MDOT Use Only
Checked _____
Loaded _____
Keyed _____

9 -

SM No. CSTPI0055040911

PROPOSAL AND CONTRACT DOCUMENTS

FOR THE CONSTRUCTION OF

(NONEXEMPT)

9
Construction necessary for site improvements to the Desoto County Rest Area on I-55, known as Federal Aid Project No. STP/IM-0055-04(091) / 105575301 & 302, in the County of Desoto, State of Mississippi.
Project Completion: September 10, 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

TABLE OF CONTENTS

PROJECT: STP/IM-0055-04(091) / 105575301 & 302 – Desoto County

901--Advertisement

904--Notice to Bidders: Governing Specs. - # 1
Final Cleanup - # 3
Storm Water Discharge Associated W/Construction Activities (≥ 1 and < 5 Acres) - #14
Fiber Reinforced Concrete - # 640
Disadvantage Business Enterprise, W/Supplement - # 696
On-The-Job Training Program - # 777
Payroll Requirements - # 883
Errata & Modifications to 2004 Standard Specifications - # 1405
Safety Apparel - # 1808
Minimum Wage Rate - # 1869
Non-Quality Control/Quality Assurance Concrete - # 1922
Federal Bridge Formula - # 1928
Department of Labor Ruling - # 2239
Mississippi Resident Agent Requirement - # 2361
Status of ROW, W/Attachments - # 2382
Removal of Haul Permit - # 2400
Clearing and/or Grubbing - #2418
American Recovery and Reinvestment Act (ARRA) Sign - # 2438
Requirements Under Section 902 of the ARRA - # 2476
Special Reporting Criteria - # 2594
DBE Forms, Participation and Payment - # 2596
DUNS Requirement for ARRA Funded Projects - #2616
Contract Time - #2734
Petroleum Products Base Price - #2737
Project Number Change - #2761

906: Required Federal Contract Provisions -- FHWA-1273, W/Supplement

907-104-1: Partnering Process
907-105-3: Cooperation By Contractors, W/Supplement
907-107-1: Liability Insurance, W/Supplement
907-107-3: Contractor's Protection Plan
907-107-6: Legal Relations & Responsibility to Public, W/Supplement
907-108-17: Prosecution and Progress
907-109-3: Partial Payment, W/Supplement
907-213-2: Agricultural Limestone
907-225-1: Grassing, W/Supplement

CONTINUED ON NEXT PAGE

907-230-10: Tree and Shrub Planting
907-233-1: Tree Bark Mulch
907-242-16: Rest Area Improvements
907-258-9: Miscellaneous Site Amenities
907-259-6: Miscellaneous Site Lighting
907-262-2: Sanitary Sewer System
907-265-2: Potable Water System
907-282-5: Irrigation System
907-290-3: Flagpole
907-604-4: Manholes
907-608-3: Concrete Sidewalks
907-681-2: Submittal Data
907-683-10: Low Mast Lighting Assembly
907-701-3: Hydraulic Cement, W/Supplement
907-711-4: Synthetic Structural Fiber Reinforcement
907-713-1: Admixtures for Concrete
907-714-5: Miscellaneous Materials, W/Supplement
907-723-1: High Mast Lighting Wind Velocity
907-804-8: Concrete Bridges and Structures, W/Supplement

906-3: MDOT On-the-Job Training Program
906-6: MDOT On-the-Job Training Program - Alternate Program

SECTION 905 - PROPOSAL,
PROPOSAL SHEET NOS. 2-1 THRU 2-8,
COMBINATION BID PROPOSAL,
CERTIFICATE OF PERFORMANCE - PRIOR FEDERAL-AID CONTRACTS,
CERTIFICATION REGADING NON-COLLUSION, DEBARMENT AND SUSPENSION,
SECTION 902 - CONTRACT FORM, AND SECTION 903 - CONTRACT BOND FORMS,
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, September 22, 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, September 22, 2009, and shortly thereafter publicly opened for:

Construction necessary for site improvements to the Desoto County Rest Area on I-55, known as Federal Aid Project Nos. STP/IM-0055-04(091) / 105575301 & 302, in the County of Desoto, 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 proposal are available at a cost of Ten Dollars ($10.00) per proposal. Specimen proposals are also available at the MDOT Contract Administration Division at a cost of Ten Dollars ($10.00) per proposal, or can be viewed or downloaded at no cost at www.gomdot.com.

Plans may be acquired on a cost per sheet basis from MDOT Plans Print Shop, 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 a glass, paper products, tires, wood products, metal, synthetic materials and other miscellaneous debris.

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 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 1 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.

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

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

DATE: 04/13/2006

SUBJECT: On-The-Job Training Program

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

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 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. 1405 **CODE: (IS)**

DATE: **03/15/2007**

SUBJECT: ERRATA AND MODIFICATIONS TO THE 2004 STANDARD SPECIFICATIONS

Page	Subsection	Change
101	201.01	In the second sentence of the first paragraph, change “salvable” to “salvageable”.
107	202.04	In the fourth sentence of the fourth paragraph, change “yard” to “feet”.
107	202.05	In the list of units measurements for 202-B, add “square foot”.
132	211.03.4	In the second sentence of the second paragraph, change “planted” to “plated”.
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 “ $\leq$ ”.

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.

Pay Item	Description
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/brdgcalc/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. 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 MDOT 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 containation 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-0055-04(091)
105575-301000
DESOTO COUNTY
June 29, 2009

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

NONE.

STATUS OF RIGHT-OF-WAY
STP/IM-0055-04(091)
105575-302000
DESOTO COUNTY
August 18, 2009

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

NONE.

STATUS OF POTENTIALLY CONTAMINATED SITES
STP-0055-04(091)
105575-301000
DESOTO COUNTY
May 11, 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.

STATUS OF POTENTIALLY CONTAMINATED SITES
STP/IM-0055-04(091)
105575-302000
DESOTO COUNTY
August 14, 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.

ASBESTOS CONTAMINATION STATUS OF BUILDINGS
TO BE REMOVED BY THE CONTRACTOR
STP-0055-04(091)
105575-301000
DESOTO COUNTY
May 11, 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.

ASBESTOS CONTAMINATION STATUS OF BUILDINGS
TO BE REMOVED BY THE CONTRACTOR
STP/IM-0055-04(091)
105575-302000
DESOTO COUNTY
August 14, 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.

ENCROACHMENT CERTIFICATION

STP/IM-0055-04(091)

105575301

DESOTO COUNTY(IES)

June 22, 2009

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

ENCROACHMENT CERTIFICATION

STP/IM-0055-04(091)

105575302

DESOTO COUNTY(IES)

August 24, 2009

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

UTILITY STATUS REPORT
STP/IM-0055-04(091)
105575301
DESOTO COUNTY(IES)
June 29, 2009

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

Forty-eight hours prior to commencing any excavation, the Contractor is advised to call MS-One-Call at 1-800-227-6477.

UTILITY STATUS REPORT
STP/IM-0055-04(091)
105575302
DESOTO COUNTY(IES)
August 14, 2009

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

Forty-eight hours prior to commencing any excavation, the Contractor is advised to call MS-One-Call at 1-800-227-6477.

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. 2418 **CODE: (SP)**

DATE: **02/19/2009**

SUBJECT: **Clearing and/or Grubbing**

All items resulting from clearing and/or grubbing operations shall be chipped on the project right-of-way and disposed of by placement in an approved landfill site, or as directed by the Engineer. Burning of these items **will not** be allowed.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2438 **CODE: (SP)**

DATE: **03/16/2009**

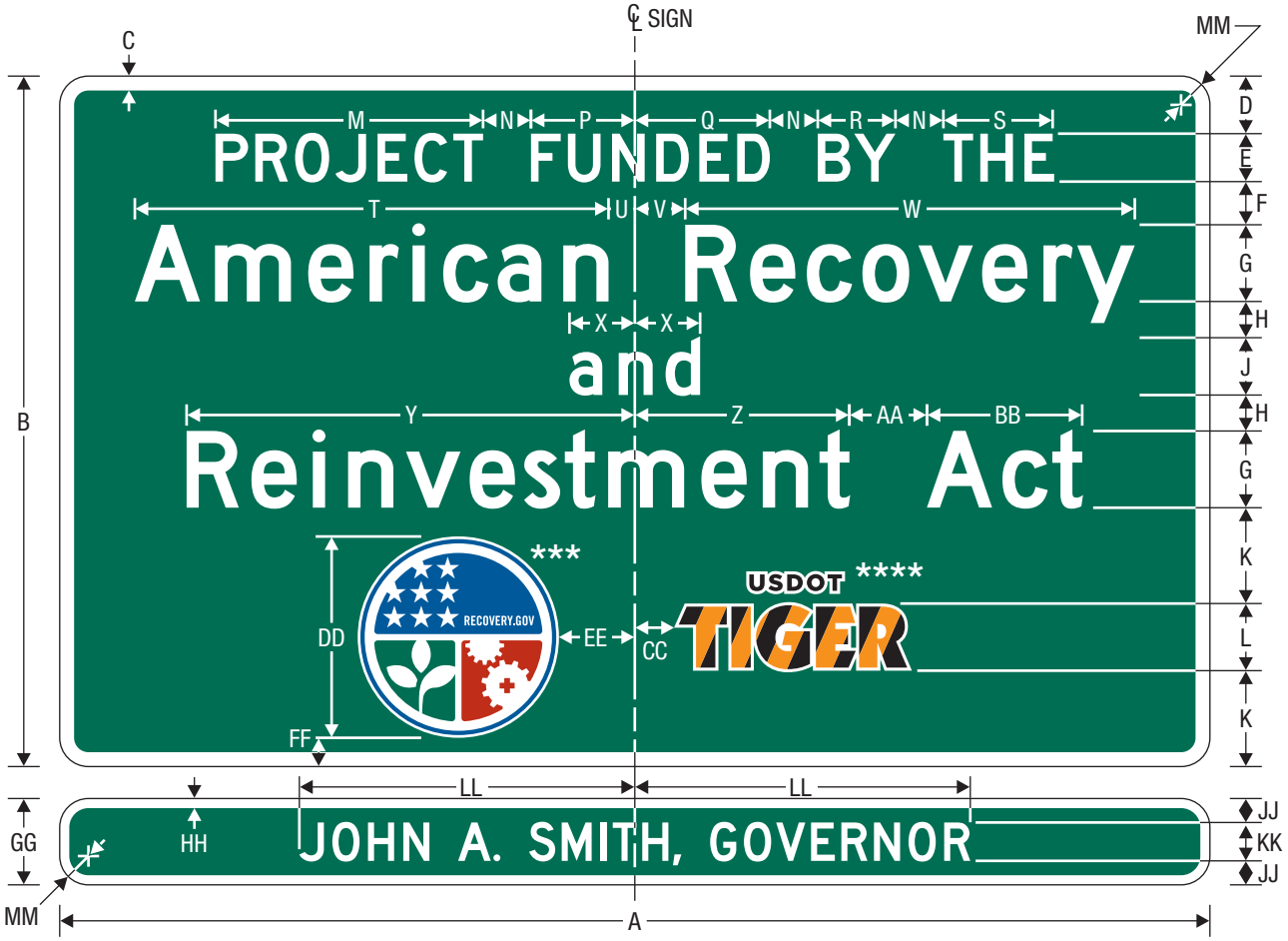
SUBJECT: **American Recovery and Reinvestment Act (ARRA) Sign**

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	4 D* (3 L.C.)	7.25	5	19.047	4	7.362

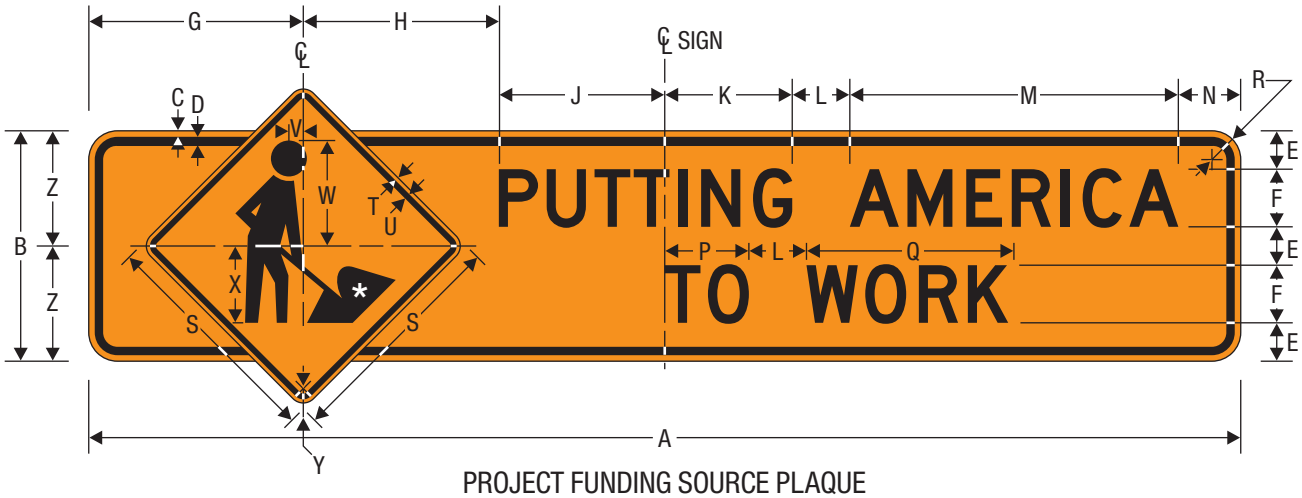
Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD
9.484	5.162	7.763	31.722	2.415	3.585	30.552	4.542	30.911	14.737	6	10.175	3	15

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



PROJECT FUNDING SOURCE PLAQUE

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

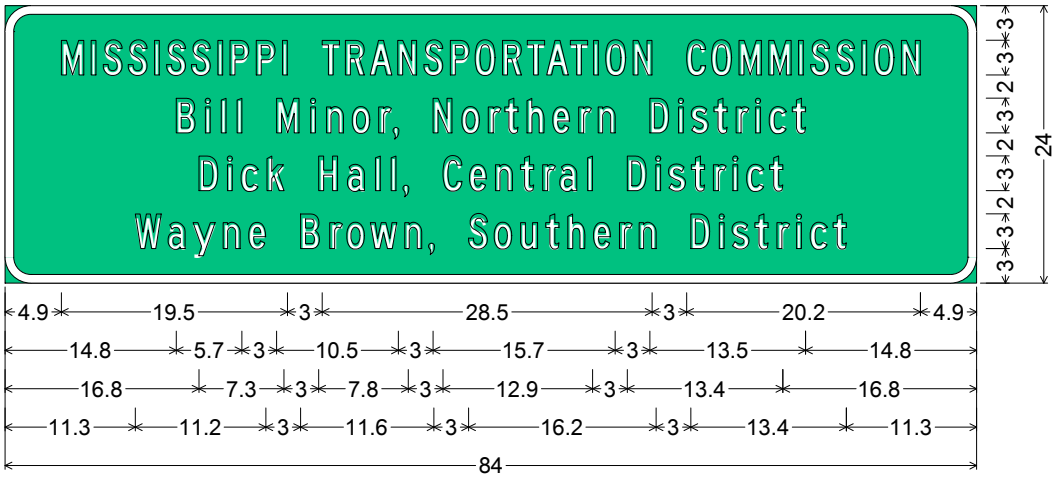
RECOVERY
Vector-Based, Vinyl-Ready Pictograph

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.

| | | |

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. 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. The most current ARRA forms can be obtained by following the link 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 included 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

Sample

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. 2734 **CODE: (SP)**

DATE: **August 7, 2009, 2009**

SUBJECT: **Contract Time**

PROJECT: **STP/IM-0055-04(091) / 105575301 & 302 – Desoto County**

The calendar date for completion of work to be performed by the Contractor for this project shall be **September 10, 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 no later than **October 13, 2009** and the effective date of the Notice to Proceed / Beginning of Contract Time will be **November 5, 2009**.

Should the Contractor request a Notice to Proceed earlier than **November 5, 2009**, the requested date will become the new Notice to Proceed / Beginning of Contract Time date.

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. 2737 **CODE: (SP)**

DATE: **8/6/2009**

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

	Per Gallon	Per Liter
Gasoline	$2.3640	$0.6245
Diesel	$2.3596	$0.6233

MATERIALS OF CONSTRUCTION

ASPHALT CEMENT	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	$1.6499	$391.43	$0.4359	$431.47
Grade PG 67-22	$1.6920	$401.43	$0.4470	$442.49
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	$2.2636	$0.5980
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)	$1.3500	$0.3566

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SECTION 904 - NOTICE TO BIDDERS NO. 2761 **CODE: (SP)**

DATE: **08/10/2009**

SUBJECT: **Project Number Change**

PROJECT: **STP/IM-0055-04(091) / 105575301 & 302 – Desoto County**

Anywhere in the plans, proposal and specifications for the above Project that reference is made to Federal Aid Project No. **STP-0055-04(091) / 105575301,** it is understood that Federal Aid Project Nos. **STP/IM-0055-04(091) / 105575301 & 302** is the correct project numbers.

SUPPLEMENT TO FORM FHWA-1273

The following MINIMUM HOURLY WAGE RATES have been predetermined by the Secretary of Labor in General Decision No. **MS20080211** dated January 16, 2009.

DESOTO COUNTY

CLASSIFICATION	MINIMUM HOURLY WAGE RATE
Carpenter, Including Form Work	13.00
Cement Mason / Concrete Finisher	12.85
Electrician	23.35
Laborer, Common or General	9.04
Laborer, Pipelayer	10.17
Operator, Backhoe	9.00
Operator, Broom	8.00
Operator, Bulldozer	9.00
Operator, Grader / Blade	11.67
Operator, Mechanic	13.00
Operator, Piledriver	12.50
Operator, Roller	10.00
Operator, Scraper	10.00
Truck Driver	10.00

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

SUPPLEMENT TO FORM FHWA-1273

DATE: 6/15/94

SUBJECT: Final Certificate and Contract Provisions for Subcontracts

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

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

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

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

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

		Page
I.	General	1
II.	Nondiscrimination	1
III.	Nonsegregated Facilities	3
IV.	Payment of Predetermined Minimum Wage	3
V.	Statements and Payrolls	6
VI.	Record of Materials, Supplies, and Labor	7
VII.	Subletting or Assigning the Contract	7
VIII.	Safety: Accident Prevention	7
IX.	False Statements Concerning Highway Projects	8
X.	Implementation of Clean Air Act and Federal Water Pollution Control Act	8
XI.	Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion	8
XII.	Certification Regarding Use of Contract Funds for Lobbying	10

ATTACHMENTS

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

I. GENERAL

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

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

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

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

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

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

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

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

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

II. NONDISCRIMINATION

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

6. **Training and Promotion:**

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

III. NONSEGREGATED FACILITIES

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

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

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

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

IV. PAYMENT OF PREDETERMINED MINIMUM WAGE

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

1. **General:**

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

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

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

2. **Classification:**

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

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

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

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

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

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

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

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

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

3. **Payment of Fringe Benefits:**

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

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

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

a. Apprentices:

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

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

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

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

b. Trainees:

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

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

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

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

c. Helpers:

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

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

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

6. **Withholding:**

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

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

7. **Overtime Requirements:**

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

8. **Violation:**

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

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

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

V. STATEMENTS AND PAYROLLS

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

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

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

2. **Payrolls and Payroll Records:**

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

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

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

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

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

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

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

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

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

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

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

VI. RECORD OF MATERIALS, SUPPLIES, AND LABOR

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

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

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

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

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

VII. SUBLETTING OR ASSIGNING THE CONTRACT

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

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

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

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

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

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

VIII. SAFETY: ACCIDENT PREVENTION

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

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

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

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

IX. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

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

NOTICE TO ALL PERSONNEL ENGAGED ON FEDERAL-AID HIGHWAY PROJECTS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

* * * * *

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

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

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

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

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

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

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

* * * * *

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

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

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

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

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

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

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

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

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

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

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

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

* * * * *

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

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

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

* * * * *

XII. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

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

DATE: **05/03/2004**

SUBJECT: **Partnering Process**

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

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

907-104.01.1--Partnering Process.

COVENANT OF GOOD FAITH AND FAIR DEALING:

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

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

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

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

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

D. Each will proceed to fulfill its obligations diligently.

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

VOLUNTARY PARTNERING:

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

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

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

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

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

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

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

DATE: **02/14/2006**

SUBJECT: **Contractor's Protection Plan**

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

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

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

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

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

SPECIAL PROVISION NO. 907-213-2 **CODE: (IS)**

DATE: **01/25/2008**

SUBJECT: **Agricultural Limestone**

Section 907-213, Fertilizing, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-213.05--Basis of Payment. Delete the first sentence of the first paragraph of Subsection 213.05 on page 136 and add the following as the first paragraph of this subsection.

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 (½) the contract unit price per ton. No payment will be made for hard rock agricultural limestone with an RNV less than 60.0%.

Delete the first pay item listed on page 137 and substitute the following:

907-213-A: Agricultural Limestone - per ton

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 (½) 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 (½) 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. 907-230-10 **CODE: (SP)**

DATE: **07/16/2009**

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, an Inland Steel Company, St. Louis, Mo., or an 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. After the sixth paragraph of Subsection 230.04 on page 169, add the following:

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

Bed preparation 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.

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

Measurement for payment will be made in the following sequence:

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

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

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

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

PLANT ESTABLISHMENT PERIOD

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

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

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

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. 907-242-16 **CODE: (SP)**

DATE: 08/21/2009

SUBJECT: Rest Area Improvements

PROJECT: STP-0055-04(091) & NH-0055-04(091) / 105575301 & 302 -- Desoto County

Section 907-242, Rest Area Improvements, 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-- Rest Area Improvements

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

SECTION 00 01 10 **TABLE OF CONTENTS**

PROJECT: **SITE IMPROVEMENTS TO REST AREA I-55 NORTHBOUND NEAR HERNANDO DESOTO COUNTY, MISSISSIPPI**

PROJECT NUMBER: **STP / IM-0055-04(091) 105575**

DATE: **AUGUST 22, 2009**

DESCRIPTION A (Pay Item 907-242-A): This Work shall consist of site work and all construction work necessary in constructing a Sewage Lift Station in accordance with these Specifications and conforming to the Drawings. Included in this Lump Sum shall be demolition of the existing Package Sewage Treatment Plant, construction of a Wet Well, installation of a Package Sewage Lift Station and Equipment, Station Piping, Associated Site Lighting (only within the lift station enclosure), Associated Electrical Panels and Rotary Phase Converters, Odor Control System, Equipment Start-up, Training and Testing.

DESCRIPTION B (Pay Item 907-242-B): This Work shall consist of construction work necessary in constructing Combination Air / Vacuum Release Valve and Vault in accordance with these Specifications and conforming to the Drawings. Included for each of these Pay Items shall be an Underground Pre-cast Concrete Vault, Connection to the Force Main, a Combination Air/Vacuum Release Valve, all other Associated Valves, Piping and Fittings within the Vault, Equipment Start-up, Training and Testing.

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

DIVISION 00 **PROCUREMENT AND CONTRACTING REQUIREMENTS**
00 01 10 TABLE OF CONTENTS

DIVISION 01 **GENERAL REQUIREMENTS**
01 10 00 SUMMARY
01 31 00 PROJECT MANAGEMENT AND COORDINATION
01 31 19 PROJECT MEETINGS
01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION
01 33 00 SUBMITTAL PROCEDURES
01 42 19 REFERENCE STANDARDS
01 43 00 QUALITY ASSURANCE

DIVISION 02 **EXISTING CONDITIONS**
02 41 13 SITE DEMOLITION

DIVISION 03 **CONCRETE**
03 30 00 CAST-IN-PLACE CONCRETE
03 31 30 CONCRETE LINING
03 40 00 PRECAST CONCRETE STRUCTURES

DIVISION 26 ELECTRICAL
26 05 00 GENERAL REQUIREMENTS - ELECTRICAL
26 05 13 CONDUIT AND BOXES FOR ELECTRICAL SYSTEMS
26 05 19 LOW VOLTAGE CONDUCTORS AND CABLES
26 05 29 HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS
26 05 53 IDENTIFICATION FOR ELECTRICAL SYSTEMS
26 09 23 LIGHTING CONTROL DEVICES
26 16 00 CABINETS AND ENCLOSURES
26 17 00 GROUNDING AND BONDING
26 28 13 FUSES
26 28 16 ENCLOSED SWITCHES AND CIRCUIT BREAKERS
26 42 10 UTILITY SERVICE ENTRANCE
26 47 00 PANELBOARDS
26 47 80 TRANSIENT VOLTAGE SURGE PROTECTIVE DEVICES
26 56 00 SITE LIGHTING
26 90 00 ELECTRICAL TESTING AND STARTUP

DIVISION 32 EXTERIOR IMPROVEMENTS
32 31 13 CHAIN LINK FENCES AND GATES

DIVISION 33 UTILITIES
33 01 32 MANHOLE TESTING
33 05 23 BORING AND JACKING
33 32 19 SEWAGE PUMPING STATION AND EQUIPMENT
33 39 13 MANHOLES

DIVISION 40 PROCESS INTEGRATION
40 23 19 PIPE AND PIPE FITTINGS
40 23 20 VALVES AND PIPING SPECIALTIES
40 23 21 TESTING PIPING SYSTEMS
40 91 13 CHEMICAL FEED SYSTEM

SECTION 01 10 00 SUMMARY

PART 1 - GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

A. Work covered by this Special Provision shall be provided as one Pay Item to construct a Sewage Pumping Station and Equipment and install as one Pay Item Combination Air Vacuum / Release Valve and Vault at the Rest Area on I-55 Northbound near Hernando in Desoto County, Mississippi.

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

C. Contractor's Duties:

1. Except as specifically noted, provide and pay for:
   a. Labor, materials, equipment.
   b. Tools, construction equipment, and machinery.
   c. Other facilities and services necessary for proper execution and completion of the Work.
2. Pay legally required sales, consumer, use, payroll, privilege and other taxes.
3. Secure and pay for, as necessary for proper execution and completion of Work, and as applicable at time of receipt of bids:
   a. Permits
   b. Government Fees
   c. Licenses
4. Give required notices.
5. Comply with codes, ordinances, rules, regulations, orders and other legal requirements of public authorities that bear on performance of Work.
6. Promptly submit written notice to Project Engineer of observed variance of Contract Documents from legal requirements. Appropriate modifications to Contract Documents will adjust necessary changes. Assume responsibility for Work known to be contrary to such requirements, without notice.
7. Enforce strict discipline and good order among employees. Do not employ on Work, unfit persons or persons not skilled in assigned task.
8. Schedule of Values: Submit 8 copies to the MDOT Architectural Services Unit a Schedule of Values as described in Section 01 29 73 of these Specifications. This submittal will be recorded as submittal number one for this Project. When this submittal is approved, a copy will be transmitted to Construction Administration to be used to review and compare to amounts submitted on the CAD-720 form. Other copies will be kept by Architectural Services Unit and distributed to Project Engineer, MDOT Consultants, and Contractor.
9. Sub-Contractors List: Submit 8 copies of a list, acceptable to the MDOT, of all subcontractors to be used on the Project within seven (7) days after written notice of Contract award by the MDOT. The list shall include the Firm's name, contact person, street address, e-mail address, telephone and fax numbers. Submit original to Contract Administration Division and one copy to the Project Engineer and to the MDOT Architect CAD-720 form - REQUEST FOR PERMISSION TO SUBCONTRACT for each subcontractor before they are allowed to perform any Work.
10. Coordination: The Contractor is responsible for the coordination of the total Project. All subcontractors will cooperate with the Contractor so as to facilitate the general progress of the Work. Each trade shall afford all other trades every reasonable opportunity for the installation of their Work. Refer to Section 01 31 00 Project Management & Coordination.

1.02 CONTRACTOR'S USE OF PREMISES

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

1. Law
2. Ordinances
3. Permits
4. Contract Documents
5. Owner

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

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

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

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

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

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

1.03 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Format: The Specifications are organized into Groups, Subgroups, Divisions and Sections using CSI/CSC's "MasterFormat" 2004 Edition numbering system.

1. Division 01: Sections in Division 01 govern the execution of the Work of all Sections 02 through 49 in the Specifications.

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

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 31 00 PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

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

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

1.02 DEFINITIONS

A. RFI: Request from Contractor seeking interpretation or clarification of the Contract Documents.

1.03 SUBMITTALS

A. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.

1.04 DUTIES OF PROJECT COORDINATOR (SUPERINTENDENT)

A. General:

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

B. Interpretations of Contract Documents

1. Consultation: Consult with Project Engineer to obtain interpretations.
2. Assistance: Assist in resolution of any questions.
3. Transmission: Transmit written interpretations to concerned parties.

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

D. Division One: Coordinate and assist in the preparation of all requirements of Division One and specifically as follows:

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

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

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

1.05 COORDINATION AND PROJECT CONDITIONS

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

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

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

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

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

1.06 SUBCONTRACTOR'S DUTIES

A. The Subcontractor is responsible to coordinate and supervise his employees in the Work accomplished under his part of the Contract.

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

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

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

1.07 REQUESTS FOR INTERPRETATION (RFIs)

A. Procedure: Immediately on discovery of the need for interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, prepare and submit an RFI in the form specified.

1. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing interpretation and the following:

1. Project name.
2. Date.
3. Name of Contractor.
4. Name of Architect.
5. RFI number, numbered sequentially.
6. Specification Section number and title and related paragraphs, as appropriate.
7. Drawing number and detail references, as appropriate.
8. Field dimensions and conditions, as appropriate.
9. Contractor's suggested solution(s). If Contractor's solution(s) impact the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
10. Contractor's signature.
11. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation.
    a. Supplementary drawings prepared by Contractor shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments.

C. Hard-Copy RFIs: CSI Form 13.2A

1. Identify each page of attachments with the RFI number and sequential page number.

D. Architect's Action: Architect will review each RFI, determine action required, and return it. Allow seven working days for Architect's response for each RFI. RFIs received after 1:00 p.m. will be considered as received the following working day.

1. The following RFIs will be returned without action:
   a. Requests for approval of submittals.
   b. Requests for approval of substitutions.

   c. Requests for coordination information already indicated in the Contract Documents.
   d. Requests for adjustments in the Contract Time or the Contract Sum.
   e. Requests for interpretation of Architect's actions on submittals.
   f. Incomplete RFIs or RFIs with numerous errors.
2. Architect's action may include a request for additional information, in which case Architect's time for response will start again.
3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 1 Section "Contract Modification Procedures."
   a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 7 days of receipt of the RFI response.

E. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.

F. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log the first week of each month. Use CSI Log Form 13.2B. Include the following:

1. Project name.
2. Name and address of Contractor.
3. Name and address of Architect.
4. RFI number including RFIs that were dropped and not submitted.
5. RFI description.
6. Date the RFI was submitted.
7. Date Architect's response was received
8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 31 19 PROJECT MEETINGS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Provisions for and procedures related to the required Project Meetings which include, but not limited to, the following for each Project Phase:

1. Pre-Construction Meeting.
2. Periodic Progress Meetings.

1.02 MEETINGS

A. Purpose of Meetings: Project Meetings shall be held for the following reasons:

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

1.03 SCHEDULING AND ADMINISTRATION

A. The Project Engineer shall schedule and preside over all meetings throughout the progress of the Work. Duties include the following:

1. Review, modify / approve minutes of the previous meeting.
2. Discuss items that have been done the previous month and anticipated work to be done within the next month.
3. Review Contractor's Pay Request and resolve questions or conflicts with Construction Documents.

B. The Contractor shall attend and administer all meetings throughout the progress of the Work. Duties include the following:

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

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

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

1.04 PRE-CONSTRUCTION MEETING

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

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

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

D. Minimum Agenda:

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

1.05 PROGRESS MEETINGS

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

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

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

D. Minimum Agenda:

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

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

END OF SECTION

SECTION 01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.01 DESCRIPTION

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

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

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

C. Content of Schedules:

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

D. Updating:

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

E. Submittals:

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

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 33 00 SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

A. Scope: Submit to the MDOT Architectural Services Unit shop drawings, product data, and samples required by Specification Sections. DO NOT submit Material Safety Data Sheets for approval. FAXED SUBMITTALS WILL NOT BE ACCEPTED. Refer to Section 01 62 15 – Product Options and Substitution Procedures, for requirements concerning products that will be acceptable on this Project.

B. Shop Drawings: Original (LEGIBLE) drawings prepared by Contractor, subcontractor, supplier or distributor which illustrates actual portions of the Work; showing fabrication, layout, setting or erection details. REPRODUCTIONS of the Contract Drawings WILL NOT BE ACCEPTABLE. Minimum requirements for shop drawings shall include the following:

1. Prepared by a qualified detailer.
2. Identify details by reference to sheet and detail numbers shown on Contract Drawings.
3. Minimum sheet size: 8-1/2 inches by 11 inches.
4. Shop drawings shall be stamped and signed by the Contractor certifying accuracy, completeness and compliance with Contract requirements prior to submitting to the MDOT Architectural Services Unit.

C. Product Data: Minimum information submitted shall include the following:

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

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

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

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

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

F. Contractor Responsibilities:

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

G. Submission Requirements:

1. Schedule submission with ample time given to review submittals prior to being needed.
2. Submit 8 copies of shop drawings and product data with additional number of copies, if required, by Contractor for distribution.
3. PARTIAL SUBMITTALS ARE NOT ACCEPTABLE, will be considered non-responsive, and will be returned without review.
4. Submit number of samples specified in each Specification Section.
5. Accompany submittals with transmittal letter, in duplicate, containing data, project title and number; Contractor's name and address; the number of each Shop Drawings, product data and samples submitted; notification of deviations from Contract Documents; and other pertinent data.
6. Each copy of submittal shall include a cover page with the following requirements:
   a. Date and revision dates.
   b. Project title and number.
   c. The names of Project Engineer, Contractor, Supplier, Manufacturer, and separate detailer, when pertinent.
   d. Identification of product or material.
   e. Relation to adjacent structure or materials and COMPLETE dimensions.
   f. Field dimensions, clearly identified as such.
   g. SPECIFICATION SECTION NUMBER.
   h. Applicable standards such as ASTM Number or Federal Specification.
   i. A blank space, 3 inches by 3 inches for the Reviewer's stamp.
   j. Identification to deviations from Contract Documents.

k. Contractor's stamp, initialed or signed, certifying the review of submittal, verification of field measurements, and compliance with Contract Documents.

H. Resubmission Requirements:

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

I. Distribution of Submittals after Review:

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

J. MDOT Architect / Consultants' Duties:

1. Review submittals with reasonable promptness.
2. Review for design concept of Project and information given in Contract Documents.
3. Review of separate item does not constitute review of an assembly in which item functions.
4. Affix stamp and initial, or signature, certifying the review of submittal.
5. Return submittals to the Architectural Services Unit, which will retain one copy and forward one copy to the Project Engineer, one copy to the Materials Engineer (if concrete), and the remainder to the Contractor.
6. Retain one copy of reviewed submittals.

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

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

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

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

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

END OF SECTION

SECTION 01420 REFERENCES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Identification and purpose of Reference Standards.

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

1.02 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. “Reviewed”: The term “Reviewed”, when used in conjunction with Architect's action on Contractor's submittals, applications, and requests, is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by Architect, requested by Architect, and similar phrases.

D. "Indicated": The term "indicated" refers to graphic representations, notes, or schedules on Drawings; or to other paragraphs or schedules in Specifications and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the user locate the reference.

E. "Regulations": The term "regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": The term "furnish" means to supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": The term "install" describes operations at Project site including unloading, temporary storage, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

H. "Provide": The terms “provide" means to furnish and install, complete and ready for the intended use.

I. "Installer": An installer is Contractor or another entity engaged by Contractor, as an employee, subcontractor, or contractor of lower tier, to perform a particular construction operation, including installation, erection, application, and similar operations.

J. The term "experienced," when used with the term "installer," means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with the special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1. Using a term such as "carpentry" does not imply that accredited or unionized individuals of a corresponding generic name, such as “carpenter”, must perform certain construction activities. It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name

K. "Project site" is the space available for performing construction activities, either exclusively or in conjunction with others performing other work as part of Project. The extent of Project site is shown on the Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.03 IDENTIFICATION AND PURPOSE

A. Identification: Throughout the Contract Documents are references to nationally known and recognized Codes, Reference Standards, Reference Specifications, and similar documents that are published by Regulatory Agencies, Trade and Manufacturing Associations and Societies, Testing Agencies and others. References also include certain Project Documents or designated portions.

B. Purpose: All named and otherwise identified “Reference Standards” are “by reference” hereby incorporated into these Specifications as though fully written and hereby serve to establish specific requirements and pertinent characteristics for materials and workmanship as well as methods for testing / reporting on compliance thereto.

1.04 PROCEDURES AND RESPONSIBILITIES

A. Compliance with Laws and Codes of governmental agencies having jurisdiction shall be mandatory and take precedence over the requirements of all other Reference Standards. For products or workmanship specified by Associations, Trade, or Federal Standards, comply with the requirements of the standard, except when supplemented instructions indicate a more rigid standard and / or define more precise requirements. Should specified reference standards conflict with regulatory requirements or the Contract Documents, request Architect’s clarification before proceeding.

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

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

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 43 00 QUALITY ASSURANCE

PART 1 - GENERAL

1.01 WORK QUALITY

A. Shop and field work shall be performed by mechanics, craftspersons, artisans, and workers skilled and experienced in the fabrication and installation/application of the work involved. The Work of this Project shall be performed in accordance with the Drawings, reviewed and approved shop drawings, and these Specifications. Quality of work shall conform to the highest established standards and practices of the various trades involved.

B. All work shall be erected and installed plumb, level, square, and true, or true to indicated angle, and in proper alignment and relationship to the work of other trades. Finished work shall be free from defects and damage.

C. Nothing specified in these Specifications shall be construed as relieving the Contractor of any responsibility for the quality of the finished work. Surfaces on which specified finishes are to be applied shall be in proper condition in every respect for superior finished work and long life without defects.

D. The Contractor's performance of the work hereunder shall be to the satisfaction of the Architect. The Architect reserves the right to reject materials and work quality which are not considered to be up to the accepted high standards of the various trades involved. Such inferior material or work quality shall be repaired or replaced, as directed by the Architect, at no additional cost to the Owner.

1.02 MANUFACTURERS' SPECIFICATIONS AND INSTRUCTIONS

A. Unless otherwise indicated or specified, manufactured materials, products, processes, equipment, systems, assemblies, and the like shall be erected, installed, or applied in accordance with the manufacturers' instructions, directions, or specifications. Said erection, installation, or application shall be in accordance with printed instructions furnished by the manufacturer of the material or equipment concerned for use under conditions similar to those at the jobsite. Two copies of such instructions shall be furnished to the Architect, and the Architect's acceptance therefore shall be obtained before work is begun.

B. Any deviation from the manufacturers' printed recommendations shall be explained and acknowledged as correct and appropriate for the circumstances, in writing, by the particular manufacturer. Any deviations must be reviewed by the Architect prior to any action by the Contractor. The Contractor will be held responsible for installations contrary to the respective manufacturers' recommendations.

1.03 SPECIALIST APPLICATOR/INSTALLER

A. Materials, equipment, systems, and assemblies requiring special knowledge and skill for the application or installation of such materials, equipment, systems, or assemblies shall be applied or installed by the specified product manufacturer or its authorized representative or by a skilled and experienced subcontractor qualified and specializing in the application or installation of the specified product with at least five years of successful experience in the type of work indicated and specified.

B. The installation subcontractor shall be approved by the product manufacturer, as applicable, and a copy of the installer's approval letter from the manufacturer shall be submitted to the Architect.

1.04 MANUFACTURER'S FIELD SERVICES

A. The manufacturer of a product, system, or assembly which requires special knowledge and skill for the proper application or installation of such product, system, or assembly shall provide appropriate field or job service at no additional cost to the Contractor or Owner. The manufacturer shall inspect and approve the application or installation work.

B. The Contractor shall make all necessary arrangements with the manufacturer of the products to be installed to provide onsite consultation and inspection services to assure the correct application or installation of the product, system, or assembly.

C. The manufacturer's authorized representative shall be present at the time any phase of this work is started.

D. The manufacturer shall inspect and approve all surfaces over which, or upon which the manufacturer's product will be applied or installed.

E. The manufacturer's representative shall make periodic visits to the site as the work proceeds as necessary for consultation and for expediting the work in the most practical manner.

1.05 TOLERANCES

A. Walls: Finished wall surfaces shall be plumb and shall have a maximum variation of 1/8 inch in 8 feet when a straightedge is laid on the surface in any direction, and no measurable variation in any 2-foot direction.

B. Ceilings: Finished ceiling surfaces shall present true, level, and plane surfaces, with a maximum variation of 1/8 inch in 8 feet when a straightedge and water level are laid on the surface in any direction and no measurable variation in any 2-foot direction.

C. Concrete floors: Tolerances for concrete floors and pavement are specified in Division 3.

D. Wood and Plywood Subfloors: Subfloor surfaces shall be level and shall have a maximum variation of plus or minus 1/8 inch in 10 feet. An additional tolerance of plus 1/4 inch per 2 feet of unsupported span will be allowed for camber.

E. Finished Floors: Level to within plus or minus 1/8 inch in 10 feet for hardwood and resilient floor coverings.

1.06 PROTECTION OF WOOD

A. Provide protection of all wood materials and products, whether or not installed, including erected and installed wood framing and sheathing, from water and moisture of any kind until completion and acceptance of the project.

B. The Contractor shall keep informed of weather conditions and forecasts, and when there is a likelihood of rain, shall protect installed and exposed framing and sheathing and stored lumber exposed to the elements with suitable water-repellent coverings, such as canvas tarpaulins and polyethylene sheeting.

C. Likewise, millwork and trim, paneling, cabinets, shelving, and products manufactured from wood shall be kept under cover and dry at the shop until time for delivery. Such materials shall not be delivered to the site until the building is roofed, and exterior walls are sheathed and protected with building paper as a minimum, the doors and windows are installed and glazed, and there is ample interior storage space for such materials and products. Delivery shall not occur during periods of rain, heavy dew, or fog.

D. Wood materials or products which become wet from rain, dew, fog, or other source will be considered to have moisture damage and will be rejected, requiring replacement by the Contractor with new, dry materials or products at no increase in the Contract Price. Excepted materials: installed exterior wood siding, exterior wood trim, exterior wood doors, and exterior wood windows, after specified treatments, such as exterior wood stain or paint, have been applied.

1.07 GROUT FILL

A. In applications where the grout installation may be subjected to moisture, the manufacturer shall submit a letter stating that the entire grout matrix does not contain any of the following:

1. Added gypsum.
2. Plaster-of-paris.
3. Sulfur trioxide levels in a portland cement component exceeding ASTM C 150's published limits.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

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 all existing sewage treatment plant equipment and structures including the chain link fence and influent lift station.
3. Demolition and removal and of all existing sewage treatment plant concrete walls. The base and foundation of the concrete tanks may remain in place.
4. 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. Control activities to prevent the spread of dust and avoid nuisance in surrounding areas.
4. 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 03 30 00 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 DESCRIPTION

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

1. Concrete Reinforcement
2. Concrete Formwork
3. Cast-In-Place Concrete
4. Concreting Accessories

1.2 REFERENCED STANDARDS AND SPECIFICATIONS

A. American Concrete Institute (ACI):

1. 211.1 Recommended Practice for Selecting Proportions for Normal and Heavy Weight Concrete
2. 214 Recommended Practice for Evaluation of Compression Test Results of Field Concrete
3. 301 Specifications for Structural Concrete for Buildings
4. 304 Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete
5. 305R Hot Weather Concreting
6. 306R Cold Weather Concreting
7. 308 Recommended Practice for Curing Concrete
8. 309 Recommended Practice for Consolidation of Concrete
9. 315 Manual of Standard Practice for Detailing Reinforced Concrete Structures
10. 318 Building Code Requirements for Reinforced Concrete
11. 347 Recommended Practice for Concrete Formwork
12. 350R Concrete Sanitary Engineering Structures

B. American Society for Testing and Materials (ASTM):

1. A185 Specification for Welded Steel Wire Fabric for Concrete Reinforcement
2. A615 Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
3. A706 Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcements
4. C31 Making and Curing Concrete Test Specimens in the Field
5. C33 Specifications for Concrete Aggregate
6. C39 Test for Compressive Strength of Cylindrical Concrete Specimens
7. C42 Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
8. C88 Test for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
9. C94 Specification for Ready-Mixed Concrete
10. C143 Test for Slump of Portland Cement Concrete
11. C150 Specification for Portland Cement
12. C171 Specification for Sheet Materials for Curing Concrete
13. C172 Sampling Fresh Concrete
14. C173 Test for Air Content of Freshly Mixed Concrete by the Volumetric Method
15. C231 Test for Air Content of Freshly Mixed Concrete by the Pressure Method
16. C260 Specification for Air-Entraining Admixtures for Concrete

17. C309 Specification for Liquid Membrane-Forming Compounds for Curing Concrete
18. C494 Specification for Chemical Admixtures for Concrete
19. C535 Test for Resistance to Abrasion of Large Size Coarse Aggregate by the Use of the Los Angeles Machine
20. C881 Specification for Epoxy-Resin-Base Bonding Systems for Concrete
21. C920 Specification for Elastomeric Joint Sealants

C. American Welding Society (AWS):

1. D12.1 Welding Reinforcing Steel Metal Inserts and Connections in Reinforced Concrete Construction

1.3 QUALITY ASSURANCE

A. Design Criteria:

1. Design each required concrete group to meet the physical properties specified in Table I of this Section.
2. In addition to structural strength and stability requirements, design and construct concrete in structures built with Concrete Group E to ensure

   a. Maximum density and impermeability - these qualities are achieved with low water cement ratios and a slow, moist cure.
   b. Maximum resistance to reaction of chemicals, alternate wetting and drying, and exposure to the elements.
   c. Well-formed and smooth surfaces to minimize resistance to flow.

B. Testing Agency: Concrete testing for slump, compressive strength, and air content shall be performed by a testing laboratory engaged and paid by the Contractor and approved by the Engineer. No concrete shall be poured unless the testing agency is on-site.

C. Concrete Testing:

1. Perform compressive strength, slump, and air content tests for each 10 cubic yards of concrete placed, or any portion thereof, for each structure. Cast at least 5 cylindrical strength test specimens for each batch. Test 2 cylinders at 7 days; test 2 cylinders at 28 days. Hold the remaining cylinder for testing in the event that any of the other cylinders are damaged prior to testing. Test concrete from Groups C and F of Table I at 3 days rather than at 7 days.
2. Determine concrete strength from standard test specimens made and cured according to ASTM C31 and ASTM C172, and tested in accordance with ASTM C39. Perform core drilling and testing in accordance with ASTM C42. Compute and evaluate in accordance with ASTM C94.
3. Determine air content in accordance with ASTM C231 or ASTM C173, as applicable.
4. Determine slump in accordance with ASTM C143.
5. Keep a slump cone and an air meter in close proximity to all concrete placements.
6. Testing is not required for non-structural applications such as MCC base pads, sidewalks, and other such uses.

1.4 SUBMITTALS

A. Shop Drawings: Submit detailed reinforcing drawings prepared in accordance with ACI 315, including bar schedule with bar marks and bends indicated.

B. Design Mix:

1. Prior to start of placing concrete, submit design mix for each group of concrete, indicating that the concrete ingredients and proportions will result in a concrete mix meeting the physical requirements for each concrete group specified in Table II of this Section.
2. Do not vary the proportions of the ingredients or source of material of the approved mix without submitting corresponding test result documentation to the Engineer for approval.

C. Manufacturer's Literature: Submit manufacturer's product literature including catalog information, dimensions, materials, instructions for installation and use, and application rates for:

1. Waterstop
2. Membrane Curing Compound

D. Certificates:

1. Submit a certification attesting that reinforcing steel meets the requirements of ASTM A615 including Supplementary Requirement S1, and that welded steel wire fabric meets the requirements of ASTM A185.
2. Submit, with the concrete mix design, laboratory test reports and manufacturer's certificates attesting the conformance of ingredients with these specifications (ASTM C94, paragraph 5.3.2).
3. Submit a certification or delivery ticket from the concrete supplier for each batch delivered to the site (ASTM C94, Section 15). The delivery ticket shall list: name of ready-mix batch plant, serial number of ticket, date and truck number, name of contractor, specific designation of job, batch number, amount of concrete, time loaded or of first mixing of cement and aggregates, number of revolutions, water added by receiver of concrete and his initials, type and name of admixtures and amount of same, type and brand of cement, amount of cement, total water content by producer, maximum size of aggregate, weights of fine and coarse aggregate, and indication that ingredients are as previously certified or approved.

E. Test Reports: Submit four (4) copies of required slump tests, air content tests, and strength tests.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Reinforcing Steel:

1. For reinforcing steel fabricated on-site, ship from the mill in bundles, limited to one size and length, tagged with a waterproof tag showing the name of the mill, heat number, grade and size of the bars, and identifying number.
2. For reinforcing steel fabricated off-site, deliver in bundles identified as to structure and shop drawing number. Identify each individual bar with a waterproof tag showing the grade, size and bar mark from the approved bar schedule.
3. Protect reinforcing steel and wire fabric from damage and from dirt, oil, grease, other foreign matter, and rust-causing conditions. Do not store reinforcement in direct contact with the ground.

B. Concrete Ingredients: Handle, control and store concrete materials in accordance with ACI 304, Chapter 2.

PART 2 - PRODUCTS

2.1 READY-MIX CONCRETE

A. Shall conform to ASTM C94, except as noted otherwise.

B. Materials:

1. Cement: ASTM C150, Types II, IIA, III, and IIIA as indicated in Table I.
2. Fine Aggregate: ASTM C33, with the following additional requirements for Concrete Groups D, E, F, and G only:

   a. Washed natural sand.
   b. Weighted percentage of loss not more than 12% by weight when subjected to five cycles of the magnesium sulfate soundness test in accordance with ASTM C88.

3. Coarse Aggregate: ASTM C33, with the following additional requirements for Concrete Group E only:

   a. Percentage of wear not exceeding 45% when tested in accordance with ASTM C535.
   b. Weighted percentage of loss not more than 15% by weight when subjected to five cycles of the magnesium sulfate soundness test in accordance with ASTM C88.

4. Water: Potable
5. Admixtures:

   a. Air Entraining Admixture: ASTM C260.
   b. Admixtures containing calcium chloride or soluble chlorides shall not be used.
   c. Admixtures other than air entraining shall conform to ASTM C494.
   d. All admixtures are subject to the written approval of the Engineer.

C. Mix Proportioning:

1. Select proportions for concrete to obtain the quality requirements for each group of concrete as specified in Table I of this Section.

D. Failure to Meet Strength Requirements: Paragraph 17 of ASTM C94 shall not apply. Failure to meet strength requirements will be governed by the appropriate provisions of the General Conditions.

2.2 REINFORCEMENT

A. Reinforcing Steel Bars: ASTM A615 including Supplementary Requirement S1, Grade 60. For applications requiring welding of reinforcing steel bars, use ASTM A706, Grade 60, Low-Alloy Deformed Bars (except where smooth bars are indicated).

B. Welded Steel Wire Fabric: ASTM A185

C. Fiber Reinforcement:

1. Multi-filament, polypropylene fibers for secondary, non-structural reinforcement of concrete.
2. Add to concrete mix at a dosage of 1.5 lbs./cu. yd. where fiber reinforced concrete is indicated on drawings or in specifications.
3. Acceptable Products:

a. Fibermesh 150 by SI Concrete Systems
b. ProCon F by Nycon, Inc.

4. Use in fillet concrete in wet well.

2.3 CONCRETING ACCESSORIES

A. Waterstops where indicated on the Contract Drawings shall be a specially formulated joint sealant comprised of bentonite/butyl rubber supplied in coil forms. Upon hydration the water stops shall swell to form a self-healing compression seal that completely locks out water and prevents water migration along the waterstop. Install a minimum of 2" from edge of wall joint. Install two parallel strips of waterstop at each wall joint. Install two parallel strips of waterstop at each wall joint. Installation shall be in strict conformance with manufacturer□s requirements. Waterstops shall be Adeka ULTRA SEAL.

B. Sealant: Polysulfide base, synthetic rubber sealant, non-staining, non-sag.

1. Two-component: ASTM C920, Type M, Grade NS
2. One Component: ASTM C920, Type S, Grade NS

C. Membrane-Forming Curing Compound: ASTM C309, Type 1D (100 resin) with fugitive dye and Type 2, Class B.

1. Apply by spraying.
2. Application Rate: As recommended by the manufacturer.
3. Use Type 2 when curing temperature is expected to be greater than 80°F, during the first 3 days of curing.
4. Use either all Type 1 or all Type 2 for an entire structure.

D. Bonding Agent: Two-component epoxy resin bonding system, ASTM C881, Type II, Grade I, Class B, C.

E. Bond Breaker: Non-staining liquid product which imparts a waterproof film to prevent adhesion of concrete and will not leave a paint-impeding coating on the face of the concrete.

F. Waterproof Sheet Material for Curing: ASTM C171.

G. Spacers, Chairs, Bolsters, Ties and Other Devices:

1. Galvanized steel or non-corroding material conforming to the requirements of the Concrete Reinforcing Steel Institute (CRSI) "Manual of Standard Practice for Reinforced Concrete Construction".
2. Form ties used in the construction of liquid containment structures shall have integral waterstops in accordance with ACI 350R. The ends of the tie metal, after breaking, should be at least 1-1/2" from the face of the concrete wall.

PART 3 - EXECUTION

3.1 GENERAL

A. Unless otherwise specified, conform to ACI 304, 305R, and 306R for concrete installation requirements such as preparation, mixing, conveying, depositing, curing, and cold and hot weather requirements. Consolidate concrete in accordance with ACI 309.

B. Concrete not placed within 90 minutes or 300 revolutions, whichever occurs first, after the first mixing of the cement and aggregates will be rejected.

3.2 COORDINATION

A. Examine the drawings and specifications for work of other sections or other contractors and coordinate such work with the requirements of this Section. Make provisions for installation of such items as sleeves, pipes, conduits, inserts and hangers in a manner that will not impair or weaken concrete construction.

3.3 REINFORCEMENT

A. Cleaning and Bending:

1. Clean metal reinforcement free of loose rust, mill scale, or other coatings that will destroy or reduce the bond.
2. Perform cutting and bending in the shop. Bend and cut steel cold. Do not bend or straighten bars in a manner that will injure the material.

B. Placement: Arrange and place reinforcement in accordance with the approved shop drawings. Secure in position with chairs, spacers, and ties. Concrete brick may be used to support reinforcement for slabs on grade when approved by the Engineer.

C. Splicing:

1. Furnish reinforcing bars in full lengths as indicated on the Contract Drawings and approved shop drawings.
2. Do not splice bars unless indicated on the Contract Drawings or approved by the Engineer in writing.
3. When authorized, make splices in accordance with ACI 318. Perform welding in accordance with AWS D12.1.
4. Lap mesh reinforcement not less than one mesh space plus 2", and tie.

D. Concrete Cover:

1. Provide clearance and spacing indicated on the Contract Drawings.
2. Where no clearances are indicated, the thickness of concrete cover over reinforcement shall be:

   a. 3" for concrete placed against ground without the use of forms
   b. 2" for concrete placed in forms that will be exposed to ground or weather
   c. 1-1/2" for formed concrete not exposed to ground or weather
   d. 1" for slabs not exposed to ground or weather

3.4 FORMWORK

A. Responsibility:

1. The design and construction of formwork are the sole responsibility of the Contractor.
2. The Contractor shall remove and replace forms which no longer have smooth surfaces and/or are weak resulting in intrusions or extrusions in the concrete face.

B. Design Criteria:

1. Design formwork system which is adequately braced and has strength and stability to insure finished concrete within the tolerances specified in ACI 347.
2. Provide formwork sufficiently tight to prevent leakage of mortar.
3. Chamfer external and exposed corners 1".

C. Coating Forms:

1. Coat forms with bond breaker prior to the placement of reinforcing steel.
2. Do not allow excess form coating material to stand in puddles in the forms or to come in contact with concrete against which fresh concrete is to be placed.
3. Clean reinforcing steel that has become contaminated with bond breaker to the satisfaction of the Engineer prior to placing concrete.

D. Embedded Items:

1. Clean items to be embedded in concrete free from oil or foreign matter that would weaken the bond of the concrete to these items.
2. Install in the formwork requisite inserts, anchors, sleeves, and other items specified under other sections of these specifications. Close ends of conduits, piping, and sleeves embedded in concrete with caps or plugs.

E. Joints:

1. Make contraction, expansion, and construction joints where indicated on the Contract Drawings. Additional construction joints are subject to prior approval of the Engineer. Locate additional construction joints to least impair the strength of the structure.
2. Form keyways and joints as indicated on the Contract Drawings.
3. Continue reinforcing steel and wire fabric across construction joints.

F. Waterstops:

1. Install waterstops of the sizes and shapes indicated. Support and protect that portion of the waterstop which extends beyond the bulkhead during placing of concrete and subsequent removal of forms.

3.5 PREPARATION OF EQUIPMENT AND PLACE OF DEPOSIT

A. Before placement, clean equipment for mixing and transporting the concrete. Remove debris and ice from the places to be occupied by the concrete. Clean reinforcement of dirt, loose rust, and mill scale, or other coatings.

B. Remove water from place of deposit before concrete is placed. Remove laitance and unsound material from hardened concrete before additional concrete is added.

C. Thoroughly wet the stone base on which slabs are to be placed where no vapor barrier is indicated.

3.6 MIXING

A. Mix and deliver ready-mixed concrete in accordance with ASTM C94.

B. Do not over-mix. Do not use concrete which is retained in mixers so long as to require additional water in excess of design mix water to permit satisfactory placing.

C. Use preparation methods capable of producing concrete with a temperature not more than 85°F, and not less than 55°F, at the time of placement.

D. Do not heat concrete ingredients to a temperature higher than that necessary to keep the temperature of the mixed concrete, as placed, within the specified temperatures.

E. Do not heat water in excess of 140°F.

3.7 CONVEYING

A. Convey concrete from the mixer to the final deposit by methods that will prevent segregation or loss of materials.

3.8 CONCRETE PLACEMENT

A. Deposit concrete as nearly as practical in its final position to avoid segregation due to rehandling or flowing. Do not use vibrators to move concrete horizontally with the forms.

B. Do not use retempered concrete or concrete contaminated by foreign material.

C. Plan and conduct concrete placement to insure that the concrete is kept plastic and that the concrete is free of cold joints.

D. Where there is a time delay greater than 45 minutes between adjacent concrete placement, a bulkhead construction joint, complete with waterstops where required, must be installed.

E. Remove temporary spreaders in forms when concrete has reached an elevation rendering their service unnecessary.

F. Do not commence placing when the sun, heat, wind or limitations of facilities provided prevent proper finishing or curing.

G. Discontinue concreting when the descending natural air temperature falls lower than 40°F unless preparations are made and in place to heat or insulate concrete in accordance with the cold weather concreting requirements of this specification.

3.9 CONSOLIDATION

A. Consolidate concrete thoroughly as it is placed in order to secure a dense mass. Work concrete well around the reinforcement and embedded items and into the corners of the forms.

B. Use internal vibrators inserted vertically over the entire area of the placement.

C. Vibrate until voids are eliminated, coarse aggregate is suspended in mortar, and entrapped air bubbles begin to rise to the surface. Concrete should move back into the space vacated by the vibrator.

D. Space vibrator insertions such that the area visibly affected by the vibrator overlaps the adjacent just-vibrated area by a few inches.

E. Penetrate at least 6" into previously placed layers in order to bond between layers and avoid cold joints.

F. Form vibrators may not be used.

G. Take care not to over-vibrate air entrained concrete. Place vibrator to eliminate honeycombing but avoid excess vibrating that bleeds all entrapped air from the mix.

H. Do not use vibrators to transport concrete.

3.10 JOINTS AND KEYWAYS

A. Construct expansion, control, and isolation joints and keyways where indicated on the drawings and at additional locations approved by the Engineer as shown on the Contract Drawings.

B. Where the placing of concrete is discontinued, clean off laitance and other objectionable material to a sufficient depth to expose sound concrete as soon as concrete is firm enough to retain its form. Smooth the top surface of concrete adjacent to the forms with a trowel to minimize visible joints on exposed faces.

C. Immediately after the work of placing concrete is halted, remove accumulations splashed upon the reinforcement and the surfaces of the forms. Perform this removal before concrete takes its initial set. Clean reinforcing steel carefully to prevent damage to the concrete steel bond.

D. Do not halt work within 18" of the top of any face.

E. For bonded horizontal joint construction, roughen the surface and expose the aggregate. Clean the surface thoroughly by wet sandblasting, by cutting with high-pressure water jet or by other approved methods. Perform cleaning after the concrete has hardened to prevent raveling of the surface below the desired depth.

F. Before bonding concrete is placed, clean the surface of loose or soft particles or other objectionable materials and keep wet for a minimum period of 12 hours.

G. Cover the cleaned and saturated surface with a coating of neat cement grout and deposit new concrete before the grout has attained its initial set.

3.11 CONCRETE PROTECTION

A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperature and mechanical injury. Maintain with minimum moisture loss and relatively constant temperature for the period necessary for hydration of the cement and hardening of the concrete.

B. After the concrete has hardened, loosen forms as soon as possible without damage to the concrete, and run curing water continuously down inside the form.

3.12 REMOVAL OF FORMS

A. Do not remove forms until members have acquired sufficient strength to support their own weight and imposed loads safely.

B. Forms for walls, columns, and other vertical faces which do not sustain loads may be removed 12 hours after the last portion of concrete in the section has been placed provided that the concrete has sufficiently hardened as described above.

C. In cold weather, all forms must remain in place for 5 days except those in Concrete Groups C and F of Table I where the requirement is 3 days.

D. Notify the Engineer before forms are removed in order that an examination of the newly-stripped surfaces may be made prior to patching.

3.13 REPAIR OF TIE HOLES AND MINOR DEFECTS

A. Repair immediately after form removal.

B. Honeycombs and Small Defective Areas:

1. Remove to sound concrete.
2. Wet the affected area.
3. Brush on bonding grout - 1 part cement, 1 part fine sand and water to produce a consistency of thick cream.
4. Apply patching mortar - 1 part cement, 2-1/2 parts sand and enough water to produce a stiff consistency.
5. Consolidate patching mortar and strike off to leave the patch slightly higher than the surrounding surface.
6. Finish the repaired area flush with the surrounding area after the mortar has been in place for one hour.

C. Tie Holes:

1. Thoroughly clean and dampen.
2. Fill solid with patching mortar.

D. Perform patching before curing compound is applied.

E. Cure patched areas in the same way as adjacent concrete.

F. Make repairs uniform in color and finish with surrounding concrete.

3.14 CURING

A. Keep concrete moist for at least 7 curing days after placement. Concrete Groups C and F of Table I must be kept moist for only 3 curing days.

B. A curing day is defined as 24-hour day when the concrete surfaces are kept moist and the uniform temperature of the concrete mass is between 55°F and 75°F.

C. Curing may be achieved by water curing or application of a liquid membrane-forming curing compound. Curing compounds may not be used on surfaces that are to receive additional concrete, paint or tile.

D. Water curing is the preferred method of protection. Cover exposed surfaces with a saturated material (burlap or cotton mats) and keep wet continuously with a soil soaker hose for 7 days. Leave covering in place, without wetting, for an additional 3 days.

E. The use of curing compound (ASTM C309) is permissible. Keep surfaces moist after the forms are removed and the form tie holes repaired. After the surfaces are finished, apply the curing compound according to the manufacturer's recommendations. Do not remove too much forming at one time.

F. Slabs: Immediately following slab finishing, apply liquid membrane-forming curing compound or begin water curing before the surface becomes dry.

G. Vertical Surfaces: When the forms are removed entirely, spray the surface with water and allow to reach a uniformly damp appearance with no free water on the surface. Apply curing compound or begin water curing.

3.15 CONCRETE SLAB FINISHING

A. Refer to Table II for type finish at each location.

B. Complete screeding and darbying slabs before excess moisture or bleeding water is present on the surface.

C. Do not begin subsequent finishing operations until surface water has disappeared and the concrete will sustain foot pressure with only approximately 1/4" indentation.

D. Float Finish:

1. Consolidate concrete with a power-driven disc-type float or a combination floating-troweling machine with metal float shoes attached.
2. Machines which have a water attachment for wetting the concrete during the finishing operation are prohibited.
3. Unless otherwise indicated in Table II, check and level surface plane to a tolerance not exceeding 1/4" in 10 feet when tested with a 10-foot straightedge. Cut down high spots and fill low spots. Immediately after re-leveling, refloat surface to a uniform, smooth, granular texture.
4. Where slab drainage is indicated, take care to maintain accurate slopes for drainage.

E. Steel Troweling: After float finishing, steel trowel surface as specified in Table II to increase the compaction of fines and to provide maximum density and wear resistance.

F. Non-slip Broom Finish: In addition to floating and troweling, provide walks, ramps, steps, and exposed floor areas subject to foot traffic and likely to be wet with a final non-slip broom finish. Draw broom over previously finished finish.

3.16 HOT WEATHER REQUIREMENTS

A. Hot weather conditions are deemed to exist when the temperature in the forms is 75°F or above, or a combination of high air temperature, low relative humidity and wind velocity impairs the quality of fresh or hardened concrete. Take protective measures for mixing, transporting and placing concrete in accordance with ACI 305R.

B. The temperature of the concrete at the place of discharge may not exceed 85°F.

1. If ice is used to lower temperature, place crushed, shaved or chipped ice directly into the mixer as part or all of the mixing water. Mix until ice is completely melted.
2. Record the concrete temperature at the time of discharge.

C. Do not add water that will cause the proportions to exceed the maximum water-cement ratio shown in Table I.

1. Notify the resident project representative before adding any water to the concrete mix.
2. Record the amount of water added to the concrete at the jobsite.

D. Discharge concrete within 90 minutes or 300 revolutions, whichever occurs first, after the first mixing of cement and aggregates.

E. Placing and Curing:

1. Place concrete promptly upon arrival.
2. Provide at least one standby vibrator for each 3 vibrators in use.
3. Protect concrete from direct sunlight. Keep forms covered and moist by means of water sprinkling or the application of continuously wetted burlap or cotton mats for a minimum of 24 hours.
4. When forms are removed, provide wet cover to the newly exposed surfaces to avoid exposure to hot sun and wind.
5. Continue specified water curing methods for 10 days. Leave covering in place 4 additional days. Do not permit alternate wetting and drying cycles.
6. For slabs on grade, beam and deck concrete, and other horizontal placements, protect the surface between finishing operations using one or more of the following methods:

   a. Careful use of a fog nozzle.
   b. Spreading and removing polyethylene sheeting between finishing operations.
   c. Application of monomolecular film after the strike off.

3.17 COLD WEATHER REQUIREMENTS

A. Cold weather is defined any time when the daily temperature is 40°F or lower during placement and the protection period.

B. Protect concrete surfaces from freezing for at least 24 hours after placement.

C. All surfaces in contact with newly-placed concrete including formwork, reinforcement and subgrade must be above 35°F.

D. Place concrete at a temperature of not less than 55°F. Mix concrete at a temperature between:

1. 60°F and 70°F when outside air temperature is above 30°F.
2. 65°F and 75°F when outside air temperature is between 0°F and 30°F.
3. 70°F and 80°F when outside air temperature is below 0°F.

E. Follow concrete placement with tarpaulins or other readily movable coverings, so only a few feet of concrete is exposed to the outside air at any time.

F. Maintain the temperature and moisture conditions specified in all parts of the newly-placed concrete by covering, insulating, housing or heating. Arrange for protection methods in advance of placement.

G. Maintain concrete at a temperature of not less than 50°F nor more than 70°F for a period of 3 days after placement. Only 2 days are required for Concrete Groups C and F of Table I.

H. Do not remove forms during the initial protection period.

I. Protect insulation against wetting that will impair its insulating value using moisture-proof cover material. Keep insulation in close contact with concrete.

J. Construct enclosure to withstand wind and snow loads and be reasonably air-tight. Provide sufficient space between the concrete and enclosure to permit free circulation of heated air.

K. Use vented heaters. Do not permit heaters to heat or dry concrete locally.

L. Maintain relative humidity above 40% within heated enclosures before construction supports are removed.

M. Monitor temperature to insure concrete is kept within specified limits recording time and concrete temperature every 8 hours.

N. Assure concrete has developed necessary strength before removing forms. Provide additional test cylinders with the same protection as the structure they represent to verify concrete strength before construction supports are removed.

O. If water curing is used, terminate at least 12 hours before end of temperature protection period. Permit concrete to dry.

P. After the required protection period, gradually reduce the concrete temperature within an enclosure or insulation at a rate not to exceed 20°F per day until the outside temperature has been reached.

Q. Apply membrane-forming curing compound to concrete surfaces during the first period of above-freezing temperatures after forms are stripped and before air temperature rises to 50°F. Apply membrane-forming curing compound to slabs as soon as finishing operations are completed, except where live steam curing is used.

SEE ATTACHED TABLES

END OF SECTION 03 30 00

TABLE I

PROPERTIES OF CEMENT CONCRETE

CON-CRETE GROUP	REQD. 7-DAY STRENGTH (PSI)	REQD. 28-DAY STRENGTH (PSI)	REINF STEEL GRADE	MAX. WATER/ CEMENT RATIO	PERCENT AIR CONTENT	MIN./ MAX. SLUMP	MAX. C_3A CONTENT	CEMENT TYPE	MAX. AGGRE GATE SIZE
A	2,100	3,000	60	0.51	5% ±1%	2"-4"	----	I or IA	1-1/2"
B	2,100	3,000	60	0.51	6% ±1%	2"-4"	----	I or IA	1"
C	2,100*	3,000	60	0.57	5% ±1%	2"-4"	----	III or IIA	1-1/2"
D	2,800	4,000	60	0.45	5% ±1%	2"-4"	----	I or IA	1-1/2"
E	2,100	3,000	**	0.51	5% ±1%	2"-4"	8%	II or IIA	1/2"
F	2,800*	4,000	60	0.46	5% ±1%	2"-4"	----	III or IIIA	1-1/2"
G	3,150	4,500	60	0.40	5% ±1%	2"-4"	8%	II or IIA	1-1/2"
H	2,800	4,000	60	0.45	1.5% ± 0.5%	2"-4"	----	I	1"
I	1,500	2,000	60	0.67	5% ±1%	2"-6"	----	I or IA	1-1/2"

* COMPRESSIVE STRENGTH AT 3 DAYS
** POLYPROPYLENE FIBER AS SPECIFIED

TABLE II

CONCRETE FINISH SCHEDULE

LOCATION	CONCRETE GROUP	FINISH	REMARKS
Cast-In-Place Fillet in Wet Well	E	Smooth Troweled	
Sidewalks and Exterior Slabs	B	Non-Slip Broom	
Floor Slab	B	Steel Troweled	

SECTION 03 31 30 - CONCRETE LINING

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section covers all workmanship, materials and quality requirements for lining work on the interior surfaces of wet wells. Provide and apply resurfacing and epoxy lining materials as specified and as indicated on drawings and per Manufacturer' instructions design details.

1.2 REFERENCES

A. This section contains references to the documents listed below. They are a part of this section as specified and modified. In case of conflict between the requirements of this section and those of the listed documents, the more stringent of the requirements shall prevail.

B. Unless otherwise specified, references to documents shall mean the documents in effect at the time of receipt of Bids. If referenced documents have been discontinued by the issuing organization, references to those documents shall mean the replacement documents issued or otherwise identified by that organization or, if there are no replacement documents, the last version of the document before it was discontinued. Where document dates are given in the following listing, references to those documents shall mean the specific document version associated with that date, whether or not the document has been superseded by a version with a later date, discontinued, or replaced.

C. Referenced publications found within this specification shall be the latest revision unless otherwise specified; and applicable parts of the referenced publications shall be come a part of this specification as if fully included.

1. ASTM American Society for Testing and Materials:

   a. ASTM C 920 Specification for Elastomeric Joint Sealants.
   b. ASTM D 3960 Practice for Determining Volatile Organic Compound Content (VOC) of Paints and Related Coatings
   c. ASTM D 4259 Practice for Abrading Concrete.
   d. ASTM E 337 Standard Practice Test Method for Measuring Humidity with a Psych meter.
   e. ASTM F 710 Practice for Preparing Concrete Floors and Other Monolithic Surfaces to Receive Resilient Flooring

2. FEDERAL STANDARD COLORS:

   a. F 595 B Federal Standard Colors
   b. Guideline No. 03732 Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays

3. ICRI International Concrete Restoration Institute:
4. Guideline No. 03732 Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays
5. NACE (National Association of Corrosion Engineers)

a. NACE Publication 6D 173 "A Manual for Painter Safety"
b. NACE Publication 6G-164 "Surface Preparation Abrasives for Industrial Maintenance Painting"
c. NACE Publication 6G-164 "Surface Preparation Abrasives for Industrial Maintenance Painting"
d. NACE Publication TPC2 Coatings and Linings for Immersion Service: Chapter 1 Safety, Chapter Surface Preparation, Chapter 3 Curing, and Chapter 4 Inspection
e. NACE Publication 617-163 "Surface Preparation of Steel or Concrete Tank Interiors."
f. NACE RP0892-92 Standard Recommended Practice, Lining over Concrete in Immersion Service.
g. NACE RP0288-88 Standard Recommended Practice, Inspection of Linings on Steel and Concrete.

6. SSPC Steel Structures Painting Council

a. SSPC-SP12 Surface Preparation and Cleaning of Steel and Other Hard Materials by High and Ultrahigh Pressure Water Jetting Prior to Recoating.
b. SSPC-SP13 Surface Preparation of Concrete
c. SSPC-PA-3 "A Guide to Safety in Paint Application"
d. SSPC-Guide 12 Guide for Illumination of Industrial Painting Project.

7. OSHA (Occupational Safety & Health Administration:

a. 1915.35 Standards - 29 CFR - Painting.

8. ANSI American National Standards Institute:

a. ANSI/ASC 29.4 Exhaust Systems Abrasive Blasting Operations - Ventilation and Safe Practice

1.3 QUALITY ASSURANCE

A. Requirements:

1. Do not use or retain contaminated, outdated, or diluted materials for resurfacing. Do not use materials from previously opened containers.
2. Use only products of the approved Manufacturer. Use products of one manufacturer in any one resurfacing system with compatible materials. Provide same material product for touch-up as for original material.
3. If any requirements of this specification conflict with a referenced standard, the more stringent requirement shall apply.
4. Make available all locations and phases of the work for access by the Engineer or other personnel designated by the Engineer. The Contractor shall provide ventilation and egress to safely access the coating work areas for inspection.
5. Conduct work so that the resurfacing system is installed as specified herein. Inspect work continually to ensure that the resurfacing system is installed as specified herein. The Contractor shall inspect the work to determine conformance with the specifications and referenced documents. The Contractor shall inform the Engineer of the progress and the quality of the work through daily reports as specified below. Any nonconforming coating system work shall be corrected as specified herein or as recommended by the Manufacturer.

6. Summarize test data, work progress, areas covered, ambient conditions, quality control inspection test findings, and other information pertinent to the resurfacing system installation in daily reports to be submitted to the Engineer or the Engineer's Representative.
7. The methods of construction shall be in accordance with all requirements of this specification.
8. Employ only trades people who have at least five years of experience performing resurfacing work of similar size and complexity as the work specified in this Section. Submittals to verify these qualifications are to be made within thirty (30) days of the Notice-to-Proceed and are subject to approval by the Engineer

1.4 SUBMITTALS

A. Submit the following prior to commencing with any phase of the work covered by this Section:

1. Manufacturer's current printed recommendations and product data sheets for all coating system products supplied under this section including performance criteria, surface preparation and applications, volatile organic compound (V.O.C.) data, and safety requirements.
2. Material Safety Data Sheets (MSDS) for any materials brought on-site including all resurfacing system materials, solvents, and abrasive blast media.
3. Storage requirements including temperature, humidity, and ventilation for resurfacing system materials.
4. Manufacturer's requirements, including application procedures for resurfacing materials shall be in writing and shall be followed in detail. All safety precautions recommended by the Manufacturer shall be strictly adhered to at all times when work is in progress.
5. Color samples for all surfaces to be resurfaced that have been field matched to existing colors.
6. Submit applicators' certification that resurfacing materials comply with Federal, State, and Local regulations for VOC (Volatile Organic Compounds).
7. Submit daily reports that contain the following information: Substrate conditions, ambient conditions, application procedures, work completed and location thereof. Mark-up drawings that show location of work.
8. Submit letter(s) with associated product data signed by Manufacturer certifying that submitted products are suitable for application on the surfaces to be resurfaced and for the service conditions.

B. Submit the following information at the completion of the work identified within the scope of this section:

1. Submit daily reports that contain the following information: surface preparation, substrate conditions, ambient conditions, application procedures, coating materials used, coating material quantities, batch numbers of materials used, and work completed and location thereof. Mark-up drawings that show location of work.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Materials shall be stored in accordance with Manufacturer's recommendations in enclosed structures and shall be protected from weather and adverse temperature conditions. Flammable materials shall be stored in accordance with state and local codes. Materials exceeding storage life recommended by the manufacturer shall be removed from the site.

B. Store all materials only in area or areas designated by the Engineer solely for this purpose. Confine mixing, thinning, clean-up and associated operations, and storage of materials-related debris before authorized disposal, to these areas. All materials are to be stored on pallets or similar

storage/handling skids off the ground in sheltered areas in which the temperature is maintained between 50°F and 90°F.

C. Mix all resurfacing materials in an enclosed mixing area designated by the Engineer. This enclosed area must protect the mixing operation and materials from direct sunlight, inclement weather, freezing, or other means of damage or contamination. Protect all other concrete and metallic surfaces and finishes from any spillage of material(s) within the mixing area.

D. Do not use floor drains, dikes or storm drains for disposal of resurfacing system materials.

E. The Contractor shall take all precautions and implement all measures necessary to avert potential hazards associated with the resurfacing system materials as described on the pertinent Material Safety Data Sheets or container labels.

F. Deliver all materials to the job site in their original, unopened containers. Each container shall bear the Manufacturer's name and label.

1. Labels on all material containers must show the following information:

a. Name or title of product.
b. Federal Specification Number if applicable. c. Manufacturer's batch number and date of manufacture. d. Manufacturer's name.
c. Generic type of material.
d. Application and mixing instructions.
e. Hazardous material identification label. h. Shelf life date.
f. Storage requirements.

2. All containers shall be clearly marked indicating any personnel safety hazards associated with the use of or exposure to the materials.
3. All materials shall be handled and stored to prevent damage or loss of label.
4. Resurfacing material storage and mixing areas shall be designated by the Engineer.
5. Do not use or retain contaminated, outdated, prematurely opened, diluted materials, or materials which have exceeded their shelf life.

1.6 COORDINATION OF WORK

A. Work Areas:

1. The work areas on the job site will be designated by the Engineer. The Contractor's personnel shall not be permitted in any area other than those expressly designated by the Engineer.

B. Coordination:

1. The contractor shall coordinate with the Engineer regarding availability of work areas, completion times, safety, access and other factors which can impact plant operations.

1.7 SAFETY

A. The Contractor's work forces should comply with the provisions outlined in the following documents:

1. SSPC-PA-3"A Guide to Safety in Paint Application"

2. NACE Pub. "A Manual for Painter Safety"

B. The Contractor shall provide personnel with all safety equipment necessary to protect them during any phase of the work. This shall include, but not be limited to safety glasses, goggles, earplugs, hard hats, steel toed work shoes, appropriate personal protective clothing, gloves, and plant approved escape respirators (where required).

C. No work shall be performed until the appropriate Work Requests and lock-outs are approved by the Engineer. The Work Request system provides a mechanism to advise plant staff of a contractor's work activities. The Lockout system is a safety procedure to prevent unintended equipment activation.

D. Keep any flammable materials such as cleaning solvents, thinners, or resurfacing materials away from open flames, sparks or temperatures higher than 150°F. Drums containing flammable materials will be grounded. No solvent in any quantity shall be allowed inside containment enclosures or permitted confined spaces at any time during resurfacing work.

E. Power tools are to be in good working order to avoid open sparking. No spark producing tools shall be utilized in restricted areas as indicated herein.

F. The Contractor shall fireproof all work areas by maintaining a clean work area and having Underwriter's Laboratories approved fire extinguishers on-hand. The Contractor shall furnish these fire extinguishers.

G. Workers doing abrasive blasting operations shall wear a fresh air supplied protective helmet and hood and personal protective clothing acceptable to industry standards and all government regulations.

H. Dispose of rags used for wiping up resurfacing materials, solvents, and thinners by drenching them with water and placing in a metal container with a tight fitting metal cover. Complete this disposal process at the end of each day. Final disposal of these materials is the Contractor's responsibility.

I. Matches, smoking, flames, or sparks resulting from any source including welding, must be remote from the work area during coating work. Smoking is permitted only in designated areas of the plant.

1.8 JOB CONDITIONS

A. Environmental:

1. Air and Surface Temperatures: Prepare surfaces and apply and cure coatings within air and surface temperature range in accordance with Manufacturer's instructions.
2. Surface Temperature: Minimum of 5 degrees F (3 degrees C) above the dew point.
3. Relative Humidity: Prepare surfaces and apply and cure coatings within relative humidity range in accordance with Manufacturer's instructions.
4. Precipitation: Do not prepare surfaces or apply coatings in rain, snow, fog, or mist.
5. Wind: Do not spray coatings if wind velocity causes overspray of the coating materials.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Materials specified are those that have been evaluated for the specific service. Products of the Tnemec Company, Inc. or APPROVED EQUAL are listed to establish a standard of quality. Equivalent materials of other manufacturer's may be submitted on written approval of the Engineer. As part of the proof of equality, the Engineer will require at the cost of the Contractor, certified test reports from a nationally known, reputable and independent testing laboratory conducting comparative tests as directed by the Engineer between the product specified and the requested substitution.

B. Requests for substitution shall include manufacturer's literature for each product giving name, product number, and generic type, descriptive information, solids by volume, recommended dry film thickness and certified lab test reports showing results to equal the performance criteria of the products specified herein. In addition, a list of five projects shall be submitted in which each product has been used and rendered satisfactory service.

C. All requests for product substitution shall be made at least 10 days prior to the bid date.

D. Any material savings shall be passed to the owner in the form of a contract dollar reduction.

2.2 MATERIALS

A. Epoxy Lining System:

1. Materials specified herein are the only approved standard coating systems unless an "or equal" is approved in writing by the Engineer prior to the bid date.
2. The following list specifies the material requirements for resurfacing systems. The approved products are as follows:

a. Shotcrete: Master Builders EMACO S88 Cl, Sikacem 103 or equal:

1) Shall be a Portland Type I or Type II cement based material with no polymer additives and with the following minimum performance properties:

a) Compressive Strength ASTM C-109 Minimum 7000 psi at 7 days
b) Freeze Thaw ASTM C 666 After 300 cycles, Minimum 95% c.
c) Splitting Tensile Strength ASTM C-496 Minimum 500 psi at 7 days
d) Flexural Strength ASTM C 348 Minimum 1000 psi after 7 days
e) Direct Bond Strength ACI 503.R Minimum 290 psi after 28 days

2) Calcium-Aluminate based materials will not be approved for use on this project.

b. Lining: Tnemec Perma-Shield Series 434, or equal

1) Minimum Performance Requirements:

a) Autoclave:

Lining materials must be tested in a controlled autoclave containing 536 ppm H2S, 10% H_2SO4, 4,000 ppm NaCl @ 150°F for 28 days.

The autoclave testing must be performed by an independent laboratory.

The lining materials must exhibit the following when tested using Electrical Impedance Spectroscopy (EIS):

1) Initial EIS impedance of 10 Log Z (Z in ohms cm^2 @ 0.1 Hz)
2) Final EIS impedance greater than 9 Log Z after 28 days exposure
3) No blistering cracking, checking, or loss of adhesion after 28 days exposure to the H_2S autoclave.

b) Impact (ASTM D 2794): Requirement - No visible cracking or delamination after 56 inch-pounds direct impact

c) Chemical Resistance (ASTM C 868): Requirement - No blistering, cracking, erosion, softening, swelling, loss of adhesion or gloss after 98 day continuous immersion at 10017 and 25% Sulfuric Acid

B. Abrasive Blast Media: If dry or wet abrasive blast cleaning is the selected method of surface preparation, provide slag grit of a sieve size, gradation, and quality necessary to produce the degree of cleanliness and surface profile required herein.

PART 3 - EXECUTION

3.1 GENERAL

A. Hoisting, Scaffolding, Staging, and Planking:

1. Provide, set-up, and maintain all required hoists, scaffolds, and staging and planking, and perform all access related hoisting work required to complete the work of this section as indicated and specified.
2. 2Scaffolds shall have solid backs and floors to prevent dropping materials from there to the floors or ground below.

B. Environmental Requirements:

1. Comply with the Manufacturer's recommendations as to environmental conditions under which materials can be applied.
2. Do not apply materials when dust is in work site.
3. The Contractor shall provide all temporary lighting during the work.

C. Protection:

1. Cover or otherwise protect finish work or other surfaces not being resurfaced.
2. Erect and maintain protective tarps, enclosures and/or maskings to contain debris (such as dust or airborne particles resulting from surface preparation) generated during any and all work activities. This includes, but is not limited to, the use of dust/debris collection apparatus as required.

D. Initial Inspection of Surfaces to be Coated:

1. It is the responsibility of the Contractor to inspect and report unacceptable concrete substrate surface conditions to the Engineer prior to the commencement of surface preparation activities.
2. Unacceptable concrete surface conditions are defined as the presence of water infiltration/inflow, cracked surfaces or concrete deteriorated to a depth of greater than 1" or otherwise unable to withstand surface preparation as specified herein.

3. Verify that the pH of the cleaned concrete surfaces to be coated is within the range of to 9 to 11. Application of coating materials outside this range will not be permitted without written approval from the Engineer.
4. Unacceptable steel or ductile/cast iron surface conditions are defined as severely corroded and/or perforated metals and are unable to withstand surface preparation as specified herein.

E. Thinners and Solvents: The Contractor shall use only solvents and thinners as recommended by the Manufacturer.

3.2 SURFACE PREPARATION REQUIREMENTS

A. General:

1. All specified surface preparation shall be performed in accordance with the latest version of the SSPC, NACE, ICRI and other standards referenced in this section.
2. Allow new concrete to cure a minimum of 28 days. Verify dryness by testing for moisture with a "plastic film tape down test." (Reference ASTM D 4263). If necessary for testing horizontal surfaces, Calcium Chloride test in accordance with ASTM F 1869. If test results indicate moisture levels outside the acceptable range of the manufacturer, contact the manufacturer. Do not proceed with the coating application.
3. Prior to applying shotcrete, all existing areas that are scheduled to receive the chemical resistant lining shall be steam cleaned with minimum 210°F water with alkaline -based detergent to remove all loose materials, acid constituents, grease, oil, and other contaminants. Oil and grease shall be removed before mechanical cleaning is started.
4. Mechanically abrade all surfaces to be coated to remove laitance, curing compounds sealer and other contaminants and to produce a minimum surface profile equal to ICRI CSP 5. Reference SSPC-SP13. This preparation will be followed by vacuum cleaning to remove all dust, dirt or friable substances leaving clean, dust free surfaces for resurfacing.
5. Prior to applying shotcrete, identify and stop all active cracks from leaking using either a hydraulic cement or a chemical grout such as DeNeef Flex LV or equivalent from Avanti. The set time of the Hydraulic Cement shall be approximately 1 minute to 90 seconds per ASTM C 403. The compressive strength of the hydraulic cement shall be approximately 1000 psi after 1 hours per ASTM C 109. All products are to be applied in accordance with manufacturer's instructions.
6. For all areas one foot below the low water line and above (except new concrete surfaces), apply shotcrete to bring surfaces out to '/2" beyond original grade. The application shall result in a finish that covers all exposed aggregate and results in no surface voids, discontinuities or irregularities. Cure in accordance with manufacturer's instructions and in accordance with ACI 308.1-98.
7. For all areas one foot below the low water line and new concrete surfaces, apply a full skim coat of Tnemec Series 218 or APPROVED EQUAL to fill all voids and bugholes.
8. All shotcreted surfaces shall be abrasive blasted to remove all laitance from release agents, curing compounds sealers and other contaminants and to produce a minimum surface profile of ICRI CSP 5. This preparation will be followed by vacuum cleaning to remove all dust, dirt or friable substances leaving clean, dust free surfaces for resurfacing. The air used for blast cleaning shall be free of oil and moisture to not cause contamination of the surfaces to be resurfaced.
9. The air used for blast cleaning shall be free of oil and moisture to not cause contamination of the surfaces to be resurfaced.
10. Cleaning and resurfacing shall be scheduled so that dust and other contaminants from the cleaning process will not fall on wet, newly resurfaced areas.

B. Initial Cleaning/Decontamination:

1. All existing areas to be resurfaced shall be pressure washed with alkaline -based detergent to remove all loose materials, acid constituents, grease, oil, and other contaminants.
2. Verify that the pH of the cleaned concrete surfaces to be coated is within the range of 9 to 11. Application of coating materials outside this range will not be permitted without written approval from the Engineer.

C. Abrasive Blast Cleaning:

1. Used or spent blast abrasive shall not be reused on work covered by this section.
2. The compressed air used for blast cleaning will be filtered free of condensed water or oil. Moisture traps will be cleaned at least once every four hours or more frequently as is appropriate.
3. Oil separators shall be installed just downstream of compressor discharge valves and at the discharge of the blast pot discharges. Oil separators shall be cleaned at least once every four hours or more frequently as is appropriate.
4. A paper blotter test shall be performed by the Contractor when requester by the Engineer or the Engineer's representative to determine if the air i,, sufficiently free of oil and moisture.
5. Regulators, gauges, filters, and separators will be in good working order for all of the compressor air lines to blasting nozzles at all times during this work.
6. An air dryer or drying unit shall be installed which dries the compressed air prior to blast connections. This dryer shall be used and maintained for the duration of surface preparation work.
7. The quality, volume, and velocity of life support and ventilation air used during surface preparation shall be in accordance with applicable safety standards and as required to ensure adequate visibility and proper dissipation of volatiles without impacting the prepared surface or the health of the public or personnel working for the Contractor, Subcontractors, Engineer, Engineer's Representatives, or anyone who may be affected by on-site maintenance coating work activities.
8. The abrasive blast nozzles used shall be the venturi or other high velocity type supplied with a minimum of 100 psig air pressure and the necessary volume to obtain the required blast cleaning production rates and specified degree of cleanliness.
9. The Contractor must provide adequate ventilation for airborne particulate evacuation and lighting (meeting all pertinent safety standards) to optimize visibility for both blast cleaning and observation of the substrate during surface preparation work.
10. All phases of surface preparation work specified herein must be inspected by the Engineer before the Contractor proceeds with the subsequent phase of surface preparation.
11. If between final surface preparation work and coating application, contamination of the prepared and cleaned substrate occurs, or if the prepared steel's appearance darkens or changes color, reblasting will be required until the specified degree of cleanliness is established.

3.3 APPLICATION REQUIREMENTS

A. General:

1. Areas not to be resurfaced shall be masked using duct tape or other protection materials to prevent these surfaces from being resurfaced.
2. Ensure straight even termination of resurfacing/topcoat materials on wall edges and flush with embedded steel.
3. The Contractor must follow the minimum and maximum recoat limitation times and related temperature range restrictions between successive lifts for all products specified herein per Manufacturer's stated requirements.
4. All equipment and procedures used for resurfacing system application shall be as recommended by the Manufacturer.

5. Unless specified elsewhere herein, the Contractor shall comply with the Manufacturer's most recent written instructions with respect to the following:

   a. Mixing of All Materials.
   b. Protection and Handling of All Materials.
   c. Recoat Limitation and Cure Times.
   d. Minimum Ambient and Substrate Temperatures, Substrate's Degree of Dryness, Relative Humidity, and Dew Point of Air.
   e. Application.
   f. Final Curing.
   g. Use of Proper Application Equipment.

6. Curing of Resurfacing System: The applied resurfacing system shall be protected from damage during curing and shall be cured as recommended by the Manufacturer. Ambient conditions shall be controlled by the Contractor during curing to ensure the minimum air temperature and minimum relative humidity as required by the Manufacturer is maintained.

B. Chemical Resistant Lining:

1. General Note: The Contractor is advised that with all thick-film, quick curing materials applied to concrete surfaces, outgassing of the concrete can occur. Possible remedies include applying materials when the temperature of the concrete surfaces are descending, or applying a thin (1/8") layer of the specified surfacing material. Other remedies may exist, and may be submitted for the Engineer's approval.
2. Apply shotcrete and Tnemec Series 218 or Approved Equal After shotcreting, prepare surfaces as described in Subsection 3.2.
3. Apply Tnemec Series 434 Permashield chemical resistant mortar to all floor areas and walls scheduled to be coated at a nominal thickness of 125 mils. Application shall be either by trowel or spray. If spray-applied, material shall be finish-troweled to a hard, dense film.

C. Safety And Ventilation Requirements:

1. Requirements for safety and ventilation shall be in accordance with SSPC Paint Application Guide No. 3.

3.4 FIELD QUALITY CONTROL INSPECTION AND TESTING

A. Inspection by the Engineer or others does not limit the Contractor's responsibilities for quality control inspection and testing as specified herein or as required by the Manufacturer's instructions.

B. Perform the quality control procedures listed below in conjunction with the requirements of this Section.

1. Inspect all materials upon receipt to ensure that all are supplied by the Manufacturer.
2. Provide specified storage conditions for the resurfacing system materials, solvents, and abrasives.
3. Inspect and record findings for the degree of cleanliness of substrates using. The pH of the concrete substrate will be measured using pH indicating papers. pH testing is to be performed once every 50 sq. ft. Acceptable pH values shall be between 9.0 and 11.0 as measured by a full-range (1-12) color indicating pH paper with readable color calibrations and a scale at whole numbers (minimum). Use Hydrion Insta-Check Jumbo 0-13 or 1-12 or equal. The paper shall be touched to the surface once using moderate gloved finger pressure. The surface shall not be wiped or moved laterally to disturb the surface during pH testing.

Following the one touch, lift the paper vertically to not "wipe" the surface. Compare the color indicated with the scale provided and record the pH.

4. Inspect and record substrate profile (anchor pattern). Surfaces shall be abraded, as a minimum, equal to the roughness of 40 grit sand paper.
5. Measure and record ambient air temperature once every two hours of each shift using a thermometer and measure and record substrate temperature once every two hours using a surface thermometer.
6. Measure and record relative humidity every two hours of each shift using a sling psychrometer in accordance with ASTM E337.
7. Provide correct mixing of resurfacing materials in accordance with the Manufacturer's instructions.
8. Inspect and record that the "pot life" of resurfacing materials are not exceeded during installation.
9. Verify curing of the resurfacing materials in accordance with the Manufacturer's instructions.
10. Upon full cure, the installed lining system shall be checked by high voltage spark detection in accordance with NACE RP0188-90 to verify a pinholefree surface. Voltage shall be set at 11,000 volts. Areas which do not pass the spark detection test shall be corrected at no cost to the Owner and rechecked. High voltage spark detection shall be conducted on the chemical resistant mortar before the installation of the gel coat.
11. Upon completion of the lining system installation the lined area shall be cleaned and prepared to permit close visual inspection by the Engineer or the Engineer's Representative. Any and all deficiencies or defective work (not in compliance with this section or related sections) will be marked for repair or removal/replacement by the Contractor at no additional cost to the Owner.

3.5 ACCEPTANCE CRITERIA

A. Acceptance Criteria for Surface Preparation Work: All surfaces shall be prepared in accordance with the specification and referenced standards therein.

B. Acceptance Criteria for Coating System Application Work

1. Acceptable coating work will be based upon the following:

   a. No pock-marks, trowel marks, depressions, unconsolidated areas waviness or ridges, pinholes or holidays in either size or frequency.
   b. No intercoat bond failures between lifts.
   c. Proper curing of coatings.

2. Resurfaced areas shall pitch to drains.
3. There shall be no areas that puddle when flood tested.
4. The Engineer or Engineer's Representative shall, at their discretion, inspect the following:

   a. Profile and degree of cleanliness of substrate.
   b. Thickness of materials/coverage rate confirmation.
   c. Ambient temperature and humidity requirements and substrate temperature.
   d. Curing and recoat times.
   e. Proper curing of the resurfacing materials.

5. Rework required on any holidays or any other inadequacies found by the Engineer or the Engineer's representative in the quality of the coating work shall be marked. Such areas shall be recleaned and reworked by the Contractor according to these specifications and the manufacturer's recommendations at no additional cost to the Owner.

6. The Contractor is responsible for keeping the Engineer informed of all progress so that inspection for quality can be achieved.
7. The Contractor is ultimately responsible for the quality performance of the applied materials and workmanship. Inspections by the Engineer or the Engineer's Representative do not limit this responsibility.

3.6 FINAL INSPECTION

A. Perform a final inspection to determine whether the resurfacing system work meets the requirements of the specifications. The Engineer and the Engineer's Representative will conduct final inspection with the Contractor.

3.7 CLEANUP

A. Upon completion of work, the Contractor shall remove surplus materials, equipment, protective coverings, and accumulated rubbish, and thoroughly clean all surfaces and repair any work-related damage. The surrounding surface areas including roadways and all other surfaces shall be restored to their pre-project condition.

END OF SECTION 03 31 30

SECTION 03 40 00 PRECAST CONCRETE STRUCTURES

PART 1 - GENERAL

1.01 DESCRIPTION

A. The Work of this section includes, but is not limited to:

1. Pump Station Wet Well
2. Air/Vacuum Release Vaults

B. Related Work Specified Elsewhere:

1. Section 40 23 19 - Pipe and Pipe Fittings
2. MDOT specifications for excavation and backfill

1.02 QUALITY ASSURANCE

A. Design Criteria:

1. Design for AASHTO HS20 live loading and surcharge.
2. Design for lateral earth pressure due to saturated earth backfill.
3. Installation conditions and manufacturing shall conform to ASTM C913.
4. Minimum 28-day Compressive Strength: 5,000 psi
5. Honeycombed or retempered concrete will not be acceptable.

B. Reference Standards:

1. American Society for Testing and Materials (ASTM):

a.	A185	Specification for Welded Steel Wire Fabric for Concrete Reinforcement
b.	A615	Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
c.	C33	Specifications for Concrete Aggregate
d.	C150	Specification for Portland Cement
e.	C260	Specification for Air-Entraining Admixtures for Concrete
f.	C858	Underground Precast Concrete Utility Structures
g.	C890	Standard Practice for Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures.
h.	C891	Practice for Installation of Underground Precast Concrete Utility Structures
i.	C913	Specifications for Precast Concrete Water and Wastewater Structures.
j.	C990	Specifications for Joints for concrete Pipe, Manholes, and Precast box Sections Using Preformed Flexible Joints Sealants

C. The precast concrete structures shall have sufficient weight to counteract the buoyancy uplift from ground water that is at a level equal to the top of the structures with a factor of safety of 1.5. Provide calculations demonstrating this requirement is being met. The Contractor shall add additional weight as needed by installing a cast-in-place anchoring collar that is structurally anchored to the precast structure via screwed in dowel rods.

1.03 SUBMITTALS

A. Design Drawings and Product Data:

1. Submit detailed shop drawings or design drawings to the Project Engineer for review prior to fabrication.

2. Include details of reinforcing steel, joint design, concrete mix design, and loading calculations.

B. Submit certification from the precast structures manufacturer attesting that the structures meet or exceed Contract Specifications.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Transport and handle precast concrete units with equipment designed to protect the units from damage.

B. Do not place units in position which will cause overstress, warp or twist.

C. Separate stacked members with battens across the full width of each bearing point.

D. Stack so that lifting devices are accessible and undamaged, and identification marks are discernible.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Portland Cement: ASTM C150, Type II

B. Coarse Aggregates: ASTM C33; Graded 1" to No. 4 Sieve.

C. Sand: ASTM C33; 2.35 fineness modulus

D. Water: Potable; clean and free of injurious amounts of acids, alkalis, salts, organic materials, or other substances that may be incompatible with concrete or steel.

E. Air-Entraining Admixtures: ASTM C260

F. Reinforcing Steel:

1. Deformed Bars: ASTM A615, Grade 40
2. Welded Wire Fabric: ASTM A185

G. Joint Sealant:

1. Provide preformed flexible plastic gasket, conforming to ASTM C990; RAM-NEK RN 103.

2.02 MIXES

A. Design concrete mix to produce the required concrete strength, air-entrainment, watertight properties, and loading requirements.

2.03 FABRICATION AND MANUFACTURE

A. Fabricate precast reinforced concrete structures in accordance with ASTM C913, to the dimensions indicated on the Contract Drawings, and to the specified design criteria.

B. Provide keyed joints with gasket sealant.

C. Provided dowels or threaded inserts to receive dowels for cast-in-place concrete where indicated on drawings.

2.04 VERTICAL LADDERS

A. Ladders shall conform to OSHA/ANSI A14.3 standards for fixed wall ladders. Manufacturers shall provide a certification of compliance.

B. Ladders, unless otherwise shown on Drawings, shall be 16" clear between stringers with maximum rung spacing of 12".

C. Mounting brackets shall be bent plates not less than 2-1/2" x 3/8" of dimensions to allow a 7" clearance from wall; brackets shall be spaced not more than 6' centers.

D. Aluminum Ladder:

1. Provide 1-1/8" round, serrated rungs, secured to stringer.
2. All ladder components alloy 6061-T6.
3. Standard mill finish.
4. All anchor bolts for aluminum ladders shall be stainless steel, Type 304.
5. Ladders shall comply with OSHA Standards.

E. Design Load: Design ladder rungs to support a concentrated center load of 1000 pounds.

F. Provide safety rail and provisions as detailed on Drawings.

2.05 ACCESS HATCHES

A. Manufacturer

1. The BILCO Company, P.O. Box 1203, New Haven, CT 06505; 1-203-934-6363, Fax: 1-203-933-8478, Web: www. bilco.com, or equal.

B. Access Door

1. Furnish and install where indicated on plans vault access door. The vault access door shall be single or double leaf. The vault access door shall be pre-assembled from the manufacturer.
2. Performance characteristics:

a. Covers: Shall be reinforced to support a minimum live load of 300 psf (1464 kg/m^2) with a maximum deflection of 1/150th of the span.
b. Operation of the cover shall be smooth and easy with controlled operation throughout the entire arc of opening and closing.
c. Operation of the cover shall not be affected by temperature.
d. Entire door, including all hardware components, shall be highly corrosion resistant.
e. Covers: Shall be 1/4” (6.3 mm) aluminum diamond pattern.
f. Frame: Channel frame shall be 1/4” (6.3mm) extruded aluminum with bend down anchor tabs around the perimeter. A continuous EPDM gasket shall be mechanically attached to the aluminum frame to create a barrier around the entire perimeter of the cover and significantly reduce the amount of dirt and debris that may enter the channel frame.
g. Hinges: Shall be specifically designed for horizontal installation and shall be through bolted to the cover with tamperproof Type 316 stainless steel lock bolts and shall be through bolted to the frame with Type 316 stainless steel bolts and locknuts.

h. Drain Coupling: Provide a 1-1/2" (38mm) drain coupling located in the right front corner of the channel frame.

i. Lifting Mechanisms: Manufacturer shall provide the required number and size of compression spring operators enclosed in telescopic tubes to provide, smooth, easy, and controlled cover operation throughout the entire arc of opening and to act as a check in retarding downward motion of the cover when closing. The upper tube shall be the outer tube to prevent accumulation of moisture, grit, and debris inside the lower tube assembly. The lower tube shall interlock with a flanged support shoe fastened to a formed 1/4" gusset support plate.

j. A removable exterior turn/lift handle with a spring loaded ball detent shall be provided to open the cover and the latch release shall be protected by a flush, gasketed, removable screw plug.

k. Hardware:

1) Hinges: Heavy forged aluminum hinges, each having a minimum 1/4" (6.3 mm) diameter Type 316 stainless steel pin, shall be provided and shall pivot so the cover does not protrude into the channel frame.

2) Covers shall be fitted with the required number and size of compression spring operators. Springs shall have an electrocoated acrylic finish. Spring tubes shall be constructed of a reinforced nylon 6/6-based engineered composite material.

3) A Type 316 stainless steel snap lock with fixed handle shall be mounted on the underside of the cover.

4) Hardware: Shall be anticorrosion throughout. (Type 316 stainless steel.)

l. Finishes: Factory finish shall be mill finish aluminum with bituminous coating applied to the exterior of the frame.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Unless otherwise specified herein below, the precast units shall be installed in accordance with ASTM C891.

B. Install precast concrete units to the elevation and location indicated on the Contract Drawings.

C. Install required pipe connections, valves, baffles and other appurtenances as indicated on the Contract Drawings.

3.02 BACKFILLING STRUCTURES

A. Do not backfill precast concrete structures until after examination and approval of the Project Engineer.

B. Backfill structures in accordance with MDOT.

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.

1.05 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.

1.06 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

2.01 SEE SPECIFIC SECTIONS FOR PRODUCTS

PART 3 - EXECUTION

3.01 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

1.01 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.

1.02 RELATED SECTIONS

A. Section 26 05 00 - General Electrical Requirements

1.03 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.

1.04 SUBMITTALS

A. Product Data: For each type of product indicated in this Section.

1.05 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

2.01 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.

2.02 CONDUCTORS AND CABLES

A. Manufacturers:

1. American Insulated Wire Corp.; a Leviton Company.
2. Carol Cable Co., Inc.
3. Southwire Company.
4. Lapp Group
5. Okonite

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.

2.03 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

C. Compression Connectors:

1. Burndy
2. Thomas & Betts

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.

2.04 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

3.01 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. Feeders and Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and in Underground Ductbanks: Type XHHW or XHHW-2, single conductors in raceway.

C. Exposed and Concealed Branch Circuits Located within the Building: Type THHN-THWN, single conductors in raceway.

D. Class 1 Control Circuits: Type THHN-THWN, in raceway.

E. 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.

F. Cord Drops and Portable Appliance Connections: Type SO, hard service cord.

3.02 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 in accordance with the provisions of Division 26 Section 26 05 29 and 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.

K. Color-code conductors and cables in accordance with Article 3.04 this Section.

L. The voltage drop at the end of any circuit shall not exceed 3% of the normal line voltage under full load.

M. Balance circuits across the phase wires of the branch and distribution panels.

N. Conductors shall be continuous from outlet to outlet; splice only within outlet or junction boxes.

3.03 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 manufacturers 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 #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.

3.04 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.
5. Feeder Circuit Conductors: Uniquely color code each phase with the appropriate color coded tape at both ends and visible points including junction boxes.
6. 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.

7. 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.

3.04 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 29 – Hanger and Supports for Electrical Systems

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Conduit and equipment supports.

B. Anchors and fasteners.

1.02 RELATED SECTIONS

A. Section 26 05 00 - General Electrical Requirements

1.03 REFERENCES

A. NECA Standard of Installation (National Electrical Contractors Association).

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

1.04 SUBMITTALS FOR REVIEW

A. Product Data: Provide manufacturer's catalog data for each type of product used.

1.05 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 PRODUCT REQUIREMENTS

A. Materials and Finishes: Corrosion resistant stainless steel.

B. Select materials, sizes, and types of anchors, fasteners and supports to carry the loads of equipment and conduit, including weight of wire in conduit.

C. Anchors and Fasteners:

1. Concrete Structural Elements: Use 316 stainless steel expansion anchors.
2. Steel Structural Elements: Use cast beam clamps with stainless steel bolts.
3. Concrete Surfaces: Use 316 stainless steel expansion anchors.
4. Hollow Masonry, Plaster, and Gypsum Board Partitions: Use toggle bolts.
5. Solid Masonry Walls: Use stainless steel expansion anchors.
6. Sheet Metal: Use sheet metal screws.

2.02 FORMED GALVANIZED STEEL CHANNEL

A. Manufacturers:

1. Unistrut
2. Kindorf
3. Beeline

2.03 FORMED NON-METALLIC SUPPORT CHANNEL

A. Manufacturers:

1. Unistrut
2. Cope
3. MMFG

PART 3 - EXECUTION

3.01 INSTALLATION

A. Locate and install anchors, fasteners, and supports in accordance with NECA "Standard of Installation".

1. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.
2. Do not use spring steel clips and clamps.
3. Do not use powder-actuated anchors.
4. Do not drill or cut structural members.

B. Fabricate supports from structural steel or formed steel members. Rigidly weld members or use hexagon-head bolts to present neat appearance with adequate strength and rigidity. Use spring lock washers under all nuts.

C. Install surface-mounted cabinets and panelboards with minimum of four anchors.

D. In wet and damp area locations use non-metallic channel supports to stand cabinets and panelboards 1 inch off wall.

E. Use sheet metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.

END OF SECTION

SECTION 26 05 53 IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Nameplates and labels.

B. Wire and cable markers.

C. Conduit markers.

1.02 RELATED SECTIONS

A. Section 26 05 00 - General Requirements - Electrical

1.03 REFERENCES

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

1.04 SUBMITTALS FOR REVIEW

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

1.05 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.

B. Conform to requirements of OSHA.

PART 2 - PRODUCTS

2.01 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.

2.02 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 con troller's address shall be included in the wire identification tag.

2.03 WIRING COLOR CODE

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

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

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.

2.04 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.

2.05 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

3.01 PREPARATION

A. Degrease and clean surfaces to receive nameplates and labels.

3.02 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 #2/0 AWG copper cable of the same type as the grounding ring.

2.05 GROUNDING JUMPERS

A. Manufacturers:

1. OZ Gedney
2. ILSCO
3. NSI

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 ± 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 ± 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 28 13 - FUSES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Cartridge fuses, rated 600 V and less.

1.02 DEFINITIONS

A. Interrupting Rating (Short-Circuit Current Rating): The highest current at rated voltage that a fuse shall safely interrupt and clear short circuits under standard test conditions. This rating is much greater than the ampere rating of a fuse.

B. Current Limiting: The highest current at rated voltage that a fuse shall safely interrupt and clear short circuits in less than ½ cycle. Fuse shall substantially limit the instantaneous peak let-through current.

C. Fuse Types:

1. Fast Acting: A fuse that opens on overload and short circuits very quickly. This fuse is not designed to withstand temporary overload currents.

2. Dual Element, Time Delay: A fuse that utilizes two (2) individual elements in series inside the fuse tube. One element opens on overloads up to 5-6 times the fuse current rating and the other element opens on short circuits up to their interrupting rating.

1.03 SUBMITTALS

A. Product Data: Include the following for each fuse type indicated:

1. Dimensions and manufacturer's technical data on features, performance, electrical characteristics, and ratings.

2. Let-through current curves for fuses with current-limiting characteristics.

3. Time-current curves, coordination charts and tables, and related data.

4. Fuse size for elevator feeders and elevator disconnect switches.

1.04 QUALITY ASSURANCE

A. Source Limitations: Provide fuses from a single manufacturer.

B. Comply with NFPA 70.

C. Comply with NEMA FU 1 for fuses.

1.05 PROJECT CONDITIONS

A. Where ambient temperature to which fuses are directly exposed is less than 40 deg F (4.4 deg C) or more than 100 deg F (38 deg C), apply manufacturer's ambient temperature adjustment factors to fuse ratings.

1.06 COORDINATION

A. Coordinate fuse ratings with utilization equipment nameplate limitations of maximum fuse size.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. 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:

1. Cooper Bussman, Inc.

2. Ferraz Shawmut, Inc.

3. Tracor, Inc.; Littelfuse, Inc. Subsidiary

2.02 CARTRIDGE FUSES

A. Characteristics: NEMA FU 1, nonrenewable cartridge fuse; class and current rating as indicated; voltage rating consistent with circuit voltage.

B. Interrupting Rating: 200,000 AIC minimum.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine utilization equipment nameplates and installation instructions. Install fuses of sizes and with characteristics appropriate for each piece of equipment.

B. Evaluate ambient temperatures to determine if fuse rating adjustment factors must be applied to fuse ratings.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 APPLICATIONS

A. Main Service: Class RK1, dual element/time delay or Class L, time delay. Use Class RK1 similar Bussmann #LPS-RK_SP series for 1A to 600A applications and Class L similar to Bussmann #KRP-C_SC series for 601A to 6,000A applications. Class J, dual element/time delay fuses similar to Bussmann #LPJ_SP series may be used in lieu of Class RK1 where the fuses are intended to be installed in new distribution equipment designed for the physical dimensions of the Class J fuse.

B. Main Feeders: Class RK1, dual element/time delay or Class L, time delay. Use Class RK1 similar Bussmann #LPS-RK_SP series for 1A to 600A applications and Class L similar to Bussmann #KRP-C_SC series for 601A to 6,000A applications. Class J, dual element/time delay fuses similar to Bussmann #LPJ_SP series may be used in lieu of Class RK1 where the fuses are intended to be installed in new distribution equipment designed for the physical dimensions of the Class J fuse.

C. Branch Circuits:

1. High Inrush Currents (i.e. Motors, Welders, Transformers, Capacitor Banks): Class RK1, dual element/time delay or Class L, time delay. Use Class RK1 similar Bussmann #LPS-RK_SP series for 1A to 600A applications and Class L similar to Bussmann #KRP-C_SC series for 601A to 6,000A applications. Class RK5, dual element/time delay fuses similar Bussmann #FRS-R series may be used in lieu of Class RK1 and Bussman # KLU series for 601A to 4,000A applications may be used in lieu of the above specified Class L fuse series only where circuit breaker protection is provided immediately upstream of the fuse before and/or at the first circuit tap.

2. No Inrush Currents (Non-Motor Loads): Class RK1, dual element/time delay or Class L, time delay. Use Class RK1 similar Bussmann #LPS-RK_SP series for 1A to 600A applications and Class L similar to Bussmann #KRP-C_SC series for 601A to 6,000A applications. Fast acting fuses similar Bussmann #KTS-R series may be used in lieu of the above specified Class RK1 fuse series and fast acting fuses similar to Bussman # KTU may be used in lieu of the above specified Class L fuse series only where circuit breaker protection is provided immediately upstream of the fuse before and/or at the first circuit tap.

3.03 INSTALLATION

A. Install fuses in fusible devices as indicated. Arrange fuses so fuse ratings are readable without removing fuse.

B. Install spare fuse cabinet where indicated. If not shown on plans, locate in the Electrical Room as directed by the Architect.

3.04 IDENTIFICATION

A. Install typewritten labels on the inside door of each fused switch to indicate fuse replacement information.

END OF SECTION

SECTION 26 28 16 ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Individually mounted switches and circuit breakers used for the following:

1. Fusible and nonfusible switches.

2. Molded-case circuit breakers (MCCBs).

3. Enclosures.

B. Related Sections

1. Division 26 Section “Fuses” for fuses in fusible disconnect switches.

2. Division 26 Section “Identification for Electrical Systems” for identification of enclosed switches and circuit breakers.

1.02 DEFINITIONS

A. NC: Normally closed.

B. NO: Normally open.

C. SPDT: Single pole, double throw.

1.03 SUBMITTALS

A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes:

1. Enclosure types and details for types other than NEMA 250, Type 1.

2. Current and voltage ratings.

3. Short-circuit current ratings (interrupting and withstand, as appropriate).

4. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices, accessories, and auxiliary components.

B. Shop Drawings: For enclosed switches and circuit breakers. Include plans, elevations, sections, details, and attachments to other work.

1. Wiring Diagrams: For power, signal, and control wiring.

C. Maintenance data for tripping devices to include in the operation and maintenance manual specified in Division 01.

1.04 QUALITY ASSURANCE

A. Source Limitations: Obtain disconnect switches and circuit breakers from one (1) source and by a single manufacturer.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Comply with NFPA 70.

1.05 COORDINATION

A. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. 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:

1. Cutler-Hammer; Unit of Eaton Corporation

2. Siemens Energy & Automation, Inc.

3. Square D; Unit of Schneider Electric

2.02 DISCONNECT SWITCHES

A. Enclosed, Non-fusible Switch: NEMA KS 1, Type HD, with lockable handle.

B. Enclosed, Fusible Switch, 800 A and Smaller: NEMA KS 1, Type HD, clips to accommodate specified fuses, enclosure consistent with environment where located, handle lockable with 2 padlocks, and interlocked with cover in CLOSED position.

2.03 MOLDED-CASE CIRCUIT BREAKERS

A. General Requirements: Comply with UL 489, NEMA AB 1, and NEMA AB 3, with interrupting capacity to comply with available fault currents and lockable handle.

B. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.

C. Characteristics: Frame size, trip rating, number of poles, and auxiliary devices as indicated and interrupting rating to meet available fault current.

D. Circuit Breakers, 200 A and Larger: Trip units interchangeable within frame size.

E. Circuit Breakers, 400 A and Larger: Field-adjustable, short-time and continuous-current settings.

F. Features and Accessories

1. Lugs: Mechanical type, suitable for number, size, trip ratings, and conductor material.

2. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge lighting circuits; Type HACR for heating, air-conditioning, and refrigerating equipment.

3. Shunt Trip: Trip coil energized from separate circuit, with coil-clearing contact.

2.04 ENCLOSURES

A. Enclosed Switches and Circuit Breakers: NEMA AB 1 (Circuit Breakers), NEMA KS 1 (Disconnect Switches), NEMA 250, and UL 50, to comply with environmental conditions at installed location.

1. Outdoor Locations: Type 3R.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install disconnect switches and circuit breakers in locations as indicated, according to manufacturer's written instructions. Comply with NECA 1.

B. Mounting: Centerline of handle 60 inches above finished floor. If switch / breaker is over 66" in height, mount bottom leading edge of enclosed disconnect 6" above finished floor

1. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.

2. Install disconnect switches and circuit breakers level and plumb.

C. Install wiring between disconnect switches, circuit breakers, control, and indication devices.

D. Install fuses in fusible devices.

E. Do not make splices within the switch / breaker enclosure. All splices and taps shall occur outside the switch / breaker in approved enclosures.

F. To comply with the listing of the circuit breaker, do not terminate more than one (1) branch circuit conductor under each lug.

3.03 IDENTIFICATION

A. Identify each disconnect switch and circuit breaker according to requirements specified in Division 26 Section "Electrical Identification."

B. Enclosure Nameplates: Label each enclosure with an engraved laminated-plastic mounted with corrosion-resistant screws.

3.04 FIELD QUALITY

A. Testing: After installing disconnect switches and circuit breakers and after electrical circuitry has been energized, demonstrate product capability and compliance with requirements.

1. Procedures: Perform each visual and mechanical inspection and electrical test stated in NETA ATS, Section 7.5 for disconnect switches and Section 7.6 for molded-case circuit breakers. Certify compliance with test parameters.

B. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, remove and replace with new units and retest.

3.05 CLEANING

A. After completing system installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finish including chips, scratches, and abrasions.

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, 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.

1.02 RELATED SECTIONS

A. Division 26 – all specifications sections

1.03 REFERENCES

A. ANSI/NFPA 70 - National Electrical Code.

1.04 SYSTEM DESCRIPTION

A. Power Utility Company: Entergy.

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 NFPA 70E 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 NFPA 70E 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 Entergy. The primary representative contact for this project is Thomas McGee, TELEPHONE 662 – 280 –6972, Email tmcgee@entergy.com.

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 00 - General Requirements

B. Section 26 17 00 - Grounding and Bonding.

C. Section 26 19 50 - Electrical Identification.

D. Section 26 90 00 - Electrical Testing.

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 1Federal Specification W-P-115C - Type II Class 1Federal 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))

1. NQ - (240/120 volt) as noted on the Drawings.

B. Equipment as supplied by Cutler-Hammer or Siemens and providing all equivalent features and

performances will be considered for review subject to all requirements for substitutions. ALL product data submittals shall identify full and specific compliance with all requirements.

2.02 LIGHTING AND APPLIANCE PANELBOARD TYPE

A. Type NQ

1. Interior

a. NQ 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. 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 3R 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.

C. 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.

D. 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 mounting within the panel.
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. The TVSS unit shall meet or exceed the following criteria:

   a. Maximum single impulse current rating shall be 40 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
120/240 V	230 V	230V	230 V

5. Designed to withstand a maximum continuous operating voltage (MCOV) of not less than 115% of nominal RMS voltage.
6. 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.
7. 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.
8. 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

PART 3 - EXECUTION

3.01 PANELBOARD

A. Install as indicated on the drawings and panelboard schedule and according to manufacturer's recommendations.

B. Neutral and ground shall not be bonded together at the panelboard locations.

3.02 OTHER LOCATIONS

A. 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.

END OF SECTION

SECTION 26 56 00 SITE LIGHTING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Exterior lighting units with luminaires, lamps, ballasts, poles/support structures, and accessories.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 26 Section “Lighting Control Devices” photoelectric switches.

1.02 DEFINITIONS

A. Ballast Factor (BF): Ratio of light output of a given lamp(s) operated by the subject ballast to the light output of the same lamp(s) when operated on an ANSI reference circuit.

B. Color Rendering Index (CRI): An international numbering system from 0-100 which indicates the relative color rendering quality of a light source when compared to a standard reference source of the same correlated color temperature.

C. Emergency Lighting Unit: A fixture with integral emergency battery-powered supply and the means for controlling and charging the battery. It is also known as an emergency light set.

D. Fixture: A complete lighting unit, exit sign, or emergency lighting unit. Fixtures include lamps and parts required to distribute light, position and protect lamps, and connect lamps to power supply. Internal battery-powered exit signs and emergency lighting units also include a battery and the means for controlling and recharging the battery. Emergency lighting units include ones with and without integral lamp heads.

E. Lighting Unit: A fixture, or an assembly of fixtures with a common support, including a bracket plus mounting and support accessories.

F. Luminaire: See Fixture.

1.03 SUBMITTALS

A. General: Submit all product data and/or shop drawings bound in a single, soft-cover binder. Incomplete submittals, i.e., missing fixtures, lamps, ballasts, Contractor’s stamp, etc. will be returned to the sender without any action being taken. The lighting fixture submittal shall comply with following:

1. Complete schedule of ALL equipment and materials that are to be furnished for the Work.

2. Typewritten cover page that includes the Contractor's and Supplier’s name, addresses, and telephone numbers, and the name of the Project.

3. Organized and physically divided into sections for each group of items, i.e., separate sections for the fixtures, lamps, ballasts, etc.

4. Clearly identify each item by high-light marker or arrow to define that specific component, all associated characteristics, and all hardware.

B. Product Data: For each type of lighting fixture scheduled, arranged in order of fixture designation. Include data on features, accessories, finishes, and the following:

1. Dimensions of fixtures.

2. Certified results of laboratory tests for fixtures and lamps for photometric performance.

3. Ballasts.

4. Types of lamps.

5. Photometric data.

C. Shop Drawings: Anchor-bolt templates keyed to specific poles and certified by manufacturer.

D. Wind Resistance Calculations: Certified by a registered Professional Engineer.

E. Maintenance Data: For lighting fixtures to include in maintenance manuals specified in Division 01.

1.04 QUALITY ASSURANCE

A. Luminaires and Accessories: Listed and labeled as defined in NFPA 70, Article 100, for their indicated use, location, and installation conditions by a testing agency acceptable to authorities having jurisdiction.

B. Comply with NFPA 70.

C. Comply with ANSI C2.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store poles on decay-resistant treated skids at least 12 inches above grade and vegetation. Support poles to prevent distortion and arrange to provide free air circulation.

B. Retain factory-applied pole wrappings on metal poles until just before pole installation. For poles with nonmetallic finishes, handle with web fabric straps

1.06 COORDINATION

A. Fixtures and Bases: Coordinate layout with installation of site utilities other construction.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. 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:

1. Light Fixtures: See light fixture schedule at end of section.

2. Lamps

a. General Electric Lighting Company

b. Philips Lighting Company

c. Osram Sylvania, Inc.

3. Ballasts

a. Advance

b. Magnetek

c. Osram Sylvania, Inc.

2.02 LUMINAIRES

A. Comply with IESNA RP-8 for parameters of lateral light distribution patterns indicated for luminaires.

B. Metal Parts: Free from burrs, sharp corners, and edges.

C. Sheet Metal Components: Corrosion-resistant aluminum, unless otherwise indicated. Form and support to prevent warping and sagging.

D. Housings: Rigidly formed, weather- and light-tight enclosures that will not warp, sag, or deform in use. Provide filter/breather for enclosed luminaires.

E. Doors, Frames, and Other Internal Access: Smooth operating, free from light leakage under operating conditions, and arranged to permit re-lamping without use of tools. Arrange doors, frames, lenses, diffusers, and other pieces to prevent accidental falling during re-lamping and when secured in operating position. Provide for door removal for cleaning or replacing lens. Arrange to disconnect ballast when door opens.

F. Exposed Hardware Material: Stainless steel.

G. Plastic Parts: High resistance to yellowing and other changes due to aging, exposure to heat, and ultraviolet radiation.

H. Reflecting Surfaces: Minimum reflectance as follows, unless otherwise indicated:

1. White Surfaces: 85 percent.

2. Specular Surfaces: 83 percent.

3. Diffusing Specular Surfaces: 75 percent.

I. Lenses and Refractors: Materials as indicated. Use heat- and aging-resistant, resilient gaskets to seal and cushion lens and refractor in luminaire doors.

2.03 LUMINAIRE SUPPORT COMPONENTS

A. Description: Comply with AASHTO LTS-3 for pole or other support structures, brackets, arms, appurtenances, base, and anchorage and foundation.

B. Wind-Load Strength of Total Support Assembly: Adequate to carry support assembly plus luminaires at indicated heights above grade without failure, permanent deflection, or whipping in steady winds of 100 mph (160 km/h) with a gust factor of 1.3. Support assembly includes pole or other support structures, brackets, arms, appurtenances, base, and anchorage and foundation.

1. Strength Analysis: For each pole type and luminaire combination, multiply the actual equivalent projected area of luminaires and brackets by a factor of 1.1 to obtain the equivalent projected area to be used in pole selection strength analysis.

C. Finish: Match finish of pole/support structure for arm, bracket, and tenon mount materials.

D. Mountings, Fasteners, and Appurtenances: Corrosion-resistant items compatible with support components.

1. Materials: Will not cause galvanic action at contact points.

2. Mountings: Correctly position luminaire to provide indicated light distribution.

3. Anchor Bolts, Nuts, and Washers: Hot-dip galvanized after fabrication unless stainless-steel items are indicated.

4. Anchor-Bolt Template: Plywood or steel.

E. Pole/Support Structure Bases: Anchor type with hold-down or anchor bolts, leveling nuts, and bolt covers.

F. Steel Poles: Tubing complying with ASTM A 500, Grade B, carbon steel with a minimum yield of 46,000 psig (317 MPa); one-piece construction up to 40 feet in length with access handhole in pole wall.

1. Grounding Provisions for Metal Pole/Support Structure: Welded 1/2-inch threaded lug, accessible through handhole and listed for copper conductor connection.

2. Shafts: Round, straight.

G. Metal Pole Brackets: Match pole metal. Provide cantilever brackets without underbrace, in sizes and styles indicated, with straight tubular end section to accommodate luminaire.

H. Pole-Top Tenons: Fabricated to support luminaire or luminaires and brackets indicated, and securely fastened to pole top.

I. Concrete for Pole Foundations: Comply with Division 03 Section "Cast-in-Place Concrete" and Division 26 “General Requirements.”

1. Design Strength: 3000-psig, 28-day compressive strength.

2.04 BALLASTS FOR LAMPS

A. Fluorescent: Unless otherwise indicated, features include the following:

1. Electronic: Designed for type and quantity of lamps indicated at full light output.

2. Total Harmonic Distortion Rating: Less than 20 percent.

3. Sound Rating: A.

4. Linear Lamps

a. Certified Ballast Manufacturer (CBM) Certification: Indicated by label.

b. Encapsulation: Without voids in potting compound.

c. Parallel Lamp Circuits: Multiple lamp ballasts connected to maintain full light output on surviving lamps if one or more lamps fail.

5. Compact Lamps:

a. Type: Electronic fully encapsulated in potting compound.

b. Power Factor: 90 percent, minimum.

c. Operating Frequency: 20 kHz or higher.

d. Flicker: Less than 5 percent.

e. Lamp Current Crest Factor: Less than 1.7.

f. Transient Protection: Comply with IEEE C62.41 for Category A1 locations.

6. Ballasts for Low-Temperature Environments: As follows:

a. Temperatures 0 Deg F Above: Electronic or electromagnetic type rated for 0 deg F starting temperature.

b. Temperatures Minus 20 Deg F and Above: Electromagnetic type designed for use with high-output lamps.

B. High Intensity Discharge (HID): Comply with ANSI C82.4. Unless otherwise indicated, features include the following:

1. Type: Constant wattage autotransformer (CWA) or regulating high-power-factor type, unless otherwise indicated.

2. Operating Voltage: Match system voltage.

3. Minimum Starting Temperature: Minus 22 deg F for single lamp ballasts.

4. Normal Ambient Operating Temperature: 104 deg F.

5. Open-circuit operation that will not reduce average life.

6. High-Pressure Sodium (HPS): Equip with a solid-state igniter/starter having a case temperature not in excess of 90 deg C.

7. Metal Halide (MH): Equip with a pulse start solid-state igniter/starter having a maximum current crest factor of 1.6 having a case temperature not in excess of 90 deg C.

2.05 LAMPS

A. General

1. All lamps shall be furnished and installed by this Contractor. Verify proper lamp type with fixture manufacturer before providing same. Contractor shall provide the Owner with two (2) of any special tools required for relamping lighting fixtures. They shall be new and shall be turned over to the Owner when the Project is completed.

2. Comply with ANSI C78 series that is applicable to each type of lamp.

B. Fluorescent: Lamps shall be low-mercury type and shall comply with Federal Toxic Characteristic Leaching Procedure (TCLP) test, and yield less than 0.2 mg of mercury per liter, when tested according to NEMA LL 1.

1. Compact Lamps: 2 or 4-pin lamps with or without electronic ballast as required. 10,000 hours rated average life with a minimum 82 CRI unless noted otherwise.

2. Linear Lamps

   a. T5 (High Performance): Mini bipin base, 3500K, 20,000 hours rated average (extended performance) life with a minimum 82 CRI unless noted otherwise.

   b. T8: Medium bipin base, 3500K, 24,000 hours rated average (extended performance) life with a minimum 85 CRI unless noted otherwise.

C. High Intensity Discharge (HID)

1. Metal Halide (MH): Metal Halide (MH) Lamps shall be clear and shall be Pulse Start with high output and reduced color shift at the end of their rated life for MH lamps less than 1050 watts. Lamps less than 250 watts shall be suitable for use in open or enclosed fixtures.

   a. Metal-Halide Color Temperature and Minimum Color-Rendering Index: 3600 K and 70 CRI, unless otherwise indicated.

2. High Pressure Sodium (HPS): High Pressure Sodium (HPS) Lamps shall be clear and shall be used for enclosed fixtures only. Lamps shall comply with Federal Toxic Characteristic Leaching Procedure (TCLP) test having lead-free, welded bases, and containing significantly less mercury than standard HPS lamps, and shall not cycle at the end of their rated life for HPS lamps less than 450 watts.

2.06 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Steel: Grind welds and polish surfaces to a smooth, even finish.

1. Galvanized Finish: Hot-dip galvanize after fabrication to comply with ASTM A 123.

2. Surface Preparation: Clean surfaces to comply with SSPC-SP 1, "Solvent Cleaning," to remove dirt, oil, grease, and other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning," or SSPC-SP 8, "Pickling."

3. Interior: Apply one coat of bituminous paint on interior of pole, or otherwise treat to prevent corrosion.

4. Polyurethane Enamel: Manufacturer's standard finish consisting of one or more coats of primer and two finish coats of high-gloss, high-build polyurethane enamel.

5. Colors as indicated in Light Fixture Schedule.

2.07 LIGHTING FIXTURE SCHEDULE

A. The manufacturer's fixture catalog numbers specified in the Light Fixture Schedule as indicated at end of section, describing the various types of fixtures; do not include all the required accessories or hardware that may be required for a complete installation.

B. The Contractor shall furnish and install a complete complement of Luminaires, as required, and all associated appurtenances including, but not necessarily limited to, all lamps, ballasts, reflec-

tors, canopies, brackets etc., completely wired, assembled, installed and tested as specified and in the manner indicated.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Concrete Foundations: Construct according to Division 03 Section "Cast-in-Place Concrete" and Division 26 “General Requirements.”

1. Comply with details for reinforcement and for anchor bolts, nuts, and washers. Verify anchor-bolt templates by comparing with actual pole bases furnished.

2. Finish for Parts Exposed to View: Trowel and rub smooth. Comply with Division 03 Section "Cast-in-Place Concrete" for exposed finish.

B. Embedded Poles: Provide only where approved by the Owner and structurally suitable for soil conditions. Set poles to depth as certified by a Professional Engineer, but not less than one-sixth of pole length below finish grade. Dig holes large enough to permit use of tampers the full depth of hole. Backfill in 6-inch layers and thoroughly tamp each layer so compaction of backfill is equal to or greater than that of undisturbed earth.

C. Install poles as follows:

1. Use web fabric slings (not chain or cable) to raise and set poles.

2. Mount pole to foundation with leveling nuts, and tighten top nuts to torque level recommended by pole manufacturer.

3. Secure poles level, plumb, and square.

4. Grout void between pole base and foundation. Use non-shrinking or expanding concrete grout firmly packed in entire void space.

5. Use a short piece of 1/2-inch diameter pipe to make a drain hole through grout. Arrange to drain condensation from interior of pole.

D. Luminaire Attachment: Fasten to indicated structural supports.

E. Luminaire Attachment with Adjustable Features or Aiming: Attach luminaires and supports to allow aiming for indicated light distribution.

F. Lamp luminaires with indicated lamps according to manufacturer's written instructions. Replace malfunctioning lamps.

3.02 CONNECTIONS

A. Ground Equipment.

B. 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.

C. Ground metal poles/support structures according to Division 26 Section "Grounding and Bonding for Electrical Systems."

1. Nonmetallic Poles: Ground metallic components of lighting units and foundations. Connect luminaires to grounding system with No. 6 AWG conductor.

3.03 FIELD QUALITY CONTROL

A. Inspect each installed fixture for damage. Replace damaged fixtures and components.

1. All inoperable lamps shall be replaced with new lamps during the course of construction, up to and including the date of final acceptance of the building by the Owner.

B. Advance Notice: Give dates and times for field tests.

C. Provide instruments to make and record test results.

D. Tests and Observations: Verify normal operation of lighting units after installing luminaires and energizing circuits with normal power source, and as follows:

1. Measure light intensities at night if specific illumination performance is indicated in the photometric report. Use photometers with calibration referenced to NIST standards.

2. Check intensity and uniformity of illumination.

3. Check excessively noisy ballasts.

E. Prepare a written report of tests, inspections, observations and verifications indicating and interpreting results.

F. Malfunctioning Fixtures and Components: Replace or repair, then retest. Repeat procedure until units operate properly.

3.04 CLEANING AND ADJUSTING

A. Clean fixtures internally and externally after installation. Use methods and materials recommended by manufacturer.

B. Adjust amiable luminaires and luminaires with adjustable lamp position to provide required light distributions and intensities.

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 APPLICABLE)

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 33 32 19 SEWAGE PUMPING STATION AND EQUIPMENT

PART 1 - GENERAL

1.1 DESCRIPTION

A. The contractor shall furnish and install one factory-built and tested above ground fiberglass reinforced automatic pump station. The station with all specified equipment shall be complete and factory installed in a fiberglass reinforced polyester resin enclosure. The items of equipment shall include: two self-priming, horizontal, centrifugal, V-belt motor driven sewage pumps, valves, internal piping, motor control center, automatic liquid level control system, and all internal wiring.

B. Electrical power to be furnished will be 3 phase, 60 hertz, 230/460 volts, maintained within plus or minus 10 percent. Phase to phase unbalance shall not exceed 1% average voltage as set forth in NEMA Standard MG-1. Control voltage shall not exceed 132 volts.

C. The pumping equipment shall be manufactured by The Gorman-Rupp Company, Mansfield, OH, or equal.

1.2 SUBMITTALS

A. Product Data: Prior to fabrication, submit the following to the engineer for approval:
1. Shop drawings providing layout of mechanical equipment and anchor bolt locations. Pipe penetrations shall be dimensional in relation to the station centerline.
2. Catalog cut sheets for major items of equipment, materials of construction, major dimensions, motor and v-belt drive data, pump characteristics curves showing design duty point capacity (GPM), head (FT), net positive suction head (NPSHR), and hydraulic brake horsepower.
3. Dimensional drawings indicating size, location and the spherical solids passing capability of the primary recirculation port and impeller.

B. Certified Tests: Prior to shipment of the equipment from the manufacturer's facility, submit the following certified tests to the engineer for approval.
1. Certified copies of factory run pump performance tests. Characteristics of pumps may have a tolerance of plus 10% of rated capacity at rated head or plus 8% at rated head capacity. No minus tolerance will be acceptable. The performance tests will substantiate the correct performance of the equipment at the design head, capacity, suction lift, speed and horsepower as herein specified.
2. Certified reprime performance test data in accordance with procedures herein specified.
3. Certified copies of air release valve closure performance test.
4. Tests shall be certified by a licensed professional engineer.

C. Operation and Maintenance Manuals:
1. Operation shall be in accordance with written instructions provided by the pump system manufacturer. Comprehensive instructions supplied at the time of shipment shall enable personnel to properly operate and maintain all equipment supplied. Content and instructions shall assume operating personnel are familiar with pumps, motors, piping and valves, but lack experience on exact equipment supplied.
2. Documentation shall be specific to the pumping equipment supplied and collated in functional sections. Each section shall combine to form a complete system manual covering all aspects of equipment supplied by the station manufacturer. Support data for any equipment supplied by others, even if mounted or included in overall station design, shall be provided by those supplying the equipment. Instructions shall include the following as a minimum:
3. Functional description of each major component, complete with operating instructions.
4. Instructions for operating pumps and pump controls in all modes of operation.

5. Calibration and adjustment of equipment for initial start-up, replacement of level control components, or as required for routine maintenance.
6. Support data for commercially available components not produced by the station manufacturer, but supplied in accordance with the specifications, shall be supported by literature from the prime manufacturer and incorporated as appendices.
7. Mechanical layout drawing of the pump system and components, prepared in accordance with good commercial practice, shall provide installation dimensions and location of all pumps, motors, valves and piping.

D. Manufacturer's Start Up Report: The manufacturer's technical representative shall inspect the completed installation, correct or supervise the correction of any defect or malfunction, and instruct operating personnel in the proper operation and maintenance of the equipment. A written report covering the equipment startup shall be mailed directly to the Owner. At a minimum, the report shall include:
1. Nameplate information.
2. Recordings of gauge readings, total dynamic head and operating speed for each pump.
3. Recordings of level control settings.
4. Certification that equipment has been properly installed and lubricated and is in accurate alignment.
5. Certification that the v-belt drive system has been properly aligned using a laser alignment instrument and v-belts tensioned using a belt tensioning instrument.
6. Results of electrical tests including voltage readings and amperage readings of all motors.
7. Certification that the equipment has been operated fully loaded and that it operated satisfactorily.
8. Outline in detail any deficiencies noted, and proposed remedial corrections.

E. Equipment Certification:
1. At the time of submitting shop drawings, submit, on the form provided, the pumping equipment manufacturer's warranty and certification attesting that the manufacturer has examined the Contract Drawings and specifications and that the equipment provided will meet the performance criteria and conforms to specification requirements.

1.3 QUALITY ASSURANCE

A. Manufacturer’s Qualifications: Upon request from the engineer, the pumping equipment manufacturer shall demonstrate the following:
1. Proof of financial stability and ability to produce the pumping equipment within the specified delivery schedules.
2. Evidence of the facilities, equipment, and expertise to demonstrate the manufacturer’s commitment to long term customer service and project support.
3. Evidence of adequate local and factory spare parts inventory to provide timely delivery of spare parts.

B. Consideration will be given only to pump manufacturers meeting the following qualifications:
1. Twenty years minimum experience successfully producing pump stations of the type specified herein.
2. A minimum of twenty-five pumping stations of the type specified herein in successful operation for a minimum of ten years.
3. Pump manufacturer shall be ISO 9001 certified.

C. Pump Performance:
1. Design and construct the pumps in accordance with standards of the hydraulic institute. The efficiency of the pumps, when operating under conditions of the specified capacities and heads shall be as near peak efficiency as practicable.

2. Design the pumps designated as self-priming centrifugal to pump raw sewage containing solids up to ten percent and stringy materials with a minimum of clogging. Pumps may be protected by screening equipment, but materials passing through may combine by a felting or balling process.

D. Manufacturer's Responsibilities:
1. Obtain pumping equipment, motors, motor starters, pump controls and appurtenances from the pump manufacturer whose responsibility it is to insure that the pumping equipment is properly coordinated and operated in accordance with these specifications.
2. The pump control panel including the level controls shall be constructed at the pump manufacturer's facilities. The pump manufacturer shall be an Underwriters Laboratories (UL) panel builder.

E. Factory System Test - All internal components including the pumps, motors, valves, piping and controls will be tested as a complete working system at the manufacturer's facility. Tests shall be conducted in accordance with Hydraulic Institute Standards at the specified head, capacity, rated speed and horsepower. Factory operational test shall simulate actual performance anticipated for the complete station. Upon request from the engineer, the operational test may be witnessed by the engineer and/or representatives of his choice at the manufacturer's facility.

1.4 PUMPING EQUIPMENT WARRANTY

A. All components of the pumping system shall be manufactured, assembled and tested as a unit by the pump manufacturer. The pumping equipment must be a standard catalog item with the manufacturer. The pump manufacturer must assume system responsibility, i.e. the complete pumping system must be warranted by the manufacturer as described herein. Individual component warranties are desirable. However, individual warranties honored solely by the manufacturers of each pump system component will not be acceptable.

B. The pump system manufacturer shall warrant all equipment to be of quality construction, free of defects in material and workmanship. A written warranty shall include specific details described below.
1. All equipment, apparatus, and parts furnished shall be warranted for five (5) years, excepting only those items that are normally consumed in service, such as light bulbs, oils, grease, packing, gaskets, 0-rings, etc. The pump station manufacturer shall be solely responsible for warranty of the pumping system and all components when installation is made and use and maintenance is performed in accordance with the manufacturer's recommendations.
2. The pump shaft seal shall be warranted for five (5) years from date of shipment. Should the seal fail within five years, the manufacturer shall furnish a new seal, without charge to owner, f.o.b. factory.
3. Components failing to perform as specified by the engineer, or as represented by the manufacturer, or as proven defective in service during the warranty period, shall be replaced, repaired, or satisfactorily modified by the manufacturer without cost of parts or labor to the owner.

C. It is not intended that the manufacturer assume liability for consequential damages or contingent liabilities arising from failure of any vendor supplied product or part which fails to properly operate, however caused. Consequential damages resulting from defects in design, or delays in delivery are also beyond the manufacturer's scope of liability.

D. The warranty shall become effective upon the acceptance of the completed pumping station by the OWNER.

1.5 MANUFACTURER

A. These specifications and accompanying drawings specify and show equipment and materials deemed most suitable for the service anticipated. This is not done, however, to eliminate other products equally as good and efficient. The Contractor shall prepare his bid on the basis of the particular equipment and materials specified for the purpose of determining the low bid. The awarding of the contract shall constitute a contractual obligation to furnish the specified equipment and materials.

B. After execution of the contract, should the Contractor desire to substitute equipment other than that specified in the contract, such substitution will be considered for one reason only: the equipment proposed for substitution is superior in construction and efficiency to that specified in the contract, and higher quality has been demonstrated by service in a similar installation.

C. In the event the contractor obtains engineer's approval of equipment other than that for which the station was originally laid out, the contractor shall, at his own expense, make any changes in the structures, buildings or piping necessary to accommodate the equipment, and shall provide as-built drawings to the engineer.

D. It will be assumed that the cost to the contractor of the equipment proposed to be substituted is less than that of the equipment specified in the contract and if substitution is approved, the contract price shall be reduced by an amount equal to the savings.

1.6 FIELD SERVICES

A. Provide the services of a manufacturer's representative experienced in the installation and operation of the pump supplied under this specification for not less than two (2) 8-hour workdays on-site for installation inspection, start-up and performance testing, and instructing Owner's personnel in the operation and maintenance of the equipment.

B. Provide for the above services to be performed during two (2) separate visits to the project site.

PART 2 - PRODUCTS

2.1 PUMP STATION ENCLOSURE

A. The station enclosure shall enclose all pumps and equipment, and shall be constructed to augment serviceability by incorporating the following design characteristics:
   1. Four access panels shall be provided. Panels shall be sized and placed to permit routine maintenance through the panel openings of the station enclosure. For these purposes, routine maintenance shall include:
      a. Pump and motor inspection
      b. V-belt drive adjustment
      c. Pump clean out
      d. Motor and liquid level control inspection
      e. Panels shall be secured with tamper-proof hardware.
   2. No less than two access panels shall be provided with a hinge and two-point latch assembly. These panels shall provide access to frequently performed adjustments and inspections of the electrical controls. The hinge shall be of the continuous full-length type. Latch shall

engage the enclosure at no less than two places, and shall have a keyed lock handle. The key for the latch assembly shall open both access panels.

3. One access panel shall contain a screened vent for station enclosure ventilation. A cover shall be provided to cover this opening during periods of cold weather.
4. The station enclosure, less base, shall be able to be completely disassembled following the removal of all reusable hardware. No portion of the enclosure shall project above the surface of the base to interfere with maintenance operations or endanger personnel after disassembly.
5. Disassembly of the entire enclosure shall be accomplished by not more than two maintenance personnel and without the use of lifting equipment.
6. Pump station shall be provided with a 1300/1500 watt, 120 volt electric space heater with cord and grounding plug. This is a factory choice item.

B. MATERIALS

1. The station enclosure shall be manufactured of molded fiberglass reinforced polyester resins with a minimum of 30 percent fiberglass, and a maximum of 70 percent resin. No resin fillers or extenders shall be allowed. Glass fibers shall be an average length of 1 1/4 inches. Structural stability, corrosion resistance, and water-tight properties are major design considerations. The polyester laminates shall provide a balance of mechanical, chemical, and electrical properties to insure station enclosure long life. The fiberglass components must be impervious to micro-organisms, mildew, mold, fungus, corrosive liquids, and gases which can be expected to be present in the environment surrounding the wet well.
2. All surfaces of the housing shall be coated with a polyester resin-rich finish. The finish shall provide:
   a. Abrasion resistance
   b. Protection from sewage, greases, oils, gasoline, and other common chemicals
3. Maintenance-free service to insure a long maintenance-free life the outside of the station enclosure shall be coated with a suitable pigmented resin compound. The resin shall protect the fiberglass from “UV” rays.

2.2 ENCLOSURE BASE

A. Station base shall be constructed of pre-cast, reinforced concrete, bonded inside a fiberglass form covering top and all four sides. Base shall be designed to insure adequate strength to resist deformation of structure during shipping, lifting, and handling. The station base shall incorporate drainage provisions and shall be provided with an opening of sufficient size to permit piping and service connections to the wet well.

B. Station base shall incorporate anchor recesses for securing the pump station to the concrete pad. Station pad shall be supplied by the contractor in accordance with the specification and installation drawings. The anchor bolts shall be provided by the contractor in accordance with the specification and installation drawings. The station base color shall de-emphasize the presence of dirt, grease, etc.

2.3 VENTILATING BLOWER

A. Mounted in the enclosure shall be an exhaust blower which will have a capacity of air exchange once every two minutes. Blower motor shall be automatically turned “on” at approximately 70°F and turned “off” at approximately 55° F. Blower motor and control circuit shall be protected by a thermal-magnetic air circuit breaker. Blower exhaust outlet shall be protected by a screen and shall be designed to prevent the entrance of rain, snow, rocks or any foreign material.

2.4 VALVES AND PIPING

A. Check Valve: Each pump shall be outfitted with a full flow check valve, with flanged ends, capable of passing a 3 inch spherical solid, and be fitted with an external lever and spring. The valve seat shall be replaceable. The valve body shall incorporate a clean out port and shall be cast iron. Valve clapper shall have a molded seating surface. Valve hinge pin and internal hinge arm shall be stainless steel, supported on each end by brass bushings. The sealing O-rings shall be easily replaceable without requiring access to the interior of valve body. Valve shall be rated at 175 PSI water working pressure and a hydrostatic test pressure of 350 PSI. Valves other than full flow or mounted in such a manner that prevents the passage of a 3 inch spherical solid shall not be acceptable.

B. Plug Valve: The discharge header piping shall include a 3-way plug valve to permit either pump or both pumps to be isolated from the common force main. Valves shall have inlet ports designed to pass 3" spherical solids. The plug valve shall be of the non-lubricated, tapered type design. Valve body shall be semi-steel with flanged end connections drilled to 125 pound standard. Valve shall be furnished with a drip-tight shutoff plug mounted in stainless steel bearings. Plug shall have a resilient facing bonded to the sealing surface. Valve shall be operated with a single lever providing lift, turn, and reseat action. The lever shall be equipped with a locking mechanism to hold the plug in the desired position.

C. Piping: Flanged header pipe shall be ductile iron, complying with ANSI/AWWA A21.51/C115 and Class 53 thickness. Pipe flanges shall be cast iron Class 125 and comply with ANSI B16.1. Pipe and flanges shall be threaded with suitable thread sealant applied before assembling flange to pipe. Bolt holes shall be in angular alignment within 1/2° between flanges. Flanges shall be faced with a gasket applied finish. Each pump shall be equipped with a glycerin-filled compound gauge to monitor suction pressure (-30' to +30'), and a glycerin-filled pressure gauge (0 - 140')to monitor discharge pressures.

D. Supports and Thrust Blocks: The suction and discharge pipes connected to the pump station shall be supported according to good commercial practices. No piping loads shall be transmitted to the pumps. The station discharge force main piping shall be anchored with thrust blocks where shown on the contract drawings.

E. Drive Unit Motors: The pump motors shall be horizontal, open drip proof, induction type, foot mounted with normal starting torque and low starting current characteristics. Motors shall be suitable for 3 phase, 60 hertz, 230 volts, VAC electrical current. The motors shall not be overloaded at the design condition or at any head in the operating range of the pump performance curve as specified. Motors shall be non-overloading throughout the entire curve. Each motor shall be in current NEMA design cast iron frame with copper windings. Motor requirements for this station 5 horsepower.

2.5 DRIVE TRANSMISSION

A. Transmitted power from the motors to the pumps shall be by means of V-belt drive assemblies. The V-belt drive assemblies shall be selected to establish proper pump speed to meet the specified operating conditions. A minimum of two V-belts shall be provided for each drive assemblies. A single belt drive shall be unacceptable. V-belt drive assembly shall be selected on the basis that adequate power will be transmitted from the motor to pump. The drive systems shall have a safety factor of no less than 1.5. Calculation of the safety factor shall be based on performance data published by the drive manufacturer.

B. Belt Guards: Pump V-belt drive assembly shall be enclosed on all sides in a guard constructed of any one or combination of materials consisting of expanded, perforated, or solid sheet metal. If perforated or expanded opening material is used, the maximum perforation shall not exceed 1/2 inch. Guards shall be manufactured to meet the following requirements:

1. Permit complete removal from the pump unit without interference with any other unit component.

2. Guard shall be securely fastened to the unit base and rigidly braced to some fixed station component.
3. All metal components shall be free from burrs and sharp edges.
4. All structural joints shall be continuously welded.
5. Panels may be riveted to frames with not more than five-inch spacing.
6. Tack welds shall not exceed a four-inch spacing.
7. The guard shall be painted in accordance with Section 3, Color Definitions of ANSI 253.1; 1967, Safety Color Code for Marking Physical Hazards.

2.6 PUMPS DESCRIPTION

A. Pumps shall be horizontal, self-priming sewage/waste pumps, specifically designed for unattended operations pumping raw, unscreened, domestic sanitary sewage or industrial waste.

B. Size: Pumps shall have 4 inch flanged suction connection, and 4 inch flanged discharge connection.

C. Pump Materials: The pump volute case, suction elbow, priming port housing, suction and discharge connections, bearing frame assembly and priming cover shall be high quality gray cast iron, ASTM A-48, Class 30 or better. In addition the three internal wearing parts of impeller, wear plate and lip plate shall be made of high quality ductile iron. All external mating parts shall be machined and Buna-N Rubber O-ring sealed on a beveled edge. Gaskets shall not be acceptable.

D. Pump Internal Passages: All openings and internal passages including the internal re-circulation port shall be large enough to permit the passage of a sphere 3 inches in diameter. Any trash or stringy material which may pass through the average household collection system must be able pass through the re-circulation port. Screens or any internal devices that create a maintenance nuisance or interfere with priming and performance of the pump shall not be permitted. A dimensional drawing indicating size and locations of the priming recirculation port shall be submitted to the engineer upon request.

E. Pump Performance: Each pump must have the necessary characteristics and be properly selected to pump unscreened sewage or trash meeting the operating conditions listed:

1. Capacity, in GPM ---------- 200 GPM (+/- 5 GPM)
2. Total Head, in feet ---------- 86 feet (+/- 2 feet)
3. Total Suction Lift, in feet ---------- 16 feet
4. Maximum Re-priming Lift, in feet ---------- >/= 17.7 feet
5. Maximum Static Suction Lift, in feet ---------- >/= 15.5 feet
6. Total Discharge Static Head, in feet ---------- 35.8 feet

Occasionally debris will lodge between the pump suction check valve and seat, given the sanitary sewage service anticipated. This will result not only in loss of the suction leg, but also in the siphoning of liquid from the pump casing to the approximate center line of the impeller. Such occurrence shall be considered normal with proper installation of an air bleed line or air release valve vented to atmosphere.

Consideration of such occurrences and of the unattended operation anticipated, each pump shall be designed with the following features: The pump case to retain adequate liquid to insure unattended automatic re-priming while operating at its rated speed in a completely open system without suction check valves and with a dry suction leg.

F. Re-Prime Performance:
1. Upon request from the engineer, certified re-prime test data, shall be submitted to the engineer for approval. Each pump must be capable of a re-prime lift of ____ feet while operating at the selected speed and the selected impeller diameter.

2. Re-prime lift is defined as the static height of pump suction centerline above liquid level start set point that the pump will prime and deliver within five minutes, with only the liquid remaining in the pump casing after a delivering pump is shut down with the suction check valve removed. Additional standards under which re-prime tests shall be run are:

   a. Piping shall incorporate a discharge check valve, same size or greater than the pump discharge, down stream from the pump.
   b. A ten-foot length of one-inch pipe shall be installed between pump and discharge check valve to simulate the air displacement rate of a typical pump equipped with an air bleed line or air release valve. This line shall be open to atmosphere at all times.
   c. No restrictions shall be present in the pump or suction piping that could restrict the rate of siphon drop of the suction leg. Suction pipe configuration shall incorporate a minimum horizontal run of 4.5 feet and one 90-degree elbow for the re-prime test.
   d. Impeller shall be set at the clearances recommended in the pump service manual.
   e. Re-prime lift repeatability shall be demonstrated by five sequential re-prime lift cycles.
   f. Water shall be used for re-prime test.

G. Serviceability: The pump manufacturer shall demonstrate that consideration has been given to reducing maintenance costs by incorporating the following features.

H. Special Tools: For any components within the pump, no special tools shall be required for replacement.

I. Suction Check Valve: Each pump shall incorporate a suction valve that can be removed or installed through the removable check valve cover plate opening, without disturbing the suction or discharge piping or draining of the pump case. Sole function of check valve shall be to eliminate re-priming with each cycle. Pumps requiring suction check valves to prime or re-prime will not be acceptable.

J. Cover Plate: Without removing suction or discharge piping the pump shall be equipped with a removable cover plate, allowing access for service and repairs

K. Lip Plate: The impeller shall be used in combination with a replaceable volute lip plate. If a full diameter impeller is utilized a flat back plate shall be provided. If an impeller trim is required a matching lip plate shall be used so as not to lose priming efficiency. Pump shall be capable of operating with various matched impeller to lip plate combinations without disturbing the volute case. The flat back plate or volute lip plate shall be replaceable for renewed efficiency. Replacement of the lip plate shall be accomplished through the removable cover plate.

L. Wear Plate: The replaceable wear plate shall be fastened to the cover plate. Replacement of the wear plate shall be accomplished through the removable cover plate.

M. Wear Plate / Lip Plate Rotating Assembly: The pump shall be fitted with a replaceable wear plate and lip plate. Replacement of the wear plate, lip plate, impeller and seal, shall be accomplished through the removable cover plate. The entire rotating assembly shall be removable as a unit without removing the pump volute or piping. The rotating unit consists of bearings, shaft, seal, and impeller,

N. Impeller Clearance Adjustment: Means shall be provided for external adjustment of the clearance between the impeller and wear plate without the use of shims or disassembly of the pump unit. The clearance set between the impeller and wear plate shall be maintained at 15 thousandths (.015).

O. Impeller Construction: The impeller shall be two-vaned, semi-open, non-clog, cast in ductile iron with integral pump out vanes on the back shroud. Impeller shall thread onto the pump shaft and be secured with a lock screw.

P. Seal: The pump shall have one mechanical and lip seal with a separate oil chamber between the seals. John Crane Type 21, BF1 C1, seals shall be used with the rotating seal faces being carbon and the stationary seal faces to be ceramic. The primary seal shall be replaceable without disassembly of the seal chamber and without the use of special tools. The primary seal shall be accessible by removing the suction cover plate and impeller. Pump-out vanes shall be present on the backside of the impeller to keep contaminants out of the seal area. Units which require the use of tungsten-carbide seals or foreign manufactured seals, shall not be acceptable. Seals shall be locally available.

1. There shall be an oil chamber between the primary seal and the lip seal with a drain plug opening. The oil consistency may be periodically checked for contamination to determine if seal failure has occurred.
2. Units equipped with opposed mechanical seals shall not be acceptable.
3. The unit shall be designed so that the seal system totally separates the pumping system from the bearing system. In the event of a seal failure, contaminants will not enter into the bearing housing and damage the bearings.
4. The unit shall be equipped with a stainless steel shaft sleeve under the seal to prolong the shaft life by eliminating the possibility of scoring the shaft, should the seal fail.
5. Replacement of the seal shall be accomplished without disturbing the suction or discharge piping.

Q. Shaft Bearings: The pump shaft bearings shall be anti-friction roller bearings, of ample size and proper design to withstand all radial and thrust loads which can reasonably be expected during normal pump operation. Bearings shall be lubricated from a separate oil reservoir. Pump designs in which the same oil lubricates both the shaft bearings and the shaft seal shall not be acceptable.

R. Pump Suction Spool Flange: Each pump shall be equipped with a one-piece, cast iron suction spool flange. The suction spool flange shall have one 1-1/4 inch NPT and one 1/4 inch NPT tapped hole with pipe plugs for mounting of gauges or other instrumentation.

S. Pump Drain Kit: The pumps shall be provided with a drain kit. This is a factory choice item.

2.7 ELECTRICAL CONTROL COMPONENTS PANEL ENCLOSURE

A. The electrical control equipment shall be mounted within NEMA 3R, dead front type control enclosures fabricated of steel. Enclosure doors shall be hinged, and shall be equipped with captive closing hardware. Control compartments shall include removable back panels on which control components shall be mounted. Back panels shall be secured to enclosures with collar studs. All operating controls and instruments shall be securely mounted and shall be clearly labeled to indicate function.

B. Receptacle: A duplex ground fault indicating utility receptacle providing 120 VAC, shall be mounted on the side of the control enclosure. This circuit shall be protected by a 15 ampere thermal-magnetic circuit breaker.

C. Mounting: All motor branch components shall be of the highest industrial quality, securely fastened to a removable back plate with screws and lock washers.

D. Circuit Breaker and Operating Mechanisms: A properly sized heavy duty air circuit breaker shall be furnished for each pump motor circuit. Circuit breakers shall have a symmetrical RMS interrupting rating of 5000 amperes at 230 volts. All circuit breakers shall be sealed by the manufacturer after calibration to prevent tampering. Operator handles for the mechanisms, shall be pad lockable, shall be located on the exterior of the control enclosure door and with interlocks to permit the door to be opened only when circuit breakers are in the OFF position.

E. Motor Starters: An open frame, across-the-line, IEC rated magnetic motor starter shall be furnished for each pump motor. Starters shall be designed for addition of at least two auxiliary contacts. All motor starters shall be equipped to provide overload protection on all three phases.

F. Overload Relays: Overload relays shall be of ambierst compensated bimetallic, and shall have visual trip indication with trip-free operation. Pressing of the overload reset lever shall not actuate the control contact until such time, as the overload spindle has reset. Resetting of the overload reset lever will cause a snap-action control contact to reset, thus re-establishing a control circuit. Resetting the overload relays shall be accomplished without opening the control panel door. Reset button shall be mounted through the door of the control enclosure

G. Control Circuit: The control circuit, 120 VAC, shall be protected by a thermal-magnetic air circuit breaker and shall be connected in such a way as to allow control power to be disconnected from all control circuits.

H. Pump Mode Selection: Pump mode selector switches and Hand-Off-Automatic switches, shall be connected to permit manual start, stop of each pump or to select automatic operation of each pump under control of the level control system. Manual operation shall override all shutdown systems, but not the motor overload relays. Switch contacts shall be rated 10 amperes minimum at 120 volts.

I. Pump Run Indicators: Control panel shall be equipped with one pump run light for each pump motor. Light shall be wired in parallel with the related pump motor starter to indicate that the motor is called to run.

J. Elapsed Time Meters: A six digit elapsed time indicator shall be connected to each motor starter to indicate the total running time of each pump in hours and "tenths of hours". The elapsed time indicators shall be of non-reset design.

K. Alarm Light : The pump station shall be supplied with one alarm light (flashing or non-flashing) in a vapor-tight fixture with red globe and NEMA 4x non-metallic enclosure.

L. Phase Failure Protection: Provides protection against out-of-phase, low voltage, phase reversal and loss of phase for three phase systems.

M. Wiring: The pump station shall be completely wired by the manufacturer, except for the power feed lines to the branch circuit breakers and final connections to remote alarm devices. All wiring, workmanship, and schematic wiring diagrams shall be in compliance with the standards and specifications set forth by the National Electrical Code (NEC). All user serviceable wiring shall be color coded to facilitate maintenance and repair of the control panel.

N. Wiring Bundles: In accordance with good commercial practice, the control conductors connecting components mounted on the enclosure door shall be bundled and tied. The wire bundles shall be of adequate length and flex so that the door can swing to its full open position. No mechanical stress or abrasion on the conductors or insulation shall occur when the door is opened. Bundles shall be clamped with mechanical fastening devices on each side of the hinge.

O. Conduit: Conduit requirements are as follows:
1. Conduit and fittings shall be “UL” listed
2. If used, liquid tight flexible metal conduit shall be constructed of a smooth, flexible galvanized steel core with a smooth abrasion resistant, liquid tight, polyvinyl chloride cover.
3. Conduit shall be supported in accordance with National Electric Code.
4. Conduit shall be sized according to NEC.

P. Grounding: The pump station manufacturer shall ground all electrical equipment inside the pump station to the enclosure back panel with ring and tongue terminals and star washers. The mounting

surface of all ground connections shall have any paint removed before making final connections. The contractor shall provide an earth driven ground connection to the pump station at the main grounding lug in accordance with the National Electric Code (NEC).

2.8 LEVEL CONTROL SYSTEM

A. Solid State Liquid Level Control with Submersible Pressure Bell:
   1. Functional Description: The liquid level control shall be of solid state design and incorporate the following features:
      a. Pump alternating relay with lead pump selector switch
      b. Lag pump start delay timer
      c. Field selectable measurement range of 5 feet to 20 feet
      d. A submersible pressure bell, non-electrical
      e. Easily adjustable set-points
      f. Visual level indication
      g. A 4-20mA non-isolated linear output
      h. Six triac output contacts with status indication

B. Alternating Relay with Lead Pump Selector Switch: The control shall include an alternating relay. The alternation of the pumps will occur at the completion of each pump cycle. A lead pump selector switch door mounted shall be provided to select either pump #1 or pump #2 to be the lead pump for each cycle or to select automatic alternation at the completion of each pump cycle.

C. Time Delay Lag Pump: The control shall include an adjustable lag pump time delay relay. This circuit shall prevent both pumps from starting simultaneously. Circuit will be field adjustable from 0 to 30 seconds.

D. Field Selectable Set Point Range:
   1. The controller shall have field settable liquid level ranges. These ranges shall be as follows:
      a. 0 to 5 feet
      b. 0 to 10 feet
      c. 0 to 15 feet
      d. 0 to 20 feet
   2. These settings shall be set with dip-switches located on the controller and shall include visual indication of the range selected.

E. Submersible Pressure Bell Non-Electrical: The pressure bell housing shall be manufactured of PVC and have a replaceable Nitrile rolling diaphragm to separate the liquid from the compressed air chamber. No screws or blots shall be permitted as part of the pressure bell assembly. The submersible pressure bell shall be non-electric and transmit a pressure signal only to the controller. No voltage from the level sensing control shall enter the wet well. The pressure signal shall be connected to the controller via flexible tubing. The tubing shall be of the non corrosive type.

F. Operating Set Points: The controller shall include adjustable set point switches. The switches shall be of the linear type and be adjustable from 0 to 100% of the measurement range selected.

G. Visual Level Indication: The controller shall include visual level indication. Multiple LED level indicators shall show the levels from 0 – 100% as measured by the submersible pressure bell.

H. Output 4 – 20mA: Controller shall include a non-isolated analog output for remote level indication. This output can be used in conjunction with “PLC” or “VFD” based controls as required. The output

shall be based upon the selected range. (example: 4mA = 0% and 20mA = 100% of the selected range of operation.)

I. Output Contacts and Field Connections: The controller shall include six triac output contacts. Output contacts shall be rated at a minimum of .5 amps @ 120 VAC. Each output contact shall have a visual status indicator, (red for de-energized and green for energized), visible on the front of the control unit. Terminals for field connection shall be of the plug in design for ease of installation and service.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Contractor shall off-load equipment at installation site using equipment of sufficient size and design to prevent injury or damage. Station manufacturer shall provide written instructions for proper handling. Immediately after off-loading, contractor shall inspect pump appurtenances for shipping damage or missing parts.

B. Any damage or discrepancy shall be noted in written claim with shipper prior to accepting delivery. Validate all station serial numbers and parts lists with shipping documentation. Notify manufacturers representative of any unacceptable conditions noted with shipper.

3.2 INSTALLATION

A. Install pump as indicated on project drawings. Installation must be in accordance with written instructions supplied by the manufacturer at time of delivery.

B. Suction pipe connections must be vacuum tight. Fasteners at all pipe connections must be tight. Install pipe with supports and thrust blocks to prevent strain and vibration on pump station piping. Install and secure all service lines (level control, air release valve or pump drain lines) as required in wet well.

C. Check motor and control data plates for compatibility to site voltage. Install and test the station ground prior to connecting line voltage to station control panel.

D. Prior to applying electrical power to motors or control equipment, check all wiring for tight connection. Verify that fuses and circuit breakers conform to project design documents. Manually operate circuit breakers and switches to ensure operation without binding. Open all circuit breakers and disconnects before connecting utility power. Verify line voltage, phase sequence and ground before actual start-up.

E. After all anchor bolts, piping connections are installed, seal all openings between wet well and pump enclosure.

3.3 PROTECTION

A. The pumping equipment should be placed into service soon after delivery of the equipment. If installation is delayed, the pumping equipment and control panel shall be stored indoors free of excessive dust, in a low humidity, heated environment.

B. During installation and after the pumping equipment is placed into operation the motor control center shall operate in an environment free of excessive dust, low humidity, and heated.

3.4 FIELD QUALITY CONTROL

A. Prior to acceptance by the owner, an operational test of all pumps and control systems shall be conducted to determine if the installed equipment meets the purpose and intent of the specifications. Tests shall demonstrate that all equipment is electrically, mechanically, structurally, and otherwise acceptable; it is safe and in optimum working condition; and conforms to the specified operating characteristics.

B. Prior to start-up, clean wet well by removing construction debris and foreign material. Contractor shall supply clear water of adequate volume to operate the station through several pumping cycles.

3.5 MANUFACTURERS START-UP SERVICES

A. Coordinate station start-up with manufacturers technical representative. The representative or factory service technician will inspect the completed installation. He will calibrate and adjust instrumentation, correct or supervise correction of defects or malfunctions, and instruct operating personnel in proper operation and maintenance procedures.

B. Observe and record operation of pumps, suction and discharge gage readings, voltage readings, ampere draw, pump controls, and liquid level controls. Align v-belt drive systems using laser alignment instrument. Check calibration of all instrumentation equipment, test manual control devices, automatic control systems and alarms. Be alert to any undue noise, vibration or other operational problems. Verify pump flow rate using the discharge line magnetic flow meter. Demonstrate proper operation of all pump control and alarm logic.

C. Demonstrate all control and alarm logic to the satisfaction of the Engineer.

3.6 CLEANING

A. Prior to acceptance, inspect interior and exterior of pump station for dirt, splashed material or damaged paint. Clean or repair accordingly. Remove from the job site all tools, surplus materials, scrap and debris.

3.7 MANUFACTURER'S OPERATION AND MAINTENANCE TRAINING

A. Manufacturer's factory-trained service technician shall instruct the Owner's personnel in proper operation, maintenance and troubleshooting procedures, safety concerns, level control system, electrical controls, and alarm circuits.

B. Operation and maintenance training shall be a separate trip and shall not be less than two weeks after the startup of the equipment.

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 Piping
   2. Pressure Piping

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" 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. AWWA C900, ASTM D1784, Class 12454-A or 12454-B; DR-25, 100 psi, with C.I./I.P.S. equivalent outside diameter.
   2. Ductile Iron Fittings:

a. ANSI/AWWA C110/A21.10; 150 psi pressure rating.

3. Push-on Joints Using Flexible Elastomeric Seals: ASTM D3139.
4. Elastomeric Seals (Gaskets): ASTM F477.

2.02 STAINLESS STEEL PIPE

A. Pipe: Welded; ASTM A312, TP 304L; and ANSI B36.19, Schedules 5S, 10S and 40S, as indicated on the Drawings.

B. Fittings:
1. ASTM A403, WP 304L.

2.03 SERVICE SADDLES

A. Material:
1. Band: Type 304 Stainless Steel
2. Side Bars and Fingers: Type 304 Stainless Steel
3. Keeper Bar: Type 304 Stainless Steel
4. Stud Bolts: Type 304 Stainless Steel with epoxy coating on threads.
5. Nuts: Type 304 Stainless Steel fluorocarbon coating on threads.
6. Washers: Type 304 Stainless Steel
7. Gasket: Buna-N compounded to resist oil, acids, alkalies, most (aliphatic) hydrocarbon fluids, water and many chemicals.

2.04 PIPE ACCESSORIES

A. 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.

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 Architect 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 Project Engineer.

B. Backfill trenches as specified in MDOT.

3.04 CUTTING AND PATCHING

A. Do not cut and patch existing structures without prior permission from the Engineer.

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

1.01 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 for the sewage forcemain, 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

1.02 QUALITY ASSURANCE

A. Products shall be new, the latest standard product of reputable manufacturers, and shall have replacement parts available.

B. Materials contaminated with gasoline, lubricating oil, liquid or gaseous fuels will be rejected.

1.03 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.

1.04 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.

1.05 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

2.01 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.

2.02 AIR RELEASE VALVE

A. Materials of Construction:
1. Drainage Outlet: Polypropylene
2. Seal Plug Assembly: Nylon + E.P.D.M. + Stainless Steel
3. Float: Foamed polypropylene
4. Clamping Stem: Reinforced Nylon
5. Body: Reinforced Nylon
6. Cover: Reinforced Nylon/Stainless Steel
7. O-Ring: BUNA-N
8. Crown Nut: Stainless Steel SAE 316
9. Plastic Base: Reinforced Nylon
10. Stopper: Acetal
11. Spring: Stainless Steel SAE 316
12. Washer: Stainless Steel SAE 316
13. Bolt and Nut: Stainless Steel SAE 316
14. Stem: Stainless Steel SAE 316
15. Float: Polycarbonate
16. Ball Valve 1”: Brass ASTM A124/ Stainless Steel
17. Body: Steel DIN st.37/Stainless Steel

B. Manufacturer shall be A.R.I. Flow Control Accessories, Ltd., Val-Matic, or APCO.

2.03 BALL VALVES

A. 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.

PART 3 - EXECUTION

3.01 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.

3.02 ADJUSTMENT

A. Check and adjust valves and accessories for smooth operation.

END OF SECTION

SECTION 40 91 13 - CHEMICAL FEED SYSTEM

PART 1 - GENERAL

1.1 DESCRIPTION

A. The Work of this section includes, but is not limited to:

1. Chemical Feed System for the Control of Hydrogen Sulfide

B. Related work specified elsewhere:

1. Section 33 32 19 - Sewage Pump Station and Equipment
2. Division 26 - Electrical

1.2 PROCESS DESCRIPTION

A. The system shall provide for bulk storage of the chemical solution product and metered dosing of the product from the bulk storage tank to the wastewater lift station forcemain for the control of hydrogen sulfide. The system shall contain controls as necessary to facilitate variation in feed rates over a 24-hr period. A calibration cylinder shall be permanently installed to facilitate calibration of feed pumps.

B. The specified odor control product shall utilize two biochemical processes for the prevention of dissolved sulfide in wastewater.

1. To prevent sulfide formation: Anthraquinone shall be used to interrupt the sulfate respiration cycle.
2. To support biochemical mechanism: Nitrate-oxygen shall be applied via nitrate salts. This material shall be chemically stable. The material shall provide the additional benefit of biochemical oxygen demand (BOD) reduction in the wastewater.

C. Product shall be Bioxide-AQ as provided by Siemens Water Technologies.

1.3 QUALITY ASSURANCE

A. Reference Standards:

1. D638 Test Method for Tensile Properties of Plastics
2. D746 Test Method for Brittleness Temperature of Plastics and Elastomers by Impact
3. D790 Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
4. D1505 Test Method for the Density of Plastics by the Density Gradient Technique
5. D1525 Test Method for Vicat Softening Temperature of Plastics
6. D1693 Test Method for Environmental Stress-Cracking of Ethylene Plastics
7. D1998 Specification for Polyethylene Upright Storage Tanks

B. Regulations and Standards:

1. UL Underwriter's Laboratories

2. NEC National Electric Code
3. ANSI American National Standards Institute
4. EPA Environmental Protection Agency

1.4 SUBMITTALS

A. Shop Drawings and Product Data:

1. Submit detailed certified dimensional shop drawings and manufacturer's product data for materials and equipment including but not limited to chemical feed pumps, feed controls and liquid storage tank and including wiring and control diagrams.
2. Show complete information concerning materials of construction, fabrication, protective coatings, installation, anchoring and layout requirements, fasteners and other details.

B. Maintenance Data and Operating Instructions:

1. Submit three (3) copies of an Operation and Maintenance Manual for the chemical feed system, including a detailed description of the function of each principal component, procedures for operation and instructions for installation, start-up, overhaul and maintenance including a trouble shooting guide.
2. Include lubrication schedule, safety precautions, test procedures, electrical schematics, and parts lists MSDS sheets for chemical product

C. Maintenance Material: (Spare Parts)

1. Provide one complete set of the manufacturer's recommended spare parts.
2. Package each part individually or in sets in moisture-proof containers or wrappings, clearly labeled with part name and manufacturer's part/stock number.
3. Submit, in writing, storage procedures for spare parts to ensure adequate protection after delivery.
4. Provide any special tools required for equipment maintenance.
5. Provide a list of all equipment and tools needed to maintain and calibrate equipment.

1.5 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 two (2) 8-hour workdays on-site for installation inspection, startup and performance testing, and instructing Owner's personnel in the operation and maintenance of the equipment.

B. Provide for the above services to be performed during two (2) separate visits to the project site.

1.6 MANUFACTURER

A. All components of the feed system shall be provided by a single manufacturer who shall have sole-source responsibility for the system.

B. The manufacturer of this equipment shall be one recognized and established in the design, production, and operation of chemical feed injection systems. The manufacturer shall provide, with the submittal data, a list of 10 systems in operation using the proposed chemical for the control of hydrogen sulfide and other odor causing components associated with municipal wastewater. These

systems must have been in operation at least five years. The list shall include correct names, phone numbers, length of service and design criteria.

C. The manufacturer shall maintain regular production facilities at their place of business. These facilities shall be open for inspection by a representative of the Owner or Engineer at any time during construction and testing of this equipment.

D. The manufacturer of the feed system shall be an Underwriters Laboratories listed manufacturer of Enclosed Industrial Control Panels.

E. The system shall be provided by Siemens Water Technologies of Sarasota, Florida.

1.7 WARRANTY

A. The Manufacturer shall guarantee that the Chemical Feed & Storage system will perform as described in these Specifications. The Manufacturer shall warrant the system, complete, to be free from defects in materials or workmanship for a period twelve (12) months from acceptance. The Manufacturer shall repair or provide replacement for any defective components under this warranty. In addition, the chemical storage tanks shall be warranted for a period of five (5) years from warranty start date.

PART 2 - PRODUCTS

2.1 PRODUCT INFORMATION

A. Technical Requirements

1. The material supplied shall be an aqueous solution of Anthraquinone and an aqueous solution of calcium nitrate containing a minimum of 1 pound antraquinone per 1,000 gallons and 3.5 pounds of nitrate-oxygen per gallon.
2. The material shall be capable of reducing the dissolved hydrogen sulfide concentration in wastewater to less than 0.1 mg/l.
3. The material shall be free of any objectionable odor-producing compounds.
4. The pH of the material shall not be less than 4.0 nor greater than 7.5.

B. Safety Requirements

1. The material shall contain no hazardous substances as defined by both the Federal EPA's and State CERCLA lists.
2. The material shall be exempt from Federal DOT placard requirements.
3. Recommended handling procedures for the material shall require protective gloves and safety glasses only.

2.2 CHEMICAL STORAGE TANKS - (GENERAL)

A. The chemical storage tank shall be constructed of Rotationally Molded High-Density Crosslinked Polyethylene (HDXLPE).

B. High density crosslinked polyethylene tanks shall be manufactured by the rotational molding process in accordance with ASTM D 1998-93 Standard Specification for Polyethylene Upright Storage Tanks, Type 1 only. Rotational Molding shall be defined as a three-stage process consisting of

loading the mold with powdered resin, fusing the resin by heating while rotating the mold about more than one axis, and cooling and removing the molded article.

C. Plastics: The molding powder used shall be Marlex CL-250 or CL-200 as manufactured by Phillips 66, or powders of equal physical and chemical properties.

1. The polyethylene shall preferably be virgin material. Any use of regrind, recycled, or reprocessed materials or combinations of such materials shall not rely upon the performance data of their original constituents, but most meet the requirements of this standard in its own right.
2. The polyethylene shall have a stress-cracking resistance of 500-h minimum F50 in accordance with Test Method ASTM D1693, Condition A, full-strength stress-cracking agent. The test specimens may be compression molded or rotationally molded. If compression molded, Procedure C of Practice D 1928 shall be followed for both types of polyethylene with a minimum platen temperature of 350°F (177°C). If it is cross-linkable polyethylene the temperature shall be 390°F (197°C) and the platen shall be kept closed under full pressure for 5 minutes at the specified temperature in order to bring about the cross-linking reaction. If the test specimens are rotationally molded, the conditions for rotational molding shall be similar to the conditions used for molding a vessel from this polyethylene.

D. Fillers and Pigments: The plastic shall contain no fillers. All plastic shall contain an ultraviolet stabilizer at a level adequate to give protection for the intended service life of the vessel, minimum of 0.25%. This stabilizer shall be compounded in the polyethylene. Pigments must be compounded at the same time of resin manufacturer.

E. Vessel Construction:

1. Mechanical properties. The nominal value for the properties of the materials shall be based on the molded parts:

Property	ASTM	Value	Units
Density	D1505	59(0.937-1.944)	Lb/ft^3 (S.G.)
ESCR spec. thickness 0.125"	D1693	900-1000	Hrs.
Tensile Strength Ultimate 2"/min.	D638 Type IV	2600	PSI
Elongation at Break 2"/min	D638 Type IV	450	%
Vicat Softening Temp	D1525	255	°F
Brittleness Temp.	D746	-180	°F
Flexural Modulus	D790	100,000-110,000	PSI

2. Design Parameters:

a. Hoop Stress: The vessels shall be designed with a hoop stress value no greater than 600 psi at 100 °F with a safety factor of no less than 2, using the Barlow Formula for calculating wall thickness.

b. Wall Thickness: the minimum required wall thickness of the cylindrical shell at any fluid level shall be determined by the Barlow Formula. The wall thickness shall be based on the maximum temperature of the service.

3. Cut edges: All edges where openings are cut into the vessel shall be trimmed smooth.
4. Appearance: Type 1 finished vessel walls shall be free, as commercially practicable of visual defects such as foreign inclusions, air bubbles, pinholes, pimples, crazing, cracking, and delaminations that will impair the serviceability of the vessel.
5. Dimensions and Tolerance: The vessel diameter shall be measured externally. The tolerances on the outside diameter, including out of roundness shall be plus or minus 1%. Measurements shall be taken in a vertical position.

F. Fittings:

1. All fittings with the exception of the overfill protection site glass, shall be located on the tank top or dome. No penetration of the tank side-wall shall be made.
2. Plastic Fittings: Plastic fittings shall be bulk-head or two-flange style and shall be constructed of PVC. There shall be 4 bolts on any bolted flanges up to and including 3 inch, 8 bolts on fittings 4 inch - 8 inch diameter, and 12 bolts on 10 inch - 12 inch fittings. All bolts shall be all thread design with heads completely encapsulated in polyethylene. The polyethylene encapsulation shall fully cover the bolt head and a minimum of 1/4" of the threads closest to the bolt head. The polyethylene shall be color coded to distinguish bolt material: (Green-316 grade S.S., Red-Hastelloy C, Blue-Monel, Black-Titanium). Each bolt shall have a gasket, which is on the inside of the vessel.
3. Openings that are cut in vessel to install fittings shall not have sharp corners. Holes shall have minimum clearance to insure best performance of fittings.
4. For all flanged connectors, the flange drilling and bolting shall be in accordance with ANSI/ASME B-16.5 for 150 psi pressure class straddling the principle centerline of the vessel.

G. Tank Manway Covers:

1. Manway covers shall be 15-24-inch diameter.
2. Manway covers shall have either a threaded or bolted cover and gasket.

H. Tank Agitation System

1. The chemical storage tank shall contain an agitation system to maintain a consistent suspension of the stored material. The agitation system shall consist of a submersible pump activated periodically by a programmable timer, or other such agitation devices as deemed adequate by the manufacturer of the stored material.

2.3 CHEMICAL STORAGE TANK - SPECIFICATIONS

A. The chemical storage tank shall have the following capacity and approximate dimensions (+/- 5%):

PARAMETER	CHEMICAL TANK
Nominal Capacity	4,100 U.S. gal
Diameter	9'-10"
Height	9'

PARAMETER	CHEMICAL TANK
Empty Weight	1,100 lbs.
Specific Gravity	1.65

2.4 CHEMICAL FEED CONTROLS

A. General: The operation of the Chemical Feed System shall be controlled from a Control Panel located in the polyethylene skid. . All equipment control switches, pilot lights, controllers, etc. shall be housed in this panel. The control system shall be rated NEMA 4X, shall be UL Approved and shall bear the "UL Listed Enclosed Industrial Control Panel" Label. The control panel shall have the capability of a 4-20 mA signal for dosing control.

B. Enclosure: The control panel enclosure shall be constructed of polyethylene.

C. Components: The Control Box shall contain the following:

1. Operator interface - 1
2. On/off switches for auxiliary equipment with push to test LED indicator light - 1.
3. Off/Auto switches for pump control with push to test LED indicator lights – 2
4. Set of contracts with surge arrestor to accept Tank level Device - 1

* Panel capable of accepting RTD temperature probe.

D. Controls Layout: All manually operated controls (control switches, pilot lights, etc.,) shall be located on a panel behind the enclosure door.

E. Standards: All fabrication and wiring shall conform to the standards of Underwriter□s Laboratories, National Electrical Code, and any other applicable federal, state, or local codes.

F. System Operation: Chemical Feed Pumps. The diaphragm pump shall be controlled by a two-position OFF/AUTO switch. Control systems utilizing less than 168 discrete flow set points per week shall not be acceptable.

1. When in the AUTO position the pump shall be controlled by the advanced dosing controller. The advanced dosing controller shall vary the feed rate in 1-hour increments as specified by the Owner. The pumps shall be turned on and off by the advanced dosing controller to match the specified dose cure. The system shall have the capability to automatically adjust the feed rate based on wastewater temperature.
2. System shall automatically calculate and dose the specified volume of product with either one pump or two pumps activated. System shall have the capability to verify the volume dosed matches the preset curve via the tank level and shall alarm at three preset tank levels.
3. Automatic functions shall be protected by one-level security.
4. Flow set points shall be linearly interpolated to provide for smooth flow curve for each day
5. Systems shall be capable of dosing from seven different flow curves. Daily flow curves shall also be adjustable by a global setting to increase the feed rate percentage across all 24 daily set points.
6. System shall allow user to copy daily curves from one day to another for ease of set-up.
7. System shall have selectable High-Low-Empty digital output alarms and provide for remote customer lockout contacts for remote customer shutdown.
8. Feed pumps shall have the capability to be interlocked with the sewage pumps and shall have the capability to be automatically shutdown on empty tank alarm.

9. System shall calculate days of product remaining in storage tank and be capable of providing alarms for tank leak detection and pipe leak detection.
10. System shall accept, store, and display a totalized flow signal, run time, and lift station pump starts.

G. Control Pumps and Accessories: The PE skid shall incorporate secondary containment for the chemical feed pumps. A sump pump shall be provided to pump contained liquid to proper disposal.

1. Calibration Cylinder. The skid shall be used to house a calibration cylinder used to measure the chemical being injected into the system. A three-way valve shall be located at the top and bottom of the calibration tube to facilitate flow measurement.
2. Disconnect Switch. A main power disconnect shall be located on the control skid.
3. Pressure Relief. The skid shall be equipped with a pressure relief valve. The pressure relief valve shall be field adjustable from 0 – 150 psi via the adjustment screw
4. Back Pressure. The skid shall be equipped with a back pressure valve. The back pressure valve shall be field adjustable from 0 – 150 psi via the adjustment screw
5. Leak detection system shall be provided within the sump and shall be interlocked with the chemical feed pumps to disable pumps in the event a leak is detected.
6. Leak detection system shall be provided within the sump and shall be interlocked with the suction line to disable the chemical suction line in the event a leak is detected.
7. Control skid shall be placed on a curbed concrete pad with a gravity drain to the wetwell.

2.5 CHEMICAL FEED PUMPS

A. Provide two chemical metering pumps. Each pump shall be capable of delivering a maximum of 8.0 gph at a maximum pressure of 50 psi. Each pump shall have an accuracy rate of ± 1.5% within the control range. Pump shall have a 100:1 turndown. Chemical dosing pumps shall be solenoid actuated, positive-displacement, with mechanical diaphragm control. The pump shall be water resistant for outdoor installation, and internally dampened for noise reduction. The pump shall be a Wallace & Tiernan Premia 75 Series, or equivalent.

2.6 PIPING AND APPURTENANCES

A. All suction and discharge piping shall be standard ½", Schedule 80 PVC. All valves, fittings, and connectors shall be Schedule 80 PVC.

B. All fill line piping shall be 2" Schedule 80 PVC. All fill line valves, fittings, and connectors shall be Schedule 80 PVC.

C. Fill line shall have a 2" stainless steel male camlock with a 2" plastic female camlock cap.

D. All chemical feed seals shall be compatible with the chemicals to be used in the regular operation, maintenance, and cleaning of the feed system.

E. All fittings shall be solvent-welded or threaded.

2.7 LEVEL DETECTION

A. Provide tank liquid level indication inclusive in the feed system controller. The system shall utilize a signal generated from pressure transducer to measure the tank liquid level. A digital display shall be shall be available on the control panel to view tank level.

B. System shall accept inputs from up to two storage tanks and allow for horizontal tank calculations. System shall display under pumping and over pumping alarms through comparison of the dose curve and tank volume change.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install chemical feed equipment as indicated on the Contract Drawings and in accordance with the manufacturer's instructions and approved shop drawings.

B. Provide and connect piping, accessories, power and control conduit and wiring as required to ensure a complete operable system as intended. The following utiies are required for a complete system:

1. Electrical. One 120 VAC, 15 Amp electrical service shall be required.
2. Drain - A minimum 2-inch P.V.C. gravity pad drain to sewer is recommended.
3. Force main taps of ½" or larger must be provided for chemical injection and flow/pressure sensor.
4. Flow signal

C. Obtain and provide the Owner with an Installation Certificate from the equipment manufacturer's representative attesting that the equipment has been properly installed and is ready for start-up and performance testing.

3.2 SHOP TESTING

A. Before shipping the equipment, the Manufacturer shall perform shop tests. These tests shall include at a minimum:

1. Visual inspection of all equipment.
2. Complete assembly, start-up, and "wet-test" of feed pumps and calibration piping.

3.3 START-UP AND PERFORMANCE TESTING

A. Operate system for a continuous period of one hour, under the supervision of the manufacturer's representative and in the presence of the Engineer; demonstrate all system control functions and alarms.

B. Check pumps, motors, and drive units for excessive vibration and high bearing temperatures; check for motor overload by taking ampere readings.

C. The performance of the system shall be demonstrated to reduce hydrogen sulfide to meet the odor control level set forth in these Specifications per manufacturer□s standard practice.

3.4 EQUIPMENT ACCEPTANCE

A. Adjust, repair, modify or replace any components of the system which fail to perform as specified and rerun the tests.

B. System modifications will be subject to approval by the Engineer.

C. Make final adjustments to the equipment under the direction of the manufacturer's representative and to the satisfaction of the Engineer.

END OF SECTION 40 91 13

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-258-9 **CODE: (SP)**

DATE: **07/23/2009**

SUBJECT: **Miscellaneous Site Amenities**

PROJECT: STP-0055-04(091) & IM-0055-04(091) / 105575301 & 302 -- Desoto County

Section 907-258, Miscellaneous Site Amenities, is hereby added to and made a part of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction.

SECTION 907-258 -- MISCELLANEOUS SITE AMENITIES

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, water hydrants, sewage dump station, cast stone benches, sign (masonry and stone), metal benches, bollards, pavilions, survey monument, car stops, cigarette receptacles, and picnic shelters , 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 Drawings or established.

907-258.02--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. Contractor shall submit eight (8) copies of brochures or shop drawings for approval prior to ordering manufactured items. Other items may require testing as directed by the Engineer.

A. Charcoal Grill. Charcoal Grill shall be the Model No. 100001085 Rotating Grill with post as manufactured by Iron Mountain Forge, Dumor Site Furnishings – Model No. 22-00, PW Athletic Manufacturing Co. – Model No. 1140-00, or approved equal. Post shall be set within a Class C concrete footing, size as recommended by manufacturer.

B. Drinking Fountain.

1. Waste Pipe. Waste pipe shall be of the size and type as shown on the Drawings and shall be standard PVC drain waste and vent piping.

2. Drain Pipe. Drain pipe shall be the size shown on the Drawings 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 Drawings, 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.

C. Concrete Picnic Table and Benches.

1. Concrete. Concrete for table top, seat top, and end supports shall be Class "A" Concrete. Concrete for table slabs will be paid for as concrete sidewalks - Pay Item No. 608-B.

2. Reinforcing Steel. Reinforcing steel shall conform to Section 711.

3. Paint for Table top and Seats. Paint or coating for table top and seats shall be an approved HP Acrylic Latex paint conforming to or exceeding Master Paint Institute (MPI) numbers, primer MPI # 3 and topcoat MPI #141.

D. Wooden Picnic Tables and Benches. ADA Accessible Wooden Picnic Tables shall be the model number No.100000186, eight feet long with galvanized pipe frame and treated wood top and seats, as manufactured by Iron Mountain Forge, Picnic Table Source – Model No. M115-1061, All Picnic Tables – Model No. UPB158H-PT8, or approved equal.

Picnic tables shall be secured to the concrete with lead shields, anchors, or other means as approved by the Engineer.

E. Trash Receptacle.

1. Trash Receptacle. The trash receptacle shall be Upbeat Site Furnishings Model No. WR32AGBCT, 32-gallon Essence Receptacle Outdoor Trash Can with curved top, rounded corners and stone panels with leveling devices, rigid plastic liner, and hardware to secure the receptacle to the sidewalk, stone panel color shall be Golden Glo. United Receptacle, Inc. – Model No. R-38HT-202, Barco Products – Earth-Tone Panel Commercial Trash Cans, Model No. 38SQSTDMA, or approved equal.

2. Concrete. Concrete, unless otherwise specified, shall be paid for as sidewalk, and have a finish to match the finish on the adjacent sidewalk.

F. Water Hydrant.

1. Water Hydrant. Steel body, self-closing, anti-freezing hydrant with heavy stainless operating springs, with 3/4-inch supply as the model M-175 hydrant as manufactured by Murdock-Super Secur, The Kupferle Foundry Company model Total Eclipse #1 Yard Hydrant, , or approved equal. Color shall be black.

2. Concrete. Concrete, unless otherwise specified, shall be paid for as sidewalk and have

same finish as finish on adjacent sidewalk.

3. Valves (Stop and Drain). The cut-off valve shall be standard brass stop and drain cut-off valve of the proper size and type as shown on the Drawings.

G. Travel Trailer Sewage Dump Station (Modifications).

1. Sewage Dump Station. The sewage dump station shall be constructed similar to the details shown on the Drawings, with Schedule 40 galvanized steel pipe and fittings complete with vacuum breaker, and hose, in accordance with the Drawing details, and State Health Department minimum standards.

2. Concrete. Concrete unless otherwise specified shall be Class "B" conforming to Section 804 of the Standard Specifications and have an approved trowel finish.

3. Stand Pipe. Water stand pipe shall be standard galvanized Schedule 40 of the size shown on the Drawings.

4. Vent Pipe. Vent pipe shall be standard galvanized Schedule 40 of the size shown on the Drawings.

5. Signs. The signs shall be designed as shown on the details on the Drawings, constructed of 0.080-inch aluminum or 14 Ga. galvanized steel. The signs shall be manufactured by an approved sign company. The Contractor shall submit shop drawings.

H. Cast Stone Bench. Cast stone benches shall be constructed from the same material or an approved equal material as concrete picnic tables and benches.

I. Sign (Masonry and Stone).

1. Brick and Mortar. Brick and mortar shall be produced by the same manufacturer(s), and be the same type and kind, including bullnose and watertable units, and shall match the existing brick used on the Welcome Center Building, or approved equal.

2. Concrete Masonry Units. The concrete masonry units shall be hollow non-load bearing, light-weight aggregate, concrete masonry units conforming to ASTM Designation: C331-64T. Units shall be normal modular size for typical 3/8-inch mortar joint.

3. Concrete. Concrete, unless otherwise specified, shall be Class "B" conforming to Section 804 of the Standard Specifications.

4. Reinforcing Steel. Reinforcing steel shall conform to Section 711.

5. Precast Architectural Panel.

a. General.

Cement: Portland Cement shall conform to ASTM Designation: C-150, Type I or III.

Fine and coarse aggregate: Fine and coarse aggregate shall conform to ASTM Designation: C-33. Variations from aggregate gradations are permissible for the facing mix.

Reinforcement shall conform to ASTM Designation: C-185 for welded wire fabric.

Hot-dip galvanizing shall conform to ASTM Designation: A-153

Anchoring devices, inserts, etc., shall be either galvanized or corrosion resistant types approved by the Architect and as detailed on the Drawings.

b. Textures and Finishes. Precast architectural concrete shall be honed finish, lightly textured, approximating finish of limestone, with color as selected by the Engineer.

c. Fabrication. Precast architectural concrete shall be sufficiently reinforced to withstand conditions on the sign, including handling and erection stresses. Deformed bars with one inch (1") or less clearance to an exterior face shall be galvanized.

Units shall be fabricated straight, smooth, and true to size and shape, with exposed edges and corners precise and square unless otherwise indicated.

Reglets, slots, holes, and other accessories shall be provided in units to receive cramps, dowels, reglets, waterstops, flashings, and other similar work as indicated.

Arises, inscriptions and details shall be faithfully executed to the Engineer's design.

Each precast item shall be marked to correspond to identification mark on shop drawings.

Location of anchors, inserts and blockouts shall be plus or minus 3/8 inch from center line of location shown on drawings.

Rust-inhibitive coating shall be applied on damaged areas at welded connections, same as shop-applied material. Galvanizing repair coating shall be used on galvanized surfaces.

d. Mixes. Standard 6-inch by 12-inch cylinder strength of precast concrete shall not be less than 5,000 psi at 28 days when tested in accordance with ASTM Designation: C-39.

Absorption shall not be less than three percent (3%) and not more than seven percent (7%) when tested in accordance with ASTM Designation: C-97.

Minimum thickness of facing mix shall be 1½ 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, Matthews, or approved equal.

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.

J. Metal Bench. Garden – Style all – steel bench, six feet long, color – green, as Bench 118 series as manufactured by DuMor, Inc., Highland Products Group – 6-foot 'Sunshine' Thermoplastic-Coated expanded Metal Bench, Columbia Cascade Co. – Manor Bench No. 2824-6, or approved equal.

Metal Bench shall be secured to pavement. Method of securing shall be reviewed with and approved by the Engineer.

K. Bollard. Pipe shall be schedule 40 steel pipe, in the size as noted on the drawings. Finial shall be the Linn Park Ball Finial, as manufactured by Robinson Iron, Tennessee Fabricating Company, Reliance Foundry Co., Ltd., or approved equal. Pipe and finial shall be painted with 1 shop coat of a rust inhibitive primer and two (2) field coats of an oil base exterior paint, color selected by the Engineer. Class B concrete required for pipe infill.

L. Pavilion:

1. Masonry Components, Concrete, and Cast Stone. Masonry components, concrete, and cast stone shall conform to the specifications described in Sign (Masonry and Stone), above.

2. Steel. Steel shall be provided in the shapes, sizes, and fabricated as noted on the Drawings.

Steel shall receive the following paints/ coatings, all as manufactured by PPG, Sherwin Williams, Tnemec Company, Inc., or approved equal, and applied in strict accordance with the manufacturer's written instructions.

PPG Products		
First Shop Coat (primer)	UC65147 Zinc	3.0 – 4.0 Mils Dry Film Thickness
Field Spot Primer (if necessary)	UC65147 Zinc	3.0 – 4.0 Mils Dry Film Thickness
Second Field Coat	94-2800 pitthame*	3.0 – 6.0 Mils Dry Film Thickness

Third Field Coat	94-2800 pitthame*	3.0 – 6.0 Mils Dry Film Thickness
Sherwin Williams Products		
First Shop Coat (primer)	B65G10 Zinc	3.0 – 4.0 Mils Dry Film Thickness
Field Spot Primer (if necessary)	B65G10 Zinc	3.0 – 4.0 Mils Dry Film Thickness
Polyurethane finish		
Second Field Coat	B65-600 Series*	3.0 – 6.0 Mils Dry Film Thickness
Third Field Coat	B65-600 Series*	3.0 – 6.0 Mils Dry Film Thickness
Tnemec Products		
First Shop Coat (primer)	90-97 Tneme Zinc	2.5 – 3.5 Mils Dry Film Thickness
Field Spot Primer (if necessary)	90-97 Tneme Zinc	2.5 – 3.5 Mils Dry Film Thickness
Second Field Coat	74 Endura-Shield*	2.0 – 2.5 Mils Dry Film Thickness
Third Field Coat	74 Endura-Shield*	2.0 – 2.5 Mils Dry Film Thickness

*Color of second and third field coat shall be selected by the Engineer.

3. Metal Roof. Metal roof shall be copper roofing sheet, 16 ounce per square foot, with 1½ inch standing seam "S" lock located 16 inches on center. Contractor shall design fabrication and fastening of the system for an I-60 wind uplift rating, using the purlins as noted on the drawings.

   Product data for materials, and fastening devices as well as shop drawings noting assembly and finished product appearance shall be submitted for review and approval of the Engineer. A minimum of eight (8) copies of each is required.

   Roof panel system shall be guaranteed by the manufacturer for a period of five (5) years.

4. Display Panel. The display panel shall be an exterior rated panel, with a top hinged impact resistant acrylic cover, cylinder lock and gas cylinder cover supports; baked on enamel finish, metal back with magnetic back (interior); for wall mounting, in a 40-inch high by 60-inch wide size, as the Module x Wide Profile as manufactured by ASI Sign Systems, Matthews International Corp., Mohawk Sign Systems, Inc., or approved equal.

   Color of panel shall be selected by the Engineer.

   Mounting of panel to metal work shall be reviewed with and approved by the Engineer.

M. Survey Monument.

1. Masonry Components and Concrete. Masonry components and concrete shall conform to the specifications described in Sign (Masonry and Stone), above.

2. Granite. Polished (finish) granite veneer, in the thickness as noted on the drawings. Color shall be selected by the Project Engineer. Method of attachment to masonry and

devices for attachment shall be reviewed with and approved by the Engineer.

N. Car Stop. Car stops shall be six (6) foot long concrete curb (car) stops. Curb stops shall be secured to pavement with two (2) No. 3 reinforcing bars, 24 inches long.

O. Cigarette Receptacle. Cigarette Receptacles shall be Aladdin Smoker' Station – Model Number R1639E-HCHAR- steel smokers' station, 39 inches high by 16 inches diameter, color – Hammertone Charcoal, as manufactured by Gilmore-Kramer Company, Johnson Environmental Products –Smokers Outpost-black Model Number 710101 , Ashtrays And Urns – Smoker' Station Model Number LL144-1645 , or approved equal.

Cigarette Receptacle shall be secured to pavement with anchoring kit. Method of securing shall be reviewed with and approved by the Engineer.

P. Picnic Shelter:

1. Building Type. Building shall be Icon HIP 16 x 24T as manufactured by Icon Shelter Systems Inc., American Building Products "Navajo Shelters", Litchfield Industries "Pittsburg Hip End", or approved equal.

2. Concrete. Concrete shall conform to the specifications described in Sign (Masonry and Stone), above.

3. Description. Picnic shelter shall be 16 feet by 24 feet galvanized steel frame hipped rectangle shelter with standard 24 gage Multi-rib metal roof panels, overhead "Linear" ornaments and square stepped base columns.

4. Submittals. Product data for materials, color charts and fastening devices as well as shop drawings noting assembly and finished product appearance shall be submitted for review and approval of the Engineer.

5. Steel Framing and Finishes. Steel framing, columns, base covers and overhead ornaments shall receive hot-dipped zinc galvanizing prior to finish. A double coat of TGIC polyester powder coating shall be applied. Color shall be "Surrey Beige", unless another color is selected by the Engineer from manufacturer's standard 14 colors

6. Base Connection. Base connection shall be surfaced mounted with base covers.

7. Metal Roof Materials. Metal roof material shall be standard 24 gage Galvalume® Multi-rib roof panels with Kynar 500 finish. Color "Copper Penny", or other color selected by the Engineer. Design fabrication and fastening of system for an UL 90 wind uplift rating. Roof pitch shall be 4:12, unless noted otherwise on Drawings.

8. Warranty. Product shall carry a manufacturer's standard 10-year warranty

907-258.03--Construction Requirements. 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.

A. Charcoal Grill. The charcoal grill with concrete footing shall be installed in accordance with the manufacturer's written instructions in the locations as noted on the Drawings.

B. 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 Drawings, 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 Drawings or as directed by the Engineer. The concrete will be paid for under separate pay item for that class of concrete.

C. Concrete Picnic Tables and Benches. Concrete picnic tables and benches shall be constructed to the detailed dimensions shown on the Drawings. 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 Drawings and as directed by the Engineer.

D. Wooden Picnic Tables and Metal Benches. Wooden picnic tables and metal benches shall be located and secured in an approved manner as shown on the Drawings and as directed by the Engineer.

E. Trash Receptacle. The trash receptacle shall be installed on and secured to a square concrete pad four inches thick, with outside dimensions six inches greater than the width of the trash receptacle, in locations designated by the Engineer.

The excavation when required to place the trash receptacle into the ground shall be disposed

of as directed by the Engineer.

The concrete shall be placed and finished to match the adjacent sidewalk. On locations adjacent to existing sidewalks, top of concrete pad for the receptacle shall meet flush with existing walk. Slope elevation of pads no more than 1/8 inch per foot in order that water will not stand.

The method to secure the trash receptacle to the concrete pad shall be submitted to the Engineer for approval.

F. Water Hydrant. Install water hydrant in accordance with the manufacturer's written instructions and the Drawings.

G. 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 Drawings.

H. Cast Stone Bench. The cast stone benches shall be a similar design and size as shown on the Drawings. Brochures or shop drawings shall be submitted.

The benches shall be secured to the sidewalk or bench pad in an approved manner with epoxy cement or other approved cement, to the satisfaction of the Engineer.

I. Sign (Masonry and Stone), Pavilion, and Survey Monument. The excavation required to place the sign and survey monument into the ground shall be disposed of as directed by the Engineer.

The concrete base shall be constructed as shown on the Drawings or as directed by the Engineer. The placing and fastening of reinforcement shall conform to Subsection 805.05.

Concrete Masonry Unit and Brick construction shall be in accordance with Section 611, and to the satisfaction of the Engineer.

Precast architectural concrete panels shall be set straight, plumb, level, and square. Exposed facings shall be cleaned to remove dirt and stains which may be on the units after erection and completion of joint treatments. Panels shall be washed and rinsed in accordance with precast manufacturer's recommendations. Other work shall be protected from damage due to cleaning operations. Do not use cleaning materials or processes which could change the character of exposed concrete finishes.

Letters and symbols shall be attached in accordance with the Drawings, approved shop drawings, and to the satisfaction of the Engineer.

Pavilion and survey monument shall be constructed straight, plumb, level, and square, in accordance with the drawings and to the satisfaction of the Engineer. Welds shall be grinded smooth prior to painting/ coatings application.

J. Metal Bench. Metal bench shall be located where noted on the Drawings. Metal bench shall be secured to pavement as approved by the Engineer.

K. Bollard. Bollards shall be constructed plumb and in accordance with the drawings to the satisfaction of the Engineer. Welds shall be ground smooth prior to painting/ coatings application.

N. 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 1/4 inch below the top of the car stop.

O. Cigarette Receptacle. Cigarette receptacles shall be located where noted on the Drawings. Secure to pavement as approved by the Engineer.

P. Picnic Shelter. The excavation required to place the picnic shelter into the ground shall be disposed of as directed by the Engineer.

The concrete base shall be constructed as shown on the Drawings or as directed by the Engineer. The placing and fastening of reinforcement shall conform to Subsection 805.05

Picnic shelter shall be constructed straight, plumb, level, and square, in accordance with the drawings and to the satisfaction of the Engineer. Care shall be taken to protect paint finishes and touch up with matching paint and color to the satisfaction of the Engineer. Items that can not be successfully repaired in the field shall be replaced.

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 Drawings.

A unit of wooden picnic tables shall consist of one table with benches, and the devices to secure the table when required.

A unit of charcoal grill shall consist of the grill complete with steel post and concrete footing.

A unit of drinking fountain shall consist of all concrete, steel, masonry elements, piping, plumbing elements, and drains as shown on the Drawings.

A unit of trash receptacle shall consist of the receptacle, complete, with leveling devices and approved devices to secure the trash receptacle to the pavement.

A unit of water hydrant shall consist of the hydrant complete with connection to water supply, piping, cut off valve, drain and drain line (where shown), and concrete footing, located where shown on the plans and installed in accordance with manufacturer's directions.

A unit of travel trailer sewage dump station shall consist of one tower, one drain, signs and concrete as shown in the plan details.

A unit of cast stone bench shall consist of one bench seat and three bench supports.

A unit of sign (masonry and stone) shall consist of all concrete, steel, masonry elements, letters, as symbols shown on the plans.

A unit of bollard shall consist of steel pipe with finial, and concrete for footing and infill, as shown on the plans.

A unit of metal benches shall consist of one bench, and the devices to secure the bench when required.

A unit of pavilion and survey monument shall consist of concrete (not including sidewalk), steel (painted), metal roof, masonry elements, granite, re-location of survey monument, and display panel as applicable and as shown on the Drawings.

A unit of cigarette receptacle shall consist of one receptacle, and the devices to secure the receptacle when required.

A unit of picnic shelter shall consist of concrete (not including sidewalk), steel framing, metal roof, steel columns, and overhead ornaments, as shown on the Drawings.

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, cast stone benches, sign (masonry and stone), metal benches, bollards, pavilion, survey monument, car stops, cigarette receptacles, and picnic shelters each unit shall be paid for at the contract unit price bid per each, which price shall be full compensation for furnishing all materials and supplies; for performing all work necessary for each completed unit; and for all equipment, tools, labor and incidentals necessary to complete the work.

Payment will be made under:

907-258-A:	Charcoal Grill	- per each
907-258-B:	Drinking Fountain	- per each
907-258-C:	Concrete Picnic Table and Benches	- per each
907-258-D:	Wooden Picnic Table and Benches	- per each
907-258-E:	Trash Receptacle	- per each

907-258-F:	Water Hydrant	- per each
907-258-G:	Travel Trailer Sewage Dump Station	- per each
907-258-H:	Cast Stone Bench	- per each
907-258-I:	Sign, Masonry and Stone	- per each
907-258-J:	Metal Bench	- per each
907-258-K:	Bollard	- per each
907-258-L:	Pavilion	- per each
907-258-M:	Survey Monument	- per each
907-258-N:	Car Stop	- per each
907-258-O:	Cigarette Receptacle	- per each
907-258-P:	Picnic Shelter	- per each

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-259-6 **CODE: (SP)**

DATE: **07/10/2009**

SUBJECT: **Miscellaneous Site Lighting**

PROJECT: **STP/IM-0055-04(091) / 105575301 & 302 – Desoto County**

Section 907-259, Miscellaneous Site Lighting, is hereby added to and made a part of the Standard Specifications for Road and Bridge Construction, 2004 Edition.

SECTION 907-259 – MISCELLANEOUS SITE LIGHTING

907-259.01--Description. This item shall consist of installing Unlighted and Lighted Bollards, Flag Pole Lights, Sign Lights, Vapor Tight Fluorescents, Column Up-lights, and Vandal Resistant Fluorescents, each complete in place with lamp, 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 shall 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. Unlighted Bollards: Unlighted Bollards shall be Model Number BOL/CH44/12/DT-CA/BK as manufactured by Holophane, BLMV by Spring City or 7701B/BK by Sternberg. Bollards shall be fluted, cast aluminum with a decorative base and dome top. They shall match and be the same manufacturer as lighted bollard. Color shall be black, factory painted.

B. Lighted Bollards: Lighted Bollards shall be Model Number BOL/CH44/12/DTL-CA/BK-M70/xx, as manufactured by Holophane, BLMVL by Spring City or 7701LB/100MHxx by Sternberg. It shall be fluted, cast aluminum with decorative base and dome top. They shall match and be the same manufacturer as pole for area luminaire. It shall have Type V distribution with no louvers. The voltage and single fuse protection shall accommodate the available voltage on site. Color shall be black, factory painted.

C. Flag Pole Lights: Flag pole lights shall be Model Number VFS-K-175MP-xx-HS-BK as manufactured by Cooper, DF7-ST-HSP-175PSMH-xx-BLP by Gardco or AFL27-175PMHxx-BL by Kim. Fixture and knuckle shall be heavy-duty die-cast aluminum, mounted on stanchion in concrete base and have horizontal spot optics. The voltage and

single fuse protection shall accommodate the available voltage on site. Color shall be black, factory painted.

D. Sign Lights: Sign lights shall be Model Number PVT5HO-48-BLK-HB-(2)HBX, as manufactured by Architectural Area Lighting, SNSOC-1LFT5-1C120-K-CYI by Cooper or P1-SSW-148T5/HO-SCK1L/R/I-SGB by Winona. The light shall have 4-foot long extruded aluminum housing, with all required accessories for continuous 12'-0" row configuration. Ballasts shall be internal to the fixture housing or remote mount in single enclosure on rear of sign. The voltage and single fuse protection shall accommodate the available voltage on site. Color shall be black, factory painted.

E. Vapor Tight Fluorescents: Vapor tight fluorescents (4-foot long -1 lamp) shall be Model Number LWPE154HO-xxx-LT, as manufactured by Day-Brite, VT3-154T5-DR-xxx-EHT1 by Cooper or LUN4-154-EPU-PP by Columbia. Fixture shall be a non-metallic, wet location housing with prismatic lens and use low temperature ballast and T5HO lamp. The voltage shall accommodate the available voltage on site.

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 Up-lights: Column up-lights shall be Model Number LTV10-NF-100PMHxxx, as manufactured by KIM, G7100MH-RB-W-NF-xxx by Bronzelite or 6000N-MH100NFL-xxx-BZ by Lumiere (Cooper). Fixture shall be composite housing with cast bronze lens ring and narrow flood optics. The voltage shall accommodate the available voltage on site.

H. Vandal Resistant Fluorescents: Vandal resistant fluorescents (4-foot long -2 lamp) shall be Model Number SLW232-UNV-1/2LT, as manufactured by Day-Brite, FPS232-xxx-EB82 by Cooper or VL4-232-EU by Columbia. Fixture shall have clear prismatic, high impact, polycarbonate lens and use low temperature ballast. The voltage shall accommodate the available voltage on site.

907-259.03--Construction Requirements. The Contractor shall provide and install miscellaneous site lighting 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. Miscellaneous site lighting of the type specified will be measured by the unit quantity per each.

907-259.05--Basis of Payment. Miscellaneous site lighting, measured as prescribed above, 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:	Unlighted 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, Vapor Tight	- per each
907-259-F:	Weatherproof GFCI Receptacle	- per each
907-259-G:	Lighting Assembly, Column Uplights	- per each
907-259-H:	Lighting Assembly, Vandal Resistant	- per each

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-262-2 **CODE: (SP)**

DATE: 08/14/2009

SUBJECT: Santitary Sewer System

PROJECT: STP-0055-04(091) & NH-0055-04(091) / 105575301 & 302 -- Desoto County

Section 907-262, Santitary Sewer System, 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 907-262--SANITARY SEWER SYSTEM

907-262.01--Description. This work shall consist of the installation of a sanitary sewer force main consisting of 6-inch PVC Pipe, C900, Class 100 in accordance with these Specifications and conforming to the Plans.

This Work shall consist of installation of gravity sanitary sewers consisting of 8" PVC Pipe, SDR 35 in accordance with these Specifications and conforming to the Plans.

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

907-262.02--Materials. Materials shall meet the following applicable sections.

1.1 REFERENCES

A. Referenced publications found within this specification shall be the latest revision unless otherwise specified; and applicable parts of the referenced publications shall be come a part of this specification as if fully included.

1. ASTM American Society for Testing and Materials:
   - a. ASTM C 920 Specification for Elastomeric Joint Sealants.
   - b. ASTM D 3960 Practice for Determining Volatile Organic Compound Content (VOC) of Paints and Related Coatings
   - c. ASTM D 4259 Practice for Abrading Concrete.
   - d. ASTM E 337 Standard Practice Test Method for Measuring Humidity with a Psych meter.
   - e. ASTM F 710 Practice for Preparing Concrete Floors and Other Monolithic Surfaces to Receive Resilient Flooring

2. FEDERAL STANDARD COLORS:
   a. F 595 B Federal Standard Colors
   b. Guideline No. 03732 Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays
3. ICRI International Concrete Restoration Institute:
4. Guideline No. 03732 Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays
5. NACE (National Association of Corrosion Engineers)
   a. NACE Publication 6D 173 "A Manual for Painter Safety"
   b. NACE Publication 6G-164 "Surface Preparation Abrasives for Industrial Maintenance Painting"
   c. NACE Publication 6G-164 "Surface Preparation Abrasives for Industrial Maintenance Painting"
   d. NACE Publication TPC2 Coatings and Linings for Immersion Service: Chapter 1 Safety, Chapter Surface Preparation, Chapter 3 Curing, and Chapter 4 Inspection
   e. NACE Publication 617-163 "Surface Preparation of Steel or Concrete Tank Interiors."
   f. NACE RP0892-92 Standard Recommended Practice, Lining over Concrete in Immersion Service.
   g. NACE RP0288-88 Standard Recommended Practice, Inspection of Linings on Steel and Concrete.
6. SSPC Steel Structures Painting Council
   a. SSPC-SP12 Surface Preparation and Cleaning of Steel and Other Hard Materials by High and Ultrahigh Pressure Water Jetting Prior to Recoating.
   b. SSPC-SP13 Surface Preparation of Concrete
   c. SSPC-PA-3 "A Guide to Safety in Paint Application"
   d. SSPC-Guide 12 Guide for Illumination of Industrial Painting Project.
7. OSHA (Occupational Safety & Health Administration:
   a. 1915.35 Standards - 29 CFR - Painting.
8. ANSI American National Standards Institute:
   a. ANSI/ASC 29.4 Exhaust Systems Abrasive Blasting Operations - Ventilation and Safe Practice

1.2 SUBMITTALS

A. Submit the following prior to commencing with any phase of the work covered by this Section:

1. Manufacturer's current printed recommendations and product data sheets for all coating system products supplied under this section including performance criteria, surface preparation and applications, volatile organic compound (V.O.C.) data, and safety requirements.

2. Material Safety Data Sheets (MSDS) for any materials brought on-site including all resurfacing system materials, solvents, and abrasive blast media.
3. Storage requirements including temperature, humidity, and ventilation for resurfacing system materials.
4. Manufacturer's requirements, including application procedures for resurfacing materials shall be in writing and shall be followed in detail. All safety precautions recommended by the Manufacturer shall be strictly adhered to at all times when work is in progress.
5. Color samples for all surfaces to be resurfaced that have been field matched to existing colors.
6. Submit applicators' certification that resurfacing materials comply with Federal, State, and Local regulations for VOC (Volatile Organic Compounds).
7. Submit daily reports that contain the following information: Substrate conditions, ambient conditions, application procedures, work completed and location thereof. Mark-up drawings that show location of work.
8. Submit letter(s) with associated product data signed by Manufacturer certifying that submitted products are suitable for application on the surfaces to be resurfaced and for the service conditions.

B. Submit the following information at the completion of the work identified within the scope of this section:
   1. Submit daily reports that contain the following information: surface preparation, substrate conditions, ambient conditions, application procedures, coating materials used, coating material quantities, batch numbers of materials used, and work completed and location thereof. Mark-up drawings that show location of work.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Materials shall be stored in accordance with Manufacturer's recommendations in enclosed structures and shall be protected from weather and adverse temperature conditions. Flammable materials shall be stored in accordance with state and local codes. Materials exceeding storage life recommended by the manufacturer shall be removed from the site.

B. Store all materials only in area or areas designated by the Engineer solely for this purpose. Confine mixing, thinning, clean-up and associated operations, and storage of materials-related debris before authorized disposal, to these areas. All materials are to be stored on pallets or similar storage/handling skids off the ground in sheltered areas in which the temperature is maintained between 50°F and 90°F.

C. Mix all resurfacing materials in an enclosed mixing area designated by the Engineer. This enclosed area must protect the mixing operation and materials from direct sunlight, inclement weather, freezing, or other means of damage or contamination. Protect all other concrete and metallic surfaces and finishes from any spillage of material(s) within the mixing area.

D. Do not use floor drains, dikes or storm drains for disposal of resurfacing system materials.

E. The Contractor shall take all precautions and implement all measures necessary to avert potential hazards associated with the resurfacing system materials as described on the pertinent Material Safety Data Sheets or container labels.

F. Deliver all materials to the job site in their original, unopened containers. Each container shall bear the Manufacturer's name and label.

1. Labels on all material containers must show the following information:
   a. Name or title of product.
   b. Federal Specification Number if applicable. c. Manufacturer's batch number and date of manufacture. d. Manufacturer's name.
   c. Generic type of material.
   d. Application and mixing instructions.
   e. Hazardous material identification label. h. Shelf life date.
   f. Storage requirements.
2. All containers shall be clearly marked indicating any personnel safety hazards associated with the use of or exposure to the materials.
3. All materials shall be handled and stored to prevent damage or loss of label.
4. Resurfacing material storage and mixing areas shall be designated by the Engineer.
5. Do not use or retain contaminated, outdated, prematurely opened, diluted materials, or materials which have exceeded their shelf life.

1.4 SAFETY

A. The Contractor's work forces should comply with the provisions outlined in the following documents:
   1. SSPC-PA-3"A Guide to Safety in Paint Application"
   2. NACE Pub. "A Manual for Painter Safety"

B. The Contractor shall provide personnel with all safety equipment necessary to protect them during any phase of the work. This shall include, but not be limited to safety glasses, goggles, earplugs, hard hats, steel toed work shoes, appropriate personal protective clothing, gloves, and plant approved escape respirators (where required).

C. No work shall be performed until the appropriate Work Requests and lock-outs are approved by the Engineer. The Work Request system provides a mechanism to advise plant staff of a contractor's work activities. The Lockout system is a safety procedure to prevent unintended equipment activation.

D. Keep any flammable materials such as cleaning solvents, thinners, or resurfacing materials away from open flames, sparks or temperatures higher than 150°F. Drums containing flammable materials will be grounded. No solvent in any quantity shall be allowed inside containment enclosures or permitted confined spaces at any time during resurfacing work.

E. Power tools are to be in good working order to avoid open sparking. No spark producing tools shall be utilized in restricted areas as indicated herein.

F. The Contractor shall fireproof all work areas by maintaining a clean work area and having Underwriter's Laboratories approved fire extinguishers on-hand. The Contractor shall furnish these fire extinguishers.

G. Workers doing abrasive blasting operations shall wear a fresh air supplied protective helmet and hood and personal protective clothing acceptable to industry standards and all government regulations.
H. Dispose of rags used for wiping up resurfacing materials, solvents, and thinners by drenching them with water and placing in a metal container with a tight fitting metal cover. Complete this disposal process at the end of each day. Final disposal of these materials is the Contractor's responsibility.
I. Matches, smoking, flames, or sparks resulting from any source including welding, must be remote from the work area during coating work. Smoking is permitted only in designated areas of the plant.

1.5 JOB CONDITIONS

A. Environmental:
1. Air and Surface Temperatures: Prepare surfaces and apply and cure coatings within air and surface temperature range in accordance with Manufacturer's instructions.
2. Surface Temperature: Minimum of 5 degrees F (3 degrees C) above the dew point.
3. Relative Humidity: Prepare surfaces and apply and cure coatings within relative humidity range in accordance with Manufacturer's instructions.
4. Precipitation: Do not prepare surfaces or apply coatings in rain, snow, fog, or mist.
5. Wind: Do not spray coatings if wind velocity causes overspray of the coating materials.

1.6 MANUFACTURERS

A. Materials specified are those that have been evaluated for the specific service. Products of the Tnemec Company, Inc. or APPROVED EQUAL are listed to establish a standard of quality. Equivalent materials of other manufacturer's may be submitted on written approval of the Engineer. As part of the proof of equality, the Engineer will require at the cost of the Contractor, certified test reports from a nationally known, reputable and independent testing laboratory conducting comparative tests as directed by the Engineer between the product specified and the requested substitution.
B. Requests for substitution shall include manufacturer's literature for each product giving name, product number, and generic type, descriptive information, solids by volume, recommended dry film thickness and certified lab test reports showing results to equal the performance criteria of the products specified herein. In addition, a list of five projects shall be submitted in which each product has been used and rendered satisfactory service.
C. All requests for product substitution shall be made at least 10 days prior to the bid date.
D. Any material savings shall be passed to the owner in the form of a contract dollar reduction.

1.7 MATERIALS

A. Epoxy Lining System:

1. Materials specified herein are the only approved standard coating systems unless an "or equal" is approved in writing by the Engineer prior to the bid date.
2. The following list specifies the material requirements for resurfacing systems. The approved products are as follows:
   a. Shotcrete: Master Builders EMACO S88 Cl, Sikacem 103 or equal:
      1) Shall be a Portland Type I or Type II cement based material with no polymer additives and with the following minimum performance properties:
         a) Compressive Strength ASTM C-109 Minimum 7000 psi at 7 days
         b) Freeze Thaw ASTM C 666 After 300 cycles, Minimum 95% c.
         c) Splitting Tensile Strength ASTM C-496 Minimum 500 psi at 7 days
         d) Flexural Strength ASTM C 348 Minimum 1000 psi after 7 days
         e) Direct Bond Strength ACI 503.R Minimum 290 psi after 28 days
      2) Calcium-Aluminate based materials will not be approved for use on this project.
   b. Lining: Tnemec Perma-Shield Series 434, or equal
      1) Minimum Performance Requirements:
         a) Autoclave:

            Lining materials must be tested in a controlled autoclave containing 536 ppm H2S, 10% H_2SO4, 4,000 ppm NaCl @ 150°F for 28 days.

            The autoclave testing must be performed by an independent laboratory.

            The lining materials must exhibit the following when tested using Electrical Impedance Spectroscopy (EIS):

            1) Initial EIS impedance of 10 Log Z (Z in ohms cm^2 @ 0.1 Hz)
            2) Final EIS impedance greater than 9 Log Z after 28 days exposure
            3) No blistering cracking, checking, or loss of adhesion after 28 days exposure to the H_2S autoclave.
         b) Impact (ASTM D 2794): Requirement - No visible cracking or delamination after 56 inch-pounds direct impact
         c) Chemical Resistance (ASTM C 868): Requirement - No blistering, cracking, erosion, softening, swelling, loss of adhesion or gloss after 98 day continuous immersion at 10017 and 25% Sulfuric Acid

B. Abrasive Blast Media: If dry or wet abrasive blast cleaning is the selected method of surface preparation, provide slag grit of a sieve size, gradation, and quality necessary to produce the degree of cleanliness and surface profile required herein.

1.8 MANHOLES

Manholes shall be as required in the special provision for manholes.

1.9 PIPE AND PIPE FITTINGS

Pipe, pipe fittings, and testing for pipe shall be as required in the special provision for manholes

907-262.03--Construction Requirements. Installation shall meet the following applicable sections.

2.0 GENERAL

A. Hoisting, Scaffolding, Staging, and Planking:
   1. Provide, set-up, and maintain all required hoists, scaffolds, and staging and planking, and perform all access related hoisting work required to complete the work of this section as indicated and specified.
   2. 2Scaffolds shall have solid backs and floors to prevent dropping materials from there to the floors or ground below.

B. Environmental Requirements:
   1. Comply with the Manufacturer's recommendations as to environmental conditions under which materials can be applied.
   2. Do not apply materials when dust is in work site.
   3. The Contractor shall provide all temporary lighting during the work.

C. Protection:
   1. Cover or otherwise protect finish work or other surfaces not being resurfaced.
   2. Erect and maintain protective tarps, enclosures and/or maskings to contain debris (such as dust or airborne particles resulting from surface preparation) generated during any and all work activities. This includes, but is not limited to, the use of dust/debris collection apparatus as required.

D. Initial Inspection of Surfaces to be Coated:
   1. It is the responsibility of the Contractor to inspect and report unacceptable concrete substrate surface conditions to the Engineer prior to the commencement of surface preparation activities.
   2. Unacceptable concrete surface conditions are defined as the presence of water infiltration/inflow, cracked surfaces or concrete deteriorated to a depth of greater than 1" or otherwise unable to withstand surface preparation as specified herein.
   3. Verify that the pH of the cleaned concrete surfaces to be coated is within the range of to 9 to 11. Application of coating materials outside this range will not be permitted without written approval from the Engineer.
   4. Unacceptable steel or ductile/cast iron surface conditions are defined as severely corroded and/or perforated metals and are unable to withstand surface preparation as specified herein.

E. Thinners and Solvents: The Contractor shall use only solvents and thinners as recommended by the Manufacturer.

2.1 SURFACE PREPARATION REQUIREMENTS

A. General:

1. All specified surface preparation shall be performed in accordance with the latest version of the SSPC, NACE, ICRI and other standards referenced in this section.
2. Allow new concrete to cure a minimum of 28 days. Verify dryness by testing for moisture with a "plastic film tape down test." (Reference ASTM D 4263). If necessary for testing horizontal surfaces, Calcium Chloride test in accordance with ASTM F 1869. If test results indicate moisture levels outside the acceptable range of the manufacturer, contact the manufacturer. Do not proceed with the coating application.
3. Prior to applying shotcrete, all existing areas that are scheduled to receive the chemical resistant lining shall be steam cleaned with minimum 210°F water with alkaline -based detergent to remove all loose materials, acid constituents, grease, oil, and other contaminants. Oil and grease shall be removed before mechanical cleaning is started.
4. Mechanically abrade all surfaces to be coated to remove laitance, curing compounds sealer and other contaminants and to produce a minimum surface profile equal to ICRI CSP 5. Reference SSPC-SP13. This preparation will be followed by vacuum cleaning to remove all dust, dirt or friable substances leaving clean, dust free surfaces for resurfacing.
5. Prior to applying shotcrete, identify and stop all active cracks from leaking using either a hydraulic cement or a chemical grout such as DeNeef Flex LV or equivalent from Avanti. The set time of the Hydraulic Cement shall be approximately 1 minute to 90 seconds per ASTM C 403. The compressive strength of the hydraulic cement shall be approximately 1000 psi after 1 hours per ASTM C 109. All products are to be applied in accordance with manufacturer's instructions.
6. For all areas one foot below the low water line and above (except new concrete surfaces), apply shotcrete to bring surfaces out to '/2" beyond original grade. The application shall result in a finish that covers all exposed aggregate and results in no surface voids, discontinuities or irregularities. Cure in accordance with manufacturer's instructions and in accordance with ACI 308.1-98.
7. For all areas one foot below the low water line and new concrete surfaces, apply a full skim coat of Tnemec Series 218 or APPROVED EQUAL to fill all voids and bugholes.
8. All shotcreted surfaces shall be abrasive blasted to remove all laitance from release agents, curing compounds sealers and other contaminants and to produce a minimum surface profile of ICRI CSP 5. This preparation will be followed by vacuum cleaning to remove all dust, dirt or friable substances leaving clean, dust free surfaces for resurfacing. The air used for blast cleaning shall be free of oil and moisture to not cause contamination of the surfaces to be resurfaced.
9. The air used for blast cleaning shall be free of oil and moisture to not cause contamination of the surfaces to be resurfaced.

10. Cleaning and resurfacing shall be scheduled so that dust and other contaminants from the cleaning process will not fall on wet, newly resurfaced areas.

B. Initial Cleaning/Decontamination:

1. All existing areas to be resurfaced shall be pressure washed with alkaline -based detergent to remove all loose materials, acid constituents, grease, oil, and other contaminants.
2. Verify that the pH of the cleaned concrete surfaces to be coated is within the range of 9 to 11. Application of coating materials outside this range will not be permitted without written approval from the Engineer.

C. Abrasive Blast Cleaning:

1. Used or spent blast abrasive shall not be reused on work covered by this section.
2. The compressed air used for blast cleaning will be filtered free of condensed water or oil. Moisture traps will be cleaned at least once every four hours or more frequently as is appropriate.
3. Oil separators shall be installed just downstream of compressor discharge valves and at the discharge of the blast pot discharges. Oil separators shall be cleaned at least once every four hours or more frequently as is appropriate.
4. A paper blotter test shall be performed by the Contractor when requester by the Engineer or the Engineer's representative to determine if the air i,, sufficiently free of oil and moisture.
5. Regulators, gauges, filters, and separators will be in good working order for all of the compressor air lines to blasting nozzles at all times during this work.
6. An air dryer or drying unit shall be installed which dries the compressed air prior to blast connections. This dryer shall be used and maintained for the duration of surface preparation work.
7. The quality, volume, and velocity of life support and ventilation air used during surface preparation shall be in accordance with applicable safety standards and as required to ensure adequate visibility and proper dissipation of volatiles without impacting the prepared surface or the health of the public or personnel working for the Contractor, Subcontractors, Engineer, Engineer's Representatives, or anyone who may be affected by on-site maintenance coating work activities.
8. The abrasive blast nozzles used shall be the venturi or other high velocity type supplied with a minimum of 100 psig air pressure and the necessary volume to obtain the required blast cleaning production rates and specified degree of cleanliness.
9. The Contractor must provide adequate ventilation for airborne particulate evacuation and lighting (meeting all pertinent safety standards) to optimize visibility for both blast cleaning and observation of the substrate during surface preparation work.
10. All phases of surface preparation work specified herein must be inspected by the Engineer before the Contractor proceeds with the subsequent phase of surface preparation.
11. If between final surface preparation work and coating application, contamination of the prepared and cleaned substrate occurs, or if the prepared steel's appearance darkens or changes color, reblasting will be required until the specified degree of cleanliness is established.

2.2 APPLICATION REQUIREMENTS

A. General:

1. Areas not to be resurfaced shall be masked using duct tape or other protection materials to prevent these surfaces from being resurfaced.
2. Ensure straight even termination of resurfacing/topcoat materials on wall edges and flush with embedded steel.
3. The Contractor must follow the minimum and maximum recoat limitation times and related temperature range restrictions between successive lifts for all products specified herein per Manufacturer's stated requirements.
4. All equipment and procedures used for resurfacing system application shall be as recommended by the Manufacturer.
5. Unless specified elsewhere herein, the Contractor shall comply with the Manufacturer's most recent written instructions with respect to the following:
   a. Mixing of All Materials.
   b. Protection and Handling of All Materials.
   c. Recoat Limitation and Cure Times.
   d. Minimum Ambient and Substrate Temperatures, Substrate's Degree of Dryness, Relative Humidity, and Dew Point of Air.
   e. Application.
   f. Final Curing.
   g. Use of Proper Application Equipment.
6. Curing of Resurfacing System: The applied resurfacing system shall be protected from damage during curing and shall be cured as recommended by the Manufacturer. Ambient conditions shall be controlled by the Contractor during curing to ensure the minimum air temperature and minimum relative humidity as required by the Manufacturer is maintained.

B. Chemical Resistant Lining:

1. General Note: The Contractor is advised that with all thick-film, quick curing materials applied to concrete surfaces, outgassing of the concrete can occur. Possible remedies include applying materials when the temperature of the concrete surfaces are descending, or applying a thin (1/8") layer of the specified surfacing material. Other remedies may exist, and may be submitted for the Engineer's approval.
2. Apply shotcrete and Tnemec Series 218 or Approved Equal After shotcreting, prepare surfaces as described in Subsection 3.2.
3. Apply Tnemec Series 434 Permashield chemical resistant mortar to all floor areas and walls scheduled to be coated at a nominal thickness of 125 mils. Application shall be either by trowel or spray. If spray-applied, material shall be finish-troweled to a hard, dense film.

C. Safety And Ventilation Requirements:

1. Requirements for safety and ventilation shall be in accordance with SSPC Paint Application Guide No. 3.

3.3 FIELD QUALITY CONTROL INSPECTION AND TESTING

A. Inspection by the Engineer or others does not limit the Contractor's responsibilities for quality control inspection and testing as specified herein or as required by the Manufacturer's instructions.

B. Perform the quality control procedures listed below in conjunction with the requirements of this Section.

1. Inspect all materials upon receipt to ensure that all are supplied by the Manufacturer.
2. Provide specified storage conditions for the resurfacing system materials, solvents, and abrasives.
3. Inspect and record findings for the degree of cleanliness of substrates using. The pH of the concrete substrate will be measured using pH indicating papers. pH testing is to be performed once every 50 sq. ft. Acceptable pH values shall be between 9.0 and 11.0 as measured by a full-range (1-12) color indicating pH paper with readable color calibrations and a scale at whole numbers (minimum). Use Hydrion Insta-Check Jumbo 0-13 or 1-12 or equal. The paper shall be touched to the surface once using moderate gloved finger pressure. The surface shall not be wiped or moved laterally to disturb the surface during pH testing. Following the one touch, lift the paper vertically to not "wipe" the surface. Compare the color indicated with the scale provided and record the pH.
4. Inspect and record substrate profile (anchor pattern). Surfaces shall be abraded, as a minimum, equal to the roughness of 40 grit sand paper.
5. Measure and record ambient air temperature once every two hours of each shift using a thermometer and measure and record substrate temperature once every two hours using a surface thermometer.
6. Measure and record relative humidity every two hours of each shift using a sling psychrometer in accordance with ASTM E337.
7. Provide correct mixing of resurfacing materials in accordance with the Manufacturer's instructions.
8. Inspect and record that the "pot life" of resurfacing materials are not exceeded during installation.
9. Verify curing of the resurfacing materials in accordance with the Manufacturer's instructions.
10. Upon full cure, the installed lining system shall be checked by high voltage spark detection in accordance with NACE RP0188-90 to verify a pinholefree surface. Voltage shall be set at 11,000 volts. Areas which do not pass the spark detection test shall be corrected at no cost to the Owner and rechecked. High voltage spark detection shall be conducted on the chemical resistant mortar before the installation of the gel coat.
11. Upon completion of the lining system installation the lined area shall be cleaned and prepared to permit close visual inspection by the Engineer or the Engineer's Representative. Any and all deficiencies or defective work (not in compliance with this section or related sections) will be marked for repair or removal/replacement by the Contractor at no additional cost to the Owner.

2.4 ACCEPTANCE CRITERIA

A. Acceptance Criteria for Surface Preparation Work: All surfaces shall be prepared in accordance with the specification and referenced standards therein.

B. Acceptance Criteria for Coating System Application Work

1. Acceptable coating work will be based upon the following:
   a. No pock-marks, trowel marks, depressions, unconsolidated areas waviness or ridges, pinholes or holidays in either size or frequency.
   b. No intercoat bond failures between lifts.
   c. Proper curing of coatings.
2. Resurfaced areas shall pitch to drains.
3. There shall be no areas that puddle when flood tested.
4. The Engineer or Engineer's Representative shall, at their discretion, inspect the following:
   a. Profile and degree of cleanliness of substrate.
   b. Thickness of materials/coverage rate confirmation.
   c. Ambient temperature and humidity requirements and substrate temperature.
   d. Curing and recoat times.
   e. Proper curing of the resurfacing materials.
5. Rework required on any holidays or any other inadequacies found by the Engineer or the Engineer's representative in the quality of the coating work shall be marked. Such areas shall be recleaned and reworked by the Contractor according to these specifications and the manufacturer's recommendations at no additional cost to the Owner.
6. The Contractor is responsible for keeping the Engineer informed of all progress so that inspection for quality can be achieved.
7. The Contractor is ultimately responsible for the quality performance of the applied materials and workmanship. Inspections by the Engineer or the Engineer's Representative do not limit this responsibility.

2.5 FINAL INSPECTION

A. Perform a final inspection to determine whether the resurfacing system work meets the requirements of the specifications. The Engineer and the Engineer's Representative will conduct final inspection with the Contractor.

2.6 CLEANUP

A. Upon completion of work, the Contractor shall remove surplus materials, equipment, protective coverings, and accumulated rubbish, and thoroughly clean all surfaces and repair any work-related damage. The surrounding surface areas including roadways and all other surfaces shall be restored to their pre-project condition.

3.0 MANHOLES

Manholes shall be as installed in accordance with the special provision for manholes.

3.1 PIPE AND PIPE FITTINGS

Pipe, pipe fittings, and testing for pipe shall be as required in the special provision for manholes

907-262.04--Method of Measurement. Installation of pipe of the type specified will be measured by the linear foot.

907-262.05--Basis of Payment. Pipe, measured as prescribed above, will be paid for at the contract bid price per the linear foot, which price shall include the cost of all labor, materials, tools, pipe bedding, connections to manholes, leak testing, and all incidentals necessary to complete the work.

Payment will be made under:

907-262-A: ___" Description Pipe - per lineal foot

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-265-2 **CODE: (SP)**

DATE: **08/17/2009**

SUBJECT: **Potable Water System**

PROJECT: STP-0055-04(091) & NH-0055-04(091) / 105575301 & 302 -- Desoto County

Section 907-265, Potable Water System, 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 907-265-- POTABLE WATER SYSTEM

907-265.01--Description. This Work shall consist of the installation and testing of a potable water line consisting of ¾" PVC Pipe, Schedule 40, in accordance with these Specifications and conforming to the Plans. Included in the linear feet of pipe shall be casing under sidewalks, leakage testing and disinfection.

It is the intention of these Specifications to provide the necessary items and instruction for a complete installation including all code compliance. Omission of items or instruction necessary or considered standard good practice for the proper installation and construction of these items shall not relieve the Contractor of furnishing and installing such items and conforming to the codes having jurisdiction. Contractor should refer to the general requirements of 907-242-16 for additional information.

907-265.02--Materials. Materials shall meet the following applicable sections.

1.01 POLYVINYL CHLORIDE (PVC) PIPE

A. Gravity Sewer Pipe and Fittings:

1. Pipe 15" 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. AWWA C900, ASTM D1784, Class 12454-A or 12454-B; DR-25, 100 psi, with C.I./I.P.S. equivalent outside diameter.
2. Ductile Iron Fittings:
   a. ANSI/AWWA C110/A21.10; 150 psi pressure rating.

3. Push-on Joints Using Flexible Elastomeric Seals: ASTM D3139.
4. Elastomeric Seals (Gaskets): ASTM F477.

1.02 STAINLESS STEEL PIPE

A. Pipe: Welded; ASTM A312, TP 304L; and ANSI B36.19, Schedules 5S, 10S and 40S, as indicated on the Plans.

B. Fittings:

1. ASTM A403, WP 304L.

1.03 SERVICE SADDLES

A. Material:

1. Band: Type 304 Stainless Steel
2. Side Bars and Fingers: Type 304 Stainless Steel
3. Keeper Bar: Type 304 Stainless Steel
4. Stud Bolts: Type 304 Stainless Steel with epoxy coating on threads.
5. Nuts: Type 304 Stainless Steel fluorocarbon coating on threads.
6. Washers: Type 304 Stainless Steel
7. Gasket: Buna-N compounded to resist oil, acids, alkalies, most (aliphatic) hydrocarbon fluids, water and many chemicals.

1.04 PIPE ACCESSORIES

A. 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.

907-265.03--Construction Requirements. Installation shall be in accordance with the following applicable sections.

1.05 PREPARATION

A. Perform trench excavation to the line and grade indicated on the Plans.

B. Unless otherwise indicated on the Plans, provide a minimum cover of 4'-0" above the top of piping laid in trenches.

1.06 LAYING PIPE IN TRENCHES

A. Give ample notice to the Architect 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 Plans 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.

1.07 BACKFILLING TRENCHES

A. Backfill pipeline trenches only after examination of pipe laying by the Project Engineer.

B. Backfill trenches as specified in MDOT.

1.08 CUTTING AND PATCHING

A. Do not cut and patch existing structures without prior permission from the Engineer.

B. Perform cutting and patching where indicated in the Plans. Patch to match adjacent finishes.

1.09 TESTING

A. 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.

B. Flush pipeline to remove debris; collect and dispose of flushing water and debris in a manner conforming to Regulatory Agency requirements.

1.10 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:sec	Length for Min. Time, feet	Time for Longer Length, sec	Specification Time for Length (L) Shown, min:sec							
				100 feet	150 feet	200 feet	250 feet	300 feet	350 feet	400 feet	450 feet
4	3:46	597	0.380 L	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	5:42	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.

1.11 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.

907-265.04--Method of Measurement. Pipe of the size and type specified will be measured by the linear foot.

Testing and any re-testing will not be measured for payment.

907-262.05--Basis of Payment. Pipe, measured as prescribed above, will be paid for at the contract bid price per the linear foot, which price shall include the cost of all labor, materials, tools, pipe bedding, connections to manholes, leak testing, and all incidentals necessary to complete the work.

Payment will be made under:

907-265-A: __" Description Pipe - per lineal foot

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-282-5 **CODE: (SP)**

DATE: **08/13/2009**

SUBJECT: **Irrigation System**

PROJECT: **STP/IM-0055-04(091) / 105575301 & 302 – Desoto 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 that 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 furthermost 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, Size	- per linear foot
907-282-D:	Valve Control Wire	- per linear foot
907-282-G:	Electric Controller, Type	- per each
907-282-H:	Electric Control Valve, Size	- per each
907-282-I:	Backflow Preventer, Size	- per each
907-282-J:	Isolation Valve, Size	- per each

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

SPECIAL PROVISION NO. 907-604-4 **CODE: (SP)**

DATE: 08/14/2009

SUBJECT: Precast Manholes

PROJECT: STP-0055-04(091) & NH-0055-04(091) / 105575301 & 302 -- Desoto County

Section 604, Manholes, Inlets and Catch Basins, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-604.01--Description. Delete the second paragraph of Subsection 604.01 on page 367 and substitute the following:

The installation of Precast Sanitary Sewer Manholes shall be in accordance with these Specifications and conforming to the Plans.

It is the intention of these Specifications to provide the necessary items and instruction for a complete installation including all code compliance. Omission of items or instruction necessary or considered standard good practice for the proper installation and construction of these items shall not relieve the Contractor of furnishing and installing such items and conforming to the codes having jurisdiction. Contractor should refer to the general requirements of 907-242-16 for additional information.

907-604.02--Materials. Delete the last paragraph of Subsection 604.02 on page 367 and substitute the following:

907-604.02.1--Manholes. Manholes shall be constructed in accordance with the following applicable Standard Details at the end of Special Provision 907-242-16:

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

The Contractor shall submit a certification from the material suppliers attesting that materials meet or exceed specification requirements.

The Contractor shall submit to the Engineer the following Shop Drawings for approval.

- detailed shop drawings of manhole sections and precast bases if used.
- detailed shop drawings of manhole frames and covers.
- detailed shop drawings of manhole steps.

The Contractor shall submit manufacturers' descriptive literature and installation instructions for the resilient pipe-to-manhole connection and for the joint sealant compound.

Precast concrete manhole sections shall conforming to ASTM C478, with 5.5% +1% air-entrained cement concrete.

The Contractor shall provide the following:

- flat slab top sections for manholes less than four (4) feet deep or as indicated on Contract Drawings.
- eccentric cone sections for manholes greater than four (4) feet in depth, except as indicated on Contract Drawings.
- 24" minimum access opening.
- Precast riser sections of length to suit.
- Precast bases of a design similar to the precast riser sections. Base to be integral with first riser section, minimum height of riser - 24 inches.

Manhole steps shall meet the following:

- Steel reinforced copolymer polypropylene meeting the following specifications:
- ASTM C478
- ASTM C497, Method of test
- ASTM D4101, PP0344B33534Z02 copolymer polypropylene
- ASTM A496, D20, 1/2-inch reinforced rod

Manhole frames and covers shall meet the following::

- Cast Iron Castings shall be 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.
- Cover Gasket shall be one-piece O-ring gasket factory installed in a machined dovetail groove in the frame.
  Gasket material shall be of neoprene composition having good abrasion resistance, low compression set Type D, 40 durometer hardness and suited for use in sanitary sewer manholes. Gluing of gasket is not permitted.
- Contact surfaces shall be machined and matched.
- Cover inscription shall be casted with pipeline service:
- Contractor shall comply with Federal Country-of-Origin Markings law required on imported castings.
- Cover inscription shall be casted with pipeline service and, when directed by the Project Engineer, the Owner's name.

- Castings shall be Neenah R-1642, East Jordan Iron Works 1045AGS, Clay & Bailey 2032, or equal.
- Manhole inserts are to be provided only where indicated on the plans. Manhole inserts shall be one of the following:
  - Wolverine Brand™ Activated Carbon Manhole Filter by Simple Solutions Distributing L.L.C., West Milford, NJ, (973) 846-7817.
  - NODOR™ Manhole Odor Eliminator by Advanced Carbon Systems, Saugerties, NY (866) 834-5674; or
  - Parson Odoreater Manhole Insert by Parson Environmental Products, Inc., Reading, PA, (800) 356-9023.
- Joint Sealant shall meet ASTM C990.
- Resilient Pipe-to-Manhole Connection shall meet ASTM C923.

907-604.02.2--Piping. Shop drawings and product data shall include but not limited to:

- Piping layout
- Pipe hangers, supports, guides and anchors
- Pipe wall sleeves and seals
- Pipe coupling adapters

Contractor shall 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. The Contractor shall also submit a certification from each product manufacturer attesting that the pipe, pipe fittings, joints, joint gaskets and lubricants meet or exceed specification requirements.

During loading, transporting, unloading, and storage on site, exercise care to prevent damage to piping materials. Pipe or fittings shall not be dropped. Pipe and fittings shall be store materials on site in enclosures or under protective coverings. Assure that the materials are kept clean and dry; do not store materials directly on the ground.

Polyvinyl Chloride (PVC) Pipe.

Gravity sewer pipe and fittings shall be 15" diameter and smaller meeting ASTM D3034, SDR-35. The flexible elastomeric seals shall meet ASTM D3212. The seal material shall meet ASTM F477.

Pressure pipe and fittings shall meet AWWA C900, ASTM D1784, Class 12454-A or 12454-B; DR-25, 100 psi, with C.I./I.P.S. equivalent outside diameter. Ductile iron fittings shall meet ANSI/AWWA C110/A21.10; 150 psi pressure rating. Push-on joints using flexible elastomeric seals shall meet ASTM D3139. Elastomeric seals (Gaskets) shall meet ASTM F477.

Stainless Steel Pipe.

Stainless steel pipe shall be welded pipe meeting ASTM A312, TP 304L; and ANSI B36.19, Schedules 5S, 10S and 40S, as indicated on the plans.
Fittings shall meet ASTM A403, WP 304L.

Service Saddles. Service saddles shall meet the following:

1. Band: Type 304 Stainless Steel
2. Side Bars and Fingers: Type 304 Stainless Steel
3. Keeper Bar: Type 304 Stainless Steel
4. Stud Bolts: Type 304 Stainless Steel with epoxy coating on threads.
5. Nuts: Type 304 Stainless Steel fluorocarbon coating on threads.
6. Washers: Type 304 Stainless Steel
7. Gasket: Buna-N compounded to resist oil, acids, alkalies, most (aliphatic) hydrocarbon fluids, water and many chemicals.

Pipe Accessories. Wall seals shall be an 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.

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 inch thick and shall project three inches (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.

Century-Line prefabricated sleeves as manufactured by the Thunderline Corporation, Belleville, Michigan, or approved equal, may be used in lieu of steel or cast iron sleeves for wall seal application.

907-604.03--Construction Requirements. Delete Subsection 604.03.7 beginning on page 368 and substitute the following:

907-604.03.7--Precast Manholes. Manholes shall be watertight manholes of precast concrete sections of the type indicated on the Contract Drawings. They shall be 48" diameter manholes unless otherwise indicated.

Precast concrete bases shall be installed on a minimum of four (4) inches of crushed stone subbase. Precast bases shall be installed as shown on Standard Detail 5100G. A sealed, flexible resilient connection shall be installed between pipe and precast base section.

Flow Channels shall be formed in manhole bases as indicated on the Standard Details. Channels shall be sloped uniformly from influent invert to effluent invert with a minimum one inch (1") drop. Bends shall be constructed of the largest possible radius. Channel sides and invert shall be formed smooth and uniform; free of cracks, holes or protrusions. Do not permit pipe to project more than 2" into the manhole.

Joints shall be sealed between precast concrete manhole sections with joint sealant compound. Joint sealant compound shall be applied in accordance with instructions of the manufacturer. The compound shall be placed on the interior and exterior sides of the joint to be squeezed out by the weight of the upper section. Sealant compound shall be toweled smooth with manhole interior. Do not apply rigid mortar to the joints between manhole sections.

Manhole sections shall be installed with steps in proper vertical alignment.

Precast manhole rings shall be used to achieve elevation indicated for frame and cover. Do not adjust elevation more than one foot (1') with precast rings. Joints shall be sealed between precast rings with joint sealant compound.

Manhole frames and covers shall be set with the top of frames at finished grade elevation or other elevation indicated on the Contract Drawings. Manhole covers installed in unpaved areas shall be anchored as indicated on Standard Detail 5109A. Joint between manhole frame and manhole shall be sealed with joint sealant compound.

Manholes shall be tested as specified in 907-604.03.7.2 prior to backfilling.

Backfill shall be placed in approximately equal lifts on opposite sides of manhole to equalize opposing horizontal pressures.

907-604.03.7.1--Piping. Piping shall be installed to meet the requirements of state and local building codes. Materials contaminated with gasoline, lubricating oil, liquid or gaseous fuels, aromatic compounds, paint solvent, paint thinner, or acid solder will be rejected.

Trench excavation shall be performed to the line and grade indicated on the plans and as specified. Unless otherwise indicated on the plans, a minimum cover of 4'-0" shall be provided above the top of piping laid in trenches.

Pipe shall be laid by proceeding upgrade with the bell or groove pointing upstream.

The pipe shall be laid to a uniform line with the barrel of the pipe resting solidly in bedding material throughout its length. Recesses shall be excavated in the bedding material to accommodate joints, fittings and appurtenances. Do not subject the pipe to a blow or shock to achieve solid bedding or grade.

Each section of pipe shall be laid in such a manner as to form a close concentric joint with the adjoining section and to avoid offsets in the flow line.

Pipe shall be jointed as follows:

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.

Mechanical joints shall be assembled in accordance with ANSI/AWWA C111/A21.11, Appendix A. If satisfactory seating of the joint is not obtained at maximum torque, The Contractor shall disassemble the joint, reclean, and reassemble using a new gasket.

Push-on joints shall be assembled in accordance with the recommendations of the pipe manufacturer. On field-cut pipe, The Contractor shall 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. The spigot end shall be installed to full depth of socket. Prior to installation, the spigot end of field-cut pipe shall be marked with the insertion depth.

Each pipe installed shall be checked as to line and grade in place; correct deviation from grade immediately; deviation from the designed grade and alignment as indicated on the plans will be cause for rejection.

Joints in pressure piping shall not be deflected more than the maximum recommended by the pipe manufacturer.

Sufficient backfill shall be placed on each section of pipe, as it is laid, to hold pipe firmly in place.

The interior of the pipe shall be cleaned as the work progresses. Where cleaning after laying is difficult because of small pipe size, the Contractor shall use a suitable swab or drag in the pipe and pull forward past each joint immediately after joining has been completed.

Trenches and excavations shall be kept free of water during construction.

When the work is not in progress, and at the end of each workday, ends of pipe and fittings shall be securely plugged to prevent trench water, earth or other substances from entering the pipe or fittings.

Existing structures shall not be cut and patched without prior permission from the Engineer. Cutting and patching shall be performed where indicated in the Contract Drawings. Patch to match adjacent finishes.

907-604.03.7.2--Manhole Testing. No manhole test will be accepted until the results are below the specified maximum limits. The Contractor shall determine and correct the causes of test failure and retest until successful test results are achieved.

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.

Vacuum test shall be in accordance with ASTM C1244 and as follows:

Plug all pipe openings; taking care to securely brace the plugs and pipe; 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 inches of mercury (Hg); close the valve; start the test.

Test duration for the manhole shall be determined from the following table:

Vacuum Test Table

Manhole Diameter	Test Period
48"	60 sec.
60"	75 sec.
72"	90 sec.

The vacuum drop shall be recorded during the test period. If the vacuum drop is greater than 1.0 inch of Hg during the test period, the manhole shall be repaired and retested. If a vacuum drop of 1.0 inch of Hg does not occur during the test period, the test shall be discontinued and the manhole will be accepted.

If the vacuum test fails to meet a 1.0-inch Hg drop in the specified time after repair, the unit shall be subjected to repair and retest as necessary.

907-604.04--Method of Measurement. Delete the second paragraph of Subsection 604.04 on page 369 and substitute the following:

Precast manholes will be measured per linear foot.

907-604.05--Basis of Payment. Delete the second paragraph of Subsection 604.05 on page 370 and substitute the following:

Precast manholes, measured as prescribed above, will be paid for at the contract bid price per linear foot, which price shall be full compensation for all necessary excavation, backfill, sheeting, cribbing, shoring, bracing, well-pointing, furnishing and assembling all elements of the manhole including concrete bases, covers, castings, steps, joint seals, gaskets, inverts, pipe-to-manhole connections, vacuum testing, and for all other items of work necessary and incident to the complete construction and for all equipment, labor, tools and incidentals necessary to complete the work.

Delete the last pay item listed on page 370 and substitute the following:

907-604-C: Precast Manhole, ___" Diameter -per each

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-608-3 **CODE: (SP)**

DATE: **08/02/2005**

SUBJECT: **Concrete Sidewalks**

Section 608, Concrete Sidewalks, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows.

907-608.02--Materials. After the last paragraph of Subsection 608.02 on page 390, add the following:

Colored concrete sidewalk materials shall be manufactured by L. M. Scofield Company, Butterfield Color, Solomon Colors, or approved equal.

A. Coloring Agents: Contractor may elect to color the concrete integrally using the manufacturer's recommended admixture for color-conditioned concrete, or may apply the manufacturer's recommended dry-shake to the surface of the freshly poured concrete.

   Colors for colored sidewalk shall be selected by the Engineer from a Standard or Designer color charts.

B. Curing and Finishing Material: Contractor shall utilize the manufacture's recommended color–matched curing and finishing material. Curing materials or methods for uncolored concrete sidewalks shall not be used with colored concrete sidewalks.

Once the color and method of coloring have been selected, the Contractor shall provide a 4-foot square panel, separate from proposed sidewalk, to be reviewed and approved by the Engineer. Engineer will evaluate color as compared to color chart and texture of broom finish.

Subsequent panels may be required, if finish or color are unacceptable to the Engineer. The Contractor shall remove unaccepted panels immediately from site. Accepted panel shall remain until colored concrete sidewalks have been completed by the Contractor, at which time the Contractor shall remove the panel from the site.

907-608.03.4--Handling, Measuring, Proportioning, and Mixing Materials. After the first paragraph of Subsection 608.03.4 on page 391, add the following:

Should an integral coloring method be selected by the Contractor, the Contractor shall mix coloring agent in strict accordance with the manufacture's written instructions. Copies of the manufacturer's written instructions shall be furnished to the Engineer prior to manufacture and placement of colored concrete.

Should an dry-shake applied coloring method be selected by the Contractor, the Contractor shall measure and apply coloring agent in strict accordance with the manufacturer's written instructions. Copies of the manufacturer's written instructions shall be furnished to the Engineer prior to manufacture and placement of colored concrete.

907-608.03.4--Protection and Curing. After the second paragraph of Subsection 608.03.7 on page 392, add the following:

Protection and curing materials and methods of application for colored concrete sidewalk shall be in strict accordance with the manufacturer's written instructions. Copies of the manufacturer's written instructions shall be furnished to the Engineer prior to manufacture and placement of colored concrete.

907-608.04--Method of Measurement. After the last paragraph of Subsection 608.04 on page 392, add the following:

Colored Concrete Sidewalk, completed and accepted, will be measured by the square yard. Sample panels will not be measured for separate payment.

907-608.05--Basis of Payment. After the first paragraph of Subsection 608.05 on page 392, add the following:

Colored Concrete Sidewalk will be paid for at the contract unit price of square yard, which shall be full compensation for completing the work.

After the last pay item listed on page 608-3, add the following:

907-608-C: Colored Concrete Sidewalk - per square yard

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION NO. 907-681-2 **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. 907-683-10 **CODE: (SP)**

DATE: **08/07/2009**

SUBJECT: **Low Mast Type Lighting Assembly**

PROJECT: **STP/IM-0055-04(091) / 105575301 & 302 – Desoto County**

Section 683, Lighting Assemblies, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-683.01--Description. Delete the first sentence of the first paragraph of Subsection 683.01 on page 573 and substitute the following:

In addition to the requirements set forth in Section 681, lighting assemblies shall consist of low mast lighting assemblies.

Delete the third sentence of the first paragraph of Subsection 683.01 beginning on page 573 and substitute the following:

The low mast lighting assemblies of the types required shall consist of pole with arm, luminaire, anchor bolts, lamp, break-away device where required, and miscellaneous hardware.

907-683.02--Materials. Delete Subsection 683.02.2 on page 574 and substitute the following:

907-683.02.2--Low Mast Lighting Assembly.

907-683.02.2.1--Poles. The pole shall have a tapered wall increasing in thickness from the top to the base in proportion to the load and ground line moment requirements. The pole shall be reinforced in areas of handholes and special hardware attachments. The poles shall meet the requirements of AASHTO Standard Specifications for Structural Supports for Highway signs, Luminaires, and Traffic Signals.

Pole for Area Luminaire. The poles shall be Model Number CH12T5/16-CA/BK as manufactured by Holophane, APMV12-SSTP by Spring City, or 7716T5 by Sternberg. The pole shall be cast aluminum and have tapered shaft with decorative, fluted base matching the bollards in Special Provision 907-259-5.

Pole for Roadway Luminaire. The poles shall be TSLP-LD, as manufactured by Millerbernd, DS90-783A38T-12S-xxx by Nafco or J3012 by Ameron. The pole shall be steel davit type of one piece construction, with long radius 12’-0” arm and standard anchor base with break-away couplings.

Performance Criteria. The pole shall be designed with a minimum safety factor of 2:1 and have

no more than a 10% deflection at full wind loading. The pole shall deflect no more than 5% of the above-ground length with 200 lbs. of lateral top load (stiffness).

Wire Entrance. The anchor base shall have a minimum conduit entry of six inches (6") I.D.

Finish. The surface of the pole for Area Luminaire shall be uniform and consistent for the entire length of the pole. The resin shall contain pigment to improve ultraviolet resistance. Solid coloration shall be throughout the structure of the pole. The pole color shall be black powder coat.

The surface of the pole for Roadway Luminaires shall be galvanized poles per ASTM Designation: A123. The painted poles shall be semi-gloss powder paint or Kynar 500 with 70% PVC.

Handhole. The handhole shall be a minimum 3-inch x 5-inch oval. The handhole cover shall be non-corrosive metal and painted to match the post. The handhole cover shall be concealed by the ornamental slipover decorative base cover.

Anchor Bolts. Anchor bolts shall be made of steel in accordance with ASTM Designation: F1554, Grade 55. Anchor bolts shall be galvanized as per ASTM Designation: A123. Minimum yield strength shall be 50,000 psi and "L" shaped. Anchor bolts shall be provided for each pole with two (2) hex nuts and washers per bolt. A bolt layout template shall be provided by the manufacturer for proper bolt installation. The number of anchor bolts and design yield strength shall be as recommended by the manufacturer.

Base Cover. Pole base shall be per ASTM Designation: A36 and shall telescope pole shaft and be circumferentially welded top and bottom. Base cover shall be two piece, interlocking construction.

907-683.02.2.2--Luminaires. The luminaire shall be an Architectural Arm mounted high efficiency fixture using a high efficiency, Illuminating Engineering Society (I.E.S.) Type III prismatic acrylic reflector panels for Area Lighting assemblies and Type V for Roadway Lighting assemblies. An internal reflector or glass refractor shall not be used. All I.E.S. photometric files to be readily available through manufacturer's web site.

Area Luminaires. Area luminaires shall be Model Number LU15DMH-xx-S-1B, as manufactured by Holophane, FXCL34 by Spring City or 2143BB-RE5G-CA by Sternberg. It shall have Type V distribution, prismatic refractor. The voltage and single fuse protection shall accommodate the available voltage on site. Color shall be black, factory applied powder coat.

Roadway Luminaires. Roadway luminaires shall be OVF-40P-M-x-3D-1-BK, as manufactured by Streetworks (Cooper), MDCL-40E-x-M-x-x-F-MC3 by General Electric or 325-40M-MR-x-R3-FG-M2-BK-xF by American Electric Lighting. Lens shall be flat glass. The voltage and single fuse protection shall accommodate the available voltage on site.. Color shall be black, factory painted or Kynar 500 with 70% PVC.

Ballast. The ballast shall be easily accessible in an upper housing using a latch/strike plate connection to open a tilt-back power module. Ballast and fixture shall be from same manufacturer. The ballast shall be 277 Volt for Area Lighting and Roadway Lighting assemblies.

Socket. A mogul-base socket shall be used for 250 Watt & 400 Watt metal Halide. An encapsulated plug in starter shall be used.

907-683.10.5--Basis of Payment. Delete Pay Item 683-B on page 576 and substitute the following:

907-683-B: Lighting Assembly, Low Mast, _____ - per each

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

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 l65°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 (C_3A) 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 (C_3A) 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. 907-711-4 **CODE: (IS)**

DATE: 06/26/2009

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. The synthetic structural fibers shall be approved for listing in the Department's "Approved Sources of Materials" prior to use. The synthetic structural fibers shall be added to the concrete and mixed in accordance with the manufacturer's recommended methods.

907-711.04.1--Material Properties. The fibers shall meet the requirements of ASTM Designation: C 1116, Section 4.1.3. The fibers shall be made of polypropylene, polypropylene/polyethylene blend, nylon, or polyvinyl alcohol (PVA).

907-711.04.2--Minimum Dosage Rate. The dosage rate shall be such that the average residual strength ratio ($R_{150,3.0}$) of fiber reinforced concrete beams is a minimum of 20.0 percent when the beams are tested in accordance with ASTM Designation: C 1609. The dosage rate for fibers shall be determined by the following.

The fiber manufacturer shall have the fibers tested by an acceptable, independent laboratory acceptable to the Department and regularly inspected by the Cement and Concrete Reference Laboratory of the National Institutes of Standards and Technology and approved to perform ASTM Designations: C 39, C 78, and C192.

The laboratory shall test the fibers following the requirements of ASTM Designation: C 1609 in a minimum of three (3) test specimens cast from the same batch of concrete, molded in 6 x 6 x 20-inch standard beam molds meeting the requirements of ASTM Designation: C 31. The beams shall be tested on an 18-inch span. The tests for $R_{150,3.0}$ shall be performed when the average compressive strength of concrete used to cast the beams is between 3500 and 4500 psi. The tests for compressive strength shall follow the requirements of ASTM Designation: C 39. The average compressive strength shall be determined from a minimum of two (2) compressive strength cylinders.

The value for $R_{150,3}$ shall be determined using the following equation:

$$R_{150,3.0} = \frac{f_{150,3.0}}{f_1} \times 100$$

The residual flexural strength ($f_{150,3.0}$) shall be determined using the following equation:

$$f_{150,3.0} = \frac{P_{150,3.0} \times L}{b \times d^2}$$

where:

$f_{150,3.0}$ is the residual flexural strength at the midspan deflection of $L/150$, (psi),

$P_{150,3.0}$ is the residual load capacity at the midspan deflection of $L/150$, (lbf),

L is the span, (in),

b is the width of the specimen at the fracture, (in), and

d is the depth of the specimen at the fracture, (in).

For a 6 x 6 x 20-inch beam, the $P_{150,3.0}$ shall be measured at a midspan deflection of 0.12 inch.

Additionally, $R_{150,3.0}$, $f_{150,3.0}$, and $P_{150,3.0}$ may also be referred to as R_{150}^{150}, f_{150}^{150}, and P_{150}^{150} respectively.

At the dosage rate required to achieve the minimum $R_{150,3}$, the mixture shall both be workable and the fibers shall not form clumps.

The manufacturer shall submit to the State Materials Engineer certified test reports from the independent laboratory showing the test results of each test specimen.

907-711.04.3--Job Control Requirements. The synthetic structural fibers shall be one from the Department's "Approved Sources of Materials."

At the required dosage rate, the mixture shall both be workable and the fibers shall not form clumps to the satisfaction of the Engineer. If the mixture is determined by the Engineer to not be workable or have clumps of fibers, the mixture may be rejected.

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 ±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 place 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 alkalies 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. 907-723-1 **CODE: (SP)**

DATE: 08/16/2007

SUBJECT: High Mast Lighting Wind Velocity

Section 723, Materials For Roadway Lighting Installation, of the 2004 Edition of the Mississippi Standard Specifications for Road and Bridge Construction is hereby amended as follows:

907-723.04--High Mast Lighting Assembly.

907-723.04.1--Pole. Delete the last sentence of the first paragraph of Subsection 723.04.1 on page 792 and substitute the following.

Designed wind velocity shall be in accordance with the 2001 AASHTO Standard Specifications for Structural Supports for High Signs, Luminaires and Traffic Signals to support the number and type luminaires and lowering device required on the different assembly types. Design wind velocities shall be as follows:

140 MPH -------Hancock, Harrison & Jackson Counties
130 MPH -------Pearl River, Stone, & George Counties
120 MPH -------Lamar, Forrest, Perry & Greene Counties
110 MPH -------Pike, Walthall, Marion, Jefferson Davis, Covington, Jones & Wayne Counties
100 MPH -------Wilkinson, Amite, Adams, Franklin, Lincoln,, Lawrence, Simpson, Smith, Jasper & Clarke Counties
90 MPH -------All counties north of and including Jefferson, Copiah, Rankin, Scott, Newton, & Lauderdale

Ice Loading shall be considered in the design for structures in all counties above and including Washington, Humphreys, Holmes, Attala, Winston, & Noxubee.

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 that 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.

S E C T I O N 9 0 5 - P R O P O S A L

Date _____

Mississippi Transportation Commission
Jackson, Mississippi

Sirs: The following proposal is made on behalf of _____
_____ of _____
_____
for constructing the following designated project(s) within the time(s) hereinafter specified.

The plans are composed of drawings and blue prints on file in the offices of the Mississippi Department of Transportation, Jackson, Mississippi.

The Specifications are the current Standard Specifications of the Mississippi Department of Transportation approved by the Federal Highway Administration, except where superseded or amended by the plans, Special Provisions and Notice(s) to Bidders attached hereto and made a part thereof.

I (We) certify that I (we) possess a copy of said Standard and Supplemental Specifications.

Evidence of my (our) authority to submit the Proposal is hereby furnished. The proposal is made without collusion on the part of any person, firm or corporation. I (We) certify that I (we) have carefully examined the Plans, the Specifications, including the Special Provisions and Notice(s) to Bidders, herein, and have personally examined the site of the work. On the basis of the Specifications, Special Provisions, Notice(s) to Bidders, and Plans, I (we) propose to furnish all necessary machinery, tools, apparatus and other means of construction and do all the work and furnish all the materials in the manner specified. I (We) understand that the quantities mentioned herein are approximate only and are subject to either increase or decrease, and hereby propose to perform any increased or decreased quantities of work at the unit prices bid, in accordance with the above.

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

INSTRUCTION TO BIDDERS: Alternate and Optional Items on Bid Schedule.

1. Two or more items entered opposite a single unit quantity WITHOUT DEFINITE DESIGNATION AS "ALTERNATE ITEMS" are considered as "OPTIONAL ITEMS". Bidders may or may not indicate on bids the Optional Item proposed to be furnished or performed WITHOUT PREJUDICE IN REGARD TO IRREGULARITY OF BIDS.

2. Items classified on the bid schedule as "ALTERNATE ITEMS" and/or "ALTERNATE TYPES OF CONSTRUCTION" must be preselected and indicated on bids. However, "Alternate Types of Construction" may include Optional Items to be treated as set out in Paragraph 1, above.

3. Optional items not preselected and indicated on the bid schedule MUST be designated in accordance with Subsection 102.06 prior to or at the time of execution of the contract.

4. Optional and Alternate items designated must be used throughout the project.

I (We) further propose to perform all "force account or extra work" that may be required of me (us) on the basis provided in the Specifications and to give such work my (our) personal attention in order to see that it is economically performed.

S E C T I O N 9 0 5 -- P R O P O S A L (CONTINUED)

I (We) further propose to execute the attached contract agreement (Section 902) as soon as the work is awarded to me (us), and to begin and complete the work within the time limit(s) provided for in the Specifications and Advertisement. I (We) also propose to execute the attached contract bond (Section 903) in an amount not less than one hundred (100) percent of the total of my (our) part, but also to guarantee the excellence of both workmanship and materials until the work is finally accepted.

I (We) enclose a certified check, cashier's check or bid bond for **five percent (5%) of total bid** and hereby agree that in case of my (our) failure to execute the contract and furnish bond within Ten (10) days after notice of award, the amount of this check (bid bond) will be forfeited to the State of Mississippi as liquidated damages arising out of my (our) failure to execute the contract as proposed. It is understood that in case I am (we are) not awarded the work, the check will be returned as provided in the Specifications.

Respectfully Submitted,

DATE _____

_____
Contractor

BY _____
Signature

TITLE _____

ADDRESS _____

CITY, STATE, ZIP _____

PHONE _____

FAX _____

E-MAIL _____

(To be filled in if a corporation)

Our corporation is chartered under the Laws of the State of _____ and the names, titles and business addresses of the executives are as follows:

_____
President Address

_____
Secretary Address

_____
Treasurer Address

The following is my (our) itemized proposal.

Revised 09/21/2005

Construction necessary for site improvements to the Desoto County Rest Area on I-55, known as Federal Aid Project No. STP/IM-0055-04(091) / 105575301 & 302, in the County of Desoto, 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	201-C001		5	Acre	Random Clearing and Grubbing				
0020	202-A001		1	Lump Sum	Removal of Obstructions	XXXXXXXX	XXX		
0030	202-B039		3	Each	Removal of Delineator, All Types				
0040	202-B099		35	Each	Removal of Existing Light and Foundation				
0050	202-B115		8	Each	Removal of Trees 10" to 20"				
0060	202-B116		17	Each	Removal of Trees Greater Than 20"				
0070	202-B248		6	Each	Removal of Manhole Sewer				
0080	202-B256		1	Each	Removal of Monument				

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Bid Amount	
0090	202-B271		1	Each	Removal of Treatment Plant Sturctures and Appurtenances				
0100	202-B272		1	Each	Removal of Pump Structures and Appurtenances				
0110	203-EX018	(E)	750	Cubic Yard	Borrow Excavation, AH, LVM, Class B9				
0120	211-B001	(E)	50	Cubic Yard	Topsoil for Slope Treatment, Contractor Furnished				
0130	216-B004		1,270	Square Yard	Solid Sodding, Bermuda				
0140	234-A001		28,254	Linear Feet	Temporary Silt Fence With Woven Wire Backing				
0150	235-A001		250	Bale	Temporary Erosion Checks				
0160	603-A037	(S)	119	Linear Feet	18" Steel Pipe, Jacked or Bored, Wall Thickness 0.375"				
0170	603-CA002	(S)	84	Linear Feet	18" Reinforced Concrete Pipe, Class III				
0180	603-CB001	(S)	2	Each	18" Reinforced Concrete End Section				
0190	607-B022		130	Linear Feet	96" Type II Chain Link Fence, Class II				
0200	607-P1030		13	Each	Line Post, 11' x 2 1/2" Galvanized Steel				

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Bid Amount	
0210	607-P2010		8	Each	Brace Post, 9' x 2 1/2" Galvanized Steel				
0220	607-P2012		4	Each	Brace Post, 12' x 2 1/2" Galvanized Steel				
0230	608-A001	(S)	64	Square Yard	Concrete Sidewalk, Without Reinforcement 4" Thick, Rock Finish				
0240	608-A001	(S)	23	Square Yard	Concrete Sidewalk, Without Reinforcement 6" Thick, Rock Finish				
0250	609-C002	(S)	253	Linear Feet	Concrete Curb, Integral, Type 2				
0260	614-A004	(S)	64	Square Yard	Concrete Driveway, Without Reinforcement, 8-inch Thickness 8" Thickness				
0270	619-D4001		116	Square Feet	Directional Signs				
0280	620-A001		1	Lump Sum	Mobilization	XXXXXXXX	XXX		
0290	630-F007		3	Each	Delineators, Post Mounted, Single Yellow				
0300	682-A031		6,118	Linear Feet	Underground Branch Circuit, AWG 6, 3 Conductor				
0310	682-D001		12	Each	Underground Pull Box				
0320	684-A001		2	Cubic Yard	Pole Foundation, 12" Diameter				

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Bid Amount	
0330	684-A003		40	Cubic Yard	Pole Foundation, 24" Diameter				
0340	699-A001		1	Lump Sum	Roadway Construction Stakes	XXXXXXXX	XXX		
0350	813-E001	(S)	132	Linear Feet	Concrete Pedestrian Sidewalk Railing				
0360	815-A009	(S)	200	Ton	Loose Riprap, Size 300				
0370	907-225-A001		4	Acre	Grassing				
0380	907-225-B001		10	Ton	Agricultural Limestone				
0390	907-230-A106		4	Each	Shrub Planting, Yoshino Cherry				
0400	907-230-A107		4	Each	Shrub Planting, Helieri Holly				
0410	907-230-A108		6	Each	Shrub Planting, Heavenly Bamboo				
0420	907-230-A109		4	Each	Shrub Planting, Daylily				
0430	907-230-A110		4	Each	Shrub Planting, Creeping Lily Turf				
0440	907-230-A111		35	Each	Shrub Planting, Japanese Spinea				

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Bid Amount	
0450	907-230-A112		10	Each	Shrub Planting, Blue Wave Hydrangea				
0460	907-230-B087		4	Each	Tree Planting, Crape Myrtle				
0470	907-230-B088		4	Each	Tree Planting, Chinese Dogwood				
0480	907-230-D001		2,925	Square Feet	Bed Preparation				
0490	907-233-A002		10	Cubic Yard	Tree Bark Mulch, Type V				
0500	907-242-A011		1	Lump Sum	Installation of Sewer Lift Station	XXXXXXXX	XXX		
0510	907-242-A013		11	Each	Installation of Combination Air Vacuum/Release Valve andVault				
0520	907-258-D001		1	Each	Wooden Picnic Table and Benches				
0530	907-258-E001		1	Each	Trash Receptacle Decorative Washed Rock				
0540	907-258-F001		3	Each	Water Hydrant				
0550	907-258-J001		4	Each	Metal Bench				
0560	907-258-PP001		3	Each	Handicap Parking Sign and Post, Per Plans				

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Bid Amount	
0570	907-259-C001		2	Each	Lighting Assembly, Flag Pole Lighting				
0580	907-262-A003	(S)	14,127	Linear Feet	6" PVC Pipe, C-900, Class 100				
0590	907-262-A004	(S)	440	Linear Feet	8" PVC Pipe, SDR 35				
0600	907-265-A003	(S)	420	Linear Feet	3/4" PVC Pipe, Schedule 40				
0610	907-282-A007		9	Each	Sprinkler Head, 1804-PRS-15Q				
0620	907-282-A008		5	Each	Sprinkler Head, 1804-PRS-15H				
0630	907-282-A064		1	Each	Sprinkler Head, 1804-PRS-15EST				
0640	907-282-B002		105	Linear Feet	Piping, 3/4" Diameter				
0650	907-282-B003		155	Linear Feet	Piping, 1" Diameter				
0660	907-282-B006		7	Linear Feet	Piping, 2" Diameter				
0670	907-282-D001		100	Linear Feet	Valve Control Wire				
0680	907-282-G003		1	Each	Electric Controller, 6 Station				

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Bid Amount	
0690	907-282-H001		3	Each	Electric Control Valve, 1"				
0700	907-282-I001		1	Each	Backflow Preventer, 2"				
0710	907-290-A001		2	Each	Flagpole				
0720	907-604-C001	(S)	20	Each	Precast Manhole, 48-inch Diameter				
0730	907-608-C001	(S)	202	Square Yard	Colored Concrete Sidewalk Red				
0740	907-683-B008		7	Each	Lighting Assembly, Low Mast, 150 W Type II				
0750	907-683-B008		17	Each	Lighting Assembly, Low Mast, 250 W Type III Traditionalized Post Top				
0760	907-683-B008		16	Each	Lighting Assembly, Low Mast, 250 W Type V Traditionalized Post Top				

*** 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.

* * * *

SECTION 905 - COMBINATION BID PROPOSAL (Continued)

Project Number	Pay Item Number	Unit	Unit Price Reduction	Total Item Reduction	Total Contract Reduction
1. _____	_____ _____	_____ _____	_____ _____	_____ _____	
2. _____	_____ _____	_____ _____	_____ _____	_____ _____	
3. _____	_____ _____	_____ _____	_____ _____	_____ _____	
4. _____	_____ _____	_____ _____	_____ _____	_____ _____	
5. _____	_____ _____	_____ _____	_____ _____	_____ _____	
6. _____	_____ _____	_____ _____	_____ _____	_____ _____	
7. _____	_____ _____	_____ _____	_____ _____	_____ _____	
8. _____	_____ _____	_____ _____	_____ _____	_____ _____	

Project Number	Pay Item Number	Unit	Unit Price Reduction	Total Item Reduction	Total Contract Reduction
9. _____	_____ _____	_____ _____	_____ _____	_____ _____	
10. _____	_____ _____	_____ _____	_____ _____	_____ _____	

C. If option (c) has been selected, then initial and complete one of the following, go to II. and sign Combination Bid Proposal.

_____ I (We) desire to be awarded work not to exceed a total monetary value of $ _____.

_____ I (We) desire to be awarded work not to exceed _____ number of contracts.

II. It is understood that the Mississippi Transportation Commission not only reserves the right to reject any and all proposals, but also the right to award contracts upon the basis of lowest separate bids or combination bids most advantageous to the State.

It is further understood and agreed that the Combination Bid Proposal is for comparison of bids only and that each contract shall operate in every respect as a separate contract in accordance with its proposal and contract documents.

I (We), the undersigned, agree to complete each contract on or before its specified completion date.

SIGNED _____

_____

_____

Certification with regard to the Performance of Previous Contracts or Subcontracts subject to the Equal Opportunity Clause and the filing of Required Reports

The Bidder ____, proposed Subcontractor ____, hereby certifies that he has ____, has not ____, participated in a previous contract or subcontract subject to the Equal Opportunity Clause, as required by Executive Orders 10925, 11114, or 11246, and that he has ____, has not ____, filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the applicable filing requirements.

_____
(COMPANY)

BY _____

_____
(TITLE)

DATE: _____

NOTE: The above certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41 CFR 60-1.7 (b) (1)), and must be submitted by bidders and proposed subcontractors only in connection with contracts and subcontracts which are subject to the Equal Opportunity Clause. Contracts and Subcontracts which are exempt from the Equal Opportunity Clause are set forth in 41 CFR 60-1.5. (Generally only contracts or subcontracts of $10,000 or under are exempt.)

Currently, Standard Form 100 (EEO-1) is the only report required by the Executive Orders or their implementing regulations.

Proposed prime Contractors and Subcontractors who have participated in a previous contract or subcontract subject to the Executive orders and have not filed the required reports should note that 41 CFR 60-1.7 (b) (1) prevents the award of contracts and subcontracts unless such Contractors submit a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director, Office of Federal Contract Compliance, U. S. Department of Labor.

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

CERTIFICATION
(Execute in duplicate)

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-0055-04(091) / 105575301 & 302**,

in **Desoto** 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-0055-04(091) / 105575301 & 302**,

in **Desoto** 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-0055-04(091) / 105575301 & 302**

LOCATED IN THE COUNTY(IES) OF **Desoto**

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: Executive Director
(names and addresses of witnesses)

_____ _____
Secretary to the Commission

Award authorized by the Mississippi Transportation Commission in session on the ____ day of _____, _____, Minute Book No. _____, Page No. _____.

Revised 8/06/2003

S E C T I O N 9 0 3

CONTRACT BOND FOR: **STP/IM-0055-04(091) / 105575301 & 302**

LOCATED IN THE COUNTY(IES) OF: **Desoto**

STATE OF MISSISSIPPI,

COUNTY OF HINDS

Know all men by these presents: that we, _____

_____ Principal, a _____

residing at _____ in the State of _____

and _____

residing at _____ in the State of _____,

authorized to do business in the State of Mississippi, under the laws thereof, as surety, are held and firmly bound unto the State of Mississippi in the sum of _____

_____

($_____) Dollars, lawful money of the United States of America, to be paid to it for which payment well and truly to be made, we bind ourselves, our heirs, administrators, successors, or assigns jointly and severally by these presents.

Signed and sealed this the _____ day of _____ A.D. _____.

The conditions of this bond are such, that whereas the said _____

_____

principal, has (have) entered into a contract with the Mississippi Transportation Commission, bearing the date of _____ day of _____ A.D. _____ hereto annexed, for the construction of certain projects(s) in the State of Mississippi as mentioned in said contract in accordance with the Contract Documents therefor, on file in the offices of the Mississippi Department of Transportation, Jackson, Mississippi.

Now therefore, if the above bounden _____

_____ in all things shall stand to and abide by and well and truly observe, do keep and perform all and singular the terms, covenants, conditions, guarantees and agreements in said contract, contained on his (their) part to be observed, done, kept and performed and each of them, at the time and in the manner and form and furnish all of the material and equipment specified in said contract in strict accordance with the terms of said contract which said plans, specifications and special provisions are included in and form a part of said contract and shall maintain the said work contemplated until its final completion and acceptance as specified in Subsection 109.11 of the approved specifications, and save harmless said Mississippi Transportation Commission from any loss or damage arising out of or occasioned by the negligence, wrongful or criminal act, overcharge, fraud, or any other loss or damage whatsoever, on the part of said principal (s), his (their) agents, servants, or employees in the performance of said work or in any manner connected therewith, and shall be liable and responsible in a civil action instituted by the State at the instance of the Mississippi Transportation Commission or any officer of the State authorized in such cases, for double any amount in money or property, the State may lose or be overcharged or otherwise defrauded of, by reason of wrongful or criminal act, if any, of the Contractor(s), his (their) agents or

employees, and shall promptly pay the said agents, servants and employees and all persons furnishing labor, material, equipment or supplies therefor, including premiums incurred, for Surety Bonds, Liability Insurance, and Workmen's Compensation Insurance; with the additional obligation that such Contractor shall promptly make payment of all taxes, licenses, assessments, contributions, damages, any liquidated damages which may arise prior to any termination of said principal's contract, any liquidated damages which may arise after termination of the said principal's contract due to default on the part of said principal, penalties and interest thereon, when and as the same may be due this state, or any county, municipality, board, department, commission or political subdivision: in the course of the performance of said work and in accordance with Sections 31-5-51 et seq. Mississippi Code of 1972, and other State statutes applicable thereto, and shall carry out to the letter and to the satisfaction of the Executive Director of the Mississippi Department of Transportation, all, each and every one of the stipulations, obligations, conditions, covenants and agreements and terms of said contract in accordance with the terms thereof and all of the expense and cost and attorney's fee that may be incurred in the enforcement of the performance of said contract, or in the enforcement of the conditions and obligations of this bond, then this obligation shall be null and void, otherwise to be and remain in full force and virtue.

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

_____	_____
(Contractors) Principal	Surety
By _____	By _____
	(Signature) Attorney in Fact
	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 **Construction necessary for site improvements to the Desoto County Rest Area on I-55, known as Federal Aid Project Nos. STP/IM-0055-04(091) / 105575301 & 302, in the County of Desoto, 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)

_____ By: _____
(Witness) (Name) (Title)

_____
(Surety) (Seal)

_____ By: _____
(Witness) (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.

OCR-485
REV. 3/08

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-0055-04(091) / 105575301 & 302**

County: **Desoto**

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.