific fire rated floor design. Fire barrier shall be rated to prohibit passage of smoke when heat is not present.

B. If and where required, floor outlets shall be single gang floor boxes or as listed on the plan sheets, equal to Steel city No. 601 Series, complete with cast iron body, vertical angular adjustment, with brass frame, brass floor-plate (#P60-CACP for duplex receptacle and #P60-3/4-2-CACP for phone/data) and gasket. Larger than standard tappings shall be furnished where required. Adjacent boxes shall be installed on minimum 7" centers.

2.08 POKE-THROUGH ASSEMBLIES: Flush poke-through fittings shall be U. L. Listed for fire rating, with retaining ring, suitable for use in three (3) inch core or insert, consisting of flush service fitting, poke-through device and outlet box. Fittings shall be U. L. Listed for dual service use (power and phone/data) in a single service fitting and shall have neoprene seals at base of fitting. Minimum spacing shall be two (2) feet between similar fittings. Specific fitting requirements shall be as specified on the drawings. Carpet flange with epoxy finish shall be provided.

2.09 ACCEPTABLE MANUFACTURERS:

A. Wiring devices & cover plates:

1. Arrow-Hart
2. Sierra
3. Eagle
4. Hubbell
5. Leviton
6. Pass & Seymour
7. Square D
8. TayMac

B. Wall dimmers:

1. Lutron
2. Prescolite
3. Hunt
4. Lightolier

C. Plugs & connectors:

1. Arrow-Hart
2. Eagle
3. Hubbell
4. Leviton
5. Pass & Seymour

D. Floor outlets & concealed service floor outlets:

1. Steel City
2. Hubbell
3. Walker

E. Poke through assemblies:

1. Steel City
2. Hubbell
3. Raceway Components
4. Walker

PART3 - EXECUTION

3.01 STANDARDS COMPLIANCE:

A. Installation and provision of all specified equipment shall be in accordance with:

1. National Electrical Code NFPA 70
2. Underwriters Laboratories (UL) UL 20, 498, 943
3. National Electrical Manufacturer’s Association (NEMA) NEMA STDS WD 1, 2, 5

3.02 INSTALLATION:

A. Coordinate installation rough-in requirements with architectural and structural features, equipment installed under other portions of these specifications, and electrical equipment.

B. Coordinate the installation of switches and wall dimmers with the door swings to insure that the devices are located on the strike side of the door.

C. Review the architectural and/or interiors drawings and elevations for devices requiring specific locations.

D. Coordinate access to poke-through assembly junction boxes such that these are readily accessible after completion of construction.

E. The mounting height of devices is indicated in the legend on the drawings and is intended to mean the bottom of the device above the finished floor unless otherwise noted.

F. Mount all devices within outlet boxes to allow device cover-plates to be in contact with wall on all sides. Verify all outlet boxes in grouping are at the same elevation.

G. Install vertically mounted receptacles with the ground connection up.

H. Install switches with “Off” position down.

3.03 WIRING DEVICES:

A. Install wiring devices as indicated, in compliance with manufacturer’s written instructions, applicable requirements of NEC and NECA’s “Standard of Installation”, and in accordance with recognized standard industry practices to fulfill project requirements.

B. Where more than one wiring device is indicated at a location, the devices shall be gang-mounted in combined multi-gang boxes and covered jointly by a common cover-plate. Provide barriers as required by the devices and voltages being used.

C. Install wiring devices only in electrical outlet boxes which are clean, free from construction debris, drywall compound and dirt. At final inspection all wiring devices shall be clean, free of paint overspray, unbroken and in new condition.

D. Ground all wiring devices by electrically continuous, pigtail connection such that removal of device does not open grounding path to any downstream device. Connect the grounding screw of each device to the equipment grounding conductor.

E. Prior to energizing circuits, test wiring system for electrical continuity, freedom from faults, and proper polarity of connections. After energizing circuits, test wiring devices to demonstrate compliance with these requirements.

3.04 COVER-PLATES:

A. All junction boxes, outlet boxes, multi-gang switch boxes, utility boxes, etc., shall be covered with a cover-plate. The cover-plate shall be a finished plate as specified unless designated otherwise.

B. Cover-plates shall be mounted vertically unless designated otherwise.

C. Do not install cover-plates until after painting and/or other finish work is complete.

D. Where the cover-plate does not completely cover the wall opening, replace the plate with an oversized (midi or jumbo) plate or repair the wall opening. Where one oversize plate is used, replace all cover-plates in the room with the oversize plates.

E. Remove concrete protectors and clean all floor boxes after concrete pour. Adjust boxes to be flush with finish floor elevation.

F. At final inspection, all wiring devices and cover-plates shall be clean, without paint overspray, undamaged and unscratched or broken.

END OF SECTION

SECTION 16150 MOTOR CONTROLS

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 provision and installation of manual and magnetic motor starters for use on 600 VAC and below for all integral or fractional horsepower motors furnished on the project, except as noted on mechanical drawings or specifications to be packaged units with integral starters. Motor starters shall be separately mounted adjacent to the equipment served.

C. Motor power wiring is defined as those conductors between the energy source and the motor termination. Power wiring shall be connected through all line voltage control devices such as firestats and thermostats.

D. Control wiring is defined as those conductors required for starting and stopping of motors, as well as safety devices. All control wiring required for automatic starting and stopping of motors shall be provided under Division 15 unless specifically shown on the electrical drawings.

E. Review submittals under this and other sections, as well as other divisions, to ensure coordination between work required among different trades. Coordinate the installation sequence with other contractors to avoid conflicts and to provide the fastest overall installation schedule. Coordinate installation with architectural and structural features, equipment installed under other sections of the specifications and electrical equipment to insure access and so that clearance minimums are provided.

F. All motors shall be provided under other Divisions, unless noted otherwise, and shall be connected under Division 16 scope of work.

1.02 QUALITY ASSURANCE:

A. Industry Reference Standards:

1. Underwriters Laboratories Inc. Publications:

UL 94 Test for Flammability of Plastic Materials for Parts for Devices and Appliances

UL 198.2 High Interrupting Fuses, Current Limiting Type
UL 198.4 Class R Fuses
UL 489 Molded Case Circuit Breakers and Circuit Breaker Enclosures
UL 508 Industrial Control Equipment
UL 845 Standards for Motor Control Centers
UL 991 Tests for Safety-related Controls Employing Solid-state Devices

2. National Fire Protection Association (NFPA): NFPA 70, latest edition.
3. National Electrical Manufacturers Association:

AB-1 Molded Case Circuit Breakers

ICS-1 General Standards for Industrial Control and Systems

ICS-2 Industrial Control Devices, Controllers and Assemblies

ICS-3 Industrial Systems

ICS-4 Terminal Blocks for Industrial Control Equipment and Systems

ICS-6 Enclosures for Industrial Controls and Systems

PUB MG1 Motors and Generators

PUB 250 Enclosures for Electrical Equipment

4. American National Standards Institute:

C37.90.1 IEEE Standard Surge Withstand Capability Tests for Protective Relays and Relay Systems

C62.41 IEEE Guide for Surge Voltages in Low-voltage AC Power Circuits

C97.1 Low Voltage Cartridge Fuses (600 v)

B. All equipment furnished shall be UL Listed and Labeled.

1.03 SUBMITTALS:

A. Coordinate fully the requirements of equipment provided by other sections of the specifications, and by vendors, to verify that correct control components are provided without incurring additions to the Contract.

B. Submit manufacturer's product data and production drawings for the following items:

1. Motor Starters
2. Motor Switches
3. Combination Starters

PART 2 - PRODUCTS

2.01 MOTOR STARTERS:

A. Starters for motors 1/2 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 on the plan sheets or in these specifications.. Manual motor starters shall be quick-make, quick break trip, free toggle or push-button operating mechanism with provisions for positive padlocking in the "OFF position, with green pilot lights, hand-off-auto selector switch equipped with thermal overload relay (field adjustable) for protection of 120 VAC motors of 1/2 hp or less. All other starters shall be magnetic. Enclosures shall be of NEMA 1, gasketed construction in interior locations and NEMA 3R in exterior and damp or wet locations. Equipment shall be

fully rated for the system operating voltage utilized. Furnish a dedicated equipment grounding lug installed via dedicated fastener in each unit.

B. Each starter for a three-phase motor shall be furnished with three (3) overload protection relays sized per NEC 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 protection 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 surface mounted in unfinished areas and shall be flush mounted in all finished areas. Starters mounted exterior or in wet or damp conditions shall be NEMA 3R. Each starter shall have a laminated nameplate to indicate Division 15 unit number, function and circuit number.

E. All motor starters, push buttons and pilot lights shall be of the same manufacturer as the switchboard.

F. Magnetic starters shall be minimum NEMA Size 0.

G. In size 3 & 4 reduced voltage non-reversing and Size 5 & 6 starters, the contactor coil shall be operated at line voltage. The starters shall be operated by a control relay with 120 volt coil. Two NEMA Class J fuses shall be provided connected from line to starter coil circuit.

H. Motor starter sizes are based on design conditions using horsepower ratings of motors indicated on the drawings. If motors actually furnished have horsepower ratings other than those indicated, motor starters and feeders shall be adjusted in accordance with the actual horsepower at no additional costs to the Owner.

2.02 COMBINATION STARTERS:

A. Combination starters shall consist of a fused switch with Class R fuses or motor circuit protector and a magnetic motor starter mounted in a common NEMA Type 1 general purpose enclosure unless indicated otherwise on the drawings. Motor circuit protectors shall be rated minimum 22,000 rms. interrupting capacity.

B. The motor starter components shall be as specified in paragraph 2.1 for motor starters.

2.03 CONTROL TRANSFORMERS: Control transformers, when required, shall be provided. Both legs of the primary and one leg of the secondary of the control transformer shall be fused. The other leg of the secondary shall be grounded. The capacity of the control transformers shall be adequate to operate all the control devices in the circuit.

2.04 OVERLOAD AND SHORT CIRCUIT PROTECTION:

A. Heater elements shall be provided for overload protection. Motor circuit protectors or Class R fuses shall be provided for motor short circuit protection. Motor circuit protectors shall be rated minimum 22,000 rms. interrupting capacity.

B. Where fused switches are provided, furnish additional fuses, amounting to one set of three (3) fuses for each ten (10) units provided, but not less than six (6) fuses of each size.

C. Provide a fuse cabinet located in the main electrical room for storage of spare fuses.

2.05 NAMEPLATES:

A. Nameplates shall have 3/8" high engraved letters, core and finish as previously specified.

B. Flush motor switches shall have a red nameplate identifying equipment controlled.

2.06 ACCEPTABLE MANUFACTURERS:

A. Acceptable motor controllers manufacturers are:

1. Square D
2. Cutler Hammer
3. Siemens
4. Allen-Bradley

B. Acceptable fuse manufacturer's are:

1. Chase-Shawmut
2. Bussmann
3. GEC Alsthom

C. Equipment supplied under this section shall be the same manufacturer as the Service and Distribution Equipment.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. Provide power wiring to and install all motor starters and extend feeders to motors, unless integrally factory mounted on a piece of equipment.

B. Provide power wiring to all roof mounted equipment via roof curb openings provided. Do not penetrate roof membrane with conduit stub-ups.

C. Where line voltage control devices are mounted at, on or inside a unit, such as aqua-stats, fire-stat for single phase devices, etc., the power wiring to the unit shall be connected through such control device.

D. Coordinate exact location of motor termination boxes with raceway rough-in provisions to insure correct installation. Coordinate with controls contractor to insure compatibility with motor control center control wiring provisions.

E. Connect all heating and air conditioning equipment and have this equipment complete and ready for operation. Contractor shall be responsible for checking equipment manufacturer submittal data to obtain exact location of all electrical connections for equipment before installation.

F. A short section of watertight metallic flexible conduit shall be used at each motor connection. Watertight flexible conduit shall be used on any motors installed in damp locations or outside

G. Restore factory finish to all equipment provided herein and touch up scratched or marred surfaces to match original finish. Clean enclosure interior and exterior of dirt, paint, and construction debris.

H. Maintain conductor phase relationship originating at service entrance throughout motor control center. Group and strap all conductors installed in starter and wiring gutters with nylon straps. Install only one conductor under each terminal. Connect extra conductors via terminal strips. Form and train conductors neatly in enclosures parallel and at right angles to sides of box. Un-insulated conductors shall not extend more than 1/8” from terminal lug.

I. Do not splice conductors in enclosure, other than on terminal strips provided for this purpose. Lugs shall identify wiring terminated thereon.

J. Conductors not terminating in starter shall not extend through or enter starter enclosure. Utilize wiring gutters and troughs.

K. Provide a four (4) inch high concrete housekeeping pad exceeding motor control center footprint by four (4) inches on all sides, with wire fabric (6 x 6”) reinforcement, pegged to structural concrete floor. Radius all edges with one (1) inch chamfer.

3.02 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 push-button, 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.

3.03 MOUNTING AND SUPPORT:

A. Locate motor starters to provide working clearance and fully accessible as required by the NEC. Do not mount starters directly to or on any mechanical equipment.

B. Enclosure shall be secured to structure by a minimum of four (4) fastening devices. A fender washer (minimum 1 1/4” OD) shall be used between head of screw and enclosure.

C. Install equipment with operating handle at 5’-0” AFF, unless otherwise noted.

D. Where enclosure is not indicated on a wall or structure, construct a metal channel (power strut) free standing frame secured to floor, pad, or building structure. In exterior applications, all support structure shall be galvanized.

3.04 MOTOR PROTECTION:

A. Final overload relay calibration shall be determined after the exact motor to be installed has been determined.

B. The Contractor shall submit final calibration values to the Project Engineer for approval. Submittal shall include a list of all motors and starters complete with nameplate information from the motor and recommended overload rating.

C. Adjust motor circuit protector settings in accordance with the manufacturer's recommendations to sustain motor current.

3.05 TESTING:

A. Demonstrate to the Project Engineer 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.

B. Inspect operating mechanisms, including reset function, for malfunctioning and adjust units for free mechanical movement.

C. Coordinate with control contractor to insure that correct automatic operation of all equipment is obtained per specification requirements. Adjust equipment provisions (I.E. contacts, timers, wiring, et al) as required.

3.06 STORAGE: If the motor starters cannot be placed into service reasonably soon after its receipt, store in a clean, dry, and ventilated building free from temperature extremes.

END OF SECTION

SECTION 16160 PANELBOARDS

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 lighting and appliance panelboards and load centers.

PART 2 - PRODUCTS

2.01 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 rated 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 copper 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. Phase bussing shall be full height without reduction. Cross and center connectors shall be of the same material as the bus.

I. The neutral bus shall have 100% rating and 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. Ground bus shall be sized in accordance with U.L. standards.

J. Spaces for future devices shall be molded case, included as indicated and shall be bussed for the maximum rated device that can be fitted into them.

K. 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 10,000 RMS symmetrical amperes interrupting capacity unless designated otherwise.

L. 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. Acceptable manufacturers are Square D, Siemens or Cutler Hammer.

P. All panelboards fed from UPS systems and K-rated transformers shall be furnished with 200% rated neutral bus bars and separate insulated/isolated ground bar.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. Provide a typewritten directory under plastic for all panelboards with spares left blank.

B. Provide all necessary hardware to secure panelboards to structure 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 panelboards of all foreign matter, including dust.

D. Bond separate ground bars to panelboard boxes and to the main service entrance ground bus with a code-sized grounding conductor installed in the same conduit as the phase and neutral conductors.

E. Provide six circuit breaker handle lock-on devices for each lighting panelboard for circuits as directed by the Project Engineer to prevent unauthorized personnel from turning off circuits to controls, unit heaters, clocks, night lights, etc. Turn spare lock-on devices over to the Owner for his use.

END OF SECTION

SECTION 16165 DISTRIBUTION PANELBOARDS

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 circuit breaker type distribution panelboards.

PART 2 PRODUCTS

2.01 PANELBOARDS:

A. Distribution panelboards shall be of the circuit breaker type, factory assembled by the manufacturer of the circuit breakers. Flush mounted units shall have front door cover. The main breaker and the branch circuit breakers shall be as indicated. The main bus shall be copper and rated 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.

B. Panels shall be flush or surface mounted as indicated, with baked-on enamel trim, adjustable trim clamps and door with corrosion resistant cylinder lock and catch and nameplate for each device and a blank (not engraved) nameplate for each spare breaker or space.

C. The neutral bus shall have 100% rating and utilize set-screws to bond the neutral bus through hoes drilled into the neutral bar. A sheet copper neutral bus utilizing flathead screws to hold the neutral wires will not be acceptable. Ground bus shall be sized per U.L. standards.

D. All circuit breakers shall be molded case, 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 as indicated on plans.

F. All circuit breakers, including any connector to the main bus, shall be bolted on or plug-in type.

G. 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.

H. Provide ground fault protection for any breaker serving panels with kitchen equipment or elevator motors.

I. Acceptable manufacturers are, Square D, Cutler Hammer or Siemens.

PART 3 EXECUTION

3.01 INSTALLATION:

A. Provide a typewritten directory under plastic for all panelboards with spares left blank.

B. Provide all necessary hardware to secure panelboards to structure 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 panelboards of all foreign matter, including dust.

D. Bond separate ground bars to panelboard boxes and to the main service entrance ground bus with a code-sized grounding conductor installed in the same conduit as the phase and neutral conductors.

E. Provide six circuit breaker handle lock-on devices for each lighting panelboard for circuits as directed by the Project Engineer to prevent unauthorized personnel from turning off circuits to controls, unit heaters, clocks, night lights, etc. Turn spare lock-on devices over to the Owner for his use.

END OF SECTION

SECTION 16170 MOTOR AND FEEDER DISCONNECT SWITCHES

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 disconnect switches for electrical equipment, 600 volts or less, and fuses mounted in the disconnect switches.

C. Furnish and install disconnect switches for the following conditions:

1. Where indicated on the drawings or schedules.
2. For all motor controllers unless installation conforms to exceptions in the NEC.
3. For all motors located out-of-sight of its motor controller.
4. For all transformers as required by NEC.
5. For all water heaters.
6. For electrical duct heaters.
7. Where required by the National Electrical Code.

1.02 QUALITY ASSURANCE:

A. Industry Reference Standards:

1. Underwriters Laboratories Inc. Publications:
   UL 98 Enclosed Switches
   UL 198.2 High Interrupting Fuses,
   Current Limiting Type
   UL 198.4 Class R Fuses
2. National Fire Protection Association (NFPA):
   NFPA 70,
3. National Electrical Manufacturers Association:
   KS-1 Enclosed Switches
   PUB 250 Enclosures for Electrical Equipment
4. American National Standards Institute:
   C97.1 Low Voltage Cartridge Fuses (600 v)

B. All equipment furnished shall be U.L. Listed and Labeled.

PART 2 - PRODUCTS

2.01 DISCONNECT SWITCHES:

A. Disconnect switches shall be "heavy-duty" type enclosed switches of quick-make, quick-break construction. Current carrying parts shall be copper, with silver tungsten type switch contacts and positive pressure type reinforced fuse clips. Switches shall be horsepower rated type HD where motor is served and rated for either 250 volt AC or 600 volt AC as required for voltages utilized. Size in accordance with the NEC. Lugs shall be UL listed for copper and aluminum cable.

B. 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. When subject to splashing water, seepage of water, or falling or hose-directed water, switches shall be furnished in NEMA 4 enclosures. When located in an industrial plant subject to fibers, lint, dust, dirt, etc., switches shall be furnished in NEMA 12 enclosures.

C. Fused disconnect switches shall have rejection type fuse clips with dual element, current limiting fuses of rating shown.

D. Furnish a solid neutral bus or lug for each switch being installed in a circuit which contains a neutral conductor.

E. Furnish an equipment grounding conductor lug bonded to the switch enclosure by dedicated fastener.

F. Disconnect switches shall be non-fusible type safety switch, unless fused type is specified or indicated on the drawings, with the number of poles required to disconnect all ungrounded conductors serving equipment.

G. Provide multi-pole disconnect switches for all dual speed motors to disconnect all ungrounded conductors serving equipment.

H. Switches shall have the following features:

1. Line terminal shields on line and load lugs.
2. Padlocking provisions shall be provided for padlocking in the "Off" position.
3. Each switch shall have defeatable door interlock mechanism to prevent door from being opened when switch is in closed position.
4. Provide arc chute for each pole.
5. Provide nameplate for each switch as previously specified.

I. Fusible switches through 600 ampere shall be provided with rejection clips to accept RK1 or RK5 fuses only. Fusible switches larger than 600 ampere shall be suitable for Class L fuses. Furnish and install a complete set of fuses in each disconnect switch sized as indicated on the drawings. Fuses serving predominantly motor or transformer loads shall be dual element, time-delay type, otherwise non-time delay type is required. Fuses shall be current limiting type.

2.02 ACCEPTABLE MANUFACTURERS:

A. Acceptable disconnect switch manufacturers are:

1. General Electric
2. Square D
3. Cutler Hammer
4. Siemens-Allis
5. Allen-Bradley
6. Appleton Electric
7. Crouse-Hinds

B. Acceptable fuse manufacturer's are:

1. Chase-Shawmut
2. Buss
3. GEC Alsthom

C. Equipment supplied under this section shall be the same manufacturer as the Service and Distribution Equipment.

PART 3 EXECUTION

3.01 INSTALLATION:

A. Locate disconnect switches to provide working clearance and full accessibility as required by the NEC.

B. Unless indicated otherwise on the drawings, locate disconnect switches adjacent to equipment served.

C. Provide power wiring to and install all disconnect switches and extend feeders to motors or other loads, unless integrally factory mounted on a piece of equipment.

D. Provide power wiring to all roof mounted equipment via roof curb openings provided. Do not penetrate roof membrane with conduit stubups.

E. Coordinate exact location of motor termination boxes with raceway roughin provisions to insure correct installation

F. Connect all heating and air conditioning equipment and have this equipment complete and ready for operation. Contractor shall be responsible for checking equipment manufacturer submittal data to obtain exact location of all electrical connections for equipment before installation.

G. A short section of watertight metallic flexible conduit shall be used at each motor connection.

H. Restore factory finish to all equipment provided herein and touch up scratched or marred surfaces to match original finish. Clean enclosure interior and exterior of dirt, paint, and construction debris.

I. Maintain conductor phase relationship originating at service entrance throughout motor control center. Group and strap all conductors installed in starter and wiring gutters with nylon straps. Install only one conductor under each terminal. Connect extra conductors via terminal strips. Form and train conductors neatly in enclosures parallel and at right angles to sides of box. Uninsulated conductors shall not extend more than 1/8” from terminal lug.

J. Do not splice conductors in enclosure. Connections shall be made in suitable junction box located exterior of switch

K. Conductors not terminating in switch shall not extend through or enter switch enclosure

3.02 MOUNTING AND SUPPORT:

A. Locate switches to provide working clearance and fully accessible as required by the NEC. Do not mount switches directly to or on any mechanical equipment.

B. Enclosure shall be secured to structure by a minimum of four (4) fastening devices. Disconnect switches 600 ampere and larger shall have a minimum of eight (8) fastening devices. A fender washer (minimum 1 1/4” OD) shall be used between head of screw and enclosure.

C. Install equipment with operating handle at 5’-0” AFF, unless otherwise noted.

D. Where enclosure is not indicated on a wall or structure, construct a metal channel (power strut) free standing frame secured to floor, pad, or building structure. In exterior applications, all support structure shall be galvanized.

E. Where disconnect switch is mounted on drywall partitions, provide 3/4" painted plywood backboard exceeding switch size by one (1) foot in each direction, secured to drywall studs and fasten switch to backboard.

F. Provide specified nameplates on feeder switches, fused disconnect switches and non-fused disconnect switches.

END OF SECTION

SECTION 16203 PAD MOUNTED TRANSFORMERS

PART 1 GENERAL

1.01 REFERENCES:

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

ANSI C2	National Electric Safety Code
ANSI C57.12.26	Transformers - Pad-Mounted Compartmental-Type, Self Cooled, Three-Phase Distribution Transformers for Use with Separable Insulated High-Voltage Connectors, High-Voltage 34, 500 Grd Y\19, 920 Volts and Below; 2500 kVA and Smaller
IEEE 386	Separable Insulated Connector Systems for Power Distribution Systems Above 600 V
NEMA LA1	Surge Arresters
NFPA 70	National Electrical Code – Latest Edition

1.02 GENERAL REQUIREMENTS: All work specified in this section shall comply with the provisions of Section 16010, "Electrical General Requirements," and as specified herein. The work includes the provision of new pad mounted transformers, for outdoor use.

1.03 SUBMITTALS:

A. Submit the following in accordance with Section 16010, "Submittals."

1. Manufacturer's catalog data

   a. Pad mounted transformer
   b. Separable insulated high voltage connectors
   c. Surge arresters
   d. Fuses
   e. Meters

2. Drawings

   a. Pad mounted transformers

3. Contents - Drawings shall indicate, but not be limited to the following:

   a. Overall dimensions, front view, and sectional views.
   b. Elementary diagrams and wiring diagrams with terminals identified, and indicating internal wiring for and interconnection between each item of equipment.

4. Manufacturer's Instructions

   a. Ground megger - Submit one copy of the megger manufacturer's directions for use of the ground megger and indicate the method to be used.

5. Factory Test Reports

   a. Pad mounted transformer tests

6. Field Test Reports

   a. Ground rod tests

PART 2 PRODUCTS

2.01 INSULATING LIQUIDS: Mineral Oil, ASTM D3487, Type II tested in accordance with ASTM D117.

2.02 UNDERCOATING: Coat the underside of transformer bases with a 4-mil thick coating conforming to MIL-P-28641.

2.03 NAMEPLATES: Provide transformer nameplates conforming to ANSI C57.12.00, except indicate the number of gallons of coolant.

2.04 WARNING SIGNS: Provide metal signs reading "DANGER HIGH VOLTAGE" on two lines in letters of minimum 3-inch height.

2.05 PAD MOUNTED TRANSFORMER:

A. Outdoor type, consisting of a high-voltage (incoming) compartment, a transformer section, and a low-voltage (outgoing) compartment separated by full height isolating barriers. Components shall be assembled and shipped by one manufacturer as a unit, completely weatherproof and tamperproof for mounting on a concrete pad without additional housing, fences or other enclosures. Unit shall conform to applicable portions of ANSI C57.12.26, modified as necessary to accommodate the components specified herein. Component ratings shall be as indicated, and as specified herein.

B. The incoming compartment shall be dead-front construction and shall include load break connectors, dead-front lightning arresters, feed-thru inserts, parking stands, insulated. Fuses shall be accessible from the primary compartment.

   1. Load break connectors shall be the separable insulated type rated 125 basic insulation level (B.I.L.), 200 amps and in conformance with IEEE 386. Associated bushing wells, feed-thru inserts, and insulated bushings shall be compatible with the load break connectors.
   2. Provide a parking stand near each bushing well. Provide three insulated bushings for parking of energized load break connectors on parking stands.
   3. Fuses shall be current limiting type in dry-well fuse holders; kV B.I.L. rating for fuses and fuseholder; interrupting rating for fuses, 50,000 amps symmetrical.
   4. NEMA LA1, fully shielded, dead front, elbow type surge arresters suitable for plugging into feed-thru inserts.

C. Transformer shall be 3-phase, [radial/loop] feed, two winding, 60 Hz, 65 degree C rise, oil insulated, self-cooled type rated [ ] kVA capacity, high voltage [ ] kV, with two 2 1/2 - percent full capacity taps above and below rated primary voltage. 75 kV basic insulation level; [ ] volts wye low voltage; 2.5 percent minimum impedance. Provide external tap changer with position indicator for de-energized operation only. Locate change control handle within the high voltage compartment and provide means to prevent unintentional operation. Transformer shall have a sealed tank with a welded bolted and gasketed cover. Provide the following accessories:

1. Drain and sampling valves
2. Filter press connections
3. Ground pads
4. Provision for lifting and jacking
5. Top liquid dial-type thermometer without alarm contacts
6. Pressure-vacuum gauge
7. Pressure-relief device valve

D. Include low voltage bushings, spade-type terminals.

2.06 TRANSFORMER PAD: 8-inch thick concrete pad, placed on well compacted gravel sub-base so that top surface of slab is 6 inches above grade. Size to allow 8 inches of free space on all sides of equipment. Reinforce with 6-inch by 6-inch number 6 mesh, uniformly placed 4 inches below top surface of slab. Chamfer edges 1/2 inch. Determine cable entrance space and location according to requirements of equipment to be mounted or as directed by local power company.

2.07 GROUND RODS: Copper clad steel, drive full length to a minimum depth of 6 inches below finished grade. Minimum dimensions of rods shall be 3/4 inch diameter, and 10 ft. length.

PART 3 EXECUTION

3.01 INSTALLATION: Conform to the manufacturer's shop drawings and mounting instructions including securing the transformer to the concrete slab with a minimum of four anchor bolts. Completed installation shall conform to the requirements of ANSI C2.

3.02 GROUNDING:

A. Pad mounted transformer shall have grounded pads, lightning arresters connected to a solid earth ground using cone pointed driven ground rods in accordance with paragraph in this section, entitled, "Ground Rods." Install as indicated to provide an earth ground having a minimum test resistance of 5 ohms.

B. Buried or otherwise inaccessible grounding connections, except those which specifically require access for periodic testing shall be made by exothermic weld or compatible completely brazed mechanical connector. Welds which have "puffed up" or have convex surfaces, indicate improper cleaning and will be rejected.

3.03 SIGNS: Install "DANGER HIGH VOLTAGE" signs on each side of pad mounted transformers, except when the transformer is surrounded by a fence, mount the signs on each side of the fence.

3.04 FIELD QUALITY CONTROL:

A. Upon completion of installation, notify the owner and power company 5 days in advance of the proposed operating test. Verify by demonstration that equipment and devices are operating satisfactorily.

B. Test ground rods for ground resistance value before connecting wire. Test each ground rod or group of rods with a portable ground testing megger, equipped with a meter that indicates the ground valve of the electrode being tested directly in ohms or fractions thereof. Identify each ground and record test value.

END OF SECTION

SECTION 16425 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. This section covers describes the Electrical service entrance requirements to the building from the power company transformer.

C. Electric service shall be obtained from the local Electrical Utility Company having jurisdiction.

D. Transformers pads, barriers, clearances and primary service shall be provided and installed as directed by the Electric Utility Company rules, regulations and installation guide.

E. Electric service shall be 480/277 Volts and 208/120 Volts, 3 Phase, 4 Wire, Wye connected, Ampacity as indicated on the plans.

F. Electrical Contractor shall make all arrangements with the Electric Utility that are necessary to obtain electrical service, both temporary and permanent.

G. Metering and current transformers shall be provided and installed as directed by the Electric Utility Company. This contractor shall make all provisions necessary for the installation of the Electric Utility metering equipment in accordance with utility company.

H. Electrical Contractor shall make all arrangements for temporary electrical service to the site during the construction phase, and maintain electric service to existing facilities as required.

PART 2 PRODUCTS

2.01 SERVICE ENTRANCE CABLES:

A. Install service entrance cables as shown on drawings and as specified herein.

B. All materials and methods of construction for service provisions shall comply with the Electric Utility Company requirements.

C. Provide 4” PVC primary conduit from the utility demarcation point to the primary side of the power company transformer. Coordinate routing with the power company representative.

PART 3 DISTRIBUTION

3.01 INSTALLATION:

A. Obtain all necessary standards and detail drawings from the Electric Utility Company before building construction or excavation adjacent to service equipment is started.

B. Coordinate service and connections with the Electric Utility.

C. Make arrangements with the Owner and the Electric Utility Company to install, terminate, relocate, or transfer primary electric service without disruption of the normal operation of the Owner's business, or any other electric services (eg. adjacent tenants...etc.) as required. Installation cost of the electric service should included provision for the work of both the electrical contractor and utility company (if so required) for non normal work hours (eg. nighttime or weekend...etc.).

END OF SECTION

SECTION 16450 GROUNDING

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 installation of the building grounding system. The grounding system shall be established with equipment grounding conductors; the use of metallic raceways as the only method of equipment grounding is not acceptable.

C. In addition, this section covers ground fault protection for the main service entrance equipment.

PART 2 PRODUCTS

2.01 GROUNDING CONDUCTORS:

A. Grounding electrode conductors shall be bare or green insulated copper conductor sized as indicated on the drawings.

B. Equipment grounding conductors shall be green insulated type THHN/THWN, or XHHW conductors sized as indicated on the drawings. Where size is not indicated on the drawings, conductor size shall be determined from the National Electrical Code table on sizes of equipment grounding conductors.

C. Bonding jumpers shall be flexible copper bonding jumpers sized in accordance with the National Electrical Code tables for grounding electrode conductors.

2.02 PANELBOARDS, TRANSFORMERS, MOTOR CONTROLLERS, AND DISCONNECT SWITCHES:

A. Provide each low voltage distribution and branch circuit panelboard with a copper equipment grounding bar brazed or riveted to the associated enclosures or cabinet and an insulated neutral bar.

B. Provide a conductor termination grounding lug bonded to the enclosure of each equipment item.

2.03 DEVICES: Each receptacle and switch device shall be furnished with a grounding screw connected to the metallic device frame.

2.04 GROUND RODS:

A. Ground rods shall be 3/4" x 10'-0 copper clad steel.

B. Sectional ground rods shall be hot dip galvanized 5/8" x 10' sections with an internal stainless steel splined coupling pin.

2.05 HYDRAULIC TERMINATIONS:

A. Acceptable manufacturers for hydraulically applied terminations are Square D, Burndy and Thomas and Betts (T & B).

B. Acceptable manufacturers for mechanically applied terminations are Ideal, Burndy and Thomas and Betts (T & B).

PART 3 EXECUTION

3.01 INSTALLATION:

A. Ground all non-current carrying parts of the electrical system, i.e. raceways, equipment enclosures and frames, junction and outlet boxes, machine frames and other conductive items in close proximity with electrical circuits, to provide a low impedance path for potential grounded faults.

B. Service entrance and separately derived electrical systems, grounding electrode system:

1. The neutral conductor of the electrical service serving the premises wiring system shall be grounded to the ground bus bar in the service equipment which shall be grounded to the cold water system, the ground rod system, and other grounding electrodes specified herein or indicated on the drawings. Grounding electrode conductors shall be installed in rigid, nonmetallic conduit to point of ground connection, unless subject to physical damage in which case it shall be installed in galvanized rigid steel. Where metallic conduit is permitted, bond conduit at both ends to grounding electrode conductor with a U.L. bonding busing.
2. Make connection to main water line entering the building. Make connections ahead of any valve or fittings whose removal may interrupt ground continuity. Install a bonding jumper of the same size as the grounding conductor around the water meter.
3. Bond together the following systems to form the grounding electrode system. All system connections shall be made to the electrodes as close as possible to the service entrance equipment and each connected at the service entrance equipment ground bus. Do not connect electrode systems together except at ground bus.

   a. Cold water piping system
   b. Ground rod system
   c. Lightning protection system
   d. Steam and chilled water piping
   e. Main rebar in foundation footing
   f. Building structural steel components.

4. Ground the neutral of all dry type transformers with #4/0 cu. conductor riser tied back to main switchgear which shall serve as the grounding electrode for the separately derived system. In reinforced concrete structures, building steel shall be considered to be reinforcing steel of vertical columns. Make connection to building steel with chemical weld type connector, in a location in unfinished space where the connection will not be subject to physical abuse.
5. Ground the neutral and frame of the emergency generator to building steel and the ground rod system, which shall serve as the grounding electrode for the separately derived system. In reinforced concrete structures building steel shall be considered to be reinforcing steel in vertical columns. Make connection to building steel with chemical weld type connector, in a location in unfinished space where the connection will not be subject to physical abuse.
6. Grounding Electrode connections to structural steel, reinforcing bars, ground rods, or where indicated on the drawings shall be with chemical exothermic weld connection devices recommended for the particular connection type. Connections to piping shall be with U.L. listed mechanical ground clamps.
7. Bonding shall be in accordance with the National Electrical Code.
8. Install ground rods where indicated on the drawings with the top of the ground rods 12 inches below finished grade.

C. Equipment Grounding Conductor:

1. Grounding conductors for branch circuits are not shown on the drawings; however, grounding conductors shall be provided in all branch circuit raceways and cables. Grounding conductors shall be the same AWG size as branch circuit conductors.
2. Grounding conductors for feeders are typically indicated on the drawings and the raceway is sized to accommodate grounding conductor shown. Where grounding conductor size is not indicated on the drawings, conductor shall be in accordance with the equipment grounding conductor table of the National Electrical Code.
3. A grounding conductor shall be installed in all flexible conduit installations. For branch circuits, grounding conductor shall be sized to match branch circuit conductors.
4. A feeder serving several panelboards shall have a continuous grounding conductor which shall be connected to each related cabinet grounding bar.
5. The equipment grounding conductor shall be attached to equipment with bolt or sheet metal screw used for no other purpose. Where grounding conductor is stranded, attachment shall be made with lug attached to grounding conductor with crimping tool.
6. Ground all motors by drilling and tapping the bottom of the motor junction box and attaching the equipment grounding conductor to the box with a round head bolt used for no other purpose. Conductor attachment shall be through the use of lug attached to conductor with crimping tool.
7. Equipment grounding conductors shall terminate on panelboard, switchboard, or motor control center grounding bus only. Do not terminate on neutral bus. Provide a single terminal lug for each conductor. Conductor shall terminate in the same section as the phase conductors originate. Do not terminate neutral conductors on the ground bus or equipment grounding conductors on the neutral bus.

D. Other Grounding Requirements:

1. Each telephone backboard shall be provided with a No. 6 grounding conductor. When backboard is located in vicinity of electrical service equipment, the "point of grounding" of this conductor shall be the main cold water service with connections made ahead of any valves or joints. Remote backboards shall use building steel as "point of ground". Terminate conductor by stapling to backboard.
2. At each building expansion joint flexible copper bonding jumpers shall be attached to building structure by chemical weld process. Install bonding jumpers in concealed locations that will not subject connections or jumpers to physical abuse. Install 100' on centers across expansion joints.
3. Bond all metal at pools or fountains to grounding electrode system per NEC requirements.

3.02 TESTING:

A. Upon completion of the ground rod installation, the Contractor shall test the installation in accordance with the "Electrical System Tests" section of this Specification. Grounding resistance reading shall be taken before connection is made to the building cold water piping system. Ground resistance readings shall not be taken within forty-eight hours of rainfall. Results of ground resistance readings shall be forwarded, in writing, immediately to the Project Engineer.

B. If the resistance to ground exceeds 5 ohms, additional rods shall be driven and bonded together, until a reading of 5 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 Project Engineer two (2) copies of each test report certified by the testing technician and the electrical contractor.

C. All grounding electrode conductors and ground bus shall be measured by the Contractor for objectionable levels of current, and to detect any inadvertent connection of neutral to ground.

D. If the ground current exceeds 10% of the rating of the conductor ampacity, all devices on that feeder or circuit shall be rechecked for proper connection.

E. All grounding system connections shall be rechecked at final checkout for correct wiring termination methods and mechanical strength.

END OF SECTION

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SECTION 16460 DRY-TYPE TRANSFORMERS (600 VOLTS)

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 furnishing, connection and installation of dry type transformers.

1.02 QUALITY ASSURANCE:

A. Industry Reference Standards:

1. National Fire Protection Association (NFPA):
   a. NFPA 70, 2002.

2. National Electrical Manufacturers Association:
   a. ST-20 Standards for 220 C UL Component
   b. Recognized Insulation System
   c. Control and Systems

3. American National Standards Institute:
   a. C57.12.01
   b. C57.12.91

4. Underwriters Laboratories (UL)
   a. No. 506 Transformers (1000 kva, 3 phase and below
   b. 167 kva, 1 phase and below)

B. All equipment furnished shall be U.L. Listed and Labeled.

PART 2 PRODUCTS

2.01 GENERAL: Transformers shall be self-cooled rated for continuous operation at rated load KVA, twenty-four hours per day, 365 days per year with normal life expectancy (IEEE Standard 65). KVA ratings shall be as indicated on the drawings.

2.02 GENERAL PURPOSE DRY TYPE TRANSFORMERS:

A. Insulation System:

1. Single phase 25-167 KVA and three phase 30-1500 KVA:
   a. Transformers shall be rated for average temperature rise by resistance of 150° C in 40° C maximum ambient, 30° C average ambient.
   b. Transformer insulation system shall be UL rated as 220° C system. Provide K-13 rated transformers for all serving panelboards fed by the UPS system or as indicated on the panel schedules.

2. Three phase 3 - 15 KVA:
   a. Transformers shall be rated for average temperature rise by resistance of 115° C.
   b. Transformer insulation system shall be 180°C.

3. Single phase 3 - 15 KVA:

   a. Transformers shall be rated for average temperature rise by resistance of 55° C.
   b. Transformer insulation system shall be 105° C.

B. Sound rating shall not exceed NEMA and ANSI standards for KVA rating. Internal vibration dampening shall be provided as a standard feature for all transformers.

C. Standard voltage taps shall be:

1. Single phase transformers rated up to 15 KVA shall have two (2), 5 percent full capacity taps below normal rated primary voltage.
2. All other single phase transformers and all three phase transformers shall be provided with six (6) 2 ½ % full capacity taps, two (2) above and four (4) below normal voltage.

D. Construction and enclosures

1. Transformers to 25 KVA: Transformers shall be totally enclosed, non-ventilated with a resin encapsulated core and coil and drip-proof housing. Removable panel sections shall permit full access to wiring compartment.
2. Transformers 30 - 1500 KVA: Transformers shall be open, ventilated, drip-proof with removable front and rear cover panels. Transformers shall be suitable for floor mounting, unless wall or suspension mounting is indicated on the drawings.

E. Dry type transformers shall provide 3 phase 4 wire 208Y/120 volt AC service to designated electrical equipment unless shown otherwise on the drawings. Primary voltage shall be 480 volts AC.

F. Nominal transformer impedance shall be 4.5 % minimum.

G. Core assemblies and the center ground connection point of the coil secondary shall be grounded to their enclosures by suitably sized, flexible ground straps. Provide grounding lug at the strap to enclosure bonding location for connection of three conductors: the primary and secondary equipment grounding conductors and the grounding electrode conductor.

2.03 ACCEPTABLE MANUFACTURERS:

A. Acceptable dry type transformer manufacturers are:

1. Square D
2. Cutler Hammer
3. Siemens

PART 3 EXECUTION

3.01 INSTALLATION:

A. Dry type transformers larger than 15 KVA shall be floor mounted, unless wall or suspension mounting is indicated on the drawings. Transformers 15 KVA and smaller shall be wall mounted. Installation shall provide not less than twelve (12) inch clearance from combustible materials and not less than six (6) inch clearance from walls and other equipment. Floor mounted transformers shall be installed on a four (4) inch thick concrete pad with minimum ¾" thick neoprene waffle type vibration pads between transformer base and structural surface. Where transformers are indicated on the drawings to be wall or suspension mounted

bolt to structure with minimum ¾" thick neoprene waffle type vibration pads between transformer base and structural surface.

B. Primary and secondary connections to dry type transformers shall be made with watertight flexible metallic conduit and fittings. Support raceway per NEC requirements.

C. The secondary windings for each dry type transformer shall be grounded in accordance with NEC requirements for separately derived electrical systems. Extend a grounding electrode conductor from the transformer grounding lug to the nearest building structural steel or main column rebar. Connect the primary and secondary grounds to the grounding lug. Refer to the grounding section of these specifications for additional requirements.

D. Install secondary over-current protective device within ten (10) feet horizontally from transformer. Where none is indicated on the drawings, provide enclosed fused safety switch rated at 125 % of the transformer full load ampacity but not greater than the secondary conductor ampacity.

E. Do not install equipment over transformers, unless indicated on the drawings.

F. Locate transformers to provide working clearance and full accessibility as required by the NEC.

G. Provide nameplates on each dry type transformer as specified elsewhere.

3.02 CLEANING AND ADJUSTMENT:

A. Prior to final inspection, under maximum available load, measure secondary voltage and adjust tap settings to deliver nominal rated voltage within the percent limits of one tap setting. Record the voltages of each transformer at primary and secondary and document for future Owner reference.

B. After completion, clean the interior and exterior of dirt, paint and construction debris.

C. Touch up paint scratched or marred surfaces with factory furnished touch up paint of the same color as factory applied finish.

END OF SECTION

SECTION 16505 LIGHTING

PART 1 GENERAL

1.01 DESCRIPTION:

A. All work in this Section shall comply with the provisions of Section 16010.

B. The equipment and materials specified in this Section shall contain no asbestos or PCBs.

C. The work of this Section shall include the careful examination of the Architect/Structural and Mechanical drawings so as to become acquainted with the structural features of the building and the location of pipe and ductwork which would alter the location and spacing of outlets for fixtures. Where conflicts develop, same shall be referred to the A/E for a decision as to the proper location. The work of the Section shall also include responsibility for the proper reinforcement of any ductwork necessary to carry the added weight of lighting fixtures where same must be supported by such ductwork.

1.02 JOB CONDITIONS: Verify the compatibility of recessed lighting fixtures with the ceiling in which each fixture is to be located.

1.03 PRODUCT HANDLING:

A. Deliver fixtures sufficiently in advance of installation to prevent delay of work.

B. Store all materials in a closed building, in original packaging, and protect from damage and the elements.

1.04 SUBMITTALS: Shop Drawings: Show fixture locations and support details. Materials shall not be purchased until approved. Include copy of ballast warranty for each type of ballast required.

A. Product Data:

1. Provide lighting fixture submittals in a single, bound and indexed assembly for all lighting fixtures. Incomplete submittals will be returned without processing. Fixture submittals shall contain manufacturer's name and catalog illustration and number, dimensions and details, ballast and diffuser information, metal gauges, pre-treatment and paint data, UL-ETL approval, and connection details. Provide photometric data for fixture with lamp and ballast specified. Provide information on adjustable fixtures if such type fixture is required. Provide fuse type and size when specified.
2. Provide complete ballast submittals of the exact ballast to be used for each fixture. Provide sound rating of ballast.
3. Provide complete lamp submittals of the exact lamp to be used including color temperature,color rendering index and rated lamp life.
4. Some fixtures may be required with multiple ballasts for two-level switching or other

PART 2 PRODUCTS

2.01 LIGHTING FIXTURES:

A. Fixtures shall bear U.L. and manufacturer's label. Furnish and install lighting fixtures as indicated and specified, complete with lamps, required ballasts and accessories.

B. All recessed incandescent fixtures shall comply with Article 410-65,(C) of the N.E.C.

C. Each lighting fixture shall have been tested and certified for proper operation by the fixture manufacturer for the type mounting and ceiling on/in which it is installed.

D. Confirm exact locations of all lighting fixtures by coordination with the Architect/Engineerural Reflected Ceiling Plans and mechanical equipment above or on the ceiling. Confirm all ceiling types before ordering lighting fixtures. 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. Each lighting fixture recessed in a plastered ceiling of any type shall have a plaster frame.

E. Most lighting fixturesd are lettered or groups of fixtures are indicated by a letter. The lighting fixtures that are indicated by the letters shall be as indicated on the Lighting Fixture Schedule. No substitutions for any fixtures in the light fixture schedule shall be allowed without written permission of the Engineer.

F. Each fixture shall be supplied with the necessary straps, supports, hangers, or other miscellaneous materials and devices to install them in a satisfactory manner and to conform to the Architect/Engineerural treatment in the areas in which they are to be installed. The Electrical Contractor shall consult all Architect/Engineerural plans in order that he may familiarize himself with all the necessary details for the various units to be installed throughout the building. Failure to do this will not relieve him of the responsibility of furnishing all necessary materials, to perform the function intended for the lighting system shown on the drawings.

G. Unless specified otherwise, all prismatic diffusers for fluorescent lighting fixtures shall be prismatic acrylic KSH K12 with a thickness of 0.2", measured from the back side to the peak of the prism. All wraparound lenses shall be virgin acrylic, one-piece and injection molded.

H. Fixtures with highly polished reflective surfaces shall not be handled with bare hands, but with clean, grease-free cotton gloves. Surfaces found with finger prints shall be cleaned or replaced with new fixtures.

I. Fixtures shall be furnished with special anodized finishes and colors as indicated in the Lighting Fixture Schedule. Fixtures with special factory applied baked enamel finish must conform to a color sample supplied by the Architect/Engineer. Full-size finished samples of each fixture with special finish and/or color shall be delivered to the Architect/Engineer for written approval when requested.

J. Prior to the application of any finish, all metal parts of all fixtures shall be protected by a rust-inhibiting process. the rust-inhibiting process shall be chemical. No type of sprayed, painted, or dipped primer may be used as the basic rust inhibitor. Any fixtures and /or parts of any fixtures which shall have begun to show signs of rusting or corroding at the time of completion of the job shall be removed and replaced by properly protected metal parts.

K. Fixtures shall be constructed to provide continuous operation when installed in air plenums, or when surrounded with restrictive enclosures. Where space above ceiling is used as an air plenum changer for either supply or return air, the fixture shall be factory wired in accordance with Article 300-22 of the NEC.

L. The exit lighting fixtures shall be U.L. listed, meet the requirements of Federal, State and Local codes for handicapped occupants and coordinated with the building fire safety systems.

2.02 LAMPS:

A. General:

1. The type lamps shall be as specified for each lighting fixture in the Lighting Fixture Schedule.
2. The lamp catalog number is the catalog number for General Electric and is given as a standard of the quality and performance required. Equal lamps by Sylvania, Philips or Westinghouse will be acceptable. When a lamp manufacturer's name is used along with the catalog number in the Lighting Fixture Schedule, it is considered unequaled by any other lamp and shall not be substituted. The lamp performance with energy conserving ballasts furnished under this Section shall be certified by a nationally recognized independent testing laboratory.
3. Contractor shall replace any lamps damaged during shipping or installation with lamps of like manufacturer to those installed in the fixture. Lamps used during construction shall be replaced with new lamps prior to final inspection.

B. Fluorescent Lamps shall be as specified in the Lighting Fixture Schedule. No substitutions, or contractor submittals for value engineered products shall be allowed.

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 130 volt operation.
5. All MR-16 lamps shall be by the same manufacturer and shall have the same lot code or number stamped on the lamp.
6. Handle all quartz lamps with clean cotton gloves.

D. High Intensity Discharge (HID) lamps shall be the voltage and type specified in the Lighting Fixture Schedule.

2.03 BALLASTS:

A. Provide ballasts of the proper voltage rating to match the circuit voltage from which the units are supplied. All ballast shall bear the UL label.

B. Fluorescent ballasts shall be the high frequency (20KHZ or greater) electronic type with a minimum power factor of 95 percent and a total harmonic distortion rating of no greater than 20 percent. Ballast shall be U.L. listed, non-PCB, have a class “A” sound rating and shall meet the requirements of the Federal Communications Commission Rules and Regulations, Part 18, Class A. Fluorescent ballasts shall have an automatic resetting thermostat to provide class P protection.

C. Provide low temperature starting ballasts of required type for outdoor fixtures and in unheated areas. Starting temperature shall be 0 degrees Fahrenheit.

D. Ballasts for metal halide lamps and high-pressure sodium lamps shall be properly selected for lamp characteristics, operating temperatures and lamp position, where critical. Ballasts shall be HPF type.

E. Noisy ballasts shall be replaced at no additional cost to Architect/Engineer. Ballasts for indoor application shall be enclosed in a housing which provides necessary wiring compartments and provisions for required electrical connectors or devises. Ballast components shall be surrounded with a thermosetting fill to ensure adequate heat dissipation and quiet operation below local ambient noise level. Ballast shall be provided with necessary mounting hardware and vibration dampers.

F. Ballasts for outdoor use shall be enclosed in weather-tight enclosures with proper outdoor type wiring devices.

G. All ballasts shall be by Advance, Motorola, Magnetek or Energy Savings.

H. Electronic fluorescent dimming ballasts shall be by Lutron or Advance with dimming range as specified in the Lighting Fixture Schedule. Light output shall be flicker-free and continuous over entire dimming range.

I. Fixture fusing shall be provided as follows:

1. All 277V and 480V high intensity discharge fixtures.
2. All exterior lighting for all voltages. Fuses shall be in accessible locations, approved equal to Buss and of proper style. Exterior fixture fuses shall be Buss "TRON," or approved equal, in water-resistant enclosure where fixtures may come in contact with moisture or water.

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 ensure the fixture's 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 from 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 or jack chain. 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 be supported as detailed on the drawings.

END OF SECTION

SECTION 16506 LIGHTING DIMMING

PART 1 GENERAL

1.01 SYSTEM DESCRIPTION: System shall consist of factory pre-assembled dimming and switching panels, and/or control interfaces, and solid-state high frequency fluorescent dimming ballasts (where applicable). Additional items may also be required and are described herein and/or shown on the drawings.

1.02 SUBMITTALS:

A. Provide a written line-by-line review of the specification.

B. Shall include a load schedule which indicates the actual connected load and load type per circuit, circuits and their respective control zones, circuits that are on emergency (if applicable), and the capacity, phase, and corresponding circuit numbers (per the electrical drawings).

C. Shall include a complete schematic of the system.

D. Shall include catalog cut sheets with performance specifications including historical testing data demonstrating complete compliance to all of the specifications herein.

E. Shall include all exceptions taken to the Specification.

F. Manufacturer shall provide any additional information or factory demonstrations as required by the specifier to demonstrate conformance with Part 2 of this specification. All demonstrations are to be at a location, time and in a manner chosen by the specifier.

1.03 APPROVALS:

A. Prior approval is required for alternate proposals.

B. Complete Catalog data, specifications, and technical information on alternate equipment must be furnished to the Architect and Owner at least ten business days in advance of the bid date.

1.04 QUALITY ASSURANCE:

A. Manufacturer shall have a minimum of 10 years continuous experience in the manufacturing of lighting controls.

B. Lighting control system shall be UL, CSA, NOM or CE listed (where appropriate) specifically for the required loads (i.e. incandescent, magnetic and electronic low voltage, fluorescent, etc.). Manufacturer shall provide evidence of compliance on request.

C. Manufacturer shall have their quality system registered to the ISO 9001 Quality Standard, including in-house engineering for all product design activities. Due to the exclusion of the Design Control element, ISO 9002 Registration is not acceptable.

D. Manufacturer shall have component quality program in place to reduce defective levels to less than 100 PPM and provide documentation on request.

E. Lighting control system shall meet IEC801-2, tested to withstand a 15kV electrostatic discharge without damage or loss of memory.

F. Manufacturer shall provide software to simplify the design and installation of all lighting controls.

G. Lighting control system shall be bid separately from all other lighting equipment. Packages of lighting equipment and dimming systems shall not be acceptable.

1.05 PROJECT/SITE CONDITIONS: Lighting controls shall operate in an ambient temperature range of 0°C (32°F) to 40°C (104°F) and 90% non-condensing relative humidity without the requirement of a regularly scheduled maintenance program for air filtration components.

1.06 WARRANTY: The manufacturer shall provide a full two-year limited warranty on all equipment supplied. The warranty shall cover 100% of the parts and manufacturers labor costs required over the first two-years, which are directly attributable to the manufacturer. The factory commissioned warranty shall also entitle the end user to an eight-year replacement parts program. Warranty coverage shall begin on the date that the equipment is energized.

1.07 COMMISSIONING:

A. The Contractor shall provide the manufacturer with 10 working days notice of the scheduled commissioning date.

B. Upon completion of the installation, the system shall be completely commissioned by a factory-employed engineer. The check-out will be performed after all loads have been tested live for continuity and freedom from defects and that all control wiring has been connected and checked for proper continuity. The factory-employed engineer shall demonstrate and educate the Owner's representative(s) on the system capabilities, operation and maintenance.

C. Manufacturer shall offer extended warranty based upon successful factory commissioning.

1.08 MAINTENANCE:

A. The manufacturer shall make available to the end user a method of ordering new equipment for expansions, replacement, or parts to be used as spares twenty-four hours a day, seven days a week. The manufacturer must make available new or remanufactured parts for a minimum period of ten years from the final date of commissioning.

B. The manufacturer shall supply factory service, new or remanufactured replacement parts, and a service contract that extends the factory-limited warranty from two to five years. In addition, this shall allow end user to purchase this coverage on an annual basis for a minimum period of ten years from the date of final commissioning.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

A. Lutron Electronics, Inc.

B. EDI

C. ETC

D. Macro

E. The listing of a manufacturer as "acceptable" does not imply automatic approval. It is the sole responsibility of the electrical contractor to ensure that any price quotations received and submittals made are for products/systems that meet or exceed the specifications included herein.

2.02 LIGHTING CONTROL DIMMING PANEL:

A. Mechanical

1. Panels shall be UL listed, CSA certified, NOM approved, or CE marked (as appropriate).
2. Panels shall be wall or recess mountable. Enclosure shall be NEMA Type 1 and IP-20 rated as specified by IEC 60529. Panel shall be constructed of steel with steel gauge of type required by UL508. Contractor shall reinforce wall as required.
3. Panels shall be completely pre-assembled and factory tested by the manufacturer prior to shipment. The contractor shall be required to provide input feed wiring, load wiring, and control wiring. No other wiring or assembly by the contractor shall be permitted. Panels requiring field assembly are not acceptable.
4. All input feed, load, and control terminals shall be front accessible without the need to remove dimmer assemblies or other components.
5. Panels shall be passively cooled via free-convection, unaided by fans. Systems that are fan dependent or fan assisted for cooling of components are not acceptable. Systems that require or recommend regularly scheduled maintenance for air filtration components are not acceptable.

B. Electrical

1. Panel shall contain from three to one hundred and forty four dimmers. Each dimmer may be controlled independently or in combination with any other dimmer within the panel or with dimmers from other panels within the system. Each dimmer shall be rated for 16A.
2. Unless the panel is a dedicated feed-through-type panel or otherwise indicated, panels shall contain branch circuit protection for each dimmer.
3. Branch Circuit Breakers in 120 Volt Panels shall have the following performance characteristics:

    a. Must be UL 489 listed as a molded case circuit breaker for use on lighting circuits.
    b. Contain a visual trip indicator and shall be rated at 10,000 AIC unless otherwise noted. Panel shall accept breakers rated up to 22,000 AIC without the need for additional externally mounted equipment. With the use of approved series rated external current limiting main breakers, circuits shall be operable up to 100,000AIC.
    c. Must be thermal-magnetic in construction for overload, short-circuit, and over-temperature protection. The use of fully magnetic breakers shall not be acceptable, even when used in conjunction with individual dimmer thermal cut-out devices.

4. Branch Circuit Breakers in 220-240 Volt Panels shall have the following performance characteristics:
5. Panel shall have minimum UL listed short circuit current rating (SCCR) of 42,000A.
6. Panels shall be equipped with an electronic dimmer BYPASS feature which electronically switches lighting loads to full light output from any level by toggling the individual branch circuit breakers (for individual circuits) or main breaker (for all circuits) when there is no intensity data available from the control system.
7. Panels shall be shipped with each dimmer in a mechanical BYPASS position via a jumper bar inserted between the input and load terminals to allow dimming panel to be used as a temporary lighting panel with no possibility of dimmer failure due to short-circuit condition. These jumpers shall carry the full-rated load current and

shall be reusable at any time. Mechanical bypass device must allow for switching operation of connected load with the dimmer removed via a circuit breaker. Bypass devices that are integral to the dimmer are not acceptable.

8. Panel shall be capable of operating from a normal feed, an emergency feed, or a normal/emergency feed. Panels requiring additional devices to make them capable of accepting normal/emergency or emergency feeds are not acceptable.

a. Normal / Emergency Panels

i. Upon the loss of normal input power, a panel operating from a normal/emergency feed shall immediately turn all circuits within that panel to full-on condition when emergency input power is present.

i. During the presence of normal power, circuits designated as emergency circuits shall be controlled via the same controls as circuits designated normal. If both normal and emergency circuits are on the same zone of control, all circuits shall react identically to a control intensity change.

ii. Emergency power feed may be provided by an emergency generator, a UPS system, or an IPS system with true sine wave output and a maximum of 10% THD when driving dimmed loads. The generator, UPS system, or IPS system must be capable of operating under no load conditions. Alternatively, the generator can be turned on only under emergency conditions.

iii. Normal / Emergency panels shall be fed by a single Normal / Emergency feed through the use of a line side (upstream) normal/emergency power transfer switch supplied by others.

iv. Under Emergency input power feed, unless otherwise indicated all dimmers shall operate at 100% of dimmer output voltage. Under these conditions, semiconductor device will be in the full-on state.

v. Under Emergency input power feed, if required, dimmer shall be capable of operating lighting load at an emergency level lower than 100% dimmer output voltage. Panels shall provide means to modify this emergency output level via panel processor without requiring external programming devices.

vi. Under Emergency input power feed, all local control stations shall be inoperable. Once normal power is restored, all lighting zones shall revert back to their status prior to the emergency condition without requiring any action on the part of the user. Restoration to OFF, ON, or a "default" level is not acceptable.

b. Emergency Panels

i. Upon the loss of normal input power, a panel operating from an emergency feed shall immediately turn all circuits within that panel to full-on condition when emergency input power is present.

ii. Emergency power feed may be provided by an emergency generator, a UPS system, or an IPS system with true sine wave output and a maximum of 10% THD when driving dimmed loads. The generator, UPS system, or IPS system must be capable of operating under no load conditions. Alternatively, the generator can be turned on only under emergency conditions.

iii. Under Emergency input power feed, unless otherwise indicated all dimmers shall operate at 100% of dimmer output voltage. Under these conditions, semiconductor device will be in the full-on state.

iv. Under Emergency input power feed, if required, dimmer shall be capable of operating lighting load at an emergency level lower than 100% dimmer output voltage. Panels shall provide means to modify this emergency output level via panel processor without requiring external programming devices.

v. Under Emergency input power feed, all local control stations shall be inoperable. Once normal power is restored, all lighting zones shall revert back to their status prior to the emergency condition without requiring any action on the part of the user. Restoration to OFF, ON, or a "default" level is not acceptable.

vi. Illumination levels shall be field-programmable to meet local code requirements for Emergency power conditions. Such options include, but are not limited to, providing a constant minimal light level for emergency circuits during normal operation or providing full function dimming under emergency power.

9. Panel shall be capable of directly interfacing with a voltage detection/sensing device for Emergency lighting.

a. 3-Phase detection/sensing device shall:

i. be UL 924 listed as Emergency Lighting and Power Equipment

ii. have two dry contact closure inputs (normally open and "supervisory" normally closed). The normally open input requires a maintained dry contact closure to activate the Emergency mode. The "supervisory" normally closed input will activate the Emergency mode when a dry contact closure is opened. A status indicator will indicate when these inputs are activated.

iii. have a function test switch with status indicator to simulate a phase failure

iv. have a phase status indicator

C. Dimmer

1. Under fully-loaded operating conditions, all semiconductor devices shall operate at a minimum 20ºC (36ºF) safety margin below the component manufacturer's maximum component temperature rating at a 40ºC (104ºF) ambient room temperature.
2. A positive air gap switch shall be employed by each dimmer in the panel to ensure that the load circuits are open when the "off" function is selected from the control system.
3. Dimmer shall be capable of withstanding inrush current of 50 times operating current typically generated by a full circuit of switching electronic non-dim ballasts.
4. Each dimmer shall compensate for incoming line voltage variations such as changes in RMS voltage, frequency shifts, harmonics and line noise. Dimmer shall be capable of maintaining constant light level with no visible flicker under the following conditions:

a. ±2% change in RMS voltage/cycle
b. ±2 Hz change in frequency/second
c. Dimmers that do not regulate the dimmer output in real time shall be unacceptable.

D. Panel Processor

1. Panel processor shall provide the following programming capability:

a. Electronically assign each circuit to any zone in the dimming system.
b. Adjust High-End Trim and Low-End Trim
c. Determine load type for each dimmer
d. Determine Normal / Emergency function of panel and set emergency lighting levels

1. Panel processors using mechanical switches, rewiring, or EPROMS for reprogramming circuit-to-zone assignments and other functions shall not be acceptable. Panels requiring the use of proprietary software without the capability to program circuit-to-zone assignments and other functions manually shall not be acceptable.
2. All circuits shall be capable of being operated (dimmed or switched where appropriate) from the panel processor.
3. Panel processor shall maintain dimmers at current light levels in the event of a control failure. Systems that fail to OFF, ON, or a preset level during a control failure are not acceptable.

2.03 PRESET CONTROL UNIT(S):

A. General:

1. Definitions: A "scene" or "preset" is a specific look or mood created by different lighting zones set at different intensities. A "zone" is either one or more lighting circuits which are controlled together as a group or one or more motor circuits which are controlled together as a group.
2. Control shall provide 4 preset lighting scenes and 'off' for up to 24 control zones. Control shall be capable of storing an additional 12 preset lighting scenes which can be accessed via wall stations and/or control interfaces. Up to 64 zones may be tied together in one system. Preset shall be set via easy-to-use raise/lower switches, one raise and lower switch per zone. The intensity for each zone shall be indicated via an illuminated barograph, one barograph per zone. More than one zone may be proportionately raised or lowered at the same time. Programming of preset scenes shall be accomplished without the use of an 'enter' or 'store' button. Additionally, one or more zones may be temporarily overridden without altering the scene values, which are stored in memory.
3. Lighting levels shall fade smoothly between scenes at time intervals of 0 to 59 seconds or 1 to 60 minutes. The fade time shall be separately selectable for each scene and shall be indicated by a digital display for the current scene. Pressing a scene select button will illuminate the corresponding scene LED and simultaneously begin changing the barograph levels to reflect the currently selected scene. In the event that a preset scene with a fade time greater than 5 seconds is initially selected from an 'off' condition, the programmed fade time shall be temporarily overridden, unless otherwise noted, and the lights shall fade up to that scene over a five-second time span.
4. Controls shall incorporate built-in wide-angle infrared receiver, providing control via a separate wireless remote control transmitter from up to 50 feet away.
5. Control shall provide tamperproof protection of scenes using a minimum of four levels of electronic 'lockout' which prevent alterations of scene values stored in

memory. Highest level of 'lockout' shall be capable of disabling manual control at the preset control unit.

6. Wall stations and control interfaces shall be capable of recalling preset lighting scenes, which shall be stored in preset control unit(s) and/or slider control(s).

B. Mechanical:

1. Faceplate shall attach using no visible means of attachment.
2. Controls shall be engraved with appropriate zone and/or scene descriptions, furnished to the manufacturer prior to fabrication. Size and style of engraving type shall be determined by the Architect. Any silk-screened borders, logos, graduations, etc., shall use a graphic process that chemically bonds the graphics to the metal faceplate, resisting removal by scratching, cleaning, etc.
3. Manufacturer shall ensure the following items regarding product color:

   a. Product color matches NEMA standard WD1, Section 2, and the maximum color deviation from this standard shall not exceed ? E=1, CIE L*a*b color space units. For non-NEMA colors, color match coordination shall be provided on request.
   b. Color variation of any control in the same product family shall not exceed ? E=1, CIE L*a*b color units.
   c. Visible parts shall exhibit ultraviolet color stability when tested with multiple actinic light sources as defined in ASTM D4674-89. Manufacturer to submit proof of testing upon request.

4. Dimmer shall mount individually in standard 2, 3, or 4 gang U.S.

C. Electrical:

1. Control shall provide power failure memory. Should power be interrupted and subsequently returned, the lights will come back on to the same levels set prior to the power interruption without requiring any actions on the part of the user. Restoration to some other default level is not acceptable, unless specifically noted elsewhere.
2. Wiring from dimming and switching panel(s) to preset control unit(s) and wall-stations and control interfaces shall be low voltage type Class 2 wiring (PELV).
3. Controls shall provide an immediate, local LED response upon button activation to indicate that a system command action has been requested. LED will remain lit contingent upon receiving system confirmation of the successful completion of the command.

2.04 WALLSTATIONS:

A. Architectural-Style Wall-station(s)

1. Faceplate shall attach using no visible means of attachment.
2. Wall-stations shall be engraved with appropriate zone and/or scene descriptions, furnished to the manufacturer prior to fabrication. Size and style of engraving type shall be determined by the Architect. Any silk-screened borders, logos, graduations, etc. shall use a graphic process that chemically bonds the graphics to the metal faceplate, resisting removal by scratching, cleaning, etc.
3. Manufacturer shall ensure the following items regarding product color:

a. Product color matches NEMA standard WD1, Section 2, and the maximum color deviation from this standard shall not exceed ? E=1, CIE L*a*b color space units. For non-NEMA colors, color match coordination shall be provided on request.
b. Color variation of any control in the same product family shall not exceed ? E=1, CIE L*a*b color units.
c. Visible parts shall exhibit ultraviolet color stability when tested with multiple actinic light sources as defined in ASTM D4674-89. Manufacturer to submit proof of testing upon request.

4. Wall-stations shall mount individually in standard single gang U.S. wall-boxes.
5. Wall-station(s) shall provide an immediate local LED response upon button activation to indicate that a system command has been requested. LED will remain lit contingent upon receiving system confirmation of the successful completion of the command.
6. Wall-station(s) functions shall be configured through software.
7. Single Button Wall-station(s) shall provide one button to toggle between 'Scene 1' and 'off'. Control shall be line voltage.
8. Two button wall-station(s) shall be capable of performing any of the following functions:

a. recalling Scene 1 and 'off,' Scene 9 and 10, or Scene 13 and 14
b. directing preset control units to operate independently or in combination to reflect partition status for one moveable wall (two rooms)
c. locking out manual control of preset control unit(s) and turning lighting to full 'on' for Panic mode
d. Sequencing through twelve steps. A sequence shall be defined as a series of steps, while a step shall be defined as the recall of a scene. Each step interval is adjustable for 1 second to 60 minutes.
e. Fine-tuning an individual zone(s).

Control shall configure in the field through DIP switches to perform one of these functions. The buttons shall provide green LED status feedback.

9. Four-button wall-station(s) shall be capable of recalling preset light levels for four scenes, each providing green LED status feedback. Control shall be capable of recalling one of four different banks of scenes which can be configured in the field through DIP switches.
10. Four-button Master wall-station(s) shall provide four buttons which toggle selected preset control unit(s) on to Scene 1 and 'off', each providing green LED status feedback, plus 'ALL ON' -or- 'ALL OFF' for selected preset control unit(s).
11. Four-button Partitioning Control(s) shall provide four buttons each capable of directing preset control units to operate independently or in combination to reflect partition status for one moveable wall. Control shall be capable of directing preset control units for up to four moveable walls (five rooms). Each button shall provide green LED status feedback to indicate status of a specific partition.
12. Five-button wall-station(s) with Raise/Lower shall be capable of recalling preset light levels for four scenes, each providing green LED status feedback, plus 'off' and of fine-tuning light levels with master raise/lower. Control shall be capable of recalling one of four different banks of scenes which can be configured in the field through DIP switches.

13. Five-button wall-station(s) with Raise/Lower and Infrared Receiver shall be capable of recalling preset light levels for four scenes, each providing green LED status feedback, plus 'off'. Control shall provide means for Four Scene Wireless Remote Control(s) and Eight Scene Wireless Remote Control(s) to recall preset light levels for up to four or eight scenes (dependent on wireless remote control) plus 'off' and of fine-tuning light levels. Control shall provide means for wireless remote controls to recall one or two (dependent on wireless remote control) of four different banks of scenes which can be configured in the field through DIP switches.
14. Five-button wall-station(s) with Raise/Lower, Infrared Receiver, and Switch Input shall be capable of recalling preset light levels for four scenes, each providing green LED status feedback, plus 'off' from the keypad and from a wireless remote control. Fine-tuning of light levels with the master raise/lower shall be available from the wireless remote control. Control shall be capable of recalling one of two different banks of scenes based on the status of an external dry contact closure wired into the control.
15. Five Button Programming wall-station(s) with Raise/Lower and Infrared Receiver shall be capable of recalling preset light levels for four scenes, each providing green LED status feedback, plus 'off'. Control shall provide means for Four Scene Wireless Remote Control(s) and Eight Scene Wireless Remote Control(s) to recall preset light levels for up to four or eight scenes (dependent on wireless remote control) plus 'off' and fine-tuning of light levels. Control shall provide means for wireless remote controls to recall one or two (dependent on wireless remote control) out of four different banks of scenes which can be configured in the field through DIP switches. Control should also provide ability to program scene intensities using a suitable IR transmitter such as a PALM PDA. When used with a PALM PDA and available software, the control can select scenes 1-16 and off on any GRX unit in the system, raise or lower any zone in the system and save new zone levels as the current scene.

2.05 INFRARED TRANSMITTERS AND RECEIVERS:

A. Four Scene Wireless Remote Control(s)

Wireless remote control shall be capable of recalling preset light levels for four scenes plus 'off' and of fine-tuning light levels with master raise/lower. Wireless remote control shall be used in conjunction with a compatible infrared receiver and scenes recalled shall be dependent on that receiver. Wireless remote control shall operate up to 50 feet (15 meters) within line-of-sight to that receiver. Wireless remote control shall operate at a frequency of 40 kHz and shall be 'learnable' by other variable frequency remote controls.

B. Eight Scene Wireless Remote Control(s)

Wireless remote control shall be capable of recalling preset light levels for eight scenes plus 'off' and of fine-tuning light levels with master raise/lower. Wireless remote control shall be used in conjunction with a compatible infrared receiver and scenes recalled shall be dependent on that receiver. Wireless remote control shall operate up to 50 feet (15 meters) within line-of-sight to that receiver. Wireless remote control shall operate at a frequency of 40 kHz and shall be 'learnable' by other variable frequency remote controls.

C. Ceiling-Mounted Infrared Receiver(s)

Control shall provide means for Four Scene Wireless Remote Control(s) and Eight Scene Wireless Remote Control(s) to recall preset light levels for up to four or eight scenes (dependent on wireless remote control) plus 'off' and of fine-tuning light levels. Control shall provide means for wireless remote controls to recall one or two (dependent on wireless remote control) of four different banks of scenes which can be configured in the field through DIP switches. Control shall be ceiling-mounted and shall provide 360° reception range for wireless remote controls within 50 feet (15 meters) of the control. Manufacturer shall supply mounting collar which shall be no larger than 2.19" (56mm) square.

2.06 CONTROL INTERFACE(S):

A. RS232 Interface(s)

Control shall provide integration of preset control unit(s) to user-supplied PC or digital audiovisual equipment using RS232 serial communication. Control must be mounted within 50 feet (15 meters) of the RS232 source. Control shall provide

1. Access to scene selections
2. 2. Scene lockout (prohibits manual light level changes) 3. Sequencing
3. Zone lockout (prohibits permanent scene changes)
4. Fine-tuning of light levels with individual zone raise/lower
5. Status monitoring through button feedback and scene-status updates.
6. Control must be mounted within 50 feet

B. Programmer Interface(s)

Control shall provide integration of preset control unit(s) to user-supplied PC or digital audiovisual equipment using RS232 serial communication. Control shall provide an integral astronomic time-clock capable of running four schedules with 60 events per schedule. Time-clock shall be capable of being turned on and off manually without requiring access to the programmer interface. Additionally, control shall provide

1. Access to scene selections
2. Scene lockout (prohibits manual light level changes)
3. Sequencing for a minimum of 60 steps
4. Zone lockout (prohibits permanent scene changes)
5. Fine-tuning of light levels with individual zone raise/lower
6. Status monitoring through button feedback and scene-status updates
7. Where indicated, control shall provide capability of complete setup of all parameters via an IBM-compatible PC. Parameters shall include scenes (including both light levels in 1% increments and fade times), load types, low-end trim, tamperproof protection of scenes, and communication between control units (if applicable). Interrogation of these parameters, including control unit type, shall also be available via the RS232 connection. Permanent installation of the PC shall not be required unless indicated on the drawings. Windows-based software shall be supplied by the lighting control manufacturer.
8. Where indicated, control shall provide capability of runtime monitoring/changing of the parameters listed above via an IBM compatible PC or digital audiovisual equipment using RS232 serial communication. The control shall also provide

    a. Ability to turn On/Off LED’s on a control regardless of its programming

b. Ability to read/set any individual system zone to an intensity with any fade time
c. Sequence stop/pause/resume
d. Ability to read control data
e. Read/Set the time-clock schedule for the current day
f. Report sunrise/sunset times for the current day

C. DXM512 Interface(s)

Control shall be capable of converting preset control unit zone intensities to DMX512 output.

D. Contact Closure Interface(s)

Control shall provide two way interfaces between preset control unit(s) and dry contact closure devices such as from time-clock Inputs, building management systems, Fire alarm systems, security systems, and occupancy sensors. Control shall provide a minimum of five input and five output terminals. Input terminals must be able to accept maintained or momentary inputs with a minimum pulse time of 40msec. Inputs must have an on-state saturation voltage less than 2.0VDC and an off-state leakage current less than 10mA. Outputs must be capable of controlling other manufacturers' equipment. Customer provided output indicators must not exceed 200mA at 30VDC. Control shall be capable of providing the following functions which can be configured in the field through DIP switches: scene selection, panic mode, occupancy response, sequencing, zone and scene lockouts, and partitioning.

2.07 PROGRAMMER INTERFACE SOFTWARE:

A. Manufacturer shall supply a single software product to configure and optionally control the system. System configuration shall be via personal computer running Windows XP Professional.
B. System configuration shall provide capability to program:

1. preset control units, including scenes and load types
2. light levels can be set in 1% increments
3. fade times can be set up to 60 minutes
4. communication between control units
5. communication between wall-stations and control units
6. sequence of up to 60 scene selections
7. astronomic time-clock based on longitude, latitude, and daylight savings
8. up to four schedules of 60 events per schedule

C. System control shall provide capability to:

1. select scenes on any preset control unit
2. start/stop sequence
3. view control unit details, including scenes and load types
4. view wall-station details
5. view the events scheduled for the current day
6. recover system programming including presets, schedules and communications

2.08 SOURCE QUALITY CONTROL: Equipment shall be 100% tested for proper operation at three different levels—printed circuit board, end of line, and for two hours at 40°C (104°F) ambient—prior to shipment from the factory. Manufacturers sampling at end-of-line shall not be acceptable.

PART 3 EXECUTION

3.01 INSTALLATION:

A. Equipment shall be installed utilizing manufacturer's catalogue cut sheets and installation instructions and in accordance with these specifications.

B. Contractor shall furnish all equipment, labor, system setup and other services necessary for the proper installation of the products/system as indicated on the drawings and specified herein. System setup shall include defining each dimmer's load type, assigning each load to a zone and setting the control functions.

3.02 FIELD QUALITY CONTROL:

A. Manufacturers' Field Services

1. Upon completion of the installation, the system shall be completely commissioned by a factory-employed engineer. The check-out will be performed after all loads have been tested live for continuity and freedom from defects and that all control wiring has been connected and checked for proper continuity. The factory-employed engineer shall demonstrate and educate the owner's representative on the system capabilities, operation and maintenance.
2. Manufacturer shall offer upgraded warranty based upon successful field commissioning.
3. Manufacturer shall provide toll-free technical support hotline 24 hours per day, 7 days per week.
4. Manufacturer shall be capable of providing on-site service support within 24 hours anywhere in the continental U.S.A., and within 72 hours anywhere in the world, except where special visas are required.
5. Manufacturer shall offer a renewable service contract on a year to year basis which will include parts and factory labor as well as annual training visits.
6. Service Contracts will be available for up to ten years from date of system commissioning.

END OF SECTION

SECTION 16730 SPECIAL SYSTEMS CABLING

PART 1 GENERAL

1.01 SUMMARY: This specification shall include all fiber optic cabling, data cabling and voice cabling as well as termination hardware for these systems. All work specified in this Section shall comply with the provisions of Section 16010.

1.02 QUALITY ASSURANCE AND REFERENCE STANDARDS:

A. All cables shall be UL listed

B. N.E.C. article 770

C. BICSI Telecommunications Distribution Methods Manual

D. EIA/TIA 568

E. ETL

1.03 SUBMITTALS:

A. Refer to Division 01, Submittals, for general requirements.

B. Contractor shall provide submittals indicating the following:

1. Cable description, including manufacturer's published specifications.
2. Use of cable
3. Testing and qualification data
4. Cable labeling scheme

1.04 WARRANTY: All cables, materials, hardware, components and terminations shall be warranted for a period of not less than 5 years. Any defects in material or workmanship shall be remedied in a timely manner by the contractor.

PART 2 PRODUCTS

2.01 FIBER OPTIC CABLE:

A. All cables shall be 2-strand, 62.5/125 micron, multi-mode, FDDI grade, 900 micron, tight buffer construction with an overall Plenum (FT6) rated jacket.

B. Cable shall be routed between media retrieval control terminal panels and the cabinet mounted fiber distribution unit located in the Hub Room.

C. Acceptable products are as listed below:

1.	Siecor	P/N 002K72-31141-00
2.	AT&T	Comcode # 106524390
3.	CommScope	P/N P-002-DU-6F-00
4.	Optical Cable Corporation	P/N AO2-030S-W3SB/IUC/900

D. Terminations shall be Bayonet Style (ST), hot melt, connectors. For termination of individual fiber strands of the control terminals/panels and the FDU. Acceptable terminations are:

1. 3M P/N 6100

2.03 CABINET MOUNTED, TERMINATION HOUSING:

A. Provide 7"H x 17"W x 12"D, metal housing, FDU with built in cable management (front and rear). Housing shall accept "snap in" coupler panels and blank filler panels. Housing shall be as manufactured by the following:

1. FDU (Housing & Mounting Hardware)
   3M P/N 8425
2. 6-ports, ST, Multi-mode, Coupler Panel
   3M P/N 8406-TM
3. Single Position - Blank Panel
   3M P/N 8499
4. Four Position - Blank Panel
   3M P/N 8499-4W

2.04 DATA CABLE: All cables shall be 4 pair, 24 guage UTP, Category V, BICC, Plenum (FT6) rated jacket.

2.05 VOICE/DATA OUTLETS: For Voice only, AT&T P/N M1AH-262, white RJ-11. For modem/fax and miscellaneous use, AT&T P/N MPS100BH one blue RJ-45 jack for voice and one orange RJ-45 jack for data, UL certified Category 5. Flush-mounted outlets to use AT&T P/N M14A or NORDEX faceplates. Systems furniture outlets to use AT&T P/N M104SMB or NORDEX surface-mount box, or AT&T P/N M14C. Wiremold and flush-floor outlets to use AT&T P/N M106FR4 or NORDEX, Modular Mounting Frame, mounted behind Wiremold or appropriate A/C covers. Outlet jack colors to be white-voice, blue-misc. and orange-data. Check with electrician to determine faceplate color used on each job.

PART 3 EXECUTION

3.01 All connecting hardware, connectors, and faceplates shall be installed per manufacturer's instructions and recommendations. All fiber optic and data cabling shall be routed to maintain at least 12 inches separation from any power wiring. Where it is necessary to cross power wiring, all crossings shall be done with the fiber optic or data cabling perpendicular to the power wiring.

3.02 Fiber optic cable shall be installed inside the building using the following guidelines:

A. Do not exceed maximum pulling tension.

B. Do not exceed minimum installed and long term bend radius.

C. Avoid sharp bends and corners.

D. Provide additional crush/mechanical protection in high risk environments.

E. Do not exceed maximum vertical rise specification unless intermediate tension relief is used.

F. Observe all governing building and fire codes (either by using a property listed cable or suitable raceway).

G. Secure the fiber optic cable to existing supports or large cables wherever possible.

H. Do not deform the cable jacket, specifically when using cable fasteners or ties.

3.03 When installing fiber optic cable in cable trays or cable rack trays, the following special guidelines should be observed:

A. Install fiber optic cable so as to minimize potential damage when additional cables are installed or retrieved.

B. Secure the cable every 24 to 36 inches to the cable tray or rack.

C. Maintain minimum bend radius around corners.

D. Provide miscellaneous distribution rings to secure cable where necessary.

3.04 VERTICAL RUNS:

A. When installing fiber optic cable in vertical runs, the following special guidelines should be observed:

1. Work from the top down, when possible.
2. Install intermediate spit wire mesh grip(s) wherever the maximum vertical rise is exceeded.
3. Secure the cable in the riser wiring closets with cable ties or straps as needed to prevent accidental damage to cable.

3.05 TERMINATION POINTS:

A. When installing fiber optic cable, the following guidelines should be observed at termination points:

1. The amount of cable slack at termination points should allow the cable to be routed to the termination location with enough additional cable to reach a convenient location for the polishing, plus an additional 3 meters (9.75 ft.).
2. Termination hardware should be located to allow convenient use, convenient termination, and facilitate routing of additional locations.
3. When routing cable into an equipment rack/cabinet, the minimum bend radius should be maintained in the transition form the cable tray to the rack.
4. In equipment racks, the cable should be secured to the frame with cable ties to provide accidental snagging of the cable.

3.06 INSTALLATION:

A. When pulling fiber optic cable by any mechanical device (winch etc.) a dynamometer must be used to ensure the maximum tensile strength isn't exceeded.

B. The mechanical pulling device shall be equipped with clutches or shear pins to ensure this.

C. The fiber cable shall be attached to the pull line via the strength member of mesh grip.

D. At each end of a cable run approximately 10 feet of slack should be left for cable repairs, connecting and moving of equipment. Coil up and provided tie wrapping.

E. All installation work shall be done by qualified craftspeople in a neat, high quality manner and shall conform with the most stringent of applicable local, state, and federal building codes.

F. Cables shall be placed with sufficient bending radius so as not to kink, shear, or damage jackets, binders or cables, including where cables are coiled for future use or slack. Bending shall not exceed manufacturers' specified bend radii. Cable shall not be wrapped around the feet of systems furniture.

G. Tie wraps shall not be pulled so tight as to kink or crimp the cable jackets.

H. In no event shall any station cables be spliced (between closets and workstation locations).

I. Ceiling tiles broken or defaced by the Contractor during the installation and testing process shall be replaced at the cost to the Contractor.

J. The Contractor shall ensure that all floor and wall penetrations will be fire-stopped to the satisfaction of the Owner and as required by applicable codes. Provide firestop immediately after all cables have been installed.

K. Contractor shall individually and properly ground all relay racks, ladder rack, equipment cabinets and inside and outside plant cable shields, wherever the cables leave the sheaths, to Owner-supplied building grounds.

L. Voice/Data Cables

1. Install four-pair Cat5E UTP station cables with jacks (T568B pin art) placed in faceplates,
2. The cables for a typical flush mounted closed wall outlet extends from the outlet, up inside the wall conduit to the ceiling space, then run to the cable tray above ceiling to the nearest IDF or MDF and left coiled up with sufficient length to be terminated on patch panels.
3. When installing cables in conduits with pull-strings, replace pull-strings used with new ones.
4. All cables will run parallel or at right angles to all existing walls. Secure cables to independent ceiling supports using Caddy CAT32 j-hangers. All cables must be supported at least every 48” and within 6” of any conduit stub-up point.

M. Labeling Scheme

1. Station cables are to be machine labeled on each end of the cables and at the workstation outlets, within 2 inches of the termination, and on the face of both the workstation outlets with:

a. Cable or Location number, usually Room Number

b. Jack Designator:

Color:	Typical Use:
White	Voice-Digital phone
Blue	Voice-analog modem/fax
Orange	Data/Computer

2. The above recommended labeling scheme should be coordinated with any existing standards which may already be in use by the Owner.

3. Fiber Optic cables shall be labeled in pairs at each end and at cross-connect points with building, room number, pair number, and strand (NT-301-06-F1).

3.07 "SC" TERMINATIONS:

A. Provide and install an "SC" connector, onto each strand of each end of each cable.

B. Follow Manufacturers instructions for installing each connector.

C. Use a 3 micron lapping film for light polishing as required.

D. Install a polished fiber connector onto the back side port of each patch panel.

E. Install a polished fiber connector onto the back side port of each face plate coupler module.

F. Leave a minimum of 5'-0" of slack of each strand coiled carefully in patch panel tray.

3.08 INSTALL ACCESSORIES ACCORDING TO INSTRUCTIONS PACKED WITH THEM:

A. Along with above specifications, use 3M's installation product bulletins which accompany each product.

3.09 TESTING – FIBER CABLES:

A. Each strand shall be tested and the following information be turned over to the owner in chart form:

1. From Point-To-Point
2. Fiber I.D. Label No.
3. RX Level
4. Attenuation Total
5. Wave Length
6. Reference Level
1. Each strand shall not exceed a level of 3.75db of attenuation.

B. All fiber optic cables shall be tested in the following manner:

1. Using an Optical Time Domain Reflectometer (OTDR), test and record, the quality of each cable while still on the reel, within 48 hours of installation, to verify that no damage has occurred during shipment. This test needs to be done in one direction only.

2. Using an optical power meter, measure end-to-end attenuation for all installed cables, including: all splices, the terminated fiber itself; all connectors, and patch panel couplings. The total loss shall be measured and reported for each cable at the appropriate operating wavelengths, for multi-mode. Optical attenuation measurements are to be done from both directions, end-to-end. The maximum permissible loss on each cable is less than 2.5 dB, plus the loss per 1,000 feet due to cable length. Losses through each panel connector shall not exceed 0.2 dB. Losses through each fusion splice, if used, shall not exceed 0.2 dB.
3. Using the OTDR, test and record the optical quality of each cable after installation. Test in one direction only. Provide all printed readings, both before and after installation, so they can be included in the as-built documentation.

3.10 TESTING – VOICE/DATA CABLES:

A. All horizontal cables, outlets and terminations shall meet or exceed all performance specifications designated by ANSI, EIA/TIA 568A Annex E, or IEEE, for telephone, terminal to CPU, 10BaseT, 100BaseT, and FDDI.

B. Testing and labeling shall be completed prior to occupancy and, where possible test results presented to Owner during close-out.

C. Testing of all vertical and horizontal Voice cables and outlet jacks must include tests for the following:

1. Opens
2. Shorts
3. Grounds
4. Continuity
5. Polarity, or pair reversals
6. DC resistance

D. Testing of all horizontal data cables and outlet jacks, must include end-to-end tests using an EIA/TIA TSB 67, Level II compliant testing device such as a Microtest PentaScanner+. The documentation must show the outlet designation, the name of the technician who actually performs the test, as well as the time and date when the test was performed. The results for each workstation outlet must show the results of the following tests:

1. Opens
2. Shorts
3. Grounds
4. Continuity
5. Polarity, or pair reversals
6. DC resistance
7. Impulse noise
8. Signal attenuation @ from 200 KHz to 100 MHz in 100 KHz increments (Category 5)
9. Insertion loss @ 200 KHz to 100 MHz in 100 KHz increments (Category 5)
10. NEXT (near-end crosstalk) @ from 200 KHz to 100 MHz in 100 KHz increments (Category 5)
11. Station cable length/overall loop resistance

E. Any cables failing to meet above indicated standards must be removed and replaced, at no cost to the Owner, with cables that prove, in testing, to meet the standards. The installation will not be accepted until testing documentation has reported that all pairs in all cables meet the appropriate standards.

3.11 DOCUMENTATION:

A. Cable Records: The Contractor must provide a database of cable records, both hard copy and on floppy disk, using (*.dbf) Dbase format, for input into Owner's facilities management package. The cable records format must include at least the following information about each cable:

1. Room/Location code/Jack ID.
2. Riser/backbone or distribution cable pair assignments
3. Test results
4. Station cable lengths/Overall loop resistance

B. Project Documentation: Owner will provide sepias of Contract Comm Drawings to Contractor prior to close-out. Contractor shall transfer as-built documentation from field prints onto Contractor-produced mylars. Only mylars will be accepted as a reproducible medium. Additionally Contractor to provide four (4) sets of bluelines produced from as-built documentation. If significant discrepancies are found on the as-built Comm Drawings, corrections shall be made and additional reproduction costs will be borne by the Contractor. As-built Comm Drawings and close-out package shall include at least the following:

1. Locations of all technology outlets, cable location numbers, conduit, cable tray, ladder rack, sleeves and J-hooks
2. Documentation of all backbone cable and pair routings and assignments
3. Cut sheets showing station and backbone terminations and pair assignments
4. Test results

END OF SECTION

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-243-2 **CODE: (SP)**

DATE: **05/26/2006**

SUBJECT: **Landscape Mowing**

PROJECT: **STP-0008-03(041) / 103975 -- Hinds County**

Section 907-243, Landscape Mowing, is added to and becomes a part of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows:

SECTION 907-243 - LANDSCAPE MOWING

907-243.0l--Description. Landscape mowing shall consist of mowing areas indicated on the plans or established by the Engineer during the life of the contract. Mowing shall be accomplished in the manner, at the times and for the purpose set forth in the contract all as ordered by the Engineer.

907-243.02--Blank

907-243. 03--Construction Requirements.

907-243.03.l--Equipment. Equipment used shall be approved mowers suitable to perform the work, and shall be subject to the requirements of Subsection 108.05. Lawn type mowers shall be used around structures and areas adjacent thereto. Field type mowers may be used on other areas.

907-243.03.2--Mowing. The Contractor shall perform the work on areas designated on the plans or established by the Engineer. The Contractor shall Lake full advantage of weather and soil conditions, and no attempt shall be made to mow while the areas are deemed to be wet enough to cause damage to the soi1 or vegetation. Care shall be taken to use methods and mowers that will provide even, uniform mowed areas, and not damage adjacent vegetation and structures.

Areas shall be mowed to the height shown on the plans or established by the Engineer.

If deemed necessary, the Contractor shall immediately remove, by raking, excess grass clippings from the mowed areas and trim vegetation adjacent to structures, walks, and pavement.

If any time during the mowing operation the Engineer determines that the equipment or operators of the equipment are not performing satisfactorily, he may require change or adjustment of the equipment or operator.

907-243.04--Method of Measurement. Acceptable mowed areas specified, or ordered, will be measured by each mowing or by the acre.

907-243.05--Basis of Payment. Landscape mowing, measured as prescribed in Subsection 907-243.04, will be paid for at the contract unit price per each mowing or acre, which price shall be full compensation for all equipment, tools, labor and incidentals necessary to complete the work.

Payment will be made under:

907-243-A:	Landscape Mowing	- per each
907-243-B:	Landscape Mowing	- per acre

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-244-2 **CODE: (SP)**

DATE: **05/26/2006**

SUBJECT: **Tree Pruning**

PROJECT: **STP-0008-03(041) / 103975 -- Hinds County**

Section 907-244, Tree Pruning, is hereby added to and made a part of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows:

SECTION 907-244 -- TREE PRUNING

907-244.01--Description. This work shall consist of selective removal of existing tree branches and growth, to improve the visual appearance, site conditions regarding future maintenance, and overall health of existing trees on the site. The selection of trees to be pruned shall be determined by the Engineer. Extents to which pruning is required shall be in accordance with this specification to the satisfaction of the Engineer.

907-244.01.1--Qualifications. Contractor shall be licensed as a tree surgeon by the State of Mississippi, and having a minimum of two consecutive years experience in this area of work, having performed similar work. Contractor shall provide a minimum of three references and a list of similar project with the Client's names, addresses, and telephone number, when requested by the Engineer.

907-244.01.2--Field Investigation. Contractor shall visit the job site and become familiar with the nature and location of the work, existing conditions, and other conditions that he will be obligated to operate in the performance of the work.

907-244.02--Materials. Pruning seal shall be an asphaltum paint, formulated for the specific purpose of being used as a seal for tree cuts. Material shall be an aerosol or brush applied material. The Contractor shall submit six copies of manufacturer's product data for review and approval of the Engineer.

907-244.03--Construction Requirements.

907-244.03.1--Pruning. The Contractor shall use tools satisfactory for work of this nature, remove all dead wood, insignificant sucker growth, material causing strain on limbs and trunks, and all limbs that are in conflict with limbs of other trees or with buildings. Lower limbs of trees that may interfere with street (or parking lot) traffic or with the Department's maintenance vehicles shall be removed. Where street traffic is not a concern, prune lower limbs to a clearance of eight feet (8').

Do not cut limbs at the base flush with the main trunk. Cuts shall be made outside of the collar of the limb at its intersection with the main trunk. This shall also apply to dead limbs which are removed.

All cuts two (2) inches or greater in diameter shall be sealed, and any cuts which have been previously cut or broken, shall be sealed with asphaltum tree paint. Liquid applied paint shall require one coat. Aerosol paint shall require two (2) coats.

907-244.03.2--Clean Up. All limbs, leaves, and pruning debris shall be removed and disposed of to the satisfaction of the Engineer.

907-244.04--Method of Measurement. Tree Pruning will be measured per each size of tree as noted on the drawings or as selected by the Engineer. Diameter of trees shall be as measured four feet six inches (4.5') above ground at the base of the tree.

Separate measurement for payment will not be made of any individual unit, operation, or incidental item involved in the work.

907-244.05—Basis of Payment. Tree Pruning, measured as prescribed above, shall be paid for at the contract unit price per each for each designated size, which price shall be full compensation for furnishing all materials and supplies, for performing all work necessary, and for all equipment, tools, labor, and incidentals necessary to complete the work.

Payment will be made under:

907-244-A: Tree Pruning, Size - per each

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-258-4 **CODE: (SP)**

DATE: 06/14/2005

SUBJECT: Miscellaneous Rest Area Facilities

Section 907-258, Miscellaneous Rest Area Facilities, is hereby added to and made a part of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction.

SECTION 907-258 -- MISCELLANEOUS REST AREA FACILITIES

907-258.01--Description. This item shall consist of constructing and installing concrete picnic tables and benches, wooden picnic tables and benches, charcoal grills, drinking fountains, trash receptacles, sewage dump station, sign (masonry and stone), and cast stone benches, each complete in place, in accordance with these Specifications and in reasonably close conformity with the locations, lines, grades, configurations, dimensions and other requirements shown on the plans or established.

907-258.02--Materials.

A. General. Unless otherwise stipulated, the materials used in this construction, in addition to the general requirements of these Specifications and the plans shall conform to the provisions and requirements prescribed in the sections of the Standard Specifications for the several items which constitute the complete structure.

All items will require approval by the Engineer from the manufacturer. The Contractor Shall submit eight copies of brochures or shop drawings for approval prior to ordering manufactured items. Other items may require testing as directed by the Engineer.

B. Concrete Picnic Table and Benches.

1. Concrete. Concrete for table top, seat top, and end supports shall be Class "A" Concrete. Concrete for table slabs will be paid for as concrete sidewalks - Pay Item No. 608-B.

2. Reinforcing Steel. Reinforcing steel shall conform to Section 711.

3. Paint for Table top and Seats. Paint or coating for table top and seats shall be an approved chlorinated rubber paint conforming to or exceeding Federal Specifications Number TT-P-91-D.

C. Wooden Picnic Tables and Benches. Wooden Picnic Tables shall be the model number 238-6GT, six feet long with galvanized pipe frame and treated wood top and seats, as manufactured by Iron Mountain Forge, Farmington, Missouri, or approved equal.

Picnic tables shall be secured to the concrete with lead shields, anchors, or other means as approved by the Engineer.

D. Charcoal Grill. Charcoal Grill shall be the Model 200-X Rotating Grill with post as manufactured by Iron Mountain Forge, Farmington, MO 63640, or approved equal. Post shall be set within a Class C concrete footing, size as recommended by manufacturer.

E. Drinking Fountain.

1. Waste Pipe. Waste pipe shall be of the size and type as shown on the plans and shall be standard PVC drain waste and vent piping.

2. Drain Pipe. Drain pipe shall be the size shown on the plans and shall conform to or exceed Commercial Standard CS 272-65 or CS 272.65.

3. Drinking Fountain. The drinking fountain shall be designed similar to the details shown on the plans, freeze-proof, and conforming to approved Handicapped Standards by the Engineer.

4. Concrete. Concrete, unless otherwise specified, shall be paid for as sidewalk, and have an approved exposed aggregate finish to match the finish on the adjacent sidewalk.

5. Valves (Stop and Drain). The cut-off valve shall be a standard brass stop and drain cut-off valve of the proper size and type as shown on the plans.

F. Trash Receptacle.

1. Trash Receptacle. The trash receptacle shall be the Aspen Series R-38 Standard with hinged top, leveling devices, galvanized metal liner, and hardware to secure the receptacle to the sidewalk, Empire Green in color with desert brown stone panels, model #R-38HT-202, as manufactured by United Receptacle, Inc., Pottsville, PA 17901-0870, or approved equal.

2. Concrete. Concrete, unless otherwise specified, shall be paid for as sidewalk, and have a finish to match the finish on the adjacent sidewalk.

G. Water Hydrant.

1. Water Hydrant. Steel body, self-closing, anti-freezing hydrant with heavy stainless operating springs, with ¾ inch supply as the model M-175 hydrant as manufactured by Murdock, Cincinnati, OH 45204, or approved equal. Color shall be selected by the Engineer.

2. Concrete. Concrete, unless otherwise specified, shall be paid for as sidewalk and have an approved exposed aggregate finish to match the finish on the sidewalk.

3. Valves (Stop and Drain). The cut-off valve shall be standard brass stop and drain cut-off valve of the proper size and type as shown on the plans.

H. Travel Trailer Sewage Dump Station (Modifications).

1. Sewage Dump Station. The sewage dump station shall be constructed similar to the details shown on the plans, with Schedule 40 galvanized steel pipe and fittings complete with vacuum breaker, and hose, in accordance with the plan details, and State Health Department minimum standards.

2. Concrete. Concrete unless otherwise specified shall be Class "B" conforming to Section 804 of the Standard Specifications and have an approved trowel finish.

3. Stand Pipe. Water stand pipe shall be standard galvanized Schedule 40 of the size shown on the plans.

4. Vent Pipe. Vent pipe shall be standard galvanized Schedule 40 of the size shown on the plans.

5. Signs. The signs shall be designed as shown on the details on the plans, constructed of 0.080 aluminum or 14 Ga. galvanized steel. The signs shall be manufactured by an approved sign company. The Contractor shall submit shop drawings.

I. Cast Stone Bench. Cast stone benches shall be constructed from the same material or an approved equal material as concrete picnic tables and benches.

J. Sign (Masonry and Stone).

1. Brick and Mortar. Brick and mortar shall be produced by the same manufacturer(s), and be the same type and kind, including bullnose and watertable units, and shall match the existing brick used on the Welcome Center Building, or approved equal.

2. Concrete Masonry Units. The concrete masonry units shall be hollow non-load bearing, light-weight aggregate, concrete masonry units conforming to ASTM Designation: C331-64T. Units shall be normal modular size for typical 3/8 inch mortar joint.

3. Concrete. Concrete, unless otherwise specified, shall be Class "B" conforming to Section 804 of the Standard Specifications.

4. Reinforcing Steel. Reinforcing steel shall conform to Section 711.

5. Precast Architectural Panel.

a. General:

Cement: Portland Cement shall conform to ASTM Designation: C-150, Type I or III.

Fine and coarse aggregate: Fine and coarse aggregate shall conform to ASTM Designation: C-33. Variations from aggregate gradations are permissible for the facing mix.

Reinforcement shall conform to ASTM Designation: C-185 for welded wire fabric.

Hot-dip galvanizing shall conform to ASTM Designation: A-153

Anchoring devices, inserts, etc., shall be either galvanized or corrosion resistant types approved by the Architect and as detailed on the drawings.

b. Textures and Finishes. Precast architectural concrete shall be honed finish, lightly textured, approximating finish of limestone, with color as selected by the Engineer.

c. Fabrication. Precast architectural concrete shall be sufficiently reinforced to withstand conditions on the sign, including handling and erection stresses. Deformed bars with one inch (1") or less clearance to an exterior face shall be galvanized.

Units shall be fabricated straight, smooth, and true to size and shape, with exposed edges and corners precise and square unless otherwise indicated.

Reglets, slots, holes, and other accessories shall be provided in units to receive cramps, dowels, reglets, waterstops, flashings, and other similar work as indicated.

Arises, inscriptions and details shall be faithfully executed to the Engineer's design.

Each precast item shall be marked to correspond to identification mark on shop drawings.

Location of anchors, inserts and blockouts shall be ± 3/8 inch from center line of location shown on drawings.

Rust-inhibitive coating shall be applied on damaged areas at welded connections, same as shop-applied material. Galvanizing repair coating shall be used on galvanized surfaces.

d. Mixes. Standard 6-inch by 12-inch cylinder strength of precast concrete shall not be less than 5,000 psi at 28 days when tested in accordance with ASTM Designation: C-39.

Absorption shall not be less than three percent (3%) and not more than seven percent (7%) when tested in accordance with ASTM Designation: C-97.

Minimum thickness of facing mix shall be 1 1/2 inches thick.. Backup concrete may be made with grey cement and aggregates conforming to requirements for cast-in-

place concrete.

e. Joint Material. Joint material shall be as recommended by the precast architectural concrete manufacturer, and as approved by the Engineer.

6. Letters and Symbols. Letters, including custom letters, and symbols shall be brass, in the shapes and sizes noted on the drawings, as manufactured by Metal Arts, A. R. K. Ramos, or Matthews.

The Engineer will provide camera ready art work of the symbols and custom letters to the Contractor for the manufacturer.

Method(s) of attaching letters and symbols to precast architectural concrete panel shall be approved by the Engineer.

K. Bollard. Pipe shall be schedule 40 steel pipe, in the size as noted on the drawings. Finial shall be the Linn Park Finial, as manufactured by Robinson Iron, Alexander City, AL 35011-1119, or approved equal. Pipe and finial shall be painted with 1 shop coat of a rust inhibitive primer and 2 field coats of an oil base exterior paint, color selected by the Engineer. Class B concrete required for pipe infill.

L. Metal Bench. Garden – Style all – steel bench, six feet long, color – green, as Bench 118 series as manufactured by DuMor, Inc., Mifflintown, PA 17059-0142, or approved equal.

Metal Bench shall be secured to pavement. Method of securing shall be reviewed with and approved by the Engineer.

907-258.03--Construction Requirements.

A. General. The method of construction, unless otherwise stipulated, shall conform to the provisions and requirements where applicable, prescribed in the standard specifications with the additions shown hereafter. All work shall be performed in a good workmanlike manner, to the satisfaction of the Engineer.

B. Concrete Picnic Tables and Benches. Concrete picnic tables and benches shall be constructed to the detailed dimensions shown on the plans. The handling and placing of concrete shall conform to Subsection 804.10. The top and edge surfaces of the table and benches shall receive a slick smooth finish.

The concrete shall be free of honeycomb and air pockets and in no case have a slump greater than one and one-half inches.

The ground under the slab shall be graded or shaped and compacted when necessary to insure a smooth, firm foundation for the slab. The ground adjacent to the slab shall be sloped to drain away from the slab in a manner so as to preserve the natural shape of the terrain as close as possible.

The concrete slab shall be poured around the table and benches in place and correctly aligned. Care shall be taken to place the expansion joint material around the top and bench supports as shown on the plans in a neat, secure manner. The slab shall be sloped to drain and receive an approved exposed aggregate finish to match the finish on the sidewalk.

The placing and fastening of reinforcement shall conform to Subsection 805.05.

The table shall be located as shown on the plans and as directed by the Engineer.

C. Wooden Picnic Tables and Metal Benches. Wooden picnic tables and metal benches shall be located and secured in an approved manner as shown on the plans and as directed by the Engineer.

D. Charcoal Grill. The charcoal grill with concrete footing shall be installed in accordance with the manufacturer's written instructions in the locations as noted on the plans.

E. Drinking Fountain. The drinking fountain shall be installed by skilled plumbers, concrete finishers, and workmen in an approved manner to the satisfaction of the Engineer, to the dimensions and details shown on the plans, or approved by the Engineer.

The fountain drain shall be located to drain to the existing drain field or an approved ditch as directed by the Engineer.

The concrete base shall be constructed as shown on the plans or as directed by the Engineer. The concrete will be paid for under separate pay item for that class of concrete.

F. Trash Receptacle. The trash receptacle shall be installed on and secured to a square concrete pad four inches thick, with outside dimensions six inches greater than the width of the trash receptacle, in locations designated by the Engineer.

The excavation when required to place the trash receptacle into the ground shall be disposed of as directed by the Engineer.

The concrete shall be placed and finished to match the adjacent sidewalk. On locations adjacent to existing sidewalks, top of concrete pad for the receptacle shall meet flush with existing walk. Slope elevation of pads no more than 1/8 inch per foot in order that water will not stand.

The method to secure the trash receptacle to the concrete pad shall be submitted to the Engineer for approval.

G. Water Hydrant. The water hydrant shall be shall be installed in accordance with the manufacturer's written instructions and the plans.

H. Cast Stone Bench. The cast stone benches shall be a similar design and size as shown on the plans. Brochures or shop drawings shall be submitted.

The benches shall be secured to the sidewalk or bench pad in an approved manner with epoxy cement or other approved cement, to the satisfaction of the Engineer.

I. Travel Trailer Sewage Dump Station. The travel trailer sewage dump station shall be constructed by skilled plumbers, concrete finishers, and workmen in an approved manner to the satisfaction of the Engineer, to the details and dimensions shown on the plans.

J. Sign (Masonry and Stone). The excavation required to place the sign into the ground shall be disposed of as directed by the Engineer.

The concrete base shall be constructed as shown on the plans or as directed by the Engineer. The placing and fastening of reinforcement shall conform to Subsection 805.05.

Concrete Masonry Unit and Brick construction shall be in accordance with Section 611, and to the satisfaction of the Engineer.

Precast architectural concrete panels shall be set straight, plumb, level, and square. Exposed facings shall be cleaned to remove dirt and stains which may be on the units after erection and completion of joint treatments. Panels shall be wash and rinse in accordance with precast manufacturer's recommendations. Other work shall be protected from damage due to cleaning operations. Do not use cleaning materials or processes which could change the character of exposed concrete finishes.

Letters and symbols shall be attached in accordance with the drawings, approved shop drawings, and to the satisfaction of the Engineer.

K. Bollard. Bollards shall be constructed plumb and in accordance with the drawings to the satisfaction of the Engineer. Welds shall be ground smooth prior to painting/ coatings application.

J. Metal Bench. Metal bench shall be located where noted on the plans. Metal bench shall be secured to pavement as approved by the Engineer.

907-258.04--Method of Measurement. Miscellaneous Rest Area Facilities, constructed and complete in accordance with the requirements of the contract, and accepted, will be measured by the unit quantity per each unit.

A unit of concrete picnic tables and benches shall consist of one table, two benches, the concrete slab shall be as indicated on the plans.

A unit of wooden picnic tables shall consist of one table with benches, and the devices to secure the table when required.

A unit of charcoal grill shall consist of the grill complete with steel post and concrete footing.

A unit of drinking fountain shall consist of all concrete, steel, masonry elements, piping, plumbing elements, and drains as shown on the plans.

A unit of trash receptacle shall consist of the receptacle, complete, with leveling devices and approved devices to secure the trash receptacle to the pavement.

A unit of water hydrant shall consist of the hydrant complete with connection to water supply, piping, cut off valve, drain and drain line (where shown), and concrete footing, located where shown on the plans and installed in accordance with manufacturer's directions.

A unit of travel trailer sewage dump station shall consist of one tower, one drain, signs and concrete as shown in the plan details.

A unit of cast stone bench shall consist of one bench seat and three bench supports.

A unit of sign (masonry and stone) shall consist of all concrete, steel, masonry elements, letters, as symbols shown on the plans.

A unit of bollard shall consist of steel pipe with finial, and concrete for footing and infill, as shown on the plans.

A unit of metal benches shall consist of one bench, and the devices to secure the bench when required.

Separate measurement for excavation and other individual items will not be made, it being understood that the cost thereof is included in one contract price bid per complete items.

907-258.05--Basis of Payment. Charcoal grills, drinking fountains, concrete picnic tables and benches, wooden picnic tables and benches, trash receptacles, water hydrants, travel trailer sewage dump station, sign (masonry and stone), and cast stone benches, each unit shall be paid for at the contract unit price bid per each, which price shall be full compensation for furnishing all materials and supplies; for performing all work necessary for each completed unit; and for all equipment, tools, labor and incidentals necessary to complete the work.

Payment will be made under:

907-258-A:	Charcoal Grill	- per each
907-258-B:	Drinking Fountain	- per each
907-258-C:	Concrete Picnic Table and Benches	- per each
907-258-D:	Wooden Picnic Table and Benches	- per each

907-258-E:	Trash Receptacle	- per each
907-258-F:	Water Hydrant	- per each
907-258-G:	Travel Trailer Sewage Dump Station	- per each
907-258-H:	Cast Stone Bench	- per each
907-258-I:	Sign, Masonry and Stone	- per each
907-258-J:	Metal Bench	- per each
907-258-K:	Bollard	- per each

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-259-4 **CODE: (SP)**

DATE: **05/19/2006**

SUBJECT: **Site Amenities**

PROJECT: **STP-0008-03(041) / 103975 -- Hinds County**

Section 907-259, Site Amenities, is hereby added to and made a part of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows.

SECTION 907-259 -- SITE AMENITIES

907-259.01--Description. This item shall consist of installing unlighted and lighted bollards, flag pole lights, sign lights and column uplights, each complete in place, in accordance with these Specifications and in reasonably close conformity with the locations, lines, grades, configurations, dimensions and other requirements shown on the plans or established.

907-259.02--Materials. Unless otherwise stipulated, the materials used in this construction, in addition to the general requirements of these specifications and the plans, shall conform to the provisions and requirements prescribed in the sections of the Standard Specifications for the several items which constitute the complete structure.

All items will require approval by the Engineer from the manufacturer. The Contractor submit six (6) copies of brochures or shop drawings for approval prior to ordering manufactured items. Other items may require testing as directed by the Engineer

A. Non-lighted Bollards. Bollards shall be Charleston Model Number BOL/CH44/12/DT/CA/DB, as manufactured by Holophane or other accepted models by Gardco, American Pole or approved equal.

B. Lighted Bollards. Bollards shall be Charleston Model Number BOL/CH44/12/DTL/CA/DB/S100/208 , as manufactured by Holophane or other accepted models by Gardco, American Pole or approved equal.

C. Flag Pole Lights. Flag pole lights shall be Model Number DF7-SP(W/ST) – HFL 250 HPS-208-BRP as manufactured by GARDCO or other accepted models by Kim, Greenlee or approved equal.

D. Sign Lights. Sign lights shall be Model Number DF7-SP(W/ST) – HFL-175-208-BRP as manufactured by GARDCO or other accepted models by Kim, Greenlee or approved equal.

E. Fluorescent Light @ Kiosk. Fluorescent lights (2’ x 4’ - 2 lamp) shall be Model Number

SWN 232 120 1/2 LT as manufactured by Day-Brite or other accepted models by Lithonia, Cooper or approved equal.

F. Weatherproof GFCI Receptacles. Weatherproof GFCI receptacle shall be commercial specification grade 20A 125V GFCI receptacle(s) as manufactured by Hubbell or other accepted models by Pass & Seymour, Leviton or approved equal. Color shall be black and verified with Project Engineer.

G. Column Uplights. Column lights shall be Model Number LTV10 NF 70MH208/RG10/GM10 as manufactured by KIM or other accepted models by Gardco, Greenlee or approved equal.

907-259.03--Construction Requirements. The Contractor shall provide and install site amenities in accordance with the drawings, special provisions, and the standard specifications. All work shall be performed in a good workmanlike manner, to the satisfaction of the Engineer.

907-259.04--Method of Measurement. Site Amenities of the type specified, constructed and complete in accordance with the requirements of the contract, will be measured by the unit quantity per each.

907-259.05--Basis of Payment. Site Amenities of the type specified shall be paid for at the contract unit price bid per each, which price shall be full compensation for furnishing all materials and supplies; for performing all work necessary for each completed unit; and for all equipment, tools, labor and incidentals necessary to complete the work.

Payment will be made under:

907-259-A:	Lighting Assembly, Non-lighted Bollards	-per each
907-259-B:	Lighting Assembly, Bollards	- per each
907-259-C:	Lighting Assembly, Flag Pole Lighting	- per each
907-259-D:	Lighting Assembly, Sign Lighting	- per each
907-259-E:	Lighting Assembly, Kiosk	- per each
907-259-F:	Weatherproof GFCI Receptacle	- per each
907-259-G:	Lighting Assembly, Column Uplights	- per each

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-282-3 **CODE: (SP)**

DATE: **08/02/05**

SUBJECT: **Irrigation System**

Section 907-282, Irrigation System, is hereby added to and made a part of the 2004 Edition of the Standard Specifications for Road and Bridge Construction as follows.

SECTION 907-282 -- IRRIGATION SYSTEM

907-282.01--Description. Lawn and shrub bed irrigation systems shall be constructed to the grades and conforming to the areas and locations shown on the plans.

Irrigation lines shown on the plans are essentially diagrammatic. Specific locations of equipment shall be established by the Contractor at the time of construction. Exceed spacing of heads as shown on the plans only with the permission of the Engineer.

907-282.01.1--Irrigation Operations. Irrigation operations shall be performed by a firm having a minimum of two consecutive years experience in this area of work and having installed other jobs of similar size and scope. Contractor shall provide a minimum of three references and a list of similar projects with the Client's names, addresses, and telephone numbers, when requested by the Engineer.

907-282.01.2--Field Investigations: The Contractor shall visit the job site and become familiar with the nature and location of the work, existing conditions, and other conditions that will be obligated to operate in the performance of the work.

907-282.01.3--Substitutions and Submittals. Substitutions shall be made only with the written approval of the Engineer. Substitutions will not be considered prior to opening of bids. Substitution of an irrigation head shall be accompanied by a Contractor prepared piping diagram noting pipe sizes, pressure loss calculations, and head locations necessary to achieve the desired watering provided by the system as designed.

The Contractor shall submit seven copies of manufacturer’s product data of materials specified herein for review and approval by the Engineer.

907-282.01.4--Department's Instruction and Maintenance Data. General: The Contractor shall furnish the following instructions and maintenance data. Final Acceptance will not be made until the Work has been reviewed and approved by the Engineer.

1) As-built plans: Two sets, noting exact locations of elements and changes to the plans in red.

2) Operation Manual: Two copies, bound in 1-inch diameter three ring binders, indexed and tabbed for easy reference, and labeled on spine and cover. Manual to include:

   A. Approved submittals,
   B. Installation instructions, including mounting details for control valves.
   C. Operating Instructions, including winterization procedures, recommended operation sequence, frequency, and length of operation cycle, as per relationship to estimated absorption rate, evaporation rate and anticipated GPM.
   D Maintenance Instructions: Items requiring manufacturer's product data and installation instructions. Complete warranty information, mail to manufacturer, and provide copies to the Department.

3) Extra Stock: In addition to the installed system, provide one sprinkler head of each size and type, one valve key (per valve) for operating manual valves, one key per valve box, two wrenches for each type of head cover, and two wrenches for removing and installing each type of head.

907-282.02--Materials.

907-282.02.1--General: Materials shall be new and without flaws or defects, and of quality and performance as specified. Overages at completion are property of the Contractor, and are to be removed from the site.

Materials and equipment specified by "Proprietary Specification" as manufactured by a particular company, etc., shall be for the express purpose of establishing minimum acceptable performance requirements. Acceptable manufacturers shall include:

A. The Toro Company - Irrigation Division
B. Rain Bird Sales, Inc. - Turf Division
C. Hunter Irrigation

The provision of providing other acceptable manufacturer's as potential substitutions shall not disregard the requirements of paragraph Subsection 907-282.01.3.

907-282.02.2--Delivery and Storage. Damaged materials will not be accepted. Any packaged materials shall be delivered to the site in the original, unopened containers. Materials delivered to site prior to actual usage shall be stored in a place not to interfere with other trades or construction operations and protected from damage by weather or other elements as needed.

907-282.02.3--Pipe and Pipe Fittings.

907-282.02.3.1--Plastic Piping. Plastic pipe shall be Class 160 SDR 26 - ASTM D2241 Polyvinyl Chloride (PVC) pipe NSF approved. Pipe up to and including 2½ inches in diameter shall have bell and socket joints. Pipe greater that 2½ inches in diameter shall have snap connections with rubber gasket joints.

907-282.02.3.2--Sleeves. Sleeves shall be of the size noted on the plans, and shall be schedule 40 PVC pipe.

907-282.02.3.3--Plastic Fittings and Risers. Plastic fitting and risers shall be Schedule 40 or Schedule 80 PVC. Risers above finished grade shall receive two coats of black exterior semi-gloss enamel paint.

907-282.02.3.4--PVC Solvent Cement. PVC solvent cement shall meet the requirements of ASTM Designation: D 2564.

907-282.02.3.5--Polyethylene Pipe and Fittings. Polyethylene pipe and fittings shall be installed between supply lines and heads. Thick wall, flexible, polyethylene pipe, with fittings that have male barbs on one end and either male or female screw ends opposite shall be used. Glue fittings and female barb adapters shall not be allowed. Pipe and fittings shall be Toro Funny Pipe and Fittings as manufactured by Toro-Irrigation Division, Riverside, California, or approved equal.

907-282.02.4--Valves.

907-282.02.4.1--Electric Control Valves. Electric control valves shall be as delineated on the drawings, or approved equal.

Water-tight connectors shall be Scotch Lock connectors with sealant for wiring connections at electric valves as manufactured by 3M – Scotch Brand, Rain Bird Sales, Inc.- Turf Division, King Innovation Company, or approved equal.

Valve box for electric valves shall be the 12-inch Standard Box with snap lock cover as manufactured by Armor Access Boxes, Rain Bird Sales, Inc.- Turf Division, Carson Industries, or approved equal.

907-282.02.4.2--Quick Couplers. Quick couplers, each with Key and Hose Swivel, shall be the 44 Series Coupler and Coupler Key, and SH series swivel hose connector, as manufactured by Rain Bird Sprinkler Mfg. Corp., Glendora, CA., or approved equal.

Quick couplers shall be installed inside a valve box as noted on the plans.

907-282.02.4.3--Isolation Valves. Gate valves shall be manufactured in accordance with AWWA C500 and shall have a rated water working pressure of 200 PSI. Gate valves shall be iron body, bronze mounted, double disc, parallel seat, non-rising stem type. Each valve shall have "O" ring type stem seal, standard 2-inch AWWA square operating nut, and shall be opened by COUNTER-CLOCKWISE stem rotation. Except where otherwise specified, indicated, or required for the application involved, gate valves ends shall be AWWA Specification C111 mechanical joint type, with plain rubber gaskets. Gate valves shall be as manufactured by Waterous Company, Clow, Mueller, or approved equal.

One (1) key for every three valves installed shall be provided.

With each valve, install a valve box which shall be standard cast iron two-piece 5¼-inch inside shaft diameter screw adjustable type, consisting of a cover marked "WATER", and upper telescoping section, and a lower section. Where necessary to provide extra depth, provide cast iron extension pieces as required.

907-282.02.5--Sprinkler Heads. Sprinkler heads shall be as delineated on the drawings, or approved equal.

907-282.02.6--Control Wire. Control Wire and common wire shall be a minimum AWG 14 size, copper wire suitable for direct burial.

907-282.02.7--Low Point Drains. Low-point drains shall be an Automatic Valve model number 290-02 as manufactured by Toro-Irrigation Division, or approved equal. The Contractor shall provide two drains at the lowest points of each zone, with each atop an 8-inch by 8-inch by 8-inch area of coarse gravel.

907-282.02.8--Automatic Controller. Automatic controllers shall be as delineated on the drawings, or approved equal. With each controller, the Contractor shall provide one Automatic Rain/ Freeze Switch, the Rain/Freeze-Clik, as manufactured by Hunter Irrigation, or approved equal..

907-282.02.9--Backflow Preventer. The backflow preventer shall be as manufactured by Watts, Orbit Irrigation Products, Inc, Febco, or approved equal. With each backflow preventer, the Contractor shall provide one above ground enclosure as specified on the drawings, or an approved equal.

907-282.03--Construction Requirements.

907-282.03.1--Pressure/ Flow Test. Immediately after installation of meters, and before installing pipe, the Contractor shall test and provide written results to the Engineer of the static pressure, dynamic pressure, and gallons per minute. Tests shall be performed at the beginning tap or meter and note as such on the written results.

The Contractor shall receive approval from the Engineer to proceed with construction along with proposed revisions (if required due to test results) prior to installation.

907-282.03.2--Execution and Trenching. Trenches shall be excavated to pipe grade depth. The width of trench shall be at least 3 1/2 inches. Any over-excavation shall be backfilled and hand tamped prior to installing piping. In soils containing rock or other hard material that may damage the pipe, the trench shall be excavated deeper than required and backfilled to pipe grade with selected fine earth or sand. The trenches shall be kept free of obstructions and debris that would damage pipe.

More than one pipe may utilize the same trench, however, pipe arrangement in the trench shall remain continuous throughout the run of pipe/ trench and the amount of cover shall not be reduced to accommodate additional pipe.

907-282.03.3--Piping System.

907-282.03.3.1--Cover. Pipe system cover shall be as follows:

Lawn and planting areas:	14 inches below finish grade
Roadways:	36 inches below finish grade
Parking areas:	24 inches below finish grade

907-282.03.3.2--Clearances. A minimum 1-inch vertical clearance shall be maintained between lines crossing at an angle greater than 45 degrees.

907-282.03.4--Piping Erections.

907-282.03.4.1--Threaded Plastic Pipe. Do not use solvent cement on threaded joints. Threaded joints are to be wrapped with Teflon tape. When threaded pipe is used, material shall be Schedule 80 PVC.

907-282.03.4.2--Cemented Joints for PVC Bell End Pipe and PVC Pipe with Socket Fittings. These joints shall meet the requirements of ASTM Designation: D 2855.

907-282.03.5--Valves. Values shall be installed plumb to within 1/16 inch. Wire connectors shall be installed to wiring in accordance with the manufacturer's written instructions. A 2-foot section, beginning at the Wire connection, is to be wrapped around a minimum 1/2-inch diameter pipe to protect against electrical surges from lightning..

907-282.03.6--Sprinklers. Sprinklers shall be installed plumb to within 1/16 inch. Heads along walks and curbs shall be set flush to within 1/8 inch. Other heads shall be set as per details and plans.

907-282.03.7--Control Wire. Control wire shall be buried in the same pipe trench, and bundle and tape together at not more than 10-foot intervals.

907-282.03.8--Backfill: Do not backfill until system, or that portion thereof, has been tested and approved. Trench shall be filled to within three inches of top with excavated soil and water to compact soil. Fill the top three inches of the trench with existing topsoil in planting areas and wheel roll until compaction of backfill is same as surrounding soil.

907-282.03.9--Electrical Connections. Electrical connections shall be in strict accordance with the latest edition of the National Electrical Code. Contractor shall provide the electrical connection to the system as designated on the plans and as specified herein. Splices to electrical

wire between the controller to valves or power supply shall be made within watertight junction boxes.

907-282.03.10--Automatic Controller. Location and installation of the automatic controller shall be as per plans, and approved by Engineer prior to installation.

Rain–Freeze device shall be located where approved by the Engineer.

907-282.03.11--Flushing. Following installation of piping, risers and valves, but prior to installation of sprinkler heads, the piping system shall be thoroughly flushed under a full head of water. Flushing shall continue for three minutes through the furthermost valve. After flushing, the risers shall be capped.

907-282.03.12--Backflow Preventer. Backflow preventer shall be set in a level horizontal position twelve inches above grade inside of an insulated backflow preventer box, as noted on the plans.

907-282.03.13--Testing. The tests shall be performed in the presence of the Engineer.

907-282.03.13.1--Pressure Test. The Contractor shall hydrostatically test the main piping system between meter and valves in place prior to backfilling. A minimum pressure of 50 PSI shall be maintained without pumping for period of one hour. The test shall be considered acceptable if no leakage or loss of pressure is evident during test period. Any leaks shall be repaired. Retests shall be performed until test pressure can be maintained for duration of test. It is assumed that a water supply with a 50-PSI pressure is available on site, wherein no mechanical pumping equipment is required.

907-282.03.13.2--Operation Test. At the conclusion of pressure test, sprinkler heads shall be installed and entire system tested for operation under normal operating pressure. Heads shall be adjusted as noted on plans. The entire system shall then be retested. Test is acceptable if the system operates in a satisfactory manner, with uniform coverage of areas to be irrigated.

907-282.03.14--Guarantee. The Work shall be guaranteed for one year from date of final acceptance against defects in material, equipment and workmanship. The Contractor shall repair damage to the premises resulting from leaks or other defects in material, equipment and workmanship to the satisfaction of the Department. Repairs, if required, shall be done promptly at no cost to the Department.

907-282.03.15--Final Acceptance. Final acceptance shall be in accordance with Section 105 of the Standard Specifications.

907-282.04--Method of Measurement.

907-282.04.1--Sprinkler Heads. Sprinkler heads, accepted in place, will be measured per each for the type of head specified, including nozzle.

Excavation, fittings to lateral pipe including risers, if necessary, adjustment of spray pattern, setting to proper grade, and backfilling, will not be measured for separate payment.

907-282.04.2--Piping. Piping, as noted on the plans and as adjusted by the Contractor in the field, will be measured per linear foot for each size specified.

Miscellaneous fittings, PVC cleaner and glue, and operations necessary to fit and contour pipe to the trench will not be measured for separate payment.

907-282.04.3--Sleeves. Sleeves, as noted on the plans and as adjusted by the Contractor in the field, will be measured per linear foot for each size specified.

Boring under existing pavement, miscellaneous fittings, PVC cleaner and glue, and operations necessary to install the sleeves will not be measured for separate payment.

907-282.04.4--Valve Control Wire. Valve control wire, as needed for power supply and control of the electric control valves from the electric controllers, shall be measured per linear foot.

Miscellaneous fittings, water–tight junction boxes, if necessary, and curling of wire at valves will not be measured for separate payment.

907-282.04.5--Trench Excavation and Backfill. Trench excavation and backfill, as needed for piping and wiring, will be measured per linear foot.

Depth or width of trench will not be considered for separate payment.

907-282.04.6--Meter with Meter Box. Meters with meter box, complete and in place, will be measured per each.

Tap or connection to existing tap, cut off valves, meter deposit, or backfilling will not be measured for separate payment.

907-282.04.7--Electric Controller. Electric controllers, complete and in place, will be measured per each.

Connection to power supply, installation of rain-freeze switch, rigid galvanized conduit above grade with straps, ground rod and ground wire will not be measured for separate payment.

907-282.04.8--Electric Control Valve, Isolation Valve, and Quick Coupler Valve. Electric control valves, isolation valves, and quick coupler valves, complete and in place, will be measured per each.

Excavation, installation of valve box, backfilling, scotch lock protectors, and connection to valve wiring will not be measured for separate payment.

907-282.04.9--Backflow Preventer. Where noted on the plans, backflow preventer, complete and in place, will be measured per each.

Installation of backflow preventer box, backfilling, miscellaneous fittings and piping, concrete base, insulated enclosure, adjusting, and connection to piping will not be measured for separate payment.

907-282.05--Basis of Payment.

907-282.05.1--Sprinkler Heads. Accepted quantities for each type of sprinkler head will be paid for at the contract unit price per each. Prices paid shall be full compensation for completing the work.

907-282.05.2--Piping and Sleeves. Accepted quantities for each size of piping will be paid for at the contract unit price per linear foot. Prices paid shall be full compensation for completing the work.

907-282.05.3--Valve Control Wire and Trench Excavation and Backfill. Accepted quantities for valve control wire and trench excavation and backfill will be paid for at the contract unit price per linear foot. Prices paid shall be full compensation for completing the work.

907-282.05.4--Meter with Meter Box, Electric Controller, Electric Control Valve, Isolation Valve, and Quick Coupler with Key and Hose Swivel, and Backflow Preventer. Accepted quantities for meter with meter box, electric controller, electric control valve, isolation valve and quick coupler will be paid for at the contract unit price per each. Prices paid shall be full compensation for completing the work.

Payment will be made under:

907-282-A:	Sprinkler Head, Type	- per each
907-282-B:	Piping, Size	- per linear foot
907-282-C:	Sleeves, Size	- per linear foot
907-282-D:	Valve Control Wire	- per linear foot
907-282-E:	Trench Excavation and Backfill	- per linear foot
907-282-F:	Meter with Meter Box, Size	- per each
907-282-G:	Electric Controller, Type	- per each
907-282-H:	Electric Control Valve, Size	- per each

907-282-I:	Backflow Preventer (__Size___)	- per each
907-282-J:	Isolation Valve, Size	- per each
907-282-K:	Quick Coupler with Key and Hose Swivel	- per each

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-290-2 **CODE: (SP)**

DATE: 6/20/2006

SUBJECT: Flagpole

Section 907-290, Flagpole, is hereby added to and made part of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows:

SECTION 907-290 -- FLAGPOLE

907-290.01--Description. This work shall consist of furnishing all materials and erecting a flagpole as indicated on the plans or established.

907-290.02--Materials.

907-290.02.1--General. Unless otherwise stipulated, the materials used in this construction, in addition to the general requirements of this Special Provision, shall conform to the applicable sections of the Standard Specifications.

907-290.02.2--Concrete for Flagpole Footing. Concrete for the flagpole footing shall conform to Class "B" Concrete, meeting the requirements of applicable subsections of Section 804 of the Standard Specifications.

907-290.02.3--Flagpole. The flagpole shall be an approved groundset tapered aluminum flagpole, having an approximate 30-foot exposed height. The pole shall be complete with an approved ornamental finial, umbrella type revolving truck, tiedown cleat with cover constructed of similar material capable of being padlocked in the cover (closed) position, two No. 10 (5/16") polypropylene halyards with solid bronze swivel snaps per halyard, ground sleeve, and ornamental base collar.

The pole shall be made from 6063T6 extruded aluminum tubing with approximately one inch every five to six feet straight taper, with a butt diameter of approximately six inches and top diameter of approximately three and one half inches and have an approved satin finish. Pole wall thickness to be a minimum of 0.156 inches. Base collar finish shall match pole finish.

907-290.02.4--Descriptive Data. Six (6) copies of material descriptive data, in the form of brochures or shop drawings, shall be submitted for review and approval prior to installation of the materials.

907-290.03--Construction Requirements. The flagpole shall be erected plumb in an approved manner to the satisfaction of the Engineer and in accordance with the manufacturer's details and recommendations. Material excavated in flagpole construction shall be disposed of as directed by the Engineer.

907-290.04--Method of Measurement. Flagpole, complete in place and accepted, will be measured per each. Separate measurement for payment will not be made of any individual unit, operation, or incidental item involved in this construction.

907-290.05--Basis of Payment. Flagpole, measured as prescribed above, will be paid for at the contract unit price per each complete unit, which price shall be full compensation for furnishing all materials and supplies, for all excavation, backfilling and disposal of surplus material, and for any other work required to complete the flagpole installation.

Payment will be made under:

907-290-A: Flagpole - per each

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-304-4 **CODE: (SP)**

DATE: **05/02/2006**

SUBJECT: **Crushed Stone Granular Materials**

Section 907-304, Granular Courses, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-304.02--Materials. After the first paragraph of Subsection 304.02.1 on page 183, add the following:

Gradation requirements for crushed stone granular material shall meet the following:

Crushed Stone

Sieve Size	Percent Passing by Weight
1 1/2 inch	100
1 inch	90 - 100
1/2 inch	62 - 90
No. 4	30 - 65
No. 10	15 - 40
No. 200	3 - 16

Gradation requirements for crushed stone granular material size 825 shall meet the following:

Size 825

Sieve Size	Percent Passing by Weight
2 inch	100
1 1/2 inch	90 - 100
1 inch	75 - 98
1/2 inch	60 - 85
No. 4	40 - 65
No. 8	28 - 54
No. 16	19 - 42
No. 50	9 - 27
No. 200	4 - 18

Granular material, RAP shall be milled recycled asphalt pavement and shall be visually inspected by the Engineer to insure it is free from chunks and deleterious materials.

907-304.03--Construction Requirements.

907-304.03.5--Shaping, Compacting and Finishing. Delete the first table in Subsection 304.03.5 on page 186 and substitute the following:

Granular Material Class	Lot Average	Individual Test
7,8,9 or 10	97.0	93.0
5 or 6	99.0	95.0
3 or 4	100.0	96.0
1 or 2	102.0	98.0
Crushed Stone Courses*	99.0	95.0

* When placed on filter fabric on untreated subgrade, the individual tests and the average of the five (5) tests shall equal or exceed the following values:

Lot Average	Individual Test
96.0	92.0

Before the last paragraph of Subsection 304.03.5 on page 186, add the following:

Unless otherwise specified, density for granular material, RAP, shall be achieved by two passes of an approved roller and density tests will not be required.

For Size 825 crushed stone base, the required density shall equal or exceed ninety-nine percent (99.0%) with no single density below ninety-five percent (95.0%).

907-304.05--Basis of Payment. Add the "907" prefix to pay items 304-D, 304-E, 304-F, 304-G & 304-H on page 187.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-401-2 **CODE: (IS)**

DATE: 11/04/2005

SUBJECT: Hot Mix Asphalt (HMA)

Section 401, Hot Mix Asphalt (HMA) - General, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

Delete in toto Subsection 401.02.6.2 on pages 248 and 249, and substitute:

907-401.02.6.2--Assurance Program for Mixture Quality. The Engineer will conduct a quality assurance program. The quality assurance program will be accomplished as follows:

1) Conducting verification tests.
2) Validate Contractor test results.
3) Periodically observing Contractor quality control sampling and testing.
4) Monitoring required quality control charts and test results.
5) Sampling and testing materials at any time and at any point in the production or laydown process.

The rounding of all test results will be in accordance with Subsection 700.04.

The Engineer will conduct verification tests on samples taken by the Contractor under the direct supervision of the Engineer at a time specified by the Engineer. The frequency will be equal to or greater than ten percent (10%) of the tests required for Contractor quality control and the data will be provided to the Contractor within two asphalt mixture production days after the sample has been obtained by the Engineer. At least one sample shall be tested from the first two days of production. All testing and data analysis shall be performed by a Certified Asphalt Technician-I (CAT-I) or by an assistant under the direct supervision of the CAT-I. Certification shall be in accordance with the *MDOT HMA Technician Certification Program* chapter in the Materials Division Inspection, Testing, and Certification Manual. The Department shall post a chart giving the names and telephone numbers for the personnel responsible for the assurance program.

The Engineer shall be allowed to inspect Contractor testing equipment and equipment calibration records to confirm both calibration and condition. The Contractor shall calibrate and correlate all testing equipment in accordance with the latest versions of the Department's Test Methods and AASHTO Designation: R 18.

Random differences between the Engineer's verification tests and the current running average of four quality control tests at the time of obtaining the verification sample will be considered acceptable if within the following limits:

Item	Allowable Differences
Sieve - % Passing	
3/8-inch and above	6.0
No. 4	5.0
No. 8	4.0
No. 16, for 4.75 mm mixtures ONLY	3.5
No. 30	3.5
No. 200	2.0
AC Content	0.4
Specimen Bulk SG, Gmb @ N_{Design}	0.030
Maximum SG, Gmm	0.020

If four quality control tests have not been tested prior to the time of the first verification test, the verification test results will be compared to the average of the preceding quality control tests. If the verification test is the first material tested on the project or if a significant process adjustment was made just prior to the verification test, the verification test results will be compared to the average of four subsequent quality control test results. For all other cases after a significant process adjustment, the verification test results will be compared to the average of the preceding quality control tests (taken after the adjustment) as in the case of a new project start-up when four quality control tests are not available.

In the event that; 1) the comparison of the Contractor's running average quality control data and Engineer's quality assurance verification test results are outside the allowable differences in the above table, or 2) if a bias exists between the results, such that one of the results is predominately higher or lower than the other, and the Engineer's results fail to meet the JMF control limits, the Engineer will investigate the reason immediately. As soon as the need for an investigation becomes known, the Engineer will increase the quality assurance sampling rate to the same frequency required for Contractor testing. The additional samples obtained by the Engineer may be used as part of the investigation process or for routine quality assurance verification tests. The Engineer's investigation may include testing of the remaining quality control split samples, review and observation of the Contractor's testing procedures and equipment, and a comparison of split sample test results by the Contractor quality control laboratory, Department quality assurance laboratory and the Materials Division laboratory. The procedures outlined in the latest edition of MDOT's Field Manual for HMA may be used as a guide for the investigation. In the event that the Contractor's results are determined to be incorrect, the Engineer's results will be used for the quality control data and the appropriate payment for the mixture will be based on the procedures specified in Subsection 401.02.5.8(j).

The Engineer will periodically witness the sampling and testing being performed by the Contractor. The Engineer, both verbally and in writing, will promptly notify the Contractor of any observed deficiencies. When differences exist between the Contractor and the Engineer which cannot be resolved, a decision will be made by the State Materials Engineer, acting as the referee. The Contractor will be promptly notified in writing of the decision. If the deficiencies are not corrected, the Engineer will stop production until corrective action is taken.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-403-4 **CODE: (IS)**

DATE: **11/04/2005**

SUBJECT: **Hot Mix Asphalt (HMA)**

Section 403, Hot Bituminous Pavement, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-403.05.2--Pay Items. Add the "907" prefix to the pay items listed on page 275 & 276.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-603-6 **CODE: (SP)**

DATE: **07/12/2005**

SUBJECT: **3-inch to 12-inch Corrugated Polyethylene Pipe**

PROJECT: **STP-0008-03(041) / 103975 -- Hinds County**

Section 603, Culverts and Storm Drains, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby modified as follows:

907-603.02--Materials. Three-inch to twelve-inch corrugated polyethylene pipe shall meet the requirements of Subsection 708.19.

907-603.05--Basis of Payment. Add the "907" prefix to pay item 603-PE on page 366 for 3-inch to 12-inch corrugated polyethylene pipe.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-608-3 **CODE: (SP)**

DATE: **08/02/2005**

SUBJECT: **Concrete Sidewalks**

Section 608, Concrete Sidewalks, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-608.02--Materials. After the last paragraph of Subsection 608.02 on page 390, add the following:

Colored concrete sidewalk materials shall be manufactured by L. M. Scofield Company, Butterfield Color, Solomon Colors, or approved equal.

A. Coloring Agents: Contractor may elect to color the concrete integrally using the manufacturer's recommended admixture for color-conditioned concrete, or may apply the manufacturer's recommended dry-shake to the surface of the freshly poured concrete.

   Colors for colored sidewalk shall be selected by the Engineer from a Standard or Designer color charts.

B. Curing and Finishing Material: Contractor shall utilize the manufacture's recommended color–matched curing and finishing material. Curing materials or methods for uncolored concrete sidewalks shall not be used with colored concrete sidewalks.

Once the color and method of coloring have been selected, the Contractor shall provide a 4-foot square panel, separate from proposed sidewalk, to be reviewed and approved by the Engineer. Engineer will evaluate color as compared to color chart and texture of broom finish.

Subsequent panels may be required, if finish or color are unacceptable to the Engineer. The Contractor shall remove unaccepted panels immediately from site. Accepted panel shall remain until colored concrete sidewalks have been completed by the Contractor, at which time the Contractor shall remove the panel from the site.

907-608.03.4--Handling, Measuring, Proportioning, and Mixing Materials. After the first paragraph of Subsection 608.03.4 on page 391, add the following:

Should an integral coloring method be selected by the Contractor, the Contractor shall mix coloring agent in strict accordance with the manufacture's written instructions. Copies of the manufacturer's written instructions shall be furnished to the Engineer prior to manufacture and placement of colored concrete.

Should a dry-shake applied coloring method be selected by the Contractor, the Contractor shall measure and apply coloring agent in strict accordance with the manufacturer's written instructions. Copies of the manufacturer's written instructions shall be furnished to the Engineer prior to manufacture and placement of colored concrete.

907-608.03.4--Protection and Curing. After the second paragraph of Subsection 608.03.7 on page 392, add the following:

Protection and curing materials and methods of application for colored concrete sidewalk shall be in strict accordance with the manufacturer's written instructions. Copies of the manufacturer's written instructions shall be furnished to the Engineer prior to manufacture and placement of colored concrete.

907-608.04--Method of Measurement. After the last paragraph of Subsection 608.04 on page 392, add the following:

Colored Concrete Sidewalk, completed and accepted, will be measured by the square yard. Sample panels will not be measured for separate payment.

907-608.05--Basis of Payment. After the first paragraph of Subsection 608.05 on page 392, add the following:

Colored Concrete Sidewalk will be paid for at the contract unit price of square yard, which shall be full compensation for completing the work.

After the last pay item listed on page 608-3, add the following:

907-608-C: Colored Concrete Sidewalk - per square yard

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-626-3 **CODE: (SP)**

DATE: 07/21/2004

SUBJECT: Thermoplastic Markings

Section 626, Thermoplastic Traffic Markings, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-626.03.1.2--Construction Details. After the first sentence of the eighth paragraph of Subsection 626.03.1.2 on Page 445, add the following:

For 4-inch stripe, additional beads by the drop-on method shall be applied at a rate of not less than two pounds of beads per 100 feet of four-inch stripe.

907-626.04--Method of Measurement. After the second paragraph of Subsection 626.04 on Page 445, add the following:

Four-inch equivalent detail traffic stripe will be measured by the linear foot from end-to-end of individual stripes. Measurements will be made along the surface of each stripe and will exclude skip intervals where skips are specified. Stripes more than four inches in width will be converted to equivalent lengths of four-inch stripe.

After the last paragraph of Subsection 626.04 on Page 446, add the following:

When transverse railroad bands, pedestrian crosswalks and stop lines are measured by the linear foot of 4-inch equivalent stripe, stripes more than four inches in width will be converted to equivalent lengths of four-inch widths.

907-626.05--Basis of Payment. Add the following pay items to the list of pay items on page 446.

907-626-A:	4" Thermoplastic Traffic Stripe, Skip White	- per linear foot or mile
907-626-B:	4" Thermoplastic Traffic Stripe, Continuous White	- per linear foot or mile
907-626-C:	4" Thermoplastic Edge Stripe, Continuous White	- per linear foot or mile
907-626-D:	4" Thermoplastic Traffic Stripe, Skip Yellow	- per linear foot or mile
907-626-E:	4" Thermoplastic Traffic Stripe, Continuous Yellow	- per linear foot or mile
907-626-F:	4" Thermoplastic Edge Stripe, Continuous Yellow	- per linear foot or mile

907-626-G:	Thermoplastic Detail Stripe, Color, 4" Equivalent Length	- per linear foot
907-626-H:	Thermoplastic Legend, Color, 4" Equivalent Length	- per linear foot or square foot

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-626-4 **CODE: (SP)**

DATE: 06/10/2004

SUBJECT: Thermoplastic Markings

Section 626, Thermoplastic Traffic Markings, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-626.02--Materials. After the first paragraph of Subsection 626.02.1 on page 443, add the following:

Blue-ADA thermoplastic marking material shall meet the requirements of Subsection 720.02 with the exception that the color shall be blue-ADA.

907-626.04--Method of Measurement. After the last paragraph of Subsection 626.04 on page 446, add the following:

Thermoplastic Legend, Handicap Symbol of the color specified will be measured per each as determined by actual count in place.

907-626.05--Basis of Payment. Delete the first sentence under Subsection 626.05 on page 446 and substitute the following:

Thermoplastic traffic markings will be paid for at the contract unit price per mile, linear foot, square foot or each, as applicable, which shall be full compensation for completing the work.

Add the following pay items after pay item 626-G on page 446.

907-626-G:	Thermoplastic Detail Stripe, Blue-ADA	- per linear foot
907-626-H:	Thermoplastic Legend, Blue-ADA	- per square foot
907-626-H:	Thermoplastic Legend, Handicap Symbol, Color	- per each

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-683-5 **CODE: (SP)**

DATE: **05/30/06**

SUBJECT: **Low Mast Type Lighting Assembly**

PROJECT: **STP-0008-03(041) / 103975 – Hinds County**

Section 683, Lighting Assemblies, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-683.01--Description. Delete the first sentence of the first paragraph of Subsection 683.01 on page 573 and substitute the following:

In addition to the requirements set forth in Section 681, lighting assemblies shall consist of low mast lighting assemblies.

Delete the third sentence of the first paragraph and replace it with the following:

The low mast lighting assemblies of the types required shall consist of pole, luminaire, anchor bolts lamp, and miscellaneous hardware.

907-683.02--Materials. Delete Section 683.02.2 on page 574 and substitute the following:

907-683.02.2--Low Mast Lighting Assembly.

907-683.02.2.1--Poles.

The pole shall have a minimum wall thickness of 0.156 inch. The pole shall have a tapered wall increasing in thickness from the top to the base in proportion to the load and ground line moment requirements. The post will be reinforced in areas of handholes and special hardware attachments.

The pole shall be Holophane Model Number CIS/2224-DB-BHC-(48/96)/(1/2)-CA/DB-CLD (Types P1 & P2) or other accepted models by Valmont, Lithonia or approved equal. Type P2 shall have two fixtures on it utilizing am Architectural arm mount by Holophane (Boston Harbor Mast) or other accepted models by Valmont, Lithonia or approved equal Boston Harbour cross arm painted to match with luminaire fitting adapter.

Performance Criteria – The pole shall be designed with a minimum safety factor of 2:1 and have no more than a 10% deflection at full wind loading. The pole shall deflect no more than 5% of the above-ground length with 200 lbs. of lateral top load (stiffness).

Pole Top Style - D1 for drilling for one unit and D2 for drilling for two units @ 180 degrees.

Wire Entrance – The anchor base shall a minimum conduit entry of six inches (6") I.D.

Finish – The surface of the pole shall be uniform and consistent for the entire length of the pole. The resin shall contain pigment to improve ultraviolet resistance. Solid coloration will be throughout the structure of the pole. The pole coloring shall be black.

Handhole – The handhole will be a 3" x 5" oval. The handhole cover shall be non-corrosive metal and painted to match the post. The handhole cover shall be concealed by the ornamental slipover decorative base cover.

Anchor Bolts – Anchor bolts shall be made of steel in accordance with ASTM Designation: F 1554, Grade 55. Anchor bolts shall be galvanized as per ASTM Designation: A 123. Minimum yield strength shall be 50,000 psi and "L" shaped. Anchor bolts shall be provided for each pole with two (2) hex nuts and washers per bolt. A bolt layout template shall be provided by the manufacturer for proper bolt installation. The number of anchor bolts and design yield strength shall be as recommended by the manufacturer.

Base Cover – Pole base shall be per ASTM A36 and shall telescope pole shaft and be circumferentially welded top and bottom. Base cover shall be two piece, interlocking construction.

Finish – Galvanized poles per ASTM A123. Painted poles shall be semi-gloss powder paint.

907-683.02.2.2--Luminaires.

Luminaire – The luminaire shall be an Architectural Arm mounted high efficiency fixture using a high efficiency, Illuminating Engineering Society (I.E.S.) Type III prismatic acrylic reflector panels for P1 assemblies and Type V for P2 assemblies. An internal reflector or glass refractor shall not be used. All I.E.S. photometric files to be readily available through manufacturer's web site.

The luminaries shall be the Esplanade Model Number ESU250MH24Z4 w/ S-64457 lamp by Holphane for P1 assemblies and ESU250MH24Z6 w/ S-64457 lamp by Holophane for P2 assemblies or other accepted models by LSI, Lithonia or approved equal. No light fixture shall be accepted without written approval of the engineer.

Ballast – The ballast shall be easily accessible in an upper housing using a latch/strike plate connection to open a tilt-back power module. Ballast and fixture shall be from same manufacturer. The ballast shall be 240 Volt for assemblies type P1 & P2.

Socket – A mogul-base socket shall be used for 250 Watt metal Halide. An encapsulated plug in starter shall be used.

907-683.10.5--Basis of Payment. Delete Pay Item 683-B on page 576 and substitute the following:

907-683-B: Lighting Assembly, Low Mast, Type - per each

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-701-2 **CODE: (IS)**

DATE: 01/12/2006

SUBJECT: Portland Cement

Section 701, Hydraulic Cement, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-701.02--Portland Cement. Delete the third paragraph and table in Subsection 701.02 on page 596, and substitute the following:

When Portland cement concrete or cement for soil stabilization is exposed to moderate or severe soluble sulfate conditions, or to seawater, cement types and replacement of cement by Class F fly ash (FA), ground granulated blast furnace slag (GGBFS), or metakaolin shall be as follows:

Cementitious Materials for Soluble Sulfate Conditions

Sulfate Exposure	Water-soluble sulfate (SO_4) in soil, % by mass	Sulfate (SO_4) in water, ppm	Cementitious material required
Moderate and Seawater	0.10 - 0.20	150 - 1500	Type II*, ** cement, or Type I cement with one of the following replacements of cement: 25% Class F, FA, or 50% GGBFS, or 10% metakaolin
Severe	0.20 - 2.00	1500 - 10,000	Type II* cement with one of the following replacements of cement: 25% Class F, FA, or 50% GGBFS, or 10% metakaolin

* Type I cement with a maximum 8% tricalcium aluminate may be used in lieu of Type II cement.

** Class F, FA or GGBFS may be added as a replacement for Portland cement in accordance the proportions as listed in this table.

Class C fly ash shall not be used as a replacement for Portland cement in any of the sulfate exposure conditions listed above.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-708-3 **CODE: (IS)**

DATE: 01/12/2006

SUBJECT: Non-Metal Drainage Structures

Section 708, Non-Metal Structures and Cattlepasses, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-708.02.1.2--Fly Ash. In the first sentence of Subsection 708.02.1.2 on page 639, change "20 percent" to "25 %".

907-708.02.3.2--Marking. Delete the second sentence of Subsection 708.02.3.2 on page 640, and substitute the following:

Machine made pipe shall be marked in accordance with one of the following methods: 1) the pipe shall be inscribed on the outside of the pipe and stenciled on the inside of the pipe, or 2) the pipe shall be inscribed on the inside of the pipe, only. All other pipe may be stenciled.

907-708.22.2--Exceptions to AASHTO. Delete the sixth paragraph of Subsection 708.22.2 on page 647.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-711-3 **CODE: (IS)**

DATE: 09/26/2005

SUBJECT: Synthetic Structural Fiber Reinforcement

Section 711, Reinforcement and Wire Rope, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

After Subsection 711.03.4.3 on page 665, add the following:

907-711.04--Synthetic Structural Fiber. Synthetic structural fibers shall meet the requirements of ASTM Designation: C 1116, Section 4.1.3, Note 3. The fibers shall be monofilament made of polypropylene or polypropylene/polyethylene blend meeting the following conditions:

Property	Results
Length, minimum	1.5 inches
Aspect Ratio (length / equivalent diameter)	90
Breaking tenacity, minimum *	530 mN/tex
(Tensile Strength, minimum	70 ksi)
Chord modulus, minimum *	980 cN/tex
(Modulus of Elasticity, minimum	1,300 ksi)

* When tested in accordance with ASTM Designation: D 3822

The dosage rate for the fibers shall be a minimum of three pounds per cubic yard (3 lb / yd^3). The dosage rate for the fibers when used in pile encasements shall be a minimum of four pounds per cubic yard (4 lb / yd^3).

The manufacturer shall furnish the Engineer three copies of the certified test report(s) showing results of all required tests, and certification that the material meets the specifications.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-714-2 **CODE: (IS)**

DATE: 1/23/2006

SUBJECT: Miscellaneous Materials

Section 714, Miscellaneous Materials, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

Delete Subsection 714.07 on page 682 and substitute the following:

907-714.07--Other Cementitious Materials.

907-714.07.1--Metakaolin.

907-714.07.1.1--General. Metakaolin shall only be used to bring the cementitious materials in Portland cement concrete and cement for soil stabilization into compliance with the requirements for cementitious materials exposed to soluble sulfate conditions. The approval of each metakaolin source shall be on a case by case basis as determined by the State Materials Engineer. Source approval will be based on, but not limited to, review of the proposed source's quality control program, production history, certified test reports, certification of shipment from the supplier, and job control sampling and testing requirements.

The Contractor shall provide suitable means for storing and protecting the metakaolin against dampness and contamination. Metakaolin which has become partially set, caked, or contains lumps shall not be used.

The State Materials Engineer shall be notified in writing of the nature, amount and identity of any processing, or other additions made to the metakaolin during production.

Metakaolin from different sources shall not be mixed or used alternately in any one class of construction or structure without written permission from the Engineer. In addition to these requirements, metakaolin shall meet the following specific requirements.

907-714.07.1.2--Specific Requirements. Metakaolin shall meet the requirements of AASHTO Designation: M 295 Class N with the following modifications:

1. The sum of SiO_2 + Al_2O_3 + Fe_2O_3 shall be at least 85%. The Material Safety Data Sheet shall indicate that the amount of crystalline silica, as measured by National Institute of Occupation Safety and Health (NIOSH) 7500 method, after removal of the mica interference, is less than 1.0%.
2. The loss on ignition shall be less than 3.0%.
3. The available alkalies, as equivalent Na_2O, shall not exceed 1.0%.
4. The amount of material retained on a No. 325 mesh sieve shall not exceed 1.0%.
5. The strength activity index at seven (7) days shall be at least 85%.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-804-2 **CODE: (SP)**

DATE: **01/20/2006**

SUBJECT: **Concrete Bridges And Structures**

Section 804, Concrete Bridges And Structures, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-804.02.1--General. Add the following materials to the list of materials in Subsection 804.02.1 on page 847.

Ground Granulated Blast Furnace Slag (GGBFS).....714.06
Metakaolin 714.07.01

907-804.02.10--Portland Cement Concrete Mix Design. Change Note ***** of Subsection 804.02.10 on page 851 as follows:

***** Class DS Concrete for drilled shafts shall have an 8±1-inch slump. In the event of free fall method of concrete placement is used, the slump shall be 6±1-inch.

Delete the last paragraph of Subsection 804.02.10 on page 851 and substitute the following:

Either Type A, D, F, G or mid-range chemical admixture, shall be used in all classes of concrete. Any combination of water reducing admixtures shall be approved by the Engineer before their use.

907-804.05--Basis of Payment. Add the "907" prefix to the pay items listed on page 898.

SPECIAL PROVISION NO. 906-3

Training Special Provisions

This Training Special Provision supersedes subparagraph 7b of the Special Provision entitled "Specific Equal Employment Opportunity Responsibilities," (Attachment 1), and is in implementation of 23 U.S.C. 140(a).

As part of the Contractor's equal employment opportunity affirmative action program training shall be provided as follows:

> The Contractor shall provide on-the-job training aimed at developing full journeymen in the type of trade or job classification involved.

The number of trainees to be trained under this special provision will be as indicated in the bid schedule of the contract.

In the event that a Contractor subcontracts a portion of the contract work, he shall determine how many, if any, of the trainees are to be trained by the subcontractor, provided, however, that the Contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The Contractor shall also insure that this training special provision is made applicable to such subcontract. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training.

The number of trainees shall be distributed among the work classifications on the basis of the Contractor's needs and the availability of journeymen in the various classifications within a reasonable area of recruitment. Prior to commencing construction, the Contractor shall submit to the State highway agency for approval the number of trainees to be trained in each selected classification and training program to be used. Furthermore, the Contractor shall specify the starting time for training in each of the classifications. The Contractor will be credited for each trainee employed by him on the contract work who is currently enrolled or becomes enrolled in an approved program and will be reimbursed for such trainees as provided hereinafter.

Training and upgrading of minorities and women toward journeymen status is a primary objective of this Training Special Provision. Accordingly, the Contractor shall make every effort to enroll minority trainees and women (e.g., by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees) to the extent that such persons are available within a reasonable area of recruitment. The Contractor will be responsible for demonstrating the steps that he has taken in pursuance thereof, prior to a determination as to whether the Contractor is in compliance with this Training Special Provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed as a trainee in any classification in which he has successfully completed a training course leading to journeyman status or in which he has been employed as a

journeyman. The Contractor should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used the Contractor's records should document the findings in each case.

The minimum length and type of training for each classification will be as established in the training program selected by the Contractor and approved by the State highway agency and the Federal Highway Administration. The State highway agency and the Federal Highway Administration shall approve a program if it is reasonably calculated to meet the equal employment opportunity obligations of the Contractor and to qualify the average trainee for journeyman status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau and training programs approved but not necessarily sponsored by the U.S. Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training shall also be considered acceptable provided it is being administered in a manner consistent with the equal employment obligations of Federal-aid highway construction contracts. Approval or acceptance of a training program shall be obtained from the State prior to commencing work on the classification covered by the program. It is the intention of these provisions that training is to be provided in the construction crafts rather than clerk-typists or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc., where the training is oriented toward construction applications. Training in the laborer classification may be permitted provided that significant and meaningful training is provided and approved by the division office. Some offsite training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

Except as otherwise noted below, the Contractor will be reimbursed 80 cents per hour of training given an employee on this contract in accordance with an approved training program. As approved by the engineer, reimbursement will be made for training persons in excess of the number specified herein. This reimbursement will be made even though the Contractor receives additional training program funds from other sources, provided such other does not specifically prohibit the Contractor from receiving other reimbursement. Reimbursement for offsite training indicated above may only be made to the Contractor where he does one or more of the following and the trainees are concurrently employed on a Federal-aid project; contributes to the cost of the training, provides the instruction to the trainee or pays the trainee's wages during the offsite training period.

No payment shall be made to the Contractor if either the failure to provide the required training, or the failure to hire the trainee as a journeyman, is caused by the Contractor and evidences a lack of good faith on the part of the Contractor in meeting the requirements of this Training Special Provision. It is normally expected that a trainee will begin his training on the project as soon as feasible after start of work utilizing the skill involved and remain on the project as long as training opportunities exist in his work classification or until he has completed his training program. It is not required that all trainees be on board for the entire length of the contract. A

Contractor will have fulfilled his responsibilities under this Training Special Provision if he has provided acceptable training to the number of trainees specified. The number trained shall be determined on the basis of the total number enrolled on the contract for a significant period.

Trainees will be paid at least 60 percent of the appropriate minimum journeyman's rate specified in the contract for the first half of the training period, 75 percent for the third quarter of the training period, and 90 percent for the last quarter of the training period, unless apprentices or trainees in an approved existing program are enrolled as trainees on this project. In that case, the appropriate rates approved by the Departments of Labor or Transportation in connection with the existing program shall apply to all trainees being trained for the same classification who are covered by this Training Special Provision.

The Contractor shall furnish the trainee a copy of the program he will follow in providing the training. The Contractor shall provide each trainee with a certification showing the type and length of training satisfactorily completed.

The Contractor will provide for the maintenance of records and furnish periodic reports documenting his performance under this Training Special Provision.

SPECIAL PROVISION NO. 906-6

MISSISSIPPI DEPARTMENT OF TRANSPORTATION
ON-THE-JOB TRAINING PROGRAM

ALTERNATE TRAINING SPECIAL PROVISION

PURPOSE

The purpose of the On-The-Job Training (OJT) Program is to provide training for minority, female and economically disadvantaged individuals in order that they may develop marketable skills and gain journey status in the skilled craft classifications in which they are being trained.

INTRODUCTION

This voluntary OJT Program has been developed through the partnering efforts of the Road Builders of Mississippi, the Federal Highway Administration (FHWA) and the Mississippi Department of Transportation (MDOT).

The OJT Program has been designed for use by participating contractors and subcontractors in meeting their training needs. The objective of the OJT Program is to develop skilled workers in the skilled craft trade areas of highway construction who are sufficiently trained to be productive employees in the highway construction industry work force.

The success of the OJT Program will require that contractors and subcontractors take part in the program and follow uniform procedures in training and in tracking trainee's progress.

FUNDING

MDOT will establish an annual OJT Fund from which, contractors and subcontractors may bill the Department directly for hours worked by trainees. The funding source of this money will be state and federal funds for MDOT's OJT Program.

DISBURSEMENT OF FUNDS

MDOT will pay $3.00 per hour toward the trainee's salary for each hour of training performed by each trainee in an approved training program. Program reimbursements will be made directly to the prime or sub contractor. Requests for payment will be submitted to the Office of Civil Rights for approval.

Contractors must provide a signed invoice providing the following information to be reimbursed.

- Contractor's Name
- Mailing Address
- Trainee Name
- Social Security Number

- Race
- Sex
- Project Number
- Job Classification
- Total Number of Hours Completed

TRAINING PROGRAM APPROVAL

A. To use the OJT Program on highway construction projects, the contractor will notify the Department Office of Civil Rights using the On-the-Job Trainee Schedule Form. The notification must include the following information:

- Trainee Starting Date
- Project number (s) trainee starting on
- Training program (classification) to be used; and
- Number of Training Hours Required

B. If a contractor chooses to use a training program different from those listed in the OJT Program Manual, or desires to train in a different classification, the training program must be submitted in its entirety for approval by the Department and FHWA. The training proposal must include the following:

1. The primary objective of the program: To provide training for minority, female and economically disadvantaged individuals for development to full journey status in the work classifications in which they are being trained.

2. The minimum number of hours and type of training the trainee will receive as it relates to each specific task required to achieve journey status.

3. No less than minimum wage.

4. Trainee certification of completion.

5. Records and reports submitted to the Office of Civil Rights on a monthly basis.

DEPARTMENT RESPONSIBILITY

1. Department project staff will monitor trainees on the project. They will monitor payrolls for payment of correct wage rates and fringe benefits. The Office of Civil Rights will maintain a master list by contractor name, project number, trainee name and trainee social security number to aid project staff in monitoring trainees who work on multiple projects.

2. The Office of Civil Rights may elect to interview trainees periodically during the training period to assess their performance and training program.

CONTRACTOR RESPONSIBILITY

1. Trainees must be identified on payrolls (i.e. dragline trainee).

2. When any trainee completes a program, or is terminated for a reason or reasons other than successful completion, the contractor must include the date of completion or an explanation for the termination and date of termination on the OJT Termination Report.

3. The contractor will assign each trainee to a particular person--either a supervisor or a journeyman/woman who is proficient in the craft the trainee is being trained in, to ensure that timely instructional experience is received by the trainee. This person, cooperating with the appropriate company personnel, will see that proper records and the total intended training hours are completed during the allocated number of hours set up in the classification criteria.

4. The contractor has the prerogative of terminating the training period of the trainee and advancing the trainee to journey status. Approval requests must be submitted to the Office of Civil Rights with an explanation (***refer to 2 above***).

5. Upon notification from the contractor, the Department will issue a skill verification card and certificate of training to the trainee.

6. Trainees may be transferred to state-aid highway construction projects in order to complete the training program. If transfers are made the Office of Civil Rights must be notified on the Monthly Trainee Form. All of the training hours completed by trainees will count toward overall program completion.

7. Program reimbursements will be made directly to the prime or sub contractor.

WAGE RATE

The wage rate for all trainees is $5.15, during their OJT training program. Trainees shall be paid full fringe benefit amounts, where applicable. At the completion of the training program, the trainee shall receive the wages of a skilled journey.

RECRUITMENT AND SELECTION PROCEDURES

A. Prerequisites for Trainees

To be qualified for enrollment in the OJT Program, trainees must possess basic physical fitness for the work to be performed, dependability, willingness to learn and ability to follow instructions.

B. Licenses

Truck driver trainees must possess appropriate driver permits or licenses for the operation of Class A, B and C trucks. However, when an instructional permit is used in lieu of a license, the trainee must be accompanied by an operator who:

1. Holds a license corresponding to the vehicle being operated;

2. Has had at least one year of driving experience; and

3. Is occupying the seat next to the driver.

C. Recruitment

1. Notices and posters setting forth the contractor's Equal Employment Opportunity Policy and availability of training programs will be placed in areas readily accessible to employees, applicants for employment and potential employees.

2. The contractor must target minority, female or economically disadvantaged trainees.

3. The contractor will conduct systematic and direct recruitment through public and private employee referral sources. Contractors must submit the trainee's name and completed application form to the Office of Civil Rights for review and approval. Approval must be obtained before the trainee can begin work under the training program.

4. Present employees will be screened for upgrading.

D. Selection

1. The selection and employment of a person by participating contractor shall qualify the person for the OJT Program.

2. Selection will be made without regard to race, color, religion, sex, age or national origin and shall be completely nondiscriminatory.

3. Employment of trainees will be in accordance with the work force requirements of the contractor. Each contractor will hire and train the trainees for uses in their own organization.

4. Written certification of individuals under the category of economically disadvantaged can be provided to the contractor at the time of the interview. This certification must then be provided to the Office of Civil Rights with the other required information as part of the approval process for trainees.

- ***NOTE:*** The OJT Program is to provide training for minority, female and economically disadvantaged individuals in order that they may develop marketable skills and gain journey status in the skilled craft classifications in which they are being trained. However, this program does not exclude trainees that are not members of the above groups.

S E C T I O N 9 0 5 - P R O P O S A L

Date _____

Mississippi Transportation Commission
Jackson, Mississippi

Sirs: The following proposal is made on behalf of _____
_____ of _____
_____
for constructing the following designated project(s) within the time(s) hereinafter specified.

The plans are composed of drawings and blue prints on file in the offices of the Mississippi Department of Transportation, Jackson, Mississippi.

The Specifications are the current Standard Specifications of the Mississippi Department of Transportation approved by the Federal Highway Administration, except where superseded or amended by the plans, Special Provisions and Notice(s) to Bidders attached hereto and made a part thereof.

I (We) certify that I (we) possess a copy of said Standard and Supplemental Specifications.

Evidence of my (our) authority to submit the Proposal is hereby furnished. The proposal is made without collusion on the part of any person, firm or corporation. I (We) certify that I (we) have carefully examined the Plans, the Specifications, including the Special Provisions and Notice(s) to Bidders, herein, and have personally examined the site of the work. On the basis of the Specifications, Special Provisions, Notice(s) to Bidders, and Plans, I (we) propose to furnish all necessary machinery, tools, apparatus and other means of construction and do all the work and furnish all the materials in the manner specified. I (We) understand that the quantities mentioned herein are approximate only and are subject to either increase or decrease, and hereby propose to perform any increased or decreased quantities of work at the unit prices bid, in accordance with the above.

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

INSTRUCTION TO BIDDERS: Alternate and Optional Items on Bid Schedule.

1. Two or more items entered opposite a single unit quantity WITHOUT DEFINITE DESIGNATION AS "ALTERNATE ITEMS" are considered as "OPTIONAL ITEMS". Bidders may or may not indicate on bids the Optional Item proposed to be furnished or performed WITHOUT PREJUDICE IN REGARD TO IRREGULARITY OF BIDS.

2. Items classified on the bid schedule as "ALTERNATE ITEMS" and/or "ALTERNATE TYPES OF CONSTRUCTION" must be preselected and indicated on bids. However, "Alternate Types of Construction" may include Optional Items to be treated as set out in Paragraph 1, above.

3. Optional items not preselected and indicated on the bid schedule MUST be designated in accordance with Subsection 102.06 prior to or at the time of execution of the contract.

4. Optional and Alternate items designated must be used throughout the project.

I (We) further propose to perform all "force account or extra work" that may be required of me (us) on the basis provided in the Specifications and to give such work my (our) personal attention in order to see that it is economically performed.

S E C T I O N 9 0 5 -- P R O P O S A L (CONTINUED)

I (We) further propose to execute the attached contract agreement (Section 902) as soon as the work is awarded to me (us), and to begin and complete the work within the time limit(s) provided for in the Specifications and Advertisement. I (We) also propose to execute the attached contract bond (Section 903) in an amount not less than one hundred (100) percent of the total of my (our) part, but also to guarantee the excellence of both workmanship and materials until the work is finally accepted.

I (We) enclose a certified check, cashier's check or bid bond for **five percent (5%) of total bid** and hereby agree that in case of my (our) failure to execute the contract and furnish bond within Ten (10) days after notice of award, the amount of this check (bid bond) will be forfeited to the State of Mississippi as liquidated damages arising out of my (our) failure to execute the contract as proposed. It is understood that in case I am (we are) not awarded the work, the check will be returned as provided in the Specifications.

Respectfully Submitted,

DATE _____

_____
Contractor

BY _____
Signature

TITLE _____

ADDRESS _____

CITY, STATE, ZIP _____

PHONE _____

FAX _____

E-MAIL _____

(To be filled in if a corporation)

Our corporation is chartered under the Laws of the State of _____ and the names, titles and business addresses of the executives are as follows:

_____
President Address

_____
Secretary Address

_____
Treasurer Address

The following is my (our) itemized proposal.

SECTION 905

PROPOSAL (Sheet No. 2- 1)

CONSTRUCTION NECESSARY TO BUILD A NEW REST AREA BUILDING, GUARD BOOTH, SEWAGE TREATMENT FACILITY AND OTHER IMPROVEMENTS TO THE REST AREA ON HIGHWAY 49 AT POCAHONTAS, KNOWN AS FEDERAL AID PROJECT NO. STP-0008-03(041) / 103975, IN THE COUNTY OF HINDS, 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 BOTH UNIT PRICES AND ITEM TOTALS ARE ENTERED

BIDS WILL NOT BE CONSIDERED UNLESS THE BID CERTIFICATE LOCATED AT THE END OF THE BID SHEETS IS SIGNED

BID SCHEDULE

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
					DIRECT PAY ITEMS				
(10)	201-B		1	Acre	Clearing and Grubbing				
(20)	201-D		1	Acre	Random Clearing				
(30)	202-A			Lump Sum	Removal of Obstructions	XXXXXXXXXXX XXXXXXXXXXX XXXXXXXXXXX XXXXXXXXXXX	XXXX XXXX XXXX XXXX		
(40)	202-B		3,584	Square Yard	Removal of Asphalt Pavement, All Depths				

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
(50)	202-B		10	Square Yard	Removal of Concrete Paved Ditch				
(60)	202-B		145	Square Yard	Removal of Concrete Sidewalk				
(70)	202-B		1,274	Linear Feet	Removal of Curb & Gutter, All Types				
(80)	202-B		12	Each	Removal of Trees 4" to 10"				
(90)	202-B		13	Each	Removal of Trees 10" to 20"				
(100)	202-B		7	Each	Removal of Trees Greater Than 20"				
(110)	203-A	(E)	2,311	Cubic Yard	Unclassified Excavation, LVM, AH				

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
(120)	203-EX	(E)	20,618	Cubic Yard	Borrow Excavation, AH, LVM, Class B15				
(130)	203-I		84,195	Square Yard	Site Grading				
(140)	209-A		4,777	Square Yard	Geotextile Stabilization, Type V				
(150)	907-209-PP		645	Square Yard	Geotextile Stabilization, Jute Netting				
(160)	211-B	(E)	750	Cubic Yard	Topsoil for Slope Treatment, Contractor Furnished				
(170)	211-C	(E)	32	Cubic Yard	Topsoil for Plant Holes, Contractor Furnished				
(180)	212-B		24,200	Square Yard	Standard Ground Preparation				

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
(190)	213-B		1	Ton	Combination Fertilizer, 13-13-13				
(200)	213-B		1	Ton	Combination Fertilizer, 8-8-8				
(210)	213-D		1	Ton	Ammonium Nitrate				
(220)	214-A		300	Pounds	Seeding, Annual Rye Grass				
(230)	214-A		250	Pounds	Seeding, Bermudagrass				
(240)	215-A		10	Ton	Vegetative Materials for Mulch				
(250)	216-B		401	Square Yard	Solid Sodding, 419 Hybrid Bermuda				

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
(260)	221-A	(S)	2	Cubic Yard	Portland Cement Concrete Paved Ditch				
(270)	907-222-A		1	Acre	Wildflower Seeding				
(280)	907-230-A		48	Each	Shrub Planting, Carissa Holly				
(290)	907-230-A		6	Each	Shrub Planting, Dwarf Burford Holly				
(300)	907-230-A		76	Each	Shrub Planting, Dwarf Yaupon Holly				
(310)	907-230-A		56	Each	Shrub Planting, Burgundy Loropetalum				
(320)	907-230-A		57	Each	Shrub Planting, Maiden Grass				

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
(330)	907-230-A		6	Each	Shrub Planting, Border Forsythia				
(340)	907-230-A		30	Each	Shrub Planting, Pampas Grass				
(350)	907-230-A		16	Each	Shrub Planting, Japanese Cleyera				
(360)	907-230-A		64	Each	Shrub Planting, Clara Indian Hawthorn				
(361)	907-230-A		64	Each	Shrub Planting, Shi-Shi Gashira Camellia				
(370)	907-230-A		72	Each	Shrub Planting, Anthony Waterer Spiraea				
(380)	907-230-A		14	Each	Shrub Planting, Yuletide Camellia				

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
(390)	907-230-A		18	Each	Shrub Planting, Nellie R. Stevens Holly				
(400)	907-230-A		292	Each	Shrub Planting, Majestic Liriope				
(410)	907-230-A		390	Each	Shrub Planting, Silvery Sunproof Liriope				
(420)	907-230-A		6,931	Each	Shrub Planting, Asiatic Jasmine				
(430)	907-230-A		732	Each	Shrub Planting, WinterCreeper Euonymus				
(440)	907-230-A		144	Each	Shrub Planting, Dwarf Stella De Oro Daylily				
(450)	907-230-A		50	Each	Shrub Planting, Purple Verbena Homestead				

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
(460)	907-230-B		8	Each	Tree Planting, Dynamite Crape Myrtle				
(470)	907-230-B		12	Each	Tree Planting, Nutall Oak				
(480)	907-230-B		11	Each	Tree Planting, Bald Cypress				
(490)	907-230-B		12	Each	Tree Planting, Little Gem Magnolia				
(500)	907-230-B		12	Each	Tree Planting, Shumard Oak				
(510)	907-230-B		4	Each	Tree Planting, Chinafir				
(520)	907-230-B		6	Each	Tree Planting, Australis Sweetbay Magnolia				

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
(530)	907-230-B		12	Each	Tree Planting, Lennei Saucer Magnolia				
(540)	907-230-B		4	Each	Tree Planting, Tree-Form Zhuzhou Loropetalum				
(550)	907-230-B		6	Each	Tree Planting, Ann Star Magnolia				
(560)	907-230-B		2	Each	Tree Planting, Slender Silhouette Sweetgum				
(570)	907-230-B		6	Each	Tree Planting, Eastern Red Cedar				
(580)	907-230-B		6	Each	Tree Planting, Bracken's Southern Magnolia				
(590)	907-230-C		399	Linear Feet	Bed Edging				

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
(600)	907-230-D		10,700	Square Feet	Bed Preparation				
(610)	232-A		1	Thousand	Fertilizer for Woody Plant Material, Tablet, 21 gram				
(620)	232-A		1	Thousand	Fertilizer for Woody Plant Material, Tablet, 10 gram				
(630)	907-233-A		156	Cubic Yard	Tree Bark Mulch, Type III				
(640)	907-233-A		120	Cubic Yard	Tree Bark Mulch, Type V				
(650)	234-A		1,520	Linear Feet	Temporary Silt Fence				
(660)	907-234-C		2,000	Linear Feet	Temporary Tree Protection Fencing, Per Plans				

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
(670)	235-A		200	Each	Temporary Erosion Checks				
(680)	236-A		4	Each	Silt Basin, Type A Modified				
(690)	907-242-A			Lump Sum	Rest Area Building	XXXXXXXXXXX XXXXXXXXXXX XXXXXXXXXXX XXXXXXXXXXX	XXXX XXXX XXXX XXXX		
(700)	907-242-B			Lump Sum	Prefabricated Guard Booth	XXXXXXXXXXX XXXXXXXXXXX XXXXXXXXXXX XXXXXXXXXXX	XXXX XXXX XXXX XXXX		
(710)	907-243-A		135	Each	Landscape Mowing				
(720)	907-244-A		50	Each	Tree Pruning, 10" to 20"				
(730)	907-258-E		11	Each	Trash Receptacle				

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
(740)	907-258-J		15	Each	Metal Bench				
(750)	907-258-K		3	Each	Bollard				
(760)	907-259-B		36	Each	Lighting Assembly, Bollards				
(770)	907-259-C		2	Each	Lighting Assembly, Flag Pole Lighting				
(780)	907-259-D		1	Each	Lighting Assembly, Sign Lighting				
(790)	907-282-A		48	Each	Sprinkler Head, 1812-PRS-15Q				
(800)	907-282-A		29	Each	Sprinkler Head, 1812-PRS-15H				

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
(810)	907-282-A		1	Each	Sprinkler Head, 1812-PRS-15TQ				
(820)	907-282-A		2	Each	Sprinkler Head, 1812-PRS-15F				
(830)	907-282-A		30	Each	Sprinkler Head, 1804-PRS-15Q				
(840)	907-282-A		19	Each	Sprinkler Head, 1804-PRS-15H				
(850)	907-282-A		1	Each	Sprinkler Head, 1804-PRS-15TQ				
(860)	907-282-A		2	Each	Sprinkler Head, 1804-PRS-15F				
(870)	907-282-A		6	Each	Sprinkler Head, R-50-SAM-PC-1.5				

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
(880)	907-282-A		14	Each	Sprinkler Head, R-50-SAM-PC-3.0				
(890)	907-282-A		6	Each	Sprinkler Head, R-50-SAM-PC-4.0				
(900)	907-282-A		1	Each	Sprinkler Head, R-50-SAM-PC-6.0				
(910)	907-282-B		1,048	Linear Feet	Piping, 1/2" Diameter				
(920)	907-282-B		513	Linear Feet	Piping, 3/4" Diameter				
(930)	907-282-B		370	Linear Feet	Piping, 1" Diameter				
(940)	907-282-B		174	Linear Feet	Piping, 1 1/4" Diameter				

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
(950)	907-282-B		102	Linear Feet	Piping, 1 1/2" Diameter				
(960)	907-282-B		13	Linear Feet	Piping, 2" Diameter				
(970)	907-282-B		417	Linear Feet	Piping, 2 1/2" Diameter				
(980)	907-282-C		217	Linear Feet	Sleeves, 6-inch Diameter				
(990)	907-282-D		8,111	Linear Feet	Valve Control Wire				
(1000)	907-282-E		5,792	Linear Feet	Trench Excavation and Backfill				
(1010)	907-282-G		1	Each	Electric Controller, 12 Station				

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
(1020)	907-282-H		6	Each	Electric Control Valve, 1 1/2"				
(1030)	907-282-H		5	Each	Electric Control Valve, 2"				
(1040)	907-282-I		1	Each	Backflow Preventer, 2"				
(1050)	907-282-J		2	Each	Isolation Valve, 2 1/2"				
(1060)	907-282-K		3	Each	Quick Coupler Key with Hose and Swivel				
(1070)	907-290-A		2	Each	Flagpole				
(1080)	304-A	(GY)	1,700	Cubic Yard	Granular Material, LVM, Class 5, Group C				

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
(1090)	907-304-H	(GY)	759	Cubic Yard	3/4" and Down Crushed Stone Base, LVM				
(1100)	907-403-A	(B) (A1)	375	Ton	Hot Mix Asphalt, ST, 9.5-mm mixture				
(1110)	907-403-A	(B) (A1)	500	Ton	Hot Mix Asphalt, ST, 12.5-mm mixture				
(1120)	907-403-A	(B) (A1)	2,098	Ton	Hot Mix Asphalt, ST, 19-mm mixture				
(1130)	601-B	(S)	10	Cubic Yard	Class "B" Structural Concrete, Minor Structures				
(1140)	602-A	(S)	818	Pounds	Reinforcing Steel				
(1150)	603-CA	(S)	26	Linear Feet	18" Reinforced Concrete Pipe, Class III				

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
(1160)	907-603-PE	(S)	59	Linear Feet	6" Corrugated Polyethylene Pipe				
(1170)	603-PE	(S)	86	Linear Feet	12" Corrugated Polyethylene Pipe				
(1180)	603-PE	(S)	308	Linear Feet	15" Corrugated Polyethylene Pipe				
(1190)	603-PE	(S)	48	Linear Feet	18" Corrugated Polyethylene Pipe				
(1200)	907-603-PE2	(S)	4	Each	12" Corrugated Polyethylene End Section				
(1210)	907-603-PE2	(S)	5	Each	15" Corrugated Polyethylene End Section				
(1220)	907-603-PE2	(S)	1	Each	18" Corrugated Polyethylene End Section				

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
(1230)	604-A		316	Pounds	Castings				
(1240)	606-B		480	Linear Feet	Guard Rail, Class A, Type 1				
(1250)	907-608-C	(S)	2,353	Square Yard	Colored Concrete Sidewalk				
(1260)	609-D	(S)	1,597	Linear Feet	Combination Concrete Curb and Gutter Type 1				
(1270)	907-609-PP	(S)	132	Linear Feet	Colored Concrete Curb with Reinforcement, Per Plans				
(1280)	618-B		1	Square Feet	Additional Construction Signs	10	0000	10	00
(1290)	619-G4		20	Linear Feet	Barricades, Type III, Single Faced				

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
(1300)	619-G5		40	Each	Free Standing Plastic Drums				
(1310)	619-G6		10	Each	Warning Lights, Type "A"				
(1320)	626-A		1,000	Linear Feet	6" Thermoplastic Traffic Stripe, Skip White				
(1330)	907-626-B		360	Linear Feet	4" Thermoplastic Traffic Stripe, Continuous White				
(1340)	626-C		960	Linear Feet	6" Thermoplastic Edge Stripe, Continuous White				
(1350)	907-626-G		264	Linear Feet	Thermoplastic Detail Stripe, Blue-ADA				
(1360)	626-G		1,452	Linear Feet	Thermoplastic Detail Stripe, White				

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
(1370)	626-H		152	Square Feet	Thermoplastic Legend, White				
(1380)	907-626-H		24	Square Feet	Thermoplastic Legend, Blue-ADA				
(1390)	630-A		142	Square Feet	Standard Roadside Signs, Sheet Aluminum, 0.080" Thickness				
(1400)	630-C		50	Linear Feet	Steel U-Section Posts, 2.0 lb/ft				
(1410)	907-630-PP		3	Each	Handicap Parking Sign with Post				
(1420)	907-630-PP		1	Each	Relocation of Site Sign, Per Plans				
(1430)	907-630-PP		5	Each	Site Interpretive Sign, Per Plans				

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
(1440)	907-630-PP		5	Each	Site Sign, Per Plans				
(1450)	907-683-B		3	Each	Lighting Assembly, Low Mast, Type 30-1-4-250				
(1460)	907-683-B		2	Each	Lighting Assembly, Low Mast, Type 30-1-8-250				
(1470)	682-A		1,420	Linear Feet	Underground Branch Circuit, AWG 6, 3 Conductor				
(1480)	682-A		510	Linear Feet	Underground Branch Circuit, AWG 10, 3 Conductor				
(1490)	682-B		30	Linear Feet	Underground Branch Circuit, Jacked or Bored, AWG 6, 3 Conductor				
(1500)	682-B		270	Linear Feet	Underground Branch Circuit, Jacked or Bored, AWG 10, 3 Conductor				

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
(1510)	682-D		3	Each	Underground Pull Box				
(1520)	684-A		5	Cubic Yard	Pole Foundation, 24" Diameter				
(1530)	684-B		8	Linear Feet	Slip Casing, 24" Diameter				
(1540)	815-A	(S)	20	Square Yard	Loose Riprap, Size 100				

SUBTOTAL - DIRECT PAY ITEMS.....$_____

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
					DEPENDENT PAY ITEMS				
(1550)	699-A			Lump Sum	Roadway Construction Stakes	XXXXXXXXXXX	XXXX		
						XXXXXXXXXXX	XXXX		
						XXXXXXXXXXX	XXXX		
						XXXXXXXXXXX	XXXX		
(1560)	618-A			Lump Sum	Maintenance of Traffic	XXXXXXXXXXX	XXXX		
						XXXXXXXXXXX	XXXX		
						XXXXXXXXXXX	XXXX		
						XXXXXXXXXXX	XXXX		
(1570)	620-A			Lump Sum	Mobilization	XXXXXXXXXXX	XXXX		
						XXXXXXXXXXX	XXXX		
						XXXXXXXXXXX	XXXX		
						XXXXXXXXXXX	XXXX		

SUBTOTAL - DEPENDENT ITEMS.....$_____

TOTAL BID - DIRECT AND DEPENDENT ITEMS.....$_____

COMPLETE ITEM NOS. 1, 2, AND/OR 3 AS APPROPRIATE. SEE NOTICE TO BIDDERS NO.696 AND SUPPLEMENT.

1. I/We agree that no less than percent shall be expended with small business concerns owned and controlled by socially and economically disadvantaged individuals (DBE and WBE).

2. Classification of Bidder: Small Business (DBE)_____ Small Business (WBE)_____

3. A joint venture with a Small Business (DBE/WBE): YES _____

*** 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

CONDITIONS FOR COMBINATION BID

If a bidder elects to submit a combined bid for two or more of the contracts listed for this month's letting, the bidder must complete and execute these sheets of the proposal in each of the individual proposals to constitute a combination bid. In addition to this requirement, each individual contract shall be completed, executed and submitted in the usual specified manner.

Failure to execute this Combination Bid Proposal in each of the contracts combined will be just cause for each proposal to be received and evaluated as a separate bid.

* * * *

SECTION 905 - COMBINATION BID PROPOSAL (Continued)

Project Number	Pay Item Number	Unit	Unit Price Reduction	Total Item Reduction	Total Contract Reduction
1. _____	_____ _____	_____ _____	_____ _____	_____ _____	
2. _____	_____ _____	_____ _____	_____ _____	_____ _____	
3. _____	_____ _____	_____ _____	_____ _____	_____ _____	
4. _____	_____ _____	_____ _____	_____ _____	_____ _____	
5. _____	_____ _____	_____ _____	_____ _____	_____ _____	
6. _____	_____ _____	_____ _____	_____ _____	_____ _____	
7. _____	_____ _____	_____ _____	_____ _____	_____ _____	
8. _____	_____ _____	_____ _____	_____ _____	_____ _____	

Project Number	Pay Item Number	Unit	Unit Price Reduction	Total Item Reduction	Total Contract Reduction
9. _____	_____ _____	_____ _____	_____ _____	_____ _____	
10. _____	_____ _____	_____ _____	_____ _____	_____ _____	

C. If option (c) has been selected, then initial and complete one of the following, go to II. and sign Combination Bid Proposal.

_____ I (We) desire to be awarded work not to exceed a total monetary value of $ _____.

_____ I (We) desire to be awarded work not to exceed _____ number of contracts.

II. It is understood that the Mississippi Transportation Commission not only reserves the right to reject any and all proposals, but also the right to award contracts upon the basis of lowest separate bids or combination bids most advantageous to the State.

It is further understood and agreed that the Combination Bid Proposal is for comparison of bids only and that each contract shall operate in every respect as a separate contract in accordance with its proposal and contract documents.

I (We), the undersigned, agree to complete each contract on or before its specified completion date.

SIGNED _____

_____

_____

Certification with regard to the Performance of Previous Contracts or Subcontracts subject to the Equal Opportunity Clause and the filing of Required Reports

The Bidder ____, proposed Subcontractor ____, hereby certifies that he has ____, has not ____, participated in a previous contract or subcontract subject to the Equal Opportunity Clause, as required by Executive Orders 10925, 11114, or 11246, and that he has ____, has not ____, filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements.

_____
(COMPANY)

BY _____

_____
(TITLE)

DATE: _____

NOTE: The above certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41 CFR 60-1.7 (b) (1)), and must be submitted by bidders and proposed subcontractors only in connection with contracts and subcontracts which are subject to the Equal Opportunity Clause. Contracts and Subcontracts which are exempt from the Equal Opportunity Clause are set forth in 41 CFR 60-1.5. (Generally only contracts or subcontracts of $10,000 or under are exempt.)

Currently, Standard Form 100 (EEO-1) is the only report required by the Executive Orders or their implementing regulations.

Proposed prime Contractors and Subcontractors who have participated in a previous contract or subcontract subject to the Executive orders and have not filed the required reports should note that 41 CFR 60-1.7 (b) (1) prevents the award of contracts and subcontracts unless such Contractors submit a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director, Office of Federal Contract Compliance, U. S. Department of Labor.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

CERTIFICATION
(Execute in duplicate)

State of Mississippi

County of _____

I, _____,
(Name of person signing certification)

individually, and in my capacity as _____ of
(Title)

_____ do hereby certify under
(Name of Firm, Partnership, or Corporation)

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

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

on Project No. **STP-0008-03(041) / 103975**,

in **Hinds** County(ies), Mississippi, has not either

directly or indirectly entered into any agreement, participated in any collusion; or otherwise taken any action in restraint of free competitive bidding in connection with this contract; nor have any of its corporate officers or principal owners.

Except as noted hereafter, it is further certified that said legal entity and its corporate officers, principal owners, managers, auditors and others in a position of administering federal funds:

a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in (b) above; and

d) Have not within a three-year period preceding this application/ proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

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.

The bidder further certifies that the certification requirements contained in Section XI of Form FHWA 1273, will be or have been included in all subcontracts, material supply agreements, purchase orders, etc. except those procurement contracts for goods or services that are expected to be less than the Federal procurement small purchase threshold fixed at 10 U.S.C. 2304(g) and 41 U.S.C. 253(g) (currently $25,000) which are excluded from the certification requirements.

The bidder further certifies, to the best of his or her knowledge and belief, that:

1) No Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this contract, Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions will be completed and submitted.

The certification contained in (1) and (2) above is a material representation of fact upon which reliance is placed and a prerequisite imposed by Section 1352, Title 31, U.S. Code prior to entering into this contract. Failure to comply shall be subject to a civil penalty of not less than $10,000 and not more than $100,000. The bidder shall include the language of the certification in all subcontracts exceeding $100,000 and all subcontractors shall certify and disclose accordingly.

All of the foregoing and attachments (when indicated) is true and correct.

Executed on _____ _____

Signature

(11/23/92F)

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

CERTIFICATION
(Execute in duplicate)

State of Mississippi

County of _____

I, _____,
(Name of person signing certification)

individually, and in my capacity as _____ of
(Title)

_____ do hereby certify under
(Name of Firm, Partnership, or Corporation)

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

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

on Project No. **STP-0008-03(041) / 103975**,

in **Hinds** County(ies), Mississippi, has not either

directly or indirectly entered into any agreement, participated in any collusion; or otherwise taken any action in restraint of free competitive bidding in connection with this contract; nor have any of its corporate officers or principal owners.

Except as noted hereafter, it is further certified that said legal entity and its corporate officers, principal owners, managers, auditors and others in a position of administering federal funds:

e) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

f) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

g) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in (b) above; and

h) Have not within a three-year period preceding this application/ proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

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.

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The bidder further certifies that the certification requirements contained in Section XI of Form FHWA 1273, will be or have been included in all subcontracts, material supply agreements, purchase orders, etc. except those procurement contracts for goods or services that are expected to be less than the Federal procurement small purchase threshold fixed at 10 U.S.C. 2304(g) and 41 U.S.C. 253(g) (currently $25,000) which are excluded from the certification requirements.

The bidder further certifies, to the best of his or her knowledge and belief, that:

3) No Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

4) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this contract, Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions will be completed and submitted.

The certification contained in (1) and (2) above is a material representation of fact upon which reliance is placed and a prerequisite imposed by Section 1352, Title 31, U.S. Code prior to entering into this contract. Failure to comply shall be subject to a civil penalty of not less than $10,000 and not more than $100,000. The bidder shall include the language of the certification in all subcontracts exceeding $100,000 and all subcontractors shall certify and disclose accordingly.

All of the foregoing and attachments (when indicated) is true and correct.

Executed on _____ _____

Signature

(11/23/92F)

S E C T I O N 9 0 2

CONTRACT FOR **STP-0008-03(041) / 103975**

LOCATED IN THE COUNTY(IES) OF **Hinds**

STATE OF MISSISSIPPI,

COUNTY OF HINDS

This contract entered into by and between the Mississippi Transportation Commission on one hand, and the undersigned contractor, on the other witnesseth;

That, in consideration of the payment by the Mississippi Transportation Commission of the prices set out in the proposal hereto attached, to the undersigned contractor, such payment to be made in the manner and at the time of times specified in the specifications and the special provisions, if any, the undersigned contractor hereby agrees to accept the prices stated in the proposal in full compensation for the furnishing of all materials and equipment and the executing of all the work contemplated in this contract.

It is understood and agreed that the advertising according to law, the Advertisement, the instructions to bidders, the proposal for the contract, the specifications, the revisions of the specifications, the special provisions, and also the plans for the work herein contemplated, said plans showing more particularly the details of the work to be done, shall be held to be, and are hereby made a part of this contract by specific reference thereto and with like effect as if each and all of said instruments had been set out fully herein in words and figures.

It is further agreed that for the same consideration the undersigned contractor shall be responsible for all loss or damage arising out of the nature of the work aforesaid; or from the action of the elements and unforeseen obstructions or difficulties which may be encountered in the prosecution of the same and for all risks of every description connected with the work, exceptions being those specifically set out in the contract; and for faithfully completing the whole work in good and workmanlike manner according to the approved Plans, Specifications, Special Provisions, Notice(s) to Bidders and requirements of the Mississippi Department of Transportation.

It is further agreed that the work shall be done under the direct supervision and to the complete satisfaction of the Executive Director of the Mississippi Department of Transportation, or his authorized representatives, and when Federal Funds are involved subject to inspection at all times and approval by the Federal Highway Administration, or its agents as the case may be, or the agents of any other Agency whose funds are involved in accordance with those Acts of the Legislature of the State of Mississippi approved by the Governor and such rules and regulations issued pursuant thereto by the Mississippi Transportation Commission and the authorized Federal Agencies.

The Contractor agrees that all labor as outlined in the Special Provisions may be secured from list furnished by

It is agreed and understood that each and every provision of law and clause required by law to be inserted in this contract shall be deemed to be inserted herein and this contract shall be read and enforced as though it were included herein, and, if through mere mistake or otherwise any such provision is not inserted, then upon the application of either party hereto, the contract shall forthwith be physically amended to make such insertion.

The Contractor agrees that he has read each and every clause of this Contract, and fully understands the meaning of same and that he will comply with all the terms, covenants and agreements therein set forth.

Witness our signatures this the _____ day of _____, _____.

_____

Contractor (s)

By _____

MISSISSIPPI TRANSPORTATION COMMISSION

Title _____

By _____

Executive Director

Signed and sealed in the presence of:
(names and addresses of witnesses)

_____

_____

Secretary to the Commission

Award authorized by the Mississippi Transportation Commission in session on the ____ day of _____, _____, Minute Book No. _____, Page No. _____.

Revised 8/06/2003

S E C T I O N 9 0 3

CONTRACT BOND FOR: **STP-0008-03(041) / 103975**

LOCATED IN THE COUNTY(IES) OF: **Hinds**

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 projects(s) in the State of Mississippi as mentioned in said contract in accordance with the Contract Documents therefor, on file in the offices of the Mississippi Department of Transportation, Jackson, Mississippi.

Now therefore, if the above bounden _____

_____ in all things shall stand to and abide by and well and truly observe, do keep and perform all and singular the terms, covenants, conditions, guarantees and agreements in said contract, contained on his (their) part to be observed, done, kept and performed and each of them, at the time and in the manner and form and furnish all of the material and equipment specified in said contract in strict accordance with the terms of said contract which said plans, specifications and special provisions are included in and form a part of said contract and shall maintain the said work contemplated until its final completion and acceptance as specified in Subsection 109.11 of the approved specifications, and save harmless said Mississippi Transportation Commission from any loss or damage arising out of or occasioned by the negligence, wrongful or criminal act, overcharge, fraud, or any other loss or damage whatsoever, on the part of said principal (s), his (their) agents, servants, or employees in the performance of said work or in any manner connected therewith, and shall be liable and responsible in a civil action instituted by the State at the instance of the Mississippi Transportation Commission or any officer of the State authorized in such cases, for double any amount in money or property, the State may lose or be overcharged or otherwise defrauded of, by reason of wrongful or criminal act, if any, of the Contractor(s), his (their) agents or

employees, and shall promptly pay the said agents, servants and employees and all persons furnishing labor, material, equipment or supplies therefor, including premiums incurred, for Surety Bonds, Liability Insurance, and Workmen's Compensation Insurance; with the additional obligation that such Contractor shall promptly make payment of all taxes, licenses, assessments, contributions, damages, any liquidated damages which may arise prior to any termination of said principal's contract, any liquidated damages which may arise after termination of the said principal's contract due to default on the part of said principal, penalties and interest thereon, when and as the same may be due this state, or any county, municipality, board, department, commission or political subdivision: in the course of the performance of said work and in accordance with Sections 31-5-51 et seq. Mississippi Code of 1972, and other State statutes applicable thereto, and shall carry out to the letter and to the satisfaction of the Executive Director of the Mississippi Department of Transportation, all, each and every one of the stipulations, obligations, conditions, covenants and agreements and terms of said contract in accordance with the terms thereof and all of the expense and cost and attorney's fee that may be incurred in the enforcement of the performance of said contract, or in the enforcement of the conditions and obligations of this bond, then this obligation shall be null and void, otherwise to be and remain in full force and virtue.

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

_____	_____
(Contractors) Principal	Surety
By _____	By _____
	(Signature) Attorney in Fact
	_____
Title _____	_____
(Contractor's Seal)	(Name and Address of Local (Mississippi) Representative)
	(Surety Seal)

OCR-485
REV. 10/02

MISSISSIPPI DEPARTMENT OF TRANSPORTATION
OFFICE OF CIVIL RIGHTS
JACKSON, MISSISSIPPI

LIST OF FIRMS SUBMITTING QUOTES

I/we received quotes from the following firms on Project No: **STP-0008-03(041) / 103975**
County: **Hinds**

Disadvantaged Business Enterprise (DBE) Regulations as stated in 49 CFR 26.11 require the Mississippi Department of Transportation (MDOT) to create and maintain a comprehensive list of all firms quoting/bidding subcontracts on prime contracts and quoting/bidding subcontracts on federally-funded transportation projects. For every firm, we require the following information:

Firm Name: _____
Contact Name/Title: _____
Firm Mailing Address _____
Phone Number: _____
_____ DBE Firm _____ Non-DBE Firm

Firm Name: _____
Contact Name/Title: _____
Firm Mailing Address _____
Phone Number: _____
_____ DBE Firm _____ Non-DBE Firm

Firm Name: _____
Contact Name/Title: _____
Firm Mailing Address _____
Phone Number: _____
_____ DBE Firm _____ Non-DBE Firm

Firm Name: _____
Contact Name/Title: _____
Firm Mailing Address _____
Phone Number: _____
_____ DBE Firm _____ Non-DBE Firm

Firm Name: _____
Contact Name/Title: _____
Firm Mailing Address _____
Phone Number: _____
_____ DBE Firm _____ Non-DBE Firm

_____
SUBMITTED BY (Signature)

_____
FIRM NAME

Submit this form to Contract Administration as a part of your bid package. If this form is not included as part of the bid packet, your bid will be deemed irregular. For further information about this form, call Mississippi DOT's Office of Civil Rights at (601) 359-7466; FAX (601) 576-4504. Please make copies of this form when needed and also add those copies to the bid package.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

HAUL PERMIT FOR BRIDGES

WITH

POSTED WEIGHT LIMITS

DATE: _____

PROJECT: STP-0008-03(041) / 103975

COUNTIES: Hinds

LOCATION: Construction necessary to build a new Rest Area Building, Pre-Fabricated Guard Booth, Sewage Treatment Facility and make other improvements to the existing Rest Area Site on Highway 49 at Pocahontas.

A permit is issued to _____ 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 weight 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.

_____

EXECUTIVE DIRECTOR