PROPOSAL AND CONTRACT DOCUMENTS

FOR THE CONSTRUCTION OF

(EXEMPT)

15
Construction necessary to build Maintenance Area Headquarters and Storage Building/Field Laboratory at Vicksburg, known State Project Nos. BWO-3122-75(001) / 501408 & BWO-3121-75(001) / 501409, in the County of Warren, State of Mississippi.
Project Completion: October 31, 2005

NOTICE

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

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

SECTION 900

OF THE CURRENT
(2004) STANDARD SPECIFICATIONS
FOR ROAD AND BRIDGE CONSTRUCTION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION
JACKSON, MISSISSIPPI

BIDDER CHECK LIST
(FOR INFORMATION ONLY)

_____ All unit prices and item totals have been entered in accordance with Subsection 102.06 of the Mississippi Standard Specifications for Road and Bridge Construction.

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

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

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

_____ Addenda, if any, have been acknowledged. Second sheet of Section 905 listing the addendum number has been substituted for the original second sheet of Section 905. Substituted second sheet of Section 905 has been properly completed, signed, and added to the proposal.

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

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

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

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

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

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

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

_____ A Certified check, cashier's check or bid bond payable to the State of Mississippi in the principal amount of 5% of the bid has been included. 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.

(04/2004)

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 166 **CODE: (SP)**

DATE: 07/20/2004

SUBJECT: READVERTISEMENT

PROJECT: BWO-3122-75(001) / 501408 & BWO-3121-75 / 501409 - WARREN COUNTY

The contents of this proposal are the same as when advertised for the May 2004 Letting,, except as follows:

Revised Proposal to meet the 2004 Standard Specification Book;

Add this Notice to Bidders No. 166.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

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(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, August 24, 2004; 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, August 24, 2004, and shortly thereafter publicly opened for:

Construction necessary to build a new Maintenance Area Headquarters and Storage Building/Field Laboratory at Vicksburg, known as Project No. BWO-3122-75(001) 501408 & BWO-3121-75(001) 501409, in the County of Warren, State of Mississippi.

The attention of bidders is directed to the predetermined minimum wage rate set by the U. S. Department of Labor under the Fair Labor Standards Act.

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.

Plans and specifications are on file in the offices of the Mississippi Department of Transportation.

Bid proposals must be acquired from the MDOT Contract Administration Division. These proposal 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

(SPWP)

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.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 3 **CODE: (SP)**

DATE: **05/03/2004**

SUBJECT: **Final Clean-Up**

Immediately prior to final inspection for release of maintenance, the Contractor shall pick up, load, transport and properly dispose of all litter from the entire highway right-of-way that is within the termini of the project.

Litter shall include, but not be limited to, solid wastes such a glass, paper products, tires, wood products, metal, synthetic materials and other miscellaneous debris.

Litter removal is considered incidental to other items of work and will not be measured for separate payment.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 7 **CODE: (IS)**

DATE: **05/03/2004**

SUBJECT: **On-The-Job Training Program**

Payment for training hours will be handled as outlined in Special Provision 906-4. 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 906-4).

On Federal-Aid projects, failure on the part of the Contractor to carryout the terms of the Alternate Training Special Provision (Special Provision 906-4) 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. 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. 14 **CODE: (SP)**

DATE: **05/03/2004**

SUBJECT: **Storm Water Discharge Associated with Construction Activity (≥ 1 and < 5 Acres)**

Construction Storm Water General NPDES Permit MSR 15 to discharge storm water associated with construction activity is required. This project is granted permission to discharge treated storm water into State waters. Copies of said permit 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 of Part IV. For this project, the Contractor shall furnish, set up and read, as needed, an on-site rain gauge.

Prior to the commencement of construction activities, the Contractor must furnish the Project Engineer a completed copy of the Small Construction Notice of Intent (SCNOI) for the Project Engineer's records.

The Contractor shall make inspections in accordance with Part IV.C 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 form provided in Part IX with the inspection portion completed shall be sufficient. The weekly inspections must be documented monthly on the Inspection and Certification Form for Small Construction Erosion and Sediment Controls (Part IX) . 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 the completed monthly Inspection and Certification Form for Small Construction Erosion and Sediment Controls (Part IX) 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 submittal of the completed monthly Inspection and Certification Form for Small Construction Erosion and Sediment Controls (Part IX) is brought back into compliance with this specification.

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 furnish the Project Engineer a completed copy of the Small Construction Notice of Intent (SCNOI) for the Project Engineer's records.

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. 18 **CODE: (IS)**

DATE: **05/03/2004**

SUBJECT: **ERRATA AND MODIFICATIONS TO THE 2004 STANDARD SPECIFICATIONS**

Page	Subsection	Change
278	404.04	In the second sentence, change the subsection from "401.04" to "403.04".
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".
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".
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".
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.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 19 **CODE: (SP)**

DATE: **05/14/2004**

SUBJECT: **Clarification of Pay Items**

Bidders are hereby advised that the pay items listed on the Summary of Quantities Sheets of the plans may have a different pay item number than that shown on the bid sheets of the contract proposal. Bidders shall consider the pay items listed on the bid sheets of the proposal as the correct pay items.

Bidders are reminded that this project is let under the 2004 Edition of the Mississippi Standard Specification for Road and Bridge Construction.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 101 **CODE: (SP)**

DATE: **07/12/2004**

SUBJECT: **Petroleum Products Base Prices For Contracts Let In August, 2004**

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	$1.6178	$0.4274
Diesel	$1.5225	$0.4022

MATERIAL OF CONSTRUCTION

Asphalt Cements	Per Gallon	Per Ton	Per Liter	Per Metric Ton
Viscosity Grade AC-5	$0.7903	$187.50	$0.2088	$206.68
Viscosity Grade AC-10	$0.7888	$187.14	$0.2084	$206.28
Viscosity Grade AC-20	$0.7737	$183.57	$0.2044	$202.35
Viscosity Grade AC-30	$0. 7737	$183.57	$0.2044	$202.35
Grade PG-58-28	$0.7868	$186.67	$0.2079	$205.76
Grade PG 64-22	$0.7768	$184.29	$0.2052	$203.14
Grade PG 67-22	$0.7708	$182.86	$0.2036	$201.57
Grade PG 76-22	$1.1064	$262.50	$0.2923	$289.35
Grade PG 82-22	$1.3134	$311.60	$0.3470	$343.47

Emulsified Asphalts		
Grade EA-4 (SS-1)	$0.7314	$0.1932
Grade RS-2C (CRS-2)	$0.7505	$0.1983
Grade CRS-2P	$0.8616	$0.2276

Primes		
Grades EA-1 and MC-70	$0.9775	$0.2582

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 152 **CODE: (IS)**

DATE: **07/15/2004**

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 and guard rail anchors. Substitution in any other items of work must be approved by the State Construction Engineer prior to use.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 163 **CODE: (SP)**

DATE: **07/20/2004**

SUBJECT: **CONTRACT TIME**

PROJECT: **BWO-3122-75(001) / 501408 & BWO-3121-75 / 501409 - WARREN COUNTY**

The calendar date for completion of work to be performed by the Contractor for this project shall be **October 31, 2005** which date or extended date as provided in Subsection 108.06 shall be the end of contract time. It is anticipated that the Notice to Proceed will be issued by not later than **Ootober 4, 2004** and the date for Beginning of Contract Time will be **October 14, 2004** .

A progress schedule as referenced to in Subsection 108.03 will not be required for this contract.

A Construction Schedule as described in Section 01310 of Special Provision 907-242-2 will be required.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 164 **CODE: (SP)**

DATE: **07/20/2004**

SUBJECT: **Specialty Items**

PROJECT: **BWO-3122-75(001) / 501408 &**
BWO-3121-75(001) / 501409--WARREN 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: EROSION CONTROL

Ref No	Pay Item	Description
80	212-B	Standard Ground Preparation
90	213-A	Agricultural Limestone
100	213-B	Combination Fertilizer, 13-13-13
110	213-B	Combination Fertilizer, 8-8-8
130	214-A	Seeding, Bermudagrass
140	214-A	Seeding, Annual Rye Grass

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 165 **CODE: (SP)**

DATE: **07/20/2004**

SUBJECT: **SUBCONTRACTING**

PROJECT: **BWO-3122-75(001) 501408 -- Warren County**
BWO-3121-75(001) 501409 -- Warren County

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

Specialty Items

Soil Treatment for Termite Control
Sheet Metal Roofing
Plumbing Items
Heating, Ventilating, & Air Conditioning Items
Electrical Items

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 167 **CODE: (SP)**

DATE: **07/20/2004**

SUBJECT: **Special Provision Number Change**

PROJECT: **BWO-3122-75(001) / 501408 & BWO-3121-75 / 501409 - WARREN COUNTY**

Bidders are advised that anywhere in the plans, proposal and specifications of the above project that reference is made to Special Provision No. **907-242-137,** it is understood that Special Provision No. **907-242-2** is the **Correct** Number.

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. 907-230-1 **CODE: (SP)**

DATE: **05/11/2004**

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.

Delete Subsection 230.02.14 on page 165 and substitute the following:

907-230.02.14--Mulch. Type I mulch used for bed preparation shall meet the requirements of Subsection 715.07. Type V mulch used for the surface mulching plant beds and 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.

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, an Inland Steel Company, St. Louis, Mo., or an approved equal.

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

Where plant areas are bound all around by bed edging and/or paving all around, bed preparation shall be required. Bed preparation 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, spreading a 3-inch layer of Type I mulch throughout the area, tilling in the Type I mulch to a depth of six inches uniformly throughout the area and excavating planting pits in accordance with this special provision. The entire bed area shall receive Type V mulch as a surface mulch.

Backfill for tree, shrub, and groundcover planting pits shall be a 50/50 mix of existing soil and topsoil.

907-230.04--Method of Measurement: After the sixth paragraph of Subsection 230.04 on page 169, add the following:

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, complete in place and accepted, will be measured per square foot. Excavation of existing soil, providing and incorporating Type I mulch, surface Type V mulch, and weeding will not be measured for separate payment.

Type V mulch, complete in place and accepted, will be measured per cubic yard for individual tree and shrub pits outside of bed areas requiring bed preparation.

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.

Accepted quantities for Type V mulch used at tree and shrub planting pits (not within areas of bed preparation) will be paid for at the contract unit price per cubic meter. Prices paid shall be full compensation for completing the work.

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
907-230-E: Type V Mulch	- per cubic yard

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

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PROJECT NUMBERS: **BWO-3121-75(001) 501409**
BWO-3122-75(001) 501408

SPECIAL PROVISION NUMBER: **SP-907-242-2**

DATE: **4-15-04**

DESCRIPTION A: This Work shall consist of all construction work necessary for constructing the Maintenance Area Headquarters in Vicksburg, for District Three, Warren County, Mississippi, Special Provision 907-242-137, in accordance with these Specifications and conforming with the Drawings.

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

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DESCRIPTION B: This Work shall consist of all construction necessary for the Storage / Field Lab Building in Vicksburg for District Three at Warren County, Mississippi, Project No. BWO-3122-75(001) 501408, in accordance with these Specifications and conforming to the Drawings.

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

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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.

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

1.06 Use Of Site And Facilities: Contractor shall not allow tradesman, technicians and laborers to enter other portions of existing facilities except as predetermined and approved by the Project Architect. Existing utilities shall not be interrupted unless pre-approved by the Project Architect. 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.

Article 1 GENERAL PROVISIONS

1.1 BASIC DEFINITIONS

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

The Contract Documents include the Advertisement for Bids, Instructions to Bidders, Notice to Bidders, Proposal Form, sample forms and all portions of addenda issued prior to execution of the Contract.

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

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

This Paragraph in no way supersedes the Owner's document rights set forth in the "Engineering Services Contract" Agreement Between the Owner and the Professional.

Article 2 OWNER

2.1 GENERAL

2.1.1 Change this Subparagraph to read as follows:

The Owner, as used in these Documents, refers to the Mississippi Transportation Commission, a body Corporate of the State of Mississippi, acting by and through the duly authorized Executive Director of the Mississippi Department of Transportation for the benefit of the Department for which the Work under this Contract is being performed. The Owner is the entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner's representative, who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization, is the individual who signed the Construction Contract for the Owner. Except as otherwise provided in Subparagraph 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

2.2.5 Change this Subparagraph to read as follows:

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

Article 3 CONTRACTOR

3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

3.3.1 Change the last sentence to read as follows:

If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner and Professional shall be responsible for any resulting loss or damage.

3.18 INDEMNIFICATION

3.18.3 Add a new Subparagraph as follows:

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

Article 4 ADMINISTRATION OF THE CONTRACT

4.1 ARCHITECT

4.1.4 Add a new Subparagraph as follows:

The term "Architect," "Engineer," "Professional", or "Consultant" as used in these Documents refers to the Professional firm who has been directed by the Owner to design and inspect construction of this Project.

4.1.5 Add a new Subparagraph as follows:

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

4.5 MEDIATION

4.5.1 Delete this Subparagraph in its entirety.

4.5.2 Delete this Subparagraph in its entirety.

4.5.3 Delete this Subparagraph in its entirety.

4.6 ARBITRATION

4.6.1 Delete this Subparagraph in its entirety.

4.6.2 Delete this Subparagraph in its entirety.

4.6.3 Delete this Subparagraph in its entirety.

4.6.4 Delete this Subparagraph in its entirety.

4.6.5 Delete this Subparagraph in its entirety.

4.6.6 Delete this Subparagraph in its entirety.

4.7 Add a new Paragraph as follows:

ARBITRATION PROCEDURES FOR THE MISSISSIPPI TRANSPORTATION COMMISSION

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

4.7.1 Add a new Subparagraph as follows:

CONDITIONS PRECEDENT TO ARBITRATION

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

.2 If the dispute cannot be satisfactorily resolved, within thirty (30) days of the complaint being rejected in writing by either party, notice by certified mail shall be given to the Project Architect. 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 Architect, 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 Architect, 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

7.2 CHANGE ORDERS

7.2.3 Add a new Subparagraph as follows:
The maximum cost included in a Change Order for profit and overhead is limited to twenty-five percent (25%) of the total of the actual cost for materials, labor and subcontracts. Profit and overhead include: all taxes, fees, permits, insurance, bond, job superintendent, job and home office expense. All Subcontractors shall acquiesce to the same requirements when participating in a Change Order.

Article 8 TIME

8.1 DEFINITIONS

8.1.3 Change this Subparagraph to read as follows:

See edited paragraph 9.8.4 for Substantial Completion."

8.3 DELAYS AND EXTENSIONS OF TIME

8.3.1 Change this Subparagraph to read as follows:

If the Contractor is delayed at any time in the commencement or progress of the Work by any act of neglect of the Owner or Project Engineer / MDOT Architect, or by any employee or either, or by changes ordered in the Work, or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or any causes beyond the Contractor's control, or by any other causes which the Project Engineer / MDOT Architect determines may justify the delay, then the Contract time may be extended by Change Order for such reasonable time as the Architect may determine, subject to the Owner's approval. Any claim for loss or any delay occasioned by any separate Contractor, or Subcontractor, shall be settled between the Contractor and such other separate Contractor, or Subcontractors.

Article 9 PAYMENTS AND COMPLETION

9.3 APPLICATIONS FOR PAYMENT

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

The form of Application for Payment will be AIA Document G702, Application and Certification for Payment, supported by AIA Document G703, Continuation Sheet, or a computer generated form containing similar data.

9.3.1.3 Add a new Clause to Subparagraph 9.3.1 as follows:

The Owner will retain five percent (5%) until the Work is at least fifty percent (50%) complete, on schedule, and satisfactory in the Architect's and/or Engineer's opinion, at which time fifty percent (50%) of the retainage held to date shall be returned to the Contractor for distribution to the appropriate Sub-Contractors and Suppliers. Future retainage shall be withheld at the rate of two and one half percent (2 ½%) of the amount due the Contractor on account of progress payments.

9.3.1.4 Add a new Clause to Subparagraph 9.3.1 as follows:

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

9.3.2.1 Add a new Clause to Subparagraph 9.3.2 as follows:

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

.1 An acceptable Lease Agreement between the General Contractor and the owner of the land, or building, where the materials are located.

.2 Consent of Surety, or other acceptable Bond, to cover the materials stored off-site.

.3 All Perils Insurance coverage for the full value of the materials stored off-site.

.4 A Bill of Sale from the Manufacturer to the General Contractor for the stored materials.

.5 A complete list and inventory of materials manufactured, stored and delivered to the storage site and of materials removed from the storage site and delivered to the job site.

.6 A review by the Project Engineer of the materials stored off-site prior to release of payment.

.7 Guarantee no storage costs, additional delivery fees, or subsequent costs to the Owner.

. 8 List of stored items shall be sent to the Chief Engineer for his approval prior to payment of stored materials.

9.3.2.2 Add a new Clause to Subparagraph 9.3.2 as follows:

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

.1 A Bill of Sale from the Manufacturer to the General Contractor for the stored materials.

.2 List of stored items shall be sent to the Chief Engineer for his approval prior to payment of stored materials.

9.6 PROGRESS PAYMENTS

9.6.8 Add a new Subparagraph as follows:

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

9.7 FAILURE OF PAYMENT

9.7.1 Change this Subparagraph to read as follows:

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

9.8 SUBSTANTIAL COMPLETION

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

Substantial Completion shall not be recognized under this Contract. The Project Engineer, under the advisement of the MDOT Architect, shall determine when this portion of the Work 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 complete as referenced in Mississippi Department of Transportation Specifications for Construction of Roads & Bridges.

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 Architect and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Paragraph 3.18.

10.3 HAZARDOUS MATERIALS

10.3.2 Delete this Subparagraph in its entirety.
10.3.3 Delete this Subparagraph in its entirety.
10.4 Delete this Subparagraph in its entirety.
10.5 Delete this Subparagraph in its entirety.

Article 11 INSURANCE AND BONDS

11.1 CONTRACTOR'S LIABILITY INSURANCE

11.1.4 Add a new Subparagraph as follows:

Refer to Mississippi Department of Transportation Specifications for Construction of Roads & Bridges.

11.1.5 Add a new Subparagraph as follows:

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

11.1.6 Add a new Subparagraph as follows:

If the coverages are provided on a claims-made basis, the policy date or retroactive date shall predate the Contract: the termination date, or the policy, or applicable extended

reporting period shall be no earlier than the termination date of coverages required to be maintained after final payment.

11.2 OWNER'S LIABILITY INSURANCE

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

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

11.3 PROJECT MANAGEMENT PROTECTIVE LIABILITY INSURANCE
Delete this Paragraph in its entirety.

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

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

The Contractor shall purchase…

11.4.1.2 Delete this Clause under Subparagraph 11.4.1 in its entirety.

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

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

11.4.2 Delete this Subparagraph in its entirety.
11.4.3 Delete this Subparagraph in its entirety.
11.4.4 Delete this Subparagraph in its entirety.
11.4.5 Delete this Subparagraph in its entirety.
11.4.6 Delete this Subparagraph in its entirety.

11.4.10 Change this Subparagraph to read as follows:

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

Article 12 UNCOVERING AND CORRECTION OF WORK
No supplementary conditions.

Article 13 MISCELLANEOUS PROVISIONS
No supplementary conditions.

Article 14 TERMINATION OR SUSPENSION OF THE CONTRACT
No supplementary conditions.

END OF DOCUMENT

SECTION 01110 SUMMARY OF WORK

PART 1 GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

A. Work covered by the Contract Documents shall be provided by one (1) General Contractor under one (1) Contract to improve the Mississippi Department of Transportation site at Vicksburg, Warren County, Mississippi. Separate Lump Sums as described in these Specifications and Drawings are to be given for each of the following separate descriptions and combined to total one (1) lump sum for the Special Provision 907-242-137 Contract Sum.

1. Description: A. Maintenance Area Headquarters.

2. Description: B. Storage Building / Field Lab.

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 Architect 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: The Contractor shall submit to the Project Architect 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: The Contractor shall submit 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. Submit to the Project Architect CAD-720 form - REQUEST FOR PERMISSION TO SUBCONTRACT for each subcontractor before they are allowed to perform any Work.

10. Coordination: The Contractor is responsible for the coordination of the total Project. All subcontractors will cooperate with the Contractor so as to facilitate the general progress of the Work. Each trade shall afford all other trades every reasonable opportunity for the installation of their Work. Refer to Section 01310– Project Management & Coordination.

1.02 CONTRACTOR'S USE OF PREMISES

A. Confine operations at the site to areas permitted by:

1. Law

2. Ordinances

3. Permits

4. Contract Documents

5. Owner

B. Do not unreasonably encumber site with materials or equipment.

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

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

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

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

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

PART 2 PRODUCTS
Not Used

PART 3 EXECUTION
Not Used

END OF SECTION

SECTION 01210 ALLOWANCES

PART 1 GENERAL

1.01 DESCRIPTION

A. Related work specified elsewhere:

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

B. Allowances for products:

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

2. Amount of each allowance includes:

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

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

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

C. Selection of products:

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

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

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

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

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

1.02 SCHEDULE OF ALLOWANCES

A. Include in the Contract Sum the amount of $15,000.00 for Contingency Allowance to be used upon Owner's instruction.

1. Unforeseen changes or modifications to the Work that increase the aggregate total Contract Sum up to $15,000.00, including the Contractor's costs for taxes, bonding, insurance, overhead and profit shall be calculated in the Base Bid. These changes shall be shown on the Schedule of Values as an Allowance line item so that Change Orders (Supplemental Agreements) authorizing expenditure of funds from this amount will only include costs of materials and delivery, installation, equipment rental, and direct labor associated with installation.

2. After the total aggregate amount of changes to the Work has exceeded $15,000.00, the Contractor shall be allowed to include taxes, bonding, insurance, costs of materials and delivery, installation, equipment rental, labor, and payroll. Contractor shall also be allowed to include overhead and profit costs as stated in Supplementary Conditions of these Specifications for any additional Work.

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

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

B. There are no other Allowances for this Project.

PART 2 PRODUCTS
Not Used

PART 3 EXECUTION
Not Used

END OF SECTION

SECTION 01290 PAYMENT PROCEDURES

PART 1 GENERAL

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

1.02 APPLICATION FOR PAYMENT

A. Format:

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

B. Preparation of Application:

1. Present required information in type written form.
2. Execute certification by signature of authorized officer.
3. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of Work performed and for stored products.
4. List each authorized Change Order as an extension on continuation sheet, listing Change Order number and dollar amount as for an original Item of Work.
5. Prepare Application for Final Payment as specified in Section 01770-Closeout Procedures.

C. Submittal Procedures:

1. Submit 5 copies of each Application for Payment.
2. Submit an updated construction schedule with each Application for Payment as described in Section 01320-Construction Progress Documentation.
3. Submit request for payment at intervals agreed upon by the Project Engineer, Owner, and Contractor.
4. Submit requests to the Project Engineer at agreed upon times, or as may be directed otherwise.

D. Substantiating Data:

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

1.03 BASIS OF PAYMENT

A. This Work will be paid for by Contract Sum for the construction in District Three. The Work includes Maintenance Area Headquarters and Storage Building / Field Laboratory at Vicksburg, Warren County, Mississippi. The Contract Sum shall be full compensation for all site work, for furnishing all materials, and all other Work and effort of whatever nature in the construction of the buildings, installation of underground and other equipment, and final clean-up of the area. It shall also be complete compensation for all equipment, tools, labor, and incidentals necessary to complete the Work.

B. Payment will be made under:

1. DESCRIPTION A: Maintenance Area Headquarters
MDOT Project No. BWO-3121-75(001) 501409
Maintenance Area Headquarters and Storage Building /
Field Laboratory at Vicksburg, Warren County, Mississippi Lump Sum

2. DESCRIPTION B: Storage Building / Field Laboratory
MDOT Project No. BWO-3122-75(001) 501408
Maintenance Area Headquarters and Storage Building /
Field Laboratory at Vicksburg, Warren County, Mississippi Lump Sum

TOTAL PROJECT S.P. #907-242- 137 CONTRACT SUM LUMP SUM

PART 2 PRODUCTS
Not Used

PART 3 EXECUTION
Not Used

END OF SECTION

SECTION 01295 SCHEDULE OF VALUES

PART 1 GENERAL

1.01 DESCRIPTION

A. Scope: Submit a Schedule of Values to the Project Architect at least 10 days prior to submitting first Application for Payment. This Schedule will be reviewed and forwarded to the Consultants. Upon Project 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. Use Schedule of Values only as basis for contractor's Application for Payment.

B. Form of Submittal: Submit typewritten Schedule of Values on AIA Document G703-1992, using Table of Contents of this Specification as basis for format for listing costs of Work for Sections under Divisions 2- 16. Identify each line item with number and title as listed in Table of Contents of this Specification.

C. Preparing Schedule of Values:

1. Itemize separate line item costs for each of the following general cost items: Performance and Payment Bonds, field supervision and layout, Contingency Allowance, temporary facilities and controls, and closeout documents.

2. Itemize separate line item cost for Work required by each Section of this specification. Breakdown installed cost with overhead and profit.

3. For each line item, which has installed value of more than $20,000, break down costs to list major products for operations under each item; rounding figures to nearest dollar. Make sum of total costs of all items listed in schedule equal to total Contract Sum.

D. Preparing Schedule of Unit Material Values:

1. Submit separate schedule of unit prices for materials to be stored on which progress payments will be made. Make form of submittal parallel to Schedule of Values with each line item identified same as line item in Schedule of Values. Include in unit prices only: Cost of material, delivery and unloading site, and sales tax.

2. Make sure unit prices multiplied by quantities equal material cost of that item in Schedule of Values.

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

PART 2 PRODUCTS
Not Used

PART 3 EXECUTION
Not Used

END OF SECTION

SECTION 01298 CHANGE ORDER PROCEDURES

PART 1 GENERAL

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

1.02 CHANGE ORDER PROCEDURES

A. Change Proposed by the Project Engineer / MDOT Architect: The Project Engineer / MDOT Architect 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 and MDOT Architect, 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. 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 using the Mississippi Department of Transportation's Change Order Form.

F. Types of Change Orders:

1. Stipulated Sum Change Orders: Based on Proposal Request and Contractor's fixed price quotation, or Contractor's request for a Change Order as approved by the Project Engineer.

2. Unit Price Change Order: For pre-determined unit prices and quantities, the Change Order 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.
3. Time and Material Change Order: 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: The Project Engineer will issue Change Orders for signatures of parties as provided in the Standard Form of Agreement Between the Owner and the Contractor. Final execution of all Change Orders 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 as a separate line item and adjust the Contract Sum. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust time for other items of Work affected by the change and resubmit. Promptly enter changes in Project Record Documents.

PART 2 PRODUCTS
Not Used

PART 3 EXECUTION
Not Used

END OF SECTION

SECTION 01310 PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.01 SECTION INCLUDES

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

B. Project Coordinator: The General Contractor shall designate one individual as Project Coordinator (Superintendent), as referred to in the General Conditions. Prior to beginning Work his name, qualifications and address shall be submitted, in writing, to the MDOT Director with copies to the Construction Engineer, Office Engineer, District Engineer, Project Engineer and MDOT Architect. Upon approval, he will remain until the Project is completed and cannot be removed during construction without the written consent of the Project Engineer.

1.02 DUTIES OF PROJECT COORDINATOR (SUPERINTENDENT)

A. General:
1. Coordination: Coordinate the work of all subcontractors and material suppliers.
2. Supervision: Supervise the activities of every phase of Work taking place on the project.
3. Contractor's Daily Job Diary: Submit copy of daily job dairy to the Project Engineer and the MDOT Architect each Monday for the previous week.
4. Electrical: Take special care to coordinate and supervise the Work of the electrical and other subcontractors.
5. Communication: Establish lines of authority and communication at the job site.
6. Location: The Project Coordinator (Superintendent) must be present on the job site at all times while work is in progress.
7. Permits: Assist in obtaining building and special permits required for construction.

B. Interpretations of Contract Documents
1. Consultation: Consult with Project Engineer / MDOT Architect to obtain interpretations.
2. Assistance: Assist in resolution of any questions.
3. Transmission: Transmit written interpretations to concerned parties.

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

D. Division One: Coordinate and assist in the preparation of all requirements of Division One and specifically as follows:
1. Enforce all safety requirements.
2. Schedule of Values: Assist in preparation and be knowledgeable of each entry in the Schedule of Values.
3. Cutting and Patching: Supervise and control all cutting and patching of other trades work.
4. Project Meetings: Schedule with Project Engineer's approval and attend all project meetings.
5. Construction Schedules: Prepare and submit all construction schedules. Supervise Work to monitor compliance with schedules.
6. Shop Drawings, Product Data and Samples: Administer the processing of all submittals required by the Project Manual.

7. Testing: Coordinate all required testing.
8. Temporary Facilities and Controls: Allocate, maintain and monitor all temporary facilities.
9. Substitutions and Product Options: Administer the processing of all substitutions.
10. Cleaning: Direct and execute a continuing (daily) cleaning program throughout construction, requiring each trade to dispose of their debris.
11. Project Closeout: Collect and present all closeout documents to the Project Engineer for transmittal to the MDOT Architect
12. Project Record Documents: Maintain up-to-date Project Record Documents.

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

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

1.03 COORDINATION AND PROJECT CONDITIONS

A. Coordinate scheduling, submittals, and Work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

B. Verify utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

C. Coordinate space requirements, supports, and installation of Mechanical and Electrical Work that are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

D. Coordinate completion and clean-up of Work of separate sections in preparation for Substantial Completion and for portions of Work designated for Owner's partial occupancy, if required.

E. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

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

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

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

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

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

SECTION 01315 PROJECT MEETINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

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

1.02 MEETINGS

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

1.03 SCHEDULING AND ADMINISTRATION

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

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

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

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

1.04 PRE-CONSTRUCTION MEETING

A. Schedule: The Project Engineer will schedule the Pre-Construction Meeting within 10 days after Notice to Proceed.

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

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

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

1.05 PROGRESS MEETINGS

A. Schedule: Progress Meetings will be scheduled monthly. The Project Engineer will cancel the meeting with at least 48 hours notice if a meeting is not necessary for any particular month.

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

C. Attendance: Attending shall be the Project Engineer or his representative and MDOT representatives associated with the Project, the MDOT Architect or his representative (if requested by the District) and his Consultants, the General Contractor, and all Subcontractors as pertinent to the agenda.

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

PART 2 PRODUCTS (Not Used)
PART 3 EXECUTION (Not Used)

END OF SECTION

SECTION 01320 CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 GENERAL

1.01 DESCRIPTION

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

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

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

C. Content of Schedules:

1. Provide complete sequence of construction by activity.
2. Indicate dates for beginning and completion of each stage of construction.
3. Identify Work of logically grouped activities.
4. Show projected percentage of completion for each item of Work as of first day of each month.

D. Updating:

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

E. Submittals:

1. Submit initial schedules to the Project Engineer / MDOT Architect within 15 days after date of Notice to Proceed.
2. Submit to the Project Engineer / MDOT Architect, periodically updated schedules accurately depicting progress to first day of each month.
3. Submit 2 copies, one to be retained by the Project Engineer and the other forwarded to the MDOT Architect..

F. If the Contractor is required to produce two revised construction schedules because of lack of progress in the Work, the Owner will notify the Contractor's surety.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

SECTION 01330 SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

A. Scope: Submit to the Project Engineer Shop Drawings, product data, and samples required by Specification Sections. Faxed submittals will **not** be accepted. Do **not** submit Material Safety Data Sheets for approval. Refer to Section 01630 – Product Options and Substitution Procedures, for requirements concerning products that will be acceptable on this Project.

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

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

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

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

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

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

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

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

F. Contractor Responsibilities:

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

G. Submission Requirements:

1. Schedule submission with ample time given to review submittals prior to being needed.
2. Submit 7, 8 if Plumbing, Mechanical or Electrical copies of Shop Drawings and number of copies of product data which Contractor requires for distribution.
3. Submit number of samples specified in each Specification Section.
4. Accompany submittals with transmittal letter, in duplicate, containing data, project title and number; Contractor's name and address; the number of each Shop Drawings, product data and samples submitted; notification of deviations from Contract Documents; and other pertinent data.
5. Submittals shall include the following on each copy:

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

H. Resubmission Requirements:

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

I. Distribution of Submittals after Review:

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

J. Architect / Engineer's Duties:

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

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

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

M. After an item has been accepted, no change in brand, make, manufacturer's catalog number, or characteristics will be considered unless:

1. Satisfactory written evidence is presented to and approved by the MDOT Architect, that manufacturer cannot make scheduled delivery of accepted item, or;
2. Item delivered has been rejected and substitution of a suitable item is an urgent necessity, or;
3. Other conditions became apparent which indicates acceptance of such substitute item to be in the best interest of the Owner.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

SECTION 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 Architect's clarification before proceeding.

B. The Contractor (including any and all Parties furnishing and / or installing any portion of The Work) shall be familiar with the indicated codes and standards. It shall be the Contractor's responsibility to verify the detailed requirements of the specifically named codes and standards and to verify (and provide written certification, when required) that the items procured for use in this Work (and their installation, as applicable) meet or exceed the specified requirements.

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

D. The contractual relationship of the Parties to the Contract shall not be altered from the requirements of the Contract Documents by mention or inference otherwise in any reference document.

PART 2 PRODUCTS
Not Used

PART 3 EXECUTION
Not Used

END OF SECTION

SECTION 01455 TESTING LABORATORY SERVICES

PART 1 GENERAL

1.01 SUMMARY

A. Scope: The Contractor shall use testing laboratory services of the Mississippi Department of Transportation for all testing required in this Section. These services will be provided to the Contractor by the MDOT at no charge. Use of said services shall in no way relieve the Contractor of his obligation to perform Work in accordance with the Contract.

B. Inspection, Sampling and Testing are required for:

1. Section 02315, Excavation, Filling, and Grading for Buildings.
2. Section 03200, Concrete Reinforcement.
3. Section 03300, Cast-In-Place Concrete.

1.02 LABORATORY'S DUTIES

A. Materials will be inspected and sampled in accordance with current Mississippi Department of Transportation SOP pertaining to inspecting and sampling.

B. Prepare reports of inspections and tests including:

1. Date issued.
2. Project title and number.
3. Testing laboratory, name and address.
4. Name and signature of inspector.
5. Date of inspection or sampling.
6. Record of temperature and weather.
7. Date of test.
8. Identification of product and Specification Section.
9. Location of Project.
10. Type of inspection or test.
11. Observations regarding compliance with Contract Documents requirements.

C. Distribute copies of reports of inspections and tests to Project Architect.

1.03 CONTRACTOR'S RESPONSIBILITIES

A. Cooperate with laboratory personnel to provide to laboratory in required quantities preliminary representative samples of materials to be tested.

B. When required, furnish copies of mill test reports. Furnish to laboratory, casual labor to obtain and handle samples at the site and to facilitate inspections and tests.

C. Provide facilities for laboratory's exclusive use for storage and curing of test samples.

D. Notify laboratory in advance of operations to allow for assignment of personnel and scheduling of tests.

1.04 MATERIAL CERTIFICATIONS AND CERTIFIED TEST REPORTS

A. All certifications shall meet the following requirements:

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

B. All certified test reports shall meet the following requirements:

1. Have letterhead of the manufacturer, producer, supplier, fabricator, or laboratory.
2. Include name and description of material, lot, batch, or heat number, etc., as applicable.
3. Show results of each required test, and state that the test was run according to the test method specified.
4. Test reports for all steel and steel wire products must also include a certified statement by the manufacturer that all of the manufacturing processes are of domestic origin.
5. Signature of a responsible laboratory official.

PART 2 PRODUCTS
Not Used

PART 3 EXECUTION
Not Used

END OF SECTION

SECTION 01500 TEMPORARY FACILITIES AND CONTROLS

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

A. Field Office (One Required): For the use of the Contractor, Project Engineer and his representative(s), MDOT Architect and his representative(s), and Consultants. Provide in office suitable furniture for plan layout, progress meetings and storage. Storage files and racks will maintain duplicates of all correspondence, shop drawings, plans, specifications, samples, etc. required to administer the project. These duplicates will be permanently kept as reference and shall not be used in the field. Also, provide lights, heat, air-conditioning, fax machine and telephone. Maintain each office in a sanitary and usable condition. Contractor shall provide the Project Engineer and the MDOT Architect with job site and emergency telephone numbers.

B. Storage Facilities: It shall be the Contractor's option to provide watertight storage facilities for storage of cement, lime, and / or other materials subject to water damage. If storage facilities are used, it shall be of sufficient size to hold all materials required for logically grouped activities on the site at one time, and shall have floors raised at least 6 inches above the ground on heavy joists or sleepers. Fully enclosed trailer is allowed, but location must be coordinated with Project Engineer.

1.03 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.

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

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

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

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

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

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

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

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

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

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

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

1.03 QUALITY ASSURANCE – GENERAL

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

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

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

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

1.04 QUALITY ASSURANCE – PRODUCTS

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

B. Matching / Mating of Products:

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

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

1.05 QUALITY ASSURANCE – WORKMANSHIP

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

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

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

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

D. Provide finishes to match approved samples.

E. Adjusting of Operating Products: As follows:

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

1.06 TRANSPORTATION AND HANDLING

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

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

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

1.07 STORAGE AND PROTECTION

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

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

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

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

PART 2 PRODUCTS
Not Used

PART 3 EXECUTION
Not Used

END OF SECTION

SECTION 01630 PRODUCT OPTIONS AND SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

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

1.02 CONTRACTOR'S OPTIONS

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

B. For products specified by naming several (minimum of three) products or manufacturers, select any product and manufacturer named. Contractor must submit request, as required for substitution, for any product not specifically named and give reasons for not using product specified. Substitution will **not** be granted unless reasons are considered justified.

C. For product specified by naming one or more products, but indicating the option of selecting equivalent products by stating "or approved equal" after specified product, Contractor must submit request, as required for substitution, for any product not specifically named.

D. For products specified by naming only one product and manufacturer, an equivalent product will always be accepted if it is equal in all respects (size, shape, texture, color, etc.). The Contractor must submit a request for substitution as set forth in this section

E. For products specified by naming only one product and manufacturer and stating no substitutions will be accepted, there is no option and no substitutions will be allowed.

1.03 PRODUCT SUBSTITUTION LIST

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

B. Tabulate list by each Specification Section.

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

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

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

1.04 SUBSTITUTIONS

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

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

B. In making request for substitution, Contractor represents:

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

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

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

PART 2 PRODUCTS
Not Used

PART 3 EXECUTION
Not Used

END OF SECTION

SECTION 01735 CUTTING AND PATCHING

PART 1 GENERAL

1.01 SECTION INCLUDES

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

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

1. Make several parts fit properly.

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

3. Remove and replace defective work.

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

5. Install specified work in existing construction.

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

1. Uncover work for observation of covered work.

2. Remove samples of installed materials for testing.

3. Remove work to provide alteration of existing work.

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

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

PART 2 PRODUCTS

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

PART 3 EXECUTION

3.01 GENERAL

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

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

C. Performance:

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

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

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

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

END OF SECTION

SECTION 01740 CLEANING

PART 1 GENERAL

1.01 SUMMARY

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

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

PART 2 PRODUCTS

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

PART 3 EXECUTION

3.01 DURING CONSTRUCTION

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

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

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

3.02 FINAL CLEANING

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

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

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

D. Keep Project clean until occupied by Owner.

END OF SECTION

SECTION 01770 CLOSEOUT PROCEDURES

PART 1 GENERAL

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

1.02 FINAL INSPECTIONS

A. Engineer and Architect's Inspection: The Contractor shall make written request for a Final Inspection to the Project Engineer and MDOT Architect. Notice is to be given 10 calendar days prior to this inspection. At the day of inspection, the Contractor shall have in hand 6 copies of the HVAC Test and Balance Report, Reference Specification Section 15080 and 6 copies of a list prepared by the Contractor of deficiencies, which will be edited by the Project Engineer, MDOT Architect and Consultants. A copy of these composite lists will be given to the Contractor for correcting the Work. Within 15 calendar days after this revised list is received, the Contractor shall make all corrections of the items listed. If, in the Project Engineer and MDOT Architect's judgment, the Project is not ready for an Inspection, the Project Engineer may schedule another inspection.

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

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

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

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

1.04 CLOSEOUT DOCUMENTS: Unless otherwise notified, the Contractor shall submit to the Owner through the Project Engineer to the MDOT Architect 2 copies the following before final payment is made:

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

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

C. Release of Liens and Certification that all Bills Have Been Paid: AIA Document G706A, current edition, completed in full or a sworn statement and affidavit from the Contractor to the Owner stating that all bills for this project have been paid and that the Owner is released from any and all claims and / or damages.

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

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

F. Guarantee of Work: Sworn statement that all Work is asbestos free and guaranteed against defects in materials and workmanship for one year from Date of Final Acceptance, except where specified for longer periods.

1. Word the guaranty as follows: "We hereby guarantee all Work performed by us on the above captioned Project to be free from asbestos and defective materials. We also guarantee workmanship for a period of one (1) year or such longer period of time as may be called for in the Contract Documents for such portions of the Work".

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

3. Within the guaranty period, if repairs or changes are requested in connection with guaranteed Work which, in the opinion of the Owner, is rendered necessary as a result of the use of materials, equipment, or workmanship which are inferior, defective, or not in accordance with the terms of the Contract, the Contractor shall promptly, upon receipt of notice from and without expense to the Owner, place in satisfactory condition in every particular, all such guaranteed Work, correct all defects wherein and make good all damages to the building, site, equipment or contents thereof which, in the opinion of the Owner, is the result of the use of materials, equipment, or workmanship which are inferior, defective or not in accordance with the terms of the Contract; and make good any Work or materials or the equipment and contents of said buildings or site disturbed in fulfilling any such guaranty.

4. If, after notice, the Contractor fails to proceed promptly to comply with the terms of the guaranty, the Owner may have the defects corrected and the Contractor and his sureties shall be liable for all expense incurred.

5. All special guaranties applicable to definite parts of the Work stipulated in the Project Manual or other papers forming part of the Contract shall be subject to the terms of this paragraph during the first year of the life of such special guaranty.

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

1. Provide all certificates, warranties, guarantees, bonds, or documents as called for in the individual Sections of the Project Manual. The Contractor is responsible for examining the Project Manual for these requirements

H. Additional Documents Specified Within the Project Manual:

1. General: Provide all additional 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.

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 legible condition. Do not use Record Documents for construction purposes.

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

C. Recording:

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

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

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

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

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

D. Submittals:

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

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

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

4. Sufficient information, such as as-built control drawings for air handling system and variable drive controls, shall be furnished to allow qualified personnel to service equipment.

PART 2 PRODUCTS
Not Used

PART 3 EXECUTION
Not Used

END OF SECTION

SECTION 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.

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 Architect. 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 Architect 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: 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.

A. 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.

B. 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 MDOT Architect's approval. Transmit copy of instructions to the Applicator.

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

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. 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.

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. Fuel oil will not be permitted as a diligent. Provide a working solution of one of the following chemical elements and concentrations:

1. Chlorpyrifos, 1.0 percent in water emulsion.
2. Aldrin, 0.5 percent in water emulsion.

B. Other solutions may be used as recommended by Applicator and if acceptable to local and state governing authorities. Use only 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

A. 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.

B. 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 as follows:

1. Apply 4 gallons of chemical solution per 20 linear feet to the soil critical areas under the slab, such as along the inside of foundation walls, along both sides of interior partition walls, and around plumbing.
2. Apply one gallon of chemical solution per 10 square feet as an overall treatment under the slab and attached slab areas where fill is soil or unwashed gravel. Apply one & one-half gallons of chemical solution to those areas where fill is washed gravel or other coarse absorbent material.
3. Apply 4 gallons of chemical solution per 10 linear feet of trench, for each foot of depth from grade to footing, along the outside edge of the building. When the outside edge of the exterior grade beam is formed with other than earth, treat 6 inches to 8 inches wide along the outside of the foundation to a depth of not less than 12 inches. Punch holes to top of footing at not more than 12 inches on center and apply chemical solution. Mix the chemical solution with the soil as it is being replaced in the trench.
4. In absorbent soil or fill (sand, sand and gravel mix, etc.) increase the application rate to one & one-half gallons per 10 square feet where one gallon to 10 square feet is specified.
5. Reapply soil treatment solution to areas disturbed by subsequent excavation or other construction activities following application.

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

3.03 PROTECTION: 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 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 Architect 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 Architect.

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 Project Architect's approval is obtained.

B. Reinforcing for one day's pour shall be completely placed and an inspection made by the Project Architect prior to starting the pour.

C. Concrete Protection for Reinforcement: Minimum coverage shall be as follows unless shown otherwise on drawings:

1.	Footings (bottom and sides)	3 inches clear
2.	Slabs	1-1/2 inches clear top and 3/4 inch clear bottom
3.	Beams	1-1/2 inch clear to stirrups
4.	Walls	2-1/2 inches clear
5.	Columns	2 inches clear to verticals

D. Steel Dowels for successive work shall be wired in correct position before placing concrete. The "sticking" of dowels after placing concrete will not be permitted.

E. Do not weld reinforcing steel unless specifically approved by the Project Engineer.

END OF SECTION

SECTION 03300 CAST-IN-PLACE CONCRETE

PART 1 GENERAL

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

1.02 RELATED SECTIONS

A. Section 03100 – Concrete Forms and Accessories.

B. Section 03200 – Concrete Reinforcement.

C. Section 07260 – Vapor Retarders

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

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

1.05 QUALITY ASSURANCE

A. Concrete work shall conform to all requirements of ACI 301, Specifications for Structural Concrete for Buildings and ACI 318 Building Code Requirements for Reinforced Concrete, latest editions, except as modified by supplemental requirements herein.

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

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

1.06 COORDINATION

A. Verify that all pipes under grade have been installed and tested before being covered. Check and verify materials and locations of inserts, anchors, and items required by other trades before pouring concrete. Concerned subcontractors shall be notified of date of pour in sufficient time to allow for completion of their work.

B. The Contractor shall notify the Project Engineer upon completing formwork and all reinforcing steel for the next intended pour, and shall not commence pouring operation until all forms and steel are approved by the Project Engineer.

C. Project Engineer shall have free access to all materials used, and the required samples are to be furnished by the Contractor, as directed.

D. Inspection and written approval from the floor-covering subcontractor is required for slab finish receiving floor covering.

PART 2 PRODUCTS

2.01 CONCRETE

A. All concrete, unless otherwise specifically approved in writing by the Project Engineer, shall be transit-mixed in accordance with ASTM C94. Control of concrete shall be under supervision of testing laboratory as described in Section 01455.

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

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

2.02 CONCRETE MATERIALS

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

B. Water: From city or community water supply.

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

D. Admixtures: Provide admixtures produced by established reputable manufacturers and use in compliance with manufacturer's printed directions. Do not use admixtures that have not been incorporated and tested in accepted mixes, unless otherwise authorized in writing by the Project Architect. Non-uniform addition of mixtures that result in erratic setting of the concrete will cause rejection of the concrete with subsequent removal from the structure at the concrete producer's expense.

2.03 RELATED MATERIALS

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

B. Chemical Hardener (Sealer): Colorless aqueous solution containing a blend of magnesium fluosilicate and zinc fluosilicate combined with a wetting agent containing not less than 2 pounds of fluosilicates per gallon.

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

D. Non-shrink Grout: Shall be one part Portland cement to 2-1/2 parts of fine aggregate or Cement grout ASTM C 387 Dry Package mixtures similar and equal to Masterflow 713, Master Builders; Sonnogrout, Sonneborn; Five Star Grout, U.S. Grout Company.

2.04 CONCRETE MIXES

A. The ready-mix concrete shall be mixed and delivered in accordance with requirements of ASTM C 94. Uniformly and accurately control proportions of material weight. Control mixes for concrete shall be "Class 1" conforming to ACI 301. Mix proportions shall be selected in accordance with ACI 211.1 “Recommended Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete”. Excessive slump deviations will be cause for rejection of the supplied mix. Calcium chloride shall not be used.

B. Failure of concrete to meet the specified requirements may result in rejection with subsequent removal and replacement or re-testing (including coring, load test, etc.) at the supplier’s expense. Concrete exhibiting adverse reaction as a result of the presence of deleterious substances shall be removed and replaced or repaired in a manner completely satisfactory to the Project Architect. All cost of such corrective action, including all necessary testing, shall be borne by the concrete producer.

C. 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.

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 Architect. 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. Exterior walks and ramps shall have smooth trowel and fine broom finish.

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

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

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

3.06 FINISHES FOR GRADE BEAMS

A. Exposed grade beam faces shall have a smooth form finish obtained by using selected form facing plywood, arranged orderly and symmetrically with a minimum of seams. Repair and patch defective areas with all fins or other projections completely removed and smoothed. Provide grout cleaned finish consisting of 1 part Portland Cement to 1-1/2 parts fine sand by column, and mix with water to the consistency of thick paint. Blend standard Portland cement and white Portland cement, amounts determined by trial patches, so that the final color of dry grout will closely match adjacent concrete surfaces.

B. Thoroughly wet concrete surfaces and apply grout immediately to coat surfaces and fill small holes. Remove excess grout by scraping and rubbing with clean burlap. Keep damp by fog spray for at least 36 hours after rubbing.

END OF SECTION

SECTION 04200 MASONRY UNITS

PART 1 GENERAL

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

1.02 RELATED SECTIONS: Section 09050 – Color Design.

1.03 SUBMITTALS: Submit product data, specifications and other data for each type of masonry unit and accessory required, including certification that each type complies with the specified requirement. Include instructions for handling, storage, installation and protection of each. Indicate by transmittal that the Installer has received a copy of each instruction.

1.04 QUALITY ASSURANCE

A. Fire-rated Masonry: Wherever a fire-resistance classification is shown or scheduled for unit masonry construction (4 hour, 3 hour, and similar designations), comply with the requirements for materials and installation established by the American Insurance Association and other governing authorities for the construction shown.

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

1.05 PROJECT CONDITIONS

A. Protect partially completed masonry against weather, when Work is not in progress, by covering top of walls with strong, waterproof, non-staining membrane. Extend membrane a minimum of 2 inches down both sides of walls and anchor securely in place.

B. Protect masonry against freezing when the temperature of the surrounding air is 40 degrees F. and falling. Heat materials and provide temporary protection of completed portions of masonry work. Comply with the requirements of the governing code and with the "Construction and Protection Recommendations for Cold Weather Masonry Construction" of the Technical Notes on Brick and Tile Construction by the Brick Institute of America (BIA).

PART 2 PRODUCTS

2.01 ACCEPTABLE BRICK MANUFACTURERS

A. Equivalent products by the following manufacturers are acceptable:

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

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

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

2.03 BRICK, GENERAL: Unless otherwise shown or specified, provide standard size brick (8 inches long by 2-l/4 inches high by 3-3/4 inches wide) for exposed vertical brickwork. At Contractor's option, provide solid or cored brick for vertical brickwork. Do not use cored brick with net cross-sectional area less than 75 percent of gross area in the same plane or with core holes closer than 3/4 inch from any edge.

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

B. Building (Common) Brick: Brick not exposed to view, ASTM C 62, Grade SW for exterior exposures and Grade MW for interior masonry which will be concealed by other work. Select from manufacturer's standard colors and textures.

2.04 MORTAR MATERIALS: Mortar mixes shall comply with the requirements of ASTM C 270 Standard Specification for Mortar for Unit Masonry. Type S mortar shall be used for exterior Work. Type N mortar shall be used for interior Work. Mortar color for face brick shall be as selected by the Project Architect from manufacturer's standard colors. Mortar color for building (common) brick shall be natural color or white cement as required to produce the required standard mortar color.

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

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

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

2.05 MASONRY ACCESSORIES: Provide adjustable wire ties conforming to ASTM A 82 Specification for Steel Wire, Plain, for Concrete Reinforcement. The wire shall be a minimum of W1.7, 9 gage. Plate portions of adjustable ties shall be a minimum of 14 gage in thickness. Plate portion shall conform to ASTM A 366 Standard Specification for Steel, Carbon, Cold-Rolled Sheet, Commercial Quality. All tie components shall be hot-dip galvanized after fabrication and shall conform to ASTM A 153 Standard Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware, Class B-2.

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.

B. Concrete Inserts for Masonry:

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

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

2.06 MASONRY MAT & WEEP VENTS

A. Manufacturer and Type: Products equal to CavClear Masonry Mat and CavClear Weep Vents as manufactured by Archovations, Inc., PO Box 241, Hudson, WI 54016. Telephone (888) 436-2620.

1. Description: Airspace maintenance and drainage system for masonry cavities to prevent mortar from making contact with the backup to ensure water management. The system shall be fluid conducting, non-absorbent, mold and mildew resistant polymer mesh consisting of 100 percent recycled polymer with PVC binder. Weep Vents shall have “M” notched bottom. Color to be selected by the MDOT Architect from full range of standard colors
2. Mat Size: 1-1/4 inch thick by 16 inches high by 8 feet long.
3. Weep Vent Size: 1/2 inch thick by 2-1/2 inches high by 3-1/2 inches wide.

B. Equivalent products by the following manufacturers are acceptable:

1. Advanced Building Products, Inc., P.O. Box 98, Springvale, ME 04083. Tel: (800) 252-2306.
2. Colbond Geosynthetics, P.O. Box 1057, Sand Hill Road, Enka, NC 28728. Tel. (800) 664-6638.

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

PART 3 EXECUTION

3.01 INSPECTION: Masonry installer must examine the areas and conditions under which masonry is to be installed and notify the 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: 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 brick with motor-driving saw designed to cut masonry with clean, sharp, un-chipped edges. Cut units as required to provide pattern shown and to fit adjoining Work neatly. Use full units without cutting wherever possible.

C. Wet brick having ASTM C67 absorption rates greater than 0.025 oz. per sq. inch per minute. Determine absorption by drawing a circle the size of a quarter on typical units and place 20 drops of water inside the circle. Wet brick units only if water is absorbed within 1-1/2 minutes. The units shall be wetted thoroughly 3 to 24 hours prior to their use so as to allow moisture to become distributed throughout the unit. The units shall be surface dry when laid.

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

E. Pattern Bond: Lay masonry work in a 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.

3.03 MORTAR BEDDING AND JOINTING: 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.

A. Lay brick and other solid masonry units with completely filled bed and head joint; butter ends with sufficient mortar to fill head joints and shove into place. Do not slush head joints.

B. 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.

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

3.04 EXTERIOR BRICK VENEER WALLS: Keep cavity clean of mortar droppings during construction. Strike joints facing cavity, flush.

A. Tie exterior wythe to back-up with adjustable ties embedded in mortar joints at proper spacing, not more than l6 inches on center vertically and 24 inches on center horizontally. Fasten ties to wood frame with corrosion-resistant nails that penetrate the sheathing and are driven a minimum of 1-1/2 inches into the studs.

B. Place Masonry Mat continuously full height in exterior masonry cavity prior to construction of exterior wythe; follow manufacturer's installation instructions. Install horizontally between wall ties or joint reinforcement. Stagger end joints in adjacent rows. Butt adjacent pieces to moderate contact. Fit to perimeter construction and penetrations without voids. Use multiple layers at bottom of wall and above through-wall flashings when air space depth exceeds masonry mat thickness by more than 3/8 inch. Extend extra mat at least to top of base flashing.

C. Place Weep Vents in head joints at exterior wythe of cavity wall located immediately above ledges and flashing, spaced 24 inches on center, unless otherwise shown. Install with notched side down. Leave the side of the masonry units forming the vent space un-buttered and clear from mortar. Slide vent material into joint once the two masonry units forming the weep vent are in place. Install the Weep Vents as the wall is being erected so joints do not become filled with mortar or debris.

3.05 ANCHORING MASONRY WORK

A. Provide anchoring devices of the type shown and as specified. If not shown or specified, provide standard type for facing and back-up involved. Anchor masonry to structural members where masonry abuts or faces such members to comply with the following:

B. Provide an open space not less than l/2 inch in width between masonry and structural member, unless otherwise shown. Keep open space free of mortar or other rigid materials. Anchor masonry to structural members with metal ties embedded in masonry joints and attached to structure. Provide anchors with flexible tie sections unless otherwise shown. Space anchors as shown, but not more than 24 inches on center horizontally.

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

3.07 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 30'-0" on center. Locate control joints at points of natural weakness in the masonry work.

3.08 FLASHING OF MASONRY WORK

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

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

3.09 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. Clean exposed brick masonry surfaces as recommended by BIA Technical Notes 20 "Cleaning Clay Products Masonry".

C. Clean exposed CMU masonry by dry brushing at the end of each day's work and after final pointing to remove mortar spots and droppings.

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 bollards, steel lintels 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: Submit shop drawings for shop fabricated items. Indicate profiles, sizes, materials connection details, attachments, reinforcing, anchorage, size and type of fasteners, 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.

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, such as aluminum to cement mortar or concrete, the surface shall be protected by zinc chromate primer or approved paint.

2.03 PIPE BOLLARDS: Provide 8-inch round extra strong steel pipe 1/2-inch thick, 36KSI. Form bent corners to the radius shown without causing grain separation or otherwise impairing the Work.

2.04 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.

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

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

B. Galvanize exterior miscellaneous frames and supports.

PART 3 EXECUTION

3.01 INSTALLATION

A. Perform cutting, drilling and fitting required for installation; set Work accurately in location, alignment and elevation measured from established lines and levels. Provide anchorage devices and fasteners where necessary for installation to other Work.

B. Set loose items on cleaned bearing surfaces, using wedges or other adjustments as required. Solidly pack open spaces with bedding mortar, consisting of 2 part Portland Cement to 3 parts sand and only enough water for packing and hydration, or use commercial non-shrink grout material.

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 05535 PRECAST TRENCH DRAIN SYSTEM

PART 1 GENERAL

1.01 SECTION INCLUDES: Precast trench drain system of pre-sloped channel sections of polymer concrete with built-in 0.6 percent slope with drainage accessories and ductile iron grates and frames as shown and / or required for a complete trench drain system.

1.02 RELATED SECTIONS

A. Section 03100 – Concrete Forms & Accessories.

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

C. Section 15400 – Plumbing Basic Materials & Methods.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's technical data and installation instructions for trench drain system.

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

1.04 QUALITY ASSURANCE

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

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

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

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

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

B. Equivalent products by the following manufacturers are acceptable:

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

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

2.02 COMPONENTS

A. Drain Trench: Precast channels fabricated of polyester polymer concrete, 6 inches wide, 4inches ID with radiused bottom and interlocking ends, having the following attributes:

1. Lengths: 39.2 inches and 19.6 inches.
2. Bottoms: sloped to provide 0.6 percent slope.
3. Anchoring ribs: full length.
4. Grate locking slots: blind, vibration damping, thermoplastic.

B. Grates and Frames: Equal to ABT, Inc. Model No. 512AF ductile iron slotted grates with ductile iron anchor frames.

C. Accessories as follows:

1. End plates.
2. 4 inch diameter horizontal outlet / inlet plates.
3. No. 815B locking devices.
4. PolySeal 2, two-part epoxy, joint sealant.
5. PolyClip installation devices.

PART 3 EXECUTION

3.01 EXAMINATION: Installer must examine areas and conditions under which this Work is to be installed and notify the Contractor in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

3.02 PREPARATION

A. Assure that substrate is compacted per Division 2 requirements.

B. Roughen surface, and acetone wash, area to receive PolySeal 2 sealant.

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

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

END OF SECTION

SECTION 06100 ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES: Concealed wood grounds and blocking to frame openings, form terminations, to provide anchorage and / or support of other interior and exterior locations; plywood, particleboard, furring channels and rough hardware.

1.02 RELATED SECTIONS

A. Section 03100 - Concrete Forms and Accessories.

B. Section 06400 - Architectural Woodwork.

C. Section 08710 - Door Hardware.

1.03 COORDINATION: Fit carpentry Work to other Work; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds and similar supports to allow proper attachment of other Work.

1.04 QUALITY CONTROL: Factory mark each piece of lumber and plywood to identify the type, grade, agency providing the inspection service, the producing mill and other qualities as specified.

1.05 DELIVERY, STORAGE AND PROTECTION: Keep materials dry during delivery and storage. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber and plywood, and provide air circulation within stacks. Protect installed carpentry work from damage by work of other trades until Owner's acceptance of the Work. Contractor shall comply with manufacturer’s required protection procedures.

1.06 PROJECT CONDITIONS: Installer must examine all parts of the supporting structure and the conditions under which the carpentry Work is to be installed, and notify the Contractor in writing of any conditions detrimental to the proper and timely completion of the Work. Do not proceed with the installation until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

PART 2 PRODUCTS

2.01 LUMBER: For each use, comply with the "American Softwood Lumber Standard" PS 20 by the U.S. Department of Commerce. Nominal sizes are shown or specified; provide actual sizes complying with the minimum size requirements of PS20 for the moisture content specified for each use. Provide dressed lumber, S4S, unless otherwise shown or specified. Provide seasoned lumber with 19 percent maximum moisture content at time of dressing and complying with dry size requirements of PS 20, unless otherwise specified.

2.02 FRAMING LUMBER

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

B. For Light Framing: Standard Grade.

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

2.03 BOARDS

A. Where lumber less than 2 inches in nominal thickness and 2 inches or more in nominal width is shown or specified, provide boards complying with dry size requirements of PS 20.

B. Concealed Boards: Where boards will be concealed by other work, provide the following:

1. Moisture Content: 19 percent maximum, mark boards "S- Dry".
2. Species and Grade: Provide one of the following:
Southern Pine (SPIB) No. 2 boards of WCLB (any species) No. 3 boards.

2.04 PLYWOOD

A. For each use, comply with the requirements for "Softwood Plywood/Construction and Industrial" PS 1 by the U.S. Department of Commerce.

B. Concealed Plywood: Where plywood will be concealed by other work, provide 5/8-inch minimum thickness Interior Type plywood C-D Plugged Grade, unless otherwise specified or shown on Drawings. For backing panels for electrical or telephone equipment, provide fire-retardant treated Standard grade plywood with exterior glue.

C. Exposed Plywood: Where plywood will be exposed to view, provide 5/8 inch minimum thickness Interior Type plywood C-D Plugged Grade, unless otherwise specified or shown on Drawings. Unless specifically stated otherwise, all exposed plywood shall be painted or stained from standard colors as selected by Project Architect.

D. Plywood Subfloor: T&G panels shall be 3/4 inch thick and comply with APA-The Engineered Wood Association rated Sturd-I-Floor, Exposure 1.

E. Particleboard: Particleboard shall be 1/2-inch thick and comply with Type PBU, ANSI standard A208.1

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

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

2.05 ANCHORAGE AND FASTENING MATERIALS: For each use, select proper type, size, material and finish complying with the applicable Federal Specifications. Zinc electroplated steel fasteners for high humidity and treated wood locations. All nails shall be coated.

2.06 FURRING CHANNELS: “Hat-shaped”, 7/8 inch by 2-9/16 inches, cold-rolled, 20 gage, galvanized.

2.07 TREATED WOOD: Complete fabrication of treated items prior to treatment, wherever possible. If cut after treatment, coat cut surfaces with heavy brush coat of same fire-retardant chemical used for treatment. Inspect each piece of lumber or plywood after drying and discard damaged or defective pieces.

A. Preservative Treatment: Where lumber or plywood is indicated as "Treated", or is specified herein to be treated, comply with the applicable requirements of the American Wood Preservers Institute (AWPI). Mark each treated item to comply with the AWP Quality Mark requirements for the specified requirements.

1. Pressure-treat aboveground items with water-borne preservatives complying with AWPI P-2. After treatment, kiln-dry to maximum moisture content of 15 percent. Treat indicated items and the following:

a. Wood cants, nailers, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers and waterproofing.
b. Wood sills, sleepers, blocking, furring stripping and similar concealed members in contact with masonry or concrete.

B. Fire-Retardant Treatment: Where "PR-S" lumber or plywood is shown or scheduled, comply with the AWPI Specification C-208 for pressure impregnation with fire-retardant chemicals to achieve a flame-spread rating of not more than 25 when tested in accordance with UL Test 723, ASTM E A4, or NFPA Test 355. Where treated items are indicated to receive a transparent or paint finish, use a fire-retardant treatment that will not bleed through or adversely affect bond of finish.

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

PART 3 EXECUTION

3.01 INSTALLATION: Use only sound, thoroughly seasoned materials of the longest practical lengths and sizes to minimize jointing. Use materials free from warp that cannot be easily corrected by anchoring and attachment. Sort out and discard warped material and material with other defects that would impair the quality of the Work.

A. Securely attach carpentry work to substrates by anchoring and fastening as shown and as required by recognized standards. Countersink nail heads on exposed carpentry work and fill holes.

B. Set carpentry work accurately to required levels and lines, with members plumb and true and accurately cut and fitted.

3.02 ATTACHMENT AND ANCHORAGE

A. Use common wire nails, except as otherwise shown or specified. Use finishing nails for finish Work. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood; pre-drill as required.

B. Plywood Sheathing: Panel ends and edges shall have spacing of 1/8 inch, unless otherwise indicated by the panel manufacturer. Nail 6 inches on center along supported panel edges and 10 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.

C. Plywood Subfloor: Fasten to supporting members using combination of glue and wood screws. Mastic construction adhesives shall comply with the APA Glued Floor System and ASTM standard D3498, Standard Specification for Adhesives for Field-Gluing Plywood to Lumber Framing for Floor Systems (based on APA Specification AFG-01). Fasten screws at 6 inches on center along all edges and 10 inches on center at intermediate supports.

D. Particleboard: Fasten to plywood subfloor using combination of glue and type A or AB, sheet metal, twin fast types and fully threaded designed for use in particleboard. Install in accordance with installation instructions of The Composite Panel Association.

E. Furring Channels: Fasten to purlins using self-drilling, self-tapping screws, Spaced at 6 inches on center .

3.03 WOOD GROUND NAILERS, BLOCKING, AND SLEEPERS: Provide wherever shown and where required for screeding or attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be attached. Set true to line and level, plumb with intersections true to required angle. Coordinate location with other Work involved.

A. Attach to substrates securely with anchor bolts and other attachment devices as shown as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise shown. Building into masonry; anchor to formwork before concrete placement.

B. Provide grounds of dressed, preservative treated, key-beveled lumber not less than 1-1/2 inch wide and of the thickness required to bring face of ground to exact thickness of finish material involved. Remove temporary grounds when no longer required.

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

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

3.05 WOOD FRAMING

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

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

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 style number 1 as manufactured by Cleveland Steel Specialty Company.

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 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 Project 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 finish, Countertops, Shelving, and Miscellaneous work.

1.02 RELATED SECTIONS: Section 09050 – Color Design.

1.03 SUBMITTALS

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

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

1.04 QUALITY ASSURANCE

A. Unless otherwise shown or specified, comply with specified provisions of the Architectural Woodwork Institute (AWI) and approved "Quality Standards".

B. Quality Marking: Mark each unit of architectural woodwork with mill's or fabricator's identification and grade marks, located on surfaces which will not be exposed after installation.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING: Protect woodwork during transit, delivery, storage and handling to prevent damage, soiling and deterioration. Do not deliver woodwork until painting, wet work, grinding and similar operations which could damage, soil or deteriorate woodwork have been completed in installation areas. If, due to unforeseen circumstances, woodwork must be stored in other than installation areas, store only in areas meeting requirements specified for installation areas.

1.06 PROJECT CONDITIONS: The Installer shall examine the substrates and conditions under which the work is to be installed; and notify the Contractor in writing of unsatisfactory conditions. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

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

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

PART 2 PRODUCTS

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

A. Wood Moisture Content: Provide kiln-dried lumber and maintain optimum 8 to 13 percent range (damp region) moisture content in solid wood (hardwood and softwood) through fabrication, installation, and finishing operations of interior Work.

B. Wood for Painted Finish: Comply with quality standards for selection of species, grade and cut (fabricator's option, except as otherwise indicated). Wood for trim shall be maple or other closed-grain hardwood subject to Project Engineer / Architect's prior approval.

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

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

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

E. Design and Construction Features: Comply with the details shown for profile and construction for architectural woodwork; and where not otherwise shown, comply with applicable Quality Standards, with alternate details at fabricator's option.

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

G. Measurements: Before proceeding with fabrication of woodwork required to be fitted to other construction, obtain measurements and verify dimensions and shop drawing details as required for accurate fit. Where sequence of measuring substrates before fabrication would delay the project, proceed with fabrication (without field measurements) and provide ample borders and edges to allow for subsequent scribing and trimming of woodwork for accurate fit.

2.02 ARCHITECTURAL WOODWORK TYPES

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

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

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

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

2.04 CABINET HARDWARE AND ACCESSORY MATERIALS: Provide cabinet hardware and accessory materials associated with architectural woodwork, except for units that are specified as "door hardware" in other sections of these specifications. Except as otherwise indicated, comply with ANSI A156.9 "American National Standard for Cabinet Hardware." Unless shown or noted otherwise, cabinet hardware shall comply with the following: Hinges: Concealed type equal to Blum 125 Series using full side adjustment. Pulls: Wire type equal to Stanley 4484. Drawer guides equal to K&V 1300. Provide adjustable shelf hardware (side support) K&V 255-256 and adjustable shelf hardware (back support) K&V 87-187 for 16" deep shelves. Closet Rods to be chrome pipe one inch in diameter, braced 4 feet on center maximum. Provide closet Rod Support - Stanley 7046. Hardware finishes to be selected by MDOT Architect.

PART 3 EXECUTION

3.01 PREPARATION

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

B. Deliver concrete inserts and similar anchoring devices to be built into substrates, well in advance of the time substrates are to be built. Prior to installation of architectural woodwork, examine shop fabricated work for completion, and complete work as required, including back priming and removal of packing.

3.02 INSTALLATION

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: Repair damaged and defective woodwork wherever possible to eliminate defects functionally and visually; where not possible to repair properly, replace woodwork. Adjust joinery for uniform appearance.

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

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

C. Protection: The Installer of architectural woodwork shall advise the Contractor of final protection and maintenance conditions necessary to ensure that the Work will be without damage or deterioration at the time of acceptance.

END OF SECTION

SECTION 07210 BUILDING INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES: Building insulation for exterior walls, interior walls, and ceilings as shown on the Drawings and specified herein.

1.02 RELATED SECTIONS: Other types of insulation are specified in Roof Insulation under Section 13122 Metal Building System Specifications.

1.03 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 Engineer / MDOT Architect's approval.

1.04 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. Celotex Building Products, 4010 Boy Scout Blvd, Tampa, FL 33607, Tel. (813) 873-4000.
2. Dow Chemical Company, 200 Larkin Center, Midland, MI 48674, Tel. (800) 441-4369.
3. Johns Manville Corp, 717 17 Street, Denver, CO 80202, Tel. (303) 978-2531.
4. Owens Corning, One Owens Corning Parkway, Toledo, OH 43659, Tel. (800) 438-7465.
5. UC Industries, Inc., 137 East Ave., Suite 64, Tallmadge, OH 44278, Tel. (330) 630-6134.
6. United States Gypsum Company, 125 S. Franklin St., Chicago, IL 60606, Tel. (800) 874-4968.

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 ACCESSORIES

A. 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 Engineer / MDOT 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 Engineer / MDOT 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.

END OF SECTION

SECTION 07260 VAPOR RETARDERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Vapor barrier under concrete floor slab.

B. Concrete curing paper on top of freshly poured concrete floor slab. .

C. Weather-resistive barrier on exterior face of wall sheathing.

D. 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. Griffolyn ® Division, Reef Industries, Inc., 9209 Almeda Genoa Road, Houston, TX 77075. Tel: (800) 231-6074.
2. Grace Construction Products, 62 Whittermore Avenue, Cambridge, Ma 02140. Tel: (800) 444-6459.

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

2.02 VAPOR BARRIER: Membrane shall be a non-woven geo-textile laminated with polyethylene to a low-perm membrane, meeting ASTM E-1745-96 Class C Test Method, equal to “ Moistop Plus”.

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 WEATHER-RESISTIVE BARRIER: Membrane shall be a single ply, asphalt saturated kraft 60 minute Grade D breather type sheathing paper, meeting ASTM E-1677 Type I Test Method, equal to “Fortify”.

2.05 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 vapor barrier 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 or mastic 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 doubled in thickness and sealed as before specified for joints. 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.

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 weather-resistive barrier shall be installed in weather-board fashion over approved exterior sheathing, lapping horizontal joints a minimum of 2 inches and lapping vertical joints a minimum of 6 inches. Lapped joints shall be taped with Fortify Tape. Tears and punctures shall be sealed with Fortify Tape and/or Moistop Sealant.

D. 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 07315 FIBERGLASS REINFORCED SHINGLES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. The extent of shingles is shown on the Drawings and defined to include manufactured units used as weather protection for roof at Storage / Field Lab Building.

B. Steep slope granular surfaced reinforced fiberglass roofing shingles.

C. Moisture shedding underlayment, eave, valley, ridge and deck protection.

D. Ridge vents.

1.02 RELATED SECTIONS

A. Section 07465 – Aluminum Soffit Panels.

B. Section 07620 – Sheet Metal Flashing and Trim.

C. Section 09050 – Color Design.

1.03 REFERENCES

A. ASTM B 209 – Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 1996.

B. ASTM D 3018 – Standard Specification for Class A Asphalt Shingles Surfaced with Mineral Granules; 1990 (Re-approved 1994).

C. ASTM D 3161 – Standard Test Method for Wind-Resistance of Asphalt Shingles (Fan-Induced Method); 1997.

D. ASTM D 4586 – Standard Specification for Asphalt Roof Cement, Asbestos-Free; 1993.

E. UL 790 – Test for Fire Resistance of Roof Covering Materials; 1995.

F. UL 997 – Wind Resistance of Prepared Roof Covering Materials; 1995.

1.04 SUBMITTALS

A. Data: Submit technical product data, installation instructions, and recommendations from shingle manufacturer, including data that materials comply with requirements of this specification.

B. Samples: Submit full range of samples for color and texture selection. After selection, submit 2 full-size shingles for verification and approval of color, style, and texture.

C. Warranty: Submit original copy of manufacturer's warranty for type of shingle specified.

1.05 QUALITY ASSURANCE

A. Materials: Provide labeled materials tested and listed by UL for Class and Rating indicated for shingle type required. Shingles shall be uniform and consistent in shade, color, and texture under varying light conditions. Shingles that are inconsistent and do not match adjacent shingles shall not be accepted. Installed shingles that do not conform to these Specifications shall be replaced.

B. Manufacturer: Company specializing in Fiberglass Reinforced Shingles with 10 years minimum experience.

C. Installer: Company specializing in Fiberglass Reinforced Shingles, with 5 years minimum experience, who has completed work similar to that indicated for this project and with a record of successful in-service performance. Certified by shingle manufacturer for steep sloped installation.

1.06 PRODUCT DELIVERY, STORAGE, AND HANDLING: Deliver materials in manufacturer's unopened, labeled containers. Store materials to avoid water damage, and store rolled goods on end. Comply with manufacturer's recommendations for job-site storage and protection.

1.07 JOB CONDITIONS

A. Substrate: Proceed with shingle work only after substrate construction and penetrating work has been completed.

B. Weather Conditions: Proceed with shingle work only when weather conditions are in compliance with manufacturer's recommendations and when substrate is completely dry.

1.08 SPECIFIED PRODUCT WARRANTY: Provide warranty equal to GAF Smart Choice System Plus Ltd. Warranty on installed work, agreeing to pay 100 percent of the repair or replacement on defective shingles and as necessary to eliminate leaks for a period of 10 years from date of Maintenance release. Subsequent years of warranty are prorated based on 30-year life cycle expectancy.

1.09 EXTRA MATERIALS: Deliver to Owner two bundles in unopened condition of shingles in full range selected for future replacement. Also deliver ten each starter and ridge shingles in color selected.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Drawings and Specifications are based on products manufactured by GAF Materials Corporation, 1361 Alps Road, Wayne, NJ 07470, Tel: (888) 532-5767.

B. Equivalent products by the following manufacturers are acceptable:

1. Celotex Corp., P.O. Box 31602, Tampa, FL 33631, Tel: (800) 235-6839.
2. Owens Corning, One Owens Corning Parkway, Toledo, OH 43659. Tel: (800) 766-3464.

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

2.02 MATERIALS

A. Shingles: 30 year minimum Ltd. Warranty, Fungus/Algae Resistance granular surfaced glass fiber mat reinforced asphalt shingles complying with ASTM D 3018 and ASTM D 3161; UL 790 Class A rated with UL 997 Wind resistance Label. Style: GAF Original Timberline, with Algae Eater Protection and Timbertex hip and ridge. Color to be selected by MDOT Architect from manufacturer's full range of standard colors.

B. Leak Barriers: Self-adhesive rubberized asphalt sheet, with strippable release film. Product: GAF Weather Watch; bonded to skid-resistant fine granules; 58 mils total thickness.

C. Roof Deck Protection: Water repellent breather type cellulose / glass fiber composite building paper; GAF Shingle-Mate underlayment.

D. Nails: Standard round wire shingle type, zinc-coated steel or aluminum; 10 to 12 gage, barbed or deformed shank, with heads 3/8-inch to 7/16-inch in diameter; length sufficient to penetrate 3/4 -inch into deck lumber or through plywood deck.

E. Plastic Cement: ASTM D 4586. Type II or I.

F. Ridge Vent: UV stable, polyester, non-woven, non-wicking, fiber-based matting of three-dimensional construction; GAF COBRA Ridge Vent.

G. Metal Drip Edge: Brake-formed to provide 3 inch roof deck flange, and 1-1/2 inch fascia flange with 3/8-inch drip at lower edge. Furnish in 8-foot minimum and 12 foot maximum lengths.

PART 3 EXECUTION

3.01 EXAMINATION: Installer of shingles must examine substrate and conditions under which shingling work is to be performed and must notify Contractor in writing of unsatisfactory conditions. Do not proceed with installation of shingles until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.02 PREPRATION OF SUBSTRATE: Clean substrate of any projections and substances detrimental to installation of underlayment and shingles. Cover knotholes or other minor voids in substrate with sheet metal flashing secured with roofing nails. At areas to receive leak barrier membrane, fill knotholes cracks with latex filler.

3.03 INSTALLATION OF UNDERLAYMENTS: Install using methods recommended by manufacturer in accordance with local building code.

A. Eaves: Install leak barrier membrane up the slope from eave edge a full 36 inches or 24 inches minimum beyond the interior “warm wall”; lap ends 6 inches and bond.

B. Valleys: Install leak barrier membrane a minimum of 36 inches wide centered on valley; lap ends 6 inches minimum and seal.

C. Roof Deck Protection: Install one layer of roof deck underlayment over entire area not protected by leak barrier membrane; run sheets horizontally lapped so water sheds; nail in place. Lap horizontal edges 2 inches minimum and 2 inches minimum over leak barrier membrane. Lap ends 4 inches minimum; stagger end laps of each layer 36 inches minimum. Lap underlayment over valley protection 6 inches minimum.

D. Vent Pipes: At vent pipes, install a 24 inch minimum square piece of leak barrier membrane lapping over roof deck underlayment; seal tightly to pipe.

E. Vertical Walls: At vertical walls, install leak barrier membrane extending 6 inches minimum up the wall and 12 inches minimum on to the roof surface lapping over roof deck underlayment.

F. Metal Drip Edge: At rake edges, install metal drip edge flashing over leak barrier membrane and roof deck underlayment; set tight to rake boards; lap joints 2 inches minimum and seal with plastic cement; secure with nails.

G. Ridge Vent: Cut continuous vent slot through sheathing, stopping 6 inches from each end of ridge. Make slot 2 inches wide, centered on ridge. Install ridge vent material full length of ridge, including uncut areas. Butt ends of lengths of ridge vent material and join using plastic cement.

3.04 INSTALLATION OF SHINGLES

A. Shingles: Install in accordance with manufacture's instructions and requirements of local building code. Avoid breakage of shingles by avoiding dropping bundles on edge, by separating carefully (not by "breaking" over ridge or bundles), and by taking extra precautions in temperatures below 40 degrees F. Handle carefully in hot weather to avoid damaging shingle edges. Secure with 4, 5, or 6 nails per shingle in accordance with manufacturer's instructions or local code.

B. Ridge Cap: Make hips and ridges using shingles required by manufacturer.

C. Ridge: At ridges, install ridge shingles over ridge vent material; use nails of specified length; do not drive nails home, leaving 3/4-inch slot open between ridge and roof shingles.

D. Valleys: Make valleys using "closed cut valley" technique. Run the first, and only the first, course of shingles from the higher roof slope across the valley 12 minimum. Run all courses of shingles from the lower roof slope across the valley 12 inches minimum and nail no closer than 6 inches to center of valley. Run shingles from the upper roof slope into valley and trim 2 inches from center of valley.

3.05 CLEANING: Clean any marks or stains from the shingles per manufacturer's recommendations. Remove all nails, staples, scrap and construction debris from the site.

END OF SECTION

SECTION 07464 VINYL SIDING

PART 1 GENERL

1.01 SECTION INCLUDES: Solid vinyl siding related accessories and attaching devices as shown on Drawings for the Storage / Field Lab Building and as required for a complete system.

1.02 RELATED SECTIONS: Section 09050 – Color Design.

1.03 SUBMITTALS

A. Submit detailed drawings showing anchoring details, trim and accessories.

B. Submit technical product data and color chart.

C. Submit a two-foot by two-foot representative sample of each type of panel and accessory complete with factory finish and color if product is not one of those specified.

D. Warranty: Submit original copy of manufacturer's warranty for type of siding specified.

1.04 DELIVERY, STORAGE AND HANDLING: Upon receipt of siding and other materials, installer shall examine the shipment for damage and completeness. Siding shall be stored in a clean, dry place. Stack all materials to prevent damage and to allow for adequate ventilation.

1.05 WARRANTY: Limited lifetime, non-prorated.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Drawings and Specifications are based on products manufactured by Wolverine Vinyl Siding, 750 East Swedesford Rd., Valley Forge, PA. Tel: (888) 838-8100

B. Equivalent products by the following manufacturers are acceptable:

1. Georgia-Pacific Corp., 133 Peachtree St. NE, Atlanta, GA 30303. Tel: (404) 652-4000.
2. Heartland Building Products, Inc., 300 Park Place, Booneville, MS 38829. Tel: (800) 432-7801

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

2.02 MATERIALS

A. American Legend double 4 inch Clapboard ALD4 – wood grain finish.

B. Solid vinyl siding shall comply with the provisions set forth in ASTM standard specifications for Rigid Polyvinyl Chloride (PVC) Siding # D3679 Class 2.

C. Solid vinyl siding shall meet the following manufacturing and product specifications:

1.	Warp (per two panels, in.)	0.250
2.	Thickness (inches)	0.042
3.	Shrinkage (percent)	3.0
4.	Gardner Impact (in./lb. Ft./mil)	1.74
5.	Surface Distortion @ 120 deg. F	None
6.	Gloss (75 Degrees T Gloss Meter)	Uniform

D. Weathering: Shall be according to ASTM D1435 requirements and free of any visual surface defects, such as peeling, chipping, cracking, flaking, or crazing due to manufacturing conditions.

E. Chalking: Shall not exceed ASTM D659 Number 6 Rating caused by manufacturing defects within 5 years in a vertical exposure.

F. Color: Shall be uniform on the surface and throughout the panels.

G. Color Selection: Shall be selected by the MDOT Architect from manufacturer's full range of standard colors.

2.03 ACCESSORY MATERIALS

A. Perimeter trim, moldings, etc. shall be the same material as the siding panels.

B. All fasteners shall be non-corrosive and compatible with the vinyl siding. The manufacturer shall supply all necessary fasteners. Exposed fasteners will not be accepted.

PART 3 EXECUTION

3.01 EXAMINATION

A. Installer shall examine all substrates on which panel system is to be applied. Notify the Contractor in writing if surfaces are not suitable for application.

B. Installation shall not proceed until surface is acceptable to the installer.

C. Installer shall field verify all dimensions prior to fabrication and installation.

3.02 INSTALLATION

A. Vinyl siding, accessories and trim shall be installed in accordance with the latest edition of installation instructions prepared by the Vinyl Siding Institute of The Society of the Plastic Industry, Inc. and vinyl siding manufacturer's recommended procedures.

B. Install panels in such a manner that all joint members are true and plumb.

C. Attach panels using manufacturer's fasteners, spaced in accordance with approved shop drawings.

D. Protect installed siding panels and trim from damage caused by adjacent construction until completion of installation.

E. Remove and replace any panels or components which are damaged beyond successful repair.

3.03 CLEANING: Clean any grease, finger marks, or stains from the panels per manufacturer's recommendations. Remove all scrap and construction debris from the site.

END OF SECTION

SECTION 07465 ALUMINUM SOFFIT PANELS

PART 1 GENERL

1.01 SECTION INCLUDES: Preformed aluminum soffit panels, related accessories and attaching devices as shown on Drawings and as required for a complete system.

1.02 RELATED SECTIONS: Section 09050 – Color Design.

1.03 SUBMITTALS

A. Submit detailed drawings showing layout of panels, anchoring details, trim and accessories.

B. Submit technical product data and color chart.

C. Submit a two-foot by two-foot representative sample of each type of panel and accessory complete with factory finish and color if product is not one of those specified.

1.04 DELIVERY, STORAGE AND HANDLING: Upon receipt of panels and other materials, installer shall examine the shipment for damage and completeness. Panels should be stored in a clean, dry place. One end should be elevated to allow moisture to run off. Stack all materials to prevent damage and to allow for adequate ventilation.

1.05 WARRANTY: Paint finish shall have a twenty-year guarantee against cracking, peeling and fade.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Drawings and Specifications are based on products manufactured by ATAS International, Inc. 1610 Mustang Dr., Maryville, TN 37801. Tel. (800) 468-1441

B. Equivalent products by the following manufacturers are acceptable:

1. Merchant & Evans, Inc.
100 Connecticut Dr., Burlington, NJ 08016. Tel. (800) 257-6215

2. Petersen Aluminum Corp
1005 Tonne Road., Elk Grove Village, IL 60007. Tel. (800) 323-1960

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

2.02 MATERIALS

A. Type 12 inch WIND-LOK Smooth: WLS 120 and 12 inch WIND-LOK Vented: WLV 120; panel width: 12 inches, panel depth: 7/16-inch, metal: 0.032-inch thick aluminum 3005 H26, texture: smooth.

B. Finish shall be full strength Kynar 500 (70% PVDF), AAMA 2650, Fluorocarbon coating applied by the manufacturer on a continuous coil coating line, with a top side dry film thickness of 0.70 to 0.90 mil over 0.25 to 0.35 mil prime coat, to provide a total dry film thickness of 0.95 to 1.25 mil. Bottom side shall be coated with primer with a dry film thickness of 0.25 mil. Finish shall conform to all tests for adhesion, flexibility, and longevity as specified by the finish supplier.

B. Color: Shall be selected by the MDOT Architect from manufacturer's full range of standard colors.

2.03 ACCESSORY MATERIALS

A. Perimeter trim, moldings, etc. shall be the same material as the soffit panels.

B. All fasteners shall be non-corrosive and compatible with aluminum. The manufacturer shall supply all necessary fasteners. Exposed fasteners will not be accepted.

PART 3 EXECUTION

3.01 INSPECTION

A. Installer shall examine all substrates on which panel system is to be applied. Notify the Contractor in writing if surfaces are not suitable for application.

B. Installation shall not proceed until surface is acceptable to the installer.

C. Installer shall field verify all dimensions prior to fabrication and installation.

3.02 INSTALLATION

A. Comply with Drawings, manufacturers standard instructions, and conform to standards set forth in the Architectural Sheet Metal Manual published by SMACNA.

B. Install panels in such a manner that horizontal lines are true and level.

C. Attach panels using manufacturer's fasteners, spaced in accordance with approved shop drawings.

D. Do not allow panels or trim to come into contact with dissimilar materials.

E. Protect installed soffit panels and trim from damage caused by adjacent construction until completion of installation.

F. Remove and replace any panels or components which are damaged beyond successful repair.

3.03 CLEANING: Clean any grease, finger marks, or stains from the panels per manufacturer's recommendations. Remove all scrap and construction debris from the site.

END OF SECTION

SECTION 07610 SHEET METAL ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES: Factory formed, prefinished standing seam metal roof panels with concealed fasteners and related accessories, valleys, hips, ridges, eaves, corners, rakes, miscellaneous flashing and attaching devices as shown and / or required for a complete metal roofing system.

1.02 RELATED SECTIONS: Section 09050 – Color Design.

1.03 REFERENCES

A. ASTM A-525 General Requirements for Steel Sheet, Zinc-Coated (Galvanized)

B. ASTM A-653 Steel Sheet, Zinc-Coated (Galvanized) by Hot Dip Process, Structural Physical Quality.

C. ASTM E-1646: Static Water Infiltration

D. ASTM E-1680: Static Air Infiltration

E. Spec Data Sheet - Galvalume Sheet Metal by Bethlehem Corp.

F. SMACNA - Architectural Sheet Metal Manual

G. UL 90 Rating: Wind Uplift Approval Conforming to Underwriters Lab. (UL) Section 580 Specifications.

1.04 SUBMITTALS

A. Product Data: Submit manufacturer's technical data and installation instructions for each type of roofing material and accessory required.

B. SHOP Drawings: Submit detailed drawings showing layout of panels, anchoring details, joint details, trim, flashing, and accessories. Show details of weatherproofing terminations, and penetrations of metal work. Indicate material type, Thickness, finish and color.

C. Submit a two-foot by two-foot representative sample of each type of panel and accessory indicating panels, standing seams, closure, edge trim and flashing complete with factory finish and color if product is not one of those specified.

D. Submit results indicating compliance with minimum requirements of the Water Infiltration - ASTM E-1646 performance tests.

E. Submit sample copies of the Paint Finish Guarantee and Weather Tightness Warranty prior to installation for Project Architect's approval.

1.05 QUALITY ASSURANCE

A. Manufacturer: Company specializing in Architectural Sheet Metal Products with 10 years minimum experience.

B. Installer: Company specializing in Architectural Sheet Metal Products, with 5 years minimum experience, who has completed work similar to that indicated for this project and with a record of successful in-service performance. Submit identification of at least 3 projects of similar scope and complexity along with name, address, and telephone number of the Architect, Owner and General Contractor.

1.06 DELIVERY, STORAGE AND HANDLING: Upon receipt of panels and other materials, installer shall examine the shipment for damage and completeness. Panels should be

stored on edge in a clean, dry place. One end shall be elevated to allow moisture to run off. Panels with strippable film must not be stored in the open exposed to the sun. Stack all materials to prevent damage and to allow for adequate ventilation.

1.07 WARRANTY

A. Paint Finish: Paint finish shall have a 20-year guarantee against cracking, peeling and fade (Not to exceed 5 N.B.S. units).

B. Weather Tightness: The entire installation (clips, panels, fasteners, rakes, eaves, ridge/valley flashing conditions, roof to wall conditions as well as all materials specified as supplied by the manufacturer) shall be guaranteed weather tight for a minimum of 20 years. This warranty shall be identified as neither Non-Depreciating, Non-prorated nor have exclusions that identify valleys, curbs, and flashings. Provide written warranty, signed by metal roofing manufacturer and his authorized installer, agreeing to replace / repair defective materials and workmanship during the warranty period with no cost to the Owner.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Drawings and Specifications are based on products manufactured by Petersen Aluminum Corp., 1005 Tonne Road, Elk Grove Village, IL 60007. Tel: (800) 323-1960.

B. Equivalent products by the following manufacturers are acceptable:

1. Architectural Building Components, P.O. Box 52488, Houston, TX 77086. Tel: (800) 423-1105.
2. CENTRIA Roof Systems, 1005 Beaver Grade Road, Moon Township, PA 15108. Tel: (800) 759-7474.
3. Copper Sales, Inc., 1001 Lund Blvd., Anoka, MN 55303, Tel: (800) 426-7737.
4. Englert, Inc., 1200 Amboy Ave., Perth Amboy, NJ 08862 Tel: (732) 826-8614.
5. MBCI, 300 Highway 51 North, Hernando, MS 38632, Tel: (800) 206-6224.

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

2.02 SHEET MATERIALS

A. Materials: Sheet Steel shall be PAC-CLAD 24 gage G-90 Galvanized ASTM A 653, or (24 gage prefinished Galvalume ASTM 792 Grade 50B with an AZ-50 coating).

B. Finish: Finish shall be full strength (70% PVDF) Kynar 500 Fluorocarbon coating applied by the manufacturer on a continuous coil coating line. Top side dry film thickness of 0.70 to 0.90 mil over 0.25 to 0.35 mil prime coat, to provide a total dry film thickness of 0.95 to 1.25 mil. Bottom side shall be coated with primer with a dry film thickness of 0.25 mil. Finish shall conform to all tests for adhesion, flexibility, and longevity as specified by the finish supplier.

C. Color: Shall be selected by the MDOT Architect from manufacturer's full line of standard colors. Refer to Section 09050 for color selection.

D. Film: Strippable film shall be applied to the top side of the painted coil to protect the finish during fabrication, shipping and field handling. This strippable film shall be removed before installation.

2.03 ACCESSORY MATERIALS

A. Concealed fastening clips: G-90 Galvanized steel, spaced 18-inches on center.

B. Fasteners: 1-inch # 10 pancake head wood screw with a # 2 Phillips head size. Minimum 2 fasteners per clip.

C. Sealant: Extruded vinyl weatherseal

D. Roofing Felt: 30-pound asphalt saturated un-perforated organic felt, complying with ASTM D226, Type 1.

E. Leak Barriers: Peel and Stick Membrane shall be installed at valley, ridge, hip and eave areas. Membrane shall be equal to Certainteed Wintergard, Grace Ice and Watershield, Henry Perma-Seal PE, Owen-Corning Deck-Dri, or Tamko Moisture Guard.

2.04 FABRICATION

A. Panels, 40 feet and less, shall be in one continuous length.

B. Panels fabricated by a portable roll former will not be approved.

C. All exposed adjacent flashing and accessories shall be of the same material and finish as the roof panels. All flashing, hem exposed edges on underside 1/2 inch. Fabricate in accordance with standard SMACNA procedures and details.

2.05 PREFORMED METAL ROOFING SYSTEM: Equal to Petersen Aluminum Corp. SNAP-CLAD panel system .

A. System shall include, but is not limited to the following components:

1. Standing Seam Metal Roof Panels with Striations.
2. Preformed Metal Valley Flashing.
3. Preformed Metal Hip Flashing.
4. Preformed Metal Vented Ridge Cap.
5. Concealed fastening clips and fasteners.
6. Preformed Metal Gutters.
7. Preformed Metal Downspouts.
8. Solid and Vented Metal Soffit Panels.
9. Metal Fascia and Cladding.
10. Miscellaneous Metal Trim Necessary for a Complete System Installation.

B. SNAP-CLAD roof panels with striations shall have 16 inches on center seam spacing, roll-formed in continuous lengths from eave to ridge, with a minimum standing seam height of 1-3/4 inches.

C. PAC-750 soffit panels (Solid and fully vented as shown on Drawings) shall be 12-inches on center “V” grooved panels in .032 inch thick aluminum with Kynar 500 finish. Color to be selected by the Project Architect from manufacturers full range of standard colors

D. Certification shall be submitted, based on independent testing laboratory, indicating no measurable water penetration or air leakage through the system when tested in accordance with ASTM E-1646 and ASTM E-1680.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine wood trusses to ensure proper attachment to framing.

B. Inspect roof structure to verify deck is clean and smooth, free of depressions, waves or projections, properly sloped to valleys or eaves.

C. Verify roof openings, curbs, pipes, sleeves, ducts or vents through roof are solidly set, cant strips and reglets in place, and nailing strips located.

D. Installer shall examine substrate and conditions under which Work is to be performed and must notify Contractor in writing of unsatisfactory conditions. Do not proceed with installation until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.02 INSTALLATION OF UNDERLAYMENTS: Install using methods recommended by manufacturer in accordance with local building code.

A. Eaves: Install Peel and Stick Membrane up the slope from eave edge a full 36 inches or 24 inches minimum beyond the interior “warm wall”; lap ends 6 inches and bond.

B. Valleys: Install Peel and Stick Membrane a minimum of 36 inches wide centered on valley; lap ends 6 inches minimum and seal.

C. Ridge / Hip: Install Peel and Stick Membrane a minimum of 36 inches wide centered on ridge / hip; lap ends 6 inches minimum and seal.

D. Roofing Felt: Install one layer of 30-lb. roofing felt lapped, staggered, and applied horizontally from eave to ridge over 3/4-inch thick plywood sheathing. Run sheets horizontally lapped so water sheds; nail in place. Lap horizontal edges 2 inches minimum and 2 inches minimum over Peel and Stick Membrane. Lap ends 4 inches minimum; stagger end laps of each layer 36 inches minimum. Lap underlayment over valley protection 6 inches minimum. Repair or replace any torn felt to maintain a continuous membrane ahead of installation of metal roofing.

E. Vent Pipes: At vent pipes, install a 24 inch minimum square piece of Peel and Stick Membrane lapping over roof deck underlayment; seal tightly to pipe.

F. Vertical Walls: At vertical walls, install leak barrier membrane extending 6 inches minimum up the wall and 12 inches minimum on to the roof surface lapping over roof deck underlayment.

G. Metal Drip Edge: At rake edges, install metal drip edge flashing over Peel and Stick Membrane and roof deck underlayment; set tight to rake boards; lap joints 2 inches minimum and seal with plastic cement; secure with nails.

3.03 INSTALLATION OF PANELS

A. Comply with Drawings, manufacturer’s instructions, and conform to standards set forth in the Architectural Sheet Metal Manual published by SMACNA, in order to achieve a watertight installation.

B. Install panels in such a manner that horizontal lines are true and level and vertical lines are plumb.

C. Install starter and edge trim before installing roof panels.

D. Remove protective strippable film prior to installation of roof panels.

E. Attach panels using manufacturer's standard clips and fasteners, spaced in accordance with approved shop drawings.

F. Install sealants for preformed roofing panels as specified on shop drawings.

G. Do not allow panels or trim to come into contact with dissimilar materials.
H. Do not allow traffic on completed roof. If required, provide cushioned walk boards.

I. Protect installed roof panels and trim from damage caused by adjacent construction until completion of installation.

J. Thoroughly clean and touch-up any areas scarred during installation with a touch-up paint approved by panel manufacturer. Only minor scratches and fastener heads shall be touched-up; any other damaged material shall be replaced.

K. Gutter supports spaced at maximum 48 inches on center, constructed of same material as gutters.

L. Downspout straps shall be spaced 72 inches on center maximum (minimum of 3 per downspout) and be the same material as the downspout.

3.04 CLEANING

A. Clean any grease, finger marks, or stains from the panels per manufacturer's recommendations.

B. Remove all scrap and construction debris from the site.

END OF SECTION

SECTION 07620 SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES: Flashing and sheet metal work as indicated on the Drawings and provisions of this specification. The types of work include the following:

A. Metal flashing and counter flashing.

B. Gutters and downspouts at Storage / Field Lab Building.

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 MDOT 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 0.040-inch thick aluminum, mill finish. ASTM B209 (ASTM B 209M), 3003-H14. Use where concealed from view only.

2.02 GUTTERS, DOWNSPOUTS, AND FLASHING: Shall be shop fabricated in accordance with SMACNA standards to sizes and profiles shown on the drawings. Pre-finished aluminum, minimum 0.040-inch thick, colors as selected, Kynar 500 (70% PVDF), 20 year coating. Equal to Petersen Aluminum Corp. Tel. (800) 722-2523.

2.03 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.

A. 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.

B. Metal Accessories: Provide sheet metal clips, straps, anchoring devices and similar accessory units as required for installation of work, matching or compatible with material being installed, non-corrosive, size and gage required for performance.

PART 3 EXECUTION

3.01 INSTALLATION REQUIREMENTS: Except as otherwise indicated, comply with manufacturer's installation instructions and recommendations, and with SMACNA "Architectural Sheet Metal Manual". Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible and set units true to line and level as indicated. Install work with laps, joints and seams which will be permanently watertight and weatherproof.

3.02 ACCESSORIES INSTALLATION

A. Comply with manufacturer's instructions and recommendations. Coordinate with installation of roof deck and other substrates to receive accessory units, and with vapor barriers, roof insulation, roofing and flashing; as required to ensure that each element of the work performs properly, and that combined elements are waterproof and weathertight. Anchor units securely to supporting structural substrates, adequate to withstand lateral and thermal stresses as well as inward and outward loading pressures.

B. Gutter supports shall be spaced at 48 inches on center, constructed of same material as gutters.

C. Downspout straps shall be spaced 6 feet on center maximum (minimum of 3 required per downspout) and be same material as downspout.

D. Separate metal from incompatible metal or corrosive substrates by coating concealed surfaces with asphalt mastic as recommended by manufacturer.

3.03 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 07650 FLEXIBLE FLASHING

PART 1 GENERAL

1.01 SECTION INCLUDES:

A. Self-adhesive flashing used to seal around exterior windows, doors, and where required to weatherproof the building.

B. Waterproof membrane flashing used to seal around exterior door and window heads and sills, brick ledges, copings at masonry walls, common through-wall penetrations such as hose bibbs, vents, electrical boxes, exterior lights, and where required to waterproof the building.

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 product 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, 62 Whittermore Avenue, Cambridge, Ma 02140. Tel: (800) 444-6459.
2. Griffolyn ® Division, Reef Industries, Inc., 9209 Almeda Genoa Road, Houston, TX 77075. Tel: (800) 231-6074.

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

2.02 SELF-ADHESIVE FLASHING: Membrane shall be a multi-layer composite employing polyethylene, fiberglass membrane and self-adhesive backing, meeting ASTM E-96 (Method B), ASTM F-1249, ASTM D-779 and ASTM D-828 Test Methods, equal to "Moistop E-Z Seal".

2.03 WATERPROOF MEMBRANE FLASHING: Membrane shall be a self-sealing SBS modified asphalt waterproof membrane laminated to high density, cross-laminated polyethylene film reinforcement and self-adhesive backing, meeting ASTM E-96, ASTM D-779, ASTM D-903-98, ASTM D-412 Test Methods, equal to "FortiFlash".

PART 3 EXECUTION

3.01 PREPARATION

A. Ensure items that pass through membrane are properly and rigidly installed, substrate is free of projections and irregularities that may be detrimental to proper installation of membrane.

B. Prior to installation, window, door flanges, brick ledges and base materials shall be dry and cleaned free of any dirt or other substances that may interfere with adhesion.

3.02 INSTALLATION

A. The self-adhesive flashing shall first be applied at the sill of window openings. Moistop Sealant is then applied to the back of the window flanges and windows are installed. E-Z Seal flashing is next applied over the window flanges at jambs and then the head, completing the installation. Flashing around door openings is similar to window application. To apply, peel away the release paper and place E-Z Seal over the substrate or window and door flanges. Apply firm pressure along the entire adhesive strip to ensure a continuous seal.

B. To apply FortiFlash flashing, peel away the release paper and press membrane firmly over substrate, applying sufficient pressure along the entire membrane to ensure a continuous seal. If adhesion is inadequate, prime the surface with a polymer-emulsion-based primer designed specifically for SBS self-adhered membranes, in accordance with the manufacturer's instructions.

3.03 CLEANING: Inspect membrane and substrate thoroughly and keep clean. Remove any dirt, oils, mud, debris, etc. prior to installation.

END OF SECTION

SECTION 07840 FIRESTOPPING

PART 1 GENERAL

1.01 SECTION INCLUDES: Firestopping as indicated on the drawings, specified herein, and/or required for completion of the work. Firestopping shall be required at all rated fire and smoke "fire barrier" walls and at floors.

1.02 SUBMITTALS: Submit manufacturer's product data, specifications and installation procedures for each type of firestopping and accessory required. Submit detailed location where each will be used. Submit UL data for assemblies where shown on the Drawings.

1.03 QUALITY ASSURANCE: Penetrations and miscellaneous openings in rated fire and smoke "fire barrier" walls shall be protected in accordance with NFPA 101, Life Safety Code, Chapter 6, Features of Fire Protection. All openings for air-handling ductwork or air movement, pipes, conduits, bus ducts, cables, wires, air ducts, pneumatic tubes and ducts and similar building service equipment that pass through or penetrate in any way a rated fire or smoke "fire barrier" wall or floor shall be protected. All firestopping materials used shall conform to ASTM E814, ASTM E119, and UL 1479 and tested in accordance with NFPA 90A and NFPA 251 as part of a rated assembly.

A. FIRE AND SMOKE PARTITIONS AND RELATED ASSEMBLIES: Based on Underwriters Laboratories (UL) systems and tests and are designed in accordance with UL fire resistance ratings. Contractor shall comply with the applicable UL requirements for fire and smoke partitions and assemblies shown on the drawings.

B. Materials not conforming to these firestopping specifications shall not be used. Materials that are not UL rated and approved shall not be allowed. Materials containing asbestos are not acceptable and shall not be used in this project.

1.04 DELIVERY, STORAGE, AND HANDLING: Deliver packaged materials in manufacturer's original unopened containers and store in weathertight enclosure. Handle and store all materials so as to prevent inclusion of foreign materials, breakage or damage by water.

1.05 WORKMANSHIP: Materials and workmanship not conforming to provisions of the specifications and manufacturer's printed instructions shall be rejected at any time during the course of the work. Rejected materials shall be removed from the site at the time of rejection. Rejected workmanship shall be corrected immediately after rejection.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Equivalent products by the following manufacturers are acceptable:

1. Hilti, Inc., P.O. Box 21148, Tulsa, OK 74121, Tel. (800) 879-8000.
2. International Protective Coatings Corp, 1330 Industry Road, Hatfield, PA 19440, Tel. (800) 334-8796.
3. 3M Fire Protection Products, P.O. Box 33225, Saint Paul, MN 55144, Tel. (800) 328-1687.
4. United States Gypsum Company, 125 S. Franklin Street, Chicago, IL 60606, Tel. (880) 874-4968.

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

2.02 SEALANT: Equal to Hilti, Inc. FS-One.

2.03 CAULKING AND PUTTY: Equal to 3M Brand Fire Barrier CP- 25 Caulk and Putty 303.

2.04 PENETRATION SEALANTS: Equal to 3M Fire Barrier Penetration Sealing Systems 7902 and 7904 series as required.

2.05 INSULATION: Equal to United States Gypsum Company “Therafiber” Safing Insulation, 4 pcf density, unfaced.

2.06 INTUMESCENT FIRESTOPPING: Equal to Hilti, Inc. FS-One, CP 642 and FS 657 Fire Block as required.

2.07 ACCESSORIES: Provide backing / filling materials, retainers, collars, clamps, sleeves, primers and other necessary items of types and duration required by regulatory requirements and / or as recommended by product manufacturer for the specific substrates, surfaces and applications.

2.08 FINISHES

A. Concealed locations: Manufacturer’s Standards.

B. Exposed to View Locations: “Custom” Colors as selected by Project Architect unless Manufacturer’s Standards closely matches finish of penetrated surfaces.

PART 3 EXECUTION

3.01 INSTALLATION: Installation of firestopping materials for small openings, cracks, crevices, and penetrations shall be in accordance with manufacturer's printed instructions.

A. Verify application required and location for each type of firestopping to be used and conform to manufacturer's exact instructions for specific applications.

B. After installation of all Work, including but not limited to ductwork, fire and smoke dampers, communication cabling, electrical conduit, etc., properly seal all openings, cracks, crevices and penetrations throughout the entire project, to maintain fire ratings shown.

C. Install fireproof sealant at all penetrations through rated walls and floors and at top and bottom on each side of rated walls.

D. Install approved metal sleeves with fireproof sealant at all communication and control wiring passing through rated walls throughout the entire project.

E. Install firestopping at fire and smoke walls and floors where construction passes through those areas.

END OF SECTION

SECTION 07920 JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preparation of substrate surfaces to receive materials.

B. Sealant and joint backing (backer rod) materials and installation in the following general locations (even though not shown on the Drawings):

1. Exterior and interior wall joints, including control / expansion joints and abutting like or similar materials (in walls, ceilings, and roof construction) that have spaces between in excess of 3/16 inch (except where less restrictive tolerances are indicated or where the condition is specifically the responsibility of others).
2. Abutting dissimilar materials, exterior and interior.
3. Exterior and interior wall openings (including at perimeter doors, exterior thresholds, windows, louvers, and penetrations required by piping, ducts, and other service and equipment, except for sealants provided by Section 07840-Firestopping).
4. Joints in 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. Interior and exterior hollow metal doors and frames; rated and non-rated.
2. Trimmed openings.
3. Preparation of metal doors and bucks to receive finish hardware, including reinforcements, drilling and tapping necessary.
4. Preparation of hollow metal door to receive glazing (where required).
5. Factory prime painting of Work in this Section.

1.02 RELATED SECTIONS

A. Section 06100- Rough Carpentry.

B. Section 08210- Wood Doors.

C. Section 08710- Door Hardware.

D. Section 08800-Glazing.

E. Section 09050-Color Design.

F. 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, glazing.

C. Samples (not required for named products):

1. Submit hollow metal frame, corner section of typical frame, of sufficient size to show corner joint, hinge reinforcement, dust cover boxes, anchors, and floor anchors.
2. Submit hollow metal door section of typical door, of sufficient size to show edge, top and bottom construction, insulation, hinge reinforcement, face stiffening, corner of vision opening construction, and glazing beads.

1.05 PRODUCT IDENTIFICATION: 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. Local Supplier is Glen Lewis with Thrasher Architectural Products Tel. (601) 981-9611

B. Equivalent products by the following manufacturers are acceptable:

1. Amweld Building Products, Inc., P.O. Box 267, Garrettsville, OH 44231. Tel. (330) 527-4385.
2. Ceco Door Products, 750 Old Hickory Blvd. Building 1, Suite 150, Brentwood, TN 37027. Tel. (615) 661-5030.
3. Republic Builders Products, 155 Republic Drive, McKenzie, TN 38201. 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. Frames for interior openings shall be commercial grade cold rolled steel conforming to ASTM A366-68 or commercial grade hot rolled and pickled steel conforming to ASTM A569-66T. Metal thickness shall be 16 gage for frames in openings 4 feet or less in width; 14 gage for frames in openings over 4 feet in width.

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. Cut-off (sanitary or hospital type) stops, where scheduled, shall be capped at 45 degrees at heights shown on drawings, and all jamb joints below cut-off stops shall be ground and filed smooth, making them imperceptible. Do not cut off stops on frames for soundproof, lightproof on lead-lined doors.
2. When shipping limitations so dictate, frames for large openings shall be designed and fabricated for field splicing by others.
3. Frames for multiple or special openings shall have mullion and / or rail members which are closed tubular shapes having no visible seams or joints. All joints between faces of abutting members shall be securely welded and finished smooth.
4. Hardware reinforcements: Frames shall be mortised, reinforced, drilled and tapped at the factory for fully templated mortised hardware only, in accordance with approved hardware schedule and templates provided by the hardware supplier. Where surface-mounted hardware is to be applied, frames shall have reinforcing plates. Frames shall be reinforced for closers. Minimum thickness of hardware reinforcing plates shall be as follows:

   a. Hinge and pivot reinforcements - 7 gage, 1 1/4 inches by 10 inches minimum.
   b. Strike reinforcements - 12 gage.
   c. Flush bolt reinforcements - 12 gage.
   d. Closer reinforcements - 12 gage.
   e. Reinforcements for surface-mounted hardware - 12 gage.

5. Floor anchors: Floor anchors shall be securely welded inside jambs for floor anchorage. Where required, provide adjustable floor anchors, providing not less than 2 inches height adjustment. Floor anchors shall be 14-gage minimum.

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 interior doors shall be18 gage minimum. Face sheets for exterior doors shall be 16-gage minimum with zinc coating conforming to ASTM A653, with a coating designation of A60 or G60 and a minimum coating thickness of 0.60 oz. per sq. ft. minimum

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. Glass moldings and stops:

1. Where specified or scheduled, doors shall be provided with hollow metal moldings to secure glazing by others per glass opening sizes shown on Drawings. Fixed moldings shall be securely welded to door on security side.
2. Loose stops shall be 20-gage steel, with mitered corner joints, secured to the framed opening by cadmium or zinc-coated countersunk screws spaced 8 inches on center. Snap-On attachments will not be permitted. Stops shall be flush with face of door.

H. Finish: After fabrication, tool marks and surface imperfections shall be dressed, filled and sanded as required to make all faces and vertical edges smooth, level and free of all irregularities. Doors shall be chemically treated to ensure maximum paint adhesion and shall be coated, on all exposed surfaces, with manufacturer's standard rust-inhibitive primer. Fully cure before shipment.

I. Flatness: Doors shall maintain a flatness tolerance of 1/16 inch maximum in any direction, including a diagonal direction.

2.05 HOLLOW METAL PANELS: Hollow metal panels shall be made of the same materials and constructed and finished in the same way as specified for hollow metal doors.

2.06 LABELED DOORS & FRAMES

A. Labeled doors and frames shall be provided for those openings requiring fire protection ratings, and as scheduled on Drawings. Such doors and frames shall be Underwriters' Laboratories, Inc. labeled or other nationally recognized agency having a factory inspection service.

B. When door or frame specified to be fire-rated cannot qualify for appropriate labeling because of its design, size, hardware or any other reason, the Project Engineer / Architect shall be advised before fabricating work on that item is started.

2.07 HARDWARE LOCATIONS

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.
4. on Dutch doors:

   a. 5 inches from head of frame to top of hinge.
   b. 10 inches from finished floor to bottom of bottom hinge.
   c. 5 inches from split line to top and bottom respectively of lower and upper intermediate hinges.

B. Unit and integral type locks and latches – 3’- 2” to centerline of knob.

C. Deadlocks – 5’- 0” to centerline of cross bar.

D. Panic hardware – 3’-1” to centerline of cross bar.

E. Door pulls – 3’-6” to center of grip.

F. Push-pull bars – 3'-1" to centerline of bar.
G. Arm pulls – 3'-11" to centerline.

H. Push plates – 4'- 0" to centerline of plate.

I. Roller latches – 3'-9" to centerline.

J. All of the above dimensions from paragraph 2.07(B) through 2.07(I) are from finished floor.

2.08 CLEARANCES

A. Edge clearances:

1. Between doors and frame, at head and jambs - 1/8 inch.
2. At door sills: where no threshold is used - 1/4 inch maximum above finished floor; where threshold is used - 3/4 inch maximum above finished floor.
3. Between meeting edges of pairs of doors - 1/8 inch.

B. Finished floor is defined as top surface of floor, except when resilient tile or carpet is used, when it is top of concrete slab. Where carpet is more than 1/2 inch thick, allow 1/4 inch clearance.

2.09 PREPARATION FOR FINISH HARDWARE

A. Hardware supplier shall furnish hollow metal manufacturer approved hardware schedule, hardware templates, and samples of physical hardware where necessary to ensure correct fitting and installation. Include preparation for mortise and concealed hardware.

B. Provide reinforcements for both concealed and surface applied hardware. Drill and tap mortise reinforcements at factory, using templates. Install reinforcements with concealed connections designed to develop full strength of reinforcements.

2.10 REJECTION: 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 Architect 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. At wood stud partitions, attach wall anchors to studs with tapping screws. Place frames at fire-rated openings in accordance with NFPA Standard No. 80.
2. Make field splices in frames as detailed on final Shop Drawings, welded and finished to match factory work.
3. Remove spreader bars only after frames or bucks have been properly set and secured.
4. Door installation: Fit hollow metal doors accurately in their respective frames, with the following clearances:

    a. Jambs and head: 3/32 inch.
    b. Meeting edges, pairs of doors: 1/8 inch.
    c. Bottom: 1/4 inch, where no threshold or carpet.
    d. Bottom: at threshold or carpet: 1/8 inch.
    e. Place fire-rated doors with clearances as specified in NFPA Standard No. 80.

END OF SECTION

SECTION 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. Louvers for wood doors, including furnishing and installation, are specified under this Section.

B. Types of doors required include solid core flush wood doors with veneer faces.

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 louvers, 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: AWI “Architectural Flush Doors” of the Architectural Woodwork Institute.

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 AWI “Care & Instruction at Job Site” Section 1300, G-22.

1.06 WARRANTY: Manufacturer to provide a written warranty covering the life of the installation.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Drawings and specifications are based on products manufactured by Weyerhaeuser Architectural Doors, P.O. Box 7780, Marshfield, WI 54449. Tel. (715) 384-2141. Local Supplier is Glen Lewis with Thrasher Architectural Products Tel. (601) 981-9611.

B. Equivalent products by the following manufacturers are acceptable:

1. Algoma Hardwoods, Inc., 1001 Perry Street, Algoma, WI 54201
Tel. (920) 487-5221.
2. Buell Door Co., PO Box 97755, Dallas, TX 75397. Tel. (800) 556-0155.
3. Graham Manufacturing Corp., PO Box 1647, Mason City, IA.
Tel (641) 423-2444.

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

2.02 MATERIALS AND COMPONENTS

A. Wood Doors: Provide wood doors complying with the applicable requirements of AWI 7th Edition Version 1.2 for the kinds and types of doors indicated and as further specified. Provide manufacturer's standard 2 ply face panels complying with AWI PC-5 ME, unless otherwise specified. Provide same exposed surface material on both faces of each door, unless otherwise indicated.

B. Fire-rated Doors: Provide exposed faces and edges to match non-fire-rated doors in the same area of the building, unless otherwise shown or scheduled. Provide trim for openings (if any) which have been tested and listed for the kind of door and rating indicated.

C. Wood Louvers: Door manufacturer's standard solid wood louvers of same species as face veneers, unless otherwise specified and of the size, type and profile shown.

2.03 GENERAL FABRICATION REQUIREMENTS

A. Wood Doors: Cut and trim openings through doors and panels. Comply with applicable requirements of referenced standards.

B. Wood Louvers: Factory install louvers in prepared openings.

C. Light Openings: Factory cut openings. Trim openings for non-fire rated doors with solid wood moldings of profile shown.

2.04 INTERIOR FLUSH WOOD DOORS:

A. Core Construction: Solid core construction shall be solid wood block, wood particleboard, or mineral with wood lock blocks. Doors shall be Type II water resistant BCNO. Provide manufacturer's standard 2 face panels

B. Exposed Surfaces for Transparent Finish: Where solid core interior wood doors are shown or scheduled to receive a transparent finish, provide manufacturer's standard thickness face veneers complying with AWI 7th Edition Version 1.2 of the following quality:

1. Custom Grade “A” face veneers of Plain Sliced Select White Birch.
2. Sharp contrast of shades shall not be permitted at veneer joints. Provide exposed edges and other exposed solid wood components of same species as face veneers.

C. Factory Finished Doors: Reference AWI Section 1300, G-21 and Section 09050 Color Schedule.

2.05 PREFITTING AND PREPARATION FOR HARDWARE: Comply with tolerance requirements of AWI 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 metal frames to verify dimensions and alignment before proceeding with machining.

PART 3 EXECUTION

3.01 EXAMINATION: Installer shall examine doorframes and verify that frames are correct type and have been installed for proper hanging of corresponding doors. Installer shall notify Contractor in writing of conditions detrimental to proper and timely installation of wood doors; do not proceed with installation until unsatisfactory conditions have been corrected. Install fire-rated doors in corresponding fire-rated frames in accordance with the requirements of NFPA No. 80.

3.02 PREPARATION: Condition doors to average prevailing humidity in installation area prior to hanging.

3.03 INSTALLATION

A. Install wood doors in accordance with manufacturer's instructions and approved Shop Drawings. Fit doors to frame for proper fit and uniform clearance at each edge and machine for hardware. Seal cut surfaces after fitting and machining. Bevel non-fire rated doors 1/8 inch in 2 inches at lock and hinge edges. Bevel fire rated doors 1/16 inch in 2 inches at lock edge.

B. Door Clearances: Fit to frames and machine for hardware for proper fit and uniform clearance at each edge.

1. For non-fire rated doors, provide following clearances:

a. 1/8 inch at jambs and heads.
b. 1/8 inch at meeting stiles for pairs of doors.
c. 1/2 inch from bottom of door to top of decorative floor finish or covering, except where threshold is shown or scheduled provide 1/4 inch clearance from bottom of door to top of threshold.

2. For fire-rated doors, provide clearances complying with limitations of authority having jurisdiction.

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 08335 OVERHEAD COILING DOORS

PART I GENERAL

1.01 SUMMARY: The extent of overhead coiling 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

A. Section 09050 - Color Design.

B. Section 16100 – Basic Materials and Methods (Wiring).

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's product data, roughing-in diagrams, and installation instructions for each type and size of overhead coiling doors. 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 overhead coiling door as a complete unit produced by one manufacturer, including hardware, accessories, mounting and installation components. Unless otherwise acceptable to MDOT Architect, furnish overhead coiling door units by one manufacturer for entire project.

B. Insert and Anchorage: Furnish inserts and anchoring devices that must be set into walls for the installation of the overhead coiling door units. Provide setting drawings, templates, instructions and directions for installation of anchorage devices. Coordinate delivery with other Work to avoid delay.

C. Wind Loading: Design and reinforce overhead coiling doors to withstand a 20 PSF (87 MPH) wind loading pressure in the fully closed position unless otherwise indicated.

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 Overhead Door Corp., 6750 LBJ Freeway, Suite 1200, Dallas, TX 75240. Tel. (800) 887-3667.

B. Equivalent products by the following manufacturers are acceptable:

1. Raynor Garage Doors, P.O. Box 448, Dixon, IL 61021. Tel. (800) 472-9667.
2. Windsor Door, 5800 Scott Hamilton Drive, Little Rock, AR 72209. Tel. (800) 946-3767.

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

2.02 OVERHEAD COILING DOOR: Equal to 625 Series with F-265I slats, face-of-wall mounted, Insulated Service Doors by Overhead Door Corporation.

2.03 DOOR CURTAIN MATERIALS AND CONSTRUCTION

A. Curtain: Interlocking roll-formed slats as specified following. Endlocks shall be attached to each end of alternate slats to prevent lateral movement.

B. Slats: Flat profile type F-265I for doors up to 40 feet wide. The front slat shall be fabricated of 22-gage galvanized steel. The back slat shall be 24-gage galvanized steel. Slat cavity shall be filled with CFC-free foamed-in-place, polyurethane insulation.

C. Finish: Slats and hood shall be galvanized steel in accordance with ASTM A 525 and receive rust-inhibitive, roll coating process, including bonderizing, 0.2 mils thick baked-on prime paint, and 0.6 mils thick baked-on polyester top coat. Non-galvanized exposed ferrous surfaces shall receive one coat of rust-inhibitive primer.

D. Color: Polyester topcoat in color as selected by MDOT Architect from manufacturer's standard colors.

E. Weather seals: Vinyl bottom seal, exterior guide and internal hood seals.

F. Bottom Bar: Two prime painted galvanized steel angles, minimum thickness of 1/8 inch, bolted back to back to reinforce curtain in the guides.

G. Guides: Three galvanized structural steel angles with minimum thickness of 3/16 inch. Guides shall be weatherstripped with a vinyl weather seal at each jamb, on the exterior curtain side and interior curtain side.

H. Brackets: Hot rolled galvanized steel to support counterbalance, curtain and hood.

2.04 COUNTERBALANCE MECHANISM: Helical torsion spring type designed for standard 50,000 cycle life design. Counterbalance shall be housed in a steel tube or pipe barrel, supporting the curtain with deflection limited to 0.03 inch per foot of span. Counterbalance shall be adjustable by means of an adjusting tension wheel.

2.05 HOOD: Galvanized steel, 24 gage hood with intermediate supports as required. Provide with internal hood baffle weatherseal.

2.06 ELECTRIC DOOR OPERATOR

A. Operator: Provide UL listed electric operator Model RDB, 1 Hp to move door in either direction at not less than 2/3 foot nor more than 1 foot per second. Operator is to be front-of-hood mounted.

B. Sensing Edge Protection; Pneumatic sensing edge.

C. Operator Controls: Push-button operated control stations with open, close, and stop buttons for surface mounting, for interior location.

D. Coordinate electrical wiring requirements and characteristics with current electrical supply.

2.07 LOCKING: Cylinder lock for electric operation with interlock switch.

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 and fitting weathertight for entire perimeter.

B. Touch-up damaged coatings and 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 08365 SECTIONAL OVERHEAD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES: Electric operated overhead sectional doors of steel panels.

1.02 SYSTEM DESCRIPTION: Electric operation with chain hoist operation requiring a maximum exertion of 25-lbs. force. Provide electric operation unless manually operated doors are designated on Drawings.

1.03 RELATED SECTIONS

A. Section 09050 – Color Design.

B. Section 16100 – Basic Materials and Methods (Wiring).

1.04 SUBMITTALS

A. Product Data: Submit manufacturer's product data, roughing-in diagrams, and installation instructions for each type and size of sectional overhead doors. 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.

1.05 QUALITY ASSURANCE

A. Furnish each sectional overhead door as a complete unit produced by one manufacturer, including hardware, accessories, mounting and installation components. Unless otherwise acceptable to MDOT Architect, furnish sectional overhead door units by one manufacturer for entire project.

B. Insert and Anchorage: Furnish inserts and anchoring devices that must be set into walls for the installation of the sectional overhead door units. Provide setting drawings, templates, instructions and directions for installation of anchorage devices. Coordinate delivery with other Work to avoid delay.

C. Wind Loading: Design and reinforce sectional overhead doors to withstand a 20 PSF (87 MPH) wind loading pressure in the fully closed position unless otherwise indicated.

1.06 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.

1.07 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 Overhead Door Corp., 6750 LBJ Freeway, Suite 1200, Dallas, TX 75240. Tel. (800) 887-3667.

B. Equivalent products by the following manufacturers are acceptable:

1. Raynor Garage Doors, P.O. Box 448, Dixon, IL 61021. Tel. (800) 472-9667.
2. Windsor Door, 5800 Scott Hamilton Drive, Little Rock, AR 72209. Tel. (800) 946-3767.

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

2.02 SECTIONAL OVERHEAD DOOR: Steel door assembly with rabbeted meeting rails to form weathertight joints and provide full-width interlocking structural rigidity. Equal to 430 Series Steel Doors by Overhead Door Corporation.

2.03 SECTIONAL DOOR ASSEMBLY

A. Panels: Two-inch thick flush steel construction; outer sheet of 24-gage galvanized steel, v-grooved profile.

B. Track: Provide track as recommended by manufacturer to suit loading required and clearances available. Lift track in follow-the -roof configuration.

C. Hardware: Heavy duty galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.

D. Door Panel Weatherstripping: Fitted to bottom of door panel, full length; double contact resilient.

E. Jamb Weatherstripping: Formed metal retainer fitted full height of jamb with integral resilient weatherstripping in moderate contact with door panels.

F. Electric Motor Operator: Provide UL listed electric operator, size and type as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than one foot per second.

1. Entrapment Protection: Electric sensing edge.
2. Operation Controls: Push-button operated control station with open, close, and stop buttons for surface mounting, for interior location.

G. Finish: Galvanized steel in accordance with ASTM A 525 and receive rust-inhibitive, roll coating process, including bonderizing, 0.2 mils thick baked-on prime paint, and 0.6 mils thick baked-on polyester top coat. Non-galvanized exposed ferrous surfaces shall receive one coat of rust-inhibitive primer.

H. Color: Polyester topcoat in color as selected by MDOT Architect from manufacturer's standard colors.

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 PREPARATION: Prepare door opening components to permit installation of door unit and preserve continuity of wall air and vapor barrier seal.

3.03 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. Anchor components securely to wall construction and building framing without distortion or stress. Secure tracks to structural members only.

C. Instruct Owners personnel in proper operating procedures and maintenance

3.04 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 and fitting weathertight for entire perimeter.

B. Touch-up damaged coatings and finishes and repair minor damage. Clean exposed surfaces using non-abrasive materials and methods recommended by manufacturer of material or products being cleaned.

3.05 TOLERANCES

A. Variation from Plumb: 1/8 inch maximum.

B. Variation from Level: 1/8 inch.

C. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch from 10-foot straight edge.

END OF SECTION

SECTION 08415 ALUMINUM ENTRANCES & STOREFRONTS

PART 1 GENERAL

1.01 SECTION INCLUDES: Aluminum-framed storefront system includes tubular aluminum sections with supplementary internal support framing as required, aluminum and glass entrances, shop fabricated, factory finished, glass and glazing, related flashing, anchorage and attachment devices.

1.02 RELATED SECTIONS

A. Section 08710 - Door Hardware: Mortised hardware reinforcement requirements affecting framing members; hardware items other than specified in this section.

B. Section 08800 - Glazing.

C. Section 09050 - Color Design.

D. Section 12495 - Window Blinds: Attachments to framing member.

1.03 SUBMITTALS

A. Product Data: Submit component dimensions; describe components within assembly, anchorage, fasteners, and glass.

B. Shop Drawings: Submit Shop Drawings for fabrication and installation, including elevations, detail sections, anchorage, reinforcement, and glazing.

C. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.04 QUALITY ASSURANCE: Perform Work in accordance with AAMA - Metal Curtain Wall, Window, storefront and Entrance Guide Specifications Manual.

1.05 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing aluminum glazing systems with minimum five years experience.

B. Design structural support framing components under direct supervision of a professional engineer experienced in design of this Work and licensed at the place where the Project is located.

1.06 DELIVERY, STORAGE, AND PROTECTION

A. Deliver, store, protect, and handle products to and on project site per manufacturer’s instructions.

B. Store products on minimum 4-inch high wood blocking and cover. Do not use non-vented plastic or canvas that could create a humidity chamber.

1.07 ENVIRONMENTAL REQUIREMENTS: Do not install sealant or glazing materials when ambient temperature is less than 40 degrees F during and 48 hours after installation.

1.08 COORDINATION

A. Section 01310 – Project Management & Coordination: Administrative requirements for coordination and project conditions.

B. Coordinate Work with Section 08710 Door Hardware.

1.09 WARRANTY: Section 01770 - Closeout Procedures: Execution Requirements for Product warranties and bonds.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Drawings and specifications are based on products manufactured by Kawneer Co., Inc., 555 Guthridge Court, Norcross, GA 30092. Tel. (770) 449-5555. Local Supplier is Capital Glass Company, Inc. Tel. (601) 982-0328.

B. Equivalent products by the following manufacturers are acceptable:
1. Traco, 71 Progress Ave., Cranberry Township, PA 16066. Tel. (724) 776-7000.
2. Vistawall Architectural Products, 803 Airport Road, Terrell, TX 75160. Tel. (972) 551-6100.

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

2.02 MATERIALS

A. Storefront Framing: Kawneer Trifab VG 451 - 2 inches by 41/2 inches and 41/2 inches by 4 1/2 inches nominal dimensions; Screw Spline Fabrication.

B. Aluminum Entrances: Kawneer Series 350 Medium Style Swing Doors.

C. Accessories:
1. Weatherstripping: Sealair weathering comprised of a thermoplastic elastomer weathering on a tubular shape with a semi-rigid polymeric backing.
2. Sill Sweep Strips: EPDM blade gasket sweep strip in an aluminum extrusion applied to the interior exposed surface of the bottom rail with concealed fasteners. Finish shall be painted to match door color.
3. Threshold: Extruded aluminum with bronzed anodized finish, one piece per door opening, with ribbed surface.
4. Offset Pivots: Top and bottom. Finish shall be #40 Bronze.
5. Push / Pull: Architects Classic Hardware Style “CO-9” pull and “CP-11” push bar. Mount pull top attachment 44-3/16 inches above bottom of door and push bar 37 inches above bottom of door. Finish shall be #40 Dark Bronze anodized aluminum.
6. Closers: LCN Quest.
7. Locks: Adams-Rite MS 1850A (Refer to Section 08710 for cylinder) mount 41-9/16 inches above bottom of door.

2.03 COMPONENTS

A. Extruded Aluminum: ASTM B221; 6063 alloy for extruded structural members.

B. Glass: Specified in Section 08800.

C. Glazing Materials: As specified in Section 08800.

D. Flashing: Minimum 0.032-inch thick aluminum.

E. Sealant and Backing Materials:
   1. Sealant used within system (Not Used for Glazing): Manufacturer's standard materials to achieve weather, moisture, and air infiltration requirements.
   2. Perimeter Sealant: Specified in Section 07920.

2.04 FABRICATION

A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.

B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.

C. Prepare components to receive anchor devices. Fabricate anchors.

D. Arrange fasteners and attachments to conceal from view.

E. Reinforce interior horizontal head rail to receive blind track brackets and attachments.

F. Prepare components with internal reinforcement for door hardware.

G. Reinforce framing members for imposed loads.

2.05 SHOP FINISHING

A. Fluropon (70% PVDF), AAMA 2605, Fluroropolymer Coating, color selected by MDOT Architect from manufacturer's standard colors.

B. Extent of Finish:
   1. Apply factory coating to all surfaces exposed at completed assemblies.
   2. Apply finish to surface cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.
   3. Apply touch-up materials recommended by coating manufacturer for field application to cut ends and minor damage to factory applied finish.

PART 3 EXECUTION

3.01 EXAMINATION

A. Section 01310 - Administrative Requirements: Coordination and project conditions.

B. Verify dimensions, tolerances, and method of attachment with other Work.

C. Verify wall openings and adjoining air and vapor seal materials are ready to receive Work of this Section.

3.02 INSTALLATION

A. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

B. Provide alignment attachments and shims to permanently fasten system to building structure.

C. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent Work

D. Provide thermal isolation where components penetrate or disrupt building insulation.

E. Install sill flashing. Turn up ends and edges; seal to adjacent Work to form water tight dam.

F. Coordinate attachment and seal of perimeter air and vapor barrier materials.

G. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

H. Install integral flashing and integral joint sealers.

I. Set thresholds in bed of mastic and secure.

J. Install hardware using templates provided. Refer to Section 08710 for installation requirements.

K. Coordinate installation of glass with Section 08800; separate glass from metal surfaces.

L. Coordinate installation of perimeter sealants with Section 07920.

3.03 CLEANING

A. Section 01740 - Execution Requirements: Final cleaning.

B. Remove protective material from pre-finished aluminum surfaces.

C. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

D. Remove excess sealant by method acceptable to sealant manufacturer.

3.04 PROTECTION OF INSTALLED CONSTRUCTION

A. Section 01740 - Execution Requirements: Protecting installed construction.

B. Protect finished Work from damage.

END OF SECTION

SECTION 08520 ALUMINUM WINDOWS

PART 1 GENERAL

1.01 SECTION INCLUDES: Extent of aluminum windows is shown on Drawings and in Schedules. Types of aluminum windows required include fixed and single hung exterior window units.

1.02 RELATED SECTIONS

A. Section 08800 – Glazing for glazing requirements of aluminum windows, including windows specified herein shall be factory pre-glazed.

B. Section 09050 – Color Design.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's sample warranty, specifications, standard details, and installation recommendations for components of aluminum window units required for project, including independent laboratory certified test reports that products tested comply with performances requirements.

B. Shop Drawings: Submit Shop Drawings for fabrication and installation of aluminum windows, including unit elevations, full-or half-scale detail sections of typical composite members. Show anchorage locations and other components not included in manufacturer's standard data. Indicate type glazing, screening and window finish being supplied.

C. Samples: Submit samples as follows:
1. Two samples of each required aluminum finish, on a three-inch long section of an extruded shape or flat aluminum sheet.
2. Additional samples, if required and as directed by the Project Engineer / MDOT Architect, to show fabrication techniques, workmanship of component parts and design of hardware and other exposed auxiliary items.

1.04 QUALITY ASSURANCE: Except as otherwise indicated, requirements for aluminum windows, terminology, tolerances, standards of performance, and fabrication workmanship are those specified and recommended in AAMA/NWWDA 101/I.S. 2-97 and applicable general recommendations published by AAMA and AA.

A. Manufacturer: Provide aluminum 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: Except as otherwise indicated, comply with air infiltration tests, water resistance tests and applicable load tests in AAMA/NWWDA 101/I.S. 2-97 for type and classification of window units required in each case. Where manufacturer's standard window units comply with requirements and have been tested in accordance with specified tests, provide certification by manufacturer showing compliance with such tests.

C. Uniform Load Structural Test: A minimum exterior and interior uniform load of 75 pounds per square foot shall be applied to the entire outside surface of the test unit. This test load shall be maintained for a period of 10 seconds. At the conclusion of the test, there shall be no glass breakage, permanent damage of fasteners, hardware parts, support

arms, actuating mechanisms, or any other damage causing the window to be inoperable. There shall be no permanent deformation of any frame or sash member in excess of 0.4 percent of span.

D. Air Infiltration Test: With the sash in a closed and locked position, the window shall be subjected to an air infiltration test in accordance with ASTM E 283. Air infiltration shall not exceed 0.07 cubic feet per minute, per square foot of window area.

E. Water Resistance Test: No water shall pass the interior face of the window frame and there shall be no leakage as defined in tests methods ASTM E 331 and ASTM E547.

F. Condensation Resistance Factor: The window shall be tested in accordance with AAMA 1502 standards and tests of thermal performance and shall have a condensation resistance factor of no less than 48.

G. Operating Force: The sash shall have been adjusted to operate in either direction with a force not exceeding 45 pounds after the sash is in motion.

H. 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

A. Store and handle windows, mullions, panels, hardware and all appurtenant items in strict compliance with the manufacturer's instructions.

B. Protect windows and all accessory materials adequately against damage from the elements, construction activities and other hazards before, during and after installation.

1.06 SPECIAL PROJECT WARRANTY: Provide written warranty signed by Manufacturer, Installer, and Contractor, agreeing to replace aluminum windows which fail in materials or workmanship within 3 years of acceptance. Failure of materials or workmanship includes excessive leakage or air infiltration, excessive deflections, faulty operation of entrances, deterioration of finish or 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 Series 4000-4 Model 4140 Single Hung windows as manufactured by Peerless Products, Inc., 15500 College Blvd., Lenexa, KS 66219. Tel. (800) 279-9999.

B. Equivalent products by the following manufacturers are acceptable:
   1. Graham Architectural Products, 1551 Mount Rose Ave., York, PA17403. Tel. (800) 755-6274.

   2. Winco Window Company, 6200 Maple Ave., Saint Louis, MO 63130. Tel. (800) 525-8089.

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

2.02 MATERIALS AND ACCESSORIES

A. Aluminum Members: All extruded sections shall be of 6063-T5 aluminum. Alloy and temper recommended by manufacturer for strength, corrosion resistance, and application of required finish; ASTM B 221 for extrusions, ASTM B 209 for sheet/plate. Main frame extruded members shall have a minimum depth of 4 inches.

B. Fasteners: Aluminum, non-magnetic stainless steel, or other materials warranted by manufacturer to be noncorrosive and compatible with aluminum components. Do not use exposed fasteners except where unavoidable for application of hardware. Match finish of adjoining metal. Provide Phillips flat-head machine screws for exposed fasteners. Locate all fasteners so as not to bridge the thermal break construction of windows.

C. Concealed Flashing: Dead-soft stainless steel, 26 gage minimum, type selected by manufacturer for compatibility.

D. Brackets and Reinforcements: Manufacturer's high-strength aluminum units where feasible; otherwise, nonmagnetic stainless steel or hot-dip galvanized steel complying with ASTM A 386.

E. Clear Protective Coatings: AAMA 602.2, compounded specifically for protection of aluminum finish during construction.

F. Sliding Weather-stripping: Provide double weather-stripping using silicone-coated woven pile with polypropylene fin center complying with AAMA 701.

G. Glass and Glazing Materials: Provide glass and glazing materials that comply with requirements of Section 08800 of these Specifications.

2.03 WINDOW CLASSIFICATION (GRADE): Except as otherwise indicated, provide window units complying with requirements of AAMA classification of H-HC55.

2.04 WINDOW TYPE (OPERATION): Single hung aluminum window units containing one balanced vertically sliding sash; requiring up to four (4) counter balancing mechanisms complying with AAMA 902 “Voluntary Specifications for Sash Balances”, and as specified hereinafter, lift handles on lower rail of lower sash. Provide Zamac sweep lock latches at meeting rails to lock sash in closed position. Provide units with “tilt-in” feature which permit sash to be cleaned from the interior. Sash shall not tilt in without the use of a maintenance-only release mechanism.

2.05 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. Sequence: Complete cutting, fitting, forming, drilling, and grinding of metal work prior to cleaning, finishing, surface treatment, and application of finishes. Remove arises from cut edges and ease edges and corners to radius of approximately 1/64".

C. Welding: Comply with AWS recommendations to avoid discoloration; grind exposed welds smooth and restore mechanical finish.

D. Reinforcing: Install reinforcing as necessary for performance requirements; separate dissimilar metals with bituminous paint or other separator that will prevent corrosion.

E. Continuity: Maintain accurate relation of planes and angles, with hairline fit of contacting members.

F. Fasteners: Conceal fasteners wherever possible.

2.06 SILLS: Provide extruded sills equal to those manufactured by Peerless. Sizes shown on Drawings.

2.07 SCREENS: Provide manufacturer's standard aluminum screen at operable units.

2.08 FINISHES: Kynar 500 (70% PVDF), AAMA 2650, finish to be selected by MDOT Architect from manufacturer's full range of standard colors available. Protect finishes promptly after drying by applying clear protective coating not less than 0.5 mils dry film thickness.

PART 3 EXECUTION

3.01 INSTALLATION: Comply with manufacturer's instructions and recommendations for installation of aluminum windows. Set units plumb, level, and true to line, without warp or rack of framing members. Anchor securely in place, separating aluminum and other corrodible metal surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

A. 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.

B. Refer Section 08800 - Glazing for installation of glass to be glazed into windows.

3.02 ADJUSTING AND CLEANING: Adjust operating hardware to function properly, without binding, and to provide tight fit at contact points and weather-stripping, for smooth operation and weather-tight closure. Lubricate any hardware or moving parts as required.

A. Clean completed system, inside and out, promptly after installation of glass and sealants. Remove excess glazing and sealant compounds, dirt, and other substances from aluminum surfaces. Remove protective coating when completion of construction activities no longer requires its retention.

B. Institute protective measures and other precautions required to ensure that aluminum window units will be without damage or deterioration, other than normal weathering, at time of acceptance.

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.

A. The required types of hardware include (but are not limited to) the following:

1. Butts and hinges
2. Lock cylinders and keys
3. Lock and latch sets
4. Bolts
5. Panic exit devices
6. Push/pull units
7. Closers
8. Door trim units
9. Stripping and seals
10. Thresholds

B. 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.

C. 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.

D. 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 REFERENCES

A. Coordinate with the following Sections for the installation of finish hardware:

1. Section 08100 – Metal Doors and Frames.
2. Section 08210 – Wood Doors.
3. Section 08415 – Aluminum Entrances and Storefronts

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's product data, roughing-in diagrams, and Installation instructions for each type of hardware. Include operating instructions, maintenance information and spare part sources.

B. Contractor's Hardware Schedule: After all samples have been approved but prior to delivery of hardware, Contractor shall prepare and submit to the MDOT Architect a complete schedule of all finish hardware required. Schedule shall follow requirements of Specifications and shall indicate type, manufacturer's name and number, location and finish of each item required. Approval of schedule will not relieve Contractor of responsibility for furnishing all necessary hardware.

C. Submit such samples as required by the MDOT Architect for approval. Do not deliver hardware until approval is obtained.

1.04 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.

1.05 PACKING AND MARKING: Package each item of hardware and lockset separately in individual containers, complete with screws, keys, instructions and installation template for spotting mortising tools. Mark each container with item number corresponding to number shown on Contractor's hardware schedule.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Equivalent products by the following manufacturers are acceptable:

1. Best Access Sys. Indianapolis, IN. Tel: (800) 311-1705.
2. Corbin Russwin Arch’t. Hardware. Berlin, CT. Tel: (800) 543-3658.
3. Dorma Door Controls, Inc. Reamstown, PA. Tel: (800) 523-8483.
4. Hager Companies. Saint Louis, MO. Tel: (800) 325-9995.
5. LCN. Princeton, IL. Tel: (800) 526-2400.
6. McKinney Hinge. Scranton, PA. Tel: (800) 346-7707.
7. Pemko. Ventura, CA. Tel: (800) 283-9988.
8. Rockwood Manufacturing Co. Rockwood, PA. Tel: (800) 458-2424.
9. Schlage Lock Co. Colorado Springs, CO. Tel: (800) 847-1864.
10. Stanley Hardware. New Britain, CT. Tel: (800) 337-4393.
11. Trimco/BBW/Quality. Los Angeles, CA. Tel: (323) 262-4191.

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

2.02 KEYING / CYLINDERS

A. All cylinders and locksets shall be set to a masterkey system. Furnish all cylinders & locksets with removable type cores. The removable core system shall be one that uses either temporary construction cores or construction keyed cores operated by a construction key until such time the construction key is rendered inactive by the change key or retractor key.

B. All cylinders shall be keyed in sets as directed by the MDOT Architect. Furnish 3 change keys per lock and 6 masterkeys per set.

2.03 MATERIALS: See Hardware Schedule at end of this Section. Products listed set standard.

PART 3 EXECUTION

3.01 INSTALLATION: Mount hardware units at heights recommended in "Recommended Locations for Builders' Hardware" NBHA, except as other wise specifically indicated or required to comply with governing regulations, and except as may be otherwise directed by the Project Architect.

A. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, install each item completely and then remove and store in a secure place during the finish application. After completion of the finishes, re-install each item. Do not install surface-mounted items until finishes have been completed on the substrate.

B. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation. Drill and countersink units that are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

C. Cut and fit threshold and floor covers to profile of door frames, with mitered corners and hairline joints. Join units with concealed welds or concealed mechanical joints. Cut smooth openings for spindles, bolts and similar items, if any.

D. Screw thresholds to substrate with No. 10 or larger screws, of the proper type for permanent anchorage and of bronze or stainless steel that will not corrode in contact with the threshold metal.

1. At exterior doors, and elsewhere as indicated, set thresholds in a bed of either butyl rubber sealant or polyisobutylene mastic sealant to completely fill concealed voids and exclude moisture from every source.
2. Do not plug drainage holes or block weeps. Remove excess sealant.

3.02 ADJUSTING AND CLEANING: Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Lubricate moving parts with type lubrication recommended by manufacturer (graphite-type if no other recommended). Replace units that cannot be adjusted and lubricated to operate freely and smoothly as intended for the application made.

3.03 SCHEDULE:

HW1 (For Storefront Door)
Each Opening Shall Have:

2 – Each Cylinders	Best	1E72/1E74 (as required) 626

HW2 (For Exterior Hollow Metal Door)
Each Opening Shall Have:

3 – Each Hinges	Hager	BB1279 4 1/2 X 4 1/2 X NRP X 652
1 – Lockset	Schlage	D50RD Rhodes X 626
1 – Closer	LCN	P1460/1460 X TBGN
1 – Kickplate	Rockwood	8 X 2 LDW 0.050 X 630 (Mounted push side)
1 – Threshold	Pemko	2005AV
1 – W/Strip	Pemko	303AV
1 – Door Bottom	Pemko	2211AV (for Hollow Metal Doors)
3 – Silencers		

HW3 (For Interior Wood Door @ Crew Rooms)
Each Opening Shall Have:

3 – Each Hinges	Hager	BB1279 4 1/2 X 4 1/2 X 652
1 – Passage	Schlage	D10S Rhodes X 626
1 – Closer	LCN	1460 X TBGN
1 – Kickplate	Rockwood	8 X 2 LDW 0.050 X 630 (Mounted push side)
1 – Mop Plate	Rockwood	6 X 1 LDW 0.050 X 630 (Mounted pull side)
1 – Stop	Rockwood	440 X 626
3 – Silencers		

HW4 (For Interior Wood Door @ Offices, Equip & Storage Rooms)
Each Opening Shall Have:

3 – Each Hinges	Hager	BB1279 4 1/2 X 4 1/2 X 652
1 – Lockset	Schlage	D50RD Rhodes X 626
1 – Cylinder	Best	As Required
1 – Stop	Rockwood	440 X 626
3 – Silencers		

HW5 (For interior Wood Door @ HVAC Rooms)
Each Opening Shall Have:

Each Hinges		
1 – Set Spring Hinges	Hager	1256 4 1/2 X 4 1/2 X 652
1 – Lockset	Schlage	D80RD Rhodes X 626
1 – Cylinder	Best	As Required
1 – Stop	Rockwood	440 X 626
3 – Silencers		

HW6 (for Interior Wood Door @ single toilet rooms)
Each Opening Shall Have:

3 – Each Hinges	Hager	BB1279 4 1/2 X 4 1/2 X 652
1 – Privacy	Schlage	D40S Rhodes X 626
1 – Indicator Bolt	Falcon	D871 X 626
1 – Closer	LCN	1460 X TBGN
1 – Kickplate	Rockwood	8 X 2 LDW 0.050 X 630 (Mounted push side)
1 – Mop Plate	Rockwood	6 X 1 LDW 0.050 X 630 (Mounted pull sise)
1 – Stop	Rockwood	440 X 626
3 – Silencers		

HW7 (For Interior Wood Door @ Corridor to Corridor Passage)
Each Opening Shall Have:

3 – Each Hinges	Hager	BB1279 4 1/2 X 4 1/2 X652
1 – Closer	LCN	1461 AL X TBGN
1 – Push Plate	Rockwood	70 (4 X 16) X 630
1 – Pull	Rockwood	70 (4 X 16) X 630
1 – Kickplate	Rockwood	8 X 2 LDW 0.050 X 630 (Mounted push side)
1 – Stop	Rockwood	440 X 626
3 – Silencers		

HW8 (For Interior Hollow Metal Door @ Area Separation)
Each Opening Shall Have:

3 – Each Hinges	Hager	BB1279 4 1/2 X 4 1/2 X652
1 –Lockset	Schlage	D50PD Rhodes X 626
1 – Cylinder	Best	As Required
1 – Closer	LCN	1461 AL X TBGN
1 – Kickplate	Rockwood	8 X 2 LDW 0.050 X 630 (Mounted push side)
1 – Stop	Rockwood	440 X 626
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 08100-Metal Doors and Frames.

B. Section 08210-Wood Doors.

C. Section 08415-Aluminum Entrances and Storefronts.

D. Section 08520-Aluminum Windows.

1.03 QUALITY ASSURANCE: Comply with recommendations of Flat Glass Marketing Association (FGMA) "Glazing Manual" and "Sealant Manual" except where more stringent requirements are indicated. Refer to those publications for definitions of glass and glazing terms not otherwise defined in this section or other referenced standards.

A. Prime Glass Standard: FS DD-G-45l.

B. Heat-Treated Glass Standard: FS DD-G-l403.

C. Safety Glass Standard: CPSC l6 CFR l20l.

1.04 DELIVERY, STORAGE, AND HANDLING: Protect glass during transit, storage and handling to prevent scratching or breakage of glass. Replace all broken glass.

1.05 PROJECT CONDITIONS: Meet with Glazier and other trades affected by glass installation, prior to beginning of installation. Do not perform work under adverse weather or job conditions. Install liquid sealant when temperatures are within lower or middle third of temperature range recommended by manufacturer.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Equivalent products by the following prime glass manufacturers are acceptable:

1. AFGD, Inc., 1600 Parkwood Circle, Suite 300, Atlanta, GA 30339. Tel. (800) 766-2343.
2. Guardian Industries Corp., 14600 Romine Road, Carleton, MI 48117. Tel. (800) 521-9040.
3. Pilkington Libbey-Owens-Ford, P.O. Box 799, Toledo, OH 43697. Tel. (419) 246-6078.
4. PPG Industries, Inc., One PPG Place, Pittsburgh, PA 15272. Tel. (800) 377-5267.
5. Visteon Float Glass Operations, 17333 Federal Drive, Suite 230, Allen Park, MI 48101. Tel. (800) 521-6345.

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

2.02 INSULATING GLASS

A. Material: Shall consist of organically sealed panes of glass enclosing a hermetically sealed dehydrated air space and complying with ASTM E 774 for performance classification indicated. Unless shown otherwise on Drawings, use this type glass for all exterior applications.

B. Characteristics: Other requirements specified for glass characteristics, air space, sealing system, sealant spacer material, corner design and desiccant are as follows:

1. Thickness of Each Pane: 1/4 - inch.
2. Airspace Thickness: 1 inch Sealing System: Manufacturer's standard.
3. Spacer Material: Manufacturer's standard metal.
4. Desiccant: Manufacturer's standard, either molecular sieve or silica gel.
5. Corner Construction: Manufacturer's standard.
6. Exterior Pane: Gray tinted.
7. Interior Pane: Clear.

2.03 LAMINATED CLEAR SAFETY GLASS: Two layers of 1/8 inch glass Type 1 (transparent glass, flat), Class 1 (clear), Quality q3 (glazing select) with a 0.030 polyvinyl butyryl interlayer. Total thickness, 1/4 inch (plus). Unless shown otherwise on Drawings, use this type glass for all interior applications.

2.04 SETTING MATERIALS: Provide all necessary primers, sealants, channels, setting blocks, etc. with items to be glazed. Conform to requirements set forth in FGJA Glazing Manual.

PART 3 EXECUTION

3.01 GLAZING INSTALLATION

A. Do not commence glazing Work until the required primers have been applied and have dried. Clean all surfaces to which setting materials are to be applied to assure that the materials properly adhere and seal.

B. Experienced glaziers having highest quality workmanship shall perform all glazing. Glass shall be set without springing or forcing. Putty, glazing compound, stops and the like shall not project above the sight line. Exposed surfaces of putty and glazing compound shall be left straight, flat and clean. Corners shall be well formed.

C. Remove and replace glass which is broken, chipped, cracked, abraded or damaged in other ways during construction period, including natural causes, accidents and vandalism.

D. Apply clear glazing compound around perimeter and at all glass-to-glass connections of butt-glazing system. Compound shall be the type recommended by the glass manufacturer for this particular installation.

3.02 STANDARDS AND PERFORMANCE

A. Watertight and airtight installation of each glass product is required, except as otherwise shown. Each installation must withstand normal temperature changes, wind loading, impact loading (for operating sash and doors), without failure including loss or breakage of glass, failure of sealant or gaskets to remain watertight and airtight, deterioration of glazing materials and other defects in the Work.

B. Protect glass from edge damage during handling and installation, and subsequent operation of glazed components of the Work. During installation, discard units with significant edge damage or other imperfections.

C. Glazing channel dimensions where shown are intended to provide for necessary bite on glass, minimum edge clearance, and adequate sealant thickness, with reasonable tolerances. Adjust as required by job conditions at time of installation.

D. Comply with combined recommendations and technical reports by manufacturers of glass and glazing products as used in each glazing channel, and with recommendations of Flat Glass Marketing Association "Glazing Manual," except where more stringent requirements are indicated.

3.03 PREPARATION FOR GLAZING

A. Clean glazing channel and other framing members to receive glass, immediately before glazing. Remove coatings that are not firmly bonded to substrate. Remove lacquer from metal surfaces where elastomeric sealants are used.

B. Apply primer or sealant to joint surfaces where recommended by sealant manufacturer.

3.04 GLAZING

A. Install setting blocks of proper size in sill rabbet, located l/4 of glass width from each corner. Set blocks in thin course of heel-bead compound, if any.

B. Provide spacers inside and out, of proper size and spacing, for glass sizes larger than 50 united inches, except where gaskets or pre-shimmed tapes are used for glazing. Provide l/8" minimum bite of spacers on glass and use thickness equal to sealant width, except with sealant tape use thickness slightly less than final compressed thickness of tape.

C. Set units of glass in each series with uniformity of pattern, draw, bow and similar characteristics.

D. Force sealant into channel to eliminate voids and to ensure complete "wetting" or bond of sealant to glass and channel surfaces.

E. Tool exposed surfaces of glazing liquids and compounds to provide a substantial "wash" away from glass. Install pressurized tapes and gaskets to protrude slightly out of channel, so as to eliminate dirt and moisture pockets.

F. Clean and trim excess glazing materials from glass and stops or frames promptly after installation, and eliminate stains and discoloration.

G. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage to ensure that gasket will not "walk"

out when installation is subjected to movement. Anchor gasket to stop with matching ribs, or by proven adhesives, including embedment of gasket tail in cured heel-bead.

3.05 CURE AND PROTECTION

A. Protect glass from breakage immediately upon installation, by use of crossed streamers attached to framing and held away from glass. Do not apply markers to surfaces of glass. Remove nonpermanent labels and clean surfaces. Cure sealant for high early strength and durability.

B. Remove and replace glass which is broken, chipped, cracked, abraded or damaged in other ways during construction period, including natural causes, accidents and vandalism.

3.06 CLEANING

A. Wash and polish glass on both faces not more than 4 days prior to date scheduled for inspections intended to establish date of Substantial Completion in each area of Project. Comply with glass product manufacturer's recommendations for final cleaning.

B. The General Contractor shall be responsible for removal of protective materials and cleaning with plain water, or water with soap or household detergent as approved by the glass manufacturer. The General Contractor shall be held responsible for damages resulting from the use of other cleaning material.

END OF SECTION

SECTION 09050 COLOR DESIGN

PART 1 GENERAL

1.01 SECTION INCLUDES: A coordinated comprehensive Color System in which requirements for materials specified in other Sections of this Specification and / or shown on the Drawings are identified for quality, color, finish, texture and pattern.

1.02 MANUFACTURER'S TRADE NAMES: Manufacture's trade names and number designations used herein identify colors, finishes, textures and patterns for materials and products specified in the technical sections of the Specifications. Wherever such products are referred for selection or approval in other sections, such products shall be understood to be referenced to this Section. If no selection is listed herein for products, the Project Engineer / MDOT Architect shall be contacted for a color selection. Subject to approval of the Project Engineer / MDOT Architect, products of other manufacturers will be considered, provided they are equivalent to the quality, colors, finishes, textures and patterns listed and meet the requirements of the Specifications and Drawings.

1.03 RELATED SECTIONS: Section 01330 – Submittal Procedures.

1.04 SAMPLES: Samples shall be submitted for approval prior to applying or installing any finishes or items that are not included in this Section. See appropriate technical Sections for submittal requirements. Upon receipt of samples, the MDOT Architect may make revisions to the Color schedule.

PART 2 PRODUCTS

2.01 MATERIALS: Materials are specified in other Sections of the Specifications. Any reference by trade name or manufacturer shall be considered as establishing a standard of quality and shall in no way limit competition.

2.02 MANUFACTURERS: The following manufacturers were used in preparing the Color Schedule:

SECTION / MATERIAL	MANUFACTURER / NUMBER & COLOR NAME	COLOR DESCRIPTION
• 03300 – Concrete Floor Stain	Anvil – Bermuda Tan	(tan)
• 04200 - Brick (Field)	TS #401B Red Velour (Modular)	(red/brown)
• 04200 - Brick (accent)	TS # 403B Burgundy (Modular)	(burgundy)
• 04200 - Mortar	Lonestar Gray Mortar	(gray)
• 04200 - Weep Vents	Match Mortar Color	(gray)
• 05500 - Miscellaneous Steel	ICI #1133 New England Green	(dark green)
• 06400 - Architectural Woodwork	ICI #429 Desert Sand	(tan)
• 06400 - Plastic Lam Countertop	Formica #7219-58 Forest Terra	(green/brown)
• 07315 - Fiberglass Shingles	GAF #T30 Midnight Green	(green/brown)
• 07464 - Vinyl Siding (Field)	Wolverine #836 Wheat	(tan)
• 07464 - Vinyl Siding (Trim)	Wolverine # 824 Ivy	(green)
• 07465 - Alum. Soffit Panels	Petersen-Sierra Tan	(light tan)
• 07610 - Metal Roofing	Petersen-Forest Green	(dark green)
• 07610 - Met Trim, Gutters & DS	Petersen-Forest Green	(dark green)
• 07610 - Soffit Panels	Petersen-Sierra Tan	(light tan)
• 07620 - Met Trim, Gutters & DS	Petersen-Forest Green	(dark green)
• 07920 - Joint Sealants	Sonneborn-Match adjacent lighter color	

• 08100 - Metal Dr Frames (Ext)	ICI #1133 New England Green	(green)
• 08100 - Metal Dr Frames (Int)	ICI #410 Nutty Brown	(light brown)
• 08210 - Wood Doors (stained)	Graham #700-Dark Brown	(brown)
• 08415 - Alum Ent & Storefront	Kawneer-Dark Green	(green)
• 08520 - Aluminum Windows	Peerless-#95F515 Sarapi Green	(green)
• 08710 - Door Hardware	Antique Bronze Oiled	(bronze)
• 09250 - Gypsum (Walls)	ICI #560 Russian White	(light tan)
• 09250 - Gypsum (Ceilings)	ICI #2015 White Whisper	(white)
• 09310 - Ceramic Tile Floor ‘A’	Daltile #DC02-Almond (8” x 8”)	(beige)
• 09310 - Ceramic Tile Floor ‘B’	Daltile #DC09-Hunter (8” x 8”)	(dark green)
• 09310 - Ceramic Tile Wall ‘A’	Daltile #K165-Almond (41/4” x 41/4”)	(beige)
• 09310 - Ceramic Tile Wall ‘B’	Daltile #K112-Timberline (41/4” x 41/4”)	(dark green)
• 09310 - Grout (Floors)	Laticrete #61-Parchment	(tan)
• 09310 - Grout (Walls)	Laticrete #61-Parchment	(tan)
• 09650 - Resilient Floor ‘A’	Armstrong Tile #51901Taupe	(tan)
• 09650 - Resilient Floor ‘B’	Armstrong Tile #51808 Lichen Green	(light green)
• 09650 - Resilient Floor ‘C’	Armstrong Tile #51947 Basil Green	(dark green)
• 09650 - Rubber Base	Johnsonite #86 Hunter Green	(green)
• 10100 - Visual Display Board	Claridge-Fabricork #B220 Antique White	(cream)
• 10100 - Tackboard	Claridge-Cork #1110 Fawn	(tan)
• 10170 - Toilet Partition	Comtec #D406 Sand Castle	(tan)
• 10200 - Louvers	C/S Group #80 Interstate Green	(green)
• 10260 - Corner Guards	C/S Group #253 Parchment	(light tan)
• 10400 - Specialty Signs (Int)	ASI Sign SC-812 Sand & SC-905 Black	(tan w/ blk trim)
• 10400 - Specialty Signs (Ext)	ASI Sign M38 Green	(dark green)
• 10500 – Lockers (frames)	Penco-# 012 Tawny Tan	(tan)
• 10500 – Lockers (Doors)	Penco- #812 Hunter Green	(green)
• 11455 - Appliances (Range)	GE-White	(white)
• 11455 - Appliances (Microwave)	GE-White	(white)
• 11455 - Appliances (Refrigerator)	GE-White	(white)
• 12485 - Floor Mats	C/S Group-Carpet #9316 Spruce	(green)
• 12485 - Floor Mats	C/S Group-Rails Bronze Anodized	(brown)
• 12495 - Window Blinds	Hunter Douglas #C270-Linen	(off white)

PART 3 EXECUTION

3.01 EXECUTION: Refer to execution requirements specified in other Sections of this Specification for the specific products listed. Any remaining colors, finishes, textures or patterns not included in this Color Design will be selected by the MDOT Architect upon written notification and subsequent submittals by the Contractor.

END OF SECTION

SECTION 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 manufacturers 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, 5/8 inch thick Durock, as a base for ceramic tile.

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: 4-1/4 inches by 4-1/4 inches by 5/16 inch, cushioned edge, bright glaze, cove base round top, color to be selected from standard colors available.

2.04 GLAZED WALL TILE: Size 4-1/4 inches by 4-1/4 inches by 5/16 inch, cushioned edge, bright glaze, colors to be selected from standard colors available.

2.05 TRIM AND SPECIAL SHAPES

A. Provide necessary units with rounded internal and external corners, and rounded internal and external corner units of same material and finish as field tile, and as follows:

1. Base: Sanitary cove units.
2. External Corners: Bullnose shapes, with a radius of not less than 3/4 inch, unless otherwise shown.
3. Internal Corners: Field-butted square, except use square corner, combination angle and stretcher type cap.

2.06 MARBLE THRESHOLDS: Provide sound Group "A" marble with an abrasive hardness of not less than 10.0, when tested in accordance with ASTM C 241. Color of marble threshold to be selected by the MDOT Architect from manufacturer's full range of standard colors.

2.07 ADHESIVE: ANSI A136.1 and ANSI A118.4 when mixed with additive, with Tile Contractor's Association or Adhesive and Sealant Council certification of conformance, for base and wall tile set on each type of substrate. Provide primer-sealer as recommended by adhesive manufacturer. Equal to Laticrete Type 272 Premium or 317 Floor 'N Wall Thin-Set with 333 Super Flex Additive. Equivalent products by Mapei and Bostik are acceptable.

2.08 GROUT: ANSI A 118.3, with Tile Contractor's Association certification of conformance. Proprietary compound composed of 100 percent Solid Epoxy for a more flexible and less permeable grout. Equal to Laticrete Type LATAPOXY SP-100 Stainless Epoxy Grout. Equivalent products by Mapei and Bostik are acceptable. Color of grout to be selected by the MDOT Architect from manufacturer's full range of standard colors.

PART 3 EXECUTION

3.01 INSPECTION: Installer must examine the substrate and the conditions under which ceramic tile is to be installed and notify the contractor in writing of any conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.02 INSTALLATION

A. Comply with the applicable parts of ANSI 108 Series of tile installation standards included under “American National Standard Specifications for the Installation of Ceramic Tile", and the tile and grout manufacturer's printed instructions, and applicable installation specifications of the Tile Council of America's "Handbook for Ceramic Tile Installation", latest edition.

B. Handle, store, mix and apply proprietary setting and grouting materials in compliance with the manufacturer's instructions.

C. Extend tile Work into recesses and under equipment and fixtures, to form a complete covering without interruptions, except as otherwise shown. Terminate Work neatly at obstructions, edges and corners without disruption of pattern or joint alignment.

D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight, aligned joints. Fit tile closely to electrical outlets, piping, and fixtures so that plates, collars, or covers overlap tile.

3.03 JOINTING PATTERN: Unless otherwise shown, lay tile in grid pattern. Align joints where adjoining tiles on floor, base, walls and trim are the same size. Layout tile Work and center tile fields both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise shown.

3.04 COLOR PATTERN: A simple color pattern shall be provided with approved color chart and sample submittal to Contractor using 3 or less colors on walls and floors.

3.05 CLEANING AND PROTECTION

A. Cleaning: Clean grout and setting materials from face of tile while materials are workable. Leave tiles face clean and free of all foreign matter. Unglazed tile may be cleaned with acid solutions only when permitted by the tile and grout manufacturer's printed instructions, but not sooner than 14 days after installation. Protect metal surfaces, cast iron and vitreous plumbing fixtures from effects of acid cleaning. Flush the surface with clean water before and after cleaning.

B. Finished Tile Work: Leave finished installation clean and free of cracked, chipped, broken, unbonded, or otherwise defective tile Work.

C. Protection: When recommended by tile manufacturer, apply a protective coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile Work by covering with floor protection paper during the construction period to prevent damage and wear. Prohibit all foot and wheel traffic from using tiled floors for 7 days after installation. Before final inspection, remove protective covering and rinse neutral cleaner from all tile surfaces.

END OF SECTION

SECTION 09510 ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Lay-in acoustical panels (2' by 2' Grids) for metal ceiling suspension systems.

B. Suspended metal grid system complete with wall trim.

1.02 RELATED SECTIONS

A. Section 07210 – Building Insulation.

B. Section 09250 – Gypsum Board.

C. Section 15010 – Mechanical General.

D. Section 16010 – Basic Electrical Requirements.

1.03 SUBMITTALS

A. Manufacturer's product specifications, samples, and installation instructions for each acoustical ceiling material required, and for each suspension system, including certified laboratory test reports and other data as required to show compliance with these specifications. Include manufacturer's recommendations for cleaning and refinishing acoustical units, including precautions against materials and methods that may be detrimental to finishes and acoustical performances.

1.04 QUALITY ASSURANCE: Installer shall be a company with not less than 3 years of documented successful experience in installation of acoustical ceilings similar to requirements for this Project and acceptable to manufacturer of acoustical units, as shown by current written statement from manufacturer (required for approval).

1.05 PROJECT CONDITIONS

A. Do not install interior acoustical ceilings until the following conditions are met:

1. Space is enclosed and weatherproof.
2. Wet work in space completed and nominally dry.
3. Work above ceilings is completed.
4. Ambient conditions of temperature and humidity will be continuously maintained at values near those indicated for final occupancy.

B. Maintain a light level of a minimum of 50 fc during entire installation.

1.06 PROJECT COORDINATION: It shall be this contractor's responsibility to coordinate with mechanical and electrical trades with respect to their requirements for additional suspension system components. Any additional components required shall be furnished and installed by this contractor.

1.07 MAINTENANCE STOCK: At time of completing installation, deliver stock of maintenance material to Owner. Furnish full size units matching units installed, packaged with protective covering for storage, and identified with appropriate labels. Furnish amount equal to 2 percent of acoustical units and exposed suspension installed.

PART 2 PRODUCTS

2.01 ACOUSTICAL PANELS

A. Provide manufacturer's standard lay-in panels of type recommended by manufacturer for application indicated. Provide sizes shown by reflected ceiling plans or, if not otherwise indicated, 2' by 2' grid-size panels, with white washable finish.

B. Mineral Fiber Acoustical Tile: Provide units with Intersept Antimicrobial solution (mold and mildew guard) not less than 5/8-inch thick and of density not less than l0 pounds per cubit foot, medium-coarse non-directional texture, NRC 0.50 to 0.60, CAC 25 to 33, light reflectance over 75 percent. Products offered by manufacturers to comply with requirements include the following:

1. No. 770 Cortega Square Edge; Armstrong World Industries, Inc.
2. Van-157 Vantage 10 Trim Edge ; BPB Celotex
3. No. 560 Fissured Square Edge; U.S. Gypsum Co.

2.02 CEILING SUSPENSION MATERIALS

A. Comply with ASTM C 635, as applicable to type of suspension system required for type of ceiling units indicated. Coordinate with other work supported by or penetrating through ceilings, including light fixtures, HVAC equipment, and partition system (if any). Structural Class of the system shall be intermediate-duty.

B. Attachment Devices: Size for 5 times design load indicated in ASTM C 635, Table l, Direct Hung.

1. Hanger Wires: Galvanized carbon steel, ASTM A 64l, soft temper pre-stretched, yield-stress load of at least 3 times design load, but not less than l2 gage (0.l06 inch).
2. Type of System: Either direct or indirect-hung suspension system, at Contractor's option.
3. System Manufacturer: Same as acoustical unit manufacturer or one of the following:

   a. Chicago Metallic Corp. Donn Corp.
   b. W. J. Haertel Div.; Leslie-Locke.
   c. National Rolling Mills Co. Roblin Building Products Roper.
   d. Eastern Building Systems.

C. Edge Moldings: Manufacturer's standard channel molding for edges and penetrations of ceiling, with single flange of molding exposed, white baked enamel finish unless otherwise indicated.

D. Exposed Suspension System: Manufacturer's standard exposed runners, cross-runners and accessories, or types and profiles indicated, with exposed cross runners coped to lay flush with main runners. Provide uniform factory-applied finish on exposed surfaces of ceiling suspension system, including moldings, trim, and accessories. Use manufacturer's standard baked enamel finish, white unless otherwise selected by MDOT Architect.

2.03 MISCELLANEOUS MATERIALS

A. Edge Trim Molding: Metal or extruded PVC plastic, of types and profiles indicated, white finish unless otherwise indicated.

B. Hold-Down Clips: Where required for wind uplift resistance or fire-resistance rating, provide standard spring steel clips, except provide accessible type at locations indicated on drawings.

PART 3 EXECUTION

3.01 COORDINATION: Mechanical and electrical work above suspended ceiling shall be strictly coordinated with the work in this Section.

3.02 EXAMINATION: Installer must examine conditions under which acoustical ceiling work is to be performed and must notify Contractor in writing of unsatisfactory conditions. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.03 PREPARATION: Furnish layouts for inserts, clips, or other supports required to be installed by other trades for support of acoustical ceilings. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less-than-half width units at borders, and comply with reflected ceiling plans wherever possible.

3.04 INSTALLATION

A. Install materials in accordance with manufacturer's printed instructions, and to comply with governing regulations, fire resistance rating requirements as indicated, and industry standards applicable to the Work.

B. Install suspension systems to comply with ASTM C 636, with hangers supported only from building structural members. Locate hangers near each end and spaced 4 feet along each carrying channel or direct-hung runner, unless otherwise indicated, leveling to tolerance of l/8 inch in l2 feet. Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eye-screws, or other devices which are secure and appropriate for substrate, and which will not deteriorate or fail with age or elevated temperatures.

C. Install edge moldings of type indicated at perimeter of acoustical ceiling area and at locations where necessary to conceal edges of acoustical units. Screw-attach moldings to substrate at intervals not over l6 inches on center and not more than 3 inches from ends, leveling with ceiling suspension system to tolerance of l/8 inch in l2 feet. Miter corners accurately and connect securely.

D. Install acoustical panels in coordination with suspension system, with edges concealed by support of suspension members. Scribe and cut panels to fit accurately at borders and at penetrations. Install hold-down clips in areas indicated, and in areas where required by governing regulations or for fire- resistance ratings; space as recommended by panel manufacturer, unless otherwise indicated or required.

3.05 ADJUSTING AND CLEANING

A. Adjust sags or twists which develop in the ceiling system and replace parts that are damaged or faulty.

B. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members; comply with manufacturer's instructions for cleaning and touch-up of minor finish damage. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

SECTION 09650 RESILIENT FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES: Vinyl Composition Tile (V.C.T.) Flooring, Vinyl Base, 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 type of resilient flooring and accessories.

B. Submit complete line of color samples for selection.

1.04 QUALITY ASSURANCE

A. Wherever possible, provide resilient flooring, adhesives, cleaners, polishes and accessories produced by a single manufacturer.

B. Secure the service of an experienced, professional floor service to provide necessary equipment and manpower to complete the Work.

1.05 PROJECT CONDITIONS: Continuously heat areas to receive flooring to 70 degrees F. for at least 48 hours prior to installation, when project conditions are such that heating is required. Maintain 70 degrees F. temperature continuously during and after installation as recommended by flooring manufacturer but not less than 48 hours. Maintain a minimum lighting level of 50 fc during installation.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Drawings and specifications are based on products manufactured by Armstrong Commercial Flooring, P.O. Box 3001, Lancaster, PA 17604, Tel. (800) 292-6308.

B. Equivalent products by the following manufacturers are acceptable:

1. American Tile, Inc., 4302 N. Camino Ferreo, Tucson, AZ 85750, Tel.: (520) 577-2969.
2. Azrock Commercial Flooring, P.O. Box 354, Florence, AL 35631, Tel. (800) 558-2240
3. Mannington Resilient Floors, P.O. Box 30, Salem, NJ 08079, Tel. (800) 241-2262

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

2.02 TILE FLOORING

A. Vinyl Composition Tile: Federal Specification SS-T 312b: Type IV, Composition 1; ASTM F 1066: Composition 1, Class 2, Standard Excelon, as manufactured by Armstrong Commercial Flooring, P.O. Box 3001, Lancaster, PA 17604, Tel. (800) 292-6308.

B. Size: 12 inches by 12 inches.

C. Thickness: 1/8- inch gage.

D. Color: Color to be selected by MDOT Architect from manufacturer's full range of standard colors.

2.03 ACCESSORIES

A. Provide rubber base complying with ASTM F-1861, Type TP, Group 1 (solid) Standard Specification for Resilient Wall Base, with matching end stops and preformed or molded corner units. Base shall be 4 inches high, 0.125-inch gage, standard top-set cove.

B. Resilient Edge Strips: 1/8-inch thick, homogenous vinyl of rubber composition, tapered or bullnose edge, color to match flooring, or as selected by MDOT Architect from standard colors available; not less than 1 inch wide.

C. Adhesives (Cements): As recommended by flooring manufacturer to suit material and substrate conditions.

D. Concrete Slab Primer: Non-staining type as recommended by flooring manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION: Installer shall examine the areas and conditions under which resilient flooring and accessories are to be installed and notify the Contractor in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.02 PREPARATION

A. Acclimate tile to job site conditions for at least 48 hours prior to installation. Prior to laying flooring, broom clean or vacuum surfaces to be covered and inspect subfloor. Start of flooring installation indicates acceptance of subfloor conditions and full responsibility for completed Work.

B. Use leveling compound as recommended by flooring manufacturer for filling small cracks and depressions in subfloors.

C. Perform moisture tests on concrete slabs to determine that concrete surfaces are sufficiently cured and ready to receive flooring. Apply concrete slab primer, if recommended by flooring manufacturer, prior to application of adhesive.

3.03 INSTALLATION

A. Install flooring after finishing operations, including painting, have been completed and permanent-heating system is operating. Moisture content of concrete slabs, building air temperature and relative humidity must be within limits recommended by flooring manufacturer.

B. Place flooring with adhesive cement in strict compliance with manufacturer's recommendations. Butt tightly to vertical surfaces, thresholds, nosings and edgings. Scribe around obstructions to produce neat joints, laid tight, even, and straight. Extend flooring into toe spaces, door reveals, and into closets and similar openings.

C. Maintain reference markers, holes, or openings that are in place or plainly marked for future cutting by repeating on finish flooring as marked on subfloor. Use chalk or other non-permanent marking device.

1. Install flooring on covers for telephone and electrical ducts, and other such items as occur within finished floor areas. Maintain overall continuity of color and pattern with pieces of flooring installed in these covers.
2. Tightly cement edges to perimeter of floor around corners and to corners. Tightly cement flooring to subbase without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections.

D. Tile Flooring: Lay tile from center marks established with principal walls, discounting minor off-sets, so that tile at opposite edges of the room are of equal width. Adjust as necessary to avoid use of cut widths less than 1/2 tile at room perimeters. Lay tile square to room axis, unless otherwise shown. Match tiles for color and pattern by using tile from cartons in the same sequence as manufactured and packaged. Cut tile neatly to and around all fixtures. Broken, cracked, chipped or deformed tiles are not acceptable.

1. Tightly cement tile to subbase without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks through tile, or other surface imperfections.
2. Lay tile with grain in all tiles running in the same direction.

E. Accessories: Apply resilient base to walls, columns, pilaster, casework and other permanent fixtures in rooms or areas where base is required. Install base in as long lengths as practicable, with preformed corner units. Tightly bond base to backing throughout the length of each piece, with continuous contact at horizontal and vertical surfaces. Place resilient edge strips tightly butted to flooring and secure with adhesive. Install edging strips at all unprotected edges of flooring, unless otherwise shown.

3.04 PATTERN: A simple color pattern shall be provided to Contractor with approved color chart and sample submittal using 3 or less colors.

3.05 CLEANING AND PROTECTION

A. Initial Cleaning: Remove excess adhesive or other surface blemishes, using neutral type cleaners as recommended by flooring manufacturer.

B. Maintenance Immediately After Installation:

1. Do not wash or scrub the floor for 5 days after installation to allow the floor tiles to bond to the underlayment / subfloor.
2. Keep heavy furniture and equipment off the floor at least 48 hours to allow the adhesive to set.

3. Sweet or vacuum thoroughly, and remove residual adhesive with a clean white cloth dampened with cleaners as recommended by flooring manufacturer.
4. Apply 3 coats of manufacturers recommended high-quality cross-linked acrylic floor polish, allowing 60 minutes drying time between applications.

C. Protection: Protect installed flooring from damage by covering with floor protection paper.

D. Finishing: After completion of project and just prior to final inspection of Work, scrub the floor using a good quality non-alkaline cleaner and a floor machine of 170-250 rpm equipped with a green or blue scrubbing pad.

1. Thoroughly rinse the floor (avoid flooding the floor) and allow the floor to dry completely.
2. Apply 3 coats of manufacturers recommended high-quality, cross-linked acrylic floor polish, allowing 60 minutes between applications.
3. After polish is completely dry, spray buff using a diluted (7 - 8 percent solids) floor polish. Before the liquid is dry, buff with a floor machine equipped with a white or tan buffing pad or a soft brush at 170-700 rpm. Buff until the liquid is dry and a thin glossy film remains.
4. Protect completed Work from traffic and damage until acceptance by the Owner.

END OF SECTION

SECTION 09900 PAINTS AND COATINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Painting and finishing of exterior and interior exposed items and surfaces, including structural metal building components, throughout the Project, except as otherwise indicated. Surface preparation, priming and finish coats specified in this Section are in addition to shop priming and surface treatment specified under other Sections of the Work.

B. The Work includes field painting of exposed bare and covered pipes and ducts (including color coding), and of hangers, exposed steel and iron work, and primed metal surfaces of equipment installed under the mechanical and electrical Work, except as otherwise indicated.

C. "Paint" means all coating systems materials, including primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate or finish coats.

D. Paint all exposed surfaces whether or not colors are designated in "schedules", except where the natural finish of the material is specifically noted as a surface not to be painted. Where items or surfaces are not specifically mentioned, paint these the same as adjacent similar materials or areas. If color or finish is not designated, the MDOT Architect will select these from standard colors available for the materials system specified.

1.02 PAINTING NOT INCLUDED: The following categories of Work are not included as parts of the field-applied finish Work, or are included in other Sections of these Specifications.

A. Shop Priming: Unless otherwise specified, shop priming of ferrous metal items is included under the various Sections for structural steel, miscellaneous metal, hollow metal work, and similar items. Also, for fabricated or factory-built mechanical and electrical equipment or accessories.

B. Pre-Finished Items: Unless otherwise indicated, do not include painting when factory-finishing or installer finishing is specified for such items as (but not limited to) plastic toilet enclosures, prefinished partition systems, acoustic materials, architectural woodwork and casework, finished mechanical and electrical equipment including light fixture, switch-gear and distribution cabinets, elevator entrance frames, door and equipment.

C. Concealed Surfaces: Unless otherwise indicated, painting is not required on surfaces such as walls or ceilings in concealed areas and generally inaccessible areas, foundations spaced, furred areas, utility tunnels, pipe spaces, duct shafts and elevator shafts.

D. Finished Metal Surfaces: Metal surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze and similar finished materials will not require finish painting, unless otherwise indicated.

E. Operating Parts and Labels: Moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sinkages, sensing devices, motor and fan shafts will not require finish painting, unless otherwise indicated. Do not paint over any code-required labels, such as Underwriter's Laboratories and Factory Mutual, or any equipment identification, performance rating, name, or nomenclature plates.

1.03 RELATED SECTIONS: Section 09050 – Color Design.

1.04 SUBMITTALS

A. Product Data: Submit manufacturer's technical information including basic materials analysis and application instructions for each coating material specified.

B. Samples: Submit color samples for selection by MDOT Architect from full range of colors.

1.05 QUALITY ASSURANCE: On actual wall surfaces and other exterior and interior building components, duplicate painted finishes as specified. On at least 100 square feet 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, STORAGE AND HANDLING

A. Deliver all materials to the job site in original, new and unopened packages and containers bearing manufacturer's name and label, and the following information:

1. Name or title of material.
2. Fed. Spec. Number, if applicable.
3. Manufacturer's stock number and date of manufacturer.
4. Manufacturer's name.
5. Contents by volume, for major pigment and vehicle constituents.
6. Thinning instructions.
7. Application instructions.
8. Color name and number.

B. Store materials under cover, protected from inclement weather and adverse temperature extremes, in original containers or unopened packages, in accordance with manufacturer’s instructions.

1.07 PROJECT CONDITIONS

A. Apply water-base paints only when the temperature of surfaces to be painted and the surrounding air temperatures are between 50 degrees F. and 90 degrees F. unless otherwise permitted by the paint manufacturer's printed instructions.

B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and the surrounding air temperatures are between 45 degrees F. and 95 degrees F. unless otherwise permitted by the paint manufacturer's printed instructions.

C. Do not apply paint in snow, rain, fog or mist; or when the relative humidity exceeds 85 percent; or to damp or wet surfaces; unless otherwise permitted by the paint manufacturer's printed instruction. Painting may be continued during inclement weather only if the areas and surfaces to be painted are enclosed and heated within the temperature limits specified by the paint manufacturer during application and drying periods.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Drawings and specifications are based on products manufactured by ICI Dulux Paints, 925 Euclid Ave., Cleveland, OH 44115. Tel. (800) 984-5444.

B. Equivalent products by the following manufacturers are acceptable:

1. Devoe - 925 Euclid Ave., Cleveland, OH 44115. Tel. (888) 265-6753.
2. Benjamin Moore & Company, 51 Chestnut Ridge Road, Montvale, NJ 07645. Tel. (800) 344-0400.
3. Porter Paints, 400 S. 13th Street, Louisville, KY 40203. Tel. (800) 332-6270.
4. PPG Architectural Finishes, Inc., One PPG Place, Pittsburgh, PA 15272. Tel. (800) 441-9695.
5. Sherwin-Williams Company, 101 Prospect Ave., NW, Cleveland, OH 44115. Tel. (800) 321-8194.
6. Anvil Paints & Coatings, Inc., 1255 Starkey Road, Largo, FL 33771 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 MDOT Architect will select color chips for surfaces to be painted. Use representative colors when preparing samples for review. Final acceptance of colors will be from samples.

B. Color Pigments: Pure, non-fading, applicable types to suit the substrates and service indicated. Lead content in the pigment, if any, is limited to contain not more than 0.5 percent lead, as lead metal based on the total non-volatile (dry-film) of the paint by weight.

C. Paint Coordination: Provide finish coats which are compatible with prime paints used. Review other sections of these Specifications in which prime paints are to be provided to ensure compatibility of total coats system for various substrates. Upon request from other trades, furnish information on characteristics of finish materials provided for use, to ensure compatible prime coats are used. Provide barrier coats over incompatible primer or remove and reprime as required. Notify the Project Engineer / MDOT Architect in writing of any anticipated problems using specified coating systems with substrates primed by others.

2.03 MATERIAL QUALITY

A. Provide the best quality grade of the various types of coatings as regularly manufactured by acceptable paint materials manufacturers. Materials not displaying the manufacturer's identification as a standard, best grade product will **not** be acceptable. Proprietary names used to designate colors or materials are not intended to imply that products of the named manufacturers are required to the exclusion of equivalent products of other manufacturers.

B. Provide undercoat paint produced by the same manufacturer as the finish coats. Use only thinners approved by the paint manufacturer, and use only within recommended limits.

2.04 PAINT SYSTEMS: Provide the following paint systems for the various substrates, as indicated.

A. Exterior Paint Systems are as follows:

1. Ferrous Metal
   1st Coat – Waterborne Acrylic Primer – ICI Devflex # 4020
   2nd Coat – Waterborne Acrylic Semi Gloss Enamel – ICI Devflex # 4206
   3rd Coat – Waterborne Acrylic Semi Gloss Enamel – ICI Devflex # 4206
   (First coat not required on items that are shop primed.)
   Not less than 2.5 mils dry film thickness.
2. Zinc Coated Metal
   1st Coat – Waterborne Acrylic Primer – ICI Devflex # 4020
   2nd Coat – Waterborne Acrylic Semi Gloss Enamel – ICI Devflex # 4206
   3rd Coat – Waterborne Acrylic Semi Gloss Enamel – ICI Devflex # 4206
   Not less than 2.5 mils dry film thickness.

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. Zinc Coated Metal
   1st Coat – Waterborne Acrylic Primer – ICI Devflex # 4020
   2nd Coat – Waterborne Acrylic Semi Gloss Enamel – ICI Devflex # 4206
   3rd Coat – Waterborne Acrylic Semi Gloss Enamel – ICI Devflex # 4206
   Not less than 2.5 mils dry film thickness.

4. Ferrous Metal
   1st Coat – Waterborne Acrylic Primer – ICI Devflex # 4020
   2nd Coat – Waterborne Acrylic Semi Gloss Enamel – ICI Devflex # 4206
   3rd Coat – Waterborne Acrylic Semi Gloss Enamel – ICI Devflex # 4206
   (First coat not required on items that are shop primed.)
   Not less than 2.5 mils dry film thickness.

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

7. Concrete Floor Stain & Sealer
   1st Coat –Siliconized Acrylic Concrete Sealer– Anvil # 1900
   2nd Coat – Siliconized Acrylic Concrete Sealer– Anvil # 1900
   Not less than 2.0 mils dry film thickness

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 with 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.

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, insulation.
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 and Tackboard.

1.02 RELATED SECTIONS: Section 09050 – Color Design.

1.03 SUBMITTALS: Submit manufacturer's technical data and installation instructions for each material and component part, including data substantiating materials comply with requirements.

A. Samples: Submit full range of color samples for each type of visual display 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 for each type of visual display board. Include 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: Unless otherwise acceptable to MDOT Architect, furnish all visual display boards by one manufacturer for entire project.

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. However, allow for trimming and fitting wherever taking of field measurements before fabrication might delay 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

A. Visual Aid Board: Equal to Claridge No. 209 Premier Lecture Cabinet Unit with satin anodized finish, LCS marker board back panel, and Fabricork vinyl finish on inside doors in colors and textures as selected by MDOT Architect from manufacturer's standards. Include fluorescent light fixture with 15 foot cord, pad of white sketching paper, map hooks, felt eraser, and assorted LCS markers. Size to be 4 feet high by 4 feet long. One unit required unless shown otherwise.

B. Tackboard: Equal to Claridge Series # 1 type "CO" factory built tackboard. Tackboard is Claridge 1/4-inch Cork on 1/4 inch Hardboard, color as selected by MDOT Architect from manufacturer's standards. Size to be 4 feet by 6 feet. One unit required unless shown otherwise.

PART 3 EXECUTION

3.01 EXAMINATION: Installer shall examine areas and conditions under which units are to be installed and notify Contractor in writing of conditions detrimental to proper and timely completion of Work. Do not proceed with Work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.02 INSTALLATION: Deliver factory-built units 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 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 units in locations and mounting heights 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 units are not shown on Drawings, install units in locations as directed by the Project Engineer with top at 7'-0" above finish floor.

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 for units are properly installed and operating units are adjusted and properly functioning.

B. Adjust length of light cord to remove slack.

C. Clean units in accordance with manufacturer's instructions, breaking in only as recommended.

END OF SECTION

SECTION 10200 LOUVERS AND VENTS

PART 1 GENERAL

1.01 SECTION INCLUDES: Extruded aluminum louvers and vents with insect/bird screens as indicated on the Drawings including indications of sizes and locations.

1.02 RELATED SECTION: Section 09050 – Color Design.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's specifications; certified test data, where applicable; and installation instructions for required products, including finishes.

B. Shop Drawings: Submit Shop Drawings for the fabrication and erection of louver units and accessories. Include plans, elevations and details of sections and connections to adjoining Work. Indicate materials, finishes, fasteners, joinery and other information to determine compliance with specified requirements.

C. Samples: Submit 6-inch square samples of each required finish. Prepare samples on metal of same gage and alloy to be used in Work. Where normal color and texture variations are to be expected, include two or more units in each sample showing limits of such variations.

1.04 QUALITY ASSURANCE

A. Performance Requirements: Where louvers are indicated to comply with specific performance requirements, provide units whose performance ratings have been determined in compliance with Air Movement and Control Association (AMCA) Standard 500.

B. SMACNA Recommendations: Comply with SMACNA "Architectural Sheet Metal Manual" recommendations for fabrication, construction details and installation procedures, except as otherwise indicated.

C. Field Measurements: Verify size, location and placement of louver units prior to fabrication, wherever possible.

D. Shop Assembly: Coordinate field measurements and Shop Drawings with fabrication and shop assembly to minimize field adjustments, splicing, mechanical joints and field assembly of units. Pre-assemble units in shop to greatest extent possible and disassemble as necessary for shipping and handling limitations. Clearly mark units for re-assembly and coordinated installation.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Equivalent products by the following manufacturers are acceptable:
   1. All-Lite Louvers, 100 Sams Creek Road, Mineral Wells, WV 26150 Tel. (304) 489-8113.
   2. Construction Specialties, Inc., 49 Meeker Ave., Cranford, NJ 07016. Tel. (908) 272-5200.

3. Ruskin Manufacturing, 3900 Doctor Greaves Rd., Kansas City, MO 64030. Tel. (816) 761-7476.

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

2.02 WALL LOUVERS

A. Double Drainable Blade Fixed Louver: 4 inch deep extruded aluminum louver equal to C/S Model A4157. Free area to be 51.4 percent minimum for 48 inches square. Pressure drop to be no more than 0.07-inch of water gage at 649 FPM in intake direction.

B. Standard Brick Vent: 4 inch deep vent equal to C/S Model M23EX with aluminum through wall duct extension. Free area to be 60.20 Sq. inches. Fabricated from extruded aluminum alloy, minimum 0.125 inch thick, with 1/4-inch structural ribs. A die-formed 7 by 7 mesh, 0.028-inch diameter, wire insect screen is to be mechanically secured on interior face of vent. Size to be 15 5/8 inches wide by 8 1/16 inches high by 4 inches deep.

2.03 MATERIALS

A. Aluminum Sheet: ASTM B 209, Alloy 3003 or 5005 with temper as required for forming, or as otherwise recommended by metal producer to provide required finish.

B. Aluminum Extrusions: ASTM B 221, Alloy 6063-T52. Blade and frame thickness shall be 0.081 inch minimum.

C. Fastenings: Use same material as items fastened, unless otherwise indicated. Fasteners for exterior applications may be hot-dip galvanized, stainless steel or aluminum. Provide types, gages, and lengths to suit unit installation conditions. Use Phillips flat-head machine screws for exposed fasteners, unless otherwise indicated.

D. Anchors and Inserts: Use non-ferrous metal or hot-dip galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. Use steel or lead expansion bolt devices for drilled-in-place anchors. Furnish inserts, as required, to be set into concrete or masonry work.

E. Bituminous Paint: SSPC-Paint 12 (cold-applied asphalt mastic).

2.04 FABRICATION, GENERAL

A. Provide louvers and accessories of design, materials, sizes, depth, arrangement, and metal thickness indicated, or if not indicated, as required for optimum performance with respect to airflow; water penetration; air leakage; strength; durability; and uniform appearance.

B. Fabricate frames including integral sills to suit adjacent construction with tolerances for installation, including application of sealant in joints between louvers and adjoining Work.

C. Include supports, anchorage, and accessories required for complete assembly.

D. Provide hidden vertical mullions of type and at spacing indicated but not further apart than recommended by manufacturer or 72 inches on center, whichever is less. At horizontal joints between louver units provide horizontal mullions except where continuous vertical assemblies are indicated.

E. Provide sill extensions and loose sills made of same material as louvers, where indicated, or required for drainage to exterior and to prevent water penetrating to interior. Setback dimension is 3-3/4 inches to 6 inches.

F. Join frame members to one another and to stationary louver blades. Maintain equal blade spacing, including separation between blades and frames at head and sill, to produce uniform appearance.

G. Finish: Kynar 500 (70% PVDF) finish to be selected by MDOT Architect from full range of standard colors.

2.05 LOUVER SCREENS

A. Provide removable screens for exterior louvers. Fabricate screen frames of same metal and finish as louver units to which secured, unless otherwise indicated. Provide frames consisting of U-shaped metal for permanently securing screen mesh.

B. Use insect screens of 18X14 aluminum mesh and additional 1/2-inch sq. mesh, 0.050-inch aluminum wire bird screen. Locate screens on inside face of louvers, unless otherwise indicated. Secure screens to louver frames with machine screws, spaced at each corner and at 12 inches on center between.

C. Use bird screen only for louvers that are connected to duct work, operable dampers or fans.

PART 3 EXECUTION

3.01 PREPARATION: Coordinate setting drawings, diagrams, templates, instructions and directions for installation of anchorage. Coordinate delivery of such items to Project Site.

3.02 INSTALLATION

A. Locate and place louver units plumb, level and in proper alignment with adjacent Work. Use concealed anchorage wherever possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weather-tight connection.

B. Form tight joints with exposed connections accurately fitted together. Provide reveals and openings for sealant and joint fillers, as indicated.

C. Repair finishes damaged by cutting, welding, soldering, and grinding operations required for fitting and jointing. Restore finishes so there is no evidence of corrective Work. Return items that cannot be refinished in field to shop, make required alterations and refinish entire unit, or provide new units, at Contractor's option.

D. Protect galvanized and non-ferrous metal surfaces from corrosion or galvanic action by application of a heavy coating of bituminous paint on surfaces that will be in contact with concrete, masonry or dissimilar metals.

E. Refer to Section 07920 for sealant in connection with installations of louvers.

END OF SECTION

SECTION 10260 WALL AND CORNER GUARDS

PART 1 GENERAL

1.01 SECTION INCLUDES: Vinyl / Acrylic surfaced mounted Corner Guards.

1.02 RELATED SECTIONS: Section 09050 – Color Design.

1.03 SUBMITTALS

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

B. Samples: Submit samples of material finishes, profiles and colors for corner guards.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Equivalent products by the following manufacturers are acceptable:

1. Arden Architectural Specialties, Inc., 151 Fifth Ave. NW, Suite J, Saint Paul, MN 55112-3268. Tel. (651) 631-1607.
2. Construction Specialties, Inc., P.O. Box 380, Muncy, PA 17156. Tel. (570) 546-5941.
3. Koroseal Wall Protection Systems, Inc. 3875 Embassy Pkwy., Fairlawn, OH 44333. Tel. (330) 668-7600.

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

2.02 CORNER GUARDS: Corner guards shall be installed full height, unless height indicated otherwise on the Drawings, at all outside corners in corridors and elsewhere as shown on the Drawings. Corner guards shall be equal to C/S Model SSM-20 series surface mounted corner guards with optional full height aluminum retainers, vinyl covers and matching top and bottom end caps. Color to be selected by MDOT Architect from full range of standard colors. Refer to Section 09050 for color(s).

PART 3 EXECUTION

3.01 INSTALLATION: Install units plumb and level, in locations as shown or described. Securely attach to supporting structure, in accordance with manufacturer's installation instructions.

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 10400 IDENTIFICATION DEVICES

PART 1 GENERAL

1.01 SECTION INCLUDES: Signage for room identification system, informational and directional signage, and exterior individual building signage and free standing, ground mounted sign.

1.02 RELATED SECTIONS: Section 09050 – Color Design.

1.03 SUBMITTALS: Submit manufacturer's technical data and installation instructions for each type of sign required.

A. Samples: Submit samples of each color and finish of exposed materials and accessories required for specialty signs. MDOT Architect's review of samples will be for color and texture only. When requested, furnish full-size samples of specialty sign materials.

B. Shop Drawings: Submit Shop Drawings for fabrication and erection of specialty signs. Include plans, elevations, and large-scale details of sign wording and lettering layout. Show anchorage and accessory items. Furnish location template drawings for items supported or anchored to permanent construction.

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 ASI Sign Systems, Inc., 3890 W. NW Hwy, Suite 102, Dallas, TX 75220. Tel. (800) 274-7732. Local Distributor is ASI/Mississippi. Tel. (601) 981-9540.

B. Equivalent products by the following manufacturers are acceptable:

1. Matthews International Corp., 1315 W. Liberty Ave., Pittsburgh, PA 15226. Tel. (800) 628-8439.
2. Metal Arts, P.O. Box 639, Mandan, ND 58554. Tel. (701) 663-6535.
3. Mohawk Sign Systems, Inc., P.O. Box 966, Schenectady, NY 12301. Tel. (518) 370-3433.
4. Scott Sign Systems, Inc., 7524 Commerce Pl., Sarasota, FL 34243. Tel. (800) 237-9447.

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

2.02 SIGN SYSTEM

A. Exterior signage: Wall mounted LC Series, Helvetica and Helvetica Medium styles, size as shown on Drawings.

B. Interior signage: Wall or desktop mounted WS Series with rounded corners. Design so that paper insert can be installed from each end.

2.03 COMPONENTS – EXTERIOR SIGNAGE

A. Material: Cast aluminum, projected mount with sleeve and stud.

B. Finish: Baked enamel in manufacturer's standard color.

2.04 COMPONENTS – INTERIOR SIGNAGE

A. Window Inserts: Laser printed paper insert with MDOT watermark. Text to be furnished by Owner.

B. Sign Face: Clear Acrylic, 0.080-inch thick, matte first surface.

C. Adhesive: Pressure sensitive, adhesive film on second surface.

D. Insert Guide Rails: 0.040-inch thick vinyl tape.

E. Tactile Laminate: Polyamid Resin.

F. Laminating Base: Acrylic, 0.080-inch thick.

G. Fasteners: 0.030- inch thick, double-face tape.

H. Stand: Clear Acrylic, 0.080-inch thick.

I. Sizes as follows:

1. Type 1: 10 inches wide by 3 inches high.
2. Type 2: 6 inches wide by 9 inches high.
3. Type 3: 9 inches wide by 8 inches high.
4. Type 4: 10 inches wide by 3 inches high.

2.05 BRAILLE AND TACTILE COPY: Comply with requirements of the Americans with Disabilities Act. Tactile copy to be raised 1/32-inch minimum from sign first surface by manufacturer's photomechanical stratification processes. Translation of copy into Braille shall be the responsibility of the manufacturer.

2.06 FINISHES – INTERIOR SIGNAGE

A. Colors: Selected from manufacturer's standard.

B. Surface Texture: Matte.

2.07 FONT: Shall be Helvetica Medium, unless noted otherwise.

PART 3 EXECUTION

3.01 EXAMINATION: Installer shall examine the substrates and conditions under which the specialty signs are to be installed and notify the Contractor in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.02 INSTALLATION

A. Install sign units and components at the locations shown or scheduled, securely mounted with concealed theft-resistant fasteners, unless otherwise indicated. Attach signs to substrates in accordance with the manufacturer's instructions, unless otherwise shown.

B. Install level, plumb, and at the proper height. Cooperate with other trades for installation of sign units to finish surfaces. Repair or replace damaged units as directed by the Project Engineer.

C. Position sign on wall surface 2 inches from strike side of doorframe and 60 inches high to center of sign from finish floor, typical unless indicated otherwise.

3.03 SCHEDULES

A. Sign Type 1: Offices, single occupant
Crew Room / Break
Storage
Mechanical

B. Sign Type 2: Toilets

C. Sign Type 3: Entrance to Shop from Office Building

D. Sign Type 4: Office (Desktop at Secretary / Receptionists)

END OF SECTION

SECTION 10500 LOCKERS

PART 1 GENERAL

1.01 SECTION INCLUDES: Locker units with hinged doors, metal bases, tops, filler panels, closed bases, finished end panels, accessories and hardware.

1.02 REFERENCES

A. ANSI/ASTM A446 – Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality.

B. ANSI/ASTM A526 – Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Commercial Quality.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's installation instructions and product data on locker types, sizes and accessories.

B. Shop Drawings: Submit shop drawings indicating locker plan layout, numbering plan, key codes, sizes and configurations.

C. Color Selection: Provide samples of materials, texture, color and finishes available for MDOT Architect's selection.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Drawings and specifications are based on products manufactured by Penco Products, Inc., 99 Brower Ave, Oaks, PA 19456. Tel. (800) 562-1000.

B. Equivalent products by the following manufacturers are acceptable:

1. Art Metal Products, 401 NW 12th Ave., Deerfield, FL 33442. Tel. (800) 252-5633.
2. Lyon Metal Products, P.O. Box 671, Aurora, IL 60507-0671. Tel. (800) 323-0082.
3. Republic Storage System Co, Inc., 1038 Belden Ave. NE, Canton, OH 44705. Tel. (800) 477-1255.

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

2.02 SELECTED UNIT: Vanguard Model 6235V Double Tier Locker with standard louvered doors. Size: 72" overall height x 12" width x 18" depth. Provide closed bases and finished end panels. Six units are required, unless indicated otherwise on the Drawings.

2.03 MATERIALS: All parts shall be made from prime grade mild cold rolled sheet steel free from surface imperfection, and capable of taking a high grade enamel finish.

2.04 ACCESSORIES: Each locker tier shall have chrome plated zinc alloy die-cast case and door handle, door latch channel assembly, polished aluminum number plate (2-1/4 inches wide x 1 inch high with 3/8 inch high black etched numerals), three single-prong wall hooks and one double-prong ceiling hook.

2.05 FINISHES

A. Chemically pretreat metal with a six stage cleaning phosphatizing and metal preparation process. Finish coat shall be hot airless electrostatically applied baked on enamel.

B. Paint locker bodies and doors in contrasting colors as selected by the MDOT Architect from manufacturer's standard range of 17 colors.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install metal lockers at location show on Drawings in accordance with manufacturer's instructions for plumb, level, and flush installation.

B. Secure lockers with anchor devices to suit substrate materials. Minimum pullout force: 100 lbs. Bolt adjoining lockers units together to provide rigid installation.

C. Install bases, end panels, filler panels and accessories

3.02 ADJUSTING: Adjust doors and latches to operate without binding. Verify that latches are operating satisfactorily.

3.03 TOUCH UP: Touch up all marred finished with factory supplied paint. Color shall match finished product.

3.04 CLEANING: Clean locker interiors and exterior surfaces.

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. Local Supplier is Hubbard-Lawson Building Specialties, Inc. Tel. (601) 366-7358.

B. Equivalent products by the following manufacturers are acceptable:

1. Amerex Corp., P.O. Box 81, Trussville, AL 35173. Tel. (205) 655-3271.
2. Larsen's Mfg. Co., 7421 Commerce Lane NE, Minneapolis, MN 55432. Tel. (612) 571-1181.
3. Potter-Roemer, 3100 S. Susan St. Santa Ana, CA 92704. Tel. (800) 366-3473.

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

2.02 FIRE EXTINGUISHERS

A. Provide fire extinguishers for each location indicated, in colors and finishes that comply with requirements of governing authorities.

B. Multi-Purpose Dry Chemical for 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 six units is required if not indicated otherwise. Units with cabinets shall be required in Crew Room and another location in Office Building Corridor. Extinguishers without cabinets shall include 3 in Shop and 1 in Shop Storage Room. If not indicated on Drawings, spacing to 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 10535 CANOPIES

PART 1 GENERAL

1.01 SECTION INCLUDES: Extruded aluminum wall-supported canopies as shown on the Drawings and specified herein.

1.02 RELATED SECTIONS

A. Section 07920 – Joint Sealants.

B. Section 09050 – Color Design.

C. Section 13122 – Metal Building System

1.03 SUBMITTALS

A. Shop Drawings: Showing fabrication and installation of canopies including plans, elevations and details of components and attachments to other units of work. Indicate materials, profiles of each metalwork member and fitting, joinery, finishes, fasteners, anchorage and accessory items.

B. Where installed products are indicated to comply with certain design loading, include structural computations, material properties, and other information needed for structural analysis which has been prepared by, or under the supervision of, a qualified professional engineer registered in the State of Mississippi.

C. Samples for initial selection purposes in form of manufacturer's color charts consisting of actual units or sections of units showing full range of colors and other finish characteristics available for each item indicated below:

1. Include 6-inch long samples of linear shapes.
2. Include 6-inch square samples of plates.
3. Include full-size samples of castings and forgings.

1.04 DELIVERY, STORAGE AND HANDLING: Store materials in clean, dry location, away from polyethylene sheeting in a manner that permits air circulation within covering. Handle metalwork on site to a minimum; exercise care to avoid damaging metal finishes.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Drawings and specifications are based on products manufactured by Mapes Industries, Inc., 2929 Cornhuskers Hwy, Lincoln, NE 68504. Tel. (800) 228-2391.

B. Equivalent products by the following manufacturers are acceptable:

1. E.L. Burns Co., Inc., P.O. Box 19160, Shreveport, LA 71149. Tel. (318) 636-2722.
2. Dittmer Arch. Alum., 1006 Shepard Rd., Winter Springs, FL 32708. Tel (800) 822-1755.

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

2.02 MATERIALS

A. All canopy sections shall consist of 3003-H14 or 5005-H14 roll-formed aluminum, combined with 6063-T6 extruded aluminum intermediate supports. Fasteners shall be stainless steel or cadmium plated as provided by the manufacturer.

B. Roof deck shall be roll-formed interlocking self-flashing .032 inch thick aluminum of “W” profile. Deck sections shall be designed to the proper length to withstand the design load as determined by the local code. Deck width shall be 12 inches on center and 2-1/2 inches deep.

C. Hanger rods shall be galvanized steel pipe with cast and cadmium-plated clevis and reducers at ends for attachment to the wall eyebolts and canopy decking.

D. Water drainage shall be accomplished as a spill out on the front corners.

2.03 MANUFACTURED UNITS: Lumishade all weather aluminum hangar rod canopy with roll-formed interlocking deck members and style “J”, 1/8 inch thick by 8 inches high heavy extruded aluminum, fascia.

2.04 FINISHES: Standard powder coated finish. Color to be selected by the MDOT Architect from manufacturer’s complete selection of standard colors.

PART 3 EXECUTION

3.01 FIELD MEASUREMENTS: Take field measurements prior to preparation of shop drawings and fabrication, where possible, to ensure proper fitting of metalwork. Do not delay job progress; allow for adjustments and fitting where taking of field measurements before fabrication might delay work.

3.02 ERECTION: Shall be performed by the manufacturer or his approved installer.

3.03 INSTALLATION: Installation shall be in accordance with manufacturer’s instructions.

3.04 CARE: Extreme care shall be taken to prevent damage or scratching. All workmanship must be of the very best with neat miters and fitted joints.

3.05 REPAIR AND PROTECTION: Protect exiting materials from damage during the installation process. When installation is complete, repair or replace any items damaged. Replacement items are to match the original.

3.06 CLEAN-UP: After work is complete, remove all waste materials and dispose of it off the owner's property.

END OF SECTION

SECTION 10670 STORAGE SHELVING

PART 1 GENERAL

1.01 SECTION INCLUDES: Work Benches, Work Tables and Metal Shelving as show on the Drawings.

1.02 RELATED SECTIONS: Section 09050 – Color Design.

1.03 SUBMITTALS: Submit manufacturer's technical data and installation instructions for each material and component part, including data substantiating that materials comply with requirements.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Drawings and specifications are based on products manufactured by Penco Products Inc., P.O. Box 378, Oaks, PA 19456. Tel. (610) 666-0500.

B. Equivalent products by the following manufacturers are acceptable:

1. Lyon Metal Products, P.O. Box 671, Aurora, IL 60507-0671. Tel. (603) 892-8941.
2. Stanley Storage Systems, P.O. Box 1151, Allentown, PA 18105-1151. Tel. (800) 523-9462.

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

2.02 STORAGE SHELVING, MODULAR WORK BENCHES AND OPEN WORK BENCHES

A. Open Clipper Heavy Duty Steel Shelving Unit: Model No. 1H7026, 36 inches wide, 18 inches deep, and 87 inches high with 6 shelves.

B. Modular Work Bench: Model No. 32038, Tuff Top™ (Resin Board) top bench, 72 inches wide, 28 inches deep, and 34 inches high with 2 cabinet pedestals and 2 bases. Cabinet pedestals, 15-3/4 inches wide, 20 inches deep and 27 inches high with one adjustable shelf and locking handle with 2 keys.

C. Open Work Bench: Model No. 34532, Tuff Top™ (Resin Board) top fixed bench, 72 inches wide, 28 inches deep, and 34 inches high.

D. Color: Color to be selected from standard color chart by MDOT Architect.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install units plumb and level, in locations and with mountings as shown.

B. Securely attach all components together in accordance with manufacturer's installation instructions.

C. Securely attach units to adjacent units and to wall as required to not move or fall.

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

END OF SECTION

SECTION 10810 TOILET ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES: The extent of each type of toilet accessory is shown on the Drawings and Schedules, unless otherwise indicated. The type of toilet accessories required include the following:

1. Mirrors
2. Toilet Paper Dispenser
3. Grab Bars
4. Soap Dispensers
5. Paper Towel Dispenser
6. Clothes Hook
7. Mop Holder

1.02 SUBMITTALS: Submit manufacturers product and technical data indicating compliance with these specifications and Shop Drawings for the fabrication and installation of all toilet accessories. Show all anchorage and other necessary items including mounting heights.

1.03 QUALITY ASSURANCE: Provide products of the same manufacturer for each type of accessory unit and for units exposed in the same areas, unless otherwise acceptable to the MDOT Architect. Stamped names or labels on exposed faces of units will not be permitted, except where otherwise indicated.

1.04 DELIVERY, STORAGE AND HANDLING: Upon receipt of toilet accessories and other materials, installer shall examine the shipment for damage and completeness. Materials shall be stored in a clean, dry place. Stack all materials to prevent damage.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Drawings and specifications are based on products manufactured by Bradley Washroom Accessories Division, P.O. Box 309, Menomonee Falls, WI 53051. Tel. (414) 354-0100. Local Supplier is Hubbard-Lawson Building Specialties, Inc. Tel. (601) 366-7358.

B. Equivalent products by the following manufacturers are acceptable:

1. A & J Washroom Accessories, 319 Temple Hill Road, New Windsor, NY 12553.
2. American Specialties, Inc., 441 Saw Mill River Road, Yonkers, NY 10701.
3. Bobrick Washroom Equipment, Inc., 225 Bobrick Drive, Jackson, TN 38301.

C. 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 multi-roll toilet tissue dispenser equal to Bradley model 5402. Locate at each toilet mounted in locations shown.

C. Grab Bars: Provide 1-1/2 inches diameter horizontal 2 wall stainless steel grab bars with safety-grip non-slip finish and concealed mounting equal to Bradley model 8122-059, 36 inches by 52 inches standard dimensions. Locate at toilets where indicated at heights shown. Contractor has option to use one 36-inch grab bar and one 42-inch grab bar, but installation must meet all ADA requirements.

D. Soap Dispensers: Provide surface mounted liquid type stainless steel soap dispenser units equal to Bradley model 6542. Locate at each lavatory at heights shown.

E. Paper Towel Dispenser: Provide surface mounted stainless steel paper towel dispensers equal to Bradley model 250-15. Locate at each area with lavatory/sink where shown and at height shown.

F. Clothes Hook: Provide surface mounted stainless steel hook equal to Bradley model 9135 at each Toilet Room, unless coat hooks are provided with toilet partition doors.

G. Mop Holder: Provide surfaced mounted stainless steel mop and broom holder equal to Bradley model 9933. One piece construction with welded gusset and hooks. Holder consist of spring activated rubber cams on plated steel retainers. Unit measures 14 inches high by 34 inches long, with 4 hooks and 3 holders. Shelf projects 8 inches. Locate at each service sink where shown and at height shown or if not shown then per the Project Engineer's instructions.

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 10900 WARDROBE AND CLOSET SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES: Wall mounted tubular steel coat racks.

1.02 RELATED SECTIONS: Section 06100 – Rough Carpentry.

1.03 SUBMITTALS : Submit manufacturer's product data and installation instructions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Drawings and specifications are based on products manufactured by Raymond Engineering, Inc., 704 Vandalia Street, St. Paul, MN 55114. Tel. (800) 365-5770. Local Supplier is Hubbard-Lawson Building Specialties, Inc. Tel. (601) 366-7358.

B. Equivalent products by the following manufacturers are acceptable:

1. A.J. Binns Ltd., 76 Ethan Allen Dr., South Burlington, VT 05403. Tel: (802) 655-7502.
2. Magnuson Group Inc., 1400 Internationale Pky., Woodridge, IL 60517. Tel: (800) 342-5725.

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

2.02 COAT RACK: Equal to Rigid – Rak Model 315.

2.03 MATERIALS

A. Brackets (3 req'd per rack) are 1-1/8 inch sq. tubing with mitered angle and hidden weld.

B. Shelf tubes (3 required per rack) are 3 /4 inch round steel tube.

C. Accessories: Model 913 hooks (12 required per rack) mounted on alternate tubes.

D. Finish: Bright commercial nickel chrome.

E. Size: 5 feet long by 12 -1/4 inches deep.

PART 3 EXECUTION

3.01 INSTALLATION: Install unit(s) plumb and level, at location(s) shown on Drawings or if not shown, as directed by the Project Engineer. A minimum of one unit is required. Securely attach to supporting structure, in accordance with manufacturer's installation instructions.

3.02 CLEANING AND PROTECTION: At completion of installation, clean surfaces in accordance with manufacturer's instructions. Protect units from damage.

END OF SECTION

SECTION 11455 RESIDENTIAL APPLIANCES AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES: Residential appliances as shown on the Drawings and as specified herein.

1.02 SUBMITTALS: Submit manufacturer's brochures, technical data, installation, maintenance and operating instructions for each item and component part specified, including data substantiating that materials comply with requirements.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Equivalent products by the following manufacturers are acceptable:

1. GE Appliances, 9500 Williamsburg Office Plaza, Louisville, KY 40222. Tel. (800) 626-2000.
2. Magic Chef Co., 740 King Edward Avenue, Cleveland, TN 37311. Tel. (423) 472-3371.
3. Manitowoc Ice, Inc., 21105 26TH Street, Manitowoc, WI 54220. Tel. (800) 545-5720.
4. Scotsman Ice System, 775 Corporate Woods Parkway, Vernon Hills, IL 60061. Tel. (847) 215-4500.
5. Sears Contract Sales, 3333 Beverly Road, Hoffman Estates, IL 60179. Tel. (847) 286-2994.

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

2.02 ELECTRIC RANGE: 30 inch slide-in electric range equal to GE Model JSS16PDWH with Backguard JSX31, White.

2.03 REFRIGERATOR: 17.9 cu. ft. capacity equal to GE Model GTS18JCPWW with automatic icemaker, frost free freezer and reversible door, White.

2.04 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.

2.05 ICE MACHINE: Equal to Model CME256WS by Scotsman. Power supply shall be 115/60/1. Ice Storage Bin Model HTB350 – 270 lbs. ARI Bin storage capacity.

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 all plumbing and electrical hook-ups 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: Metal-rails, tapered vinyl-frame, surfaced mounted, removable, carpeted floor mats for Building Entrances.

1.02 RELATED SECTIONS: Section 09050 – Color Design.

1.03 SUBMITTALS

A. Product Data: Submit manufacturers' product and technical data indicating compliance with these specifications and recommended maintenance practices.

B. Shop Drawings: Submit materials description, component dimensions and details. Show plan view that clearly indicates traffic direction and size of mat.

C. Colors: Submit samples of manufacturer's full range of available colors (minimum 20 for carpet) and finishes for materials exposed to view.

1.04 QUALITY ASSURANCE

A. Single Source: All floor mats required by this Section shall be products of only one manufacturer.

B. Manufacturer : Company regularly engaged in producing types of floor mats required by this Section and with minimum 10 years documented satisfactory experience

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Drawings and specifications are based on products manufactured by Construction Specialties, Inc. P.O. Box 380, Muncy, PA 17756. Tel. (888) 834-4455.

B. Other acceptable manufacturers offering equivalent products:

1. Arden Architectural Specialties, Inc., 151 Fifth Ave. NW, Suite J, Saint Paul, MN 55112-3268. Tel. (651) 631-1607.
2. J.L. Industries, Inc., 4450 W. 78th Street Circle, Bloomington, MN 55435. Tel. (612) 835-6850.
3. R. C. Musson Rubber Co., P.O. Box 7038, Akron, OH 44306. Tel. (330) 773-7651.

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

2.02 FLOOR MATS: C/S "Pedimat" Surface-Mounted Floor Mat, Model M1-D-CP-SM.

A. Size: 6 feet wide by 4 feet deep (traffic direction) at double doors; 4 feet wide by 4 feet deep (traffic direction) at single doors.

B. Carpet Color: As selected by MDOT Architect from full range of standard colors.

C. Rails: Extruded aluminum 6063-T52 as selected by MDOT Architect from full range of standard colors

D. Carpet tread: Colorfast, solution dyed 100% nylon tread, in color selected by MDOT Architect, fusion bonded to rigid two-ply backing. Carpet fiber shall contain an antimicrobial additive and “Scotchgard” soil reducing treatment.

E. Frame: Tapered vinyl with mitered corners and color to match rails.

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 12495 WINDOW BLINDS

PART 1 GENERAL

1.01 SECTION INCLUDES: Horizontal blinds at exterior windows.

1.02 RELATED SECTIONS: Section 09050 – Color Design.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's specifications and installation instructions for each type of blind unit required. Include methods of installation for each type of opening and supporting structure. Transmit copy of instructions and recommendations to the installer.

B. Samples: Submit samples of each exposed metal finish, cords, tapes and tassels required. Architect's review of samples will be for design, color, and finish only. Compliance with all other requirements is the exclusive responsibility of the Contractor.

1.04 QUALITY ASSURANCE: Provide each blind as a complete unit produced by one manufacturer, including hardware, accessory items, mounting brackets, and fastenings. Unless otherwise acceptable to the MDOT Architect, furnish all blind units by one manufacturer for the entire project.

PART 2 PRODUCTS

2.01 MANUFACTURER

A. Drawings and specifications are based on products manufactured by Hunter Douglas, Inc., 2 Park Way, Upper Saddle River, NJ 07458. Tel. (800) 727–8953.

B. Other Acceptable manufacturers offering equivalent products:

1. Levolor Home Fashions Contract Division, 4110 Premier Dr., High Point, NC 27265. Tel. (336) 812-8181.
2. Springs Window Fashions Division, Inc., P.O. Box 500, Montgomery, PA 17752. Tel. (570) 547-6671.

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

2.02 PRODUCTS: Hunter Douglas Commercial Lightlines Aluminum Blinds 1” de-Light Model DL88. Color to be selected by the MDOT Architect from manufacturers full line of standard colors.

2.03 MATERIALS AND COMPONENTS

A. Manufacturer's standard head rail, channel-shaped section fabricated from minimum 0.040 inch thick aluminum. Increase metal thickness as recommended by the manufacturer for large blind units. Cross-brace for extra rigidity. Furnish complete with tilting mechanism, top and end brace, top cradle, cord lock, and accessory items required for the type of blind and installation indicated.

B. Bottom Rail: Manufacturer's standard tubular steel bottom rail designed to withstand twisting or sagging. Contour top surface to match slat curvature, with flat or slightly curved bottom. Close ends with manufacturer's standard metal or plastic end caps of the same color as rail. Finish rails the same color as slats, unless otherwise indicated.

C. Slats: Manufacturer's standard, spring tempered aluminum slats not less than 0.008 inches thick. Provide l inch narrow slats, with other components sized to suit.

D. Braided Ladders: Manufacturer's standard polyester support cords with integrally braided ladder rungs. Provide cord size and rung spacing as required for each type of blind shown.

E. Tilter: Manufacturer's standard enclosed, lubricated, tilting mechanism which will tilt and securely hold the tilting rod, slats and bottom rail at any set angle. Furnish wand (or rod) type tilter consisting of standard tilter mechanism adopted for rotating wand operation. Furnish manufacturer's standard plastic or aluminum rod of proper length to suit blind installation.

F. Cords: Manufacturer's standard braided polyester cord, sized to suit blind type, equipped with soft-molded plastic rubber or composition tassels securely attached to each cord end.

1. Cord Locks: Provide manufacturer's standard cord locks for each type of blind.
2. Cord Equalizers: Nylon, self-aligning type, designed to maintain horizontal blind position.

G. Hardware: Furnish manufacturer's standard brackets, supports and internal reinforcement as required to suit blind type and size. Finish exposed hardware and accessories to match rail color.

H. Finish: Prime aluminum slats with chromate conversion coating, followed by manufacturer's standard glass-smooth, baked-on synthetic resin enamel finish.

2.04 FABRICATION AND OPERATION: Prior to fabrication, verify actual opening dimensions by accurate site measurements. Adjust blind dimensions for proper fit in all openings. Fabricate components of blinds from non-corrosive, non-staining, non-fading materials which are completely compatible with each other, and which do not require lubrication during normal expected life.

A. Fabricate blind units to completely fill the openings as indicated, from head to sill and jamb to jamb. Space supporting tapes or cords in accordance with manufacturer's standards, unless otherwise indicated. Space louver blades (slats) to provide overlap for light exclusion when in the fully closed position.

B. Equip blind units, unless otherwise indicated, for the following operation:

1. Full-tilting operation with slats rotating approximately l80 degrees. Place tilt operation controls on left-hand side of blind units.
2. Full-height raising, to manufacturer's minimum stacking dimension with lifting cord locks for stopping blinds at any point of ascending or descending travel. Place pull cords on right-hand side of blind units.

PART 3 EXECUTION

3.01 INSPECTION: Installer must examine the substrates and conditions under which the horizontal venetian blinds 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: Install horizontal venetian blinds at each window and in accordance with the manufacturer's instructions unless noted otherwise. Provide intermediate supports at intervals to permit easy entrance and removal of head, and to ensure level head and slat position.

END OF SECTION

SECTION 13122 METAL BUILDING SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Building Type: The building is a single-story, single-span, rigid-frame-type pre-engineered metal building of the nominal length, width eave height, and roof pitch indicated.

B. Exterior Walls: Field assembled, un-insulated panels attached to framing.

C. Roof system: Standing-seam roof with thermal insulation blankets, concealed clips and factory-applied sealant.

D. Components and Accessories: Manufacturer's standard building components and accessories may be used, provided components, accessories, and complete structure conform to design indicated and specified requirements.

1.02 RELATED SECTIONS: Plywood wainscot is specified in Section 06100. Personnel doors and frames and finish hardware are specified in Sections 08100 and 08710. Overhead service doors, including operators, are specified in Sections 08335 and 08365. Colors are specified in Section 09050 – Color Design. Painting for ferrous metal exposed to view is specified in Section 09900 – Paints and Coatings. Canopies are specified in Section 10535

1.03 STRUCTURAL FRAMING AND ROOF AND SIDING PANELS: Design anchor bolts, structural members, and exterior covering for applicable loads and combinations of loads in accordance with the MBMA's "Design Practices Manual."

A. Structural Steel: Comply with AISC's "Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings" for design requirements and allowable stresses.

B. Light Gage Steel: Comply with AISI's "Specification for the Design of Cold-Formed Steel Structural Members" and "Design of Light Gage Steel Diaphragms" for design requirements and allowable stresses.

C. Welded Connections: Comply with AWS's "Standard Code for Arc and Gas Welding in Building Construction" for welding procedures.

D. Metal Roofing: Comply with SMACNA Architectural Sheet Metal Manual.

1.04 SUBMITTALS

A. Product Data: Submit manufacturer's sample warranty and product information for building components, accessories and color chart.

B. Shop Drawings: Submit Shop Drawings for anchor bolts, structural framing system, roofing and siding panels, and components and accessories not fully detailed or dimensioned in manufacturer's product data.
   1. Structural Framing: Furnish erection drawings. Include fabrication and assembly details. Show anchor bolts' settings and sidewall, end-wall, and roof framing.
   2. Siding Panels: Provide panel layouts and details of edge conditions, joints, corners, custom profiles, supports, anchorage, trim, flashing, closures, and special details.

3. Sheet Metal Accessories and Roofing: 1/4-inch-scale layouts and 1-1/2-inch-scale details of accessories; show profiles, methods of joining to system components and dissimilar building materials, flashing of each condition for roof penetrations, and anchorage.

C. Certification prepared, signed, and sealed by a Professional Engineer registered in the State of Mississippi, verifying that anchor bolts, structural framing and covering panels meet loading requirements and codes, including design calculations.

D. Installer certificates signed by Contractor certifying that welders comply with requirements specified under "Quality Assurance" article.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced Installer, with 5 years minimum experience, who specializes in erection of building similar to that required and is certified by the building manufacturer as qualified for erection of the manufacturer's products.

B. Manufacturer's Qualifications: Provide buildings manufactured by a firm with 10 years experience in manufacturing buildings similar to those indicated. The manufacturer shall be AISC Certified (Class MB).

C. Welders' Qualifications: Qualify welding processes and welding operations in accordance with the AWS D1.1 "Structural Welding Code".
1. Certify that each welder employed in unit of work of this section has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone re-certification.
2. Testing for re-certification is Contractor's responsibility.

1.06 WARRANTIES

A. Paint Finish: Paint finish shall have a 20-year guarantee against cracking, peeling and fade (Not to exceed 5 NBS vertical / 6 NBS non-vertical units per ASTM D2244-93).

B. Weather Tightness: The entire installation (sub-framing, clips, panels, fasteners, rakes, eaves, ridge/valley flashing conditions, roof to wall conditions as well as all materials specified as supplied by the manufacturer) shall be guaranteed weather tight for a minimum of 20 years. This warranty shall be identified as neither Non-Depreciating, Non-prorated nor have exclusions that identify, valleys, curbs, and flashings. Provide written warranty, signed by the manufacturer and his authorized installer / dealer, agreeing to replace / repair defective materials and workmanship with no cost to the Owner during the warranty period.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Drawings and Specifications are based on products manufactured by Ceco Building Division, P. O. Box 6500, Columbus, MS 39703, Tel.: (662) 328-6722.

B. Equivalent products by the following manufacturers are acceptable:
1. Butler Mfg. Co., Inc., BMA Tower, 31st & Southwest Trafficway, Kansas City, MO 64108. Tel. (816) 968-3000.
2. Gulf States, P.O. Box 1128, Starkville, MS 39760. Tel. (800) 844-4853.
3. Nucor, 600 Apache Trail, Terrell, TX 75160. Tel. (972) 524-5407.
4. Ruffin, 6914 Hwy. 2, Oak Grove, LA 71263. Tel. (800) 421-4232.
5. VP Buildings, 3200 Players Club Cir., Memphis, TN 38125. Tel. (800) 238-3246.

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

2.02 METAL MATERIALS

A. Hot-Rolled Structural Steel Shapes: ASTM A 36 or A 529.

B. Steel Members Fabricated from Plate or Bar Stock: ASTM A 529, A 570, or A 572. Provide 42,000 psi minimum yield strength.

C. Steel Members Fabricated by Cold Forming: ASTM A 607, Grade 50.

D. Cold-Rolled Carbon Steel Sheet: ASTM A 366 or ASTM A 568.

E. Hot-Rolled Carbon Steel Sheet: ASTM A 568 or ASTM A 569.

F. Structural Quality Zinc-Coated (Galvanized) Steel Sheet: ASTM A 446 with G90 coating complying with ASTM A 525.

G. Aluminum-Zinc Alloy Coated (Galvalume) Steel Sheet: ASTM A792.

H. Aluminum Sheets: ASTM B 209 for Alclad alloy 3003 or 3004 temper required to suit forming operations.

I. Bolts for Structural Framing: ASTM A 307 or ASTM A 325 as necessary for design loads and connection details.

J. Mastic: Non-staining saturated vinyl polymer as recommended by panel manufacturer for sealing laps.

2.03 THERMAL INSULATION

A. Glass-fiber blanket. Comply with ASTM C 991, 0.5 lb. per cubic foot density, 3 inches thickness, R10, with UL flame spread classification of 25 or less, and 2-inch wide continuous vapor tight edge tabs.

B. Vapor Barrier: Facing shall be equal to Lamtec Corporation model WMP-50. Facing shall be composed of .0015” white polypropylene film, 4 X 5 tri-directional scrim reinforcing layer, and .0005” metallized polyester film backing layer. The facing shall have a water vapor transmission rate of .02 US perm (ASTM E96, Procedure A), a beach puncture of 125 scale units and a mullen burst of 100 psi. Tensile strength shall be 55# in the machine direction and 50# in the cross-machine direction.

C. Retainer Strips: 26 gage (0.0179-inch) formed galvanized steel retainer clips colored to match insulation facing.

2.04 PAINT MATERIALS: Comply with performance requirements of federal specifications indicated.

A. Shop Primer for Ferrous Metal: Fast-curing, lead-free, universal primer. Comply with Federal Specification TT-P-645.

B. Shop Primer for Galvanized Metal Surfaces: Zinc dust- zinc oxide primer. Comply with Federal Specification TT-P-641.

C. Unpainted Galvalume: Unpainted Galvalume shall conform to ASTM A792-89 with a coating class of AZ- 55, chemically treated and lightly oiled. All 24 gage unpainted Galvalume used for roof applications shall be grade 80, except when used for trim it shall be grade 50B. All unpainted Galvalume 24 gage and thicker shall be grade 50B.

D. Painted Galvalume: Galvalume used as a substrate for factory applied baked on paint shall conform to ASTM A792-89 with a coating class of AZ-50 or heavier, minimum spangle, chemically treated and lightly oiled, as specified by the coater. All painted Galvalume shall be grade 50B.
   1. The paint system shall be applied as follows: Topcoat shall consist of a primer 0.20 - 0.25 mil thick and a top coat 0.70 - 0.80 mil thick, for total film thickness of 1.0 mil. The reverse coat shall consist of a primer 0.20 - 0.25 mil thick and a wash coat backer 0.30 - 0.40 mil thick, for a total film thickness of 0.50 - 0.65 mil.
   2. Finish system shall conform to all tests for adhesion, flexibility, and longevity as specified by the finish supplier.
   3. Wall panels to be painted with Kynar 500 (70% PVDF) fluorocarbon coating.

2.05 STRUCTURAL FRAMING

A. Rigid Frames: Factory welded, shop painted, built-up "I-beam" shape or open-web type consisting of tapered or parallel flange beams and straight columns with attachment plates, bearing plates, and splice members. Factory drilled for field-bolted assembly. Provide length of span and spacing indicated.

B. Primary End-wall Framing: Provide the following frame members fabricated for field-bolted assembly.
   1. End-wall Columns: Shop-painted, built-up factory-welded "I"-shape or cold-formed "C" sections, fabricated from 14 gage (0.0747-inch) steel.
   2. End-wall Beams: Shop-painted "C"-shape roll-formed sections fabricated from 14 gage (0.0747-inch) steel.

C. Secondary Framing: Provide the following:
   1. Roof Purlins, Sidewall and Endwall Girts: 16 gage (0.598-inch) shop-painted roll-formed steel "C" or "Z" sections. Fabricate purlin spacers from 14 gage cold-formed galvanized steel sections. Purlins to be 8 inches deep minimum. Girts to be 10 inches deep.
   2. Eave Struts: Unequal flange 16-gage (0.0598-inch) shop-painted roll-formed steel "C" sections formed to provide adequate backup for both wall and roof panels.
   3. Flange and Sag Bracing: 1-5/8 inch by 1-5/8 inch angles fabricated from 16 gage (0.0598-inch) shop-painted roll- formed steel.
   4. Base or Sill Angles: 14 gage (0.747-inch) cold-formed galvanized steel sections.
   5. Secondary endwall structural members, except columns and beams, shall be fabricated from 14 gage (0.0747-inch) shop-painted roll- formed steel.

D. Wind Bracing: Provide portal beam wind bracing at rigid frame members. Use manufacturer's standard detail.

E. Bolts: Provide zinc- or cadmium-plated bolts when structural framing components are in direct contact with roofing and siding panels. In other cases provide shop-painted bolts.

F. Extra Materials: Furnish 5 percent excess over required amount of nuts, bolts, screws, washers, and other required fasteners for each building. Pack in cartons labeled to identify contents and store on site where directed.

G. Shop Painting: Clean surfaces of loose mill scale, rust, dirt, oil, grease, and other matter. Follow procedures of SSPC-SP3 for power-tool cleaning, SSPC-SP7 for brush-off blast cleaning, and SSPC-SP1 for solvent cleaning.
   1. Prime framing members with rust-inhibitive primer.
   2. Prime galvanized members after phosphoric acid pretreatment with zinc dust-zinc oxide primer.

2.06 ROOFING AND SIDING PANELS

A. Roof Panel: CXP Standing Seam Panel, 2 inches high (2-7/8 inches including standing leg) with 24 inches wide coverage, 24 gage, Galvalume. Main roof shall be without color coating. Roof at front porch shall have a Kynar 500 color coating finish. Standard colors from manufacturer's full range of colors to be selected by MDOT Architect.

B. Wall Panel: MVW Ribbed-type panel, 1-3/16 inches deep with 36 inches wide coverage and rib spacing at 12 inches on center, 26 gage, Galvalume with Kynar 500 (70% PVDF) color coating finish. Standard colors from manufacturer's full range of colors to be selected by MDOT Architect.

C. Interior Partition Panel: MIP ribbed-type panel to be 3/4 inch deep by 36 inches wide coverage and rib spacing at 6 inches on center, 26 gage, Galvalume without color coating.

D. Soffit Panel: MIP ribbed-type panel with reversed ribs to be 3/4 inch deep by 36 inches wide and full span on ceiling with no splices or laps, 26 gage, Galvalume, with Kynar 500 (70% PVDF) color coating finish. Standard colors from manufacturer's full range of colors to be selected by MDOT Architect.

2.07 STRUCTURAL FRAMING: Shop-fabricate framing components to indicated size and section with base plates, bearing plates, and other plates required for erection welded in place. Provide holes for anchoring or connections shop-drilled or punched to template dimensions.

A. Shop Connections: Power-riveted, bolted, or welded shop connections.

B. Field Connections: Provide bolted field connections.

2.08 FLASHING AND TRIM: Flashing and trim shall be furnished at eaves, rake, corners, base, framed openings, and wherever necessary to seal against the weather and provide a finished appearance.

2.09 SHEET METAL ACCESSORIES

A. Gutters shall be formed in sections not less than 20 feet in length complete with any special pieces that may be required. Join sections with riveted and soldered or sealed joints. Provide expansion joints with cover plate where required. Furnish gutter supports spaced at maximum 48 inches on center, constructed of same metal as gutters. Provide aluminum wire ball strainers at each outlet. Gutters shall be, 26 gage, roll formed, galvanized steel, ASTM A653 with G90 coating. Gutters are box-shaped with face profile shaped to match rake trim. Finish to match roof fascia and rake.

B. Downspouts shall be formed in full-length sections complete with any special pieces that may be required. Downspouts shall be, 26 gage, roll formed, galvanized steel, ASTM A653 with G90 coating. Downspouts are rectangular-shaped and shall have a 45 degrees elbow at the bottom. Straps shall be spaced 6 feet on center maximum (minimum of 3 required per downspout) and be the same material as downspout. Strap edges shall be rolled or smooth.

2.10 FASTENERS

A. Wall fasteners shall be No. 14 self-taping, carbon steel screws with an integral, hex-washer head, and without a sealing washer. Minimum length of fasteners shall be 1 inch.

B. Roof fasteners shall be No. 12 self-tapping carbon steel screws with an extended life hexagon head that is compatible with Galvalume panels. A sealing washer shall be provided. Minimum length of fasteners shall be 1 inch.

PART 3 EXECUTION

3.01 ERECTION

A. Primary Framing: Erect framing required true to line, plumb, level, rigid, and secure. Level base plates to true even plane with full bearing to supporting structures, set with double-nutted anchor bolts. Use non-shrinking grout to obtain uniform bearing and maintain level baseline elevation. Moist-cure grout for 7 days after placement.

B. Purlins and Girts: Rake or gable purlins shall have tight-fitting closure channels and fascias. Locate and space girts to suit door and window arrangements and heights. Secure purlins and girts to structural framing and hold rigidly to straight line by sag rods.

C. Bracing: Use movement-resisting frames in lieu of sidewall rod bracing. Rod bracing allowable in roof.

D. Framed Openings: Provide shapes of design and size to reinforce openings and carry loads and vibrations imposed, including equipment furnished under mechanical and electrical Work. Securely attach to building structural frame.

E. Siding: Arrange and nest sidelap joints so prevailing winds blow over, not into, lapped joints. Apply panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line. Protect factory finishes from damage.

F. Field cutting of exterior panels by torch is not permitted.

G. Wall Sheets: Apply elastomeric sealant continuously between metal base channel and concrete and where necessary for waterproofing. Apply sealant and back up in accordance with the sealant manufacturer's recommendations. Shim up from concrete shelf 1/2 inch for wall panels, and remove shims after panels have been securely fastened.
   1. Align bottom of wall panels and fasten with blind rivets, bolts or self-tapping screws. Fasten flashiness, trim around openings, and similar elements with self-tapping screws. Fasten window and door frames with machine screws or bolts. When building height requires two rows of panels at gable ends, align lap of gable panels over wall panels at eave height.
   2. Install screw fasteners with power tools having controlled torque to compress neoprene washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.

3. Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.

H. Sheet Metal Accessories: Install gutters, downspouts, and other accessories for positive anchorage to building and weathertight mounting. Adjust operating mechanism for precise operation.

I. Thermal Insulation: Install insulation concurrently with roof and wall panels in accordance with manufacturer's directions. Install blankets straight and true in one-piece lengths with both sets of tabs sealed to provide a complete vapor barrier. Locate insulation on inside face of wall panels and on underside of roof sheets, extending across top flange of purlin members and held taut and snug to roofing panels with retainer clips. Install retainer strips at each longitudinal joint, straight and taut, nesting with roof / wall rib to hold insulation in place.

J. Roof Panels: Comply with manufacturers standard instructions and conform to standards set forth in the Architectural Sheet Metal Manual published by SMACNA, in order to achieve a watertight installation.
1. Install panels in such a manner that horizontal lines are true and level and vertical lines are plumb. Coordinate with mechanical and electrical so that all penetrations through roof occur in flat portion of panel with sufficient space adjacent to penetration to be properly flashed and waterproofed.
2. Attach panels using manufacturer’s standard Concealed clips and fasteners, spaced in accordance with approved Shop Drawings.
3. Provide weatherseal under ridge cap. Flash and seal roof panels at eave and rake with rubber, neoprene, or other closures to exclude weather.
4. Install sealants for preformed roofing panels as specified on Shop Drawings.
5. Do not allow traffic on completed roof. If required, provide cushioned walk boards.
6. Protect installed roof panels and trim from damage caused by adjacent construction until completion of installation.
7. Remove and replace panels or components that are damaged beyond successful repair.

3.02 CLEANING AND TOUCH-UP: Clean component surfaces. Touch up abrasions, marks, skips, or other defects to shop-primed surfaces with same material as shop primer.

***END OF SECTION ***

SECTION 15010 BASIC MECHANICAL REQUIREMENTS

PART 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 for approval.

B. These drawings and specifications shall be considered a part of this contract. Should an error or omission occur in either or both the drawings and specifications, or conflict one with the other, this Contractor shall not avail himself of such unintentional error, omission or conflict, but shall have same explained to him and adjusted before signing the contract or proceeding with the work.

PART 2 PRODUCTS

2.01 COORDINATION: The products of particular manufacturers have been used as the basis of design in preparation of these documents. Any modifications to the mechanical systems and their components, the electrical systems, the building structure and architecture, or any other portion of the building that result from the use of any other than the basis of design equipment shall be coordinated with all other trades. Such coordination shall occur before delivery of products from the manufacturer (before shop drawing submittals) and shall be clearly indicated on the shop drawings. Any related modifications shall be performed without any additional cost to the contract.

2.02 DESCRIPTION: All products shall be new and bear the Underwriter's Laboratories, Inc., (UL) label unless specifically indicated otherwise.

PART 3 EXECUTION

3.01 GENERAL:

A. The mechanical plans do <u>not</u> give exact elevations or locations of lines, nor do they <u>show</u> all the offsets, control lines, or other installation details. The Contractor shall carefully lay out his work at the site to conform to the structural conditions, to provide proper grading of lines, to avoid all obstructions, to conform to details of installation supplied by the manufacturers of the equipment to be installed, and to thereby provide an integrated, coordinated and satisfactory operating installation.

B. If the Contractor proposes to install equipment, including piping and ductwork, requiring space conditions other than those shown, or to rearrange the equipment, he shall assume full responsibility for the rearrangement of the space and shall have the Architect review the change before proceeding with the work. The request for such changes shall be accomplished by Shop Drawings of the space in question.

C. The Contractor is responsible for the proper location and size of all slots, holes or openings, in the building structure pertaining to his work, and for the correct location of sleeves, inserts, cores, etc.

3.02 EQUIPMENT CONNECTIONS:

A. Each equipment item with drain connections, shall be provided with a properly-sized drain, with trap and clean-out, run to the nearest floor drain or as directed.

B. Rough-in and make final connection to all equipment requiring same, furnished under other divisions of these specifications or by the Owner.

1. Provide necessary labor and materials, including stop valves, traps, pressure-reducing valves, etc. where necessary. Trap and vent drainage connections as required.

2. If equipment or fixtures to be furnished by Owner and/or Owner's vendor are not delivered prior to final acceptance, services shall be capped or plugged at walls or floor as directed, ready for future connection.

C. No equipment or fixture shall be "roughed-in" until proper rough-in drawings are in the hands of the trade doing the work.

3.03 PROTECTION OF EQUIPMENT:

A. Responsibility for care and protection of equipment and material under this Contract rests with this Contractor until equipment or materials have been installed, tested and accepted.

B. Store equipment, including pipe and valves, off the ground and under cover. For storage outdoors, minimum 4 mil thick plastic shall be fitted to withstand splattering, ground water, precipitation and wind.

C. All pipe ends, valves, and parts of equipment left unconnected permanently or temporarily, shall be capped, plugged or properly protected to prevent entry of foreign matter.

D. Protect air handling unit coils by use of protective sheet metal panels or plywood.

E. Plug ends of pipe when work is stopped and close ends of ducts with plastic taped in place until work resumes.

F. Damaged equipment shall be repaired or replaced at the option of the Architect/Engineer.

3.04 PAINTING:

A. Factory painted equipment that has been scratched or marred shall be repainted to match original factory color.

B. All uninsulated black ferrous metal items exposed to sight inside the building, such as gas piping, equipment hangers and supports not provided with factory prime coat, shall be cleaned and painted with one coat of zinc chromate primer. In addition, such items in finished spaces shall also be painted with two coats of finish paint in a color to match adjacent surfaces or as otherwise selected by the Architect.

C. Black ferrous metal items exposed outside the building, such as equipment support beams, uninsulated pipe and pipe supports not provided with factory prime coat, shall be cleaned and painted with one coat of rust inhibiting primer and two coats of an asphaltic base aluminum paint. Insulated pipes outside the building shall be cleaned and painted with one coat of rust inhibiting primer before installing insulation.

D. In lieu of painting hanger rods, cadmium plated or galvanized rods may be furnished.

E. No nameplates or equipment shall be painted, and suitable protection shall be afforded to the plates to prevent their being rendered illegible during the painting operation.

F. Galvanizing broken during construction shall be recoated with cold galvanizing compound.

G. All <u>ductwork</u>, <u>piping</u>, <u>insulation</u>, <u>conduit</u> 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.

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. This instruction shall include a complete walk-through of all equipment and systems. The Architect reserves the right to attend any such meeting and shall be duly notified. Where specified, certain major items of equipment shall be installed under the supervision of and tested by a specialist furnished by the manufacturer of the equipment. Such specialist shall train the operator in the use of his equipment.

4. A competent technician employed by the Temperature Control Subcontractor shall be required to instruct the Owner in proper operating procedures and shall explain the significance of the temperature control literature filed in the maintenance manual while the system is in continuous operation as specified above.

5. Printed instructions, installed in a suitable frame with a glass front, covering the operation and maintenance of each major item of equipment, shall be posted at locations designated by the Architect. Provide two bound manuals containing complete repair parts lists, and operating service and maintenance instructions for all equipment provided.

3.13 RECORD SET DRAWINGS:

A. The Contractor shall maintain on a daily basis at the project site a complete set of "Record Drawings" reflecting an accurate dimensional record of all buried or concealed work. In addition, the "Record Drawings" shall be marked to show the precise location of concealed work and equipment, including concealed or embedded piping and valves and all changes and deviations in the Mechanical work from that shown on the Contract Documents. This requirement shall not be construed as authorization for the Contractor to make changes in the layout or work without definite instructions from the Architect. The "Record Drawings" shall consist of a set of mylar sepia prints of the Contract Drawings for this Division with the Engineer's seal and Engineer's firm name removed or blacked out. Prior to commencing work the Contractor shall purchase from the Architect a set of mylar sepia prints to be used for the "Record Drawings".

B. Record dimensions shall clearly and accurately delineate the work as installed; locations shall be suitably identified by at least two (2) dimensions to permanent structures.

C. The Contractor shall mark all "Record Drawings" on the front lower right hand corner with a rubber stamp impression that states the following:

> "RECORD DRAWINGS (3/8" high letters) to be used for recording Field Deviations and Dimensional Data Only" (5/16" high letters)

3.14 GUARANTY-WARRANTY:

A. This guarantee shall include capacity and integrated performance of component parts of various systems in strict accord with the true intent and purpose of these Specifications.

Conduct such tests as herein specified or as may be required by the Architect to demonstrate capacity and performance ability of various systems to maintain specified conditions.

B. All materials and equipment shall carry a full year's warranty from time Owner accepts building or the date of substantial completion, whichever is earlier, regardless of start-up date of equipment, unless a longer warranty period is specified under other sections.

3.15 INSTALLATION: All equipment shall be installed in strict conformance with manufacturer's recommendations, as specified herein and as shown. If any conflict arises between these instructions, notify the Engineer immediately for guidance.

3.16 FLAME SPREAD AND SMOKE DEVELOPED PROPERTIES OF MATERIALS:

A. Materials and adhesives used throughout the mechanical and electrical systems for insulation, and jackets or coverings of any kind, or for piping or conduit system components, shall have a flamespread rating not over 25 without evidence of continued combustion and with a smoke developed rating of not higher than 50. If such materials are to be applied with adhesives, they shall be tested as applied with such adhesives, or the adhesives used shall have a flamespread rating not over 25 and a smoke developed rating not higher than 50. (Note: Materials need not meet these requirements where they are entirely located outside of a building and do not penetrate a wall or roof, and do not create an exposure hazard.)

B. "Flame-Spread Rating" and "Smoke Developed Rating" shall be as determined by the "Method of Test of Surface Burning Characteristics of Building Materials, NFPA No. 255, ASTM E84, Underwriter's Laboratories Inc., Standard". Such materials are listed in the Underwriters' Laboratories, Inc., "Building Materials List" under the heading "Hazard Classification (Fire)".

3.17 EQUIPMENT FURNISHED BY OWNER:

A. The Contractor shall unload, uncrate, assemble, and connect any and all equipment shown on the drawings or called out in the Specifications to be furnished by the Owner for installation by the Contractor.

B. The Contractor shall take full charge of such equipment from the time the items are delivered to the job, set in place, connected, tested, adjusted, and placed into operation.

3.18 HAZARDOUS MATERIALS:

A. No products shall be used that contain any known hazardous or carcinogenic materials. Products with asbestos or radioactive content shall not be used.

B. Handling of any hazardous material is not covered in this specification Division (15). Any requirements for such are beyond the scope of this contract and shall be done only by those persons contracted to do so.

3.19 ELECTRICAL WORK:

A. All electrical equipment provided under this division shall comply with the electrical system characteristics indicated on the electrical drawings and specified in Division 16.

B. All components shall be in conformance with the requirements of the National Electrical Code and Division 16. Motor starters and disconnects as required for rooftop units, and fans provided under this division shall be furnished under Division 15.

C. All power wiring and final power connections to the system shall be provided under Division 16.

D. Control wiring (120V. and less) shall be provided under Division 15 and extended from the 120V power circuits indicated on the electrical drawings. All wiring for voltages higher than 30 volts shall be done by a licensed electrician.

E. All electrical characteristics shall be taken from the mechanical and electrical drawings and specifications and coordinated before equipment is ordered or submitted.

3.20 MOTORS:

A. Unless specifically noted otherwise in other sections of this specification, all motors and motor controllers shall meet the requirements specified in this section. All motors shall be built in accordance with the current applicable IEEE, and NEMA standards and shall have voltage, phase, frequency and service as scheduled.

B. Each motor shall be suitable for the brake horsepower of the driven unit, rated with 1.15 minimum service factor, and shall be NEMA design B. The motor temperature rise shall not exceed 40 degrees C. for drip proof motors, 50 degrees C. for splash proof motors, and 55 degrees C. for totally enclosed or explosion proof motors. The motor shall be capable of operating continuously at such temperature rises, and shall be capable of withstanding momentary overloads of 25 percent without injurious overheating.

C. Each item of motor driven equipment shall be furnished complete with the motors and drives as required to perform the specific function for which it is intended, scheduled, and specified.

D. Motors shall be ball bearing type selected for quiet operation and shall be manufactured for general purpose duty unless otherwise indicated. Each bearing shall be accessible for lubrication, where necessary, and designed for the load imposed by the V-belt drive or the driven apparatus. Direct drive motors shall be designed for the specific application with all necessary thrust bearings, shaft capacities, etc.

E. Motors larger than 1/2 horsepower shall be of U.S. manufacture and have bearings with pressure grease lubrication fittings.

F. Motors connected to drive equipment by belt shall be furnished with adjustable slide rail bases except for fractional horsepower motors which shall have slotted bases. Motor leads shall be permanently identified and supplied with connectors.

G. Each motor to be installed outdoors shall be of the totally-enclosed fan-cooled type, or housed in a weatherproof housing.

H. Unless otherwise indicated, motors smaller than 1/2 horsepower shall be capacitor start or split phase type designed for 120 volt, single phase, 60 cycle alternating current. Shaded pole motors are not to be acceptable except 35 watts and smaller. Motors 1/2 horsepower and larger shall be squirrel cage induction type, 3 phase, 60 cycle alternating current.

I. If the Contractor proposes to furnish motors varying in horsepower and/or characteristics from those specified, he shall first inform the Architect/Engineer of the change and shall then coordinate the change and shall pay all additional charges in connection with the change.

END OF SECTION

SECTION 15011 SCHEDULE OF SUBMITTAL DATA

PART 1 GENERAL

1.01 RELATED DOCUMENTS: The requirements of the General Conditions, Supplementary Conditions, and Section 15010 apply to all work herein.

1.02 QUALITY ASSURANCE:

A. Shop drawings or fully descriptive catalog data shall be submitted by the Contractor for all items of material and equipment furnished and installed under this contract. The Contractor shall submit to the Architect a sufficient number of copies of all such Shop Drawings or catalog data to provide him with as many reviewed copies as he may need, plus two (2) copies for retention; one by the Architect and one by the Engineer.

B. Before submitting Shop Drawings to the Architect for review, the Contractor shall examine them and satisfy himself that they are correctly representative of the material or equipment to which they pertain. The Contractor shall so note these Drawings before submitting them. The Contractor's review of the Shop Drawings is not intended to take the place, in any way, of the official review of the Architect, and Shop Drawings which have not been reviewed by the Architect shall not be used in fabricating or installing any work.

C. The review of Shop Drawings or catalog data by the Architect shall not relieve the Contractor from responsibility for deviations from the Plans and Specification unless he has, in writing, specifically called attention to such deviations at the time of submission and has obtained the permission of the Architect thereon; nor shall it relieve him from responsibility for error of any kind in Shop Drawings. When the contractor does call such deviations to the attention of the Architect, he shall state in his letter whether or not such deviations involve any extra cost. If this is not mentioned, it will be assumed that no extra cost is involved for making the change.

D. Verification and assignment of dimensions, quantities, and construction means, methods, sequences or procedures, the correctness of which is set forth in the Contract Documents or submittal, shall be the sole responsibility of the Contractor.

E. Reproduction of design documents in any portion for use in a submittal is <u>not</u> acceptable.

PART 2 PRODUCTS

2.01 GENERAL: All products shall be new and bear all labels which are identified by the applicable specification section and Contract Documents.

PART 3 EXECUTION

3.01 SUBMITTAL DATA:

A. General

1. The submittal data to be furnished for this project shall comply with the Specifications and Contract Documents in their entirety. Any submittals herein scheduled are as a minimum only and shall not be construed to limit the submittal data required within the individual Sections of these Specifications.

2. Shop Drawings will be returned unchecked unless the following information is included: Reference to all pertinent data in the Specifications or on the Drawings, such as sound power levels of motor driven equipment where called for in the specifications, electrical characteristics and horse power, capacities, construction material of equipment, UL labels where required, accessories specified, manufacturer, make and model number, weights where specified, starters where required by Division 15, size and characteristics of the equipment, name of the project and a space large enough to accept an approval stamp. The date submitted shall reflect the actual equipment performance under the specified conditions and shall not be a copy of the scheduled data on the drawings. All submitted equipment must be identified on Shop Drawings with same "Mark Numbers" as identified on Drawings or in Specifications. All pertinent data such as accessories shall also be marked. Any deviation from any part of the Contract Documents shall be clearly and completely highlighted.

3. HVAC and plumbing submittal data shall be bound into separate HVAC and plumbing volumes, with each volume containing one copy of all specified equipment shop drawings. The binders shall be provided with an identification tab for each Specification Section that requires submittals. Each item in each tabbed section shall be identified with the paragraph number relating to the item submitted the use of a cover sheet or by highlighting the paragraph on the first page concerning the item. If necessary, binders shall be 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
Cleanouts
Condensing Units
Cooling Coils
Disconnect Switches
Ductwork Accessories and Details (min. 1/4"=1'0" scale)
Fans
Furnaces
Gas Cocks
Gas-Fired Unit Heaters
Grilles, Registers and Diffusers
Insulation

Louvers
Plumbing Drains
Plumbing Fixtures, Carriers and Fittings
Refrigerant Piping Diagrams and Layouts approved by the Compressor Manufacturer
Sewage Lift Station and Controls
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. 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 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 15015 DESIGN CONDITIONS

PART 1 GENERAL

1.01 DESCRIPTION: The requirements of the General Conditions and Supplementary Conditions apply to all Work herein.

PART 2 DESIGN CONDITIONS

2.01 DESIGN CONDITIONS:

A. Outside conditions are as follows:

	Dry Bulb Deg. F.	Wet Bulb Deg. F.
Summer Outside Air Temperature	98	80
Winter Outside Air Temperature	0	

B. The indoor design condition for cooling is 75 deg. F. dry bulb/50% relative humidity.

C. The indoor design condition for heating is 75 deg. F. dry bulb.

D. Schedule of Working Pressures:

	System	Working Pressure	Normal Operating Temperature Range
1.	Sanitary drain and vent	Atmospheric	Ambient
2.	Domestic Cold Water	150	Ambient
3.	Dom. Hot Water	150	140 deg. F.
4.	Natural Gas, Exterior	20 psi	Ambient
5.	Natural Gas, Interior	14"W.C	Ambient

E. Range of indoor design goals for HVAC sound control:

1. All occupied spaces shall have an NC range not to exceed NC 35.

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 (2003)

B. All plumbing materials and workmanship shall comply with the following codes and standards as applicable:

1. The International Plumbing Code (2003)

2. The International Fuel Gas Code (2003)

3. The National Electric Code (2003)

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 Gas Association, Inc. Laboratories (AGA)

5. American Society of Mechanical Engineers Code (ASME)

6. Factory Mutual Underwriters (FM)

7. National Fire Protection Association Standard (2000)

8. Sheet Metal and Air Conditioning Contractor's National Association, Inc. (SMACNA)

9. 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 general provisions.

B. All above ground piping inside the building shall be identified with color bands at each shut-off valve, each piece of equipment, each branch take-off, and 40'-0" maximum spacing on exposed straight pipe runs.

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 VALVE TAGS: Valve tags shall be circular brass tags 1-1/2" in diameter. The tags shall have the valve number (1/2" minimum height) firmly embossed and filled with a durable black compound and shall be attached to the valve with copper wire and brass "S" links. See Section 15010.

2.03 BAND AND LETTER SIZE: Band and letter sizes shall conform to ASHRAE standards of the following table:

O.D. of Pipe Covering	Width of Color Band	Size of Letter/Numbers
1-1/4" and smaller	8"	1/2"
1-1/2" to 2"	8"	3/4"
2-1/2" to 6"	12"	1-1/4"
6" to 10"	24"	2-1/2"
over 10"	32"	3-1/2"

2.04 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)	Black	Green
Hot Water (Domestic)	HW (Dom)	Black	Yellow
Refrigerant Liquid	RL	Black	Yellow
Refrigerant Suction	RS	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 thru walls and floors.
4. At each change in direction or height.
5. Every 40 feet along continuous runs.
6. Within 4 feet of exit or entrance to vessel or tank.

B. Indicate pipe content flow direction with arrows of matching style and placed so the arrow points away from the legend.

C. 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.

B. All motors shall be provided.

C. A motor starter shall be provided under this Section for each motor including package units which shall be furnished with integral starters. Motor starters shall be installed either in a Motor Control Center or separately mounted adjacent to the motor served as shown, indicated and/or required.

D. Motor power wiring is defined as those conductors between the energy source and the motor. This power wiring shall be terminated at motor terminals and will be provided under Division 16 work.

E. All control wiring required for automatic starting and stopping of motors shall be provided under this Division unless specifically shown on the electrical drawings.

F. Power wiring will be connected through all line voltage control devices such as firestats, smoke detectors and thermostats by Division 16 work.

PART 2 PRODUCTS

2.01 MOTOR STARTERS: Starters for motors 1/3 horsepower or smaller shall be manual unless remote or automatic starting is required, in which case the starters shall be magnetic, full voltage, non-reversing, single-speed, unless otherwise indicated.

PART 3 EXECUTION

3.01 INSTALLATION:

A. Provide control wiring and install all motor starters, unless integrally factory mounted on a piece of equipment.

B. Provide control wiring to all motors except packaged units that are prewired between the starter and motor.

C. Where line voltage control devices are mounted at, on or inside a unit, such as aquastats, 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 removing any wiring or disconnecting any current carrying parts.

E. Standard minimum one-year warranty on all electrical equipment provided herein shall apply.

END OF SECTION

SECTION 15080 HVAC TEST AND BALANCE

PART 1 GENERAL

1.01 RELATED DOCUMENTS: All work specified in this Section is subject to the provisions of General Conditions, Supplementary General Conditions And Section 15010.

1.02 SCOPE OF WORK:

A. The Contractor shall procure the services of an independent Test and Balance Agency that is independent of any contractor or manufacturer to perform the testing and balancing and prepare reports to the General Contractor and to the Architects and Engineers.

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: 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 as specified in the AIR HANDLING Section.

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: The following items shall be tested, recorded, and incorporated in the test and balance report. The report shall not be limited to these items. but shall include these tests as minimum requirements.

1. Record each fan manufacturer, model numbers and serial numbers.

2. Test, adjust and record required and measured total CFM for each fan system. Test and record quantity of exhaust of relief air in CFM.

3. Test, adjust and record all required and measured outside air quantities and return air CFM. Test and record quantity of return air in CFM.

4. Test and record required and measured system static pressures; filter differential, coil differential, and fan total static pressure.

5. Record all installed fan drive assemblies; fan sheaves, motor sheaves, and belts.

6. Record each installed motor manufacturer.

7. Record each installed motor horse power.

8. Test and record each motor name plate and measured voltage.

9. Test, adjust, and record each motor name plate and full load amperage.

10. Test, adjust, and record each blower RPM.

11. Test and adjust the CFM delivery of each diffuser, grille, and register.

12. Identify the location of each diffuser, grille, and register.

13. Record the size, type, and manufacturer of each grille, register and diffuser.

14. Data obtained for each diffuser, grille and register shall include required FPM velocity and test resultant velocity, required CFM and test resultant CFM after adjustments.

15. All diffusers, grilles, and registers shall be adjusted to minimize drafts.

16. All tests shall be made with supply, return, and exhaust systems operating, and all doors, windows, etc., closed or in their normal operating condition.

17. All damper positions shall be permanently marked after air balancing is complete.

18. The final balanced condition of each area shall include the testing and adjusting of pressure conditions. Front doors, exits, elevator shafts, etc., should be checked for air flow so that exterior conditions do not cause excessive abnormal pressure conditions.

END OF SECTION

SECTION 15100 PIPE HANGERS AND SUPPORTS

PART 1 GENERAL

1.01 RELATED DOCUMENTS: Drawings and general provisions of Contract, including General Conditions, Supplemental Conditions, apply to work of this section.

1.02 DESCRIPTION OF WORK:

A. Furnish hangers to support the required loads. Where necessary, supports shall be designed to permit movement due to expansion and contraction. Where drawings show details of supports and anchors, conform to details shown. Where details are not shown, conform to general requirements specified herein.

B. **"C" CLAMPS** shall not be used to support piping.

C. Do not pierce waterproofing with support bolts.

D. All ferrous metal hangers and supports not otherwise coated shall be provided with a field applied coat of zinc chromate primer prior to installation. In lieu of field painting the contractor may furnish cadmium plated, or galvanized hangers and supports.

1.03 QUALITY ASSURANCE:

A. All hangers, support, anchors, and guides shall be in accordance with the American National Standard Code for Pressure Piping, ANSI B31.1 with addenda 31.1 OA-69.

B. Provide an adequate suspension system in accordance with recognized engineering practices, using where possible, standard commercially accepted pipe hangers and accessories.

C. Horizontal suspended pipe shall be hung using adjustable pipe hangers with bolted hinged loops or turnbuckles. Chains, wire, perforated strap iron or flat steel strap are not acceptable.

D. Submit fastening methods to the structural engineer for approval and as approved copy to the engineer.

E. For the purpose of this specification figure numbers for Grinnell products are given; equal products by B-Line and Michigan Hanger Co. (M-Co) are acceptable.

1.04 DESIGN:

A. Supporting steel not shown for the equipment will be designed, supplied and erected by the Contractor. (The supporting steel is that steel which is connected to the structural steel shown on the drawings and carries the weight of the mechanical items.) This supporting steel design must carry the dead weight and dynamic load imposed by the equipment.

B. The supporting steel shall be connected to the structural steel in such a manner as not to overload the structural steel. It is the responsibility of the General Contractor, Mechanical Contractor and the steel fabricator to verify that this purpose is accomplished. It is the responsibility of the General Contractor to call to the attention of the Architect-Engineer any deficiency prior to bidding.

C. Where thermal movement in the pipe line will occur, the pipe hanger assembly must be capable of supporting the line in all operating conditions. Accurate weight balance calculations shall be made to determine the supporting force at each hanger in order to prevent excessive stress in either pipe or connected equipment.

PART 2 PRODUCTS

2.01 UPPER ATTACHMENTS:

A. Wood Construction:

1. Support piping in wood construction with Side Beam Bracket, Grinnell Fig. 202 or Hanger Flange, Grinnell Fig 128R, using lag screws.

2.02 WALL SUPPORTS: Where piping is run adjacent to walls or steel columns welded steel brackets Grinnell Fig. 195 and 199 may be used. The bracket shall be bolted to the wall and a back plate of such size and thickness as to properly distribute the weight.

2.03 FLOOR SUPPORTS:

A. Where pipe lines are located next to the floor and no provision for expansion are required support piping with Grinnell Fig. 258., pipe rest with nipple and floor flange.

B. Where provisions for expansion are required support piping with Grinnell adjustable pipe stand Fig. 274., or pipe roll stand Fig. 271.

C. Vertical piping shall be supported at every other floor using riser clamps Grinnell Fig. 261., for steel and cast iron pipe, and copper clad riser clamp Grinnell Fig. CT.121., for all copper piping.

2.04 SUPPORTS FOR PIPING OUTSIDE THE STRUCTURE: Support piping outside the structure on adjustable pipe supports Grinnell Fig. 264.

2.05 INTERMEDIATE ATTACHMENTS:

A. Supports for horizontal piping shall be all threaded galvanized steel, ASTM A-107, Grinnell Fig. 146., of the following sizes:

Pipe Size	Hanger Rod Diameter
2" and smaller	3/8"
2-1/2" and 3"	1/2"
4" and 5"	5/8"
6"	3/4"
8" to 12"	7/8"
14" and 16"	1"

2.06 PIPE ATTACHMENTS:

A. Hangers for insulated pipe shall be sized to bear on the outside of the insulation.

B. Hangers for steel and cast-iron horizontal piping where provision for expansion are not required shall be Grinnell Fig. 260., clevis type with vertical adjustment.

C. Hangers for uninsulated copper pipe 4" and smaller shall be copper plated adjustable band hangers Grinnell Fig. CT.99C., for pipe sizes over 4" provide Grinnell Fig. 260., clevis type hanger with a 4 psf lead saddle at each hanger location.

D. Hanger for PVC pipe shall be Grinnell Fig. CT.99., adjustable band hanger.

E. Hangers for steel and copper piping where provisions for expansion are required shall be Grinnell Fig. 171 or Fig 181., adjustable roller hanger with Grinnell Fig. 160., pipe covering protection saddles.

F. Support hot and cold water piping in spaces behind plumbing fixtures with plastic coated brackets and plastic coated U-bolts.

G. Pipe guides shall be Grinnell Fig. 256.

PART 3 EXECUTION

3.01 INSTALLATION:

A. Support horizontal equipment such as in-line pumps, strainer, air separators, independently of the piping system.

B. Hang pipe from substantial building structure. Pipe shall not be hung from other piping.

C. Support each horizontal length of NO-HUB cast iron pipe with in 2-1/2' of each joint and a maximum of 5'-0" on centers.

D. Provide a hanger within one foot of each elbow.

E. Provide a hanger within one foot of each riser in addition to the riser clamp support at every other floor.

F. Unless specified otherwise provide the following support spacing.

1.

Pipe Size	Support Spacing
1" and smaller	5'-0"
1-1/4" and larger	10'-0"

END OF SECTION

SECTION 15180 THERMAL INSULATION FOR HVAC SYSTEMS

PART 1 GENERAL

1.01 RELATED DOCUMENTS:

A. Drawing and general provisions of Contract, including General and Supplementary Conditions and Specification sections, apply to work of this section.

B. All work specified in this Section is subject to the provisions of Section 15010.

1.02 DESCRIPTION:

A. All insulation products used outside of mechanical rooms shall meet NFPA requirements for Flame Spread Rating 25, Smoke Developed Rating 50, and Fuel Contributed 50.

B. **Staples shall not be used for securing insulation.** All insulation shall be installed in accordance with the insulation manufacturer's recommendations. Insulation shall be continuous through wall, ceiling, floor and roof openings and sleeves, except at fire/smoke dampers.

C. Supports for insulated piping shall be outside the insulation. Inserts shall be provided at hangers. Inserts shall be Foamglass Insulation, Calcium Silicate or Perlite and shall be 2" longer than the pipe shields. Pipe shoes welded to the pipe shall be used for roll type hangers.

D. All tests shall be completed before insulation is applied.

E. Do not store materials in building until it is enclosed and dry. Wet insulation shall not be installed.

F. Insulation products with self-sealing type jacket shall not be applied at temperatures below 40°F.

G. <u>Items not to be insulated:</u>

1. Ducts with internal lining or factory insulated ducts.

2. Exhaust ductwork inside building.

H. Clean and dry all surfaces to be insulated from loose scale, dirt, oil, water and other foreign matter.

I. Insulate completely all metal surfaces of piping, ductwork and equipment other than hangers.

J. Surface finishes shall present a tight smooth appearance.

K. Permit expansion and contraction without causing damage to insulation or surface finish.

L. Surface finish shall be extended to protect all surfaces, ends, and raw edges of insulation.

M. Vapor barriers must be continuous and uninterrupted throughout the system where specified except where insulation is interrupted for fire dampers. See details for special conditions.

1.03 PIPING:

A. Insulate all valves, strainers and fittings. For the purposes of this Specification, fittings include unions and flanges. Use premolded material where available.

B. Insulate valves up to and including bonnets.

1.04 DUCTWORK: Insulation shall cover all standing seams and metal surfaces. Materials shall be applied subject to their temperature limits.

1.05 QUALITY ASSURANCE:

A. Codes and regulations referred to are minimum standards. Where the requirements of these specifications or drawings exceed those of the codes and regulations, the drawings and specifications shall govern.

B. Any methods of application of insulation materials or finishes not specified in detail herein shall be in accordance with the particular manufacturer's published recommendations. Insulation shall be applied by experienced workers regularly employed for this type of work.

C. Insulation products shall be Owens-Corning, Certainteed, Armstrong, or Knauf.

PART 2 PRODUCTS

2.01 FOAMED PLASTIC SHEET, AND TUBING:

A. Minimum of 4.5 lbs. per cu. ft. Thermal conductivity shall not exceed 0.28 at 75° f mean temperature.

B. Insulate: Refrigerant Piping, Indirect refrig. waste and drains from air conditioning equipment.

C. Refrigerant piping outside the building shall be insulated with 1" thick flexible foamed plastic insulation.

2.02 PRE-MOLDED FIBER GLASS PIPE INSULATION: Pipe insulation (4 lbs. per cubic foot) shall be fibrous glass wool accurately molded to conform to the outside diameter of the pipe. Insulation shall be one piece snap-on or self-sealing type with white all service jacket. Insulation shall be suitable for use on either hot or cold water pipes with temperature range of +35 degrees to 400 degrees F. Thermal conductivity shall not exceed 0.26 at 75 degrees F. mean temperature.

INSULATION THICKNESS IN INCHES
FOR PIPE SIZES

	Temperature Up to	**Up to 1"**	**1 to 2"**	**2" to 3"**	**4"& over**
Cooling Systems					
Refrigerant hot gas and liquid	Any	3/4"	1"	1"	2"
Refrigerant Suction		3/4"`	1"	1"	2"

2.03 FIBERGLASS DUCT INSULATION:

A. Duct insulation round supply:

1. Duct wrap (blanket type) insulation shall be 2" thick, foil-faced 1 lb. density fiberglass type. Duct wrap shall be applied to all supply air ductwork not lined. Insulation shall have laps sealed with 3" wide fiberglass reinforced SMACNA foil tape. Thermal conductivity for duct wrap insulation shall be K=0.31 BTU-in. per sq. ft. per degree F mean temperature.

2.04 LOW PRESSURE DUCT LINER (RECTANGULAR SUPPLY & RETURN): Acoustical duct liner shall be a flexible type using long Fiberglass with a smooth firmly bonded fire-resistant surface to prevent erosion of the insulation. Surface shall not exceed 25 flamespread and 50 smoke development. Thermal conductivity shall not exceed 0.26 at 75° F. mean temperature. Noise reduction coefficient (NRC) shall not be less than .60 based on acoustical materials test, Mounting No. 6. Completely coat all duct surfaces with Benjamin Foster 85-15 adhesive. Neoprene coated side on liner shall face air stream. Sections shall be joined by coating the edges with Foster 30-36. Secure liner to duct system with self-adhering pins adhered to clean surface and secure with self locking washers; space pins not more than 4" from the edges and not more than 16" on centers. Lining shall meet National Board of Fire Underwriters' Standards for Internal Duct Application and shall have a minimum density of 1"-1-1/2 lbs. per cu. ft. All duct liner shall be marked with the density located so as to be visible on the exposed surface of the liner. Air friction correction factor shall not exceed 1.40 at 2000 FPM and 1.5 at 4000 FPM.

2.05 ADHESIVES, MASTIC, COATINGS:

A. Acceptable Manufacturers: Benjamin Foster, Childers, Insul-Coustic, EPOLUX, Minnesota Mining and Manufacturing Co.

B. Treatment of pipe jackets and duct facings to impart flame and smoke safety shall be permanent. The use of water-soluble treatments is prohibited.

C. Vapor barriers shall have a perm rating of not more than .05 perms. Adhesives, coatings and mastics shall have a perm rating of not more than .25 perms.

2.06 TAPE: Wherever tape is used for sealing purposes, it shall be of the type and shall be applied as recommended by the non-conductive covering manufacturer. Where recommendation is lacking, the tape used shall be sealed with Minnesota Mining Adhesive EC-1329.

2.07 INSULATING CEMENT: Insulating cement shall be O-C 110 mineral wool Benjamin Foster or Minnesota Mining, all purpose cement. Where insulating cement is applied to pipe fittings in concealed locations, it shall be "one-coat" cement.

PART 3 EXECUTION

3.01 GENERAL:

A. Surfaces to be insulated shall be clean, dry, and free of foreign material, such as rust, scale and dirt when insulation is applied. Perform pressure tests required by other Sections before applying insulation.

B. Where existing insulation is damaged due to the new work, repair damage to match existing work or replace damaged portion with insulation specified for new work.

3.02 INSULATION FOR PIPING SYSTEM:

A. Insulate pipe, fittings, flanges, unions and valves.

B. Install insulation materials with smooth and even surfaces, jackets drawn tight and cemented down smoothly at longitudinal seams and end laps. Do not use scrap pieces of insulation where a full length section will fit.

C. Install insulation, jackets and coatings continuous through wall and floor openings and sleeves.

D. Fittings, valves and flanges shall be insulated with field fabricated multiple mitered segments of molded fiberglass insulation of the same thickness as adjoining pipe insulation. Secure fitting insulation segments with 20 gauge galvanized steel wire and apply a smoothing coat of insulating cement. White fabric and mastic shall be used on exposed fittings.

E. Application of all materials shall be in accordance with the manufacturer's instructions.

F. Butt all joints of pipe insulation together and secure all jacket laps with lap adhesive. Seal all butt joints with joint straps furnished with insulation.

G. Care shall be taken so as not to place insulation over vent and drain inlets and outlets.

H. **Staples are not permitted on pipe insulation.**

I. Insulate all refrigerant piping and appurtenances subject to sweating, such as thermometer wells, gauge cocks, and valve stems, with preformed and mitered fiberglass pipe insulation. Finish with white vapor barrier mastic.

3.03 INSULATION FOR DUCT SYSTEM: Secure insulation to duct with Benjamin Foster 85-15 adhesive applied in 4 inch strips around the duct on 8 inch centers. Nylon cord shall be used to secure the insulation. Where ductwork is 36" wide or more secure insulation to the bottom of the duct using self adhering pins and self locking washers placed not more than 18 inches on center. Insulation shall overlap lining and factory applied insulation a minimum of 2 inches. Vapor barrier at all butted joints or breaks shall be sealed with 4" inch wide foil reinforced tape adhered with Benjamin Foster 82-07.

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 15335 COMPRESSED AIR PIPING SYSTEM

PART 1 GENERAL

1.01 RELATED DOCUMENTS:

A. All work specified in this Section is subject to the provisions of Section 15010 "Basic Mechanical Requirements".

B. Refer to the following sections for related work in connection with the compressed air piping system:

15011 Submittals
15020 Identification of Piping System
15100 Pipe Hangers and Supports

1.02 DESCRIPTION OF WORK: Extent of the compressed air piping systems work, is indicated on Drawings and by requirements of this section.

1.03 QUALITY ASSURANCE:

A. Manufacturing firms shall be regularly engaged in the manufacture of compressed air piping system products, of types, materials, and sizes required, whose products have been in satisfactory use in similar service for not less than five (5) years.

B. Installation contracting firm shall have at least three (3) years of successful installation experience on projects with compressed air piping systems work similar to that required for project.

C. Comply with applicable portions of Plumbing Code pertaining to materials, construction and installation of products.

D. Comply with applicable American National Standards pertaining to products and installation of compressed air piping systems.

PART 2 PRODUCTS

2.01 COMPRESSED AIR PIPING MATERIALS AND PRODUCTS: Provide piping materials and factory fabricated piping products of sizes, types, pressure ratings, temperature ratings, and capacities as indicated. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements. Provide sizes and types matching piping and equipment connections; provide fittings of materials which match pipe materials used in compressed air piping systems. Where more than one type of material or product is indicated, selection is Installer's option.

2.02 BASIC IDENTIFICATION: Provide identification complying with Section 15020 "Identification for Piping Systems".

2.03 COMPRESSED AIR PIPING: Aboveground Piping, Pipe Sizes Up To and Including 2": Black steel pipe, Schedule 40, ASTM-A53 with threaded joints and Class 150 malleable iron threaded fittings.

2.04 VALVES:

A. Ball Valves: Bronze body, 2-piece valve with threaded end, teflon packed stainless steel stem, vinyl cover steel handle and shall be Lunkenheimer Valve Co. #70S-HST, Conbraco Apollos Co. #70-100 or Nibco #T-508.

B. Check Valves: Bronze body with screwed ends, swing check, bronze disc and suitable for 200 P.S.I. working air pressure. Valve shall be Jenkins Co. 92-A, Crane Co. #41 or Walworth Co. #420.

2.05 PRESSURE RELIEF VALVES: All bronze body with threaded connections. Valves set to relieve at 15% above working pressure, and shall be Lonergan Model No. TL, Crane Co., Cash Co. or Quincy Co.

2.06 PRESSURE REGULATING VALVES: Bronze body, threaded ends, diaphragm operated adjustable type, A.W. Cash Co. E55, Spencer Regulator, Watts or Leslie Co.

2.07 AIR COMPRESSOR:

A. Air compressor package shall be of the Simplex design, consisting of one (1) pump, motor, and control package mounted on one (1) tank. Compressor pumps shall be of 2-stage design, air cooled, splash lubricated, one piece integrally cast cylinder and head assembly, with domed pistons and cylinders, circular cage valves, spring and disc design loadless starting, heavy duty, enclosed filter/silencers, and factory authorized five (5) year warranty.

B. Compressor pump shall produce no less than 19.1 CFM of free air, at a rated pressure of 125 PSIG, be V-belt driven by electric motor of no less than 5 H.P., and designed to operate on an available power supply of 230 volts, 1 phase, 60 cycle.

C. Pump and motor shall be mounted on an ASME national board coded tank, of not less than 80 gallons capacity. Package shall be equipped with totally enclosed belt guards, ASME safety valve, automatic pressure switches, bucket high tank drain, tank pressure gauge, tank service valve, and shall include one (1) magnetic motor starter, factory mounted and wired.

D. Additional equipment shall include:

air-cooled aftercooler
automatic tank drain
tank vibration mountes (set of 4)

E. Air compressor shall be as manufactured by Champion, Ingersoll-Rand, Dayton or Saylor-Beall.

2.08 REFRIGERATED AIR DRYER:

A. Dryer shall be of the refrigerated, non-cycling type capable of reducing the temperature of 19.1 SCFM of saturated air at 100 PSIG from 100 to 35 F at line pressure dewpoint, and removing the condensed water via an integral automatic drain design. Dryer shall include air-cooled reciprocating refrigeration unit, water separator, suction pressure gauge, and NEMA 4 electrical enclosure. Dryer shall be prewired and factory tested. Heat exchanger, interconnecting air piping, and low pressure refrigerant piping shall include automatic drain valve and shall be rated to 200 PSIG working pressure. Unit suitable for 115 volt, 1 phase, 60 hz, service.

B. Air dryer shall be as manufactured by Champion, Ingersol-Rand, Dayton or Saylor-Beall.

2.09 FLOOR, WALL AND CEILING PLATES: Where exposed piping, bare and insulated, passes through floors, walls and ceiling, except in Mechanical Rooms, escutcheons shall be provided. Escutcheons shall be chrome-plated steel plates, hinged type with set screw. Escutcheons shall be as manufactured by Bea-Cor, F&S or Grinnell. Escutcheons for chrome plated connections at plumbing fixtures shall be as specified under the plumbing fixtures.

2.10 PRESSURE GAUGES AND GAUGE COCKS:

A. Gauges shall be flangless type and shall have 4-1/2" dials, cast aluminum cases, stainless steel rotary gear movements, phosphor bronze bourdon tubes, forged brass rod sockets and tips, 1/2% accuracy of scale range, plexiglass dial covers, safety blow-out disc and 1/4" lower connections. Gauges shall be Weksler, Trerice or Wiss. Scale range shall be suitable for the pressure ranges in which they are to operate, shall be as follows:

1. System with working pressure less than 100 PSIG: Scale range 0-150 PSI.

2. System with working pressure between 100 PSIG and 150 PSIG: Scale range 0-200 PSI.

3. System with working pressure between 150 PSIG and 300 PSIG: Scale ranges 0-400 PSI.

B. Gauge pointer shall be micrometer adjustment type, recalibrated from the front of the gauge.

2.11 UNIONS:

A. Unions shall be of the same material as the fittings specified and suitable for use at the working pressure and temperatures of the system in which they are installed.

B. Unions in piping, 2-1/2" and smaller shall be screwed. Unions in piping 3" and larger shall consist of flanges.

C. Unions shall be installed at locations shown on the Drawings and where necessary to accommodate the proper installation and servicing of equipment.

2.12 DIELECTRIC ADAPTERS:

A. All connections between dissimilar metals subject to galvanic action shall be made with an insulating type dielectric adapter.

B. No insulating type dielectric adapter or connection between dissimilar metals shall be installed in an inaccessible area.

C. Dielectric adapters shall be the union type for pipes 2" in size and smaller and flanged type for pipe 2-1/2" in size and larger. Adapters shall have working pressure of 250 psi for union type and 175 psi for flanged type. The insulating gasket shall have an operating range of 40°F. to 240°F and shall limit the galvanic corrosion to a maximum of 1% of the short circuit current. Dielectric adapters shall be Ebco, Crane or Capital.

D. Provide a dielectric adapter between any ferrous and copper connection including piping and equipment.

2.13 BASIC SUPPORTS, ANCHORS AND SEALS: Provide supports, anchors and seals complying with Section 15100 "Pipe Hangers and Supports".

PART 3 EXECUTION

3.01 GENERAL:

A. All piping shall be pitched to low points. Low points shall be piped to the floor and shall be provided with drip legs and drain valves.

B. All branch connections must be made to the top of the pipe.

3.02 CLEANING:

A. Drain and clean all dirt pockets and drain legs.

B. Thoroughly air blow all compressed air piping.

3.03 TESTING:

A. 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.

B. Tests of all systems shall be witnessed by Engineer. Ample notice of the performance of test must be given by the Contractor to the Engineer.

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 Pipe Hangers and Supports
15431 Drains, Cleanouts and Drainage Accessories
15442 Water Heaters - Electric
15450 Plumbing Fixtures & Trim

1.02 CODE:

A. The work shall comply with the International Plumbing Code, International Fuel Gas Code (2003 Edition), and NFPA 54 (2000 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. Drainage piping all sizes: Polyvinyl chloride pipe (PVC) ASTM D2665, PVC Type DWV fittings with solvent weld joints.

B. Condensate Drain Piping: Polyvinyl chloride pipe (PVC) ASTM D2665, PVC Type DWV fittings with solvent weld joints.

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.

B. Underground piping 1½" and larger below building slab: Type "K" hard drawn copper tubing, with 95-5 silver soldered joints and wrought copper socket fittings.

C. Underground piping 1¼" and smaller below building slab: Type "L" soft drawn copper tubing, with no joints.

D. Underground piping outside building all sizes: Polyvinyl chloride (PVC) plastic piping Schedule 40, ASTM D1785 with 150 PSI minimum pressure rating. Fittings shall conform to ASTM D2466 with solvent weld joints conforming to ASTM D2564.

2.04 GAS PIPING:

A. Aboveground Piping, Pipe Sizes Up To and Including 2": Black steel pipe, Schedule 40, ASTM-A53 with threaded joints and Class 150 malleable iron threaded fittings, except piping located within return air plenums or above non-accessible ceilings which shall be all welded same as for pipe sizes 2-1/2" and larger.

B. Aboveground Piping, Pipe Sizes 2-1/2" and Larger: Black steel pipe Schedule 40, ASTM-Z53 with buttwelded joints and standard weight wrought steel buttwelded fittings.

C. Exposed Exterior Piping, All Pipe Sizes: Black steel pipe, Schedule 40, ASTM-A120 with buttwelded joints and standard weight wrought steel buttwelded fitting. Pipe shall have a factory applied extruded high density polyethylene coating of a minimum thickness of 24 mils with a hot applied adhesive undercoating. Coating shall be equal to Republic X-Tru-Coat. All joints, fittings and mars in pipe coating shall be wrapped with a cold applied coal tar tape of 35 mil thickness minimum. Tape coating shall be equal to X-Tru-Tape Tapecoat CT or Scotchwrap No. 51.

D. Underground piping shall be all welded, same for exposed gas piping, including factory applied coating.

E. All gas piping located above non-accessible ceilings shall be installed within a black steel, Schedule 10 pipe casing with welded joints and standard weight wrought steel buttwelded 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. Thermometers:

1. Thermometers shall be the red-reading mercury filled adjustable angle type. Thermometers shall be adjustable to any angle through a 180 degree arc and shall

be provided with a locking device. Thermometers shall have V-cast aluminum case with baked enamel finish and 9 inch scale. Thermometers shall be provided with separable sockets and, where installed on insulated pipes, sockets shall be extended neck type. Thermometer scale range shall be 0 to 160 degrees F. Thermometers shall be Weksler Adjust-Angle Series Type AA-5, Trerice Adjustable Angle Series Type BX, or Weiss Vari-Angle Series Type VS.

D. 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. 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.

7. Inserts shall be cast iron or galvanized steel individual type, with accommodations for removable nuts and threaded rods up to 3/4 inch diameter, and permitting lateral adjustment.

E. Floor, Wall and Ceiling Plates:

1. Escutcheons shall be installed on all pipes where they pass through floors, ceilings, walls, or partitions in finished areas.

2. The interior of closets, adjacent to finished areas, shall be considered as finished for the intent of these Specifications.

3. Escutcheons shall be split, hinged, stamped brass type designed to fit the pipe, and to cover the terminating pipe sleeve, in chrome plated finish unless otherwise specified, with securing device to hold the escutcheon tight to the pipe.

2.06 WATER HAMMER ARRESTORS: Water hammer arrestors shall be stainless steel sealed bellows type, pressure rated for 250 psi, tested and certified in accordance with PDI standard WH-201; J.R. Smith Series 5000 or approved equal.

2.07 VALVES:

A. All shutoff valves shall be gate or ball 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. Class 150 valves meeting the above specifications may be used where pressure requires; NIBCO S-134 or approved equal.

C. Ball valves 2" and smaller shall be 600 psi CWP, have cast brass bodies, replaceable reinforced Teflon seats, conventional port, blowout proof stems, chrome-plated brass ball, solder ends with extended solder cups; NIBCO S-580-BR-R-70 or approved equal.

D. Gas valves and cocks shall be Class 200 plug cocks, conforming to ASTM A-126 Class B, with semi-steel body teflon coated tapered plug, threaded of flanged ends, wrench operated; Walworth 1559 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 pipe lines shall be sealed off with white vapor barrier coating at valves, flanges and fittings.

E. Unions shall not be insulated.

F. Pipe covering protection shields and saddles shall be provided around exterior of pipe insulation at pipe hangers which fit around pipe insulation. Foamglass pipe insulation shall be used under saddles on pipe 2" and larger.

2.09 FIBERGLASS PIPE INSULATION: Insulation on all aboveground piping within building shall be one piece fibrous glass sectional pipe insulation with white all service jacket. Longitudinal jacket laps and butt strips shall be self-sealing. Insulation shall have an average thermal conductivity not to exceed 0.23 BTU-in. per square foot per degrees F. per hour at a mean temperature of 75 deg. F. Insulation shall be Owens Corning Fiberglass 25 ASJ/SSL or 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"	1¼ to 2"	2½ to 4"	4" & Over
Cold Water	50°-65°F	1/2"	1"	1"	1"
Hot Water	200°	½"	1"	1"	1-1/2"

2.11 PIPE HANGERS AND SUPPORTS: Provide pipe hangers and supports in accordance with Section 15100 "Pipe Hangers and Supports".

PART 3 EXECUTION

3.01 INSTALLATION:

A. Install soil and vent piping pitched to drain at minimum slope of 1/4" per foot (2%) for piping 3" and smaller, and 1/8" per foot (1%) for piping 4 " and larger.

B. Install piping and make all joints in accordance with the pipe manufacturer's recommendations. Make provisions for thermal expansion and contraction.

C. Install cleanouts on drainage piping where indicated on the drawings and as required by the code, and at every change in direction of more than 45 deg. in horizontal piping. Locate wall cleanouts as low as possible but high enough for the cover plate to clear the base. Locate test tees where necessary to separate sections of piping for testing.

D. Rough-in for fixtures in accordance with the fixture 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 shall terminate at 1'-0" above roof.

H. Install shut-off valves where indicated on the drawings and required by the code including valves at all fixture groups, and equipment.

I. Install drain valves at low points of all new water piping except buried piping.

3.02 EXCAVATION, TRENCHING AND BACKFILLING:

A. Perform all excavation, trenching and backfilling for work under Division 15. During excavation, material for backfilling shall be piled back from the banks of the trench to avoid overloading and to prevent slides and cave-ins. All excavated materials not to be used for backfilling shall be re moved and disposed of. Grading shall be done to prevent surface water from flowing into trenches and other excavation and any water accumulating therein shall be removed by pumping. All excavations shall be made by open cut. No tunneling shall be done.

B. Bottom of trench shall be uniformly graded to provide firm support and even bearing surface for pipe.

C. Pipe shall be laid on firm soil, laid in straight lines and on uniform grades. Provide bell holes so that barrels of pipe rest evenly on bottom of trench along entire length of pipe .

D. Pipe shall be inspected and tested prior to backfilling. No roots, rocks or foreign materials of any description shall be used in backfilling the trenches. Trench shall be hand filled to a minimum of 12" above the top of the pipe with clean earth and tamped to 95 percent compaction after first layer using the modified Proctor test method of compaction.

3.03 TESTS OF PIPING:

A. Install temporary connections and plugs or valves at all points necessary for venting air from the piping, filling, holding test pressure, draining and flushing the piping.

B. Test all new soil, waste and vent piping under 10 feet head of water (except for the uppermost 10 feet) as required by the Plumbing Code, with zero leakage allowed. The test pressure shall be maintained for at least 30 minutes before inspection starts and maintained for the time necessary to inspect all joints but not less than 15 minutes.

C. Test all new pressure piping roughing hydrostatically to show zero leakage in eight (8) hours at the following pressures measured at the low points: Domestic water (C.W. and H.W.), 125 psi.

D. All gas piping shall be tested with air at a minimum of 50 psi for two (2) hours with no drop in pressure.

3.04 FLUSHING AND STERILIZING:

A. Flush all new water piping after pressure tests and repairs are completed by draining from the low points; refill with clean water.

B. Sterilize the above ground water piping after fixtures and equipment are installed with 50 ppm chlorine solution distributed throughout all C.W. and H.W. piping; let stand for 24 hours, then flush enough water at drinking fountains and lavatories to reduce the residual chlorine content to less than one (1) ppm. Domestic water heater shall have the heat source shut off while sterilization is in progress.

3.05 START-UP, ADJUSTMENT, INSTRUCTION: Start-up, lubricate, adjust and test equipment installed under this Section and furnish instructions to the Owner.

3.06 OPERATIONAL TESTS:

A. When installation and adjustment of all fixtures and equipment is complete, perform operational tests of all plumbing system components at normal operating pressures and include the following tests:

1. Operate all manual and automatic valves at least one full open-closed cycle; examine for stem leakage, failure to close or other malfunction.

2. Pour at least five (5) gallons of water into every floor drain to test for pipe stoppage.

END OF SECTION

SECTION 15431 DRAINS, CLEANOUTS & DRAINAGE ACCESSORIES

PART 1 GENERAL

1.01 RELATED DOCUMENTS:

A. All work specified in this section is subject to the general provisions.

B. Refer to the following sections for related work in connection with drains, cleanouts and drainage accessories.

15011 Submittals
15400 Plumbing Basic Materials and Methods

1.02 DESCRIPTION OF WORK: The number and size of the drains and cleanouts are indicated and scheduled on the drawings.

1.03 QUALITY ASSURANCE:

A. Manufacturing firms shall be regularly engaged in the manufacture of plumbing products of type and sizes required, whose products have been in satisfactory use in similar service for not less than five (5) years.

B. Subject to compliance with requirements, provide drains, cleanouts & drainage accessories of one of the following manufacturers:

1. Josam Mfg. Co.

2. Smith (Jay R.) Mfg. Co.

3. Wade div., Tyler Pipe

4. Zurn Industries, Hydromechanics Div.

PART 2 PRODUCTS

2.01 GENERAL:

A. Provide factory fabricated drainage piping products of the size and type as indicated on drawings, including features as specified herein. Where not indicated, provide proper selection as determined by installer to comply with installation requirements and governing regulations.

B. Floor drains shall be provided with trap primer connections where indicated on drawings.

C. All floor drains without trap primers shall be provided with deep seal "P" traps.

2.02 CLEANOUTS:

A. Vertical and horizontal lines exposed - Test Tee - Smith 4510.

B. Vertical lines concealed - Smith 4472 with stainless steel access cover.

C. Horizontal lines under unfinished floors - Smith 4405.

D. Finished Floors - Smith 4023 cast iron adjustable floor level cleanout assembly with round polished bronze top.

E. Finished Floors - Linoleum, Terrazzo or Tile - Smith 4143 cast iron adjustable floor level cleanout assembly with round polished bronze top. Top depression to be covered with surrounding floor pattern bonded with waterproof adhesive.

F. All lines outside of building - Smith 4400.

G. Finished floors - Carpet Smith 4023-Y cast iron adjustable floor level cleanout assembly with nickel bronze top an 1-1/2" diameter stainless steel carpet marker. Carpet shall cover top of cleanout with carpet marker exposed above carpet to serve as cleanout locator.

PART 3 EXECUTION

3.01 EXECUTION:

A. All floor drain strainers shall be securely fastened to drain body.

B. During construction drains shall be kept covered so that traps, sediment buckets and dome type strainers are kept free from debris and trash.

END OF SECTION

SECTION 15442 WATER HEATERS - ELECTRIC

PART 1 GENERAL

1.01 RELATED DOCUMENTS:

A. All work specified in this section is subject to the provisions of Section 15010 "Mechanical General".

B. Refer to the following sections for related work in connection with electric water heaters:

15011 Submittals
15020 Identification of Piping System
15100 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 and shall also include the following: Tank Accessories

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 90.1-1989 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 for heater size, capacity, electrical characteristics and element operation.

2.02 ELECTRICAL STORAGE TYPE WATER HEATERS:

A. Tank Materials - Tank shall be welded steel construction, 150 psi working pressure.

B. Lining - All interior tank surfaces shall be glass lined.

C. Elements - Electric heating elements shall be low watt density with zinc plated copper sheath.

D. Enclosure - Heater shall be factory insulated and provided with steel enclosure with baked enamel finish.

E. Controls - Adjustable thermostat, high temperature cut off and low water cut off.

F. Accessories - Provide the following water heater accessories:

Magnesium anode
ASME combination temperature and pressure relief valve.
Brass tank blowdown drain valve.
Thermometer
Automatic air vent
Watts No. 530 adjustable bleeder pressure relief valve.

G. Warranty - Furnish three (3) year limited warranty for tank leakage.

H. Manufacturer - Provide water heaters meeting specification requirements of one of the following manufacturers:

A.O. Smith
Lochinvar
Rheem
Ruud
State Industries

PART 3 EXECUTION

3.01 INSTALLATION OF WATER HEATER:

A. Install water heater as indicated, in accordance with manufacturer's installation instructions, and in compliance with applicable codes.

B. Connections - Make connections between water heaters and domestic water piping shutoff valves with unions or flanges as indicated. Provide dielectric isolation at all tank connections.

C. Pipe heater drain and relief valve drain, full size through exterior wall or into mop sink.

D. Install bleeder pressure relief valve in tank drain line, set 25 psi below relief valve setting.

E. Where water heaters are indicated to be suspended above floor either above or below ceiling install heaters as detailed on drawings. Provide all necessary hanger rods, bolts, plates and miscellaneous steel as required.

F. Drain Pans - Provide drain pans constructed of 20 gauge galvanized sheet metal for all water heaters suspended above finished floor. Provide a minimum 1 inch drain from bottom of pan to mop sink.

G. Identification - Provide sign securely attached to water heater identifying equipment number, service and capacity. Provide valve tags on all valves and provide identification on all piping connections to water heaters.

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: Drawings and general provisions of Contract, including General and Supplementary Conditions apply to work of this section.

1.02 DESCRIPTION OF WORK:

A. Extent of plumbing fixtures and trim work is indicated by drawings and schedules, and by requirements of this section.

B. Refer to Division-16 sections for electrical connections to water coolers and other plumbing fixtures; not work of this section.

1.03 QUALITY ASSURANCE:

A. Manufacturing: Firms shall be regularly engaged in the manufacturing of plumbing fixtures of the type, style and configuration required, whose products have been in satisfactory use in similar service for not less than five (5) years.

B. Comply with applicable portions of the Plumbing Code, latest edition, pertaining to materials and installation of plumbing fixtures.

C. Comply with applicable ANSI standards pertaining to plumbing fixtures and systems, and bath tub units.

D. Comply with ANSI A117.1 standard and the Americans with Disabilities Act (ADA) pertaining to plumbing fixtures for handicapped.

E. Comply with standards established by Plumbing and Drainage Institute pertaining to plumbing fixture supports.

F. Comply with applicable FS WW-P-541/-Series sections pertaining to plumbing fixtures.

G. Provide water coolers which are rated and certified in accordance with applicable Air-Conditioning and Refrigeration Institute standards and are listed by Underwriter's Laboratories.

1.04 SUBMITTALS:

A. Submit manufacturer's specifications for plumbing fixtures and trim, including catalog cut of each fixture type and trim item furnished, roughing-in dimensioned drawings, templates for cutting substrates, fixture carriers, and installation instructions.

B. Submit maintenance data and parts lists for each fixture type and trim item, including instructions for care of finishes. Include this data in maintenance manual.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING:

A. Deliver plumbing fixtures individually wrapped in factory-fabricated containers.

B. Handle plumbing fixtures carefully to prevent breakage, chipping and scoring the fixture finish. Do not install damaged plumbing fixtures; replace and return damaged units to equipment manufacturer.

C. Fixtures shall be protected after installation to prevent scratches, dents, surface mar or any other damage during the course of construction.

PART 2 PRODUCTS

2.01 PLUMBING FIXTURES:

A. Provide factory-fabricated fixtures of type, style and material scheduled on drawings. For each type fixture, provide fixture manufacturer's standard trim, carrier, seats, and valves as indicated by their published product information; either as designed and constructed, or as recommended by the manufacturer, and as required for a complete installation. Where more than one type is indicated, selection is Installer's option; but, all fixtures of same type must be furnished by single manufacturer. Where type is not otherwise indicated, provide fixtures complying with governing regulations.

B. Fixture color shall be white unless noted otherwise.

2.02 MATERIALS:

A. Provide materials which have been selected for their surface flatness and smoothness. Exposed surfaces which exhibit pitting, seam marks, roller marks, foundry sand holes, stains, decoloration, 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
Aqua-Glass Corporation
2. Plumbing Trim

American Standard, U.S. Plumbing Products
Chicago Faucet Company
Eljer Plumbingware Division, Wallace-Murray Corporation
Kohler Company
Speakman Company
T & S Brass and Bronze Works, Inc.
Eastman Brasscraft
McGuire Manufacturing Co.

3. Fixture Seats

Bemis Mfg. Co.
Beneke Corp., Div. Of Beatrice Foods
Church
Olsonite Corp., Olsonite Seats

4. Fixture Carriers

Josam Mfg. Co.
J.R. Smith
Wade
Zurn Industries, Inc., Hydromechanics Div.

PART 3 EXECUTION

3.01 INSPECTION AND PREPARATION:

A. Examine roughing-in work of domestic water and waste piping systems to verify actual locations of piping connections prior to installing fixtures. Also examine floors and substrates, and conditions under which fixture work is to be accomplished. Correct any incorrect locations of piping, and other unsatisfactory conditions for installation of plumbing fixtures. Do not proceed with work until unsatisfactory conditions have been corrected.

B. Install plumbing fixtures of types indicated where shown and at indicated heights; in accordance with fixture manufacturer's written instructions, roughing-in drawings, and with recognized industry practices. Ensure that plumbing fixtures comply with requirements and serve intended purposes. Comply with applicable requirements of the Plumbing Code pertaining to installation of plumbing fixtures.

C. Fasten plumbing fixtures securely to indicated supports or building structure; and ensure that fixtures are level and plumb. Secure plumbing supplies behind or within wall construction so as to be rigid, and not subject to pull or push movement.

D. Where fixtures are mounted against or abut walls, caulk along fixture.

3.02 CLEAN AND PROTECT:

A. Clean plumbing fixtures of dirt and debris upon completion of installation.

B. Protect installed fixtures from damage during the remainder of the construction period.

3.03 FIELD QUALITY CONTROL:

A. Upon completion of installation of plumbing fixtures and after units are water pressurized, test fixtures to demonstrate capability and compliance with requirements. When possible, correct malfunctioning units at site, then retest to demonstrate compliance; otherwise, remove and replace with new units and proceed with retesting.

B. Inspect each installed unit for damage to finish. If feasible, restore and match finish to original at site; otherwise, remove fixture and replace with new unit. Feasibility and match to be judged by Architect. Remove cracked or dented units and replace with new units.

3.04 EXTRA STOCK: Furnish special wrenches and other devices necessary for servicing plumbing fixtures and trim to Owner with receipt. Furnish one (1) device for every ten (10) units.

END OF SECTION

SECTION 15616 GAS FLUES

PART 1 GENERAL

1.01 DESCRIPTION:

A. All work specified in this Section is subject to the provisions of Section 15010.

B. Gas flues shall be U.L. listed and provided as indicated, shall meet all constraints of construction and shall comply with all Specifications Sections.

1.02 COORDINATION: The gas flues as manufactured by Metalbestos have been used as the basis of design. Any modifications to roof openings, structural supports, etc., that result from the use of equipment by any other manufacturer, shall be coordinated with all other trades; this coordination shall occur before delivery of the equipment from the manufacturer. Any modifications shall be performed without incurring any additional cost to the Owner.

1.03 ACCEPTABLE MANUFACTURERS: Factory fabricated gas flues shall be Metalbestos or an approved equal. Any flues selected must meet or exceed all the requirements of the Contract Documents.

PART 2 PRODUCTS

2.01 GENERAL:

A. The flue supports shall be tested, approved and listed by Underwriter's Laboratories. These supports shall be capable of supporting four times the combined weight of the flue installation.

B. All clearances to combustible material shall be maintained so as to comply with all codes and regulations.

C. Provide weatherproof roof caps with bird-proof screens on all gas vents.

D. Flues extending above roof surfaces shall terminate in a U.L. listed top or housing assembly, according to Appendix D of NFPA No. 211 or according to local code.

PART 3 EXECUTION

3.01 INSTALLATION:

A. Gas flues shall be installed in complete conformance with the manufacturer's recommendations and these Contract Documents.

B. Provide all necessary expansion joints, supports, thimbles, etc., for a complete installation.

END OF SECTION

SECTION 15665 DX/GAS SPLIT SYSTEM

PART 1 GENERAL

1.01 DESCRIPTION:

A. All work specified in this Section is subject to the provisions of Section 15010.

B. Split system air handler shall be provided with minimum capacities schedules, shall meet all constraints of construction, and shall comply with all sections of this specification.

1.02 COORDINATION: The units of one manufacturer have been used as a basis of design. Any modifications to ductwork, piping, wiring, building structure, etc., that result from the use of any other units shall be coordinated with all trades prior to delivery of approved equipment from the manufacturer to the job site. Any costs incurred because of these modifications shall be the responsibility of the Contractor.

1.03 ACCEPTABLE MANUFACTURERS: The following manufacturers are acceptable on this project: Carrier and Trane. The manufacturer shall have a local distributor with repair parts in stock or have access to repair parts within a 24 hour period.

PART 2 PRODUCTS

2.01 FURNACE:

A. Casing shall be heavy-gauge steel finish with a baked on acrylic finish. Unit shall be lined with one-half (1/2") inch thick insulation. Multiple knock-outs shall be provided for utility and control connections.

B. Evaporator fan shall be multi-speed, direct driven, centrifugal, forward curved type sized to meet the air quantity and static pressure scheduled at the middle speed selection.

1. Provide a permanently lubricated, open drip-proof motor with thermal overload protection. Motor shall have a Class B insulation.

2. Fan bearings shall be permanently lubricated with an average life of 100,000 hours.

3. The entire fan/motor assembly shall be isolated from the unit with rubber-in-shear vibration isolators.

C. Gas furnace section shall be up flow as indicated on the drawings. Furnace shall be natural draft type, AGA certified and fueled by LP gas. Unit shall meet or exceed the capacities scheduled.

1. Heat exchanger shall be constructed of aluminized steel with twenty (20) year warranty.

2. Provide electronic ignition with intermittent pilot and redundant gas valve.

3. Burners shall be multi-port type constructed out of aluminized steel.

2.02 EVAPORATOR COIL:

A. Evaporator coil shall have aluminum fins bonded to seamless copper tubes. Coil shall be factory tested under 300 psig pressure to assure leakproof construction. Units shall ship

with thermal expansion valve, metering devices, quick-connect couplings and an operating charge of refrigerant.

B. Coil casing shall be heavy-gauge steel lined with one half (1/2") inch thick insulation. Unit shall have horizontal insulated drain pan.

C. Coil shall be provided with a secondary drain pan, either factory installed or field fabricated.

2.03 COMPRESSOR UNIT:

A. Air cooled outdoor unit shall be factory assembled into a weatherproof cabinet. Unit shall be UL listed and comply with ARI Standard No. 240.

B. Cabinet shall be heavy-gauge, zinc coated steel, phosphatized, painted with an epoxy resin primer (exterior) and finished with an acrylic topcoat. Electrical and refrigeration connections shall be located at accessible points. Removable panel shall allow access to all components and connections. Drainage hole shall be provided in basepan for removal of moisture.

C. Each refrigerant circuit shall be complete with hermetic or semi-hermetic compressor with high and low pressure cutouts, crankcase heater, moisture indicating sight glass, filter drier, and access and service valves. Compressor shall be mounted on rubber grommets to minimize noise and vibration transmission.

D. Condenser coil shall have heavy aluminum fins bonded to copper tubes. Unit shall be factory tested under pressure at 425 psig to assure leak proof construction.

E. Condenser fans shall be propeller type, direct driven by permanently lubricated motors, designed for outdoor installation. Entire fan/motor assembly shall be isolated from unit with rubber-in-shear vibration isolators. Provide fan guard on outside of fan.

2.04 FILTRATION:

A. Each furnace unit shall be furnished with two (2") inch thick throwaway filters.

B. Furnace units shall either be provided with side filter racks or bottom return plenums and filter racks as shown on the drawings.

2.05 CONTROL SYSTEM: Units shall be complete with unit manufacturer’s solid state temperature controls package, with 7-day programmable thermostat.

PART 3 EXECUTION

3.01 INSTALLATION:

A. The entire split system air handler and associated items shall be installed in complete conformance with the manufacturer's recommendations and these Contract Documents.

B. Units shall be provided with duct connections as indicated on the drawings, and all connections shall be made with flexible connectors as specified herein.

C. All low voltage wiring shall be installed in conduit by a licensed electrician. Low voltage control wiring shall be installed under this division. All line voltage wiring (115V and higher) shall be installed under Division 16.

END OF SECTION

SECTION 15668 SPLIT SYSTEM HEAT PUMP

PART 1 - GENERAL

1.01 DESCRIPTION:

A. All work specified in this Section is subject to the provisions of Section 15010

B. Split system air handler shall be provided with minimum capacities scheduled, shall met all constraints of construction, and shall comply with all sections of this specifications.

1.02 COORDINATION: The units of one manufacturer have been used as a basis of design. Any modifications to ductwork, piping, wiring, building structure, etc., that result from the use of nay other units shall be coordinated with all trades prior to delivery of approved equipment from the manufacturer to the job site. Any costs incurred because of these modifications shall be the responsibility of the Contractor.

1.03 ACCEPTABLE MANUFACTURERS: The following manufacturers are acceptable on this project: Trane, Carrier, and McQuay. The manufacturer shall have a local distributor with repair parts in stock or have access to repair parts within a 24 hour period.

PART 2 - PRODUCTS

2.01 BLOWER COIL UNIT:

A. Furnish and install units of the type and size as shown on the drawings. The unit and application rating data shall bear the ARI and UL seal. Units shall be for arrangement as shown on drawings.

B. The cabinet shall be constructed of 20 gauge steel. The cabinet shall be reinforced, braced and welded for maximum strength. All interior casing parts exposed to moisture laden atmosphere shall be zinc-coated sheet metal. Casing on cabinet unit shall be sound and thermal insulated with a glass fiber blanker fastened with water-proof adhesive. The basic unit front shall have heavy density ½" glass fiber insulation for thermal and acoustic insulation.

C. The coil shall be of the copper or aluminum tube, aluminum fin direct expansion type and shall meet the capacities as specified.

D. The unit drain pan shall have a zinc protective coat and shall be insulated on the underside. The drain pan is pitched to provide a smooth surface for positive condensate drainage, provided the unit is installed level.

E. The fans shall be centrifugal forward curved, double width. The fan housing volutes shall be metal high strength material.

F. Motors shall have thermal overload protection with resilient mounts.

G. Unit shall be furnished with built-in electric heating coil sized as shown on drawings. Coil shall have nichrome element, contactor, and safety controls. Coil shall be UL listed.

H. Unit shall be furnished with filter frame and 2 sets of 1" throwaway filters, Farr 30/30 or approved equal. Filter frame shall be furnished by manufacturer or job built to unit manufacturer's specifications.

I. Unit shall be Trane or approved equal by Carrier, or McQuay.

2.02 OUTDOOR HEAT PUMP UNIT:

A. Furnish and install in accordance with the manufacturer's instructions air cooled heat pump compressor/coil/fan units as shown on the drawings. Units shall be ARI rated.

B. The unit frame shall be a one piece welded assembly with zinc coated steel formed channel members. Exterior surfaces shall be phosphatized, epoxy primed and finished with baked on enamel.

C. Compressor shall be of the hermetic reciprocating type. Compressor shall have a forced feed lubrication system with strainers, magnetic plugs and centrifugal cleaning, reversible, positive displacement oil pump, two point lubrication for each bearing surface, built-in crankcase heater, internal spring loaded relief valves between high and low sides. Hermetic motors shall be suction gas cooled, sized for operation within the limits of the motor rating. Solid state sensors imbedded in motor windings shall protect the motor fan overtemperature or overloads.

D. Condenser fans shall be of the vertical discharge, propeller type, direct drive, statically and dynamically balanced, with aluminum blades, and zinc plated corrosion resistant hubs. Motors shall have permanently lubricated ball bearings in accordance with NEMA Standard MG-1 complete with built-in current and thermal overload protections. ;Motors shall have weathertight slingers over the bearings.

E. Condenser coils shall be of the copper or aluminum tube, aluminum fin design with fins mechanically bonded to the tubes. Coils shall be factory tested at 450 PSIG air pressure under warm water and vacuum de-hydrated. Coil guards shall protect the coils form mechanical damage.

F. The control circuit shall include fusing, four way reversing valve, and control power transformer. Unit shall be wired complete with magnetic contactors for compressors and condenser fan motors. Compressor and condenser fan motors shall have overload protection. Unit safety controls shall include high and low pressure cutouts.

G. Units shall be Trane or approved equal by Carrier or York .

2.03 CONTROLS FOR SPLIT SYSTEM HEAT PUMP: Controls shall be furnished by the unit manufacturer and shall include 7-day programmable room thermostat with sub-base. Thermostat shall have system "Heat-Off-Cool" switch and "On-Auto" fan switch. Wiring diagrams shall be furnished as required for installation.

END OF SECTION

SECTION 15760 UNIT HEATERS

PART 1 GENERAL

1.01 DESCRIPTION:

A. All work specified in this Section is subject to the provisions of Section 15000.

B. Unit heaters (UH) shall be provided to meet the minimum capacities scheduled at the indicated conditions, shall meet all constraints of construction and shall comply with all Specifications Sections.

1.02 COORDINATION: Unit heaters of one manufacturer (Modine) have been used as the basis of design. Any modifications to controls, electrical connections, structural supports, etc., that result from the use of equipment by any other manufacturer shall be coordinated with all other trades; this coordination shall occur before delivery of equipment from the manufacturer. Any modifications required shall be performed without incurring additions to the Contract.

1.03 ACCEPTABLE MANUFACTURERS: Unit heaters shall be Modine or equal units by Reznor, Sterling, or Trane.

PART 2 PRODUCTS

2.01 DESCRIPTION:

A. Unit heaters shall be A.G.A. certified, gas-fired propeller type.

B. Cabinet shall be cold rolled steel, with factory-applied finish.

C. Heat exchanger shall be aluminized steel with minimum 20 gauge tube sections and header plates. Burners shall be aluminized or stainless steel.

D. Gas valve shall be 24 volt, 1 phase, 60 cycle, arranged for 100% safety shut-off at both main and pilot burner gas supply. High limit control shall be wired to shut off gas valve and cause fan to operate until limit resets. 115/24 volt transformer shall be supplied on each unit and factory wired on the low voltage side to the gas valve.

E. Fan time delay switch shall be provided and shall be controlled by low voltage thermostat.

F. Units shall have intermittent spark ignition with electronic flame supervision.

G. Motor shall be 120 volt, 1 phase, 60 cycle, totally enclosed fan cooled type with internal automatic reset thermal overload protection.

H. Fan shall be direct driven, with fan guard. Fan shall be statically balanced.

I. All line voltage wiring shall be completely enclosed in flexible conduit.

J. All units and component assemblies shall be warranted for one year. Heat exchanger, flue collector and burners shall have ten year non-prorated limited warranty on materials and workmanship.

PART 3 EXECUTION

3.01 INSTALLATION: Unit heaters shall be installed in complete conformance with the manufacturer's recommendations and the Contract Documents.

END OF SECTION

SECTION 15765 GAS-FIRED INFRA-RED HEATERS

PART 1 - GENERAL

1.01 DESCRIPTION:

A. All work specified in this Section is subject to the provisions of Section 15000.

B. Infra-red heaters shall be provided to meet the minimum capacities scheduled at the indicated conditions, shall meet all constraints of construction, and shall comply with all specification sections.

1.02 COORDINATION: Infra-red heaters of one manufacturer (Enerco Products) have been used as the basis of design. Any modifications to controls, electrical connections, structural supports, etc. that result from the use of equipment by any other manufacturer shall be coordinated with all other trades, this coordination shall occur before delivery of equipment from the manufacturer. Any modifications required shall be performed without incurring additions to the Contract.

PART 2 - PRODUCTS

2.01 DESCRIPTION:

A. Heaters shall be 8060N.DSP-5 as manufactured by Enerco Products Company, or equal by American, Space-Ray, or Lambert. Heaters shall be equipped with direct spark, 100% shut-off ignition. Heaters shall be design certified by A.G.A., and comply with current OSHA requirements.

B. The heater's combustion surface shall be made of perforated ceramic refractory, shall be capable of operating continuously at 1810 degrees F., and shall withstand thermal shock when water quenched. Heater shall have a minimum of 25 square inches of ceramic radiant surface per 10,000 BTU input. This surface area is measured by the length x the width of exposed ceramic emitting surface only. Burner housings shall be constructed of aluminized steel. Secondary radiant surface (rods or screens) shall be constructed of stainless steel. The reflectors shall be constructed of polished aluminum.

C. The manufacturer shall have a published ten (10) year warranty on the heater's infra-red ceramic element assembly and the secondary radiating surface (rods or screens).

PART 3 - EXECUTION

3.01 INSTALLATION: Infra-red heaters shall be installed in complete conformance with the manufacturer's recommendations and the contract Documents.

END OF SECTION

SECTION 15820 FANS

PART 1 GENERAL

1.01 DESCRIPTION:

A. All work specified in this Section is subject to the provisions of Section 15010.

B. Fans shall be provided to meet the minimum capacities scheduled at the indicated conditions and shall meet all constraints of construction and shall comply with all specification Sections.

C. Fans shall be tested and rated in accordance with the Air Moving and Conditioning Association, Inc., Standard No. 210, Test Code for Air Moving Devices and bear the AMCA Seal.

D. Fan motor enclosure shall be the drip-proof type unless specifically indicated otherwise.

E. Roof-mounted fans shall be waterproof design so that water cannot enter the building through the fan housing, whether or not the fan is operating.

F. Centrifugal fan wheels shall be statically and dynamically balanced.

1.02 COORDINATION: Fans of specific manufacturers have been used as the basis of design. Any modifications to controls, electrical connections, structural supports, etc., that result from the use of equipment by any other manufacturer, shall be coordinated with all other trades; this coordination shall occur before delivery of the equipment from the manufacturer. Any modifications shall be performed without incurring additions to the Contract.

PART 2 PRODUCTS

2.01 DESCRIPTION:

A. CABINET FANS:

1. Ceiling cabinet fans as indicated on drawings shall have acoustically insulated housings and shall not exceed sound level ratings shown. Fans shall bear the AMCA Certified Ratings Seal and U.L. Label. Integral backdraft damper shall be chatterproof. Fans shall have true centrifugal wheels. Face grille shall be of aerodynamic white eggcrate design and provide 85% free area. Manufacturers shall submit vibration amplitudes and magnetic motor hum in decibels. Fans shall be provided with cord, plug, and receptacle inside the housing. Entire fan, motor and wheel assembly shall be removable without disturbing the housing. Fan motors shall be suitably grounded and mounted on vibration isolators. Fans shall be Greenheck or approved equal by Cook, Acme or Penn.

B. SIDEWALL PROPELLER FANS:

1. The propeller fan blade shall have die formed gussetted blades welded to a spherically shaped steel hub. Provide keyway slots and set screws to secure fan wheel to the shaft. The entire propeller assembly shall be statically and dynamically balanced to ensure vibration free operation.

2. The steel fan panel shall be of one (1) piece construction with spun venturi, formed flanges and welded corners. The fan panel shall have a drive support frame providing a rigid platform for the motor and shaft.

3. V-belt drives shall be designed for not less than 150% of connected driving capacity and motor sheaves shall be adjustable to provide not less than 20% speed variation. Sheaves shall be selected to drive the fan at a speed to produce the scheduled capacity indicated on the drawings when set at the approximate midpoint of the sheave adjustment. Motors with V-belt drives shall be provided with adjustable bases.

4. Fan shaft shall be ground and polished steel with slotted keyways.

5. Bearings shall be the ball bearing pillow block type. Bearing shall be rated for an average life of 100,000 hours.

6. Provide matching factory fabricated motor side guards, outlet screens and mounting collars.

7. Fans shall be Greenheck or approved equal by Cook, Acme or Penn.

PART 3 INSTALLATION

3.01 INSTALLATION: Fans shall be installed in complete conformance with the manufacturer's recommendations and the Contract Documents. Coordinate the actual units to be provided with all trades.

3.02 ADJUSTMENT: The fans shall be tested and adjusted to provide the scheduled capacities.

END OF SECTION

SECTION 15840 DUCTWORK AND ACCESSORIES

PART 1 GENERAL

1.01 DESCRIPTION:

A. All work specified in this Section is subject to the general provisions of Section 15010.

B. Ductwork shall be provided to meet the minimum capacities indicated, shall meet all constraints of construction, and shall comply with all Specification Sections.

C. See Section 15180 for ductwork insulation (duct wrap and liner).

D. No ductwork shall be fabricated until fabrication shop drawings have been prepared, submitted and reviewed. Ductwork installed before reviewed shop drawings is entirely at the risk and expense of the contractor.

PART 2 PRODUCTS

2.01 DUCTWORK - GENERAL:

A. SMACNA Standards indicated shall mean standard published 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:

1. Low pressure - 2" static pressure, Class A Seals

2. Exhaust ductwork - 1" S.P., Class B Seals

B. Ductwork shall be constructed of G90 galvanized sheet steel, unless otherwise specified herein. All rectangular ductwork shall be lined. Ductwork shall be round, oval or rectangular as indicated. Sizes given shall be considered to be the clear inside dimension.

C. Turning vanes shall be installed in all 90 degree square and rectangular elbows and at other locations shown. The turning vanes shall be double thickness type, with vanes secured to the runners and runners secured to the duct. Elbows in round ductwork and other radiused elbows shall have an inside radius equal to the diameter of the duct.

D. Low pressure round ducts up to including 12" in diameter shall be longitudinal lock seam construction. Round ducts larger than 12" shall be spiral lock seam construction.

1. Girth joints in ducts up to and including 12" shall be beaded crimp type and each joint shall be fastened with sheet metal screws, equally spaced, not more than 8" on centers and with a minimum of 3 screws in each joint. The beaded-crimp joint shall provide at least a 1" lap to accommodate the sheet metal screws.

2. Girth joints in ducts larger than 12" shall be the beaded sleeve type. The beaded sleeve joints shall be fabricated of the same gauge galvanized sheet steel and the duct shall be a minimum of 4" in length. Each section of duct shall be fastened to the sleeve with sheet metal screws equally spaced, not more than 8" on centers and with a minimum of 3 screws in each section.

E. Duct hangers and supports shall be in accordance with Section V (pages 5-1 thru 5-13) HANGERS AND SUPPORTS of the referenced SMACNA Standard, except:

1. Hangers shall be spaced not over 8'-0" on centers.

2. For rectangular ducts with longest dimensions up through 60", hangers shall be the galvanized steel strap type; with the longest dimension 61" and larger, hangers shall be trapeze type constructed of galvanized steel angles with round hanger rods. Sizes for strap hangers and trapeze angles and rods shall be based on duct size as scheduled in the SMACNA Standard, Table 5-1 (page 5-8) for strap hangers and Table 5-3 (page 5-10) for trapeze hangers.

3. For round ducts, hangers shall be galvanized steel strap hangers. Sizes and number of strap hangers shall be based on duct size as scheduled in the SMACNA Standard, Table 4-2 (page 4-9). For duct sizes requiring 2 hangers, the hanger supports shall be minimum 3/8" round steel hanger rods.

2.02 MANUAL DAMPERS AND DAMPER HARDWARE:

A. Splitter dampers shall be constructed of not less than 20 gauge galvanized steel sheet. The length of the damper blade shall be the same as the width of the widest duct section at the split, but in no case shall blade length be less than 12".

B. Volume Control Dampers:

1. Dampers shall be single blade butterfly type in ducts up to and including 12" x 12" size; for ducts larger than 12" x 12", in either or both dimensions, the dampers shall be the multi-blade type. All dampers in O.A. ductwork shall shut tightly and have vinyl edge seals and stainless steel jamb seals.

2. Single blade butterfly dampers shall be constructed of not less than 16 gauge galvanized steel blades mounted in a galvanized steel frame. For rectangular dampers, the top and bottom edges of the blade shall be crimped to stiffen the blade. Damper shall be provided with an extended rod to permit installation of a damper regulator.

3. Dampers larger than 12" in either direction shall be multi-blade dampers and shall be the opposed blade type, constructed of not less than 16 gauge galvanized steel blade mounted in galvanized steel channel frame. Blade spacing shall not exceed 6" and the top and bottom edges of the blade shall be crimped to stiffen the blades. Damper blades shall be interconnected by rods and linkages to provide simultaneous operation of all blades. Damper shall be provided with an extended rod to permit installation of a damper regulator.

C. Hardware for Manual Dampers:

1. Splitter damper hardware - When neither dimension of a damper exceeds 18", the damper shall be provided with a ball joint bracket attached to the outside of the duct. The bracket shall have a set screw for securing damper rod in position. The damper operating rod shall be not less than 1/4" diameter steel rod and shall be secured to the damper blade with a clip. When either dimension of a damper exceeds 18", the damper shall be provided with 2 ball joint brackets and rods. The rods shall be located at quarter points on the damper.

2. Duct mounted regulators with operating handle and locking quadrant shall be provided on manual volume control dampers.

3. Damper hardware shall be Ventfabrics, Young Regulator or Duro-Dyne, provided the equipment meets or exceeds the requirements of the Contract Documents.

D. Acceptable manufacturers of dampers are Ruskin, Air Balance, or Louvers and Dampers Inc., provided the equipment meets or exceeds the requirements of the Contract Documents.

2.03 FLEXIBLE DUCTWORK:

A. Flexible ductwork shall be Class 1, UL 181 air duct with an aluminized mylar or polyester inner liner laminated to a corrosion resistant steel wire helix. Aluminum helix is not acceptable.

B. A 1" thick, one (1) pound density fiberglass insulation and vinyl outer jacket shall cover the wire helix.

C. The maximum allowable length of low pressure flexible ductwork shall be 4'-0" and shall be limited to short run-outs and end runs connected to round neck ceiling supply diffusers. Provide a spin-in fitting with integral volume damper at all flexible run-out connections in low pressure ductwork.

D. Flexible ductwork shall be designed for pressures up to 4" W.G.

E. Acceptable manufacturers of flexible ductwork are Clecon, Wiremold, Flexmaster, Flexmold or Genflex.

2.04 FLEXIBLE DUCT CONNECTIONS: Flexible duct connections shall be non-combustible, installed at all belt-driven equipment and where shown. Material shall be glass fabric double coated with neoprene (30 0z. per square yard minimum) and shall be Vent Fabrics, Duro-Dyne or Young Regulator, provided the equipment meets or exceeds the Contract Documents. Provide duct supports on each side of flexible connections.

2.05 STAND-OFF MOUNTING BRACKETS: Locking-type quadrant operators for dampers, when installed on ducts to be externally insulated, shall be provided with stand-off mounting brackets bases or adapters to provide clearance between the duct surface and the operator not less than the thickness of the insulation. Stand-off mounting items shall be integral with the operator or standard accessory of the damper manufacturer.

2.06 DUCT INSTRUMENT TEST HOLES: Provide for each system four (4) test holes; two (2) in supply duct and two (2) in return air plenum at opposite ends near air handling units with screwed caps.

2.07 REGISTER AND GRILLE CONNECTION:

A. Where take-offs are on side of a duct, clinch lock short tee sections onto trunk. Install collars with slip joints and 3/4" flange at outlet end. At plastered surfaces set collars exactly flush with plaster surface (mechanic must be on job to make adjustments during plaster application). Set flange face so as to receive register gasket, and be concealed by register flange. Collars may be deleted where mounting frames are furnished with registers.

B. Install boots above lay-in ceilings simultaneously with ceiling work; mechanic must be on job during this phase of construction work.

C. At return relief and exhaust grilles 48" or more in either dimension, collars shall be 1 x 2 x 1/8 inch steel angle frames with corners mitered, welded and ground smooth. Frames in ceilings shall be independently suspended from the ceiling structure, or the duct shall have special reinforcing to prevent sagging of the boot.

D. Interior of ductwork visible through grilles and diffusers shall be painted flat black.

2.08 ACCESS DOORS: Provide in duct wall at each splitter, fire, fire/smoke and motorized damper, at each end of coils, in plenums and elsewhere indicated. Size and position so as to provide access to bearings, fire links, etc. Typical doors shall be double metal faced, internally insulated same as duct provided with gasket seal, and held in place with four or more sash locks. Minimum size shall be 16" x 12", maximum duct size for smaller ducts.

PART 3 EXECUTION

3.01 INSTALLATION:

A. Install all ductwork and accessories as shown and in accordance with applicable SMACNA standards.

B. Duct liner shall be cut to provide overlapped and compressed longitudinal corner joints. Liner shall be installed with coated surface facing the air stream. Duct liner shall be adhered to the ductwork with a 100% coverage of the sheet metal surfaces using a fire retardant adhesive applied by spraying. Coat all exposed leading edges and all transverse joints with airfoils.

C. Splitter Dampers:

1. Fabricate blades of same thickness galvanized steel as the duct where used (min. 20 ga.), securely attached to a rod at the air leading edge to present a round nose to air flow. Length shall be sufficient to close either branch duct.

2. Anchor splitters at the air entering edge by 3/16 inch adjustable galvanized steel rods that pass through set screw clamps on the outside of duct. Use one (1) rod and clamp on splitters with leading edge up to 15 inches, (2) rods up to 30 inches, and on 15 inch centers above 30 inches. See typical details on plans.

3. When splitter dampers occur above other than lay-in ceilings, provide Young Model No. 890-A damper assembly complete with supports, bearings and Young No. 1 regulators with an additional end bearing and chromium plated ceiling.

D. Joints in all low pressure ductwork shall be sealed with a water based gray vinyl acrylic sealant. Sealant shall be U.L. listed Class 1 classified adhesive with flame spread and smoke developed ratings of O. Sealant shall be applied to surfaces relatively free of dirt, oil and grease after ductwork has been installed. Sealant shall be Hardcast, Inc. "Iron Grip" IB-601 or approved equal.

END OF SECTION

SECTION 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 Metalaire, Price 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 follows:

1. Exhaust air register shall have a fixed core of 1/2" x 1/2" x 1/2" aluminum squares. Register shall have opposed blade dampers. Register shall be Metalaire Series CC5 or equal.

2. Return air grilles (ceiling mounted) shall have a fixed core of 1/2" x 1/2" x 1/2" aluminum squares. Grille shall be Metalaire Series CC5 or equal. Finish shall be white baked enamel.

3. Supply air diffusers (square) shall be Metalaire Series 5000S or 5500S as scheduled extruded aluminum rectangular to round neck diffusers with T-Bar flange frames.

4. Sidewall air registers shall be Metalaire Series 4000 with 1" frame border and aluminum face bars on 1/2" centers. Unit shall have off-white finish.

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. Each system shall be controlled by individual 7-day programmable thermostats with separate heating and cooling setpoints, fan "on-off-auto" switch, and system "heat-off-cool" switches. Thermostat locations shall be as shown on drawings.

C. Remote position indicators for the electric controllers shall be located adjacent to the controllers and controlled devices.

D. High limit thermostats shall be provided in intake of all exhaust fans and in discharge air of all supply fans except where smoke detectors are provided.

E. Smoke detectors shall be provided under Division 15 and installed by Division 15 in the supply air path and return air path(s) at each furnace or air handling unit prior to mixing with outside air. Detectors shall be ionization duct-mounted type. All necessary interlocks, relays, contactors, etc., with the smoke detection system and mechanical equipment, shall be provided under Division 15. Wiring for unit shut-down shall be provided under Division 15. Provide normally open contacts at each smoke detector for interlock with building fire alarm system.

PART 2 PRODUCTS

2.01 MATERIALS AND COMPONENTS: All electrical components of the control systems shall conform to the requirements of Division 16.

PART 3 EXECUTION

3.01 INSTALLATION:

A. The automatic temperature controls shall be installed in complete conformance with the manufacturer's recommendations and the Contract Documents.

B. The ATC systems shall be installed to provide a completely functional and fully coordinated system of control.

3.02 SEQUENCE OF OPERATION:

A. Gas-Fired Furnaces and Heat Pump Indoor Units:

1. Units shall be started and stopped, subject to safety thermostats and smoke detectors, and by a thermostat mounted in space.
2. Install ionization type smoke detectors in the supply air stream and return air stream of all units. Upon signal from smoke detector or high limit thermostat, the fan shall stop. The fan shall stop via a signal obtained from the relay provided by Division 15. Control Wiring from the relay to the 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.

END OF SECTION

SECTION 16011 ELECTRICAL REQUIREMENTS

PART 1 GENERAL

1.01 SCOPE:

A. This Division and the accompanying electrical drawings cover furnishing all labor, equipment and materials and performing all operations in connection with the installation of complete electrical systems as documented.

B. There are many interfaces between the work involved with this Division and the work in other Divisions, particularly with Division 15. Be aware of the responsibilities at the interfaces.

C. The plans and specifications are considered cooperative and complimentary.

1.02 DEFINITIONS:

A. Provide: furnish, install, connect, test, demonstrate and leave operational.

B. Wiring: wire or cable installed in raceway with all required boxes, fittings, connectors, etc.

C. Work: materials completely installed, including the labor involved.

D. Raceway: Galvanized rigid steel conduit (GRC), electrical metallic tubing (EMT), Intermediate metal conduit (IMC), schedule 40 and 80 Polyvinyl Chloride (PVC), flexible steel (FLX), sheathed flexible steel (SLT).

1.03 CODES AND REGULATIONS:

A. All work shall comply with all local laws, ordinances and regulations applicable to the electrical installation, applicable building codes and with the requirements of the National Electrical Code (NEC), Vol. 70 of the N.F.P.A.

B. Where different sections of any of the aforementioned codes and regulations, the Specifications and/or the Drawings require different materials, methods of construction, or other requirements, the most restrictive shall govern. In any conflict between a general provision and a special provision, the special provision shall govern.

C. Obtain all permits and licenses, and pay all fees as required for execution of the Contract. Arrange for necessary inspections required by the city, county, state and other authorities having jurisdiction and present certificates of approval to the Owner or his designated representative.

D. Under no circumstances will asbestos, or asbestos related materials, be allowed on this project. Should any be found on the project they will be reported in writing and removed from the project by the contractor at no change in contract time or price.

E. Communicate with all required utility offices to meet utility schedules and regulations. Acquire services to avoid project delays.

1.04 SITE VISIT:

A. All interested parties shall visit the site and thoroughly familiarize themselves with the local conditions in advance of any project activity.

B. No allowances will be made for lack of knowledge of job conditions.

1.05 DRAWINGS AND SPECIFICATIONS:

A. The Electrical Drawings are diagrammatic, and are not intended to show the exact location of raceways, outlets, boxes, bends, sleeves, couplings or other such elements.

B. The Drawings and Specifications shall both be considered as part of the Contract. Any work or material shown in one and omitted in the other, or which may fairly be implied by both or either, shall be provided in order to give a complete job.

C. Should conflicts exist between the Drawings and Specifications, the Specifications shall govern.

D. Refer to the Architectural, Structural and Mechanical plans and details for dimensions, and fit the work to conform to the details of building construction. The right is reserved to shift any switch, receptacle, ceiling outlet or any other outlet a maximum of 10'-0" from its location as shown before it is permanently installed, without incurring additions to the Contract in time or cost.

E. All conduit and wiring shown on the Electrical Drawings shall be provided under this Division regardless of its function.

1.06 DEVIATIONS:

A. No deviations from the drawings and specifications shall be made without the full knowledge and consent of the Owner and/or Engineer.

B. If it is found that existing conditions make desirable a modification in requirements covering any particular item, report such item to the Owner and/or Engineer for his decision and instructions.

1.07 MECHANICAL EQUIPMENT LOADS:

A. The horsepower, wattage (or amperes) of mechanical equipment indicated is the estimated requirement of equipment furnished under another Division. All wiring, protective devices and disconnect switches shall be of the voltage, size and ampacity for the actual equipment installed. In no case shall these items be of smaller capacity than those indicated.

B. Coordinate with other trades and provide suitable equipment so that the above requirements shall be met without incurring additions to the Contract in time or cost.

C. The Contractor shall provide suitable disconnecting means in conformance with the requirements of the NEC, for all items or equipment utilized on the project no matter how, or by whom, furnished. However, duplication, or redundancy, is not required.

PART 2 PRODUCTS

2.01 STANDARDS FOR MATERIALS AND WORKMANSHIP:

A. All material shall be new and shall bear the inspection label of Underwriter's Laboratories, Inc. (UL).

B. The published standards and requirements of the National Electrical Manufacturer's Association (NEMA), the American National Standards Institute (ANSI), the Institute of Electrical and Electronic Engineers (IEEE) and the American Society of Testing Materials (ASTM) shall govern and apply where applicable.

C. Specified catalog numbers and trade or manufacturers names are intended to describe the material, devices, or apparatus desired for type, style and quality. Similar materials of other manufacturers, if of equal quality, capacity or character may be substituted in conformity with the provisions of the General Requirements.

D. Where 3 or more manufacturers are named, one of the named manufacturers shall be used.

E. Where, in the opinion of the designer, no equal exists then "no equal" will be stated.

2.02 SHOP DRAWINGS:

A. Shop drawings shall be submitted for the following equipment and items suitably bound.

I. <u>SECTION 16100</u>

1. Conduit and fittings
2. Wire and Cable
3. Junction boxes
4. Pull boxes
5. Outlet boxes
6. Floor boxes
7. Cabinets
8. Wall switches
9. Receptacles
10. Coverplates
11. Supporting devices
12. Wire connection devices
13. Nameplates
14. Smoke & firestop fittings
15. Grounding system

II. <u>SECTION 16200</u>

1. Circuit breakers
2. Panelboards
3. Disconnect switches
4. Fuses
5. Distribution Panel

III. <u>SECTION 16300</u>

1. Lighting fixtures
2. Lamps
3. Ballasts
4. Lenses and diffusers

IV. <u>SECTION 16721</u>

1. Controller
2. Devices
3. Wiring diagram

2.03 MAINTENANCE AND INSTRUCTION MANUALS: Submit to the Owner and/or Engineer, upon completion of the work, copies of maintenance and instruction manuals for equipment provided.

PART 3 EXECUTION

3.01 COORDINATION:

A. Before any piping, conduit, outlets, equipment or lighting fixtures are located in any area, coordinate the space requirements with all trades. Such shall be arranged so that space conditions will allow all trades to install their work, and will also permit access for future maintenance and repair.

B. Piping, ductwork, conduit and equipment installed at variance with the above requirements shall be relocated and/or revised to conform with the above requirements without incurring additions to the Contract.

C. Coordination of space requirements with all trades shall be performed so that:

1. No piping or ductwork, other than electrical, shall be run within 42" of panelboards, switchboards or transformers.

2. No pipes or ducts that operate at a temperature in excess of 120 degrees F. shall be installed nearer than 3" to any electrical conductor.

3.02 PROTECTION OF MATERIALS:

A. All conduit and other openings shall be kept protected to prevent entry of foreign matter. Fixtures, equipment, and apparatus shall be kept covered for protection against dirt, water, chemical or mechanical damage before and during construction.

B. The original finish, including shop coat of paint of fixtures, apparatus or equipment that has been damaged shall be restored without incurring additions to the Contract in time or price.

3.03 HOUSEKEEPING PADS: The contractor shall provide 4" minimum height concrete pad, integral with floor, under all floor mounted electrical equipment or apparatus.

3.04 CUTTING AND PATCHING: The Contractor is responsible for all cutting and patching, including escutcheon plates where necessary, whether or not such cutting and patching is shown or indicated.

3.05 ACCESS TO ELECTRICAL ITEMS: The contractor is responsible for maintaining access to all concealed electrical equipment, apparatus, or devices whether, or not, shown or indicated. Where access panels are required, refer to Owner or Engineer for approved means, methods and appearance.

3.06 ELECTRICAL ROOMS AND CLOSETS:

A. Doors to electric rooms and closets shall open outward. If in conflict with Arch. drawings refer to Owner or Engineer for resolution.

B. Manufacturer's equipment shall not be larger than that dimensioned, or scaled, on plans. Conflicts shall be brought to the attention of the Owner, or Engineer for resolution prior to order.

C. Clear working space in electric rooms and closets shall be no less than that required by the N.E.C.

D. The contractor shall submit for review, prior to construction or purchase of any equipment, scaled drawings of electrical rooms, closets, or spaces showing, in detail, his planned installation locations of the equipment he intends to purchase. These shall clearly show compliance with A,B, and C above.

3.07 TESTS:

A. Upon completion of the electrical work, conduct an operating test in the presence of the Engineer or his designated representative.

B. The installation shall be demonstrated to operate in accordance with the Contract Documents. Any material or workmanship which does not meet with the approval of the Engineer shall be removed, repaired or replaced as directed without incurring additions to the Contract in time or cost.

C. Furnish all instructions, tools and personnel required for the test. Have sufficient tools and personnel available to remove panel covers, coverplates, etc., as required for proper inspection. Provide suitable test equipment.

3.08 DEMONSTRATION AND INSTRUCTIONS: Present to the Owner and/or Engineer or his designated representative a physical demonstration and oral instructions for proper operation and maintenance of electrical equipment and systems installed.

3.09 GUARANTEE:

A. All systems and components shall be provided with a one year guarantee from the time of final acceptance. The guarantee shall cover all materials and workmanship. During this guarantee period, all defects in materials and workmanship shall be corrected without incurring additions to the Contract. The correction shall include all required cutting, patching, repainting, or other work involved, including repair or restoration of any damaged sections or parts of the premises resulting from any fault included in the guarantee.

B. In addition to this general guarantee, present to the Owner and/or Engineer any other guarantees or warranties from equipment or system manufacturers. These supplemental guarantees or warranties shall not invalidate the general guarantee.

END OF SECTION

SECTION 16100 BASIC MATERIALS AND METHODS

PART 1 GENERAL

1.01 DESCRIPTION:

A. All work specified in this Section shall comply with the provisions of Section 16011.

B. This Section covers the basic electrical materials and installation methods that are applicable to Division 16.

PART 2 PRODUCTS

2.01 CONDUIT:

A. Galvanized rigid steel conduit (GRC) shall be low carbon, hot-dipped galvanized and to meet UL Standards and shall have threaded joints.

B. Intermediate metal conduit (IMC) shall be steel, galvanized to meet UL Standards and shall have threaded joints.

C. Electrical metallic tubing (EMT) shall be steel, galvanized to meet UL Standards.

D. Plastic conduit (PVC) shall be schedule 40 PVC heavy wall type for 3" and smaller, and Schedule 80 for 4" and larger. Schedule 80 PVC shall be used at road crossings.

E. Flexible metal conduit (FLX) shall be flexible steel conduit tubing and shall meet Underwriters Laboratories Standard for Flexible Steel Conduit.

F. Steel conduit approved manufacturers are Allied, Southwire, Triangle, Republic, Wheatland and Pittsburg.

G. PVC conduit approved manufacturers are Carlon, Triangle, and Johns-Manville.

2.02 CONDUIT FITTINGS:

A. GRC and IMC conduit fittings shall be zinc-coated, ferrous metal and taper threaded type.

B. EMT fittings shall be zinc-coated steel with hexnut compression. EMT connectors shall have insulated throats.

C. PVC fittings, elbows and cement shall be produced by the same manufacturer. All joints shall be solvent welded in accordance with the manufacturer's recommendations.

D. Conduit connections to switchboards, motor control centers, transformers, panels, cabinets, and pull boxes with specific grounding requirements, shall have grounding wedge lugs between the bushing and the box or locknuts designed to bite into the metal.

E. Each conduit end shall be provided with either an insulated throat connector or separate locknut and insulated bushing. Bushing shall be installed before any wire is pulled.

F. Conduit fittings approved manufacturers are Raco, Steel City, O.Z Gendy, Thomas & Betts, Efcor and Appleton.

G. Expansion fittings shall be provided in all conduit which crosses an expansion joint either in, across, or through same.

2.03 CONDUCTORS: Conductors shall be copper of 98% conductivity, 600 volt insulation. Sizes specified are AWG gauge for No. 4/0 and smaller and circular mils (MCM) for all sizes larger than No. 4/0. Conductors No. 10 and smaller shall be solid and type "THHN" or THWN" insulation. No. 8 and larger shall be stranded and type "THHN" or "THWN" insulation.

2.04 OUTLETS:

A. Outlet boxes and covers shall be of such form and dimensions as to be adapted to their specified usage, locations, size and quantity of conduit, and size and quantity of conductors entering the boxes. In special "Fire Rated" partitions, outlets shall comply with ASTM No. E119.

B. Flush ceiling outlets for surface or pendant mounted lighting fixtures shall be one-piece 4" square or octagonal pressed steel boxes. Boxes for devices in unfinished masonry walls or stud walls shall be pressed steel, square corner, sectional switch boxes, or shall be 4" square box with a square cornered tile wall cover, set flush with masonry construction. Boxes in concrete ceiling slab shall be octagonal, shallow concrete boxes. Welded boxes are not acceptable. Steel boxes shall be used with all steel conduit and type AC or MC cable. Boxes used in conjunction with ENT shall conform with the foregoing except shall be made of a high heat-resistant plastic suitable for fixture support and shall be specifically designed for use with ENT.

C. All outlet boxes in plaster or masonry walls or ceiling shall be provided with plaster rings.

D. Junction boxes and all outlets not indicated as containing wiring devices or lighting fixtures shall have covers. Covers for outlets in walls shall be as specified for wall switches and receptacles.

E. Outlet boxes exposed to the weather and outlet boxes for vaportight lighting fixtures and devices shall be of cast corrosion resistant type.

F. Outlet box approved manufacturers are Appleton, Raco, Steel City or Crouse-Hinds.

2.05 DISCONNECT SWITCHES:

A. Disconnect switches shall be "heavy-duty" type enclosed switches of quick-make, quick-break construction. Switches shall be horsepower rated for 600 volts AC as required. Lugs shall be UL listed for copper and aluminum cable.

B. Padlocking provisions shall be provided for padlocking in the "Off" position.

C. Switches shall be furnished in NEMA I General Purpose enclosure unless noted otherwise. Switches located on the exterior of the building or in "wet" locations shall have NEMA 3R enclosures.

D. Fused disconnect switches shall have rejection type fuse clips with dual element, current limiting fuses of rating shown.

E. Disconnect switches for water heaters and vent fans shall be HVAC molded case switches unless otherwise noted on drawings.

2.06 NAMEPLATES: Nameplates shall have 3/8" high engraved letters, white core laminated bakelite with black finish.

2.07 WALL SWITCHES:

A. Wall switches shall be plastic, totally enclosed, quiet type, self-grounding, 120-277 volts and 20A rating.

Single Pole: Hubbell No. 1221
Double Pole: Hubbell No. 1222
Three-way: Hubbell No. 1223
Four-way: Hubbell No. 1224

B. Color shall be grey or as selected by owner's representative. Coordinate with owner's representative.

C. Comparative switches by Arrow Hart, Leviton, Bryant, or Sierra are acceptable as equal.

D. Flush motor switches shall have a red pilot light and overload protection for fractional horsepower motors.

E. Wall dimmer switches shall be totally enclosed, self-grounding, vertical slide type, square law dimming, with 600 watt capacity unless shown otherwise, Lutron Nova Series.

2.08 RECEPTACLES:

A. Duplex receptacles shall be plastic, two-pole, three wire, self-grounding, side wired, 125 volts and 20A rating. Hubbell No. 5262 Series. Isolated ground type to be Hubbell No. IG-5262 Series. GFCI type to be Hubbell No. GF-5362 Series.

B. Single receptacles shall be two-pole, three wire, self-grounding, side wired, 125 volts and 20A rating, Hubbell No. 5361 Series. Isolated ground type to be Hubbell No. IG-5361 Series.

C. Color shall be grey or as selected by owner's representative. Coordinate with owner's representative.

D. Clock outlets shall be Arrow-Hart 5708.

E. Comparative devices by Arrow-Hart, Leviton, Bryant, or Sierra are acceptable as equal.

2.09 COVERPLATES:

A. Coverplates for flush mounted devices in all areas shall be grey nylon, standard size or as selected by owner's representative.

B. Telephone outlet coverplates shall have same finish as above and have a bushed hole in the center.

C. Coverplates for exterior receptacles shall be self closing, die cast aluminum.

2.10 PLYWOOD BACKBOARDS:

A. Provide plywood backboards where shown. Backboards shall be minimum 3/4" thick and sized as shown or to accommodate equipment indicated to be mounted thereon. Plywood shall be fire retardant.

B. Secure plywood to the building structure and paint with two coats of fire retardant gray paint.

2.11 SMOKE AND FIRE STOP FITTINGS: If and where required, smoke and fire stop fittings shall be U.L. listed for that purpose. The fittings used to seal conduit either on the outside of the conduit, busway or cable or internally shall have heat activated intumescent material which expands to fill all voids and shall be O.Z./Gedney "FIRE-SEAL" 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.

2.12 FLOOR OUTLETS:

A. If and where required, floor outlets shall be single gang floor boxes (unless indicated otherwise on plans), Steel city No. 600 Series, complete with cast iron body, vertical angular adjustment, bronze frame, bronze floorplate and gasket. Larger than standard tappings shall be furnished where required. Adjacent boxes shall be installed on minimum 7" centers.

B. Duplex floor receptacle outlets shall have (unless indicated otherwise on plans), No. P-60-DU floor plate, a No. P-60-CP carpet plate where installed in carpeted floor and a Hubbell 5262 Series duplex receptacle. Single floor receptacle outlets shall have a No. P-60-2 plate and Hubbell single receptacle. Provide a No. 700 split bell nozzle for each 5261 Series single receptacle and two (2) No. 703 for each duplex receptacle.

C. Floor outlets for telephone, signal or alarm use shall have a No. P-60-3/4-2 floor plate and a No. 467 bushed opening standpipe with a No. 461 base, all bronze finish (unless otherwise indicated on plans).

2.13 FUSES:

A. Provide all fuses. All fuses shall be of the same manufacturer. All fuses shall be of the high interrupting rating (200,000 Amps), current limiting type and manufactured by Bussmann or an approved equal. Fuses shall be provided for each fuse cutout and the specified quantity of fuses shall be furnished for spares.

B. Circuits 0 to 600 ampere shall be protected by rejection type, current limiting BUSSMANN LOWPEAK Dual Element Fuses LPN-RK (250 volts) or LPS-RK (600 volts). All dual-element fuses shall have separate overload and short-circuit elements. Fuse shall incorporate element having a 284 degree F. melting point alloy and shall be independent of the short-circuit clearing chamber. The fuse must hold 500% of rated current for a minimum of 10 seconds and be listed by Underwriter's Laboratories, Inc., with an interrupting rating of 200,000 amperes RMS symmetrical. The fuses shall be UL Class RK-1.

D. Circuits 601 to 6000 ampere shall be protected by current limiting BUSSMANN HI-CAP Time-Delay Fuses KRP-C. Fuses shall employ "O" rings as positive seals between the end bells and the glass melamine fuse barrel. The terminals shall be peened. Fuses shall be time-delay and must hold 500% of rated current in .01 seconds or less and be listed by

Underwriter's Laboratories, Inc., with an interrupting rating of 200,000 amperes RMS symmetrical. The fuses shall be UL Class L.

D. Furnish and turn over to the Owner a minimum of one (1) set of spare fuses (set consisting of three fuses) for each type and rating of fuse used. When the number of fuse sets of the same type and rating actually installed exceeds five (5) sets, furnish an additional spare set of fuses for each five (5) or fraction thereof.

E. Provide a cabinet in which to store all spare fuses, Bussmann Catalog No. SFC or equal.

PART 3 EXECUTION

3.01 CONDUIT:

A. Rigid steel shall be used for service entrance and all feeders and branch circuits where exposed to damage.

B. EMT may be used for branch circuits, fire alarm and telephone when not underground or in concrete in contact with the earth .

C. Schedule 40 PVC may be used for all underground feeders, service entrance conductors when under the lowest floor slab, and in Schedule 80 PVC when crossing under roadways.

D. Conduit shall be continuous from outlet to outlet, from outlet to cabinet, junction box and pull box. Conduit shall enter and be secured to all boxes, etc., in such a manner that each system will be electrically continuous from service to all outlets. All conduit from cabinets and junction boxes shall terminate in approved outlet boxes or conduit fittings. Conduit connections to any box which has no threaded hub shall be double locknutted.

E. Provide junction boxes or pull boxes where shown and where necessary to avoid excessive runs or too many bends between outlets. The conduit sizes shown may be increased if desired to facilitate the pulling of cables.

F. All conduit shall be concealed unless indicated otherwise. Install exposed conduit parallel with or at right angles to the building walls and support from walls or ceilings at intervals required by Code with approved galvanized iron clamps or hangers. Concealed conduit above the ceiling shall be supported independent of ceiling construction. Where ceilings of lay-in type are used, conduit must be installed high enough to permit removal of ceiling panels and lighting fixtures. Use threaded rods and hangers consisting of double-nutted threaded rods and "Unistrut" channels or angles of 12 gauge minimum steel for supporting multiple conduit.

G. Minimum size conduit for branch circuits shall not be smaller than 1/2". Home runs shall extend from outlets shown to panel designated. Home runs shown shall not be combined. Home run conduit shall not be smaller than 3/4".

H. At couplings, conduit ends shall be threaded so that they meet in the coupling. Right and left hand couplings shall not be used; conduit couplings of the Erikson Type shall be used at locations requiring such joints.

I. All conduit for future use and for telephone data or TV wire shall be left with No. 16 gauge wire or approved pull cord pulled in them.

J. Expansion fittings shall be installed in all conduit which pass through expansion joints.

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 and for each conduit passing from one space into another which is normally at a lower temperature.

L. Provide watertight conduit hubs on conduit terminating in a box or cabinet exposed to the weather.

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 unlabeled fire resistive material that will maintain the rating of the barrier penetrated.

N. All conduit located on exterior of building shall be rigid aluminum.

3.02 FLEXIBLE CONDUIT:

A. PVC extruded cover flexible conduit shall be used in making short flexible connections to rotating or vibrating machinery or equipment. The flexible conduit at these locations shall be as short as possible, but shall have a minimum length of 12".

B. A green stranded bonding jumper shall be installed outside of all flexible conduit that extends directly from a non-flex conduit to a rotating or vibrating machine. Where a junction box is used, the green stranded bonding jumper shall be installed inside the flexible conduit and attached to the junction box and to the machine. When the bonding jumper is installed outside of the flexible conduit, plastic wire straps shall be used 6" o.c. to secure the jumper to the flexible conduit.

3.03 CONDUIT PROTECTION:

A. All threaded joints in rigid conduit that is encased in concrete shall have a U.L. listed joint compound applied. Where conduit inside the building is installed below the floor slab, the vapor barrier shall be run below the conduit concrete encasement. Conduit installed in any slab, where permitted above, shall be above the bottom steel and below the top steel. No conduit shall be spaced less than 3" apart.

B. Conduit shall be secured in place and protected where necessary to prevent damage to work during construction. The ends of all conduit shall be plugged to avoid filling with any foreign matter. All conduit shall be blown out and swabbed clear of water and trash prior to pulling wire.

C. Provide identifying marker tape the entire length of each conduit installed in the ground outside the building. The tape shall be constructed of inert polyethylene, resistant to acids, alkalis, etc., in the soil, and shall be a minimum 4 mil thickness. The tape shall be yellow, 6" wide, and shall have the words, "CAUTION - ELECTRIC LINE BURIED BELOW," imprinted with contrasting permanent ink. The imprint shall repeat itself for the entire length of the tape. The tape shall be buried at a maximum of 18" below finished grade, above a portion of the earth fill.

3.04 WIRING:

A. All conductors shall be installed in conduit. No conductors shall be pulled into the conduit until the conduit system is complete.

B. Conductors shall be continuous from outlet to outlet and from outlet to junction box or pull box. All splices and joints shall be carefully and securely made to be mechanically and electrically solid with pressure type connectors. Where connection is made to any terminals of more than 30 amperes capacity and where conductors larger than No. 10 AWG are connected to any terminal, copper terminal lugs shall be bolted to the conductors. Where multiple connections are made to the same terminal, individual lugs for each conductor shall be used.

C. Each conduit shall have a minimum of two (2) conductors pulled in unless that particular conduit is noted as being for systems other than electrical circuitry and/or future use or unless noted otherwise.

D. Conductors for lighting and receptacle circuits shall have color coded jackets. The wiring shall be color coded with the same color used with its respective phase throughout the entire job as follows:

120/208 Volt System
Phase A - Black
Phase B - Red
Phase C - Blue
Neutral - White
Ground - Green

E. The feeder and service entrance conductors shall be color coded by the use of colored plastic tape applied within 6" of each conductor end.

F. Branch circuit conductors shall not be smaller than No. 12 AWG and where the home run from center of load exceeds 100'-0", the conductors from home run outlet to panel shall be No. 10 AWG minimum.

G. Branch circuit wiring which supplies more than one fluorescent fixture through wireway of other fixtures shall be rated for use at 105 degrees C.

H. For branch circuits terminating in outlet without device, leave minimum of 12" of slack wire coiled for connection of equipment.

I. All conductors shall be identified with proper circuit numbers at terminals, junction boxes and at panelboards within 6" of conductor ends.

J. Stranded conductors, #10 and smaller, shall be terminated at screw type terminals with fork type insulated wire terminals applied with manufacturer's tool.

K. Conductor sizes are generally indicated in schedules and riser diagrams, otherwise follow rules of N.E.C.

3.05 OUTLETS:

A. Provide galvanized steel or cast type boxes for all outlets.

B. Where outlet boxes are used to support lighting fixtures, the outlet box shall be anchored to the structural members of the building per NEC 370-13.

C. Outlet boxes shall be flush mounted unless they are specifically shown as being used with exposed conduit or are located above a ceiling.

D. Where outlets are supplied from conduit run in or below floor slabs, the conduit shall be stubbed up at the location shown and the wall built up around the conduit.

E. Cuts for outlet boxes in masonry walls shall be made so that the coverplate will completely cover the cut. The mounting height of switch, receptacle and other outlets may be varied slightly, with the Engineer's approval, so that the outlet box, top or bottom, will occur at a masonry joint.

F. The edge of all outlet boxes shall be flush with the surface in which they are recessed. The devices that fit into the outlet boxes shall be screwed tight before the cover plate is installed and the coverplate shall not be used as a means of tightening the devices in place.

G. Where outlets are shown as being adjacent and different mounting heights are specified for each, they shall be mounted one directly over the other, on the centerline of the group.

3.06 NAMEPLATES:

A. Provide specified nameplates on the main switchboard, feeder switches, feeder breakers, distribution panels, panelboards, disconnect switches, contactors, starters, transformers, start-stop push buttons and motor switches.

B. Nameplates for surface mounted equipment shall be installed on the exterior of equipment with sheetmetal screws. Nameplates for flush or recessed mounted equipment shall be installed on the inside of the panel door or cover with epoxy cement.

3.07 WALL SWITCHES AND RECEPTACLES: Where more than one device is indicated at a location, the devices shall be gang-mounted in combined multi-gang boxes and covered jointly by a common coverplate. Provide barriers as required by the devices and voltages being used.

3.08 COVERPLATES:

A. All junction boxes, outlet boxes, multi-gang switch boxes, utility boxes, etc., shall be covered with a coverplate. The coverplate shall be a finished plate as specified unless designated otherwise.

B. Coverplates shall be mounted vertically unless designated otherwise.

3.09 GROUNDING:

A. Ground connections shall be in accordance with the 2002 National Electrical Code.

1. Provide a grounding electrode system consisting of a minimum of three (3) copper weld rods, 3/4" x 10'-0", driven 24" below grade a minimum of 72" apart in the form of an equilateral triangle, bonded together with No. 4/0 conductors. Install rods a minimum of 36" clear of foundation walls to effect the building ground. If the resistance to ground exceeds 25 ohms, additional rods shall be driven and bonded together until a reading of 25 ohms or less to ground is obtained. After completion of the grounding system, measure the system ground resistance with a "Megger Earth Tester". Submit directly to the Engineer two (2) copies of each test report certified by the testing technician and the Engineer's representative.

2. Extend from the electrodes to the main service disconnect with a No. 4/0 copper insulated ground conductor in a 1" conduit and connect to the neutral bar, housing

and frame.

3. Provide a No. 4/0 copper insulated conductor across the water meter with the conductor attached with clamps to the water line on each side of the meter.

4. Provide a No. 4/0 copper insulated ground conductor in a 1" conduit from cold water entrance pipe ahead of first valve to the main service disconnect and connect to the neutral bar, housing and frame.

5. Where nonmetallic insulating couplings or dielectric flanges are used in metallic water piping systems, provide a No. 4/0 copper, insulated ground conductor across the couplings with the conductor attached with clamps to the water line on each side of the coupling.

6. All ground clamps shall be equipped with compression type cable lugs independent of the compression device clamping the pipe or rod.

7. All steel conduit entering the main service disconnect shall have threaded conduit insulated grounding bushings. All bushings shall be bonded together and bonded to the main grounding bus with a No. 4 bare conductor.

B. Provide an insulated green bonding jumper from the grounding lug of all receptacles to a clip or a sheet metal screw in the outlet box. The ground wire installed behind the device mounting screws will not be acceptable.

C. Provide 1 #6 AWG copper conductor in 1" conduit from the point of attachment of the system ground at the water main to the telephone company room backboard.

D. All branch circuits shall include a green insulated ground wire sized per NEC or as shown connected to each device and outlet box on the circuit and to the panelboard ground bus. Multiple wire branch circuits with common neutral require only one ground wire. The number of wires shown on the drawings does not include this ground wire.

3.10 TELEPHONE/INTERCOM CONDUIT SYSTEM:

A. Telephone service shall include wood backboards with service entrance conduit as shown.

B. Telephone service entrance cable, all branch cabling and telephone instruments shall be provided by the telephone equipment vendor.

C. Provide an outlet and conduit system for the telephones as shown and leave the same in readiness for wiring by others. Provide pull line in all telephone conduit. Terminate all conduit at a uniform height with smooth insulated bushings at the telephone wood backboards.

D. Telephone wall outlets shall be pressed steel sectional switch boxes, wall mounted at the locations indicated. Coverplate shall have a bushed hole or modular jack as required.

E. Telephone conduits shall be 3/4" and stub out of walls 6" above ceiling for each outlet.

F. Telephone floor outlets, if and where required, shall be floor boxes as specified at the locations indicated.

3.11 CONNECTION TO EQUIPMENT:

A. Equipment furnished by the Owner or under other Sections, such as mechanical, signs, kitchen equipment, etc., will be installed by others. Provide electrical service and make the electrical circuit connection to this equipment.

B. Provide PVC insulated flexible cord sets for all cord and plug connected building appliances and equipment. Cords shall be sized in accordance with electrical circuits indicated. Multiple conductor cords shall be type "SO" cable with PVC jacket and green insulated ground conductor.

3.12 CORING, CUTTING AND PATCHING:

A. Set sleeves for conduit accurately before the concrete floors are poured, or set boxes on the forms so as to leave openings in the floors in which the required sleeves can be subsequently located. Fill in the voids around the sleeves with concrete.

B. Should the performance of this preliminary work be neglected and should cutting be required in order to install conduit, then the expense of the cutting and restoring of surfaces to their original conditions shall be accomplished without incurring additions to the Contract.

3.13 EQUIPMENT ANCHORING: All items of electrical equipment, such as switchboards, panelboards, etc., shall be securely anchored to the building structure. The anchoring shall be accomplished by utilizing a minimum size of 3/8" steel anchor bolts in the structure and to the item of equipment. A minimum of two (2) anchor bolts shall be provided on each side of each item of equipment with the following exceptions:

Exception No. 1: If the equipment manufacturer includes more than two (2) anchor holes per side in the base or base frame of the equipment item, then there shall be one anchor for each anchor hole.

Exception No. 2: If the equipment manufacturer recommends a particular quantity greater than two (2) per side, then that quantity of anchors shall be provided.

3.14 CONTROL WIRING:

A. Control wiring is defined as the wiring, which provides connections between control circuit elements and does not provide the power circuit.

B. Generally, control wiring is specified in Division 15; however, where a control device such as a pushbutton, thermostat, firestat, etc. is to be installed in the power circuit, these devices shall be received, stored and installed as part of the work of this Division.

C. Control wiring and conduit for control wiring shown on the electrical drawings shall be provided regardless of its function.

END OF SECTION

SECTION 16200 SERVICE AND DISTRIBUTION

PART 1 GENERAL

1.01 DESCRIPTION:

A. All work specified in this Section shall comply with the provisions of Section 16011.

B. Provide a complete electrical distribution system. The system shall include the secondary service entrance, main switchboard, feeders, distribution panels, panelboards, busway, remote control switches, contactors, etc., to provide a complete system.

C. All distribution switchgear (branch circuit panelboards, switchboard, distribution panelboards, busway, etc.) shall be the unit responsibility of one manufacturer. All component parts of the above listed items shall be of the same manufacturer except where a written request for a deviation from this requirement has been approved prior to bid date.

D. Shop drawings for equipment specified in this Section shall show that all specified requirements have been incorporated.

E. All floor mounted distribution equipment shall be mounted on a 4" high concrete pad.

1.02 ELECTRICAL SERVICE:

A. Make all arrangements with the power company and pay all charges made by the power company for permanent electric service. In the event that the power company's charges are not available at the time the project is bid, the bids shall be qualified to notify the Owner and/or Engineer that such charges are not included.

B. The contractor shall provide the required conduit and/or weatherheads. There shall be one active and one spare primary conduit.

C. The contractor shall provide ground rods, ground cables, and ground wires, so as to provide a complete grounding system as per NEC 250.

D. The secondary service to the building shall be 120/208 volts, three phase, 4 wire, 60 Hertz AC. Provide all conduit and wire as specified from the secondary terminals of the transformer to the main switchboard.

PART 2 PRODUCTS

2.01 BRANCH CIRCUIT PANELBOARDS:

A. Panelboards (panels) shall be general purpose enclosures and shall be surface or flush mounted as indicated. Panels shall be of the automatic circuit breaker type, factory assembled by the manufacturer of the circuit breakers. Panels shall be for the voltage indicated with the quantity of poles and ampacity of circuit breakers shown.

B. Boxes and trim shall be made from code gauge steel. Boxes shall be of sufficient size to provide a minimum gutter space of 4" on all sides. Boxes shall be minimum 20" width and 5-3/4" depth.

C. Hinged door covering all device handles shall be included in all panel trim. Doors shall have flush-type cylinder lock and catch, except that doors over 48" in height shall have auxiliary fasteners at top and bottom of door in addition to flush-type cylinder lock and catch. Door hinges shall be concealed. All locks shall be keyed alike. Directory frame and

card having a transparent cover shall be furnished with each panel door.

D. Trims for flush panels shall overlap the box by at least 3/4" all around. Surface trims shall have the same width and height as the box. Trims shall be mountable by a screwdriver without the need for special tools. After installation, trim mounting mechanism or hardware shall not be accessible when panel door is closed and locked.

E. All exterior and interior steel surfaces of the trim shall be cleaned and finished with gray paint over a rust-inhibiting phosphatized coating.

F. All interiors shall be completely factory assembled with protective devices, wire connectors, and shall be so designed that devices may be changed without machining, drilling or tapping.

G. Interiors shall be so designed that devices can be replaced without disturbing adjacent units and without removing the main bus connectors.

H. Bus bars for the mains shall be copper sized in accordance with U.L. Standards. Full size bars shall be included. Bus bar taps for panels with single pole branches shall be arranged for sequence phasing of the branch circuit devices.

I. Phase bussing shall be full height without reduction. Cross and center connectors shall be of the same material as the bus.

J. The neutral bus shall utilize set-screws to bond the neutral wire to the neutral bus through holes drilled in the neutral bar. A sheet copper neutral bus utilizing flathead screws to hold the neutral wires will not be acceptable.

K. Spaces for future devices shall be included as indicated and shall be bussed for the maximum rated device that can be fitted into them.

L. All circuit breakers shall be manually operated, thermal-magnetic, automatic, of the ampacity and poles as indicated. They shall be quick-make, quick-break, both on manual and automatic operation. Breakers shall be over-the-center toggle operating type, with the handle going to a position between ON and OFF to indicate automatic tripping. All multi-pole breakers shall have internal common trip. Breakers shall have a minimum of 10,000 RMS symmetrical amperes interrupting capacity unless designated otherwise. The breakers furnished shall be determined by the specifications and by the minimum U.L. labeled RMS symmetrical amperes interrupting capacity at circuit voltage. All circuit breakers shall be bolted on or Square D I-Line and rigidly braced.

M. Panels having sub-feed lugs for feeding through shall have 8" minimum extra gutter space at the lug end and on one side.

N. Each panel as a complete unit shall have a short-circuit current rating equal to or greater than the equipment rating indicated.

O. Panels shall be as manufactured by ITE/Siemens, Square D, G.E. or Cutler Hammer.

2.02 DISTRIBUTION PANELBOARDS:

A. Distribution panelboards shall be of the circuit breaker type, factory assembled by the manufacturer of the circuit breakers, complete with front door cover. The main breaker and the branch circuit breakers shall be as indicated. The main bus shall be copper rated as and of capacity equal to or greater than the rating or setting of the over-current protective device next back in the line. Panel shall be suitable for the voltage and phase indicated.

Provide 25% ground bus.

B. Panels shall be flush or surface mounted as indicated, with baked-on enamel trim, adjustable trim clamps and door with chromium plated combination cylinder lock and catch, all locks keyed alike. Provide a specified nameplate for each device and a blank (not engraved) nameplate for each spare breaker or space.

C. The neutral bus shall utilize set-screws to bond the neutral bus through holes drilled in the neutral bar. A sheet copper neutral bus utilizing flathead screws to hold the neutral wires will not be acceptable.

D. All circuit breakers shall be manually operated, thermalmagnetic, 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 multipole breakers shall have internal common trip. All breakers shall be capable of being locaked in the "off" position.

E. The interrupting capacity of the breakers furnished shall be 22,000 RMS symmetrical unless indicated otherwise.

F. All main circuit breakers shall be molded case and vertically mounted. All vertically mounted molded case circuit breakers shall be mounted so that the handle is up for "ON" and down for "OFF", when viewed from the normal standing position. All vertically mounted molded case main circuit breakers shall be UL approved for feeding in the bottom and out the top.

G. All circuit breakers, including any connectors to the main bus, shall be bolted and rigidly braced.

H. Spaces for future installation of molded case circuit breakers are specified by range of trip rather than a single trip size or frame size. The spaces so scheduled shall be complete with all bus and required bus connectors such that future breakers can be installed without adding or changing bus connectors on the main bus and without using a larger (frame size) or more expensive breaker than the trip size and interrupting capacity would require. If the bus connectors furnished on the main bus will not cover the trip range specified, then duplicate sets of connectors shall be furnished on the main bus for each frame size required.

I. Distribution panels shall be as manufactured by Square D, G.E., ITE/Siemens, or Cutler Hammer.

PART 3 EXECUTION

3.01 INSTALLATION:

A. Provide a typewritten directory under plastic for all panelboards with spares marked in pencil.

B. Provide all necessary hardware to level and secure the switchgear as required by the manufacturer's instructions. Make all electrical connections for supply and load circuits and leave in operating condition.

C. Clean enclosure of all switchgear of all foreign matter, including dust.

END OF SECTION

SECTION 16300 LIGHTING

PART 1 GENERAL

1.01 DESCRIPTION:

A. All work in this Section shall comply with the provisions of Section 16011.

B. Provide all lighting fixtures and lamps as specified herein and as shown.

C. All lamps shall be operating at the time of the final inspection.

D. Confirm exact locations of all lighting fixtures by coordination with the Architectural Reflected Ceiling Plans and mechanical equipment above or on the ceiling.

E. Confirm all ceiling types before ordering lighting fixtures.

F. Each lighting fixture shall have been tested and certified for proper operation by the fixture manufacture for the type mounting and ceiling on/in which it is installed.

G. Lamps and ballasts shall be compatible.

PART 2 PRODUCTS

2.01 LAMPS:

A. The type lamps shall be as specified with each lighting fixture and shall be suitable for use in the fixture for which it is specified.

1. The lamp catalog number is given as a standard of the quality and performance required. Equal lamps by General Electric, Sylvania or Phillips/Westinghouse will be acceptable. 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.

2. Energy conserving and standard (non-energy conserving) fluorescent lamps shall be by the same manufacturer.

B. Fluorescent Lamps:

1. Fluorescent lamps shall be as specified in Lighting Fixture Schedule.

2. Floor lamps shall be listed by manufacturer as suitable for use on the ballasts intended for use.

C. High Intensity Discharge (HID) lamps shall be the voltage and type specified in the lighting fixture schedule.

2.02 BALLASTS:

A. Provide ballasts of the proper voltage rating to match the circuit voltage from which the units are supplied.

B. Fluorescent ballasts shall be the high power factor type, Class "A" sound rating, non-PCB, CBM certified and shall have an automatic resetting thermostat to provide Class P ballast protection.

C. Fluorescent ballasts shall be energy-saving, solid-state, full light output type. Electromagnetic interference shall be minimal. Ballast shall e protected from voltage transients and minimum power factor shall be 90%. Ballast current third harmonic content shall be less than 10%. Average input wattage shall be 65 or less when operating 2 – 32 watt energy-saving lamps. Ballasts shall be as manufactured by Magnetek or approved equal by Advance or Motorola.

D. Ballasts for High Intensity Discharge (HID) lamps shall be Constant Wattage Autotransformer (CWA) type or equal type with 90% minimum power factor. Low power factor or normal power factor (NPF) ballast shall not be used.

2.03 DIFFUSERS:

A. Unless specified otherwise, all prismatic diffusers for fluorescent lighting fixtures shall be prismatic acrylic with a thickness of 0.125", measured from the back side to the peak of the prism.

B. All wraparound lenses shall be virgin acrylic, one-piece and injection molded.

2.04 LIGHTING FIXTURE TRIM:

A. Each recessed lighting fixture shall have a trim to match the type of ceiling (plaster, exposed grid, concealed spline, exposed panel, etc.) in which it is being installed, regardless of catalog number given.

B. Each lighting fixture recessed in a plastered ceiling of any type shall have a plaster frame.

2.05 LIGHT FIXTURE TYPES:

A. Most lighting outlets are lettered or groups of outlets are indicated by a letter.

B. Each lighting fixture shall have a manufacturer's label affixed and shall comply with the requirements of all authorities having jurisdiction.

C. The lighting fixtures that are indicated by the letters shall be as indicated on the Lighting Fixture Schedule.

2.06 RECESSED INCANDESCENT FIXTURES: All recessed incandescent fixtures shall comply with Article 410-65, C of the N.E.C.

2.07 LIGHTING CONTROL:

A. Provide a Photo/Control system with mechanically held contactor for exterior lighting. Photocontrol shall operate to energize the contactor circuits whenever natural lighting falls below 25 footcandles.

PART 3 EXECUTION

3.01 SUPPORT OF LIGHTING FIXTURES:

A. All lighting shall be supported from the building structure. The fixtures shall be supported in a manner that will insure the fixture weight being equally distributed from each support and the fixture remaining in a level position.

B. Fluorescent fixtures installed recessed in a suspended ceiling system shall be supported form the building structure with two (2) 12 gauge wires on diagonal corners of the fixture. In addition, the fixture shall be clipped to members of the ceiling suspension system.

C. Fluorescent fixtures installed in or on any ceiling other than a suspended ceiling system specifically mentioned above shall be supported with concealed steel rods. Rods shall be 1/4" diameter minimum and shall be located where recommended by the fixture manufacturer. Provide a minimum of two (2) supports for each 4' or 8' fixture chassis. Supports shall be maximum of 48" centers. For incandescent fixtures, steel hanging wire may be used by attaching the wire to the fixture mounting frame.

D. Pendant mounted incandescent fixtures shall be stem supported by a fixture stud mounted in the outlet box. Suspended fluorescent fixtures shall have mounting stems located as per the manufacturer's recommendations, but in no case shall have less than two (2) stems per chassis.

3.02 AIMING OF ADJUSTABLE LIGHT FIXTURES: All fixtures with lamp position, tilt, shutters, rotation, or other types of adjustment shall be rough adjusted at the time of installation. The Engineer or his representative will determine the final inspection. Fixtures serving areas where daylighting is predominant will be adjusted after sunset.

3.03 LIGHTING FIXTURES IN MILLWORK, IF AND WHERE REQUIRED:

A. Special attention shall be given to lighting fixtures indicated to be mounted within, under, on or otherwise incorporated into millwork or cabinetry.

B. Refer to the Architectural drawings and details for specific dimensions. This coordination shall occur prior to ordering fixtures to assure fixtures will fit the space limitations of the millwork.

C. This requirement is intended to preclude incurring additions to the Contract due to fixtures being too small or too large for the space.

END OF SECTION

SECTION 16721 FIRE ALARM AND DETECTION SYSTEM

1.01 GENERAL: Shall be installed in conduit. Conduit and wiring though not shown shall be furnished and installed to accomplish the intent of the system as shown on the drawings by symbols and this specification.

1.02 INSTRUCTIONS:

A. Fire Alarm System shall consist of a zoned, non-coded, supervised, general alarm system with automatic and manual detectors.

B. Actuation of any initiation device shall cause the following actions:

1. Activate general alarms (audible & visual)
2. Activate associated zone indicators (audible & visual)
3. Turn off power to all air supply units.

C. The system shall have the capacity to transmit signal to Central Fire reporting station. Furnish all necessary hardware required to accomplish this function and coordinate installation including the proper polarity reversing relays, if required.

D. System wiring shall be Class B as defined by NFPA. Any system circuit wiring ground or open, or any system component failure shall cause all trouble signals to operate. System components shall be protected against transient over voltages.

E. A photoelectric smoke detector shall be located as indicated on plans. Each detector shall be equipped with an integral 135 degree, heat sensing element. No radioactive material shall be used.

F. Manual stations shall be non-coded, dual action stations located as shown on drawings, ensure that one manual station is located at each egress door. Stations shall be red in color and fabricated of high impact Lexan.

G. Main terminal cabinet shall be equipped with a drill switch which, when activated, shall cause only the general alarm audible and visual signals to activate but no other general alarm functions shall be affected.

H. Main terminal cabinet shall have battery standby complete with metered charger. Batteries shall be maintenance free sealed type capable of operating system for 24 hours. Charger shall be rated for recovery of batteries from full discharge to full charge in 24 hours or less.

I. Main terminal cabinet shall contain proper devices and circuity to cause the general alarm bells to sound for (5) minutes and then silence. Other alarm functions will not be affected.

J. System components shall be the following as manufactured by Simplex or equal approved by Architect/Engineer.

Item	Cat. No.	Box
Main terminal cabinet, 4 zone max.	4001 Series	With device
Smoke detector, photo electric	2098 Series	4" octagon
Heat detector	2098 Series	4" octagon
Manual Station	2099 Series	4" Sq. with Lgg raised cover
Audible & visual signal	4903 Series	4" square
Visual signal	4904 Series	4" square

END OF SECTION

SECTION 16920 MOTOR CONTROLS AND WIRING

PART 1 GENERAL

1.01 SCOPE:

A. All work specified in this Section shall comply with the provisions of Section 16010.

B. All motors shall be provided under Division 15.

C. All motor starters shall be furnished under Division 16 for each motor except for package units, which will be furnished with integral starters. Motor starters shall be installed either in a Motor Control Center or separately mounted adjacent to the motor served, as indicated on plans.

D. Motor power wiring is defined as those conductors between the energy source and the motor. This power wiring shall be terminated at the motor terminals.

E. All control wiring required for automatic starting and stopping of motors shall be provided under Division 15 unless specifically shown on the electrical drawings.

F. Power wiring shall be connected through all line voltage control devices such as firestats and thermostats provided by Division 15.

PART 2 PRODUCTS

2.01 MOTOR STARTERS:

A. Starters for motors 1/3 horsepower or smaller shall be manual unless remote or automatic starting is required, in which case the starters shall be magnetic, full voltage, non-reversing, single-speed, unless otherwise indicated. Refer to mechanical drawings, specifications and schedules to determine which motors are not remote started. All other starters shall be magnetic.

B. Each starter for a three-phase motor shall be furnished with three (3) overload relays sized for the full load running current of the motor actually provided. Provide an external "RESET" button or "HAND-OFF-AUTO" selector switch as scheduled with red "RUNNING" light. Provide a green pilot light to indicate motor "STOPPED." Each pilot light shall have a legend plate indicating reason for signal.

C. Each overload relay shall have a normally open alarm contact which will close only when actuated by an overload (not to be confused with N.O. or N.C. auxiliary contacts). These contacts shall be properly wired to their respective blue pilot light provided on the starter front cover and having a "TRIPPED" legend plate.

D. Individually mounted motor starters shall be in a NEMA Type 1 general purpose enclosure in unfinished areas and shall be flush mounted in all finished areas. Each starter shall have a laminated nameplate to indicate Division 15 unit number, function and circuit number. Starters installed outdoors shall be NEMA 3R.

E. All motor starters, push buttons and pilot lights shall be of the same manufacture as the switchboard and shall be Westinghouse-Cutler Hammer, GE, or ITE/Siemens.

2.02 COMBINATION STARTERS:

A. Combination starters shall consist of a circuit breaker or fused switch and a motor starter mounted in a common NEMA Type 1 general purpose enclosure.

B. The motor starter components shall be as specified in paragraph 2.01 for motor starters.

C. The circuit breaker component shall be a minimum 22,000 RMS interrupting capacity and shall be as required in Section 16200.

PART 3 EXECUTION

3.01 INSTALLATION:

A. Provide power wiring to and install all motor starters, unless integrally factory mounted on a piece of equipment.

B. Provide power wiring to all motors except packaged units that are prewired between the starter and motor.

C. Where line voltage control devices are mounted at, on or inside a unit, such as aquastats, firestat for single phase devices, etc., the power wiring to the unit shall be connected through such a control device.

D. On final inspection, it shall be demonstrated to the Architect or his representative that each overload relay control circuit is properly wired and functioning correctly by manually tripping each overload relay individually, one at a time. This inspection procedure shall not involve removing of any wiring or disconnecting any current carrying parts.

END OF SECTION

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-243-l **CODE: (SP)**

DATE: **06/03/2004**

SUJECT: **Landscape Mowing**

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.

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.

907-243.05--Basis of Payment. Landscape mowing, measured as prescribed above, will be paid for at the contract unit price per each mowing, 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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-282-1 **CODE: (SP)**

DATE: **07/20/2004**

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 an approved equal.

907-282.02.4--Valves.

907-282.02.4.1--Electric Control Valves. Electric control valves shall be PEB Series as manufactured by Rain Bird Sprinkler Mfg. Corp., Glendora, California, or approved equal.

Water-tight connectors shall be provided using Scotch Lock or Rain Bird Snap Tight connectors with sealant for wiring connections at electric valves.

Valve box for electric valves shall be the 12-inch Standard Box with snap lock cover as manufactured by Ametek, Plymouth Products Division, Sheboygan, WI 53082, or an 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 manufactured by Waterous, Clow, or an 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.

907-282.02.5.1--Full or Part Circle Pressure Regulating Pop-Up Fixed Spray Sprinkler. These sprinklers shall be 1800 Series sprinklers with pressure regulators and nozzles as manufactured by Rain Bird Sprinkler Mfg. Corp., Glendora, California, or approved equal.

907-282.02.5.2--Full or Part Circle Pop-up Gear Driven Rotor Sprinkler. These sprinklers shall be R-50 and 3500 Series sprinklers with the Seal-A-Matic anti-drainage check valve feature (SAM) as manufactured by Rain Bird Sprinkler Mfg. Corp., Glendora, California, 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, or an 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 a Model ESP-LX+ controller with lockable cabinet, as manufactured by Rain Bird Sprinkler Mfg. Corp., Glendora, California, or approved equal. With each controller, the Contractor shall provide one Automatic Rain/ Freeze Switch, the Mini-Clic 2 Rain Sensor #502, as manufactured by Glen Hilton, or approved equal.

907-282.02.9--Backflow Preventer. Backflow preventer shall be a No. 009 series Reduced Pressure Backflow Preventer as manufactured by Watts Regulator Company, Lawrence, MA., or 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. Scotch Lock connectors shall be installed to wiring in accordance with the manufacturer's written instructions. A 2-foot section, beginning at the Scotch Lock 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.

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, gravel, 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. 907-288-1 **CODE: (SP)**

DATE: 06/04/2004

SUBJECT: Site Grading

Section 907-288, Site Grading, 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 907-288 -- SITE GRADING

907-288.01--Description. This work shall consist of grading, shaping, excavating, filling, and dressing around the completed facilities and other areas within the site as specified or as deemed necessary by the Engineer to provide a pleasing appearance and adequate drainage.

Ordinarily under this specification, site grading, no more than two feet of excavating and filling will be required.

907-288.02--Blank.

907-288. 03--Construction Requirements.

907-288.03.l--Equipment. Equipment used shall be approved tractors conforming to Subsection 108.05 and capable of performing the work in an approved manner to the satisfaction of the Engineer. The equipment shall be of the type to provide a smooth, uniform finish to the surface of the ground when finish grading is performed without leaving undesirable track or other equipment marks on the finished ground.

907-288.03.2--Construction Methods. At the earliest practical time, as determined by the Engineer, this work shall proceed, provided favorable soil moisture conditions exist for construction.

On areas specified or determined by the Engineer to receive topsoil, appropriate adjustment shall be made during the grading and dressing operation such that the finished section after placing the topsoil will conform to typical section shown on the plans or established by the Engineer. Immediately following the grading and dressing of the areas to receive topsoil, the Contractor shall spread the topsoil on all such areas as directed by the Engineer.

Areas within the site required by the Engineer to be site graded only shall be graded, shaped, and dressed meeting the approval of the Engineer.

The planting of the vegetation as required and in accordance with the contract shall follow immediately on the topsoil, if specified, and site graded areas.

Desirable vegetation including trees shall not be damaged or destroyed by the Contractor's operations.

907-288.04--Method of Measurement. Acceptable areas of site grading will be measured by the square yard.

907-288.05--Basis of Payment. Site grading, measured as prescribed above, will be paid for at the contract unit price bid per square yard, which price shall be full compensation for the necessary grading, shaping, excavating, filling, and dressing all materials within the limits of the work necessary for properly grading the site, and for completing all incidentals thereto, and for all equipment, tools labor, supplies, and incidentals necessary to complete the work.

Payment will be made under:

907-288-A: Site Grading - per square yard

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-603-2 **CODE: (SP)**

DATE: **07/20/2004**

SUBJECT: **Slotted Drain Pipe**

Section 603, Culverts and Storm Drains, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as modified by this special provision is applicable to slotted drain pipe ONLY:

907-603.01--Description. This work consists of the construction of a slotted drain system in accordance with these specifications and in reasonably close conformity with the details, lines and grades shown on the plans, or as established. This work shall also consist of furnishing all materials for the installation and backfill of the drain system, and joining the work to other conduit, catch basins, manholes, inlets, etc., as may be required to complete the work as designated.

907-603.02--Materials. The slotted drain pipe shall meet the applicable requirements of Section 709 of the Standard Specifications for corrugated metal pipe. Unless otherwise specified, the pipe shall be 14 gauge.

907-603.03--Construction Requirements. After the trench is prepared and any leveling course placed, the slotted drain pipe shall be placed, aligned and joined together. The joint connection shall produce a water/soil tight connection. Prior to backfilling, the Contractor shall make sure the slot in the top of the pipe is to grade and properly aligned. The drain pipe shall then be carefully backfilled in accordance to the details in the plans.

When the drain pipe begins or terminates without a connection to other pipe or structure, the pipe end shall be sealed or plugged with a suitable cap properly connected to provide a waterproof connection.

907-603.04--Method of Measurement. The lengths of slotted drain pipe will be measured per linear foot by multiplying the number of commercial lengths installed by the nominal length per section; except portions of commercial lengths extending more than four feet beyond the ends of conduit actually required or at the face of structures will not be measured for payment. Costs associated with backfilling the slotted drain pipe, including concrete when required, shall not be measured for separate payment. Such costs shall be included in the unit price bid for slotted drain pipe.

907-603.05--Basis of Payment. Accepted quantities of slotted drain pipe will be paid for at the contract unit price per linear foot, which price shall be full compensation for all equipment, materials, tools labor and incidentals necessary to complete the work, including backfilling.

Payment will be made under:

907-603-MK: ___" Slotted Drain Pipe - per linear foot

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-711-1 **CODE: (IS)**

DATE: 07/15/2004

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, Part III. 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 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.

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. 906-4

2000 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

The Year 2000 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 follow uniform and basic procedures in training in keeping records of trainees' progress toward journey status, and in reporting trainees' successful completion or termination from the program.

FUNDING

MDOT will establish an annual OJT Fund in 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, with a cap of $50,000.00.

PROCEDURE

Trainee positions will be selected by prime and sub contractors and will not be project specific. Provided below are some of the factors that will be used to establish the number of trainee positions each contracting year, they are:

- number of contracts let during a contracting year
- dollar volume
- type of project
- location
- available trainees
- training program(s) submitted by contractor

Each contractor will submit a yearly certification with regard to their participation in the OJT Program. This certification will also identify the number of trainees each prime or sub contractor intends to train on either federal or state funded highway projects.

DISBURSEMENT OF FUNDS

Contractors will be paid $3.00 rate for each hour of training performed by all trainees in an approved training program. Program reimbursements will be made directly to the prime or sub contractor. Request for payment will be submitted to the Contract Administration Office for approval.

Contractors must complete the form providing the following information to be reimbursed.

Contractor's Name
Mailing Address

Trainee Name _____

Social Security Number _____

Type of Program _____

Total Number of Training Hours Required _____

Training Hours Completed for Reimbursement _____

Type of Statement: Monthly _____ Quarterly _____ Annual _____

Work Period or Time Frame	Project Number	Total Hours Worked By Project	Cumulative Hours in Program	Number of Hours to be paid on this Voucher

I hereby certify that this information is true... (Must have customary certification of information).

Signed by: _____ Date: _____

TRAINING PROGRAM APPROVAL

A. To use the OJT Program on highway construction projects, the contractor will notify the Department Contract Administration Office using the Request for On-the-Job Training Program Approval. The notification must include the following information:

- Trainee Starting Date
- Project number (s) trainee starting on
- Training program (classification) to be used; and
- Anticipated date of trainee employment
- Number of classroom training hours by subject

B. If a contractor chooses to use a training program different from those listed in the OJT Program, 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. Minimum wage.

4. Trainee certification of completion.

5. Records and reports submitted to the Contract Administration Office on a quarterly 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 Contract Administration Office 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 Contract Administration Office may elect to interview trainees periodically during the training period to assess their performance and training program. To facilitate the interviews, the Contract Administration Office will contact contractors for the location of the trainees.

CONTRACTOR RESPONSIBILITY

1. Trainees must be identified on payrolls (i.e. dragline trainee).

2. The contractor will submit a quarterly report of training hours completed by trainees to the Contract Administration Office by the tenth working day of the first month of the new quarter using the Federal-Aid Highway Construction Contractors Monthly Training Report form (CAD-322). The trainee must also be provided a copy of the report.

3. 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 quarterly training report.

4. 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.

5. 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 Contract Administration Office with an explanation (***refer to 2 above***).

6. Upon notification from the contractor, the Department will issue a certificate of completion to the trainee.

7. Trainees may be transferred to state-aid highway construction projects in order to complete the training program. If transfers are made the Contract Administration Office must be notified on the Quarterly Reporting Form. All of the training hours completed by trainees will count toward overall program completion.

8. Program reimbursements will be made directly to the prime or sub contractor.

CLASSROOM TRAINING

1. Classroom training programs must be pre-approved by the Department, if the contractor wishes to count the hours toward the trainee's training program.

2. Contractors will be reimbursed for classroom training hours after the trainee has completed 20 hours of work on a highway construction project.

3. Reimbursement for classroom training will be limited to 40 hours per trainee per construction season.

- ***NOTE:*** All proposed classroom training must be submitted as part of the trainee's OJT training program.

WAGE RATE

1. 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.

2. For the purpose of this training program, a quarter does not represent three months. The first two quarters of a 500-hour training program would end after 250 hours. On a 750-hour training program, the first two quarters would end after 375 hours, the third quarter after 560 or an additional 186 hours or work and the fourth after 750 hours.

JOURNEY WORKER RATIO

The ratio of trainee to journey will be less than 1:4 and not more than 1:10.

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 Contact Administration Office 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 Contract Administration Office 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 and Supplemental 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.

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

ADDENDUM NO. _____ DATED _____ ADDENDUM NO. _____ DATED _____
ADDENDUM NO _____ DATED _____ ADDENDUM NO. _____ DATED _____

Number Description

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

Respectfully Submitted,

DATE _____

_____
Contractor

BY _____
Signature

TITLE _____

ADDRESS _____

(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.

Revised 07/08/2004

SECTION 905

PROPOSAL (Sheet No. 2- 1)

CONSTRUCTION NECESSARY TO BUILD MAINTENANCE AREA HEADQUARTERS AND STORAGE BUILDING/FIELD LABORATORY AT VICKSBURG, KNOWN STATE PROJECT NOS. BWO-3122-75(001) / 501408 & BWO-3121-75(001) / 501409, IN THE COUNTY OF WARREN, 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)	202-A			lump sum	Removal of Obstructions	XXXXXXXXXXX XXXXXXXXXXX XXXXXXXXXXX XXXXXXXXXXX	XXXX XXXX XXXX XXXX		
(30)	203-A	(E)	2,037	cubic yard	Unclassified Excavation, FM				
(40)	203-G	(E)	1,357	cubic yard	Excess 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
(50)	211-A	(E)	5,362	square yard	Topsoil for Slope Treatment, From Right-of-Way				
(60)	211-C	(E)	7	cubic yard	Topsoil for Plant Holes, Contractor Furnished				
(70)	211-D	(E)	42	cubic yard	Topsoil for Plant Pits, Contractor Furnished				
(80)	212-B		5,362	square yard	Standard Ground Preparation				
(90)	213-A		1	ton	Agricultural Limestone				
(100)	213-B		1	ton	Combination Fertilizer, 13-13-13				
(110)	213-B		1	ton	Combination Fertilizer, 8-8-8				

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
(120)	213-D		1	ton	Ammonium Nitrate				
(130)	214-A		60	pound	Seeding, Bermudagrass				
(140)	214-A		60	pound	Seeding, Annual Rye Grass				
(150)	215-A		4	ton	Vegetative Materials for Mulch				
(160)	221-A	(S)	11	cubic yard	Portland Cement Concrete Paved Ditch				
(170)	230-A		23	each	Shrub Planting, Indian Hawthorn				
(180)	230-A		42	each	Shrub Planting, Carissa Holly				

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
(190)	230-A		1,308	each	Shrub Planting, Liriope				
(200)	230-B		6	each	Tree Planting, Biloxi Crapemyrtle				
(210)	230-B		2	each	Tree Planting, Red Maple				
(220)	230-B		3	each	Tree Planting, Scarlett Oak				
(230)	230-B		3	each	Tree Planting, Willow Oak				
(240)	907-230-C		166	linear foot	Bed Edging				
(250)	907-230-D		2,284	square foot	Bed Preparation				

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
(260)	907-230-E		22	cubic yard	Type V Mulch				
(270)	232-A		1	M	Fertilizer for Woody Plant Material, Tablet, 21 gram				
(280)	232-A		1	M	Fertilizer for Woody Plant Material, Tablet, 10 gram				
(290)	233-A		20	cubic yard	Tree Bark Mulch, Type I				
(300)	234-A		413	linear foot	Temporary Silt Fence				
(310)	235-A		76	each	Temporary Erosion Checks				
(320)	907-242-A			lump sum	Maintenance Area Headquarters Building	XXXXXXXXXXX XXXXXXXXXXX XXXXXXXXXXX XXXXXXXXXXX	XXXX XXXX XXXX XXXX		

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
(330)	907-242-B			lump sum	Storage Building / Field Lab	XXXXXXXXXXX XXXXXXXXXXX XXXXXXXXXXX XXXXXXXXXXX	XXXX XXXX XXXX XXXX		
(340)	907-243-A		6	each	Landscape Mowing				
(350)	907-258-PP		2	each	Handicap Parking Sign and Post, Per Plans				
(360)	907-282-A		10	each	Sprinkler Head, 1812-PRS-15Q				
(370)	907-282-A		14	each	Sprinkler Head, 1812-PRS-15H				
(380)	907-282-A		2	each	Sprinkler Head, 1812-PRS-15SST				
(390)	907-282-A		4	each	Sprinkler Head, 1804-PRS-15Q				

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
(400)	907-282-A		8	each	Sprinkler Head, 1804-PRS-15H				
(410)	907-282-A		4	each	Sprinkler Head, 1804-PRS-15F				
(420)	907-282-A		11	each	Sprinkler Head, 1804-PRS-15SST				
(430)	907-282-A		6	each	Sprinkler Head, T-SAM-4-PC-T22-.65				
(440)	907-282-A		25	each	Sprinkler Head, T-SAM-4-PC-T22-1.30				
(450)	907-282-A		2	each	Sprinkler Head, T-SAM-4-PC-T22-2.0				
(460)	907-282-A		8	each	Sprinkler Head, T-SAM-4-PC-T22-2.5				

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
(470)	907-282-B		679	linear foot	Piping, 1/2" Diameter				
(480)	907-282-B		534	linear foot	Piping, 3/4" Diameter				
(490)	907-282-B		168	linear foot	Piping, 1" Diameter				
(500)	907-282-B		105	linear foot	Piping, 1 1/4" Diameter				
(510)	907-282-B		72	linear foot	Piping, 1 1/2" Diameter				
(520)	907-282-B		36	linear foot	Piping, 2" Diameter				
(530)	907-282-B		255	linear foot	Piping, 3" Diameter				

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
(540)	907-282-C		185	linear foot	Sleeves, 6-inch Diameter				
(550)	907-282-D		900	linear foot	Valve Control Wire				
(560)	907-282-E		2,000	linear foot	Trench Excavation and Backfill				
(570)	907-282-G		1	each	Electric Controller, 6 Station				
(580)	907-282-H		1	each	Electric Control Valve, 1"				
(590)	907-282-H		2	each	Electric Control Valve, 1 1/2"				
(600)	907-282-H		2	each	Electric Control Valve, 2"				

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
(610)	907-282-J		1	each	Isolation Value, 3"				
(620)	907-282-K		1	each	Quick Coupler Key with Hose and Swivel				
(630)	907-288-A		5,362	square yard	Site Grading				
(640)	304-A	(GY)	469	cubic yard	Granular Material, LVM, Class 5, Group C				
(650)	601-B	(S)	2	cubic yard	Class "B" Structural Concrete, Minor Structures				
(660)	602-A	(S)	95	pound	Reinforcing Steel				
(670)	603-CA	(S)	40	linear foot	15" 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
(680)	603-CA	(S)	24	linear foot	24" Reinforced Concrete Pipe, Class III				
(690)	603-CB	(S)	1	each	15" Reinforced Concrete End Section				
(700)	603-CB	(S)	2	each	24" Reinforced Concrete End Section				
(710)	907-603-MK	(S)	86	linear foot	12" Slotted Drain Pipe				
(720)	607-B		2,416	linear foot	72" Type I Chain Link Fence, Class I , With Top Guard				
(730)	607-G		2	each	Gate, 13' x 6' Chain Link, With Top Guard				
(740)	608-B	(S)	71	square yard	Concrete Sidewalk, With Reinforcement				

REF. NO.	PAY ITEM NO.	ADJ. CODE	APPROX. QUANTITY	UNIT	DESCRIPTION	UNIT PRICE DOLLAR	UNIT PRICE CENT	ITEM TOTAL DOLLAR	ITEM TOTAL CENT
(750)	609-B	(S)	134	linear foot	Concrete Curb, Header				
(760)	609-D	(S)	511	linear foot	Combination Concrete Curb and Gutter Type 1				

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				
(770)	620-A			lump sum	Mobilization	XXXXXXXXXXX XXXXXXXXXXX XXXXXXXXXXX XXXXXXXXXXX	XXXX XXXX XXXX XXXX		
(780)	699-A			lump sum	Roadway Construction Stakes	XXXXXXXXXXX XXXXXXXXXXX XXXXXXXXXXX XXXXXXXXXXX	XXXX XXXX XXXX XXXX		

SUBTOTAL - DEPENDENT ITEMS.....$_____

TOTAL BID - DIRECT AND DEPENDENT ITEMS.....$_____

*** 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 _____

_____

_____

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

CERTIFICATE

If awarded this contract, I (we) contemplate that portions of the contract will be sublet. I (we) certify that those subcontracts which are equal to or in excess of fifty thousand dollars ($50,000.00) will be in accordance with regulations promulgated and adopted by the Mississippi State Board of Contractors on January 13, 1999.

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

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

_____	_____
(Individual or Firm)	(Address)
_____	_____
(Individual or Firm)	(Address)
_____	_____
(Individual or Firm)	(Address)
_____	_____
(Individual or Firm)	(Address)

NOTE: Failure to complete the above DOES NOT preclude subsequent subcontracts. Subsequent subcontracts, if any, equal to or in excess of fifty thousand dollars ($50,000.00) will be in accordance with regulations promulgated and adopted by the Mississippi State Board of Contractors on January 13, 1999.

Contractor _____

By _____

Title _____

CERTIFICATE MUST BE EXECUTED

REV. 2/99

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. _____,

in_____ Count ____, Mississippi, has not either directly or indirectly entered into any agreement, participated in any collusion; or otherwise taken any action in restraint of free competitive bidding in connection with this contract; nor have any of its corporate officers or principal owners.

Except as noted hereafter, it is further certified that said legal entity and its corporate officers, principal owners, managers, auditors and others in a position of administering federal funds are not currently under suspension, debarment, voluntary exclusion or determination of ineligibility; nor have a debarment pending; nor been suspended, debarred, voluntarily excluded or determined ineligible within the past three years by the Mississippi Transportation Commission, the State of Mississippi, any other State or a federal agency; nor been indicted, convicted or had a civil judgment rendered by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past three years.

Initial here "_____" if exceptions are attached and made a part thereof. Any exceptions shall address to whom it applies, initiating agency and dates of such action.

Note: Exceptions will not necessarily result in denial of award but will be considered in determining bidder responsibility. Providing false information may result in criminal prosecution or administrative sanctions.

All of the foregoing and attachments (when indicated) is true and correct.

Executed on _____ _____
Signature

(11/23/92S)

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. _____,

in_____ Count ____, Mississippi, has not either directly or indirectly entered into any agreement, participated in any collusion; or otherwise taken any action in restraint of free competitive bidding in connection with this contract; nor have any of its corporate officers or principal owners.

Except as noted hereafter, it is further certified that said legal entity and its corporate officers, principal owners, managers, auditors and others in a position of administering federal funds are not currently under suspension, debarment, voluntary exclusion or determination of ineligibility; nor have a debarment pending; nor been suspended, debarred, voluntarily excluded or determined ineligible within the past three years by the Mississippi Transportation Commission, the State of Mississippi, any other State or a federal agency; nor been indicted, convicted or had a civil judgment rendered by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past three years.

Initial here "_____" if exceptions are attached and made a part thereof. Any exceptions shall address to whom it applies, initiating agency and dates of such action.

Note: Exceptions will not necessarily result in denial of award but will be considered in determining bidder responsibility. Providing false information may result in criminal prosecution or administrative sanctions.

All of the foregoing and attachments (when indicated) is true and correct.

Executed on _____ _____
Signature

(11/23/92S)

S E C T I O N 9 0 2

CONTRACT FOR _____

LOCATED IN THE COUNTY OF _____

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: _____

LOCATED IN THE COUNTY OF: _____

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 Constract 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)

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

HAUL PERMIT FOR BRIDGES

WITH

POSTED LOAD LIMITS

DATE: _____

PROJECT: BWO-3122-75(001) / 501408 & BWO-3121-75 / 501409

COUNTY: WARREN COUNTY

LOCATION: VICKSBURG AREA HEADQUARTERS AND LAB BUILDING..

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 load limits.

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

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

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

_____

EXECUTIVE DIRECTOR