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SM No. CSTP0055022101

PROPOSAL AND CONTRACT DOCUMENTS

FOR THE CONSTRUCTION OF
(NONEXEMPT)

11

Site Improvements to the Rest Area on I-55 Northbound north of Durant, known as Federal Aid Project No. STP/IM-0055-02(210) / 105533301 & 302, in the County of Holmes, State of Mississippi.

Project Completion: June 30, 2010

NOTICE

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

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

**SECTION 900
OF THE CURRENT
(2004) STANDARD SPECIFICATIONS
FOR ROAD AND BRIDGE CONSTRUCTION
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.
- | _____ The Certification regarding Non-Collusion, Debarment and Suspension, etc. has been executed in duplicate.
- _____ A certified check, cashier's check or bid bond payable to the State of Mississippi in the principal amount of 5% of the bid has been included with project number identified on same. Bid bond has been signed by the bidder and has also been signed or countersigned by a Mississippi Resident Agent for the Surety with Power of Attorney attached.
- | _____ 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.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

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OCR-485.

(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 25, 2009; thereafter, bids will be received in the First Floor Auditorium of the Mississippi Department of Transportation Administration Building, Jackson, Mississippi, until 10:00 o'clock A.M., Tuesday, August 25, 2009, and shortly thereafter publicly opened for:

Site Improvements to the Rest Area on I-55 Northbound north of Durant, known as Federal Aid Project No. STP/IM-0055-02(210) / 105533301 & 302, in the County of Holmes, State of Mississippi

The attention of bidders is directed to the Contract Provisions governing selection and employment of labor. Minimum wage rates have been predetermined by the Secretary of Labor and are subject to Public Law 87-58 1, Work Hours Act of 1962, as set forth in the Contract Provisions.

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

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

Bid proposals must be acquired from the MDOT Contract Administration Division. These proposals are available at a cost of Ten Dollars (\$10.00) per proposal. Specimen proposals are also available at the MDOT Contract Administration Division at a cost of Ten Dollars (\$10.00) per proposal, or can be viewed or downloaded at no cost at www.gomdot.com.

Plans may be acquired on a cost per sheet basis from MDOT Plans Print Shop, MDOT Shop Complex, Building C, Room 114, 2567 North West Street, Jackson, Mississippi 39216, 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

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. 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 as 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. 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. 640

CODE: (IS)

| DATE: 09/26/2005

SUBJECT: Fiber Reinforced Concrete

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

SUPPLEMENT TO NOTICE TO BIDDERS NO. 696

DATE: 06/06/2008

The goal is 7 percent for the Disadvantaged Business Enterprise. The low bidder is required to submit Form OCR-481 for all DBEs. Bidders are advised to check the bid tabulation link for this project on the MDOT website (<http://www.gomdot.com/applications/bidsystem/currentletting.aspx>) for results. Bid tabulations are usually posted by 3:00 pm on Letting Day.

Form OCR-481 is available at http://www.gomdot.com/Divisions/CivilRights/Resources/Forms/pdf/MDOT_OCR481.pdf or by calling 601-359-7466.

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

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

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

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

A pre-bid meeting will be held in Amphitheater 1 & 2 of the Hilton Jackson located at I-55 and County Line Road, Jackson, Mississippi at 2:00 P.M. on the day preceding the date of the bid opening.

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

A list of "Certified DBE Contractors" which have been certified as such by the Mississippi Department of Transportation and other Unified Certification Partners (UPC) can be found on the Mississippi Department of Transportation website at www.gomdot.com. The DBE firm must be on the Department's list of "Certified DBE Contractors" that is posted online at the time the job is let and approved by MDOT to count towards meeting the DBE goal.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 696

CODE: (IS)

DATE: 12/20/2005

SUBJECT: DISADVANTAGED BUSINESS ENTERPRISES IN FEDERAL-AID HIGHWAY CONSTRUCTION

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

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

Copies of the program may be obtained from:

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

POLICY

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

ASSURANCES THAT CONTRACTORS MUST TAKE:

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

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

DEFINITIONS

For purposes of this provision the following definitions will apply:

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

CONTRACTOR'S OBLIGATION

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

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

CONTRACT GOAL

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

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

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

FORMS ARE AVAILABLE FROM THE CONTRACT ADMINISTRATION DIVISION

The OCR-481 Form must contain the following information:

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

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

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

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

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

- (1) Whether the bidder attended the pre-bid meeting that was scheduled by the Department to inform DBEs of subcontracting opportunities;
- (2) whether the bidder advertised in general circulation, trade association, and minority-focus media concerning the subcontracting opportunities;
- (3) whether the bidder provided written notice to a reasonable number of specific DBEs that their interest in the contract is being solicited;
- (4) whether the bidder followed up initial solicitations of interest by contacting DBEs to determine with certainty whether they were interested;
- (5) whether the bidder selected portions of the work to be performed by DBEs in order to increase the likelihood of meeting the contract goal;
- (6) whether the bidder provided interested DBEs with adequate information about the plans, specifications and requirements of the contract;

- (7) whether the bidder negotiated in good faith with interested DBEs and did not reject them as unqualified without sound reasons based on a thorough investigation of their capabilities; and
- (8) whether the bidder made efforts to assist interested DBEs in obtaining any required bonding or insurance.

DIRECTORY

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

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

REPLACEMENT

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

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

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

GOOD FAITH EFFORTS

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

- (a) Proof of written notification to certified DBE Contractors by certified mail that their interest is solicited in subcontracting the work defaulted by the previous DBE or in subcontracting other items of work in the contract.
- (b) Efforts to negotiate with certified DBE Contractors for specific items shall include as a minimum:
 - (1) The name, address, and telephone number of each DBE contacted;
 - (2) A description of the information provided about the plans and specifications for those portions of the work to be subcontracted; and
 - (3) A statement of why agreements were not reached.
- (c) For each DBE contacted that was rejected as unqualified, the reasons for such conclusion.
- (d) Efforts made to assist each DBE that needed assistance in obtaining bonding or insurance required by the Contractor.

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

PARTICIPATION / DBE CREDIT

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

- (1) If the Prime Contractor is a certified DBE firm, only the value of the work actually performed by the DBE Prime can be counted towards the project goal, along with any work subcontracted to a certified DBE firm.
- (2) If the Contractor is not a DBE, the work subcontracted to a certified DBE Contractor will be counted toward the goal.
- (3) The Contractor may count toward the goal a portion of the total dollar value of a contract with a joint venture eligible under the standards of this provision equal to the percentage of the DBE partner in the joint venture.
- (4) Expenditures to DBEs that perform a commercially useful function may be counted toward the goal. A business is considered to perform a commercially useful function when it is responsible for the execution of a distinct element of the work and carries out its responsibilities by actually performing, managing, and supervising the work involved.

- (5) The Contractor may count 100% of the expenditures for materials and supplies obtained from certified DBE suppliers and manufacturers that produce goods from raw materials or substantially alters them for resale provided the suppliers and manufacturers assume the actual and contractual responsibility for the provision of the materials and supplies. The Contractor may count 60 percent of the expenditures to suppliers that are not manufacturers, provided the supplier performs a commercially useful function in the supply process. Within 30 days after receipt of the materials, the Contractor shall furnish to the DBE Coordinator invoices from the certified supplier to verify the DBE goal.
- (6) Any work that a certified DBE firm subcontracts or sub-subcontracts to a non-DBE firm will not count towards the DBE goal.
- (7) Only the dollars actually paid to the DBE firm may be counted towards the DBE goal.

AWARD

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

- (1) Concurrence from Federal Highway Administration, when applicable.
- (2) Bidder must submit to the Contract Administration Division for approval, Form OCR-481 (DBE Commitment) no later than the 10th day after opening of the bids, or submit information with the bid proposal to satisfy the Department and that adequate good faith efforts have been made to meet the contract goal.
- (3) Bidder must submit **with the bid proposal** a list of all firms that submitted quotes for material supplies or items to be subcontracted. This information must be submitted on form OCR-485 in the back of the contract proposal.

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

DEFAULT

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

DBE REPORTS

- (1) OCR-481: Refer to "CONTRACT GOAL" section of this Notice to Bidders for information regarding this form.
- (2) OCR-482: At the conclusion of the project the Contractor will submit to the Project Engineer for verification of quantities and further handling Form OCR-482 whereby the Contractor certifies to the amounts of payments made to each Contractor / Supplier. The Project Engineer shall submit the completed Form OCR-482 to the DBE Coordinator (Office of Civil Rights). Final acceptance of the project is dependent upon Contract Administration Division's receipt of completed Form OCR-482 which they will receive from the Office of Civil Rights.
- (3) OCR-483: The Project Engineer/Inspector will complete Form OCR-483, the Commercially Useful Function (CUF) Performance Report, in accordance with MDOT S.O.P. No. OCR-03-09-01-483. Evaluations reported on this form are used to determine whether or not the DBE firm is performing a CUF. The Prime Contractor should take corrective action when the report contains any negative evaluations. DBE credit may be disallowed and/or other sanctions imposed if it is determined the DBE firm is not performing a CUF. This form should also be completed and returned to the DBE Coordinator (Office of Civil Rights).
- (4) OCR-484: Each month, the Contractor will submit to the Project Engineer OCR-484 certifying payments to all Subcontractors.
- (5) OCR-485: The bidder must submit **with the bid proposal** a list of all firms that submitted quotes for material supplies or items to be subcontracted.
- (6) OCR-487: Only used by Prime Contractors that are certified DBE firms. This form is used in determining the exact percentage of DBE credit for the specified project. It should be returned to MDOT with the OCR-481 form, or can also be returned with the Permission to Subcontract Forms (CAD-720 or CAD-725).

SANCTIONS

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

- (1) Disallow credit towards the DBE goal
- (2) Withhold progress estimate payments
- (3) Deduct from the final estimate an amount equal to the unmet portion of the DBE goal

- (4) Recover an amount equal to the unmet contract goal
- (5) Debar the Contractor involved from bidding on Mississippi Department of Transportation projects.
- (6) Deduct from the Contractor's final estimate all or any combination of the following.

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

| SECTION 904 - NOTICE TO BIDDERS NO. [777](#)

CODE: (IS)

| DATE: [04/13/2006](#)

SUBJECT: On-The-Job Training Program

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

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 883

CODE: (IS)

DATE: 04/28/2006

SUBJECT: Payroll Requirements

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

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

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

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

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

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 1321

CODE: (SP)

DATE: 01/22/2007

SUBJECT: Use of Precast Drainage Units

Bidders attention is brought to the content of Subsection 601.02.3 regarding precast units. The Contractor must make a request to the Project Engineer for approval to use precast units prior to installation. Even though the units have been pre-approved by MDOT, official request for use is required.

MDOT has pre-approved the following manufactures. Any other manufacturer must be pre-approved by MDOT Roadway Design Division prior to use.

Hanson Pipe & Products, Inc.
2840 W. Northside Drive
Jackson, MS 39213
(Formally Choctaw, Inc.)

Custom Precast Products, Inc.
125 International Boulevard
Lavergne, TN 37086-3326

Custom Precast Products, Inc.
P.O. Drawer #242
#68 Industrial Park
Lumberton, MS 39455

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 1405

CODE: (IS)

DATE: 03/15/2007

SUBJECT: ERRATA AND MODIFICATIONS TO THE 2004 STANDARD SPECIFICATIONS

<u>Page</u>	<u>Subsection</u>	<u>Change</u>
101	201.01	In the second sentence of the first paragraph, change “salvable” to “salvageable”.
107	202.04	In the fourth sentence of the fourth paragraph, change “yard” to “feet”.
107	202.05	In the list of units measurements for 202-B, add “square foot”.
132	211.03.4	In the second sentence of the second paragraph, change “planted” to “plated”.
192	306.02.4	In the first line of the first paragraph, delete the word “be”.
200	307.03.7	In the fourth sentence of the second paragraph, change “lime-fly ash” to “treated”.
236	401.01	Change the header from “Section 403” to “Section 401”.
242	401.02.3.2	In the first sentence of the third full paragraph, add “1/8” in the blank before the inch mark.
250	401.02.6.3	In the second sentence of the first paragraph on page 250, change “rutting over ”” to “rutting over 1/8” ”.
253	401.02.6.4.2	In the paragraph preceding the table, change “91.0” to “89.0”.
259	401.03.1.4	In the first paragraph, change “92.0 percent” to “the specified percentage (92.0 or 93.0)”.
269	403.03.2	In the table at the top of page 269, change the PI requirement from “ = ” to “ ≤ ”.

- 278 404.04 In the second sentence, change the subsection from “401.04” to “403.04”.
- 283 409.02.2 Change “PG 64-22” to “PG 67-22”.
- 294 413.02 In the first sentence of the second paragraph, change “707.02.1.3” to “Subsection 707.02.1.3”.
- 340 511.04 In the second sentence of the second paragraph, change “412” to “512”.
- 349 601.03.3 In the first sentence, change “804.03.2” to “804.03.5”.
- 355 603.02 Change the subsection reference for Joint mortar from “707.03” to “714.11”.
- 369 604.04 In the first sentence, change “601.04” to “Subsection 601.04”.
- 427 619.04 Delete the second paragraph.
- 442 625.04 In the third paragraph, change “626.04” to “Subsection 626.04”.
- 444 626.03.1.2 Delete the third sentence of the first paragraph.
- 464 631.02 Change the subsection reference for Water from “714.01.0” to “714.01.1”.
- 570 682.03 Change the subsection number from “682-03” to “682.03”.
- 575 683.10.4 Change the subsection number from “683.10.4” to “683.04”.
- 575 683.10.5 Change the subsection number from “683.10.5” to “683.05”.
- 596 701.02 In the table under the column titled “Cementations material required”, change Class F, FA” to “Class F FA,”.
- 603 702.11 In the first sentence, change “702.12” to “Subsection 702.12”.
- 612 703.04.2 In the fifth paragraph, delete “Subsection 703.11 and”.
- 616 703.07.2 In the Percentage By Weight Passing Square Mesh Sieves table, change the No. 10 requirement for Class 7 material from “30 - 10” to “30 - 100”.

- 618 703.13.1 In the first sentence of the first paragraph, change “703.09” to “703.06”.
- 618 703.13.2 In the first sentence, change “703.09” to “703.06”.
- 671 712.06.2.2 In the first sentence, change “712.05.1” to “Subsection 712.05.1”.
- 689 714.11.2 In the first sentence, change “412” to “512”.
- 709 715.09.5 In the first sentence of the first paragraph, change “guage” to “gauge”.
- 717 717.02.3.4 In the top line of the tension table, change “1 1/2” to “1 1/8” and change “1 1/8” to “1 1/2”.
- 741 720.05.2.2 In the last sentence of this subsection, change “720.05.2.1” to “Subsection 720.05.2.1”.
- 827 803.03.2.3.7.5.2 In the first sentence of the second paragraph, change “803.03.5.4” to “803.03.2.3.4”.
- 833 803.03.2.6 In the first sentence, change “803.03.7” to “803.03.2.5”.
- 854 804.02.11 In the last sentence of the first paragraph, change “automatically” to “automatic”.
- 859 804.02.13.1.3 In the last sentence, change Subsection “804.02.12.1” to “804.02.12”.
- 879 804.03.19.3.2 In the first sentence of the third paragraph, change “listed on of Approved” to “listed on the Approved”.
- 879 804.03.19.3.2 In the last sentence of the last paragraph, change “804.03.19.3.1” to “Subsection 804.03.19.3.1”.
- 962 814.02.3 In the first sentence, change “710.03” to “Subsection 710.03”.
- 976 820.03.2.1 In the first sentence, change “803.02.6” to “803.03.1.7”.
- 976 820.03.2.2 In the first sentence, change “803.03.9.6” to “803.03.1.9.2”.
- 985 Index Change the subsection reference for Petroleum Asphalt Cement from “702.5” to “702.05”.

985	Index	Change the subsection reference for the Definition of Asphaltic Cement or Petroleum Asphalt from “700.2” to “700.02”.
985	Index	Change the subsection reference for Automatic Batchers from “501.03.2.4” to “804.02.10.4”.
986	Index	Delete “501.03.2” as a subsection reference for Batching Plant & Equipment.
988	Index	Change the subsection reference for the Central Mixed Concrete from “501.03.3.2” to “804.02.11”.
988	Index	Change the subsection reference for the Concrete Batching Plant & Equipment from “501.03.2” to “804.02.11”.
999	Index	Delete “501.03.3.3” as a subsection reference for Truck Mixers.
1001	Index	Change the subsection reference for Edge Drain Pipes from “605.3.5” to “605.03.5”.
1002	Index	Change the subsection reference for Metal Posts from “713.05.2” to “712.05.2”.
1007	Index	Change the subsection reference for Coarse Aggregate of Cement Concrete Table from “703.3” to “703.03”.
1007	Index	Change the subsection reference for Composite Gradation for Mechanically Stabilized Courses Table from “703.8” to “703.08”.
1009	Index	Delete “501.03.3.3” as a subsection reference for Truck Mixers and Truck Agitators.
1010	Index	Delete reference to “Working Day, Definition of”.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 1808

CODE: (IS)

DATE: 09/09/2008

SUBJECT: Safety Apparel

Bidders are advised that the Code of Federal Regulations CFR 23 Part 634 final rule was adopted November 24, 2006 with an effective date of November 24, 2008. This rule requires that **"All workers within the right-of-way of a Federal-Aid Highway who are exposed either to traffic (vehicles using the highway for the purposes of travel) or to construction equipment within the work area shall wear high-visibility safety apparel"**. High-visibility safety apparel is defined in the CFR as **"personnel protective safety clothing that is intended to provide conspicuity during both daytime and nighttime usage, and that meets the Performance Class 2 or 3 requirements of the ANSI/ISEA 107-2004 publication entitled American National Standard for High-Visibility Safety Apparel and Headwear"**. All workers on Mississippi State Highway right-of-way shall comply with this Federal Regulation. Workers are defined by the CFR as **"people on foot whose duties place them within the right-of way of a Federal-Aid Highway, such as highway construction and maintenance forces, survey crews, utility crews, responders to incidents within the highway right-of-way, and law enforcement personnel when directing traffic, investigating crashes, and handling lane closures, obstructed roadways, and disasters within the right-of-way of a Federal-Aid Highway"**.

You can access this final rule at the following link:

<http://a257.g.akamaitech.net/7/257/2422/01jan20061800/edocket.access.gpo.gov/2006/pdf/E6-19910.pdf>

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 1869

CODE: (SP)

DATE: 02/01/2008

SUBJECT: Minimum Wage Rate

Bidders are advised of an increase in the minimum federal wage rate established by the United States Department of Labor Wage and Hour Division beginning July 24, 2007. On July 24, 2007, the minimum wage rate was increased to \$5.85 per hour.

MDOT gets the minimum wage rates and classifications that are used in proposals from the Department of Labor website. Because of delays in posting to the website, the wages rates and classifications in this proposal may not contain the latest information regarding wage rates and classifications.

Bidders are advised that regardless of the wage rates listed in the Supplement to FHWA 1273, minimum federal wage rates must be paid.

Below are Federal minimum wage rates and effective dates.

Beginning July 24, 2007	\$ 5.85
Beginning July 25, 2008	\$ 6.55
Beginning July 24, 2009	\$ 7.25

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 1922

CODE: (SP)

DATE: 03/31/2008

SUBJECT: Non-Quality Control / Quality Assurance Concrete

Bidders are advised that the following pay items will not be accepted based on the Quality Control / Quality Assurance (QC/QA) requirements of Section 804 of the specifications. The acceptance of these pay items will be based on sampling and testing at the project site by MDOT forces. The Contractor is required to submit mix designs to accomplish this work in accordance with Section 804 and perform normal Quality Control functions at the concrete plant. Acceptance will be in accordance with the requirements of 907-601, Structural Concrete, and TMD-20-04-00-000. At the discretion of the Engineer, the Contractor may request that the concrete be accepted based on QC/QA requirements.

<u>Pay Item</u>	<u>Description</u>
221	Paved Ditches
601	Structural Concrete, Minor Structures - manholes, inlets, catch basins, junction boxes, pipe headwalls, and pipe collars.
606	Guardrail Anchors
607	Fence Post Footings
608	Sidewalks
609	Curb and Gutter
614	Driveways
616	Median and Island Pavement
630	Sign Footings, except Overhead Sign Supports

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

| SECTION 904 - NOTICE TO BIDDERS NO. 1928

CODE: (IS)

| DATE: 04/14/2008

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/sw/brdgcalf/calc_page.htm

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2239

CODE: (SP)

DATE: 01/06/2009

SUBJECT: Department of Labor Ruling

On December 19, 2008 the U.S. Department of Labor issued a final rule revising their regulations in 29 CFR Parts 3 and 5. This rule takes effect for all Federal funded contracts awarded after January 19, 2009.

The primary change in the rule is a provision that requires Contractors to limit the amount of personal information on the weekly payroll submissions. Personal addresses and full social security numbers may no longer be used. Contractors must use an ". . . individually identifying number for each employee (e.g., the last four digits of the employee's social security number)." Form FHWA-1273 - "Required Contract Provisions Federal-aid Construction Contracts" will eventually be revised to reflect this change.

Until the revised is made to FHWA-1273, bidders are advised to disregard any requirement in FHWA-1273 regarding the use of personal addresses and full social security numbers, such as in Section V, Paragraph 2b.

Bidders are also advised that the requirement for maintaining and submitting form FHWA-47, as referenced in FHWA-1273 Section VI, is no longer required on construction projects.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2246

CODE: (SP)

DATE: 07/14/2009

SUBJECT: Contract Time

PROJECT: STP-0055-02(210) / 105533301 – Holmes County

The calendar date for completion of work to be performed by the Contractor for this project shall be **July 30, 2010** which date or extended date as provided in Subsection 108.06 shall be the end of contract time. It is anticipated that the Notice of Award will be issued by not later than **September 8, 2009** and the effective date of the Notice to Proceed / Beginning of Contract Time will be simultaneous with the execution of the contract.

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 – NOTICE TO BIDDERS NO. 2290

CODE: (SP)

DATE: 05/11/2009

SUBJECT: Additional Construction Considerations

PROJECT: STP-0055-02(210) / 105533301 – Holmes County

Contractor shall begin immediately with the required demolition of site elements and installation of utilities to the existing building under construction. Demolition of site elements shall be coordinated with the Engineer and the Building Contractor, who is currently under a separate contract with the Department, to preserve existing parking areas for layout space, parking, and access for the Building Contract. The remaining site demolition shall not occur until approved by the Engineer.

The rest area building and site has been closed to the Public during construction and will not open until construction is complete with these site improvements and landscape maintenance has begun. Every effort shall be made to minimize conflicts between the Site and Building Contractors and minimize construction impacts to the site.

Contractor is also advised to plant trees, shrubs and grassing outside the irrigated areas as early as possible in order to provide the maximum time for plant material establishment. It is further advised that warm season grassing (Bermudagrass) is planted where possible during the allowable seasonal limitations, minimizing the need for cool season grassing (Ryegrass), and subsequent warm season grassing the following spring.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2361

CODE: (SP)

DATE: 01/26/2009

SUBJECT: Mississippi Resident Agent Requirement

Bidders are advised of new changes in the proposal bond forms and required signatures. Commencing with the February 2009 letting, non-resident agents **WILL NOT** be allowed to sign contract documents, including bonds and insurance. Qualified non-resident agents that were allowed to sign contract documents in the January 2009 letting will not be allowed in future contracts until further notice. Only Mississippi Resident Agents will be allowed to sign contract documents.

Another change for the February 2009 letting is that the new performance bond and new payment bond that was utilized in the January 2009 proposals has been replaced with the one contract bond used by MODT prior to the January 2009 letting.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

| SECTION 904 - NOTICE TO BIDDERS NO. [2382](#)

CODE: (IS)

| DATE: [02/12/2009](#)

| SUBJECT: **Status of Right-of-Way**

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 receiving bids, sometimes 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 possible unacquired rights-of-way, relocatees and utilities which have not been completed.

| The status of right-of-way acquisition, utility adjustments, [encroachments](#), potentially contaminated sites [and asbestos containment](#) are set forth in [the following](#) attachments.

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

**STATUS OF RIGHT-OF-WAY
STP-0055-02(210)
105533-301000
HOLMES COUNTY
March 20, 2009**

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

NONE.

ASBESTOS CONTAMINATION STATUS OF BUILDINGS
TO BE REMOVED BY THE CONTRACTOR

STP-0055-02(210)
105533-301000
HOLMES COUNTY
March 20, 2009

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

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

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

STATUS OF POTENTIALLY CONTAMINATED SITES

STP-0055-02(210)

105533-301000

HOLMES COUNTY

March 20, 2009

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

ENCROACHMENT CERTIFICATION

STP-0055-02(210) / 105533301

Holmes County(ies)

February 27, 2009

This is to certify that the above captioned project has been inspected and no encroachments were found.

UTILITY STATUS REPORT

STP-0055-02(210) / 105533301

Holmes County(ies)

February 27, 2009

This is to certify that the above captioned project has been inspected and there are no known utilities in conflict with the project.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2400

CODE: (SP)

DATE: 02/19/2009

SUBJECT: Removal of Haul Permit

Bidders are advised that the Haul Permit that had been previously included in the back of the proposal is no longer included in MDOT contracts. The Contractor, Subcontractors, Suppliers, and others transporting loads exceeding the posted limit on bridges when making deliveries to and from the project will no longer be allowed. Bidders are advised that when a road is open to the traveling public, the posted weight limit will be enforced for everyone, including the successful bidder of the project. Bidders are advised to consider this when preparing their bid.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2438

CODE: (SP)

DATE: 03/16/2009

SUBJECT: American Recovery and Reinvestment Act (ARRA) Sign

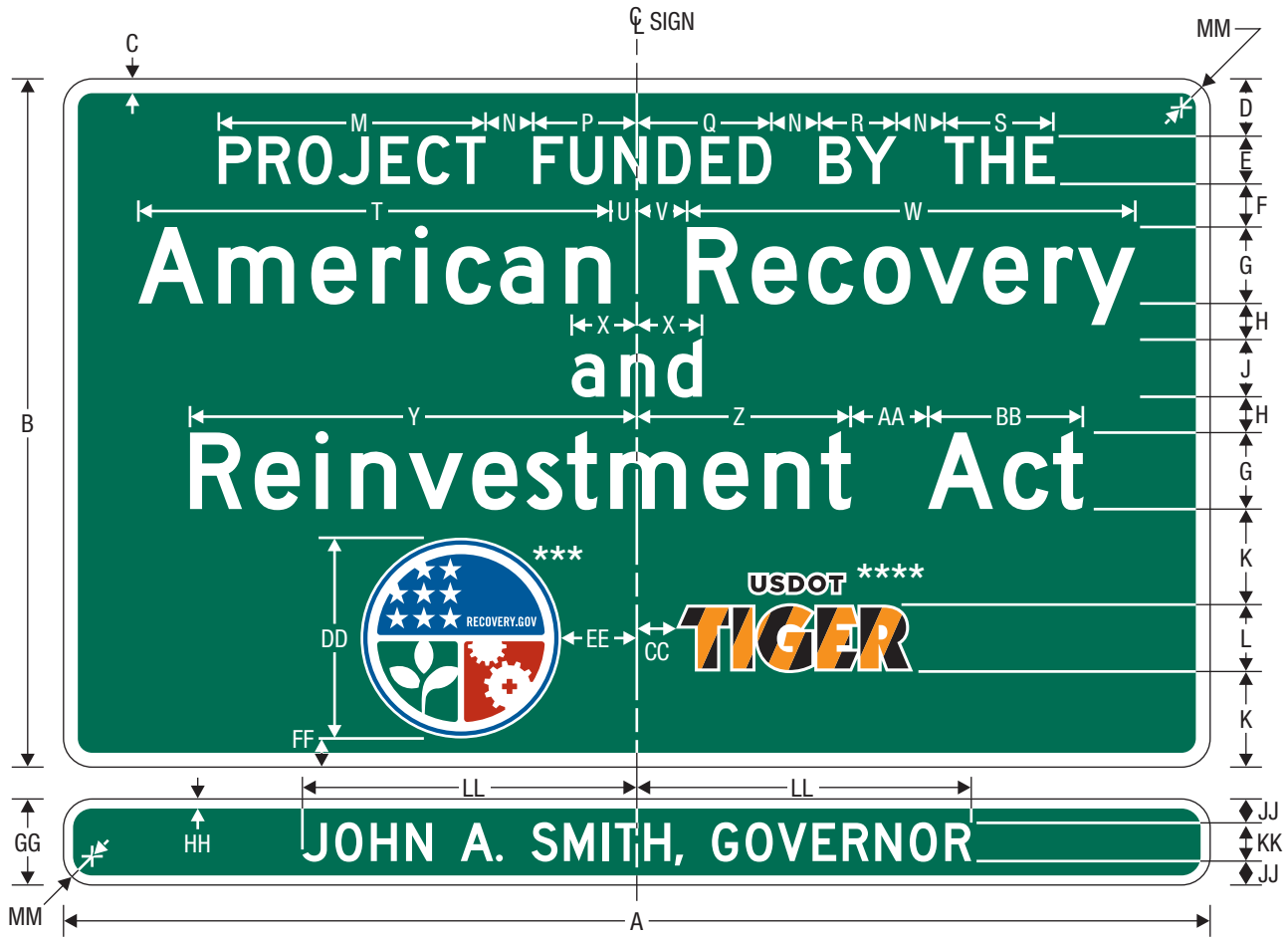
Bidders are hereby advised that the Contractor shall install, maintain, and remove two (2) economic recovery signs at the beginning (BOP) and end (EOP) of this project, unless otherwise directed by the Engineer. A picture of the signs and the dimensions of the signs are shown on the attached sheets. The signs shall be constructed, installed and maintained in accordance with the MUTCD, and Sections 618 & 619 of the Standard Specifications. These signs shall be fabricated from 0.125" sheet aluminum. Signs shall be mounted on three (3) - three pounds per linear foot (3 lbs. / ft.) U-Section posts. Each post shall be 14 feet long mounted onto another 14-foot U-Section post driven halfway into the ground. All cost of installing and maintaining the signs, including material, labor, posts, hardware, etc., will be measured and paid for under the pay item no. 619-D4.

PROJECT FUNDING SOURCE SIGN ASSEMBLY AMERICAN RECOVERY AND REINVESTMENT ACT SIGN LAYOUT DETAILS



PROJECT FUNDING SOURCE
SIGN ASSEMBLY

PROJECT FUNDING SOURCE SIGN ASSEMBLY AMERICAN RECOVERY AND REINVESTMENT ACT SIGN LAYOUT DETAILS



PROJECT FUNDING SOURCE SIGN AND OPTIONAL SUPPLEMENTAL PLAQUE

NOTE: SIGN SHALL NOT BE INSTALLED WITHOUT PROJECT FUNDING SOURCE PLAQUE (SEE SHEET 3).

NOTE: SEE SHEET NO. 6 FOR DETAILS OF SUPPLEMENTAL SIGN SHOWING COMMISSIONER'S NAMES.

A	B	C	D	E	F	G	H	J	K	L	M	N	P
█	█	█	█	█	█	█	█	█	█	█	█	█	█
84	54	1	5	4 C	3.5	6 C*	3	4D*(3LC)	7.25	5	19.047	4	7.362

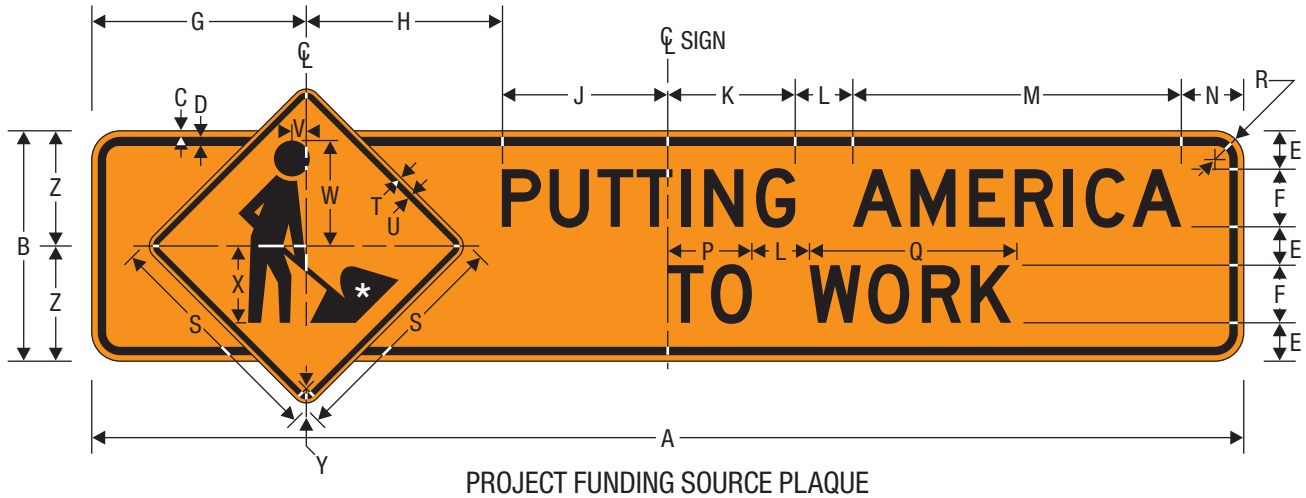
Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD
█	█	█	█	█	█	█	█	█	█	█	█	█	█
9.484	5.162	7.763	31.722	2.415	3.585	30.552	4.542	30.911	14.737	6	10.175	3	15

EE	FF	GG	HH	JJ	KK	LL	MM
█	█	█	█	█	█	█	█
6	2.25	9	.75	2.75	3.5 C	VAR	2.25

- * Increase character spacing 50%
- ** Series C may be used for longer legends
- *** See Pictograph page 4
- **** See Pictograph page 5

COLORS: LEGEND, BORDER — WHITE (RETROREFLECTIVE)
BACKGROUND GREEN (RETROREFLECTIVE)

PROJECT FUNDING SOURCE SIGN ASSEMBLY AMERICAN RECOVERY AND REINVESTMENT ACT SIGN LAYOUT DETAILS



NOTE: PLAQUE SHALL NOT BE INSTALLED WITHOUT SIGN (SEE SHEET 2).

* See *Standard Highway Signs* Page 6-59 for symbol design.

A	B	C	D	E	F	G	H	J	K	L	M	N	P
84	18	0.375	0.625	3.5	4 D	16.607	15.686	9.707	10.667	4	22.813	5	5.843

Q	R	S	T	U	V	W	X	Y	Z
14.009	2.25	18	0.375	0.625	1	7	6	1.5	9

COLORS: LEGEND, BORDER — BLACK
BACKGROUND — ORANGE (RETROREFLECTIVE)

PROJECT FUNDING SOURCE SIGN ASSEMBLY AMERICAN RECOVERY AND REINVESTMENT ACT SIGN LAYOUT DETAILS



RECOVERY

Vector-Based, Vinyl-Ready Pictograph

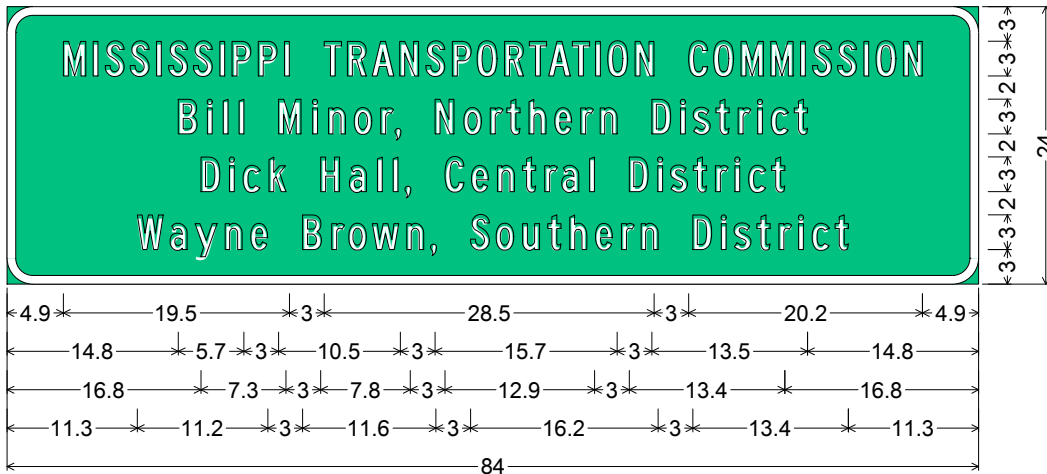
- | | |
|--------------------------|---------------------------|
| COLORS: LEGEND, OUTLINE | — WHITE (RETROREFLECTIVE) |
| BORDER | — BLUE (RETROREFLECTIVE) |
| BACKGROUND (UPPER) | — BLUE (RETROREFLECTIVE) |
| BACKGROUND (LOWER RIGHT) | — RED (RETROREFLECTIVE) |
| BACKGROUND (LOWER LEFT) | — GREEN (RETROREFLECTIVE) |

**PROJECT FUNDING SOURCE SIGN ASSEMBLY
AMERICAN RECOVERY AND REINVESTMENT ACT
SIGN LAYOUT DETAILS**



USDOT TIGER
Vector-Based, Vinyl-Ready Pictograph

- COLORS: OUTLINE — WHITE (RETROREFLECTIVE)
USDOT LEGEND — BLACK
TIGER DIAGONALS — BLACK,
ORANGE (RETROREFLECTIVE)



2.3" Radius, 0.8" Border, White on Green;

"MISSISSIPPI TRANSPORTATION COMMISSION" C; "Bill Minor, Northern District" C;

"Dick Hall, Central District" C; "Wayne Brown, Southern District" C;

Table of distances between letter and object lefts.

4.9	M	I	S	S	I	S	S	I	P	P	I							
2.5	1.1	2.1	2.3	1.1	2.1	2.3	1.0	2.3	2.3									
	T	R	A	N	S	P	O	R	T	A	T	I	O	N				
	3.4	2.0	2.2	2.3	2.3	2.3	2.1	2.4	2.2	1.6	2.1	2.0	1.0	2.4				
	C	O	M	M	I	S	S	I	O	N								
	4.6	2.2	2.3	2.6	2.6	1.1	2.1	2.3	1.0	2.4	1.6	4.9						
14.8	B	i	l	i	M	i	n	o	r	, N	o	r	t	h	e	r	n	
	2.5	1.4	1.4	3.4	2.9	1.4	2.2	2.3	1.3	3.4	2.5	2.3	1.4	1.9	2.2	2.3	1.7	
	D	i	s	t	r	i	c	t										
	4.4	2.5	1.1	2.0	1.9	1.7	1.2	2.0	1.1	14.8								
16.8	D	i	c	k	H	a	l	l	, C	e	n	t	r	a	i			
	2.4	1.2	2.2	4.5	2.5	2.4	1.4	1.0	3.5	2.2	2.3	2.2	1.9	1.5	2.4			
	D	i	s	t	r	i	c	t										
	3.4	2.5	1.1	1.9	1.9	1.7	1.2	2.0	1.1	16.8								
11.3	W	a	y	n	e	B	r	o	w	n	, S	o	u	t	h	e	r	n
	2.8	2.1	2.6	2.3	4.4	2.6	1.4	2.1	3.0	2.1	3.4	2.2	2.3	2.1	2.0	2.2	2.2	1.7
	D	i	s	t	r	i	c	t										
	4.5	2.5	1.1	1.9	1.9	1.7	1.2	2.0	1.1	11.3								

COLORS: LEGEND, BORDER — WHITE (RETROREFLECTIVE)
 BACKGROUND — GREEN (RETROREFLECTIVE)

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2476

CODE: (SP)

DATE: 03/26/2009

SUBJECT: Requirements Under Section 902 of the ARRA

Bidders are advised that Section 902 of the American Recovery and Reinvestment Act (ARRA) of 2009 requires that each contract awarded using ARRA funds must include a provision that provides the U.S. Comptroller General and his representatives with the authority to:

- (1) examine any records of the Contractor or any of its subcontractors, or any State or local agency administering such contract, that directly pertain to, and involve transactions relating to, the contract or subcontract; and
- (2) interview any officer or employee of the Contractor or any of its subcontractors, or of any State or local government agency administering the contract, regarding such transactions.

Accordingly, the Comptroller General and his representatives shall have the authority and rights as provided under Section 902 of the ARRA. Section 902 further states that nothing in this section shall be interpreted to limit or restrict in any way any existing authority of the Comptroller General.

Additionally, Section 1515(a) of the ARRA provides authority for any representatives of the Inspector General to examine any records or interview any employee or officers working on this contract. The Contractor is advised that representatives of the Inspector General have the authority to examine any record and interview any employee or officer of the Contractor, its Subcontractors or other firms working on this contract. Section 1515(b) further provides that nothing in this section shall be interpreted to limit or restrict in any way any existing authority of an inspector general.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2586

DATE: 05/07/2009

SUBJECT: Specialty Items

PROJECT: STP-0055-02(210) / 105533301 - Holmes County

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

Line No	Pay Item	Description
0110	211-C001	Topsoil for Plant Holes, Contractor Furnished
0120	216-B004	Solid Sodding, Bermuda
0130	219-A001	Watering
0140	221-A001	Portland Cement Concrete Paved Ditch
0310	907-225-A001	Grassing

CATEGORY: LANDSCAPING

Line No	Pay Item	Description
0320	907-230-A001	Shrub Planting, Asiatic Jasmine
0330	907-230-A087	Shrub Planting, Magnolia X Soulangeana
0340	907-230-A088	Shrub Planting, Lagerstroemia X
0350	907-230-A089	Shrub Planting, Prunus X Yedoensis
0360	907-230-A090	Shrub Planting, Cornus Kousa
0370	907-230-A091	Shrub Planting, Ilex Crenata
0380	907-230-A092	Shrub Planting, Nandina Domestica
0390	907-230-A093	Shrub Planting, Hemerocallis
0400	907-230-C001	Bed Edging
0410	907-230-D001	Bed Preparation
0420	907-230-F004	Shrub and Groundcover Planting, Liriope Spicata
0430	907-233-A002	Tree Bark Mulch, Type V

CATEGORY: PAVEMENT STRIPING AND MARKING

Line No	Pay Item	Description
0680	907-626-G001	Thermoplastic Detail Stripe, Blue-ADA
0690	907-626-G002	Thermoplastic Detail Stripe, White, 4" Equivalent Length
0700	907-626-H002	Thermoplastic Legend, Blue-ADA Handicap Symbol
0710	907-628-G002	Cold Plastic Detail Stripe, White, 4" Equivalent Length
0720	907-628-H001	Cold Plastic Legend, Blue-ADA
0730	907-628-H002	Cold Plastic Legend, Blue-ADA Handicap Symbol

CATEGORY: SURVEY AND STAKING

Line No	Pay Item	Description
0290	699-A001	Roadway Construction Stakes

CATEGORY: TRAFFIC CONTROL - TEMPORARY

Line No	Pay Item	Description
0220	619-D4001	Directional Signs

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2594

CODE: (SP)

DATE: 05/12/2009

SUBJECT: Special Reporting Criteria

Bidders are advised that this project is using funds from the American Recovery and Reinvestment Act (ARRA) of 2009 and will require the Contractor to report certain information regarding the creation of new positions or employment resulting in the construction of this project. In addition to the Prime Contractor's information, the Prime Contractor will have to collect information from all Subcontractor(s) that were used during the construction of this project.

On a monthly basis, the Contractor shall complete a Department supplied FHWA-1589 reporting form. This form shall also be completed by all Subcontractors that were used during the construction of this project. After receiving the Subcontractor(s) form, the Prime Contractor shall submit the forms (Prime and Subcontractor), to the Project Engineer no later than the 4th of each month **The submission of this form will be required for processing the monthly estimate and the Engineer will withhold payments because of the Contractor's failure to submit the required form(s).**

Attached is a copy of the reporting instruction for FHWA-1589 along with a sample copy of the form. ARRA forms can be obtained online at

<http://www.gomdot.com/Divisions/Highways/Resources/ContractAdministration/ARRA/Home.aspx>

or by contacting B. B. House in Contract Administration Division at 601-359-7730.

THE AMERICAN RECOVERY AND REINVESTMENT ACT OF 2009

REPORTING REQUIREMENTS

Federal Highway Administration
U.S. Department of Transportation

March 23, 2009

Version 1.0

Monthly Employment Report (Form: FHWA-1589)

This form is a guide for the States in providing employment information on each ARRA project. Monthly employment information on each ARRA project is used by States for meeting the reporting requirements of Sections 1201 and 1512. In order for States to fulfill their reporting obligations, the States must collect and analyze certain employment data for each ARRA funded contract. The data requirement in ARRA extends beyond the number of workers at the work site and, therefore, FHWA has produced a form for guidance to the States. This data to be reported is identified below and will be used by the States in developing Form 1587, which is to be submitted to FHWA. Since States may not currently collect this data, the States should develop a new specification for each ARRA-funded contract in order to obtain this information from contractors and consultants. In doing so, the States should use the provided model form and require the reporting of this data from the prime contractor or consultant. The prime contractor or consultant shall complete a report for each month from the date of the Notice to Proceed until completion of the contract or September, 2012 whichever occurs sooner. This report is only required for contracts that use ARRA funds. States should require contractors and consultants to provide the required information for their own workforce as well as the workforce of all subcontractors that were active on their ARRA funded project(s) for the reporting month. It will be up to each State to determine when they obtain the necessary data from their contractors or consultants, keeping in mind that the summary form is due from the State to the FHWA Division no later than the 20th day of each month for the preceding month's data.

It is the State DOT's responsibility to report the number of jobs on projects managed by funding recipients, such as other state agencies or local governments. The State DOT must make arrangements with each ARRA funding recipient to assure each recipient reports the required data in a timely manner.

The States shall require the following data be provided by each contractor, consultant and funding recipient working on an ARRA project. The primary contractor or consultant for each project shall be responsible for reporting their firm as well as all sub-contractors data.

Format: The State, contractors, or consultant may use the FHWA provided model form, but the use of the model form is optional and at the discretion of the State.

Due date: As determined by the State, until September 2012.

Due to: To be sent by each ARRA funded project prime contractor or consultant to the designated office in each State DOT or Federal Lands Division Office.

Coding Instructions

BOX 1. **Report Month:** The month and year covered by the report, as *mm/yyyy* (e.g. "May 2009" would be coded as "05/2009").

BOX 2. **Contracting agency:** The name of the contracting agency. Enter "State" for State DOT projects. For non-State projects, enter the name of the contracting

agency (other State agency, Federal agency, tribe, MPO, city, county, or other funding recipient).

- BOX 3. **Federal-aid project number:** The State assigned federal-aid project number, consistent with the format reported in FMIS.
- BOX 4. **State project number or identification number:** The project number or ID, as assigned by the State of its funding recipient, consistent with the format reported in FMIS.
- BOX 5. **Project location:** State where project occurs. If the project performed for Federal Lands, provide the FLH Division or Federal Land Managing Agency (FLMA) region.
- BOX 6. **Contractor name and address:** The name and address of the contracting or consulting firm shall include the name, street address, city, state, and zip code.
- BOX 7. **Contractor DUNS number:** The unique nine-digit number issued by Dun & Bradstreet. Followed by the optional 4 digit DUNS Plus number. Reported as "999999999.9999"
- BOX 8. **Employment data:** The prime contractor or consultant will report the direct, on-the-project jobs for their workforce and the workforce of their sub-contractors active during the reporting month. These jobs data include employees actively engaged in projects who work on the jobsite, in the project office, in the home office or telework from a home or other alternative office location. This also includes any engineering personnel, inspectors, sampling and testing technicians, and lab technicians performing work directly in support of the ARRA funded project. This does not include material suppliers such as steel, culverts, guardrail, and tool suppliers. States should include in their reports all direct labor associated with the ARRA project such as design, construction, and inspection. The States reports should include their own project labor, including permanent, temporary, and contract project staff. States are asked not to include estimated indirect labor, such as material testing, material production or estimated macro-economic impacts. FHWA will be estimating all indirect labor based on the information provided in this form along with other FHWA data. The form requests specifically:
 - a. **Subcontractor name:** The name of each subcontractor or sub-consultant that was active on the project for the reporting month.
 - b. **Employees:** The number of project employees on the contractor's or consultant's workforce that month, and the number of project employees for each of the active subcontractors for the reporting month. Do not include material suppliers. Total field at bottom will be automatically calculated and reported as a whole number.
 - c. **Hours:** The total hours on the specified project for all employees reported on the contractor's or consultant's project workforce that month, and the total hours for all project employees reported for each of the active subcontractors that month. Total field at bottom will be automatically calculated and reported as a whole number.

- d. **Payroll:** The total dollar amount of wages paid by the contractor or consultant that month for employees on the specified project, and the total dollar amount of wages paid by each of the active subcontractors that month. Payroll only includes wages and does not include overhead or indirect costs. Total field at bottom will be automatically calculated and will be rounded to the nearest whole dollar and reported as a whole number.

BOX 9. Prepared by:

- a. **Name:** Indicate the person responsible for preparation of the form. By completing the form the person certifies that they are knowledgeable of the hours worked and employment status for all the employees. Contractors, consultants, and their subs are responsible to maintain data to support the employment form and make it available to the State should they request supporting materials.
- b. **Date:** The date that the contractor completed the employment form. Reported as "mm/dd/yyyy." (e.g. "May 1, 2009" would be coded as "05/01/2009").

**MONTHLY EMPLOYMENT REPORT
AMERICAN RECOVERY AND REINVESTMENT ACT**

1. Report Month: (mm/yyyy)	2. Contracting Agency	
3. Federal-Aid Project Number	4. State Project Number or ID Number	5. Project Location: State, County or Federal Region
6. CONTRACTOR NAME AND ADDRESS		
Name:		
Address:		
City:	State:	
Zip:		
7. Contractor/Subcontractor DUNS Number:		

8. Employment Data			
	EMPLOYEES	HOURS	PAYROLL
Prime Contractor Direct, On-Project Jobs (see guidance for definitions)			
Subcontractor Direct, On-Project Jobs			
Subcontractor Name			
Prime and Subcontractor Totals	0	0	0.00

9. PREPARED BY CEO or Payroll Official:	DATE:
Name:	
Title:	

Form FHWA-1589

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2596

CODE: (IS)

DATE: 05/13/2009

SUBJECT: DBE Forms, Participation and Payment

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

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

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

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

DBE Forms, including Forms OCR-482, OCR-484 and OCR-485, can be obtained from the Office of Civil Rights Division, MDOT Administration Building, 401 North West Street, Jackson, MS, or at www.gomdot.com under *Business, Disadvantaged Enterprise, Applications and Forms for the DBE Program, MDOT Forms*.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2616

CODE: (SP)

DATE: 05/20/2009

SUBJECT: DUNS Requirement for ARRA Funded Projects

Bidders are advised that the Prime Contractor must maintain current registrations in the Central Contractor Registration (<http://www.ccr.gov>) at all times during which they have active federal awards funded with Recovery Act funds. A Dun and Bradstreet Data Universal Numbering System (DUNS) Number (<http://www.dnb.com>) is one of the requirements for registration in the Central Contractor Registration.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 – NOTICE TO BIDDERS NO. 2696

CODE: (SP)

DATE: 7/10/2009

SUBJECT: Petroleum Products Base Prices For Contracts Let in August, 2009

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

	<u>Per Gallon</u>	<u>Per Liter</u>
Gasoline	\$2.1394	\$0.5652
Diesel	\$2.1721	\$0.5738

MATERIALS OF CONSTRUCTION

<u>ASPHALT CEMENT</u>	Per Gallon	Per Ton	Per Liter	Per Metric Ton
Viscosity Grade AC-5	\$1.7197	\$408.00	\$0.4543	\$449.74
Viscosity Grade AC-10	\$1.7282	\$410.00	\$0.4565	\$451.94
Viscosity Grade AC-20	\$1.6895	\$400.83	\$0.4463	\$441.83
Viscosity Grade AC-30	\$1.6755	\$397.50	\$0.4426	\$438.16
Grade PG 64-22	\$1.6439	\$390.00	\$0.4343	\$429.89
Grade PG 67-22	\$1.6981	\$402.86	\$0.4486	\$444.07
Grade PG 76-22	\$2.2901	\$543.33	\$0.6050	\$598.91
Grade PG 82-22	\$2.5360	\$601.67	\$0.6700	\$663.22

EMULSIFIED ASPHALTS, PRIMES, & TACK COATS

Grade EA-4 (SS-1)	\$2.2690	\$0.5994
Grade RS-2C (CRS-2)	\$1.9135	\$0.5055
Grade CRS-2P	\$2.2776	\$0.6017
Grade EA-1, MC-70 & AE-P	\$2.4113	\$0.6370
Grade SS-1 & 1H	\$2.3000	\$0.6076
Grade CSS-1 & 1H (Undiluted)	\$2.3000	\$0.6076
Grade CSS-1 & 1H (Diluted 1 to 1 Fog Seal)	\$1.4750	\$0.3897

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2726

CODE: (SP)

DATE: 07/17/2009

SUBJECT: Project Number Change

PROJECT: STP/IM-0055-02(210) / 105533301 & 302 – Holmes County

Bidders are advised that anywhere in the plans, proposal and specifications that reference is made to Federal Aid Project No. **STP-0055-02(210) / 105533301**, it is understood that Federal Aid Project No. **STP/IM-0055-02(210) / 105533301 & 302** is the correct project number.

SUPPLEMENT TO FORM FHWA-1273

The following MINIMUM HOURLY WAGE RATES have been predetermined by the Secretary of Labor in General Decision No. **MS20080184** dated April 3, 2009.

HOLMES COUNTY

<u>CLASSIFICATION</u>	<u>MINIMUM HOURLY WAGE RATE</u>
Carpenter, Including Form Work	10.85
Cement Mason / Concrete Finisher	10.00
Electrician	21.55
Ironworker, Reinforcing	9.67
Laborer, Asphalt Raker and Asphalt Shoveler	7.50
Laborer, Common or General	8.35
Laborer, Pipelayer	9.96
Operator, Asphalt Paver and Asphalt Spreader	10.00
Operator, Backhoe	11.43
Operator, Broom	10.17
Operator, Bulldozer	10.68
Operator, Crane	14.92
Operator, Grader / Blade	13.04
Operator, Loader	9.00
Operator, Mechanic	10.60
Operator, Oiler	12.33
Operator, Roller	9.75
Operator, Scraper	11.15
Operator, Tractor	10.05
Truck Driver	9.44

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

SUPPLEMENT TO FORM FHWA-1273

DATE: 6/15/94

SUBJECT: Final Certificate and Contract Provisions for Subcontracts

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

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

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

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

**REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS**

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ATTACHMENTS

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

I. GENERAL

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

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

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

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

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

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

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

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

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

II. NONDISCRIMINATION

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be

taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

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

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

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

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

6. Training and Promotion:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

III. NONSEGREGATED FACILITIES

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

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

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

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

IV. PAYMENT OF PREDETERMINED MINIMUM WAGE

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

1. General:

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

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

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

2. Classification:

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

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

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

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

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

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

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

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

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

3. Payment of Fringe Benefits:

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

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

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

a. Apprentices:

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

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

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

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

b. Trainees:

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

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

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

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

c. Helpers:

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

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

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

6. Withholding:

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

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

7. Overtime Requirements:

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

8. Violation:

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

9. Withholding for Unpaid Wages and Liquidated Damages:

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

V. STATEMENTS AND PAYROLLS

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

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

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

2. Payrolls and Payroll Records:

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

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

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

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

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

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

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

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

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

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

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

VI. RECORD OF MATERIALS, SUPPLIES, AND LABOR

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

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

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

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

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

VII. SUBLETTING OR ASSIGNING THE CONTRACT

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

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

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

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

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

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

VIII. SAFETY: ACCIDENT PREVENTION

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

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

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

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

IX. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

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

NOTICE TO ALL PERSONNEL ENGAGED ON FEDERAL-AID HIGHWAY PROJECTS

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

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

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

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

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

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

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

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

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

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

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

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

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

1. Instructions for Certification - Primary Covered Transactions:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

2. Instructions for Certification - Lower Tier Covered Transactions:

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

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

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

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

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

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

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

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

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

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

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

* * * * *

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

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared

ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

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

* * * * *

XII. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

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

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

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

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

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

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

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

1. The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.
2. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Timetables	Goals for female participation in each trade (percent)
From April 1, 1978 until March 31, 1979	3.1
From April 1, 1979 until March 31, 1980	5.1
From April 1, 1980 until March 31, 1981	6.9
 Until further notice	 Goals for minority participation for each trade (percent)
 SHSA Cities:	
Pascagoula - Moss Point -----	16.9
Biloxi - Gulfport-----	19.2
Jackson-----	30.3
 SMSA Counties:	
Desoto-----	32.3
Hancock, Harrison, Stone-----	19.2
Hinds, Rankin-----	30.3
Jackson-----	16.9
 Non-SMSA Counties:	
George, Greene -----	26.4
Alcorn, Benton, Bolivar, Calhoun, Carroll, Chickasaw, Clay, Coahoma, Grenada, Itawamba, Lafayette, Lee, Leflore, Marshall, Monroe, Montgomery, Panola, Pontotoc, Prentiss, Quitman, Sunflower, Tallahatchie, Tate, Tippah, Tishomingo, Tunica, Union, Washington, Webster, Yalobusha-----	26.5
Attala, Choctaw, Claiborne, Clarke, Copiah, Covington, Franklin, Holmes, Humphreys, Issaquena, Jasper, Jefferson, Jefferson Davis, Jones Kemper, Lauderdale, Lawrence, Leake, Lincoln, Lowndes, Madison, Neshoba, Newton, Noxubee, Oktibbeha, Scott, Sharkey, Simpson, Smith, Warren, Wayne, Winston, Yazoo -----	32.0
Forrest, Lamar, Marion, Pearl River, Perry, Pike, Walthall -----	27.7
Adams, Amite, Wilkinson-----	30.4

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

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

3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor, employer identification number of the subcontractor, estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed.
4. As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is to the county and city (if any), stated in the advertisement.
5. The notification required in Paragraph 3 shall be addressed to the following:

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SUPPLEMENT TO SPECIAL PROVISION NO. 907-105-3

DATE: 03/31/2008

SUBJECT: Cooperation By Contractor

Delete the first sentence of the first paragraph under 907-105-05 on page 1, and substitute the following:

On projects that include erosion control pay items, the Contractor shall also designate a responsible person whose primary duty shall be to monitor and maintain the effectiveness of the erosion control plan, including NPDES permit requirements.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-105-3

CODE: (IS)

DATE: 02/14/2006

SUBJECT: Cooperation By Contractor

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

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

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

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SUPPLEMENT TO SPECIAL PROVISION NO. 907-107-1

DATE: 03/21/2006

SUBJECT: Liability Insurance

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-107-1

CODE: (IS)

DATE: 05/03/2004

SUBJECT: Liability Insurance

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

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

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

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

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

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

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

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

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

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

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

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

Coverage shall include:

- (1) death of or bodily injury to passengers of the railroad and employees of the railroad not covered by State workmen's compensation laws,
- (2) personal property owned by or in the care, custody or control of the railroads,
- (3) the Contractor, or any of the Contractor's agents or employees who suffer bodily injury or death as a result of acts of the railroad or its agents, regardless of the negligence of the railroads, and
- (4) negligence of only the following classes of railroad employees:
 - (i) any supervisory employee of the railroad at the job site
 - (ii) any employee of the railroad while operating, attached to, or engaged on, work trains or other railroad equipment at the job site which are assigned exclusively to the Contractor, or
 - (iii) any employee of the railroad not within (i) or (ii) above who is specifically loaned or assigned to the work of the Contractor for prevention of accidents or protection or property, the cost of whose services is borne specifically by the Contractor or Governmental authority.

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

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SUPPLEMENT TO SPECIAL PROVISION NO. 907-107-6

DATE: 11/16/2007

SUBJECT: Legal Relations and Responsibility to Public

After Subsection 907-107.15 on page 1, add the following:

907-107.17--Contractor's Responsibility for Work. Delete the fifth sentence of the fifth paragraph of Subsection 107.17 on page 63 and substitute the following:

The eligible permanent items shall be limited to traffic signal systems, changeable message signs, roadway signs and sign supports, lighting items, guard rail items, delineators, impact attenuators, median barriers, bridge railing or pavement markings. The eligible temporary items shall be limited to changeable message signs, guard rail items, or median barriers.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

| SPECIAL PROVISION NO. 907-107-6

CODE: (IS)

| DATE: 07/03/2007

| SUBJECT: **Legal Relations and Responsibility to Public**

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

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

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

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

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

| **907-107.15--Third Party Beneficiary Clause.** In the first sentence of the first paragraph of Subsection 107.15 on page 61, change "create the public" to "create in the public".

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

| SPECIAL PROVISION NO. 907-108-17

CODE: (IS)

| DATE: 06/11/2008

SUBJECT: Prosecution and Progress

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

907-108.01--Subletting of Contract.

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

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

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

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

907-108.06--Determination and Extension of Contract Time.

907-108.06.1--Based on Time Units.

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

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

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

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

907-108.06.2--Based on Calendar Date Completion. After Subsection 108.06.2.1 on page 85, add the following:

907-108.06.2.2--Cessation of Contract Time. When the Engineer by written notice schedules a final inspection, time will be suspended until the final inspection is conducted and for an additional 14 calendar days thereafter. If after the end of the 14-day suspension all necessary items of work have not been completed, time charges will resume. If the specified completion date had not been reached at the time the Contractor called for a final inspection, the calendar day difference between the specified completion date and the date the Contractor called for a final inspection will be added after the 14-day period before starting liquidation damages. If a project is on liquidated damages at the time a final inspection is scheduled, liquidated damages will be suspended until the final inspection is conducted and for seven (7) calendar days thereafter. If after the end of the 7-day suspension all necessary items of work have not been completed, liquidated damages will resume. When final inspection has been made by the Engineer as prescribed in Subsection 105.16 and all items of work have been completed, the daily time charge will cease.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SUPPLEMENT TO SPECIAL PROVISION NO. 907-109-3

DATE: 11/21/2006

SUBJECT: Changes in Material Costs

After the last paragraph of Subsection 907-109.06.1 on page 1, add the following:

907-109.07--Changes in Material Costs. Delete the second sentence of the first paragraph of Subsection 109.07 on page 95, and substitute the following:

When a pay item on the bid sheets indicate that an adjustment is allowed and when a notice to bidders is included in the contract showing current monthly base prices, an adjustment will be provided as follows:

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-109-3

CODE: (IS)

DATE: 04/21/2006

SUBJECT: Partial Payment

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

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

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

907-109.06--Partial Payment.

907-109.06.1--General. Delete the fourth and fifth sentences of the third paragraph of Subsection 109.06.1 on page 94, and substitute the following:

In the event mutual agreement cannot be reached, the Contractor will be allowed a maximum of 25 calendar days following the Contractor's receipt of the monthly estimate in question to file in writing, a protest Notice of Claim in accordance with the provisions Subsection 105.17. Otherwise, the Engineer's estimated quantities shall be considered acceptable pending any changes made during the checking of final quantities.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SUPPLEMENT TO SPECIAL PROVISION NO. 907-225-1

DATE: 04/29/2008

SUBJECT: Grassing

Delete the first paragraph of Subsection 907-225.05 on page 1 and substitute the following:

Hard rock agricultural limestone will be paid for at the contract unit price per ton. Hard rock agricultural limestone with a relative neutralizing value (RNV), determined in accordance with Subsection 907-715-02.2.1.3, of between 60.0% and 62.9% will be paid for at half ($\frac{1}{2}$) the contract unit price per ton. No payment will be made for hard rock agricultural limestone with an RNV less than 60.0%.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-225-1

CODE: (IS)

DATE: 09/23/2004

SUBJECT: Grassing

Section 907-225, Grassing, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-225.04--Method of Measurement. After the second sentence of Subsection 225.04 on page 163, add the following:

Acceptable quantities of agricultural limestone will be measured by the ton.

907-225.05--Basis of Payment. After the first paragraph of Subsection 225.05 on page 163, add the following:

Agricultural limestone will be paid for at the contract unit price per ton. Grade "A" agricultural limestone with an equivalent neutralizing value (ENV), determined in accordance with Subsection 907-715-02.2.1.3, of between 60.0% and 62.9% will be paid for at half (1/2) the contract unit price per ton. No payment will be made for Grade "A" agricultural limestone with an ENV less than 60.0%.

Delete the first pay item listed on page 163 and substitute the following:

907-225-A: Grassing	- per acre
907-225-B: Agricultural Limestone	- per ton

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-230-2

CODE: (SP)

DATE: 06/01/2004

SUBJECT: Tree, Annual, Shrub and Groundcover Planting

Section 907-230, Tree and Shrub Planting, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as amended by this special provision is applicable to Tree, Annuals, Shrub and Groundcover Planting Only.

907-230.01--Description. The work covered under this special provision consists of furnishing all labor, materials, tools, tests, royalties, services and other incidentals as may be required for the good and proper completion of the tree, annual, shrub and groundcover planting operations.

The extent of planting locations are shown on the plans.

The Contractor is responsible for notes on the plans which call attention to particular requirements or conditions. The fact that these requirements or conditions are not called out in the specifications does not relieve the Contractor of responsibility for these requirements or conditions.

907-230.01.1--Maintenance of Site During Planting. Sidewalks, roads and other paving adjacent to planting operations shall be kept clean and free of obstruction, mud and debris at all times. Wheels of vehicles used in the work shall be cleaned if necessary. Sidewalks shall be protected from damage and markings from wheels of vehicles used in the work.

Flushing of streets and disposal of dirt or debris into sewers or drainage ditches will not be permitted.

Dust shall be controlled by approved means to the satisfaction of the Engineer.

907-230.01.2--Quality Assurance. At least one person thoroughly familiar with the type of materials being installed and the proper materials and methods for their installation shall be present at all times during execution of this work and shall direct all work being performed.

All workers shall have sufficient skill and experience to properly perform the work assigned to them. Workers engaged in special work or skilled work shall have the sufficient experience in such work and in the operation of the equipment required to perform all work properly and satisfactory.

The selection of all materials and execution of all preparations required under the plans and specifications shall be subject to the approval of the Engineer. The Engineer shall have the right to reject any and all materials, any and all work, which in the opinion of the Engineer does not meet with the requirements of the specifications at any stage of the operations. All rejected materials shall be removed from the site at no additional cost to the State. Rejected work shall be replaced with

work of the specified quality or corrected as directed by the Engineer at no additional cost to the State.

All plants and their installation materials, shall meet or exceed the specifications of Federal, State, and County laws requiring inspection for plant disease and insect control.

Quality and size shall conform with the current edition of "Horticulture Standards" for number one grade nursery stock as adopted by the American Association of Nurserymen.

All plants shall be true to name. Each tree or planting lot shall be tagged with the name and size of the plants in accordance with the standards of practice of the American Association of Nurserymen. In all cases, botanical names shall take precedence over common names.

Plant nomenclature shall conform to Hortus Third, A Concise Dictionary of Plants Cultivated in the United States and Canada by MacMillan Publishing Company, Inc., New York.

907-230.01.3--Replacements of Plants. The Contractor shall make periodic inspections during the life of the project to determine what changes, if any, should be made in the City of Ridgeland's maintenance program. All such recommended changes shall be submitted, in writing, to the Engineer.

The Contractor shall replace, at no additional cost to the State, and as soon as weather conditions permit, all dead plants and all plants not in a vigorous, thriving condition, as determined by the Engineer. The plants shall be free of dead branches and dead branch tips, and shall bear foliage of a normal density, size and color. Replacements shall closely match adjacent specimens of the same species. Replacements shall be subject to all requirements stated in this specification.

The Contractor shall make all necessary repairs to grades, mulch or plant materials required because of plant replacements. Such repairs shall be done at no additional cost to the State.

907-230.02--Materials.

907-230.02.1--Soil Mix. Soil mix within all groundcover and annual planting beds shall be furnished at a 24-inch depth. Shrub planting pits shall be backfilled with soil mix as specified on the shrub planting drawing details. Soil mix furnished for all plant materials shall be fertile, friable, sandy loam soil mix complying with the following quantitative analysis:

- 1. Decomposed organic matter 5 to 8%
- 2. Silt 10 to 30%
- 3. Sand 25 to 75%
- 4. Clay 5 to 10%
- 5. pH 5.0 to 6.5

Soil mix shall not contain any substance or material inhibitory to plant growth, and shall be without admixture of clay, hardpan, mulch, marl, shale or other material which in the opinion of the Engineer

shall render it unsuitable for use. Soil mix shall also be free of stones, lumps, noxious weeds or their seeds, grasses or their seeds, other plants or their roots, branches, sticks, or other extraneous material larger than two inches in diameter. Soil mix found to contain any of the above-listed items shall be chemically or mechanically treated, or removed from the project at the discretion of the Engineer.

The Contractor shall be required to have tests run on the soil mix proposed for use, to determine the soil mix's compliance with the above-listed quantitative analysis. In addition to the above tests, the Contractor shall be required to have tests run for soluble salt, nitrogen, phosphorus, potassium, calcium, and magnesium content, for percent organic matter, and pH. These soil tests shall be conducted by a soils testing laboratory approved by the Engineer.

Following initial soil testing and approval of soil mix for use, soil mixes placed on the project may be sampled and tested as specified above at random, as directed by the Engineer, at no additional cost to the State.

Additions of fertilizer and/or lime to the soil mix furnished, as may be recommended by the Soil Test Report issued by the soil testing laboratory, shall be done by the Contractor as part of the work. No additions of fertilizer, lime, conditioning, or placement of soil mix shall be done prior to furnishing, in writing to the Engineer, all initial soil test results and obtaining his approval of soil mixes tested.

907-230.02.1.1--Fertilizer. Fertilizer shall be a commercially available material conforming to Mississippi Fertilizer Laws. Fertilizer shall be uniform in composition, dry and free flowing, and shall be delivered to the site in the original unopened containers, each bearing the manufacturer's guaranteed analysis. Any fertilizer which becomes caked or otherwise damaged, making it, in the opinion of the Engineer, unsuitable for use, will not be accepted. Commercial balanced fertilizer of analysis 13-13-13 shall be provided for use in soil mixture conditioning.

907-230.02.1.2--Lime. Lime shall be crushed or ground so that 90 percent passes a 10-mesh screen and not less than 50 percent will pass a 60-mesh screen. All lime shall have a neutralizing value of 90 percent calcium carbonate or better. Lime which has become caked or otherwise damaged, making it, in the opinion of the Engineer, unsuitable for use, will not be accepted.

Lime shall be applied at the rate specified by the soil test reports.

907-230.02.1.3--Water. Potable water, furnished by the Contractor, shall be supplied to the plants in adequate quantities to insure their healthy survivability until final acceptance of the project. The Contractor shall make whatever arrangements may be necessary to insure an adequate supply of water. The Contractor shall also furnish all necessary hose, equipment, attachments and accessories as may be necessary to complete the work.

907-230.02.1.4--Organic Matter. Klumb's, or approved equal, decomposed pine bark soil conditioner shall be provided for use in planting soil mix.

907-230.02.1.5--Sand. Clean sharp builder's sand shall be provided for use in planting soil mix.

907-230.02.2—Plant Materials.

907-230.02.2.1--General. All plants as indicated on the plans and/or listed in the plant schedule shall be provided. Unless otherwise specifically permitted, plants shall be nursery-grown in accordance with the best modern horticultural practices.

Plants shall comply with State and Federal laws relating to inspection for diseases and insect infestation. Inspection certificates shall be filed with the State.

Substitutions of other plants shall not be permitted unless authorized in writing by the Engineer. If proof is submitted that any plant size specified is unobtainable, a proposal will be considered for use of the nearest equivalent size or variety.

Durable, legible labels stating the correct plant name and size specified in the Plant Schedule shall be securely attached to each plant or plant container delivered to the planting site for the purpose of inspection and plant identification.

907-230.02.2.2--Quality and Inspection. Plants shall conform to the requirements set forth in ANSI 260.1 Standard for Nursery Stock and shall be of standard quality, true to name and type and first-class representatives of their species and variety. Balled & Burlapped (B&B) materials shall have been root pruned within the last two years. Container grown plants shall have been grown in the delivery container for one growing season.

Plants shall have normal, well-developed branches and vigorous fibrous root systems. They shall be healthy, vigorous plants free from defects, decay, disfiguring roots, sun-scald injuries, abrasions of the bark, diseases, insect pests or their eggs, borers and any other form of infestation or objectionable disfigurements.

Plants lacking density or proper proportions, plants which are weak or thin, plants which have a damaged or crooked leader or multiple leaders unless specifically specified, or plants injured by too close planting in nursery rows will be rejected. Plant materials which have been cut back from larger grades to meet certain requirements will not be accepted. Plants shall not be pruned prior to delivery to the point of planting.

All plants shall be subject to inspection and approval by the Engineer at any place and at any time. Portions or parts of plants required for the work may be inspected at the place of growth, but inspection at the place of growth shall not in any way impair the right of rejection at the site.

907-230.02.2.3--Measurements. Trees shall be measured when branches are in their normal position. Height and spread dimensions specified refer to the main body of the plant and not from tip to tip. Caliper measurements shall be taken at a point on the tree trunk six inches above natural ground line for trees up to four inches in caliper. Caliper measurements for trees specified as greater than four inches in caliper shall be taken at a point on the trunk 12 inches above the natural ground line.

Shrubs and groundcover shall be measured by container size; however, additional dimensions are often given within the plant material schedule on the plans to verify that the container size is accurate for the spread & height of the plant, per the American Association of Nurserymen (AAN). These measurements are taken when branches are in the plant's normal position. Height and spread dimensions specified refer to the main body of the plant and not from tip to tip.

Annuals shall be measured by container size.

If a range of size is given, no plant shall be less than the minimum size and not less than 50% of the plants shall be as large as the maximum size acceptable and/or the measurements after pruning, where pruning is necessary.

Plants that meet the measurements specified, but do not possess a normal balance between height and spread, shall be rejected.

Plants larger than those specified and of equal quality to those specified may be accepted at no additional cost to the State.

907-230.02.2.4--Balled & Burlapped (B&B) Trees. Trees designated "B&B" in the Plant Schedule shall be adequately balled with firm, natural balls of soil in sizes as set forth in ANSI 260.1 Standard for Nursery Stock. Balls shall be firmly wrapped with jute burlap weighing not less than 7.2 ounces per square yard or other approved strong cloth of equal strength and resistance to tearing and laced with a suitable heavy jute twine. No B&B tree shall be planted if the root ball is cracked or broken before or during the process of planting or if the tree is loose in the root ball.

907-230.02.2.5--Container Grown Plants. Plants designated "container-grown" in the Plant Schedule shall be furnished in sound containers of the size specified. The plant materials contained therein shall conform to the requirements set forth in ANSI 260.1 Standard for Nursery Stock for container-grown plants. No container-grown plant shall be planted if the root and soil mass is cracked or broken either before or during the process of planting. Root bound container-grown stock will not be accepted. Containers shall be free of weeds and grasses. Containers found to contain objectionable weeds and/or grasses will be rejected.

907-230.02.2.6--Delivery, Handling and Temporary Storage. Trees designated "B&B" shall be freshly dug at the time of delivery. All trees shall be dug and/or handled with skill and care so as to prevent injuries to the trunk, branches and roots and shall be packed in an approved manner to ensure arrival at the project site in good condition.

Plants shall not be bound with wire or rope at any time in such a manner that injury to the plant results. Plants shall be handled and lifted from the bottom of the root ball, using whatever means is necessary.

Protective covering shall be provided for the plants during delivery and while in storage awaiting planting.

Until planted, all plants shall be protected from excessive moisture loss and/or freezing by covering the root balls or containers with sawdust or other approved mulch material. Adequate water shall be provided to all plants while in storage and awaiting planting.

907-230.02.2.7--Pine Bark Mulch. A three (3) inch depth layer of clean pine bark mulch, free of weed seeds, moss, stones, sticks, cones, or other debris shall be provided within the planting saucer of each tree. Pine bark mulch shall not contain materials or toxic substances which may adversely influence growth.

907-230.02.2.8--Antitranspirant. "Wilt-proof" antitranspirant or other approved wilt-proofing agent shall be provided for all trees in leaf.

907-230.02.2.9--Staking And Guying. Materials for staking and guying of trees shall be as called for by the planting details.

The Contractor will be responsible for removal of all tree guy wires. It will be up to the Contractor to determine when to remove guy wires to prevent girdling to tree trunks. The Contractor will re-guy trees if the tree is not yet mature enough to support its own weight, or not enough root growth has occurred to anchor it firmly. If damage occurs to trees from girdling of the trunks, or removal of guy wires too early, the Contractor will replace all such material at no additional cost to the State.

907-230.03--Construction Requirements.

907-230.03.1--Site Preparation. All construction debris shall be removed from the subgrade surface before beginning landscape operations. Subgrade shall be free of all brick, concrete, mortar, gravel, asphalt, lumber, sheetrock, and any other materials which would adversely influence plant growth.

907-230.03.2--Installation. The locations of all trees shall be staked and approval of the Engineer obtained before planting begins. The Engineer may adjust the locations of tree prior to planting.

Prior to planting, fluorescent marking paint shall be used to lay out each of the plant beds for location approval by the Engineer. The plant material in their original containers shall be positioned within the painted bed locations, for approval as well. The Engineer may adjust the locations of the plants prior to planting.

Existing site conditions shall be examined before work begins. The Contractor shall notify the Engineer of any unsatisfactory conditions. No work shall be performed until such conditions are satisfactory and acceptable.

Prior to planting, the Engineer shall be informed in writing of existing conditions which could be detrimental to the successful planting and subsequent growth and health of the plants, including but not limited to: subsurface drainage conditions, underground utility locations, and other subgrade conditions.

All plant pits shall be circular in outline. All excavations shall have vertical sides. The depths and widths shall be as specified on planting details.

907-230.03.3--Setting Plants. Trees shall be uniformly set two to four inches (2" to 4") higher than the surrounding grade or as necessary to provide adequate drainage away from the roots.

Annuals, shrubs and groundcover, as specified in the appropriate planting detail, shall be set to insure the plant material is high enough to promote positive water drainage away from the roots.

Planting areas and pits shall be prepared as specified and as shown on the plans, prior to inserting plants. Specified soil mixture shall be used to backfill beds and pits. When tree pits have been backfilled approximately 2/3 full, water shall be thoroughly incorporated before installing remainder of soil mix to top of pit.

Plants shall be set plumb and braced rigidly in position until the soil mix has been tamped solidly around the root ball.

Rope or strings shall be cut from the top of the root ball after the tree has been set. Burlap or cloth wrapping shall be left intact around balls. Portions of the burlap exposed at the top of root ball shall be turned under and buried.

Shallow saucers capable of holding water about each tree shall be formed by placing a mound of soil mix around the edge of each filled-in pit.

All plants shall be thoroughly watered by hose immediately after planting.

Tree saucers and bed areas shall be uniformly mulched with a three (3) inch layer of pine bark mulch.

Trees over two inches in caliper shall be guyed with a minimum of three guy wires spaced evenly around the tree. Each guy wire shall be attached to the tree with a single loop through a hose with an angle of 60 degrees to the tree trunk. The guy wire shall be attached in accordance with planting details. Guy wires shall be kept taut. Removal of guy wires will be the responsibility of the Contractor.

All trees shall be pruned, as necessary, at the site in accordance with standard modern horticultural practice as approved by the Engineer. Cuts over two inches in diameter shall be painted with flat black oil based enamel paint. Pruning shall be done with clean, sharp tools.

907-230.03.4--Site Maintenance. Excess and waste materials shall be continuously and promptly removed and disposed of as specified herein and all reasonable precaution taken to avoid damage to existing structures.

When all work has been completed in an area, the area shall be cleaned up to the satisfaction of the Engineer. Debris, rubbish, subsoil, soil mix and other waste material shall be cleaned up and

removed from the project site.

907-230.03.5--Protection Of The Work And The Public. The Contractor shall take all necessary precautions to adequately protect the work under construction from damage by the public and to protect the public from accident and unnecessary inconvenience.

In the event that pavement, structures, walls, sidewalks, curbs, substructures, or utilities are disturbed or damaged by the Contractor during execution of the work, the Contractor shall make repairs, at no additional cost to the State. If the damaged item is owned or operated by one of the several public utilities, repair shall be accomplished as directed by the utility. If the damaged item is the property of the State, repair shall be made in a manner acceptable to the Engineer.

907-230.03.6--Landscape Maintenance. Maintenance shall begin immediately after each plant is planted.

Maintenance of new plants shall consist of pruning, trimming, watering, cultivating, weeding, mulching, resetting to proper grades or upright position, restoration of the planting saucer, litter removal from bed areas and furnishing and applying such sprays as are necessary to keep the plants free of insects and diseases. This will be required until final acceptance of the work.

Planting areas and plants shall be protected at all times against trespassing damage of any kind for the duration of the maintenance period. If any plants become damaged or injured, they shall be treated or replaced as directed by the Engineer at no additional cost to the State. No work shall be done within, adjacent to, or over any planting area without proper safeguards and protection to the plant.

The Contractor shall be responsible for keeping all plants and work incidental thereto, in good condition by planting replacements, watering, weeding, pruning and spraying, and by performing all other necessary operations of care for promotion of root growth and plant life, so that all work is in a satisfactory condition at the final inspection of the project.

All leaves, litter, gravel, or other debris shall be removed from all landscaped areas at weekly intervals until final acceptance. Such materials shall be collected and properly disposed of off the project site.

The root system of all plants shall be watered at such intervals as will keep the surrounding soil in the best condition for promotion of root growth and the overall healthy life of the plant.

907-230.3.7--Inspection And Final Acceptance. After the completion of all items of work, and upon written request of the Contractor, the Engineer will inspect all work for final acceptance. Upon completion of any deficiencies, the Engineer will certify in writing as to the final acceptance of the project. The Contractor's responsibility for maintenance will terminate the day after final acceptance of the work.

907-230.04--Method of Measurement. Tree planting, annual planting, shrub and groundcover

planting, complete and accepted, will be measured per each as indicated on the plans and in the bid schedule of the contract.

907-230.05--Basis of Payment. Tree planting, annual planting, shrub and groundcover planting, measured as prescribed above, will be paid for at the contract unit price bid per each, which price shall be full compensation for furnishing all planting soil mix, soil lab testing and reports, fertilizer, lime, herbicide treatment, nursery tagging and associated trips, tree staking and guying, mulches, watering, plant material, labor and equipment, storing and protection and incidentals necessary to complete the work.

Payment will be made under:

- 907-230-A: Tree Planting, Description - per each
- 907-230-F: Shrub and Groundcover Planting, Description - per each
- 907-230-G: Annuals Planting, Description - per each

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-230-4

CODE: (SP)

DATE: 09/19/2005

SUBJECT: Tree and Shrub Planting

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

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

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

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

907-230.03--Construction Requirements.

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

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

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

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

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

Measurement for payment will be made in the following sequence:

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

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

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

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

PLANT ESTABLISHMENT PERIOD

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

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

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

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

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

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

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

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

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

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

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-233-1

CODE: (SP)

DATE: 02/01/2005

SUBJECT: Tree Bark Mulch

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

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

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

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

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

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

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

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

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

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-242-11

CODE: (SP)

DATE: 04/20/2009

SUBJECT: Sewer Treatment Plant

PROJECT: STP-0055-02(210) / 105533301 -- Holmes County

Section 907-242, Sewer Treatment Plant, is hereby added to and made part of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows:

SECTION 907-242-- SEWER TREATMENT PLANT

The specification format for this item of work is different from Standard Road & Bridge Construction. The Contractor shall install the Sewer Treatment Plant in accordance with the requirements set forth as follows.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

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ON I-55 (NORTHBOUND) NEAR WEST
HOLMES COUNTY, MISSISSIPPI**

PROJECT NUMBER: **STP-005-02(210)105533**

DATE: **June 25, 2009**

DESCRIPTION A: (Pay Item 907-242-A) This Work shall consist of items shown on Drawings and described in this Special Provision for removal of existing Sewage Treatment Plant and constructing the Sewage Treatment Plant at the Rest Area on the Northbound Side of Interstate 55 near West, Holmes County, Mississippi, as a Lump Sum portion of this Contract.

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

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END OF SECTION

SECTION 02 41 13 SITE DEMOLITION

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included:

1. Dewatering and cleanout of all existing sewage treatment plant tankage.
2. Removal of selected existing equipment and structures, relocation of selected equipment, and modifications to existing structures necessary for installation of new equipment.
3. Take all necessary precautions to insure against damage to existing work to remain in place, to be reused, or to remain the property of the Owner, and any damage to such work shall be repaired or replaced as approved at no additional cost to the Owner.

B. Related Work specified elsewhere:

1. MDOT specification Section 202 for removal of structures and obstructions
2. MDOT specification Section 203 for excavation and backfill

1.2 SUBMITTALS

A. Obtain, pay for, and submit all permits required for execution of demolition work including the following:

1. Permits and notices authorizing building demolition.
2. Certificates of severance of utility services.
3. Permit for transport and disposal of debris and wastewater.

B. Submit demolition procedures and operation sequence following MDOT Section 202 Removal of Structures and Obstructions

C. Permits for Disposal of Debris:

1. Arrange for legal disposal of debris and wastewater and obtain written agreements with the owners of the property and/or landfill where the debris/wastewater shall be deposited.
2. Provide a certification of disposal (use form attached at the end of this section) that an agreement releasing the Owner from all responsibility in connection with the disposal of the debris was executed.

1.3 COORDINATION

A. Utility Removal: Arrange with utility companies for changes in their equipment, and capping of pipes and wiring as required.

B. Schedule disruption of utilities or facilities with the Owner a minimum of 48 hours in advance of shut-down.

C. Maintaining Traffic:

1. Do not close or obstruct public streets, sidewalks, alleys access drives or passageways without permission from authorities having jurisdiction.
2. If required by authorities, provide alternate routes around closed or obstructed traffic ways.

1.4 JOB CONDITIONS

A. Existing Conditions: Survey existing work and examine the Contract Documents to determine extent of demolition work.

B. Protection:

1. Includes but not limited to erecting barriers, fences, guard rails, enclosures, chutes and shoring as required to protect structures and utilities remaining intact.
2. Protect any trees, plants, grass and other landscaping designated to remain from damage. Replace any trees, plants or other landscaping materials designated to remain that are damaged during the work under this Contract.
3. Protect the interior of the building and all materials and equipment from the weather at all times. Replace materials and equipment damaged by weather at no additional cost to the Owner.
4. Control activities to prevent the spread of dust to occupied portions of the building and avoid nuisance in surrounding areas.
5. Take necessary precautions to insure against damage to existing materials or equipment to remain in place, to be reused, or to remain the property of the Owner. Repair or replace damaged materials and equipment at no additional cost to the Owner.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 PREPARATION

A. Preparation:

1. Verify the extent of demolition work to be performed with the Project Engineer.
2. Verify that structures, equipment or spaces to be demolished are isolated, unoccupied and discontinued in use.
3. Arrange for and verify termination of utility services, including removing meters and capping lines.
4. Remove items scheduled to be salvaged for Owner and place in designated storage area.

B. Dewatering and Cleanout

1. The Contractor will be responsible to dewater the treatment plant structures prior to demolition. The Contractor will pump liquid wastewater from the tanks and will be responsible for the removal of the grit and sludge at the bottom of the units. The Contractor will be responsible to provide the necessary manpower, pumps, hoses, squeegees, etc. to remove all wastewater, grit and sludge. The Contractor may arrange to dispose of the wastewater at a facility accepting wastewater or another wastewater treatment plant. The grit, sludge (and wastewater if not disposed otherwise) shall be drained or bulked with approved inert materials to achieve landfill disposal requirements. These requirements stipulate that the material to be disposed of contain no free liquids and pass a paint filter test. The Contractor shall than properly dispose of the materials.

3.2 DEMOLITION

A. Demolition:

1. Demolish structures in accordance with demolition procedures submitted.
2. Maintain area outside in as clean condition as possible during progress of demolition work.
3. Existing utilities shall be removed as indicated; when utility lines are encountered that are not indicated on the Drawings, the Owner and Project Engineer shall be notified.
4. Use of explosives will not be permitted.
5. Limit dust to lowest practicable level.
6. Do not use water to extent of causing flooding or contaminated runoff.
7. Backfill in accordance with MDOT specification section 203, Excavation and Embankment.
8. Grade surface to adjacent contours and slope to drain.
9. Repair damage to adjacent construction or structures.
10. Remove all clamps, brackets, supports, hangers, conduits, controls, wire, etc. associated with equipment/pipe indicated to be removed and patch all areas to match adjacent areas.

3.3 DISPOSAL

A. Disposal:

1. Remove demolition debris to designated disposal area promptly.
2. Do not store or burn materials on-site.
3. Disposal areas shall be approved by authorities having jurisdiction.

END OF SECTION

CERTIFICATION OF DISPOSAL

The undersigned hereby attests that they have written agreements to dispose of debris from the _____ Project, _____ County, Mississippi and hereby certifies that all disposal of debris is in accordance with all Federal, State and local laws and regulations.

Approximate Quantity of Material Disposed: _____ Cu. Yds.

Type of Material Disposed: _____

Location of Disposal Site: _____

CONTRACTOR: _____

President (Signature)

(Typed/Printed Name)

Treasurer (Signature)

(Typed/Printed Name)

(CORPORATE SEAL)

Attest: _____
Secretary (Signature)

(Typed/Printed Name)

SECTION 07 92 00 JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Urethane joint sealants.
 - 2. Latex joint sealants.
 - 3. Preformed joint sealants.

1.2 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples: For each kind and color of joint sealant required.
- C. Joint-Sealant Schedule: Include the following information:
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.
 - 4. Joint-sealant color.
- D. Product test reports.
- E. Field-adhesion test reports.
- F. Warranties.

1.3 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.

PART 2 - PRODUCTS

2.1 URETHANE JOINT SEALANTS

- A. Urethane Joint Sealant US 1: ASTM C 920.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. BASF Building Systems.
 - b. Bostik, Inc.
 - c. Pecora Corporation.
 - d. Sika Corporation; Construction Products Division.
 - e. Tremco Incorporated.
 - 2. Type: Single component (S).
 - 3. Grade: Pourable (P) or Nonsag (NS).

4. Class: 50.
5. Uses Related to Exposure: Traffic (T).

B. Urethane Joint Sealant U.S. 2: ASTM C 920.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. BASF Building Systems.
 - b. Bostik, Inc.
 - c. Pecora Corporation.
 - d. Sika Corporation; Construction Products Division.
 - e. Tremco Incorporated.
2. Type: Single component (S).
3. Grade: Nonsag (NS).
4. Class: 50.
5. Uses Related to Exposure: Nontraffic (NT).

2.2 LATEX JOINT SEALANTS

A. Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. BASF Building Systems.
 - b. Bostik, Inc.
 - c. Pecora Corporation.
 - d. Tremco Incorporated.

2.3 PREFORMED JOINT SEALANTS

A. Preformed Foam Joint Sealant: Manufacturer's standard preformed, precompressed, open-cell foam sealant manufactured from urethane foam with minimum density of 10 lb/cu. ft. (160 kg/cu. m) and impregnated with a nondrying, water-repellent agent. Factory produce in precompressed sizes in roll or stick form to fit joint widths indicated; coated on one side with a pressure-sensitive adhesive and covered with protective wrapping.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Dayton Superior Specialty Chemicals.
 - b. EMSEAL Joint Systems, Ltd.
 - c. Sandell Manufacturing Co.
 - d. Schul International, Inc.
 - e. Willseal USA, LLC.

2.4 JOINT SEALANT BACKING

A. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

B. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer.

2.5 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.
 - 1. Remove laitance and form-release agents from concrete.
 - 2. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.2 INSTALLATION

- A. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- B. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- C. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.

3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- D. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
1. Remove excess sealant from surfaces adjacent to joints.
 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
- E. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.3 FIELD QUALITY CONTROL

- A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
1. Extent of Testing: Test completed and cured sealant joints as follows:
 - a. Perform 2 tests for the first 1000 feet of joint length for each kind of sealant and joint substrate.
 2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
- B. Evaluation of Field-Adhesion Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.4 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces.
1. Joint Locations:
 - a. Isolation and contraction joints in cast-in-place concrete slabs.
 - b. Other joints as indicated.
 2. Joint Sealant: Urethane.
 3. Joint-Sealant Color: As selected by Project Engineer from manufacturer's full range of colors.
- B. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.
1. Joint Locations:
 - a. Construction joints in cast-in-place concrete.
 - b. Control and expansion joints in unit masonry.
 - c. Joints between different materials listed above.

- d. Perimeter joints between materials listed above and frames of doors and louvers.
 - e. Other joints as indicated.
 2. Joint Sealant: Urethane.
 3. Joint-Sealant Color: As selected by Project Engineer from manufacturer's full range of colors.
- C. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.
1. Joint Locations:
 - a. Isolation joints in cast-in-place concrete slabs.
 - b. Other joints as indicated.
 2. Joint Sealant: Urethane.
 3. Joint-Sealant Color: As selected by Project Engineer from manufacturer's full range of colors.
- D. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces.
1. Joint Locations:
 - a. Perimeter joints of exterior openings where indicated.
 - b. Vertical joints on exposed surfaces of interior unit masonry and concrete walls.
 - c. Perimeter joints between interior wall surfaces and frames of interior doors and louvers.
 - d. Other joints as indicated.
 2. Joint Sealant: Latex.
 3. Joint-Sealant Color: White.

END OF SECTION

SECTION 08 12 00

ALUMINUM FLUSH DOORS AND ALUMINUM FRAMES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The Work of This Section includes, but is not limited to:
 - 1. Furnishing and installing aluminum flush doors with aluminum door frames.
- B. Related Sections:
 - 1. Section 07 92 00 - Joint Sealants
 - 2. Section 08 71 00 - Hardware

1.2 QUALITY ASSURANCE

- A. American Society for Testing and Materials (ASTM).
- B. Standards: Comply with the requirements and recommendations in applicable specifications and standards by NAAMM, AAMA, and AA, including the terminology definitions, and specifically including the "Entrance Manual" by NAAMM, except to the extent more stringent requirements are indicated.

1.3 SUBMITTALS

- A. Product Data: Submit door manufacturer's product data; specification to include core materials, stile and rail construction, and face sheets.
- B. Shop Drawings: Submit shop drawings of half-size detail sections of composite members, face sheet to rail and stile sections, and all pertinent details required to fabricate and install doors.
- C. Templates: Submit hinge templates and other hardware templates to allow frame manufacturer to properly position holes for hinges and all other hardware as shown.
- D. Samples: Samples shall be furnished of doors and frames, complete with protective coating, for approval.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the job site in original, unopened packages with labels intact. Inspect materials for damage and immediately advise manufacturer of any defective components.
- B. Doors shall be floated within cartons with no portion of the door having contact with the outer shell of the container.

1.5 WARRANTY

- A. Manufacturer of doors shall provide a written warranty agreeing to replace, at no cost to the Owner, door(s) that fail in materials or workmanship for a period of ten years after the contractor's warranty expires.

- B. Failure of materials or workmanship includes excessive deflection, faulty operation, deterioration of finish in excess of normal weathering and defects in weatherstripping.

1.6 MANUFACTURER

- A. Manufacturer shall have been in flush aluminum door production for at least five years.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

- A. Manufacturer:
 1. Special-Lite, Inc.(Basis-of-Design)
 2. Cline Aluminum Doors, Inc.
 3. Kawneer Co., Inc.
 4. Vistawall Architectural Products

2.2 MATERIALS

- A. Aluminum Rails and Stiles: ASTM B221, 6063-T5 aluminum, minimum thickness 0.125".
- B. Aluminum Face Sheets: ASTM B209 aluminum, minimum thickness 0.062" with embossed finish.
- C. Aluminum Frame Members: Provide alloy and temper as recommended by manufacturer for strength, corrosion resistance, and application of required finish and control of color; ASTM B221 for extrusions, ASTM B209 for sheet/plate, with a minimum wall thickness of 0.125".
- D. Fasteners: Aluminum, non-magnetic stainless steel or other non-corrosive metal fasteners, compatible with the doors and items being fastened.
- E. Reinforcement and Brackets: Manufacturer's standard formed or fabricated steel units, of shapes, plates, or bars, with 2.0 ounce hot-dip zinc coating, complying with ASTM A123, applied after fabrication.
- F. Expansion Anchor Devices: Lead shield or toothed steel, drilled-in, expansion bolt anchors.
- G. Bituminous Coating: Cold applied asphalt mastic complying with SSPC-PS 12, compounded for 30-mil thickness per coat.
- H. Compression Weatherstripping: Provide weatherstripping as specified in Section 08 71 00 - Hardware.
- I. Sealants and Gaskets: Provide sealants and gaskets in the fabrication, assembly and installation of the work, which are recommended by the manufacturer to remain permanently elastic, non-shrinking, non-migrating and weatherproof.

2.3 DOOR FABRICATION

- A. Shall be Style "SL-16 Aluminum Flush Door".

- B. Doors shall be 1-3/4" thick constructed of aluminum alloy rails and stiles, joined with steel tie rods, inner core of poured-in-place polyurethane with aluminum face sheets locked in with extruded interlocking edges; provide 0.120" thickness rigid backing for face sheets.
- C. Stiles shall be tubular shape with top and bottom rails to be extruded with legs for interlocking rigidity weather bar.
- D. Core shall be poured-in-place polyurethane of 5 pounds per cubic foot density; doors shall be properly reinforced for hardware prior to urethane core foaming in door.
- E. All doors shall be premachined in accordance with templates from the hardware supplier. Provide reinforcing for all hardware. Comply with hardware manufacturer's instructions and template requirements. See Section 08 71 00.
- F. Phillips head flat screws with finish matching the item to be fastened shall be used for exposed fasteners. Exposed fasteners shall not be used except where unavoidable for the assembly of the door or hardware fastening.

2.4 ALUMINUM FRAME FABRICATION

- A. Shall be Style "SL-240, 2" x 4" Frame"; box type with four enclosed sides; open back framing not acceptable.
- B. Fabricate tubular and channel frame assemblies with either welded or mechanical joints, in accordance with manufacturer's standards; reinforced as necessary to support required loads, applied stops.
- C. Door Frames: Provide non-removable door stops (0.625" thickness minimum) for single acting doors, either extruded integrally with frame or applied with fasteners which are concealed when door is closed.

2.5 HARDWARE

- A. Shall be as specified in Section 08 71 00.
- B. Hardware shall be provided to the door manufacturer, within this section, for factory installation prior to shipment to the job site.

2.6 FINISHES

- A. Aluminum: Finish for exposed aluminum surfaces shall be dark bronze meeting finish designation AA C22A42 of the NAAMM Metal Finishes Manual.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with manufacturer's recommendations and specifications for the installation of the door and frame.
- B. Set units plumb, level and true to line, without warp or rack of doors, frames or panels. Anchor securely in place. Separate aluminum and other corrodible metal surfaces, from sources of

corrosion or electrolytic action at points of contact with other materials, with bituminous coatings or other means as approved by Engineer.

- C. Set saddles in a bed of sealant.
- D. Clean aluminum surfaces promptly after installation of doors and frames, exercising care to avoid damage to the protective coating (if any). Remove excess sealant compounds, dirt, and other substances.
- E. Provide protective treatment and other precautions required through the remainder of the construction period, to ensure that the doors and frames will be without damage or deterioration (other than normal weathering) at the time of acceptance.

END OF SECTION

SECTION 08 71 00 DOOR HARDWARE

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. The Work of This Section includes, but is not limited to:

1. Furnishing and installing hardware specified herein and noted on drawings for a complete and operational system, including any hardware components, systems, controls and hardware for aluminum entrance doors.

B. Items include but are not limited to the following:

1. Hinges - Continuous hinge
2. Flush Bolts
3. Locksets
4. Closers
5. Thresholds, Gasketing and Door Bottoms
6. Silencers
7. Miscellaneous Trim and Accessories

C. Related Work Specified Elsewhere:

1. Section 08 12 00 - Aluminum Flush Doors & Aluminum Frames
2. Sections within 09 90 00 - Painting

1.2 REFERENCES SPECIFIED (in this section subject to compliance as directed)

- A. NFPA-80-1995 - Standard for Fire Doors and Windows
- B. NFPA-101-1994 - Life Safety Code
- C. ADA - The Americans with Disabilities Act - Title III - Public Accommodations
- D. ANSI-A 117.1 - American National Standards Institute - Accessible and Usable Buildings and Facilities
- E. ANSI-A156.5 - American National Standards Institute - Auxiliary Locks and Associated Products
- F. UFAS - Uniform Federal Accessibility Standards
- G. UL - Underwriter's Laboratories
- H. WHI - Warnock Hersey International, Division of Inchcape Testing Services
- I. State and Local Codes including Authority Having Jurisdiction

1.3 SUBMITTALS

A. Schedule to be in vertical format, listing each door opening, including:

1. Type, style, function, size, and finish of each hardware item.

2. Name and manufacturer of each item.
 3. Fastenings and other pertinent information.
 4. Location of each hardware set cross referenced to indications on Drawings both on floor plans and in door and frame schedule.
 5. Explanation of all abbreviations, symbols, and codes contained in schedule.
 6. Mounting locations for hardware.
 7. Door and frame sizes and materials.
 8. Keying information.
- B. Supply the hardware schedule within three (3) weeks from date purchase order is received by the hardware supplier. The supplier is to arrange to meet with the Owner / Project Engineer to finalize keying requirements.
- C. Manufacturer's cut/catalog sheets: Submit all hardware items including any required special mounting instructions as listed in the hardware schedule. Identify each hardware item and all other data required to confirm compliance with these specifications.
- D. Certification of Compliance:
1. Submit any information necessary to indicate compliance to all of these specifications as required.
 2. Submit a statement from the manufacturer that electronic hardware and systems being supplied comply with the operational descriptions exactly as specified.
- E. Submit any sample necessary, as requested by the Project Engineer.
- F. Templates for finish hardware items to be sent to related door and frame suppliers within three (3) working days of receipt of approved hardware schedule.

1.4 QUALITY ASSURANCE

- A. Hardware supplier must be a qualified, Factory Authorized, direct distributor of the products to be furnished. The supplier must have warehousing facilities within a 50 mile radius of the project site and a record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this project. In addition, the supplier is to have in their regular employment an A.H.C. or person of equivalent experience who will be made available, at reasonable times, to consult with the Project Engineer/Contractor and/or Owner regarding any matters affecting the finish hardware on this project.
- B. Pre-Installation Conference for Hardware: Prior to installation of hardware, the General Contractor will arrange a conference between supplier, installers and related trades to review materials, procedures and coordinating related work.
- C. Single Source Responsibility: Obtain each type of hardware (hinges, latch and lock sets, exit devices, closers, etc.) from a single manufacturer.

1.5 DELIVERY, HANDLING AND PACKAGING

- A. Furnish all hardware with each unit clearly marked and numbered in accordance with the hardware schedule. Include door and item number for each.
- B. Pack each item complete with all necessary parts and fasteners.

- C. Properly wrap and cushion each item to prevent scratches and dents during delivery and storage.

1.6 SEQUENCING AND SCHEDULING

- A. Any part of the finish hardware required by the frame or door manufacturers or other suppliers that is needed in order to produce doors or frames is to be sent to those suppliers in a timely manner, so as not to interrupt job progress.

1.7 WARRANTY

- A. All finish hardware shall be supplied with a one (1) year warranty against defects in materials and workmanship, commencing with substantial completion of the project except all door closers to have a ten (10) year warranty.

PART 2 - PRODUCTS

2.1 FASTENERS

- A. Furnish with finish hardware all necessary screws, bolts and other fasteners of suitable size and type to anchor the hardware in position for a long life under hard use.
- B. Furnish fastenings where necessary with expansion shields, toggle bolts and other anchors designated by the Project Engineer according to the material to which the hardware is to be applied and the recommendations of the hardware manufacturer. All thresholds shall be fastened with machine screws and lead anchors. Where specified in the hardware sets, security type fasteners of the type called for are to be supplied.
- C. Design of all fastenings shall harmonize with the hardware as to material and finish. Supply stainless steel fastenings whenever possible. Sex-nuts for door closers may be fabricated of aluminum.

2.2 ENVIRONMENTAL CONCERN FOR PACKAGING

- A. The hardware shipped to the job site is to be packaged in biodegradable packs such as paper or cardboard boxes and wrapping. If non-biodegradable packing such as plastic, plastic bags or large amounts of Styrofoam is utilized, then the Contractor will be responsible for the disposal of the non-biodegradable packing to a licensed or authorized collector for recycling of the non-biodegradable packing.

2.3 HINGES

- A. Exterior Door Hinges: Provide out-swinging door hinges of solid stainless steel.
- B. Where required to clear trim or permit doors to swing 180 degrees, furnish hinges of sufficient throw.
- C. Provide heavy weight hinges on all doors.
- D. Finishes: US32D (Satin stainless steel)

2.4 LOCKS AND LOCK TRIM

- A. All locksets, latchsets and trim to be of one manufacturer as hereafter listed for continuity of design and consideration of warranty. All locks to be in accordance with ANSI/BHMA A156.13 and paragraphs below.
- B. Provide metal wrought box strike boxes and curved lip strikes with proper lip length to protect trim of the frame, but not to project more than 1/8 inch beyond frame trim.
- C. Mechanical mortise locks to meet ANSI Operational Grade 1 and Security Grade 1 requirements. Levers to be rated for a minimum of 1,000 inch pounds of pressure without allowing access.
 - 1. Steel cap and case with a minimum thickness of .093 inches.
 - 2. One or two piece 3/4 inch, stainless steel, anti-friction latch bolts.
 - 3. One (1) inch stainless steel deadbolt with hardened steel roller inserts.
 - 4. Hand of lock is to be easily field reversible without opening the lock body case.
 - 5. All lever trim is to be thru-bolted through the door and lock case.
 - 6. All cylinder collars for mortise locks to be cast.
 - 7. Lever trim will be solid.
- D. All hardware functions to be exactly as listed in the individual hardware sets with no exceptions.
- E. Acceptable Products: Sargent specified. Products by Schlage or Yale may be considered, subject to compliance to the above paragraphs
- F. Finish: US32D, satin stainless steel trim.

2.5 CYLINDERS AND KEYING

- A. Provide locks and exit devices requiring cylinders with 6-pin cylinders which comply with performance requirements of ANSI A156.5. All keys to be of nickel silver only.
- B. Furnish all locks and cylinders keyed, as directed by the Owner, to a New or Existing, Standard, Grandmaster Key system. All keying to be accomplished at the factory of the lock manufacturer or by a factory authorized distributor.
- C. Each cylinder or lock to be supplied with three (3) change keys.
- D. All cylinders and keys shall be properly tagged to indicate their intended location and to enable the Owner, with a minimum of effort, to establish their key control system.
- E. Furnish all locks and cylinders construction master keyed.
- F. Five (5) construction master keys to be supplied for the project.
- G. Stamp all change keys with keyset symbol (VKC), but do not stamp with key section or biting number.
- H. Acceptable Products: Sargent specified. Equal products by Schlage and Yale will be considered. At the discretion of the Owner, a manufacturer may be added to facilitate an existing keying system.

2.6 SURFACE MOUNTED DOOR CLOSERS

- A. All closers for this project to be the product of a single manufacturer for continuity of design and consideration of warranty.
- B. All closers to be heavy duty, surface mounted, hydraulic type, with a two piece cast iron cylinder x steel spring tube(LCN) or a one-piece, high strength cast aluminum alloy case (Sargent). Full rack and pinion constructed of heavy steel.
- C. Size all closers in accordance with the manufacturer's recommendations at the factory.
- D. All closers to have adjustable spring power and separate tamper resistant, non-critical regulating screw valves for closing speed, latching speed and backcheck control as a standard feature.
- E. All closer covers to be rectangular, full cover type of non-ferrous, non-corrosive material painted or powder coated to match closer.
- F. Closer arms to be forged steel and treated with Special Rust Inhibitors (SRI).
- G. Supply appropriate arm assembly for each closer so that closer body and arm are mounted on non-public side of door opening and on the interior side of exterior openings, except where required otherwise in the hardware sets.
 - 1. When specified, furnish manufacturer's specialty arm to decelerate door to a positive stop located in the closer arm. Sargent (CPS) or LCN (Cush-n-Stop).
- H. Provide closers with special application and heavy-duty arms as specified in the hardware sets or as otherwise called for to insure a proper-operating, long-lasting opening.
- I. The door closers are to comply with ANSI A156.4-1992 and A156.15.
- J. Acceptable Products: Sargent specified. Equal products by LCN are acceptable.

2.7 EXIT DEVICES

- A. Manufacturers:
 - 1. Sargent Manufacturing Company; Div. of ESSEX Industries, Inc. (SGT).
 - 2. Adams Rite Manufacturing Co. (ARM).
 - 3. Von Duprin; an Ingersoll-Rand Company (VD).
 - 4. Yale Security Inc.; Div. of Williams Holdings (YAL).
- B. Panic Exit Devices: Listed and labeled for panic protection, based on testing according to UL 305.
 - 1. Outside Trim: Lever with cylinder, material, finish, and design to match locksets and latchsets, unless otherwise indicated.
 - 2. Through Bolts: For exit devices and trim on metal doors.

2.8 THRESHOLDS AND GASKETING

- A. Provide materials and finishes as specified, unless otherwise listed in the hardware sets.
- B. Provide thresholds with stainless steel machine screws and lead anchors.

- C. Weatherstripping, Sound and Light Seals are to be supplied with #6 stainless steel sheet metal screws. Bubble type weatherstrip, without an aluminum housing, is to be secured with double stick adhesive tape.
- D. All material to comply with ANSI A156.21
- E. Thresholds are to comply with ADA and ANSI A117.1
- F. Finishes: Thresholds are to be brushed aluminum. Aluminum extrusions for gasketing or drip caps are to be clear anodized aluminum. □Bubble□ type gasketing is to be brown. Vinyl gasketing is to be grey. Neoprene gasketing is to be black.
- G. Acceptable Products: Supply threshold and gasketing material as indicated, unless otherwise listed in the hardware sets. National Guard specified. Equal products by Pemko or Reese will be acceptable.

2.9 FINISHES

- A. The finishes for all hardware are as required in this specification and the hardware sets.
- B. Special care is to be taken to make uniform the finish of all various manufactured items.
- C. Extruded aluminum products, except for thresholds and specified gasketing and astragals, are not acceptable.

2.10 OWNER'S STOCK:

- A. At the completion of the project, supply to the owner the following items:
 - 1. One (1) complete bitting list of key cuts
 - 2. One (1) set of instruction sheets for each item furnished
 - 3. One (1) each of any non-standard tool for installation of each non-standard item furnished
 - 4. Two (2) key blanks of each section used.

PART 3 - EXECUTION

3.1 INSTALLATION OF FINISH HARDWARE

- A. Hardware is to be installed by experienced finish hardware installers only.
- B. Check hardware against the reviewed hardware schedule upon delivery. Store the hardware in a dry, secure location to protect against loss and damage.
- C. Install finish hardware in accordance with the approved hardware schedule, the manufacturers' printed instructions and in accordance with □Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames□, by the Door and Hardware Institute. Prefit hardware before finish is applied; remove and reinstall after finish is complete and dry. Install and adjust hardware so that parts operate smoothly, close tightly, and do not rattle.
- D. Mortise and cutting to be done neatly, and evidence of cutting to be concealed in the finished work.
- E. Protect all finish hardware from scratching or other damage.

- F. Field Quality Control of Hardware: The manufacturers' Representatives of the supplied hardware shall make a visit to the job site at the request of the Project Engineer or Contractor for the purposes of monitoring compliance with manufacturer's installation requirements.

END OF SECTION

HARDWARE SET

HW SET-1

3 EA	HINGES	T4A3386 4.5 x 4.5 NRP	US32D	McKINNEY
1 EA	EXIT DEVICE	12-8804 x ETL x LESS DOGGING	US32D	SARGENT
1 EA	CLOSER	1601SS-P	SS	NORTON
1 EA	OVERHEAD STOP	#9x630	SS	NORTON
1 EA	THRESHOLD	513SS x SSMS x LEAD ANCHORS	SS	NGP
1 EA	DOOR SWEEP	200NSS x SSSMS	SS	NGP
1 SET	WEATHERSTRIP	5050	BROWN	NGP
1 EA	RAIN DRIP	16AD x SSSMS	ALUM	NGP
1 EA	RIM CYLINDER	FUNCTION 04	US32D	SARGENT

SECTION 09 90 00

PAINTING AND COATING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The work of this Section includes furnishing coatings and coatings systems for painting and finishing, preparation of surfaces to receive coatings, and application of coatings on interior and exterior surfaces.
- B. Work Included - The work of this Section includes but is not limited to painting the following surfaces:
 - 1. Interior concrete walls and ceilings in the Chemical Feed Room
 - 2. Miscellaneous Metalwork
 - 3. Interior Piping, Valves & Appurtenances
 - 4. Mechanical Equipment
- C. Work Not Included - The following related items shall not be painted under this Section of the Contract:
 - 1. Anodized aluminum, stainless steel or fiberglass
 - 2. Any surface or equipment that has received finish coat of paint at factory, if such finish is undamaged and matches the color schedule.
 - 3. Manufacturer's serial number or identification plates on equipment when such plates are prefinished or polished type. (This does not include cast or embossed names on equipment castings.)
 - 4. Machined or polished surfaces of equipment where such surfaces are susceptible to rolling or sliding friction.
 - 5. No concrete is to be painted.

1.02 DEFINITIONS

- A. The term "paint" as used herein includes emulsions, enamels, epoxies, paints, stains, varnishes, sealers and other coatings, whether organic or inorganic, indicated as prime, intermediate or finish coats in this specification and other documents made a part thereof.
- B. "Submerged" is defined as below the elevation of the top of the wall of a structure containing liquid. In all cases, the decision of the Project Engineer shall be final in determining classification of surfaces.

1.03 QUALITY ASSURANCE

- A. Include on label of each container:
 - 1. Manufacturer's name
 - 2. Type of paint
 - 3. Manufacturer's stock number
 - 4. Color
 - 5. Instructions for reducing, where applicable
- B. Applicable Industry Standards:
 - 1. Steel Structures Painting Council (SSPC):

- a. Steel Structures Painting Manual, Volume 2, "Systems & Specifications", 1982 Edition.

C. Field Quality Control:

1. Request review by Project Engineer of first finished room, space, or item of each color scheme required for color, texture, and workmanship.
2. Use first acceptable room, space or item as product standard for each color scheme.
3. For spray application, paint surface not smaller than 100 square feet as project standard.

D. Standard of Quality:

1. Tnemec Paints is listed as a guide to description and quality required for the paint systems for this project and is not meant to preclude other painting manufacturers that produce paints of the quality specified. Paints product by Sherwin-Williams Company and ICI Devoe will be acceptable if of equal type and quality.

1.04 SUBMITTALS

- A. Submit color chart for the paint system to the Project Engineer for selection of colors.
- B. Submit manufacturer's product data listing materials properties, application recommendations, and environmental conditions required for use.

1.05 PRODUCTS DELIVERY, STORAGE AND HANDLING

- A. Deliver paint products in sealed containers with manufacturer's labels legible and intact.
- B. Store products in ventilated dry areas, protected from contact with soil and from exposure to the elements. Keep products dry at all times. Restrict storage to paint materials and related equipment. Comply with health and fire regulations.

1.06 JOB CONDITIONS

A. Environmental Requirements:

1. Comply with manufacturer's recommendations as to environmental conditions under which coatings and coating systems may be applied.
2. Do not apply paint in areas where dust is being generated.

B. Protection:

1. Cover or otherwise protect finished work, surfaces not being painted concurrently or not to be painted.

C. Factory Painted Surfaces:

1. The surface preparation and painting of materials and equipment will be to manufacturer's standard unless otherwise specified in applicable portions of these specifications.
2. Assure compatibility of coatings applied at the project site with coatings provided by manufacturers and suppliers.

PART 2 - PRODUCTS

2.01 REFERENCE STANDARDS

- A. Paint and coatings provided under this Contract shall be manufactured by one of the manufacturers listed below. Products of other manufacturers of comparable quality and specified type will be acceptable if said paints are submitted for approval to the Project Engineer with satisfactory data on past performance in wastewater treatment plants, certification of composition, and detailed directions for application and use including recommended coverages.
- B. Coatings shall be comparable to the products of:
 - 1. Tnemec Company, Inc.
 - 2. Sherwin-Williams Company
 - 3. ICI Devco
- C. Brick and Concrete Sealer:
 - 1. Sealer shall be a one component product that will provide protection from wet/dry cycles, freeze/thaw cycles, and provide a hydrophobic water-shedding affect to concrete and masonry surfaces. It shall repel liquid water but be permeable to water vapor. It shall reduce water absorption by a minimum of 92% when tested in accordance with ASTM C462.
 - 2. The coating shall be invisible after curing and not leave a surface sheen. The sealer shall resist U.V. light degradation.
 - 3. The sealer shall be Fox Industries FX-425 Silane Penetrating sealer.
- D. Apply coatings to surfaces as listed in the Schedule at the end of this Section.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Examine surfaces scheduled to receive paint and finishes for conditions that will adversely affect execution, permanence or quality of work and which cannot be put into an acceptable condition through preparatory work as included in paragraph 3.03, Surface Preparation.
- B. Do not proceed with surface preparations or coating application until environmental conditions are suitable.

3.02 TEMPORARY CONSTRUCTION

- A. Furnish, install and remove upon completion of painting all scaffolding, ladders or other facilities required to complete painting work.
- B. Temporary heating and ventilating facilities will be required in damp areas or confined spaces. These facilities and all other methods or equipment required to facilitate painting work or afford protection of workmen or work shall be furnished, installed and removed at the completion of work as part of this Contract.

3.03 SURFACE PREPARATION

- A. Remove or protect hardware, hardware accessories, plates, lighting fixtures and similar items placed prior to painting; reposition or remove protection upon completion of each space.

Disconnect equipment adjacent to walls; where necessary, move to permit painting of wall surfaces, and, following completion of painting, replace and reconnect.

B. Metal Surfaces:

1. Metal to be painted that has not been shop primed shall have all rust, scale, dust, loose or foreign substances removed by wire brushing with power tools, chipping or sandblasting. Cleaned metal shall be field primed immediately after cleaning to prevent new rusting.
2. Clean galvanized metal surfaces per SSPC-SP1 to remove oily residue. Dry with a clean cloth.
3. Touch-up paint structural steel, miscellaneous metal, hollow metal doors and frames and other materials which have been prime coated, as required, where shop coat has been damaged by welding or handling and erection; paint rivets, bolts and welds which are unpainted after assembly and erection.
4. Prepare steel substrates in accordance with the Steel Structures Painting Council surface preparation number indicated in the application schedule and as outlined below, unless otherwise required by the coatings manufacturer's most recent printed application instructions:
 - a. SSPC-SP1 Thoroughly wipe with aromatic/ketone solvent using clean rags and clean solvent.
 - b. SSPC-SP3 Surface Preparation Specification No. 3 Power Tool Cleaning.
 - c. SSPC-SP6 Good Commercial Finish.
 - d. SSPC-SP7 Brush blast concrete surfaces using fine sand or grit to obtain finish similar to medium sandpaper.
 - e. SSPC-SP10 Near-White Metal Finish.
5. To minimize potential for flash rusting, steel surfaces shall be at least 5°F above the dew point before surface preparation and priming begin.

3.04 APPLICATION

A. General:

1. Apply paint in strict accordance with manufacturer's instructions and in a manner satisfactory to the Project Engineer.
2. Apply each coating at rate specified by manufacturer. If material has thickened or must be diluted for application by spray gun, build up coating to the same film thickness achieved with undiluted material. Correct deficiencies in film thickness by application of additional coats of paint.
3. Drying time shall be construed to mean "under normal conditions". Where conditions are other than normal because of weather or because painting must be done in confined spaces, longer drying times will be required. Do not apply additional coats of paint or place unit in service until paint is thoroughly dry.
4. Where thinning is necessary, only the products of manufacturer furnishing the paint, and for particular purpose, will be allowed. Thin paint in strict accordance with manufacturer's instructions and only with the full knowledge and approval of the Project Engineer.
5. Do not apply final coats until after other trades, whose operations would be detrimental to finish painting, have finished work in the areas to be painted, and the areas have been approved by the Project Engineer for painting.
6. Slightly vary the color of successive coats.
7. Sand and dust between each coat to remove defects visible from a distance of 5 feet.
8. Finish coats shall be smooth, free of brush marks, streaks, laps or pile up of paints, and skipped or missed areas.
 - a. Finished metal surfaces shall be free of skips, voids or pinholes in any coat when tested with a low voltage detector.

9. Mask edges of paint adjoining other materials or color to obtain sharp, clean division without overlapping.

B. Finishing:

1. Do not apply additional coats until completed coat has been examined by the Project Engineer.
2. Change colors at corner of stop where colors differ between adjoining spaces or rooms and where door frames match wall color.
 - a. Refinish whole wall where portion of finish has been damaged or is not acceptable.
 - b. Adjust stained and natural finishes as necessary to obtain uniform appearance.

3.05 CLEANING

- A. Touch-up and restore finish where damaged. Remove spilled, splashed, or spattered paint from all surfaces.
- B. Leave storage space clean and in condition required for equivalent spaces in project.

3.06 SCHEDULE

- A. The finish schedule and color schedule shall be as indicated on the Drawings or as directed by the Project Engineer. Paint any work not specifically named, but required by the intent of the Drawings and Specifications to be painted, in accordance with similar items.
 1. Omit the first coats specified hereinafter, except for touch-up, if surfaces have been primed at the mill, factory or shop. For touch-up, use primer of the same composition as the mill, factory or shop primer.
- B. Apply paints to surfaces in accordance with the Schedule.
- C. Piping:
 1. Paint piping as indicated on the Schedule for ferrous metals.
 2. Color selections for piping systems will be made by the Owner. Paint all valves, handwheels and operating handles of all valves, associated meters, pumps and equipment, etc. the same color as the piping system.
 3. For ductile or cast iron piping with a bituminous primer, apply the appropriate number of coats of the manufacturer's recommended sealer to prevent bleed through.
- D. Equipment and Control Panels:
 1. Paint factory finished equipment and control panels where necessary to match colors.
 2. Paint process equipment the same color as their respective piping systems.
- E. Physical Hazards: Comply with OSHA Standard 1910.144 for identification and color code marking of all physical hazards.

3.07 PROCESS EQUIPMENT IDENTIFICATION MARKINGS

A. Equipment Identification:

1. Mark each unit of process equipment including all pumps, air compressors, local control panels, local recorders, analyzers, chemical feed tanks, reset timers, flow meters, thermostats, switches, etc. with its functional name (example: "Raw Sewage Pump No.

- 1", "Chlorine Leak Detector") by means of an etched aluminum name plate with permanent adhesive backing.
 2. Name plates, unless otherwise specified, shall be 1-1/2" x 4" with a black enamel background and etched or engraved lettering.
 3. Insure that equipment designations and their corresponding electrical control equipment designations coincide.
- B. Locations and method of attachment of name plates, tags, and markers shall be approved by the Owner's representative.

END OF SECTION

**PAINTING/COATING SCHEDULE
NEW OR PREVIOUSLY UNPAINTED SURFACES**

SYSTEM NUMBER	SURFACE	PREPARATION	GENERIC	COATS	NAME	TNEMEC	DFT
1	INTERIOR NON- SUBMERGED FERROUS METAL	SSPC-SP-6	ACRYLIC URETHANE	SHOP PRIME *	161-1211	3-5	
				FIELD TOUCHUP	50-330	2-3	
				INTERMEDIATE	SERIES 73	2-3	
				FINISH	SERIES 73	2-3	
2	EXTERIOR NON- SUBMERGED FERROUS METAL	SSPC-SP-10	EPOXY ACRYLIC URETHANE	SHOP PRIME	161-1211	3-5	
				FIELD TOUCHUP	50-330	2-3	
				INTERMEDIATE	SERIES 73	2-3	
				FINISH	SERIES 73	2-3	
3	SUBMERGED FERROUS METAL	SSPC-SP-10	EPOXY- AMINE CURE	PRIME	1255	SERIES 104-	8-10
				FINISH		SERIES 104	8-10
4	FACTORY PAINT EQUIPMENT & MACHINERY	DULL CLEAN & DRY	BARRIER COAT EPOXY POLYA- MINE	PRIME	SERIES 27	2-3	
				INTERMEDIATE	SERIES 27	2-3	
				FINISH	SERIES 27	2-3	
5	GALVANIZED	SSPC-SP-1	EPOXY POLYA- MIDE	PRIME	SERIES 161	2-3	
				FINISH	SERIES 161	2-3	
6	MILL FINISH ALUMINUM	CLEAN & DRY/ SSPC-SP-1	EPOXY POLYA- MIDE	PRIME	SERIES 161	2-3	
				FINISH	SERIES 161	2-3	
7	INTERIOR CONCRETE FLOOR	BRUSH-OFF BLAST CLEAN & DRY	EPOXY POLYAMIDE (NON-SKID)	PRIME	SERIES 67	2-3	
				FINISH	(THIN 25%) SERIES 67	3-5	
8	PVC PIPE	CLEAN, DRY & DULL	EPOXY POLYA- MIDE	PRIME	SERIES 161	2-3	
				FINISH	SERIES 161	2-3	
9	COPPER	CLEAN & DRY	EPOXY	PRIME	SERIES 161	2-3	
				FINISH	SERIES 161	2-3	

*Color same as finish coat

SECTION 13 34 23 CHEMICAL FEED BUILDING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The Work Of This Section Includes, but is not limited to:
1. One pre-engineered factory or field assembled prefabricated building to be utilized as a chemical feed building to house a chemical mix tank, chemical feed pumps, and miscellaneous piping and electrical devices.
 2. The Chemical Feed Building is to be supplied by the Package Plant Sewage Treatment System Supplier specified in Section 44 41 13 who will have total system responsibility for the entire treatment system.

1.02 RELATED SECTIONS

- A. Division 26: Electrical
B. Section 44 41 13: Packaged Sewage Treatment System

1.03 SUBMITTALS

- A. Product Data:
1. Provide manufacturer's standard details and catalog data demonstrating compliance with referenced standards. Submit complete descriptive literature on all building accessories (air conditioning, doors, door hardware, etc.).
 2. Provide installation instructions.
 3. Shop Drawings: Submit drawings showing layout, dimensions, exterior elevations, wall panel details, floor panel details, roof panel details, connections, anchorages, and accessories. Submit structural calculations.
 4. Shop drawings and structural calculations shall be sealed by a Professional Engineer registered in the state in which the project is located.

PART 2 - PRODUCTS

2.01 GENERAL

- A. This specification covers the design, construction and assembly of building(s) as follows:
1. Quantity: 1
 2. Width: Interior 10'
 3. Length: Interior 10'
 4. Height: Interior 10'-0"
- B. The Contract Drawings shall show the general arrangement and requirements of this specification. The actual building design is the responsibility of the Fabricator. Drawings and calculations are to be certified by a Project Engineer licensed for such practice within the State where the buildings are to be located. The Fabricator is to be certified by the State within which the buildings are to be located if a State certification program is in place. The buildings will carry a decal and data sheet displaying acceptance of each structure by the State within which the building is to be located if there is a State certification program in place. If the subject State

does not have a certification program, the building shall carry the inspection decal of an acceptable third party inspector whose primary business it is to provide such services.

- C. It is the Fabricator's responsibility to ensure that all materials comply with the requirements of the relevant specification. Substitutions will not be made without the prior written approval of the Owner and Project Engineer. Any such approval, however, will in no way relieve the vendor of full responsibility for the adequacy of all materials provided.
- D. All conflicts between the specifications and standards and codes must be resolved with the Owner and Project Engineer.
- E. Buildings shall be designed to meet UBC and SBC building construction codes as manufactured by GFRC Shelters, 3725 E. Texas St., Bossier City, LA (Phone No. 800-543-7205).
- F. Buildings shall be suitable for a remote environment. All materials shall have adequate protection from corrosion. The outside building finish shall be an exposed aggregate of a generally brownish shade with corner posts, doors, door frames and roof edges painted dark brown. The interior walls and ceiling shall be covered with 3/4" marine plywood which in turn is covered with white FRP paneling. The FRP paneling laminate shall be self-extinguishing per ASTM E84 and have a Class "A" flame spread. The plywood shall have one smooth side facing the FRP paneling.
- G. The design loading shall be as follows:
 - 1. Minimum wind load is 125 MPH. Ultimate shall be 150 MPH.
 - 2. Minimum roof load requirement is 100 Lb/Ft².
 - 3. Seismic design shall be for Zone IV.
 - 4. Transfer force design shall be for a minimum of 2 g.
- H. Minimum material properties as follows:
 - 1. Concrete compressive strength, precast=4500 psi, cip=3000 psi.
 - 2. Glass Fiber Reinforced Concrete=4500 psi, tens 1600 psi.
 - 3. A36 structural steel, 36 ksi yield strength.
 - 4. Bolts - A326 high strength.
 - 5. Concrete density - 125 lbs/ft³.
- I. Air infiltration shall be 200 CFH maximum.
- J. All materials of construction shall be new. Buildings shall be fabricated in a workmanlike manner and in accordance with an established Quality Control Program for which all records are kept for future audit.
- K. Fabricator shall make provisions for bolting building to concrete slab. Provide and install these fasteners which shall be stainless steel.
- L. The building is to be preassembled to the fullest extent possible at the building manufacturer's factory. Building component sizes are to be based on the largest size that will allow shipping without need for special transport permits.
- M. Fabricator is responsible for transporting the completed building to site, off loading the building, and assembling the building on the concrete foundation pad. The Fabricator shall install all fasteners, caulking, interior paneling, etc. to provide a completely finished building assembly.

2.02 BASE FOUNDATION

A. Base:

1. Building shall feature a reinforced waffle type concrete skid/base to support the building walls and distribute floor loadings to the foundation pad. Base shall extend from the outer wall face and no more than 8" beyond the inner wall face. Four removable lifting assemblies (lugs) shall be attached to the beams of the skid/base. The building shall be capable of being lifted without using spreader bars.
2. Fabricator shall provide suitable lifting lugs and associated hardware for lifting, transporting and setting the building in place. The lifting lugs shall be designed so they can be unbolted from the skid/base after the building has been set in place. Placing transport beams or straps under the skid/base for lifting purposes, that must be removed when the building is being placed on the foundation slab is not acceptable. The Fabricator shall supply a drawing that details the quantity and placement of the perimeter edge connections.

2.03 BUILDING STRUCTURE AND SUPPORT SYSTEMS

A. General:

1. The building walls shall be fabricated from glass fiber reinforced concrete with a steel frame.
2. Multiple modular panels shall be joined by welding. All panel joints shall be sealed together using neoprene gaskets to insure a watertight seal. Outside of joined panels shall be externally caulked for aesthetic appearance with a caulk of a suitable (matching) color.
3. All exterior mounting hardware (nuts, bolts, fasteners, hinges, etc.) shall be stainless steel.
4. All penetrations into the building shall be sealed with a suitable compound.
5. Wall Requirements:
 - a. Wall frame shall utilize modular glass reinforced concrete panels with aggregate exterior, attached to steel frames.
 - b. Suitable areas for cable entry bulkhead penetration plates and other accessory entries shall be "blocked" during forming.
 - c. The walls shall be insulated to an R value of not less than R-16. Insulation shall be of the fiberglass batt type.
 - d. Walls shall be bullet resistant to High Powered Small Arms (HPSA) as defined in UL 752.
6. Roof Requirements:
 - a. Roof shall be flat type of the same construction as the skid/base/floor and sloped for run-off (1/8" per 1' minimum).
 - b. The roof shall be insulated to an R value of not less than R-16. Insulation shall be of the fiberglass batt type.
7. Building Structure Ground:
 - a. All steel in the building structural system, including wire, rebar and steel tubing shall be connected to the lifting implants located on the sides of the building skid/base/floor.

2.04 DOORS

- A. Provide aluminum doors of the size and configuration shown on the Contract Drawings in accordance with specification Section 08 12 16.

- B. Provide door hardware in accordance with specification Section 08 71 00. Doors are to be keyed to match the Owner's master keying system.

2.05 BUILDING ACCESSORIES

- A. Provide building with a minimum 50 amp 120/240 volt, single phase breaker panel housing a main breaker and the following sub-breakers:
 - 1. 20 amp – building lighting
 - 2. 20 amp – building unit heater
 - 3. 20 amp – chemical mix tank mixer
 - 4. 20 amp – building receptacles
 - 5. 20 amp – spare
 - 6. 20 amp – spare
- B. Provide two (2) four foot long corrosion resistant fluorescent light fixtures each having two 40 watt fluorescent bulbs. Provide an Exide 12 volt, 100 watt, 1.5 hour capacity, 120 volt wall mounted emergency lighting unit with batter charger. Provide a 120 volt weather proof, corrosion resistant, incandescent 100 watt light fixture above the door.
- C. Provide a 110V, 1 phase, 200 cfm wall mounted vent fan with gravity back draft damper, bird screen, and aluminum fixed storm louver. Also, provide a 1'-6" square air inlet louver with bird screen and gravity damper.
- D. Provide a thermostat mounted beside the building door for control of the ventilation fan. Provide a manual switch mounted along side the thermostat. The switch "on" position shall bypass the thermostat.
- E. Provide a 1000 watt 110V, 1 phase unit heater with integral fan and thermostat to heat the building.
- F. Provide a wall mounted 110 volt, 1 phase cycle flip/flop timer having a 0-60 minute adjustable off time and 0-60 minute adjustable on time and contacts rated at 10 amps for control of the mix tank mixer. Flush mount timer on the hinged door of a NEMA 4X stainless steel panel along with an H/O/A selector switch. "Auto" position of switch to enable timer control of the mixer. The "on" and "off" positions provide direct manual contact. Provide panel with terminal strip for all wiring terminations. Timer shall be Eagle Signal Model HG1 Flexopulse repeat cycle timer.
- G. Provide one 120 volt wall mounted duplex receptacle.
- H. Factory install all conduit and wiring to the electrical devices previously described. Conduit shall be threaded galvanized steel. Wiring shall be No. 10 THHN. Provide a ground wire in each conduit. All conduit shall be neatly installed and properly supported.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that concrete is level and true to plane and of correct dimensions to receive structure. Correct any deficiencies before proceeding.

3.02 INSTALLATION

- A. Layout anchor bolt pattern according to manufacturer's drawings. Drill holes of depth and diameter required by anchor bolt manufacturer.
- B. Install structure in accordance with manufacturer's instructions.
- C. Erect structure true to line and plumb, free of twist or warp.
- D. Install and test accessories in accordance with manufacturer's instructions.
- E. Demonstrate proper operation of doors, ventilation and heating unit, and mixer control timer.

3.03 ADJUST AND CLEAN

- A. Adjust components for proper operation.
- B. Leave Project site clean and free of debris.

END OF SECTION

SECTION 25 00 00 CONTROL PANELS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included:

1. Furnish and install the following control panels for the Treatment Plant:
 - a. Treatment Plant Control Panel
2. Control Panel shall be provided by the package treatment plant manufacturer and shall be complete and include all components and wiring as shown on the Drawings and specified herein.

B. Related Work Specified Elsewhere:

1. Section 44 41 13 - Package Plant Sewage Treatment System
2. Division 26

1.02 QUALITY ASSURANCE

A. Regulations and Standards:

1. UL Underwriters' Laboratories
2. NEC National Electrical Code
3. NEMA National Electrical Manufacturers Association
4. ANSI American National Standards Institute
5. IEEE Institute of Electrical and Electronic Engineers
6. ISA Instrument Society of America

- B. All control panel components shall be of the most current and proven design. Specifications and Drawings call attention to certain features but do not purport to cover all details entering into the design of the control panels. The components provided by the Supplier shall be compatible with the functions required and shall form a complete working system.

- C. All control panels shall be UL listed as a complete assembly in accordance with UL-508.

1.03 SUBMITTALS

A. Shop Drawings:

1. Shop drawings shall be complete in all respects and shall include a complete bill of material, catalog information, descriptive literature of all components, wiring diagrams, and panel layout drawings showing dimensions to all devices.

- B. Maintenance Data and Installation / Operating Instructions: Submit required number of copies of an Operation and Maintenance Manual for the equipment furnished including a detailed description of the function of each principal component, procedures for operation, instructions for overhaul and maintenance. Include lubrication schedule, safety precautions, test procedures, electrical schematics, and parts lists. Installation Data to be provided with shop drawings.

C. Spare Parts:

1. Provide 4 spare fuses and 4 spare bulbs of each type and size required.
2. Provide one spare relay of each type utilized.
3. Provide two spare float switches.

1.04 FIELD SERVICES

- A. Provide the services of a manufacturer's representative experienced in the installation and operation of the equipment supplied under this specification for not less than four (4) 8-hour days on-site for installation inspection, start-up, performance testing and instruction of the Owner's operating personnel. Travel time is NOT considered part of this time requirement.
- B. Provide for the above services to be performed during two (2) separate visits to the project site. Coordinate with Owner.

PART 2 - PRODUCTS

2.01 CONTROL PANEL COMPONENTS

- A. Control Panel Enclosure:
 - 1. The control panel enclosures shall be designed and sized in accordance with the requirements of the Drawings and as specified herein.
 - 2. Each Control Panel enclosure shall be NEMA 4X, dead front constructed of 14 gauge stainless steel with continuously welded seams. Panel shall have stainless steel piano type hinged doors with neoprene gasket. Enclosure exterior doors shall be equipped with a heavy-duty 3-point latching mechanism operated by a padlocking handle.
 - 3. All control panel components shall be properly identified with an engraved nameplate mounted on the panel. All components not mounted on the inner door of the panel shall be mounted to a subpanel. All wiring shall be installed in a neat, workmanlike manner and shall be grouped, bundled, supported and routed horizontally and vertically to provide a neat appearance. All wires leaving the panel shall be terminated at the terminal strips inside the enclosure. Terminals and wires shall be identified in accordance with the Supplier's panel wiring diagrams. Provide 20% spare terminals.
 - 4. Provide a copper grounding plate inside each control panel for terminating all ground wires.
- B. Flange Mounted Disconnect Switch:
 - 1. A flange mounted disconnect switch shall be mounted on the exterior of each control panel enclosure to disconnect power to the control panel. The disconnect switch shall consist of a disconnect switch with operating mechanism and an operating handle.
- C. Transient Voltage Surge Suppressor:
 - 1. Provide a 1 phase transient voltage surge suppressor in each control panel to protect the panel components from damage which may occur from transient voltages caused by lightning or surges on the incoming power line. The surge suppressor shall have an indication light to indicate the unit is functioning. Surge suppressor shall be as manufactured by Advanced Protection Technologies.
- D. Motor Circuit Protector Type Circuit Breakers:
 - 1. Provide a properly sized motor circuit protector (MCP) type molded case circuit breaker for each motor starter. Circuit breakers shall be magnetic only, quick-make, quick-break. Motor circuit protector circuit breakers shall be Cutler-Hammer/Westinghouse.
- E. Motor Starters:
 - 1. Motor starters shall be across-the-line magnetic type rated in accordance with NEMA standards, sizes and horsepower ratings. Minimum starter size shall be size 1. The motor starter shall be sized for the motor horsepower. Motor starters shall be Allen-Bradley Bulletin 509.

2. Each motor starter shall be furnished with a 2 pole overload relay. Provide a heater element in each phase of the relay, sized for the motor nameplate full load amps.
 3. Provide a minimum of three reversible run status contacts for use in the panel control logic.
 4. Submersible pumps and blowers shall be provided with 240 volt, single phase power.
- F. Control Circuit Breakers:
1. Circuit breakers shall be quick-make, quick-break thermal magnetic molded case type, individually mounted and identified. Circuit breakers shall be Square D Type QOU.
- G. Selector Switches:
1. Selector switches shall be 30.5mm, heavy-duty, non-illuminated. Switches shall have double-break silver contacts. Switches shall be maintained contact type unless otherwise indicated on the Drawings. Provide auxiliary contact blocks on switches where indicated on the Drawings or in the Description of Operation. Provide a gray legend plate for each switch with white marking as indicated on the Drawings. Selector switches shall be Allen-Bradley Bulletin 800H, NEMA Type 4X.
- H. Push Buttons:
1. Push buttons shall be 30.5mm heavy-duty, non-illuminated. Push buttons shall have double-break silver contacts. Push buttons shall be momentary contact type, color coded as indicated on the Drawings. Stop push buttons shall have extended heads. All other push buttons shall have flush heads. Provide a gray legend plate for each push button with white marking as indicated on the Drawings. Push buttons shall be Allen-Bradley Bulletin 800H, NEMA Type 4X.
- I. Pilot Lights:
1. Pilot lights shall be 30.5mm, heavy-duty, transformer type. Voltage rating shall be 120 volts AC. Color caps shall be green for "run" and red for "alarm", unless otherwise noted on the Drawings. Provide a gray legend plate for each pilot light with white marking as indicated on the drawings. Pilot lights shall be Allen-Bradley Bulletin 800H, NEMA Type 4X.
- J. Relays:
1. Relays shall be heavy-duty general purpose type with 10 amp contacts. Relays shall have terminals which plug-in to a socket, mounted to the inside of the panel enclosure. Terminals for relays having AC coils shall be pin type, and terminals for relays having DC coils shall be blade type. Contact configuration shall be 3PDT.
 2. Relay coils shall operate on 120 volts AC, unless indicated otherwise on the Drawings. Relays shall have an indicator light to indicate the relay coil is energized. Relays shall be Idec No. RR3B-UL.
- K. Time Delay Relay:
1. The time delay relay shall have C-MOS integrated circuitry containing all timing and logic control functions, shall have eight field programmable time range settings, an adjustable time range knob, 10 amp DPDT output contacts, on and timing out LED indicators, and shall be of the plug-in design. Timers shall be IDCC RTE Series.
- L. Intrinsically Safe Relays:
1. Intrinsically safe relays shall be provided in the control panel for each float switch and level sensor in NFPA classified areas. Relays shall be plug-in type provided with panel mounting base. Intrinsically safe relays shall be UL listed and shall be Warrick Controls.

M. Elapsed Time Meters:

1. Elapsed time meters shall be time totalizer, non-resettable type. They shall have a synchronous motor which shall drive a set of digit readout wheels to indicate the total time the unit is energized. Readout shall be five-digit including 1/10 digit. Range shall be 0 to 0000.0 hours. Elapsed time meters shall operate on 120 VAC. Provide an elapsed time meter for every motor starter.

N. Transformers:

1. Transformers shall be provided in control panels where specified or indicated on the Drawings. Transformers shall be sized as required and protected in accordance with the NEC and as specified. Provide primary and secondary fusing for all control transformers. Transformers shall be rated for minimum of 150% of calculated full or maximum load, 80°C rise maximum. Provide load calculations with panel submittal. Transformers shall be Acme.

- O. A power monitor shall be provided in the panel to monitor the incoming 240 volt, single phase power for phase loss, phase unbalance, or under voltage condition. If a problem is detected, an adjustable time delay shall be provided and then control power shall be interrupted to all motors. Also, a "power failure" alarm light shall be lit and a dry alarm contact closure shall be output to the panel master terminal strip. The motors shall be enabled to automatically restart when the power returns to normal.

P. Time Clocks:

1. Time clocks shall be 24 hour, 96 position type with adjustable tabs allowing minimum on and off time settings of 15 minutes. Time clocks shall be Tork time clocks.

Q. Fuses:

1. All fuses shall be sized as required for the circuit they are protecting. Fuses shall be Bussmann, touch-safe type.

R. Terminal Blocks:

1. Terminal blocks shall be provided in the control panel for terminating field wiring. All terminal blocks shall be rated for 600 volts AC, and shall be identified with a permanent machine printed marking in accordance with the terminal numbers shown on the panel wiring diagrams. Terminal blocks for 24vdc inputs shall be blue. Provide 20% spare terminal blocks in the control panel. Terminal blocks shall be Allen-Bradley Bulletin 1492-W4.

S. Programmable Controller:

1. The treatment plant supplier has the option of utilizing relays, time delay relays, and time clocks for control of the process equipment or utilizing a programmable controller. If a programmable controller is utilized, it shall not be used for providing the equalization pump start/stop control based on float switch contact status. Standard relay logic shall be utilized. Programmable logic controller, if utilized, shall conform to the following:
 - a. Provide a programmable logic controller (PLC) with graphic interface to provide all logic for the control of the blowers, return sludge and scum skimming air lift solenoid valves, and the soda ash feed pumps. The PLC shall also perform failure monitoring for the equalization pumps and blowers.
 - b. Provide a disc containing documentation of the system programming and graphics to the Owner. Disc to contain control programs to allow restoration and reloading of PLC controller in the event of equipment failure or replacement. The wiring of all inputs and outputs shall be via the control panel terminal strip. Provide interposing relays for all 120 volt outputs. Provide fused terminal blocks for all 120 volt I/O.

- c. Provide a minimum of four spare I/O inputs wired to the panel terminal strip. Provide a minimum of four spare 120 volt I/O outputs wired to spare interposing relays with a normally open relay contact wired to the master terminal strip.
- d. Provide a dry contact output closure to a control panel relay when a failure occurs in the programmable controller system. The relay in turn shall light a "PLC Failure" light on the panel and shall output a dry contact closure to the panel terminal strip.
- e. PLC with all I/O modules, power supplies, and transient voltage surge protection. PLC shall be an Allen Bradley Micro Logix PLC. The operator interface unit shall consist of an Allen Bradley Panel View color touch screen display operator interface. The PLC shall be supplied with battery back-up capability so all programs and settings are retained if a power supply failure occurs. Sufficient RAM memory shall be provided to meet the requirements of the system plus 20% spare capacity. The PLC and associated operator interface unit shall operate off an internal 24V DC power supply.

T. Alarm Dialer:

1. Mount an 8 channel alarm dialer in the control panel to send alarm messages via phone line to preselected phone numbers. Alarm dialer shall be a RACO Chatterbox Real Voice Dialer.

U. Wiring:

1. All wiring shall be stranded copper. Control wiring shall be 16 gauge, 600 volt, Type MTW. Power wiring shall be 600 volt, Type MTW, sized as required.
2. All analog signal wiring shall be 16 gauge twisted pairs with foil shield and drain wire, with 300 volt, 90°C insulation. Drain wires shall be grounded at one end only.
3. All wiring and terminal strips shall be isolated by voltage levels to the greatest extent possible.
4. All wiring shall conform to the following color code:
 - a. 480 volt - 3 phase: Brown, Orange, Yellow
 - b. 120 volt - 1 phase: Black, White
 - c. 24 vdc: Blue
 - d. 120 VAC Control Wires: Red
 - e. Ground Wires: Green
5. 120 VAC control wires energized from a source external to the control panel or MCC power source shall be yellow.
6. All control wiring shall be tagged at each end with a legible permanent coded wire marking sleeve. Sleeves shall be white PVC tubing with machine printed black marking. Markings shall be in accordance with the wire numbers shown on the control wiring diagrams, and shall match terminal strip numbers.

V. Nameplates:

1. Provide laminated phenolic nameplates on the front of the control panel. Nameplates shall be black with white engraved letters. Engraving shall be as indicated on the Drawings. Minimum size of engraving shall be 1/4".

2.02 MAIN TREATMENT PLANT CONTROL PANEL

A. The main treatment plant control panel shall house the following:

1. Main power disconnect for turning off 120/240 Volt, 1 phase power to the panel. Disconnect shall be non-fused type with a through-the-door operator.
2. 240 Volt, 1 phase motor starters with motor circuit protector type breakers, thermal overloads, H/O/A selector switch run indication light, and run time meter for the following motors:
 - a. Aeration Blower No. 1
 - b. Aeration Blower No. 2
 - c. Equalization Blower

- d. Standby Blower
 - e. Equalization Pump No. 1
 - f. Equalization Pump No. 2
 - g. 2 spare future uses (Provide name plate marked [Spare])
 3. Individual Open/Close/Auto switch, 24 hour time clock, control relay, and "open" indication light for the return activated sludge air lift air supply solenoid valve and scum air lift solenoid valve.
 4. H/O/A selector switch, control relay, and run indication light for the following solenoid coil type chemical feed pumps.
 - a. Soda Ash Feed Pump No. 1
 - b. Soda Ash Pump No. 2
 - c. 1 spare future use
 5. O/C/A selector switch, control relay, and on indication light for the soda ash carrying water solenoid valve
 6. Alarm relays with auxiliary dry normally open dry contacts wired to the panel master terminal strip and front panel mounted alarm lights for the following:
 - a. Equalization Tank Low Level
 - b. Equalization Tank High Level
 - c. Equalization Pump No. 1 Failure
 - d. Equalization Pump No. 2 Failure
 - e. Aeration Blower No. 1 Failure
 - f. Aeration Blower No. 2 Failure
 - g. Equalization Blower Failure
 - h. Standby Blower Failure
 - i. Control Panel Power Failure
 - j. PLC Failure
 - k. High Effluent Flow
 7. Alarm reset pushbutton
 8. Control power available light
 9. Intrinsically safe relays for:
 - a. Equalization Pump Station 5 Float Switches
 10. Time delay relays for each motor failure alarm. Provide 2 installed spare time delay relays.
 11. Time clock enable/disable selector switches and 24 hour time clocks for controlling off time and run time for the equalization tank blowers.
 12. Time clock enable/time clock disable selector switch and 24 hour time clock for control of the aeration system blowers.
 13. No. 1/Auto/No. 2 alternation bypass switch and two circuit alternator for each of the following:
 - a. Equalization Pumps No. 1 and No. 2
 - b. Aeration Blowers No. 1 and No. 2
 - c. Equalization/Standby Blowers
 - d. Soda Ash Feed Pumps No. 1 and No. 2
 14. Equalization Tank/Standby/Aeration Tank selector switch to be used to assign the standby blower.
 15. Effluent flow recorder.
- B. Treatment plant contact logic and failure monitoring logic shall be as follows:
1. Equalization Pumps:
 - a. The two pumps will be controlled by the individual H/O/A selector switches located on the control panel. The "hand" and "off" positions of the H/O/A switches provide for manual start/stop control of the pumps. When the H/O/A switches are in the "auto" position, the pumps will be automatically controlled by the pumping station float switches and control relays as follows:
 - 1) When the water level in the pumping station rises to the level of the "lead pump start" float switch, a relay will energize and latch the circuit. When the lead pump is started, it will continue to run until the water level in the pumping station is drawn down to the level of the "pump off" float switch which will unlatch the pump control relay. When this occurs, the pump will shut down.

- 2) If the water level in the pumping station rises to the level of the "lag pump start" float switch, a relay will energize and latch the circuit. When the lag pump is started, it will continue to run until the water level in the pumping station is drawn down to the level of the "pump off" float switch. When this occurs, the pump control relay will unlatch and the pump will shut down.
 - b. If the water level in the pumping station is drawn down to the level of the "low level" float switch, all pumps will be shut down. When a low level occurs, a pumping station low level alarm light shall be lit and a dry alarm contact closure shall be output to the panel terminal strip.
 - c. If the water level in the pumping station rises to the level of the "high level" float switch, a high level alarm light shall be lit and a dry contact closure shall be output to the panel terminal strip.
 - d. Failure monitoring shall be performed for each pump as follows:
 - 1) When a pump H/O/A switch is in the "auto" position and the pump gets a signal to start, a failure timer will be started. If this timer times out and the motor starter is not energized, a pump failure alarm shall be lit and a dry contact closure shall be output to the panel terminal strip.
 - e. A No. 1/Auto/No. 2 alternation bypass selector switch and a two circuit alternator shall be provided. When the switch is in the "auto" mode, the alternator shall index at the end of each pump run cycle causing the lag pump to become the lead pump on the next start cycle. The No. 1 and No. 2 positions of the selector switch provide manual assignment of the lead pump.
2. Equalization Tank Blowers and Aeration Tank Blowers:
 - a. The blower will be controlled by individual H/O/A selector switches mounted on the control panel. The "hand" and "off" positions of the H/O/A switches provides for manual start/stop control of the blowers. When the H/O/A switches are in the "auto" position, the blowers will be controlled as follows:
 - 1) Equalization Tank Blower:
 - a) A 24 hour time clock will be mounted in the control panel to control the on time and off time of the blower when the blower is being operated in the "auto" mode. A time clock enable/disable switch will be mounted on the control panel. When the switch is in the "disable" position, the switch contact will close and will be wired in parallel to the time clock contact causing the blower to run continuously in the "auto" mode.
 - b) If a blower is called for in the "auto" mode but the motor starter contact does not open, a time delay relay shall begin timing out. If the timer times out, the equalization blower control contact shall open and an equalization blower failure alarm light shall be lit and a dry contact closure shall be output to the panel terminal strip.
 - c) An equal/auto/standby alternation bypass switch and two circuit alternator shall be provided for the equalization tank and standby blower. The standby blower will normally be assigned to equalization service and be a normal part of the equalization blower rotation. When the alternator bypass switch is in "auto", the alternator will index at the end of each run cycle causing the offline blower to switch to the online mode.
 - 2) Aeration Tank Blowers:
 - a) The same controls shall be provided as previously described for the equalization tank blower.
 - 3) Standby Blower:
 - a) The necessary piping and valving have been provided to enable the standby blower to serve either the equalization tank or the aeration tank. Valve positions must be manually changed for the standby blower to serve either tank. An Equalization Tank/Standby/Aeration Tank assignment switch shall be provided for the standby blower. The selector switch will enable the time clock controls from either use to control start/stop of the standby blower and failure shutdown of the standby blower.

- b) If the standby blower is called for in the "auto" mode but the motor starter contact does not open, a time delay relay shall begin timing out. If the timer times out, the blower control contact shall open. Also, a standby blower failure alarm light shall be lit and a dry contact closure shall be output to the panel terminal strip.
3. Effluent Flow Meter:
- a. A V-notch weir controls effluent from the chlorine contact tank to the UV system. A sonic level sensor is mounted to sense level over the weir and is wired to a flow transmitter mounted on a backboard. The flow transmitter will output a 4-20mA signal proportional to flow to a flow recorder mounted in the treatment plant control panel. The flow recorder will also indicate and totalize the flow rate. The flow recorder has a "High Flow Alarm Setpoint" contact wired to a time delay relay. If the timer times out, a "High Effluent Flow" alarm light on the panel shall be lit and a dry contact closure shall be output to the control panel terminal strip.
4. RAS Control:
- a. An air lift is used to transfer return activated sludge from the final clarifier to the aeration tank. A normally open-energized-to-close solenoid valve is mounted on the air supply line to the air lift. An O/C/A selector switch is mounted on the treatment plant control panel to control the open/closed status of the solenoid valve. The "open" and "closed" positions of the O/C/A switch provide manual control of the solenoid valve. When the switch is in the "auto" mode, the solenoid valve will be controlled as follows:
- 1) A 24 hour time clock will have adjustable on duration and off duration settings for the blowers. A time clock enable/disable switch will be mounted on the front of the control panel. When the switch is in the disable position, its contact will be open. The contact will be wired in series with the time clock contact causing the normally open solenoid valve to stay open.
- b. The solenoid valve control relay will have a normally closed contact wired to a [RAS On] indication light on the control panel.
5. Scum Removal Control:
- a. An air lift is used to draw scum from the surface of the final clarifier and return it to the aeration tank. The same controls shall be provided for the scum air lift as previously described for the RAS air lift.
6. Soda Ash Feed System:
- a. Two soda ash feed pumps are provided to pump a soda ash solution to the aeration tank. One pump will be on-line while the second serves as a standby.
- b. The two pumps will be controlled by the individual H/O/A selector switches located on the treatment plant control panel. The "hand" and "off" positions of the H/O/A switches provide for manual start/stop control of the pumps. When the H/O/A switches are in the "auto" position, the pumps will be automatically controlled by the run status of the equalization pumps. An auxiliary run status contact will be provided on each equalization pump motor starter and will be wired in parallel to a two circuit alternator. A No. 1/Auto/No.2 alternator bypass switch will be provided. The No. 1 and No. 2 switch positions allow assignment of the online soda ash feed pump. The "auto" switch position enables the output contact of the two circuit alternator to determine the online soda ash feed pump. The alternator will index at the end of each pumping cycle switching the online and standby pump. A control relay will be provided for start/stop control of each soda ash feed pump. One contact on each relay will be wired to a run indication light on the control panel. The second contact will be wired to a 110 V, 1 phase receptacle mounted adjacent to each pump. The pumps power cord will plug into this receptacle. The receptacle will be a duplex receptacle with the top receptacle powered from the control panel via the "auto" or "hand" circuit. The bottom receptacle shall be continuously powered from the control panel.
- c. The soda ash feed tank will have a mixer that will be powered via a control station mounted adjacent to the mixer. The control station will house an H/O/A switch and flip/flop cycle timer. When the H/O/A is in "auto" the cycle timer will control the on/off operation of the mixer.
- d. A water feed is provided to the common soda ash feed pump discharge line to provide carrying water to dilute and flush the soda ash through the feed line to the

aeration tank. A rotometer is provided to indicate the flow rate. A solenoid valve is provided on the water supply line and will be controlled by an Open/Close/Auto selector switch mounted on the control panel. The "open" and "close" positions of the selector switch provide manual control of the solenoid valve. The "auto" position of the switch enables automatic control based on the run status of the two equalization pumps. Each equalization pump motor starter will have an auxiliary run status contact wired in parallel with the "auto" position of the O/C/A switch. When a run status contact closes, a relay will energize. One contact on the relay will light a soda ash carrying water "on" indication light on the control panel. The second contact will be wired to the water line solenoid valve.

7. An alarm dialer unit is being provided to transmit eight (8) alarms to a central monitoring location. All individual alarms have dry contacts wired to the treatment plant control panel terminal strip. Groups of individual alarms shall be wired in parallel to individual alarm input terminals on the alarm telemetry unit. Tentative alarm outputs are as follows (list will be finalized during the construction phase):
 - a. Control Panel Power Failure
 - b. Equalization Tank Level Alarm
 - c. Blower Failure
 - d. Pump Failure
 - e. PLC Failure
 - f. High Effluent Flow
 - g. Spare
 - h. Spare

PART 3 - EXECUTION

3.01 STARTUP, TESTING AND INSTRUCTIONS

- A. Testing and start-up shall be completed as specified in Section 26 90 00 and as listed below.
- B. Testing Prior to Shipment: Each panel shall be tested to assure proper operation of every function. Test records shall be retained by the manufacturer and be made available to the Owner if requested.
- C. Start-up:
 1. The Contractor shall verify proper operation of all equipment in the presence of the Engineer.
 2. Provide the services of a manufacturer's representative experienced in the operation of the control panel for an initial start-up, testing and instruction of operating personnel. Demonstrate the proper operation of all control and alarm functions to the satisfaction of the Engineer.
 3. Provide the services of the effluent flow transmitters manufacturer's representative for initial calibration, startup, testing, and instruction of operating personnel.
- D. Provide a minimum of four (4) hours operator training in the use of control system.

END OF SECTION

SECTION 26 05 00 GENERAL REQUIREMENTS - ELECTRICAL

PART 1 - GENERAL

1.01 DESCRIPTION

- A. All items of labor, materials and equipment, not specified in detail or shown on drawings but necessary for complete installation and proper operation of work described or implied, shall be furnished and installed.
- B. Test all electrical conductors, after completion of installation of wiring and apparatus, to insure continuity, proper splicing, freedom from grounds, except "made grounds" and those required for protection and insulation resistance. Use testing instruments, i.e. megger. Activation of each circuit will be required as final test. Testing shall be done at no additional expense to the Owner.
- C. Drawings are indicative of work to be installed but do not indicate all bends, fittings, boxes, etc. that will be required in this Contract. The structural and finished conditions of the project shall be investigated prior to construction.
- D. Coordinate work with other trades to avoid interference between piping, ducts, equipment, and architectural or structural features. In case of interference, the Project Engineer decides which work is to be relocated, regardless of which is first installed.
- E. Visit the site to determine actual conditions. No extra compensation will be allowed by failure to determine existing conditions.

1.02 RELATED SECTIONS

- A. Division 26 sections as herein included.

1.03 REFERENCES

- A. NEC - National Electrical Code of National Fire Protection Association
- B. ASTM - American Society for Testing and Materials
- C. UL - Underwriters' Laboratories
- D. IPCEA - Insulated Power Cable Engineers Association
- E. NEMA - National Electrical Manufacturers Association
- F. IEEE - Institute of Electrical and Electronic Engineers
- G. ANSI - American National Standards Institute, Inc.
- H. BOCA - Building Officials and Code Administrators
- I. ISA - Instrument Society of America

J. NESC - National Electrical Safety Code

K. ADA - Americans with Disabilities Act

1.04 DESIGN REQUIREMENTS

A. The installation must comply with all Federal and State, municipal or other authority's laws, rules and/or regulations.

B. Inspections by the required authorities shall be made. Original final wiring certificates with two copies shall be submitted to the Project Engineer, at no additional cost to Owner.

C. The electrical inspections shall be made by the local inspection agency for compliance with the National Electrical Code. Obtain certificates of acceptance, compliance and approval for delivery to the Owner. Furnish copies to the Project Engineer for review.

D. All electrical equipment and its components and materials shall meet all applicable UL criteria and bear the appropriate label of the Underwriters' Laboratory.

E. All electrical equipment or apparatus of any one system shall be of the same quality as produced by one or more manufacturers, suitable for use in a unified system. The term "manufacturer" shall be understood as applying to a reputable firm who assumes full responsibility for its products.

F. Qualification: When more than one name of manufacturer is listed in these specifications, the first manufacturer and number determine the style and quality. Other manufacturers named have been included based on their ability to furnish (fabricate, construct and test) equipment, which will provide similar quality and performance. Products from these manufacturers will be reviewed by the Project Engineer providing the physical and performance attributes provide equivalence to those of the first named manufacturers. The Project Engineer shall provide sole determination to this equivalency. If such products are acceptable to the Project Engineer but differ from those named in the Specification or on the Drawings to the extent that their proper incorporation into the Work requires changes to the structural piping, mechanical, electrical, instrumentation, or any other changes of whatsoever nature, the Contractor must be responsible for such changes.

1.5 SUBMITTALS

A. All shop drawings shall be submitted to the Project Engineer for review. If incorrect, they shall be resubmitted in quantity according to Contract conditions until satisfactory. Work shown on shop drawings shall not be executed until such drawings are approved. See related sections for complete listing of all required equipment submittal.

B. All shop drawing submittals shall clearly indicate, using arrows and/or highlighting on all copies, which item(s) are being submitted and that each item being submitted is in compliance with all requirements on the drawings and in these specifications. All pertinent specification and drawing requirements shall be indicated on the manufacturer's drawings.

C. See specific section for further breakdown of shop drawing items.

D. Submit certification with shop drawing submittal that all equipment is UL listed.

E. Shop drawings shall indicate adequate clearance for operation, maintenance and replacement of operating equipment devices.

- F. This specification does not necessarily include all items of shop drawings required. The Project Engineer reserves the right to request additional shop drawings.
 - G. A sample board shall be furnished and installed (construction shed) consisting of samples of all wiring devices, conduits, conductors, floor boxes, floor service fittings, disconnect switches, wall plates and any other item required by the Project Engineer.
 - H. All items may be removed from the board and used in the construction.
- 1.6 DELIVERY, STORAGE AND HANDLING
- A. Deliver, store, protect and handle products to site.
 - B. Protect all unfinished installations, construction materials and equipment.

PART 2 – PRODUCTS (Not Used)

2.1 SEE SPECIFIC SECTIONS FOR PRODUCTS

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Protection of Installation:
 - 1. All equipment shall be protected during construction.
 - 2. All damaged equipment caused by noncompliance with this requirement shall be repaired at no expense to the Owner.
- B. Openings and Chases:
 - 1. Determine locations of chases and openings prior to construction so that same may be provided where required.
- C. Methods and Materials:
 - 1. All work shall be installed in a first-class, neat and workmanlike manner by skilled mechanics.
 - 2. All materials shall be new unless otherwise indicated.
 - 3. Firmly support all materials and equipment.
 - 4. Any materials or workmanship found to be of inferior quality, damaged, improperly installed, or having been exposed to harmful substances or conditions at any time in the construction work, shall be immediately replaced upon notification of the Contractor by the owner that such condition has been observed by the owner or his representatives. The Contractor shall at all times provide protective equipment as may become necessary to protect all parts of the work from damage or exposure to harmful conditions or contaminating substances.

- D. Cutting, Repairing and Finishing:
1. All cutting, repairing, finishing and painting required for the installation of work under this Contract shall be performed under this Contract.
 2. All disturbed surfaces shall be repaired and finished to match adjacent surfaces by skilled mechanics working in their respective fields.
- E. Excavation, Backfilling and Blasting: Excavation, backfilling and blasting work as required to complete the work according to details on drawings.
- F. Concrete: As required to complete the work according to details on drawings.
- G. Cutting and Patching of Macadam and Concrete Areas:
1. Openings in concrete or macadam required for Electrical construction shall be made by taking extreme precautions to prevent excessive damage to existing facilities.
 2. Prior to completion, all disturbed areas shall be closed, restored to normal and finished to match surrounding areas.
- H. Access: Install all conduit, wire, cable, wiring devices and equipment to preserve access to all equipment installed under this Contract.
- I. Layout of Wiring:
1. The layout of wiring as shown on the drawings shall not be considered as absolute; it shall be subject to changes where necessary to overcome obstacles in construction.
 2. Where a major deviation from the plans is indicated by practical consideration, shop drawings shall be submitted showing all deviations in detail to clearly indicate the necessity or desirability for the change.
- J. Furnish and install all necessary steel angles, beams, channels, hanger rods or other supports for equipment and piping furnished under this Contract requiring support or suspension from building structure, except support steel where otherwise noted on the plans.
- K. Continuity of Service:
1. Uninterrupted electrical service shall be maintained during the entire time required for complete installation of the work contemplated under these specifications and drawings.
 2. Temporary equipment, materials, coordination with the progress of work, and related supporting work shall be provided as required to maintain electrical and telephone service at all times. Provide temporary power and telephone services and where these are in use as replacement for any disconnected services, the temporary service facilities shall not be disconnected or removed until new services are placed in proper operation. Disconnect of all services shall ONLY be done after approval by Project Engineer and Owner.
 3. Where any existing service or system will be interrupted, the Contractor shall request permission in writing stating the date, time, etc. the same service will be interrupted and all of the areas affected. This request shall be made in sufficient time for proper arrangements to be made, and not less than 10 working days prior to the expected outage. Written permission shall be obtained from the Owner before interrupting electrical and telephone service.

L. Clean Up:

1. Upon completion of all work, furnish labor, materials and incidentals to accomplish the following: remove all dirt, foreign materials, stains, fingerprints, etc. from all lighting fixtures adjacent to the above equipment and leave the electrical work in such a condition that no cleaning will be required by the Owner.
2. The complete system shall be subject to inspection and approval by the Project Engineer.

M. Start-up and Testing:

1. Provide the services of a manufacturer's representative to start-up, adjust and test each piece of equipment.
2. All start-up and testing shall be performed in the presence of the Owner and the Project Engineer. All startup data and controls configuration and programming shall be recorded at startup or training on approved data recording sheets and verified. Completed data sheets shall accompany the Operations and Maintenance manuals provided for use in training. Scheduling and coordination arrangements are to be made a minimum of two weeks in advance, approved by the Owner.

N. Training:

1. The Contractor shall provide training session for operation, maintenance, and troubleshooting procedures.

END OF SECTION

SECTION 26 05 13 CONDUIT AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Metal conduit.
- B. PVC , Schedule 40 or 80 and coated metal conduit.
- C. Flexible metal conduit.
- D. Liquidtight flexible metal conduit.
- E. Electrical metallic tubing.
- F. Nonmetallic conduit.
- G. Flexible nonmetallic conduit.
- H. Fittings and conduit bodies.

1.02 BOXES INCLUDING THE FOLLOWING:

- A.. Device Boxes.
- B. Outlet Boxes.
- C. Pull and Junctions Boxes.

1.03 RELATED SECTIONS

- A. Section 26 05 00 - General Requirements - Electrical
- B. Section 26 05 29 – Hangers and Supports for Electrical Systems
- C. Section 26 05 53 - Electrical Identification

1.04 REFERENCES

- A. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
- B. ANSI C80.3 - Electrical Metallic Tubing, Zinc Coated.
- C. ANSI/NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
- D. ANSI/NFPA 70 - National Electrical Code, Latest Edition.
- E. NECA "Standard of Installation."
- F. NEMA RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
- G. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.

1.05 DESIGN REQUIREMENTS

- A. Conduit Size: ANSI/NFPA 70.

1.06 SUBMITTALS

- A. Product Data: Provide data for each type of raceway used - metallic conduit, PVC, PVC coated metal conduit, flexible metal conduit, liquid-tight flexible metal conduit, metallic tubing, nonmetallic conduit, flexible nonmetallic conduit, fittings, conduit bodies and accessories.

1.07 PROJECT RECORD DOCUMENTS

- A. Accurately record actual routing of conduits where concealed in floors or below grade.

1.08 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70, NEC, Latest Edition.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc. or testing firm acceptable to authority having jurisdiction as suitable for purpose specified and shown.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.
- B. Protect PVC conduit from sunlight.

1.10 PROJECT CONDITIONS

- A. Verify that field measurements are as shown on Drawings.
- B. Verify routing and termination locations of conduit prior to rough-in.
- C. Conduit routing is shown on Drawings in approximate locations unless dimensioned. Route as required to complete wiring system.

PART 2 - PRODUCTS**2.01 CONDUIT REQUIREMENTS**

- A. Minimum Size: 3/4 inch unless otherwise specified or indicated on Drawings.
- B. Underground or Concrete encased Installations: Schedule 40 or 80 PVC or as indicated on drawings.
- C. Outdoor Locations, Above Grade: Use rigid galvanized steel (RGS), unless otherwise indicated on Drawing.
- D. Wet and Damp Locations: Use rigid galvanized steel, unless otherwise indicated on the Drawing. These areas also include below grade locations and walls, which are water bearing. No cast-in-place raceway (or outlets) permitted.
- E. Dry Exposed and Concealed Locations: Use rigid galvanized steel conduit for feeders, EMT for branch circuits.

2.02 METAL CONDUIT

A. Manufacturers:

1. Wheatland Tube Co.
2. Anixter Brother, Inc.
3. Carol Cable Co., Inc.
4. Alcoa

B. Rigid Steel Conduit: ANSI C80.1.

C. Fittings and Conduit Bodies: ANSI/NEMA FB 1; material to match conduit. Conduit bodies to meet the requirements for Form 8; Form 7 not permitted.

2.03 FLEXIBLE METAL CONDUIT

A. Manufacturers:

1. Carol Cable Co., Inc.
2. Electri-Flex Co.

B. Description: Interlocked steel construction as applicable for use with rigid metal raceway system specified.

C. Fittings: ANSI/NEMA FB 1.

2.04 LIQUID-TIGHT FLEXIBLE METAL CONDUIT

A. Manufacturers:

1. Thomas & Betts Corp.
2. Hubbell, Inc.; Raco, Inc.
3. Lamson & Sessions

B. Description: PVC jacketed, interlocked steel construction as applicable for use with rigid metal raceway system specified.

C. Fittings: ANSI/NEMA FB 1.

2.05 ELECTRICAL METALLIC TUBING (EMT)

A. Manufacturers:

1. Wheatland Tube Co.
2. Anixter Brother, Inc.
3. Carol Cable Co., Inc.
4. Alcoa

B. Description: ANSI C80.3; galvanized tubing.

C. Fittings and Conduit Bodies: ANSI/NEMA FB 1; steel compression type suitable for raintight, concrete-tight and corrosion resistant installation.

2.06 BOXES

A. Manufacturers:

1. Hubbell Inc.; Killark Electric Manufacturing Co.
2. Thomas & Betts Corp.
3. Hoffman Engineering Co.

B. Sheet Metal boxes: NEMA OS1.

2.07 INGROUND BOXES AND ENCLOSURES

A. Manufacturers:

1. Quazite Co., Div of MMFG.
2. Pentek
3. Old Castle

B. Precast polymer concrete (cast composolite), minimum 12" x 12" size, with outside flanges and recessed, gasketed cover for flush mounting. Nonskid finish on cover.

1. Service Box Assemblies: Underground enclosure shall be concrete gray color and rated for no less than 8,000 lbs. over a 10" x 10" area and designed and tested to temperatures of -50 deg. F. Material compressive strength should be no less than 11,000 lbs. Covers shall have a minimum coefficient of friction of .5. Boxes shall be stackable for extra depth where required.
2. Divided Box Assemblies: Similar to service box assemblies except the box shall include a divider to allow separation between electric and communication cables.
3. Cover Legend
 - a. Power Distribution: ELECTRIC.
 - b. Site Lighting: LIGHTING.
 - c. Communication/Data: COMMUNICATION.

2.06 ASSOCIATED PRODUCTS

A. Warning and Marking tape

1. Provide detectable red plastic tape lettered at approx 12 inch intervals with "ELECTRIC LINE BELOW". Tape shall be not less than 3 inches in width and formulated for direct burial.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install conduit in accordance with NECA "Standard of Installation" and in accordance with

- manufacturer's instructions. Conduit installation and acceptable usage shall be in accordance with the N.E.C.
- B. Arrange supports to prevent misalignment during wiring installation.
 - C. Support conduit using galvanized steel straps, lay-in adjustable hangers, clevis hangers, and split hangers.
 - D. Group related conduits; support using conduit rack. Construct rack using unistrut type channel; provide space on each for 25 percent additional conduits.
 - E. Fasten conduit supports to building structure and surfaces as required.
 - F. Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary supports
 - G. Do not attach conduit to ceiling support wires.
 - H. Arrange conduit to maintain headroom and present neat appearance.
 - I. Route exposed conduit parallel and perpendicular to walls.
 - J. Route conduit installed above accessible ceilings parallel and perpendicular to walls.
 - K. Route conduit above ceilings from point-to-point.
 - L. Do not cross conduits in slab except when approved by the Project Engineer prior to installation.
 - M. Maintain adequate clearance between conduit and piping.
 - N. Maintain 12 inch clearance between conduit and surfaces with temperatures exceeding 104 degrees F.
 - O. Cut conduit square using saw or pipe cutter; de-burr cut ends.
 - P. Bring conduit to shoulder of fittings; fasten securely.
 - Q. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum.
 - R. Use conduit hubs to terminate conduit to enclosures and cabinets in damp and wet locations. Cast boxes to utilize hub connections.
 - S. Install no more than equivalent of three 90 degree bends between boxes. Use conduit bodies to make sharp changes in direction, as around beams. Use factory elbows for bends in metal conduit larger than 2 inch size.
 - T. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.
 - U. Provide suitable fittings to accommodate expansion and deflection where conduit crosses building expansion joints.
 - V. Provide suitable non-metallic pull string in each empty conduit except sleeves and nipples.

- W. Use suitable caps to protect installed conduit against entrance of dirt and moisture. Provide removable plugs at each end on all "spare" underground conduit runs.
- X. Ground and bond conduit under provisions of Section 26 17 00
- Y. Identify conduit under provisions of Section 26 05 53.
- Z. Install PVC coated raceway and fittings as recommended by manufacturer. Utilize appropriate methods, materials and equipment to prevent damage to PVC coating.
- AA. All conduit duct banks entering building or structure shall be installed in such a manner as to eliminate damage due to shear force. Utilize sheaves with appropriate sealants or other means reviewed by the Project Engineer. Provide pinned and reinforced concrete joint, watertight and supported to prevent breakaway or sinking
- BB. Space supports for conduit as per latest edition of NEC for the size and type of conduit being supported.
- CC. Bend conduit only by use of an approved pipe bending machine or hickey so the conduit will always retain its cylindrical shape, contractor to submit evidence of manufacturer training prior to installations. The use of touch-up coating material is limited to the provisions established by the manufacturer. Improper installations will be removed and replaced by the Contractor without extra compensation when directed by the Project Engineer.
- DD. Install conduit so wires may be removed and replaced at a later date.

3.02 EXCAVATION AND FILL, SURFACE RESTORATION

- A. Open excavations in sod and unpaved/unsurfaced areas using approved machinery except where in proximity to found utilities and other locations. Provide cover for all materials exposed during rain or snow and provide runoff control and excavation dewatering. No wet fill or mud shall be placed as fill. Remove all rock and materials unacceptable for use as fill.
- B. Excavate across paved, sidewalk, and other surfaced areas using sawcut and removal of the surface material, then excavate substrate and soil by normal means.
- C. Fill excavations in six inch lifts with select fill, tamping and compacting each firmly to prevent later sinking.
- D. Restoration of nonsurfaced areas:
 - 1. Fill and tamp to within 6 inches of surface grade. Provide select fill for the balance and tamp.
 - 2. Provide select sod or other cover, or surfacing as required to restore the area to its original state prior to excavation.
 - 3. Provide watering, maintenance, and inspection of sod and covering to ensure proper regrowth.
- E. Restoration of surfaced areas: paved, concrete, sidewalk, curbed, drainage and control troughs, etc.
 - 1. Place conduit, supports, anti-floatation ties and stakes, etc. as required. Slope conduits using placement of tamped fill beneath them if excavation does not provide

correct sloping and drainage.

2. Place select fill in not larger than 6 inch lifts and machine tamp to fully compact each lift, up to within 12 inches of surface grade
3. Provide foundation structure, curbing, subgrade gravel fill or other material and ballast, etc. as specified for the surface type. Compact the fill materials fully in not larger than two-inch lifts to prevent voids and settling and sinking. Build lifts to the final surface level and restore the paving, concrete, curbing, ramps, drains, and all other structures to original status.
4. Properly apply joint penetrating waterproofing and seal all surface cuts with approved permanent sealer materials. Cover all joints with approved permanent mastic strip fully bonded across the joint to both new and old substrates.
5. Provide compaction, surface, and adhesion testing and paving testing for all resurfacing materials in-place. Take and preserve materials samples during placement work for later use in testing and submit all records.

END OF SECTION

SECTION 26 05 19

LOW VOLTAGE CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Low voltage wire and cable conductors including building wire; metal clad cable; tray rated cable and associated connectors, splices, and terminations for wiring systems rated 600 V and less.

1.2 RELATED SECTIONS

- A. Section 26 05 00 - General Electrical Requirements

1.3 REFERENCES

- A. NECA (National Electrical Contractors Association) - Standard of Installation.
- B. NETA ATS (International Electrical Testing Association) - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated in this Section.
- B. Samples: Submit 1 each, 18 inch length of cable assembly from each reel. Select each length to include complete set of manufacturer markings. Attach tag indicating cable size and application information.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Testing agency as defined by OSHA in 29 CFR 1910.7 or a member company of the InterNational Electrical Testing Association and that is acceptable to authorities having jurisdiction.
- B. Testing Agency's Field Supervisor: Person currently certified by the InterNational Electrical Testing Association or the National Institute for Certification in Engineering Technologies to supervise on-site testing specified in Part 3.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- D. Comply with NFPA 70; National Electrical Code, Latest Edition.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:

- B. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

2.2 CONDUCTORS AND CABLES

- A. Manufacturers:

1. American Insulated Wire Corp.; a Leviton Company.
2. General Cable Corporation.
3. Southwire Company.
4. Okonite
5. Or Equal

- B. Refer to Part 3 "Conductor and Insulation Applications" Article for insulation type, cable construction, and ratings.

- C. Conductor Material: Copper complying with NEMA WC 5 or 7, stranded conductor for No. 10 AWG and smaller as well as stranded for No. 8 AWG and larger.

- D. Conductor Insulation Types: Type XHHW or XHHW-2 or THHN/THWN as specified complying with NEMA WC 5 or 7.

2.3 CONNECTORS AND SPLICES

- A. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated. Note: Split-bolt connectors are NOT permitted for use on this project. Utilize compression type connectors for all terminations and splices. Spring-nut connectors may be utilized for branch circuit terminations / splices on wire sizes # 10 AWG and smaller.

- B. Solderless Pressure Connectors:

1. Burndy
2. Thomas & Betts
3. IlSCO

- C. Compression Connectors:

1. Burndy
2. Thomas & Betts
3. IlSCO

- D. Multilug:

1. Burndy
2. Thomas & Betts
3. IlSCO

- E. Tape: Low voltage tape to be as manufactured by 3M, 33 plus.

- F. Low Voltage Motor Termination / Insulation Kits: Utilize lug connectors, insulated by means of Raychem Corporation, RVC Series pre-manufactured "roll-on" type insulation kits; voltage rating as required by the installation.

2.4 METAL CLAD CABLE, TYPE MC

- A. Manufacturers:
 - 1. General Cable Co. Model
 - 2. Okonite
 - 3. Southwire
- B. Conductor: Copper.
- C. Insulation Voltage Rating: 600 volts, Type XHHW or XHHW-2
- D. Insulation Temperature Rating: 75 or 90 degrees C; applied at the 75 degree C ampacity rating.
- E. Insulation Material: Thermosetting.
- F. Armor Material: Steel.
- G. Armor Design: Corrugated tube.
- H. Jacket: PVC, Where required or otherwise indicated.

2.5 TRAY CABLE, TYPE TC

- A. General:
 - 1. Conductor: Copper.
 - 2. Insulation Temperature Rating: 75 or 90 degrees C, applied at the 75 degree C ampacity rating.
- B. Low Voltage Power and (Non-Shielded) Control Cable: (120 volt AC Systems)
 - 1. Manufacturers:
 - a. Aetna, Spec 6-15
 - b. Alpha
 - c. Standard Wire and Cable
 - 2. Description: NFPA 70, XHHW-2, (THHN - THWN not permitted.), Type TC with identified equipment grounding conductor, suitable for use in damp locations.
 - 3. Conductor: Copper, multi conductor cable, 7/C #14 minimum, unless quantity of conductors is otherwise indicated on the Drawings, copper (ASTM B-3) Class B stranded, with outer PVC jacket.
 - 4. Insulation Voltage Rating: 600 volts, XLP.
 - 5. Use: As indicated on the Drawings for 120 AC equipment connection.
 - 6. Special Use: Where non-shielded control / status cable is identification the Drawings, utilize this cable type but with #14 AWG conductors, quantity as required.
- C. Shielded Control Cable: (Instrumentation System)
 - 1. Manufacturers:
 - a. Aetna, Spec 6-25
 - b. Belden
 - c. Alpha

- d. West Penn
- e. Standard Wire and Cable
- 2. Description: NFPA 70, XHHW-2, Type TC
- 3. Conductor: Copper, 8/C #16, tinned copper, 100% shielded with outer PVC jacket. (6/C - limit switch wiring; 2/C - Spare)
- 4. Insulation Voltage Rating: 600 volts
- 5. Use: Valve limit switch wiring and as otherwise specified or indicated.

D. Analog Instrumentation Cable:

- 1. Manufacturers:
 - a. Belden #9342
 - b. Alpha #7616/2 (tinned copper)
 - c. West Penn
 - d. Standard Wire and Cable
- 2. Description: NEC TC-TFFN; UL Standard 1277, Type TC.
- 3. Conductor: Copper, 2/C #16 tinned copper, shielded with #16 AWG stranded tinned copper drain wire; outer PVC jacket.
- 4. Insulation Voltage Rating: 600 volts
- 5. Use: Instrumentation signal wiring.

2.6 CORDS AND CAPS

A. Manufacturers:

- 1. American Wire & Cable
- 2. Rome
- 3. Triangle (Royal Products)

B. Attachment Plug Construction: Conform to NEMA WD 1.

C. Configuration: NEMA WD 6; match receptacle configuration at outlet provided for equipment.

D. Cord Construction: NFPA 70, Type SO multiconductor flexible cord with identified equipment grounding conductor, suitable for use in damp locations.

E. Size: Suitable for connected load of equipment, length of cord, and rating of branch circuit overcurrent protection.

PART 3 - EXECUTION

3.1 CONDUCTOR AND INSULATION APPLICATIONS

- A. Exposed and Concealed (in raceway) Feeders: As noted on drawings. Otherwise, type XHHW or XHHW-2, single conductors in raceway only.
- B. Exposed (in cabletray) Feeders: Armored cable, Tray Cable, Type TC as indicated on the Drawings or required for the specific application.
- C. Feeders and Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and in Underground Ductbanks: Type XHHW or XHHW-2, single conductors in raceway.

- D. Exposed and Concealed Branch Circuits Located within the Building: Type THHN-THWN, single conductors in raceway.
- E. Class 1 Control Circuits: Type THHN-THWN, in raceway.
- F. Class 2 Control Circuits: Power-limited cable, concealed in raceways routed through building finishes and /or by means of Power-limited tray cable, in cable tray.
- G. Fire Alarm Circuits: Power-limited, fire-protective, signaling circuit cable.
- H. Cord Drops and Portable Appliance Connections: Type SO, hard service cord.

3.2 INSTALLATION

- A. Completely and thoroughly swab raceway before installing wire.
- B. Route wire and cable to meet Project conditions.
- C. Install wire and cable in accordance with NECA "Standard of Installation."
- D. Neatly train and lace wiring inside boxes, equipment, and panelboards.
- E. Conceal cables in finished walls, ceilings, and floors, wherever possible and unless otherwise indicated. Where the Contractor proposes to utilize surface metal raceway, obtain written permission from the Owner prior to installation.
- F. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- G. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage cables or raceway.
- H. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- I. Support cables as required by the National Electrical Code.
- J. Identify according to Division 26, Section 26 05 53, Electrical Identification. Identify each conductor with its circuit number or other designation indicated.
- L. Color-code conductors and cables in accordance with Article 3.4 this Section.
- M. The voltage drop at the end of any circuit shall not exceed 3 percent of the normal line voltage under full load.
- N. Balance circuits across the phase wires of the branch and distribution panels.
- O. Conductors shall be continuous from outlet to outlet; splice only within outlet or junction boxes.

3.3 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- B. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than un-spliced conductors.
- C. Wiring at Outlets: Install conductor at each outlet, with a minimum of 6 inches of slack.
- D. Clean conductor surfaces before installing lugs and connectors.
- E. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
- F. Tape uninsulated conductors and connectors with electrical tape to 150 percent of insulation rating of conductor.
- G. Utilize pre-manufactured insulated splice covers and terminations as previously specified, installed in accordance with the manufacturer's installation instructions. Where otherwise applicable, insulate uninsulated conductors and connectors with electrical tape to 150 percent of insulation rating of conductor.
- H. Install lug connectors for copper conductor on conductors No.6 AWG and larger. Splices and taps to utilize UL Listed and Labeled compression type splice kits.
- I. Install solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG and smaller.
- J. Install insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.
- K. Install stranded conductors for feeder and branch wiring. Install crimp-on fork or ring terminals for device terminations. Do not place bare stranded conductors directly under screws.
- L. Make electrical connections in accordance with equipment manufacturer's instructions.
- M. Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.
- N. Install terminal block jumpers to complete equipment wiring requirements.
- O. Install suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.

3.4 WIRE COLOR

A. General:

- 1. For wire sizes 10 AWG and smaller, install wire colors in accordance with the

requirements of Section 26 05 53.

2. For wire sizes 8 AWG and larger, identify wire with colored tape at terminals, splices and boxes in accordance with the requirements of Section 26 05 53.
3. Neutral Conductors: Color code in accordance with the requirements of Section 26 05 53. When two or more neutrals are located in one conduit, individually identify each with proper circuit number.
4. Branch Circuit Conductors: Install three or four wire home runs with each phase uniquely color coded. Do not gang branch circuits associated with "clean power" / electronic equipment circuits; maintain use of individual neutral conductor with each branch circuit installed.
6. Feeder Circuit Conductors: Uniquely color code each phase with the appropriate color coded tape at both ends and visible points including junction boxes.
7. Ground Conductors:
 - a. For 6 AWG and smaller utilize wire with insulation color coded in accordance with the requirements of Section 26 05 53.
 - b. For 4 AWG and larger: Identify with green tape at both ends and visible points including junction boxes.
8. Isolated (insulated) Ground Conductors: (where applicable)
 - a. For 6 AWG and smaller utilize wire with insulation color coded in accordance with the requirements of Section 26 05 53.
 - b. For 4 AWG and larger: Identify with green and yellow tape at both ends and visible points including junction boxes.

3.4 FIELD QUALITY CONTROL

- A. Testing: Engage a qualified NETA Certified testing agency to perform the following field quality-control testing. After installing conductors and cables and before electrical circuitry has been energized, test for compliance with requirements.
 1. Perform each electrical test in accordance with NETA ATS, except Section 4. Perform visual and mechanical inspections as stated in NETA ATS, Section 7.3.1. Certify compliance with test parameters.
 2. Test Reports: Prepare a written report to record the following:
 3. Document all Test procedures used and submit to the Project Engineer for review.
 4. Verify that all Test results comply with the stated requirements and criteria.
 5. Test results that do not comply with requirements shall be reported and corrective action taken shall be documented. Re-test to achieve compliance with the requirements outlined by these Documents.

END OF SECTION

SECTION 26 05 53 ELECTRICAL IDENTIFICATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Nameplates and labels.
- B. Wire and cable markers.
- C. Conduit markers.

1.2 RELATED SECTIONS

- A. Section 26 05 00 - General Requirements - Electrical

1.3 REFERENCES

- A. NFPA 70 - National Electrical Code, Latest Edition.

1.4 SUBMITTALS FOR REVIEW

- A. Product Data: Provide catalog data for nameplates, labels, and markers.

1.5 REGULATORY REQUIREMENTS

- A. Conform to requirements of NFPA 70.
- B. Conform to requirements of OSHA.

PART 2 - PRODUCTS

2.1 NAMEPLATES AND LABELS

- A. Nameplates: Engraved three-layer laminated plastic, black letters on white background.
- B. Locations:
 - 1. Each electrical distribution and control equipment enclosure.
 - 2. Communication cabinets.
 - 3. Motor starters, controllers, safety switches.
 - 4. Control stations and control panels.
- C. Letter Size:
 - 1. 1/8-inch letters for identifying individual equipment and loads.
 - 2. 1/4-inch letters for identifying grouped equipment and loads.
 - 3. 1/2-inch letters for identifying power distribution equipment such as motor control centers, panelboards, main distribution switchboard and transformers.
- D. Labels: Embossed adhesive tape, with 3/16-inch white letters on black background. Use only for identification of individual wall switches, receptacles, and control device stations.

2.2 WIRE MARKERS

A. Manufacturers:

- 1. Brady
- 2. Seton
- 3. LEM
- 4. Panduit

B. Description: Tubing/sleeve type wire marker system. Identification labeling shall utilize sleeve identification labeling system with numbers (and/or letters) permanently printed using HEAT TRANSFER technology. Dot Matrix type print on vinyl sleeves is NOT considered acceptable.

C. Locations: In general, each conductor or cable required to be labeled shall be identified in every panelboard gutter space, pull box, and at the load connection termination. Control and instrumentation cabling to be identified in each device enclosure; control station, wiring termination cabinet and at main (or auxiliary) control panels.

D. Legend:

- 1. Power and Lighting Circuits: Branch circuit or feeder number indicated.
- 2. Control Circuits: Control wire number indicated on schematic and interconnection diagrams. All control wiring shall be tagged with a legible permanent coded wire marking sleeve. Sleeves shall be white PVC tubing with machine printed black marking. Markings shall be in accordance with the wire numbers shown on the control wiring diagrams. All I/O wiring shall be labeled. The process controller's address shall be included in the wire identification tag.

2.3 WIRING COLOR CODE

A. All wiring shall conform to the following color code:

<u>Phase</u>	<u>480/277 Volts 3 Ph, 4 W Sys.</u>	<u>208/120 Volts 3 Ph, 4 W Sys.</u>	<u>240/120 Volts 1 Ph, 3 W Sys.</u>
A	Brown	Black	Black
B	Orange	Red	-----
C	Yellow	Blue	Red
Neutral	Gray	White	White
Equip. Ground	Green	Green	Green

SPECIAL NOTE: Panel "1B" is a 240/120V, 3Ph, 4-Wire 'High-Leg' configured unit and requires that the all conductors connected to the B-Phase be color coded ORANGE. Use phase tape or other means as identified in specification section 26 05 19 – Low Voltage Conductors.

B. Control Wire: 120 Vac - Red Stripe
- Yellow Stripe (Externally Powered)
24 V or 48 Vdc - Purple

C. Isolated Ground: Green with yellow tracer stripe

D. Factory apply color the entire length of the conductors, except that field applied color coding methods may be used in lieu of factory coded wire for sizes larger than No. 10 AWG.

2.4 UNDERGROUND WARNING TAPE

- A. Manufacturers:
 - 1. Brady
 - 2. Seton
 - 3. LEM
 - 4. Panduit
- B. Description: 4-inch wide plastic tape, detectable type, colored red with suitable warning legend describing buried electrical lines.
- C. Location: Along length of each underground conduit. Install tape six (6) inches below finished grade.

2.5 PANELBOARD SCHEDULES

- A. Upon completion of the installation of each Panelboard's circuiting, provide an updated panel schedule of all new and existing circuits. Insert schedule into clear plastic protective sleeve and install designated location of panelboard door.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Degrease and clean surfaces to receive nameplates and labels.

3.2 INSTALLATION

- A. Install nameplate and label parallel to equipment lines.
- B. Secure nameplate to equipment front using rivets.
- C. Secure nameplate to inside surface of door on panelboard that is recessed in finished locations.
- D. All control wiring shall be tagged at each end in motor control center and at each control panels with a legible permanent coded wire marking sleeve. Accessible locations between the end terminations shall also be provided with wire tagging identification labels.
- E. Provide wiring label on all control, instrumentation, telecommunications/data and other wire and cable as indicated in these Documents. Sleeve type identification label to be placed on wire or cable in such a manner as it is readable within the enclosure. Do not heat shrink labels to the cable, but rather choose a tube size, which closely matches the conductor or jacket overall diameter. Apply labels to conductor or cable prior to installation of termination devices.
- F. Identify underground conduits using one underground warning tape per trench at 3 inches below finished grade.

END OF SECTION

SECTION 26 16 00

CABINETS AND ENCLOSURES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Hinged cover enclosures.

1.02 RELATED SECTIONS

- A. Section 26 05 00 - General Requirements

1.03 REFERENCES

- A. NECA Standard of Installation (National Electrical Contractors Association).
- B. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- C. NFPA 70 - National Electrical Code, Latest Edition.

1.04 SUBMITTALS FOR REVIEW

- A. Product Data: Provide manufacturer's standard data for enclosures and cabinets. Provide complete data for arrangement of contents, basis of sizing, thermal loading, etc. as required.

1.05 SUBMITTALS FOR INFORMATION

- A. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

1.06 REGULATORY REQUIREMENTS

- A. Conform to requirements of NFPA 70.
- B. Products: Listed and classified by Underwriters Laboratories, Inc. or other testing firm acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.

PART 2 - PRODUCTS

2.01 HINGED COVER ENCLOSURES

- A. Manufacturers:
 - 1. Hoffman
 - 2. Austin
 - 3. Vynckier
 - 4. Stalin
- B. Construction: NEMA 250, Type as indicated on Drawings.
- C. Covers: Continuous hinge, held closed by hasp and staple for padlock.

- D. Provide interior metal panel for mounting terminal blocks and electrical components; finish with white enamel.
- E. Enclosure Finish: Manufacturer's standard enamel.
- F. Enclosures with more than one door, or having a door with its overall vertical or horizontal dimension exceeding 22 inches shall be provided with three point latches, locking type.

2.02 TERMINAL ENCLOSURES, EQUIPMENT ENCLOSURES

- A. Provide each enclosure with the necessary number of terminal positions as noted or as required for the function plus 10% additional spare positions, but not less than three spare positions. Equipment ground conductor position is required in all enclosures and is not counted as spare.
- B. Terminals : 600V, barrier type, provided with screw terminals rated for stranded wire (indoors) or for use with compression terminal (outdoors)
 - 1. Mount terminals on DIN rail or other standoff rail.
 - 2. Enclosures having more than 10 terminals or containing instrument or control equipment shall be provided with removable backplane.
 - 3. Provide separate terminal strips for power, control wiring, instrument (analog) wiring, instrument (discrete) wiring, communications wiring.
- B. Wiring :
 - 1. Provide barriers, wireway, isolation of wiring, securing and identification for all contents.
 - 2. Across- the- hinge wiring shall be provided using extra-flexible wiring terminated on terminal strips in the fixed portion of the enclosure.
- C. Construction:
 - 1. Indoors: Nema 12 epoxy-powdercoated steel, 14ga. min.
 - 2. Outdoors : NEMA 4X, 14 ga. min
 - 3. Locking type hinged cover, flanged and gasketed
- D. Equipment enclosures
 - 1. Provide each enclosure with the necessary space, size, and arrangement for the equipment noted. All wiring leaving the enclosure shall proceed from terminal strip(s) located near to the point of raceway exit from the enclosure.
 - 2. Provide interior equipment on DIN rail or other standoff rail suitable for equipment replacement without removal of backplane.
 - 3. Provide door-mounted equipment using weatherproof methods or provide inside the main enclosure door on a hinged front panel accessible by opening the main enclosure door: visible device status and controls status shall be observable via a fixed polycarbonate window in the main door.
 - a. instruments and displays shall be provided in interior visible locations where enclosure is located outdoors.
- E. Special outlet/special design enclosures
 - 1. Provide enclosure sized properly and with all fittings and accessories for the purpose. Meet all equipment manufacturers' requirements and recommendations. Meet all utility requirements and recommendations.:
 - a. generator receptacle enclosure

- b. CT cabinet/enclosure
- c. telephone terminal interface and related enclosures

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Division 1 for Quality Control: Manufacturer's instructions.
- B. Install in accordance with NECA "Standard of Installation."
- C. Install enclosures and boxes plumb. Anchor securely to wall and structural supports at each corner.
- D. Install cabinet fronts plumb.
- E. Submit record of enclosure contents and arrangement for use in testing and in as-built record documents:
 - 1. equipment enclosures
 - 2. terminal enclosures
 - 3. special outlet or special design enclosures
 - 4. pull and junction boxes
 - 4. pull and junction boxes

3.02 CLEANING

- A. Clean electrical parts to remove conductive and harmful materials.
- B. Remove dirt and debris from enclosure.
- C. Clean finishes and touch up damage.

END OF SECTION

SECTION 26 17 00 GROUNDING AND BONDING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Grounding electrodes and conductors.
- B. Equipment grounding conductors.
- C. Bonding.
- D. Conduit Grounding Bushing
- E. Grounding System Resistance Test Equipment
- F. Grounding System Inspection Point Box
- G. Grounding System Conductors Entry Point Concrete Markers

1.02 RELATED SECTIONS

- A. Section 26 05 00 - General Requirements
- B. Section 26 90 00 - Electrical Testing and Start-Up

1.03 REFERENCES

- A. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems (International Electrical Testing Association).
- B. NFPA 70 - National Electrical Code; Latest Edition.
- C. ANSI - American National Standards Institute, Inc.
- D. ASTM - American Society for Testing and Materials.
- E. IEEE - Institute of Electrical and Electronic Engineers.

1.04 GROUNDING SYSTEM DESCRIPTION

- A. Metallic pipe and piping systems.
- B. Metal frame of the building.
- C. Ground ring / counterpoise (limited).
- D. Rod electrode.
- E. Metallic Equipment frames and back plates.
- F. Freestanding Electrical Equipment Enclosures; Panelboards and Transformers.

1.05 PERFORMANCE REQUIREMENTS

- A. AC Power - Grounding System Earth Electrode Resistance: 3 ohms.
- B. Instrumentation and Controls Grounding Systems Network Resistance: 1 ohm.
- C. Lightning, telecommunications, and any additional ground connections: as required by the system specifying the ground requirement

1.06 SUBMITTAL FOR REVIEW

- A. Product Data: Provide for grounding electrodes, conductors, and connectors of all types.
- B. Product Data: Provide for conduit grounding bushings and jumpers.
- C. Product Data: Provide for grounding system resistance test equipment. Coordinate with testing as outlined in Section 26 90 00.
- D. Procedure data: submit system test procedure and test reports for all testing

1.07 SUBMITTAL FOR INFORMATION

- A. Test Reports: submit test report with test datasheets indicating for each test: overall resistance value to ground, dimensioned drawing indicating the locations of the test probes in relation to the site's exterior ground system at all test points, test equipment and test method, date and time of test, environmental conditions. Report shall be signed and certified by trained and approved test technician. All tests shall be reported including failed or incomplete tests. Indicate planned dates of all testing in the project schedule documents.
- B. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
- C. Grounding riser: schematic drawing showing intended ground systems elements and points of connection. Indicate test points. Final as-built documents shall include a corrected and approved copy of this schematic showing actual test points, all grounding system connections, bonds and all connections to separate systems (transformers, generators, UPS systems, inverters, battery systems, communications, lightning protection, etc.) , and actual system elements and markings applied.

1.08 SUBMITTAL FOR CLOSEOUT

- A. Project Record Documents: Record actual locations of components and all grounding electrodes, system connections to service ground network, test points. Provide fully complete and accurate copy of ground riser.

1.09 REGULATORY REQUIREMENTS

- A. Conform to requirements of NFPA 70.
- B. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

PART 2 - PRODUCTS

2.01 ROD ELECTRODES

- A. Manufacturers:
 - 1. Blackburn
 - 2. Carolina
- B. Material: Copper-clad steel.
- C. Diameter: 3/4 inch, unless otherwise noted.
- D. Length: 10 feet.
- E. Electrodes to meet the requirements of UL Specification No. 467 (ANSI C-33.8-1972)

2.02 MECHANICAL CONNECTORS

- A. Manufacturers:
 - 1. OZ Gedney
 - 2. Appleton.
 - 3. Steel City.

- B. Material: Bronze.

2.03 EXOTHERMIC CONNECTIONS

- A. Manufacturers:
 - 1. Erico Products, Inc. (Cadweld)
 - 2. Continental Industries, Inc. (Thermoweld)
- B. Material: Mixtures of copper oxide and aluminum packaged according to connection type in plastic tubes.

2.04 CONDUCTORS

- A. Material: Stranded copper.
- B. Grounding Ring or Counterpoise Conductor: 2/0 AWG minimum OR AS NOTED.
- C. Grounding Electrode Conductor: Size to meet NFPA 70 requirements as minimum: larger where noted.
- D. Equipment Grounding Conductor: 2/0 AWG or as otherwise indicated on the Drawings.
- E. Electric service ground conductor shall be sized in accordance with NEC Article 250-66 as minimum acceptable size (larger where noted) and shall be connected to the associated building/structure grounding ring as well as all other equipment and building components as required by the NEC.
- F. All connections between the associated building/structure grounding ring and the individual

equipment or building/structure components called for to be grounded thereon shall be made using No.2/0 AWG copper cable of the same type as the grounding ring.

2.05 GROUNDING JUMPERS

A. Manufacturers:

1. OZ Gedney

B. Material: Braided, tinned copper, factory connected as a single assembly to two galvanized steel U-bolts.

2.06 CONDUIT GROUNDING CONNECTORS

A. Manufacturers:

1. OZ Gedney

2. Appleton

3. Steel City

B. Material: Insulating bushing type with ground lug terminal and three bonding setscrews around the circumference.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that final backfill and compaction has been completed before driving rod electrodes. Rods placed into fill shall be tested individually before connection to ground ring.

3.02 INSTALLATION

A. Install rod electrodes at locations indicated. Install additional rod electrodes as required to achieve specified earth electrode resistance to ground.

B. Provide grounding well box with cover at rod locations where indicated. Install well box top flush with finished floor (indoors) or grade (outdoors).

C. Provide grounding electrode conductor and connect to reinforcing steel. Bond steel together.

D. Provide bonding to meet Regulatory Requirements.

E. Bond together reinforcing steel and metal accessories in structures.

F. Grounding system shall comply with the current edition of the National Electrical Code, the current edition of the National Electrical Safety Code and as specified herein.

G. Raceway, including flexible conduit to motors and other equipment shall not be used as an equipment grounding conductor: provide equipment grounding wire in each raceway for this purpose.

H. All branch and feeder circuit ground conductors shall be copper and sized according to the requirements of the NEC, (minimum, larger where noted) as applicable.

I. All service ground conductors for main, emergency, standby, and normal distribution systems

shall have an identification tag attached at each end that identifies their origin and purpose.

- J. All metallic electrical raceways shall be bonded to the equipment ground terminal, ground wire or ground bus using a ground bushing and jumpers sized as required by the NEC. Bond shall be provided at all conduit terminations.
- K. Ground conductors shall be green, insulated type where installed in conduit; all other ground conductors shall be bare type unless otherwise noted on the Drawings or in the Specifications.
- L. All connections to the grounding ring, ground rods, and at any other locations as indicated on the Drawings shall be made using controlled exothermic weld process; surfaces of grounding electrode and ground conductor shall be cleaned, dry and chemically treated to be free from oxides before welds are made. All welds shall be tested.
- M. Flexible jumpers (bonding straps) shall be installed where conduit expansion fittings occur; bonding straps for steel conduit shall be steel.
- N. System ground rings and top of grounding electrodes shall be direct buried to a minimum depth of 24" and a maximum depth of 30", unless otherwise indicated; electrodes shall be driven straight down, perpendicular to the finished grade, or, if this is not possible, as allowed by NEC Article 250-83,c,3.
- O. Structural steel system, piping systems, gratings, handrails, and all process equipment required to be grounded shall not be used as a ground conductor for any of the other equipment or systems required to be connected to ground by these Specifications unless otherwise indicated on the Drawings.
- P. Ground rings shall be installed \pm 3' min.- 6' max. from the associated structure's foundation at the depth indicated. Where ground conductors must be installed under or through concrete foundations, etc. that may hinder future access to the conductors, a 1" or larger Schedule 40 PVC conduit shall be installed for the length of the run under or through the concrete. This requirement is not intended to require provision of conduit for ground ring conductors installed under sidewalks or macadam areas. Conduit shall be provided only where the bare copper ground ring conductors would be completely or partially encased in concrete or run directly below an underground concrete pour.
- Q. The term "ground ring" or "grounding ring" shall be understood to mean a copper conductor, as specified in this Section, buried and connected to grounding electrodes (driven rods) at \pm 20'-0" intervals; splices in and connections to the copper conductor and grounding electrodes shall be made using an exothermic weld process, as described in this Section. In no case shall grounding electrodes be installed at less than 15' spacing.
- R. All metallic piping and all related outdoor aboveground metal structures shall be connected to the associated structure's grounding ring at all locations where piping enters or leaves the building. Connections shall be made using the grounding fitting described in this Section. Jumpers shall be installed around all nonmetallic fittings, electronic metering devices, and utility meters. Coordinate jumpers and grounding with related systems including instrumentation, metering, galvanic corrosion protection, and telemetry systems.
- S. All fastener hardware including bolts, studs, nuts, spacers, and washers for lug connections to steel or aluminum structural or process material shall be minimum 3/8" nominal diameter stainless steel type 316. Length shall be as required to accommodate the thickness of the material to which the grounding lug is to be connected. Connections shall be made up tight, and shall be spot-tested to confirm conductivity when used for grounding connections.

3.03 INSPECTION AND TESTING

- A. Final testing of system including actual ground resistance shall be provided by the independent testing company and executed as outlined in Section 26 90 00. Final testing shall not be performed until after all connections are made and after all ground connections as indicated on Drawings have been connected to the ground ring. Test shall be made using the fall-of-potential method where an alternating current is induced into the system and an ammeter and high-resistance voltmeter are connected between the ground system and two reference ground points (one stationary and one moveable). The current and voltage shall be read at a minimum of two points between the point being measured and the stationary test probe. The stationary ground test probe shall be located as close as possible to 1000 feet, but no less than 100 feet, from the point being measured. Maximum resistance at each test point shall be 5 ohms unless otherwise noted. If the system's resistance is not below the maximum resistance value specified herein, additional grounding shall be installed until the specified resistance value has been met. Any additional work required as a result of the ground system testing will be in addition to the original Contract amount, unless the resistance tests fail due to improper installation by the Contractor. In this case, the Contractor shall be responsible for any corrections required. The test shall be made in the presence of the Owner and Project Engineer.
- B. Where the location of the site does not permit testing with the fall-of-potential method, the test shall be conducted using the ratio method where the series resistance of the grounding system and a test probe is measured using a ground meter which operates using the slide-wire potentiometer principle (slider of the potentiometer connected to a second test ground point).
- C. The ground system resistance tests shall be documented with test reports indicating the actual system resistance value, instrument used to perform the test, date and time of the test, and a dimensioned drawing indicating the locations of the test probes in relation to the site's exterior ground system.
- D. Meters utilized shall have been inspected by the meter manufacturer within a maximum of one year of the actual test date; meter shall not have been exposed to any adverse testing environments within said year that may require meter recalibration.

END OF SECTION

SECTION 26 34 00

TRANSFER SWITCHES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Non-Automatic transfer switches (NATS) rated 600 V and less.

1.2 SUBMITTALS

- A. Product Data: Include rated capacities, operating characteristics, furnished specialties, and accessories.
- B. Shop Drawings: Dimensioned plans, sections, and elevations showing minimum clearances, conductor entry provisions, gutter space, installed features and devices, and material lists for each switch specified.

1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Maintain a service center capable of providing training, parts, and emergency maintenance repairs within a response period of less than eight (8) hours from time of notification.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, for emergency service under UL 1008, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Comply with NEMA ICS 1
- D. Comply with NFPA 70 "National Electrical Code."
- E. Comply with NFPA 110 "Emergency and Standby Power Systems."
- F. Comply with UL 1008 "Standard for Transfer Switch Equipment" unless requirements of these Specifications are stricter.
- G. Comply with IEEE Standard 446 "IEEE Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications."

1.4 COORDINATION

- A. Coordinate layout and installation of transfer switch and components with other construction, including conduit, piping, equipment, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, provide products by one of the manufacturers specified herein.

B. Manufacturers:

1. Independent Manufacturer
 - a. Storm Switch ESL Power Systems, Inc.
 - b. Ronk Electrical Industries
 - c. Or equal

2.2 GENERAL TRANSFER SWITCH PRODUCT REQUIREMENTS

- A. It is the intent of this specification to secure a transfer switch that has been prototype tested, factory built, production tested, site tested, of the latest commercial design, together with all accessories necessary for a complete installation. Transfer switches with number of poles, voltage and current ratings as shown on the plans and specified herein shall be provided.
- B. Indicated Current Ratings: Apply as defined in UL 1008 for continuous loading and total system transfer including tungsten filament lamp loads.
- C. Tested Fault-Current Closing and Withstand Ratings: Adequate for duty imposed by protective devices at installation locations in Project under the fault conditions indicated, based on testing according to UL 1008.
- D. Solid-State Controls: Repetitive accuracy of all settings is plus or minus 2 percent or better over an operating temperature range of minus 20 to plus 70 deg C.
- E. Resistance to Damage by Voltage Transients: Components shall meet or exceed voltage-surge withstand capability requirements when tested according to IEEE C62.41. Components shall meet or exceed voltage-impulse withstand test of NEMA ICS 1.
- F. Neutral Terminal: Solid and fully rated, unless otherwise indicated.
- G. Electrical Operation: Accomplish by a non-fused, momentarily energized solenoid or electric-motor-operated mechanism, mechanically and electrically interlocked in both directions.
- H. Switch Characteristics: Designed for continuous-duty repetitive transfer of full-rated current between active power sources.
 1. Limitation: Switches using molded-case switch or insulated-case circuit-breaker components and switches using contactors not designed for continuous-duty repetitive switching between active power sources are not acceptable.
 2. Switch Action: Double throw; mechanically held in both directions.
 3. Switch Contacts: Silver composition for load current switching. Switches rated 600 amperes and above shall have segmented, blow-on construction for high withstand and close-on capability and be protected by separate arcing contacts.
 4. Transfer Time: The contact transfer time in either direction shall not exceed one-sixth (1/6) of a second.
 5. Inspection: Inspection of all contacts (movable and stationary) shall be possible from the front of the switch without disassembly of operating linkages and without disconnection of power conductors. A manual operating handle shall be provided for maintenance purposes. The handle shall permit the operator to stop the contacts at any point throughout the entire travel to properly inspect and service the contacts when required.

I. Controller:

1. Microprocessor:

- a. The controller's sensing and logic shall be provided by a single built-in microprocessor for maximum reliability and minimum maintenance.
- b. A single controller shall provide 12 selectable nominal voltages for maximum application flexibility and minimal spare part requirements. Voltage sensing shall be true RMS type and shall be accurate to $\pm 1\%$ of nominal voltage. Frequency sensing shall be accurate to $\pm 0.2\%$. The panel shall be capable of operating over a temperature range of -20 to +60 degrees C and storage from -55 to +85 degrees C.
- c. The controller shall be connected to the transfer switch by an interconnecting wiring harness. The harness shall include a keyed disconnect plug to enable the controller to be disconnected from the transfer switch for routine maintenance. Sensing and control logic shall be provided on multi-layer printed circuit boards. Interfacing relays shall be industrial grade plug-in type with dust covers. The panel shall be enclosed with a protective cover and be mounted separately from the transfer switch unit for safety and ease of maintenance. The protective cover shall include a built-in pocket for storage of the operator's manuals.
- d. All customer connections shall be wired to a common terminal block to simplify field-wiring connections.

J. Voltage, Frequency and Phase Rotation Sensing:

1. Voltage and frequency on both the normal and emergency sources shall be continuously monitored and have adjustable pickup, dropout, and trip setting capabilities.
2. Repetitive accuracy of all settings shall be within $\pm 0.5\%$ over an operating temperature range of -20°C to 60°C.
3. Voltage and frequency settings shall be field adjustable in 1% increments either locally with the display and keypad or remotely via serial communications port access.
4. The controller shall be capable (when activated by the keypad or through the serial port) of sensing the phase rotation of both the normal and emergency sources. The source shall be considered unacceptable if the phase rotation is not the preferred rotation selected (ABC or CBA).
5. Source status screens shall be provided for both normal & emergency to provide digital readout of voltage on all 3 phases, frequency, and phase rotation.

K. Time Delays:

1. An adjustable time delay of 0 to 6 seconds shall be provided to override momentary normal source outages and delay all transfer and engine starting signals. Capability shall be provided to extend this time delay to 60 minutes by providing an external 24 VDC power supply.
2. A time delay shall be provided on transfer to emergency, adjustable from 0 to 60 minutes, for controlled timing of transfer of loads to emergency.
3. Two (2) time delay modes (which are independently adjustable) shall be provided on re-transfer to normal. One time delay shall be for actual normal power failures and the other for the test mode function. The time delays shall be adjustable from 0 to 60 minutes. Time delay shall be automatically bypassed if the emergency source fails and the normal source is acceptable.

4. A time delay shall be provided on shut down of engine generator for cool down, adjustable from 0 to 60 minutes.
5. A time delay activated output signal shall also be provided to drive an external relay(s) for selective load disconnect control. The controller shall have the ability to activate an adjustable 0 to 5 minute time delay in any of the following modes:
 - a. Prior to transfer only.
 - b. Prior to and after transfer.
 - c. Normal to emergency only.
 - d. Emergency to normal only.
 - e. Normal to emergency and emergency to normal.
 - f. All transfer conditions or only when both sources are available.
6. All time delays shall be adjustable in 1 second increments, except the extended parallel time, which shall be adjustable in .01 second increments.
7. All time delays shall be adjustable by using the LCD display and keypad. The time delay value displayed on the LCD shall be the remaining time until the next event occurs.

L. Additional Features:

1. Momentary Test Switch: 3-position momentary-type test switch shall be provided for the test/automatic/reset modes. The test position will simulate a normal source failure. The reset position shall bypass the time delays on either transfer to emergency or retransfer to normal.
2. Contacts:
 - a. DPDT: Double-pole, double-throw gold-flashed contacts rated 10 amps, 32 VDC shall be provided for a low-voltage engine start signal. The start signal shall prevent dry cranking of the engine by requiring the generator set to reach proper output, and run for the duration of the cool down setting, regardless of whether the normal source restores before the load is transferred.
 - b. Auxiliary: Rated 10 amps, 250 VAC consisting of one contact, closed when the ATS is connected to the normal source and one contact closed, when the ATS is connected to the emergency source.

M. Withstand and Closing Ratings:

1. The ATS shall be rated to close on and withstand the available RMS symmetrical short circuit current at the ATS terminals with the type of overcurrent protection shown on the plans.
2. The ATS shall be UL listed in accordance with UL 1008 and be labeled in accordance with that standard's 1½ and 3 cycle, long-time ratings. ATSs which are not tested and labeled with 1½ and 3 cycle (any breaker) ratings and have series, or specific breaker ratings only, are not acceptable.

2.3 FINISHES

- A. Enclosures: ATS shall be in a NEMA 3R Secure enclosure.

2.4 SOURCE QUALITY CONTROL

- A. Factory test and inspect components, assembled switches, and associated equipment. Ensure proper operation. Check transfer time and voltage, frequency, and time-delay settings for compliance with specified requirements. Perform dielectric strength test complying with NEMA ICS 1.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Pad Mounted Exterior:

1. Mounting: Plumb and rigid without distortion of box against existing building.
2. Pad to have 4" clearance on 3 sides.

B. Clearances: Verify that field measurements are as needed to maintain working clearances required by NFPA 70 and manufacturer's written instructions.

1. Workspace: 48" minimum from face of transfer switch to nearest obstruction. Allow 90 deg. door swing to access interior contacts and/or components.

3.2 IDENTIFICATION

A. Nameplates: Label each transfer switch with an engraved laminated-plastic mounted with epoxy, industrial cement, industrial adhesive, or corrosion-resistant screws. See Division 16 "Identification for Electrical Systems" for additional requirements.

3.3 CONNECTONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections, and to assist in field testing. Report results in writing.

B. Perform the following field tests and inspections and prepare test reports:

1. After installing equipment and after electrical circuitry has been energized, test for compliance with requirements.
2. Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Section 7.22.3. Certify compliance with test parameters.
3. Measure insulation resistance phase-to-phase and phase-to-ground with insulation-resistance tester. Include external annunciation and control circuits. Use test voltages and procedure recommended by manufacturer. Comply with manufacturer's specified minimum resistance.
 - a. Check for electrical continuity of circuits and for short circuits.
 - b. Inspect for physical damage, proper installation and connection, and integrity of barriers, covers, and safety features.
 - c. Verify that manual transfer warnings are properly placed.
 - d. Perform manual transfer operation.
4. After energizing circuits, demonstrate interlocking sequence and operational function for each switch at least three (3) times.
 - a. Simulate power failures of normal source to automatic transfer switches and of emergency source with normal source available.
 - b. Simulate loss of phase-to-ground voltage for each phase of normal source.
 - c. Verify time-delay settings.
 - d. Verify pickup and dropout voltages by data readout or inspection of control settings.

- e. Test bypass/isolation unit functional modes and related automatic transfer-switch operations.
 - f. Verify proper sequence and correct timing of automatic engine starting, transfer time delay, retransfer time delay on restoration of normal power, and engine cool-down and shutdown.
5. Ground-Fault Tests: Coordinate with testing of ground-fault protective devices for power delivery from both sources.
- a. Verify grounding connections and locations and ratings of sensors.
 - b. Observe reaction of circuit-interrupting devices when simulated fault current is applied at sensors
- C. Coordinate tests with tests of generator and run them concurrently.
- D. Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation and contact resistances and time delays. Attach a label or tag to each tested component indicating satisfactory completion of tests.
- E. Remove and replace malfunctioning units and retest as specified above.
- 3.5 CLEANING
- A. After completing equipment installation, inspect unit components. Remove paint splatters and other spots, dirt, and debris. Repair damaged finish to match original finish.
 - B. Clean equipment internally, on completion of installation, according to manufacturer's written instructions.
- 3.6 DEMONSTRATION
- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain transfer switches and related equipment as specified below. Refer to Division 01 for additional requirements.
1. Coordinate this training with that for generator equipment.

END OF SECTION

SECTION 26 42 10

UTILITY SERVICE ENTRANCE

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Coordinate all scheduling and work with local Utility Company and provide all submissions, data, information, samples, and adjustments to the location and type of materials, to provide the electrical service in full compliance with all requirements of the contract documents.
- B. Provide a complete new electrical service for the facilities and equipment of this project: temporary construction power may be sourced from the existing facility if approved in writing by the facility owner. The new electrical service to the new work shall be a separately metered and separately wired entity from the existing service.

1.02 RELATED SECTIONS

- A. Division 26 – all Specification Sections

1.03 REFERENCES

- A. ANSI/NFPA 70 - National Electrical Code.

1.04 SYSTEM DESCRIPTION

- A. Power Utility Company: DELTA ELECTRIC, WINONA, Mississippi.
- B. System Characteristics: 120/240 volts, SINGLE phase, three-wire, 60 Hertz

1.05 SUBMITTAL REQUIREMENTS

- A. Obtain approval information from the local electrical power utility company and submit shop drawings for the service equipment to this local power company for approval. Main Service-Entrance Equipment shop drawings shall be approved by this Power Company before submitting to Project Engineer. These requirements include but are not limited to the following items
 - 1. maintenance disconnect, where required
 - 2. weatherhead
 - 3. service mast and all raceways
 - 4. conductors provided by Contractor
 - 5. grounding rods, electrodes, fittings
 - 6. service disconnecting means (switch, circuit breaker, etc.)
 - 7. service rated overcurrent protective devices (circuit breakers, fuses, etc.)
 - 8. meterbase
 - 9. meter wiring
 - 10. locking provisions
 - 11. ratings of all equipment shall be in accordance with the contract documents in all regards.
- C. Submit complete arc-flash and short-circuit fault calculations and provide full ARC-FLASH labeling for all energy sources. COMPLY WITH ALL PROVISIONS OF NFPA70E IN ALL RESPECTS.
 - 1. Provide exterior-rated permanent labeling for all outdoor energy control and distribution equipment including all safety switches, circuit breakers, disconnects, control and

distribution panels.

2. COMPLY WITH ALL PROVISIONS OF NFPA70E IN ALL RESPECTS
3. Provide fault calculations based on fault current provided by the utility company. Calculations shall be by an approved provider and shall be in accordance with all IEEE and other accepted regulations and methods. Identify the respective SCCR, fault interrupting capacity (AIC), and the short-circuit fault withstand capacity of all items as noted below and for all conductors that feed these items. Show short-circuit fault available current at all items as follows:
 - a. disconnect switches
 - b. circuit breakers
 - c. control panels
 - d. distribution panels
4. Shop drawings and equipment submittals for the items as noted above shall clearly identify the short-circuit performance and ratings of each item of the submitted equipment.
5. Submit a grounding diagram identifying and graphically showing the location and materials of all grounding electrodes, grounding conductors, bond locations, conduit grounding/bonding connections, and ground and neutral connections for all power distribution equipment including panels, switches, taps and splices, and all equipment ground connections to the various items of equipment. show location of all ground tests and refer to ground test data values submitted for these locations.

1.06 QUALITY ASSURANCE

- A. Contact the local Power Company during bidding for specific instructions regarding service requirements and before beginning work. The local power utility is DELTA ELECTRIC, WINONA, Mississippi. The primary representative contact for this project is JOHN LUMBLEY, TELEPHONE 662 – 283 – 2544.
- B. Provide and perform all Work in accordance with Utility Company written requirements. Complete installation must be fully approved by Power Company.
- C. Provide inspections as described in other electrical specifications sections at the service energization, the rough-in, and the final wiring conditions: submit complete reports of all inspections.
- D. Maintain one complete and approved copy of each document on site.

1.07 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.
- C. Provide supports, mounting equipment, backboard, labeling, safety and protective guards and interlocks as required for compliance with all regulations

PART 2 - PRODUCTS

2.01 UTILITY METERING

- A. Existing Utility Metering will be maintained in use by the Utility Company.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that service equipment is ready to be connected and energized.

3.02 PREPARATION

- A. Make arrangements with Utility Company to provide continued permanent electric service to the Project.

3.03 INSTALLATION

- A. Provide the electrical service in a timely fashion to support the construction schedule and to provide the facility in fully inspected and approved working order
- B. Provide materials in full accordance with the local utility requirements and regulations: includes service cable, terminations, protective devices and equipment, and related work to be provided by the Contractor.
- C. Contractor shall pay all Utility charges associated with the installation of the new service to this facility.

END OF SECTION

SECTION 26 47 00 PANELBOARDS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Power Distribution Panelboard - Furnish and install panelboard(s) as specified herein and where shown on the associated schedules indicated on the Drawings.

1.02 RELATED SECTIONS

- A. Section 26 05 10 - General Requirements-Electrical
- B. Section 26 17 00 - Grounding and Bonding.
- C. Section 26 90 00 - Electrical Testing and startup

1.03 REFERENCES

- A. The panelboard(s) and circuit breaker(s) referenced herein are designed and manufactured according to the latest revision of the following specifications.
 - 1. NEMA PB 1 - Panelboards
 - 2. NEMA PB 1.1 - Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less.
 - 3. NEMA AB 1 - Molded Case Circuit Breakers
 - 4. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum)
 - 5. UL 50 - Enclosures for Electrical Equipment
 - 6. UL 67 - Panelboards
 - 7. UL 98 - Enclosed and Dead-front Switches
 - 8. UL 489 - Molded-Case Circuit Breakers and Circuit Breaker Enclosures
 - 9. CSA Standard C22.2 No. 29-M1989 - Panelboards and Enclosed Panelboards
 - 10. CSA Standard C22.2 No. 5-M91 - Molded Case Circuit Breakers
 - 11. Federal Specification W-P-115C - Type I Class 1 Federal Specification W-P-115C - Type II Class 1 Federal Specification W-C-375B/Gen - Circuit Breakers, Molded Case, Branch Circuit And Service. Federal Specification W-C-865C - Fusible Switches
 - 12. NFPA 70 - National Electrical Code (NEC); Latest Edition
 - 13. ASTM - American Society of Testing Materials

1.04 SUBMITTALS FOR REVIEW

- A. Shop Drawings: Indicate outline and support point dimensions, voltage, main bus ampacity, integrated short circuit ampere rating for main and branch circuit breakers and for the assembled panelboard, circuit breaker arrangement and sizes.
- B. Approval documents shall include drawings. Drawings shall contain overall panelboard dimensions, interior mounting dimensions, and wiring gutter dimensions. The location of the main, branches, and solid neutral shall be clearly shown. In addition, the drawing shall illustrate one line diagrams with applicable voltage systems.
- C. Submit confirmation of the available fault current at the location where the panel is to be provided. Identify fault duty and AIC of the panel on the submittal and show that it is within the acceptable range.

- D. Product data submittals shall identify specific compliance with all requirements.
- E. Submit inspection reports for all service equipment. Submit a diagrammatic detail of the service grounding on the grounding submittals.

1.05 SUBMITTALS FOR INFORMATION

- A. Submit manufacturer's product data and installation instructions. Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

1.06 SUBMITTALS FOR CLOSEOUT

- A. Record actual circuiting arrangements and physical locations on project record documents.
- C. Maintenance Data: Include spare parts listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.

1.07 QUALIFICATIONS

- A. Company specializing in manufacturing of panelboard products with a minimum of three (3) years documented experience.
- B. Panelboards shall be manufactured in accordance with all standards listed.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Inspect and report concealed damage to carrier within their required time period.
- B. Handle carefully to avoid damage to panelboard internal components, enclosure, and finish.
- C. Store in a clean, dry environment. Maintain factory packaging and, if required, provide an additional heavy canvas or heavy plastic cover to protect enclosure(s) from dirt, water, construction debris, and traffic.

1.09 OPERATIONS AND MAINTENANCE MATERIALS

- A. Manufacturer shall provide installation instructions and NEMA Standards Publication PB 1.1 - Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less.

1.10 WARRANTY

- A. Manufacturer shall warrant specified equipment free from defects in materials and workmanship for one (1) year from the date of final Owner's acceptance.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Square D Company (refer to the Schedules on the Drawings for applicable panelboard type(s))
- B. Cutler-Hammer

C. Siemens

2.02 LIGHTING AND APPLIANCE PANELBOARD TYPE

A. Type NQO

1. Interior

- a. Shall be type NQO panelboard rated for 120/240 VAC/48 VDC maximum. Continuous main current ratings, as indicated on associated schedules, not to exceed 600 amperes maximum.
- b. Minimum short circuit current rating: 10,000 or as indicated on the Schedule. Submit confirmation of the available fault at the location where the panel is to be provided, and identify fault duty and AIC of the panel as within the acceptable range.
- c. Provide one (1) continuous bus bar per phase. Each bus bar shall have sequentially phased branch circuit connectors suitable for plug-on or bolt-on branch circuit breakers. The bussing shall be fully rated. Panelboard bus current ratings shall be determined by heat-rise tests conducted in accordance with UL 67. Bussing rated 100-400 amperes shall be copper. Bussing rated for 600 amperes shall be copper as standard construction. Main panelboards shall be labeled and suitable for use as Service Equipment unless indicated otherwise when application requirements comply with UL 67 and NEC Articles 230-F and -G.
- d. All current-carrying parts shall be insulated from ground and phase-to-phase by Noryl high dielectric strength thermoplastic or equivalent.
- e. Split solid neutral shall be plated and located in the mains compartment up to 225 amperes so all incoming neutral cable may be of the same length. Panelboards shall be marked for non-linear load applications.
- f. Interior trim shall be of dead-front construction to shield user from energized parts. Dead-front trim shall have pre-formed twistouts covering unused mounting space.
- g. Nameplates shall contain system information and catalog number or factory order number. Interior wiring diagram, neutral wiring diagram, UL Listed label and short circuit current rating shall be displayed on the interior or in a booklet format.
- h. Interiors shall be field convertible for top or bottom incoming feed. Main and sub-feed circuit breakers shall be vertically mounted. Main lug interiors up to 400 amperes shall be field convertible to main breaker. Interior leveling provisions shall be provided for flush mounted applications.

2. Main Circuit Breaker

- a. Main circuit breakers shall have an over-center, trip-free, toggle mechanism which will provide quick-make, quick-break contact action. Circuit breakers shall have a permanent trip unit with thermal and magnetic trip elements in each pole. Each thermal element shall be true RMS sensing and be factory calibrated to operate in a 40° C ambient environment. Thermal elements shall be ambient compensating above 40° C.
- b. Two- and three-pole circuit breakers shall have common tripping of all poles. Circuit breakers frame sizes above 100 amperes shall have a single magnetic trip adjustment located on the front of the circuit breaker which allows the user to simultaneously select the desired trip level of all poles. Circuit breakers shall have a push-to-trip button for maintenance and testing purposes.
- c. Breaker handle and faceplate shall indicate rated ampacity. Standard construction circuit breakers shall be UL Listed for reverse connection without restrictive line or load markings.
- d. Circuit breaker escutcheon shall have standard ON/OFF markings. Circuit breaker handle accessories shall provide provisions for locking handle in the ON or OFF position where indicated.
- e. Lugs shall be UL Listed to accept solid or stranded copper and aluminum conductors. Lugs shall be suitable for 90° C rated wire, sized according to the 75° C

- temperature rating per NEC Table 310-16. Lug body shall be bolted in place; snap-in designs are not acceptable.
- f. The circuit breakers shall be UL Listed for use with the following accessories: Shunt Trip, Under Voltage Trip, Ground Fault Shunt Trip, Auxiliary Switch, Alarm Switch, Mechanical Lug Kits, and Compression Lug Kits where indicated on the Drawings.
3. Branch Circuit Breakers
 - a. Shall be Square D type circuit breakers. Circuit breakers shall be UL Listed with amperage ratings, interrupting ratings, and number of poles as indicated on the panelboard schedules.
 - b. Molded case branch circuit breakers shall have bolt-on type bus connectors.
 - c. Circuit breakers shall have an overcenter toggle mechanism which will provide quick-make, quick-break contact action. Circuit breakers shall have thermal and magnetic trip elements in each pole. Two- and three-pole circuit breakers shall have common tripping of all poles.
 - d. There shall be two forms of visible trip indication. The breaker handle shall reside in a position between ON and OFF. In addition, there shall be a red VISI-TRIP® indicator (or equivalent identifier) appearing in the clear window of the circuit breaker housing.
 - e. The exposed faceplates of all branch circuit breakers shall be flush with one another.
 - f. Lugs shall be UL Listed to accept solid or stranded copper and aluminum conductors. Lugs shall be suitable for 90° C rated wire, sized according to the 75° C temperature rating per NEC Table 310-16. Branch circuit breakers rated 30 amperes and below shall be UL Listed to accept 60° C rated wire.
 - g. Breakers shall be UL Listed for use with the following factory installed accessories: Shunt Trip, Auxiliary Switch, Alarm Switch where indicated on the Drawings.
 4. Enclosure: NEMA 12 or as otherwise scheduled on the Drawings.

2.03 SPECIAL PROVISIONS

- A. Enclosed service entrance main circuit breakers shall be provided in enclosures as noted. Entire unit shall be service rated. All Utility, panelboard enclosure, and circuit breaker requirements apply. Provide items with all recommended accessories, ratings, and related items to comply with all utility company requirements.
- B. Separately mounted devices including circuit breakers, molded case switches, and motor circuit protectors, shall be provided in enclosures: NEMA 1 indoors, Nema 3R outdoors unless otherwise noted. All panelboard enclosure and circuit breaker requirements apply: size enclosure for all accessories and equipment as needed. Provide lock-out device for use with padlock and lockout devices, and related provisions as necessary to comply with lockout requirements. Main panelboards located outdoors in areas exposed to weathering shall be provided with NEMA 4X enclosures.
- C. Provide properly rated arc-fault type circuit breakers, ground-fault type circuit breakers, motor-circuit protectors, and shunt-trip circuit breakers in all applicable areas per latest revision of NEC. Provide all control devices for complete shunt trip circuit per manufacturers recommendations.
- D. Provide handle locks for all circuit breakers supplying circuits for life-safety systems or equipment, emergency lighting, fire alarm, hazard signaling equipment and monitoring systems.
- E. Provide lock-out device for use with padlock, and related provisions as necessary to comply with all NEC and lockout requirements, for all panel mounted circuit breakers and motor circuit protectors supplying motorized equipment circuits where a local disconnect is not otherwise

provided for the motorized equipment.

- F. Circuit breakers and other devices shown or specified to work on system that are not 60 HZ AC basis shall be rated properly for the system application: submittal datasheets shall be noted to indicate the proper equipment application ratings.
- G. Panels installed as service equipment shall be provided with all grounding and bonding per NEC and all local requirements. Submit inspection report from local authorities and inspection officials showing that the service has been inspected and meets all local requirements.
- H. Circuit breakers and related devices that are shown or required to be located in individual enclosures shall be provided with enclosures rated as required for panelboards.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install equipment in accordance with manufacturer's written instructions, NEMA PB 1.1, other NEMA standards, and NEC standards.
- B. Anchor equipment to suitable structural members and make all conductor connections.
- C. Coordinate the equipment bus ratings, fault ratings, and circuit breaker coordination rating with the available fault current.
- D. Provide new vapor corrosion-inhibitor (Cortex or equivalent) of proper size in each enclosure at completion of installation.

3.02 FIELD QUALITY CONTROL

- A. Inspect complete installation for physical damage, proper alignment, anchorage, and grounding. Provide testing per requirements of Section 26 90 00.
- B. Measure steady state load currents at each feeder; rearrange circuits to balance the phase loads within 20% of each other. Maintain proper phasing for multi-wire branch circuits.
- D. Check tightness of bolted connections and circuit breaker connections using calibrated torque wrench or torque screwdriver per manufacturer's written specifications, prior to energization. Check branch circuit terminations (L-N-G) for proper tightness and conductor contact. Log all torque data and submit in test data submittals.
- E. Check all wiring connections after the panel has been energized for more than 30 days and confirm all connections are tight and all conductor terminations and circuit breakers are not subject to overheating. Submit test record.

END OF SECTION

SECTION 26 47 80

TRANSIENT VOLTAGE SURGE PROTECTIVE DEVICES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Description:

1. This section describes the materials and installation requirements for transient voltage surge suppression (TVSS) devices for the protection of AC electrical circuits from the effects of lightning induced currents, substation switching transients and internally generated transients resulting from inductive and/or capacitive load switching.

1.02 REFERENCES

- A. UL 1449 Transient Voltage Surge Suppressors; Latest Edition
- B. UL 1283 Electromagnetic Interference Filters
- C. ANSI/IEEE C62.41 IEEE Guide for Surge Voltages in Low Voltage AC Power Circuits
- D. ANSI/IEEE C62.45 IEEE Guide for Surge Suppressor Testing
- E. NEMA LS-1 Low Voltage Surge Protective Devices
- F. NFPA-70 National Electrical Code; Latest Edition

1.03 QUALITY ASSURANCE

- A. Products shall satisfy the applicable requirements for testing and reporting as established by the aforementioned references and as indicated within this Section.
- B. UL derived clamping voltage range for all mode of operation application to the device shall be displayed on the authorized UL nameplate; (i.e. L-N, L+N-G, L-L, L-G, N-G, etc.) and shall be indicative of the specific category tested.
- C. Devices proposed for use on this project shall be tested in accordance with ANSI/IEEE C62.45. The residuals or "clamping voltages" shall be recorded for all applicable modes of operation and for each of the test standard waveforms referenced. The results of these tests shall be submitted to the Project Engineer with the product data sheets as outlined under Article 1.04 of this Section.

1.04 SUBMITTALS

- A. Submit shop drawings, product data and manufacturer's installation instruction for equipment and devices specified herein for approval by the Project Engineer.
 1. Dimensional drawing of each suppressor type.
 2. UL Standard 1449, Standard for Safety, Transient Voltage Surge Suppressors documentation: current edition.
 3. UL Standard 1283 Listing, Electromagnetic Interference Filters, documentation.
 4. IEEE C62.41-1991 Category C3 let through voltage test results for the category of the device specified.

5. Submit test data complete as specified herein along with the product data for materials being proposed. No review of shop drawings will be conducted without the supportive test data included; this includes manufacturers products specified.
6. Spectrum analysis of TVSS based on MIL-STD-220A test procedures between 50 kHz and 200 kHz verifying noise attenuation exceeds 50 dB at 100 kHz where indicated.
7. Independent third party test results verifying single impulse current rating capabilities.

PART 2 - PRODUCTS

2.01 PANELBOARD LOCATIONS

A. Surge Protective Device (SPD):

1. TVSS units shall be UL listed to UL 1449, Standard for Safety, Transient Voltage Surge Suppressors, UL 1283, Electromagnetic Interference Filters and CSA Certified to CSA C22.2.
2. Unit to be suitable for close nipple installation. The mounting position shall permit a straight and short lead length connection.
3. Provide suppression components between each phase conductor and neutral, between each phase conductor and ground and between the neutral conductor and ground. (L-N, L-G, N-G)
4. All protective devices, whether modular or chase nipple units, shall utilize an encapsulant that is UL listed and holds a 94-V2 fire retardant rating. No encapsulant compounds that incorporate epoxy shall be permitted.
5. The TVSS unit shall meet or exceed the following criteria:
 - a. Maximum single impulse current rating shall be 120 kA per phase. (60 kA L-N, 60 kA L-G, 60 kA N-G)
 - b. Pulse Life Test: Capable of protecting against and surviving 2000 ANSI/IEEE C62.41 Category C3 transients without failure or degradation of UL 1449 suppression voltage ratings by more than 10%.
 - c. The UL 1449 suppression voltage ratings shall not exceed the following:

Voltage	L-G	L-N	N-G
120/208 V	400 V	400 V	400 V

6. Designed to withstand a maximum continuous operating voltage (MCOV) of not less than 115% of nominal RMS voltage.
7. Visible indication of proper SPD connection and operation shall be provided. Visual indication shall be by means of solid state indicator lights on the front of the SPD.
8. Provide complete with a set of dry contacts (1-N.O./1-N.C.) For connection to a remote building management or annunciator system. Contacts to monitor performance of each phase providing a summary alarm.
9. SPD shall have a warranty for a period of five years, incorporating unlimited replacements of suppressor parts if they are destroyed by transients during the warranty period.

2.02 MANUFACTURERS

- A. Square D
- B. Advanced Protection Technologies, Inc., TE/XG Series
- C. Tycor International, PTY-S Series

2.03 LIGHTNING ARRESTERS

- A. Lighting arrester devices shall be secondary surge arresting units to protect against high current surges to 40KA. Integral internal fusing and fault self-protection.
 - 1. UL listed to 1449
 - 2. ANSI /IEEE C62.11-1987
 - 3. LED status indicator to indicate operational status
 - 4. Approved units for single phase 120/240V
 - a. Schneider/Square D Model SDSA1175
 - b. Intermatic UG240R
 - c. Joslyn JSP120-1S240

PART 3 - EXECUTION

3.01 PANELBOARD

- A. Install as indicated on the single line diagrams and according to manufacturer's recommendations.
- B. Conductors between the point of attachments shall be kept as short as possible and straight. (Utilize #6 AWG copper conductors.)
- C. Neutral and ground shall not be bonded together at the panelboard locations.
- D. One 40 Amp (typical size) circuit breaker, with the appropriate number of poles, shall be provided as a dedicated disconnect for the SPD. Breaker to be provided with "lock on" handle device to prevent unintentional disconnection of the circuit. The size (40 Amp) of the circuit breaker shall be coordinated with manufacturer and confirmed by manufacturer literature. Breaker shall be mounted at the bus location closest to the incoming line terminals. Indicate this circuit breaker in panelboard submittals.

3.02 OTHER LOCATIONS

- A. Provide one TVSS unit at the location designated as the service TVSS point as shown on drawings or as noted.
 - 1. Provide an enclosed fused safety switch or circuit breaker of not less than 60 amp rating and enclosure type as required in accordance with the TVSS mfg. recommendations. Provide conductors not less than AWG #4 to connect to the TVSS unit to the panel, maintaining conductor pathway as short as possible.
- B. Provide a panelboard TVSS device at the power distribution point at all control panels that distribute more than two circuits of 120V power via circuit breakers within the panel.
- C. Provide a lightning arrester at the main service location unless otherwise noted. Provide all installation materials as recommended by the equipment manufacturer.

END OF SECTION

SECTION 26 90 00

ELECTRICAL TESTING AND START-UP

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Work Included: Furnish all labor and materials required for tests, start-up and associated work required to be performed under this Contract as specified below and as noted otherwise.
- B. General:
 - 1. The testing and start-up procedures, where indicated, shall be made by a NETA certified, independent electrical testing company. Acceptable testing companies are MET Electrical Testing Company, Inc. or Approved Other NETA Certified Testing Company. Unless otherwise indicated, the Contractor may provide electrical equipment and systems testing or may utilize the services of the independent testing company. In either case, however, the acceptance testing procedures established by the National Electrical Testing Association (NETA) shall be utilized in establishing test procedures and evaluating results. The Contractor shall provide suitable test forms for all tests conducted and shall submit all testing for review and comment to the Project Engineer.
 - 2. The Contractor shall provide all the necessary labor and equipment to perform all the testing required by this specification. The Contractor shall submit test reports for approval to the Project Engineer as required by this specification. Testing of the power distribution system shall be performed after completion of the coordination study.
 - 3. All work provided under Division 26 requirements shall conform to the requirements of this section: this includes but is not limited to - work provided under the various specifications and drawings of the Contract Documents including testing, startup, alignment, and adjustment of electrically-powered equipment and all work as provided or installed under Division 26 requirements. Typical equipment includes but is not limited to: mechanical HVAC systems, plumbing systems, elevators and escalators, hoists, access controls, fire alarm, and other systems.
 - 4. All equipment shall be demonstrated as operating properly prior to the acceptance of the work.
 - 5. All protective devices shall be operative during all testing of operations.
 - 6. Tests shall be conducted during the construction period, and the completion of records covering such work shall be the responsibility of the Contractor; all such tests and checks shall be made in strict accordance with applicable manufacturer and instructions of the Project Engineer.
 - 7. Where conditions are found during the work which require correction or change, the Contractor shall proceed promptly with the necessary work as directed by the Project Engineer.

1.02 RELATED SECTIONS

- A. Division 26 Sections and other Division Sections as related to the equipment and testing identified herein.
- B. Various requirements including specifications and drawings of the Contract Documents as refer to testing, startup, alignment, and adjustment of electrically-powered equipment and work as provided or installed under Division 26 requirements. Includes but not limited to: mechanical HVAC systems, plumbing systems, elevators and escalators, hoists and cranes, conveyors, access controls, fire alarm and fire protection systems, and other systems. All work provided under Division 26 requirements shall conform to the requirements of this section.

1.03 QUALITY ASSURANCE

A. Regulations, Standards and Publications:

1. NEC National Electrical Code of National Fire Protection Association, Latest Edition
2. ASTM American Society for Testing and Materials
3. UL Underwriters' Laboratories
4. IPCEA Insulated Power Cable Engineers Association
5. IEEE Institute of Electrical and Electronic Engineers
6. ANSI American National Standards Institute, Inc.
7. NEMA National Electrical Manufacturers Association
8. BOCA Building Officials and Code Administrators
9. NETA National Electrical Testing Association
10. NFPA National Fire Protection Association
11. CFR Code of Federal Regulations

1.04 SUBMITTALS

- A. Submit planned test dates and intervals for all testing in the project schedule documents.
- B. Test documents format : on request, submit a sample copy of each test procedure, test report, list of test equipment and test methods, and certifications of personnel and equipment.
- C. On request, submit a list of all testing to be conducted in the project work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 TESTING

A. Tests Performed by the Contractor:

1. The Contractor shall furnish all the necessary labor and equipment for testing in accordance with this specification. The Contractor shall be responsible for all tests and test records. Testing shall be performed by and under the immediate supervision of the Contractor and shall be performed by personnel fully qualified by formal training, and experienced in this type of testing. All test personnel and all supervisory personnel shall have proof of approved safety training for the work indicated: all work shall be conducted under the basis of all safety requirements and recommendations as described in NFPA 70E and the applicable portions of OSHA and CFR.
2. The Contractor shall provide all the necessary test and safety equipment and shall be responsible for setting up all test equipment and other preliminary work in preparation for the tests.
3. All testing shall be done in the presence of the Owner and/or his designated representative.
4. Records of all tests and inspections, with completed data of all readings taken, shall be made and incorporated into a report for each piece of equipment tested. Individual reports shall be bound together with all test reports associated with the facility. The reports shall be indexed and grouped in a logical sequence and the bound report shall be provided complete in a sectional and indexed binder. No partial submissions are acceptable.

5. The tests specified herein apply to all equipment installed by the Contractor: any mechanical or electrical defects or damage in the Contractor's furnished equipment shall be immediately reported to the Owner or his designated representative and shall be replaced or repaired as soon as practical by the Contractor at no additional cost to the Owner. Determination of repair or replacement is solely at the judgement of the owner.
6. Equipment supplied under other Contracts damaged by careless or improper use of testing equipment associated with this Contract, shall be replaced or repaired as soon as practical by the Contractor at no additional cost to the Owner. Determination of repair or replacement is solely at the judgement of the owner.
7. No equipment shall be energized without the prior written approval of the Project Engineer.
8. Test forms shall be generated by the Contractor to document test results which the forms included with this specification do not cover. These forms shall be standardized for all tests of the specific type. Additional test forms shall be approved by the Project Engineer.
9. Test procedures complying with all recommendations and requirements of manufacturer data shall be provided by the Contractor. Procedures shall be submitted on request and shall include completion of all test data and written proof of qualifications for all test personnel.
10. After the visual inspection of joints and connections and the application of final covers and insulating devices, all sections of the complete system of wiring shall be thoroughly tested for shorts and grounds; the Contractor shall correct all defects.
11. In addition to the grounding system test described in Section 26 17 00 (Note: Testing to be performed by independent test company), the grounding systems tests shall include the following. If the ground system fails this testing, additional ground rods shall be driven and connected to the system as directed by the Project Engineer. The system shall then be retested until satisfactory results are obtained.
 - a. Ground resistance measurements shall be made between the equipment ground buses or connections listed below and at two alternate points on the facility's external ground grid.
 - 1) Motors, 20 hp and larger
 - 2) Power distribution panelboard.
 - b. The maximum permissible resistance shall be 0.05 ohm between the ground bus and two ground grid points.
12. Acceptance Tests for Cables:
 - a. Perform wire and cable tests prior to connecting to equipment. All testing to be in accordance with NETA recommendations for acceptance testing.
13. Phasing and Phase Rotation:
 - a. Phasing and identification of 3 phase, 60 cycle circuits, conductors and terminals shall be:
 - 1) ABC from top to bottom in vertical arrangement.
 - 2) ABC from left to right in horizontal arrangement.
 - a) Facing front of 3 phase panels.
 - b) Facing low voltage side of transformers.
 - c) Facing right end of panel or primary control cubicle (right end determined from a) above).
 - d) Facing right end of transformer bank (right end determined from b) above).
 - b. Phase rotation is to be counterclockwise (this refers to electrical rotation only and not to mechanical rotation of machines).
 - c. Confirm phasing at all power generation and distribution equipment. Test actual phasing before testing or startup of any power-using equipment at each:
 - 1) main service switchgear
 - 2) panel,
 - 3) switchboard,
 - 4) motor control center,
 - 5) UPS system,

- 6) generator,
 - 7) separately derived system
 - 8) transfer switch (manual and automatic types)
 - 9) generator or power supply disconnecting device (receptacle, switch, etc.)
14. Motors:
- a. Rotating machinery shall be given the following visual and mechanical inspections:
 - 1) Inspect for physical damage; compare equipment nameplate information with single-line diagram.
 - 2) Inspect for proper anchorage, mounting, grounding and connection.
 - 3) The Contractor shall compile for each motor the following data in a neatly tabulated form:
 - a) Motor number
 - b) Drive or Starter Nameplate Identification
 - c) Horsepower
 - d) Volts
 - e) Nameplate amperes
 - f) Code letter
 - g) rpm
 - h) Service factor
 - i) Enclosure
 - j) NEMA design letter
 - k) Insulation resistance
 - l) Overload heater
 - m) Power factor
 - b. This information shall be filed with the Project Engineer prior to start-up of any equipment.
 - c. All 3 phase rotation machines larger than 20 horsepower shall be given an insulation test in accordance with NETA recommendations for acceptance testing.
 - d. Provide vibration testing of Booster Pump assemblies in accordance with Hydraulics Institutes Standards.
15. All Transformers:
- a. Transformers shall be given the following visual and mechanical inspections:
 - 1) Inspect for physical damage; transformers shall be checked for correct connections and proper tap settings in accordance with the specifications and drawings.
 - 2) Verify proper auxiliary device operation such as fans, indicators and tap changer.
 - 3) Check tightness of accessible bolted electrical joints.
 - 4) Perform specific inspections and mechanical tests as recommended by the manufacturer.
 - b. Dry Transformer Test:
 - 1) The manufacturer shall submit guaranteed transformer test data covering the following:
 - a) Efficiency at 25%, 50%, 75% and full 100% load.
 - b) Percent regulation at 100% and 80% power factor.
 - c) No load and full load losses in watts.
 - d) Impedance based on reference temperature, hot spot and average temperature rise above 40 degrees C ambient.
 - e) Sound level in decibels.
 - 2) The transformer shall meet standards equal to or in excess of those specified by NEMA, IEEE, NEC or ANSI; these tests shall be performed on all transformers including unit substation transformers.
16. Electrical Power Monitoring and Instrumentation Equipment:
- a. Examine all devices for broken parts, indication of shipping damage and wire connection tightness; verify equipment and connections in accordance with approved shop drawings and manufacturers diagram(s).

- b. Calibrate all meters at mid-scale; calibration instruments shall have a precision no more than 50% of the instrument under test.
 - c. Confirm all setup and startup procedures have been completed and reports submitted .
 - d. Test all meter and instrument functions.
17. Low Voltage Phase Failure Tests:
- a. Phase Failure Protection: The Contractor shall arrange to simulate phase loss through the power company by removing a phase from each of the incoming services to demonstrate the single phase protective system and explain operation in the presence of the Owner and also submit results of test in writing.
18. Thermographic Inspection (to be performed by the independent testing company):
- a. Perform thermographic inspection of the electrical equipment and installations listed herein in the presence of the Project Engineer.
 - b. The thermographic inspection shall locate, by comparisons of temperature levels, high resistive points in installations of electrical materials and equipment. Comparisons are made by referencing a known ambient temperature of the object being scanned to the hot spot detected.
 - c. Detection Equipment: Equipment shall consist of an infrared cameras that provided input to a display screen over a range of at least -20 degrees C to 900 degrees C with the infrared emissions of the object being displayed having an accuracy of 0.1 degree C.
 - d. Equipment to be tested include the following:
 - 1) Outdoor Terminations between Utility Company and Owner's Cabling
 - 2) Panelboards
 - 3) Dry Type Transformers
 - 4) Motors, including terminations
 - 5) RTU Controller Equipment
 - 6) Transfer switch
 - 7) Magnetic contactors and starters over ½ HP.
- B. Final Installation Check:
- 1. Prior to operational testing and after Contractor's test, final checking of equipment, raceways, circuits and connections is required. Such checking will be done under the direction of the Project Engineer. The Contractor shall provide all necessary labor and, where requested, supervision to accompany, advise and assist the Owner's personnel in making such checks and in recording the results. Improper or defective items discovered during the checking processes shall be listed and shall be corrected as soon as possible.
 - 2. The requirements for pre-operational checking include but are not limited to the following items:
 - a. Phase rotation and voltage of power interconnections.
 - b. All fuse and circuit breaker ratings correct as specified or shown on drawings.
 - c. All metering circuits correctly wired.
 - d. All current transformer secondaries correctly wired to equipment or shorted.
 - e. Electrical equipment installed, connected, clean and ready for operations.
 - f. Motor starters in operating condition, cleaned, adjusted and tested; checked for proper operation and checked for proper trip settings.
 - g. Thermal overload relays in motor starters of correct ratings and properly installed.
 - h. Transformers tested connected and operable.
 - i. Integrity of grounding system verified including all ground connections tight. All equipment properly grounded and bonded in accordance with the Contract requirements. All metal raceway systems electrically continuous and correctly grounded.
 - j. Power and control circuit connections completed and tight.
 - k. All motors checked for rotation, tested, clean and ready for operation, with driven equipment connected or positively and safely disconnected as may be required.

- l. All tests performed by the Contractor and the independent testing company complete in accordance with this specification.
- m. Instrumentation devices and controllers, limit switches, pressure switches and other control devices correctly connected and adjusted.
- n. Conduits properly installed in accordance with applicable documents and drawings.

C. Operational Check:

- 1. All equipment and all power, control and instrument circuits will be operated and checked after other preliminary checking and testing is completed and reports approved, to ensure that operation conforms to the requirements of the elementary diagrams, wiring diagrams and specifications; each component of subsystems shall be operated, observed operating in all functions, and any necessary corrections made, and then the component shall be fully rechecked before operation of major systems is attempted.
- 2. The Contractor shall be responsible for the testing, calibration, and reporting of all control and instrumentation devices and circuits.
- 3. The Contractor shall provide all necessary labor and, where requested, supervision to assist the Owner's designated personnel with the required operational checking and to correct at once, as directed, any defective conditions disclosed by such preliminary operation.
- 4. Where checking, testing, and operation reveal defects, errors or misoperation of equipment installed by others, the Contractor shall notify the Project Engineer at once and shall cooperate with other Contractors or trades to correct such conditions.

D. Testing Equipment:

- 1. Testing equipment, in sufficient numbers, to be provided by the Contractor shall include but shall not be limited to thermographic test equipment, motor driven and electronic meggers, ground test sets, resistance testers, communications systems testers, timers, motor and phase rotation indicators and instruments, and meters and diagnostic equipment of all types necessary to complete the testing. All equipment shall be in good operating condition and shall be properly maintained and calibrated. The calibrations will be checked at intervals as requested by the Project Engineer, and recalibration will be done whenever necessary. Submit certified calibration reports for all equipment used.
- 2. Upon completion of testing, checking and preliminary operation of each item of equipment, circuit or system, the Contractor shall be responsible for any necessary maintenance and protection until the item is turned over to and accepted by the Owner's operating personnel; where periodic testing is a part of prescribed maintenance, the Contractor shall continue to make such tests and to record results according to approved procedures.

E. Inspection: The following are mandatory hold points for which prior Owner notification is required.

- 1. All underground duct lines, grounding systems, direct buried conduits and other work which will be concealed in concrete or backfilled with earth shall be Contractor, and photographed, inspected and released by the Project Engineer before concrete is poured or backfill is completed. Work covered prior to this inspection shall be uncovered for inspection and recovered, at no additional cost.
- 2. Rough-in inspection for electrical work.
- 3. Service inspection- electrical work for service energization.
- 4. Final inspection for electrical work.

END OF SECTION

SECTION 32 31 14 CHAIN-LINK FENCES AND GATES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The Work of This Section Includes, but is not limited to:
1. Chain-Link Fencing: Height as indicated on the Drawings
 2. Zinc-coated (Galvanized) steel fabric
 - a. Top rail, bottom tension wire
 - b. Gates: Size and swing as indicated on the Contract Drawings

1.2 QUALITY ASSURANCE

- A. Referenced Standards:
1. American Association of State Highway and Transportation Officials (AASHTO)
 - a. M 181 Standard Specification for Chain Link Fence
 2. American Society for Testing and Materials (ASTM):
 - a. A120 Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless
 - b. A121 Zinc-Coated (Galvanized) Steel Barbed Wire
 - c. A123 Zinc (Hot-Galvanized) Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars, and Strip
 - d. A392 Zinc-Coated Steel Chain-Link Fence Fabric

1.3 SUBMITTALS

- A. Manufacturer's Product Data: Submit manufacturer's latest publications of descriptive literature and product data.
- B. Shop Drawings: Submit shop drawings of fence layout including details of gates, fittings, hardware, and anchoring.
- C. Samples:
1. Fence Fabric: one 12" square
 2. Posts and Rails: one 12" length each size
 3. Caps, Ties, Hardware: one representative sample each
 4. Barbed Wire: one 18" length

PART 2 - PRODUCTS

2.1 CHAIN-LINK FABRIC

- A. Zinc-Coated (Galvanized) Steel; AASHTO M-181 / ASTM A392, Class 1. Hot-dip galvanized after weaving. One-piece full height of fabric.

- B. 2" Diamond Mesh; 9 gage (0.148") wire, 1290 lbf minimum breaking strength. ASTM A 121
1. Selvages barbed and barbed.

2.2 FRAMEWORK

- A. Galvanized Steel Pipe; ASTM A120, Schedule 40. Hot-dip galvanized inside and outside. Provide post caps.
- B. Fence Posts:
1. Corner, Terminal and Pull Posts: 2.875" O.D.
 2. Line Posts: 2.375" O.D.
 3. Top Rail, Brace Rails: 1.660" O.D.
 4. Truss Rods: 0.313" Rod, w/Turnbuckles

- C. Gate Posts:

<u>Single Gate</u>	<u>Double Gate</u>	<u>Post Size</u>
Up to 6'	Up to 12'	2.875" O.D.
7' to 12'	13' to 25'	4.000" O.D.
13' to 17'	26' to 35'	6.625" O.D.

2.3 GATES

- A. Framework:
1. 1.660" O.D. galvanized steel pipe, with diagonal truss rods. Provide horizontal center rail on gates over 6' high; vertical center upright on gate leaves over 8' wide.
- B. Hinges: Non-lift-off, 180° swing offset type, of size to accommodate gate frame and post.

2.4 FITTINGS

- A. Rail ends, rail sleeves, tension bars, brace ends, post tops and caps, latch forks, lock keepers, and other appurtenances, including gate hinges and barbed wire support arms:
1. Malleable, pressed or cast steel. Hot-dip galvanized after fabrication, ASTM A123.

2.5 TENSION WIRE

- A. #6 gage Galvanized Coil Spring Tension Wire; #9 gage Hog Rings and Tie Wire.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify that final grading in fence location is completed without irregularities which would interfere with fence installation. Do not commence work until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Measure and layout complete fence line; measure parallel to surface of ground.
- B. Locate and mark position of posts. Locate corner posts at each horizontal angle point; locate line posts at equal distant spacing on not more than 10' nor less than 8' centers, unless otherwise indicated on the Contract Drawings.

3.3 POST INSTALLATION

- A. Encase posts in concrete to minimum 3' depth. Extend concrete at least 6" below bottom of posts.
 - 1. 10" diameter encasement for line posts,
 - 2. 12" diameter encasement for end, corner, pull and gate posts.

Extend concrete 2" above finished grade, crowned to drain water away from the posts.

- B. Provide corner, end, and pull posts with a horizontal brace and tie rod on each side of the posts, extending and connecting to adjacent line posts.
- C. On fences less than 6' high, attach post caps with setscrews.

3.4 FABRIC INSTALLATION

- A. Remove slack from fabric by means of mechanical fence stretchers before making attachment to posts.
- B. Cut fabric to form one continuous piece between terminal posts.
- C. Hold bottom of fabric 1" to 2" above finished grade.
- D. Attach fabric to terminal posts with vertical tension bars threaded through fabric and held by tension bands spaced maximum 12" o.c.
- E. Fasten fabric to line posts with # 9 gage ties, or by integral fabric lock loops as applicable, at maximum 12" intervals.
- F. Fasten fabric to top rail and intermediate rail with # 9 gage ties at maximum 18" intervals.
- G. Fasten fabric to tension wire with hog rings and ties at maximum 18" intervals.
- H. Provide fabric hold-downs between posts.

3.5 GATES

- A. Install gates of the size and swing as indicated on the Contract Drawings.
- B. Fill gate frame with same fabric as fence.
- C. Attach fabric to gate frame vertical end members with tension bars threaded through fabric and held by tension bands spaced maximum 12" intervals; attach to horizontal rails, center upright, and brace rails with # 9 gage ties at maximum 12" intervals.

- D. Provide latch forks, lock keepers, catches, plungerbars and stop holders. Latches and plunger bars operable from either side of gate. Padlock hasp integral part of latch.
- E. Locate gate stops, set in concrete, so that plungerbar fully engages. Adjust hardware to provide smooth operation.

3.6 FIELD QUALITY CONTROL

- A. Remove and replace fencing which is improperly located or is not true to line and grade, and posts which are not plumb.
- B. Adjust brace rails and tension rods for rigid installation.
- C. Tighten hardware, fasteners and accessories.
- D. Remove excess and waste materials from the project site.

END OF SECTION

SECTION 33 01 32 MANHOLE TESTING

PART 1 - GENERAL

1.1 DESCRIPTION

A. The Work of this section includes, but is not limited to:

1. Vacuum Testing Sewer Manholes

B. Related Work specified elsewhere:

1. Section 33 39 13 - Manholes

1.2 QUALITY ASSURANCE

A. Reference Standards:

1. American Society for Testing and Materials (ASTM):

a. C1244 Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test

B. Test Acceptance:

1. No test will be accepted until the results are below the specified maximum limits.
2. The Contractor shall determine and correct the causes of test failure and retest until successful test results are achieved.

1.3 SUBMITTALS

A. Submit the following prior to start of testing:

1. Testing procedures
2. List of test equipment
3. Testing sequence schedule
4. Certification of test gauge calibration

1.4 JOB CONDITIONS

A. Do not allow personnel in manholes during vacuum or pressure testing.

PART 2 - PRODUCTS

2.1 VACUUM TESTING EQUIPMENT

- A. Vacuum pump
- B. Vacuum line
- C. Vacuum tester base with compression band seal and outlet port
- D. Shut-off valve
- E. Stop watch
- F. Plugs
- G. Vacuum gauge, calibrated to 0.1" Hg

PART 3 - EXECUTION

3.1 TESTING MANHOLES

- A. General: Testing using air shall be done whenever possible prior to backfilling to assist in locating leaks. Joint repairs are to be done on both outside and inside of the joint to ensure a permanent seal. Manholes shall be tested with manhole frame set in place.
- B. Vacuum test in accordance with ASTM C1244 and as follows:
 - 1. Plug all pipe openings; take care to securely brace the plugs and pipe.
 - 2. Inflate the compression band to effect a seal between the vacuum base and the structure; connect the vacuum pump to the outlet port with the valve open; draw a vacuum to 10" of Hg; close the valve; start the test.
 - 3. Test:
 - a. Determine the test duration for the manhole from the following table:

VACUUM TEST TABLE

<u>Manhole Diameter</u>	<u>Test Period</u>
48"	60 sec.
60"	75 sec.
72"	90 sec.

- b. Record the vacuum drop during the test period; if the vacuum drop is greater than 1.0" of Hg during the test period, the manhole shall be repaired and retested; if a vacuum drop of 1" of Hg does not occur during the test period, the test shall be discontinued and the manhole will be accepted.
- c. If the vacuum test fails to meet a 1" Hg drop in the specified time after repair, the unit shall be subjected to repair and retest as necessary.

END OF SECTION

SECTION 33 39 13 MANHOLES

PART 1 - GENERAL

1.1 DESCRIPTION

A. The Work of this section includes, but is not limited to:

1. Precast Concrete Manholes
2. Manhole Steps
3. Manhole Covers and Frames

B. Related Work specified elsewhere:

1. Mississippi Department of Transportation for Excavation and Backfill
2. Mississippi Department of Transportation for Concrete
3. Section 33 01 32: Manhole Testing

C. Applicable Standard Details:

1. 5100B Plans of Manhole Bases
2. 5100G Precast Manhole Base Detail
3. 5106 Standard Shallow Precast Manhole
4. 5107 Standard Deep Precast Manhole
5. 5109 Precast Manholes, Typical all joints
6. 5109A Manhole Cover with Anchor Bolt
7. 5110C Manhole Step Details
8. 5115 Heavy Duty Manhole Frame and Cover with Gasket in Frame

1.2 QUALITY ASSURANCE

A. American Society for Testing and Materials (ASTM):

1. A48 Specification for Gray Iron Castings
2. A496 Specifications for Steel Wire, Deformed, for Concrete Reinforcement
3. C32 Specification for Sewer and Manhole Brick
4. C270 Specifications for Mortar for Unit Masonry
5. C478 Specifications for Precast Reinforced Concrete Manhole Sections
6. C497 Standard Test Methods for Concrete Pipe, Manhole Sections, or Tile
7. C923 Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures and Pipes
8. C990 Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants
9. D448 Standard Sizes of Coarse Aggregate for Highway Construction
10. D4101 Specification for Propylene Plastic Injection and Extrusion Materials

B. Federal Country-of-Origin Marking Law:

1. United States Federal Law requires that imported castings (manhole frame and covers) are subject to specific country-of-origin markings in order to legally enter the United States.

1.3 SUBMITTALS

- A. Submit certification from material suppliers attesting that materials meet or exceed specification requirements.
- B. Shop Drawings:
 - 1. Submit detailed shop drawings of manhole sections and precast bases if used.
 - 2. Submit detailed shop drawings of manhole frames and covers.
 - 3. Submit detailed shop drawings of manhole steps.
- C. Submit manufacturers' descriptive literature and installation instructions for the resilient pipe-to-manhole connection and for the joint sealant compound.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Crushed Stone Subbase: ASTM D448, Size 57 (AASHTO M-43)
- B. Manhole Brick: ASTM C32, Grade MS, Solid
- C. Masonry Mortar: ASTM C270, Type S
- D. Cement Concrete: Mississippi Department of Transportation Standards

2.2 MANHOLES

- A. Precast Concrete Manhole Sections:
 - 1. Conforming to ASTM C478, with 5.5% + 1% air-entrained cement concrete.
 - 2. Provide flat slab top sections for manholes less than 4' deep or as indicated on Contract Drawings.
 - 3. Provide eccentric cone sections for manholes greater than 4' in depth, except as indicated on Contract Drawings.
 - 4. Provide 24" minimum access opening.
 - 5. Precast riser sections of length to suit.
 - 6. Precast bases of a design similar to the precast riser sections. Base to be integral with first riser section, minimum height of riser - 24".
- B. Manhole Steps:
 - 1. Steel reinforced copolymer polypropylene meeting the following specifications:
 - a. ASTM C478
 - b. ASTM C497, Method of test
 - c. ASTM D4101, PP0344B33534Z02 copolymer polypropylene
 - d. ASTM A496, D20, 1/2" reinforced rod.

C. Manhole Frames and Covers:

1. Cast Iron Castings: AASHTO M306/ASTM A48, AASHTO M105/Class 35B or better; free of bubbles, sand and air holes, and other imperfections. Designed for AASHTO Highway Loading H-25.
2. Cover Gasket: One piece O-ring gasket factory installed in a machined dovetail groove in the frame.
 - a. Gasket material of neoprene composition having good abrasion resistance, low compression set Type D, 40 durometer hardness and suited for use in sanitary sewer manholes.
 - b. Gluing of gasket is not permitted.
3. Contact surfaces machined and matched.
4. Cast cover inscription with pipeline service:
 - a. Comply with Federal Country-of-Origin Markings law required on imported castings.
 - b. Cast cover inscription with pipeline service and, when directed by the Project Engineer, the Owner's name.
5. Neenah R-1642 or East Jordan Iron Works 1045AGS. Equal products by LaBaron Foundry, Inc. will be considered.

D. Manhole Inserts: Manhole inserts shall be stainless steel Tetherlock Model Rainstopper as manufactured by Southwestern Packing and Seals, Shreveport, LA, Telephone (318)687-4330.

E. Joint Sealant: ASTM C990.

F. Resilient Pipe-to-Manhole Connection: ASTM C923.

PART 3 - EXECUTION

3.1 EXCAVATION

- A. Perform excavation to the line and grade indicated on the Contract Drawings.
- B. Location and depth of manholes as indicated on the Contract Drawings.

3.2 CONSTRUCTION

- A. Construct watertight manholes of precast concrete sections of the type indicated on the Contract Drawings.
- B. Construct 4' diameter manholes unless otherwise indicated.
- C. Provide precast concrete bases.
 1. Install a minimum of 4" of crushed stone subbase for cast-in-place concrete bases.
 2. Provide concrete to support the full length of the pipe section cast into the base as shown on the Standard Details.
 3. Install precast bases as shown on Standard Detail 5100G.
 - a. Set the precast base on 6" crushed stone subbase.
 - b. Provide a sealed, flexible resilient connection between pipe and precast base section.

D. Flow Channels:

1. Form flow channels in manhole bases as indicated on the Standard Details.
2. Slope channels uniformly from influent invert to effluent invert, minimum 1" drop.
3. Construct bends of the largest possible radius. Form channel sides and invert smooth and uniform; free of cracks, holes or protrusions.

E. Do not permit pipe to project more than 2 inches into the manhole.

F. Joint Sealant:

1. Seal joints between precast concrete manhole sections with joint sealant compound.
2. Apply joint sealant compound in accordance with instructions of the manufacturer. Place compound on the interior and exterior sides of the joint to be squeezed out by the weight of the upper section.
3. Trowel sealant compound smooth with manhole interior.
4. Do not apply rigid mortar to the joints between manhole sections.

G. Install manhole sections with steps in proper vertical alignment.

H. Precast Manhole Rings:

1. Use precast manhole rings to achieve elevation indicated for frame and cover.
2. Do not adjust elevation more than 1 ft. with precast rings.
3. Seal joints between precast rings with joint sealant compound.

I. Install Manhole Frames and Covers:

1. Set top of frames at finished grade elevation or other elevation indicated on the Contract Drawings.
2. Anchor manhole covers installed in unpaved areas as indicated on Standard Detail 5109A.
3. Seal joint between manhole frame and manhole with joint sealant compound.

3.3 BACKFILLING

- A. Test manhole as specified in Section 33 01 32 prior to backfilling.
- B. Perform backfilling as specified in MDOT Specification 203.
- C. Place backfill in approximately equal lifts on opposite sides of manhole to equalize opposing horizontal pressures.

END OF SECTION

SECTION 40 23 19 PIPE AND PIPE FITTINGS

PART 1 - GENERAL

1.01 DESCRIPTION

A. The Work of This Section Includes, but is not limited to:

1. Gravity Flow Yard Piping
2. Pressure Flow Yard Piping
3. Wastewater Treatment Process Piping

B. Related Work Specified Elsewhere:

1. MDOT Specifications for excavation and Backfill
2. Section 44 41 13 Package Plant Sewage Treatment System

1.02 QUALITY ASSURANCE

A. Install piping to meet the requirements of state and local building codes.

B. Materials contaminated with gasoline, lubricating oil, liquid or gaseous fuels, aromatic compounds, paint solvent, paint thinner, or acid solder will be rejected.

1.03 SUBMITTALS

A. Shop Drawings and Product Data: Submit shop drawings and manufacturer's catalog information for pipe materials, including but not limited to

1. Piping layout
2. Pipe hangers, supports, guides and anchors
3. Pipe wall sleeves and seals
4. Pipe coupling adapters

B. Manufacturer's Instructions: Submit manufacturer's instructions for installation of adapters and assembly of mechanical and push-on joints, including the manufacturer's maximum recommended deflection per joint.

C. Certificates: Submit certification from each product manufacturer attesting that the pipe, pipe fittings, joints, joint gaskets and lubricants meet or exceed specification requirements.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

A. During loading, transporting, unloading, and storage on site, exercise care to prevent damage to piping materials.

B. Do not drop pipe or fittings.

C. Store materials on site in enclosures or under protective coverings.

D. Assure that materials are kept clean and dry; do not store materials directly on the ground.

PART 2 - PRODUCTS

2.01 POLYVINYL CHLORIDE (PVC) PIPE

A. Gravity Sewer Pipe and Fittings:

1. Pipe 15 inch Diameter and Smaller: ASTM D3034, SDR-35
2. Flexible Elastomeric Seals: ASTM D3212
3. Seal Material: ASTM F477

B. PVC Pressure Pipe and Fittings:

1. ASTM D1785, Schedule 80, with fittings conforming to ASTM D2467.

2.02 GALVANIZED STEEL PIPE

A. Pipe: ASTM A53, Seamless. Schedule 40, unless otherwise indicated on the Contract Drawings.

B. Fittings:

1. Threaded: Malleable Iron, ANSI B16.3, 150# Class
2. Flanged: Cast Iron, ANSI B16.1, 125# Class
3. Socket Welded: Forged Steel, ANSI B16.11

C. Flanges: AWWA C 207.

D. Unions: Threaded, Forged Carbon Steel, MSS SP-83.

2.03 COPPER PIPE

A. Tubing: ASTM B88, Seamless, Temper H, Type K

B. Fittings:

1. Wrought Copper and Bronze, Solder Joint: ANSI B16.22
2. Cast Bronze, Solder Joint, Pressure: ANSI B16.18
3. Cast Bronze, Threaded: ANSI B16.15, 125# Class Bronze Flanges/Flange Fittings: ANSI B16.24, 150# Class
4. Cast Bronze, for Flared Copper Tube: ANSI B16.26

C. Brazing Filler Material: AWS 5.8

D. Brazing Flux: Federal Specification O-F-499, Type B

E. Soldering Flux: Federal Specification O-F-506, Type 1

F. Joints in copper tubing shall be made using 95-5 tin-antimony solder conforming to ASTM B32.

2.04 FLEXIBLE POLYETHYLENE PIPE

A. Pipe and fitting shall conform to ASTM D3350, SDR 9, ASTM D3035, ASTM F714 and ASTM D3350. NSF 14 and AWWA C901 - C906 approved. Pressure rating 200 PSI.

- B. Provide test reports verifying pipe compliance in regards to materials, dimensions, and pressure rating.

2.05 STAINLESS STEEL PIPE

- A. Pipe: Welded; ASTM A312, TP 304L; and ANSI B36.19, Schedules 40S.
- B. Fittings: ASTM A403, WP 304L.
- C. Joints: Welded, flanged or threaded as indicated on the Drawings. All flanges shall be stainless steel. All bolts shall be stainless steel.

2.06 PIPE ACCESSORIES

A. Couplings (Interior):

1. Factory pre-assembled couplings for plain-end pipe.
2. Sleeve: Carbon steel, minimum yield of 30,000 psi.
3. Followers: Steel
4. Bolts and Nuts: High-strength, low-alloy steel with heavy, semi-finished hexagon nuts.
5. Gaskets: Grade 60
6. Finish: Enamel
7. Anchor studs
8. Manufacturer: Smith-Blair, Type 411. Equal products by Dresser, Inc. or Straub shall be considered.

B. Couplings (Buried Service):

1. Factory pre-assembled couplings for plain-end pipe.
2. Sleeve: Ductile iron
3. Followers: Ductile iron
4. Bolts and Nuts: Stainless steel
5. Gaskets: Grade 60
6. Finish: Fusion bonded epoxy
7. Manufacturer: Smith-Blair, Type 441. Equal products by Dresser, Inc. or Straub shall be considered.

C. Transition Couplings (Interior):

1. Factory pre-assembled couplings for plain-end pipe.
2. Sleeve: Carbon steel, minimum yield of 30,000 psi.
3. Followers: Steel
4. Bolts and Nuts: High-strength, low-alloy steel with heavy, semi-finished hexagon nuts.
5. Gaskets: Grade 60
6. Finish: Enamel
7. Manufacturer: Smith-Blair, Type 413. Equal products by Dresser, Inc. or Straub shall be considered.

D. Transition Couplings (Buried Service):

1. Factory pre-assembled couplings for plain-end pipe.
2. Sleeve: Ductile iron
3. Followers: Ductile iron
4. Bolts and Nuts: Stainless steel
5. Gaskets: Grade 60
6. Finish: Fusion bonded epoxy

7. Manufacturer: Smith-Blair, Type 441. Equal products by Dresser, Inc. or Straub shall be considered.
- E. Reducer Couplings (Interior):
1. Factory pre-assembled couplings for plain-end pipe.
 2. Sleeve: Carbon steel, minimum yield of 30,000 psi.
 3. Followers: Steel
 4. Bolts and Nuts: High-strength, low-alloy steel with heavy, semi-finished hexagon nuts.
 5. Gaskets: Grade 60
 6. Finish: Enamel
 7. Manufacturer: Smith-Blair, Type 415. Equal products by Dresser, Inc. or Straub shall be considered.
- F. Reducer Couplings (Buried Service):
1. Factory pre-assembled couplings for plain-end pipe.
 2. Sleeve: Ductile iron
 3. Followers: Ductile iron
 4. Bolts and Nuts: Stainless steel
 5. Gaskets: Grade 60
 6. Finish: Fusion bonded epoxy
 7. Manufacturer: Smith-Blair, Type R441. Equal products by Dresser, Inc. or Straub shall be considered.
- G. Wall Seals:
1. Assembly of synthetic rubber links connected with stainless steel bolts; when the bolts are tightened, Delrin plastic pressure plates compress the rubber links to fill the annular space between the pipe and the wall sleeve to form a watertight seal.
 2. All wall seals located in penetrations through new walls that are below grade shall be installed in a cast iron wall sleeve that conforms to the requirements of this specification section or installed in a stainless steel wall sleeve. This steel wall sleeve shall consist of a piece of standard weight stainless steel pipe with an integral steel anchoring collar. This anchoring collar shall be 1/4" thick, shall project 3" beyond the pipe outer wall and shall be welded to the pipe around its entire periphery. No sleeves are required if hole is core drilled through a new or existing concrete wall.
 3. Century-Line prefabricated sleeves as manufactured by the Thunderline Corporation, Belleville, Michigan may be used in lieu of steel or cast iron sleeves for wall seal application.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Perform trench excavation to the line and grade indicated on the Contract Drawings and as specified in MDOT Section 203.
- B. Unless otherwise indicated on the Drawings, provide a minimum cover of 4'-0" above the top of piping laid in trenches.

3.02 LAYING PIPE IN TRENCHES

- A. Give ample notice to the Engineer in advance of pipe laying operations.
- B. Use laser alignment equipment during pipe laying operations.

- C. Lower pipe into trench using handling equipment designed for the purpose to assure safety of personnel and to avoid damage to the pipe; do not drop pipe.
- D. Lay pipe proceeding upgrade with the bell or groove pointing upstream.
- E. Lay to a uniform line with the barrel of the pipe resting solidly in bedding material throughout its length; excavate recesses in bedding material to accommodate joints, fittings and appurtenances; do not subject pipe to a blow or shock to achieve solid bedding or grade.
- F. Lay each section of pipe in such a manner as to form a close concentric joint with the adjoining section and to avoid offsets in the flow line.
- G. Pipe Joining:
 - 1. Clean and inspect each pipe and fitting before joining; assemble to provide tight, flexible joints that permit movement caused by expansion, contraction and ground movement.
 - 2. Use lubricant recommended by the pipe or fitting manufacturer for making joints.
 - 3. If unusual joining resistance is encountered or if the pipe cannot be fully inserted into the bell, disassemble joint, inspect for damage, reclean joint components, and reassemble joint.
- H. Assemble mechanical joints in accordance with ANSI/AWWA C111/A21.11, Appendix A; if satisfactory seating of the joint is not obtained at maximum torque, disassemble the joint, reclean, and reassemble using a new gasket.
- I. Push-On Joints:
 - 1. Assemble push-on joints in accordance with the recommendations of the pipe manufacturer.
 - 2. On field-cut pipe, file or grind the spigot to resemble the pipe as manufactured so that the spigot end will slip into the socket intact without hindrance or cause gasket damage.
 - 3. Install spigot end to full depth of socket.
 - 4. Prior to installation, mark the spigot end of field-cut pipe with the insertion depth.
- J. Check each pipe installed as to line and grade in place; correct deviation from grade immediately; deviation from the designed grade and alignment as indicated on the Contract Drawings will be cause for rejection.
- K. Do not deflect joints in pressure piping more than the maximum recommended by the pipe manufacturer.
- L. Place sufficient backfill on each section of pipe, as it is laid, to hold pipe firmly in place.
- M. Clean the interior of the pipe as the work progresses; where cleaning after laying is difficult because of small pipe size, use a suitable swab or drag in the pipe and pull forward past each joint immediately after joining has been completed.
- N. Keep trenches and excavations free of water during construction.
- O. When the work is not in progress, and at the end of each workday, securely plug ends of pipe and fittings to prevent trench water, earth or other substances from entering the pipe or fittings.

3.03 BACKFILLING TRENCHES

- A. Backfill pipeline trenches only after examination of pipe laying by the Engineer.

- B. Backfill trenches as specified MDOT Section 203.

3.04 INTERIOR PROCESS PIPING INSTALLATION

- A. Pipe Layout in Buildings:

1. Coordinate work to prevent interference between architectural, structural, electrical and mechanical features; the Contract Drawings are generally diagrammatic due to their small scale.
2. Provide such offsets, fittings and other items as may be required to suit conditions.
3. Do not place joints or fittings over switchboards, panels, motors or other electrical equipment.
4. The completed installation shall present a neat, orderly appearance; do not block openings or passageways; run piping parallel to the walls of buildings or structures.
5. Provide clearance between piping, walls, floors, machinery and equipment to prevent the transmission of noise and vibration.
6. Orient handwheels, levers, valve operators and other valve actuators for convenience of operation; set gate valves with the stem above the horizontal.
7. Cut pipe to measurements established at the site and install without springing or forcing; make changes in direction with fittings.
8. Connect ferrous piping to non-ferrous piping with dielectric couplings.

- B. Equipment Connections:

1. Make connections to pumps and other equipment in a manner to eliminate strains on piping and equipment.
2. Install unions or flanges adjacent to equipment and wherever their use will facilitate removal of equipment.

- C. Threaded Joints: ANSI B2.1, NPT.

1. Cut threads full and clean with sharp dies; ream ends of pipe after threading and before assembly to remove burrs; leave not more than three pipe threads exposed at each connection; use joint compound or thread tape on the male thread only.

- D. Solder Joints:

1. Ream or file pipe to remove burrs; clean and polish contact surfaces of joints.
2. Apply flux to both male and female end; insert end of tube into fittings full depth of socket.
3. Bring joint to soldering temperature, in as short a time as possible, forming continuous solder bead around entire circumference of joint.

- E. Solvent Cemented Joints (PVC): Make joints in pipe and fittings in accordance with the procedures and techniques in ASTM D2855.

- F. Fusion Welded Joints (PE): Make joints in pipe and fittings in accordance with the procedures and techniques in ASTM D2657 or ASTM D3261 as applicable.

3.05 PIPE SUPPORTS

- A. Support piping from structural construction using pipe hangers, pipe riser clamps and pipe clamp hangers in conjunction with beam clamps, brackets or other equipment as dictated by structure construction.

- B. Trapeze hangers approved by the Engineer may be used where several horizontal pipes run closely parallel; secure pipes on trapeze hangers to prevent sideway motion.
- C. Install supports for piping 2-1/2 inches and greater in diameter in accordance with details indicated on the Contract Drawings; support piping under 2-1/2 inches diameter as specified herein.
- D. Vertical Piping:
 - 1. Secure at sufficiently close intervals to keep pipe in alignment and to support weight of pipe and its contents.
 - 2. Support vertical iron and steel pipe on maximum 5'-0" centers with steel pipe riser clamps.
 - 3. Support vertical copper tubing at no more than 10'-0" spacing, using plastic coated steel pipe riser clamps or pipe clamp hangers at end of runs and at intermediate points as installation dictates.
 - 4. Support vertical plastic pipe at 4'-0" centers, using plastic coated pipe riser clamps or pipe clamp hangers at end of runs and at intermediate points as installation dictates.
- E. Horizontal Piping:
 - 1. Support at sufficiently close intervals to prevent sagging, thrust restraint, and vibration.
 - 2. Install hangers or supports at ends of runs or branches and at each change of direction or alignment.
 - 3. Install steel clevis-type pipe hangers for horizontal iron and steel pipe on maximum 10'-0" centers.
 - 4. Install steel clevis-type pipe hangers for copper tubing on 6'-0" centers for 1-1/4" size and smaller, and on 10'-0" centers for copper tubing larger than 1-1/4" size. Install plastic coated ring-type pipe hangers for horizontal plastic pipe on maximum 4'-0" centers, close to every joint, at ends of each branch, and at each change in direction of elevation; hangers shall not compress, distort, cut or abrade plastic piping and shall permit free movement of the pipe.
- F. Pipe Bracing: The Contractor is responsible for properly bracing piping against lateral movement or sway. The Owner shall review with the Contractor and approve method of bracing of piping at each location prior to Contractor proceeding with the installation of the bracing. Bracing shall be installed at all locations where sway is anticipated and as directed by the Engineer.

3.06 CUTTING AND PATCHING

- A. Do not cut and patch existing structures without prior permission from the Owner.
- B. Perform cutting and patching where indicated in the Contract Drawings. Patch to match adjacent finishes.

END OF SECTION

SECTION 40 23 20

VALVES AND PIPING SPECIALTIES

PART 1 - GENERAL

1.1 DESCRIPTION

A. The Work of This Section Includes, but is not limited to:

1. Provide and install all valves and other piping specialties as specified, as indicated on the Contract Drawings, and as necessary to provide complete piping systems as intended.

B. Related Work Specified Elsewhere:

1. Section 40 23 19 - Pipe and Pipe Fittings

1.2 QUALITY ASSURANCE

A. Products shall be new, the latest standard product of reputable manufacturers, and shall have replacement parts available.

B. Potable water system materials shall bear the seal of approval of the National Sanitation Foundation (NSF).

C. Materials contaminated with gasoline, lubricating oil, liquid or gaseous fuels will be rejected.

1.3 SUBMITTALS

A. Shop Drawings and Product Data:

1. Submit manufacturer's catalog data, literature, illustrations and specifications.
2. Submit shop drawings of valves and valve operators including dimensions, net assembled weight of each size valve furnished, construction details, and materials of components.
3. Submit manufacturer's installation instructions.
4. Submit manufacturer's maintenance instructions and complete parts lists.

B. Certificates:

1. Submit a Certificate of Compliance, together with supporting data, from the materials supplier(s) attesting that valves, accessories, and specialties meet or exceed specification requirements.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver valves and accessories to the job site in the manufacturer's boxes or crates. Mark each valve as to size, type and installation location.

B. Seal valve ends to prevent entry of foreign matter into valve body.

C. Store valves and accessories in areas protected from weather, moisture and possible damage.

D. Do not store materials directly on the ground.

- E. Handle valves and accessories to prevent damage to interior and exterior surfaces.

1.5 JOB CONDITIONS

- A. Investigate conditions affecting this work and coordinate with other contractors to prevent interference between architectural, structural, mechanical and electrical features.
- B. The Contract Drawings for small diameter pipe are generally diagrammatic and it is not possible to indicate all fittings, valves, and other items required for a complete operating system. Provide all such valves, fittings and specialties to complete the systems as intended.
- C. Provide necessary valve wheels, keys, wrenches, levers and stem extensions. Locate to assure accessibility and operability throughout the operating range without interference. Install valve stem supports, guides and operators. For buried valves, provide valve boxes and stem extensions to grade. Provide valve accessories of the same manufacturer as the valve, unless specified otherwise.
- D. Provide chain operators for valves 4" size and larger that are located 6'0" or more above finished floor level.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide valves and piping specialties of the size and type indicated on the Contract Drawings.
- B. Cast iron valve material shall meet or exceed the requirements of ASTM A126, Class B.
- C. Valve flanges shall conform to ANSI B16.10, (125# and 250# Class) as applicable.
- D. Mechanical joint valve ends shall conform to ANSI/AWWA C111/A21.11.
- E. Screwed valve ends shall conform to ANSI B2.1; American Standard Taper pipe threads.
- F. Valves shall be of a design that requires no more than 50 lbs pull on the handwheel or standard valve wrench to provide positive shutoff against rated working pressure.

2.2 BUTTERFLY VALVES (METAL BODY)

- A. Rubber seated, tight-closing type designed, manufactured and tested in accordance with AWWA C504, latest revision.
- B. Valve Body: Cast iron, ASTM A126, Class B.
- C. Body Seat: 18-8, 304 or 316 stainless steel if a resilient seat ring is provided in the valve vane. Body seat shall be Buna-N or EPDM if a stainless steel seat ring is provided in the valve vane. Valves used on blower piping shall have a 300 degree F temperature rating.
- D. Valve Vane: Ductile iron, A536, Grade 65-45-12, with rubber seat secured with a serrated 18-8 stainless steel clamp ring. Rubber seat shall be full 360° capable of replacement or adjustment without special tools.

- E. Valve Shafts: 18-8 Type 304 stainless steel with diameter equal or greater than as shown in AWWA C504.
- F. 200 psi working pressure. All butterfly valves used on air service shall be rated for a 250 degree F operating temperature.
- G. Furnish with valve position indicator.
- H. Notch-plate lever throttling handles for valves 6" size and smaller.
- I. Heavy-duty manual actuators for valves larger than 6" size.
 - 1. Sealed and permanently lubricated. Fully supported, exert no thrust or load on valve shaft.
 - 2. Vertical, right-angle or buried type as applicable. Crank handle, handwheel, or square nut operator as indicated on the Drawings.

2.3 PVC KNIFE GATES

- A. PVC knife gates are utilized on air lifted return sludge, waste sludge, and scum lines.
- B. Valve shall be constructed of high density PVC with gate having a stainless steel handle.
- C. Valve shall be rated for a 10 psi minimum working pressure.
- D. Coordinate valve connection size and type with type of piping being utilized. If valve is unavailable in flanged ends, then solvent weld flanges on adjoining piping to facilitate valve removal.
- E. PLC knife gates shall be as supplied by Aquamasters USA, equivalent products by Red Valve and ACT Inc. will be considered.

2.4 BALL VALVES

- A. Ball valves utilized on copper water piping, unless otherwise noted, shall have a bronze body, chrome-plated brass ball, bronze stem, packing gland and nut, and a lever type handle. Seats and seals shall be reinforced TFE. The valve shall have threaded end or solder end connections and a minimum working pressure rating of 200 psi. Ball Valves shall be as manufactured by Nibco, Inc., equivalent products by ACT Inc. and Tyco Flow Control will be considered.
- B. Stainless Steel Ball Valves:
 - 1. Provide ball valves with stainless steel bodies and ball, double seal TFE seat, TFE stem seal and bonnet O-ring where stainless steel ball valves are indicated on the Contract Drawings. Ball valves shall have a 200 psi working pressure and flanged or threaded joints as applicable.
- C. PVC Ball Valves (For Use on PVC Pipe):
 - 1. True union, double entry; Viton O-ring seals, self-lubricating Teflon seats; 150 psi working pressure. Ball shall be positively retained to prevent blowout if valve union is removed.

2.5 HOSE BIBBS

- A. Cast brass with replaceable valve set, stainless steel shaft, nylon washer. 3/4" NPT. Fixed operating wheel for outdoor service. Provide frost free type for outdoor service.

2.6 SOLENOID VALVES

- A. Two-way type. Forged brass body, Buna N seat, 150 psi working pressure. 0 psi operating differential. NEMA IV enclosure, 120 volt, continuous duty coil. Normally closed, energize-to-open.

2.7 PRESSURE REDUCING/REGULATOR VALVES (AIR AND LIQUID)

- A. Maintain constant downstream pressure regardless of varying upstream pressures.
- B. Bronze body, renewable nickel-alloy seat, removable stainless steel strainer, replaceable bronze diaphragm, stainless steel adjustment spring.
 - 1. 10-35 psi or 25-75 psi adjustment range as indicated on the Contract Drawings.
 - 2. 250 psi working pressure

2.8 BACKFLOW PREVENTER

- A. Reduced pressure principle type to protect against back-pressure backflow and back-siphonage. Size as indicated on the Contract Drawings.
- B. Bronze body construction, stainless steel internal parts and flange bolts, tight seating rubber check valve assemblies. Provide complete with inlet Y-strainer and non-rising stem gate valves before and after the device. Provide with integral drain cup with air gap and threaded connection for piping drainage to floor drain.
- C. NSF approved. Certified to meet or exceed the requirements of ASSE Standard 1013, AWWA C506, and USC Foundation for Cross-Connection Control Research.

2.9 EMERGENCY EYE WASH

- A. Interior Installation:
 - 1. Wall mounted indoor eye wash with edge of bowl to project no more than 12-3/4" from the wall.
 - 2. Eye Wash: Hand operated, 11" dia. yellow ABS bowl with twin spray heads with protective dust covers.
 - 3. Eye wash shall require no more than a 3.2 gpm flow rate for adequate performance.
 - 4. Eye wash shall be a Speakman Model SE-580, equivalent products by Guardian Equipment and Dental EZ Group will be considered.

2.10 CHECK VALVES (SODA ASH DILUTION WATER SUPPLY)

- A. Check valves shall be of "duck bill" shaped pinch tube type with PVC body, Viton pinch tube sleeve, female NPT ends, and a 75 psi minimum working pressure rating. The check valve shall have removable end caps to allow sleeve replacement. Provide a PVC plug for plugging gage tap.

- B. Check valve shall be Tideflex Series 2633 as manufactured by Red Valve.

2.11 FLOOR DRAINS

- A. Floor drains shall have PVC or polypropylene body with membrane flange, invertible camping collar with weepholes and threaded or solvent weld outlet as required. Strainer shall be adjustable height, round PVC with 6 inch diameter top and nine square inch open area.

2.12 TRAPS

- A. Deep Seal Traps: PLC with inlet and outlet matching connected piping and cleanout where indicated:
 1. 2-inch Size: 4-inch minimum water seal.
 2. 2-1/2-inches and Larger: 5-inch minimum water seal.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install valves and accessories in accordance with the manufacturer's instructions.
- B. Inspect joint surfaces for structural soundness and thoroughly clean before installation.

3.2 FLOOR DRAIN INSTALLATION

- A. Install floor drains according to manufacturer's written instructions, in locations indicated.
- B. Install floor drains at low points of surface areas to be drained, or as indicated. Set grates of drains flush with finished floor or as indicated. Size outlets as indicated.
- C. Set floor drains below elevation of surrounding finished floor to allow for floor drainage. Set with grates depressed according to the following drainage area radii:
 1. Radius, 30 inches or less: Equivalent to 1 percent slope, but not less than 1/4 inch total depression.
 2. Radius, 30 inches to 60 inches: Equivalent to 1 percent slope.
 3. Radius, 60 inches to larger: Equivalent to 1 percent slope, but not greater than 1 inch total depression.
- D. Install individual traps for floor drains connected to sanitary building drain unless otherwise indicated. Use deep seal traps.
- E. Install floor drain flashing collar or flange so that no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes, where penetrated.
- F. Position floor drains for easy access and maintenance.

3.3 ADJUSTMENT

- A. Check and adjust valves and accessories for smooth operation.

END OF SECTION

SECTION 40 23 21 TESTING PIPING SYSTEMS

PART 1 - GENERAL

1.1 DESCRIPTION

A. The Work of This Section Includes, but is not limited to:

1. Gravity Pipe Low-Pressure Air Testing
2. Pressure Pipe Hydrostatic Testing
3. Disinfection of Potable Water Piping

B. Related Work Specified Elsewhere:

1. MDOT Specification for Excavation and Backfill
2. Section 40 23 19 - Pipe and Pipe Fittings
3. Section 40 23 20 - Valves and Piping Specialties

1.2 QUALITY ASSURANCE

A. Reference Standards:

1. American Society for Testing and Materials (ASTM):
 - a. ASTM F1417 Standard Test Method for Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air
2. American National Standards Institute (ANSI); American Water Works Association (AWWA):
 - a. ANSI/AWWA C600 Section 4 - Hydrostatic Testing
 - b. ANSI/AWWA C651 Disinfecting Water Mains

B. Test Acceptance:

1. No test will be accepted until leakage rate is below specified maximum limits.
2. The Contractor shall determine and correct the cause of test failures and retest until successful test results are achieved.

1.3 SUBMITTALS

A. Submit the following prior to start of testing:

1. Test Procedures
2. List of Test Equipment
3. Testing Sequence Schedule
4. Certification of test pressure gauge calibration and accuracy
5. Certification of composition of chlorination products

PART 2 - PRODUCTS

2.1 DISINFECTION PRODUCTS

A. Liquid Chlorine: AWWA B301

- B. Calcium Hypochlorite and Sodium Hypochlorite: AWWA B300

2.2 AIR TESTING EQUIPMENT

- A. Air Compressor
- B. Air Supply Lines
- C. Test Connections
- D. Pressure Regulator
- E. Pressure Relief Valve
- F. Pressure Gauge Calibrated to 0.1 lb/sq. in.

2.3 HYDROSTATIC TEST EQUIPMENT

- A. Hydro Pump
- B. Pressure Hose
- C. Test Connections
- D. Pressure Relief Valve
- E. Pressure Gauge Calibrated to 0.1 lb/sq. in.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Backfill trenches in accordance with MDOT Specification Section 203.
- B. Provide concrete reaction support blocking, cured a minimum of 7 days, or a minimum of 3 days if high early strength concrete is used, for the pipeline to be tested.
- C. Flush pipeline to remove debris; collect and dispose of flushing water and debris in a manner conforming to Regulatory Agency requirements.

3.2 AIR TESTING GRAVITY FLOW PIPELINES

- A. Test each section of gravity flow pipeline between structures; plug all pipeline outlets; brace plugs to offset thrust.
- B. Slowly introduce air to the plugged pipeline until internal air pressure is approximately 4.0 psig.
- C. If groundwater is present, determine its elevation above the springline of the pipe by means of a piezometric tube; for every foot of groundwater above the springline of the pipe, increase the starting test pressure reading by 0.43 psig; do not increase pressure above 9 psig.

- D. Allow air pressure to stabilize for at least five minutes; adjust pressure to 3.5 psig or to the increased test pressure as determined above if groundwater is present; start the test.
- E. Determine the test duration for a section with a single pipe size from the following table.

AIR TEST TABLE

Minimum Specified Time for a 1.0 psig Pressure Drop for Size and Length of Pipe Indicated for Q=0.0015

Pipe Diameter, in.	Min. Time, min's	Length for Min. Time, ft.	Time for Longer Length, s	Specification Time for Length (L) Shown, min's								
				100 ft	150 ft	200 ft	250 ft	300 ft	350 ft	400 ft	450 ft	
4	3:46	597	0.380 L	3:46	3:46	3:46	3:46	3:46	3:46	3:46	3:46	3:46
6	5:40	398	0.854 L	5:40	5:40	5:40	5:40	5:40	5:40	5:40	5:42	6:24
8	7:34	398	1.520 L	7:34	7:34	7:34	7:34	7:36	8:52	10:08	11:24	
10	9:26	239	2.374 L	9:26	9:26	9:26	9:53	11:52	13:51	15:49	17:48	
12	11:20	199	3.418 L	11:20	11:20	11:24	14:15	17:05	19:56	22:47	25:38	
15	14:10	159	5.342 L	14:10	14:10	17:48	22:15	26:42	31:09	35:36	40:04	
18	17:00	133	7.692 L	17:00	19:13	25:38	32:03	38:27	44:52	51:16	57:41	
21	19:50	114	10.470 L	19:50	26:10	34:54	43:37	52:21	61:00	69:48	78:31	
24	22:40	99	13.674 L	22:47	34:11	45:34	56:58	68:22	79:46	91:10	102:33	
27	25:30	88	17.306 L	28:51	43:16	57:41	72:07	86:32	100:57	115:22	129:48	
30	28:20	80	21.366 L	35:37	53:25	71:13	89:02	106:50	124:38	142:26	160:15	
33	31:10	72	25.852 L	43:05	64:38	86:10	107:43	129:16	150:43	172:21	193:53	
36	34:00	66	30.768 L	51:17	76:55	102:34	128:12	153:50	179:29	205:07	230:46	

- F. Record the drop in pressure during the test period; if the air pressure has dropped more than 1.0 psig during the test period, the line is presumed to have failed; if the 1.0 psig air pressure drop has not occurred during the test period, the test shall be discontinued and the line will be accepted.
- G. If the line fails, determine the source of the air leakage, make corrections and retest. After the leaks are repaired, retest the entire section.
- H. The Contractor has the option to test the section in incremental stages until the leaks are isolated.

3.3 HYDROSTATIC LEAKAGE TESTING PRESSURE FLOW PIPELINES

- A. Applicable to pressure flow yard piping.
- B. Hydrostatically test each section of pressure pipeline at the pressure designated on yard piping plan, based on the elevation of the lowest point in the pipeline corrected to the elevation of the test gauge, for a minimum period of one hour.
- C. Slowly fill the section with water, expelling air from pipeline at the high points; install corporation cocks at high points if necessary; after all air is expelled, close air vents and corporation cocks and raise the pressure to the specified test pressure.
- D. Observe joints, fittings and valves under test, remove and renew cracked pipe, joints, fittings, and valves showing visible leakage; retest.

- E. After visible deficiencies are corrected, continue testing at the same test pressure for an additional two hours to determine leakage rate.
- F. Maintain pressure within plus or minus 0.5 psig of test pressure.
- G. Leakage is defined as the quantity of water supplied to the pipeline necessary to maintain test pressure during the period of the test and shall not exceed that determined by the following formula:

$$L = \frac{ND (P)^{1/2}}{7,400}$$

Where: L is the allowable leakage in gallons per hour
 N is the number of joints in the section tested
 D is the nominal diameter of pipe in inches
 P is the average test pressure in psig

- H. If the test of the pipeline indicates leakage greater than that allowed, locate the source of the leakage, make corrections and retest until leakage is within the allowable limits.
- I. Correct visible leaks regardless of the amount of leakage.

3.4 HYDROSTATIC TESTING PRESSURE PIPING SYSTEMS

- A. Applicable to chlorine solution piping system, potable water pressure system, chemical feed systems, and all process piping systems within the wastewater treatment plant buildings.
- B. Fill entire systems with water and vent air from the system at least 24 hours before the actual test pressure is applied.
- C. Apply the required test pressure when the water and average ambient temperatures are approximately equal and constant.
- D. Test piping at pressures listed on Yard Piping Plan; avoid excessive pressure on safety devices and mechanical seals.
- E. Maintain test pressure for a minimum of 2 hours without drop after the force pump has been disconnected.
- F. Visually inspect joints, fittings, and valves while pipe is under test pressure.
- G. Correct all visible leaks and retest as often as necessary until satisfactory results are achieved.

3.5 DISINFECTION OF POTABLE WATER PIPING

- A. Conduct disinfection of potable water system after completion of satisfactory pressure and leakage testing.
- B. Flush potable water system, or section thereof, with clean potable water until no dirty water appears at any outlet point.
- C. Fill system or section thereof to be disinfected with a water-chlorine solution containing at least 50 parts per million of chlorine; valve off system or portions thereof and allow it to stand for 24

hours, or; use water-chlorine solution containing at least 200 parts per million of chlorine and allow it to stand for 3 hours.

D. Following specified standing time, flush system with clean potable water until no chlorine remains in the water leaving points of outlet.

E. Bacteriological Testing:

1. After flushing and before the system is placed in service, test the system for bacteriological quality.
2. Collect a sample from each outlet point in sterile bottles; obtain bacteriological analysis of test samples from an independent testing laboratory approved by the Project Engineer; submit test results to the Project Engineer.
3. Failure to meet State Health Standard requirements will be cause for the Contractor to rechlorinate and retest the system, at no additional cost to the Owner.

SEE TABLE BELOW

END OF SECTION

TABLE

Required Flow to Flush Pipelines *(a)

<u>Pipe Dia. (Inches)</u>	<u>Flow Required To Produce 25 fps Velocity in gpm</u>	<u>Size of Tap on Main (Inches)*(b)</u>	<u>Hydrant Number</u>	<u>Outlets Size (Inches)</u>
4	100	15/16	1	2-1/2
6	220	1-3/8	1	2-1/2
8	390	1-7/8	1	2-1/2
10	610	2-5/16	1	2-1/2
12	880	2-13/16	1	2-1/2

*(a) With a 40 psi pressure in main, hydrant flowing to atmosphere, a 2-1/2" hydrant outlet will discharge approximately 1,000 gpm.

*(b) Size of tap on main with no length of discharge piping.

SECTION 44 41 13 PACKAGE PLANT SEWAGE TREATMENT SYSTEM

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The Equipment of This Section Includes, but is not limited to:
 - 1. Package sewage treatment plant, with necessary tankage, capable of treating domestic sewage by means of the extended aeration activated sludge process.
 - 2. Included in the package plant treatment system will be flow equalization tank, aeration tank, chlorine contact tank , aerobic digester tank, influent bar screen, all pumps, air diffusion piping, air lift sludge return, air lift skimmer valves, internal piping, blowers and accessories, chemical feed systems, main treatment plant control panel, precast tank access slab, and all miscellaneous and ancillary equipment required for a complete, operable system to perform the intended sewage treatment.
- B. The package plant sewage treatment system shall be designed for underground installation with the side walls finishing above the adjoining grade. See Contract Drawings for required tank elevations.
- C. The Package Plant Sewage Treatment System Supplier shall also be responsible for providing the Chemical Feed Building specified in Section 13 34 23, and the Treatment Plant Control Panel specified in Section 25 00 00, thereby having total responsibility for the Package Treatment System.
- D. Related Work Specified Elsewhere:
 - 1. MDOT Specification for Excavation and Backfill, Section 203
 - 2. Division 26 - Electrical.

1.02 QUALITY ASSURANCE

- A. Influent Criteria:
 - 1. Average Daily Flow: 7,500 gallons per day (5.2 gpm)
 - 2. Peak Flow Rate: 13 gpm *
 - 3. BOD₅: 250 mg/l
 - 4. SS: 200 mg/l
 - 5. NH³: 60 mg/l

* Flow will occur erratically and must be equalized to maintain the average daily flow over a 24 hour period.
- B. Performance Criteria: The effluent quality from the treatment plant final clarifier shall be equal to or less than the following:

	<u>Monthly</u>	<u>Weekly</u>
1. BOD ₅ :	30 mg/l	45 mg/l
2. SS:	30 mg/l	45 mg/l
3. pH:	8.5 (max.)	6.5 (min.)
4. E Coli:	126 mpn/100 ml Monthly Geometric Mean	

- C. Soda ash addition for alkalinity adjustment will be provided at the location shown on the Contract Drawings.
- D. Unit Design Criteria:
1. Provide aeration system with minimum detention period of 25 hours based on the specified design flows, capable of achieving effluent limits of BOD₅.
 2. The maximum organic loading on the aeration system shall be 15.0 lb. BOD₅/1,000 cu. ft. based on a 0.0075 MGD design flow @ 15.6 lb. BOD/day.
 3. The aeration tank shall have a minimum side water depth of 12 ft.
 4. Base clarifier design parameters on the following hydraulic and solids loadings, calculated at 100% of the above daily design flows:
 - a. Hydraulic Loading: 87 gpd/sq. ft.
 - b. Weir Loading: 469 gpd/lf.
- E. Reference Standards:
1. American Welding Society (AWS):
 - a. Structural Welding Code AWS D1.1.
 2. Electrical components shall meet the requirements of the National Electrical Manufacturer's Association (NEMA) and NFPA 820.
 3. ACI American Concrete Institute
- F. The package treatment plant supplier is responsible for providing the main treatment plant control panel which are specified in Section 25 00 00.
- G. The treatment plant design shall be such that will prevent freezing in any area or any piping.
- H. All applicable regulatory requirements of the Mississippi Department of Environmental Quality (DEQ) and the U.S. EPA (Environmental Protection Agency) with regard to the minimum dimensions, capacities, performance, etc. of the proposed wastewater treatment plant shall be met.
- I. Substitutions:
1. Substitutions of equipment may be made if the proposed substitution is superior or equal in construction and performance. The substitutions shall not conflict with the specifications and contract drawings. Substitutions are subject to approval by the Project Engineer. The Contractor shall be responsible for all incidental cost incurred for installation of equipment or treatment units of a size or type other than indicated on the Contract Drawings; including but not limited to engineering, reimbursement of additional Project Engineer review time, DEQ, piping, site work, additional concrete, electrical work, etc., and shall include all such incidental costs in his bid.
- J. Experience Requirements:
1. The wastewater treatment plant shall be the product of a wastewater treatment plant manufacturer with a minimum of ten years experience in the design, manufacturing, and construction of wastewater treatment plants. The manufacturer shall have installed a minimum of ten similar wastewater treatment plants in the last five years (in process and size) to meet the necessary experience requirements. A list of similar wastewater treatment plants supplied by the manufacturer with contact names, telephone numbers, plant location and size shall be submitted to the Project Engineer prior to the award of the contract.

K. Quality of Material:

1. All materials shall be of excellent quality used for the purpose in commercial practice. Material shall be free from all defects and imperfections that may affect the serviceability of the finished product. All products shall be constructed with excellent workmanship and shall be aesthetically acceptable to the Owner.
2. The equipment supplied under this specification shall be the standard product of the specified manufacturer so that prompt and continuous service and delivery of spare parts may be secured. The component parts of the unit need not be the product of the same manufacturer but shall be supplied by one manufacturer.

1.03 SUBMITTALS**A. Shop Drawings and Product Data:**

1. Submit detailed shop drawings sealed by a professional engineer licensed in the State of Mississippi and manufacturer's product data for system materials and component equipment, including pertinent engineering data. Submit detailed plans of the treatment plant, including plan view, sections, individual tank, details, mechanical details, and a hydraulic profile.
2. Submit performance curves for each pump and performance data for each blower. Submit design calculations for all blowers and for all pumps determining the system curves at the minimum and maximum static head conditions. Plot the system curves on the pump performance curve to demonstrate the pump will be operating at an acceptable point on its performance curve.
3. Show complete information concerning fabrication, installation, anchoring, fasteners and other details.
4. Manufacturer shall provide an affidavit certifying tanks have been designed to resist all loading and attest to structural adequacy; structural engineer certified in the state of Mississippi shall certify to structural integrity and tank must resist hydrostatic uplift based on the ground water level being at grade level.
5. Submit pertinent engineering data and certified plant performance data based on tests from existing similar plants.

B. Maintenance Data and Operating Instructions:

1. Submit five(5) copies of an Operation and Maintenance Manual for the package treatment plant including detailed description of function of each principal component, procedures for operation, instructions for overhaul and maintenance; include lubrication schedule, safety precautions, test procedures and parts lists. The manual shall include phone numbers and addresses of all manufacturers of major components.

C. Maintenance Material (Spare Parts):

1. Provide four spare diffusers of each type and size utilized.
2. Provide one spare equalization pump
3. Provide 1 spare solenoid valve of each type and size utilized
4. Provide 1 spare filter for each blower
5. Package each part individually or in sets in moisture-proof containers or wrappings, clearly labeled with part name and manufacturer's part/stock number.
6. Provide any special tools required for equipment maintenance and overhaul.

1.04 FIELD SERVICES

- A. Provide the services of a manufacturer's representative experienced in the installation and operation of the equipment supplied under this specification.

- B. Services shall be provided for not less than five 8-hour mandays on-site for installation inspection, hydraulic start-up, performance testing and instruction of the Owner's operating personnel. Provide detailed startup forms indicating voltages, phase, and pump draws of each motor, verification of rotation and vibration of all equipment, all timer settings, etc. Also, provide 8 hours of process training. Training shall be provided by Mississippi certified plant operation with a minimum of five years of experience in the operation of this type of plant to explain the functions and operation of this specific plant to the Owner.

PART 2 - PRODUCTS

2.01 TREATMENT SYSTEM DESCRIPTION

- A. This work consists of furnishing and installing one complete Extended Aeration Wastewater Treatment Facility with all necessary parts and equipment as described in the following specifications, and as shown on the Contract Drawings. The plant tankage shall be manufactured, installed and assembled by one manufacturer. The extended aeration wastewater treatment plant shall be as manufactured by McNeil Water and Wastewater, Inc. of Tallahassee, FL, Environmental Construction Corporation of Pass Christian, MS, or Mack Industries of Brunswick, OH.

The Contract Drawings are based on a package treatment system provided by McNeil Water and Wastewater, Inc. utilizing round precast concrete tanks. Square or rectangular concrete tanks shall also be acceptable. All process equipment shall be as specified. If the McNeil Water and Wastewater, Inc. treatment system is not selected by the Contractor, the Contractor is responsible for providing revised site plan layout, tank layout, yard piping, and electrical drawings for the selected manufacturer at no additional cost to the Owner. These drawings shall be sealed by a Professional Engineer of the State of Mississippi. The information shall be submitted within six (6) weeks after Notice to Proceed is given.

- B. Principal tankage shall include:

1. Flow Equalization Tank
2. Aeration Tank
3. Final Clarifier
4. Chlorine Disinfection Tank
5. Sludge Storage Tank

- C. Contractor to provide the following equipment to achieve one completely functional and operation wastewater treatment plant as describe herein, and on the Contract Drawings shall include but is not limited to:

1. Tankage with volumes and capacity as defined in these specifications
2. Screening unit
3. Submersible pumps
4. Air supply distribution system
5. Air diffuser system
6. Airlift sludge return pumping system
7. Airlift surface skimming system
8. Regenerative type positive displacement blowers
9. Complete control systems for equipment described in this specification section
10. Weirs and flow measuring equipment
11. Chemical feed equipment
12. Disinfection equipment
13. Alarm telemetry system
14. All necessary piping and valves

15. All equipment shall be retrievable from the top of the plant.

2.02 PLANT TANK STRUCTURES

- A. The prefabricated sewage treatment plant shall be constructed of 28 day 4,000 psi precast concrete and shall be reinforced to withstand normal pressures from external soil and hydrostatic and internal hydrostatic loads. Non-compression joints with grouted sealing compounds shall not be used. Bolted wall slabs (or other methods of connecting wall slabs with steel) shall not be accepted.
- B. Tank sections shall be joined by tongue-and-groove joints. All tongue-and-groove joints shall be sealed with Butyl Rub-R-Nek sealant. All pipe penetrations shall be fitted into cast-in gaskets or be sealed with Link Seals to insure water tightness.
- C. All vertical precast concrete walls shall be a minimum of 4.5 inch nominal thick walls.
- D. Provide a 6" thick precast concrete slab on top of tanks to form a center walkway for access to tank equipment. Provide aluminum guard rail along two sides of walkway. Guard rail shall meet OSHA requirements.
- E. Steel, fiberglass, or plants manufactured of materials other than concrete shall be specified shall not be accepted.
- F. All tanks shall be encased by a reinforced 3,500 psi minimum concrete anti-buoyancy collar, as per manufacturer's recommendations. No less than a 2 ft. x 2 ft. concrete anti-buoyancy collar shall be provided to surround the outer perimeter of the tanks. The concrete anti-buoyancy collar shall be poured between the tanks, and shall have a minimum of two #4 rebar placed within the collar. The rebar shall be overlapping, and shall be continuous. Additionally, the manufacturer shall provide a means of allowing the concrete anti-buoyancy collar to adequately latch onto the base sections of the tanks (such as a keyway). The manufacturer shall provide buoyancy calculations based on the groundwater level being at grade. Buoyancy calculations shall be performed by a Professional Engineer registered in Mississippi.

2.03 INFLUENT MANUAL BAR SCREEN (LOACATED IN EQUALIZATION TANK)

- A. The bar screen shall fabricated of stainless steel. The bars shall be on a 45° angle, 1/2 inch diameter stainless steel rods, and spaced 1 1/2 inch o.c. A 12 inch x 24 inch drying deck shall be integrated with the bar screen. The drying deck shall have a 1 inch raised lip around three sides, and shall drain towards the bar screen, and be equipped with drainage slots.
- B. Provide a stainless steel rake with 4 ft. long handle for cleaning screen.

2.04 FLOW EQUALIZATION

- A. Equalization Tankage:
 - 1. Number of Equalization Chambers: 1
 - 2. Dimensions of each Chamber: 10.5 ft. dia. x 15.80 ft. D
 - 3. Maximum Side Water Depth (SWD): 13.8 ft.
 - 4. Total Capacity: 8,939 gallons @ maximum SWD
 - 5. Effective Capacity: 6,995 gallons (pump stop level to maximum level)
- B. Air diffusers shall be provided and located as shown on the Contract Drawings. 25 CFM per 1000 cubic feet of effective capacity (30 CFM) shall be provided.

- C. Two submersible equalization pumps shall be provided. Each pump shall have a separate discharge pipe, including union and valve. The pumps shall be Goulds 3886, 0.5 hp, 240 V, 1 phase, rated at 40 GPM at 21" TDH. The pumps shall be continuous duty rated for long life, and shall be capable of withstanding temperatures up to 160° F (71° C). The mechanical seal shall be carbon rotary/ceramic stationary, 300 series stainless steel metal parts with BUNA-N elastomers. The impeller shall be cast-iron-semi open, non clog with pump out vanes for mechanical seal protection. The casing shall be cast iron volute type for maximum efficiency. The shaft shall be corrosion resistant stainless steel with a threaded design. The motor shall be fully submerged in high grade turbine oil for lubrication and efficient heat transfer. The power cable shall be severe duty rated, oil and water resistant, and shall be epoxy sealed on the motor end. Cable length shall be sufficient to reach the motor disconnect switch.
- D. Each submersible pump shall have a compatible stainless steel slide rail system installed to allow each pump to be easily removed from the tank. In addition, a portable hand hoist shall be provided to lift/lower the pumps. A stainless steel hoist base shall be installed on top of the tank containing the submersible pumps. The slide rail system shall include 1/4 inch dia. stainless steel lifting cables or chain, stainless steel wall brackets, bronze quick disconnect adapter, bottom pump bracket, and stainless steel base plate.
- E. The hoist system shall be by Halliday Products, model D1B36B, rated for 300 pounds or model D2B36B rated for 1000 pounds. The hoist sockets shall be fabricated of stainless steel. The hoist sockets shall be by Halliday Products, model D1F.
- F. A mercury level control float switch in the equalization basin shall shut off pumps in the event of low water level. The second float shall engage the lead pump, and the third float shall engage the lag pump. The fourth float shall engage the high water alarm. Provide a fifth float switch to signal a low level alarm condition and to serve as a redundant stop. The floats shall be affixed to a stainless steel cable having a 15 lb. vinyl coated weight for easy removal. Stainless steel, NEMA 3R, disconnect switches shall be provided on top of the equalization tanks for each pump.
- G. One flow regulation box shall be supplied to allow the plant operator to adequately control the forward flow from equalization to aeration. The box shall be constructed of 1/4 inch plate aluminum. The flow box shall be equipped with all necessary spill gates, flumes, velocity dissipation baffles, etc. to allow complete control and adjustment of the forward flow. This forward flow shall be 5.2 gpm. The box shall be designed to eliminate all turbulence upstream of the flow control weirs and to provide sufficient resolution in the adjustment of the weirs to accurately control the discharge flow to the aeration tank. All hardware provided with the flow box shall be stainless steel. The boxes shall be constructed as per the construction drawing details.
- H. One overflow outlet pipe shall be installed between the equalization tank and aeration tank to allow sewage to flow through the treatment plant in the event of a power or pump failure. The overflow pipe shall be 6 inches higher than the water level in aeration.
- I. Discharge piping and valving shall be provided and installed as shown on the contract drawings.

2.05 AERATION TANK

A. Aeration Zone:

1. Number of Chambers: 1
2. Dimensions of Chamber: 10.5 ft dia x 13.50 ft D
3. Side Water Depth: 12 ft.
4. Effective Capacity: 7,772 gallons

- B. No less than the 1.5 feet minimum freeboard shall be provided, to prevent splashing on the walkways.
- C. Air diffusers shall be provided and located as shown on the Contract Drawings. Air diffusers shall be sized and located to maintain the mixed liquid suspended solids in suspension, and to provide the dissolved oxygen required for an adequate level of nitrification. The diffusers in combination with the blowers shall be capable of providing a minimum nominal dissolved oxygen level in the aeration chambers of 3 mg/l with a full organic and hydraulic load.
- D. 45° fillets (6 inches high minimum) shall be installed in the bottom of the tanks parallel to the treatment flow to insure uniform tank roll and prevent deposition of solids. Overall design of the chamber shall be such that effective mixing shall be maintained to provide optimum treatment.
- E. All sludge return pipes shall be a minimum of 9 inches above the working water level in aeration. Sludge pipes closer to the water level than 9 inches shall not be accepted. Sludge return pipes shall be grouted in place with non-shrink grout, and shall be reasonably level to allow for a smooth sludge return, free of excessive air.
- F. Additional tees and valving shall be provided and installed as shown on the contract drawings, on the sludge return plumbing, to allow the operator to bypass aeration chamber and waste sludge to the sludge holding tank.
- G. Air diffusers shall be provided and located as shown on the Contract Drawings. Air flow to the aeration tank shall be 30 cfm minimum.

2.06 CLARIFIERS

- A. Clarifier Tankage:
 - 1. Number of Clarifier Chambers: 1
 - 2. Dimensions of each Chamber: 10.5 ft. dia. x 14.7 ft. D.
 - 3. Side Water Depth (SWD): 13.0 ft.
 - 4. Freeboard: 1.7 ft.
 - 5. Effective Capacity: 8,420 gallons
- B. An inlet baffle zone shall be provided at the flow inlet to the clarifier chamber. All transfer turbulence shall be dissipated upstream of the inlet baffle and the performance shall be adequate to eliminate all turbulence downstream from the baffle. Flow shall also be controlled so that short circuiting is prevented within the clarifier. The area contained behind the baffle shall allow adequate capacity and retention for surfacing of all buoyant material entering the clarifier. The inlet baffle shall extend above the surface an adequate distance to entrap all floating material and it shall extend below the transfer port a sufficient distance to eliminate passage of buoyant material or surface turbulence.
- C. An adjustable aluminum outlet baffle and aluminum effluent weir and trough shall be located at the discharge pipe of the clarifier. The outlet baffle shall run the entire length of the outlet weir trough and extend a minimum depth of three inches below the low water level and three inches above the water level. Provide 90° V-notches on 8" centers on the weir plate. A minimum of 16.0 lineal feet of weirs shall be provided in the clarifier.
- D. The clarifier hopper shall have a square bottom, and a side slope of not less than 60°. Settled sludge shall be continuously returned from the bottom of these hoppers to the aeration chambers by means of airlift pumping.
- E. Galvanized steel airlift pump, airlift skimmer, sludge return piping, sludge waste piping, skimmer return piping, plumbing, and valving shall be provided and installed as detailed on the Contract

Drawings. All sludge return pipes shall be a minimum of 9 inches above the working water level in the clarifier. Sludge return pipes shall be grouted in place, and shall be level from clarifiers to final destination in aeration and sludge holding when completed.

- F. Air shall be supplied to the airlifts through a secondary air distribution system connected to the main air header of the treatment plant. Individual air manifold piping shall be installed for each airlift and shall be equipped with a valve for fine adjustment or shut-off. Also, provide a NEMA 4, 110 volt solenoid valve on the air supply to the return sludge and scum skimmer air lifts.
- G. The airlift pump systems shall be constructed of Schedule 40 steel pipe and Schedule 40 pipe fittings. A removable clean out plug shall be installed at the top of the vertical airlift pipe and a non-rising stem gate backwash valve shall be provided in the horizontal discharge line. Piping shall be arranged so that returned sludge is deposited in the aeration tank at a point to prevent short-circuiting and with positive visible return. The airlift pumps shall be designed and manufactured of adequate size pipe and with sufficient flow air supply to provide a pumping rate between 50 percent to 150 percent of forward flow. Air required to achieve this shall be provided in excess of that necessary for aeration.
- H. The airlift pump inlets shall be equipped with an inlet bell and pedestal legs. The legs shall be used to position the inlet correctly at the base of the hopper. Inlets that are cantilevered or cut out to rest on the bottom of the hopper will restrict sludge flow and shall not be considered. The pump inlet bell shall be connected directly to the airlift inlet and shall enlarge the inlet sufficiently to reduce airlift blockage or excessive plugging.
- I. Each airlift surface skimming system shall be constructed of schedule forty galvanized steel pipe and schedule forty galvanized malleable iron pipe fittings. The skimmer airlifts shall be constructed of one continuous length of galvanized pipe formed into a 20-inch diameter return bend to pump from the chamber surface to the horizontal discharge line. Skimmer inlets and airlifts constructed with acute angle bends or submerged fittings are susceptible to plugging and shall not be considered.
- J. Each skimmer inlet shall be equipped with an adjustable polystyrene plastic cone. The inlet cone shall have attached flexible connectors for installation and adjustment of the cone on the airlift assembly. The diameter of the inlet cone shall be at least three times larger than the diameter of the airlift pipe to insure acceptable skimming velocities.
- K. A removable galvanized clean out plug shall be provided at the top of the skimmer airlift pipe where it joins the horizontal discharge line. The discharge line shall pass through the wall of the clarification chamber and return back to the aeration chamber for final discharge. The skimmer air supply shall be provided through a secondary air distribution system connected to the main air header of the treatment plant. Air adjustment/shut-off valves shall be installed in the skimmer air manifold supply lines.
- L. Minimum air flow rates shall be 5 cfm to the return sludge air lift, 8 cfm to the scum skimmers, and 2 cfm to the baffle diffuser.

2.07 CHLORINE CONTACT/SLUDGE HOLDING TANK

- A. Chlorine Contact/Sludge:
 - 1. Number of Chlorine Contact/Sludge Holding Chambers: 1
 - 2. Dimensions of the Chamber: 10.5 ft. dia. x 7.2 ft. D
 - 3. Side Water Depth (SWD): 4.7 ft. chlorine contact portion
5.7 ft. sludge holding portion
 - 4. Freeboard: 2.5 ft. chlorine contact portion
1.5 ft sludge holding portion

- 5. Effective Capacity: 1,000 gallons chlorine contact
2,200 gallons sludge holding
- B. One overflow pipe shall be provided as depicted on the Contract Drawings, to return wastewater to equalization. Air diffusers shall be valved and removable from the surface of the tank.
- C. Supernatant decanting capability shall also be supplied for return of supernatant to the equalization chamber as shown on the Contract Drawings. Airlift decant pumps shall be provided as shown. An airlift decant pump that swivels on threaded fittings shall not be accepted. Provisions to lift/lower and hook shall be as shown on the Contract Drawings.
- D. Air diffusers shall be provided and located as shown on the Contract Drawings. 16 CFM of air flow shall be provided to the air diffusers.

2.08 BLOWER SYSTEMS AND APPURTENANCES

- A. The following blowers and related equipment shall be provided and installed, complete to provide adequate air and back-up air to the plant. The blowers and motors shall be of the quantity and size specified below:

<u>Quantity</u>	<u>Capacity</u>	<u>HP</u>	<u>Voltage</u>
4	30 cfm @ 6.5 psi	3.0	240 V-1 phase

- B. The blowers shall be a Model SCL 30DH as manufactured by FPZ, Inc. The blowers shall be the regenerative type. The casing shall be cast aluminum. Bearings shall be anti-friction and the impellers shall be precision machined.
- C. The motors shall be TEFC, 1750 RPM, NEMA Design B, Class F insulated, 240 V, 1 phase with a 1.15 service factor having integral overload. The frame size shall be a standard size.
- D. Blower direct connected to the motor drive. The Contractor shall provide the proper transmission sizes and equipment required to provide the necessary CFM for the plant.
- E. A noise attenuating air intake filter shall be supplied for each blower. The filter shall be a removable media dry element type in a stainless steel weather protected housing having a 1-1/2" diameter NPT connection. Rated efficiency shall be 90% removal of 10 micron particles. The intake filter shall be an FPZ, Model FS-190-150 with a maximum pressure drop of 2 inch water at design flow conditions. Provide each filter with a "dirty filter" indicator to sense headloss across the filter and indicate when cleaning is required.
- F. Each blower shall be supplied with one liquid filled pressure gauge. The gauge shall be capable of indicating 0-15 psi.
- G. Pressure relief valves of the spring loaded type shall be supplied and mounted on the blower discharge. Bodies shall be constructed of aluminum alloy.
- H. Check valves shall be as manufactured by Techno Corporation, model 5002-AL and shall be installed directly at the discharge end of each blower.
- I. Provide each blower with an aluminum, stainless steel, or fiberglass sound attenuating weather proof enclosure having an integral 110 V, 1 phase cooling fan. Enclosure shall provide easy access for blower maintenance.

2.09 AIR DISTRIBUTION PIPING

- A. The air distribution piping shall be galvanized Schedule 40 piping and galvanized malleable iron pipe fittings shall be used throughout the air distribution system. Individual galvanized pipe unions, and flexible couplings with stainless steel clamps shall be provided as necessary in the air distribution system. Individual air control ball valves shall be installed in the air distribution piping as required to allow individual adjustment of each separate element within the system.
 - B. Primary air distribution shall be provided through a galvanized air header as illustrated on the Contract Drawings. The air header shall have individual drop pipes connected to the header assembly for air supply to each individual diffuser and airlift assembly. Each drop pipe shall be equipped with an air adjustment ball valve to control air flow individually to each diffuser and airlift assembly. In addition, a quick release union shall be provided for each drop pipe downstream from the air adjustment valve.
- 2.10 AIR DIFFUSER SYSTEM
- A. Diffuser header shall be constructed of 304 stainless steel and shall be designed to insure uniform mixing within the chambers. Air bubble distribution effected by the diffusers shall be adequate to provide all oxygen necessary for the aeration tank and aerobic digestion while maintaining a nominal dissolved oxygen level in the aeration compartments 3 mg/l.
- 2.11 FLOW METERING/RECORDING SYSTEM
- A. Provide a sonic flow transducer and a NEMA 4X flow transmitter for measuring plant effluent flow rate. Provide necessary mounting hardware for the transducer. Flow transmitter shall operate on a 110 V, 1 phase power source, have a digital display for inputting setup parameters and indicating flow rate and flow total. Transmitter shall output a 4-20mA signal to the flow recorder. Flow transmitter shall be a Milltronics Model OCM III.
 - B. One circular flow recording device shall be provided and mounted on the Treatment Plant Control Panel. The unit shall incorporate a 10 inch, 7 day circular chart. One box of standard charts shall be provided, for the design flow of this wastewater treatment plant. The instrument shall have one red pen for self-plotting. The recorder shall also provide digital indicating of flow rate and flow total and shall retransmit a 4-20 mA signal proportional to flow. The circular flow recording device shall be a Partlow ARC 4100.
- 2.12 CHEMICAL FEED SYSTEMS
- A. Soda ash solution will be fed to the aeration tank to adjust alkalinity.
 - B. The soda ash feed system shall consist of a 200 gallon polyethylene tank with mixer, two wall shelf mounted chemical feed pumps and a carrying water piping system.
- 2.13 POLYETHYLENE TANKS
- A. Materials of Construction:
 - 1. The tanks shall meet ASTM D1998-97 standards for vertical upright storage tanks.
 - 2. Wall thickness shall be based on using a 600 psi design hoop stress at 100°F.
 - 3. The tanks shall be molded from high density cross-linked polyethylene with rotationally molded one-piece seamless construction for storage of chemicals listed in Schedule B.
 - a. The tank walls shall be constructed of metallocene high density crosslinked polyethylene (MHDXLPE).
 - b. Fillers and Pigments: The plastic shall not contain any fillers. All plastic shall contain a minimum of 0.25% U.V. stabilizer and maximum of 0.50% by weight. Pigments shall not exceed 0.50% of the weight of the tank.

- c. Mechanical Properties: The nominal values for the properties of the plastic material are as follows based on molded parts:

<u>Property</u>	<u>ASTM</u>	<u>Value</u>	<u>Units</u>
Density	D1505	50	lb/cf
ESCR Spec. thickness 125 mils	D1693	900-1,000	hrs.
Tensile strength Ultimate 2"/min.	D638 Type IV Spec.	2,600	psi
Elongation at break 2"/min.	D638 Type IV Spec.	400	%
Vicat softening temp.	D1525	240	°F
Brittleness temp.	D746	-130	°F
Flexural Modulus	D790	100, 000- 110,000	psi

- 4. Provide tank with a removable top cover, hinged to allow pouring any chemical into the tank.
- 5. Provide tank with molded gallon markers to show tank fill level in 5 gallon increments.
- 6. Inspection and Test Procedures:
 - a. Test samples shall be taken from the manway cut-out area or where fittings are inserted in each tank.
 - b. Impact Test: ARM Standard method shall be used in this test. Sample shall not shatter at:

Sample ≤ 1/4"	00 ft.#	1/2" < Sample ≤ 3/4"	150 ft.#
1/4" < Sample ≤ 1/2"	100 ft.#	3/4" < Sample	200 ft.#
 - c. Degree of Crosslinking Test: ASTM D2765 as modified by Phillips PTC Report 193 shall be used in this test. Minimum of 70% gel must be obtained.
- 7. Chemical Resistance Charts: Chemical resistance charts shall be used as reference for all materials of construction
- 8. Tank shall be 36" diameter by 56-1/4" tall.

B. Tank Stand:

- 1. Provide an 18" high polyethylene tank stand having a center opening for access to the tank center drain.

C. Tank Nozzles:

- 1. One inch diameter, side mounted, bottom drawoff nozzle shall be of the two flange type with Schedule 80 flat face body flange, viton gaskets, titanium bolts, washers, and nuts and a 150 lb. Schedule 80 PVC connection flange.
- 2. Provide a bolted, double flange, total drain fitting having polypropylene threaded flanges, 1/4" Viton gaskets, and stainless steel bolts sealed in the flanged and designed to prevent metal exposure to the chemical in the tank.
- 3. All gaskets shall be compatible with the material stored.

2.14 TANK MIXERS

- A. Provide tank with a 110 V, 1 phase, 350 rpm maximum mixer having a TEFC, chem duty motor and a 316 stainless steel shaft and impeller. Provide necessary mounting brackets or stands for the mixer. Stand shall be constructed of stainless steel. Minimum motor horsepower shall be 1/3 HP.

2.15 CHEMICAL FEED PUMPS

- A. Type: Provide and install two electronically controlled, solenoid actuated diaphragm metering pumps for the soda ash feed system.
- B. Pump Design and Performance Criteria:
1. Furnish metering pumps with the following design and performance criteria:
 - a. Quantity: Two (2)
 - b. Capacity: 38 GPD
 - c. Discharge Pressure: 100 PSI minimum
 - d. Turndown Ratio: 10:1 on stroke length
20:1 on stroke frequency
 - e. Feed pump shall be Model B11 as manufactured by Liquid Metronics Co..
 - C. Materials: The pump shall have a corrosion proof housing of glass fiber and shall require no lubrication. The liquid head end shall be constructed of PVC or PVDF, pump diaphragm shall be fluorofilm, the single ball check valves on the suction and on the discharge end shall be ceramic, seats and seal rings shall be PVDF/PTFE. All materials of construction on the pump liquid end shall be compatible with the chemical being pumped.
 - D. Controls: Pump shall be powered by a 110 volt, 1 phase short stroke electronically controlled solenoid actuator. The stroke length shall be manually adjusted with a vernier dial. The stroke frequency shall be adjustable over 20:1 ratio. The stroke frequency shall be electronically adjusted by means of an integral potentiometer having a 0-100% calibrated dial. The pump shall also have a power supply fuse, stroke indicator light and an easily removable clear plastic splash guard to protect the electronic end of the pump.

2.16 FEED PUMP SYSTEM ADJUNCT EQUIPMENT

- A. General: Refer to the Contract Drawings for the number and connection sizes required for the chemical feed system adjunct equipment.
- B. Provide a combination back pressure, pressure relief valve (four function valve) mounted on the discharge end of the pump that will create a sufficient back pressure on the pump to assure accurate metering, will prevent siphoning, that will relieve excess pressure by bypassing the pumped liquid back to the storage tank, and will enable depressurizing of the pump discharge head and line without removal of discharge tubing or fittings. Valve shall be of PGC or PVDF construction.
- C. Provide one combination chemical injection and back pressure valve for each feed pump. Inlet end shall have a tubing adapter connection and outlet end shall have male NPT threads. Materials of construction shall be as follows:
1. Body - PVC or PGC
 2. Spring - Teflon PFA coated
 3. Ball - Ceramic
 4. Seal Ring - Polyprel or Teflon
 5. Valve Seat - PVC or PGC
 6. Coupling Nut - PVC

- D. Provide a heavy duty polypropylene wall mounting shelf for each pump. The pump shall be fastened to the shelf with a stainless steel bolt. The shelf shall be mounted to the wall with stainless steel expansion bolts.
- E. Provide a 0.1-1.0 gpm rotometer with rate set value. Rotometer shall have a polysulfone body 1/2" diameter union connectors, stainless steel float and a 100 psi minimum working pressure.

2.17 TABLET CHLORINATOR

- A. The tablet chlorine feed unit shall be a one piece molded polyethylene or PVC totally enclosed unit consisting of tablet feed tubes, inlet baffle, adjustable outlet weir and mounting base that provided the controlled erosion of chlorine tablets which varies based upon the level of water in the unit which is proportional to the flow rate over the units weir. The unit shall have an inlet suitable for connection to a 6", Schedule 40 PVC pipe, four (4) feed tubes with caps capable of holding a minimum of 27 3" diameter chlorine tablets, a 1", 2", and 3" interchangeable weir plates to regulate effluent level versus flow, and visual flow markings on the weir plates to allow determination of flow rate. Tablet chlorinator shall be as manufactured by Jet-Chlor, Norweco.

2.18 BOLTS AND LIFTING LUGS

- A. Provide lifting lugs to facilitate field installation of all tanks; lugs shall be located and reinforced to enable lifting of assemblies without causing structural damage to the units.
- B. All anchor bolts and fasteners utilized for interconnection of tanks and mounting of equipment shall be stainless steel.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Obtain and provide the Owner with an Installation Certificate signed by the manufacturer's field representative attesting that the completed package plant sewage treatment system has been properly installed and is ready for testing and operation including blower and air system, all pumping systems, and all control panels.
- B. Install blower and motor assembly, piping and appurtenances as indicated on Contract Drawings and in accordance with the manufacturer's instructions.
- C. Provide and connect piping, accessories and power as required to ensure a complete, operable air handling system.

3.02 STRUCTURES BASE, BACKFILL, AND GRADE WORK

- A. Base Preparation:
 - 1. The Contractor shall provide a stable base prepared to the specified bearing capacity. Contractor is solely responsible for the stable base of the structure of the tank. Project Engineer will review calculations for information purposes only.
 - 2. The Contractor shall be responsible for all necessary testing, including but not limited to moisture, density, and compaction. The Contractor shall be responsible for all testing to verify that the base is adequate for the required bearing capacity. The testing shall be performed by an independent soils testing company, approved by the Project Engineer and paid for by the Contractor.

3. If the walls or base shift, move, or crack because of poor base bearing capacity, the Contractor shall be responsible to make necessary repairs and bear the associated costs. Care in base testing and preparation is of utmost importance.
4. After excavation to the required subgrade, the subgrade shall be compacted by acceptable equipment and methods to develop a depth of at least twelve (12") inches below ground surface at least 95% of maximum density in conformance with ASTM D1557. Any soft or weak spots detected during compaction operation or proof-rolling of the subgrade shall be removed and replaced with controlled fill as authorized by the Project Engineer.
5. The stone base shall be prepared as shown on the plans by the package treatment plant manufacturer and shall be leveled and graded as necessary.

B. Backfill:

1. Backfill around all tanks shall be placed uniformly in loose and successive layers and compacted to the specified density around the entire structure to preclude the possibility of non-uniform loading of the exterior wall. Lifts are recommended to be 12 inches in height. Backfilling around structures shall be accomplished with uniform horizontal lifts of material. The difference in elevation of the backfill on opposite and/or adjacent walls shall not at any time exceed one foot, unless required for final grade (i.e. differential finished grade around the structure). The prevention of settlement shall be the responsibility of the Contractor.
2. Compaction equipment shall not be used within 10 feet of the structure.
3. Backfill between the tanks and to a point 10 ft. beyond the tank walls shall be 3/4" (2b) clean stone from the base up to final grade, in even 12" lifts.
4. Backfilling shall proceed as soon as possible, after required testing and inspections have been completed in conformance with applicable specifications, and all coatings have cured. The manufacturer shall be notified in writing at least two week prior to backfill. Backfilling shall not proceed if the Project Engineer or manufacturer requires the excavation to stay open. The last 12" of fill shall be AASHTO 57 stone within the fence and topsoil outside the fence. Install a geotextile filter fabric prior to installing the last 12" of fill.
5. The Contractor shall be responsible for all necessary testing, including but not limited to moisture, density, and compaction. The Contractor shall provide all necessary testing of the backfill, as the backfill work is being done, to insure that settlement will not occur.
6. If the walls or base shift, move, or crack due to backfilling procedures or placement of backfill materials, the Contractor shall be responsible to make necessary repairs and bear associated costs. Care in backfill material selection and placement is of utmost importance.

3.03 GENERAL

- A. The Manufacturer Project Superintendent shall be present on-site during placement of backfill to insure proper backfill procedures are followed. Ultimately the responsibility of proper backfill and site work shall be the responsibility of the Contractor.
- B. Contractor to use extreme care when driving close to tankage.
- C. Grading shall be done to prevent storm water runoff from entering the excavation.
- D. The excavation shall be kept free of water at all times.

3.04 PERFORMANCE TESTING - TREATMENT UNIT

- A. After field adjustments are completed, test treatment unit under operating conditions continuously for five consecutive days to demonstrate unit compliance with the design criteria

and permit discharge limitations. Testing shall be performed when the elementary school is in session.

- B. The testing for influent and effluent BOD, suspended solids, and NH^3 concentration will be conducted by an independent testing laboratory, approved by the Project Engineer, and paid by the Contractor.
- C. Take one sample of influent and effluent at 8:00 a.m. and 4:00 p.m. on each of the five days for a total of ten influent and ten effluent samples.
- D. Sampling shall be conducted under the supervision of the manufacturer's field representative and in the presence of and to the satisfaction of the Project Engineer.
- E. If the sewage treatment unit does not meet the specified performance criteria within 60-days, modify the system as necessary to bring it into compliance and rerun the performance test; equipment modifications will be subject to approval of the Project Engineer. The treatment plant must meet the effluent criteria in both summer and winter conditions.
- F. All costs for additional lab analysis required due to previous test failures will be the responsibility of the Contractor.
- G. In the event that the sewage treatment unit fails to meet the specified performance criteria within 60-days, remove the unit from the project site and replace with a unit that can meet the performance requirements, at no additional cost to the Owner.

3.05 PERFORMANCE TESTING

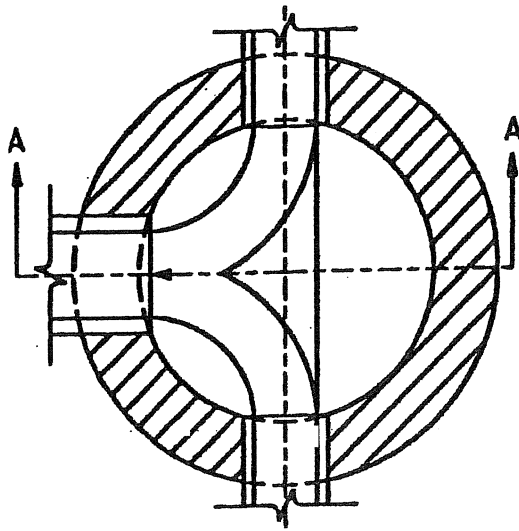
- A. Check correct rotation of blower motor; ensure proper blower and motor lubrication.
- B. Run each blower unit under the direction of the manufacturer's representative for a period of 4 continuous hours to demonstrate correct alignment, smooth operation, freedom from vibration, noise and overheating; take motor amp readings to demonstrate motor is not overloading. Measure air flow with a portable testing device. Verify blower operating speed with a tachometer. Verify pressure relief valve settings.
- C. Verify the capacity of each pump by performing a time-drawdown test when operating at the design head conditions.
- D. All testing shall be done in the presence of and to the satisfaction of the Project Engineer.
- E. In the event a component fails to perform as specified or is proven defective during operation, correct all deficiencies and rerun the performance test.
- F. Equipment modifications will be subject to the approval of the Project Engineer.

3.06 WARRANTY

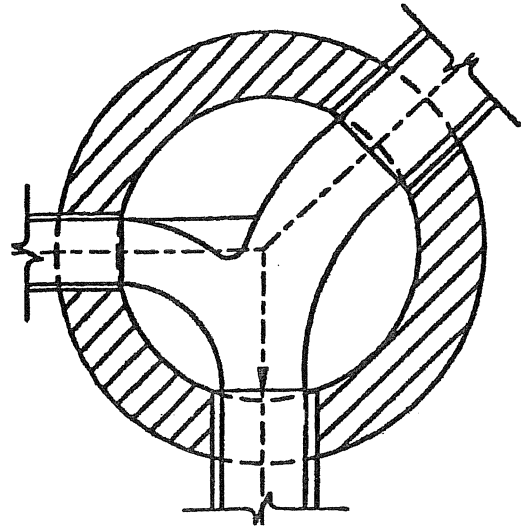
- A. The Contract shall give a two year warranty on all equipment and a five year warranty on all concrete structures. The date of warranty shall start from the date the Owner gives acceptance to the Contractor. The warranty shall cover all the equipment supplied.

END OF SECTION

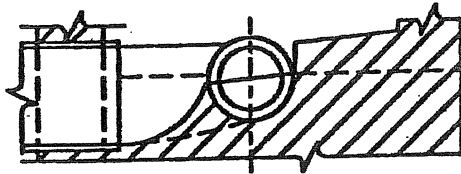
STANDARD DETAILS



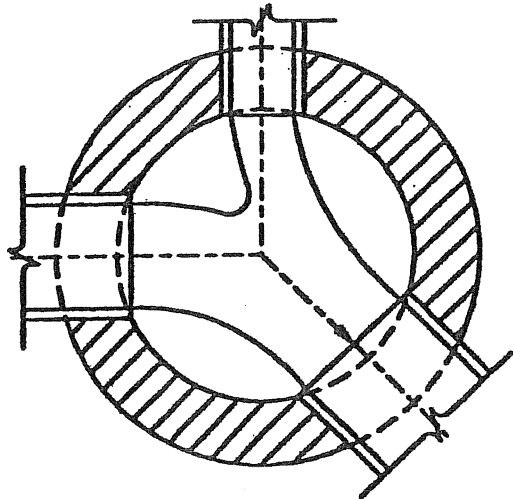
PLAN



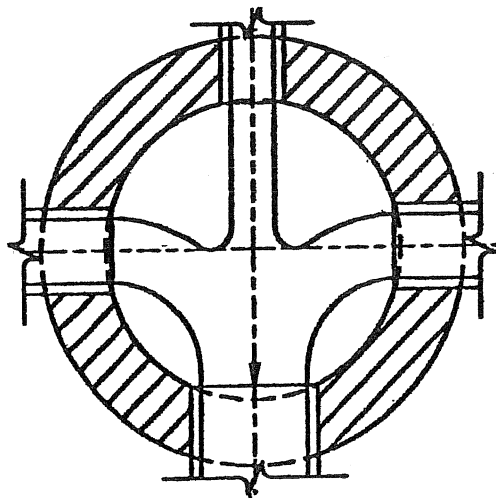
PLAN




SECTION A - A

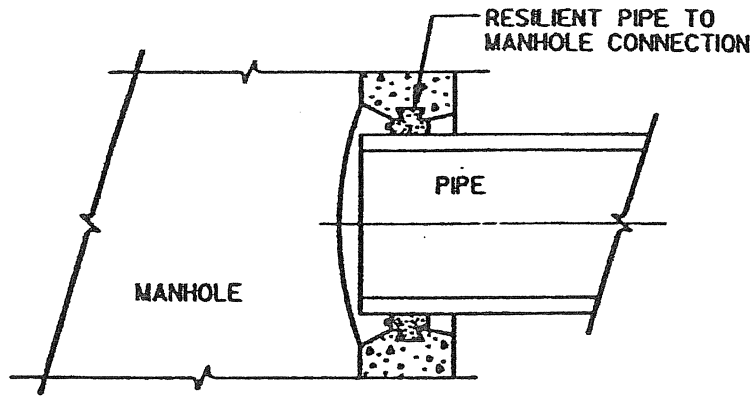
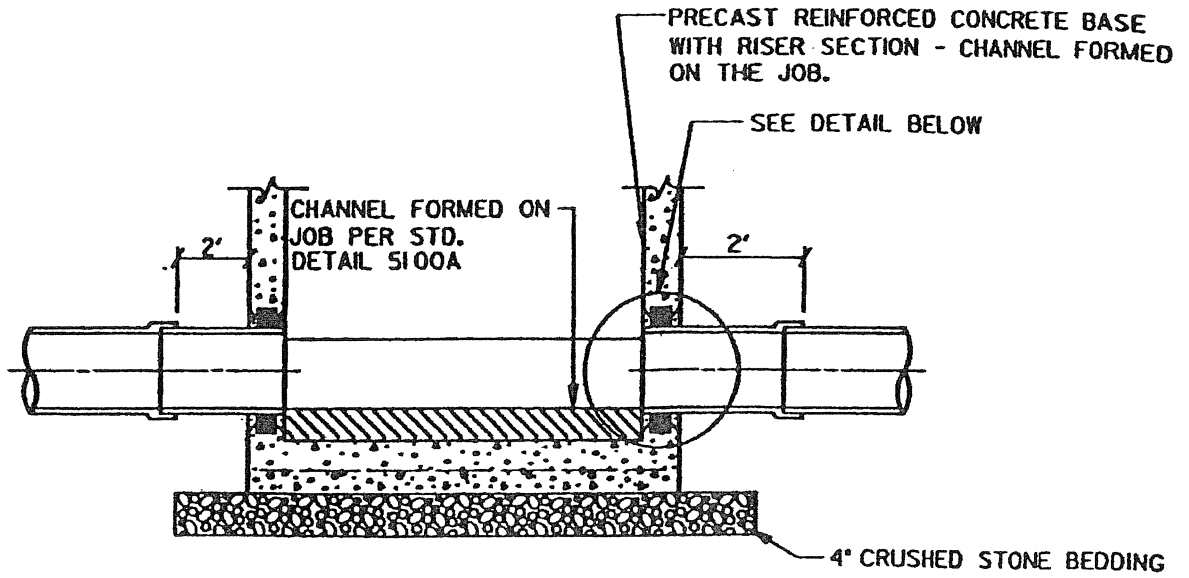


PLAN





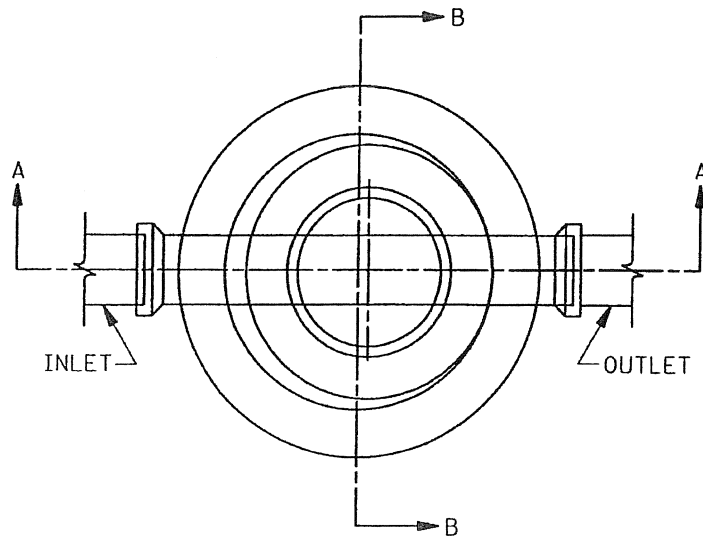
PLAN

DRAWN BY <i>REF</i>		PLANS OF MANHOLE BASE	APPROVED BY <i>[Signature]</i>
DATE <i>5-10-94</i>			DATE APPROVE <i>6-3-94</i>
CHECK BY <i>GM</i>			DETAIL NO. 5100B
DATE <i>6-2-94</i>			

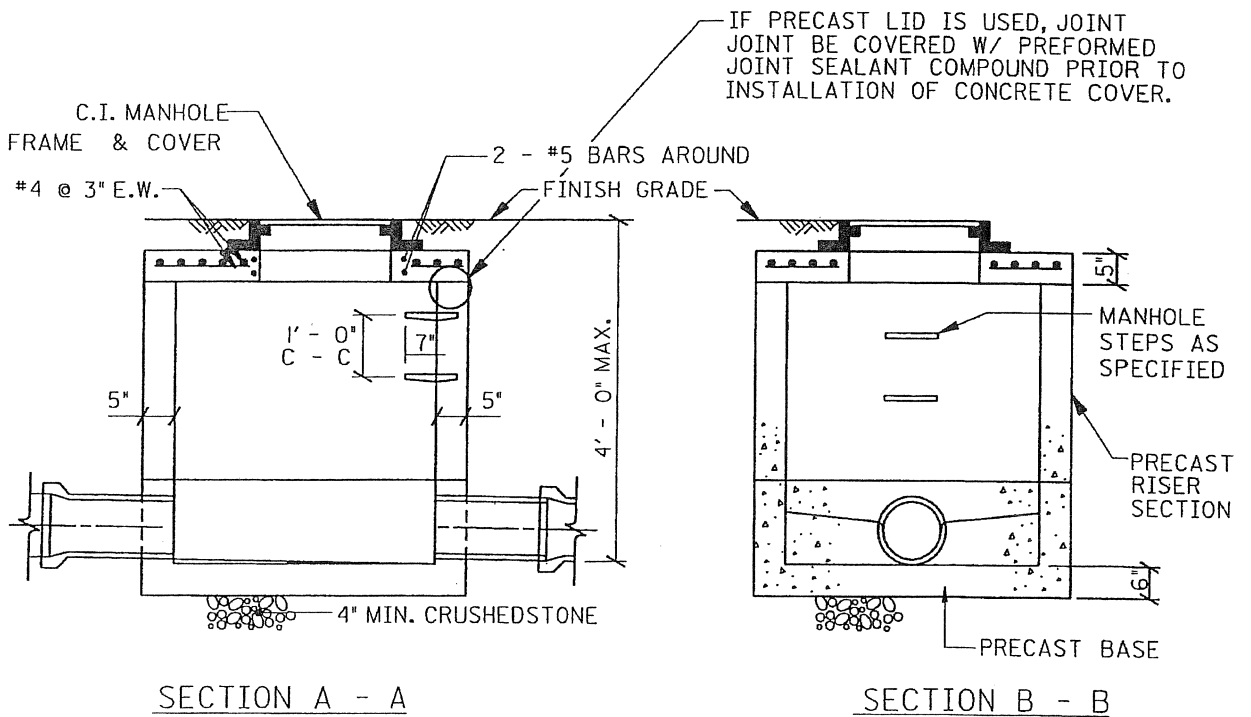


DETAIL

DRAWN BY REF	 BUCHART HORNING Consulting Engineers and Planners	PRECAST MANHOLE BASE DETAIL	APPROVED BY 
DATE 5-10-94			DATE APPROVED 6-3-94
CHECK BY GM			DETAIL NO. 5100G
DATE 6-2-94			



PLAN

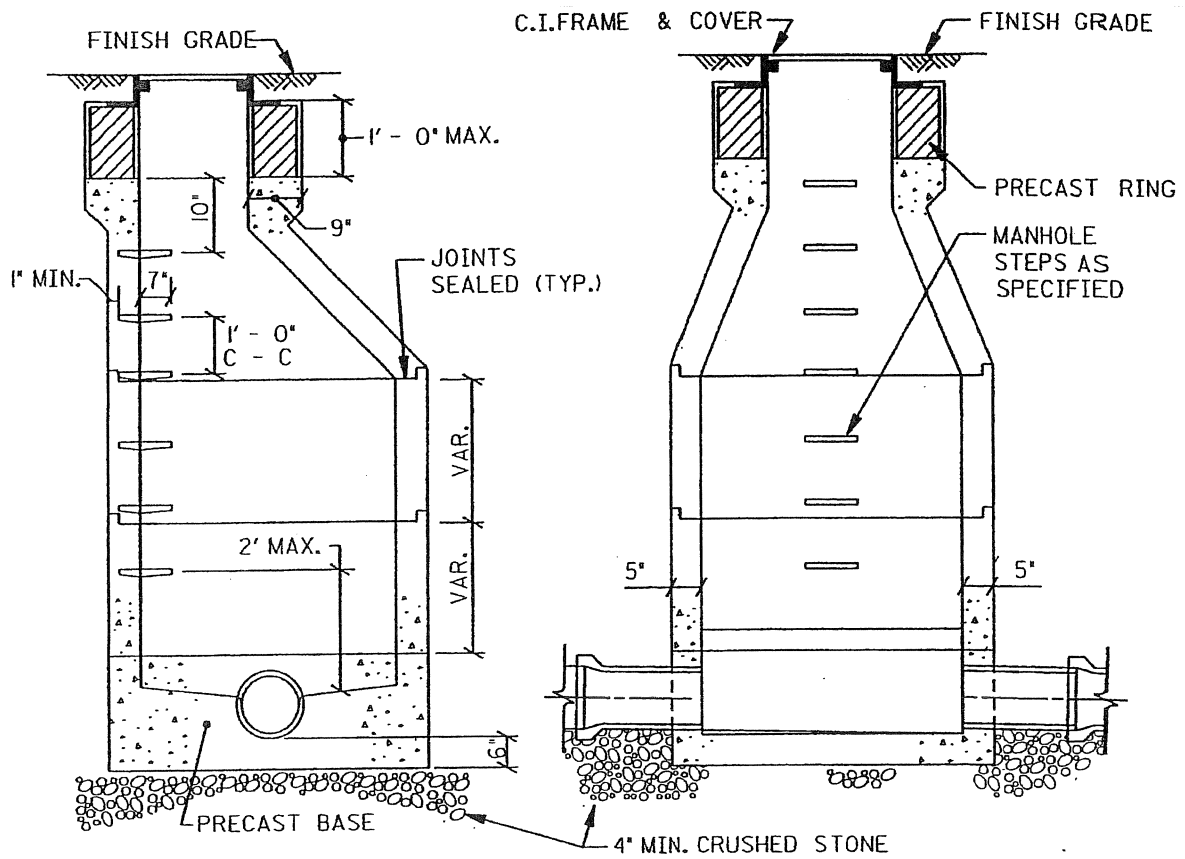


SECTION A - A

SECTION B - B

STANDARD SHALLOW PRE-CAST MANHOLE

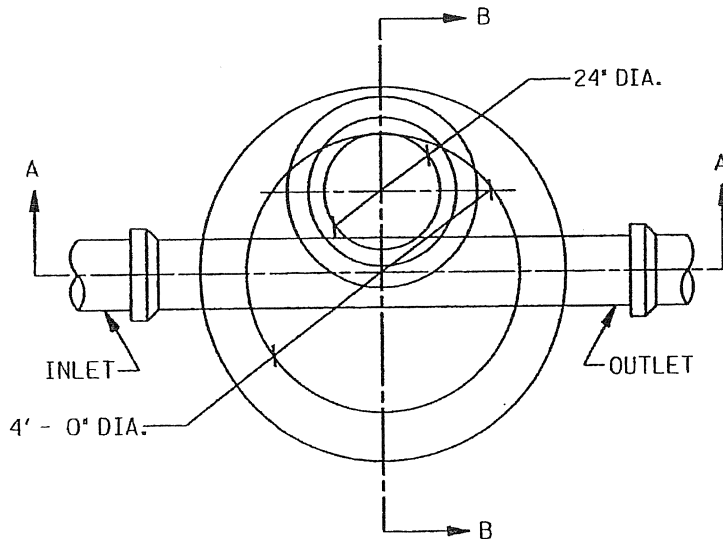
DRAWN BY	<p>BUCHART HORN, INC. Consulting Engineers and Planners</p>	<p>STANDARD SHALLOW PRE-CAST MANHOLE</p>	APPROVED BY
DATE			DATE APPROVED
CHECK BY			DETAIL NO.
DATE			5106




SECTION B - B

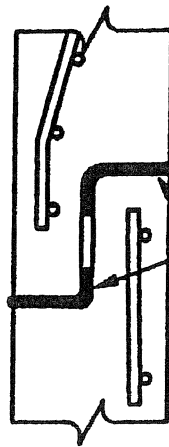
SECTION A - A

DETAIL OF STANDARD DEEP PRE-CAST MANHOLE



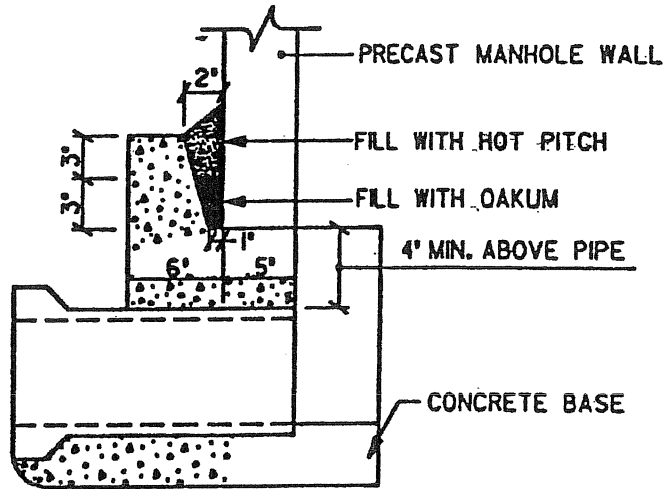
PLAN: PRE-CAST CONC. MANHOLE

DRAWN BY DATE CHECK BY DATE	 <p>BUCHART HORNUNG Consulting Engineers and Planners</p>	STANDARD DEEP PRE-CAST MANHOLE	APPROVED BY DATE APPROVED DETAIL NO. 5107
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JOINT SHALL BE SEALED
WATERTIGHT BY APPLICATION
OF PREFORMED JOINT SEALING
COMPOUND. JOINT SEALANT
COMPOUND SHALL 'SQUEEZE-OUT'
ON BOTH SIDES OF JOINT.

DETAIL A
TYPICAL ALL JOINTS



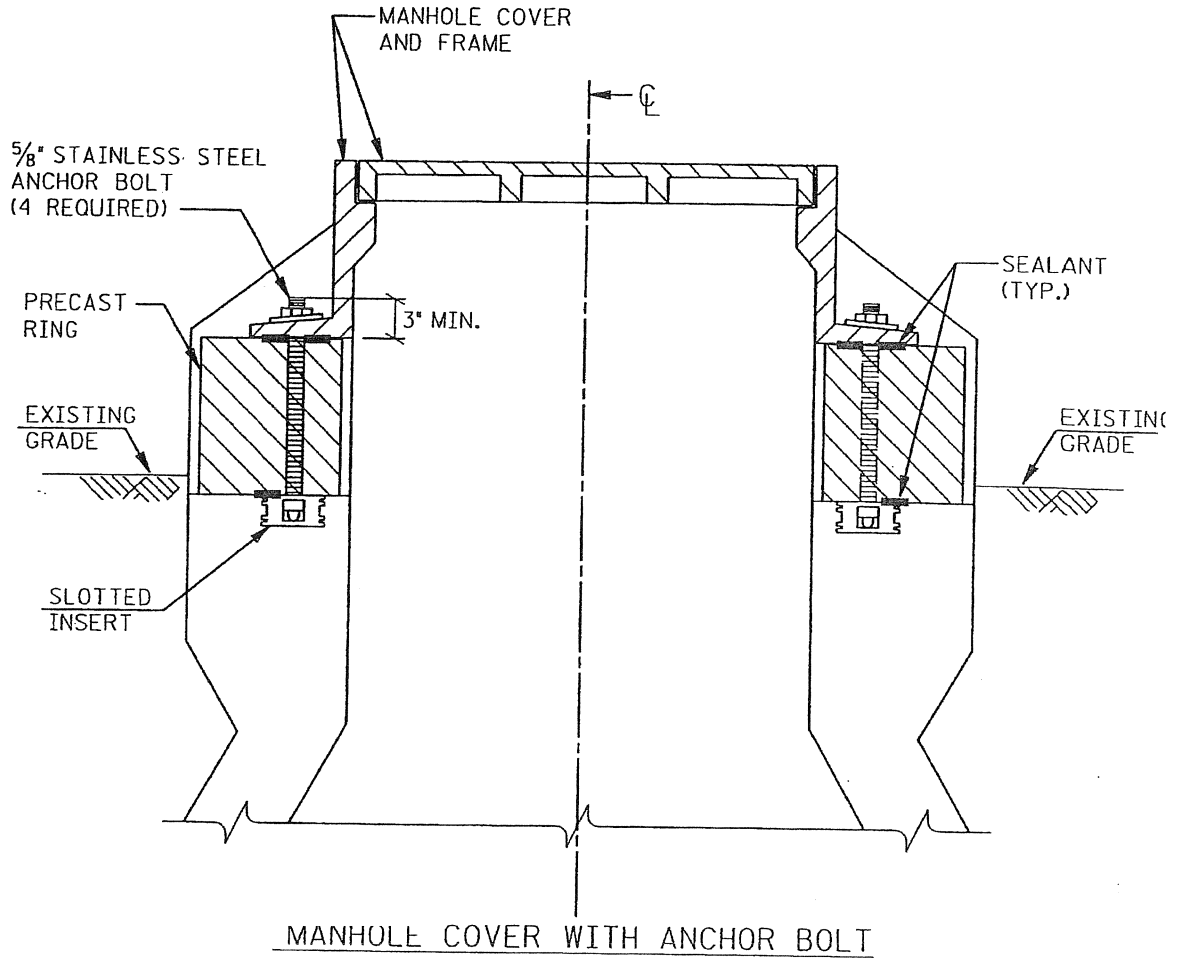
DETAIL B

DRAWN BY	REF
DATE	5-10-94
CHECK BY	GM
DATE	6-2-94

lh
BUCHART
HORNINC.
Consulting Engineers and Planners


PRECAST MANHOLES
TYPICAL ALL JOINTS

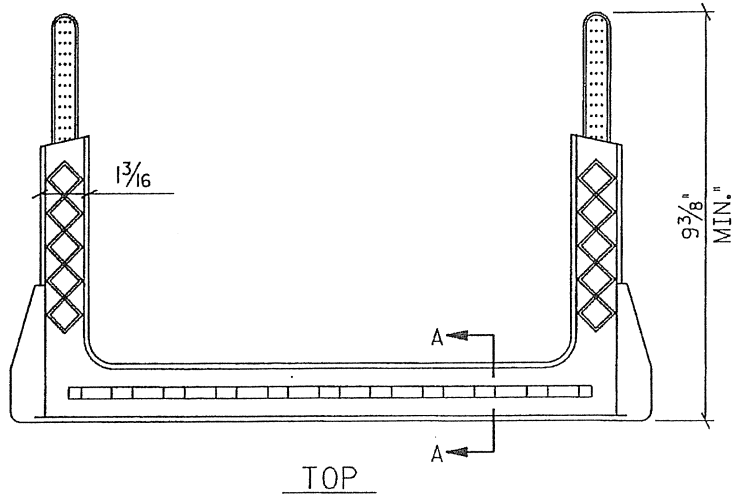
APPROVED BY	<i>[Signature]</i>
DATE APPROVED	6-3-94
DETAIL NO.	5109



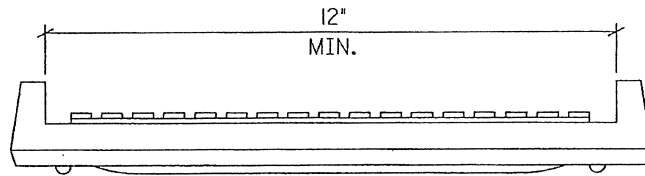
NO SCALE

USE ONLY WHEN M.H. COVER AND FRAME
EXTEND ABOVE GRADE

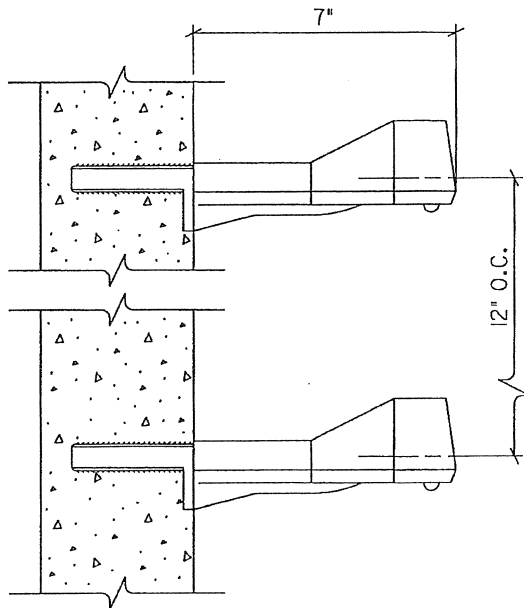
DRAWN BY	 <p>BUCHART HORN, INC.</p> <p>Consulting Engineers and Planners</p>	<p>MANHOLE COVER WITH ANCHOR BOLT</p>	APPROVED BY
DATE			DATE APPROVED
CHECK BY			DETAIL NO.
DATE			5109A



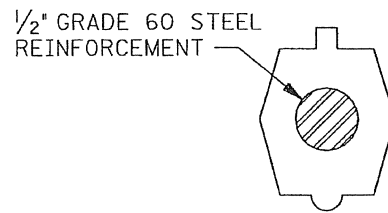
TOP



FRONT



ELEVATION



SECTION A-A


NOTES:

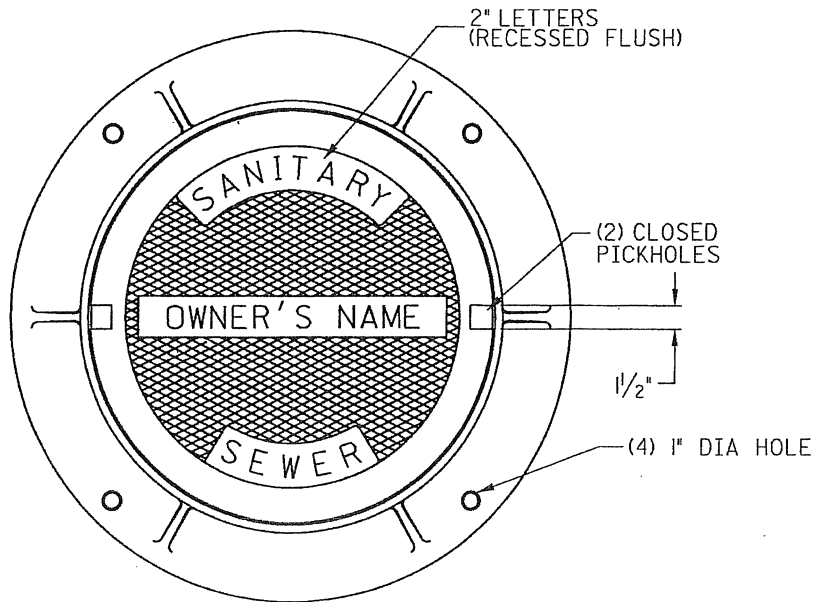
MANHOLE STEPS TO BE COPOLYMER POLYPROPYLENE PLASTIC

DISTANCE FROM RIM OF MANHOLE TO TOP STEP SHALL NOT BE GREATER THAN 2 FT.

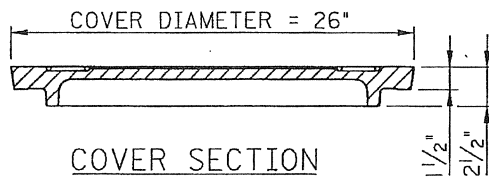
DISTANCE FROM BOTTOM STEP TO FLOOR OF MANHOLE SHALL NOT BE GREATER THAN 2 FT.

MANHOLE STEP DETAIL

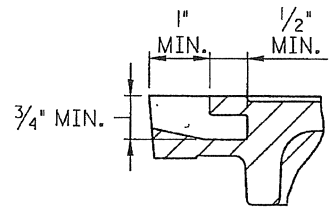
DRAWN BY	 Consulting Engineers and Planners	MANHOLE STEP DETAIL	APPROVED BY
DATE			DATE APPROVED
CHECK BY			DETAIL NO.
DATE			5110C



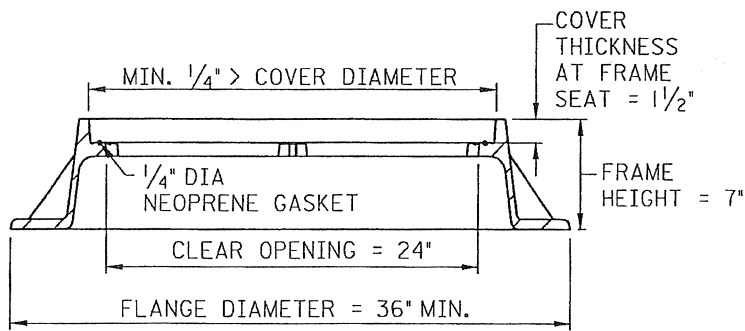
PLAN



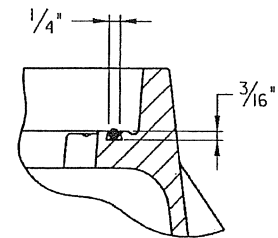
COVER SECTION



PICKHOLE DETAIL




FRAME SECTION



GROOVE DETAIL

NOTE: MINIMUM H-25 LOAD RATING

DRAWN BY	 BUCHART HORNING Consulting Engineers and Planners	HEAVY DUTY MANHOLE FRAME & COVER W/ GASKET IN FRAME	APPROVED BY
DATE			DATE APPROVED
CHECK BY			DETAIL NO.
DATE			5115

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-258-7

CODE: (SP)

DATE: 01/08/2009

SUBJECT: Miscellaneous Rest Area Facilities

PROJECT: STP-0055-02(210) / 105533301 – Holmes County

Section 907-258, Miscellaneous Rest Area Facilities, is hereby added to and made a part of the 2004 Edition of the Standard Specifications for Road and Bridge Construction as follows.

SECTION 907-258 - MISCELLANEOUS REST AREA FACILITIES

907-258.01--Description. This item shall consist of constructing and installing concrete picnic tables and benches, wooden picnic tables and benches, charcoal grills, drinking fountains, trash receptacles, sewage dump station, sign (masonry and stone), and cast stone benches, each complete in place, in accordance with these Specifications and in reasonably close conformity with the locations, lines, grades, configurations, dimensions and other requirements shown on the plans or established.

907-258.02--Materials.

A. General. Unless otherwise stipulated, the materials used in this construction, in addition to the general requirements of these Specifications and the plans shall conform to the provisions and requirements prescribed in the sections of the Standard Specifications for the several items which constitute the complete structure.

All items will require approval by the Engineer from the manufacturer. Submit six (6) copies of brochures or shop drawings for approval prior to ordering manufactured items. Other items may require testing as directed by the Engineer.

B. Concrete Picnic Table and Benches.

1. Concrete. Concrete for table top, seat top, and end supports shall be Class "A" Concrete. Concrete for table slabs will be paid for as concrete sidewalks - Pay Item No. 907-608.
2. Reinforcing Steel. Reinforcing steel shall conform to Section 711.
3. Paint for Table top and Seats. Paint or coating for table top and seats shall be an approved chlorinated rubber paint conforming to or exceeding Federal Specifications Number TT-P-91-D.

C. Wooden Picnic Tables. Wooden Picnic Tables shall be the model number 238-6GT, 6 feet long with galvanized pipe frame and treated wood top and seats, as manufactured by Iron

Mountain Forge, Farmington, Missouri, or approved equal.

Picnic tables shall be secured to the existing pavilion floor with lead shields, anchors, or other means as approved by the Engineer.

D. Charcoal Grill.

1. Charcoal Grill. Charcoal Grill shall be the Model 200-X Rotating Grill with post as manufactured by Iron Mountain Forge, Farmington, MO 63640, or approved equal. Post shall be set within a Class C concrete footing, size as recommended by manufacturer.

E. Drinking Fountain.

1. Waste Pipe. Waste pipe shall be of the size and type as shown on the plans and shall be standard PVC drain waste and vent piping.
2. Drain Pipe. Drain pipe shall be the size shown on the plans and shall conform to or exceed Commercial Standard CS 272-65 or CS 272.65.
3. Drinking Fountain. The drinking fountain shall be designed similar to the details shown on the plans, freeze-proof, and conforming to approved Handicapped Standards by the Engineer.
4. Concrete. Concrete, unless otherwise specified, shall be paid for as sidewalk, and have an approved exposed aggregate finish to match the finish on the adjacent sidewalk.
5. Valves (Stop and Drain). The cut-off valve shall be a standard brass stop and drain cut-off valve of the proper size and type as shown on the plans.

F. Trash Receptacle.

1. Trash Receptacle. The trash receptacle shall be the Aspen Series R-38 Standard with hinged top, leveling devices, galvanized metal liner, and hardware to secure the receptacle to the sidewalk, Empire Green in color with desert brown stone panels, model #R-38HT-202, as manufactured by United Receptacle, Inc., Pottsville, PA 17901-0870, or approved equal.
2. Concrete. Concrete, unless otherwise specified, shall be paid for as sidewalk, and have an approved broom finish to match the finish on the sidewalk.

G. Water Hydrant.

1. Water Hydrant. Steel body, self – closing, anti – freezing hydrant with heavy stainless operating springs, with ¾ inch supply as the model M-175 hydrant as manufactured by Murdock, Cincinnati, OH 45204, or approved equal. Color shall be selected by the Engineer.

2. Concrete. Concrete unless otherwise specified shall be paid for as sidewalk and have an approved broom finish to match the finish on the sidewalk.
3. Valves (Stop and Drain). The cut-off valve shall be standard brass stop and drain globe – type cut-off valve, in the same size as the supply line, located within a plastic valve box.

H. Travel Trailer Sewage Dump Station (Modifications).

1. Sewage Dump Station. The sewage dump station shall be constructed similar to the details shown on the plans, with Schedule 40 galvanized steel pipe and fittings complete with vacuum breaker, and hose, in accordance with the plan details, and State Health Department min. standards.
2. Concrete. Concrete unless otherwise specified shall be Class "B" conforming to Section 804 of the Standard Specifications and have an approved trowel finish.
3. Stand Pipe. Water stand pipe shall be standard galvanized Schedule 40 of the size shown on the plans.
4. Vent Pipe. Vent pipe shall be standard galvanized Schedule 40 of the size shown on the plans.
5. Signs. The signs shall be designed as shown on the details on the plans, constructed of .080 aluminum or 14 Ga. galvanized steel. the signs shall be manufactured by an approved sign company. Submit shop drawings.

I. Cast Stone Bench. Cast stone benches shall be constructed from the same material or an approved equal material as concrete picnic tables and benches.

J. Sign (Masonry and Stone).

1. Brick and Mortar. Brick and mortar shall be produced by the same manufacturer(s), and the be same type and kind (including bullnose and watertable units), and shall match the existing brick used on the Welcome Center Building, or approved equal.
2. Concrete Masonry Units. Hollow non-load bearing, light-weight aggregate, concrete masonry units conforming to ASTM C331-64T. Units shall be normal modular size for typical 3/8 inch mortar joint.
3. Concrete. Concrete unless otherwise specified shall be Class "B" conforming to Section 804 of the Standard Specifications.
4. Reinforcing Steel. Reinforcing steel shall conform to Section 711.
5. Precast Architectural Panel.

a. General:

Cement: Portland Cement conforming to ASTM C-150, Type I or III.

Fine and coarse aggregate: Conform to ASTM C-33. Variations from aggregate gradations are permissible for the facing mix.

Reinforcement shall conform to ASTM C-185 for welded wire fabric.

Hot-dip galvanizing shall conform to ASTM A-153

Anchoring devices, inserts, etc., shall be either galvanized or corrosion resistant types approved by the Architect and as detailed on the drawings.

b. Textures and Finishes.

Precast architectural concrete shall be honed finish, lightly textured, approximating finish of limestone, with color as selected by Owner and Architect.

c. Fabrication.

Precast architectural concrete shall be sufficiently reinforced to withstand conditions on the sign, including handling and erection stresses. Deformed bars with 1 inch or less clearance to an exterior face shall be galvanized.

Fabricate units straight, smooth, and true to size and shape, with exposed edges and corners precise and square unless otherwise indicated.

Provide reglets, slots, holes, and other accessories in units to receive cramps, dowels, reglets, waterstops, flashings, and other similar work as indicated.

Arises, inscriptions and details shall be faithfully executed to the Engineer's design.

Mark each precast item to correspond to identification mark on shop drawings.

Location of anchors, inserts and blockouts shall be +/- 3/8 inch from center line of location shown on drawings.

At welded connections apply rust-inhibitive coating on damaged areas, same as shop-applied material. Use galvanizing repair coating on galvanized surfaces.

d. Mixes.

Standard 6 inch by 12 inch cylinder strength of precast concrete shall not be less than 5,000 psi at 28 days when tested in accordance with ASTM C-39.

Absorption shall not be less than 3 percent and not more than 7 percent when tested in accordance with ASTM C-97.

Minimum thickness of facing mix shall be 1 1/2 inches thick.. Backup concrete may be made with grey cement and aggregates conforming to requirements for cast-in-place concrete.

e. Joint Material. Joint material shall be as recommended by the precast architectural concrete manufacturer, and as approved by the Engineer.

6. Letters and Symbols. Letters (including custom letters) and symbols shall be brass, in the shapes and sizes noted on the drawings, as manufactured by Metal Arts, A. R. K. Ramos, or Matthews.

The Engineer will provide camera ready art work of the symbols and custom letters to the Contractor for the manufacturer.

Method(s) of attaching letters and symbols to precast architectural concrete panel shall be approved by the Engineer.

K. Metal Bench. Garden – Style all – steel bench, 6 feet long, color – green, as Bench 118 series as manufactured by DuMor, Inc., Mifflintown, PA 17059-0142, or approved equal.

Bench shall be secured to concrete. Method of securing shall be reviewed with and approved by the Engineer.

L. Car Stop. 6 foot long concrete curb (car) stops as manufactured by Jackson Ready Mix Company, Jackson, MS, or approved equal. Curb stops shall be secured to pavement with number 3 reinforcing bars, 24 inches long.

907-258.03--Construction Requirements.

A. General. The method of construction, unless otherwise stipulated, shall conform to the provisions and requirements where applicable, prescribed in the standard specifications with the additions shown hereafter. All work shall be performed in a good workmanlike manner, to the satisfaction of the Engineer.

B. Concrete Picnic Tables and Benches. Concrete picnic tables and benches shall be constructed to the detailed dimensions shown on the plans. The handling and placing of concrete shall conform to Subsection 804.10. The top and edge surfaces of the table and benches shall receive a slick smooth finish.

The concrete shall be free of honeycomb and air pockets and in no case have a slump greater than one and one-half inches.

The ground under the slab shall be graded or shaped and compacted when necessary to insure a smooth, firm foundation for the slab. The ground adjacent to the slab shall be sloped to drain away from the slab in a manner so as to preserve the natural shape of the terrain as close as possible.

The concrete slab shall be poured around the table and benches in place and correctly aligned. Care shall be taken to place the expansion joint material around the top and bench supports as shown on the plans in a neat, secure manner. The slab shall be sloped to drain and receive an approved exposed aggregate finish to match the finish on the sidewalk.

The placing and fastening of reinforcement shall conform to Subsection 805.05.

The table shall be located as shown on the plans and as directed by the Engineer.

- C. Wooden Picnic Tables and Benches. Wooden picnic tables and benches shall be constructed to the dimensions and details shown on the plans. The tables shall be constructed by skilled carpenters in an approved manner so as to provide a strong, neat, well constructed table.

The table shall be located and secured in an approved manner as shown on the plans and as directed by the Engineer.

- D. Charcoal Grill. The charcoal grill shall be mounted securely to the support pipe in an approved manner as recommended by the manufacturer of the grill, with a locking device to make it as vandal proof as possible. The support pipe shall be set plumb and to the height as shown on the plans. The support pipe shall be set in concrete picnic table slab and shelter building slab during the placement of concrete. The grill shall be located as shown on the plans or as directed by the Engineer. The design of the grill proposed for use shall be submitted to the Engineer for approval.

- E. Drinking Fountain. The drinking fountain shall be installed by skilled plumbers, concrete finishers, and workmen in an approved manner to the satisfaction of the Engineer, to the dimensions and details shown on the plans, or approved by the Engineer.

The fountain drain shall be located to drain to the existing drain field or an approved ditch as directed by the Engineer.

The concrete base shall be constructed as shown on the plans or as directed by the Engineer. The concrete will be paid for under Pay Item 907-608.

- F. Trash Receptacle. The trash receptacle shall be installed on and secured to a square concrete pad 4 inches thick, with outside dimensions 6 inches greater than the width of the trash receptacle, in locations designated by the Engineer.

The excavation when required to place the trash receptacle into the ground shall be disposed of as directed by the Engineer.

The concrete shall be placed and brought to a broom finish to match the sidewalk in an approved manner. On locations adjacent to existing sidewalks, top of concrete pad for the receptacle shall meet flush with existing walk. Slope elevation of pads no more than 1/8 inch per foot in order that water will not stand.

The method to secure the trash receptacle to the concrete pad shall be submitted to the Engineer for approval.

- G. Water Hydrant. The hydrant shall be installed on and secured to a square concrete pad 4 inches thick, with outside dimensions 6 inches greater than the width of the hydrant, in locations designated by the Engineer.

The excavation when required to place the hydrant into the ground shall be disposed of as directed by the Engineer.

The concrete shall be placed and brought to a broom finish to match the sidewalk in an approved manner. On locations adjacent to existing sidewalks, top of concrete pad for the hydrant shall meet flush with existing walk. Slope elevation of pads no more than 1/8 inch per foot in order that water will not stand.

The method to secure the hydrant to the concrete pad shall be submitted to the Engineer for approval.

- H. Cast Stone Bench. The cast stone benches shall be a similar design and size as shown on the plans (submit brochures or shop drawings).

The benches shall be secured to the sidewalk or bench pad in an approved manner with epoxy cement or other approved cement, to the satisfaction of the Engineer.

- I. Travel Trailer Sewage Dump Station. The travel trailer sewage dump station shall be constructed by skilled plumbers, concrete finishers, and workmen in an approved manner to the satisfaction of the Engineer, to the details and dimensions shown on the plans.

- J. Sign (Masonry and Stone).

The excavation required to place the sign into the ground shall be disposed of as directed by the Engineer.

The concrete base shall be constructed as shown on the plans or as directed by the Engineer. The placing and fastening of reinforcement shall conform to Subsection 805.05.

Concrete Masonry Unit and Brick construction shall be in accordance with Section 611, and to the satisfaction of the Engineer.

Set precast architectural concrete panels straight, plumb, level, and square. Clean exposed facings to remove dirt and stains which may be on the units after erection and completion of

joint treatments. Wash and rinse in accordance with precast manufacturer's recommendations. Protect other work from damage due to cleaning operations. Do not use cleaning materials or processes which could change the character of exposed concrete finishes.

Attach letters and symbols in accordance with the drawings, approved shop drawings, and to the satisfaction of the Engineer.

K. Metal Bench. Install bench in strict accordance with the manufacturer's written instructions.

The method to secure the trash receptacle to the concrete pad shall be submitted to the Engineer for approval.

L. Car Stop. Drive reinforcing bars through holes in car stop and through new asphalt pavement. Top of reinforcing bar shall be driven to a point ¼ inch below the top of the car stop.

907-258.04--Method of Measurement. Miscellaneous Rest Area Facilities, constructed and complete in accordance with the requirements of the contract, and accepted, will be measured by the unit quantity (per each unit).

A unit of concrete picnic tables and benches shall consist of one table, two benches, the concrete slab shall be as indicated on the plans.

A unit of wooden picnic tables and benches shall consist of one table, two attached benches, and the concrete anchor and chain when required.

A unit of cast stone bench shall consist of one bench seat and three bench supports.

A unit of travel trailer sewage dump station shall consist of one tower, one drain, signs and concrete as shown in the plan details.

A unit of sign (masonry and stone) shall consist of all concrete, steel, masonry elements, letters, as symbols shown on the plans.

A unit of metal bench shall consist of one bench.

Separate measurement for excavation and other individual items will not be made, it being understood that the cost thereof is included in one contract price bid per complete items.

907-258.05--Basis of Payment. Charcoal grills, drinking fountains, concrete picnic tables and benches, wooden picnic tables and benches, trash receptacles, water hydrants, travel trailer sewage dump station, sign (masonry and stone), cast stone benches, and car stops each unit shall be paid for at the contract unit price bid per each, which price shall be full compensation for furnishing all materials and supplies; for performing all work necessary for each completed unit; and for all equipment, tools, labor and incidentals necessary to complete the work.

Payment will be made under:

- 907-258-A: Charcoal Grill - per each
- 907-258-B: Drinking Fountain - per each
- 907-258-C: Concrete Picnic Table and Benches - per each
- 907-258-D: Wooden Picnic Table and Benches - per each
- 907-258-E: Trash Receptacle - per each
- 907-258-F: Water Hydrant - per each
- 907-258-G: Travel Trailer Sewage Dump Station - per each
- 907-258-H: Cast Stone Bench - per each
- 907-258-I: Sign (Masonry and Stone) - per each
- 907-258-J: Metal Bench - per each
- 907-258-K: Car Stop - per each

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-259-4

CODE: (SP)

DATE: 05/19/2006

SUBJECT: Site Amenities

PROJECT: STP-0055-02(210) / 105533301 – Holmes County

Section 907-259, Site Amenities, is hereby added to and made a part of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows.

SECTION 907-259 -- SITE AMENITIES

907-259.01--Description. This item shall consist of installing unlighted and lighted bollards, flag pole lights, sign lights and column uplights, each complete in place, in accordance with these Specifications and in reasonably close conformity with the locations, lines, grades, configurations, dimensions and other requirements shown on the plans or established.

907-259.02--Materials. Unless otherwise stipulated, the materials used in this construction, in addition to the general requirements of these specifications and the plans, shall conform to the provisions and requirements prescribed in the sections of the Standard Specifications for the several items which constitute the complete structure.

All items will require approval by the Engineer from the manufacturer. The Contractor submit six (6) copies of brochures or shop drawings for approval prior to ordering manufactured items. Other items may require testing as directed by the Engineer

- A. Non-lighted Bollards. Bollards shall be Charleston Model Number BOL/CH44/12/DT/CA/DB, as manufactured by Holophane or other accepted models by Gardco, American Pole or approved equal.
- B. Lighted Bollards. Bollards shall be Charleston Model Number BOL/CH44/12/DTL/CA/DB/S100/208 , as manufactured by Holophane or other accepted models by Gardco, American Pole or approved equal.
- C. Flag Pole Lights. Flag pole lights shall be Model Number DF7-SP(W/ST) – HFL 250 HPS-208-BRP as manufactured by GARDCO or other accepted models by Kim, Greenlee or approved equal.
- D. Sign Lights. Sign lights shall be Model Number DF7-SP(W/ST) – HFL-175-208-BRP as manufactured by GARDCO or other accepted models by Kim, Greenlee or approved equal.
- E. Fluorescent Light @ Kiosk. Fluorescent lights (2' x 4' - 2 lamp) shall be Model Number SWN 232 120 1/2 LT as manufactured by Day-Brite or other accepted models by Lithonia,

Cooper or approved equal.

F. Weatherproof GFCI Receptacles. Weatherproof GFCI receptacle shall be commercial specification grade 20A 125V GFCI receptacle(s) as manufactured by Hubbell or other accepted models by Pass & Seymour, Leviton or approved equal. Color shall be black and verified with Project Engineer.

G. Column Uplights. Column lights shall be Model Number LTV10 NF 70MH208/RG10/GM10 as manufactured by KIM or other accepted models by Gardco, Greenlee or approved equal.

907-259.03--Construction Requirements. The Contractor shall provide and install site amenities in accordance with the drawings, special provisions, and the standard specifications. All work shall be performed in a good workmanlike manner, to the satisfaction of the Engineer.

907-259.04--Method of Measurement. Site Amenities of the type specified, constructed and complete in accordance with the requirements of the contract, will be measured by the unit quantity per each.

907-259.05--Basis of Payment. Site Amenities of the type specified shall be paid for at the contract unit price bid per each, which price shall be full compensation for furnishing all materials and supplies; for performing all work necessary for each completed unit; and for all equipment, tools, labor and incidentals necessary to complete the work.

Payment will be made under:

- 907-259-A: Lighting Assembly, Non-lighted Bollards -per each
- 907-259-B: Lighting Assembly, Bollards - per each
- 907-259-C: Lighting Assembly, Flag Pole Lighting - per each
- 907-259-D: Lighting Assembly, Sign Lighting - per each
- 907-259-E: Lighting Assembly, Kiosk - per each
- 907-259-F: Weatherproof GFCI Receptacle - per each
- 907-259-G: Lighting Assembly, Column Uplights - per each

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-282-5

CODE: (SP)

DATE: 01/23/2009

SUBJECT: Irrigation System

PROJECT: STP-0055-02(210) / 105533301 – Holmes County

Section 907-282, Irrigation System, is 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, complete, constructed to the grades and conforming to the areas and locations shown on the drawings.

Irrigation lines shown on the drawings 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 drawings only with the permission of the Engineer.

907-282.01.1--Irrigation Operations. 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 to provide a minimum of 3 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: Visit the job site and become familiar with the nature and location of the work, existing conditions, and other conditions that you 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.

Submittals: Submit 8 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: Furnish the following instructions and maintenance data. Final Acceptance will not be made until the Work has been reviewed and approved by the Engineer.

As-built drawings: 2 sets, noting exact locations of elements and changes to the drawings in red.

Operation Manual: 2 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.

Extra Stock: Provide in addition to installed system 1 sprinkler head of each size and type, 1 valve key (per valve) for operating manual valves, 1 key per valve box, 2 wrenches for each type of head cover, and 2 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, 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 907-282.01.3.

907-282.02.2--Delivery and Storage. Damaged materials will not be accepted. Deliver packaged materials to the site in the original, unopened containers. Store materials delivered to site prior to actual usage in a place not to interfere with other trades or construction operations and protect from damage by weather or other elements as needed.

907-282.02.3--Pipe and Pipe Fittings.

907-282.02.3.1--Plastic Piping. Class 160 SDR 26-ASTM D2241 Polyvinyl Chloride (PVC) pipe NSF approved. Pipe up to and including 2-1/2 inches in diameter shall have bell and socket joints. Pipe greater than 2-1/2 inches in diameter shall have snap connections with rubber gasket joints.

907-282.02.3.2--Sleeves. In the size as noted on the drawings, shall be schedule 40 PVC pipe.

907-282.02.3.3--Plastic Fittings and Risers. Schedule 40 or Schedule 80 PVC. Risers above finished grade shall receive 2 coats of black exterior semi-gloss enamel paint.

907-282.02.3.4--PVC Solvent Cement. As per ASTM specification D 2564-67

907-282.02.3.5--Polyethylene Pipe and Fittings. 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 (glue fittings and female barb adapters not 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. PEB Series as manufactured by Rain Bird Sprinkler Mfg. Corp., Glendora, California, or approved equal.

Provide water-tight connectors as 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 Armor Access Boxes, Sheboygan, WI 53081, 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.

Install quick coupler inside a valve box as noted on the drawings.

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.

Provide 1 key for every 3 valves installed.

With each valve install a valve box which shall be standard cast iron two-piece 5-1/4 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. 1800 Series 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. R-50 Series with 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) shall be Number 14 size, (minimum) copper wire suitable for direct burial.

907-282.02.7--Low Point Drains: Automatic Valve model number 290-02 as manufactured by Toro, or an approved equal. Provide 2 at 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. Model ESP-LX Plus controller with internal transformer and lockable cabinet, as manufactured by Rain Bird Sprinkler Mfg. Corp., Glendora, California, or approved equal. With each controller, provide 1 Automatic Rain/ Freeze Switch, the Mini-Flic 2 Rain Sensor #502, as manufactured by Glen Hilton, or approved equal.

907-282.02.9--Backflow Preventer. See Mechanical drawings and specifications.

907-282.02.10--Meter. See Mechanical drawings and specifications.

907-282.03--Construction Requirements.

907-282.03.1--Pressure/Flow Test. Immediately after installation of meters, and before installing pipe, test and provide written results to the Engineer of the static pressure, dynamic pressure, and gallons per minute. Perform tests at the beginning tap or meter and note as such on the written results.

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. Excavate trench to pipe grade depth. Make width of trench at least 3-1/2 inches. Backfill and hand tamp over-excavation prior to installing piping. Excavate trenches deeper than required in soils containing rock or other hard material that might damage pipe. Backfill to pipe grade with selected fine earth or sand. Keep trenches free of obstructions and debris that would damage pipe.

More than 1 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. 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. Maintain a minimum 1-inch vertical clearance 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. Wrap joints 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. ASTM D 2855-70.

907-282.03.5--Valves. Install plumb to within 1/16 inch. Install Scotch Lock connectors to wiring in accordance with the manufacturer's written instructions. Wrap a 2-foot section beginning at the Scotch Lock connector around a minimum 1/2-inch diameter pipe to protect against electrical surges from lightning.

907-282.03.6--Sprinklers. Sprinklers: Install plumb to within 1/16 inch. Heads along walks and curbs: Set flush to within 1/8 inch. Other Heads: Set as per details and drawings.

907-282.03.7--Control Wire. Bury beside pipe in same 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. Fill trench to within 3 inches of top with excavated soil and water to compact soil. Fill top 3 inches with existing topsoil in planting areas and wheel roll until compaction of backfill is same as surrounding soil.

907-282.03.9--Electrical Connections. Shall be in strict accordance with the latest edition of the National Electrical Code. Provide the electrical connection to the system as designated on the drawings 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 shall be as per drawings, and approved by Engineer PRIOR to installation.

Rain – Freeze device shall be located where approved by the Engineer.

907-282.03.12--Flushing. Following installation of piping, risers and valves, but prior to installation of sprinkler heads, thoroughly flush piping system under a full head of water. Maintain flushing for 3 minutes through furthest valve. After flushing, cap risers.

907-282.03.13--Testing. Conduct tests in presence of Engineer.

907-282.03.13.1--Pressure Test. Hydrostatically test the main piping system between meter and valves in place prior to backfilling. Maintain a minimum pressure of 50 PSI without pumping for period of one hour. Test is acceptable if no leakage or loss of pressure is evident during test period. Detect and repair leaks. Retest 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 conclusion of pressure test, install sprinkler heads and test entire system for operation under normal operating pressure. Adjust heads as noted on drawings. Retest entire system. Test is acceptable if system operates in a satisfactory manner, with uniform coverage of areas to be irrigated.

907-282.03.14--Guarantee. Guarantee Work for one year from date of final acceptance against defects in material, equipment and workmanship. 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. Contractor shall achieve final acceptance when systems are fully operational, approved by both the Engineer and Department, and As-Built Drawings and project manuals have been accepted and approved.

907-282.04--Method of Measurement.

907-282.04.1--Sprinkler Heads. Where noted on the drawings, sprinkler heads accepted in place will be measured per each for type of head (Pop – up fixed spray) 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. Where noted on the drawings and as adjusted by the Contractor in the field, piping accepted in place will be measured per linear foot for each size as shown on the drawings.

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. Where noted on the drawings and as adjusted by the Contractor in the field, sleeves accepted in place will be measured per linear foot for each size as required.

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. As needed for power supply and control of the electric control valves from the electric controllers, valve control wire accepted in place 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. As needed for piping and wiring, trenching and backfill accepted in place will be measured per linear foot.

Depth or width of trench will not be considered regarding separate payment.

907-282.04.6-- Electric Controller. Where noted on the drawings, 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.

907-282.04.7--Electric Control Valve, Isolation Valve, and Quick Coupler Valve. Where noted on the drawings, 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.

907-282.05--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 and sleeves 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--Electric Controller, Electric Control Valve, Isolation Valve, and Quick Coupler with Key and Hose Swivel. Accepted quantities for electric controller, electric control valve, and quick coupler valve 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, <u>Size</u>	- per linear foot
907-282-D: Valve Control Wire	- per linear foot
907-282-F: Electric Controller	- per each
907-282-G: Electric Control Valve, <u>Size</u>	- per each
907-282-H: Isolation Valve	- per each
907-282-I: Backflow Flow Preventer, <u>Size</u>	- per each

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-290-3

CODE: (SP)

DATE: 01/08/2009

SUBJECT: Flagpole

Section 907-290, Flagpole, is added to and made part of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as follows:

SECTION 907-290--FLAGPOLE

907-290.01--Description. This work shall consist of furnishing all materials and erecting a flagpole as indicated on the plans or established.

907-290.02--Materials.

907-290.02.1--General. Unless otherwise stipulated, the materials used in this construction, in addition to the general requirements of this Special Provision, shall conform to the applicable sections of the Standard Specifications.

907-290.02.2--Concrete for Flagpole Footing. Concrete for the flagpole footing shall conform to Class "B" Concrete, meeting the requirements of applicable subsections of Section 804 of the Standard Specifications.

907-290.02.3--Flagpole. The flagpole shall be an approved tapered aluminum flagpole, having an approximate 30-foot exposed height. The pole shall be complete with a 14 gauge aluminum ball gold finish finial, umbrella type revolving truck, tiedown cleat with matching (material) cover capable of being padlocked in position over the tiedown cleat, two No. 10 (5/16") polypropylene halyards with solid bronze swivel snaps per halyard, and ornamental base collar.

The pole shall be made from 6063T6 extruded aluminum tubing with approximately one inch every five to six feet straight taper, with a butt diameter of approximately six inches and top diameter of approximately three and one half inches and have an approved satin finish.

907-290.02.4--Descriptive Data. Six (6) copies of material descriptive data, in the form of brochures or shop drawings, shall be submitted for review and approval prior to installation of the materials.

907-290.03--Construction Requirements. The flagpole shall be erected plumb in an approved manner to the satisfaction of the Engineer and in accordance with the manufacturer's details and recommendations. Material excavated in flagpole construction shall be disposed of as directed by the Engineer.

907-290.04--Method of Measurement. Flagpole, complete in place and accepted, will be measured per each. Separate measurement for payment will not be made of any individual unit, operation, or incidental item involved in this construction.

907-290.05--Basis of Payment. Flagpole, measured as provided in Subsection 907-290.04, will be paid for at the contract unit price per each complete unit, which price shall be full compensation for furnishing all materials and supplies, for all excavation, backfilling and disposal of surplus material, and for any other work required to complete the flagpole installation.

Payment will be made under:

907-290-A: Flagpole

- per each

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SUPPLEMENT TO SPECIAL PROVISION NO. 907-401-2

DATE: 06/25/2009

SUBJECT: Hot Mix Asphalt (HMA)

Add the following before 907-401.02.6.2 on page 1.

907-401.02.4--Substitution of Mixture. Delete the table in Subsection 401.02.4 on page 242, and substitute the following:

Mixture	Single Lift Laying Thickness Inches	
	Minimum	Maximum
25 mm	3	4
19 mm	2 ¼	3 ½
12.5 mm	1 ½	2 ½
9.5 mm	1	1 ½
4.75 mm	½	¾

After Subsection 907-401-02.6.2 on page 2, add the following:

907-401.02.6.4.1--Roadway Density. Delete subparagraphs 1., 2., & 3. on page 251 and substitute the following:

1. For all leveling lifts, when full lane width and with a thickness as specified in the table in Subsection 401.02.4, the required lot density shall be 92.0 percent of maximum density.
2. For all single lift overlays, with or without leveling and/or milling, the required lot density shall be 92.0 percent of maximum density.
3. For all multiple lift overlays of two (2) or more lifts excluding leveling lifts, the required lot density of the bottom lift shall be 92.0 percent of maximum density. The required lot density for all subsequent lifts shall be 93.0 percent of maximum density.
4. For all pavements on new construction, the required lot density for all lifts shall be 93.0 percent of maximum density.

907-401.03.1.2--Tack Coat. Delete the three sentences of Subsection 401.03.1.2 on page 259, and substitute the following:

Tack coat shall be applied to previously placed HMA and between lifts, unless otherwise directed by the Engineer. Tack coat shall be applied with a distributor spray bar. A hand wand

will only be allowed for applying tack coat on ramp pads, irregular shoulder areas, median crossovers, turnouts, or other irregular areas. Bituminous materials and application rates for tack coat shall be as specified in Table 410-A on page 293. Construction requirements shall be in accordance with Subsection 407.03 of the Standard Specifications.

907-401.03.1.4--Density. Delete the first sentence of the first paragraph of Subsection 401.03.1.4 on page 259 and substitute the following:

The lot density for all dense graded pavement lifts, except as provided below for preleveling, wedging [less than fifty percent (50%) of width greater than minimum lift thickness], ramp pads, irregular shoulder areas, median crossovers, turnouts, or other areas where the established rolling pattern cannot be performed, shall not be less than the specified percent (92.0% or 93.0%) of the maximum density based on AASHTO Designation: T 209 for the day's production. For all leveling lifts, when full lane width and with a thickness as specified in the table in Subsection 401.02.4, the required lot density shall be 92.0 percent of maximum density.

907-401.03.9--Material Transfer Equipment. Delete the paragraph in Subsection 401.03.9 on page 264 and substitute the following:

Excluding the areas mentioned below, the material transferred from the hauling unit when placing the top lift, or the top two (2) lifts of a multi-lift HMA pavement with density requirements, shall be remixed prior to being placed in the paver hopper or insert by using an approved Materials Transfer Device. Information on approved devices can be obtained from the State Construction Engineer. Areas excluded from this requirement include: leveling courses, temporary work of short duration, detours, bridge replacement projects having less than 1,000 feet of pavement on each side of the structure, acceleration and deceleration lanes less than 1,000 feet in length, tapered sections, transition sections for width, shoulders less than 10 feet in width, crossovers, ramps, side street returns and other areas designated by the Engineer.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-401-2

CODE: (IS)

DATE: 11/04/2005

SUBJECT: Hot Mix Asphalt (HMA)

Section 401, Hot Mix Asphalt (HMA) - General, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

Delete in toto Subsection 401.02.6.2 on pages 248 and 249, and substitute:

907-401.02.6.2--Assurance Program for Mixture Quality. The Engineer will conduct a quality assurance program. The quality assurance program will be accomplished as follows:

- 1) Conducting verification tests.
- 2) Validate Contractor test results.
- 3) Periodically observing Contractor quality control sampling and testing.
- 4) Monitoring required quality control charts and test results.
- 5) Sampling and testing materials at any time and at any point in the production or laydown process.

The rounding of all test results will be in accordance with Subsection 700.04.

The Engineer will conduct verification tests on samples taken by the Contractor under the direct supervision of the Engineer at a time specified by the Engineer. The frequency will be equal to or greater than ten percent (10%) of the tests required for Contractor quality control and the data will be provided to the Contractor within two asphalt mixture production days after the sample has been obtained by the Engineer. At least one sample shall be tested from the first two days of production. All testing and data analysis shall be performed by a Certified Asphalt Technician-I (CAT-I) or by an assistant under the direct supervision of the CAT-I. Certification shall be in accordance with the *MDOT HMA Technician Certification Program* chapter in the Materials Division Inspection, Testing, and Certification Manual. The Department shall post a chart giving the names and telephone numbers for the personnel responsible for the assurance program.

The Engineer shall be allowed to inspect Contractor testing equipment and equipment calibration records to confirm both calibration and condition. The Contractor shall calibrate and correlate all testing equipment in accordance with the latest versions of the Department's Test Methods and AASHTO Designation: R 18.

Random differences between the Engineer's verification tests and the current running average of four quality control tests at the time of obtaining the verification sample will be considered acceptable if within the following limits:

Item	Allowable Differences
Sieve - % Passing	
3/8-inch and above	6.0
No. 4	5.0
No. 8	4.0
No. 16, for 4.75 mm mixtures ONLY	3.5
No. 30	3.5
No. 200	2.0
AC Content	0.4
Specimen Bulk SG, Gmb @ N_{Design}	0.030
Maximum SG, Gmm	0.020

If four quality control tests have not been tested prior to the time of the first verification test, the verification test results will be compared to the average of the preceding quality control tests. If the verification test is the first material tested on the project or if a significant process adjustment was made just prior to the verification test, the verification test results will be compared to the average of four subsequent quality control test results. For all other cases after a significant process adjustment, the verification test results will be compared to the average of the preceding quality control tests (taken after the adjustment) as in the case of a new project start-up when four quality control tests are not available.

In the event that; 1) the comparison of the Contractor’s running average quality control data and Engineer’s quality assurance verification test results are outside the allowable differences in the above table, or 2) if a bias exists between the results, such that one of the results is predominately higher or lower than the other, and the Engineer’s results fail to meet the JMF control limits, the Engineer will investigate the reason immediately. As soon as the need for an investigation becomes known, the Engineer will increase the quality assurance sampling rate to the same frequency required for Contractor testing. The additional samples obtained by the Engineer may be used as part of the investigation process or for routine quality assurance verification tests. The Engineer's investigation may include testing of the remaining quality control split samples, review and observation of the Contractor's testing procedures and equipment, and a comparison of split sample test results by the Contractor quality control laboratory, Department quality assurance laboratory and the Materials Division laboratory. The procedures outlined in the latest edition of MDOT’s Field Manual for HMA may be used as a guide for the investigation. In the event that the Contractor’s results are determined to be incorrect, the Engineer's results will be used for the quality control data and the appropriate payment for the mixture will be based on the procedures specified in Subsection 401.02.5.8(j).

The Engineer will periodically witness the sampling and testing being performed by the Contractor. The Engineer, both verbally and in writing, will promptly notify the Contractor of any observed deficiencies. When differences exist between the Contractor and the Engineer which cannot be resolved, a decision will be made by the State Materials Engineer, acting as the referee. The Contractor will be promptly notified in writing of the decision. If the deficiencies are not corrected, the Engineer will stop production until corrective action is taken.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SUPPLEMENT TO SPECIAL PROVISION NO. 907-403-4

DATE: 03/30/2007

SUBJECT: Hot Mix Asphalt (HMA)

Before Subsection 907-403-05.2 on page 1, add the following:

Delete Subsection 403.03.5.5 on page 273 and substitute the following:

907-403.03.5.5--Preliminary Leveling. All irregularities of the existing pavement, such as ruts, cross-slope deficiencies, etc., shall be corrected by spot leveling, skin patching, feather edging or a wedge lift in advance of placing the first overall lift.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-403-4

CODE: (IS)

DATE: 11/04/2005

SUBJECT: Hot Mix Asphalt (HMA)

Section 403, Hot Bituminous Pavement, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-403.05.2--Pay Items. Add the "907" prefix to the pay items listed on page 275 & 276.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-407-1

CODE: (SP)

DATE: 02/26/2008

SUBJECT: Tack Coat

Section 407, Tack Coat, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-407.02.1--Bituminous Material. Delete the second sentence of the first paragraph of Subsection 407.02.1 on page 281, and substitute the following:

When not specified, the materials shall be as specified in Table 410-A on page 293.

907-407.03.3--Application of Bituminous Material. Delete the first paragraph of Subsection 407.03.3 on page 281, and substitute the following

Tack coat shall be applied with a distributor spray bar. A hand wand will only be allowed for applying tack coat on ramp pads, irregular shoulder areas, median crossovers, turnouts, or other irregular areas. Bituminous materials and application rates for tack coat shall be as specified in Table 410-A on page 293. Tack coat shall not be applied during wet or cold weather, after sunset, or to a wet surface. Emulsions shall be allowed to "break" prior to superimposed construction.

907-407.05--Basis of Payment. Delete the pay item at the end of Subsection 407.05 on page 282, and substitute the following:

907-407-A: Asphalt for Tack Coat *

- per gallon

* Grade may be specified

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-501-3

CODE: (SP)

DATE: 08/31/2007

SUBJECT: Price Adjustment For Thickness

Section 907-501, Portland Cement Concrete Pavement, of the 2004 Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-501-05.1--General. Delete pay item nos. 501-A, 501-B & 501-C on page 326 and substitute the following.

- 907-501-A: ___ " Reinforced Cement Concrete Pavement,
 _____ Finish - per square yard
- 907-501-B: ___ " Plain Cement Concrete Pavement, _____ Finish - per square yard
- 907-501-C: ___ " Continuously Reinforced Cement Concrete
 Pavement, _____ Finish - per square yard

907-501-05.2--Price Adjustment for Thickness. Delete the table in Subsection 501.05.2 on page 327 and substitute the following:

Thickness Deficiency Inches	Proportional Part of Contract Price Allowed
0.0, 0.1, 0.2	100 percent
0.3	80 percent
0.4	72 percent
0.5	68 percent
0.6, 0.7, 0.8	57 percent
0.9, 1.0	50 percent

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-601-1

CODE: (IS)

DATE: 08/29/2007

SUBJECT: Structural Concrete

Division 600, Incidental Construction, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

After the heading **DIVISION 600 - INCIDENTAL CONSTRUCTION**, add the following:

Unless otherwise specified, all testing of Portland cement concrete in Division 600 shall be in accordance with the requirements of Subsection 907-601.02.1.

907-601.02--Materials.

907-601.02.1--General. Delete the second and third sentence of the first paragraph of Subsection 601.02.1 on page 348, and substitute the following:

Sampling and testing will be in accordance with TMD-20-04-00-000 or TMD-20-05-00-000, as applicable.

907-601.03.6.3--Removal of Falsework, Forms, and Housing. Delete the first paragraph, the table and second paragraph of Subsection 601.03.6.3 on pages 349 and 350, and substitute the following:

The removal of falsework, forms, and the discontinuance of heating, shall be in accordance with the provisions and requirements of Subsection 907-804.03.15, except that the concrete shall conform to the following compressive strength requirements:

Wingwall and Wall Forms not Under Stress	1000 psi
Wall Forms under Stress	2200 psi
Backfill and Cover clear	2400 psi

In lieu of using concrete strength cylinders to determine when falsework, forms, and housings can be removed, an approved maturity meter may be used to determine concrete strengths by inserting probes into concrete placed in a structure. The minimum number of maturity meter probes required for each structural component shall be in accordance with Subsection 907-804.03.15. Procedures for using the maturity meter and developing the strength/maturity relationship shall follow the requirements of Subsection 907-804.03.15. Technicians using the maturity meter or calculating strength/maturity graphs shall meet the requirements of Subsection 907-804.03.15.

907-601.05--Basis of Payment. Add the “907” prefix to the pay items listed on page 352.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-608-6

CODE: (SP)

DATE: 07/29/2009

SUBJECT: Stamped and Colored Concrete Sidewalk

PROJECT: STP-0055-02(210) / 105533301 – Holmes County

Section 608, Concrete Sidewalks, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as amended by this special provision is applicable to Stamped And Colored Concrete Sidewalks Only.

907-608.01--Description. The work covered under this special provision consists of furnishing all labor, materials, tools, tests, royalties, services and other incidentals as may be required for the good and proper completion of the Stamped and Colored Concrete Sidewalk operations.

The extent of colored and imprinted sidewalk locations are shown on the drawings. These locations are generally limited to all proposed concrete traffic islands and concrete median end noses.

The Contractor is responsible for notes on the drawings which call attention to particular requirements or conditions. The fact that these requirements or conditions are not called out in the specifications does not relieve the Contractor of responsibility for these requirements or conditions.

907.608.01.1--Quality Assurance. Installation shall be performed by an installer with at least one year experience in the placement of stamped and colored concrete sidewalk paving systems.

907-608.02--Materials. After the last paragraph of Subsection 608.02 on page 608-1, add the following:

Colored concrete materials and imprinting tool release agents shall be manufactured by L. M. Scofield Company, Kemiko, or ECO ProCote, meeting the following requirements.

- A. Coloring Agents: Contractor may elect to color the concrete integrally using CHROMIX Admixture for color-conditioned concrete, or may apply dry-shake LITHOCHROME COLOR HARDNER to the surface of the freshly poured concrete.

Colors for Colored and Imprinted Concrete shall be selected by the Engineer from the Scofield (or approved manufacturer) Standard or Designer color charts.

- B. Curing and Finishing Material: Contractor shall utilize LITHOCHROME COLORWAX, a color-matched curing and finishing material. Curing materials or methods for uncolored concrete shall not be used with Colored and Imprinted Concrete.

- C. Release Agent: Contractor shall utilize a dry-shake powder to facilitate the release of the concrete imprinting tools. The color of the release agent shall match the selected main coloring agent chosen by the Engineer for the concrete.
- D. Imprinting Tools: Tools shall be of high quality and shall provide uniform control of joint depth.
- E. Imprint Tool Pattern: The imprint pattern to be used for all concrete imprinting shall be a 4" x 8" brick running bond pattern, with a 4" x 8" matching soldier course border used along the perimeter of all proposed concrete traffic islands and median end noses. Refer to the drawings for pattern layout and orientation of the imprint patterns.

Once the color, method of coloring, and the imprinting tools have received approval from the Engineer, the Contractor shall provide a 4-foot square panel, separate from proposed traffic island and median end nose areas, to be reviewed and approved by the Engineer. Engineer will evaluate color as compared to color chart and texture of broom finish.

Subsequent panels may be required, if finish, imprint quality, or color are unacceptable to the Engineer. The Contractor shall remove unaccepted panels immediately from site. Accepted panel shall remain until all colored concrete traffic islands and median end noses have been completed by the Contractor, at which time the Contractor shall remove the panel from the site.

907-608.03.4--Handling, Measuring, Proportioning, and Mixing Materials. After the first paragraph of Subsection 608.03.4 on page 608-1, add the following:

Should an integral coloring method be selected by the Contractor, the Contractor shall mix coloring agent in strict accordance with the Scofield Chromix Admixture Tech-Data Bulletin A-304.08, or the approved manufacturer's written instructions. Copies of the manufacturer's written instructions shall be furnished to the Engineer prior to manufacture and placement of colored concrete.

Should a dry-shake applied coloring method be selected by the Contractor, the Contractor shall measure and apply coloring agent in strict accordance with the Scofield Lithochrome Color Hardener Tech-Data Bulletin A-104.10, or the approved manufacturer's written instructions. Copies of the manufacturer's written instructions shall be furnished to the Engineer prior to manufacture and placement of colored concrete.

907-608.03.4--Protection and Curing. After the second paragraph of Subsection 608.03.7 on page 608-2, add the following:

Protection and curing materials and methods of application for stamped and colored concrete sidewalk shall be in strict accordance with the Scofield Lithochrome Colorwax Tech-Data Bulletin A-514.04, or the approved manufacturer's written instructions. Copies of the manufacturer's written instructions shall be furnished to the Engineer prior to manufacture and placement of colored concrete.

907-608.04--Method of Measurement. After the last paragraph of Subsection 608.04 on page 608-3, add the following:

Stamped and Colored Concrete Sidewalk, completed and accepted, will be measured by the square foot. Sample panels will not be measured for separate payment.

907-608.05--Basis of Payment. After the first paragraph of Subsection 608.05 on page 608-3, add the following:

Stamped and Colored Concrete Sidewalk will be paid for at the contract unit price of square foot, which shall be full compensation for completing the work.

After the last pay item listed on page 608-3, add the following:

907-608-D: Stamped and Colored Concrete Sidewalk - per square foot

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-626-16

CODE: (SP)

DATE: 06/02/2008

SUBJECT: 40-mil Thermoplastic Markings

Section 626, Thermoplastic Traffic Markings, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction as amended by this special provision is applicable for 40-mil thermoplastic markings only:

907-626.01--Description. This work shall consist of furnishing materials and applying 40-mil thick hot thermoplastic pavement marking as shown on the plans or directed by the Engineer.

907-626.02--Materials.

907-626.02.1--Binder. The binder shall consist of a mixture of synthetic resins, at least one of which is solid at room temperature. The total binder content of the compound shall be well distributed throughout the compound. The binder shall be free from all foreign objects or ingredients that would cause bleeding, staining or discoloration. The binder shall be 26 percent minimum by weight of the compound. The binder shall be characterized by an IR Spectra.

907-626.02.2--Pigment. The pigment used for the white compound shall be a high-grade pure (minimum 93% titanium dioxide, TiO₂). The white pigment content shall not be less than 10 percent by weight and shall be uniformly distributed throughout the compound.

The pigments used for the yellow paint compound shall be heat resistant and shall produce a compound meeting the requirements of FED 595 Color No. 33538. The yellow marking material shall contain a minimum of 4 percent by weight of the yellow pigment. Yellow pigment shall be lead free.

907-626.02.3--Filler. The filler to be incorporated with the resins as a binder shall be a white calcium carbonate, silica, or an approved substitute. Any filler which is insoluble in 6N hydrochloric acid shall be of such particle size as to pass a No.100 sieve.

907-626.02.4--Glass Beads. Intermix glass beads shall be uniformly mixed throughout the material at the rate of not less than 27 percent by weight (retained on the No.100 sieve) of compound. Drop on beads shall be used with pavement marking material and shall be applied uniformly at a minimum rate of 12 pounds per 100 square feet.

907-626.02.4.1--Properties. The drop on glass beads furnished under this specification shall consist essentially of transparent, water-white glass particles of a spherical shape. They shall be manufactured from a glass of a composition designed to be highly resistant to traffic wear and to the effects of weathering. The glass beads shall conform to the following requirements:

(a) **Sieve Analysis.** The glass beads shall meet the following sieve requirements:

<u>Sieve No.</u>	<u>% Retained</u>	<u>% Passing</u>
12	0	100
14	0-5	95-100
16	5-20	75-95
18	40-80	10-47
20	10-40	0-7
25	0-5	0-2
Pan	0-2	--

(b) **Imperfections.** The surface of the glass beads shall be free of pits and scratches. The sizes beads shall have a roundness of 70% minimum average per ASTM Designation: D1155 with the exception of the +20 portion, which shall have a 65% minimum true spheres, tested visually.

(c) **Index of Refraction.** The index of refraction of the glass beads shall be not less than 1.50 when tested by the immersion method at 77°F.

(d) **Silica Content.** The glass beads shall contain not less than 65 percent silica (SiO₂).

(e) **Chemical Stability.** Glass beads which show tendency toward decomposition, including surface etching, when exposed to material or material constituents will be rejected. The glass beads shall be tested by Federal Specification T-T-B-1325A, Section 4.3.11, water resistant soxhlet extraction method, with the following exceptions:

Under "Procedure", the size of sample to be tested shall be 25 grams.

Under testing, Paragraph (1), the reflux-time shall be five hours and upon examination after testing the glass beads shall show no dulling effect.

Under Paragraph (2), if more than 4.5 mls of 0.1 N hydrochloric acid are used to reach the end point, it shall constitute failure of the test.

(f) **Flowing Properties.** The glass beads shall flow uniformly through dispensing equipment in atmospheric humidity up to 94%. The drop-on beads shall pass the following test:

One hundred grams of glass beads, spread evenly and thinly in a suitable container, shall be conditioned at 77°F for 4 hours over a solution of sulfuric acid with Sp. Gr. 1.10, in a closed desiccator. After four hours, the glass beads shall flow readily through a clean glass analytical funnel, 60°, 5-mm. diameter and 105-mm. stem. Inside diameter of the stem shall be a nominal 1/4 inch.

(g) **Coating:** The glass beads used for intermix shall be uncoated. The glass beads used for the

drop on application shall be coated with an adhesion promoting coating. Silicone coated drop on beads shall not be allowed.

(h) **Packaging.** The drop on glass beads shall be delivered in moisture proof bags consisting of at least five-ply paper construction unless otherwise approved. Each bag shall contain 50 or 55 pounds net, and shall be legibly marked with the manufacturer, specifications and type, lot number, and the month and year the glass beads were packaged.

907-626.02.5--Thermoplastic Material. In the plastic state, the material shall not give off fumes that are toxic or otherwise injurious to persons or property. The manufacturer shall provide material safety sheets for the product.

The temperature versus viscosity characteristic of the plastic material shall remain constant and the material shall not deteriorate in any manner during reheating processes.

There shall be no obvious change in color of the material as a result of repeated heatings or from batch to batch. The maximum elapsed time after application after which normal traffic will leave no impression or imprint on the new stripe shall be 30 seconds when the air and road surface temperature is approximately 68° ±6°F. After appreciable deformation or discoloration, shall remain free from tack, and shall not lift from the pavement under normal traffic conditions within a road temperature range of -20° to 150°F. The stripe shall maintain its original dimensions and placement. Cold ductility of the material shall be such as to permit normal dimensional distortion as a result of traffic impact within the temperature range specified.

The material shall provide a stripe that has a uniform thickness throughout its cross section and has the density and character to provide a sharp edge of the line.

The compound after heating for four hours ±5 minutes at 375° ±3°F and cooled at 77°F shall meet the following requirements for daylight reflectance and color, when tested, using a color spectrophotometer with 45° circumferential/0° geometry, illuminant C, and 2° observer angle. The color instrument shall measure the visible spectrum from 380 to 720 nm with a wavelength measurement interval and spectral band pass of 10 nm.

White: Daylight Reflectance (Y) 75 percent minimum

*Yellow: Daylight Reflectance (Y) 42-59 percent

* Shall match Federal 595 Color No. 33538 .and chromaticity limits as follows:

x	.470	.510	.485	.530
y	.455	.485	.425	.456

907-626.02.5.1--Specific Gravity. The specific gravity of the material shall not exceed 1.87.

907-626.02.5.2--Softening Point. After heating the material for four hours ±5 minutes at 375° ±3°F and testing in accordance with ASTM E28, the material shall have a minimum softening point of 180°F as measured by the ring and ball method.

907-626.02.5.3--Tensile Bond Strength. After heating the material for four hours ± 5 minutes at 375°F, the tensile bond strength to unprimed, sandblasted, portland cement concrete block, 0.0625-inch thick film drawdown at 375°F, tested at 75° ± 2 °F shall exceed 180 psi when tested in accordance with ASTM D4796.

907-626.02.5.4--Impact Resistance. After heating the material for four hours ± 5 minutes at 375° ± 3 °F, the impact resistance shall be a minimum of 50 inch-pounds with no cracks or bond loss when 0.0625-inch thick film drawdown is made at 375°F on an unprimed, sandblasted, portland cement concrete block, male indenter 5/8-inch, no female Die tested at 75° ± 2 °F when tested in accordance with ASTM D2794 minimum.

907-626.02.5.5--Packaging and Storage. Each package of material shall be stenciled with the manufacturer's name, the type of material and specification number. the month and year the material was packaged and lot number. Lot numbers must begin with the last two digits of the year manufactured and be sequential. The letters and numbers used in the stencils shall be a minimum of 1/2 inch in height.

The material shall be packaged in suitable containers which will not adhere to the product during shipment and storage. The container of material shall weigh approximately 50 lbs. Each container shall designate the color, binder (alkyd or hydrocarbon), spray and user information. The label shall warn the user that the that material shall be heated in the range of 350° to 425°F.

The material shall meet the requirements of this specification for a period of one year. The material must also melt uniformly with no evidence of skins or unmelted particles for this one year period. Any material not meeting the above requirements shall be replaced by the manufacturer.

907-626.03--Construction Requirements.

907-626.03.1--Installation Requirements. Before applying the thermoplastic material, the Contractor shall remove any dirt, glaze, grease, or any other material that would reduce the adhesion of the material to the pavement.

The thermoplastic material shall be readily renewable by placing an overlay of new material directly over old markings of the same material. Such new material shall bond itself to the old markings in such a manner that no splitting or separation takes place. The Contractor shall remove all existing material that might cause premature failure of the new material.

The thermoplastic material shall be installed in a molten state at a minimum temperature of 350°F and a maximum temperature of 425°F. Scorching or discoloration of material shall be cause for rejection by the Engineer. The machinery shall be constructed so that all mixing and conveying parts, up to and including the application gun, maintain the material in the molten state.

Pavement marking materials shall not be applied when air or pavement surface temperatures are

below 40°F, or when the surface of the pavement contains any evidence of moisture.

The material shall be applied at a thickness of not less than 0.040" and in no case shall it exceed a thickness of 0.050".

The Contractor shall place the pavement markings with adequate drop-on glass beads in accordance with the above requirements, uniformly applied to assure adequate nighttime reflectivity. It shall be the Contractor's responsibility to use a compatible combination of material and beads to preclude the surface beads from sinking deeply into the paint.

907-626.03.2--Equipment Requirements. The equipment used to install hot applied thermoplastic material shall provide continuous uniform heating to temperatures exceeding 400°F, mixing and agitation of the material. Conveying parts of the equipment between the main material reservoir and the line dispensing device shall prevent accumulation and clogging. All parts of the equipment which come in contact with the material shall be constructed for easy accessibility and exposure for cleaning and maintenance. The equipment shall operate so that all mixing and conveying parts including the line dispensing device, maintains the material at the plastic temperature.

Glass beads applied to the surface of the completed marking shall be applied by an automatic bead dispenser attached to the marking machine so that the beads are dispensed closely behind the installed marking. The glass bead dispenser shall be equipped with an automatic cut-off control synchronized with the cut-off of the material.

907-626.03.3--Acceptance. The manufacturer of the thermoplastic material shall furnish the Engineer three (3) copies of certified test report(s) showing results of all required test and certification that the material meets the specifications.

The manufacturer of the glass beads shall furnish the MDOT Central Laboratory three (3) copies of certified test report(s) showing results of all required test and certification that the material meets the specifications. Acceptance sampling and testing of glass beads will be in accordance with S.O.P. No. TMD-40-20-00-000.

907-626.04--Method of Measurement. Thermoplastic stripe completed in accordance with the plans and specifications will be measured by the mile or by the linear foot, as indicated, from end-to-end of individual stripes. In the case of skip lines the measurement will include skips. The length used to measure centerline, lane lines and edge stripes will be the horizontal length computed along the stationed control line.

Detail traffic stripe will be measured by the linear foot from end-to-end of individual stripes. Measurements will be made along the surface of each stripe and will exclude skip intervals where skips are specified. Stripes more than the indicated width will be converted to equivalent lengths of stripe of the indicated width.

Legend, which is to include railroad markings, pedestrian crosswalks and stop lines, will be measured by the square foot or linear foot. Pay areas of individual letters and symbols will

usually be shown on the plans and measured by the square foot. Transverse railroad bands, pedestrian crosswalks and stop lines will generally be measured by the linear foot, in which case, stripes more than the indicated width will be converted to equivalent lengths of stripe of the indicated width.

907-626.05--Basis of Payment. Thermoplastic traffic markings will be paid for at the contract unit price per mile, linear foot, or square foot, as applicable, which shall be full compensation for completing the work.

Payment will be made under:

- 907-626-U: Width" Thermoplastic Traffic Stripe, Skip White, 40-mil. min. - per linear foot or mile
- 907-626-V: Width" Thermoplastic Traffic Stripe, Continuous White, 40-mil. min. - per linear foot or mile
- 907-626-W: Width" Thermoplastic Traffic Stripe, Skip Yellow, 40-mil. min. - per linear foot or mile
- 907-626-X: Width" Thermoplastic Traffic Stripe, Continuous Yellow, 40-mil. min. - per linear foot or mile
- 907-626-Y: Thermoplastic Detail Traffic Stripe, Color, Width" Equivalent Length, 40-mil. min. - per linear foot
- 907-626-Z: Thermoplastic Legend, Color , Width" Equivalent Length, 40-mil. min. - per linear foot or square foot

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-626-19

CODE: (SP)

DATE: 01/08/2009

SUBJECT: Thermoplastic Blue ADA Markings

Section 626, Thermoplastic Traffic Markings, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-626.02--Materials. After the first paragraph of Subsection 626.02.1 on page 443, add the following:

Blue-ADA thermoplastic marking material shall meet the requirements of Subsection 720.02 with the exception that the color shall be blue-ADA.

907-626.04--Method of Measurement. After the last paragraph of Subsection 626.04 on page 446, add the following:

For pay items indicated to be 4-inch equivalents, the detail traffic stripe will be measured by the linear foot from end-to-end of individual stripes. Measurements will be made along the surface of each stripe and will exclude skip intervals where skips are specified. Stripes more than four inches in width will be converted to equivalent lengths of four-inch stripe. Legend, which is to include railroad markings, pedestrian crosswalks and stop lines, will be measured by the square foot or linear foot. Pay areas of individual letters and symbols will usually be shown on the plans and measured by the square foot. Transverse railroad bands, pedestrian crosswalks and stop lines will generally be measured by the linear foot, in which case, stripes more than four inches in width will be converted to equivalent lengths of four-inch widths. Cold Plastic Legend, Handicap Symbol of the color specified will be measured per each as determined by actual count in place.

907-626.05--Basis of Payment. Delete the first sentence under Subsection 626.05 on page 446 and substitute the following:

Thermoplastic traffic markings will be paid for at the contract unit price per mile, linear foot, square foot or each, as applicable, which shall be full compensation for completing the work.

Add the following pay items after pay item 626-G on page 446.

907-626-G: Thermoplastic Detail Stripe, Blue-ADA - per linear foot

907-626-H: Thermoplastic Legend, Blue-ADA - per square foot

907-626-H: Thermoplastic Legend, Handicap Symbol, Color - per each

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-628-2

CODE: (SP)

DATE: 06/10/2004

SUBJECT: Cold Plastic Blue-ADA Pavement Markings

Section 628, Cold Plastic Pavement Markings, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction, is hereby amended as follows:

907-628.02--Materials. After the first paragraph of Subsection 628.02 on page 450, add the following:

Blue-ADA cold plastic marking material shall meet the requirements of Subsection 720.04 with the exception that the material color shall be blue-ADA.

907-628.04--Method of Measurement. After the first sentence of Subsection 628.04 on page 451, add the following:

Cold Plastic Legend, Handicap Symbol of the color specified will be measured per each as determined by actual count in place.

907-628.05--Basis of Payment. Delete the first sentence under Subsection 628.05 on page 451 and substitute the following:

Cold plastic pavement markings will be paid for at the contract unit price per mile, linear foot, square foot or each, as applicable, which shall be full compensation for completing the work.

Add the following pay items between pay item nos. 628-G and 628-H on page 451.

907-628-G: Cold Plastic Detail Stripe, Blue-ADA	- per linear foot
907-628-H: Cold Plastic Legend, Blue-ADA	- per square foot
907-628-H: Cold Plastic Legend, Handicap Symbol, <u>Color</u>	- per each

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-628-3

CODE: (SP)

DATE: 06/14/2004

SUBJECT: Cold Plastic Pavement Markings

Section 628, Cold Plastic Pavement Markings, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction, is hereby amended as follows:

907-628.04--Method of Measurement. After the first sentence of Subsection 628-04 on page 451, add the following.

Four-inch traffic stripe shall be measured from end-to-end of individual stripes. In the case of skip lines the measurement will include skips. The length used to measure centerline, lane lines and edge stripes will be the horizontal length computed along the stationed control line.

Four-inch equivalent detail traffic stripe will be measured by the linear foot from end-to-end of individual stripes. Measurements will be made along the surface of each stripe and will exclude skip intervals where skips are specified. Stripes more than four inches in width will be converted to equivalent lengths of four-inch stripe.

When transverse railroad bands, pedestrian crosswalks and stop lines are measured by the linear foot of 4-inch equivalent stripe, stripes more than four inches in width will be converted to equivalent lengths of four-inch widths.

907-628.05--Basis of Payment. Add the following pay items to the list of pay items on pages 451 & 452.

- | | |
|--|-------------------------------------|
| 907-628-A: 4" Cold Plastic Traffic Stripe, Skip White | - per mile or linear foot |
| 907-628-B: 4" Cold Plastic Traffic Stripe, Continuous White | - per mile or linear foot |
| 907-628-D: 4" Cold Plastic Traffic Stripe, Skip Yellow | - per mile or linear foot |
| 907-628-E: 4" Cold Plastic Traffic Stripe, Continuous Yellow | - per mile or linear foot |
| 907-628-G: Cold Plastic Detail Stripe, <u>Color</u> , 4" Equivalent Length | - per linear foot |
| 907-628-H: Cold Plastic Legend, <u>Color</u> , 4" Equivalent Length | - per square foot
or linear foot |

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-630-2

CODE: (SP)

DATE: 6/30/2003

SUBJECT: Remove and Reset Ground Mounted Signs

Section 630, Traffic Signs and Delineators of the Mississippi Standard Specifications for Road and Bridge Construction, 2004 Edition, is hereby amended as follows:

907-630.01--Description. After the last paragraph of Subsection 630.01 on page 454, add the following:

Selected existing, temporarily installed, and/or permanently installed ground mounted sign assemblies other than construction traffic control sign assemblies shall be removed and reset as directed by the Engineer. Removing and resetting of ground mounted sign assemblies shall include provision of continuous sign visibility by the traveling public before, during, and after the operation. The Contractor shall provide all materials necessary to effect the removal and resetting, including footings, supports, brackets, hardware, breakaway features and other incidentals. All installations within 30 feet of the pavement edge of temporary or permanent through lanes shall include breakaway support features certified to meet NCHRP Report 350 prior to the removal and resetting of the sign assembly.

907-630.04--Method of Measurement. After the last paragraph of Subsection 630.04 on page 463, add the following:

Removing and resetting existing, temporarily installed, and/or permanently installed ground mounted sign assemblies will be measured as a unit quantity per each consisting of work as described above. Each removal and resetting of a sign assembly as described herein will be measured for payment. No separate measurement will be made for removal only of a sign assembly, as said removal shall be included in the appropriate pay item for removal of signs. If a sign assembly is removed and temporarily placed in storage, then later reset as directed by the Engineer, measurement for payment will be made one time only, after the stored sign is reset. No separate measurement will be made for any materials necessary to effect the removal and resetting, including footings, supports, brackets, hardware, breakaway features and other incidentals.

907-630.05--Basis of Payment. After the first paragraph of Subsection 630.05 on page 463, add the following:

Removing and resetting existing, temporarily installed, and/or permanently installed ground mounted sign assemblies, measured as prescribed above, will be paid for at the respective contract unit price per each, which price shall be full compensation for furnishing and placing all materials necessary to effect the removal and resetting, including footings, supports, brackets,

hardware, breakaway features; and for all labor, equipment, tools and incidentals necessary to complete the work.

Add the following to the list of pay items on page 463.

907-630-O: Remove and Reset Signs, Description - per each

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-681-2

CODE: (IS)

DATE: 12/02/2004

SUBJECT: Submittal Data

Section 681, Roadway Lighting System, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

Delete the first paragraph of Subsection 681.04.2 on page 568 and substitute the following:

907-681.04--Basic Materials and Methods. The Contractor shall submit to the Engineer eight (8) copies of submittal data for all electrical materials and equipment proposed for use not later than forty-five (45) days prior to beginning any lighting work.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-683-8

CODE: (SP)

DATE: 07/30/2009

SUBJECT: Lighting Assembly

PROJECT: STP-0055-02(210) / 105533301 – Holmes County

Section 683, Lighting Assemblies, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

Delete in toto Section 683 and substitute the following.

907-683.01--Description.

907-683.01.1--General. All items of labor, materials and equipment, not specified in detail or shown on drawings but necessary for complete installation and proper operation of work described or implied, shall be furnished and installed.

Test all electrical conductors, after completion of installation of wiring and apparatus, to insure continuity, proper splicing, freedom from grounds, except "made grounds" and those required for protection and insulation resistance. Use testing instruments, i.e. megger. Activation of each circuit will be required as final test. Testing shall be done at no additional expense to MDOT. Drawings are indicative of work to be installed but do not indicate all bends, fittings, boxes, etc. that will be required in this Contract. The structural and finished conditions of the project shall be investigated prior to construction.

Coordinate work with other trades to avoid interference between piping, ducts, equipment, architectural or structural features. In case of interference, the Engineer decides which work is to be relocated, regardless of which is first installed. Visit the site to determine actual conditions. No extra compensation will be allowed by failure to determine existing conditions.

907-683.01.1.1--References.

- NEC - National Electrical Code of National Fire Protection Association
- ASTM - American Society for Testing and Materials
- UL - Underwriters' Laboratories
- IPCEA - Insulated Power Cable Engineers Association
- NEMA - National Electrical Manufacturers Association
- IEEE - Institute of Electrical and Electronic Engineers
- ANSI - American National Standards Institute, Inc.
- IBC - International Building Code
- ISA - Instrument Society of America
- NESC - National Electrical Safety Code

ADA - Americans with Disabilities Act

907-683.01.1.2--Design Requirements. The installation must comply with all Federal and State, municipal or other authority's laws, rules and/or regulations.

Inspections by the required authorities shall be made. Original final wiring certificates with two copies shall be submitted to the Engineer, at no additional cost to Owner.

The electrical inspections shall be made by the local inspection agency for compliance with the National Electrical Code. Obtain certificates of acceptance, compliance and approval for delivery to MDOT. Furnish copies to the Engineer for review.

All electrical equipment and its components and materials shall meet all applicable UL criteria and bear the appropriate label of the Underwriters' Laboratory. All control panels, etc. shall bear the UL-508A listing. All complete assemblies shall be UL listed.

All electrical equipment or apparatus of any one system shall be of the same quality as produced by one or more manufacturers, suitable for use in a unified system. The term "manufacturer" shall be understood as applying to a reputable firm who assumes full responsibility for its products.

Qualification: When more than one name of manufacturer is listed in these specifications, the first manufacturer and number determine the style and quality. Other manufacturers named have been included based on their ability to furnish (fabricate, construct and test) equipment which will provide similar quality and performance. Products from these manufacturers will be reviewed by the Engineer providing the physical and performance attributes provide equivalence to those of the first named manufacturers. The Engineer shall provide sole determination to this equivalency. If such products are acceptable to the Engineer but differ from those named in the Specification or on the Drawings to the extent that their proper incorporation into the Work requires changes to the structural piping, mechanical, electrical, instrumentation, or any other changes of whatsoever nature, the Contractor must be responsible for such changes.

907-683.01.1.3--Submittals. All shop drawings shall be submitted to the Engineer for review. If incorrect, they shall be resubmitted in quantity according to Contract conditions until satisfactory. Work shown on shop drawings shall not be executed until such drawings are approved. See related sections for complete listing of all required equipment submittal.

All shop drawing submittals shall clearly indicate, using arrows and/or highlighting on all copies, which item(s) are being submitted and that each item being submitted is in compliance with all requirements on the drawings and in these specifications. All pertinent specification and drawing requirements shall be indicated on the manufacturer's drawings.

See specific section for further breakdown of shop drawing items.

Submit certification with shop drawing submittal that all equipment is UL listed.

Shop drawings shall indicate adequate clearance for operation, maintenance and replacement of operating equipment devices.

This specification does not necessarily include all items of shop drawings required. The Engineer reserves the right to request additional shop drawings.

907-683.01.1.4--Delivery, Storage And Handling. Deliver, store, protect and handle products to site. Protect all unfinished installations, construction materials and equipment.

907-683.01.2--Electrical Requirements. Furnish all labor and materials required to energize all equipment supplied and installed under this Contract.

907-683.01.3--Conduit. Furnish all labor and materials required to install conduit under this Contract.

907-683.01.3.1--References.

- ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
- ANSI C80.3 - Electrical Metallic Tubing, Zinc Coated.
- ANSI/NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
- ANSI/NFPA 70 - National Electrical Code, Latest Edition. NECA "Standard of Installation."
- NEMA RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
- NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.
- ACI Standard 318 - American Concrete Institute Building Code Requirements for Structural Concrete

907-683.01.3.2--Design Requirements. Conduit Size: ANSI/NFPA 70, unless otherwise noted or specified.

907-683.01.3.3--Submittals. Product Data: Provide for metallic conduit, PVC coated metal conduit, nonmetallic conduit, fittings, conduit bodies and accessories.

907-683.01.3.4--Project Record Documents. Accurately record actual routing of conduits where concealed in floors or below grade.

907-683.01.3.5--Regulatory Requirements. Conform to requirements of ANSI/NFPA 70, NEC. Furnish products listed and classified by Underwriters Laboratories, Inc. or testing firm acceptable to authority having jurisdiction as suitable for purpose specified and shown.

907-683.01.3.6--Delivery, Storage, And Handling. Deliver, store, protect, and handle Products to site. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering. Protect PVC conduit from sunlight.

907-683.01.3.7-Project Conditions. Verify that field measurements are as shown on Drawings. Conduit routing is shown on Drawings in approximate locations unless dimensioned. Route as required to complete wiring system.

907-683.01.4--Duct Banks.

907-683.01.4.1--References.

- IEEE C2 - National Electrical Safety Code.
- NFPA 70 - National Electrical Code, Latest Edition.
- ACI Standard 318 - American Concrete Institute Building Code Requirements for Structural Concrete.

907-683.01.4.2--Submittals.

Product Data: Provide for handholes and accessories.

Shop Drawings: Provide layout shop drawings of the ductbank systems for review and approval. Drawings to be to scale and shall indicate existing conditions and features. Maintain all field revisions and alterations on the approved set; submit as part of final acceptance documentation, prior to final payment. Shop drawings to indicate the installed conductor systems. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

907-683.01.4.3--Regulatory Requirements. Conform to requirements of NFPA 70, N.E.C.

Products: Listed and classified (as applicable) by Underwriters Laboratories, Inc. or other testing firm acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.

907-683.01.4.4--Field Measurements. Verify that field measurements are as indicated. Verify routing and termination locations of duct bank prior to excavation for rough-in. Verify locations of handholes prior to excavating for installation. Ductbank routing is shown in approximate locations unless dimensions are indicated. Route as required to complete duct system. Handhole locations are shown in approximate locations unless dimensions are indicated. Locate as required to form a complete direct buried ductbank system. Conduit ductbank locations are shown in approximate locations unless dimensions are indicated. Locate as required to form a complete raceway system.

907-683.01.5--Low Voltage Conductors And Cables. Low voltage wire and cable conductors including building wire and associated connectors, splices, and terminations for wiring systems rated 600 V and less.

907-683.01.5.1--References.

- NECA (National Electrical Contractors Association) - Standard of Installation.
- NETA ATS (International Electrical Testing Association) - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

907-683.01.5.2--Submittals. Product Data: For each type of product indicated in this Section.

907-683.01.5.3--Quality Assurance.

Testing Agency Qualifications: Testing agency as defined by OSHA in 29 CFR 1910.7 or a member company of the International Electrical Testing Association and that is acceptable to authorities having jurisdiction.

Testing Agency's Field Supervisor: Person currently certified by the International Electrical Testing Association or the National Institute for Certification in Engineering Technologies to supervise on-site testing specified in Part 3.

Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

Comply with NFPA 70; National Electrical Code, Latest Edition.

907-683.01.6--Electrical Identification.

907-683.01.6.1--References.

NFPA 70 - National Electrical Code, Latest Edition.

907-683.01.6.2--Submittals For Review. Provide catalog data for labels, and markers.

907-683.01.6.3--Regulatory Requirements. Conform to requirements of NFPA 70 and OSHA.

907-683.01.7--Lighting Fixtures And Emergency Lighting Units. Shall consist of Lighting Fixtures and Accessories, Ballasts and Lamps.

907-683.01.7.1--References.

- ANSI C78.379 - Electric Lamps - Incandescent and High-Intensity Discharge Reflector Lamps - Classification of Beam Patterns.
- ANSI C82.4 - Ballasts for High-Intensity Discharge and Low Pressure Sodium Lamps (Multiple Supply Type).
- NEMA WD 6 - Wiring Devices-Dimensional Requirements.
- NFPA 70 - National Electrical Code, Latest Edition.

907-683.01.7.2--Submittals For Review.

Shop Drawings: Indicate dimensions and components for each luminaire that is not a standard product of the manufacturer.

Product Data: Provide dimensions, ratings, and performance data.

907-683.01.7.3--Submittals For Information. Submit manufacturer's installation instructions. Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

907-683.01.7.4--Qualifications Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

907-683.01.7.5--Regulatory Requirements. Conform to requirements of NFPA 70.

Products: Listed and classified by Underwriters Laboratories, Inc. or testing firm acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.

907-683.02--Materials.

907-683.02.1--Conduit. Conduit shall be metal, PVC coated metal, or nonmetallic. The conduit shall meet the following requirements.

Minimum Size: 3/4 inch unless otherwise specified or indicated on Drawings.

Underground Installations: More than Five Feet from Foundation Wall: Unless otherwise indicated or specified, use Schedule 40 PVC nonmetallic conduit with PVC coated rigid steel conduit (RS) sweeps. Minimum size: 1½-inch unless specifically noted otherwise.

Within Five Feet from Foundation Wall: Use PVC coated steel conduit.

In (or Under Slab) on Grade: Use Schedule 40 PVC nonmetallic conduit with PVC coated RS Conduit sweeps to above slab or grade locations (physical and corrosion protection). Minimum Size: 1 inch. Note - wiring associated with this raceway to be general power and control wiring only.

Outdoor Locations, Above Grade: Use rigid galvanized steel (RGS), unless otherwise indicated on Drawing.

In Slabs and Above Grade: Use electrical metallic tubing for instrumentation and Class II circuit conductors. Use Schedule 40 PVC nonmetallic conduit for all other general power and control wiring.

Maximum Size Conduit in Slab: 1-inch; 3/4-inch for conduits crossing each other. Maintain a minimum concrete cover over and between parallel installed raceways as outlined in ACI Standard 318.

Dry Exposed and Concealed Locations (process related areas): Use rigid galvanized steel (RGS) conduit for feeders; EMT for branch circuits.

907-683.02.1.1--Metal Conduit.

Manufacturers:

- Wheatland
- Allied Tube and Conduit
- Triangle
- Alcoa

Rigid Steel Conduit: ANSI C80.1.

Fittings and Conduit Bodies: ANSI/NEMA FB 1; material to match conduit. Conduit bodies to meet the requirements for Form 8; Form 7 not permitted.

907-683.02.1.2--PVC Coated Metal Conduit.

Manufacturers:

- Ocal
- Robroy

Description: NEMA RN 1; rigid steel conduit with external PVC coating, 40 mil thick.

Fittings and Conduit Bodies: ANSI/NEMA FB 1; steel fittings with external PVC coating to match conduit, Form 8 design only; Form 7 fittings not permitted. Acceptable manufacturers include Ocal and Robroy.

907-683.02.1.3--Nonmetallic Conduit.

Manufacturers:

- Carlon
- Cantex, Inc.

Description: NEMA TC 2; Schedule 40 PVC.

Fittings and Conduit Bodies: NEMA TC 3.

907-683.02.2--Duct Banks. As identified on Drawings and Contract Documents.

Polymer Concrete Handholes (Non-highway/roadway loading applications).

Manufacturers: Quazite Model PC Style.

Materials: The pull/splice box shall be constructed of polymer concrete consisting of sand and aggregate bound together with a polymer resin. Internal reinforcement may be provided by means of steel, fiberglass, or a combination of the two. The use of chopped fiberglass strands applied with a chopper gun or the use of high density polyethylene or high density polystyrene is prohibited. To assure consistent production from part to part, only matched metal tooling is to be used to manufacture the product. Loading: Boxes and covers shall be (concrete gray or green) and sustain a minimum vertical test load of 12,000# over a 10" square. (non-deliberate vehicular traffic loading entry) Size as required.

Covers: Covers shall be provided with stainless steel bolts for when applicable. The logo shall be permanently recessed in the cover.

907-683.02.3--Low Voltage Conductors And Cables.

907-683.02.3.1--Conductors And Cables.

Manufacturers:

- American Insulated Wire Corp.; a Leviton Company.
- General Cable Corporation.
- Southwire Company.
- Okonite
- Or Equal

Conductor Material: Copper complying with NEMA WC 5 or 7; stranded conductor for No. 10 AWG and smaller as well as stranded for No. 8 AWG and larger.

Conductor Insulation Types: Type XHHW or XHHW-2 as specified complying with NEMA WC 5 or 7. (Note - Type THHN/THWN conductors are not to be utilized on this project.)

907-683.02.3.2--Connectors And Splices.

Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated. Note: Split-bolt connectors are NOT permitted for use on this project. Utilize compression type connectors for all terminations and splices. Spring-nut connectors may be utilized for branch circuit terminations / splices on wire sizes # 10 AWG and smaller.

Solderless Pressure Connectors:

- Burndy
- Thomas & Betts

Compression Connectors:

- Burndy
- Thomas & Betts

Multilug:

- Burndy
- Thomas & Betts
- IlSCO

Tape: Low voltage tape to be as manufactured by 3M, 33 plus.

Low Voltage Motor Termination / Insulation Kits: Utilize lug connectors, insulated by means of Raychem Corporation, RVC Series pre-manufactured “roll-on” type insulation kits; voltage rating as required by the installation.

Exposed and Concealed (in raceway) Feeders: Type XHHW or XHHW-2, single conductors in raceway only.

Feeders and Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and in Underground Ductbanks: Type XHHW or XHHW-2, single conductors in raceway.

907-683.02.4--Electrical Identification.

907-683.02.4.1--Wire Markers Manufacturers.

- Brady
- Seton
- LEM
- Panduit

Description: Tubing/sleeve type wire marker system. Identification labeling shall utilize sleeve identification labeling system with numbers (and/or letters) permanently printed using HEAT TRANSFER technology. Dot Matrix type print on vinyl sleeves is NOT considered acceptable.

Locations: In general, each conductor or cable required to be labeled shall be identified in every panelboard gutter space, pull box, and at the load connection termination.

Legend: Power and Lighting Circuits, branch circuit or feeder number indicated.

907-683.02.4.2--Wiring Color Code. All wiring shall conform to the following color code:

<u>Phase</u>	<u>480/277 Volts 3 Ph, 4 W Sys</u>	<u>208/120 Volts 3 Ph, 4 W Sys</u>	<u>240/120 Volts 1 Ph, 3 W Sys</u>
A	Brown	Black	Black
B	Orange	Red	-----
C	Yellow	Blue	Red
Neutral	Gray	White	White
Equip. Ground	Green	Green	Green

Control Wire: 120 Vac - Red Stripe
- Yellow Stripe (Externally Powered)
24 V or 48 Vdc - Purple

Isolated Ground: Green with yellow tracer stripe

Factory apply color the entire length of the conductors, except that field applied color coding methods may be used in lieu of factory coded wire for sizes larger than No. 10 AWG.

907-683.02.4.3--Underground Warning Tape.

Manufacturers:

- Brady
- Seton
- LEM
- Panduit

Description: 4-inch wide plastic tape, detectable type, colored red with suitable warning legend describing buried electrical lines.

Location: Along entire length of each underground conduit or ductbank.

907-683.02.4.4--Underground Concrete Marking. Provide red dye coloring on top of concrete protective slab.

907-683.02.5--High Intensity Discharge (HID) Ballasts and Lamps. High Pressure Sodium Vapor lamp ballast, ANSI C82.4, UL Listed, suitable for lamp specified. Provide with in-line fuse installed in fixture.

Metal Halide lamp ballast, UL Listed, suitable for use with specified lamp and lighting fixture application by the ballast manufacturer AND approved by the lighting fixture manufacturer. Provide with in-line fuse installed in fixture.

Voltage: Match luminaire voltage.

High Intensity Discharge (HID) Lamp Manufacturers:

- Osram/Sylvania
- General Electric
- Philips

Lamp Types: As specified for luminaire.

907-683.03--Construction Requirements.

907-683.03.1--General Installation.

Protection of Installation: All equipment shall be protected during construction. All damaged equipment caused by noncompliance with this requirement shall be repaired at no expense to MDOT.

Openings and Chases: Determine locations of chases and openings prior to construction, if openings or chases are made, such cutting and repairing of the building shall be made by this Contractor in complete coordination with other trades on the job site to match original conditions in quality, color and type of materials used, and at no additional expense to MDOT.

Methods and Materials: All work shall be installed in a first-class, neat and workmanlike manner by skilled mechanics. All materials shall be new unless otherwise indicated. Firmly support all materials and equipment. Any materials or workmanship found to be of inferior quality, damaged, improperly installed, or having been exposed to harmful substances or conditions at any time in the construction work, shall be immediately replaced upon notification of the Contractor by MDOT that such condition has been observed by MDOT or his representatives. The Contractor shall at all times provide protective equipment as may become necessary to protect all parts of the work from damage or exposure to harmful conditions or contaminating substances.

Cutting, Repairing and Finishing: All cutting, repairing, finishing and painting required for the installation of work under this Contract shall be performed under this Contract. All disturbed surfaces shall be repaired and finished to match adjacent surfaces by skilled mechanics working in their respective fields.

Excavation, Backfilling and Blasting: Excavation, backfilling and blasting work shall be as required to complete the work according to details on drawings.

Concrete: Concrete work shall be in accordance with the requirements to complete the work according to details on drawings.

Cutting and Patching of Macadam and Concrete Areas: Openings in concrete or macadam required for Electrical construction shall be made by taking extreme precautions to prevent excessive damage to existing facilities. Prior to completion, all disturbed areas shall be closed, restored to normal and finished to match surrounding areas.

Access: Install all conduit, wire, cable, wiring devices and equipment to preserve access to all equipment installed under this Contract.

Layout of Wiring: The layout of wiring as shown on the drawings shall not be considered as absolute; it shall be subject to changes where necessary to overcome obstacles in construction. Where a major deviation from the plans is indicated by practical consideration, shop drawings shall be submitted showing all deviations in detail to clearly indicate the necessity or desirability for the change.

Furnish and install all necessary steel angles, beams, channels, hanger rods or other supports for equipment and piping furnished under this Contract requiring support or suspension from building structure, except support steel where otherwise noted on the plans.

Clean Up: Upon completion of all work under electrical specifications, furnish labor, materials and incidentals to accomplish the following: remove all dirt, foreign materials, stains, fingerprints, etc. from all lighting fixtures, floors, walls adjacent to the above equipment and leave the electrical work in such a condition that no cleaning will be required by MDOT. The complete system shall be subject to inspection and approval by the Engineer.

Training: The Contractor shall provide training sessions for the operation, maintenance, and troubleshooting procedures.

907-683.03.2--Electrical Installation. Conduit and power wiring of required size and voltage, from a panelboard or similar source, shall be furnished and installed.

907-683.03.3--Conduit Installation. Install conduit in accordance with NECA "Standard of Installation" and in accordance with manufacturer's instructions. Conduit installation and acceptable usage shall be in accordance with the N. E. C.

Install PVC coated conduit in accordance with manufacturer's installation procedures utilizing acceptable materials. Manufacturer to provide certified letter outlining Contractor has received training on installation procedures with shop drawing submittal for product.

Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary supports.

Route exposed conduit parallel and perpendicular to walls.

Do not cross conduits in slab except as permitted in Article 2.01.D of this Section or approved by the Engineer prior to installation.

Maintain adequate clearance between conduit and piping.

Cut conduit square using saw or pipe cutter; de-burr cut ends.

Bring conduit to shoulder of fittings; fasten securely.

Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum.

Use conduit hubs to terminate conduit to enclosures and cabinets in damp and wet locations. Cast boxes to utilize hub connections.

Install no more than equivalent of three 90 degree bends between boxes.

Avoid moisture traps; provide junction box with drain fitting at low points in conduit system. Provide suitable non-metallic pull string in each empty conduit except sleeves and nipples.

Use suitable caps to protect installed conduit against entrance of dirt and moisture. Provide removable plugs at each end on all spare underground conduit runs.

Identify conduit under provisions of Subsection 907-683.02.4.

Install PVC coated raceway and fittings as recommended by manufacturer. Utilize appropriate methods, materials and equipment to prevent damage to PVC coating.

All conduit duct banks to buildings and structure shall be installed in such a manner as to eliminate damage due to shear force. Utilize sheaves with appropriate sealants or other means reviewed by the Engineer/Architect.

Space supports for conduit not more than five (5) feet apart.

Bend conduit only by use of an approved pipe bending machine or hickey so the conduit will always retain its cylindrical shape; PVC coated conduit shall be bent and threaded only with tools manufactured for that purpose. Contractor to submit evidence of manufacturer training prior to installations. The use of touch-up coating material is limited to the provisions established by the manufacturer. Improper installations will be removed and replaced by the Contractor without extra compensation when directed by the Engineer/Architect.

Install conduit so wires may be removed and replaced at a later date.

907-683.03.4--Duct Bank Installation. Install duct to locate top of ductbank at depths as indicated on drawings. Wipe nonmetallic duct dry and clean before joining. Apply full even coat of adhesive to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum. Install no more than equivalent of three 90-degree bends between pull points. Provide suitable fittings to accommodate expansion and deflection where required. Terminate duct at handhole entries using sweep bends up into handhole. Provide suitable non-metallic pull string in each empty duct except sleeves and nipples. Swab duct. Use suitable caps to protect installed duct against entrance of dirt and moisture. Interface installation of underground warning tape with backfilling. Install tape as required on drawings below finished surface.

Polymer Handhole Installation. Install handholes in accordance with manufacturer's instructions. Install handholes plumb; provide adequate stone backfill material under handhole to provide support and drainage. Install concrete support ring around handhole assembly – slope away from lid to provide nominal drainage (approximately 1”).

907-683.03.5--Low Voltage Conductors And Cables.

907-683.03.5.1--Conductor And Insulation Applications. Completely and thoroughly swab raceway before installing wire. Route wire and cable to meet Project conditions. Install wire and cable in accordance with NECA "Standard of Installation."

Neatly train and lace wiring inside boxes, equipment, and panelboards. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

Support cables as required by the National Electrical Code. Identify according to Division 26, Section 26 19 50, Electrical Identification. Identify each conductor with its circuit number or other designation indicated. Color-code conductors and cables in accordance with Specification.

The voltage drop at the end of any circuit shall not exceed 3% of the normal line voltage under full load.

907-683.03.5.2--Connections. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors. Clean conductor surfaces before installing lugs and connectors. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise. Tape uninsulated conductors and connectors with electrical tape to 150 percent of insulation rating of conductor.

Utilize pre-manufactured insulated splice covers and terminations as previously specified, installed in accordance with the manufacturer's installation instructions. Where otherwise applicable, insulate uninsulated conductors and connectors with electrical tape to 150 percent of insulation rating of conductor.

Install lug connectors for copper conductor on conductors # 6 AWG and larger. Splices and taps to utilize UL Listed and Labeled compression type splice kits.

Install solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG and smaller.

Install insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.

Install stranded conductors for feeder and branch wiring.

Make electrical connections in accordance with equipment manufacturer's instructions.

Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.

907-683.03.5.3--Wire Color. For wire sizes 10 AWG and smaller, install wire colors in accordance with this specification. For wire sizes 8 AWG and larger, identify wire with colored tape at terminals, splices and boxes in accordance with this specification.

Neutral Conductors: Color code in accordance with this specification. When two or more neutrals are located in one conduit, individually identify each with proper circuit number.

Branch Circuit Conductors: Install three or four wire home runs with each phase uniquely color coded. Do not gang branch circuits associated with "clean power" / electronic equipment circuits; maintain use of individual neutral conductor with each branch circuit installed.

Feeder Circuit Conductors: Uniquely color code each phase with the appropriate color coded tape at both ends and visible points including junction boxes.

Ground Conductors:

For 6 AWG and smaller: Utilize wire with insulation color coded in accordance with this specification.

For 4 AWG and larger: Identify with green tape at both ends and visible points including junction boxes.

Isolated (insulated) Ground Conductors: (where applicable)

For 6 AWG and smaller: Utilize wire with insulation color coded in accordance with this specification.

For 4 AWG and larger: Identify with green and yellow tape at both ends and visible points including junction boxes.

907-683.03.5.4--Field Quality Control.

Testing: Engage a qualified NETA Certified testing agency to perform the following field quality-control testing. After installing conductors and cables and before electrical circuitry has been energized, test for compliance with requirements.

Perform each electrical test in accordance with NETA ATS, except Section 4. Perform visual and mechanical inspections as stated in NETA ATS, Section 7.3.1. Certify compliance with test parameters.

Test Reports: Prepare a written report to record the following:

- Document all Test procedures used and submit to the Engineer for review.
- Verify that all Test results comply with the stated requirements and criteria.
- Test results that do not comply with requirements shall be reported and corrective action taken shall be documented. Re-test to achieve compliance with the requirements outlined by these Documents.

907-683.03.6--Electrical Identification. Identify underground conduits and ductbanks using one underground warning tape per trench as indicated below finished grade. For trenches over 24 inches in width, provide two parallel warning tapes installed nominally 6 to 12 inches from each side at depth noted above.

907-683.03.7--High Intensity Discharge (HID) Ballasts and Lamps. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within luminaire.

Bond products and metal accessories to branch circuit equipment grounding conductor. Contractor shall furnish supports for light fixtures. The fixture manufacturer's catalog numbers describing the various types of fixtures shall be used as a guide only and do not include all the required accessories or hardware that may be required for a complete installation. The Contractor shall be responsible for furnishing, at no additional cost to MDOT, all the required accessories and hardware for a complete installation. Install accessories furnished with each luminaire.

907-683.03.7.1--Field Quality Control. Operate each luminaire after installation and connection. Inspect for proper connection and operation.

907-683.03.7.2--Adjusting. Aim and adjust luminaires as indicated.

907-683.03.7.3--Cleaning. Clean electrical parts to remove conductive and deleterious materials. Remove dirt and debris from enclosures. Clean finishes and touch up damage. Clean photometric control surfaces as recommended by manufacturer.

907-683.03.7.4--Protection Of Finished Work. Relamp luminaires that have failed lamps at Final Inspection.

907-683.4--Method of Measurement. Lighting assembly, of the type specified, will be measured as a unit quantity per each, which measurement shall include the pole, lowering device, luminaires, lamps, pole wiring, conduit, anchors, and all other items necessary to complete installation.

907-683.5--Basis of Payment. Lighting assembly, measured as prescribed above, will be paid for at the contract unit price per each, which price shall be full compensation for furnishing all materials, and for all construction, placing, erecting, installing, connecting, and testing; for poles, lowering device, luminaires, lamps, conduits, cable, wiring and all hardware; for final cleaning up; and for all equipment, labor, tools, and incidentals necessary for completion of the work.

Payment will be made under:

907-683-B: Lighting Assembly, High Mast, Type - per each

907-683-B: Lighting Assembly, Low Mast, Type - per each

LIGHT FIXTURE SCHEDULE

TAG	MANUFACTURER		LAMP INFORMATION			MOUNTING		VOLTS	ALTERNATES	REMARKS
	NAME	CATALOG NUMBER	QTY	WATTS	TYPE	TYPE	HEIGHT			
SITE										
H1	STREETWORKS COOPER LIGHTING	UTR 25SX433BZEHPUW	1	250	250W HPS E-1	PM	25' A.F.G.	480	MAGRAW-EDISON TRR250HPS2402BZLP; Arch. Area Lighting ALN445- H3-250HPSDBZPT4BALL	HINGED POST TOP AREA LUMINAIRE TRADITIONAL WITH CUPOLA WITH MOLDED ACRYLIC REFRACTOR PANELS.
	COOPER	RSS6M25SF	1	--	--	--	--	--	RSS6M25SF PR55R25-250	25' OR 30' GROUNDED, 11 GUAGE, 5' ROUND STRAIGHT STEEL POLE FIXTURE POLE. FINISH OF POLE SHALL MATCH FIXTURE.
H2	STREETWORKS COOPER LIGHTING	UTR 25SX455BZEHPUW	1	250	250W HPS E-18	PM	25' A.F.G.	480	MAGRAW-EDISON TRR250HPS2405BZLS; Arch. Area Lighting ALN445- H5- 250HPSHPSDBZPT4BALL	HINGED POST TOP AREA LUMINAIRE TRADITIONAL WITH CUPOLA WITH MOLDED ACRYLIC REFRACTOR PANELS.
	COOPER	RSS6M25SF	1	--	--	--	--	--	RSS6M25SF PR55R25-250	25' OR 30' GROUNDED, 11 GUAGE, 5' ROUND STRAIGHT STEEL POLE FIXTURE POLE. FINISH OF POLE SHALL MATCH FIXTURE.
H3	MAGRAW-EDISON COOPER	TLM400HPS4804SSG	1	400	400W HPS	PM	25'	480	INVUE STM400HPS4804S; SPAULDING ALS40v4F5/F5 ALN445-H2-	HINGED POST TOP AREA LUMINAIRE TRADITIONAL WITH CUPOLA WITH MOLDED ACRYLIC REFRACTOR PANELS.
		CONSULT MANUFACTURER FOR POLE REQUIREMENT	1	--	--	--	--	--		25' OR 30' GROUNDED, 11 GUAGE, 5' ROUND STRAIGHT STEEL POLE FIXTURE POLE. FINISH OF POLE SHALL MATCH FIXTURE. WITH 15' ARM.
FLAG POLE	KIM LIGHTING	AFL14150PMH240DBHDS	1	150	150MH/PS	GM	--	120V	HUBBELL MINILITER V MHS-K150H8 STERNER(HUBBELL) PL6150MHRN480CSTFL	7'DX14'WX9'H(PULSE START) METAL HALIDE HORIZONTAL FLOOD FLAG POLE FIXTURE IN AN ALUMINUM HOUSING WITH TEMPERED GLASS LENS IN SEALED AND GASKETED DOOR WITH SWIVEL MOUNTING ASSEMBLY.

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MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SUPPLEMENT TO SPECIAL PROVISION NO. 907-701-3

DATE: 10/01/2008

SUBJECT: Hydraulic Cement

In Subsection 907-701.02.2.1 on page 3, delete the line in Table 1 addressing Severe Soluble Sulfate Conditions, and substitute the following:

Severe	0.20 - 2.00	1,500 - 10,000	Type I cement with a replacement by weight of 50% GGBFS, or Type II ** cement with one of the following replacements of cement by weight: 25% Class F fly ash, 50% GGBFS, 10% metakaolin, or 8% silica fume
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MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-701-3

CODE: (IS)

DATE: 11/30/2007

SUBJECT: Hydraulic Cement

Section 701, Hydraulic Cement, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

Delete Subsection 701.01 on pages 595 & 596, and substitute the following:

907-701.01--General. The following requirements shall be applicable to hydraulic cement:

Only hydraulic cements conforming to Section 701 shall be used. Hydraulic cements shall not be listed or designated as meeting more than one AASHTO or Department type.

Different brands of hydraulic cement, or the same brand of hydraulic cement from different mills, shall not be mixed or used alternately in any one class of construction or structure, without written permission from the Engineer; except that this requirement will not be applicable to hydraulic cement treatment of design soils, or bases.

The Contractor shall provide suitable means for storing and protecting the hydraulic cement against dampness. Hydraulic cement, which for any reason, has become partially set or which contains lumps of caked hydraulic cement will be rejected. Hydraulic cement salvaged from discarded or used bags shall not be used.

The temperature of bulk hydraulic cement shall not be greater than 165°F at the time of incorporation in the mix.

Acceptance of hydraulic cement will be based on the certification program as described in the Department's Materials Division Inspection, Testing, and Certification Manual and job control sampling and testing as established by Department SOP.

Retests of hydraulic cement may be made for soundness and expansion within 28 days of test failure and, if the hydraulic cement passes, it may be accepted. Hydraulic cement shall not be rejected due to failure to meet the fineness requirements if upon retests after drying at 212°F for one hour, it meets such requirements.

Delete Subsection 701.02 on page 596, and substitute the following:

907-701.02--Portland Cement.

907-701.02.1--General.

907-701.02.1.1--Types of Portland Cement. Portland cement (cement) shall be either Type I or Type II conforming to AASHTO Designation: M85 or Type I(MS), as defined by the description below Table 1. Type III cement conforming to AASHTO Designation: M85 or Type III(MS), as defined by the description below Table 1, may be used for the production of precast or precast-prestressed concrete members.

907-701.02.1.2--Alkali Content. All cement types in this Subsection shall meet the Equivalent alkali content requirement for low-alkali cements listed in AASHTO Designation: M85, Table 2.

907-701.02.2--Replacement by Other Cementitious Materials. The maximum replacement of cement by weight is 25% for fly ash or 50% for ground granulated blast furnace slag (GGBFS). The minimum tolerance for replacement shall be 5% below the maximum replacement content. Replacement contents below this minimum tolerance by fly ash or GGBFS may be used, but shall not be given any special considerations, like the maximum acceptance temperature for Portland cement concrete containing pozzolans. Special considerations shall only apply for replacement of cement by fly ash or GGBFS.

907-701.02.2.1--Portland Cement Concrete Exposed to Soluble Sulfate Conditions or Seawater. When Portland cement concrete is exposed to moderate or severe soluble sulfate conditions, or to seawater, cement types and replacement of cement by Class F fly ash, GGBFS, metakaolin, or silica fume shall be as follows in Table 1.

Table 1- Cementitious Materials for Soluble Sulfate Conditions

Sulfate Exposure	Water-soluble sulfate (SO ₄) in soil, % by mass	Sulfate (SO ₄) in water, ppm	Cementitious material required*
Moderate and Seawater	0.10 - 0.20	150 - 1,500	Type II **, ***, **** cement, or Type I cement with one of the following replacements of cement by weight: 25% Class F fly ash, 50% GGBFS, 10% metakaolin, or 8% silica fume
Severe	0.20 - 2.00	1,500 - 10,000	Type II ** cement with one of the following replacements of cement by weight: 25% Class F fly ash, 50% GGBFS, 10% metakaolin, or 8% silica fume

* The values listed in this table for replacement of Portland cement by the cementitious materials listed are maximums and shall not be exceeded. The minimum tolerance for replacement shall be 0.5% below the maximum replacement content. Replacement contents below this minimum tolerance by the cementitious materials listed in this table do not meet the requirements for the exposure conditions listed and shall not be allowed.

** Type I cement conforming to AASHTO Designation: M85 with a maximum 8% tricalcium aluminate (C₃A) may be used in lieu of Type II cement; this cement is given the designation "Type I(MS)". Type III cement conforming to AASHTO Designation: M85 with a maximum 8% tricalcium aluminate (C₃A) may be used in lieu of Type II cement as allowed in Subsection 907-701.02.1; this cement is given the designation "Type III(MS)".

*** Blended cement meeting the sulfate resistance requirements of Subsection 907-701.04 may be used in lieu of Type II as allowed in Subsection 907-701.04. No additional cementitious materials shall be added to or as a replacement for blended cement.

**** Class F fly ash or GGBFS may be added as a replacement for cement as allowed in Subsection 907-701.02.2.

Class C fly ash shall not be used as a replacement for cement in any of the sulfate exposure conditions listed above.

907-701.02.2.2--Cement for Soil Stabilization Exposed to Soluble Sulfate Conditions or Seawater. When Portland cement for use in soil stabilization is exposed to moderate or severe soluble sulfate conditions, or to seawater, cement types and replacement of cement by Class F fly ash or GGBFS shall meet the requirements of Subsection 907-701.02.2.1. Neither metakaolin nor silica fume shall be used to bring the cementitious materials into compliance with the requirements of Table 1.

Delete Subsection 701.03 on page 596, and substitute the following:

907-701.03--Masonry Cement. Masonry cement shall conform to ASTM Designation: C 91 and shall only be used in masonry applications.

Delete Subsection 701.04 on page 596, and substitute the following:

907-701.04--Blended Hydraulic Cement.

907-701.04.1--General.

907-701.04.1.1--Types of Blended Cement. Blended hydraulic cements (blended cements) shall be of the following types and conform to AASHTO Designation: M 240:

- Type I(SM) – Slag-modified Portland cement
- Type IS – Portland blast-furnace slag cement
- Type I(PM) – Pozzolan-modified Portland cement
- Type IP – Portland-pozzolan cement

Blended cement for use in Portland cement concrete or soil stabilization exposed to the moderate soluble sulfate condition or exposure to seawater as defined in Table 1 shall meet the Sulfate resistance requirement listed in AASHTO Designation: M 240, Table 2 and the “(MS)” suffix shall be added to the type designation.

907-701.04.1.2--Alkali Content. All blended cement types in this Subsection shall meet the Mortar expansion requirements listed in AASHTO Designation: M 240, Table 2.

907-701.04.2--Replacement by Other Cementitious Materials. No additional cementitious materials, such as Portland cement, performance hydraulic cement, fly ash, GGBFS, metakaolin, or others, shall be added to or as a replacement for blended cement.

907-701.04.3--Exposure to Soluble Sulfate Conditions or Seawater. When Portland cement concrete or blended cement for soil stabilization is exposed to moderate soluble sulfate conditions or to seawater, where the moderate soluble sulfate condition is defined in Table 1, the

blended cement shall meet the sulfate resistance requirement listed in AASHTO Designation: M 240, Table 2.

When Portland cement concrete or blended cement for soil stabilization is exposed to severe soluble sulfate conditions, where the severe soluble sulfate condition is defined in Table 1, blended cements shall not be used.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-708-5

CODE: (IS)

DATE: 05/12/2008

SUBJECT: Non-Metal Drainage Structures

Section 708, Non-Metal Structures and Cattlepasses, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-708.02.1.2--Fly Ash. In the first sentence of Subsection 708.02.1.2 on page 639, change “20 percent” to “25%”.

907-708.02.3.2--Marking. Delete the second sentence of Subsection 708.02.3.2 on page 640, and substitute the following:

Machine made pipe shall be marked in accordance with one of the following methods: 1) the pipe shall be inscribed on the outside of the pipe and stenciled on the inside of the pipe, or 2) the pipe shall be inscribed on the inside of the pipe, only. All other pipe may be stenciled.

907-708.17--Corrugated Plastic Pipe Culverts.

907-708.17.1--Corrugated Polyethylene Pipe Culverts. Delete the first sentence of the first paragraph of Subsection 708.17.1 on page 645 and substitute the following.

Corrugated polyethylene pipe shall conform to the requirements of AASHTO Designation: M 294, Type S and/or SP, as applicable, and shall have soil tight joints, unless otherwise specified.

Delete the last sentence of the second paragraph of Subsection 708.17.1 on page 645.

After Subsection 708.17.1 on page 645, add the following:

907-708.17.1.1--Inspection and Final Acceptance of Corrugated Polyethylene Pipe Culverts.

Approximately 50% of the installed length of corrugated polyethylene pipe shall be inspected for excess deflection no sooner than 30 days after the embankment material over the pipe is placed to the required subgrade elevation or the maximum required fill height. The inspection shall be performed using either electronic deflectometers, calibrated television or video cameras, or a “go, no-go” mandrel that has an effective diameter of 95% of the nominal inside diameter of the pipe.

Pipe found to have deflection values greater than 5% shall be removed and replaced at no cost to the State.

907-708.17.2--Corrugated Poly (Vinyl Chloride) (PVC) Pipe Culverts. Delete the first sentence of the first paragraph of Subsection 708.17.2 on page 645 and substitute the following.

Corrugated poly (vinyl chloride) (PVC) pipe shall conform to the requirements of AASHTO Designation: M 304 and shall have soil tight joints, unless otherwise specified. Non-perforated PVC pipe used in underdrains shall either be manufactured with an ultra-violet light inhibitor or be fully coated with an ultra-violet light inhibitor.

After Subsection 708.17.2 on page 645, add the following:

907-708.17.2.1--Inspection and Final Acceptance of Poly (Vinyl Chloride) (PVC) Pipe Culverts. Approximately 50% of the installed length of PVC pipe shall be inspected for excess deflection no sooner than 30 days after the embankment material over the pipe is placed to the required subgrade elevation or the maximum required fill height. The inspection shall be performed using either electronic deflectometers, calibrated television or video cameras, or a “go, no-go” mandrel that has an effective diameter of 95% of the nominal inside diameter of the pipe.

Pipe found to have deflection values greater than 5% shall be removed and replaced at no cost to the State.

907-708.18--Sewer Pipe Used for Underdrains.

907-708.18.1--General. After the second paragraph of Subsection 708.18.1 on page 645 add the following:

In lieu of the pipe listed in this subsection, pipe meeting the requirements of Subsection 708.19 may also be used for plastic underdrain pipe.

907-708.18.3--Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe. After the first sentence of Subsection 708.18.3 on page 645, add the following.

Non-perforated PVC pipe shall either be manufactured with an ultra-violet light inhibitor or be fully coated with an ultra-violet light inhibitor.

907-708.18.4--Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe. Delete the paragraph in Subsection 708.18.4 on page 645 and substitute the following.

This pipe shall conform to the following requirements. For pipe sizes less than or equal to six inches ($\leq 6''$), the pipe shall be Class PS46 meeting the requirements of AASHTO Designation: M 278. For pipe sizes greater than six inches ($> 6''$), the pipe shall meet the requirements of AASHTO Designation: M 304. Non-perforated PVC pipe shall either be manufactured with an ultra-violet light inhibitor or be fully coated with an ultra-violet light inhibitor.

Delete Subsection 708.19 on page 645 and substitute the following:

907-708.19--Corrugated Polyethylene Pipe. This pipe shall be high density polyethylene pipe or drainage tubing meet the requirements of AASHTO Designation: M 294, Type S or SP, or

AASHTO Designation: M 252, Type S or Type SP, as applicable.

907-708.22.2--Exceptions to AASHTO. Delete the sixth paragraph of Subsection 708.22.2 on page 647.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-709-1

CODE: (SP)

DATE: 05/05/2008

SUBJECT: Metal Pipe

Section 709, Metal Pipe, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

After Subsection 709.02 on page 649, add the following:

907-709.02.1--Aluminized Corrugated Metal Culvert Pipe and Pipe Arches. All aluminized metal pipe and arches shall be manufactured from Type 2 corrugated metal pipe and arches in accordance with the requirements of Subsection 709.02.

907-709.03--Bituminous Coated Corrugated Metal pipe and Pipe Arches.

907-709.03.1--Materials. Delete the first sentence of the first paragraph of Subsection 709.03.1 on page 649, and substitute the following:

Bituminous coated corrugated metal pipe and arches shall conform to the requirements of AASHTO Designation: M 190 and be completely coated inside and out with an asphalt cement which will meet the performance requirements hereinafter set forth.

907-709.05--Polymer Coated Corrugated Metal Pipe and Pipe Arches. Delete the first sentence of the first paragraph of Subsection 709.05 on pages 649 and 650, and substitute the following:

Polymer coated corrugated metal pipe and arches shall conform to the requirements of AASHTO Designation: M 245, except the minimum gauge thickness shall be as shown on the plans or in the contract; however, corrugated metal pipe manufactured from sheets thicker than that specified will be acceptable when approved by the Engineer. The internal diameter of corrugated metal pipe will be determined by inside measurement between the crests of the corrugations. Corrugations greater than 3" x 1" will not be allowed in arch pipe.

907-709.06--Corrugated Metal Pipe for Underdrains. Delete the sentence in Subsection 709.06 on page 650, and substitute the following:

Corrugated metal pipe shall conform to AASHTO Designation: M 36, Type III. Type I pipe which has been perforated to permit the in-flow or out-flow of water may be used in lieu of Type III pipe.

907-709.06.1--Aluminized Corrugated Metal Culvert Pipe For Underdrains. All aluminized corrugated metal pipe for underdrains shall be manufactured from Type 2 corrugated metal pipe

and arches in accordance with the requirements of AASHTO Designation: M 36, Type III. Manufacturer must repair any damaged coating caused from perforating the pipe.

907-709.07--Bituminous Coated Corrugated Metal Pipe for Underdrains. Delete the sentence in Subsection 709.07 on page 650, and substitute the following:

Bituminous coated corrugated metal pipe shall conform to the requirements of AASHTO Designation: M 190, Type A with a bituminous coating applied in accordance with the requirements of Subsection 709.03. Manufacturer must repair any damaged coating caused from perforating the pipe.

907-709.08--Polymer Coated Corrugated Metal Pipe for Underdrains. Delete the sentence in Subsection 709.08 on page 650, and substitute the following:

The metal pipe for underdrains shall conform to the requirements of AASHTO Designation: M 245, Type III and the polymer coating shall conform to the requirements of Subsection 709.05. Type I pipe which has been perforated to permit the in-flow or out-flow of water may be used in lieu of Type III pipe. Manufacturer must repair any damaged coating caused from perforating the pipe.

907-709.09--Corrugated Aluminum Alloy Culvert Pipe and Arches. Delete the first sentence in Subsection 709.09 on page 650, and substitute the following:

Corrugated aluminum culvert pipe and arches shall conform to the requirements of AASHTO Designation: M 196, Type IA.

907-709.10--Corrugated Aluminum Alloy Pipe for Underdrains. Delete the first sentence in Subsection 709.10 on page 650, and substitute the following:

Corrugated aluminum pipe underdrains shall conform to the requirements of AASHTO Designation: M 196, Type III. Type I pipe which has been perforated to permit the in-flow or out-flow of water may be used in lieu of Type III pipe.

907-709.11--Bituminous Coated Corrugated Aluminum Alloy Culvert Pipe and Arches. Delete the sentence in Subsection 709.11 on page 650, and substitute the following:

Bituminous coated aluminum culvert pipe and arches shall conform to AASHTO Designation: M 196, Type IA, and in addition shall be coated inside and out as specified in Subsection 709.03. Manufacturer must repair any damaged coating caused from perforating the pipe.

907-709.13--Bituminous Coated Corrugated Aluminum Alloy Pipe for Underdrains. Delete the sentence in Subsection 709.13 on page 650, and substitute the following:

This pipe shall conform to AASHTO Designation: M 196, Type III, and shall be coated with bituminous material conforming to AASHTO Designation: M 190, type coating as specified. Manufacturer must repair any damaged coating caused from perforating the pipe.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-711-3

CODE: (IS)

DATE: 09/26/2005

SUBJECT: Synthetic Structural Fiber Reinforcement

Section 711, Reinforcement and Wire Rope, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

After Subsection 711.03.4.3 on page 665, add the following:

907-711.04--Synthetic Structural Fiber. Synthetic structural fibers shall meet the requirements of ASTM Designation: C 1116, Section 4.1.3, Note 3. The fibers shall be monofilament made of polypropylene or polypropylene/polyethylene blend meeting the following conditions:

<u>Property</u>	<u>Results</u>
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 / yd³). The dosage rate for the fibers when used in pile encasements shall be a minimum of four pounds per cubic yard (4 lb / yd³).

The manufacturer shall furnish the Engineer three copies of the certified test report(s) showing results of all required tests, and certification that the material meets the specifications.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-713-1

CODE: (IS)

DATE: 12/11/2007

SUBJECT: Admixtures for Concrete

Section 713, Concrete Curing Materials and Admixtures, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

After the second paragraph of Subsection 713.01.2 on page 676, add the following.

Type 1-D compound may be used on bridge rails, median barriers, and other structures requiring a spray finish. When Type 1-D compound is used, it will be the Contractor's responsibility to assure that the compound has dissipated from the structure prior to applying the spray finish and that the spray finish adheres soundly to the structure.

Delete Subsection 713.02 on pages 676 & 677, and substitute the following:

907-713.02--Admixtures for Portland Cement Concrete. Admixtures shall only be approved by the Department for classification as a single type following the applicable types from AASTHO Designation: M 154 or M 194, or the definition of a mid-range water reducer listed below with the following exception: when requested by the manufacturer the Department will consider classifying an admixture as both a Type A and a Type D. Admixtures shall only be used in accordance with the manufacturer's recommended dosage range for that type. Where an admixture is classified as both a Type A and Type D, the dosage range for use as a Type A shall not overlap the dosage range for use as a Type D.

Air-entraining admixtures shall comply with AASHTO Designation: M 154. Set-retarding, accelerating, and/or water-reducing admixtures shall comply with AASHTO Designation: M 194. Mid-range water-reducers are classified as water-reducing admixtures that reduce the mix water a minimum of 8% when compared to a control mix with no admixtures when tested in accordance with the requirements in AASHTO Designation: M 194. The type designation for admixtures approved by the Department and classified as meeting the requirements of a mid-range water-reducer shall be "MR".

907-713.02.1--Source Approval. In order to obtain approval of an admixture, the Producer/Suppliers shall submit to the State Materials Engineer the following for review: certified test reports, made by an acceptable independent laboratory regularly inspected by the Cement and Concrete Reference Laboratory of the National Institutes of Standards and Technology, which show that the admixture meets all the requirements of the applicable AASHTO or Department Specification for the specific type and the dosage range for the specific type of admixture.

907-713.02.2--Specific Requirements. Admixtures containing chlorides will not be permitted.

907-713.02.3--Acceptance. The Department reserves the right to sample, for check tests, any shipment or lot of admixture delivered to a project.

The Department reserves the right to require tests of the material to be furnished, using the specific cement and aggregates proposed for use on the project, as suggested in AASHTO Designation: M 154 and outlined in AASHTO Designation: M 194.

Failure to maintain compliance with any requirement of these specifications shall be cause for rejection of any previously approved source or brand of admixture.

With each new lot of material shipped the Contractor shall submit to the State Materials Engineer, a notarized certification from the manufacturer showing that the material complies with the requirements of the applicable AASHTO or Department Specification.

When an admixture is used, it shall be the responsibility of the Contractor to produce satisfactory results.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SUPPLEMENT TO SPECIAL PROVISION NO. 907-714-5

DATE: 04/21/2009

SUBJECT: Miscellaneous Materials

Delete the second exception under the first paragraph in Subsection 907-714.05.2 regarding the strength activity index.

Delete Subsection 907-714.11.6 on page 5, and substitute the following:

Delete Subsection 714.11.6 on pages 690 and 691, and substitute the following:

907-714.11.6--Rapid Setting Cementitious Patching Compounds for Concrete Repair.

Rapid setting concrete patching compounds must be approved for listing in the Department's "Approved Sources of Materials" prior to use. Upon approval, a product must be recertified every four (4) years to remain on the "Approved Sources of Materials" list. Each product shall be pre-measured and packaged dry by the manufacturer. All liquid solutions included by the manufacturer as components of the packaged material shall be packaged in a watertight container. The manufacturer may include aggregates in the packaged material or recommend the addition of Contractor furnished aggregates.

The type, size and quantity of aggregates, if any, to be added at the job site shall be in accordance with the manufacturer's recommendations and shall meet the requirements of Subsection 703.02 for fine aggregate and Subsection 703.03 for coarse aggregate. Required mixing water to be added at the job site shall meet the requirements of Subsection 714.01.2.

Only those bonding agents, if any, recommended by the manufacturer of the grout or patching compounds may be used for increasing the bond to old concrete or mortar surfaces.

Patching compounds containing soluble chlorides will not be permitted when in contact with steel.

Site preparation, proportioning of materials, mixing, placing and curing shall be performed in accordance with the manufacturer's recommendation for the specific type of application, and the Contractor shall furnish a copy of these recommendations to the Engineer.

Rapid setting cementitious concrete patching compounds, including components to be added at the job site, shall conform to the following physical requirements:

Non-shrink cementitious grouts shall not be permitted for use.

Compressive strength shall equal or exceed 3000 psi in 24 hours in accordance with ASTM C 928 for Type R2 concrete or mortar.

Bond strength shall equal or exceed 1000 psi in 24 hours in accordance with ASTM C 928 for Type R2 concrete or mortar.

The material shall have a maximum length change of $\pm 0.15\%$ in accordance with ASTM C 928 for Type R2 concrete or mortar.

The Contractor shall furnish to the Engineer three copies of the manufacturer's certified test report(s) showing results of all required tests and certification that the material meets the specifications when mixed and placed in accordance with the manufacturer's instructions. When the mixture is to be placed in contact with steel, the certification shall further state that the packaged material contains no chlorides. Certified test report(s) and certification shall be furnished for each lot in a shipment.

The proportioning of materials must be approved by the State Materials Engineer and any subsequent change in proportioning must also be approved. A sample of each component shall be submitted to the Engineer along with the quantity or percentage of each to be blended. At least 45 days must be allowed for initial approval.

The proportioning of materials for subsequent lots may be approved by the State Materials Engineer upon receipt of certification from the manufacturer that the new lot of material is the same composition as that originally approved by the Department and that the material has not been changed or altered in any way.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-714-5

CODE: (IS)

DATE: 06/18/2008

SUBJECT: Miscellaneous Materials

Section 714, Miscellaneous Materials, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-714.05--Fly Ash. Delete Subsections 714.05.1 & 714.05.2 on pages 680 & 681, and substitute the following:

907-714.05.1--General. The fly ash source must be approved for listing in the Department's "Approved Sources of Materials" prior to use. The acceptance of fly ash shall be based on certified test reports, certification of shipment from the supplier, and tests performed on samples obtained after delivery in accordance with the Department's Materials Division Inspection, Testing, and Certification Manual and Department SOP.

Different classes of fly ash or different sources of the same class shall not be mixed or used in the construction of a structure or unit of a structure without written permission from the Engineer.

The Contractor shall provide suitable means for storing and protecting the fly ash from dampness. Separate storage silos, bins, or containers shall be provided for fly ash. Fly ash which has become partially set or contains lumps of caked fly ash shall not be used.

The temperature of the bulk fly ash shall not be greater than 165°F at the time of incorporation into the work.

All classes of fly ash shall meet the supplementary option chemical requirement for available alkalis listed in AASHTO Designation: M 295, Table 2. **Class F fly ash shall have a calcium oxide (CaO) content of less than 6.0%. Class C fly ash shall have a CaO content of greater than or equal to 6.0%.**

The replacement of Portland cement with fly ash shall be in accordance with the applicable replacement content specified in Subsection 907-701.02.2.

In addition to these requirements, fly ash shall meet the following specific requirements for the intended use.

907-714.05.2--Fly Ash for Use in Concrete. When used with Portland cement in the production of concrete or grout, the fly ash shall meet the requirements of AASHTO Designation: M 295, Class C or F, with the following exceptions:

The loss on ignition shall not exceed 6.0 percent.

The strength activity index with Portland cement shall be at least 55 percent of the control mix at seven days.

No additional cementitious materials, such as blended hydraulic cement, GGBFS, metakaolin, or others, shall be added to or as a replacement for Portland cement when used with fly ash.

907-714.06--Ground Granulated Blast Furnace Slag (GGBFS). Delete Subsection 714.06.1 on page 681, and substitute the following:

907-714.06.1--General. The GGBFS source must be approved for listing in the Department's "Approved Sources of Materials" prior to use. The acceptance of GGBFS shall be based on certified test reports, certification of shipment from the supplier, and tests performed on samples obtained after delivery in accordance with the Department's Materials Division Inspection, Testing, and Certification Manual and Department SOP.

The Contractor shall provide suitable means for storing and protecting the GGBFS against dampness and contamination. Separate storage silos, bins, or containers shall be provided for GGBFS. GGBFS which has become partially set, caked or contains lumps shall not be used.

The State Materials Engineer shall be notified in writing of the nature, amount and identity of any processing or other additions made to the GGBFS during production.

GGBFS from different mills shall not be mixed or used alternately in any one class of construction or structure without written permission from the Engineer; except that this requirement will not be applicable to cement treatment of design soils or bases.

No additional cementitious materials, such as blended hydraulic cement, fly ash, metakaolin, or others, shall be added to or as a replacement for Portland cement when used with GGBFS in the production of concrete. The replacement of Portland cement with GGBFS shall be in accordance with the applicable replacement content specified in Subsection 907-701.02.2.

Delete Subsection 714.07 on page 682, and substitute the following:

907-714.07--Additional Cementitious Materials.

907-714.07.1--Metakaolin.

907-714.07.1.1--General. Metakaolin shall only be used as a supplementary cementitious material in Portland cement concrete for compliance with the requirements for cementitious materials exposed to soluble sulfate conditions. Metakaolin from different sources shall not be mixed or used alternately in any one class of construction or structure without written permission from the Engineer. No additional cementitious materials, such as blended hydraulic cement, fly ash, GGBFS, or others, shall be added to or as a replacement for Portland cement when used with metakaolin in the production of concrete.

The State Materials Engineer shall be notified in writing of the nature, amount and identity of any processing, or other additions made to the metakaolin during production.

907-714.07.1.2--Source Approval. The approval of each metakaolin source shall be on a case by case basis as determined by the State Materials Engineer. In order to obtain approval of a metakaolin source, the Producer/Suppliers shall submit to the State Materials Engineer the following for review: certified test reports, made by an acceptable, independent laboratory regularly inspected by the Cement and Concrete Reference Laboratory of the National Institutes of Standards and Technology, which show that the metakaolin meets all the requirements of AASHTO Designation: M295, including the Effectiveness in contributing to sulfate resistance, Procedure A, listed in AASHTO Designation: M295, Table 4 for Supplementary Optional Physical Requirements, and other requirements listed herein.

In order to demonstrate effectiveness in contributing to sulfate resistance, included in this test data shall be results of metakaolin from the proposed source tested in accordance with ASTM Designation: C 1012. There shall be two sets of test specimens per the following:

- a. One set of test specimens shall be prepared using a Type I Portland cement meeting the requirements of AASHTO Designation: M85 and having a tricalcium aluminate (C_3A) content of more than 8.0%,
- b. One set of test specimens shall be prepared using a Type II Portland cement meeting the requirements of AASHTO Designation: M85.
- c. The proposed metakaolin shall be incorporated at the rate of 10% cement replacement in each set of test specimens and shall meet both of the acceptance criteria listed below for source approval.

The requirement for acceptance of the test sample using Type I Portland cement is an expansion of 0.10% or less at the end of six months. The requirement for acceptance of the test sample using Type II Portland cement is an expansion of 0.05% or less at the end of six months.

907-714.07.1.3--Storage. The Contractor shall provide suitable means for storing and protecting the metakaolin against dampness and contamination. Metakaolin which has become partially set, caked, or contains lumps shall not be used.

907-714.07.1.4--Specific Requirements. Metakaolin shall meet the requirements of AASHTO Designation: M 295, Class N with the following modifications:

1. The sum of $SiO_2 + Al_2O_3 + Fe_2O_3$ shall be at least 85%. The Material Safety Data Sheet shall indicate that the amount of crystalline silica, as measured by National Institute of Occupation Safety and Health (NIOSH) 7500 method, after removal of the mica interference, is less than 1.0%.
2. The loss on ignition shall be less than 3.0%.
3. The available alkalies, as equivalent Na_2O , shall not exceed 1.0%.
4. The amount of material retained on a No. 325 mesh sieve shall not exceed 1.0%.
5. The strength activity index at seven (7) days shall be at least 85%.

907-714.07.1.5--Acceptance. With each new lot of material shipped the Contractor shall submit to the State Materials Engineer a certified test report from the manufacturer showing that the material meets the requirements AASHTO Designation: M295, Class N and the requirements of this Subsection.

The Department reserves the right to sample, for check tests, any shipment or lot of metakaolin delivered to a project.

907-714.07.2--Silica Fume.

907-714.07.2.1--General. Silica fume shall only be used as a supplementary cementitious material in Portland cement concrete for compliance with the requirements for cementitious materials exposed to soluble sulfate conditions. Silica fume from different sources shall not be mixed or used alternately in any one class of construction or structure without written permission from the Engineer. No additional cementitious materials, such as blended hydraulic cement, performance hydraulic cement, fly ash, GGBFS, or others, shall be added to or as a replacement for Portland cement when used with silica fume in the production of concrete.

The State Materials Engineer shall be notified in writing of the nature, amount and identity of any processing, or other additions made to the silica fume during production.

907-714.07.2.2--Source Approval. The approval of each silica fume source shall be on a case by case basis as determined by the State Materials Engineer. In order to obtain approval of a silica fume source, the Producer/Suppliers shall submit to the State Materials Engineer the following for review: certified test reports, made by an acceptable, independent laboratory regularly inspected by the Cement and Concrete Reference Laboratory of the National Institutes of Standards and Technology, which show that the silica fume meets all the requirements of AASHTO Designation: M307, Table 3, including the Sulfate resistance expansion, listed in the table for Optional Physical Requirements, and other requirements listed herein.

In order to demonstrate effectiveness in contributing to sulfate resistance, included in this test data shall be results of silica fume from the proposed source tested in accordance with ASTM Designation: C 1012. There shall be two sets of test specimens per the following:

- a. One set of test specimens shall be prepared using a Type I Portland cement meeting the requirements of AASHTO Designation: M85 and having a tricalcium aluminate (C_3A) content of more than 8.0%,
- b. One set of test specimens shall be prepared using a Type II Portland cement meeting the requirements of AASHTO Designation: M85.
- c. The proposed silica fume shall be incorporated at the rate of 8% cement replacement in each set of test specimens and shall meet both of the acceptance criteria listed below for source approval.

The requirement for acceptance of the test sample using Type I Portland cement is an expansion of 0.10% or less at the end of six months. The requirement for acceptance of the test sample using Type II Portland cement is an expansion of 0.05% or less at the end of six months.

907-714.07.2.3--Storage. The Contractor shall provide suitable means for storing and protecting the silica fume against dampness and contamination. Silica fume which has become partially set, caked, or contains lumps shall not be used.

907-714.07.2.4--Acceptance. With each new lot of material shipped, the Contractor shall submit to the State Materials Engineer a certified test report from the manufacturer showing that the material meets the Chemical and Physical Requirements of AASHTO Designation: M307.

The Department reserves the right to sample, for check tests, any shipment or lot of silica fume delivered to a project.

907-714.11.6--Rapid Setting Commercial Grouts and Concrete Patching Compounds. Delete the first sentence of the first paragraph of Subsection 714.11.6 on page 690 and substitute the following:

Rapid setting commercial grouts and concrete patching compounds must be approved for listing in the Department's "Approved Sources of Materials" prior to use. Upon approval, a product must be recertified every four (4) years to remain on the "Approved Sources of Materials" list. Each product shall be pre-measured and packaged dry by the manufacturer.

907-714.11.7--Commercial Grout for Anchoring Doweled Tie Bars in Concrete. Before Subsection 714.11.7.1 on page 691, add the following:

Approved Non-"Fast Set" Epoxy anchor systems as specified below may be used for the repair of concrete pavements that do not involve permanent sustained tension applications or overhead applications.

"*Fast Set Epoxy*" may not be used for any Adhesive Anchor Applications. Adhesive Anchor Systems (Fast Set epoxy or otherwise) shall not be used for permanent sustained tension applications or overhead applications. "Fast Set Epoxy" refers to an epoxy produced by the Sika Corporation called Sikadur AnchorFix-3 and repackaged for sale under a variety of names/companies listed at the Federal Highway Administration web site at the following link:

<http://www.fhwa.dot.gov/Bridge/adhesives.cfm>

907-714.11.7.4--Acceptance Procedure. After the last sentence of the first paragraph of Subsection 714.11.4 on page 691, add the following:

Upon approval, a product must be recertified every four (4) years to remain on the "Approved Sources of Materials" list.

907-714.11.8--Epoxy Joint Repair System.

907-714.11.8.1--General. After the last sentence of the first paragraph of Subsection 714.11.8.1 on page 692, add the following:

Upon approval, a product must be recertified every four (4) years to remain on the "Approved Sources of Materials" list.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-715-3

CODE: (IS)

DATE: 01/25/2008

SUBJECT: Roadside Development Materials

Section 715, Roadside Development Materials, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-715-02.2.1--Agricultural Limestone. Delete the first sentence of Subsection 715-02.2.1 on page 704 and substitute the following.

Agricultural limestone shall be either a hard-rock limestone material or a marl or chalk agricultural liming material as addressed in the latest amendment to the Mississippi Agricultural Liming Material Act of 1993, published by the Mississippi Department of Agriculture and Commerce.

907-715.02.2.1.1--Screening Requirements. Delete the first sentence of Subsection 715.02.2.1.1 on page 704.

Delete Subsection 715.02.2.1.2 on page 704 and substitute the following:

907-715-02.2.1.2--Calcium Carbonate Equivalent. Marl or chalk liming material shall not have less than 70% calcium and magnesium carbonate calculated as calcium carbonate equivalent when expressed on a dry weight basis.

907-715-02.2.1.3--Neutralizing Values. Hard-rock limestone material shall have a minimum Relative Neutralizing Value (RNV) of 63.0%, which is determined as follows:

$$\% \text{ RNV} = \text{CCE} \times (\% \text{ passing \#10 mesh} + \% \text{ passing \#50 mesh})/2$$

Where: CCE = Calcium Carbonate Equivalent

907-715.03--Seed.

907-715.03.2--Germination and Purity Requirements. Add the following to Table B on page 705.

Name (Kind)	Name (Variety)	Percent Germination	Percent Purity
GRASSES			
Rye Grass	Annual	80	98

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-720-1

CODE: (IS)

DATE: 3/17/2008

SUBJECT: Pavement Markings Materials

Section 720, Pavement Marking Materials, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-720.02--Thermoplastic Pavement Markings. Delete the first paragraph of Subsection 720.02 on page 730 and substitute the following:

The thermoplastic material shall be lead free and conform to AASHTO Designation: M 249 except the glass beads shall be moisture resistant coated.

After the first sentence of the second paragraph of Subsection 720.02 on page 730, add the following:

In addition, the certification for the thermoplastic material shall state that the material is lead free.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SUPPLEMENT TO SPECIAL PROVISION NO. 907-804-8

DATE: 06/09/2008

SUBJECT: Concrete Bridges and Structures

Before the first sentence of 907-804.02.1 on page 1, add the following:

Delete the third and fourth sentences of the first paragraph of Subsection 804.02.1 on page 846, and substitute the following:

For projects with 1000 cubic yards and more, quality control and acceptance shall be achieved through statistical evaluation of test results. For projects of more than 200 but less than 1000 cubic yards, quality control and acceptance shall be achieved by individual test results.

Before the first sentence of Subsection 907-804.02.10 on page 2, add the following:

Delete the first sentence of the first paragraph of Subsection 804.02.10 on page 850 and substitute the following:

At least 30 days prior to production of concrete, the Contractor shall submit to the Engineer proposed concrete mix designs complying with the Department's *Concrete Field Manual*.

Delete the second paragraph of Subsection 907-804.02.11 on page 3 and substitute the following:

For projects with 1000 cubic yards and more, the concrete batch plant shall meet the requirements for an automatic system capable of recording batch weights. It shall also have automatic moisture compensation for the fine aggregate. For projects of more than 200 but less than 1000 cubic yards the plant can be equipped for manual batching with a fine aggregate moisture meter visible to the plant operator.

Delete Subsection 907-804.02.13 on page 4 and substitute the following:

907-804.02.13--Quality Assurance Sampling and Testing. Delete subparagraph c) in Subsection 804.02.13 on page 858 and substitute the following:

- c) For concrete, the Contractor's QC and Department's QA testing of concrete compressive strengths compare when using the data comparison computer program with an alpha value of 0.01 for projects with 1000 cubic yards and more; or, strength comparisons are within 990 psi for projects of more than 200 but less than 1000 cubic yards.

In Table 5 of Subsection 804.02.13 on page 858, delete "and FM" from the requirements on line A.3.

After Subsection 907-804.02.13.1.4 on page 4, add the following:

907-804.02.13.1.5--Compressive Strength. Delete the heading of the second paragraph of Subsection 804.02.13.1.5 on page 860 and substitute the following:

Projects with 1000 Cubic Yards and More.

Delete the second heading in Subsection 804.02.13.1.5 on page 860 and substitute the following:

Projects of More Than 200 but Less Than 1000 Cubic Yards.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-804-8

CODE: (IS)

DATE: 02/05/2008

SUBJECT: Concrete Bridges And Structures

Section 804, Concrete Bridges And Structures, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-804.02-- Materials.

907-804.02.1--General. Add the following materials to the list of materials in Subsection 804.02.1 on page 847.

- Blended Cement..... 907-701.01 and 907-701.04
- Ground Granulated Blast Furnace Slag (GGBFS)..... 907-714.06
- Metakaolin 907-714.07
- Silica Fume 907-714.07.2

907-804.02.8--Laboratory Accreditation. In Table 1 of Subsection 804.02.8 on page 849, substitute AASHTO: R 39 - Making and Curing Concrete Test Specimens in the Laboratory for AASHTO: T 126 - Making and Curing Concrete Test Specimens in the Laboratory.

907-804.02.9--Testing Personnel. Delete Table 2 in this subsection and replace it with the following.

Table 2

Concrete Technician's Tasks	Test Method Required	Certification Required**
Sampling or Testing of Plastic Concrete	AASHTO Designation:T 23, T 119, T 121, T 141, T 152, T 196, and ASTM Designation: C 1064	MDOT Class I certification
Compressive Strength Testing of Concrete Cylinders	AASHTO Designation: T 22 and T 231	MDOT Concrete Strength Testing Technician certification
Sampling of Aggregates	AASHTO Designation: T 2	Work under the supervision of an MDOT Class II certified technician
Testing of Aggregates	AASHTO Designation: T 19, T 27, T 84, T 85, T 248, and T 255	MDOT Class II certification
Proportioning of Concrete Mixtures*	AASHTO Designation: M 157 and R 39	MDOT Class III
Interpretation and Application of Maturity Meter Readings	AASHTO Designation: T 325 and ASTM Designation: C 1074	MDOT Class III or Two hours maturity method training

- * Technicians making concrete test specimens for meeting the requirements of Subsection 804.02.10.1.2 shall be MDOT Class I certified and under the direct supervision of an MDOT Class III certified technician.
- ** MDOT Class I certification encompasses the same test procedures and specifications as ACI Concrete Field Testing Technician Grade I. MDOT Class II certification encompasses the same test procedures and specifications as ACI Aggregate Testing Technician - Level 1. MDOT Concrete Strength Testing Technician encompasses the same test procedures and specifications as ACI Concrete Strength Testing certification.

For specifics about the requirements for each level of certification, please refer to the latest edition of the Department's *Concrete Field Manual*. Technicians holding current MDOT Class I, MDOT Class II and/or MDOT Class III certifications shall be acceptable until those certifications expire. Upon a current certification expiration, recertification with the certifications listed in Table 2 shall be required. Technicians currently performing either specific gravity testing of aggregates or compressive strength tests shall be required to either:

- have the required MDOT certification listed in Table 2, or
- have a current MDOT Class III certification or work under the direct supervision of current MDOT Class III technician, and have demonstrated the specific gravity and/or compressive strength test during the inspection of laboratory equipment by the Materials Division, Concrete Section.

907-804.02.10--Portland Cement Concrete Mix Design. Delete the Notes under Table 3 of Subsection 804.02.10 on pages 850 & 851, and substitute the following:

- * Maximum size aggregate shall conform to the concrete mix design for the specified aggregate.
- ** The replacement limits of Portland cement by weight by other cementitious materials (such as fly ash, GGBFS, metakaolin, silica fume, or others) shall be in accordance with the values in Subsection 907-701.02. Other hydraulic cements may be used in accordance with the specifications listed in Section 701.
- *** The slump may be increased up to six (6) inches with an approved mid-range water reducer or up to eight (8) inches with an approved type F or G high range water reducer, in accordance with 907-713.02. Minus slump requirements shall meet those set forth in Table 3 of AASHTO M157 specifications.
- **** Entrained air is not required except for concrete exposed to seawater. For concrete exposed to seawater, the total air content shall be 3.0 % to 6.0%. For concrete not exposed to seawater, the total air content shall not exceed 6.0%.
- ***** Class DS Concrete for drilled shafts shall have an 8 ± 1 -inch slump.

Delete the last paragraph of Subsection 804.02.10 on page 851 and substitute the following:

Either Type A, D, F, G or mid-range chemical admixture, shall be used in all classes of concrete. Any combinations of water reducing admixtures shall be approved by the Engineer before their use.

907-804.02.10.1.1--Proportioning on the Basis of Previous Field Experience of Trial Mixtures. Delete the first sentence of the first paragraph of Subsection 804.02.10.1.1 on page 851, and substitute the following:

Where a concrete production facility has a record, based on at least 10 consecutive strength tests from at least 10 different batches within the past 12 months from a mixture not previously used on Department projects, the standard deviation shall be calculated.

907-804.02.10.3--Field Verification of Concrete Mix Design. Delete the third sentence of the third paragraph of Subsection 804.02.10.3 on page 853, and substitute the following:

If the requirements of yield, slump, or total air content are not met within three (3) production days after the first placement, subsequent field verification testing shall not be permitted on department projects, and the mix design shall not be used until the requirements listed above are met

907-804.02.10.4--Adjustments of Mixture Proportions. Delete the paragraph in Subsection 804.02.10.4 on page 854, and substitute the following:

The mixture may be adjusted by the Class III Certified Technician representing the Contractor in accordance with the allowable revisions listed in the Department's Concrete Field Manual, paragraph 5.7. Written notification shall be submitted to the Engineer a minimum of seven (7) days prior to any source or brand of material change, aggregate size change, allowable material type change, or decrease in any cementitious material content. Any adjustments of the concrete mixture design shall necessitate repeat of field verification procedure as described in Subsection 804.02.10.3 and approval by the Engineer.

907-804.02.11--Concrete Batch Plants. Delete the first three paragraphs of Subsection 804.02.11 on page 854, and substitute the following:

The concrete batch plant shall meet the requirements of the National Ready Mixed Concrete Association *Quality Control Manual, Section 3, Plant Certification Checklist* as outlined in the latest edition of the Department's *Concrete Field Manual*. The Contractor shall submit a copy of the approved checklist along with proof of calibration of batching equipment, i.e., scales, water meter, and admixture dispenser, to the Engineer 30 days prior to the production of concrete.

For large volume projects the concrete batch plant shall meet the requirements for an automatic system capable of recording batch weights. It shall also have automatic moisture compensation for the fine aggregate. For small volume projects, the concrete batch plant can be equipped for manual batching with a fine aggregate moisture meter visible to the plant operator.

The concrete batch plant shall have available adequate facilities to cool concrete during hot weather.

Mixer trucks to be used on the project are to be listed in the checklist and shall meet the requirements of the checklist.

907-804.02.12--Contractor's Quality Control. Delete the fourth paragraph of Subsection 804.02.12 on page 854 & 855, and substitute the following:

The Contractor's Quality Control program shall encompass the requirements of AASHTO Designation: M 157 into concrete production and control, equipment requirements, testing, and batch ticket information. The requirement of AASHTO Designation: M 157, Section 11.7 shall

be followed except, on arrival to the job site, a maximum of 1½ gallons per cubic yard is allowed to be added. Water shall not be added at a later time. If the maximum permitted slump is exceeded after the addition of water at the job site, the concrete shall be rejected.

907-804.02.12.3--Documentation. After the second sentence of the second paragraph of Subsection 804.02.12.3 on page 856, add the following:

Batch tickets and gradation data shall be documented in accordance with Department requirements. Batch tickets shall contain all the information in AASHTO Designation: M157, Section 16 including the additional information in Subsection 16.2 with the following exception: the information listed in paragraphs 16.2.7 and 16.2.8 is not required. Batch tickets shall also contain the concrete producer's permanent unique mix number assigned to the concrete mix design.

907-804.02.12.5--Non-Conforming Materials. In Table 4 of Subsection 804.02.12.5 on page 857, delete “/ FM” from the requirements on line B.3.a.

907-804.02.13--Quality Assurance Sampling and Testing. In Table 5 of Subsection 804.02.13 on page 858, delete “and FM” from the requirements on line A.3.

907-804.02.13.1.4--Temperature. Delete the first paragraph of Subsection 804.02.13.1.4 on pages 859 & 860, and substitute the following:

Cold weather concreting shall follow the requirements of Subsection 907-804.03.16.1. Hot weather concreting shall follow the requirements of Subsection 804.03.16.2 with a maximum temperature of 95°F for Class DS concrete or for concrete mixes containing cementitious materials meeting the requirements of Subsection 907-701.02.2 as a replacement of Portland cement. For other concrete mixes, the maximum concrete temperature shall be 90°F. Concrete with a temperature more than the maximum allowable temperature shall be rejected and not used in Department work.

907-804.03--Construction Requirements.

907-804.03.15--Removal of Falsework, Forms, and Housing. Delete the first sentence of the second paragraph of Subsection 804.03.15 on page 871, and substitute the following:

Concrete in the last pour of a continuous superstructure shall have attained a compressive strength of 2,400 psi, as determined by cylinder tests or maturity meter probe, prior to striking any falsework.

Delete the first sentence of the third paragraph of Subsection 804.03.15 on page 871, and substitute the following:

At the Contractor's option and with the approval of the Engineer, the time for removal of forms may be determined by cylinder tests, in accordance with the requirements listed in Table 6, in which case the Contractor shall furnish facilities for testing the cylinders.

Delete the fourth and fifth paragraphs of Subsection 804.03.15 on pages 871 & 872, and substitute the following:

The cylinders shall be cured under conditions which are not more favorable than those existing for the portions of the structure which they represent.

Delete the table in Subsection 804.03.15 on page 872, and substitute the following:

**Table 6
Minimum Compressive Strength Requirements for Form Removal**

Forms:

Columns	1000 psi
Side of Beams	1000 psi
Walls not under pressure	1000 psi
Floor Slabs, overhead	2000 psi
Floor Slabs, between beams	2000 psi
Slab Spans	2400 psi
Other Parts	1000 psi

Centering:

Under Beams	2400 psi
Under Bent Caps	2000 psi

Limitation for Placing Beams on:

Pile Bents, pile under beam	2000 psi
Frame Bents, two or more columns	2200 psi
Frame Bents, single column	2400 psi

In lieu of using concrete strength cylinders to determine when falsework, forms, and housings can be removed, an approved maturity meter may be used to determine concrete strengths by inserting probes into concrete placed in a structure. The minimum number of maturity meter probes required for each structural component shall be in accordance with Table 7. Falsework, forms, and housings may be removed when maturity meter readings indicate that the required concrete strength is achieved. Procedures for using the maturity meter and developing the strength/maturity relationship shall follow the requirements of AASHTO Designation: T 325 and ASTM Designation: C 1074 specifications. Technicians using the maturity meter or calculating strength/maturity graphs shall be required to have at least two hours of training prior to using the maturity equipment.

**Table 7
Requirements for use of Maturity Meter Probes**

Structure Component	Quantity of Concrete	No. of Probes
Slabs, beams, walls, & miscellaneous items	0 - 30 yd ³	2
	> 30 to 60 yd ³	3
	> 60 to 90 yd ³	4
	> 90 yd ³	5
Footings, Columns & Caps	0 - 13 yd ³	2
	> 13 yd ³	3
Pavement, Pavement Overlays	1200 yd ²	2
Pavement Repairs	Per repair or 900 yd ² Whichever is smaller	2

907-804.03.16--Cold or Hot Weather Concreting.

907-804.03.16.1--Cold Weather Concreting. After the third paragraph of Subsection 804.03.16.1 on page 873, add the following:

In lieu of the protection and curing of concrete in cold weather, at the option of the Contractor with the approval of the Engineer, when concrete is placed during cold weather and there is a probability of ambient temperatures lower than 40°F, an approved maturity meter may be used to determine concrete strengths by inserting probes into concrete placed in a structure. The minimum number of maturity meter probes required for each structural component shall be in accordance with Table 7. An approved insulating blanketing material shall be used to protect the work when ambient temperatures are less than 40°F and shall remain in place until the required concrete strength in Table 6 is achieved. Procedures for using the maturity meter and developing the strength/maturity relationship shall follow the requirements of AASHTO Designation: T 325 and ASTM Designation: C 1074 specifications. Technicians using the maturity meter or calculating strength/maturity graphs shall be required to have at least two hours of training prior to using the maturity equipment.

Rename the Table in Subsection 804.03.16.1 on page 874 from "Table 6" to "Table 8".

907-804.03.19--Finishing Concrete Surfaces.

907-804.03.19.7--Finishing Bridge Floors.

907-804.03.19.7.4--Acceptance Procedure for Bridge Deck Smoothness. After the first sentence of the second paragraph of Subsection 804.03.19.7.4 on page 886, add the following:

Auxiliary lanes, tapers, shoulders and other areas that are not checked with the profilograph, shall meet a 1/8 inch in 10-foot straightedge check made transversely and longitudinally across the deck or slab.

907-804.05--Basis of Payment. Add the "907" prefix to the pay items listed on page 898.

SPECIAL PROVISION NO. 906-3

Training Special Provisions

This Training Special Provision supersedes subparagraph 7b of the Special Provision entitled "Specific Equal Employment Opportunity Responsibilities," (Attachment 1), and is in implementation of 23 U.S.C. 140(a).

As part of the Contractor's equal employment opportunity affirmative action program training shall be provided as follows:

The Contractor shall provide on-the-job training aimed at developing full journeymen in the type of trade or job classification involved.

The number of trainees to be trained under this special provision will be as indicated in the bid schedule of the contract.

In the event that a Contractor subcontracts a portion of the contract work, he shall determine how many, if any, of the trainees are to be trained by the subcontractor, provided, however, that the Contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The Contractor shall also insure that this training special provision is made applicable to such subcontract. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training.

The number of trainees shall be distributed among the work classifications on the basis of the Contractor's needs and the availability of journeymen in the various classifications within a reasonable area of recruitment. Prior to commencing construction, the Contractor shall submit to the State highway agency for approval the number of trainees to be trained in each selected classification and training program to be used. Furthermore, the Contractor shall specify the starting time for training in each of the classifications. The Contractor will be credited for each trainee employed by him on the contract work who is currently enrolled or becomes enrolled in an approved program and will be reimbursed for such trainees as provided hereinafter.

Training and upgrading of minorities and women toward journeymen status is a primary objective of this Training Special Provision. Accordingly, the Contractor shall make every effort to enroll minority trainees and women (e.g., by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees) to the extent that such persons are available within a reasonable area of recruitment. The Contractor will be responsible for demonstrating the steps that he has taken in pursuance thereof, prior to a determination as to whether the Contractor is in compliance with this Training Special Provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed as a trainee in any classification in which he has successfully completed a training course leading to journeyman status or in which he has been employed as a

journeyman. The Contractor should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used the Contractor's records should document the findings in each case.

The minimum length and type of training for each classification will be as established in the training program selected by the Contractor and approved by the State highway agency and the Federal Highway Administration. The State highway agency and the Federal Highway Administration shall approve a program if it is reasonably calculated to meet the equal employment opportunity obligations of the Contractor and to qualify the average trainee for journeyman status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau and training programs approved but not necessarily sponsored by the U.S. Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training shall also be considered acceptable provided it is being administered in a manner consistent with the equal employment obligations of Federal-aid highway construction contracts. Approval or acceptance of a training program shall be obtained from the State prior to commencing work on the classification covered by the program. It is the intention of these provisions that training is to be provided in the construction crafts rather than clerk-typists or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc., where the training is oriented toward construction applications. Training in the laborer classification may be permitted provided that significant and meaningful training is provided and approved by the division office. Some offsite training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

Except as otherwise noted below, the Contractor will be reimbursed 80 cents per hour of training given an employee on this contract in accordance with an approved training program. As approved by the engineer, reimbursement will be made for training persons in excess of the number specified herein. This reimbursement will be made even though the Contractor receives additional training program funds from other sources, provided such other does not specifically prohibit the Contractor from receiving other reimbursement. Reimbursement for offsite training indicated above may only be made to the Contractor where he does one or more of the following and the trainees are concurrently employed on a Federal-aid project; contributes to the cost of the training, provides the instruction to the trainee or pays the trainee's wages during the offsite training period.

No payment shall be made to the Contractor if either the failure to provide the required training, or the failure to hire the trainee as a journeyman, is caused by the Contractor and evidences a lack of good faith on the part of the Contractor in meeting the requirements of this Training Special Provision. It is normally expected that a trainee will begin his training on the project as soon as feasible after start of work utilizing the skill involved and remain on the project as long as training opportunities exist in his work classification or until he has completed his training program. It is not required that all trainees be on board for the entire length of the contract. A

Contractor will have fulfilled his responsibilities under this Training Special Provision if he has provided acceptable training to the number of trainees specified. The number trained shall be determined on the basis of the total number enrolled on the contract for a significant period.

Trainees will be paid at least 60 percent of the appropriate minimum journeyman's rate specified in the contract for the first half of the training period, 75 percent for the third quarter of the training period, and 90 percent for the last quarter of the training period, unless apprentices or trainees in an approved existing program are enrolled as trainees on this project. In that case, the appropriate rates approved by the Departments of Labor or Transportation in connection with the existing program shall apply to all trainees being trained for the same classification who are covered by this Training Special Provision.

The Contractor shall furnish the trainee a copy of the program he will follow in providing the training. The Contractor shall provide each trainee with a certification showing the type and length of training satisfactorily completed.

The Contractor will provide for the maintenance of records and furnish periodic reports documenting his performance under this Training Special Provision.

SPECIAL PROVISION NO. 906-6

MISSISSIPPI DEPARTMENT OF TRANSPORTATION ON-THE-JOB TRAINING PROGRAM

ALTERNATE TRAINING SPECIAL PROVISION

PURPOSE

The purpose of the On-The-Job Training (OJT) Program is to provide training for minority, female and economically disadvantaged individuals in order that they may develop marketable skills and gain journey status in the skilled craft classifications in which they are being trained.

INTRODUCTION

This voluntary OJT Program has been developed through the partnering efforts of the Road Builders of Mississippi, the Federal Highway Administration (FHWA) and the Mississippi Department of Transportation (MDOT).

The OJT Program has been designed for use by participating contractors and subcontractors in meeting their training needs. The objective of the OJT Program is to develop skilled workers in the skilled craft trade areas of highway construction who are sufficiently trained to be productive employees in the highway construction industry work force.

The success of the OJT Program will require that contractors and subcontractors take part in the program and follow uniform procedures in training and in tracking trainee's progress.

FUNDING

MDOT will establish an annual OJT Fund from which, contractors and subcontractors may bill the Department directly for hours worked by trainees. The funding source of this money will be state and federal funds for MDOT's OJT Program.

DISBURSEMENT OF FUNDS

MDOT will pay \$3.00 per hour toward the trainee's salary for each hour of training performed by each trainee in an approved training program. Program reimbursements will be made directly to the prime or sub contractor. Requests for payment will be submitted to the Office of Civil Rights for approval.

Contractors must provide a signed invoice providing the following information to be reimbursed.

- Contractor's Name
- Mailing Address
- Trainee Name
- Social Security Number

- Race
- Sex
- Project Number
- Job Classification
- Total Number of Hours Completed

TRAINING PROGRAM APPROVAL

A. To use the OJT Program on highway construction projects, the contractor will notify the Department Office of Civil Rights using the On-the-Job Trainee Schedule Form. The notification must include the following information:

- Trainee Starting Date
- Project number (s) trainee starting on
- Training program (classification) to be used; and
- Number of Training Hours Required

B. If a contractor chooses to use a training program different from those listed in the OJT Program Manual, or desires to train in a different classification, the training program must be submitted in its entirety for approval by the Department and FHWA. The training proposal must include the following:

1. The primary objective of the program: To provide training for minority, female and economically disadvantaged individuals for development to full journey status in the work classifications in which they are being trained.
2. The minimum number of hours and type of training the trainee will receive as it relates to each specific task required to achieve journey status.
3. No less than minimum wage.
4. Trainee certification of completion.
5. Records and reports submitted to the Office of Civil Rights on a monthly basis.

DEPARTMENT RESPONSIBILITY

1. Department project staff will monitor trainees on the project. They will monitor payrolls for payment of correct wage rates and fringe benefits. The Office of Civil Rights will maintain a master list by contractor name, project number, trainee name and trainee social security number to aid project staff in monitoring trainees who work on multiple projects.
2. The Office of Civil Rights may elect to interview trainees periodically during the training period to assess their performance and training program.

CONTRACTOR RESPONSIBILITY

1. Trainees must be identified on payrolls (i.e. dragline trainee).
2. When any trainee completes a program, or is terminated for a reason or reasons other than successful completion, the contractor must include the date of completion or an explanation for the termination and date of termination on the OJT Termination Report.
3. The contractor will assign each trainee to a particular person--either a supervisor or a journeyman/woman who is proficient in the craft the trainee is being trained in, to ensure that timely instructional experience is received by the trainee. This person, cooperating with the appropriate company personnel, will see that proper records and the total intended training hours are completed during the allocated number of hours set up in the classification criteria.
4. The contractor has the prerogative of terminating the training period of the trainee and advancing the trainee to journey status. Approval requests must be submitted to the Office of Civil Rights with an explanation (*refer to 2 above*).
5. Upon notification from the contractor, the Department will issue a skill verification card and certificate of training to the trainee.
6. Trainees may be transferred to state-aid highway construction projects in order to complete the training program. If transfers are made the Office of Civil Rights must be notified on the Monthly Trainee Form. All of the training hours completed by trainees will count toward overall program completion.
7. Program reimbursements will be made directly to the prime or sub contractor.

WAGE RATE

The wage rate for all trainees is [the current Minimum Federal Wage Rate](#), during their OJT training program. Trainees shall be paid full fringe benefit amounts, where applicable. At the completion of the training program, the trainee shall receive the wages of a skilled journey.

RECRUITMENT AND SELECTION PROCEDURES

A. Prerequisites for Trainees

To be qualified for enrollment in the OJT Program, trainees must possess basic physical fitness for the work to be performed, dependability, willingness to learn and ability to follow instructions.

B. Licenses

Truck driver trainees must possess appropriate driver permits or licenses for the operation of Class A, B and C trucks. However, when an instructional permit is used in lieu of a license, the trainee must be accompanied by an operator who:

1. Holds a license corresponding to the vehicle being operated;
2. Has had at least one year of driving experience; and
3. Is occupying the seat next to the driver.

C. Recruitment

1. Notices and posters setting forth the contractor's Equal Employment Opportunity Policy and availability of training programs will be placed in areas readily accessible to employees, applicants for employment and potential employees.
2. The contractor must target minority, female or economically disadvantaged trainees.
3. The contractor will conduct systematic and direct recruitment through public and private employee referral sources. Contractors must submit the trainee's name and completed application form to the Office of Civil Rights for review and approval. Approval must be obtained before the trainee can begin work under the training program.
4. Present employees will be screened for upgrading.

D. Selection

1. The selection and employment of a person by participating contractor shall qualify the person for the OJT Program.
 2. Selection will be made without regard to race, color, religion, sex, age or national origin and shall be completely nondiscriminatory.
 3. Employment of trainees will be in accordance with the work force requirements of the contractor. Each contractor will hire and train the trainees for uses in their own organization.
 4. Written certification of individuals under the category of economically disadvantaged can be provided to the contractor at the time of the interview. This certification must then be provided to the Office of Civil Rights with the other required information as part of the approval process for trainees.
- **NOTE:** The OJT Program is to provide training for minority, female and economically disadvantaged individuals in order that they may develop marketable skills and gain journey status in the skilled craft classifications in which they are being trained. However, this program does not exclude trainees that are not members of the above groups.

SECTION 905 - PROPOSAL

Date _____

Mississippi Transportation Commission
Jackson, Mississippi

Sirs: The following proposal is made on behalf of _____
_____ of _____

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

The plans are composed of drawings and blue prints on file in the offices of the Mississippi Department of Transportation, Jackson, Mississippi.

The Specifications are the current Standard Specifications of the Mississippi Department of Transportation approved by the Federal Highway Administration, except where superseded or amended by the plans, Special Provisions and Notice(s) to Bidders attached hereto and made a part thereof.

I (We) certify that I (we) possess a copy of said Standard and Supplemental Specifications.

Evidence of my (our) authority to submit the Proposal is hereby furnished. The proposal is made without collusion on the part of any person, firm or corporation. I (We) certify that I (we) have carefully examined the Plans, the Specifications, including the Special Provisions and Notice(s) to Bidders, herein, and have personally examined the site of the work. On the basis of the Specifications, Special Provisions, Notice(s) to Bidders, and Plans, I (we) propose to furnish all necessary machinery, tools, apparatus and other means of construction and do all the work and furnish all the materials in the manner specified. I (We) understand that the quantities mentioned herein are approximate only and are subject to either increase or decrease, and hereby propose to perform any increased or decreased quantities of work at the unit prices bid, in accordance with the above.

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

INSTRUCTION TO BIDDERS: Alternate and Optional Items on Bid Schedule.

1. Two or more items entered opposite a single unit quantity WITHOUT DEFINITE DESIGNATION AS "ALTERNATE ITEMS" are considered as "OPTIONAL ITEMS". Bidders may or may not indicate on bids the Optional Item proposed to be furnished or performed WITHOUT PREJUDICE IN REGARD TO IRREGULARITY OF BIDS.
2. Items classified on the bid schedule as "ALTERNATE ITEMS" and/or "ALTERNATE TYPES OF CONSTRUCTION" must be preselected and indicated on bids. However, "Alternate Types of Construction" may include Optional Items to be treated as set out in Paragraph 1, above.
3. Optional items not preselected and indicated on the bid schedule MUST be designated in accordance with Subsection 102.06 prior to or at the time of execution of the contract.
4. Optional and Alternate items designated must be used throughout the project.

I (We) further propose to perform all "force account or extra work" that may be required of me (us) on the basis provided in the Specifications and to give such work my (our) personal attention in order to see that it is economically performed.

SECTION 905 -- PROPOSAL (CONTINUED)

I (We) further propose to execute the attached contract agreement (Section 902) as soon as the work is awarded to me (us), and to begin and complete the work within the time limit(s) provided for in the Specifications and Advertisement. I (We) also propose to execute the attached contract bond (Section 903) in an amount not less than one hundred (100) percent of the total of my (our) part, but also to guarantee the excellence of both workmanship and materials until the work is finally accepted.

I (We) enclose a certified check, cashier's check or bid bond for **five percent (5%) of total bid** and hereby agree that in case of my (our) failure to execute the contract and furnish bond within Ten (10) days after notice of award, the amount of this check (bid bond) will be forfeited to the State of Mississippi as liquidated damages arising out of my (our) failure to execute the contract as proposed. It is understood that in case I am (we are) not awarded the work, the check will be returned as provided in the Specifications.

Respectfully Submitted,

DATE _____

Contractor

BY _____
Signature

TITLE _____

ADDRESS _____

CITY, STATE, ZIP _____

PHONE _____

FAX _____

E-MAIL _____

(To be filled in if a corporation)

Our corporation is chartered under the Laws of the State of _____ and the names, titles and business addresses of the executives are as follows:

President Address

Secretary Address

Treasurer Address

The following is my (our) itemized proposal.

Site Improvements to the Rest Area on I-55 Northbound north of Durant, known as Federal Aid Project No. STP/IM-0055-02(210) / 105533301 & 302, in the County of Holmes, 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 CERTIFICATION LOCATED AT THE END OF THE BID SHEETS IS SIGNED**

*****BID SCHEDULE*****

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Item Amount	
						Dollar	Ct	Dollar	Ct
Roadway Items									
0010	202-B005		707	Square Yard	Removal of Asphalt Pavement, All Depths				
0020	202-B017		1,624	Linear Feet	Removal of Concrete Combination Curb & Gutter				
0030	202-B019		2	Each	Removal of Concrete Headwall				
0040	202-B025		4	Square Yard	Removal of Concrete Paved Ditch				
0050	202-B030		2,034	Square Yard	Removal of Concrete Pavement, All Depths				
0060	202-B035		470	Square Yard	Removal of Concrete Sidewalk				
0070	202-B064		260	Linear Feet	Removal of Pipe, 8" And Above				
0080	202-B098		5	Each	Removal of Inlet and Junction Box, All Types & Sizes				

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Bid Amount	
0090	202-B099		28	Each	Removal of Existing Light and Foundation				
0100	202-B256		2	Each	Removal of Monument				
0110	211-C001	(E)	31	Cubic Yard	Topsoil for Plant Holes, Contractor Furnished				
0120	216-B004		4,000	Square Yard	Solid Sodding, Bermuda				
0130	219-A001		100	Thousand Gallon	Watering	20.	00	2,000.	00
0140	221-A001	(S)	6	Cubic Yard	Portland Cement Concrete Paved Ditch				
0150	234-A001		200	Linear Feet	Temporary Silt Fence				
0160	235-A001		100	Bale	Temporary Erosion Checks				
0170	501-D001		4,520	Linear Feet	Expansion Joints, With Dowels				
0180	602-A001	(S)	138	Pounds	Reinforcing Steel				
0190	603-CA002	(S)	88	Linear Feet	18" Reinforced Concrete Pipe, Class III				
0200	604-A001		79	Pounds	Castings				

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Bid Amount	
0210	608-A001	(S)	234	Square Yard	Concrete Sidewalk, Without Reinforcement				
0220	608-B001	(S)	2	Square Yard	Concrete Sidewalk, With Reinforcement				
0230	609-C002	(S)	1,197	Linear Feet	Concrete Curb, Integral, Type 2				
0240	609-D001	(S)	462	Linear Feet	Combination Concrete Curb and Gutter Type 1				
0250	619-D4001		58	Square Feet	Directional Signs				
0260	630-A001		43	Square Feet	Standard Roadside Signs, Sheet Aluminum, 0.080" Thickness				
0270	630-C001		70	Linear Feet	Steel U-Section Posts, 2.0 lb/ft				
0280	682-A031		3,380	Linear Feet	Underground Branch Circuit, AWG 6, 3 Conductor				
0290	682-D001		1	Each	Underground Pull Box				
0300	684-A001		1	Cubic Yard	Pole Foundation, 12" Diameter				
0310	684-A003		120	Cubic Yard	Pole Foundation, 24" Diameter				
0320	699-A001		1	Lump Sum	Roadway Construction Stakes	XXXXXXXXX	XXX		

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Bid Amount	
0330	813-E010	(S)	18	Linear Feet	Pedestrian Railing				
0340	907-225-A001		4	Acre	Grassing				
0350	907-230-A001		100	Each	Shrub Planting, Asiatic Jasmine				
0360	907-230-A087		4	Each	Shrub Planting, Magnolia X Soulangeana				
0370	907-230-A088		6	Each	Shrub Planting, Lagerstroemia X				
0380	907-230-A089		4	Each	Shrub Planting, Prunus X Yedoensis				
0390	907-230-A090		4	Each	Shrub Planting, Cornus Kousa				
0400	907-230-A091		35	Each	Shrub Planting, Ilex Crenata				
0410	907-230-A092		10	Each	Shrub Planting, Nandina Domestica				
0420	907-230-A093		93	Each	Shrub Planting, Hemerocallis				
0430	907-230-C001		100	Linear Feet	Bed Edging				
0440	907-230-D001		2,471	Square Feet	Bed Preparation				

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Bid Amount	
0450	907-230-F004		1,140	Each	Shrub and Groundcover Planting, Liriope Spicata				
0460	907-233-A002		31	Cubic Yard	Tree Bark Mulch, Type V				
0470	907-242-A011		1	Lump Sum	Installation of Sewage Treatment Plant	XXXXXXXX	XXX		
0480	907-258-E001		8	Each	Trash Receptacle , Standard				
0490	907-258-E001		6	Each	Trash Receptacle , Washed Rock				
0500	907-258-J001		4	Each	Metal Bench				
0510	907-258-PP001		3	Each	Handicap Parking Sign and Post, Per Plans				
0520	907-259-C001		2	Each	Lighting Assembly, Flag Pole Lighting				
0530	907-282-A004		8	Each	Sprinkler Head, 1812-PRS-15EST				
0540	907-282-A007		1	Each	Sprinkler Head, 1804-PRS-15Q				
0550	907-282-A008		20	Each	Sprinkler Head, 1804-PRS-15H				
0560	907-282-A045		17	Each	Sprinkler Head, 1812-PRS-12Q				

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Bid Amount	
0570	907-282-A058		2	Each	Sprinkler Head, 1804-PRS-15CST				
0580	907-282-B002		334	Linear Feet	Piping, 3/4" Diameter				
0590	907-282-B003		682	Linear Feet	Piping, 1" Diameter				
0600	907-282-B006		78	Linear Feet	Piping, 2" Diameter				
0610	907-282-D001		100	Linear Feet	Valve Control Wire				
0620	907-282-G003		1	Each	Electric Controller, 6 Station				
0630	907-282-H001		3	Each	Electric Control Valve, 1"				
0640	907-282-I001		1	Each	Backflow Preventer, 2"				
0650	907-290-A001		2	Each	Flagpole				
0660	907-403-A003 (BA1)		1,700	Ton	Hot Mix Asphalt, HT, 25-mm mixture				
0670	907-403-A005 (BA1)		80	Ton	Hot Mix Asphalt, HT, 9.5-mm mixture				
0680	907-501-B002 (C)		6,520	Square Yard	8" Plain Cement Concrete Pavement, Broom Finish				

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Bid Amount	
0690	907-601-B003	(S)	53	Cubic Yard	Class "B" Structural Concrete, Minor Structures				
0700	907-608-D002	(S)	357	Square Yard	Stamped and Colored Concrete Sidewalk, Per Plans				
0710	907-626-G001		145	Linear Feet	Thermoplastic Detail Stripe, Blue-ADA				
0720	907-626-H002		3	Each	Thermoplastic Legend, Blue-ADA Handicap Symbol				
0730	907-626-Y002		10,931	Linear Feet	Thermoplastic Detail Traffic Stripe, White, 6" Equivalent Length, 40-mil. min.				
0740	907-628-G002		300	Linear Feet	Cold Plastic Detail Stripe, White, 4" Equivalent Length				
0750	907-628-H001		4	Square Feet	Cold Plastic Legend, Blue-ADA				
0760	907-628-H002		2	Each	Cold Plastic Legend, Blue-ADA Handicap Symbol				
0770	907-630-O001		3	Each	Remove and Reset Signs, Ground Mounted on Round Post(s)				
0780	907-630-O003		9	Each	Remove and Reset Sign, All Sizes				
0790	907-683-B008		13	Each	Lighting Assembly, Low Mast, 250 W, Type III, Traditionaire Post Top				
0800	907-683-B008		9	Each	Lighting Assembly, Low Mast, 250 W, Type V, Traditionaire Post Top				

Section 905
Proposal (Sheet 2 - 8)

STP-0055-02(210) / 105533301 IM-0055-02(210) / 105533302
Holmes County

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Bid Amount	
0810	907-683-B008		8	Each	Lighting Assembly, Low Mast, 400 W, Type V				

*** BID CERTIFICATION ***

TOTAL BID.....\$_____

*** DBE/WBE SECTION ***

Complete item nos. 1, 2, and/or 3 as appropriate. See Notice to Bidders addressing Disadvantaged Business Enterprises in Highway Construction.

1. I/We agree that no less than _____ percent shall be expended with small business concerns owned and controlled by socially and economically disadvantaged individuals (DBE and WBE).
2. Classification of Bidder: Small Business (DBE)_____ Small Business (WBE)_____
3. A joint venture with a Small Business (DBE/WBE): _____

*** 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

BIDDER'S COMPANY

BIDDER'S FEDERAL TAX ID NUMBER

CONDITIONS FOR COMBINATION BID

If a bidder elects to submit a combined bid for two or more of the contracts listed for this month's letting, the bidder must complete and execute these sheets of the proposal in each of the individual proposals to constitute a combination bid. In addition to this requirement, each individual contract shall be completed, executed and submitted in the usual specified manner.

Failure to execute this Combination Bid Proposal in each of the contracts combined will be just cause for each proposal to be received and evaluated as a separate bid.

COMBINATION BID PROPOSAL

I. This proposal is tendered as one part of a Combination Bid Proposal utilizing option ___* of Subsection 102.11 on the following contracts:

* Option to be shown as either (a), (b), or (c).

<u>Project No.</u>	<u>County</u>	<u>Project No.</u>	<u>County</u>
1. _____	_____	6. _____	_____
2. _____	_____	7. _____	_____
3. _____	_____	8. _____	_____
4. _____	_____	9. _____	_____
5. _____	_____	10. _____	_____

A. If option (a) has been selected, then go to II, and sign Combination Bid Proposal.

B. If option (b) has been selected, then complete the following, go to II, and sign Combination Bid Proposal.

SECTION 905 - COMBINATION BID PROPOSAL (Continued)

Project Number	Pay Item Number	Unit	Unit Price Reduction	Total Item Reduction	Total Contract Reduction
1. _____	_____ _____	_____ _____	_____ _____	_____ _____	
2. _____	_____ _____	_____ _____	_____ _____	_____ _____	
3. _____	_____ _____	_____ _____	_____ _____	_____ _____	
4. _____	_____ _____	_____ _____	_____ _____	_____ _____	
5. _____	_____ _____	_____ _____	_____ _____	_____ _____	
6. _____	_____ _____	_____ _____	_____ _____	_____ _____	
7. _____	_____ _____	_____ _____	_____ _____	_____ _____	
8. _____	_____ _____	_____ _____	_____ _____	_____ _____	

SECTION 905 - COMBINATION BID PROPOSAL (Continued)

Project Number	Pay Item Number	Unit	Unit Price Reduction	Total Item Reduction	Total Contract Reduction
9. _____	_____ _____	_____ _____	_____ _____	_____ _____	
10. _____	_____ _____	_____ _____	_____ _____	_____ _____	

C. If option (c) has been selected, then initial and complete one of the following, go to II. and sign Combination Bid Proposal.

_____ I (We) desire to be awarded work not to exceed a total monetary value of \$ _____.

_____ I (We) desire to be awarded work not to exceed _____ number of contracts.

II. It is understood that the Mississippi Transportation Commission not only reserves the right to reject any and all proposals, but also the right to award contracts upon the basis of lowest separate bids or combination bids most advantageous to the State.

It is further understood and agreed that the Combination Bid Proposal is for comparison of bids only and that each contract shall operate in every respect as a separate contract in accordance with its proposal and contract documents.

I (We), the undersigned, agree to complete each contract on or before its specified completion date.

SIGNED _____

**Certification with regard to the Performance of Previous
Contracts or Subcontracts subject to the Equal Opportunity
Clause and the filing of Required Reports**

The Bidder _____, proposed Subcontractor _____, hereby certifies that he has _____, has not _____, participated in a previous contract or subcontract subject to the Equal Opportunity Clause, as required by Executive Orders 10925, 11114, or 11246, and that he has _____, has not _____, filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements.

(COMPANY)

BY _____

(TITLE)

DATE: _____

NOTE: The above certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41 CFR 60-1.7 (b) (1)), and must be submitted by bidders and proposed subcontractors only in connection with contracts and subcontracts which are subject to the Equal Opportunity Clause. Contracts and Subcontracts which are exempt from the Equal Opportunity Clause are set forth in 41 CFR 60-1.5. (Generally only contracts or subcontracts of \$10,000 or under are exempt.)

Currently, Standard Form 100 (EEO-1) is the only report required by the Executive Orders or their implementing regulations.

Proposed prime Contractors and Subcontractors who have participated in a previous contract or subcontract subject to the Executive orders and have not filed the required reports should note that 41 CFR 60-1.7 (b) (1) prevents the award of contracts and subcontracts unless such Contractors submit a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director, Office of Federal Contract Compliance, U. S. Department of Labor.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

CERTIFICATION (Execute in duplicate)

I, _____,
(Name of person signing certification)

individually, and in my capacity as _____ of
(Title)

_____ do hereby certify under
(Name of Firm, Partnership, or Corporation)

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

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

on Project No. **STP/IM-0055-02(210) / 105533301 & 302**,

in **Holmes** County(ies), Mississippi, has not either

directly or indirectly entered into any agreement, participated in any collusion; or otherwise taken any action in restraint of free competitive bidding in connection with this contract; nor have any of its corporate officers or principal owners.

Except as noted hereafter, it is further certified that said legal entity and its corporate officers, principal owners, managers, auditors and others in a position of administering federal funds:

- a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
- b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
- c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in (b) above; and
- d) Have not within a three-year period preceding this application/ proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

Initial here "_____" if exceptions are attached and made a part thereof. Any exceptions shall address to whom it applies, initiating agency and dates of such action.

Note: Exceptions will not necessarily result in denial of award but will be considered in determining bidder responsibility. Providing false information may result in criminal prosecution or administrative sanctions.

The bidder further certifies that the certification requirements contained in Section XI of Form FHWA 1273, will be or have been included in all subcontracts, material supply agreements, purchase orders, etc. except those procurement contracts for goods or services that are expected to be less than the Federal procurement small purchase threshold fixed at 10 U.S.C. 2304(g) and 41 U.S.C. 253(g) (currently \$25,000) which are excluded from the certification requirements.

The bidder further certifies, to the best of his or her knowledge and belief, that:

- 1) No Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- 2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this contract, Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions will be completed and submitted.

The certification contained in (1) and (2) above is a material representation of fact upon which reliance is placed and a prerequisite imposed by Section 1352, Title 31, U.S. Code prior to entering into this contract. Failure to comply shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000. The bidder shall include the language of the certification in all subcontracts exceeding \$100,000 and all subcontractors shall certify and disclose accordingly.

All of the foregoing and attachments (when indicated) is true and correct.

Executed on _____
Signature

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

CERTIFICATION
(Execute in duplicate)

I, _____,
(Name of person signing certification)

individually, and in my capacity as _____ of
(Title)

_____ do hereby certify under
(Name of Firm, Partnership, or Corporation)

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

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

on Project No. **STP/IM-0055-02(210) / 105533301 & 302**

in **Holmes** County(ies), Mississippi, has not either

directly or indirectly entered into any agreement, participated in any collusion; or otherwise taken any action in restraint of free competitive bidding in connection with this contract; nor have any of its corporate officers or principal owners.

Except as noted hereafter, it is further certified that said legal entity and its corporate officers, principal owners, managers, auditors and others in a position of administering federal funds:

- a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
- b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
- c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in (b) above; and
- d) Have not within a three-year period preceding this application/ proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

Initial here "_____" if exceptions are attached and made a part thereof. Any exceptions shall address to whom it applies, initiating agency and dates of such action.

Note: Exceptions will not necessarily result in denial of award but will be considered in determining bidder responsibility. Providing false information may result in criminal prosecution or administrative sanctions.

The bidder further certifies that the certification requirements contained in Section XI of Form FHWA 1273, will be or have been included in all subcontracts, material supply agreements, purchase orders, etc. except those procurement contracts for goods or services that are expected to be less than the Federal procurement small purchase threshold fixed at 10 U.S.C. 2304(g) and 41 U.S.C. 253(g) (currently \$25,000) which are excluded from the certification requirements.

The bidder further certifies, to the best of his or her knowledge and belief, that:

- 1) No Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- 2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this contract, Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions will be completed and submitted.

The certification contained in (1) and (2) above is a material representation of fact upon which reliance is placed and a prerequisite imposed by Section 1352, Title 31, U.S. Code prior to entering into this contract. Failure to comply shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000. The bidder shall include the language of the certification in all subcontracts exceeding \$100,000 and all subcontractors shall certify and disclose accordingly.

All of the foregoing and attachments (when indicated) is true and correct.

Executed on _____
Signature

S E C T I O N 9 0 2

CONTRACT FOR STP/IM-0055-02(210) / 105533301 & 302

LOCATED IN THE COUNTY(IES) OF Holmes

STATE OF MISSISSIPPI,
COUNTY OF HINDS

This contract entered into by and between the Mississippi Transportation Commission on one hand, and the undersigned contractor, on the other witnesseth;

That, in consideration of the payment by the Mississippi Transportation Commission of the prices set out in the proposal hereto attached, to the undersigned contractor, such payment to be made in the manner and at the time of times specified in the specifications and the special provisions, if any, the undersigned contractor hereby agrees to accept the prices stated in the proposal in full compensation for the furnishing of all materials and equipment and the executing of all the work contemplated in this contract.

It is understood and agreed that the advertising according to law, the Advertisement, the instructions to bidders, the proposal for the contract, the specifications, the revisions of the specifications, the special provisions, and also the plans for the work herein contemplated, said plans showing more particularly the details of the work to be done, shall be held to be, and are hereby made a part of this contract by specific reference thereto and with like effect as if each and all of said instruments had been set out fully herein in words and figures.

It is further agreed that for the same consideration the undersigned contractor shall be responsible for all loss or damage arising out of the nature of the work aforesaid; or from the action of the elements and unforeseen obstructions or difficulties which may be encountered in the prosecution of the same and for all risks of every description connected with the work, exceptions being those specifically set out in the contract; and for faithfully completing the whole work in good and workmanlike manner according to the approved Plans, Specifications, Special Provisions, Notice(s) to Bidders and requirements of the Mississippi Department of Transportation.

It is further agreed that the work shall be done under the direct supervision and to the complete satisfaction of the Executive Director of the Mississippi Department of Transportation, or his authorized representatives, and when Federal Funds are involved subject to inspection at all times and approval by the Federal Highway Administration, or its agents as the case may be, or the agents of any other Agency whose funds are involved in accordance with those Acts of the Legislature of the State of Mississippi approved by the Governor and such rules and regulations issued pursuant thereto by the Mississippi Transportation Commission and the authorized Federal Agencies.

The Contractor agrees that all labor as outlined in the Special Provisions may be secured from list furnished by

It is agreed and understood that each and every provision of law and clause required by law to be inserted in this contract shall be deemed to be inserted herein and this contract shall be read and enforced as though it were included herein, and, if through mere mistake or otherwise any such provision is not inserted, then upon the application of either party hereto, the contract shall forthwith be physically amended to make such insertion.

The Contractor agrees that he has read each and every clause of this Contract, and fully understands the meaning of same and that he will comply with all the terms, covenants and agreements therein set forth.

Witness our signatures this the _____ day of _____, _____.

Contractor (s)

By _____

MISSISSIPPI TRANSPORTATION COMMISSION

Title _____

By _____

Signed and sealed in the presence of:
(names and addresses of witnesses)

Executive Director

Secretary to the Commission

Award authorized by the Mississippi Transportation Commission in session on the ____ day of _____, _____, Minute Book No. _____, Page No. _____.

S E C T I O N 9 0 3

CONTRACT BOND FOR: STP/IM-0055-02(210) / 105533301 & 302

LOCATED IN THE COUNTY(IES) OF: Holmes

STATE OF MISSISSIPPI,

COUNTY OF HINDS

Know all men by these presents: that we, _____

_____ Principal, a _____

residing at _____ in the State of _____

and _____

residing at _____ in the State of _____,

authorized to do business in the State of Mississippi, under the laws thereof, as surety, are held and firmly bound unto the State of Mississippi in the sum of _____

_____ (\$ _____) Dollars, lawful money of the United States of America, to be paid to it for which payment well and truly to be made, we bind ourselves, our heirs, administrators, successors, or assigns jointly and severally by these presents.

Signed and sealed this the ____ day of _____ A.D. _____.

The conditions of this bond are such, that whereas the said _____

_____ principal, has (have) entered into a contract with the Mississippi Transportation Commission, bearing the date of _____ day of _____ A.D. _____ hereto annexed, for the construction of certain projects(s) in the State of Mississippi as mentioned in said contract in accordance with the Contract Documents therefor, on file in the offices of the Mississippi Department of Transportation, Jackson, Mississippi.

Now therefore, if the above bounden _____

_____ in all things shall stand to and abide by and well and truly observe, do keep and perform all and singular the terms, covenants, conditions, guarantees and agreements in said contract, contained on his (their) part to be observed, done, kept and performed and each of them, at the time and in the manner and form and furnish all of the material and equipment specified in said contract in strict accordance with the terms of said contract which said plans, specifications and special provisions are included in and form a part of said contract and shall maintain the said work contemplated until its final completion and acceptance as specified in Subsection 109.11 of the approved specifications, and save harmless said Mississippi Transportation Commission from any loss or damage arising out of or occasioned by the negligence, wrongful or criminal act, overcharge, fraud, or any other loss or damage whatsoever, on the part of said principal (s), his (their) agents, servants, or employees in the performance of said work or in any manner connected therewith, and shall be liable and responsible in a civil action instituted by the State at the instance of the Mississippi Transportation Commission or any officer of the State authorized in such cases, for double any amount in money or property, the State may lose or be overcharged or otherwise defrauded of, by reason of wrongful or criminal act, if any, of the Contractor(s), his (their) agents or

SECTION 903 - CONTINUED

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
	Address _____ _____ _____
Title _____ (Contractor's Seal)	_____ Mississippi Resident Agent
	_____ (Signature) Mississippi Resident Agent
	Address _____ _____ _____
	_____ (Surety Seal)



BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we _____
Contractor

Address

City, State ZIP

as Principal, hereinafter called the Principal, and _____

a corporation duly organized under the laws of the state of _____

as Surety, hereinafter called the Surety, are held and firmly bound unto State of Mississippi, Jackson, Mississippi

As Obligee, hereinafter called Obligee, in the sum of **Five Per Cent (5%) of Amount Bid**
Dollars (\$ _____)

for the payment of which sum will and truly to be made, the said Principal and said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a bid for **Site Improvements to the Rest Area on I-55 Northbound north of Durant, known as Federal Aid Project No. STP-0055-02(210) / 105533301, in the County of Holmes, State of Mississippi**

NOW THEREFORE, the condition of this obligation is such that if the aforesaid Principal shall be awarded the contract, the said Principal will, within the time required, enter into a formal contract and give a good and sufficient bond to secure the performance of the terms and conditions of the contract, then this obligation to be void; otherwise the Principal and Surety will pay unto the Obligee the difference in money between the amount of the bid of the said Principal and the amount for which the Obligee legally contracts with another party to perform the work if the latter amount be in excess of the former, but in no event shall liability hereunder exceed the penal sum hereof.

Signed and sealed this _____ day of _____, 2009

(Principal) (Seal)

(Witness)

By: _____
(Name) (Title)

(Surety) (Seal)

(Witness)

By: _____
(Attorney-in-Fact)

MS Resident Agent

Mississippi Insurance ID Number

Bid bond must be signed or countersigned by a qualified Mississippi resident agent and the bidder as per Section 102.08 of the Mississippi Standard Specifications for Road and Bridge Construction, 2004 edition.

**MISSISSIPPI DEPARTMENT OF TRANSPORTATION
OFFICE OF CIVIL RIGHTS
JACKSON, MISSISSIPPI
LIST OF FIRMS SUBMITTING QUOTES**

I/we received quotes from the following firms on Project No: **STP/IM-0055-02(210) /
105533301 & 302**

County: **Holmes**

Disadvantaged Business Enterprise (DBE) Regulations as stated in 49 CFR 26.11 require the Mississippi Department of Transportation (MDOT) to create and maintain a comprehensive list of all firms quoting/bidding subcontracts on prime contracts and quoting/bidding subcontracts on federally-funded transportation projects. For every firm, we require the following information:

Firm Name: _____
Contact Name/Title: _____
Firm Mailing Address _____
Phone Number: _____
_____ DBE Firm _____ Non-DBE Firm

Firm Name: _____
Contact Name/Title: _____
Firm Mailing Address _____
Phone Number: _____
_____ DBE Firm _____ Non-DBE Firm

Firm Name: _____
Contact Name/Title: _____
Firm Mailing Address _____
Phone Number: _____
_____ DBE Firm _____ Non-DBE Firm

Firm Name: _____
Contact Name/Title: _____
Firm Mailing Address _____
Phone Number: _____
_____ DBE Firm _____ Non-DBE Firm

Firm Name: _____
Contact Name/Title: _____
Firm Mailing Address _____
Phone Number: _____
_____ DBE Firm _____ Non-DBE Firm

SUBMITTED BY (Signature)

FIRM NAME

Submit this form to **Contract Administration as a part of your bid package**. If this form is not **signed** and included as part of the bid packet, your bid will be deemed irregular. For further information about this form, call Mississippi DOT's Office of Civil Rights at (601) 359-7466; FAX (601) 576-4504.

Please make copies of this form when needed and also add those copies to the bid package.