Pickering
Service and Good Work...
Our Foundation, Our Future
Since 1946

City of Madison, MS
City Center Water, Sewer, and Drainage Improvements
Pickering Firm, Inc. Project 26374.02

Plans, Specifications, and Contract Documents

TO: ALL PLANHOLDERS

FROM: Charles Capdepon, PE

DATE: Wednesday, 11 September 2024

The Plans, Specifications, and Contract Documents for this Project shall be amended as follows:

ADDENDUM #1

1. PRE-BID Meeting: Sign-In Sheet is Included with this Addendum
2. PRE-BID Meeting: Meeting Minutes, provided for information only, are distributed with this addendum
3. Bid Opening:

   Bid opening time and location have changed. Bid cutoff and opening will be at 10:00 am September 16, 2024. The location for the bid opening will be City of Madison, Public Works, 1239 HWY 51, Madison, MS 39110. Physical bids will be accepted until 9:30 am at City of Madison, City Hall; and until 10:00 am at City of Madison, Public Works.

<u>Clarifications:</u>

1. ARPA Documents: Solid Waste Disposal Act, Byrd Anti-Lobbying, Suspension and Debarment, and Attachment C

   Contractor is not required to submit these documents with their Bid Package, but will be required to submit prior to beginning construction during the submittal phase.

2. Sheets C2.01-C2.02 Revise roadway repair Note 4 to state the following:

   4. Where water main is being installed via trenchless methods, 2” surface course from edge of pavement to edge of pavement is required.

<u>Questions:</u>

1. Will the weight of the restrained joint gland be paid or only the weight of the bare fitting?

   Ductile Iron Fitting weight includes the weight of the fitting and the gland.

2. Specification Section 33 14 16.50 2-01B stats the wall thickness for 24" to 48" diameter to be ½", the Chart on SD1.01 conflicts with the Specification requirements.

   The wall thickness stated in the specification 33 14 16.50 will supersede the wall thickness stated in the table on SD1.01.

Plans Sheets:

1. Revised Plan Sheets:

   Replace the Following Plan Sheets in the Contract Documents with those included in this Addendum.
   a. Sheet C1.01
   b. Sheet C1.02
   c. Sheet C2.01
   d. Sheet C2.03
   e. Sheet C3.01
   f. Sheet C6.0
   g. Sheet SD1.09

Specifications:

1. Revised the following specification sections:

   Section 331400 Water Distribution System

ITEMS IN CONFLICT WITH THIS ADDENDUM ARE HEREBY DELETED.

THIS ADDENDUM IS TO BE ACKNOWLEDGED BY THE BIDDER ON THE BID FORM.

Pickering Firm, Inc.

Charles K. Capdepon, III

Charles Capdepon, PE
11 September 2024

Pickering

Meeting Minutes

DATE OF MEETING: August 29, 2024

LOCATION OF MEETING: Madison Public Works
Madison, MS

PROJECT NAME: City Center Water, Sewer, and Drainage Improvements
MCWI 161-2-DW-5.15
PFI Reference #26374.02

Meeting Purpose: Pre-Bid Meeting

The Following Was Discussed:

1. Sign-in sheet circulated
    - See attached scan for attendees
2. ARPA Funding – There's federal funds and requirements associated with the project (all provisions of 2 CRF Part 200)
    - No wage rates or Davis-Bacon are part of the requirements (less than $10 million)
    - Solid Waste Disposal Act
    - Byrd Anti Lobbying
    - Suspension and Debarment
    - Attachment C
3. Cutoff for questions; all questions, in writing, are to be sent to Charles Capdepon by 5 PM on 9/9/2024; final addendum (if needed) September 11th.
4. Bid opening 10:00 am on 9/16/2024
5. Online bids accepted on Central Bidding
    - Must submit bid on bid form provided
    - Certificate of responsibility number on outside of bid
    - Non-resident contractor – provide a copy of your state's law concerning treatment of non-resident contractors
6. Bid Form: Bidder must bid any and all alternates
7. Contract time 450 days
8. Summary of Work
    - 12" Water Main Loop around City Center development area
        - Open cut and trenchless
        - Including fire hydrants, gate valves, connections to existing water mains, road bores, etc.
    - Gravity sewer extension for future connection
    - Retention Pond

- Landscaping
- Irrigation Well

CITY CENTER WATER, SEWER, AND DRAINAGE IMPROVEMENTS
MADISON, MS
MCWI 161-2-DW-5.15
PFI Reference No.: 26374.02
August 29, 2024

Pre-Bid Meeting Sign In

Name	Representing	Phone	Mobile	Email
Charles Copeland	Pickering Firm		216.755.0490	ccopeland@pickeringfirm.com
Jack Gratwick	Hemphill Construction		601.818.0564	jgratwick@hemphillconstruction.com
Jesse Hedgepeth	Greenbriar Digging Service	601 833 0975	601 455 7664	jhedgepeth@greenbriar-dslp.com
Chris Woodward	WOODWARD CONTRACTING	601.850.4077		woodyc@woodwardcontracting.net
SAM AGNEW	Water Transport Solutions	225-907-5832	same	sam@wtsolutions.org
Hunter Atwood	UCI		601-500-0631	hatwood@uci-ms.com
Desi Underwood	Castle	601-447-8994		dunderwood@weorecastle.com
Jeff Green	PFI		601-497-5256	jgreen@pickeringfirm.com

City Center Water, Sewer, and Drainage Improvements
MCWI Grant #161-2-DW-5.15

Section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation & Recovery Act 40 CFR part 247

_____ The above contract provision is not applicable to the contract. The contractor has not purchased and will not purchase any items outlined in EPA guidelines that can be made from recovered materials.

_____ Such items were purchased, but the purchase price did not exceed $10,000.

_____
Contractor's Authorized Official

_____ _____
Official's Name and Title Date

2 CFR Appendix II 200(L) & 2 CFR 200.322

Contractor affirms that it did abide by the provisions. As appropriate and to the extent consistent with law, the Contractor did, to the greatest extent practicable under a Federal award, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products).

_____
Contractor's Authorized Official

_____ _____
Official's Name and Title Date

State of Mississippi
County of _____

The undersigned,_____, did personally appear before me on the _____ day of_____, 2024 and acknowledged the execution of the foregoing instrument.

(Seal) _____
My commission expires: Notary Public

Certification Regarding
Debarment, Suspension, and Other Responsibility Matters
Primary Covered Transactions

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 13 CFR Part 145. The regulations were published as Part VII of the May 26, 1988 *Federal Register* (pages 19160-19211). Copies of the regulations are available from local offices of the U.S. Small Business Administration.

(BEFORE COMPLETING CERTIFICATION, READ INSTRUCTIONS ON REVERSE)

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

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

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

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

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

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

Business Name _____

Date _____ By _____

Name and Title of Authorized Representative

_____

Signature of Authorized Representative

INSTRUCTIONS FOR CERTIFICATION

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

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

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

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

5. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of the rules implementing Executive Order 12549. You may contact the department or agency to which this proposal is submitted for assistance in obtaining a copy of those regulations (13 CFR Part 145).

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

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

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

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

10. Except for transactions authorized under paragraph 6 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

BYRD ANTI-LOBBYING AMENDMENT

Contractors who apply or bid for an award of $100,000 or more shall file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, officer or employee of Congress, or an employee of a Member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the recipient who in turn will forward the certification(s) to the awarding agency.

APPENDIX A, 44 C.F.R. PART 18 – CERTIFICATION REGARDING LOBBYING – REQUIRED FOR CONTRACTS OVER $100,000

Certification for Contracts, Grants, Loans, and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:

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

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

3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

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

The Contractor,_____, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. Chap. 38, Administrative Remedies for False Claims and Statements, apply to this certification and disclosure, if any.

_____

Signature of Contractor's Authorized Official

_____

Name and Title of Contractor's Authorized Official

_____

Date

ATTACHMENT C
SUBAWARD TERMS AND CONDITIONS
FOR CONTRACTED PARTIES

1. AUTHORITY TO PARTICIPATE IN THIS AGREEMENT

The Contracted Party certifies that (a) it is either a 1) state agency, 2) a validly organized business that is authorized to do business in the state of Mississippi, 3) a nongovernmental organization, or 4) a political subdivision of the state of Mississippi with valid authority to enter into this agreement and; (b) entry into and performance under this agreement is not restricted or prohibited by any loan, security, financing, contractual, or other agreement of any kind; and (c) notwithstanding any other provision of this Agreement to the contrary, that there are no existing legal proceedings, either voluntary or otherwise, which may adversely affect its ability to perform its obligations under this agreement.

2. DEBARMENT AND SUSPENSION

Contractor/Contracted Parties certifies to the best of its knowledge and belief, that it:

A. is not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transaction by any federal department or agency or any political subdivision or agency of the State of Mississippi;

B. has not, within a three (3) year period preceding this Agreement, been convicted of or had a civil judgment rendered against it for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (federal, state, or local) transaction or contract under a public transaction;

C. has not, within a three (3) year period preceding this Agreement, been convicted of or had a civil judgment rendered against it for a violation of federal or state antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

D. is not presently indicted for or otherwise criminally or civilly charged by a governmental entity (federal, state or local) with commission of any of these offenses enumerated in Article 2.B. and Article 2.C., above; and,

E. has not, within a three (3) year period preceding this Agreement, had one or more public transactions (federal, state, or local) terminated for cause or default.

This agreement is subject to 31 C.F.R. Part 19.

3. INDEMNIFICATION

To the extent allowed by state law, Contracted Party agrees to indemnify and save, release and hold harmless the State of Mississippi, the Commission on Environmental Quality, MDEQ, all of their employees and officers, and the Department's contractors from and against any and all

claim, demand, cause of action, liability, loss, damage, injury, suit, judgment, debt and cost, including attorney's fees or expenses on the part of any Contracted Party, their agents or employees or any other parties arising out of or incident to, any and all Work under the terms of this Agreement.

4. RELATIONSHIP STATUS

The Contracted Party acknowledges and agrees that MDEQ is not a party, in any manner whatsoever, to any contract between the SUBRECIPIENT and the construction contractor(s), engineer(s), attorney(s), equipment supplier(s), contractor(s), or between any other parties of any kind whatsoever (hereinafter collectively referred to as "vendor"). The SUBRECIPIENT and Contracted Party also acknowledge and agree that any benefit to vendors contracting with the SUBRECIPIENT or Contracted Parties arising from or associated with this Agreement is strictly incidental and all such vendors are not and are not intended to be considered as third party beneficiaries under any agreement between MDEQ and the SUBRECIPIENT.

Upon execution of any contract between the SUBRECIPIENT and any other party in regard to the project, MDEQ does not assume any authorities, duties, responsibilities, or liabilities under such contract. The SUBRECIPIENT and Contracted Party shall not have any authority to bind or otherwise obligate MDEQ, directly or indirectly, under any contract or agreement between the SUBRECIPIENT and any other party. The SUBRECIPIENT, Contracted Party and its vendors acknowledge and agree that any action taken by MDEQ in its role of grantor, or in its separate and distinct role as regulator shall not in any way change or alter its position as that of grantor.

MDEQ does not have any authority, duty, responsibility, or liability in contract claims or dispute identification, negotiation, resolution, or any other actions regarding contract claims under the contract(s) between the SUBRECIPIENT and any other party. The SUBRECIPIENT and the Contracted Party acknowledge and agree that MDEQ is not obligated to review, comment on, approve, or discuss the merits of any contract claims presented by or to any party. Any MDEQ reviews, approvals, observations, presence at meetings, written communications, verbal communications or other actions are not to be interpreted as addressing the merits of any claims, nor are they to be construed as interpreting the contract between the SUBRECIPIENT and the Contracted Party or any other parties.

5. ACCESS TO RECORDS

Provided Contracted Party is given reasonable advance written notice and such inspection is made during normal business hours of Contracted Party, then the Government Accountability Office, MDEQ, the State or any duly authorized representatives shall have unimpeded, prompt access to any of Contracted Party's books, documents, papers, and other records which are maintained or produced as a result of the Project for the purpose of making audits, investigations, examinations, excerpts, transcriptions, and copies of such documents. This right also includes timely and reasonable access to the Contracted Party's personnel for the purpose of interview and discussion related to such documents. All records related to this Agreement shall be retained by Contracted Party for a minimum of ten (10) years after final payment is made under this Agreement and all pending matters are closed; however, if any audit, litigation or other action arising out of or related in any way to this Project is commenced before the end of the ten (10) year period, the

records shall be retained for one (1) year after all issues arising out of the action are finally resolved or until the end of the ten (10) year period, whichever is later.

Contracted Party is not required to retain the above-mentioned records for the ten (10) year period prescribed in this Section and the "Right to Audit" provision only if all of the following conditions are satisfied:

A. Contracted Party has provided all of the documents described above and in the "Right to Audit" provision to MDEQ prior to the expiration of the ten (10) year retention period and a certification stating the same is simultaneously provided in writing to MDEQ;

B. No audit, litigation or other action arising out of or related in any way to this Project is commenced before Contracted Party provides the records and corresponding certification to MDEQ, in which case, Contracted Party shall retain the records until all issues arising out of the action are finally resolved; and

C. Contracted Party provides MDEQ a minimum of thirty (30) days written notice before providing the above-mentioned records and corresponding certification.

6. RECORD RETENTION AND RIGHT TO AUDIT

The Contracted Party shall maintain and retain books, documents, papers, financial records and other records, including electronic records, as may be prescribed by the MDEQ or by applicable federal and state laws, rules, and regulations. Contracted Party shall retain these records for a period of ten (10) years after final payment. These records shall be made available during the term of the Agreement and the subsequent ten (10) year period for examination, transcription, and audit by MDEQ, the Mississippi State Auditor's Office, its designees, or other authorized bodies, including the Office of Inspector General. If any litigation, claim, investigation, or audit relating to this Agreement or an activity funded under the Agreement is started before the expiration of the ten (10) year period, the records must be retained until all litigation, claims, investigations, or audit findings involving the records have been resolved and final action taken.

7. RIGHT TO INSPECT WORK; SITE ACCESS

MDEQ and their representatives, invitees, and consultants shall have access and the right to conduct announced and unannounced onsite and offsite physical visits to inspect all Work hereunder. Upon request by MDEQ, Contracted Party shall provide MDEQ and its representatives, invitees, and consultants with the opportunity to participate in site inspections, meetings, and/or teleconferences, as appropriate, related to the performance of the Work.

8. CONFLICT OF INTEREST

The Contracted Party covenants that he presently has no interest and shall not acquire any interest direct or indirect in the Project that is the subject to this Agreement or any parcels therein, where applicable, or any other interest which would conflict in any manner or degree with the performance of his services hereunder. The Contracted Party further covenants that, in the performance of this agreement, no person having any such interest shall be employed.

The Contracted Party agrees to establish safeguards to prohibit employees from using positions for a purpose that is or gives the appearance of being motivated by a desire for private gain for themselves or others, particularly those with whom they have a family, business, or other tie.

9. COOPERATION AND EVALUATION

The Contracted Party agrees to assist and cooperate with the MDEQ or its duly designated representatives in the monitoring of the Project(s) to which the Agreement relates, and to provide in form and manner approved by MDEQ such monitoring reports, progress reports, and the like as may be required and to provide such reports at the times specified.

Further, the Contracted Party agrees to cooperate with MDEQ or its duly designated representatives by providing timely responses to all reasonable requests for information to assist in evaluation of the accomplishments of the Project and the agreement for a period of ten (10) years after the date on which the Final Reports are provided.

The contractor certifies or affirms to the best of its knowledge and belief that it fulfilled the terms and conditions of this Attachment.

_____
Signature of Contractor's Authorized Official

_____
Name and Title

_____
Date

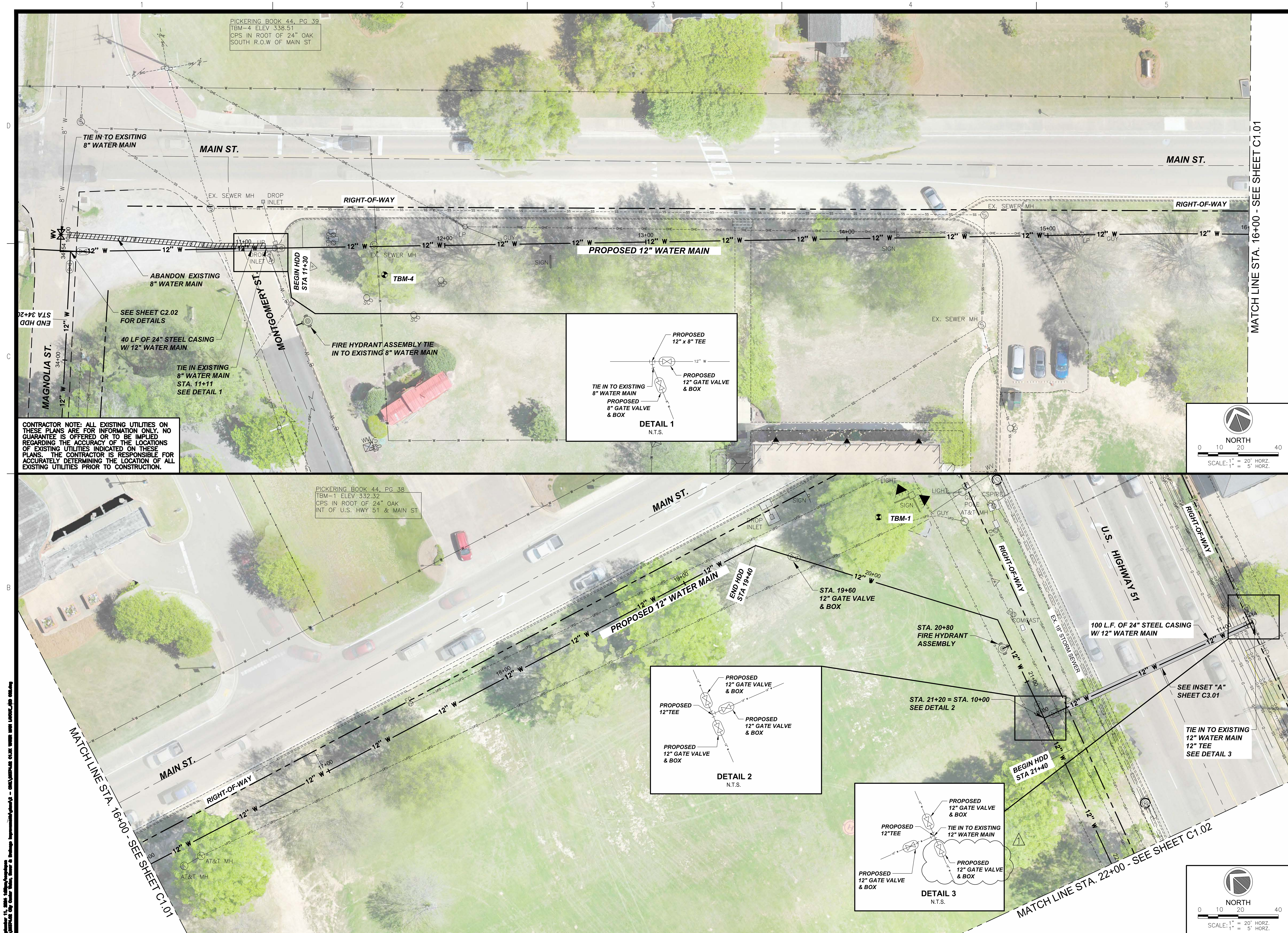
Project MCWI #161-2-DW-5.15 City Center Ware, Sewer, and Drainage Improvements

State of Mississippi

County of Hinds

Personally appeared before, the undersigned authority in and for the said county and state, on this _____ day of _____, 2024, within my jurisdiction, the within named XXXXXXX who acknowledged that he/she/they executed the above and foregoing instrument.

_____ My commission expires: _____
Notary Public



PICKERING BOOK 44, PG 39
TBM-4 ELEV 338.51
CPS IN ROOT OF 24" OAK
SOUTH R.O.W OF MAIN ST
TIE IN TO EXSITING 8" WATER MAIN
MAIN ST.
EX. SEWER MH
DROP INLET
RIGHT-OF-WAY
PROPOSED 12" WATER MAIN
BEGIN HDD STA 11+30
TBM-4
ABANDON EXISTING 8" WATER MAIN
SEE SHEET C2.02 FOR DETAILS
END HDD STA 34+20
40 LF OF 24" STEEL CASING W/ 12" WATER MAIN
TIE IN EXISTING 8" WATER MAIN STA. 11+11 SEE DETAIL 1
MONTGOMERY ST.
MAGNOLIA ST.
FIRE HYDRANT ASSEMBLY TIE IN TO EXISTING 8" WATER MAIN
PROPOSED 12" x 8" TEE
PROPOSED 12" GATE VALVE & BOX
TIE IN TO EXISTING 8" WATER MAIN
PROPOSED 8" GATE VALVE & BOX
DETAIL 1
N.T.S.
MATCH LINE STA. 16+00 - SEE SHEET C1.01
NORTH
SCALE: 1" = 20' HORZ. 1" = 5' HORZ.
CONTRACTOR NOTE: ALL EXISTING UTILITIES ON THESE PLANS ARE FOR INFORMATION ONLY. NO GUARANTEE IS OFFERED OR TO BE IMPLIED REGARDING THE ACCURACY OF THE LOCATIONS OF EXISTING UTILITIES INDICATED ON THESE PLANS. THE CONTRACTOR IS RESPONSIBLE FOR ACCURATELY DETERMINING THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION.
PICKERING BOOK 44, PG 38
TBM-1 ELEV 332.32
CPS IN ROOT OF 24" OAK
INT OF U.S. HWY 51 & MAIN ST
TBM-1
PROPOSED 12" WATER MAIN
END HDD STA 19+40
STA. 19+60 12" GATE VALVE & BOX
STA. 20+80 FIRE HYDRANT ASSEMBLY
U.S. HIGHWAY 51
EX. 18" STORM SEWER
100 L.F. OF 24" STEEL CASING W/ 12" WATER MAIN
SEE INSET "A" SHEET C3.01
STA. 21+20 = STA. 10+00 SEE DETAIL 2
TIE IN TO EXISTING 12" WATER MAIN 12" TEE SEE DETAIL 3
BEGIN HDD STA 21+40
PROPOSED 12" GATE VALVE & BOX
PROPOSED 12"TEE
DETAIL 2
N.T.S.
TIE IN TO EXISTING 12" WATER MAIN
DETAIL 3
N.T.S.
MATCH LINE STA. 16+00 - SEE SHEET C1.01
MATCH LINE STA. 22+00 - SEE SHEET C1.02

REVISIONS:

1	ADD. 1	09-11-24

PROJECT #: 26374.02
DATE: AUGUST 2024
DRAWN BY: JLC
DESIGNER: JNM
CHECKED BY: DMT

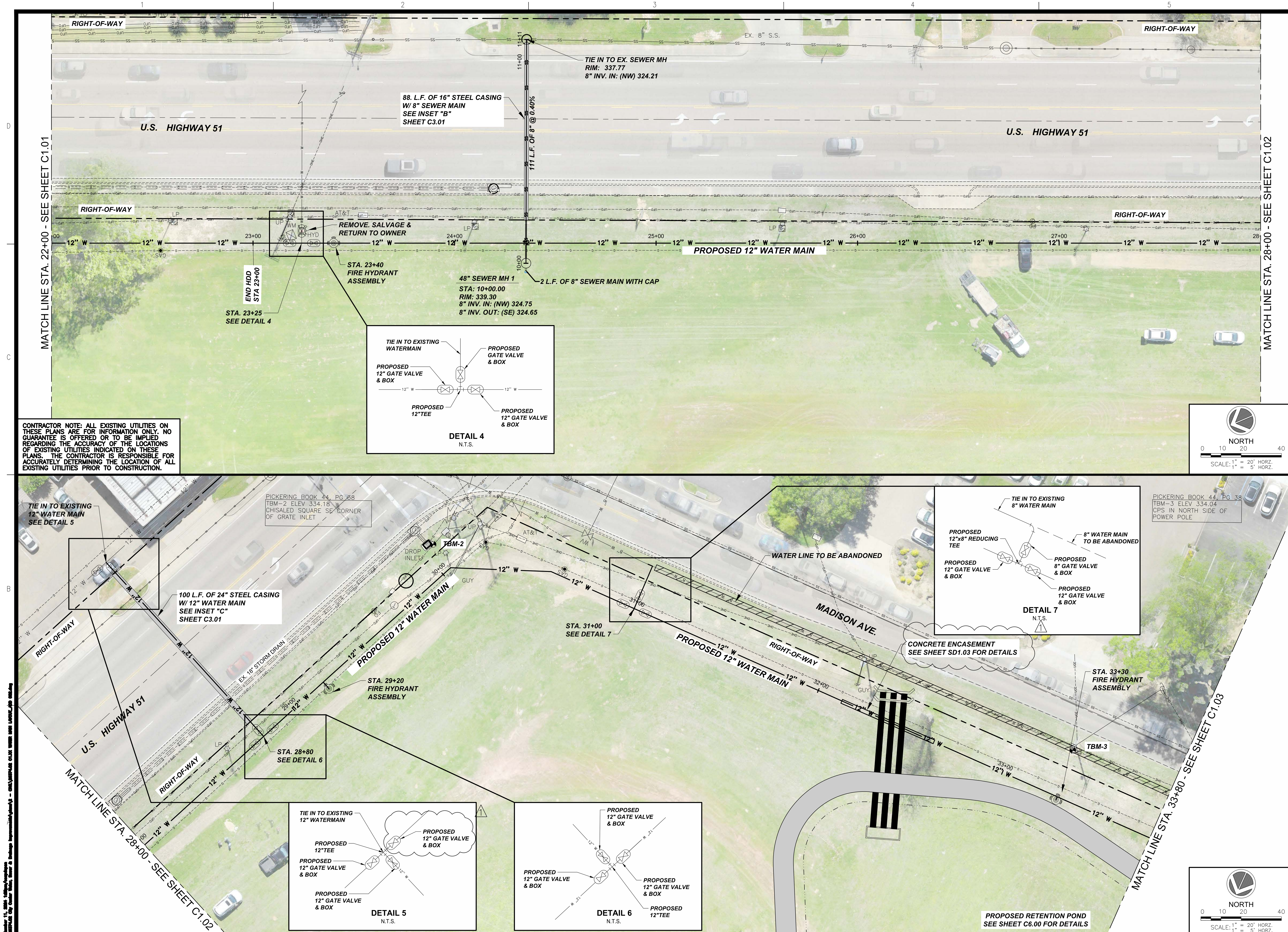
Pickering
Pickering Firm, Inc.
Facility Design • Civil Engineering • Surveying • Transportation • Natural / Water Resources
2001 Airport Drive, Suite 201
Flowood, MS 39232
601.956.3063

CITY OF MADISON
CITY CENTER WATER, SEWER & DRAINAGE IMPROVEMENTS
Madison, Mississippi

SEAL:
CHARLES KEITH CAPDEPON
LICENSED PROFESSIONAL ENGINEER
09-11-24
30033
STATE OF MISSISSIPPI

SHEET NUMBER:
C1.01

DESCRIPTION:
PROPOSED WATER MAIN PLAN VIEWS
STA. 10+00-STA. 22+00



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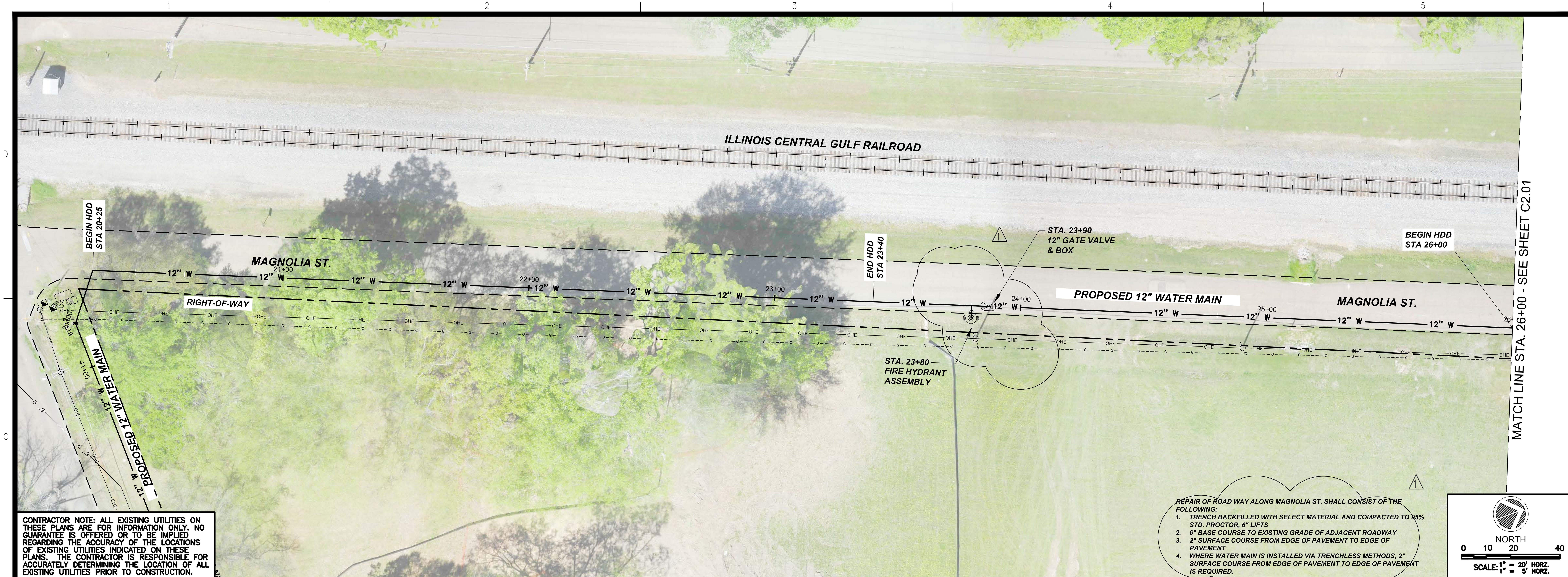
601.956.3063

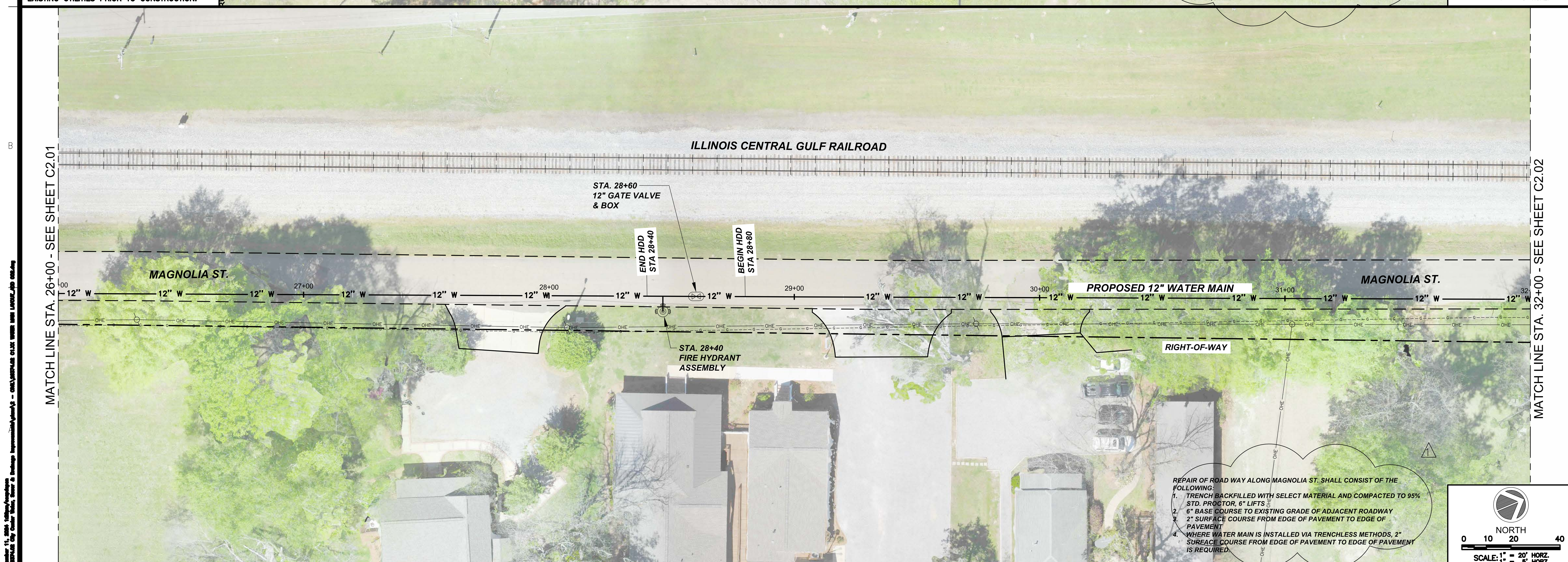
CITY OF MADISON
CITY CENTER WATER, SEWER & DRAINAGE IMPROVEMENTS
Madison, Mississippi

SEAL: CHARLES KEITH CAPDEPON, LICENSED PROFESSIONAL ENGINEER, 30033, STATE OF MISSISSIPPI, 09-16-24

SHEET NUMBER:
C1.02

DESCRIPTION:
PROPOSED WATER MAIN PLAN VIEWS
STA. 22+00-STA. 33+80





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CITY OF MADISON
CITY CENTER WATER, SEWER & DRAINAGE IMPROVEMENTS
Madison, Mississippi

SEAL:
CHARLES KEITH CAPDEPON, III
LICENSED PROFESSIONAL ENGINEER
09-11-24
30033
STATE OF MISSISSIPPI

SHEET NUMBER:
C2.01

DESCRIPTION:
PROPOSED WATER MAIN PLAN VIEWS STA. 20+00-STA. 32+00

REVISIONS:

1	ADD. 1	09-11-24

PROJECT #: 26374.02
DATE: AUGUST 2024
DRAWN BY: JLC
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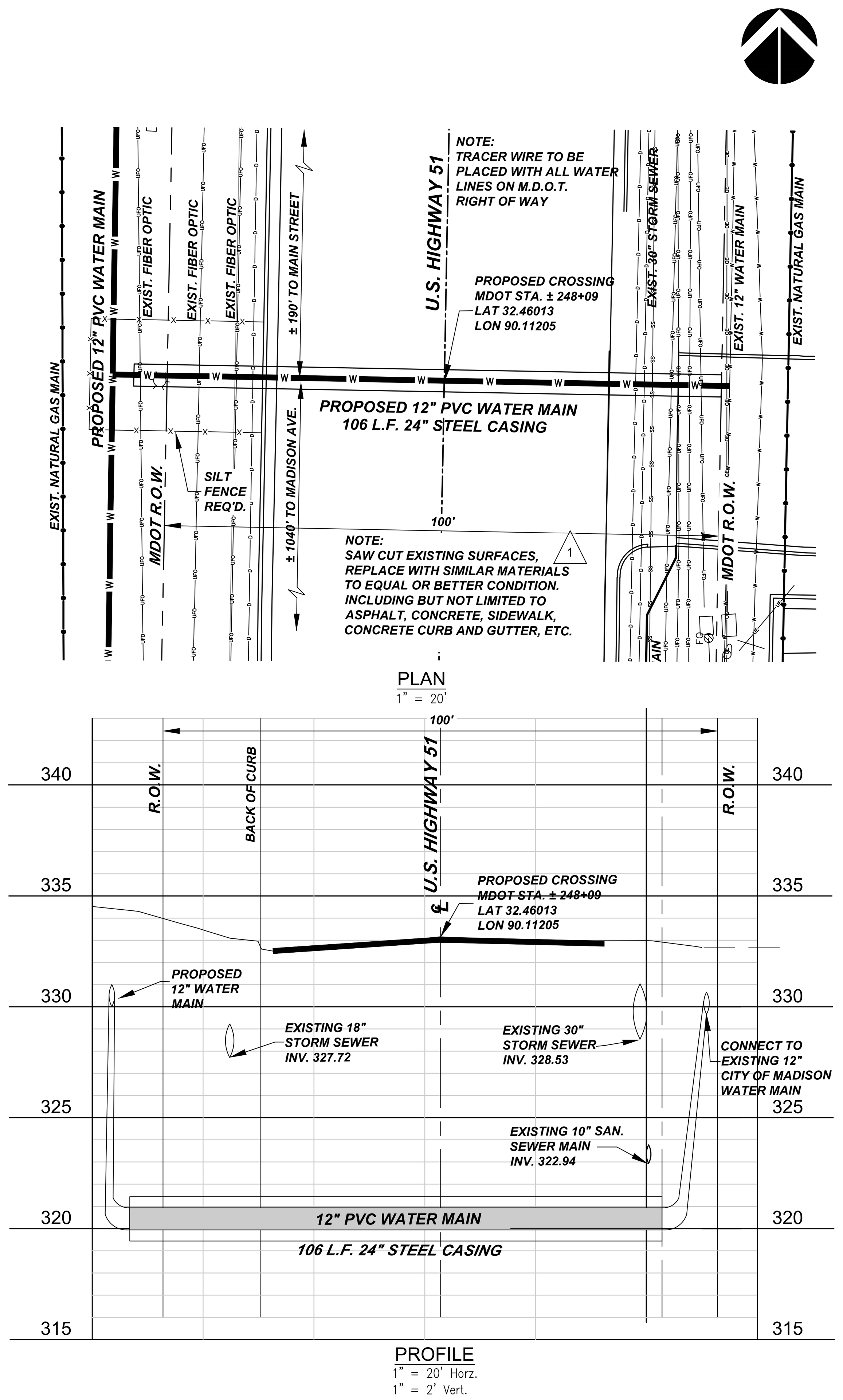
CITY OF MADISON
CITY CENTER WATER, SEWER & DRAINAGE IMPROVEMENTS
Madison, Mississippi

SEAL: CHARLES KEITH CAPDEPON, III — LICENSED PROFESSIONAL ENGINEER — 09-16-24 — 30033 — STATE OF MISSISSIPPI

SHEET NUMBER: C2.03

DESCRIPTION: PROPOSED IRRIGATION WELL



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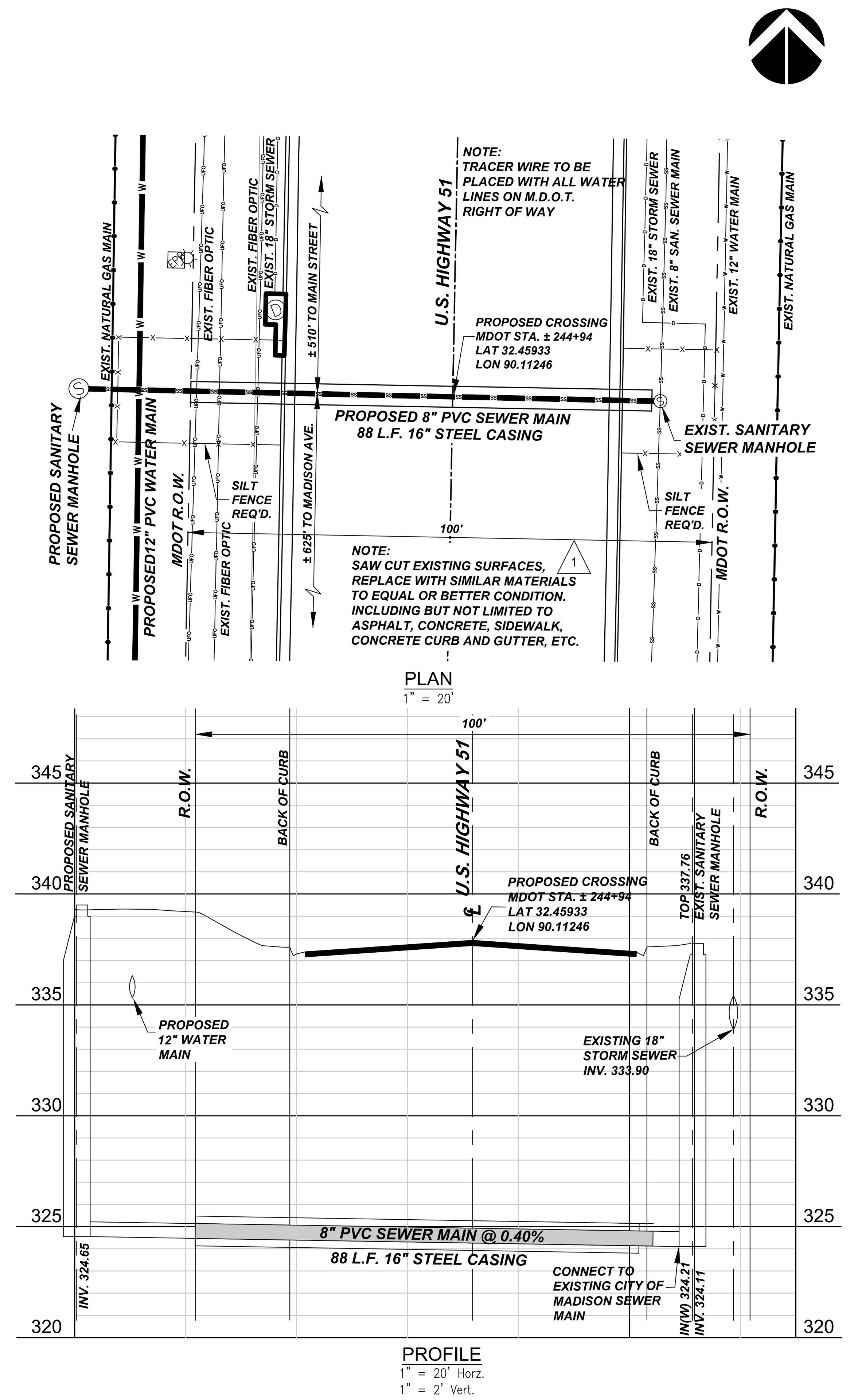

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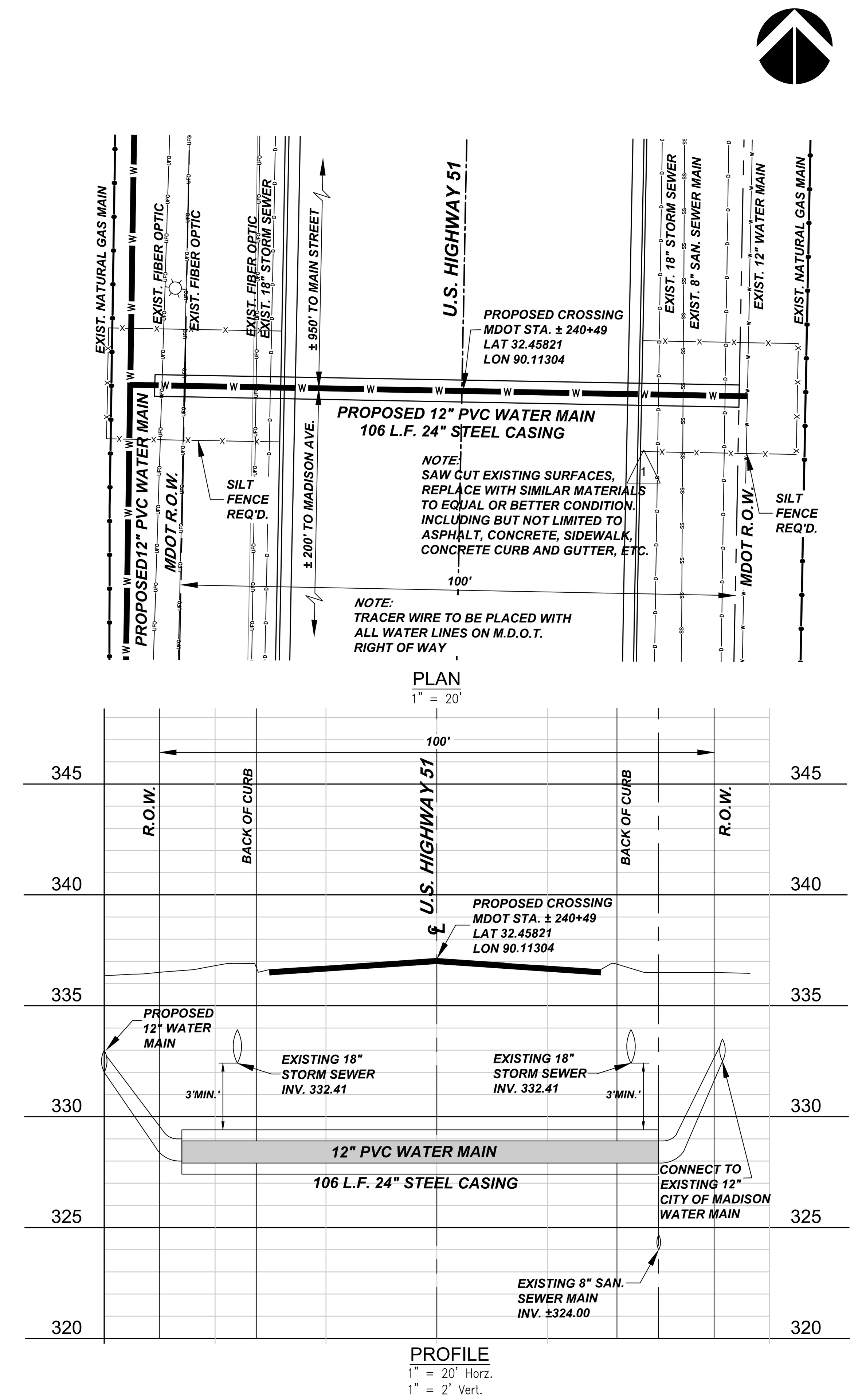

INSET "C"

REVISIONS:

1	ADD 001	09/11/24

PROJECT #: 26374.02
DATE: AUGUST 2024
DRAWN BY: MC
DESIGNER: JNM
CHECKED BY: DMT

Pickering
Pickering Firm, Inc.
Facility Design • Civil Engineering • Surveying • Transportation • Natural / Water Resources
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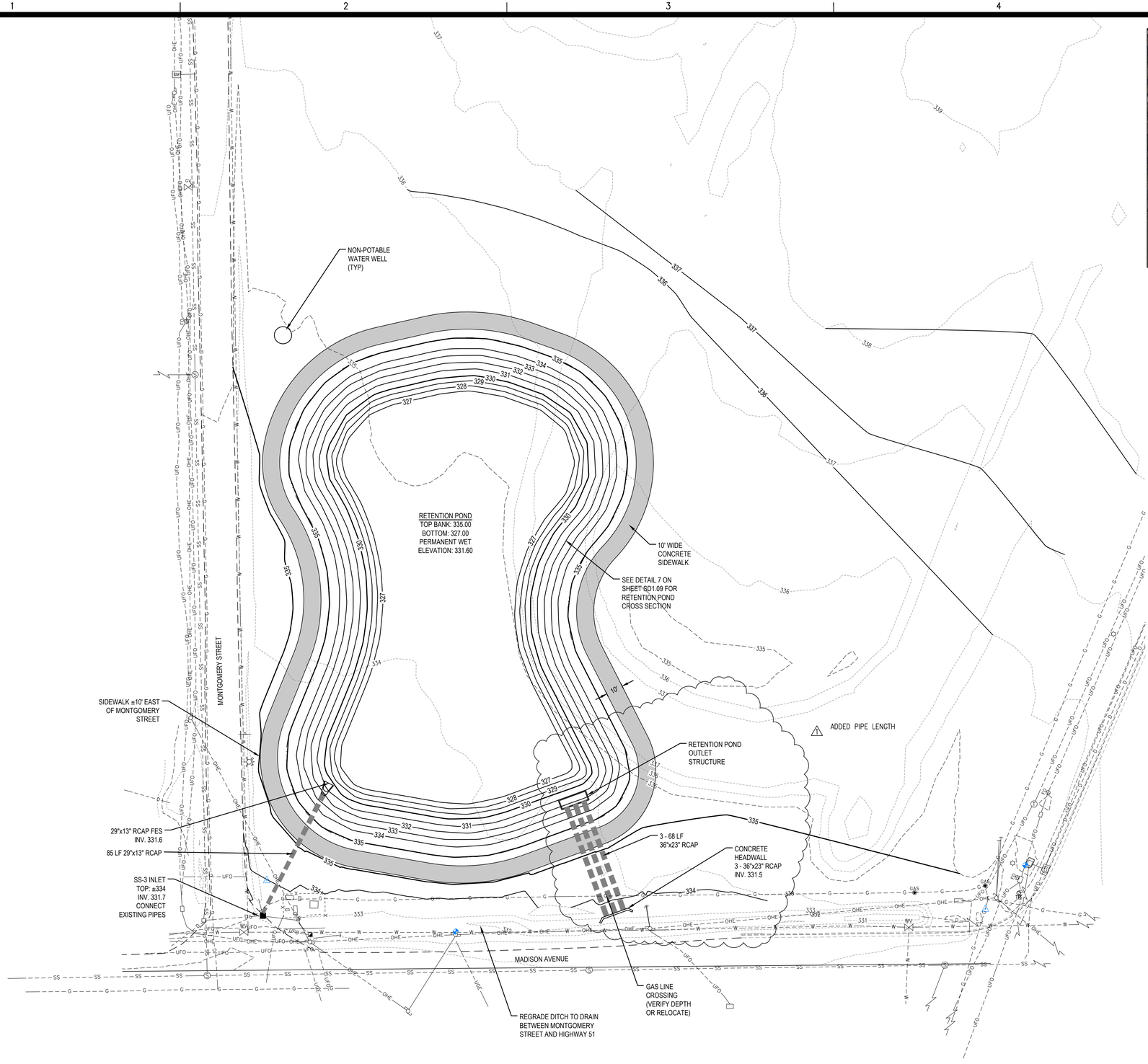
CITY OF MADISON
CITY CENTER WATER, SEWER & DRAINAGE IMPROVEMENTS
Madison, Mississippi

SEAL:
CHARLES KEITH CAPDEPON, III
LICENSED PROFESSIONAL ENGINEER
08-14-24
30033
STATE OF MISSISSIPPI

SHEET NUMBER:
C3.01

DESCRIPTION:
PROPOSED UTILITY CROSSINGS (MDOT PERMITS)



VICINITY MAP

1"=1000'

GRADING AND DRAINAGE NOTES:

1. EARTHWORK OPERATIONS SHALL BE PERFORMED PER THE RECOMMENDATIONS OF THE GEOTECHNICAL INVESTIGATION, PROJECT NO. 240221 PREPARED BY BURNS COOLEY DENNIS, INC. DATED APRIL 26, 2024.
2. ALL AREAS SHALL BE COMPACTED PER THE RECOMMENDATIONS OF THE GEOTECHNICAL INVESTIGATION REPORTS PREPARED BY BURNS COOLEY DENNIS, INC. ALL EFFORTS AND COSTS ASSOCIATED WITH PROCESSING AND/OR DRYING OUT OVER SATURATED SUITABLE MATERIAL IN ORDER TO ACHIEVE OPTIMUM MOISTURE AND COMPACTION SHALL BE INCLUDED IN THE UNIT PRICE FOR UNCLASSIFIED EXCAVATION, OR OTHER ITEMS. THIS SHALL BE NO ADDITIONAL COST TO THE OWNER.
3. SUBGRADES SHALL BE PROOF-ROLLED WITH A LOADED DUMP TRUCK TO DETECT ZONES OF UNSUITABLE AND/OR EXCESSIVELY WET SOILS. IF PUMPING BEGINS, COMPACTION SHALL BE STOPPED IMMEDIATELY AND RESUMED ONLY WHEN THE MATERIAL IS SUFFICIENTLY DRY THAT PUMPING DOES NOT OCCUR.
4. SITE GRADING SHALL PROVIDE POSITIVE DRAINAGE. NO PONDING WATER SHALL BE ACCEPTABLE ON SITE.
5. SEE SHEET C1.0 FOR ADDITIONAL GRADING AND DRAINAGE NOTES.
6. TOP ELEVATION ON SS-2 INLETS=TOP OF CURB.
7. TOP ELEVATION ON SS-3 GRATE INLETS=TOP OF GRATE.
8. TOP ELEVATION ON DRAINAGE MANHOLES=TOP OF RIM.
9. PIPE LENGTHS INCLUDE FLARED END SECTIONS.
10. ADVANCED DRAINAGE SYSTEMS, INC. (ADS) NYLOPLAST PVC DRAIN BASINS, HP PIPE, AND FITTINGS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS AND SPECIFICATIONS.
11. CONTRACTOR TO FURNISH AND INSTALL IRRIGATION SYSTEM FOR LANDSCAPE IMPROVEMENTS ADJACENT TO RETENTION POND. IRRIGATION SYSTEM TO ORIGINATE FROM PROPOSED NON-POTABLE WATER WELL.

⚠1 ADDED NOTE 11

NORTH

0 15 30 60

1 INCH = 30 FEET

REVISIONS:

1	9-11-24	ADDENDUM 1

PROJECT #: 26374.02

DATE: AUGUST 2024

DRAWN BY: SB

DESIGNER: SB

CHECKED BY: DMT

Pickering
Pickering Firm, Inc.
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CITY OF MADISON
CITY CENTER WATER, SEWER & DRAINAGE IMPROVEMENTS
Madison, Mississippi

SEAL:

STEPHEN J. BALDWYN
LICENSED PROFESSIONAL ENGINEER
8-14-24
32255
STATE OF MISSISSIPPI

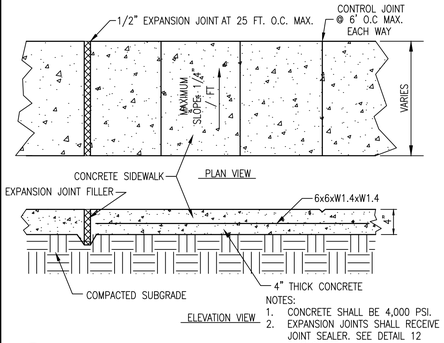
SHEET NUMBER:

C6.0

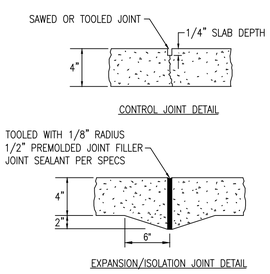
DESCRIPTION:

GRADING & DRAINAGE PLAN

September 10, 2024 3:45pm rbaldwyn
N:\26374.02 City Center Water, Sewer & Drainage Improvements\Plans\Sheets\Stephen Civil\26374.02 C0600-GRADING.dwg

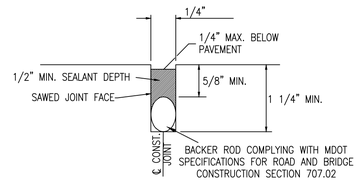


1 CONCRETE SIDEWALK
SCALE: NOT TO SCALE

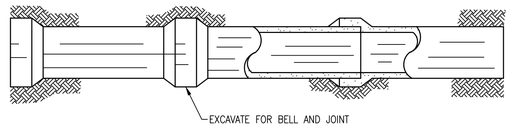


NOTE: THESE DETAILS ARE TYPICAL TO ALL EXTERIOR CONCRETE. EXPANSION JOINTS SHALL BE INSTALLED WHERE A NEW CONCRETE POUR ABUTS EXISTING CONCRETE, BUILDING, CURB OR ANY EXISTING CONSTRUCTION.

2 SIDEWALK JOINT DETAILS
SCALE: NOT TO SCALE



3 SAWED JOINT SEAL - TYPE 2
SCALE: NOT TO SCALE



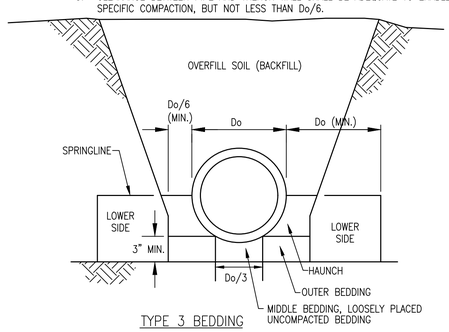
1. ALL ROUND REINFORCED CONCRETE STORM PIPES TO HAVE RUBBER GASKETS AND FILTER FABRIC TYPE V WRAPPED AT ALL JOINTS FOR FULL CIRCUMFERENCE OF PIPE WITH 18"–24" OVERLAP FOR CITY OF MADISON APPROVAL IN FIELD.
2. ALL ARCHED REINFORCED CONCRETE PIPE TO HAVE MASTIC AND FILTER FABRIC WRAPPED AT ALL JOINTS FOR FULL CIRCUMFERENCE OF PIPE WITH 18"–24" OVERLAP FOR CITY OF MADISON APPROVAL IN FIELD.
3. USE POPIT PLUG WITH TAR AND SQUARE TOP FILTER FABRIC TO COVER LIFTING HOLES.

4 STORM SEWER CONSTRUCTION
SCALE: NOT TO SCALE

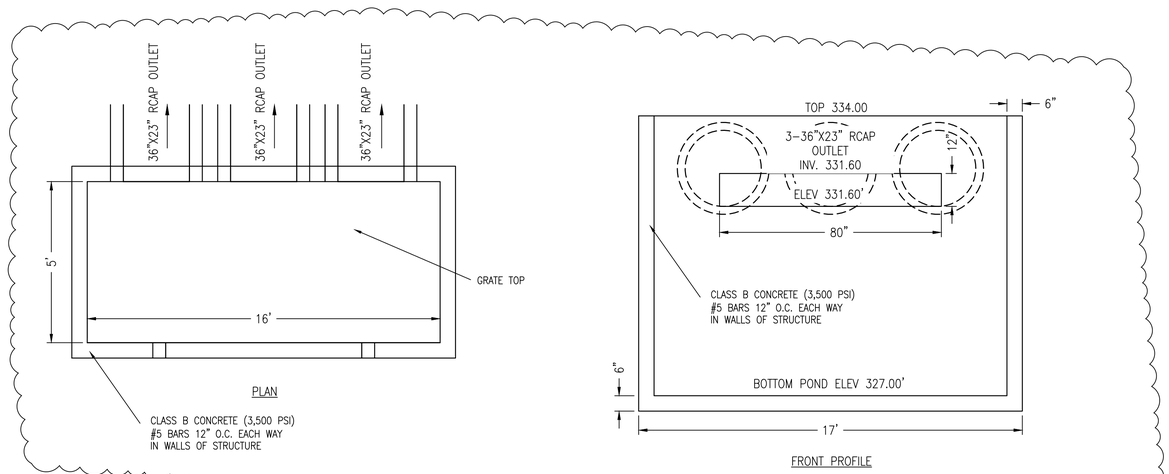
NOTES:

1. BEDDING AND BACKFILL DETAILS ARE PER THE RECOMMENDATIONS OF THE AMERICAN CONCRETE PIPE ASSOCIATION.
2. HAUNCH, OUTER BEDDING, LOWER SIDE, AND OVERFILL SOIL SHALL BE:

   CATEGORY I (GRAVELLY SAND) COMPACTED TO 85% STANDARD PROCTOR, CATEGORY II (SANDY SILT) COMPACTED TO 90% STANDARD PROCTOR, OR CATEGORY III (SILTY CLAY) COMPACTED TO 95% STANDARD PROCTOR.
3. SOIL CATEGORIES I, II, AND III ARE AS DEFINED BY THE AMERICAN CONCRETE PIPE ASSOCIATION.
4. RUBBER GASKET JOINTS REQUIRED.
5. CLEARANCE BETWEEN PIPE AND TRENCH WALL SHALL BE ADEQUATE TO ENABLE SPECIFIC COMPACTION, BUT NOT LESS THAN Do/6.

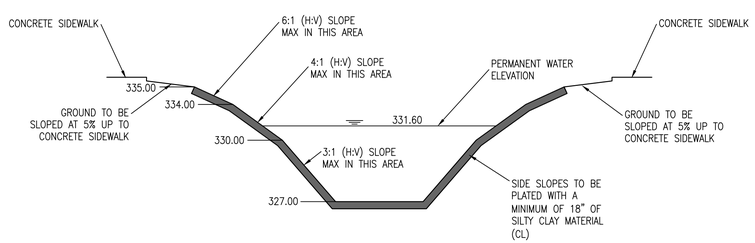


5 CONCRETE PIPE BEDDING / BACKFILL
SCALE: NOT TO SCALE



⚠1 UPDATED PIPE SIZES

6 POND OUTLET STRUCTURE
SCALE: NOT TO SCALE



7 RETENTION POND CROSS SECTION
SCALE: NOT TO SCALE

REVISIONS:

1	9-11-24	ADDENDUM 1

PROJECT #: 26374.02
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DRAWN BY: SB
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CITY OF MADISON
CITY CENTER WATER, SEWER & DRAINAGE IMPROVEMENTS
Madison, Mississippi

SEAL:

SHEET NUMBER:

SD1.09

DESCRIPTION:

SITE CIVIL DETAILS

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 C900 Polyvinyl Chloride (PVC) Pipe, Fusible PVC Pipe, PVC Pipe w/ Integral Restrained Joints, 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 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. Fusible Polyvinyl Chloride (PVC) Pipe:

1. General: This section specifies fusible polyvinylchloride pipe, including acceptable fusion technique and practice, safe handling and storage
2. Quality Assurance:
    a. Contractor shall provide a structurally sound, leak-proof, monolithic polyvinylchloride pipe for all piping identified for installation by horizontal directional drilling. Individual pipe lengths shall be assembled by butt-fusion unless otherwise specified. Connecting fittings shall be fused or mechanically joined to the piping as specified. Contractor shall also be responsible for all installation processes included drilling, back-reaming, management and disposal of all drilling fluid, dewatering flow around his work, and leak testing the fusible polyvinylchloride pipe and fittings in accordance with these specifications.
    b. Supplier shall furnish fusible polyvinylchloride pipe conforming to all applicable standards and procedures, and meeting all applicable testing and material properties as described by those standards or within this specification.
    c. Fusible polyvinylchloride pipe shall be tested at the extrusion facility for properties required to meet all applicable parameters as outlined in AWWA C900, AWWA C905, and applicable sections of ASTM D2241. Testing priority shall be in conformance with AWWA C900 and AWWA C905.
    d. Fusion Technician shall be fully qualified by the pipe supplier to install fusible polyvinylchloride pipe of the type(s) and size(s) being used. Qualification shall be current as of the actual date of fusion performance on the project.
    e. Fusible polyvinylchloride pipe shall be used as manufactured under the trade names Fusible C-900™, Fusible C-905®, and FPVC™, for Underground Solutions, Inc., Poway, CA, (858) 679-9551. Fusion process shall be as patented by Underground Solutions, Inc., Poway, CA, Patent No. 6,982,051.
    f. Wall Thickness: The average wall thickness of the pipe shall not be less than the nominal wall thickness published in the manufacturer's literature, and the minimum wall thickness at any point shall not be less than 87.5% of the nominal wall thickness. The Manufacturer shall furnish documented evidence of wall thickness design and warrant suitability to the proposed installation.
    g. Fusible polyvinylchloride pipe lengths shall be assembled in the field with butt-fused joints. The Contractor shall follow the pipe supplier's written instructions for this procedure. Joint strength

shall be equal to the pipe as demonstrated by testing requirements. All fusion joints shall be completed as described in this specification.

h. Submit the following PRODUCT DATA from the pipe supplier and/or fusion provider:
   i. Name of the pipe manufacturer and a list of the piping and quantities to be provided by manufacturer.
   ii. Product data and pipe supplier data indicating conformance with this specification and applicable standards, including written documentation regarding any intended variance from this specification and applicable standards. This will include experience of pipe supplier by years and number of projects; warranty information; and independent laboratory testing certification.
   iii. Material and pipe property testing in conformance with this specification and applicable standards indicating conformance from the pipe extruder per AWWA C900 and AWWA C905:
      1. Dimensional Checks
      2. Pipe Burst
      3. Flattening
      4. Extrusion Quality (Acetone Immersion)
   iv. Fusion joint data and fusion technician data indicating conformance with this specification and applicable standards, including written documentation regarding any intended variance from this specification and applicable standards. This will include fusion joint warranty information and recommended project specific fusion parameters, including criteria logged and recorded by data logger.
   v. The following AS-RECORDED DATA is required from the contractor and/or fusion provider:
      1. Fusion report for each fusion joint performed on the project, including joints that were rejected. Submittals of the Fusion Technician's joint reports are required as requested by the Owner or Engineer. Specific requirements of the Fusion Technician's joint report shall include:
         a. Pipe Size and Dimensions
         b. Machine Size
         c. Fusion Technician Identification
         d. Job Identification Number
         e. Fusion Number
         f. Fusion, Heating, and Drag Pressure Settings
         g. Heat Plate Temperature
         h. Time Stamp
         i. Heating and Cool Down Time of Fusion

j. Ambient Temperature

2. As-recorded plan and profile data for the actual alignment of the installed pipeline.

a. The as-recorded plan will reflect horizontal offset from the baseline and depth of cover, a maximum of every 25 feet and at all changes in direction, whichever is less.

b. All fittings, valves, or other appurtenances will also be referenced and shown.

c. This document along with tracking log sheets, should they be used, shall be provided to the Owner and/or the Engineer. Tracking log sheet data, should it be employed, shall include any and all that apply, including position, roll angle, tilt angle, depth, and hydraulic pull back force measured.

d. As recorded plans shall show any deviations from the original plans.

3. Fusion Process
    a. Fusible PVC pipe will be handled in a safe and non-destructive manner before, during, and after the fusion process and in accordance with this specification and pipe supplier's recommendations.
    b. Fusible PVC pipe will be fused by qualified fusion technicians, as documented by the pipe supplier. Training records for qualified fusion technicians shall be available to Owner or Engineer upon request.
    c. Each joint fusion shall be recorded and logged by an electronic monitoring device (data logger) affixed to the fusion machine. Joint data shall be submitted as part of the As-Recorded information, in accordance with this specification.
    d. The fusible PVC pipe will be installed in a manner so as not to exceed the recommended bending radius.
    e. Where fusible PVC pipe is installed by pulling in tension, the recommended Safe Pulling Force, according to the pipe supplier, will not be exceeded.
    f. Only appropriately sized, and outfitted fusion machines that have been approved by the pipe supplier shall be used for the fusion process. Fusion machines must incorporate the following properties, including the following elements:
        i. HEAT PLATE - Heat plates shall be in good condition with no deep gouges or scratches within the pipe circle being fused. Plates shall be clean and free of any contamination. Heater controls shall properly function, and cord and plug shall be in good condition. The appropriately sized heat plate shall be capable of maintaining a uniform and consistent heat

profile and temperature for the size of pipe being fused, per the pipe supplier's recommendations.

ii. CARRIAGE – Carriage shall travel smoothly with no binding at less than 50 psi. Jaws shall be in good condition with proper inserts for the pipe size being fused. Insert pins shall be installed with no interference to carriage travel.

iii. GENERAL MACHINE - Overview of machine body shall yield no obvious defects, missing parts, or potential safety issues during fusion.

iv. DATALOGGER - The current version of the pipe supplier's recommended and compatible software shall be used. Protective case shall be utilized for the hand held wireless portion of the unit. Datalogger operations and maintenance manual shall be with the unit at all times. If fusing for extended periods of time, an independent 110V power source shall be available to extend battery life.

g. Other equipment specifically required for the fusion process shall include the following:

i. Pipe rollers shall be used for support of pipe to either side of the machine

ii. A weather protection canopy that allows full machine motion of the heat plate, fusion assembly and carriage shall be provided for fusion in inclement and /or windy weather.

iii. Fusion machine operations and maintenance manual shall be kept with the fusion machine at all times.

iv. Facing blades specifically designed for cutting fusible polyvinylchloride pipe.

h. Each fusion joint shall be recorded and logged by an electronic monitoring device (data logger) connected to the fusion machine. The fusion data logging and joint report shall be generated by software developed specifically for the fusion of fusible polyvinylchloride pipe. The software shall include fusible PVC pipe based dimensional data and fusible PVC pipe based interfacial pressure relationships. Data not logged by the data logger shall be logged manually and be included in the Fusion Technician's joint report.

D. PVC Pipe w/ Restrained Joints

1

1. **PVC pipe with restrained joints shall meet the requirements of AWWA C900. The minimum pressure rating shall be 235 psi with a maximum dimension ratio (DR) of 18.**
2. **Unless otherwise specified, restrained joint polyvinyl chloride pipe lengths shall be assembled in the field using an integral, gasketed, restrained joint.**

The Contractor shall follow the pipe supplier's written guidelines for joining the product.

1

3. **At a minimum, restrained joint shall be rated to provide the following pull force capabilities with a minimum safety factor of two being applied to the ultimate tensile capacity of the joint.**

Nominal Size (in)	Safe Pulling Force (lbs)
4	11,200
6	24,700
8	25,800
10	42,100
12	61,800
14	80,000
16	100,000
18	130,000
20	160,000
24	195,000

4. **The cartridge-loaded, restrained joint shall use a high deflection, profile gasket per ASTM F477. Standard gasket material shall be styrene-butadiene rubber (SBR). Optional, special order nitrile rubber gaskets shall be used where indicated in the construction documents. O-rings or similar gaskets shall not be allowed.**
5. **The assembled restrained joint shall meet the requirements of ASTM D3139.**
6. **The assembled restrained joint shall allow for expansion and contraction within the joint.**
7. **Installation guidelines from the pipe supplier shall be followed for all installations.**
8. **The pipe shall be installed in a manner so as not to exceed the recommended minimum bending radius.**
9. **Where installed by pulling in tension, the recommended safe pulling force established by the pipe supplier shall not be exceeded.**

E. 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.

F. 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.

G. 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 350 PSI and be tested at 700 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.

H. 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.

I. 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.

J. 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.

K. Corporation Stops and Curb Stops: Corporation stops and curb stops shall be as described in Section 2.3, or approved equal.

L. 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.

M. 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.

N. 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.

O. 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.

P. Tracer Wire: See Section 33 05 97 – “Tracer Wire”

Q. Tapping Sleeves: Hot tap sleeves shall be stainless steel and as described in Section 2.3, or approved equal.

R. Valve Insertion: Valve insertion shall be as described in Section 2.3, or approved equal. Installer shall have successfully completed 50 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.

2.3 SUMMARY OF MATERIALS

The following materials, or approved equals, shall be used:

Summary of Materials	
DIP gasket seal	Super-Bel Tite by Clow Corporation
DIP joint restraints	Sure Stop gaskets by McWane or Field Lok by US Pipe
PVC pipe joint restraints	Romac Series 600 bell joint restraint
Restrained joint water pipe	EBBA IRON “Mega-Lug” System
Gate valves	Mueller Series 2360
Check valves	Mueller
Pressure Relief Valves	Model 66-D by GA Industries
Air Release Valves	Bermad C30
CTS service tubing	Pressure Flex by A-D Technologies or Driscopipe 5100 Ultra-Line by Phillips 66 Company
Fire hydrants	Mueller A-423
Valve Boxes	East Jordan Iron Works
Curb stops	Ford B43-342W-G
Corporation Stop	Ford F10004G
Service saddles	Mueller Company
Water meters	Badger, Neptune Meter Company, Hershey Products, Inc.
Tracer wire terminals	3M DBR/Y6
Tapping sleeves	Mueller Company
Valve insertion	Romac QuikValve for sizes 4”-8” Romac InstaValve for sizes 10-12”
Copper Meter Yokes	Mueller Company
Branch Connection	Mueller Company
Butterfly Valves	Mueller

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, 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 $\pm$ 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:*

NOMINAL DIAMETER	100 FOOT SECTION	1000 FOOT SECTION	**NOMINAL DIAMETER**	100 FOOT SECTION	1000 FOOT SECTION
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
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*

	PVC PIPE (1,000 FT.)		D.I. PIPE (1,000 FT.)	
DIAMETER (Inches)	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
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. Fire hydrant locations may be adjusted in the field to maximize their utility. No additional compensation will be provided for fire hydrant adjustments resulting in greater depths of bury or increased distance between the tee and the hydrant.

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 **