



CITY OF MERIDIAN

To: Bidders
From: Laura Jackson
Purchasing
Date: 03/19/21
Subject: ADDENDUM #1
 BID #21-12 Hwy 80 Bridge repair

The following changes have been made to bid #21-15:

- Changes to Bid #21-12; Information sent out as
 Section 902 changes
 See attached page

Please accept our apology for any inconvenience this may have caused you.

Company Name: Dozer LLC

Signature: [Handwritten Signature] Date: 3/19/21

BID BOND

KNOW ALL MEN BY THESE PRESENTS, That we,
Dozer, LLC
P.O. Box 2031 Natchez, MS 39121
as Principal, hereinafter called the Principal, and
North American Specialty Insurance Company
1200 Main Street, Suite 800 Kansas City, MO 64105
a corporation duly organized under the laws of the State of NH

as Surety, hereinafter called the Surety, are held and firmly bound unto
City of Meridian
601 23rd Avenue Meridian, MS 39301
as Obligee, hereinafter called the Obligee, in the sum of Five Percent of Amount Bid

Dollars (\$ 5%)

for the payment of which sum well and truly to be made, the said Principal and the 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
Bridge Replacement at Old Highway 80 over Okatibbee Creek, Project No. ERBR-38-320(01)

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 24th day of March **A.D.** 2021

Dozer, LLC

(Principal) (Seal)

By: [Signature]
William T. Jones, Jr. (Title) Member

[Signature]
Sherri Brasher (Witness)

North American Specialty Insurance Company

(Surety)

By: [Signature]
Peggy L Jackson (Attorney-in-Fact)

[Signature]
Angela Bullie (Witness)



Fisher Brown Bottrell Insurance, Inc.
Mississippi Resident Agent

SWISS RE CORPORATE SOLUTIONS

NORTH AMERICAN SPECIALTY INSURANCE COMPANY
WASHINGTON INTERNATIONAL INSURANCE COMPANY

GENERAL POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS, THAT North American Specialty Insurance Company, a corporation duly organized and existing under laws of the State of New Hampshire, and having its principal office in the City of Kansas City, Missouri, and Washington International Insurance Company, a corporation organized and existing under the laws of the State of New Hampshire and having its principal office in the City of Kansas City, Missouri, each does hereby make, constitute and appoint: Peggy L Jackson

Principal: Dozer, LLC Bond Number: Bid Bond
Obligee: City of Meridian Bond Amount: See Bond Form
Bond Description: Bridge Replacement at Old Highway 80 over Okatibbee Creek, Project No. ERBR-38-320(01)

Its true and lawful Attorney(s)-in-Fact, to make, execute, seal and deliver, for and on its behalf and as its act and deed, bonds or other writings obligatory in the nature of a bond on behalf of each of said Companies, as surety, on contracts of suretyship as are or may be required or permitted by law, regulation, contract or otherwise, provided that no bond or undertaking or contract or suretyship executed under this authority shall exceed the amount of: FIFTY MILLION (\$50,000,000.00) DOLLARS

This Power of Attorney is granted and is signed by facsimile under and by the authority of the following Resolutions adopted by the Boards of Directors of both North American Specialty Insurance Company and Washington International Insurance Company at meetings duly called and held on the 9th of May, 2012:

RESOLVED, that any two of the Presidents, any Managing Director, any Senior Vice President, any Vice President, any Assistant Vice President, the Secretary or any Assistant Secretary be, and each or any of them hereby is authorized to execute a Power of Attorney qualifying the attorney named in the given Power of Attorney to execute on behalf of the Company bonds, undertakings and all contracts of surety, and that each or any of them hereby is authorized to attest to the execution of any such Power of Attorney and to attach therein the seal of the Company; and it is

FURTHER RESOLVED, that the signature of such officers and the seal of the Company may be affixed to any such Power of Attorney or to any certificate relating thereto by facsimile, and any such Power of Attorney or certificate bearing such facsimile signatures or facsimile seal shall be binding upon the Company when so affixed and in the future with regard to any bond, undertaking or contract of surety to which it is attached.



By [Signature] Steven P. Anderson, Senior Vice President of Washington International Insurance Company & Senior Vice President of North American Specialty Insurance Company



By [Signature] Michael A. Ito, Senior Vice President of Washington International Insurance Company & Senior Vice President of North American Specialty Insurance Company

IN WITNESS WHEREOF, North American Specialty Insurance Company and Washington International Insurance Company have caused their official seals to be hereunto affixed, and these presents to be signed by their authorized officers this 1st day of February, 2019.

North American Specialty Insurance Company
Washington International Insurance Company

State of Illinois
County of Cook ss:

On this 1st day of February, 2019, before me, a Notary Public personally appeared Steven P. Anderson, Senior Vice President of Washington International Insurance Company and Senior Vice President of North American Specialty Insurance Company and Michael A. Ito, Senior Vice President of Washington International Insurance Company and Senior Vice President of North American Specialty Insurance Company, personally known to me, who being by me duly sworn, acknowledged that they signed the above Power of Attorney as officers of and acknowledged said instrument to be the voluntary act and deed of their respective companies.



[Signature] M. Kenny, Notary Public

I, Jeffrey Goldberg, the duly elected Assistant Secretary of North American Specialty Insurance Company and Washington International Insurance Company, do hereby certify that the above and foregoing is a true and correct copy of a Power of Attorney given by said North American Specialty Insurance Company and Washington International Insurance Company, which is still in full force and effect.

IN WITNESS WHEREOF, I have set my hand and affixed the seals of the Companies this 24th day of March, 2021.

[Signature]

Jeffrey Goldberg, Vice President & Assistant Secretary of Washington International Insurance Company & North American Specialty Insurance Company

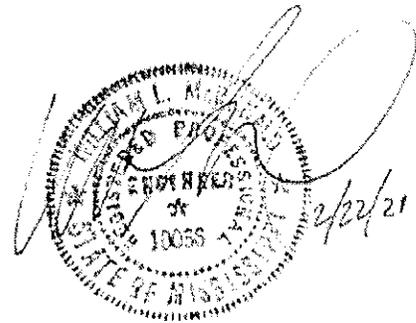


CITY OF MERIDIAN

**PROPOSAL AND CONTRACT DOCUMENTS
FOR**

**Bridge Replacement At Old Highway 80 Over Okatibbee Creek
PROJECT NO. ERBR-38-320 (01)**

February 2021



WAGGONER ENGINEERING, INC.
2211 5th St, Suite 107/109
Meridian, Mississippi 39301
WEI # 0019097

CITY OF MERIDIAN

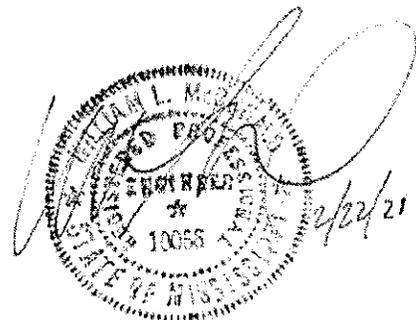
PROJECT NO. ERBR-38-320 (01)

LAUDERDALE COUNTY, MISSISSIPPI

MISSISSIPPI STANDARD SPECIFICATIONS FOR STATE AID ROAD AND BRIDGE CONSTRUCTION, 2004 EDITION

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ADVERTISEMENT FOR BIDS

**CITY OF MERIDIAN, MISSISSIPPI
BRIDGE REPLACEMENT AT OLD HIGHWAY 80 OVER OKATIBBEE CREEK
PROJECT NO. ERBR-38-320(01)**

SECTION 900

NOTICE TO CONTRACTORS:

Sealed bids for the removal and replacement of the bridge and roadway approach sections (approximately 0.273 miles) on Old Highway 80 over Okatibbee Creek in Meridian, Lauderdale County, Mississippi, known as Project No. ERBR-38-320(01) will be received no later than **11:00 AM, Wednesday, March 24, 2021**, at City Hall, Purchasing, 601 23rd Avenue, Meridian, Mississippi 39301. All bids so received will be publicly opened and read aloud.

Specifications may be obtained by contacting Vanessa Virgil, Purchasing Agent at 601-485-1940, e-mail: vanessavirgil@meridianms.org, or from the address above. Bid specification documents can also be downloaded from Central Bidding at www.centralbidding.com. Electronic bids and/or reverse auction bids can be submitted at www.centralbidding.com. For any questions relating to the electronic bidding process, please call Central Bidding at 225-810-4814.

A Pre-Bid Conference will be held on at the project site at 10:30 AM, Thursday, March 11, 2021.

PRINCIPAL ITEMS OF WORK ARE APPROXIMATELY AS FOLLOWS:

ITEM NO.	DESCRIPTION	UNIT	QTY.
S-200-A	MOBILIZATION	1	LS
S-201-A	CLEARING AND GRUBBING	1	LS
S-202-A	REMOVAL OF BRIDGE (STA. 40+88.00)	1	LS
S-202-D	REMOVAL OF CONCRETE OVERLAID WITH ASPHALT	2,129	SY
S-202-E	REMOVAL OF PIPE (ALL SIZES)	26	SF
S-203-A	UNCLASSIFIED EXCAVATION (LVM)	376	CY
S-203-E	BORROW EXCAVATION (CONTRACTOR FURNISHED) (CLASS B-9-6) (LVM)	10,774	CY
S-203-H	EXCESS EXCAVATION (LVM)	6,158	CY
S-232-A	GEOTEXTILE FABRIC STABILIZATION	19,345	SY
S-212-A	AGRICULTURAL LIMESTONE	2	TON
S-212-B	COMMERCIAL FERTILIZER (13-13-13)	1	TON
S-212-F	AMMONIUM NITRATE	1	TON
S-212-I	GROUND PREPARATION	3,373	SY
S-214-A	SEEDING	1	AC
S-233-A	TEMPORARY SILTFENCE (TYPE II) (.15-.84)	2,640	LF
S-304-A	GRANULAR MATERIAL (LVM) (CLASS 5, GROUP B)	589	CY
S-304-C	CRUSHED STONE SIZE 610 (LVM)	782	CY
S-403-A	HOT MIX ASPHALT,(MT) (9.5mm)	291	TON
S-403-A	HOT MIX ASPHALT,(MT) (12. 5mm)	346	TON
S-403-A	HOT MIX ASPHALT,(MT) (19mm)	454	TON
S-408-A	ASPHALT FOR PRIME COAT	1,043	GAL
S-409-A	GEOTEXTILE FABRIC FOR UNDERSEAL TYPE V	2,551	SY
S-603-C-A	18" REINFORCED CONCRETE PIPE, CLASS III	140	LF
S-603-C-B	18" REINFORCED CONCRETE PIPE, END SECTION	1	EA
S-603-C-D	29" X 18" REINFORCED CONCRETE, ARCH PIPE CLASS III	48	LF
S-603-C-E	29" X 18" REINFORCED CONCRETE, ARCH PIPE END SECTION	2	EA
S-606-B	GUARD RAIL, W BEAM	150	LF
S-606-D	GUARD RAIL, BRIDGE END SECTION,TYPE "I"	4	EA
S-606-E	GUARD RAIL, TERMINAL END SECTION	4	EA
S-617-A	RIGHT-OF-WAY MARKERS (TYPE I)	9	EA
S-618-A	MAINTENANCE OF TRAFFIC	1	LS
S-619-C	6" WIDE TRAFFIC STRIPE (CONTINUOUS WHITE)	2,411	LF

S-619-D	6" WIDE TRAFFIC STRIPE (CONTINUOUS YELLOW)	2,411	LF
S-620-C	6" WIDE COLD PLASTIC EDGE STRIPE (CONTINUOUS WHITE)	640	LF
S-620-E-1	6" WIDE COLD PLASTIC TRAFFIC STRIPE (CONTINUOUS YELLOW)	640	LF
S-627-L	TWO- WAY YELLOW REFLECTIVE HIGH PERFORMANCE RAISED MARKERS	40	EA
S-630-C	REFLECTORIZED TRAFFIC OBJECT MARKER (ENCAPSULATED LENS) (TYPE 3)	4	EA
S-630-D	REFLECTORIZED TRAFFIC DELINEATOR SIGN (ENCAPSULATED LENS)	22	EA
S-803-A	TEST PILE	2	EA
S-803-E	14" STEEL PILE	2,589	LF
S-804-A	BRIDGE CONCRETE, CLASS "A"	382	CY
S-804-C	40' PRESTRESSED CONCRETE BEAM TYPE I + 2	596	LF
S-804-C	100' PRESTRESSED CONCRETE BEAM TYPE IV	998	LF
S-805-A	REINFORCING STEEL	63,877	LB
S-813-A	CONCRETE RAILING	640	LF
S-815-A	LOOSE RIPRAP, 300 LB.	1,741	TON
S-815-E	GEOTEXTILE FABRIC UNDER RIP RAP, TYPE V, AOS 100 0.21-0.43	2,098	SY
S-907-262-A	10" SEWER FORCE MAIN	20	LF
S-907-262-B	10" HDPE SEWER FORCE MAIN, DIRECTIONAL BORE	480	LF
S-907-262-C	AIR RELEASE VALVE W/HOUSING	1	EA
S-907-262-D	DUCTILE IRON FITTINGS	1,500	LB
S-907-262-E	10" GATE VALVE & BOX	1	EA
S-907-262-F	CONNECTION TO EX. FORCE MAIN	2	EA
S-907-265-A	16" WATER MAIN	20	LF
S-907-265-B	16" HDPE WATER MAIN, DIRECTIONAL BORE	480	LF
S-907-265-C	DUCTILE IRON FITTINGS	3,000	LB
S-907-265-D	AIR RELEASE VALVE W/HOUSING	1	EA
S-907-265-E	16" GATE VALVE & BOX	1	EA
S-907-265-F	CONNECTION TO EXISTING WATER MAIN	2	EA
S-907-265-G	REMOVE AND REPLACE FIRE HYDRANT ASSEMBLY	1	EA

CONTRACT TIME

300 Calendar Days

BASIS OF AWARD

The award, if made, will be made to the lowest qualified bidder on the basis of published quantities.

Minimum wage rates for this project have been predetermined by the Secretary of the Department of Labor in accordance with the requirements of Federal Regulations governing the expenditure of Federal Aid Highway Funds and are set out in the labor regulations contained in the Proposal.

The City of Meridian hereby notifies all bidders that it will affirmatively insure that in any contract entered into pursuant to this advertisement, minority business enterprise 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, or national origin in consideration for an award.

The City of Meridian is an equal opportunity employer and hereby notifies all bidders that it will affirmatively insure that, in any contract entered into pursuant to this advertisement, minority 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 or national origin in consideration for an award.

The City of Meridian reserves the right to reject any and/or all bids, waive technicalities, informalities or irregularities in the bids received, solicit new bids or to choose that bid which is deemed to be in the best interest of the City of Meridian.

Official bid documents can be downloaded from Central Bidding at www.centralbidding.com. Electronic bids can be submitted at www.centralbidding.com. For any questions relating to the electronic bidding process, please call Central Bidding at 225-810-4814. Plans and Specifications are also on file in the City Hall, Purchasing, 601 23rd Avenue, Meridian, Mississippi 39301.

This project shall be constructed in accordance with the latest edition of the Mississippi Standard Specifications for State Aid Road and Bridge Construction, together with all amendments and/or special provisions and/or addenda to the standards duly approved and adopted, unless otherwise noted in these specifications

Each bid shall be accompanied by a Cashier's check, Certified Check on a solvent bank or a Bidder's Bond issued by a Surety Company licensed to operate in the State of Mississippi, in the amount of five percent (5%) of the total bid price, payable to the City of Meridian as bid security. Bidders shall also submit a current financial statement, if requested by the City. The successful bidder will be required to furnish a Performance Bond and a Payment bond each in the amount of one hundred percent (100%) of the contract amount.

Either electronic or hard copy submittals, the proposal and contract documents in their entirety shall be submitted. No stripped bids will be accepted.

The attention of Bidders is directed to the provisions of Subsection 102.07 pertaining to irregular proposals and rejection of bids.

Vanessa Vrgil
Purchasing Agen

Publishing Dates: 02/23/2021
03/02/2021

NOTICE TO CONTRACTORS

CONTRACT TIME: 300 Calendar Days

BASIS OF AWARD:

The award, if made, will be made to the lowest qualified bidder on the basis of published quantities.

Minimum wage rates for this project have been predetermined by the Secretary of the Department of Labor in accordance with the requirements of Federal Regulations governing the expenditure of Federal Aid Highway Funds and are set out in the labor regulations contained in the Proposal.

The City of Meridian hereby notifies all bidders that it will affirmatively insure that in any contract entered pursuant to this advertisement, minority business enterprise 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, or national origin in consideration for an award.

PLANS AND SPECIFICATIONS are on file in the City of Meridian, 311 27th Avenue, Meridian, MS 39301, and at Waggoner Engineering, 2211 5th Street, Suite 107/109, Meridian, MS 39301.

This project shall be constructed in accordance with the 2004 edition of the Mississippi Standard Specifications for State Aid Road and Bridge Construction, together with all amendments and/or special provisions and/or addenda to the standards duly approved and adopted, unless otherwise noted in these specifications.

Each bid shall be accompanied by a Cashier's check, Certified Check on a solvent bank or a Bidder's Bond issued by a Surety Company licensed to operate in the State of Mississippi, in the amount of five percent (5%) of the total bid price, payable to the City of Meridian as bid security. Bidders shall also submit a current financial statement, if requested by the County. The successful bidder will be required to furnish a Performance Bond and a Payment bond each in the amount of one hundred percent (100%) of the contract amount.

The proposal and contract documents in its entirety shall be submitted in a sealed envelope and deposited with the City Hall, purchasing, 601 23rd Avenue, Meridian, Mississippi 39301 prior to the hour and date above designated. No stripped bids will be accepted.

The attention of Bidders is directed to the provisions of Subsection 102.07 pertaining to irregular proposals and rejection of bids.

SPECIAL NOTICE TO BIDDERS

CONSTRUCTION SAFETY AND HEALTH STANDARDS

It is a condition of this contract, and shall be make a condition of each subcontract entered into pursuant to this contract, that the contractor and any subcontractor shall not require any laborer or mechanic employed in performance of the contract to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health or safety, as determined under the following Federal regulations:

1. (a) Occupational Safety and Health Standards, Department of Labor, Occupational Safety and Health Administration, Federal Register or October 18, 1972, pages 22102 to 22356.

(b) General Industry Guide for Applying Safety and Health Standards, OSHA Publication No. 2072, U. S. Department of Labor, Occupational Safety and Health Administration.
2. Safety and Health Regulations for Construction, Department of Labor, Occupational Safety and Health Administration, Federal Register of December 16, 1972, pages 27503 to 27600.
3. Safety and Health Standards for Maritime Employment, Department of Labor, Occupational Safety and Health Administration, Federal Register of October 19, 1972, pages 22458 to 22564.

**OFFICE OF STATE AID ROAD CONSTRUCTION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

NOTICE TO BIDDERS NO. 1

DATE: July 1, 2005

SUBJECT: BIDDING REQUIREMENTS AND CONDITIONS

REFERENCE: Section S-102.02 of 2004 Edition of the Standard Specifications for Road and Bridge Construction

NOTICE TO BIDDERS
(ALL PROJECTS)

The current (2004) Edition of the Mississippi Standard Specifications for State Aid Road and Bridge Construction adopted by this Office on July 1, 2005, and approved by the Federal Highway Administration on July 1, 2005 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 Office of State Aid Road Construction.

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 inadvertently contain references to the 1982 or 1989 Edition of the Mississippi Standard Specifications for State Aid 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.

NOTICE TO BIDDERS
(FEDERAL AID PROJECTS)

The Contractor and sub-contractors shall submit one copy each of FORMS CAD-880, "Weekly Summary of Wage Rates" and CAD-881, "Weekly Statement of Compliance" each week to the State Aid Engineer and to the County Engineer. The Contractor and sub-contractors may at their discretion, submit two (2) copies of each form to the County Engineer, who in turn, shall forward one copy to State Aid. The forms may be obtained from:

Office Supervisor
Office of State Aid Road Construction
P.O. Box 1850
Jackson, Mississippi 39215-1850

**OFFICE OF STATE AID ROAD CONSTRUCTION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

NOTICE TO BIDDERS NO. 2

DATE: July 1, 2004

SUBJECT: HIGH VOLTAGE OVERHEAD LINES

**NOTICE OF WORK TO BE PERFORMED
IN PROXIMITY OF HIGH VOLTAGE POWER LINES**

In accordance with Section 45-15-1, et seq., Mississippi Code of 1972 (as amended effective July 1, 1988), _____ (herein after referred to as "Applicant") (Supervisor in Charge: _____), whose address is _____, and whose telephone number is _____, hereby gives notice to the electric utility (hereinafter referred to as "Utility") that Applicant will be performing functions or activities at the location of _____ and that the estimated starting date of this work is _____. This work could reasonably be expected to cause persons, equipment or parts of tools or materials to be brought within ten (10) feet of Utility's high voltage lines at the proposed work area. Applicant hereby requests the Utility to confer with Applicant or his representative at the work site to ascertain the type of work activity that will take place and if further safety measures need to be taken by either the Applicant or the Utility. The Utility will give the Applicant a written cost estimate for safety arrangements to deter contact with on-site power lines. Applicant agrees not to perform such functions or activities until mutually satisfactory arrangements as provided by Section 45-15-9 have been made to deter contact with Utility's line.

Nothing contained in this Notice shall diminish or affect the obligation imposed upon the Utility under Section 45-15-1, et seq., or under existing laws or be construed as a waiver of the Applicant's or the Utility's rights under the law.

NOTICE GIVEN THIS, the _____ day of _____, _____.

APPLICANT

BY: _____

(Title)

Notice received by the Utility this the _____ day of _____, _____

**OFFICE OF STATE AID ROAD CONSTRUCTION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

SECTION 904- NOTICE TO BIDDERS NO. 2.1

DATE: 02/09/2021

SUBJECT: Designated Owner and Engineer

Any reference in the Contract Documents and Standard Specifications to the County Board of Supervisors shall be interpreted to mean the City of Meridian, the "Owner".

Any reference in the Contract Documents and Standard Specifications to the County Engineer shall be interpreted to mean the Project Engineer for the City of Meridian.

**OFFICE OF STATE AID ROAD CONSTRUCTION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

NOTICE TO BIDDERS NO. 5

DATE: _____

**SUBJECT: STATUS OF UTILITY ADJUSTMENT AND RIGHT-OF-WAY
ACQUISITION**

I. All known utilities within the construction limits of this project are shown on the plans. The owners and addresses of these utilities are as follows:

1. ATMOS GAS - initial contact was made
2. AT&T
3. Cspire
4. Southern Company
5. City of Meridian - Water and Sewage lines

The Status of the adjustment of each of the utilities is as follows:

1. No utilities within the project's ROW
2. No utility within the project's ROW
3. Work in progress to relocate the utility out of the project's ROW
4. lines and equipment have been removed out of the project's ROW
5. Initial contact was made to address utility

Subsection S-105.06 of the 2004 Edition of the Standard Specifications provides for cooperation between the Contractor and Owner of utilities. All utility agreements are available for inspection by the Contractor in the Chancery Clerk's office. Additional assistance may be obtained by contacting the following:

**MISSISSIPPI ONE-CALL CENTER
BEFORE YOU DIG CALL:
MS 1-800-227-6477 - JACKSON 362-4374
OUT-OF-STATE 1-800-445-1988**

II. _____ County has certified to the Office of State Aid Road Construction that it has title to all rights-of-way within the limits shown on the plans for this project.

(7-01-2004)

**OFFICE OF STATE AID ROAD CONSTRUCTION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

NOTICE TO BIDDERS NO. 7

DATE: January 10, 2020

SUBJECT: PAYMENTS TO SUBCONTRACTORS

Bidders are hereby advised that each month, the Contractor will submit to the County/LSBP Engineer form OCR-484-SA certifying payments to all subcontractors. Form OCR-484-SA can be obtained from the Office Of State Aid Road Construction, MDOT Lab Building, 412 Woodrow Wilson Avenue, Jackson, MS, or on the State Aid website (<https://www.osarc.ms.gov>) under Documents->Contract Documents.

**OFFICE OF STATE AID ROAD CONSTRUCTION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

NOTICE TO BIDDERS NO. 8

DATE: November 8, 2011

SUBJECT: Errata and Modifications to the 2004 Edition of the Standard Specifications for State Aid Road and Bridge Construction

<u>Page</u>	<u>Subsection</u>	<u>Change</u>
1-21	S-103.02	In the third line of the last paragraph, change "contracts in the same" to "contracts, financed wholly with State funds, in the same".
1-42	S-105.17	In line (b) of the third paragraph, add "claim." at the end of the sentence.
1-47	S-106.04	In the next to last paragraph, change "TMD-22-0100-000" to "TMD-22-01-00-000" and change "TMD-21-0100-000" to "TMD-21-01-00-000".
1-84	S-109.06.2	In the eleventh line of the second paragraph, change "of material invoices" to "of paid material invoices".
<u>1-85</u>	<u>S-109.08</u>	Replace 4 th paragraph in it's entirety with "The established base prices for bituminous products and fuels shall be the prices for the month prior to the month of the bid date and are available on the State Aid Website."
1-87	S-109.08	On page 1-87, insert the following after item (A6) and before the paragraph in the middle of the page: "(A7) Asphalt for Fog Seal Mixture -- One half pay quantity in gallons."
1-87	S-109.08	Delete the last paragraph on the page in toto.
1-88	S-109.08	Under ADJUSTMENTS, change paragraph 5 to read as follows: No adjustment will be made for items of work accomplished after the expiration of Contract Time except for cases involving natural or manmade disasters or other reasons not inherent to the construction industry. The contractor will submit documentation for the adjustment to the Engineer for approval/disapproval. If approved, the Engineer will prepare a supplemental agreement explaining the adjustment and submit the proper number of copies of the agreement to the Board of Supervisors for their consideration and action. If approved by the Board, all copies will be forwarded to the State Aid Engineer for concurrence. Upon concurrence, the State Aid Engineer will, if necessary, forward the agreement to any other involved parties for their action. A copy of the approved agreement will be furnished to all parties by the State Aid Engineer.
2-7	S-202.07	In the first sentence of the first paragraph, change "S-202" To "S-202-A". In the first sentence of the second paragraph, delete "S-202-A".

<u>Page</u>	<u>Subsection</u>	<u>Change</u>
3-30	S-308.15	In the third pay item, change "per square yard**" to "per square yard". In the fourth pay item, change " <u>S-308-B-1</u> " to " <u>S-308-B-2</u> ".
4-8	<u>S-401.02.4</u>	At the end of the third sentence, delete the "." and add "and as a base course."
4-8	S-401.02.4	In the table at the end of the Subsection, for the 19 mm, change "2 ¼" to "2 ½" in the Minimum and change "3" to "3 ½" in the Maximum; for the 12.5 mm, change "2" to "2 ½" in the Maximum; for the 9.5 mm, change "1 ½" to "2" in the Maximum; and for the 4.75 mm, change "¾" to "1 ¼" in the Maximum.
4-23	S-401.03.1.4	In the first paragraph, change "92.0 percent" to "the specified percentage (92.0 or 93.0)".
4-32	S-403.03.3	In the first sentence of the second paragraph, change "acceptance and pavement" to "acceptance and payment".
4-45	S-409.02.2	Change "PG 64-22" to "PG 67-22".
6-2	S-601.06	In the first sentence, change "S-804.03" to "S-804.03.5".
6-7	S-602.05	Change the subsection reference for Bending from "S-805.05" to "S-805.03.2".
6-9	S-603.02	Change the subsection reference for Joint Mortar from "707.02" to "714.11".
<u>6-15</u>	<u>S-603.09</u>	After second sentence, add "All lift holes shall be filled and/or sealed to the satisfaction of the Engineer."
6-78	S-620.06	Change the first sentence of the second paragraph, from "Legend will be measured by the square foot.", to "Legend will be measured by the linear foot or square foot, as applicable."
6-78	S-620.07	In the sixth pay item, change "S-620-E-1" to "S-620-E-2".
7-17	S-702.12	In TABLE 1, under the heading of Test, in the second line change "140°F, poises" to "275°F, C _s ".
7-20	S-703.02.1	In line (1) of the first paragraph, change "set-out" to "set out".
7-25	S-703.04.2	In the fifth paragraph, delete "S-703.04.3 and".
7-52	S-708.02.1.2	In the first sentence change "20 percent" to "25%".
7-104	S-714.13.1	Delete the fourth paragraph.
7-154	S-721.02.3.7	Delete Subsection S-721.02.3.7--Ground Plates in toto.
8-37	S-803.03.2.6	In the first sentence of the second paragraph, change "S-803.03.1.5.1" to "S-803.03.2.5".
8-45	S-803.04.1	Delete the second paragraph and replace with the following: Test piles which require extensions or building up will not be measured for additional payment. Splices required for the extensions will not be measured for payment.

<u>Page</u>	<u>Subsection</u>	<u>Change</u>
		No measurement for payment will be made for cut-off of a test pile.
8-50	S-803	Under <u>COMPENSATION</u> , In the seventh pay item, change " <u>S-803-G: Blank</u> " to " <u>S-803-G: Concrete Piling Cut-off, <u>Size</u></u> - per each "
8-60	S-804.02.11	In the last sentence of the first paragraph, change "automatically" to "automatic".
8-64	S-804.02.13	In the second line of paragraph (c), place a period after psi and delete "provided both the QC and QA test results are equal to or exceed the minimum compressive strength requirements."
8-66	S-804.02.13.1.3	In the last sentence change, "S-804.02.13.1" to "S-804.02.12".
8-67	S-804.02.13.1.5	Change the equation for % Reduction to:
		$\% \text{ Reduction} = \frac{(f'_c - X)}{f'_c} \times 100$
8-121	S-806.04	In the first sentence of the third paragraph, change "by the unit (one unit consists of one wing on each side and end of the abutment cap)" to "per each".
8-121	S-806.08	Change " <u>S-806.08--Basis of Payment.</u> " to " <u>S-806.05--Basis of Payment.</u> "
8-122	S-806.08	In the first pay item, change "___' Interior" to "____' Interior".
<u>8-122</u>	<u>S-806.08</u>	On pay item S-806-H, add "or Steel Posts"

**OFFICE OF STATE AID ROAD CONSTRUCTION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

NOTICE TO BIDDERS NO. 10

DATE: July 1, 2005

SUBJECT: MONTHLY ESTIMATE RETAINAGE

The monthly retainage for this project shall be two and one half (2-1/2) percent (%) subject to the provisions found in Subsection **S-109.06.3--Retainage** on page 1-84 of the 2004 Edition of the Mississippi Standard Specifications for State Aid Road and Bridge Construction.

**OFFICE OF STATE AID ROAD CONSTRUCTION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

NOTICE TO BIDDERS NO. 11

DATE: November 19, 2009

SUBJECT: CERTIFICATION OF 100 % PAYMENT TO SUBCONTRACTORS

Bidders are hereby advised that within thirty (30) days of any Subcontractor completing 100% of any subcontracted work, the Prime Contractor shall make full payment to the Subcontractor (including retainage), complete the following certification, attach it to form OCR-484-S or OCR-484-SA, as applicable, and submit it to the County/LSBP Engineer. Retainage on the subcontract will then be released to the Prime Contractor on a subsequent estimate.

CERTIFICATION OF 100% OF PAYMENT TO SUBCONTRACTOR

Date: _____
Project No.: _____
County: _____
Prime Contractor: _____
Subcontractor: _____

I, _____, hereby certify
(Printed or typed name of Subcontractor)

that I have been paid 100% (including retainage) of the amount of work subcontracted on the above mentioned project in the amount of _____ and that I was paid within thirty (30) Days of when I completed said work.

(Signature of Subcontractor)

(Signature of Prime Contractor)

Falsification of this Certification is subject to prosecution.

**OFFICE OF STATE AID ROAD CONSTRUCTION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

NOTICE TO BIDDERS NO. 12

DATE: **May 10, 2006**

SUBJECT: **FIBER REINFORCED CONCRETE**

Bidders are hereby advised that synthetic structural fibers meeting the requirements of Supplemental Specification 901-S-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 first be approved by the Engineer prior to use.

OFFICE OF STATE AID ROAD CONSTRUCTION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

NOTICE TO BIDDERS No. 15

DATE: March 11, 2010

SUBJECT: Hot Mix Asphalt Pavement Safety Edge

For the surface lift of hot mix asphalt, the contractor shall attach a manufactured shoe to produce a sound and durable compacted edge joint on the shoulder. The shoe shall be Advent-Edger by Advant-Edge Paving Equipment or Shoulder Wedge Maker (SWM) by Transtech Systems, Inc. An approved equal to these two devices will also be accepted.

During the first placement of the surface lift on the project the contractor shall demonstrate to the satisfaction of the engineer acceptable safety edge construction.

Pavement safety edge accepted will be paid for as an included item in the additional hot mix asphalt required for the safety edge, Pay Item S-403-A.

**OFFICE OF STATE AID ROAD CONSTRUCTION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

NOTICE TO BIDDERS NO. 16

DATE: November 3, 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 Nation Standard for High-Visibility Safety Apparel and Headwear”**. All workers on County right-of-way shall comply with the 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>

OFFICE OF STATE AID ROAD CONSTRUCTION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

NOTICE TO BIDDERS NO. 18

DATE: March 11, 2020

SUBJECT: TRANSPORTATION AND DRIVING OF PRESTRESSED CONCRETE PILES

Bidders are hereby advised that prestressed concrete piling shall not be transported until at least **TWO DAYS** after the concrete has reached a compressive strength of 5,000 psi or greater strength when shown on the plans.

Prestressed concrete piles shall not be driven until the concrete is **FOURTEEN (14) DAYS OLD** and has reached the compressive strength stated on the plans.

Documentation as described in S-804.03.22.10 that allows for the transport and driving of the prestressed concrete piles shall be furnished to the **CONTRACTOR** and the **COUNTY ENGINEER** upon delivery of the piles to the construction site. The Engineer's personnel will make visual inspection of each prestressed concrete pile at the construction site.

The **CONTRACTOR** shall inform the prestressed concrete pile **MANUFACTURER** of these requirements.

Supplemental Specification
901-S-102-1
Bidding Requirements and
Conditions

OFFICE OF STATE AID ROAD CONSTRUCTION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

DATE: March 11, 2010

SUBJECT: Bid Bond Agent

Delete the first sentence of the second paragraph of S-102.08 on page 1-19, and substitute the following:

If a bid bond is offered as guaranty, the bond must be on a form approved by the State Aid Engineer, made by a Surety, and must be acceptable to the Board and the State Aid Engineer and signed or countersigned by a Mississippi Agent or Qualified Nonresident Agent and the bidder.

OFFICE OF STATE AID ROAD CONSTRUCTION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

DATE: March 11, 2010

SUBJECT: Contract Bond Agent or Liability Insurance Agent

Delete the last sentence of the paragraph of S-103.05 on page 1-22, and substitute the following:

The bond or bonds shall be negotiated for, procured from, signed or countersigned by, and the premium paid to a Mississippi Agent or Qualified Nonresident Agent of the Surety.

Delete the last sentence of the first paragraph of S-103.06.1 on page 1-22, and substitute the following:

Each policy shall be signed or countersigned by a Mississippi Agent or Qualified Nonresident Agent of the insurance company.

Delete the last sentence of the second paragraph of S-103.06.1 on page 1-23, and substitute the following:

Each policy shall be signed or countersigned by a Mississippi Agent or Qualified Nonresident Agent of the insurance company.

Supplemental Specification
901-S-104-1
Removal and Disposal of Structures
and Obstructions

OFFICE OF STATE AID ROAD CONSTRUCTION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

DATE: July 1, 2005

SUBJECT: Changes in Character of Work and Changed Physical Conditions and Removal and Disposal of Structures and Obstructions:

Section S-104 - SCOPE OF WORK; of the MISSISSIPPI STANDARD SPECIFICATIONS FOR STATE AID ROAD AND BRIDGE CONSTRUCTION 2004 EDITION is hereby amended as follows:

901-S-104.02.1--Changes in Character of the Work and Changed Physical Conditions: Delete the last sentence of the first paragraph and add the following paragraphs:

Upon written notification, the Engineer will investigate the conditions, and if it is determined that the conditions materially differ and cause an increase or decrease in the cost or time required for the performance of any work under the contract, an adjustment, excluding anticipated profits, will be made and the contract modified in writing accordingly. The Engineer will notify the Contractor, in writing, of the determination whether or not an adjustment of the contract is warranted.

No contract adjustment which results in a benefit to the contractor will be allowed unless the contractor has provided the required written notice.

In the second paragraph, after the words " cannot be reached," delete "the State Aid Engineer" and insert "the Board, with the approval of the State Engineer,". Then delete the words "which the State Aid Engineer has" and insert "which the Board and the State Aid Engineer have".

901-S-104.05--Removal and Disposal of Structures and Obstructions: After the last paragraph on page 1-27, add the following paragraph:

The Contractor shall also furnish the Engineer a certified letter stating that the area of disposal is not in a wetland.

901-S-104.06--Rights in and Use of Materials Found on the Work: After the first sentence of the third paragraph insert the following sentence:

The Contractor shall also furnish the Engineer a certified letter stating that the area of disposal is not in a wetland.

**Supplemental Specifications
901-S-107-1
Storm Water Pollution
Prevention Plan**

**OFFICE OF STATE AID ROAD CONSTRUCTION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION**

DATE: 08/30/2016

SUBJECT: STORM WATER POLLUTION PREVENTION PLAN

PROJECT: MS 024-125(4)B
COUNTY: HINDS

Section 901-S-107-1, Storm Water Pollution Prevention Plan, is hereby added to and made part of the 2004 Edition of the Mississippi Standard Specifications for State Aid Road and Bridge Construction as follows.

SITE INFORMATION

The construction on this project will disturb 83 acres (with a maximum of 10 acres to be disturbed at one time). The project has medium to low erosion potential due to the soil types and gradient of the slopes. It is in the Pearl River Watershed Basin. The receiving stream (Big Creek) is impaired.

SEDIMENT AND EROSION CONTROL REQUIREMENTS

VEGETATIVE CONTROLS: Clearing and grubbing areas will be minimized to comply with the buffer zone requirements of the contract and Storm Water Permit. Permanent erosion controls (soil preparation, fertilizing, seeding and mulching and solid sodding) will be placed as shown on the plans. Any disturbed areas that remain inactive for over 30 days shall be seeded (temporary or permanent seeding) within 7 calendar days unless otherwise directed by the engineer at no additional cost to the project. Any soil material stockpiled on the project will be encircled by and earthen berm and silt fence maintained on the lower elevation contours. Within 30 days of the conclusion of land-disturbing activities in any area, the subject area will be graded bladed and permanently vegetative measures will be employed.

STRUCTURAL CONTROLS: Temporary silt fence, hay bales, rock bags, wattles, silt basins, construction entrances, stream diversions, slope drains and rip rap will be placed as shown on the plans. Concrete washout areas will be maintained at designated locations. The wash outs will be constructed as sumps encircled by and earthen berm of approximately height of 24 inches. Once the concrete has dried and set it will be removed off site to an appropriate disposal site.

OFFICE OF STATE AID ROAD CONSTRUCTION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

DATE: July 01, 2005

SUBJECT: Material Pits:

Section S-107- LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC; of the MISSISSIPPI STANDARD SPECIFICATIONS FOR STATE AID ROAD AND BRIDGE CONSTRUCTION 2004 EDITION is hereby amended as follows:

901-S-107.23--Material Pits: Delete the first and second paragraph on page 1-66 and replace with the following paragraphs:

Before a pit (quarry) is opened (area cleared or overburden disturbed), furnish to the County Engineer a letter from the Executive Director of the Department of Archives and History, P. O. Box 571, Jackson, Mississippi 39205 (telephone number 601/576-6850), stating that the pit site is satisfactory from an archaeological and historical standpoint. Additionally, the contractor will furnish the Engineer either a copy of the " Notification of Exempt Operations" or a copy of the (permanent or temporary) Class II Permit approval from the Mississippi Department of Environmental Quality, Office of Geology.

For material pits located in Clarke, Covington, Forrest, George, Greene, Hancock, Harrison, Jackson, Jones, Lamar, Pearl River, Perry, Stone and Wayne Counties, the Contractor will be required to make special considerations regarding gopher tortoises. In addition to the normal required documentation associated with material pits, the Contractor shall, for each site used to obtain or dispose of materials associated with material pits located in these Counties, provide the Engineer with a letter from a qualified biologist certifying that the site was inspected prior to any clearing of vegetation or disposal of project materials and that the site is not inhabited by gopher tortoises, or appropriate avoidance measures have been installed. No individual lacking the proper State or Federal license shall touch or otherwise harass a gopher tortoise.

All costs involved in obtaining letters of clearance shall be born by the Contractor

Supplemental Specification
901-S-107-3
Permits, Licenses and Taxes

OFFICE OF STATE AID ROAD CONSTRUCTION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

DATE: May 10, 2006

SUBJECT: Permits, Licenses and Taxes:

Section S-107- LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC; of the MISSISSIPPI STANDARD SPECIFICATIONS FOR STATE AID ROAD AND BRIDGE CONSTRUCTION 2004 EDITION is hereby amended as follows:

901-S-107.02–Permits, Licenses and Taxes. Delete in toto Subsection 107.02 on page 1-50, and substitute the following:

Except as provided in S-107.09, and S-107.22, the Contractor or Subcontractor shall procure all permits and licenses, pay all charges, fees, and taxes, and give all notices necessary and incidental to the due and lawful prosecution of the work. At any time during the life of this contract, State Aid may audit the Contractor's or Subcontractor's compliance with the requirements of this section.

The Contractor or 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., Mississippi Code of 1972, Annotated, 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 Mississippi State Tax Commission will be notified of the name and address of Contractors or any Subcontractors that are awarded State Aid contracts. The Contractor or Subcontractor will be subject one or more audits during the life of this contract to make certain that all applicable fuel taxes are being paid promptly as outlined in Section 27-55-501, et seq., Mississippi Code of 1972, Annotated, and any sales and/or use taxes, as outlined in Section 27-67-1, et seq., Mississippi Code of 1972, Annotated are being paid in compliance with the law.

Supplemental Specification
901-S-212-1
Agricultural Limestone

OFFICE OF STATE AID ROAD CONSTRUCTION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

DATE: January 01, 2005

SUBJECT: Agricultural Limestone

Section S-212-GROUND PREPARATION AND FERTILIZER; of the MISSISSIPPI STANDARD SPECIFICATIONS FOR STATE AID ROAD AND BRIDGE CONSTRUCTION 2004 EDITION is hereby amended as follows:

901-S-212.07 -- Basis of Payment. Insert the following paragraph before the first paragraph on page 2-37:

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 901-S-715-02.2.1.3, of between 60.0% and 62.9% will be paid for at half ($\frac{1}{2}$) the contract price per ton. No payment will be made for Grade " A" agricultural limestone with and ENV less than 60.0%.

Delete the first pay Item listed on page 2-37 and substitute the following:

901-S-212-A: Agricultural Limestone - per ton

OFFICE OF STATE AID ROAD CONSTRUCTION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

DATE: July 01, 2005

SUBJECT: GROUND-IN RUMBLE STRIPS

The MISSISSIPPI STANDARD SPECIFICATIONS FOR STATE AID ROAD AND BRIDGE CONSTRUCTION 2004 EDITION is hereby amended as follows: At the bottom of page 4-75 change "Sections S-414 thru S-499 Blank." to "Sections S-414 thru S-422 Blank." And add the following:

SECTION 901-S-423 - GROUND-IN RUMBLE STRIPS

901-S-423.01--Description. This work consists of grinding rumble strips at the locations indicated on the plan, in accordance with the details on the plans, and the requirements set out herein.

901-S-423.02--Blank.

901-S-423.03--Construction Requirements.

901-S-423.03.1--Equipment. The equipment shall consist of a rotary type cutting head capable of cutting rumble strips to the dimensions shown on the plans. The cutting head shall have the cutting tips arranged in such pattern as to provide a relatively smooth cut of approximately 1/8 of an inch between peaks and valleys. The cutting head(s) shall be on its own independent suspension from that of the power unit to allow the tool to self align with the slope of the shoulder and/or any irregularities in the shoulder surface.

The finished rumble strips shall be cut to the dimensions as shown on the plans within the allowable tolerance and be perpendicular to the direction of travel. The rumble strips shall be placed in relation to the roadway according to the patterns shown on the plans.

Adequate back-up equipment such as mechanical sweeper/vacuum, water truck, etc. and personnel shall be provided to remove all grindings from the shoulder.

901-S-423.03.2--Construction Details. The cutting tool shall be equipped with guides to provide a consistent alignment of each cut in relation to the edge line and to provide uniformity and consistency throughout the project. The alignment of the cuts shall not deviate from the path of the edge line.

When the contract requires shoulder paving, the rumble strips shall be cut into the finished shoulder after the final course has been placed, otherwise, rumble strips shall be cut into the existing shoulder material. The debris/grindings generated from the cutting shall be picked up and removed on a daily basis by use of a sweeper/vacuum or other method approved by the Engineer. The shoulder shall be cleaned prior to opening the adjacent lane to traffic. Any other method of cleaning debris from the shoulder or roadway other than picking up shall be approved by the Engineer prior to beginning construction.

The Contractor shall demonstrate to the Engineer the ability to achieve the desired surface inside each depression without tearing or snagging the asphalt prior to beginning the work. Areas damaged by the Contractor's operations shall be corrected and/or repaired as directed by the Engineer at no additional cost to the Project.

When placed on concrete shoulders, the Contractor shall adjust the spacing of the rumble strips to ensure that the depressions are not cut across a concrete shoulder joint.

This construction operation will encroach on the lane adjacent to the shoulder receiving the rumble strips. Therefore, construction on roadways under traffic will either require a lane closure or be considered as a moving operation. Traffic control shall be handled in accordance with the appropriate standard drawings shown in the plans or contract documents.

901-S-423.04--Method of Measurement. Rumble strips, ground-in, completed in accordance with the plans and specifications, will be measured by the mile, which price shall be full compensation for all materials, equipment, tools, disposal of grinding debris, any associated traffic control, and all incidentals necessary to complete the work. Length of measurement will start at the beginning of a continuous series of rumble strips and will terminate at the end of the continuous series. The length used to measure rumble strips will be the horizontal length computed along the stationed control line. Each shoulder on which rumble strips have been ground will be measured separately with the measurements from each shoulder combined to obtain the pay length for rumble strips.

901-S-423.05--Basis of Payment. Rumble strips, measured as prescribed above, will be paid for at the contract unit price per mile, which price shall be full compensation for completing the work.

The price for rumble strips shall include the cost of any required maintenance of traffic and protective services.

Payment will be made under:

901-S-423-A: Rumble Strips, Ground-In - per mile

Sections S-424 thru S-499 Blank

OFFICE OF STATE AID ROAD CONSTRUCTION

DATE: March 13, 2019

SUBJECT: Construction Surveying

The MISSISSIPPI STANDARD SPECIFICATIONS FOR STATE AID ROAD AND BRIDGE CONSTRUCTION 2004 EDITION is hereby amended as follows: In the middle of page 6-39 remove "Section S-607 – Blank." and add the following:

SECTION S-607 – CONSTRUCTION SURVEYING

S- 607.01—Description. This work consists of performing all calculations and other work necessary to establish and/or verify all horizontal and vertical control data; and furnishing, placing and maintaining roadway construction surveying and/or bridge, box bridge, or box culvert construction surveying, necessary for the proper prosecution of all features and items of the work under contract. This shall include, but not be limited to, grades and drainage structure locations, lengths, elevations and skews. When the contract includes a pay item for roadway construction surveying as provided herein, any references in other sections of the Standard Specifications to establishment of control points or construction surveying "by the Engineer", or "Engineer" or "County Engineer" shall be construed to mean "by the Contractor".

S-607.02--Materials. The Contractor shall furnish all personnel, materials, equipment and devices necessary for determining, establishing, setting, checking and maintaining points, lines, grades and layout of the work. All surveying equipment shall be properly adjusted and suited for performing the work required. Traffic control necessary for the proper execution of the work shall be furnished by the Contractor without separate measurement for payment. Stakes shall be of sufficient length, thickness and quality to serve the purpose for which they are being used. Nails, cotton picker spindles, rebar, wire flags or other materials may be used as appropriate to the purpose of marking and preserving layout locations as needed.

S-607.03--Construction Requirements.

S-607.03.1--General. The County Engineer will establish, one time only, secondary control points with elevations at distances not to exceed 1000 feet or that minimum distance necessary to maintain inter-visibility. For bridge work, the Engineer's field control will consist of a stationed baseline reference point near each end of the bridge(s) and one accessible bench mark near each bridge site. The Contractor shall verify the accuracy of the control points before proceeding with the layout for construction.

When errors are discovered and control points do not agree with the plans, the Contractor shall promptly notify the Engineer in writing, and explain the problem in detail. The Engineer will advise the Contractor within five (5) working days of any corrective actions that may be deemed necessary.

The Contractor will be responsible for verifying and modifying, as necessary to best fit existing field conditions, lengths, locations, elevations and skew angles of all drainage structures shown on the construction plans. All junction box and inlet locations and heights shall also be verified and modified as necessary to fit existing field conditions. Modifications to the plans shall not be made without the consent of the County Engineer. The Contractor will not be responsible for determining the size of drainage structures, but should immediately report any suspected error to the Engineer. Heights of fill over drainage structures shall be checked to verify class of pipe, bedding and the appropriate standard and/or modified standard drawing(s) required in the construction with any differences from the plans being reported to the Engineer.

The Contractor shall perform work necessary to verify alignment and plan grades on all roadway intersections and tie-ins. Any discrepancies in grades, alignment, location and or dimension detected by the Contractor shall immediately be brought to the attention of the Project Engineer.

The Contractor shall employ sufficient qualified personnel experienced in highway surveying and layout to complete the work accurately. The Contractor shall also determine and provide all additional grade controls and staking operations necessary to secure a correct layout and construction of the work. All minor variations in layout and grades required to meet field conditions shall be resolved with the Engineer and shall not be considered justification for adjusting contract price or time.

Examples of minor variations in layout and grades are:

- (a) Adjustment of drainage or other structure length, alignment, and flow line elevation.
- (b) The adjustment of grades and alignment at roadway intersections, cross-overs, railroad crossings, interchanges, existing bridges and roadways.
- (c) Adjustment of curve data.

The Contractor will be responsible for calculating and laying out all additional lines, grades, elevations and dimensions necessary to construct the work required in the plans. All grades and other layout data computed by the Contractor shall be recorded and a copy of this data shall be furnished, with sufficient time for checking, to the Engineer before field work is started. The originals of all data shall be furnished to the Engineer on or before final inspection for the Engineer's permanent file. The Contractor shall also furnish personnel to assist the Engineer in taking tolerance verification checks or other notes to determine whether specified tolerances are met. Any inspection or checking of the Contractor's layout by the Engineer and the approval of all or any part of it will not relieve the Contractor of the responsibility to secure proper dimensions, grades, and elevations of the several parts of the work.

Prior to beginning construction on any structure that references to an existing structure or topographical feature, the Contractor shall check the pertinent location and grades of the existing structures or topographical features to determine whether the location and grade shown on the plans are correct.

The Contractor shall stake centerline control at each station, BOP, EOP, PC, PT, SC, CS, TS, ST, and equations just before field cross sectioning by the Engineer for both original and final cross sections.

The Contractor shall furnish "as built" finish centerline elevations to the Engineer prior to final inspection of the project.

The Contractor shall set stakes and/or flags on the right-of-way line at each station and right-of-way break or as directed by the Engineer before clearing operations are started on any section of roadway.

The Contractor shall exercise care in the preservation of stakes and bench marks and shall reset them when they are damaged, lost, displaced or removed. The Contractor shall use competent personnel and suitable equipment for the layout work required and shall provide that it be performed under the supervision of, or directed by, a Registered Professional Engineer or Registered Land Surveyor who is duly registered and entitled to practice as a Professional Engineer or Professional Land Surveyor in the State of Mississippi. The duties performed by said Registrant shall conform to the definitions under the "practice of engineering" and practice of "land surveying" in Mississippi Law.

The Contractor shall not engage the services of any person in the employ of the Engineer for the performance of any of the work covered by this Section or any person who has been employed by the Engineer within the past six months except those who have legitimately retired during this period. All cross sections, measurements, and tickets required for determining pay quantities will be the responsibility of the Engineer.

The Engineer reserves the right to check any or all of the Contractor's layout work for accuracy and shall be assisted by the Contractor's personnel in such checking. When errors or discrepancies are found, the Contractor will take measures necessary to correct, at no expense to the County or State, any construction that has been performed using the improper layout. Any inspection, checking and approval thereof by the Engineer of work for which the Contractor is responsible will not relieve the Contractor of responsibility to secure correct dimensions, grades, elevations, alignments and locations of the work for satisfactory completion of the project and as a condition for final acceptance by the Engineer.

S-607.03.2--Conventional Surveying. In addition to the requirements set forth in Subsection 607.03.1, the following shall be required when using the conventional staking method.

On grading projects, the Contractor shall set slope stakes at each station and at the beginning and end of curves. Closer intervals will be required for sharp changes in grades or alignment, widening and certain other geometric details.

The Contractor shall set subgrade blue tops on centerline, break points and at the left and right subgrade shoulder lines at intervals of not more than 100 feet on tangents and intervals of not more than 50 feet in curves. The Engineer may require closer intervals for sharp changes in grades or alignment, widening, or super elevation.

The Contractor shall furnish personnel to assist the Engineer in taking stringline and other notes to determine whether specified tolerances are met

On paving contracts, the Contractor shall set subgrade, base and paving blue tops. The base and pavement grade stakes shall be set on intervals in accordance with the requirement of the Engineer.

S-607.03.3--Automated Machine Guidance. In addition to the requirements set forth in Subsection 699.03.1, the Contractor may submit a request to use Automated Machine Guidance (AMG) equipment and methods to complete the work. A comprehensive written request shall be submitted to the Engineer for review at least 30 days prior to expected use. The Engineer will have to approve the submittal prior to the Contractor performing any AMG work.

The Engineer shall have final authority to approve or not allow the use of AMG equipment and methods under the specification.

S-607.04--Method of Measurement. Construction Surveying will be measured as a lump sum quantity. When Pay Item No. 607-A, Roadway Construction Surveying, is provided in the contract, measurement

shall include the staking of all bridges, box bridges and box culverts, including any detour bridges, or detour run arounds, which are a part of the contract.

S-607.04.1--Roadway Construction Surveying. Roadway Construction Surveying will be measured for payment in accordance with the following schedule:

- (a) Monthly estimate # 1, 25 percent of the amount bid for Roadway Construction Surveying will be paid.
- (b) Monthly estimate # 2, 50 percent of the amount bid for Roadway Construction Surveying will be paid.
- (c) After the Contractor has earned 50 percent of the original value of all direct pay items, the amount paid on later monthly estimates will be based on the contract percent complete.

S-607.04.2—Bridge Construction Surveying. Bridge Construction Surveying will be measured for payment in accordance with the following schedule:

- (a) Monthly estimate # 1, 35 percent of the amount bid for Bridge Construction Surveying will be paid.
- (b) Monthly estimate # 2, 75 percent of the amount bid for Bridge Construction Surveying will be paid.
- (c) After the Contractor has earned 75 percent of the original value of all direct pay items, the amount paid on later monthly estimates will be based on the contract percent complete.

S-607.05--Basis of Payment. Construction Surveying, measured as prescribed above, will be paid for at the contract lump sum price, which shall be full compensation for completing the work.

Payment will be made under:

- S-607-A: Roadway Construction Surveying - lump sum
- S-607-B: Bridge Construction Surveying - lump sum

SUPPLEMENTAL PROVISION 901-S-618-1

TRAFFIC CONTROL NARRATIVE

DATE: October 28, 2020

SUBJECT: SUPPLEMENT TO TRAFFIC CONTROL PLAN

The project consists of replacing an old bridge on Highway 80 in Meridian, MS. The project also involves a roadway segment from station 33+00 to station 40+18 and from station 43+20 to station 48+25.

Prior to beginning construction on the project, ROAD CLOSED (R11-2a), ROAD CLOSED AHEAD (W20-3) signs shall be installed on the approach side of the road, TYPE III BARRICADES installed across the entire roadway and traffic will be detoured as shown. The cross roads shall remain closed until the top lift of binder course and temporary stripe are in place.

If possible, the contractor shall make safe allowances for the movement of local traffic through intersecting roads during construction.

The Contractor shall install traffic control devices as needed such as signs, barricades, drums, cones, flashers, message boards that may not be shown on the plans (Traffic Control Sheets and Plan) in order to safely maintain and direct traffic in accordance with the requirement of latest edition of the MUTCD.

During construction, the bridge will be closed to all through and local traffic.

All construction operations will be accomplished by working within the confinement of the proposed project right of way.

???? is designated as the responsible person to ensure the Contractor constructs, installs and maintains the devices called for on the Traffic Control Plan . An inspection of traffic control signs and devices shall be performed at periods not to exceed once per week regardless of construction activities with the project. The Contractor will be required to immediately rectify any noted deficiencies.

The specific requirements of the Contractor's responsibilities are as required in Subsection S-104.04, S-105-.15, S-107.07 and S-107.10; the plans; and Part IV of the MUTCD, latest edition .

The requirements of this Special Provision do not alter or in any way change the requirements of the forgoing or any other requirements of the Contract, except as specifically stated herein as an alteration or change.

OFFICE OF STATE AID ROAD CONSTRUCTION
 MISSISSIPPI DEPARTMENT OF TRANSPORTATION

DATE: May 10, 2006

SUBJECT: Portland Cement

Section **S-701 - HYDRAULIC CEMENT**; of the MISSISSIPPI STANDARD SPECIFICATIONS FOR STATE AID ROAD AND BRIDGE CONSTRUCTION 2004 EDITION is hereby amended as follows:

901-S-701.01--Portland Cement. Delete the third paragraph and table in Subsection 701.01 on page 7-9, and substitute the following:

When Portland cement concrete or cement for soil stabilization is exposed to moderate or severe soluble sulfates, or to seawater, cement types and replacement of cement by Class F fly ash (FA), ground granulated blast furnace slag (GGBFS), or metakaolin shall be as follows:

Cementitious Materials for Soluble Sulfate Conditions

Sulfate Exposure	Water-soluble sulfate (SO ₄) in soil, % by mass	Sulfate (SO ₄) in water, ppm	Cementitious material required
Negligible	0.00 - 0.10	0.0 - 150	- - -
Moderate and Seawater	0.10 - 0.20	150 - 1500	Type II*** cement, or Type I cement with one of the following replacements of cement: 25% Class F, FA, or 50% GGBFS, or 10% metakaolin
Severe	0.20 - 2.00	1500 - 10,000	Type II* cement with one of the following replacements of cement: 25% Class F, FA, or 50% GGBFS, or 10% metakaolin

* Type I cement with a maximum 8% tricalcium aluminate may be used in lieu of Type II Cement.

** Class F, FA or GGBFS may be added as a replacement for Portland cement in accordance with the proportions as listed in this table.

Class C fly ash shall not be used as a replacement for Portland cement in any of the sulfate exposure conditions listed above.

Supplemental Specification
901-S-707-2
Joint Materials

OFFICE OF STATE AID ROAD CONSTRUCTION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

DATE: May 10, 2006

SUBJECT: Joint Materials

Section S-707-JOINT MATERIALS; of the MISSISSIPPI STANDARD SPECIFICATIONS FOR STATE AID ROAD AND BRIDGE CONSTRUCTION 2004 EDITION is hereby amended as follows:

901-S-707-02-1.3--Concrete Joint Sealer Compound-Hot Poured Elastic Type. In the first paragraph of Subsection S-707.02.10.3 on page 7-45, delete "AASHTO" Designation: M 173" and replace with "AASHTO Designation: M 324 for Type I Joint and Crack Sealant".

Delete in toto Subsection S-707.02.1.5 on page 7-47 and substitute:

901-S-707.02.1.5 -- Backer Rod for Use with Hot and Cold Poured Joint Sealer. The backer rod shall be a closed-cell foam rod made from polyethylene, polyolefin or similar type material, and shall conform to ASTM Designation D 5249. The backer rod shall either be a Type 1, for use with either hot or cold poured joint sealers, or a Type 3, for use with cold poured joint sealers only.

The Contractor shall furnish the Engineer three copies of the manufacturers' s certification that the backer rod meets the requirements of this specification.

Supplemental Specification
901-S-708-1
Non-Metal Drainage Structures

OFFICE OF STATE AID ROAD CONSTRUCTION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

DATE: May 10, 2006

SUBJECT: Non-Metal Drainage Structures:

Section S-708 - NON-METAL STRUCTURES AND CATTLEPASSES; of the MISSISSIPPI STANDARD SPECIFICATIONS FOR STATE AID ROAD AND BRIDGE CONSTRUCTION 2004 EDITION is hereby amended as follows:

901-S-708.02.3.2--Marking: Delete the second sentence of Subsection 708.02.3.2 on page 7-53, and substitute the following:

Machine made Pipe shall be marked in accordance with one of the following methods: 1) the pipe shall be inscribed on the outside of the pipe and stenciled on the inside of the pipe, or 2) the pipe shall be inscribed on the inside of the pipe, only. All other pipe may be stenciled.

901-S-708.22.2--Exceptions to AASHTO: Delete the sixth paragraph of Subsection 708.22.2 on page 7-61.

Supplemental Specification
901-S-711-2
Synthetic Structural Fiber Reinforcement

OFFICE OF STATE AID ROAD CONSTRUCTION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

DATE: May 10, 2006

SUBJECT: Synthetic Structural Fiber Reinforcement:

Section S-711 - REINFORCEMENT AND WIRE ROPE; of the MISSISSIPPI STANDARD SPECIFICATION FOR STATE AID ROAD AND BRIDGE CONSTRUCTION 2004 EDITION is hereby amended as follows:

After Subsection S-711.03.4.3 on page 7-83, add the following:

901-S-711.04--Synthetic Structural Fiber. Synthetic structural fibers shall meet the requirements of ASTM Designation: C 1116, Section 4.1.3, Part III. The fibers shall be monofilament made of polypropylene or polypropylene/polyethylene blend meeting the following conditions:

<u>Property</u>	<u>Results</u>
Length, minimum	1.5 inches
Aspect Ratio (length / equivalent diameter)	90
Breaking tenacity, minimum*	530 mN/tex
(Tensile Strength, minimum	70 ksi)
Chord modules, minimum*	980 cN/tex
(Modulus of Elasticity, minimum	1,300 ksi)

* When tested in accordance with ASTM Designation: D 3822

The dosage rate for the fibers shall be a minimum of three pounds per cubic yard (3 lb / yd³). The dosage rate for the fibers when used in pile encasements shall be a minimum of four pounds per cubic yard (4 lb / yd³).

The manufacturer shall furnish the Engineer three copies of the certified test report(s) showing results of all required tests, and certification that the material meets the specifications.

Supplemental Specification
901-S-714-1
Geotextile Certification

OFFICE OF STATE AID ROAD CONSTRUCTION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

DATE: July 1, 2005

SUBJECT: Geotextile Certification:

Section S-714 - MISCELLANEOUS MATERIALS; of the MISSISSIPPI STANDARD SPECIFICATION FOR STATE AID ROAD AND BRIDGE CONSTRUCTION 2004 EDITION is hereby amended as follows:

901-S-714.13.10--Acceptance By Certification. After the second sentence of Subsection S-714.13.10 on page 7-105 insert the following:

Additionally, at least one certified test report, as per S-700.05.2, for each manufacturer's lot shall be furnished to the Engineer by the Contractor at no additional cost to the project.

OFFICE OF STATE AID ROAD CONSTRUCTION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

DATE: May 10, 2006

SUBJECT: Miscellaneous Materials:

Section S-714-MISCELLANEOUS MATERIALS; of the MISSISSIPPI STANDARD SPECIFICATIONS FOR STATE AID ROAD AND BRIDGE CONSTRUCTION 2004 EDITION is hereby amended as follows:

Delete Subsection 714.07 on page 7-92 and substitute the following:

901-S-714.07--Other Cementitious Materials:

901-S-714.07.1--Metakaolin:

901-S-714.07.1.1--Metakaolin--General: Metakaolin shall only be used to bring the cementitious materials in Portland cement concrete and cement for soil stabilization into compliance with the requirements for cementitious materials exposed to soluble sulfate conditions. The approval of each metakaolin source shall be on a case by case basis as determined by the MDOT State Materials Engineer. Source approval will be based on, but not limited to, review of the proposed source's quality control program, production history, certified test reports, certification of shipment from the supplier, and job control sampling and testing requirements.

The Contractor shall provide suitable means for storing and protecting the metakaolin against dampness and contamination Metakaolin which has become partially set, caked, or contains lumps shall not be used.

The MDOT State Materials Engineer shall be notified in writing of the nature, amount and identity of any processing, or other additions made to the metakaolin during production.

Metakaolin from different sources shall not be mixed or used alternately in any one class of construction or structure without written permission from the Engineer. In addition to these requirements, metakaolin shall meet the following specific requirements.

901-S-714.07.1.2--Specific Requirements: Metakaolin shall meet the requirements of AASHTO Designation: M 295 Class N with the following modifications:

1. The sum of $\text{SiO}_2 + \text{Al}_2\text{O}_3 + \text{Fe}_2\text{O}_3$ Shall be at least 85%. The Material Safety Data Sheet shall indicate the amount of crystalline silica, as measure 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 the No. 325 Mesh sieve shall not exceed 1.0%.
5. The strength activity index at seven (7) days shall be at least 85%.

OFFICE OF STATE AID ROAD CONSTRUCTION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

DATE: August 25, 2005

SUBJECT: Agricultural Limestone

Section S-715-ROADSIDE DEVELOPMENT MATERIALS; of the MISSISSIPPI STANDARD SPECIFICATIONS FOR STATE AID ROAD AND BRIDGE CONSTRUCTION 2004 EDITION is hereby amended as follows:

901-S-715.02.2.1.1 -- Screening Requirements. Delete the first sentence of Subsection S-715.02.2.1.1 on page 7-109 and substitute the following:

Grade "A" liming material, including ground shells, shall not have less than 90% of the material passing the No. 10 sieve, and not less than 47.5% passing the No. 6 sieve.

Delete Subsection S-715.02.2.1.2 on page 7-109 and substitute the following:

901-S-715.02.2.1.2 -- Calcium Carbonate Equivalent. Grade "A" liming material shall not have less than 85.5% calcium and magnesium carbonate calculated as calcium carbonate equivalent when expressed on a dry weight basis.

Marl or chalk liming material shall not have less than 70% calcium and magnesium carbonate calculated as calcium carbonate equivalent when expressed on a dry weight basis.

901-S-715.02.2.1.3 -- Neutralizing Values. Grade "A" liming material shall have a minimum equivalent neutralizing value (ENV) of 63.0%, which is determined as follows:

$$\text{ENV} = \text{Fineness Value} \times \text{Assay}(\%)$$

Where Fineness value = $((\% \text{ Passing } \#10 - \% \text{ Passing } \#60) \times \frac{1}{2}) + \% \text{ Passing No. } 60$, expressed as a whole number.

Assay = % calcium carbonate equivalent

Supplemental Specification
901-S-803-1
LFRD Driven Pile
Specifications.

OFFICE OF STATE AID ROAD CONSTRUCTION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

DATE: May 24, 2010

SUBJECT: LFRD Driven Pile Specifications

Delete subsections S-803.01 to S-803.03.1.11 on pages 8-8 to 8-20, and replace with the following:

S-803.01--General.

S-803.01.1--Description. This work consists of furnishing and installing deep foundations in accordance with these specifications and in reasonable conformance with the lines, elevations, and spacing's shown on the plans. It shall also consist of furnishing all required labor, tools, and equipment to determine the bearing value of the deep foundation according to Load and Resistance Factor Design (LFRD) by static load testing, by dynamic load testing, and/or by driving of the specified test piles.

S-803.01.2--Order Lists for Deep Foundations. Lengths found in the plans are estimated lengths for bid purposes. Unless otherwise specified or authorized in writing by the Engineer, with the concurrence of the State Aid Bridge Engineer, all permanent deep foundations shall be installed within the prescribed tolerances specified herein and to the depths and/or lengths indicated on the itemized Order List furnished by the Engineer. The Order List shall be furnished after bearing has been verified either through static load testing, dynamic load testing, and/or driving of the specified test piles.

In general the penetration for any pile shall be: not less than five feet in hard material, not less than one-third the length of the pile, or less than twenty (20) feet in soft material. For foundation work, no piling shall be used to penetrate a very soft upper stratum overlying a hard stratum unless the piles penetrate the hard material a sufficient distance to rigidly fix the ends. If scour is predicted then the Engineer shall account for the potential loss of skin friction over the area of the pile in the scour zone.

The Contractor shall furnish or install driven piles and/or drilled shafts in accordance with an itemized list furnished by the Engineer. The Order List will show the required length of the piles or drilled shafts for each bridge bent or footing.

S-803.02--Materials. All materials shall conform to the applicable requirements set forth in S-710, S-711, S-719, S-804, and S-814.

Driven piles shall conform to all applicable requirements set forth in S-719 and the plans. Paint for steel piles or steel shells shall conform to the applicable requirements of S-710 and S-814.

Drilled shaft concrete shall conform to the requirements of S-804 for Class "DS" concrete. All reinforcing steel shall conform to the requirements of S-711 of the Specifications.

S-803.03--Construction Requirement. This work shall consist of furnishing all labor, materials, equipment and services necessary to install driven piles of the prescribed type in accordance with these specifications and in conformance with the lines, elevations, and spacing's shown on the plans.

This work shall also consist of furnishing all labor, materials, equipment and services necessary to perform all operations to complete the drilled shaft installations in accordance with these specifications and with the details and dimensions shown on the plans. Drilled shafts shall consist of reinforced or nonreinforced concrete with or without concrete bell footings.

S-803.03.1--Driven Piles.

S-803.03.1.1--General. Unless otherwise specified or authorized by the Engineer, all permanent production piles shall be driven in a continuous operation, to the full lengths indicated on the itemized order list furnished by the Engineer, with the concurrence of the State Aid Bridge Engineer.

S-803.03.1.2--Accuracy of Installation. Driven piles in trestle bents shall be driven to within a tolerance of 1/4 inch per foot from the vertical or from the batter shown on the plans. Piles to be incorporated into a cap or footing shall not be out of the position shown on the plans by more than six inches. In all cases, piles shall be driven so that they will not be excessively stressed to place them in the proper location in the cap or footing. Excessive manipulation of the piles will not be permitted, and the Contractor shall redrive or use other satisfactory methods to avoid such manipulations. No shimming on tops of piles will be permitted.

S-803.03.1.3--Extensions, Build-ups and Splices. If determined by the Engineer to be necessary, production piles that are extended below cut-off shall be extended, built-up, or spliced in accordance with the plans to the extent established by the Engineer, with the concurrence of the State Aid Bridge Engineer. Extensions or build-ups will not be measured for payment as such, but will be included in the total length of piling in the finished structure.

S-803.03.1.4--Cut-Offs. If it is determined by the Engineer, with the concurrence of the State Aid Bridge Engineer, that the pile has reached practical refusal above pile cut-off elevation but

below the prescribed minimum tip elevation shown in the plans then the Contractor will be allowed to cut off the pile at the cut-off elevation.

S-803.03.1.5--Driven Pile Types. Driven piles shall be of the type listed below unless otherwise specified in the plans.

S-803.03.1.5.1--Concrete Piles. Concrete piles shall be the size and shape specified. Reinforcement, unless otherwise designated, shall have a clear distance of at least two inches from the face of the pile. When the piles are for use in salt water or alkali soils this clear distance shall be at least three inches.

S-803.03.1.5.2--Steel Piles. Full-length piles shall be used unless splicing is approved in writing by the Engineer, with the concurrence of the State Aid Bridge Engineer. When permitted, splicing shall be in accordance with the notes and details shown on the plans. When authorized, splices will be paid for in accordance with S-803.05.8.

S-803.03.1.5.3--Timber Piles. Timber piles shall only be used for temporary construction and shall meet the requirements set forth in S-820.

S-803.03.1.5.4--Special Piles. Piles not of the type specified above, but called for in the plans or additional specifications shall meet the general requirements contained therein.

S-803.03.1.6--Preparation for Driving.

S-803.03.1.6.1--Excavation. When a pile cap is located below the ground line, piles shall not be driven until the required excavation is completed. All material forced up between the piles shall be removed to the correct elevation at the Contractor's expense before concrete for the foundation is placed.

S-803.03.1.6.2--Pile Cushions. Suitable cushioning material shall be used between the driving helmet and the top of the pile. This is especially critical for concrete piles. The Contractor should submit the type material, cross-sectional area and total thickness of the pile cushion. This information shall be submitted to the Engineer for approval prior to driving piling. The pile cushion shall be approved with the pile driving system and is subject to satisfactory field performance.

S-803.03.1.7--Method of Installation and Driving System.

S-803.03.1.7.1--General. The pile driving system shall be defined as all equipment necessary to install the specified piles to the required minimum tip elevations specified in the plans. The pile driving system shall include the pile hammer, hammer leads, followers, water jets, drilling equipment for pre-formed pile holes, and templates, if necessary.

S-803.03.1.7.2--Submittal of Pile Driving System Data. The Contractor shall submit to the Engineer all technical specifications and operating instructions relating to the pile driving system that is to be used to drive the piling. The Contractor shall submit this data to the Engineer at the pre-construction conference or no later than 14 days prior to the anticipated driving date. The Engineer shall use the data to assess the ability of the proposed driving system to install the piles to the desired penetration without unwarranted damage to the pile in accordance with LRFD. If a drivability analysis is not conducted, design stress shall be limited as prescribed in LRFD. The Contractor will not be allowed to install any piling until the driving system has been approved by the Engineer.

The Engineer will notify the Contractor of any additional information required and/or changes that may be necessary to meet the project requirements. Any parts of the driving system that are unacceptable will be rejected and the Contractor will submit changes. Review of these changes will be completed within seven (7) days and the Contractor notified of their acceptance or rejection.

All production piles shall be driven with the hammer bearing the same Serial Number originally submitted to the Engineer and used to drive the test piles. In the event multiple hammers of differing type are used on the same bridge, the Contractor shall submit to the Engineer for approval, data for each hammer and specify the bridge bents in which each hammer will be used. This will allow the Engineer the opportunity to develop appropriate driving and acceptance criteria specific to each hammer.

A different pile driving system, modifications to the existing system, or different pile installation procedures shall be proposed by the Contractor if the Engineer determines the system does not conform to LRFD or if problems in driving the piling are encountered. All approvals are conditional and subject to trial and satisfactory performance in the field. Unless otherwise permitted by the Engineer in writing, test piles and permanent piles shall be driven with the approved driving system.

S-803.03.1.7.3--Pile Hammers. Piles may be driven with an approved single-acting or double-acting pile hammer in combination with water jets or pre-formed pile holes. The pile driving system shall be constructed so as to afford freedom of movement of the pile hammer and to drive the piles to the required depth within the tolerances specified without undue injury to the piles.

The pile hammer shall be in good working condition and produce the energy required to install piles to the depth or penetration required in the plans. Single or double-acting Steam/Air, Diesel/Internal Combustion, or Hydraulic hammers may be submitted for review and approval.

In no case shall a gravity or drop hammer be used to drive concrete piles. A drop hammer may be used to install steel or temporary timber piles when approved by the Engineer.

S-803.03.1.7.4--Driving Appurtenances.

S-803.03.1.7.4.1--Pile Hammer Leads. Either fixed leads or swinging leads may be used. Swinging leads shall be used in combination with rigid templates approved by the Engineer. Battered piles shall be driven in inclined leads or multiple rigid templates capable of holding the pile in the proper position during driving.

S-803.03.1.7.4.2--Pile Cushions. Suitable cushioning material shall be used between the driving cap and the top of the pile. The cushion material shall protect the pile top during driving and shall be constructed such that the hammer energy is uniformly distributed to the pile top. If the cushion material becomes highly compressed, or chars or burns during the driving operations or damage occurs at the pile top, it shall be replaced.

S-803.03.1.7.4.3--Water Jets. When required by the Engineer, water jets will be used in conjunction with the pile hammer to install piles to the required depth or penetration called for in the plans. The use of water jets, where the stability of embankments or other improvements would be endangered, will not be permitted. When water jets are used, the number of jets and the volume and pressure of water shall be sufficient to adequately facilitate driving without undue damage to the pile or the soil adjacent to or below the pile. Unless otherwise specified, water jets shall not be used within five feet of the final tip elevation of the pile. In addition, it shall be the Contractor's responsibility to withdraw the water jets sufficiently above the five foot requirement to obtain the specified bearing at the required cut off elevation.

In the event a jetted pile fails to obtain the specified bearing at the required penetration and a determination is made by the Engineer that the Contractor has failed to properly control the jetting operation, the Contractor should submit detailed corrective measures for founding the pile to the Engineer for approval. Any required corrective measures to the pile due to the Contractor's operation shall be performed at no additional cost to the Project.

S-803.03.1.7.4.4--Followers. Followers are considered to be part of the driving system and should be included for approval with the pile driving system data.

S-803.03.1.7.4.5--Pre-formed Pile Holes. The Engineer, with the concurrence of the State Aid Bridge Engineer will make all determinations as to the necessity for pre-formed pile holes and the size and maximum depth of each hole required or permitted.

If it is determined from the Geotechnical Investigation or from the site survey that pre-formed pile holes are necessary, a pay item and estimated quantities will be included on the plans, and the Engineer will furnish the Contractor with an itemized list showing the location, size and bottom elevation of each hole.

If the plans do not specify pre-formed pile holes and the Engineer, with the concurrence of the State Aid Bridge Engineer, determines during construction that subsurface conditions are encountered that necessitate pre-formed pile holes, at certain locations, an adjustment in the contract unit price for furnishing and driving piling at these locations may be made under the provisions of S-104.02.

If in the judgment of the Engineer pre-formed pile holes are not required and the Contractor desires to use them, the Contractor may be permitted to do so under conditions prescribed by the Engineer, with the concurrence of the State Aid Bridge Engineer, and at no additional cost to the Project.

S-803.03.1.7.4.6--Additional Equipment. When a minimum penetration is indicated on the plans and is not obtained by the use of an approved hammer, the Contractor shall provide, with the approval of the Engineer, a heavier hammer or resort to jetting at no additional cost to the Project.

S-803.03.1.8--Defective Piles. Prior to driving, piles shall not be subjected to handling that causes damage either through bending, crushing or spalling of concrete, or deformation of the steel. All piles damaged because of internal defects or by improper driving, driven out of the proper location or driven below the specified elevation shall be corrected at the Contractor's expense by one of the following methods approved by the Engineer, with the concurrence of the State Aid Bridge Engineer for the pile in question:

- (1) The pile shall be withdrawn and replaced by a new and, if necessary, a longer pile.
- (2) A second pile shall be driven adjacent to the defective or low pile.
- (3) The pile shall be spliced or built up or a sufficient portion of the footing shall be extended to properly embed the pile. All piles pushed up by the driving of adjacent piles or by any other cause shall be driven down to grade.

S-803.03.1.9--Determination of Bearing Value of Piling.

S-803.03.1.9.1--General. The ability of the pile to transfer load to the ground will be determined to the satisfaction of the Engineer. Such determination will be made using a Geotechnical investigation, load tests and/or test piles and LRFD methodologies.

S-803.03.1.9.2--Determination of Bearing Value by Pile Hammer Formulas. The safe bearing values will be determined using one of the LRFD approaches outlined herein. If an alternative approach to determine safe bearing values is used, it must comply with LRFD and be approved by the Engineer, with the concurrence of the State Aid Bridge Engineer.

The determination of bearing values shall be documented by the Engineer. Documentation shall include but not be limited to: drivability information, location of test piles or load tests, results of test piles or load tests, supporting calculations, the itemized Order List furnished by the Engineer and any other items determined necessary by the Engineer.

S-803.03.1.9.2.1--Dynamic Formulas. Dynamic formulas shall not be used when the required nominal resistance exceeds 600,000 lbs. The required nominal resistance shall be taken as the LRFD factored load divided by the LRFD resistance factor as determined by the Engineer. If scour or liquefaction is predicted at the bridge location, the Engineer shall account for potential loss of skin friction over the area of pile.

The formulas described herein are applicable for the following conditions only:

- (a) The hammer has a free fall.
- (b) The pile head is not crushed.
- (c) The penetration is reasonably quick and uniform.
- (d) There is no appreciable bounce after the blow.
- (e) A follower is not used.

When using single-acting steam/air hammers and open cylinder diesel hammers where ram velocity on the hammer is not measured, developed hammer energy shall be calculated as follows:

$$E_d = WH$$

Where W = weight, in lbs, of striking parts of hammer
 H = height of fall in feet.

Where there is appreciable bounce of the hammer, twice the height of the bounce shall be deducted from "H" to determine its value in the formula.

For all other hammer types, the developed hammer energy shall be determined by the Engineer and based on information provided by the Contractor and any further information provided by the manufacturer.

When water jets and dynamic formulas are used in combination, the bearing value shall be determined from the results of driving after the jets have been withdrawn, or a static or dynamic load test has been conducted.

Formulas for pile hammers not covered herein must be approved by the State Aid Bridge Engineer before the hammer is used.

S-803.03.1.9.2.2--FHWA Gates Formula. The FHWA Gates Formula shall be used in LRFD applications. The nominal pile resistance as measured during driving using this method shall be taken as:

$$R = 1.75 \sqrt{E_d} \log_{10} (10N_b) - 100$$

Where R = nominal pile resistance measured during pile driving in kips
 E_d = developed hammer energy in foot-lbs

N_b = Number of hammer blows for 1.0 inch of pile penetration.

S-803.03.1.9.2.3--Resistance Factor. The Engineer shall use a resistance factor of 0.40 with the FHWA Gates Formula. This resistance factor shall be applied to the nominal pile resistance determined by the Engineer using the results of the pile driving formula.

803.03.1.9.3--Determination of Bearing Value by PDA Monitoring (Dynamic Load Testing).

803.03.1.9.3.1--Description. This work consists of furnishing all labor, materials, equipment and services necessary to perform all operations to complete the determination of the bearing value of piling using a Pile Driving Analyzer (PDA) and associated equipment. The dynamic load testing measurements will be performed in accordance with the plans, Engineers direction and the requirements herein.

803.03.1.9.3.2--Resistance Factors and Number of Dynamic Test Piles. The Engineer shall use a resistance factor of 0.65 when the driving criteria are established by a dynamic test with signal matching. This resistance factor shall be applied to the nominal pile resistance determined by the Engineer using the results of PDA and the wave equation.

If scour is predicted during design flood and/or liquefaction is predicted during the design seismic event, the Engineer shall account for the potential loss of skin friction over the area of pile when determining bearing resistance.

The location and number of test piles shall be indicated on the plans or directed by the Engineer. Depending upon the conditions encountered in the field, the Engineer may increase the number of test piles required.

803.03.1.9.3.3--Scope and Sequence of Construction. The dynamic measurements shall be performed on the piles as detailed below for the purpose of obtaining pile bearing capacity, pile lengths, pile driving stresses, pile integrity, and the pile driving system efficiency. Unless otherwise directed in the plans, the sequence of construction outlined below shall not be deviated from unless an alternate sequence of construction is approved in writing by the Engineer.

1) When called for in the plans or directed by the Engineer, Conventional Static Load Testing will be performed. Piles to be load tested shall be driven at location shown in the plans or directed by the Engineer, with PDA monitoring under initial drive, and have restrikes performed.

2) When called for in the plans or directed by the Engineer, PDA Test Piles will be driven with PDA monitoring under initial drive and have restrikes performed as detailed below. The test piles will be used as production piles and be incorporated into the bridge structure.

3) The Engineer can require PDA monitoring or PDA restrikes to any production pile.

4) For Quality Control purposes, PDA testing shall be performed on 10% of the production piles when PDA testing is set up by the plans.

803.03.1.9.3.4 --PDA Monitored Driving and/or Restrike of Piling.

803.03.1.9.3.4.1--General. When called for in the plans or directed by the Engineer, a PDA and instrumentation will be used to obtain dynamic measurements during pile driving and pile restrikes. The analysis of the monitoring will be the responsibility of the Engineer.

803.03.1.9.3.4.2--Contractor Requirements. The Contractor shall be responsible for the following:

1. A power supply providing at least 1800 watts of 115-volt AC power with a frequency of 60 Hz at the driving site.
2. Prepare the driving site.
3. Supply the labor necessary for attaching the dynamic monitoring instrumentation to the piles. The Contractor shall make one of their personnel available to place the transducers on the piles after the piles have been placed in the leads.
4. Notice to the Engineer at least 14 calendar days before the scheduled date of driving piles to be monitored and confirmation of the driving date 3 calendar days prior to the scheduled driving date.
5. Access to the pile prior to driving for drilling and tapping of holes that are necessary for attachment of instrumentation.
6. Reasonable care when working with piles and installed instrumentation.
7. Drive the piles as directed by the Engineer.

The Contractor shall replace any damaged piles, instruments or PDA related equipment caused by Contractor error at no additional cost to the Project.

803.03.1.9.3.4.3--Driving Requirements. Piles to be used in the determination of pile bearing by PDA monitoring shall be driven with PDA instrumentation attached to the pile and shall have a PDA monitored 1-day and 7-day restrike performed after the initial pile driving. When a static load test is to be performed, the 7-day restrike should be eliminated and a PDA monitored restrike done within 24 hours of completion of the static load test. When determined by the Engineer, waiting periods that are required before the restrikes are performed shall be adjusted.

When deemed necessary by the Engineer, permanent piles may have PDA monitored restrikes performed to confirm or supplement design requirements.

Restrikes shall be performed with a warm hammer operating at normal efficiency. A warm hammer is defined as a hammer that has applied a minimum of 20 blows to another pile or a dummy block immediately before being used in a restrike. The restrike shall consist of striking the pile for 50 blows or until the pile penetrates an additional three inches, whichever occurs first. In the event the pile movement is less than one inch after 15 blows during the restrike, the restrike may be terminated.

S-803.03.1.9.4--Determination of Bearing Value by Static Load Testing.

S-803.03.1.9.4.1--General. When called for in the plans or directed by the Engineer, static load testing will be conducted to determine the ultimate bearing capacity of piles. Depending upon the conditions encountered in the field, the Engineer with the concurrence of the State Aid Bridge Engineer may increase or decrease the number of static load tests required.

In the event the number of loading tests are increased from that indicated in the contract, consideration will be given for delays, if any, in the applicable controlling phase of work caused solely by the seven-day or other waiting period required by the Engineer. Any adjustments will be in accordance with S-108.06.

S-803.03.1.9.4.2--Static Load Test Resistance Factors. When using static load testing, the Engineer shall determine the resistance factor according to LRFD. Factors range from 0.55–0.90 and shall consider the number of static load tests performed and soil variability at the project site as defined in LRFD. If site variability cannot be determined, a “High” site variability shall be used.

S-803.03.1.9.4.3--Methods and Equipment. Apparatus for measuring the behavior of the pile during the test shall consist of a measuring frame and two approved dial gage type measuring devices attached to the pile. Each gage shall be actuated by its stem or by a stem attachment resting on the beam of the measuring frame. Supports for the measuring frame shall be placed the maximum practical distance from the test pile and the anchor piles. Each dial gage shall be capable of providing measurements to an accuracy of 0.001 inch throughout a movement range of four inches and shall be sensitive to a force of one pound or less. At least one approved standby gage of each type used shall be provided at all times. The Contractor shall furnish a certification of the sensitivity and accuracy of each dial gage through the required range of use. The Engineer may require recertification of a gage at any time there is an indication of inaccuracy. The Contractor shall provide adequate protection from the elements or from other damage to gages and other specified measuring devices during handling, transportation, and use so that inaccurate measurements or delays will not result because of such damage.

S-803.03.1.9.4.4--Hydraulic Method. The Contractor shall furnish a hydraulic jacking system complete with gages and charts. The system shall include one or more hydraulic jacks in good condition without leaks. The jacks shall be capable of applying the required load and shall have adequate piston travel to compensate for the yield of the reaction facilities and the vertical displacement of the pile being tested.

The pressure gages shall accurately reflect the fluid pressure in the system within plus or minus one percent throughout the system capacity. The gage shall be such that the applied load can be read directly in increments of two percent or less, or shall be such that when read to the exact graduation and referred to a certified calibration chart will provide a determination of the load being applied within plus or minus one percent. Each gage shall contain a capacity for recalibration to zero at zero pressure.

The complete hydraulic jacking system and gages shall be calibrated in accordance with AASHTO Designation: T 67, ASTM Designation: E-4, at least once, and pressure gages shall be calibrated within one year preceding the time of use and whenever there is a reason to doubt the accuracy of the results. If the laboratory performing the calibration uses a hydraulic testing machine in lieu of the methods specified in AASHTO Designation: T 67 to apply the test load, the testing machine used to apply this load shall be calibrated in accordance with ASTM Method E 74, and the report shall state that the testing machine had been calibrated by this method. Calibration shall include loading and unloading with the jacking system to determine the hysteresis losses in the system. The calibration and certificate shall be made by a qualified testing laboratory approved by State Aid, and the Engineer shall be furnished a report and certificate of each calibration.

Systems containing two or more jacking pistons shall be approved by the Engineer before use and shall be subject to periodic calibration as determined by the Engineer.

S-803.03.1.9.4.5--Preparation for Loading. The Contractor shall provide means for preventing eccentricity in the pile during loading, and shall be fully responsible for all loss or damage caused by loading an eccentric pile or one which becomes eccentric during loading.

The pile to be load tested shall be installed as indicated on the plans to the specified tip elevation, or as directed. After the pile is in place, all loading devices shall be assembled in their proper position. Before load is applied to the pile, the measuring frame shall be assembled and positioned with gages properly installed.

The head of the pile shall be normal to the longitudinal axis or shall be capped in such a manner as to produce a plane bearing surface normal to the longitudinal axis. When cut-off is necessary, the head of the pile shall be normal to the longitudinal axis or capped as above. A one-inch steel plate of the pile size or larger shall be set on top of the pile.

The jacking system shall include a reaction member of sufficient strength and support to withstand required loads. The reaction member shall be attached to anchor piles. Anchor piles

shall not be closer to the test pile than five times the greatest dimension of the largest pile driven; except for 18-inch or larger piles the Engineer with the concurrence of the State Aid Bridge Engineer may authorize in writing reaction piles at a closer interval, subject to the conditions included in the authorization. The Contractor shall provide reaction facilities capable of withstanding at least two and one-half times the design load. All reaction facilities shall be subject to the approval of the Engineer with respect to possible adverse influence upon the behavior of the test pile.

S-803.03.1.9.4.6--Application of Loads. Unless otherwise directed by the Engineer, a time period of at least seven days shall elapse from the time the test pile and anchor piles, if used, are installed before the loading test is performed. During the required time lapse period, no other driving operations shall be performed within a 30-foot radius of the test pile, or a new seven-day period shall begin at the ending of the last pile driven within the 30-foot radius.

During the entire period that the test load or any portion thereof is on the pile, no pile driving operations, operation of heavy equipment, or any other operations shall be carried on within a distance, as determined by the Engineer, from the load test which might affect the behavior of the loaded pile. In the event of such occurrence, or in the event of failure of the reaction facilities or other loading and measuring equipment, the load test may be considered as defective and unacceptable, and in the case of driven piles only an additional seven-day waiting period shall elapse before the loading test is resumed.

Loads shall be applied in increments of 25 percent of the LRFD factored load until the Engineer determines an adequate test load has been reached or failure of the pile has occurred. The test load shall be taken as 1 1/2 times the LRFD factored load divided by the appropriate LRFD resistance factor in accordance with S-803.03.1.9.4.2.

If scour is predicted during design flood and/or liquefaction is predicted during the design seismic event, the Engineer shall increase the test load to account for calculated loss of skin friction over the area of pile.

A guide for determining whether the pile has failed is as follows:

- (A) For lengths of driven and cast-in-place concrete piles and timber piles up to 50 feet, a total top settlement of 1.0 inch and for lengths in excess of 50 feet, a total top settlement of 1.5 inches. However, for cast-in-place piles, when skin friction is broken there may be some settlement due to compression of relatively loose or bulked soil under the point of the pile, therefore the test must not be suspended until this possibility has been fully considered. Any special effort by the Contractor in the drilling and casting the test pile to prevent possible settlement from such cause shall be duplicated to the satisfaction of the Engineer for all piles represented by the load test.

- (B) For steel piles and steel pile shells not filled with concrete up to 60 feet in length, a total top settlement of 1.5 inches and for lengths in excess of 60 feet, a total top settlement of 2.0 inches.

Each of the following loading conditions shall be applicable until the loading is completed or unless the Engineer has suspended the loading because of obvious failure of the pile:

- a. Each loading increment, including the final increment, shall be maintained for a 15-minute period and for as many additional 15-minute periods, not to exceed two hours total time, as necessary to satisfy the conditions stated herein.
- b. During the entire loading, readings are to be made at each five-minute increment of each 15-minute period and are to be made to the nearest 0.001 inch.
- c. When the settlement rate for the pile in the last five-minute increment of a 15-minute period, averages less than 0.001 inch per minute, the next increment of load shall be applied.
- d. When at the end of a 15-minute period, the settlement rate in the last five-minute increment averages more than 0.001 inch per minute, the load increment shall remain applied for the necessary successive 15-minute periods up to a total of two hours, after which the next increment of load shall be applied.
- e. The total load shall be maintained on the pile for two hours unless directed otherwise directed by the Engineer.
- f. The pile shall be unloaded in accordance with S-803.03.1.9.4.2.7.

S-803.03.1.9.4.7--Unloading and Measuring. Unless the loading has been suspended by the Engineer, the pile shall be unloaded in decrements of 50 percent of the design load. Each decrement shall be maintained for a minimum of 15 minutes with settlement readings taken immediately before and after its removal and at five-minute intervals. The final settlement reading shall be taken two hours after the removal of the last decrement of load and shall mark the conclusion of the loading test.

S-803.03.1.10--Pile Acceptance. The safe allowable load for each type and size of pile will be as shown on the plans or as determined by the Engineer with the concurrence of the State Aid Bridge Engineer. Acceptance criteria for the length of permanent production piles will be based on the recommended lengths as determined by the Engineer with the concurrence of the State Aid Bridge Engineer from the test pile reports.

S-803.03.1.11—Test Piles. The Contractor shall furnish and install test piles of the sizes and types at the locations shown on the plans. It is the Contractor's responsibility to furnish test piles of sufficient length to obtain the minimum tip elevation and required bearing. This requirement

may necessitate test pile lengths in excess of that required to reach minimum tip elevation. The number of test piles may be increased or decreased by the Engineer with the concurrence of the State Aid Bridge Engineer as field conditions warrant. If determined by the Engineer with the concurrence of the State Aid Bridge Engineer to be necessary, test piles shall be extended, built-up, or spliced and in the case of steel piles driven further. Similarly, the Contractor may be required to drive test piles below cut-off and extended as necessary.

Supplemental Specification
901-S-804-1
Concrete Bridges And Structures

OFFICE OF STATE AID ROAD CONSTRUCTION
MISSISSIPPI DEPARTMENT OF TRANSPORTATION

DATE: May 5, 2006

SUBJECT: Concrete Bridges And Structures:

Section S-804 - CONCRETE BRIDGES AND STRUCTURES; of the MISSISSIPPI STANDARD SPECIFICATIONS FOR STATE AID ROAD AND BRIDGE CONSTRUCTION 2004 EDITION is hereby amended as follows:

901-S-804.02.1--General. Add the following materials to the list of materials in Subsection 804.02.01 on page 8-51.

Ground Granulated Blast Furnace Slag (GGBFS) S-714.06
Metakaolin 901-S-714.07.01

901-S-804.02.10--Portland Cement Concrete Mix Design. Change Note ***** of Subsection S-804.02.10 on page 8-56 as follows:

***** Class DS Concrete for drilled shafts shall have an 8 ± 1 -inch slump. In the event of free fall method of concrete placement is used, the slump shall be 6 ± 1 inch.

Delete the last paragraph of Subsection S-804.02.10 on page 8-57 and substitute the following:

Either Type A, D, F, G or mid-range chemical admixture shall be used in all classes of concrete. Any combination of water reducing admixtures shall be approved by the Engineer before their use.

901-S-804.05--Basis of Payment. Add "901" prefix to the pay items listed on page 8-108.

ADDENDUM NO. 1

City of Meridian, Mississippi

**Bridge Replacement at Old Highway 80 Over Okatibbee Creek
Project No. ERBR-38-320 (01)**

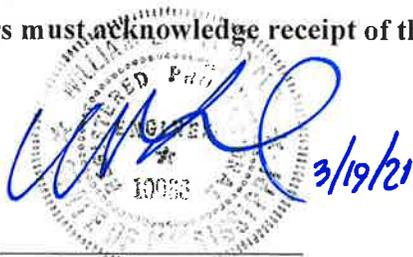
This addendum provides additional information and clarification to the Proposal and Contract Documents for the above referenced project, originally dated February 22, 2021. No changes are made to the bid items, quantities, or contract time.

The Proposal and Contract Documents are hereby amended and/or clarified as follows:

1. The Bid Form is moved to Section 902 (Page 902-4, as attached hereto). No changes are made to the bid items or quantities.
2. Liquidated Damages are established at \$1,500.00 per day.
3. 901-S-107-1 of the Supplemental Specifications is hereby replaced with the attached and amended version.
4. The following Technical Specifications, attached to this addendum, are incorporated into and made a part of the Contract Documents:
 - a. Section 33 01 30.83, Epoxy Lining for Ductile Iron Pipe
 - b. Section 33 05 07.13, Utility Directional Drilling
 - c. Section 33 14 00, Water Distribution System
 - d. Section 33 31 23, Sanitary Sewage Force Main Piping
5. Section 902, Proposal, attached to this addendum, is added to the Contract Documents.
6. Section 903, Contract, is hereby replaced with the attached and amended version.
7. Section 904, Contract Bond, is hereby replaced with the attached and amended version.

General contractors are responsible for bringing this addendum to the attention of their subcontractors and material suppliers.

All bidders must acknowledge receipt of this addendum on Page 902-1 of the Proposal.



Issued by: _____
William L. McDonald, P.E., Waggoner Engineering, Inc.
Engineer of Record

Supplemental Specifications
901-S-107-1
Storm Water Pollution Prevention Plan

DATE: 3/19/21

SUBJECT: STORM WATER POLLUTION PREVENTION PLAN

PROJECT: Bridge Replacement at Old Highway 80 over Okatibbee Creek, Project No.
ERBR-38-320 (01)

The attached Stormwater Pollution Prevention Plan is hereby added to and made a part of the Proposal and Contract Documents for the referenced project.

Storm Water Pollution Prevention Plan (SWPPP)

Bridge Replacement - Old Highway 80 Over Okatibbee Creek

City of Meridian, Lauderdale County, Mississippi

March 2021

<u>OWNER:</u>	City of Meridian 2412 7 TH Street Meridian, MS 39301 (601) 485-1924	<u>OPERATOR:</u>	tbd
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APPENDIX A – Site Location Map

APPENDIX B – Required Forms

Storm Water Pollution Prevention Plan (SWPPP) Narrative

1 PROJECT INFORMATION

1.1 Site Description and Project Scope

1.1.1 Site Location

The Old US Highway 80 Bridge replacement at Okatibbee Creek in Meridian, MS comprises approximately 2 acres and is located at Old U.S. Highway 80 near the western city limit of Meridian. The project site is located approximately 0.75 miles west of 65th Avenue, and approximately 0.4 miles north of I-20 in Meridian. The project is located at Lat 32.353056/Long. 88.756111 within Section 22, Township 7 North - Range 15 East, Lauderdale County, Mississippi and is identified on the Site Location Map in Appendix A.

1.1.2 Existing Conditions

The project site is a two-lane bridge along old US Highway 80 that is open to two-way traffic. Old Highway 80 is a two-lane highway traversing east-west and consisting of a single 12' wide travel lane in each direction. The bridge, which is approximately 100 years old, spans 229-feet over Okatibbee Creek and consists of 19', 26', 80' and four 26' spans which together total approximately 229 feet. The site is located within a Zone "AE" Special Flood Hazard Area floodway designation, per the latest revision of Flood Insurance Rate Map (FIRM) Number 28075C0282F, dated February 3, 2010. The base flood elevation is determined to be 296 just downstream of the bridge. The intent of the project is to replace the bridge with a modern, 30' wide precast concrete bridge consisting of two 12' travel lanes and two 3' shoulders.

1.1.3 Existing Drainage

The project site is relatively flat terrain surrounding the existing roadway and creek channel. Elevations within the project limits ranges from 274 to 300 feet above mean sea level. The roadway drains towards the creek from both directions by way of shallow roadside ditches. The existing drainage system along Old US 80 is owned by the City of Meridian and discharges into Okatibbee Creek. Okatibbee Creek is listed on the State's Section 303(d) list of impaired water bodies for the following pollutants: biological, pH, and total nitrogen.

1.1.4 Project Scope of Work

The Old U.S. Highway Bridge Replacement project work includes, but is not limited to the following items of work:

- Traffic control and/or temporary roadway lane closures;
- Demolition of existing bridge;
- Clearing and grubbing;
- Earthwork;
- Bank stabilization;
- Installation of concrete bridge piers and precast bridge structure;

- Relocation of a 10” sanitary sewer force main and a 16” water distribution line via horizontal directional drilling;
- Hot-mix asphalt paving;
- Pavement striping;
- Vegetation.

Project grading will occur within the project limits and includes both cut and fill activities. The soils will be stockpiled in the contractor’s staging area or within approved temporary storage areas within the project site.

1.1.5 Post-Construction Condition

Post construction surface drainage will largely resemble pre-construction drainage patterns, with surface flows from the roadway and adjacent properties being conveyed into Okatibbee Creek.

1.2 Stormwater Run-on from Offsite Areas

Because the project involves replacing a bridge at a stream crossing, the project site receives a significant amount of run-on from offsite areas. Although the majority of runoff that will enter the project site will have arrived within the creek from upstream non-point sources, there will also be some runoff/run-on entering the project site from adjacent properties and the roadside ditches along Old Highway 80. If excess run-on occurs, the contractor shall manage the run-on with appropriate Best Management Practices (BMPs) as needed.

1.3 Potential Pollutant Sources from Construction Activity

The following is a list of commonly used construction materials with the potential to contribute pollutants other than sediment to stormwater runoff:

- Vehicle fluids, including oils, grease, petroleum, and coolants;
- Vehicle and equipment batteries;
- General site litter and debris;
- Plant materials (seed, fertilizer, mulch, etc.);
- Waste associated with portable toilets;
- Concrete (cement, grout, etc.); and
- Paint.

1.4 Identification of Activities that Could Create Non-Storm Water Discharge

Activities that will be performed at may result in unauthorized non-storm water discharges include, but are not limited to:

- Equipment fueling;
- Equipment maintenance;
- Equipment leaks and spills;

- Portable toilet spillage from cleaning, and/or emptying;
- Roadway materials; and
- Fertilizer and herbicides.

2 BEST MANAGEMENT PRACTICES

2.1 Vegetative Controls

In areas where open cut installation methods are used at stream crossings rip rap will be installed to help control erosion of the stream bed. Vegetation will be maintained until cover is established over the disturbed areas. Riprap will also be placed where high erosion potential exists, such as on the banks of erodible or higher velocity streams where sewer lines cross. When a disturbed area will be left undisturbed for fourteen (14) days or more, the appropriate temporary or permanent vegetative practices shall be implemented immediately. Immediately is defined as no later than the next available workday.

2.2 Structural Controls

Where runoff can be directed to basins or drainage swales, hay waddles will be placed in the drainage swales. Silt fences will be constructed around stockpiled soil and after construction until cover is established. A stabilized gravel construction entrance shall be utilized where haul routes intersect existing roadways.

2.3 Jobsite Housekeeping Practices

All equipment maintenance and repair will be done offsite. Trash and debris will be picked up and disposed of offsite by the contractor. Any potentially toxic materials will not be stored onsite. Portable sanitary facilities will be provided for construction workers. There will be an area designated for concrete truck wash off, and any concrete materials remaining in the delivery truck will be returned to the batch plant for disposal.

2.4 Post-Construction Storm Water Management Measures

Post construction BMPs are temporary or permanent measures installed during construction that are designed to reduce or eliminate pollutant discharges from the site after construction is completed. All construction areas will be vegetated and/or seeded at the completion of the project. Seeded areas will be maintained and re-seeded as necessary and erosion blankets will be maintained until permanent cover is established. Silt fences and hay bales will be maintained until construction-related erosion has ended.

3 BMP Implementation and Inspection

3.1 Implementation Sequence

The following is the anticipated sequence in which BMPs will be installed on the project.

1. Establish construction vehicle entrance/exit platforms where needed.
2. Install silt fences/hay waddles to control silt runoff down-slope.
3. Excavate and strip to install storm drainage infrastructure and perform subgrade preparation.
4. Install silt fences around stockpiled soil.
5. Install pipe, place pavement, cover, grade, seed, and apply erosion control blanket and/or riprap as required.
6. Maintain erosion control devices and vegetation until permanent cover is maintained.
7. Replace silt fences when silt buildup is within 12" of top of fence.
8. After site is stabilized, remove all temporary measures, and apply permanent seeding or vegetation.

3.2 BMP Inspections and Maintenance

Routine job site inspections will be conducted as follows:

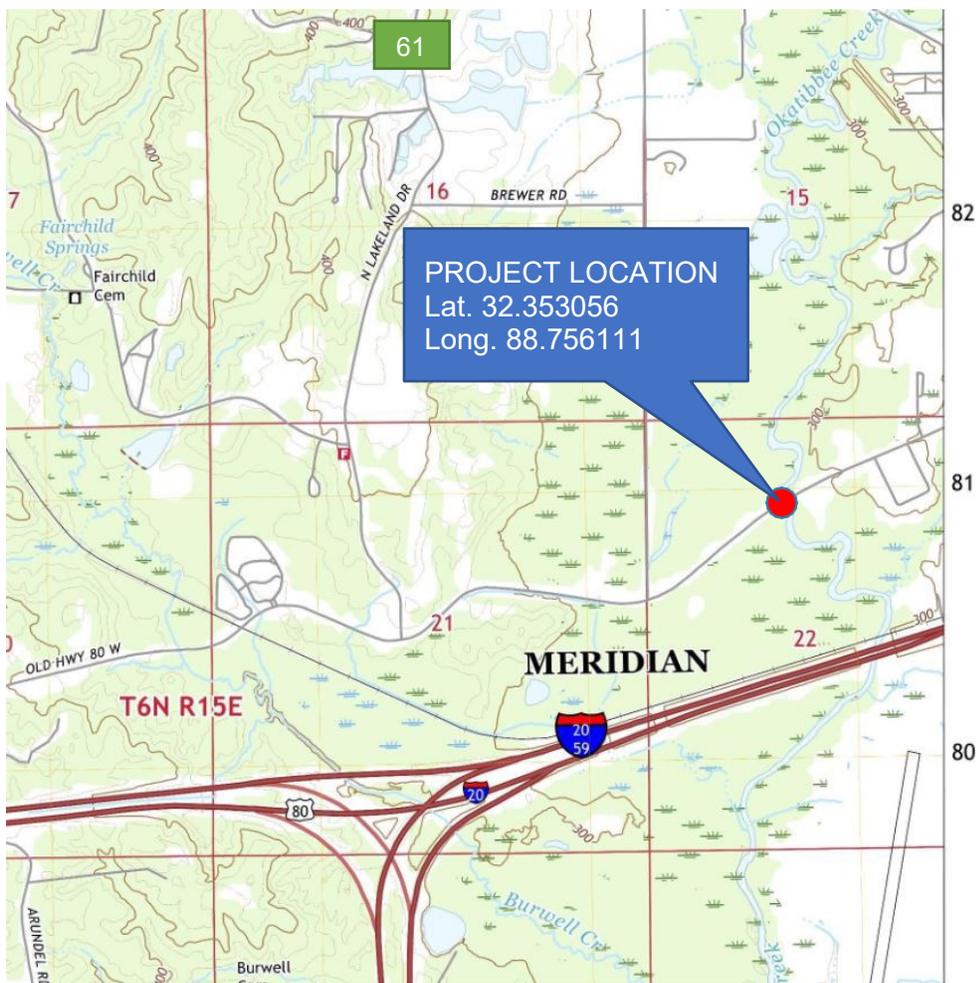
- Prior to a forecast rain event;
- After a rain event that causes runoff from the construction site;
- Daily (every 24 hours) during rain events;
- Weekly; and
- Quarterly for non-storm water inspections.

BMPs shall be inspected each week and maintained regularly to ensure proper and effective function. If necessary, corrective actions shall be implemented within 24 hours of after identification of deficiencies. Remove sediment from inlet protection devices and silt fences when accumulated amount has reached 50% of capacity. Replace all non-functional silt fencing and hay bales. Maintain all vegetative areas to provide proper ground cover. Re-seed, fertilize, and mulch as needed.

When a disturbed area will be left undisturbed for fourteen (14) days or more, the appropriate temporary or permanent vegetative practices shall be implemented within seven (7) calendar days.

APPENDIX A

SITE LOCATION MAP



APPENDIX B

REQUIRED FORMS

Submit only upon request from MDEQ



SMALL CONSTRUCTION NOTICE OF INTENT (SCNOI)

GENERAL NPDES PERMIT MSR15 ____ (Number to be assigned by MDEQ if submitted)

Prior to the commencement of small construction activity (see Small Construction General Permit ACT11, T-17), the owner or operator of a small construction project must complete this form and develop a Storm Water Pollution Prevention Plan (SWPPP) as required by ACT5 of Mississippi's Small Construction General Permit. **This SCNOI and SWPPP shall be submitted to the Mississippi Department of Environmental Quality (MDEQ) only upon request from MDEQ; however, the SCNOI and SWPPP must be maintained at the permitted site or locally available in case inspector review is necessary.** Attachments with this SCNOI must include: a USGS quad map or copy showing site location (only if required to be submitted to MDEQ) and a Storm Water Pollution Prevention Plan (SWPPP). All questions must be answered – answer "NA" if the question is not applicable.

PROJECT INFORMATION

OWNER CONTACT PERSON:

Hugh Smith

OWNER COMPANY NAME:

City of Meridian

OWNER STREET (P.O. BOX):

311 27th Avenue

OWNER CITY:

Meridian

STATE: MS

ZIP: 39301

OWNER PHONE # (INCLUDE AREA CODE):

(601) 485-1990

OPERATOR (if different from owner) CONTACT PERSON:

OPERATOR COMPANY:

OPERATOR STREET (P.O. BOX):

OPERATOR

CITY:

STATE: _____ **ZIP:** _____

OPERATORPHONE # (INCLUDE AREA CODE):

PROJECT NAME: Old Highway 80 Bridge Replacement

DESCRIPTION OF CONSTRUCTION ACTIVITY: Bridge removal and replacement

ACREAGE DISTURBED (to be covered by this permit, area must be less than five (5) acres): 2 acres +/-

PHYSICAL SITE ADDRESS (If not available, indicate the nearest named road. For linear projects, indicate the beginning of the project and identify all counties the project traverses.):

STREET: Old U.S. Highway 80

CITY: Meridian

COUNTY: Lauderdale

ZIP: 39301

NEAREST NAMED RECEIVING STREAM: Okatibbee Creek

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature¹

Date Signed

Printed Name Hugh Smith

Title Public Works Director

¹This application shall be signed according to the Small Construction General Permit, ACT10, T-4.

If requested, please submit this form to:

Chief, Environmental Permits Division
MDEQ, Office of Pollution Control
P.O. Box 2261
Jackson, Mississippi 39225

INDIVIDUAL NPDES STORM WATER PERMIT
PERMIT NUMBER (MS _____)
MONTHLY INSPECTION / VISUAL EVALUATION REPORT
(FOR INDUSTRIAL STORM WATER ACTIVITY)



As required by this permit, this inspection / visual evaluation form must be completed on a monthly basis. Completion of this form must be performed by an individual with the knowledge, skills, and training to assess conditions and activities that could impact storm water quality and to evaluate the effectiveness of best management practices required by this permit. A copy of the completed and signed form shall be maintained on-site with the SWPPP and be available for review by MDEQ personnel upon request.

FACILITY NAME:	DATE:
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PHYSICAL ADDRESS:

WEATHER INFORMATION:

- Description of Weather Conditions (e.g., sunny, cloudy, raining, snowing, etc.):

- Was the inspection conducted during or immediately after a rain event? Yes No If yes, conduct a Jar Test at each storm water outfall and attach the results to this form.

I. POTENTIAL POLLUTANT SOURCE, AREA INSPECTION AND BEST MANAGEMENT PRACTICES EVALUATION

SWPPP AND SITE MAP:	Yes	No	N/A	Findings & Remedial Action Documentation
<ul style="list-style-type: none"> • Is the Site Map current and accurate? • Is the SWPPP inventory of industrial activities, materials and products current? 	○	○	○	
<ul style="list-style-type: none"> • Is the SWPPP inventory of industrial activities, materials and products current? 	○	○	○	
VEHICLE/EQUIPMENT AREAS:				
Equipment cleaning:				
<ul style="list-style-type: none"> • Is equipment washed and / or cleaned using a detergent(s)? • If so, is all wash water captured and properly disposed of? 	○	○	○	
<ul style="list-style-type: none"> • If so, is all wash water captured and properly disposed of? 	○	○	○	
Equipment fueling:				
<ul style="list-style-type: none"> • Are all fueling areas free of contaminant buildup and evidence of chronic leaks/spills? • Are all chemical liquids, fluids, and petroleum products, stored on an impervious surface that is surrounded with a containment berm or dike that is capable of containing 10% of the total enclosed tank volume or 110% of the volume contained in the largest tank, whichever is greater? • Are structures in place to prevent precipitation from accumulating in containment areas? • If not, is there any water or other fluids accumulated within the containment area? 	○	○	○	
<ul style="list-style-type: none"> • Are all chemical liquids, fluids, and petroleum products, stored on an impervious surface that is surrounded with a containment berm or dike that is capable of containing 10% of the total enclosed tank volume or 110% of the volume contained in the largest tank, whichever is greater? 	○	○	○	
<ul style="list-style-type: none"> • Are structures in place to prevent precipitation from accumulating in containment areas? 	○	○	○	
<ul style="list-style-type: none"> • If not, is there any water or other fluids accumulated within the containment area? 	○	○	○	

	Yes	No	N/A	Findings & Remedial Action Documentation
Equipment maintenance:				
• Are maintenance tools, equipment and materials stored under shelter, elevated and covered?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
• Are all drums and containers of fluids stored with proper cover and containment?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
• Are exteriors of containers kept outside free of deposits?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
• Are any vehicles and/or equipment leaking fluids? Identify leaking equipment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
• Is there evidence of leaks or spills since last inspection? Identify and address.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
• Are materials, equipment, and activities located so that leaks are contained in existing containment and diversion systems (confine the storage of leaky or leak-prone vehicles and equipment awaiting maintenance to protected areas)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Add any additional site-specific BMPs:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

GOOD HOUSEKEEPING BMPs:				
1. Are paved surfaces free of accumulated dust/sediment and debris?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
• Date of last vacuum/sweep _____				
• Are there areas of erosion or sediment/dust sources that discharge to storm drains?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
2. Are there any waste receptacles located outdoors? If yes:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
• In good condition?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
• Not leaking contaminants?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
• Closed when not being accessed?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
• External surfaces and area free of excessive contaminant buildup?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
3. Are the following areas free of accumulated dust/sediment, debris, contaminants, and/or spills/leaks of fluids?				
• External dock areas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
• Pallet, bin, and drum storage areas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
• Maintenance shop(s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
• Equipment staging areas (loaders, tractors, trailers, forklifts, etc)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
• Around bag-house(s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
• Around bone yards	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
• Other areas of industrial activity:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

Facility Name _____

Monthly Spill & Leak Log Sheet

Month/Year _____

Physical Address _____

Permit Number _____



Instructions: A list of spills and leaks of toxic or hazardous pollutants that have occurred at the facility shall be documented on the Monthly Spill and Leak Log Sheet that is provided in the Individual NPDES Permit SWPPP Forms Package. A separate form shall be completed for each month that the facility is covered under this permit. If no spills have occurred, the form shall be completed by checking the available box and signing it as indicated. Permit recipients may use an alternate form to record this information, so long as it includes all of the information on the above referenced form and it is updated monthly. The completed forms shall be filed on-site with the SWPPP and made available to MDEQ personnel for inspection upon request.

Date of Spill	Material Spilled	Quantity Spilled (specify units)	Area that Spill Occurred	Did the Spill Result in a Discharge?	Injury / Property Damage?	Person(s) Involved In Clean-up	Date Reported to MDEQ (If significant)
Corrective Action(s) Taken							
Date of Spill	Material Spilled	Quantity Spilled (specify units)	Area that Spill Occurred	Did the Spill Result in a Discharge?	Injury / Property Damage?	Person(s) Involved In Clean-up	Date Reported to MDEQ (If significant)
Corrective Action(s) Taken							
Date of Spill	Material Spilled	Quantity Spilled (specify units)	Area that Spill Occurred	Did the Spill Result in a Discharge?	Injury / Property Damage?	Person(s) Involved In Clean-up	Date Reported to MDEQ (If significant)
Corrective Action(s) Taken							
<input type="checkbox"/> No spills have occurred this month.							
<i>"I certify under penalty of law that this report is true, accurate, and complete, to the best of my knowledge and belief."</i>							
Inspector's Name - Printed						Inspector's Signature	
						Date	

**SECTION 33 01 30.83
EPOXY LINING FOR DUCTILE IRON PIPE**

PART 1 GENERAL

1-01 DESCRIPTION

Ductile iron pipe and fittings shall have a ceramic epoxy lining on the interior and a bituminous coating on the exterior except for 6 inches back from the spigot end. The bituminous coating shall not be applied to the first 6 inches of the exterior of the spigot ends. Ductile pipe and fittings shall be delivered to the application facility without asphalt, cement lining, or other lining on the interior surface. Because removal of old linings may not be possible, the intent of this specification is that the entire interior of the ductile iron pipe and fittings shall be as cast without ever having been lined prior to the application of the specified lining. Ductile iron pipe or fittings furnished for this project must not have been lined prior to the awarding of the contract for this project.

PART 2 MATERIAL

2-01 Brand name(s) items in this sub-section are used to set a standard of quality. It is not intended to restrict the Contractor from offering an equal item from another source(s) of supply.

2-02 LINING MATERIAL

The material used for the lining shall be a 2-component amine cured epoxy of at least 87% solids. Protecto 401 by Vulcan Painters, Birmingham, Alabama; or Permite 9043, Type II glass-filled epoxy by Permite Corporation, Atlanta, Georgia, are the standard of quality. Any products submitted must be accompanied by certified test data reflecting the ability of the material to perform per these Specifications. The following are the minimum requirements to be met:

- A. A permeability rating of zero permeance when a film of at least 40 mils is tested according to ASTM D 1663-72 (reapproved 1979) or a permeability rating of 0.0 perms when measured using Method A of ASTM E96-66, procedure A with a test duration of 42 days.
- B. The material shall contain at least 20% by volume of ceramic quartz pigment in the dried film.
- C. The following test must be run on ductile iron panels with the results certified by the lining material supplier of the material being submitted.

TEST	RATING/METHOD
1. Direct Impact	ASTM D-2794
2. 3% Sulfuric Acid Immersion at 120 ⁰ F	ASTM D-714-56 (1974)
3. 25% Sodium Hydroxide Immersion at 140 ⁰ F	ASTM D-714-56 (1974)
4. Deionized Water Immersion at 160 ⁰ F	ASTM D-714-56 (1974)
5. Moisture and Ultraviolet Light Cycle 8 hours light/4 hours 100% humidity	ASTM G5377

PART 3 EXECUTION

3-01 APPLICATION

A. Applicator

The lining shall be applied by a competent firm with at least a 5-year history of applying linings to the interior of concrete and ductile pipe and fittings.

B. Surface Preparation

Prior to abrasive blasting, the entire area which will receive the protective compound shall be inspected for oil, grease, etc. Areas where oil, grease or other substances which can be removed by solvent is present shall be solvent cleaned using the guidelines outlined in SSPC-1 solvent cleaning. After the surface has been made free of grease, oil or other substances, areas to receive the protective compounds shall be abrasive blasted using compressed air nozzles with sand or grit abrasive media. The blast media shall strike the surface at a minimum angle of 45. The entire surface to be lined shall be struck with the blast media so that all rust, loose oxides, etc. are removed from the surface. Only slight stains and specks of tightly adhering oxides may be left on the surface. Areas where rust reappears before coating must be re-blasted to remove rust.

C. Lining

After the surface preparation and within 8 hours of surface preparation, the barrel of the pipe from the inside shoulder of the gasket groove to the end of the interior spigot shall receive minimum coating of 24 mils dry film thickness of the protective lining. If flange fittings of pipe are included in the project, the linings must not be used on the face of the flange; however, full face gaskets must be used to protect the ends of the pipe. Fittings shall be lined with a minimum of 24 mils of the protective lining. Push-on type fittings shall be

lined from the gasket groove to the gasket groove. The 24 mils system shall not be applied in the gasket grooves.

D. Coating of Gasket and Spigot Ends

Due to the tolerances involved, the gasket groove and spigot end up to 6 inches back from the end of the spigot end must be coated with a minimum of 10 mils dry of protective coating. This coating shall be applied by brush to ensure coverage. Care should be taken that the coating is smooth without excess buildup in the gasket groove or on the spigot end. Materials for the gasket groove and spigot end shall be applied after the application of the lining.

E. Number of Coats

The number of coats of lining material applied shall be as recommended by the lining manufacturer. However, in no case shall this material be applied in excess of the dry thickness per coat recommended by the lining manufacturer in printed literature. The time between coats shall never exceed that time recommended by the lining material manufacturer. No material shall be used for lining which cannot be recoated with itself without roughening of the surface after 4 hours cure @ 100^oF. If the lining must be recoated beyond the lining material manufacturer's recommended recoat time, the surface of the existing lining shall be roughened sufficiently to prevent delamination between coats.

3-02 INSPECTION AND CERTIFICATION

A. INSPECTION

1. Ductile iron pipe shall be checked for thickness using a magnetic film thickness gauge. The thickness testing shall be done using the method outlined in SSPC-PA-2 film thickness rating.
2. The barrel of all pipe and fittings shall be pinhole-detected with a non-destructive 2,500 volt pinhole test.
3. Each pipe joint and fitting shall be marked with the date of application of the lining system and with its numerical sequence of application on that date.

B. CERTIFICATION

The pipe or fitting manufacturer must supply a certificate attesting to the fact that the applicator met the requirements of this specification, and that the material used was as specified, and that the material was applied as required by the specification.

3-03 FIELD APPLICATION

A. SURFACE PREPARATION

1. The damaged or abraded area shall be brushed vigorously with a wire brush or sanded with coarse sandpaper to remove all loose material. After the surface has been cleaned, care should be taken to remove all dust from the cleaning operation. This can be accomplished by blowing off with compressed air or by brushing with a dry brush.
2. Lining material shall be mixed thoroughly in strict accordance with manufacturer's recommendations. After the material has been thoroughly mixed, apply to the prepared surface by brush, roller or airless spray. The material will be applied in one or two coats, as directed by the Engineer, depending on the size of the damaged area and whether it goes to the substrate or not.

***** END OF SECTION *****

**SECTION 33 05 07.13
UTILITY DIRECTIONAL DRILLING**

PART 1 – GENERAL

1-01 SCOPE OF WORK:

The work specified in this section consists of furnishing and installing underground utilities using the horizontal directional drilling (HDD) method of installation, also commonly referred to as directional boring. This work shall include all services, equipment, materials, and labor for the complete and proper installation, testing, restoration of underground utilities and environmental protection and restoration. For the supply of domestic water during construction, the contractor shall utilize an OWNER supplied meter assembly (meter & backflow device) and pay for all water consumed except in the case where the new water main is connected directly into the active water system for line filling and flushing operation. Un-metered reclaimed water may be utilized for flushing and testing of new reclaimed water mains. Un-accountable domestic water quantities shall be minimized, where possible.

1-02 QUALITY ASSURANCE:

The requirements set forth in this document specify a wide range of procedural precautions necessary to insure that the very basic, essential aspects of a proper horizontal directional drilling installation are adequately controlled. Strict adherence shall be required under specifically covered conditions outlined in this specification or within any associated permit. Adherence to the specifications contained herein, or the OWNER Representative's approval on any aspect of any directional bore operation covered by this specification, shall in no way relieve the Contractor of their ultimate responsibility for the satisfactory completion of the work authorized under the Contract. The HDD contractor shall be responsible for the repair of all damage to private and/or public property (at no expense to OWNER). Repair work shall meet all local and state rules and requirements.

1-03 WARRANTY:

The contractor shall supply to OWNER a two (2) year unconditional warranty. The warranty shall include materials and installation and shall constitute complete replacement and delivery to the site of materials and installation of same to replace defective materials or defective workmanship with new materials/workmanship conforming to the specifications.

1-04 REFERENCED STANDARDS:

The work shall conform to applicable provisions of the OWNER Water and Sewer Standards, and the following standards, latest editions, except as modified herein.

American Water Works Association (AWWA) Standards:

AWWA C906	Polyethylene (PE) Pressure Pipe and Fittings, 4 inch through 63 inch, for Water Distribution American Society for Testing and Materials (ASTM) Standards.
ASTM D618	Standard Methods of Conditioning Plastics and Electrical Insulating Materials for Testing.
ASTM D638	Standard Test Method for Tensile Properties of Plastics.
ASTM D1238	Standard Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer.
ASTM D1248	Standard Specifications for Polyethylene Plastics Molding and Extrusion Materials.
ASTM D1505	Standard Test Method for Density of Plastics by the Density-Gradient Technique.
ASTM D1598	Standard Test Method for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure.
ASTM D1599	Standard Test Method for Short-Time Hydraulic Failure Pressure of Plastic Pipe, Tubing, and Fittings.
ASTM D1603	Standard Test Method for Carbon Black in Olefin Plastics.
ASTM D2122	Standard Method of Determining Dimensions of Thermoplastics Pipe and Fittings.
ASTM D2290	Standard Test Method for Apparent Tensile Strength or Tubular Plastics and Reinforced Plastics by Split Disk Method.
ASTM D2683	Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing.
ASTM D2837	Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials.
ASTM D2839	Standard Practice for Use of a Melt-Index Strand for Determining Density of Polyethylene
ASTM D3035	Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Controlled Outside Diameter.
ASTM E3261	Standard Specification for Butt Heat Fusion Polyethylene Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.
ASTM D3350	Standard Specification for Polyethylene Plastic Pipe and Fittings Materials.
ASTM D4218	Standard Test Method for Determination of Carbon Black Content in Polyethylene Compounds by the Muffle-Furnace Technique.
ASTM F412	Standard Terminology Relating to Plastic Piping Systems.

1-05 PERMITS:

Dig permits are required for any excavation on this installation. The Contractor shall verify the existence of all permits before commencing any work on the project.

1-06 SUBMITTALS:

- A. Bid Submittal – The Contractor shall submit with his bid the following required information for all individual HDD segments greater than 600 LF.
1. Contractor shall provide an example of similar successful project experience. Minimum requirements are 8” outside diameter, HDPE pipe, and 600 LF single pull. Provide project contact name, title, telephone number, mailing address, email address, etc. for whom the successful project was performed.
 2. Contractor shall provide calculations (in accordance with ASTM F 1962 or equal) for pull back force required and the resulting rig size proposed for this project.
 3. Contractor shall provide calculations (in accordance with industry standards) predicting the expected annular pressure and identify areas subject to hydrofracture.
 4. Contractor shall provide an example of a similar project where the specified guidance system was successfully used.
 5. Contractor shall provide calculations demonstrating that the pipe will not be overstressed.
 6. Contractor shall verify that the information and calculations presented herein will be fully incorporated into the work plan.
 7. Contractor shall identify which, if any, items of the basis of design that the Contractor proposes to change (entry/exit angles, depth, radius, etc.). These changes shall be reflected in the calculations and information required in these evaluation criteria.
- B. Work Plan: Prior to beginning work, the Contractor must submit to the OWNER Representative a work plan detailing the procedure and schedule to be used to execute the project. The work plan should include a description of all equipment to be used, down-hole tools, a list of personnel and their qualifications and experience (including back-up personnel in the event that an individual is unavailable), list of sub-contractors, a schedule of work activity, a safety plan (including MSDS of any potentially hazardous substances to be used), traffic control plan (if applicable), an environmental protection plan and a contingency plan. The work plan should be comprehensive, realistic and based on actual working conditions for this particular project. Plan should document the thoughtful planning required to successfully complete the project. The HDD contractor shall submit and obtain OWNER’s approval of a pre-construction bore-log depicting a plan and profile (horizontal and vertical alignment) of the proposed bore path. The bore-log shall show all utility crossings and existing structures. All deviations from the drawings included in the contract documents shall be clearly identified. The work plan shall specifically address the following potential problems:
1. A Frac-Out and Surface Spill Contingency Plan
 2. Loss of returns
 3. Obstructions along borepath during reaming or pullback

4. Drill pipe or product pipe cannot be advanced
 5. Deviations from design line and grade exceed allowable tolerances
 6. Drill pipe or product pipe broken off in borehole
 7. Collapse or product pipe or excessive deformation
 8. Damage to a utility
 9. Excessive subsidence or heave
- C. Calculations - The following calculations shall be submitted prior to beginning any HDD work:
1. Pullback load calculation
 2. Pipe stress calculation
 3. Maximum allowable drilling fluid pressure calculation
 4. Contractor shall confirm that the design parameters do not result in installation stresses that exceed allowable pipe stresses.
- D. Existing Utilities - Provide a plan to locate and protect all adjacent utilities and infrastructure
- E. Record Drawing: Submit for the OWNER's approval the record drawings in duplicate to the OWNER's Representative within ten days after completing the pull back for review and approval. The drawings (24 x 36 (min.) and Auto CAD disk of the drawing, 20 horizontal max scale with 2 foot vertical max scale) shall include a plan, profile (data every 25 LF of main, at a minimum), and all information recorded during the progress of the work. The entry and exit points shall be located with GPS coordinates based on a locally available reference system (lat/long, state plane coordinates, etc.). The HDD contractor shall certify the accuracy of all record drawings.

1-07 NOTIFICATION:

The OWNER's representative must be notified 48 hours (minimum) in advance of starting the drilling work. The HDD work shall not begin until the proper preparations (see work plan) for the operation have been completed and approved.

1-08 SITE PREPARATION:

- A. Prior to any alterations to work-site, Contractor shall photograph or video tape entire work area. One copy of which shall be given to the OWNER's Representative and one copy to remain with Contractor for a period of two (2) years following the completion of the project.
- B. Protection of Existing Utilities - Contractor shall abide by the Common Ground Alliance, Best Practices Version 1.0 or latest, unless exceptions are specifically agreed to by OWNER. Also, the Contractor shall coordinate utilities locates with the state one-call and the owner's public works office. Once the locate service has field marked

- all utilities, the Contractor shall verify each utility (including any service laterals, i.e. water, sewer, cable, gas, electric, phone, etc.) and those within each paved area. Verification may be performed utilizing Ground Penetrating Radar, hand dig, or vacuum excavation. Prior to initiating drilling, the Contractor shall record on the drawings both the horizontal and vertical location of the utilities off of a predetermined baseline. The Contractor shall manage and control drilling practices to prevent damage to existing utilities. The Contractor shall be responsible for all losses and repairs as a result of damage to underground utilities resulting from drilling operations. The Contractor shall make a reasonable effort to locate evidence of any other potential subsurface obstructions such as piles or piers.
- C. Work site shall be graded and filled to provide a level working area. No alterations beyond what is required for operations are to be made. Contractor shall confine all activities to designated work areas.
- D. Following drilling operations, Contractor will de-mobilize equipment and restore the work-site to original condition. All excavations will be backfilled and compacted to 90% of original density (at a minimum), or as otherwise specified.

1-09 ENVIRONMENTAL PROTECTION:

Contractor shall place silt fence between all drilling operations and any drainage, wetland, waterway or other area designated for such protection by contract documents, state, federal and local regulations. Contractor shall place hay bales, or approved protection, to limit intrusion upon project area. Additional environmental protection necessary to contain any hydraulic or drilling fluid spills shall be put in place, including berms, liners, turbidity curtains and other measures. Contractor shall adhere to all applicable environmental regulations stated in local, state and federal permits.

1-10 SAFETY:

Contractor shall adhere to all applicable state, federal and local safety regulations and all operations shall be conducted in a safe manner.

1-11 PERSONNEL QUALIFICATIONS CERTIFICATION:

A. Directional Drilling:

All personnel shall be fully trained in their respective duties as part of the directional drilling crew and in safety. (Each person must have been fully trained for over 1,000 hours on all facets of directional drilling, including, but not limited to machine operations, mud mixing, locating, and material fusion.) A responsible representative who is thoroughly familiar with the equipment and type of work to be performed, must be in direct charge and control of the operation at all times. In all cases the supervisor must be continually present at the job site during the actual HDD operation. The Contractor shall have a sufficient number of

competent workers on the job at all times to insure the HDD work is made in a timely and satisfactory manner.

B. Pipe and Fitting Jointing:

Joints between plain end pipes and pipe fittings shall be made by butt fusion when possible. The on-site welder making the joints shall have received specific training from the manufacturer of the fittings and/or pipe being welded and shall have written proof of proper training/certification from the associated manufacturers. Only certified welders who have written training certifications from the fitting and/or pipe manufacturer will be allowed to perform this work. That is, to weld a fitting in place, the on-site welder (employee) must be trained and certified by the fitting manufacturer. To butt weld pipe, the on-site welder (employee) must be trained and certified by the pipe manufacturer. The fusion work shall be accomplished (welding and cool-down/closing times) in accordance with the fitting and pipe manufacturers' recommendations, at a minimum. External and internal beads shall not be removed unless approved by OWNER.

PART 2 – MATERIALS

2-01 HIGH DENSITY POLYETHYLENE (HDPE, PE) PIPE AND FITTINGS:

- A. Materials used for the manufacturer of polyethylene pipe and fittings shall be PE3408 high density polyethylene meeting cell classification 345464C per ASTM D3350; and meeting Type III, Class B or Class C, Category 5, Grade P34 per ASTM D1248; and shall be listed in the name of the pipe and fitting Manufacturer in PPI TR-4, Recommended Hydrostatic Strengths and Design Stresses for Thermoplastic Pipe and Fittings Compounds, with a standard grade rating of 1600 psi at 73°F per ASTM D-2837. The Manufacturer shall certify that the materials used to manufacture pipe and fittings meet these requirements.
- B. Polyethylene Pipe (4 inch and larger): HDPE Pipe shall conform to AWWA C906, DR-11, Ductile Iron Pipe (DIP) size and NSF 61 Standard. HDPE pipe for water or reclaimed water piping (not approved for sewer force mains) with pipe size 4 inch through 12 inch may be DR-17 conforming to AWWA C906 and NSF 61. For pipe sizes 24-inch and larger, the HDPE may be IPS size, DR 11. Polyethylene pipe shall be manufactured in accordance with ASTM F714, Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Controlled Outside Diameter and shall be so marked. Each production lot of pipe shall be tested for (from material or pipe) melt index, density, % carbon, dimensions and either quick burst or ring tensile strength (equipment permitting).
- C. Nominal pipe sizes only are indicated on the drawings and bid form. Outside diameter of pipe is generally 1 to 2-inches greater than the nominal pipe diameter.

D. Service Identification:

Permanent identification of piping service shall be provided by co-extruding multiple equally spaced color stripes into the pipe outside surface or by solid colored pipe shell. The striping material shall be the same material as the pipe material except for color. The following colors shall be used to identify piping service (pressure service):

Blue – potable water
Green – wastewater or force main
Purple – reclaimed water
Black – raw water

E. Polyethylene Fittings and Custom Fabrication:

Polyethylene fittings and custom fabrications shall be molded or fabricated by the pipe manufacturer or trained personnel. Butt fusion outlets shall be made to the same outside diameter, wall thickness, and tolerances as the mating pipe. All fittings and custom fabrications shall be fully rated for the same internal pressure as the mating pipe. Fabricated fittings must have the same working pressure as the mating pipe.

F. Molded Fittings:

Molded fittings shall be manufactured in accordance with ASTM D3261, Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing, and shall be so marked. Each production lot of molded fittings shall be subjected to the test required under ASTM D3261.

G. Fabricated Fittings:

Fabricated fittings shall be made by heat fusion joining specially machined shapes cut from pipe, polyethylene sheet stock, or molded fittings. Fabricated fittings shall be rated for internal pressure service equivalent to the full service pressure rating of the mating pipe. Directional fittings 16" and larger such as elbows, tees, crosses, etc., shall have a plain end inlet for butt fusion and flanged directional outlets.

H. Polyethylene Flange Adapters:

Flange adapter shall be made with sufficient throughbore length to be clamped in a butt fusion joining machine without the use of a stubend holder. The sealing surface of the flange adapter shall be machined with a series of small v-shaped grooved to provide gasketless sealing, or to restrain the gasket against blow-out. Below ground flange adapters may only be utilized when specified and when MJ adapters are not commercially available in the required size. Adapters for 30 inch and smaller pipe shall utilize an MJ adapter (see below).

I. Back-up Rings and Flange Bolts:

Flange adapters shall be fitted with lap joint flanges pressure rated equal to or greater than the mating pipe. Convolute style backup rings preferred over the flat stock rings. The lap joint flange bore shall be chamfered to provide clearance to the flange adapter radius. Flange bolts and nuts shall be Grade 2 or higher.

J. Manufacturer's Quality Control:

The pipe and fitting manufacturer shall have an established quality control program responsible for inspecting incoming and outgoing materials. Incoming polyethylene materials shall be inspected for density, melt flow rated, and contamination. The cell classification properties of the material shall be certified by the supplier, and verified by Manufacturer's Quality Control.

K. Polyethylene Mechanical Joint (MJ) Adapters:

Mechanical connections of HDPE pipe (4" and larger) to Ductile Iron or PVC piping, mechanical joint fittings, or valves shall be through a self-restraining, fusible mechanical joint adapter with or without an integral, internal stainless steel insert. Mechanical joint adapter shall be of the same SDR rating as the pipe. A separate, loose stainless steel type insert will only be allowed for pipe sizes 4 inch through 8 inches. Provide the mechanical joint adapter, including but not limited to longer tee bolts or all thread rods with nuts at the mechanical joint bell. Note that PE flanged adapters may only be utilized for pipe sizes where MJ adapters are not commercially available.

L. Cast Transition Couplings:

HDPE to MJ cast transition coupling may only be utilized for 8 inch and smaller pipe size. A stainless steel stiffener is required sized at proper ID of HDPE pipe. The transition coupling must be epoxy lined (3 mils minimum for water use and 12 mils minimum for sewer use). Acceptable is a Power Seal model 3520 or approved equal.

M. Electro fusion Couplings and Fittings:

Electro fusion joining procedures shall not be used in any location or application on this project.

N. Polyethylene service line tubing shall conform to AWWA C901-latest.

O. Drilling Fluids shall be a bentonite slurry.

2-02 DELIVERY, STORAGE, AND HANDLING OF MATERIALS:

A. Inspect materials delivered to the site for damage. All materials found during inspection or during the progress of work to have cracks, flaws, cracked linings, or other defects shall be rejected and removed from the job site without delay.

B. Unload and store opposite or near the place where the work will proceed with minimum handling. Store material under cover out of direct sun light. Do not store directly on the ground. Keep all materials free of dirt and debris.

C. Contractor is responsible for obtaining, transporting and sorting any fluids, including water, to the work site.

D. Disposal of fluids is the responsibility of the Contractor. Disposal of fluids shall be done in a manner that is in compliance with all permits and applicable federal, state,

or local environmental regulations. The bentonite drilling slurry may be recycled for reuse in the hole opening operation, or shall be hauled by the Contractor to an approved location or landfill for proper disposal. Contractor shall thoroughly clean entire area of any fluid residue upon completion of installation, and replace any and all plants and sod damaged, discolored or stained by drilling fluids.

- E. Locate Wire – Locate wire shall be as specified elsewhere.

PART 3 - INSTALLATION

3-01 EQUIPMENT REQUIREMENTS

A. General:

The directional drilling equipment shall consist of a directional drilling rig of sufficient capacity to perform the pilot hole, reaming, and pullback the pipe; a drilling fluid mixing, delivery and recovery system of sufficient capacity to successfully complete the drill; a drilling fluid recycling system to remove solids from the drilling fluid so that the fluid can be re-used; a guidance system to accurately guide boring operations; a vacuum truck of sufficient capacity to handle the drilling fluid volume; and trained, competent personnel to operate the system. All equipment shall be in good, safe operating condition with sufficient supplies, materials and spare parts on hand to maintain the system in good working order for the duration of this project.

B. Drilling System:

1. Drilling Rig: The directional drilling machine shall consist of a power system to rotate, push and pull hollow drill pipe into the ground at a variable angle while delivering a pressurized fluid mixture to a guidable drill (bore) head. The power system shall be self contained with sufficient pressure and volume to power drilling operations. The hydraulic system shall be free of leaks. The rig shall have a system to monitor maximum pull-back force during pull-back operations. The rig shall be grounded during drilling and pull-back operations. There shall be a system to detect electrical current from the drilling string and an audible alarm which automatically sounds when an electrical current is detected.
2. Drill Head: The drillhead shall be steerable by changing its rotation and shall provide the necessary cutting surfaces and drilling fluid jets.
3. Mud Motors (if required): Mud motors shall be of adequate power to turn the required drilling tools.
4. Drill Pipe: Shall be constructed of high quality heat-treated, forged alloy steel.

A. Guidance System:

1. The position of the drill head shall be continuously tracked and recorded by a downhole wireline tracking locator system and shall be supplemented by a "TruTracker" or equivalent tracking system installed between the entry point and the exit point. The coordinates of the surface wire grid system shall be surveyed and recorded. The guidance system shall be capable of tracking at all depths up to eighty feet and in any soil condition, including hard rock. It shall enable the driller to guide the drill head by providing immediate information on the tool face, azimuth (horizontal direction), and inclination (vertical direction) The guidance system shall be accurate to +/-2% of the vertical depth of the borehole at sensing position at depths up to one hundred feet and accurate within 1.5 meters horizontally.
2. The Guidance System shall be of a proven type and shall be operated by personnel trained and experienced with this system. The Operator shall be aware of any magnetic anomalies on the surface of the drill path and shall consider such influences in the operation of the guidance system if using a magnetic system.
3. Bore Tracking and Monitoring: At all times during the pilot bore the Contractor shall provide and maintain a bore tracking system that is capable of accurately locating the position of the drill head in the x, y, and z axes. The Contractor shall record these data at least once per drill pipe length or every twenty-five (25) feet, whichever is most frequent.
4. Downhole and Surface Grid Tracking System: Contractor shall monitor and record x, y, and z coordinates relative to an established surface survey bench mark. The data shall be continuously monitored and recorded at least once per drill pipe-length or at twenty-five (25) feet, whichever is more frequent.
5. Deviations between the recorded and design bore path shall be calculated and reported on the daily log. If the deviations exceed plus or minus 5 feet (horizontal or vertical deviation) from the design path, such occurrences shall be reported immediately to OWNER. The Contractor shall undertake all reasonable and necessary measures to correct deviations and return to design line and grade.

B. DRILLING FLUID (MUD) SYSTEM and pressure monitoring system:

1. Mixing System: A self-contained, closed, drilling fluid mixing system shall be of sufficient size to mix and deliver drilling fluid. Mixing system shall continually agitate the drilling fluid during operations.
2. Drilling Fluid Pressures and Flow Rates: Drilling fluid pressures and flow rates shall be continuously monitored and recorded by the Contractor. The pressures shall be monitored at the pump. These measurements

shall be made during pilot bore drilling, reaming, and pullback operations.

3. Downhole Annular Pressure Monitoring System: The Contractor shall use a downhole annular pressure monitoring system that will provide instantaneous and continuous operating pressures. This system shall incorporate a data recorder that will store the downhole annular pressure data for the entire drilling operation. This data shall be maintained and provided to the Engineer upon request or at the completion of the project. The data (x,y,z) shall be presented in a format easily referenced to the contract drawings. Pressure shall be indicated in psi at a specified datum.
4. Drilling Fluids: Drilling fluid shall be composed of clean water, appropriate additives and clay. Water shall be from an authorized source with a minimum pH of 6.0. Water of a lower pH or with excessive calcium shall be treated with the appropriate amount of sodium carbonate or equal. The water and additives shall be mixed thoroughly and be absent of any clumps or clods. No potentially hazardous material maybe used in drilling fluid.
5. Delivery System: The delivery system shall have filters in-line to prevent solids from being pumped into the drill pipe. Connections between the pump and drill pipe shall be relatively leak-free. Used drilling fluid and drilling fluid spilled during drilling operations shall be contained and conveyed to the drilling fluid recycling system. Pumps and or vacuum truck(s) of sufficient size shall be in place to convey excess drilling fluid from containment areas to storage and recycling facilities.
6. Drilling Fluid Recycling System: Control of Drilling Fluids: The drilling fluid recycling system shall separate sand, dirt and other solids from the drilling fluid to render the drilling fluid re-usable. Spoils separated from the drilling fluid will be stockpiled for later use or disposal. The Contractor shall follow all requirements of the Frac-Out and Surface Spill Contingency Plan as submitted and approved and shall control operational pressures, drilling fluid weights, drilling speeds, and any other operational factors required to avoid hydrofracture fluid losses to formations, and control drilling fluid spills. This includes any spillages or returns at entry and exit locations or at any intermediate point. All inadvertent returns or spills shall be promptly contained and cleaned up. The Contractor shall maintain on-site mobile spoil removal equipment during all drilling, pre-reaming, reaming and pullback operations and shall be capable of quickly removing spoils. The Contractor shall immediately notify OWNER of any inadvertent returns or spills and immediately contain and clean up the return or spill.

E. OTHER EQUIPMENT:

1. Pipe Rollers: Pipe rollers, if utilized, shall be of sufficient size to fully support the weight of the pipe while being hydro-tested and during pull-back operations. Sufficient number of rollers shall used to prevent excess sagging of pipe.
2. Pipe Rammers: Hydraulic or pneumatic pipe rammers may only be used if necessary and with the authorization of the OWNER's Representative.
3. Restrictions: Other devices or utility placement systems for providing horizontal thrust other than those defined above in the preceding sections shall not be used unless approved by the OWNER Representative prior to commencement of the work. Consideration for approval will be made on an individual basis for each specified location. The proposed device or system will be evaluated prior to approval or rejection on its potential ability to complete the utility placement satisfactorily without undue stoppage and to maintain line and grade within the tolerances prescribed by the particular conditions of the projects.

3-02 DRILLING PROCEDURES

- A. Drill Path: Prior to drilling Contractor shall utilize all verified locate information to determine drill pathway. Marked up drawings (see Site Preparation paragraph) shall be on site at all times, and referred to during the drill operation.
- B. Guidance System: Contractor shall provide and maintain a downhole wireline system to accurately locate the pilot hole (both horizontal and vertical position). A Tru-Tracker energized surface grid, or equivalent, shall be installed and used to supplement the wireline system. The OWNER Representative shall have access to instrumentation and readings at all times during operation.
- C. Drilling fluid pressures and flow rates: Drilling fluid pressures and flow rates shall be continuously monitored and recorded.
- D. Subsidence and Heave: Subsidence or heave of utilities, roads, or other features above the HDD centerlines and within the zone influenced by the HDD construction shall be limited to values that avoid damage. These values shall be determined by the utility or right-of-way owner. The Contractor shall repair any damage resulting from settlement or heave caused by HDD activities at no additional cost to OWNER. The Contractor shall grout any voids caused by or encountered during drilling.
- E. Pilot Hole: The pilot hole shall be drilled along the path shown on the plans and profile drawings or as directed by the OWNER Representative in the field. Unless approved otherwise by OWNER, the pilot-hole tolerances shall be as follows:

1. Elevation: As shown on the plans.
 2. Alignment: ± 5 feet and within 3 feet of right-of-way or easement boundary.
 3. Curve Radius: The pilot hole radius shall be no less than 150% of the minimum bending radius as recommended by the pipe manufacturer of the pipe being installed.
 4. Entry Point Location: The exact pilot hole entry point shall be within ± 5 feet of the location shown on the drawing or as directed by the OWNER Representative in the field.
 5. Exit Point Location: The exit point location shall be within ± 5 feet of the location shown on the drawing or as directed by the OWNER Representative in the field.
 6. Water Main and Non-Water Main Separation Requirements: The minimum separation requirements between HDPE water main and a non-water main shall be as defined in 62-555, F.A.C.
- F. Pull Back: After successfully reaming bore hole to the required diameter, Contractor will pull the pipe through the bore hole. In front of the pipe will be a swivel and reamer to compact bore hole walls. Once pull-back operations have commenced, operations must continue without interruption until pipe is completely pulled into bore hole. During pull-back operations Contractor will not apply more than the maximum safe pipe pull pressure at any time. Maximum allowable tensile force imposed on the pull section shall be equal to 80% of the pipe manufacturer's safe pull (or tensile) strength.
1. Torsional stress shall be minimized by using a swivel to connect a pull section to the reaming assembly.
 2. The pullback section of the pipeline shall be supported during pullback operations so that it moves freely and the pipe is not damaged.
 3. External pressure shall be minimized during installation of the pullback section in the reamed hole. Damaged pipe resulting from external pressure shall be replaced at no cost to the OWNER.
 4. Locate wire shall be attached to the leading end of the pipe pulling head and shall extend the full length of the installed pipe.
 5. Buoyancy modification shall be at the discretion of the Contractor and shall be approved by the OWNER's Representative. The Contractor shall be

responsible for any damage to the pull section resulting from such modifications.

6. In the event that pipe becomes stuck, Contractor will implement the submitted and approved contingency plan. If pipe remains stuck, Contractor will notify OWNER Representative. The OWNER's Representative and Contractor will discuss options and then work will proceed accordingly.
7. The Contractor shall cease operations if the pipe is damaged and shall remove the pipe from the bore hole and repair the pipe using the manufacturer's recommended procedure or replace the damaged pipe before resuming installation.

3-03 PIPE ASSEMBLY

- A. Pipe shall be welded/fused together in one length, if space permits. Pipe may be placed on pipe rollers before pulling into bore hole to minimize damage to the pipe. For pipe sizes larger than 12 inch, mechanical scrapers (per the fitting manufacturer's recommendation) shall be utilized during the fusion work. It is critical that all original oxidized pipe surface be removed in order for fusion to take place. The scraping process requires that approximately .10" of the outer "skin" be removed in order to penetrate the oxidation and contamination barrier.
- B. Acceptability of Damaged Pipe: Cuts or gouges that reduce the wall thickness by more than 10% are not acceptable and must be cut out and discarded.
- C. Fusion Testing: When requested by the OWNER's inspector, fusion testing will be performed. The test fusion shall be allowed to cool completely, and then fusion test straps shall be cut out. The test strap shall be 12" (min) or 30 times the wall thickness in length with the fusion in the center and 1" (min) or 1.5 times the wall thickness in width. Bend the test strap until the ends of the strap touch. If the fusion fails at the joint, a new test fusion shall be made, cooled completely and tested. No more than one passing test will be required per pull section.
- D. Mechanical Joining: Polyethylene pipe and fittings may be joined together or to the materials by means of flanged connections (flange adapters and back-up rings) or mechanical couplings designed for joining polyethylene pipe or for joining polyethylene pipe to another material. Mechanical couplings shall be fully pressure rated and fully thrust restrained such that when installed in accordance with manufacturer's recommendations, a longitudinal load applied to the mechanical coupling will cause the pipe to yield before the mechanical coupling disjoins. External joint restraints shall not be used in lieu of fully restrained mechanical couplings.
- E. Mechanical Joint and Flange Installation: Mechanical joints and flange connections shall be installed in accordance with the Manufacturer's

recommended procedure. Flange faces shall be centered and aligned to each other before assembling and tightening bolts. In no case shall the flange bolts be used to draw the flanges into alignment. Bolt threads shall be lubricated, and flat washers shall be fitted under the flange nuts. Bolts shall be evenly tightened according to the tightening pattern and torque step recommendations of the Manufacturer. At least 1 hour after initial assembly, flange connections shall be re-tightened following the tightening pattern and torque step recommendations of the Manufacturer. The final tightening torque shall be as recommended by the Manufacturer.

3-04 TESTING

- A. DISINFECTION TESTS (potable water mains only): All water pipe and fittings shall be thoroughly disinfected prior to being placed in service. Disinfection shall follow the applicable provisions of the procedure established for the disinfection of water mains as set forth in AWWA - Standard C651 entitled "AWWA Standard for Disinfecting Water Mains". Bacteriological testing of the water main shall be scheduled and completed by the OWNER. OWNER will collect the water samples and be responsible for completing the water analysis (lab testing).
- B. Temporary blow-offs shall be installed for the purpose of cleaning the water main. Blow-offs installed on water mains up to and including 12" shall be the same diameter as the water main. Blow-offs installed on 16" water mains and larger may be the next smaller size, in diameter, than the water main being tested. Temporary blow-offs shall be removed and plugged after the main is cleared. The OWNER's Representative shall be present prior to and during the operation of blow-offs. The main shall be flushed prior to disinfection.
- C. The new water main shall be connected to the existing water main at one point only for flushing purposes (no looping). The new main MUST have a blow off on the end as required previously. After the new main is thoroughly flushed, the open end shall be sealed and restrained and the main shall be thoroughly disinfected. Anytime the new line is reopened (to repair defective joints or pipe, defective fitting or valve) the complete disinfection process shall be repeated. Once bacteriological clearance has been received from the regulatory authority, the new main may be pressure tested.

3-05 PRESSURE AND LEAKAGE TESTS

- A. Contractor shall test pipelines installed under this Contract in accordance with these specifications prior to acceptance of the pipeline by the OWNER. All field tests shall be made in the presence of the OWNER's Representative. Except as otherwise directed, all pipelines shall be tested. Unless approved otherwise by OWNER, all fusible or butt weld joints shall be tested, including MJ adapter fittings associated with the new construction. All piping to operate under liquid pressure shall be tested in sections of approved length. The pressure testing of an HDPE line section shall be tested separately from the PVC and DIP line sections. Where

impractical, the HDPE test section shall include only a minimum amount of PVC and ductile iron pipe within the test section. If at all possible, the PVC and D.I.P. test sections shall be left exposed during the pressure test for visual leakage observation. For these tests, the Contractor shall furnish clean water, suitable temporary testing plugs or caps, and other necessary equipment, and all labor required. If the Contractor chooses to pressure test against an existing OWNER water main/valve, the new water main must be disinfected prior to connection to the OWNER's line. The OWNER will not be responsible for failure of the pressure test due to the existing valve leaking. The OWNER may elect to furnish suitable pressure gauges for these tests. If not, the contractor will furnish suitable pressure gauges, calibrated by an approved testing laboratory, with increments no greater than 2 psi. Gauges used shall be of such size that pressures tested will not register less than 10% or more than 90% of the gauge capacity. All valved sections shall be hydrostatic tested to insure sealing (leak allowance) of all line valves.

- B. Unless it has already been done, the section to pipe to be tested shall be filled with potable water and air shall be expelled from the pipe. Reclaimed water may be utilized for filling new reclaimed water or sewer force main installations. If blow offs or other outlets are not available at high points for releasing air, the Contractor shall provide 1 inch (minimum taps and blow-off valves (at the 12:00 position), as necessary. The cost of constructing blow-off valves and plugging them, after a successful pressure test, shall be included in the unit price bid amount for the HDPE pipe.
- C. For mains larger than 20" diameter, it is highly recommended that the contractor profile (line and grade) the main after installation and prior to pressure and leakage test to accurately locate all high points. Field survey instrument (Level equipment) shall be utilized for this task. Blow off valves shall be installed (at a minimum) at all high points which offset vertically more than two pipe diameters in length (at a minimum). The contractor shall consult the design engineer on any technical questions or concerns.
- D. Hydrostatic testing shall consist of a 150 psig test pressures, based on the elevation of the highest point of the line or section under tests. Pressure shall be applied by means of a pump connected to the pipe in a manner satisfactory to the OWNER's Representative. The pump, pipe connection and all necessary apparatus shall be furnished by the Contractor and shall be subject to the approval of the OWNER's Representative.
- E. Maximum duration for pressure test, including initial and final phase of the test, shall not exceed eight (8) hours. If the test is not completed due to leakage, equipment failure, etc., depressurize the test section, and then allow it to "relax" for at least eight (8) hours before bringing the test section up to test pressure again.

- F. Initial Phase of Pressure Testing: First, all air must be removed from the test section. The pressure test shall be completed after the line is backfilled. If possible, all flanged or mechanical joint valves and fittings shall be left exposed for visual leak inspection. If possible all PVC and D.I.P. test sections shall be left exposed for visual leak inspection. Initially, the pressure within the test section should be raised to approximately 160 psi and then allowed to be idle (no additional make-up water/pressure to be injected), for approximately 3 hours. During this 3 hour period, the test section shall be allowed to stabilize and come to an equilibrium stage. No additional make-up water/pressure shall be applied to the test section during this 3 hour stabilization period unless the line pressure drops below 140 psi. In this case, make-up water/pressure shall only be applied to the test section to maintain a minimum of 140 psi (during the 3 hour stabilization period).
- G. Final Phase of Pressure Testing: The final phase of the pressure test shall involve applying make-up water/pressure to achieve an "initial test pressure" of 150 psi (minimum)/155 psi (maximum). The test section is then allowed to be idle (no make-up water/pressure is added) for a period of 2 hours. After this 2 hour period, make-up water/pressure is applied and measured to re-establish the "initial test pressure". The quantity of water utilized to re-pump the line shall be measured and compared to the allowable quantities as determined by the table below. If the actual make-up water quantity is equal or less than the allowable amount, the pressure test passes. If the actual make-up water quantities are greater than the allowable amount, the pressure test fails (see enclosed OWNER test form).

Table 1: Allowable Make Up Amount	
Nominal Pipe Size (inches)	Make-up Water Allowance (Gallons/Linear feet of Pipe) 2-hour test
6	0.003
8	0.005
10	0.0065
12	0.0115
14	0.014
16	0.0165
18	0.0215
20	0.0275
22	0.035
24	0.044
26	0.05
28	0.0555
30	0.0635
32	0.0715
34	0.081
36	0.09
42	0.1155
48	0.1350
54	0.1570

- H. In the event a section fails to pass the tests, the Contractor shall do everything necessary to locate, uncover (even to the extent of uncovering the entire section), and replace the defective pipe, valve, fitting or joint. Visible leaks shall be corrected regardless of total leakage. Lines which fail to meet these tests shall be retested as necessary until test requirements are complied with. All testing shall be performed at the Contractor's expense
- I. If, in the judgment of OWNER, it is impracticable to follow the foregoing procedures exactly for any reason, modifications in the procedure shall be made with approval; but, in any event, the Contractor shall be responsible for the ultimate tightness of the piping within the above requirement. Re-disinfection shall be required if the line is de-pressurized for repairs.

3-06 LOCATE WIRE: Locate wire shall be provided on all installations. Locate wire shall be 12 AWG copper-clad carbon steel with 30 mils (min) insulation. Locate wire shall be brought to grade within a valve box or locate station box at all "entry point locations" and all "exit point locations". There is no maximum length or interval between locate wire stations.

PART 4 – MEASUREMENT AND PAYMENT

4-01 Payment for Horizontal Directional Drilling shall be paid for at the linear foot price for each diameter of pipe installed, and shall include all machinery, equipment, pipe, accessories, labor, and fuel to install the pipe as specified and shown on the drawings.

***** END OF SECTION *****

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**SECTION 33 14 00
WATER DISTRIBUTION SYSTEM**

PART 1 - GENERAL

1.1 DESCRIPTION

- A. These specifications shall govern the furnishings, transporting and installing of water distribution lines, fittings, valves, fire hydrants, and other appurtenances. The pipe and accessories shall be installed in accordance with the requirements of these specifications at the locations and depths indicated on the plans and shall be of the classes, sizes and dimensions shown thereon.
- B. The installation of pipe shall include all joints, connections to new or existing pipes, and the installation of all fittings, valves, fire hydrants, and other appurtenances. The pipe and accessories shall be of the classes, sizes and dimensions shown thereon.
- C. Water main shall be of polyvinyl chloride (PVC) or ductile iron (DI or DIP) manufacture as specified herein.

1.2 SUBMITTALS

- A. Shop Drawings:
 - 1. Submit size, class and other details of the pipe to be used.
 - 2. Submit information on typical joint and harnessing details.
- B. Tests: Submit a description of the proposed testing methods, procedures, and apparatus. Submit copies of all test reports.
- C. Record Drawings: During progress of the Work, keep an up to date set of drawings showing field modifications. Submit drawings at a scale satisfactory to the Engineer that show the actual in-place installation of all piping and appurtenances installed under this section. The drawings shall show all piping on the plans with all reference dimensions and elevations required for complete record drawings of the piping systems. The drawings shall be furnished no later than 30 days after Substantial Completions of the Work.

1.3 WARRANTY

- A. The contractor shall warranty all materials of construction and repair and all workmanship for a period of **one (1) year** from the date of acceptance of final work.
- B. Should defects of failures occur during the period of warranty, the contractor shall

promptly take whatever steps are necessary to return the work to first class condition.

PART 2 - MATERIALS

2.1 PIPE, COUPLINGS AND ACCESSORIES

A. PVC Pipe:

1. All PVC pipe and fittings four (4") inches to twelve (12") inches in diameter shall conform to the latest edition of AWWA C-900 and shall be made from Class 12454-A or B materials per the latest edition of ASTM D-1784. Pipe shall be a minimum of DR 18 unless otherwise specified, for a minimum pressure class rating of 235 PSI per UL standard. All pipe shall conform with the outside diameter (OD) dimensions of ductile iron pipe to facilitate use of DIP fittings, standard cast iron valves and specials. All joints shall be elastomeric seals conforming to the latest edition of ASTM F-477. All pipe shall bear the seal of the National Sanitation Foundation (NSF). All jointing shall be made in accordance with the manufacturer's recommendations.
2. All PVC pipe and fittings greater than twelve (12") inches in diameter shall conform to the latest edition of AWWA C-905 and shall be made from Class 12454-A or B materials per the latest edition of ASTM D-1784. Pipe shall be a minimum of DR 18 per UL standard unless otherwise specified, for a minimum pressure class rating of 200 PSI. All pipe shall conform with the outside diameter (OD) dimensions of ductile iron pipe to facilitate use of DIP fittings, standard cast iron valves and specials. All joints shall be elastomeric seals conforming to the latest edition of ASTM F-477. All pipe shall bear the seal of the National Sanitation Foundation (NSF). All jointing shall be made in accordance with the manufacturer's recommendations.
3. All PVC pipe (1-1/2") inches to three (3") inches in diameter shall conform to the latest edition of ASTM D-2241 and shall be made from Type 1120 material. Pipe shall be a minimum of SDR 26 unless otherwise specified, for a working pressure of 160 PSI. All joints shall be integral bell gasket in accordance with the latest edition of ASTM D-3139. Pipe shall bear the seal of the NSF. All jointing shall be made in accordance with the manufacturer's recommendations.
4. All PVC pipe (1") inch and smaller in diameter shall conform to the latest edition of ASTM D-2241 and shall be made from Type 1120 material. Pipe shall be a minimum of SDR 26 unless otherwise specified, for a working pressure of 150 PSI. All joints shall be solvent weld in accordance with latest edition of ASTM D-2855 with the solvent cement conforming to the latest edition of ASTM D-2564. All pipe shall bear the seal of the NSF. All jointing shall be made in accordance with the manufacturer's recommendations.

B. Ductile Iron Pipe:

All pipe shall be centrifugally cast in metal or sand lined molds manufactured in accordance with the later edition of ANSI A21.51 (AWWA C-151). Pipe shall be of the following classes unless otherwise specified.

24" Pressure Class 200

16" Pressure Class 250

12", 10", 8", 6" and 4" Pressure Class 350

All pipe and fittings shall be tested for minimum 150 PSI water working pressure laying conditions Type 2 flat bottom trench without blocking, tamped, backfilled and under five (5) feet of cover. All pipes and fittings shall be factory coated on the outside with an asphalt seal coat conforming to the latest edition of A 21.5 and lined inside with a minimum of 1/16 inch cement lining in accordance with the latest edition of ANSI A 21.4 (AWWA C-104). All ductile iron pipe shall be poured, cast and manufactured in the United States.

1. Ductile iron pipe installed pursuant to these specifications shall be encased with an 8 mils thick loose polyethylene encasement in accordance with the latest edition of A 21.5 (AWWA C-105).
2. Joints for ductile iron pipe shall be slip-on type unless otherwise specified. All joints for fittings, valves and specials shall be mechanical joints. Slip on pipe joint for ductile cast iron pipe shall conform to the latest edition of ANSI A 21.11 (AWWA C 111) except that the joints shall be made with a special gasket seal as described in Section 2.3 of these specifications, or approved equal. Lubricants shall be non-toxic, odorless, tasteless and shall not support bacteria and shall be specifically manufactured for the pipe utilized. Mechanical joint pipes shall conform to the latest edition of ANSI A-21.11 (AWWA C-111).
3. If flexible joint or river crossing pipe is required and/or indicated in the project plans or specifications the joint shall be designed for a maximum deflection of 15 degrees, and a maximum working pressure rating of 250 psi. The type shall be the USIFLEX joint as manufactured by U.S. Pipe or an approved equal.

C. Joints:

1. Unless otherwise shown on the Drawings, pipe joints shall be slip-on rubber gasket type conforming to the requirements of AWWA C-111 (ANSI 21-11).
2. Pipe placed within casings shall have restrained joint connections. Restrained joints shall also be used as specified in the restrained joint details. Ductile iron pipe restraints shall be as described in Section 2.3, or approved

equal. PVC pipe restraints shall be as described in Section 2.3, or approved equal.

3. Restrained joint water pipe shall be as described in Section 2.3, or approved equal. Restrained slip-on joints for pipe shall be designed for a working pressure of 250 psi and shall be capable of being deflected 3 degrees per joint.

D. Fittings:

1. All fittings shall be cast from ductile iron in accordance with ANSI/AWWA C153/A21.53. Fittings shall be listed by an approved certifying agency as conforming to the requirements of ANSI/NSF 61. The working pressure rating shall be 350 psi.
2. All fittings shall be asphalt seal coated outside and cement lined inside in accordance with the latest edition of AWWA C-104 (ANSI 21-4), except cement lining may be half of thickness (enameline type) with bituminous seal coating, per Federal Specification WW-PO42A where accepted by the Engineer.
3. All valve clusters consisting of a tee and one or more valves, including fire hydrant legs, shall be monolithically restrained with ductile iron restrained joint anchor coupling fittings.

E. Valves:

1. Gate Valves shall comply with the latest edition of AWWA C-515. Gate valves shall be iron body, encapsulated high strength cast iron wedge, resilient seat, non-rising stem, and shall open counterclockwise. All valves for buried service shall be mechanical joint; above grade shall be flanged with handwheel operator. Gate valves 16" and larger shall be furnished with bevel gearing for horizontal installation. All gate valves shall have a maximum working pressure of 250 PSI and be tested at 500 PSI. The thrust collar and other bearing surfaces shall be permanently lubricated with oil. The stuffing box shall be triple O-ring sealed with fourth O-ring serving as a dirt seal. The disc mechanism shall be designed so that the seating pressure is applied equally at multiple separate contact points near the outer edge of the rubber coated gate by the valve body. Gate valves shall be equipped with mechanical joint connections unless otherwise specified. Gate valves shall be as described in Section 2.3, or approved equal.
2. Check Valves shall be iron body, spring loaded, swing type with straight away passage of full pipe area and renewable bronze seat ring with resilient faced disc and shall comply with the latest edition of AWWA C-508. Check valves shall not be installed within 3 pipe diameters of any other "structure" in the

pipeline or as recommended by the manufacturer. Check valves shall be as described in Section 2.3, or approved equal.

3. Air Release Valves shall comply with the latest edition of AWWA C512. Air release valves shall be iron body with a maximum working pressure of 300 PSI. Air release valves orifice size ranges from 1/16 in – 1 in, and the inlet connection ranges from ½ in. – 6 in. Air Release Valves shall be as described in Section 2.3, or approved equal.
4. Post Indicator Valves shall be capable of indicating if the valve is in the open or shut position and provide a means to operate a buried valve. The adjustment range of the indicator post shall be 34.5” to suit a deeper buried valve and be easily adjusted in the field. The wrench handle shall fit over a “U” bracket on the barrel, and shall be fixed with a padlock to secure the operation wrench to the barrel.
5. Motor Operated Valves (MOV) shall be an approved gate valve with a Rotork IQ3 electric actuator or approved equal.

F. Services:

Service tubing shall be high-density polyethylene tubing (CTS) pipe SDR 9 for use in potable water service applications. Potable water service tubing shall meet the requirements of ASTM D2737, AWWA C901 and NSF Standards 14 and 61. Pipe dimensions shall meet Copper Tubing Size (CTS) standards. Tubing material shall be high-density polyethylene conforming with the minimum requirements of cell classification 345464E as defined and described in ASTM D3350. The resin shall have a material designation code of PE3608 (formerly PE3408) by the Plastic Pipe Institute. Polyethylene service tubing shall be as described in Section 2.3, or approved equal. Standards and design should be compliant with working pressures for the water mains specified above.

G. Fire Hydrants:

1. Fire hydrants shall be as described in Section 2.3, or approved equal. Hydrants shall be of the compression type with a 5 1/4 inch valve opening. All hydrants shall be nominal six inch (6") size, 3-way construction with one 4-1/2" pumper nozzle and two 2-1/2" hose connections. Nozzle threads shall be National Standard unless otherwise specified. The depth of bury shall be 4 feet unless otherwise specified.
2. Hydrants shall be furnished with a sealed oil reservoir located in the bonnet so that all threaded and bearing surfaces are lubricated when the hydrant is operated. Hydrant shall be furnished with a breakable feature that will break cleanly on impact and shall consist of two part breakable flange with a breakable stem coupling.

3. Hydrants shall be wire brushed as needed. Hydrants shall be painted one coat of red lead paint and two coats of epoxy paint of the color specified by the Owner or Engineer.
 4. Post type hydrants shall be frost proof.
- H. Valve Boxes:
1. Valve Boxes shall be two piece, screw type, 5 1/4 inch shaft, as described in Section 2.3, or approved equal. Contractor shall supply boxes with the correct base for all valves and in correct length for field conditions. The letter "W" or the word "WATER" shall be cast in the valve box cover.
 2. Valve box castings shall be manufactured of clean, even grain, gray cast iron conforming to ASTM Designation A 48, Class 30B, Gray Iron Castings; and be smooth true to pattern, free from blow holes, projections, or other harmful defects. Valve boxes shall be coated with a single coat of coal tar pitch before machining, so that machined seating surfaces will be free of any coating. Seating surfaces shall be machined so that the cover will not rock.
- I. Corporation Stops and Curb Stops: Corporation stops and curb stops shall be as described in Section 2.3, or approved equal.
- J. Service Saddles: Service saddles shall be all bronze, double strap design as described in Section 2.3, or approved equal. All service connections on PVC mains shall be equipped with service clamps unless otherwise noted.
- K. Water Meters and Meter Boxes: Water meters shall be the magnetic drive, positive displacement type with hermetically sealed registers and shall be read in gallons. They shall be as described in Section 2.3, or equal by passing test of apparent equivalence. Meters shall be complete with stub connections. Meter boxes shall be cast iron, concrete or plastic and be approximately 12" X 18" X 12" deep. Prior approval by the Engineer will be required.
- L. Specials: Specials shall be of the same material as the pipe material being used or as approved by the Engineer. The term specials shall include plugs, caps, and other items as needed. Specials shall conform to the applicable AWWA/ASTM/ANSI Standards and shall be designed for the working pressure of the water mains on which they are being installed.
- M. Marking Tape: Marking tape shall be detectable underground marker tape, 2" wide, with "CAUTION WATER MAIN BELOW printed continuously along its length. Tape shall be blue with silver-colored trim and lettering, or other color combination acceptable to the Owner.
- N. Tracer Wire: Tracer Wire shall be used with all water mains with a test cap located a maximum of 500 feet apart. Tracer wire shall be #12 insulated solid copper type THHN or THWN VW-1 600V gasoline and oil resistant wire and test caps shall be

Blue for water. Tracer Wire is to be installed with all water lines including service lines from main line to the curb stop. A location station or test cap is to be installed behind each fire hydrant.

- O. Tracer Wire Terminals: Terminals shall be as described in Section 2.3, or approved equal. Terminals shall be installed at each fire hydrant. Terminal top covers shall be blue.
- P. Tapping Sleeves: Hot tap sleeves shall be stainless steel and as described in Section 2.3, or approved equal.
- Q. Valve Insertion: Valve insertion shall be as described in Section 2.3, or approved equal. Installer shall have successfully completed 50 valves.
- R. Marker Posts: Blue fiberglass marker posts shall be installed every 500' and at all valves.

2.2 BEDDING AND BACKFILL

- A. Native material excavated from the trench shall be used for bedding and backfill where allowed by the Engineer.
- B. Select bedding and backfill shall be provided where called for by the Engineer and in additional areas where requested by the Contractor and deemed appropriate by the Engineer. Select bedding may not be used as a means of avoiding trench dewatering. Select bedding and backfill shall meet one of the following characteristics:
 - Type A: A well graded uniform mixture of coarse concrete aggregate and course sand.
 - Type B: A sand-clay material with a maximum liquid limit (LL) of 30 and a plasticity index (PI) of less than 10.
 - Type C: A silty-clay material with a maximum liquid limit (LL) of 30 and a plasticity index (PI) of 5-15.
 - Type D: A freely draining sand with not more that 15% (by weight) silt or clay content.

PART 3 - EXECUTION

3.1 GENERAL

- A. All water mains shall be located within a utility easement, or within the right-of-way of a street as noted on the plans. Water lines shall not be installed until final grading of the water line location has been completed.
- B. Vehicular traffic shall be maintained on traveled roads and streets during construction of water lines, unless temporary closures are authorized by the

Engineer. A traffic control plan must be prepared by the Contractor and approved by the Engineer prior to commencement of construction which will interfere with traffic. Traffic control shall be implemented in accordance with the Manual on Uniform Traffic Control Devices.

- C. Protection and repair of all property, including all expenses, shall be the responsibility of the Contractor. The Contractor shall erect and maintain all necessary fences, barricades, lights and danger signals as necessary for the protection of the public. Buildings, trees, fences and other public properties not scheduled for demolition shall be protected during construction. Grass sod and other property damaged or destroyed shall be replaced in like kind at the expense of the Contractor.
- D. All work accomplished under this Contract shall be accomplished in strict accordance with all OSHA, MDOT, and Mississippi State Department of Health regulations.
- E. Contractor shall be responsible for having all existing underground utilities located within the project site. The Contractor shall coordinate excavation work with other utilities as necessary to protect existing utilities. Mississippi State Law, The Underground Facilities Damage Prevention Act, requires two working days advance notification through the Mississippi One-Call System Center before excavating using mechanized equipment or explosives (except in the case of emergency). The One-Call System phone number is 1-800-227-6477. The Contractor is advised that there is a severe penalty for not making this call. Not all utility companies are members of the Mississippi One-Call System; therefore the Contractor is advised to contact all non-member utilities as well as the One-Call System.
- F. The Contractor shall preserve and protect all existing utilities and other facilities including but not limited to: telephone, television, electrical, water and sewer utilities, surface or storm drainage, highway or street signs, mail boxes, and survey monuments.
- G. The Contractor shall immediately repair or replace utilities or other facilities damaged during construction. The Contractor shall support and protect any underground conduits, pipes, or service lines where they cross the trench.

3.2 EXCAVATION

- A. The Contractor shall perform all excavation of every description and of whatever substances encountered to the depth specified in the Plans or as directed by the Engineer. The bottom of all trenches shall be carefully shaped, graded and aligned in accordance with the instructions of the Engineer and to his complete satisfaction before any pipe is placed. All trenches shall be excavated to a depth to maintain minimum cover over the installed pipe of at least 36" for pipe installed under ordinary conditions. The Contractor may reduce or increase the depth of bury at fire hydrant locations to avoid undesirable fire hydrant setting with the approval of the Engineer. Minimum cover over the installed pipe shall be 42" under existing creeks

or ditches, or as directed by the Engineer. All trenches shall maintain a width that allows for twelve inches (12") of space between the installed pipe and the trench wall.

- B. Care should be taken in shaping and grading the ditch bottom to assure that the barrel of the pipe rests in uniform and continuous contact with the supporting ground over its entire length and that the bells or joints are entirely free from the bottom of the trench.
- C. In the event it is necessary to place fill in the bottom of the ditch to obtain such uniform contact, it shall be made with approved material and thoroughly compacted in a manner satisfactory to the Engineer. Holes of ample size shall be cut under and around all bells and joints to provide adequate room for making joints. A tolerance of 8 inches from the established grade may be permitted, when approved by the Engineer, if excessive breaks in alignment at the joints prevent proper installation of the pipe.
- D. When rock is encountered, the Contractor shall excavate to a depth at least 4 inches below the required grade and backfill to grade with 4 inches of select bedding. Costs associated with the removal and disposal of rock excavation shall be considered incidental to the cost of the water main and shall be absorbed in the cost of the water main.
- E. If the established grade conflicts with other utilities, the water line grade shall be changed to avoid the conflict in a manner acceptable to the Engineer.
- F. No more than 200 feet of trench may be opened in advance of pipe laying.
- G. Contractor shall excavate only the length of trench as needed for same day pipe installation. No open trenches shall be left at the end of each work day.
- H. Water will not be permitted in the trenches while the pipe is being laid. The Contractor shall not open up more trench than the available pumping facilities are able to dewater to the satisfaction of the Engineer.
- I. Barricade open excavations occurring as part of this work and post with warning light in accordance with local requirements. Operate warning lights as recommended by authorities having jurisdiction.
- J. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

3.3 SHEETING AND BRACING

- A. The Contractor shall furnish and place sheeting and bracing to the satisfaction of the Engineer. Sheeting and Bracing may be required to support the sides of the trench and to protect the workmen and pipe or adjacent structures from injury by the sloughing or caving of the trenches. The sheeting and bracing may be removed as the trench is backfilled or may be left in place when necessary to prevent damage.
- B. In the event sheeting or bracing is left in place, it shall not extend nearer than 1 foot to the surface of the ground. In no case will extra compensation be allowed for furnishing, placing, or removing any sheeting and bracing. Any voids left in the embedment material by support removal shall be carefully filled with granular material and adequately compacted. The cost of this work shall be included in the unit price bid for installing the pipe.

3.4 PIPE LAYING

A. General:

PVC pipe shall be installed in accordance with the latest edition of ASTM D-2321 assuming the use of Class IV native material or better. Ductile iron pipe shall be installed in accordance with the latest edition of AWWA C-151 using Type 2 bedding and native material. Select bedding or backfill for PVC or DIP water main shall be provided where called for by the Engineer in accordance with the Contract Documents.

- B. Pipe, appurtenances, and fittings shall be laid to the line and grade established on the Plans and as directed by the Engineer. Extra depth shall not be measured unless noted on the Proposal Form.

C. Receiving, Handling and Storage of Pipe:

1. Ship, store, and place pipe at the storage yard or installation site, supporting the pipe uniformly. Avoid scratching the pipe surface. Do not stack higher than 4-feet nor stack with weight on bells. Cover to protect from sunlight.
2. Pipe should be inspected for any damage or imperfections. Do not install any pipe that shows evidence of exposure to sunlight, age, surface deterioration, or other physical damage. The Engineer and the Engineer's representative reserves the right to inspect all materials received and reject any which does not meet the requirements of the standards and specifications.
3. Damaged pipe will be rejected and the Contractor shall immediately place all damaged pipe apart from the undamaged and shall remove the damaged pipe from the site within 24 hours.
4. Do not install pipe that is gouged or scratched forming a clear depression.

5. Do not install a pipe that is contaminated with a petroleum product (inside or outside).
 6. Pipe should be unloaded, handled and stored in accordance with the manufacturer's recommendations. Pipe shall be handled during all phases of construction in a manner that will provide the maximum protection of the pipe and any coating or lining and will prevent the intrusion of dirt or other foreign materials into the pipe. Lift pipes with mechanical equipment using wide belt slings or a continuous fiber rope which avoids scratching the pipe. Do not use cable slings or chains. Pipes up to 12-inches in diameter may be lowered by rolling on two ropes controlled by snubbing. Pipes up to 6-inches in diameter can be lifted by hand. All slings, hooks and other lifting or handling equipment which comes in contact with the pipe and appurtenances shall be padded. **Dropping the pipe during unloading or placing in the trench is prohibited and will be cause for rejecting that material.**
 7. Only the amount of pipe and fittings necessary to insure sufficient installation progress shall be strung along the trenches. All other pipe and fittings shall be protected at all times from damage by traffic, workmen, construction operations and other hazards.
- D. The inside of the bells and the outside of the spigots shall be thoroughly cleaned before they are placed. The inside of all pipe shall be thoroughly swabbed to ensure that the pipe is clean and free of obstructions and foreign matter until the work is completed.
- E. Where pipe laying ceases at the end of the day or for any cause, the end of the pipe shall be securely closed in order to prevent the entrance of water, mud or any other objectionable matter.
- F. Pipe shall not be laid when water is in the trench.
- G. Marking Tape: Marking tape shall be placed continuously along the top of the water main above the center of the pipe and to a depth of not less than 18 inches.
- H. Tracer Wire: Tracer Wire shall be placed continuously along the top of the water main and service line above the center of the pipe and secured to the pipe with tape every 5 feet.
- I. Thrust Restraint: All buried piping shall be restrained from movement by thrust forces at the locations shown on the drawings and as directed by the Engineer. Pipe restraint rings shall be provided for this purpose. Restraint rings shall be provided at all pipe branch fittings, all fittings at direction changes, and all fittings at the dead ends of pipelines. In addition, restraints shall be provided at all pipe reducers as shown on the drawings.

J. Pipe restraint rings shall be provided for all pipe joints within the distances from the fittings as shown on the drawings. Pipe restraint rings shall be of ductile iron construction conforming to ASTM A536. A split ring shall be installed behind the pipe bell end and a serrated restraint ring shall be installed to grip the pipe. A sufficient number of bolts as recommended by the restraint manufacturer shall be installed to connect the bell ring and the pipe ring. The restrained joint combination shall be rated for a minimum working pressure of 150 psig. Pipe restraint rings shall be as described in Section 2.3, or approved equal.

K. Thrust Blocks shall be installed at locations shown on the Plans and as otherwise directed by the Engineer.

L. Existing water pipes and appurtenances to be removed or abandoned shall be as designated on the Drawings or directed by the Engineer. Abandoned water services shall be plugged at the cut ends. Abandoned water mains shall be removed as shown on the Drawings, or if abandoned in place, shall be filled with a flowable fill and mechanically plugged and blocked with a combination of steel I-beam and concrete thrust blocking.

3.5 MAKING JOINTS

A. All joints shall be constructed in accordance with the manufacturer's recommendations using the jointing materials, specials and lubricants specified by the manufacturer and approved by the Engineer.

3.6 SETTING FITTINGS, VALVES, HYDRANTS AND SPECIALS

A. All fittings, valves, valve boxes, hydrants and other appurtenances shall be set at the location indicated on the Plans or as directed by the Engineer. Omission of any of these items shall be corrected by the Contractor without extra cost to the Owner. The addition of any of these items not shown on the plans and not requested by the Owner or Engineer, which are installed without the expressed consent and agreement of the Engineer, shall not be allowed for payment but shall be considered as absorbed costs to the Contractor. In addition, any fittings or specials installed by the Contractor purely for his convenience shall not be allowed for payment unless specifically approved by the Engineer. Valves and fittings shall be jointed to pipe as recommended by manufacturers.

B. All valves, including bypass valves, shall be provided with a valve box. The valve box shall not transmit shock or stress to the valve and shall be centered and plumb over the operating nut. The valve box cover shall be flush with the pavement surface or such other level as directed. Valve box slabs or marker posts shall be provided where specified on the Drawings or as directed by the Engineer as an absorbed cost to the Contractor.

C. Hydrants shall be located as shown on the plans and in a manner that will provide complete accessibility and will prevent damage from vehicles. All hydrants shall

stand plumb and shall have their pumper connections at right angles to the curb line. The Center of streamer nozzle shall be 18" above top of finished ground or top of curb where applicable. Where necessary, hydrant extensions shall be furnished at no additional cost to the Owner, to meet this requirement.

1. Each fire hydrant shall set truly vertical and securely braced with concrete or stone blocks until it is self-standing. It shall be set on a stone or concrete slab not less than four (4) inches thick and not less than one square foot of surface area placed on well compacted soil surrounded by a minimum of seven (7) cubic feet of sound broken stone or clean gravel to permit free draining of the hydrant. The gravel or stone shall reach from the bottom of the trench to at least six (6) inches above the waste opening of the hydrant.
2. All hydrants, valves and fittings shall be anchored with anchor couplings approved by the Engineer.

3.7 SERVICE ASSEMBLIES AND SERVICE LINE INSTALLATION

- A. Service Assembly Reconnections shall consist of a corporation stop, service clamp, curb stop, connection to the existing meter using the existing meter box, fittings required to permanently cap any service line to be abandoned, and other appurtenances needed to complete the assembly in accordance with the Contract Drawings. They shall be installed in a good and workmanlike manner in the places designated on the Plans or as directed by the Engineer. Ends of services shall be located from two property corners and shown on Contractor's record drawings.
- B. Service Assembly Relocations shall consist of moving an existing meter and meter box to a location approved by the Engineer, connecting the new service line to the relocated meter and existing service line to residence, fittings required to permanently cap any service line to be abandoned and other appurtenances needed to move the assembly in accordance with the Contract Drawings. They shall be installed in a good and workmanlike manner in the places designated on the Plans or as directed by the Engineer.
- C. New Service Assemblies shall consist of a corporation stop, service clamp, curb stop, meter box, meter and other appurtenances needed to complete the assembly in accordance with the Contract Drawings. They shall be installed in a good and workmanlike manner in the places designated on the Plans or as directed by the Engineer. The ends of the service shall be plugged, permanently marked with a metal "T" post, painted "Blue" and extending a minimum of 24" above finished grade. Ends of services shall be located from two property corners and shown on Contractor's record drawings also during the construction of the curb a "W" shall be inscribed into the curb at the service crossing locations.
- D. Service line shall be as specified herein and will be measured and paid for separately as detailed herein. Service line must be continuous from the corporation stop to the curb stop without any joints in the line.

3.8 CONNECTION TO EXISTING MAINS

- A. Where indicated on the Plans, cut-ins must be made by the Contractor in order to connect the new main with existing water mains. The Contractor shall furnish all labor and materials and service required for the excavating, cutting the existing mains, removal and relocation of sections of old pipe, dewatering the trench, connection of a new main with the old and the setting of necessary fittings, specials and valves as shown on the Plans.
- B. The Contractor shall provide temporary blocking and bracing properly placed to prevent movement or blowing off of any pipe, valves or fittings due to water pressure on the main. All connections shall be made in a most expeditious and workmanlike manner to cause the least inconvenience to water customers and to traffic.
- C. Any time that the interruption of water service in the existing system is necessary because of operations under this Contract, the Contractor shall notify the Owner at least 48 hours in advance. Interruptions of water service shall not extend over night or through the weekend unless approved by the Owner and the Engineer.

3.9 BACKFILLING TRENCHES

- A. Backfilling shall be carefully performed and the original surface restored, to the full satisfaction of the Engineer. The trenches shall be backfilled with fine, loose earth, free from large clods or stones, carefully rammed until enough has been placed to provide a cover of not less than 1 foot above pipe. The remainder of the backfill material in unpaved areas shall be placed in the trenches, and any excess materials shall be windrowed over the trench. As settlement occurs, trenches shall be refilled, smoothed off, and made to conform to the surface of the ground until settlement ceases. **Water Mains will not be considered eligible for payment until the trench has been backfilled and the original surface has been restored to the full satisfaction of the Engineer.**
- B. Backfill in roadways, drives or in areas to be paved shall be made as specified above, except that fill above the pipe shall be deposited in layers not to exceed 6 inches. Such fill shall be compacted with mechanical tampers so that the compacted soil shall have a density of at least that of the undisturbed adjacent ground or 95% maximum optimum moisture density. This is done using the Proctor Method, ASTM D-698. Backfill material shall be sand-clay, clay-gravel or other approved material. Disposal of surplus material shall be as directed by the Engineer.

3.10 TEMPORARY SURFACES OVER TRENCHES

- A. Whenever the water improvements are constructed under traveled roadways, driveways, sidewalks or other traveled surfaces, a temporary surface shall be placed over the top of the trench as soon as possible after placement and compaction of

the backfill has been satisfactorily completed. The temporary surface shall consist of a minimum of twelve inches (12") of crushed limestone.

- B. The top of the temporary surface shall be smooth and meet the grade of the adjacent undisturbed surface. The temporary surface shall be maintained at the Contractor's expense until final restoration of the street surface is completed as specified. No permanent restoration of the street surface shall be initiated until authorized by the Engineer. The temporary surfacing shall be required over the entire width of the trench. Any width in excess of the specified width shall not be used in measuring payment quantities.

3.11 REPLACEMENT OF PERMANENT SURFACES, STRUCTURES, AND PROPERTY

- A. General: The Contractor shall restore all permanent type pavements, sidewalks, driveways, curbs, gutters, shrubbery, fences, poles, drainage culverts, drainage structures, and other property and surface structures removed or disturbed during or as a result of construction operations to a condition which is equal in appearance and quality to the condition that existed before the work began. The surface of improvements shall be constructed of the same material and match in appearance the surface of the improvement which was removed. Where select granular trench backfill is used, the restoration shall be made as soon as possible after compaction of the backfill has been completed.
- B. Concrete Pavement Surface: Where the existing pavement surface is Portland Cement concrete, the pavement replacement shall consist of a minimum of six (6) inches of reinforced concrete placed over six (6) inches of compacted crushed limestone or sub-base. Concrete shall conform to Section 03 00 00 "Concrete General." The concrete surface shall be finished equal to the existing finish (ie., trowel, broom, exposed aggregate, etc.). Pavement joints in the replacement surface shall conform to and match the joints in the adjacent pavement area.
- C. Asphalt Pavement Surface: Where the existing pavement surface is bituminous concrete and 12" of crushed limestone has been placed in the trench, the top 6" of gravel shall be removed and replaced with 4" of black base and 2" of surface course.

3.12 CONCRETE SIDEWALKS, DRIVEWAYS, CURB, CURB AND GUTTER

- A. General: Where necessary to remove and replace concrete sidewalks, driveways, curbs and curb and gutters, replacements shall be made as follows:
- B. Concrete sidewalks, driveways, curbs, curb and gutters shall be replaced with concrete meeting the applicable provisions of Section 03 00 00 "Concrete General" of these specifications. Minimum thickness shall be four inches (4") for sidewalks and six inches (6") for driveways. Materials and construction requirements shall conform to the various sections of these specifications. Curb and gutter shall be formed as detailed on the drawings, or as directed by the Engineer. Sidewalks and

driveways shall be finished to match existing adjacent surfaces, unless otherwise specified or directed by the Engineer.

3.13 RESTORATION OF LANDSCAPED AREAS

- A. Sod, shrubbery, decorative planting and other landscape items shall be replanted, replaced, or restored in the manner removed as an absorbed cost.
- B. Should new construction be required to replace damaged or unsalvageable items, then the Contractor shall furnish all labor, materials, equipment, tools, and incidentals set forth in the applicable sections of these Specifications as an absorbed cost.

3.14 MAINTENANCE OF SITE

- A. The Contractor shall prevent, control and correct dust nuisance or muddy conditions developing on roadways as a result of his operation. No payment for maintenance of the site shall be made but shall be considered as a subsidiary obligation of the Contractor.

3.15 COORDINATION WITH INTERESTED PARTIES OTHER THAN OWNER

- A. The Contractor shall duly notify and coordinate all work with the City/Utility, the State Health Department, and other interest parties. No work which affects these interested parties will commence until satisfactory coordination has been achieved.

3.16 FLUSHING

- A. Prior to acceptance, the Contractor shall "Open-Bore" flush the water pipe then perform hydrostatic tests and disinfection tests. In the event repairs are made to the water pipe after flushing and testing has been performed, all flushing and testing will be repeated until satisfactory results are obtained.
- B. Open Bore flushing is required of all installed water pipe to remove any foreign matter. The Contractor shall furnish, install and remove all pumps, fittings, pipes and hoses necessary to perform the flushing. The Contractor shall also provide additional excavation and backfill as needed, and shall dispose of all water and debris flushed from the water pipe.
- C. Flushing through fire hydrants, reduced outlets or fittings shall not be permitted unless specifically authorized in writing by the Engineer.
- D. The Contractor shall notify the Engineer and Owner 48 hours in advance of any flushing operation.
- E. A flushing scheme and schedule shall be submitted by the Contractor for review and approval by the Owner and Engineer prior to flushing.

- F. The Contractor shall be responsible for obtaining any permits necessary for flushing operations.

3.17 HYDROSTATIC TESTS

3.17.1 PRESSURE TESTS

- A. Before applying the specified test pressure, air shall be completely expelled from the pipe, valves, and hydrants. If permanent air relief valves are not located at the high point, the Contractor shall install corporation stops and such points, so that the air can be expelled as the line fills with water. After the air has been expelled, the corporation stops shall be closed and the pressure applied. At the conclusion of the pressure test, the corporation stops shall be removed and the holes plugged, or, at the discretion of the Owner, they may be left in place.

- B. After the pipe is laid and the line flushed, it shall be filled with water slowly with care being exercised to expel all air from the pipe by means of a pump connected to the pipe in a manner satisfactory to the owner. Where possible, the connection should be made at the lowest point in the section under test. During the test period all pipe, valves, fittings, and joints shall be examined carefully for defects. Any observed leaks or defective pipe shall be satisfactorily repaired or replaced, at the expense of the Contractor and the test repeated until the section tested is within the limits prescribed hereinafter. **The entire distribution system or parts thereof shall be tested under hydrostatic pressure of 150 psi, for a period of 4 hours, if joints are exposed, or for an 8 hour period, if joints are covered.** Test pressures shall not vary by more than ± 5 PSI. Repairs shall be made using approved materials and new replacement fittings, specials, or gaskets where leakages occur.

U.S. GALLONS REQUIRED TO FILL PIPE IN LENGTHS SHOWN BELOW:*

<u>NOMINAL DIAMETER</u>	<u>100 FOOT SECTION</u>	<u>1000 FOOT SECTION</u>	<u>NOMINAL DIAMETER</u>	<u>100 FOOT SECTION</u>	<u>1000 FOOT SECTION</u>
2	16	160	16	1044	10,440
2 ½	26	260	18	1322	13,220
3	37	370	20	1632	16,320
4	65	650	21	1799	17,990
6	147	1470	24	2350	32,500
8	261	2610	27	2974	29,740
10	408	4080	30	3672	36,720
12	588	5880	33	4443	44,430

<u>NOMINAL DIAMETER</u>	<u>100 FOOT SECTION</u>	<u>1000 FOOT SECTION</u>	<u>NOMINAL DIAMETER</u>	<u>100 FOOT SECTION</u>	<u>1000 FOOT SECTION</u>
14	800	8000	36	5288	52,880

*Quantities are based upon the nominal diameter of the pipe and will vary somewhat from actual quantities.

3.17.2 LEAKAGE TESTS

- A. A leakage test should, and normally will, be conducted concurrently with the pressure test. Leakage is defined as the quantity of "make-up" water that must be injected in the newly laid pipe, or any valved section thereof, to maintain pressure within 5 p.s.i. of the specified test pressure after air in the pipeline has been expelled, and the pipe filled with water.
- B. Leakage shall be measured by an approved calibrated meter through which all of the water required to maintain test pressure shall be pumped. All testing shall be performed in the presence of the Engineer, and the Engineer shall be notified at least 48 hours in advance of the start of the test.
- C. ALLOWABLE LEAKAGE: No pipe installation should be accepted if the leakage is greater than that determined by the following equation:

$$L = \frac{ND\sqrt{P}}{7400}$$

- L = Allowable leakage in gallons per hour
- N = Number of joints in the length tested
- D = Nominal diameter of the pipe in inches
- P = Average test pressure during the test in pounds per square inch gage (p.s.i.g.).

- D. The following table provides information concerning allowable leakage for various types of pipe. This information is for pipe tested at 150 p.s.i.g. based upon the above formula. The duration of each leakage test shall be 6 hours.

ALLOWABLE LEAKAGE IN GALLONS PER HOUR AT 150 P.S.I.G. PRESSURE*

DIAMETER (Inches)	PVC PIPE (1,000 FT.)		D.I. PIPE (1,000 FT.)	
	20 Foot Joints	40 Foot Joints	18 Foot Joints	20 Foot Joints
2			0.19	0.17
2 1/2	.17	0.08		
3	.21	.10	.28	.25
4	.25	.12	.37	.33
6	.33	.16	.55	.50

	PVC PIPE (1,000 FT.)		D.I. PIPE (1,000 FT.)	
8	.50	.25	.74	.66
10	.66	.33	.92	.83
12	.83	.41	1.10	1.00
14	1.00	.49	1.29	1.13
16			1.47	1.16
18			1.66	1.50
20			1.84	1.60
21				
24			2.21	2.00
27				
30			2.76	2.50
33				
36			2.31	3.00

* Represents a leakage of 30 gpd per mile of pipe per inch of pipe diameter for pipe in 13 foot length.

- E. When hydrants are in the test section, the test shall be made against the closed hydrant.
- F. MEASUREMENT OF WATER USED: Water, which is introduced into the line to determine leakage, shall be measured by use of a calibrated water meter. The meter must have the capability of accurately measuring the low flows, which may be required to maintain the test pressure on the line. A displacement type meter with sweep hand should be used with the sweep hand representing not more than ten gallons.
- G. ACCEPTANCE: Acceptance shall be determined on the basis of allowable leakage. If any test of pipe laid discloses leakage greater than that shown in Section 3.17.2-C, the Contractor shall, at his own expense, locate and repair the defective material until the leakage is within the specified allowance. All visible leaks are to be repaired regardless of the amount of leakage.
- H. RECORD OF TESTING: The Owner's engineer or authorized representative shall maintain a written record showing the results of testing for each section of line. The following information will be included as a minimum:
- (1) Name of owner, engineer, and contractor performing work.
 - (2) Identification of the section being tested.
 - (3) Date of the test.
 - (4) Length of the section being tested and the nominal diameter of the pipe.
 - (5) Test pressure p.s.i.g.
 - (6) Duration of the test in hours.
 - (7) Amount of water added during the leakage test in gallons.
 - (8) Total number of leaks on the section being tested.

- (9) Date leaks were repaired.
- (10) Brand name of pipe used.
- (11) Pressure rating (SDR and p.s.i.).
- (12) A similar set of data for any section of line which is retested.

A form similar to the following may be utilized, and is to be completed. A copy shall be furnished to the Owner at the time of final acceptance.

- I. The Contractor shall furnish the pump, pipe connections, fittings, gates, meters, and all necessary apparatus and shall furnish all labor and work required to make the tests. All costs of testing shall be borne by the Contractor, and testing operations shall remain in operation until approved by the Engineer.
- J. Test pressures required are at the lowest elevation of the pipeline section being tested unless otherwise specified.
- K. Tests shall be completed in accordance with the latest edition of AWWA C-600 except as modified herein.

HYDROSTATIC TESTING OF WATER MAINS

Remarks:

Test Designation _____
 Date Tested _____
 Brand Name of Pipe _____
 Pipe Pressure Rating _____
 Location of Test Pump _____

CALCULATION OF ALLOWABLE LEAKAGE

			A	B	C	
Line Diameters Being Tested	Line Lengths (Actual Footage)	Length of Pipe Joints (20' / 40')	Line Lengths (1000's of Feet)	Allowable Leakage From Chart Gals./Hour/1000 ft.	Test Duration (Hours)	Allowable Leakage (Gallons) (Col. A x Col. B x Col.C)
TOTAL ALLOWABLE LEAKAGE IN GALLONS						

- 1. Water Meter Reading at End of Pump Up _____ Gallons
- 2. Test Pressure at Pump at Beginning of Test _____ PSI
- 3. Test Pressure at Pump at End of Test _____ PSI
- 4. Pressure Loss (2) - (3) (5 PSI Max.) _____ PSI
- 5. Water Meter Reading After Pumping Lines Back to Original Test Pressure _____ Gallons
- 6. Gallons of Leakage (5) - (1) _____ Gallons
- 7. Gallons Leakage Allowed From Computations _____ Gallons

Circle Test Result **PASS** **FAIL**

Signature of Engineer's Representative
 NOTE: Show the results of retesting as a separate set of data.

3.18 DISINFECTION OF PIPELINES

- A. Flushing shall be completed before disinfection is begun. See section 3.16.
- B. Thoroughly disinfect all water pipe on potable water lines prior to being placed in service. Follow the applicable provisions of the procedure established for the disinfection of PVC pipe as set forth in the latest edition of ANSI/AWWA C651-14 entitled "Disinfecting Water Mains."
- C. During the Construction: Workmen shall be required to use utmost care to see that the surface of parts of the structures, the inside of pipes, fittings, jointing materials, valves, and specials which come in contact with the Owner's water, are maintained in a sanitary condition. Every effort shall be made to keep the inside of the pipe, fittings and valves free of all foreign matter, sticks, dirt, rocks. As each joint of pipe is being laid, it shall be swabbed so that all foreign matter is removed. All fittings and exposed open ends of pipe shall be blocked or capped until the line is completed.
- D. When the entire pipe line or certain selected sections thereof have been completed, tested and made ready for turning over to the Owner ready for use, the line or section of line shall be thoroughly disinfected according to the following procedure: The new pipe shall be disinfected by introducing HTH, Percloron, or a similar hypochlorite solution, through taps made by the Contractor. The water shall be turned into the mains slowly to allow a thorough mixing of the solution which shall be brought to a strength of 50 parts per million of available chlorine. All valves shall then be closed and the disinfection solution permitted to remain in the pipe line section for not less than 24 hours, after which the mains shall be flushed thoroughly until a chlorine residual not exceeding two tenths (0.2) part per million is obtained.
- E. Samples shall be collected under supervision of the ENGINEER, using only approved containers. **All samples shall be taken by a licensed Professional Engineer, Certified Operator, or a representative of the Mississippi State Department of Health.** Bottles will be furnished by the State and will be tested by the State Health Department. The Contractor shall arrange for the collection of samples from the end of each dead end line or from each major loop for bacteriological examination. A copy of test results shall be furnished to the Owner and the results obtained shall be deemed conclusive. If the test shows satisfactory quality of water, the line so sterilized may then be placed in service. If the sample shows unsatisfactory quality of water, the process of disinfection shall be repeated until satisfactory water is obtained. All materials, testing and labor required for complete disinfection of the system shall be furnished by the CONTRACTOR at no expense to the OWNER.
- F. Prior to final acceptance, the Contractor shall disinfect the water mains until two (2) consecutive samples of water are found to meet the State Health Department standards for water supplies. No coliform bacteria and no indication of confluent growth shall constitute a satisfactory sample when analyzed by the Mississippi Department of Public Health Laboratory or a laboratory certified by the Department.

Complete disinfection shall be defined as total coliform absent and no confluent growth for samples on two consecutive days.

3.19 DISPOSAL OF CHLORINATED DISINFECTING WATER

- A. The Contractor shall be responsible for the disposal of chlorinated water used for disinfecting mains under this contract. Chlorinated water shall be dechlorinated to a residual concentration of no greater than 0.5 mg/l total residual chlorine prior to disposal to water courses, on land or through storm or sanitary sewers. The method of disposal shall be in conformance with requirements of the Mississippi Office of Pollution Control, the Mississippi Department of Health, and other state, federal or local agencies holding jurisdiction. The Contractor will provide written confirmation from these agencies that the method of disposal is acceptable and will provide licenses or permits required for the discharge of the dechlorinated water. The Contractor will comply with requirements of agencies having jurisdiction whether additional to or different from those included herein, at no additional cost to the Owner. Cost associated with disposal of chlorinated disinfecting water shall be considered incidental to the cost of the pipeline and shall be absorbed in the cost of the pipeline.

3.20 CLEAN-UP

- A. In areas where the water mains have been backfilled, the CONTRACTOR shall clear the right-of-way and surrounding ground, and shall dispose of all waste materials and debris resulting from his operations. He shall fill and smooth holes and ruts and shall repair all miscellaneous and unclassified ground damage done by him. He shall restore the ground to such a stable and suitable condition as may be reasonably required, consistent with the condition of the ground prior to construction.
- B. Clean-up, including grading, disposal, dress work and other incidentals shall be completed by the Contractor at no additional cost to the Owner to the extent directed by the Engineer.

3.21 CLEARANCE BETWEEN WATER AND SEWER LINES

- A. Water mains shall be laid at least 10 feet horizontally and 18 inches vertically from any sanitary sewer line or manhole. The bottom of the water line shall be at least 18 inches from the top of the sewer line. Water lines should always be constructed over sewer lines.
- B. At locations where 10 feet of horizontal separation between water and sewer lines cannot be maintained, the water line shall be constructed with a minimum vertical separation of 18 inches between the bottom of the water line and the top of the sewer line. The water line shall be constructed of ductile iron pipe and the water line joints shall be located at the maximum distance possible from the sewer line joints. PVC water lines may be constructed in these conditions but shall be constructed in

steel casing throughout. The water lines and sewer lines shall be constructed in separate trenches with adequate space for maintenance.

- C. At locations where both the 10 feet of horizontal separation and 18 inches of vertical separation cannot be maintained, the PVC water lines and sewer lines may be constructed in these conditions, but both water and sewer lines shall be constructed in steel casings throughout. The water lines and the sewer lines shall be constructed in separate trenches with adequate space for maintenance.

3.22 WATER FOR CONSTRUCTION AND TESTING

- A. The Contractor shall be responsible for all water needed in constructing the work, flushing the completed system, testing and other incidental needs. All water used shall be from an approved source free of pollution and shall be of a satisfactory bacteriological quality.
- B. Water used in mixing concrete and mortar shall be fresh, clean and free from injurious amounts of sewage, oil, acid, alkalis, salts or organic matter.

PART 4 - COMPENSATION

4.1 MEASUREMENT

- A. The length of pipe, including service pipe, installed and accepted, will be determined by measurements along the center line of the pipe. No deductions will be made for space occupied by valves, fittings or specials.
- B. Valves and Fire Hydrant Assemblies will be measured as units per each. Valve boxes and gravel bedding for valves will not be measured for payment; the cost of these items shall be included in the Contract Unit Price for Valves. Fire Hydrant Assemblies shall include fire hydrant, valve, rods or anchors, spool connections, gravel, concrete, and incidentals. None of these items will be measured for separate payment.
- C. Service Assembly Reconnections will be measured as units per each. Corporation stops, curb stops, service clamps, connection to the existing meter using the existing meter box, fittings required to permanently cap any service line to be abandoned, and other assembly appurtenances will not be measured separately for payment and the cost of these items shall be included in the Contract Unit Price for Service Assembly Reconnections.
- D. Service Assembly Relocations will be measured as units per each. Corporation stops, curb stops, service clamps, connection to the existing meter using the existing meter box, fittings required to permanently cap any service line to be abandoned, and other assembly appurtenances will not be measured separately for payment and the cost of these items shall be included in the Contract Unit Price for Service Assembly Relocations.

- E. New Service Assemblies will be measured as units per each. Corporation stops, curb stops, meter boxes, service clamps, meters and other service assembly appurtenances will not be measured separately for payment and the cost of these items shall be included in the Contract Unit Price for Service Assemblies.
- F. Ductile Iron Fittings shall be measured by the pound of body weight only. Accessory PVC fittings and specials shall not be measured separately but shall be considered as an absorbed item as part of the installation of each size water main installed.
- G. Stream Crossings shall be measured by the linear foot, and shall include pipe, fittings, rip-rap, and all other items shown on the construction drawings necessary for a complete installation.
- H. Thrust Blocking shall not be measured for payment. The cost of these items shall be considered an absorbed item.
- I. Connection to Existing Water Main with Tapping Sleeve and Valve shall include all material, labor and equipment necessary to install tapping sleeves, valves, and boxes of the various sizes listed on the Bid Form.
- J. Connection to Existing Water Main shall include all labor and equipment necessary to make a complete connection. Fittings, valves, and valve boxes will be measured as set forth on the Bid Form, any other material required will be an absorbed item.
- K. Tracer wire and tracer wire terminals shall not be measured separately but shall be considered as absorbed items.
- L. Select Bedding hauled in from off-site areas shall be measured by the cubic yard along the horizontal center line of the pipe using maximum widths according to the typical trench detail in the construction drawings.
- M. Select Backfill hauled in from off-site areas shall be measured by the cubic yard along the horizontal center line of the pipe using maximum widths according to the typical trench detail in the construction drawings.

4.2 PAYMENT

- A. Payment for the water system piping, including service piping, will be made at the Contract Unit Price per linear foot. The payment shall constitute full compensation for the following: furnishing, installing all pipe, joints, accessories, specials, other materials not particularly specified for separate payment, furnishing all labor, tools, equipment and incidentals. The payment for the performing of all work also includes: excavation (rock and other unsuitable material), dewatering, installation of pipe, backfill, testing, sterilization, clean-up and any other operations essential to completing the water system as specified herein and as shown on the Contract Drawings.

- B. Payment for Valves and Fire Hydrants will be made at the Contract Unit Price per each, which price shall constitute full compensation for furnishing all boxes, concrete blocking, fire hydrant assemblies, valves, gravel and miscellaneous materials, furnishing all labor, tools, equipment and incidentals. The payment also includes the performing of all operations essential in completing the installations of valves, boxes and fire hydrants, in accordance with the Specifications and Contract Drawings.
- C. Payment for Service Assembly Reconnections, Service Assembly Relocations, and New Service Assemblies will be made at the Contract Unit Price per each. The price shall constitute full compensation for furnishing enclosures, meters, valves, connections, gravel, concrete, miscellaneous material, all labor, tools, equipment and incidentals. The payment will include performing all operations essential to completing the installation in accordance with these Specifications and Contract Drawings.
- D. Payment for Connection to Existing Water Main with Tapping Sleeve and Valve will be made on a per each unit cost basis and shall constitute full compensation for furnishing materials, bedding, labor, tools, equipment, and incidentals necessary for a complete connection, in accordance with these specifications and Contract Drawings.
- E. Payment for Connection to Existing Water Mains will be made on a per each unit cost basis and shall constitute full compensation for furnishing materials, bedding, labor, tools, equipment, and incidentals necessary for a complete connection, in accordance with these specifications and contract drawings. Payment for valves, valve boxes and fittings will be made at the unit prices bid.
- F. Payment for Ductile Iron Fittings shall be made at the contract unit price per pound of body weight, which price shall constitute full compensation for furnishing all fittings, glands, bolts, bedding, concrete blocking, labor, tools, equipment and incidentals and performing all operations essential to installation of the fittings in accordance with these Specifications and Contract Drawings. Payment for PVC fittings shall not be made separately but shall be absorbed in the unit price per foot and for each size PVC water main installed.
- G. Payment for Stream Crossings shall be made at the contract unit price per linear foot, which price shall constitute full compensation for furnishing all pipe, fittings, glands, bolts, rip-rap, labor, tools, equipment and incidentals and performing all operations essential to installation of the stream crossings in accordance with these Specifications and Contract Drawings.
- H. Payment for non-native Select Bedding and Backfill will be made at the Contract Unit Price per cubic yard, which price shall constitute full compensation for furnishing and installing the bedding and backfill, for furnishing all labor, tools, equipment and incidentals and performing all work including compaction to the required density, for disposal of all surplus and unsuitable material, including rock, excavated from the trench area at the contractor's expense to a site outside of the project area and not

adjacent thereto, except by written permission of the affected property owner, and other operations necessary to complete the work in accordance with the Specifications and Contract Drawings.

***** END OF SECTION *****

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SECTION 33 31 23
SANITARY SEWAGE FORCE MAIN PIPING

PART 1 GENERAL

1-01 DESCRIPTION

A. General: The work to be performed under this section of the Specifications shall consist of furnishing labor, equipment, materials, and performing operations in connection with the excavation, trenching, installation and backfilling of sanitary sewage force main. Place, joint, and test pipe, fittings, couplings and adaptors, as shown on the Drawings and specified herein.

B. Materials installed as a part of the work shall include the pressure pipe, appurtenances, specials, bends, tees and other items such as bedding, sand, gravel, thrust blocking, etc.

1-02 SUBMITTALS: The Contractor shall submit manufacturer's manuals, specifications, catalog sheets, tests and other information for pipe, fittings, valves, select bedding and backfill and other material requested for review by the Engineer for apparent conformance to these Specifications. Wherever "approved equal" appears in this Specification, material may be reviewed to determine if the proposed substitute meets the test of apparent equivalence for use in this project.

1-03 INSPECTION: When the term "inspection" is used in this Specification, it means visual observation of materials, equipment and construction methods, on an intermittent basis, to determine that the work is in conformance with the Contract Documents and the design intent. Such inspection does not constitute acceptance of the work, nor shall it be construed to relieve the Contractor in any way from his responsibility for the means and methods of construction **or for safety on the construction site.**

PART 2 MATERIALS

2-01 PRESSURE PIPE AND APPURTENANCES

A. PVC Pipe and Fittings

1. PVC pipe and fittings shall conform to the latest edition of ASTM D2241 and shall be made from Type 1120 material. Joints shall be elastomeric seals complying with ASTM D-3139 or solvent weld in accordance with ASTM D-2855. Products shall meet the approval of the Engineer and shall bear the seal of the National Sanitation Foundation. PVC pipe greater than 12 inches in diameter shall be gasket joint, C900 PVC class 100, DR25, meeting UNI-B-11-86. Smaller pipe shall be SDR-26, minimum.

2. Rubber ring gaskets shall conform to the manufacturer's standard dimensions and tolerances to meet the requirements of ASTM F-477 and solvent cement shall conform to ASTM D-2564.
3. Joints shall be gasket type or, if less than 3 inches in diameter solvent weld, at the Contractor's option, and be in accordance with the manufacturer's specifications. Joint bells shall be formed integrally with the pipe and spigots shall be beveled with insertion stop to facilitate proper installation.
4. Pipe and PVC fittings shall be tested for a minimum 100 PSI working pressure for sizes greater than 12 inches and 150 PSI working pressure for smaller sizes.

B. Ductile Cast Iron Pipe and Fittings

1. Ductile iron pipe shall be centrifugally cast in metal or sand lined molds manufactured in accordance with the latest edition of ANSI A21.51 (AWWA C 151). Pipe shall be class 350 Ductile Iron unless otherwise specified. Pipe and fittings shall be tested for minimum 150 PSI water working pressure, laying conditions type 2 flat bottom trench without blocking, tamped, backfilled and under five (5) feet of cover. Pipes and fittings shall be factory coated on the outside with coal tar enamel conforming to the latest edition of ANSI A 21.5. **Pipe shall be lined inside in accordance with requirements of Technical Specification Section 33 01 30.83 contained herein. Ductile iron pipe installed pursuant to these specifications shall be encased with a minimum 8 mil thick loose polyethylene encasement, in accordance with the latest edition of ANSI/AWWA C-105.**
2. Joints for ductile cast iron pipe shall be slip-on type unless otherwise specified. Joints for fittings, valves and specials shall be mechanical joints, except where shown by the Drawings to be flanged. Slip-on pipe joint for ductile cast iron pipe shall conform to the latest edition of ANSI A 21.11 (AWWA C 111). Lubricants shall be non-toxic and shall be specifically manufactured for the pipe utilized. Mechanical joint pipes shall conform to the latest edition of ANSI A 21.11 (AWWA C 111).
3. Fittings shall be compact ductile or cast iron as specified on the Bid Form and shall conform to the latest edition of AWWA C-110 for cast iron and ductile iron fittings. The minimum wall thickness of the fittings shall be determined consistent with trench conditions 'B' and less than five (5) feet cover. Fittings shall be tar coated outside in accordance with the latest edition of AWWA C-104 (ANSI 21.4). **Fittings shall be lined inside in accordance with requirements of Technical Specification Section 33 01 30.83 contained herein.**

C. High Density Polyethylene (HDPE, PE) Pipe and Fittings

1. Materials used for the manufacturer of polyethylene pipe and fittings shall be PE3408 high density polyethylene meeting cell classification 345464C per ASTM D3350; and meeting Type III, Class B or Class C, Category 5, Grade P34 per ASTM D1248; and shall be listed in the name of the pipe and fitting Manufacturer in PPI

TR-4, Recommended Hydrostatic Strengths and Design Stresses for Thermoplastic Pipe and Fittings Compounds, with a standard grade rating of 1600 psi at 73°F per ASTM D-2837. The Manufacturer shall certify that the materials used to manufacture pipe and fittings meet these requirements.

2. Polyethylene Pipe (4 inch and larger): HDPE Pipe shall conform to AWWA C906, DR-11, Iron Pipe Size (IPS) size and NSF 61 Standard. HDPE pipe for water or reclaimed water piping (not approved for sewer force mains) with pipe size 4 inch through 12 inch may be DR-11, conforming to AWWA C906 and NSF 61. For pipe sizes 24-inch and larger, the HDPE may be IPS size, DR-11. Polyethylene pipe shall be manufactured in accordance with ASTM F714, Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Controlled Outside Diameter and shall be so marked. Each production lot of pipe shall be tested for (from material or pipe) melt index, density, % carbon, dimensions and either quick burst or ring tensile strength (equipment permitting).
3. Casing Pipe shall be smooth-walled, new plain steel pipe conforming to ASTM A 252 with a 9.53mm (0.375 inches) wall thickness and minimum yield strength of 241 MPa (35,000 psi) or high density polyethylene (HDPE) pipe meeting the requirements of section 2-01 (A) AND (B).
4. Carrier pipe shall meet the requirements of section 2-01 (B) and be rated to carry the cover indicated in the plans.
5. Nominal pipe sizes only are indicated on the drawings and bid form. Outside diameter of pipe is generally 1 to 2-inches greater than the nominal pipe diameter.
6. Service Identification:
Permanent identification of piping service shall be provided by co-extruding multiple equally spaced color stripes into the pipe outside surface or by solid colored pipe shell. The striping material shall be the same material as the pipe material except for color. The following colors shall be used to identify piping service (pressure service):

Blue – potable water

Green – wastewater or force main

Purple – reclaimed water

Black – raw water

7. Polyethylene Fittings and Custom Fabrication:
Polyethylene fittings and custom fabrications shall be molded or fabricated by the pipe manufacturer or trained personnel. Butt fusion outlets shall be made to the same outside diameter, wall thickness, and tolerances as the mating pipe. All fittings and custom fabrications shall be fully rated for the same internal pressure as the mating pipe. Fabricated fittings must have the same working pressure as the mating pipe.

8. **Molded Fittings:**
Molded fittings shall be manufactured in accordance with ASTM D3261, Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing, and shall be so marked. Each production lot of molded fittings shall be subjected to the test required under ASTM D3261.
9. **Fabricated Fittings:**
Fabricated fittings shall be made by heat fusion joining specially machined shapes cut from pipe, polyethylene sheet stock, or molded fittings. Fabricated fittings shall be rated for internal pressure service equivalent to the full service pressure rating of the mating pipe. Directional fittings 16" and larger such as elbows, tees, crosses, etc., shall have a plain end inlet for butt fusion and flanged directional outlets.
10. **Polyethylene Flange Adapters:**
Flange adapter shall be made with sufficient throughbore length to be clamped in a butt fusion joining machine without the use of a stubend holder. The sealing surface of the flange adapter shall be machined with a series of small v-shaped grooves to provide gasketless sealing, or to restrain the gasket against blow-out. Below ground flange adapters may only be utilized when specified and when MJ adapters are not commercially available in the required size. Adapters for 30 inch and smaller pipe shall utilize an MJ adapter (see below).
11. **Back-up Rings and Flange Bolts:**
Flange adapters shall be fitted with lap joint flanges pressure rated equal to or greater than the mating pipe. Convuluted style backup rings preferred over the flat stock rings. The lap joint flange bore shall be chamfered to provide clearance to the flange adapter radius. Flange bolts and nuts shall be Grade 2 or higher.
12. **Manufacturer's Quality Control:**
The pipe and fitting manufacturer shall have an established quality control program responsible for inspecting incoming and outgoing materials. Incoming polyethylene materials shall be inspected for density, melt flow rated, and contamination. The cell classification properties of the material shall be certified by the supplier, and verified by Manufacturer's Quality Control.
13. **Polyethylene Mechanical Joint (MJ) Adapters:**
Mechanical connections of HDPE pipe (4" and larger) to Ductile Iron or PVC piping, mechanical joint fittings, or valves shall be through a self-restraining, fusible mechanical joint adapter with or without an integral, internal stainless steel insert. Mechanical joint adapter shall be of the same SDR rating as the pipe. A separate, loose stainless steel type insert will only be allowed for pipe sizes 4 inch through 8 inches. Provide the mechanical joint adapter, including but not limited to longer tee bolts or all thread rods with nuts at the mechanical joint bell. Note that PE flanged adapters may only be utilized for pipe sizes where MJ adapters are not commercially available.

14. **Cast Transition Couplings:**
HDPE to MJ cast transition coupling may only be utilized for 8 inch and smaller pipe size. A stainless steel stiffener is required sized at proper ID of HDPE pipe. The transition coupling must be epoxy lined (3 mils minimum for water use and 12 mils minimum for sewer use). Acceptable is a Power Seal model 3520 or approved equal.
15. **Electro fusion Couplings and Fittings:**
Electro fusion joining procedures shall not be used in any location or application on this project.
16. Polyethylene service line tubing shall conform to AWWA C901-latest.
17. **PIPE ASSEMBLY**
 1. Pipe shall be welded/fused together in one length, if space permits. Pipe may be placed on pipe rollers before pulling into bore hole to minimize damage to the pipe. For pipe sizes larger than 12 inch, mechanical scrapers (per the fitting manufacturer's recommendation) shall be utilized during the fusion work. It is critical that all original oxidized pipe surface be removed in order for fusion to take place. The scraping process requires that approximately .10" of the outer "skin" be removed in order to penetrate the oxidation and contamination barrier.
 2. **Acceptability of Damaged Pipe:** Cuts or gouges that reduce the wall thickness by more than 10% are not acceptable and must be cut out and discarded.
 3. **Fusion Testing:** When requested by the OWNER's inspector, fusion testing will be performed. The test fusion shall be allowed to cool completely, and then fusion test straps shall be cut out. The test strap shall be 12" (min) or 30 times the wall thickness in length with the fusion in the center and 1" (min) or 1.5 times the wall thickness in width. Bend the test strap until the ends of the strap touch. If the fusion fails at the joint, a new test fusion shall be made, cooled completely and tested. No more than one passing test will be required per pull section.
 4. **Mechanical Joining:** Polyethylene pipe and fittings may be joined together or to the materials by means of flanged connections (flange adapters and back-up rings) or mechanical couplings designed for joining polyethylene pipe or for joining polyethylene pipe to another material. Mechanical couplings shall be fully pressure rated and fully thrust restrained such that when installed in accordance with manufacturer's recommendations, a longitudinal load applied to the mechanical coupling will cause the pipe to yield before the mechanical coupling disjoins. External joint restraints shall not be used in lieu of fully restrained mechanical couplings.

5. Mechanical Joint and Flange Installation: Mechanical joints and flange connections shall be installed in accordance with the Manufacturer's recommended procedure. Flange faces shall be centered and aligned to each other before assembling and tightening bolts. In no case shall the flange bolts be used to draw the flanges into alignment. Bolt threads shall be lubricated, and flat washers shall be fitted under the flange nuts. Bolts shall be evenly tightened according to the tightening pattern and torque step recommendations of the Manufacturer. At least 1 hour after initial assembly, flange connections shall be re-tightened following the tightening pattern and torque step recommendations of the Manufacturer. The final tightening torque shall be as recommended by the Manufacturer.

D. Sewage Air Release Valves and Air & Vacuum Valves

1. Type: Combination Air Valves in sizes 1-6" shall be single body design and shall provide both Air Release and Air/Vacuum valve functions.
 - a. Air release shall be accomplished by dual-range venting designed to automatically provide varied and predictable air flow over a wide range of conditions. Air release shall have a 5/16" self-adjusting orifice. The fractional air release orifice must be capable of releasing 140 scfm of air at 150 psi differential pressure.
 - b. Valves shall close tightly at any pressure between 2 and 150 psi or 2 and 300 psi without leaking or spilling. The Air/Vacuum inlet and outlet areas shall meet the flow area requirements set forth in AWWA C512. In any case, the smallest cross-sectional area must define the size of the valve.
 - c. Valve shall have an upper body compression chamber to limit fluid level and solids interference. It shall also have a funnel shaped lower body to reduce solids buildup and allow for self-cleaning and maximum outflow.
 - d. A hydraulics-based float design shall be used to reduce the ballistic effect and instability of high speed fluid flow.
 - e. The guided float shaft shall provide smooth automatic Air Release and Air/Vacuum operation that will not foul and reduce performance on dirty service applications. To avoid loss of performance, the Air Release and Air/Vacuum seating action shall be direct driven by the shaft-mounted float. No linkages shall be used.
 - f. Flow deflector/splash reduction ring shall be used to restrict solids entry and minimize flow effect and splash that can cause float instability.
 - g. A 90 degree threaded side outlet shall be included with the valve with an extension pipe. Valves shall be capable of converting to optional vertical

- H. All PVC and Ductile Iron pipe and all fittings shall be with restrained joints at locations as directed by engineer.
1. Restraint devices for mechanical joint fittings and appurtenances conforming to either ANSI/AWWA C111/A21.11 or ANSI/AWWA C153/A21.53, shall conform to the following:
 2. DESIGN: Restraint devices for nominal pipe sizes 3 inch through 36 inch shall consist of multiple gripping wedges incorporated into a follower gland meeting the applicable requirements of ANSI/AWWA C111/A21.11. The devices shall have a working pressure rating equal to that of the pipe on which it is used. Ratings are for water pressure and must include a minimum safety factor of 2:1 in all sizes.
 3. MATERIAL: Gland body, wedges and wedge actuating components shall be cast from grade 65-45-12 ductile iron material in accordance with ASTM A536. Three (3) test bars shall be incrementally poured per production shift as per Underwriter's Laboratory (U.L.) specifications and ASTM A536. Testing for tensile, yield and elongation shall be done in accordance with ASTM E8. Chemical and nodularity tests shall be performed as recommended by the Ductile Iron Society, on a per ladle basis.
 4. The restraint mechanism shall incorporate a plurality of individually actuating gripping surfaces to maximize restraint capability, and have torque limiting twist off nuts to insure proper actuating of the restraint devices.
 5. Coating for restraint devices shall consist of the following:
 - a. All wedge assemblies and related parts shall be processed through a phosphate wash, rinse and drying operation prior to coating application. The coating shall consist of a minimum of two coats of liquid Xylan® fluoropolymer coating with heat cure to follow each coat.
 - b. All casting bodies shall be surface pretreated with a phosphate wash, rinse and sealer before drying. The coating shall be electrostatically applied and heat cured. The coating shall be a polyester based powder to provide corrosion, impact and UV resistance.
 6. The coupling sleeve shall be coated with a minimum of 15 mils of fusion bonded epoxy conforming to the applicable requirements of ANSI/AWWA C213 and shall be holiday tested with a 1500 volt spark test conforming to the said specification.
 7. Ductile Iron components shall meet or exceed the requirements of ASTM A536, and shall be tested in accordance with said standard.
 8. The restrained joining system shall meet the applicable requirements of AWWA C219, ANSI/AWWA C111/A21.11, and ASTM D2000.

9. The restrained coupling system shall be Series 2000PV manufactured by EBAA Iron, Inc. or an approved equal.

I. Air Release Valve Vent Scrubber

1. This specification defines the requirements for a Wager 2050-200 Vent Scrubber 2050FAPC-200 manufactured by Wager Company in Rural Hall, NC.
2. The Vent Scrubber shall consist of dry-scrubbing media contained in a fabricated aluminum plate housing, powder coated, grass green with a 4" or 6" inlet.
3. The Vent Scrubber shall contain 200 lbs of dry-scrubbing media that is engineered for the removal of H₂S gas. The media shall be contained in four corrugated plastic containers that are 11" x 18" in size.
4. The airflow shall be designed for passive applications. The configuration shall be arranged so that the contaminated air shall flow from the bottom flange and be forced upward through the media bed and discharged through ventilated openings.
5. The Vent Scrubber shall contain FOUR (4) air admittance valves. They shall intake directly into the lines without any restrictions from the unit's media bed.
6. All components of the Vent Scrubber shall include:
 - a. A fabricated aluminum plate body, powder coated grass green
 - b. 200 lbs of odor controlling media engineered in pellet form
 - c. 4" or 6" flanged connection
 - d. Tamper proof lockable hook and security latches
 - e. Disposable media corrugated plastic insert
7. Vent Scrubber Material
 - a. Fabricated Aluminum plate
 - b. Four corrugated plastic canisters measuring 11" x 18", each containing 50 LBS of media.
 - c. Latches in 316SS
 - d. Hooks in 316SS
 - e. 200 lbs of odor controlling media designed for removal of H₂S gas
 - f. 4" or 6" Flanged Connection with 7.5" (191mm) bolt
 - g. Plastic vent scrubbers that contain activated alumina media or carbon will not be accepted.
 - h. Media must be Non-Hazardous before and after it is spent.
8. Media Specification
 - a. Moisture Content: 35% Max
 - b. Crush Strength: 35%-70% Max
 - c. Abrasion: 4.5% Max
 - d. Pellet Diameter: 1/16" – 1/4" (1.5mm-6.5mm)

9. Wager media only will be accepted due to the high level of capacity. No equals will be accepted. Carbon will not be accepted.
10. Only UL certified media will be accepted in Vent Scrubber.

PART 3 EXECUTION

3-01 GENERAL

- A. Install force mains where shown on Drawings, in compliance with manufacturer's instructions. PVC pipe shall be installed in accordance with ASTM D-2321. Ductile iron pipe shall be installed in accordance with AWWA C-151. Unless otherwise specified by the Engineer, PVC pipe shall be installed on a prepared trench bottom using Class IV native materials or better and DIP shall be installed on flat-bottom trench, Type 2 bedding, using native materials.
- B. Where indicated by the Drawings, force main shall be laid on grade to prevent air entrapment. Air release valves and air & vacuum valves shall be installed at grade changes as shown on the Drawings. When required by Drawings, grade shall be maintained by using an appropriate laser system. Placement tolerance shall be + or - 1 tenth (.1) foot from the elevation shown by the laser.

3-02 **INSPECTION:** Pipe specials and jointing materials must be inspected for conformance to these Specifications immediately prior to use. Remove from site of work, materials not conforming with these Specifications. Protect pipe against impact shocks and free fall. Keep pipe clean at all times.

3-03 JOINTING

- A. Preparatory to making pipe joints, clean the surfaces of the portion of pipe to be jointed of dirt and foreign matter and then paint with factory made jointing lubricants, primers, adhesives and other materials in accordance with the pipe or joint manufacturer's recommendations. Place the jointing materials, fit, join, and adjust to obtain water tight joints.
- B. As soon as possible after the joint is made and the pipe is aligned, place sufficient approved backfill material along each side of the pipe to prevent movement from line or grade. Keep trenches free of water and as dry as possible during bedding, laying and jointing.

3-04 **OBSERVATION & INSPECTION:** Do not cover any pipe joints prior to observation by the Engineer.

3-05 **COVER:** Maintain thirty inches (42") minimum bury along force main unless otherwise shown on Drawings or directed by the Engineer.

- 3-06 CARE: Provide temporary bulkheads at the open end of the pipe to prevent the entrance of dirt, water or foreign objects into the line during construction. Lay each section of PVC pipe upon a shaped pipe bed such that the full length of the pipe barrel bears directly on the trench bottom. Recesses should be excavated to accommodate pipe bells or joints for both PVC and DIP materials.
- 3-07 HYDROSTATIC TEST:
- A. After the pipe is laid and the line flushed, it shall be filled with water, with care being exercised to expel all air from the pipe. During the test period pipe, valves, fittings, and joints shall be examined carefully for defects. Observed leaks or defective pipe shall be satisfactorily repaired or replaced, at the expense of the Contractor, and the test repeated until the section tested is within the limits specified. The entire distribution system or parts thereof shall be tested under hydrostatic pressure of 100 psi, for a period of 4 hours, if covered. Repairs shall be made using approved materials and new replacement fittings, specials, or gaskets where leakages occur.
- B. Leakage shall be measured by an approved calibrated meter through which the water required to maintain test pressure shall be pumped. Testing shall be performed in the presence of the Engineer, or his authorized representative and the Engineer shall be notified at least 24 hours in advance of the start of the test.
- C. The Contractor shall furnish the pump, pipe connections, fittings, gates, meters, and necessary apparatus and shall furnish all labor and work required to make the tests. Costs of testing shall be borne by the Contractor and testing operations shall remain in operation until approved by the Engineer. Allowable leakage shall not exceed 10 gallons per 24 hours per inch of diameter per mile of pipe, at the specified test pressure.
- 3-08 CLEAN-UP: The job site shall be maintained in a neat, and sanitary manner during construction. As portions of the work are completed, excess excavation, bricks, concrete, pipe and other materials shall be removed and disposed of by the Contractor in a manner acceptable to the Engineer.
- 309 SEPARATION FROM WATER LINES: There shall be a ten (10) foot horizontal separation between sanitary sewer mains and parallel water mains, **and** an eighteen (18) inch vertical separation between the bottom of a water line crossing over the top of a sewer main – **water over sewer**. In instances where such separation is not possible, special precautions, as determined by the Engineer, shall be taken by the Contractor to prevent contamination of waterworks facilities.
- 3-10 CROSSINGS: All utility, railroad or highway crossings shall be constructed in accordance with the applicable permits issued for such crossings.
- 3-11 PROVING: Upon completion of the hydrostatic pressure test, the force main shall be proved by "pigging" in accordance with the recommendations of the polyfoam pig manufacturer. Contractor shall supply the material and labor to successfully complete the test.

PART 4 COMPENSATION

4-01 MEASUREMENT

- A. GENERAL: MEASUREMENT SHALL ONLY BE MADE OF ITEMS SUPPLIED AND INSTALLED IN ACCORDANCE WITH THE PROJECT DRAWINGS AND SPECIFICATIONS AND LISTED ON THE APPROPRIATE SCHEDULE OF THE BID FORM. NO MEASUREMENT OR PAYMENT SHALL BE MADE OF ITEMS OR ACTIVITIES NOT LISTED AND SUBSIDIARY TO COMPLETION OF THE WORK, NOR OF ADDITIONAL ITEMS OR QUANTITIES INSTALLED OR ACTIVITIES PERFORMED FOR THE CONTRACTOR'S CONVENIENCE (SUCH AS ADDITIONAL FITTINGS OR UTILIZING SHEETING).
- B. PVC and Ductile Iron Force Main: Shall be measured per linear foot installed of each size and type specified on the Bid Form by measuring along the centerline of the completed installation. No deductions will be made for space occupied by valves or fittings.
- C. Cast Iron or Compact Ductile Iron Fittings: Shall be measured by the pound of bare body weight only. Fittings installed in addition to those shown on the Drawings will only be measured if the Engineer gives written permission prior to installation. No weight allowance shall be made for bolts, glands or specials.
- D. Restrained joints will not be measured for payment but shall be considered absorbed.
- E. Select backfill and select bedding hauled in from off site areas shall not be measured for separate payment but shall be considered an absorbed cost item unless otherwise specified on the Bid Form.
- F. Connections to existing manholes or existing structures shall be measured per each if so specified on the Bid Form.
- G. Valves and Check Valves: Shall be measured per each if so specified, and shall include motor operators and pits if required.
- H. Sewage Air Valves: Shall be measured per each type specified and shall include vent scrubber, appurtenances, and pits if required.
- I. Removal and restoration of permanent pavement surfaces shall not be measured for separate payment but shall be considered an absorbed cost item unless otherwise specified on the Bid Form.

4-02 PAYMENT

- A. GENERAL: PAYMENT FOR EACH OF THE ITEMS LISTED HEREIN SHALL CONSTITUTE FULL COMPENSATION FOR FURNISHING MATERIALS, LABOR, TOOLS, EQUIPMENT, INCIDENTALS, SPECIALS, TESTING, JOINTING AND PERFORMING WORK NECESSARY FOR THE INSTALLATION OF THE SPECIFIED ITEM IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS.

- B. PVC Force Main: Shall be paid for at the Contract Unit Price per linear foot for each size and type specified on the Bid Form.
- C. DIP Force Main: Payment for the DIP force main will be made at the Contract Unit Price per linear foot of each size and type specified on the Bid Form.
- D. No separate payment shall be made for PVC fittings and specials. Payment for such shall be included in the Contract Price per linear foot of PVC pipe, if use of PVC fittings is specified.
- E. Payment for DI or cast iron fittings and specials shall be made at the Contract Unit Price per pound. Restrained Joints shall not be paid for separately.
- F. Connections to existing manholes or structures shall be made at the Contract Unit Price per each as specified on the Bid Form.
- G. Select bedding and backfill shall not be paid for separately but shall be considered an absorbed cost item unless otherwise specified on the Bid Form.
- H. Gate Valves, Butterfly Valves and Check Valves: Payment for valves will be made at the Contract Unit Price for each size and type specified. Valves specified as "buried", "with operator", "with manhole" or "with pit" shall not have separate payment made for valve operator extensions, motor operators, pits or manhole structures, foundations, bedding or other incidentals for installing the valve(s) and accessories as indicated on the Drawings.
- I. Air Release Valves and Air & Vacuum Valves: Payment for air release valves and air & vacuum valves will be made at the Contract Unit Price for each size and type specified. If the Bid Form specifies installation with manhole, vent scrubber, or pit then no separate payment shall be made for bedding, foundation, pit structure, tapped plug or other accessories, except the cast iron fitting in the force main line, if utilized.

***** END OF SECTION *****

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SECTION 902

PROPOSAL

Proposal of Dozer LLC (hereinafter called "BIDDER"), organized and existing under the laws of the State of Mississippi doing business as a Limited Liability Company (corporation, partnership, limited liability company, or individual) to the City of Meridian, (hereinafter called "OWNER"). In compliance with your advertisement for Bids, BIDDER, hereby proposes to perform all WORK for construction of ERR-38-320(01)

in strict accordance with the CONTRACT DOCUMENTS, within the time set forth herein, and at the prices stated below. By submission of the BID, each BIDDER certifies, and in the case of a joint BID each party thereto certifies as to his own organization, that this BID has been developed independently, without consultation, communication or agreement as to any matter relating to this BID with any other BIDDER or with any competitor.

BIDDER hereby agrees to commence WORK under this contract on or before a date to be specified in a written "NOTICE TO PROCEED" and to fully complete the Project within 300 consecutive calendar days thereafter. BIDDER further agrees to pay as liquidated damages, the sum of \$ 1,500.00 for each consecutive calendar day thereafter as provided for elsewhere in these CONTRACT DOCUMENTS.

BIDDER ACKNOWLEDGES receipt of the following ADDENDA:

NUMBER: 1 DATE: 3/19/21
NUMBER: _____ DATE: _____
NUMBER: _____ DATE: _____
NUMBER: _____ DATE: _____

Each BIDDER is responsible for inspecting the site and for reading and being thoroughly familiar with the CONTRACT DOCUMENTS. The failure or omission of any BIDDER to do any of the foregoing shall in no way relieve any BIDDER from any obligation in respect to this bid.

BIDDER understands that the quantities mentioned below are approximate only and are subject to either increase or decrease, and hereby proposes to perform any increased or decreased quantities of work at the Unit Price Bid.

In accordance with the requirements of the Plans, Specifications and Contract Documents, BIDDER proposes to furnish all necessary materials, equipment, labor, tools and other means of construction and to construct the Project in accordance with the Contract Documents within the specified Contract Time for the following Unit Prices specified.

BIDDER further agrees to execute the contract agreement as bound herein within ten (10) days after receipt of contract forms from the OWNER.

BIDDER agrees to pay as liquidated damages the amount provided herein for each consecutive calendar day after the Contract completion date specified in a written "NOTICE TO PROCEED" that he fails to complete the work unless the Contract Time is extended by a written Change Order.

BIDDER also proposes to execute a Performance Bond and a Payment Bond, as shown in the Specifications, each in an amount of not less than **one hundred percent (100%)** of the total of the Base Bid. These Bonds shall not only serve to guarantee the completion of the work on the BIDDERS part, but also to guarantee the excellence of both workmanship and materials until the work is finally accepted.

BIDDER encloses a Bid Bond or Certified Check for 5% of Base Bid Amount DOLLARS (\$ Five (5%) of Base Bid Amount) and hereby agree that in case of failure to execute the Contract and furnish the required Bonds within (10) days after the Receipt of Contract Forms, the amount of this Certified Check or Bid Bond will be forfeited to the OWNER, as liquidated damages arising out of his failure to execute the Contract as proposed.

It is understood that in case BIDDER is awarded the work, the Certified Check or Bid Bond submitted as Bid security will be returned as stipulated in the Specifications.

Further, the BIDDER agrees to abide by the requirements under Executive Order No. 11246, as amended, including specifically the provision of the Equal Opportunity Clause set forth in the Federal Requirements, if applicable.

The low BIDDER shall supply the names and address of major MATERIAL SUPPLIERS AND SUBCONTRACTORS when required to do so by the OWNER.

Inspection trips for prospective BIDDERS will be coordinated thru OWNER prior to submission of proposal.

BIDDER agrees to perform all the work described in the CONTRACT DOCUMENTS for the following unit prices or base bid amount: **SEE BID FORM PAGE 902-4.**

NOTES:

1. Unit price amounts are to be shown in figures where indicated. Where a discrepancy in the unit price and the extension of any items occurs, the unit price will govern.
2. Unit prices shall include all labor, materials, bonding, shoring, removal, overhead, profit, insurance, etc., to cover the finished work of the several kinds called for.
3. Any erasure, change or alteration of any kind must be initialed by the BIDDER.
4. Bid prices shall include sales tax and all other applicable taxes and fees.
5. Any item of work not specified on the Proposal as a separate pay item or indicated as an absorbed cost in a pay item but which is incidental to completion of the work shall be considered as an absorbed cost with full compensation included in the unit price bid for the particular item involved.
6. OWNER reserves the right to award any combination of base and additive alternate bids (if any) it deems advantageous and in the event that all specified bid item units are lump sum (LS), the OWNER reserves the right to delete any such item or combination of such items from the project. The OWNER further reserves the right to delete any item or items desired from the Bid Schedule after the Contract has been awarded. Any deletions, if any made, shall be by Change Order and BIDDER hereby agrees to accept such Change Orders

BID FORM

CITY OF MERIDIAN

Bridge Replacement at Old Highway 80 over Okatibbee Creek
PROJECT NO. ERBR-38-320 (01)
February 2021

BASE BID

ITEM NO.	DESCRIPTION	UNIT	QTY.	UNIT COST	TOTAL COST
S-200-A	MOBILIZATION	1	LS	228,125.00	228,125.00
S-201-A	CLEARING AND GRUBBING	1	LS	152,500.00	152,500.00
S-202-A	REMOVAL OF BRIDGE (STA. 40+88.00)	1	LS	162,700.00	162,700.00
S-202-D	REMOVAL OF CONCRETE OVERLAID WITH ASPHALT	2,129	SY	10.00	21,290.00
S-202-E	REMOVAL OF PIPE (ALL SIZES)	26	SF	25.00	650.00
S-203-A	UNCLASSIFIED EXCAVATION (LVM)	376	CY	6.00	2,256.00
S-203-E	BORROW EXCAVATION (CONTRACTOR FURNISHED) (CLASS B-9-6) (LVM)	10,774	CY	13.00	140,262.00
S-203-H	EXCESS EXCAVATION (LVM)	6,158	CY	5.00	30,790.00
S-232-A	GEOTEXTILE FABRIC STABILIZATION	19,345	SY	2.50	48,362.50
S-212-A	AGRICULTURAL LIMESTONE	2	TON	500.00	1,000.00
S-212-B	COMMERCIAL FERTILIZER (13-13-13)	1	TON	1,000.00	1,000.00
S-212-F	AMMONIUM NITRATE	1	TON	150.00	150.00
S-212-I	GROUND PREPARATION	3,373	SY	.50	1,686.50
S-214-A	SEEDING	1	AC	2,000.00	2,000.00
S-233-A	TEMPORARY SILTFENCE (TYPE II) (.15-.84)	2,640	LF	4.00	10,560.00
S-304-A	GRANULAR MATERIAL (LVM) (CLASS 5, GROUP B)	589	CY	23.00	13,547.00
S-304-C	CRUSHED STONE SIZE 610 (LVM)	782	CY	16.00	12,512.00
S-403-A	HOT MIX ASPHALT, (MT) (9.5mm)	291	TON	141.00	41,131.00
S-403-A	HOT MIX ASPHALT, (MT) (12.5mm)	346	TON	123.00	42,558.00
S-403-A	HOT MIX ASPHALT, (MT) (19mm)	454	TON	116.00	52,604.00
S-408-A	ASPHALT FOR PRIME COAT	1,043	GAL	6.25	6,518.75
S-409-A	GEOTEXTILE FABRIC FOR UNDERSEAL,TYPE V	2,551	SY	3.00	7,653.00
S-603-C-A	18" REINFORCED CONCRETE PIPE, CLASS III	140	LF	48.00	6,720.00
S-603-C-B	18" REINFORCED CONCRETE PIPE, END SECTION	1	EA	865.00	865.00
S-603-C-D	29" X 18" REINFORCED CONCRETE, ARCH PIPE CLASS III	48	LF	74.00	3,552.00
S-603-C-E	29" X 18" REINFORCED CONCRETE, ARCH PIPE END SECTION	2	EA	1,050.00	2,100.00
S-606-B	GUARD RAIL, W BEAM	150	LF	23.00	3,450.00
S-606-D	GUARD RAIL, BRIDGE END SECTION,TYPE "I"	4	EA	2,150.00	8,600.00
S-606-E	GUARD RAIL, TERMINAL END SECTION	4	EA	2,950.00	11,800.00
S-617-A	RIGHT-OF-WAY MARKERS (TYPE I)	9	EA	2,200.00	19,800.00
S-618-A	MAINTENANCE OF TRAFFIC	1	LS	10,000.00	10,000.00
S-619-C	6" WIDE TRAFFIC STRIPE (CONTINUOUS WHITE)	2,411	LF	1.00	2,411.00
S-619-D	6" WIDE TRAFFIC STRIPE (CONTINUOUS YELLOW)	2,411	LF	1.00	2,411.00
S-620-C	6" WIDE COLD PLASTIC EDGE STRIPE (CONTINUOUS WHITE)	640	LF	4.00	2,560.00
S-620-E-1	6" WIDE COLD PLASTIC TRAFFIC STRIPE (CONTINUOUS YELLOW)	640	LF	7.50	4,800.00
S-627-L	TWO- WAY YELLOW REFLECTIVE HIGH PERFORMANCE RAISED MARKERS	40	EA	7.50	300.00
S-630-C	REFLECTORIZED TRAFFIC OBJECT MARKER (ENCAPSULATED LENS) (TYPE 3)	4	EA	8.00	32.00
S-630-D	REFLECTORIZED TRAFFIC DELINEATOR SIGN (ENCAPSULATED LENS)	22	EA	18.00	396.00
S-803-A	TEST PILE	2	EA	10,500.00	21,000.00
S-803-E	14" STEEL PILE	2,589	LF	43.00	111,307.00
S-804-A	BRIDGE CONCRETE,CLASS "A"	382	CY	1,200.00	458,400.00
S-804-C	40' PRESTRESSED CONCRETE BEAM TYPE I + 2	596	LF	104.00	61,984.00
S-804-C	100' PRESTRESSED CONCRETE BEAM TYPE IV	998	LF	195.00	194,610.00
S-805-A	REINFORCING STEEL	63,877	LB	1.20	76,652.40
S-813-A	CONCRETE RAILING	640	LF	45.00	28,800.00
S-815-A	LOOSE RIPRAP, 300 LB.	1,741	TON	65.00	113,165.00
S-815-E	GEOTEXTILE FABRIC UNDER RIP RAP,TYPE V, AOS 100 0.21-0.43	2,098	SY	3.00	6,294.00
S-907-262-A	10" SEWER FORCE MAIN	20	LF	43.36	867.20
S-907-262-B	10" HDPE SEWER FORCE MAIN, DIRECTIONAL BORE	480	LF	89.10	42,768.00
S-907-262-C	AIR RELEASE VALVE W/HOUSING	1	EA	5,110.00	5,110.00
S-907-262-D	DUCTILE IRON FITTINGS	1,500	LB	17.60	26,400.00
S-907-262-E	10" GATE VALVE & BOX	1	EA	2,970.00	2,970.00
S-907-262-F	CONNECTION TO EX. FORCE MAIN	2	EA	4,400.00	8,800.00
S-907-265-A	16" WATER MAIN	20	LF	95.70	1,914.00
S-907-265-B	16" HDPE WATER MAIN, DIRECTIONAL BORE	480	LF	173.80	83,424.00
S-907-265-C	DUCTILE IRON FITTINGS	3,000	LB	9.90	29,700.00
S-907-265-D	AIR RELEASE VALVE W/HOUSING	1	EA	5,280.00	5,280.00
S-907-265-E	16" GATE VALVE & BOX	1	EA	7,100.00	7,100.00
S-907-265-F	CONNECTION TO EXISTING WATER MAIN	2	EA	6,050.00	12,100.00
S-907-265-G	REMOVE AND REPLACE FIRE HYDRANT ASSEMBLY	1	EA	7,100.00	7,100.00

TOTAL BID (BASE BID) 2,483,828.35

RESPECTFULLY SUBMITTED BY:

Dozer Inc
(PLEASE PRINT)

SIGNATURE:

NAME AND TITLE:

William T. Jones, Jr. - Member
(PLEASE PRINT)

ADDRESS:

P.O. Box 2031, Natchez, MS 39121

PHONE NUMBER:

(601) 442-1671

CERTIFICATE OF RESPONSIBILITY NO.

15670-MC

(SEAL) IF BY CORPORATION

CORPORATE CERTIFICATE

(To be executed if BIDDER is a Corporation)

I, _____ certify that I am the Secretary of the Corporation named as CONTRACTOR in the foregoing Proposal; that _____ who signed said Proposal on behalf of the CONTRACTOR, was then _____ of said Corporation; that said Proposal was duly signed for and in behalf of said Corporation by authority of its governing body and is within the scope of its corporate powers.

Name: _____

Title: _____

Signature: _____

(CORPORATE SEAL)

PARTNERSHIP CERTIFICATE

(To be executed if BIDDER is a Partnership)

STATE OF _____

COUNTY OF _____

On this _____ day of _____ 2021, before me personally appeared _____, known to be and known by me to be the person who executed the above instrument, who being by me first duly sworn, did depose and say that he is general partner in the firm of:

_____; That said firm consists of himself and _____; and that he executed the foregoing instrument for and on behalf of said firm for the uses and purposes stated herein.

Signature _____

Title _____

(SEAL)

Sworn before me this _____ day of _____ 20__

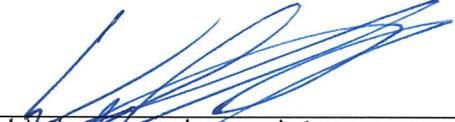
_____, Notary Public

My commission expires _____

LIMITED LIABILITY COMPANY CERTIFICATE

(To be executed if BIDDER is a LLC)

I, the undersigned William T. Jones Jr., hereby certify that I am the Manager of Dozer, LLC (the "Company") or if the Company does not have a Manager, a Member of the Company with full power and authority to bind the Company; that _____ who executed the Proposal on behalf of the Company is _____ of the Company with full power and authority to execute same on behalf of the Company, and that the Proposal and the Contract, if awarded to the Company, are within the powers and authority of the Company.

Signature 
Title Member



(SEAL)
Sworn before me this 24th day of MAR 2021

, Notary Public
My commission expires 5-27-2024

NONRESIDENT BIDDER CERTIFICATE

(to be executed if a BIDDER is a nonresident)

I, _____, hereby certify that the CONTRACTOR,
_____, is domiciled in the State of _____

and (check and complete one):

attached is a copy of the State of _____'s current law pertaining to the treatment of nonresident CONTRACTORS. Paragraph _____, page _____ of said law grants resident CONTRACTORS a _____ percent preference over nonresident CONTRACTORS for similar projects.

the State of _____ has no current law pertaining to the treatment of nonresident contractors.

I claim "resident contractor" status based upon having been qualified to do business in this state and having maintained a permanent full-time office in the State of Mississippi for two (2) years prior to January 1, 1986. Proof of such claim must be submitted and approved before contract is signed.

Signature _____

Title _____

(SEAL)

Sworn before me this _____ day of _____ 20__

_____, Notary Public

My commission expires _____

NON-COLLUSION AFFIDAVIT
(TO BE EXECUTED IN DUPLICATE)

STATE OF MISSISSIPPI
COUNTY OF Adams

I, William T. Jones, Jr.
(name of person signing affidavit)

individually, and in my capacity as Member
(title)

of Dozer, LLC
(name of firm, partnership, limited liability company, or corporation.)

being duly sworn, on oath do depose and say as follows:

(a) That Dozer, LLC, Bidder on the FROR-38-320(D1) for the _____ 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 officers, partners, employees or principal owners.

(b) further, that neither said legal entity nor any of its directors, officers, partners, principal owners or managerial employees are currently debarred from bidding on public contracts by the State of Mississippi or any of its agencies; or by one or more of the other states or any of their agencies; or by the Federal Highway Administration.

Signature [Handwritten Signature]
William T. Jones, Jr.
Title Member



(SEAL)
Sworn before me this 24th day of MAR 2021

James Cameron Huff, Jr., Notary Public

My commission expires 5-27-2024

NOTE: FAILURE TO PROPERLY SIGN AND NOTARIZE THIS AFFIDAVIT WILL DISQUALIFY THE BID.

NON-COLLUSION AFFIDAVIT
(TO BE EXECUTED IN DUPLICATE)

STATE OF MISSISSIPPI
COUNTY OF Adams

I, William T. Jones, Jr.
(name of person signing affidavit)

individually, and in my capacity as Member
(title)

of Dozer, LLC
(name of firm, partnership, limited liability company, or corporation.)

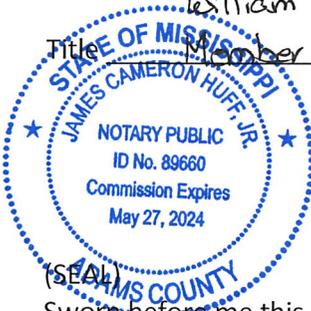
being duly sworn, on oath do depose and say as follows:

(a) That Dozer, LLC, Bidder on the FR BR-38-320(01) for the City of Meridian 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 officers, partners, employees or principal owners.

(b) further, that neither said legal entity nor any of its directors, officers, partners, principal owners or managerial employees are currently debarred from bidding on public contracts by the State of Mississippi or any of its agencies; or by one or more of the other states or any of their agencies; or by the Federal Highway Administration.

Signature [Handwritten Signature]

Title Member



Sworn before me this 24th day of MAY 2021

James Cameron Huff, Jr., Notary Public

My commission expires 5-27-2024

NOTE: FAILURE TO PROPERLY SIGN AND NOTARIZE THIS AFFIDAVIT WILL DISQUALIFY THE BID.

**SECTION 903
CONTRACT**

CONTRACT FOR Bridge Replacement at Old Highway 80 over Okatibbee Creek, Project No. ERBR-38-320 (01)

This contract entered into by and between the City of Meridian, Mississippi (hereinafter “City” or “Owner”) on one hand, and the undersigned contractor, on the other witnesseth:

That, in consideration of the payment by the City 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 City.

It is further agreed that the work shall be done under the direct supervision and to the complete satisfaction of the City or their authorized representatives, and when Federal Funds are involved subject to inspection at all times and approval by the Mississippi Department of Transportation or Federal Highway Administration, or its agents as the case may be, or the agents of any other Agency whose funds are involved in accordance with those Acts of the Legislature of the State of Mississippi approved by the Governor and such rules and regulations issued pursuant thereto by the Mississippi Transportation Commission and the authorized Federal Agencies.

It is agreed and understood that each and every provision of law and clause required by law 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 _____, 2021.

Contractor(s)

By _____

Title _____

By _____

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

Mayor Percy Bland

City Clerk

Award authorized by the City in session on the _____ day of _____, 2021, as recorded _____

SECTION 904

PERFORMANCE AND PAYMENT BOND

CONTRACT BOND FOR _____

Know all men by these presents: that we,

(Contractor)

(hereinafter "Principal"), a _____

residing at _____ in the State of _____

and _____
(Surety)

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 City of Meridian

_____, (hereinafter "City"), 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.

The conditions of this bond are such, that whereas the said Principal, has (have) entered into a

contract with the City, bearing the date of _____ day of _____ A.D.

_____ hereto annexed, for the construction of certain project(s) in the State of Mississippi

as mentioned in said contract in accordance with the Contract Documents therefor, on file in the

offices of the City.

Now therefore, if the above bounden Principal 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 City 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 City at the instance of any officer of the City authorized in such cases, for double any amount in money or property, the City 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 city Official, 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.

(Contractors) Principal

Surety

By _____

By _____

(Signature) Attorney in Fact

Address: _____

Title _____

(Contractor's Seal)

(Printed) Mississippi Agent

(Signature) Mississippi Agent

Address: _____

(Surety Seal)

Mississippi Insurance ID Number