

Nancy Koon (adpce.ad)

From: Deena Thuston (adpce.ad) on behalf of Water Permit Application
Sent: Friday, November 4, 2022 3:08 PM
To: Nancy Koon (adpce.ad)
Subject: FW: Paradise Valley (NPDES Draft Permit AR0053210)
Attachments: FW_ Saddle Ranch approval letter.pdf; 104461 D8 A1 Paradise Valley Sub Ph 1 W & S and WWTP Lift station and FMs, and outfall 10 22 2021.pdf; 104461 D8 Signed Paradise Valley Sewer Specs.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

From: Robert Reaves [<mailto:Robert.Reaves@arkansas.gov>]
Sent: Friday, November 4, 2022 11:09 AM
To: Water Permit Application
Cc: Craig Corder; Shada Roberts; Lance Jones
Subject: Paradise Valley (NPDES Draft Permit AR0053210)

To whom it may concern,

This email serves to inform you that ADH's understanding is the wastewater plant will not be constructed and the subdivision's sewage will be sent to a different wastewater plant.

Attached are the approved plans, specifications and letter sent to Joe White & Associates, Inc.

The Pulaski County Property Owners Multipurpose Improvement District No. 2021-2 informed us that they decided to route their wastewater to the Waterview Estates treatment facility instead of constructing a WWTP which was their initial intention. The plans for the proposed wastewater plant are considered unapproved by the Arkansas Department of Health. We recently were informed about a letter sent on October 26, 2022 to the improvement district indicating the plant would be constructed.

Please contact me if you have any questions,

Robert Reaves, P.E.
Engineer Supervisor
ADH Engineering Section
501-661-2066

From: [Craig Corder](#)
To: [Stephen Youngblood](#); [Shada Roberts](#)
Subject: FW: Saddle Ranch approval letter
Date: Friday, March 11, 2022 9:22:28 AM
Attachments: [20220311082034979.pdf](#)

See below, please get them a letter extending the approval.

Craig

From: Joe White <jwhite@joewhiteassociates.com>
Sent: Friday, March 11, 2022 9:13 AM
To: Craig Corder <Craig.Corder@arkansas.gov>
Cc: RICKFERGUSON777@GMAIL.COM
Subject: Saddle Ranch approval letter

Craig,

Good morning. Hope you are doing well.

Rick Ferguson who is copied asked me to forward you the attached approval letter from May of last year. Stephen Youngblood also included the approval letter you signed back in August of 2018.

As you and Rick discussed, he would like to get this approval extended for another year.

Let me know if you need anything additional from me.

We appreciate your help.

Joe White, Jr.



25 Rahling Circle, Suite A-2
Little Rock, AR 72223
Office: (501) 214-9141
Cell: (501) 680-5987

Website: www.joewhiteassociates.com

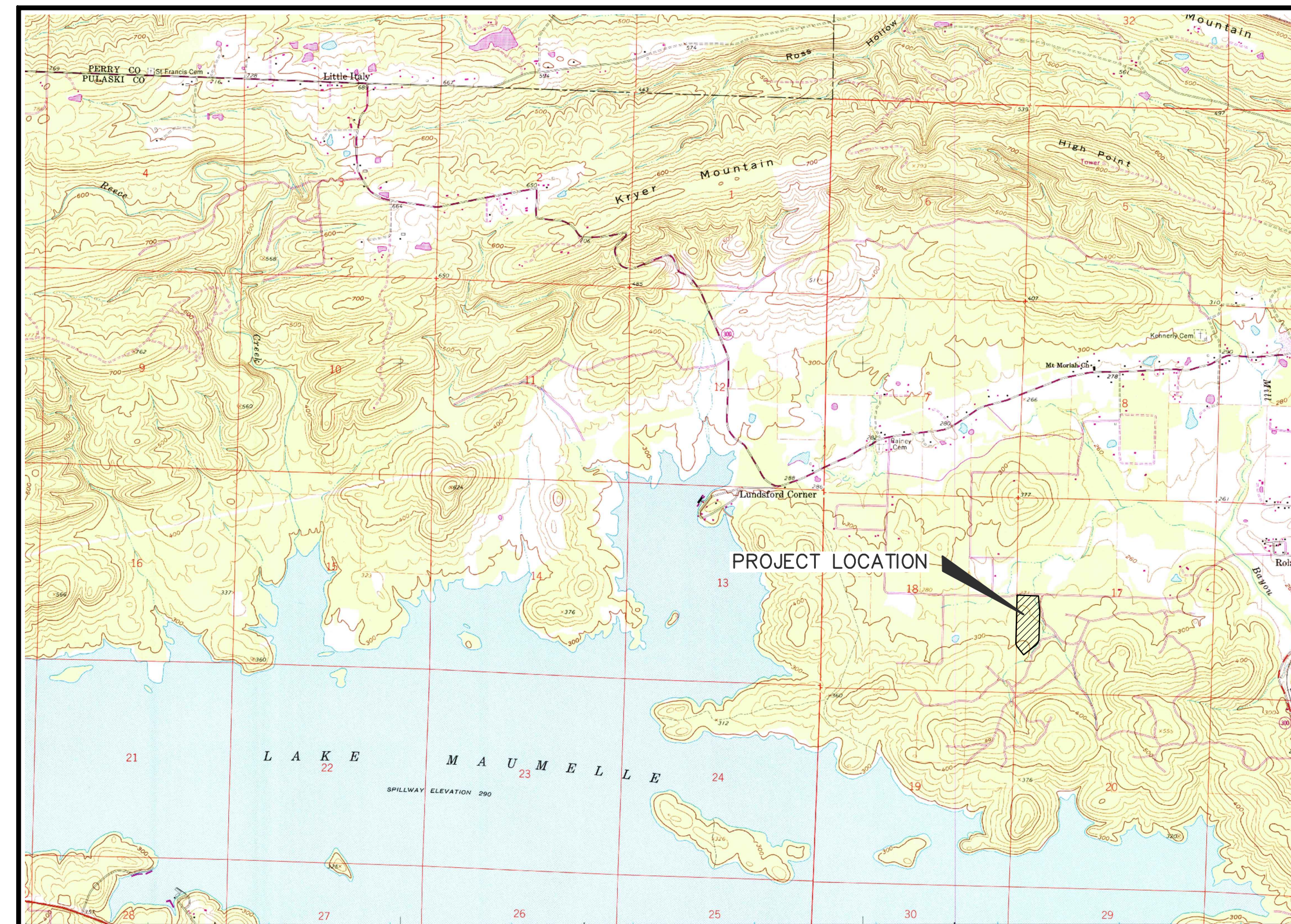
CONSTRUCTION PLANS FOR:

GRADING, PAVING, DRAINAGE,
SANITARY SEWER AND WATER SYSTEM

PARADISE VALLEY PHASE 1

AN ADDITION TO PULASKI COUNTY
BEING PART OF SECTION 17, T-3-N, R-14-W

SHEET LIST TABLE	
SHEET NUMBER	SHEET TITLE
01	TITLE SHEET
02	OVERALL KEY MAP
03	KEY MAP
04	EROSION CONTROL PLAN
05	SITE GRADING PLAN
06	STORM WATER DETENTION
07	PARADISE VALLEY DRIVE
08	PARADISE VALLEY LANE
09-10	STANDARD DETAILS
11	WASTEWATER TREATMENT PLANT
11B	LIFT STATION DETAIL
11C	WWTP STANDARD DETAILS
12-13	SANITARY SEWER LINE 'A'
14	SANITARY SEWER LINE 'A-1'
15	SANITARY SEWER LINE 'A-1-A'
16-17	SANITARY SEWER DETAILS
18	WATER PLAN
19-20	WATER DETAILS

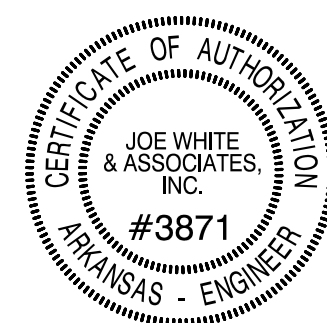


VICINITY MAP
(1"=3000')

OWNER/DEVELOPER:
WATERVIEW MEADOWS, LLC
11324 ARCADE DRIVE, SUITE 12
LITTLE ROCK, AR 72212



JOE WHITE & ASSOCIATES, INC.
CIVIL ENGINEERING - CONSULTING SERVICES - LAND SURVEYING
25 RAHLING CIRCLE, SUITE A-2 LITTLE ROCK, ARKANSAS 72223
PHONE: (501) 214-9141





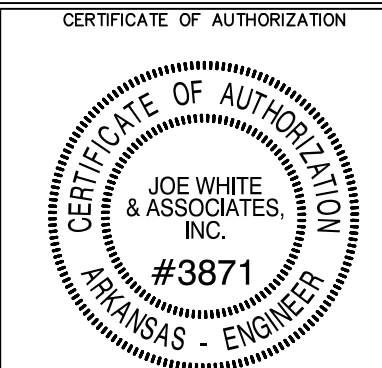
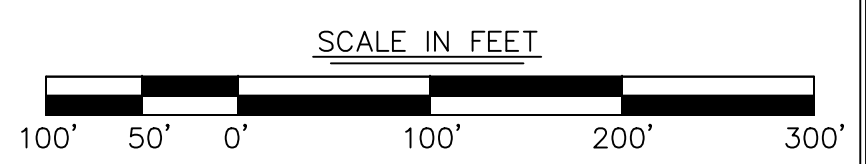
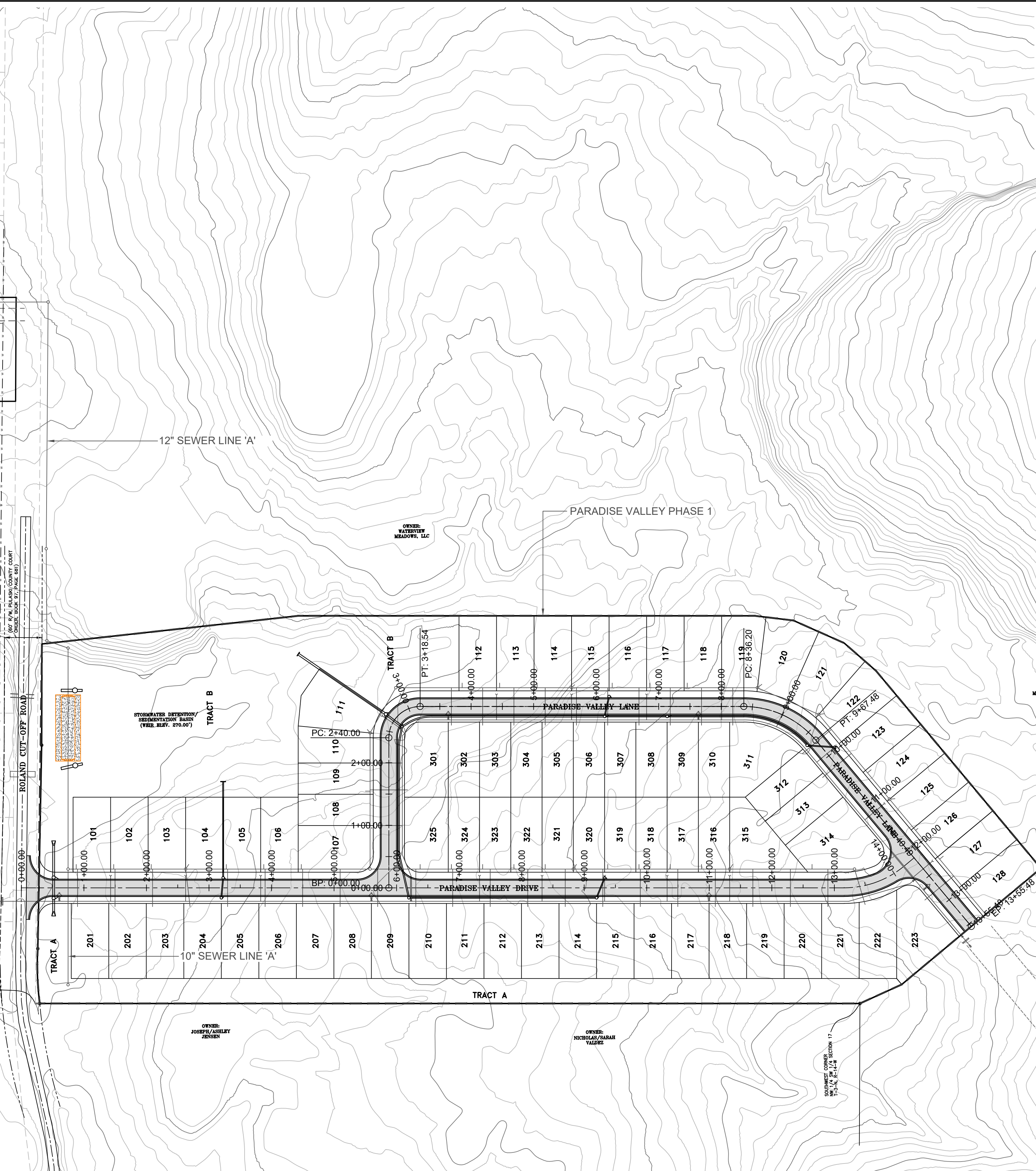
WASTEWATER TREATMENT PLANT
(SEE SHEET C11, C11A & C11B)

12" SEWER LINE 'A'

PARADISE VALLEY PHASE 1

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DATE	DESCRIPTION	BY

C02 - OVERALL KEY MAP

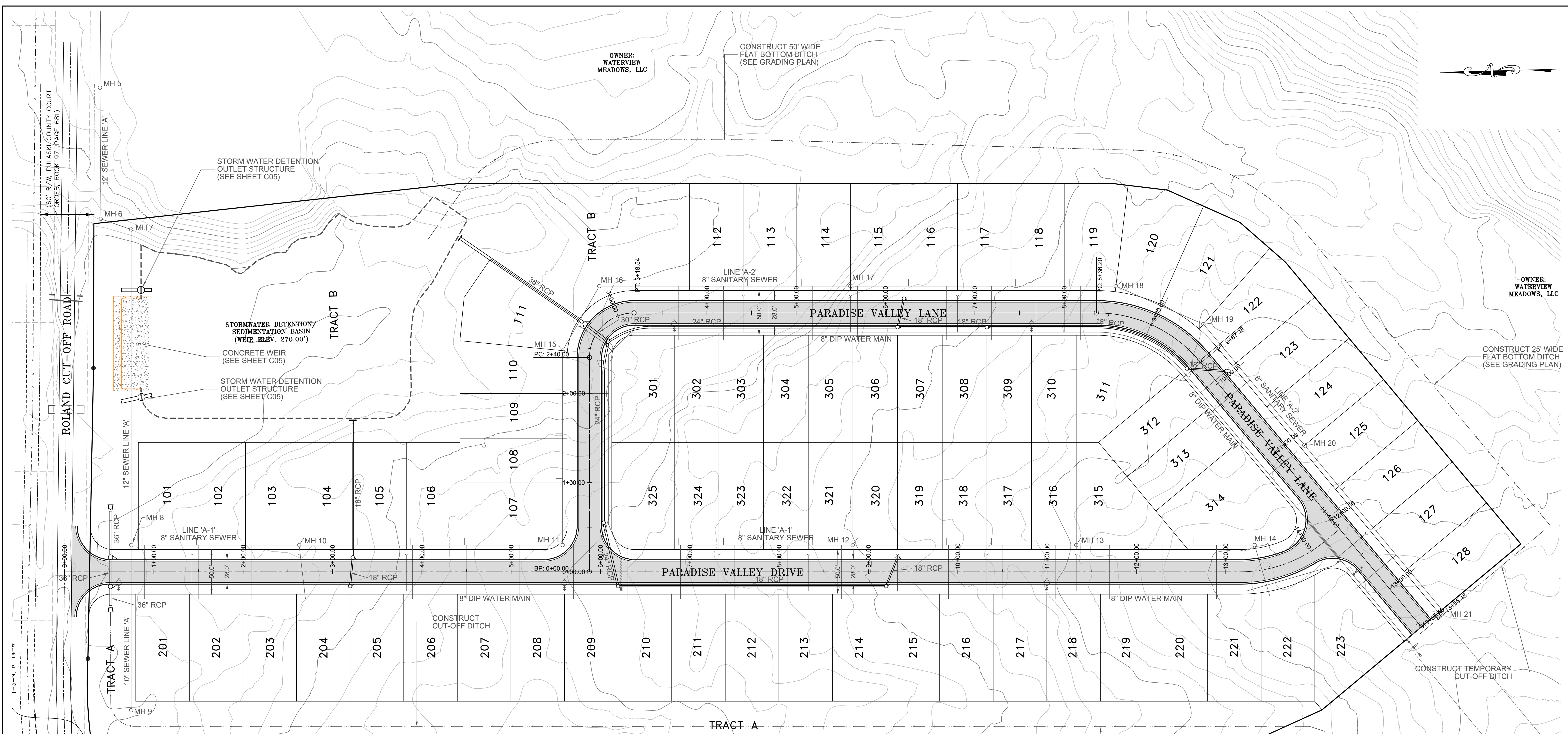
**PARADISE VALLEY
PHASE 1**

LOTS 101-128, BLOCK 1
LOTS 201-223, BLOCK 2
LOTS 301-325, BLOCK 3
TRACTS A & B

AN ADDITION TO PULASKI COUNTY
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JOE WHITE & ASSOCIATES, INC.
 CIVIL ENGINEERING - CONSULTING SERVICES - LAND SURVEYING
 25 RAHLING CIRCLE, SUITE A-2
 LITTLE ROCK, ARKANSAS 72223
 PHONE: (501) 214-9141

DATE:	10-06-2021	SCALE:	1" = 100'
PROJECT NUMBER:	21-038J		



OWNER:
JOSEPH/ASHLEY
JENSEN

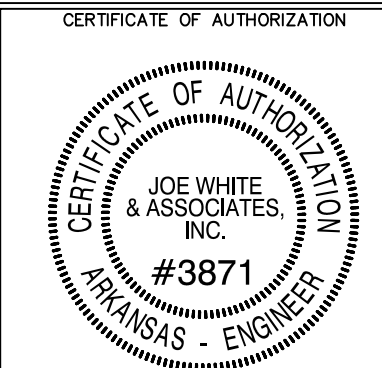
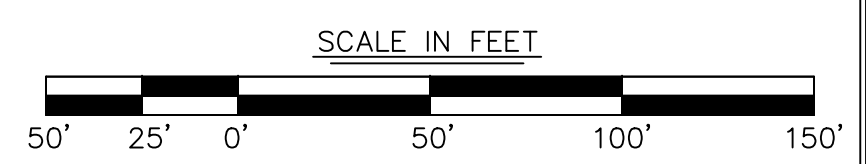
OWNER:
WATERVIEW
MEADOWS, LLC

OWNER:
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MEADOWS, LLC

OWNER:
NICHOLAS/SARAH
VALDEZ

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C03 - KEY MAP

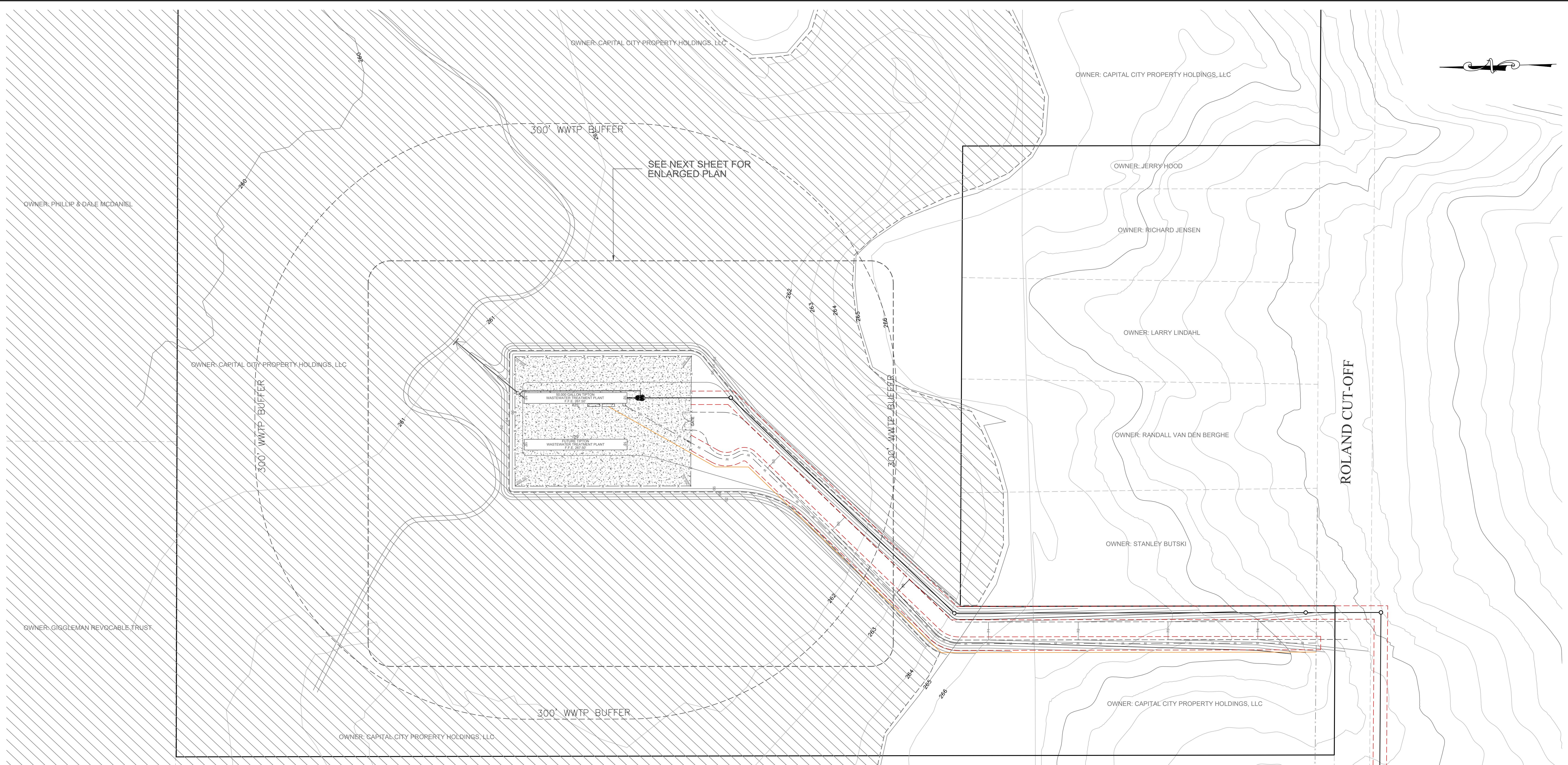
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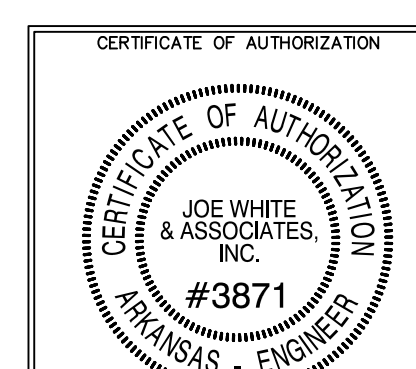
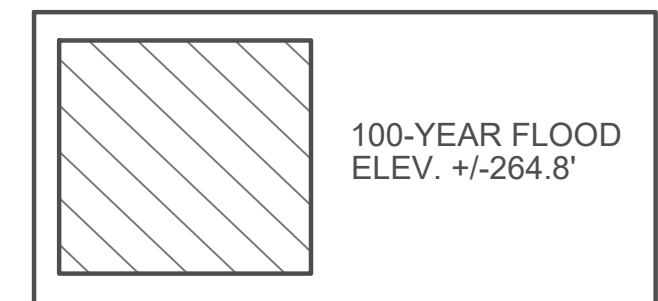
DATE: 10-06-2021 SCALE: 1" = 50'
PROJECT NUMBER: 21-038J



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OWNER: ROBBIE & BRIDGET HUDSON



SCALE IN FEET

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C11 - WASTEWATER TREATMENT PLANT OVERALL PLAN

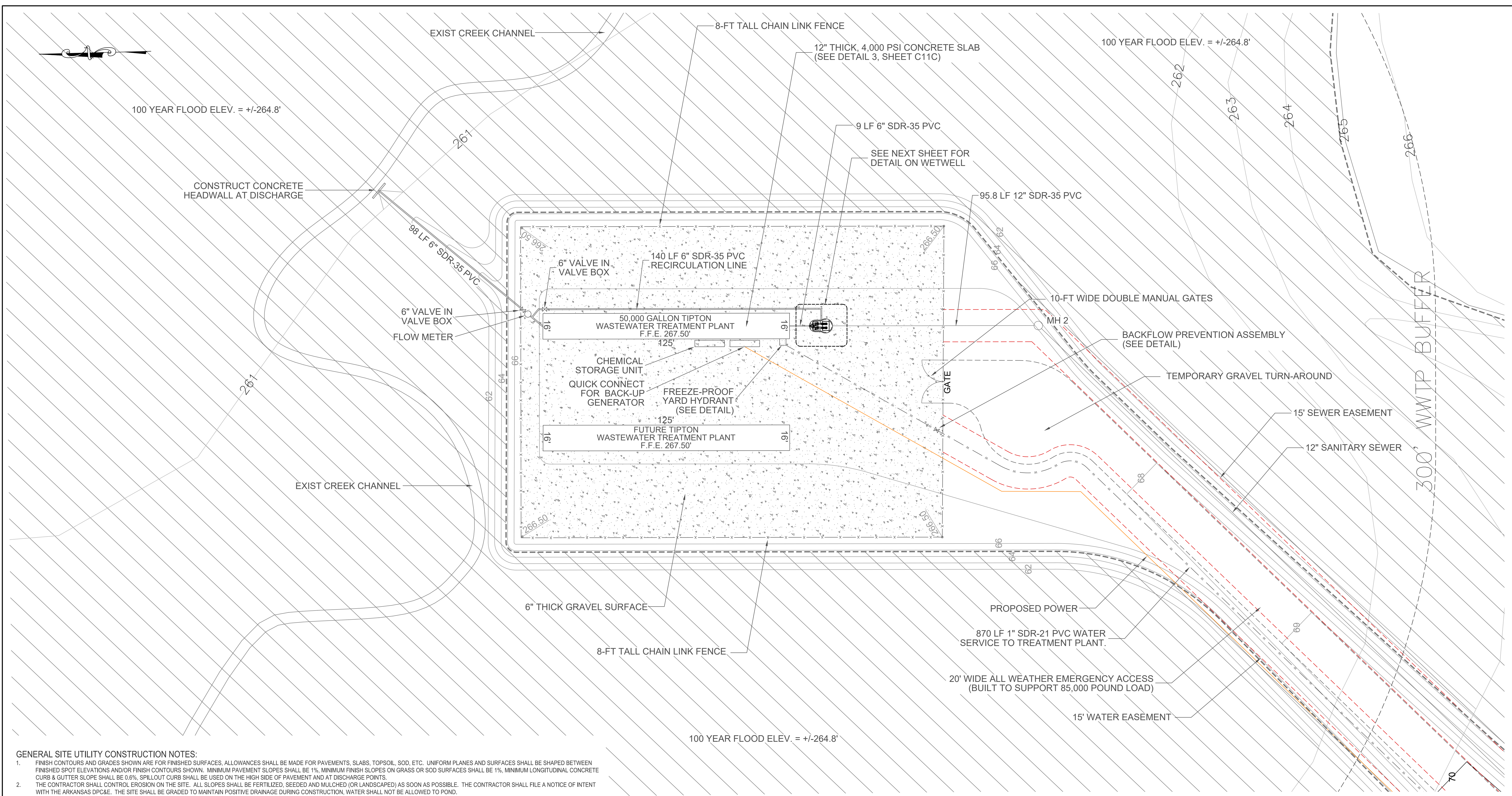
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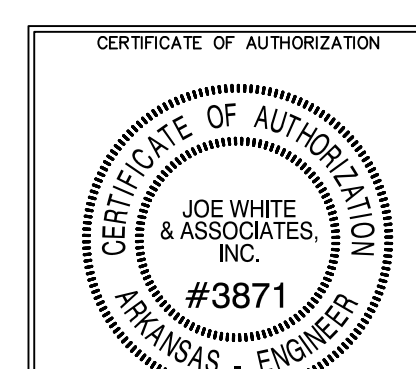
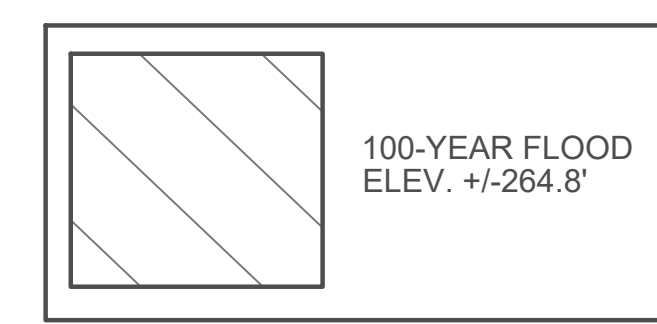


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2. THE CONTRACTOR SHALL CONTROL EROSION ON THE SITE. ALL SLOPES SHALL BE FERTILIZED, SEEDED AND MULCHED (OR LANDSCAPED) AS SOON AS POSSIBLE. THE CONTRACTOR SHALL FILE A NOTICE OF INTENT WITH THE ARKANSAS DPC&E. THE SITE SHALL BE GRADED TO MAINTAIN POSITIVE DRAINAGE DURING CONSTRUCTION. WATER SHALL NOT BE ALLOWED TO POND.
3. ALL AREAS TO BE CUT OR FILLED SHALL BE CLEARED AND GRUBBED. THE MAXIMUM FILL SLOPE SHALL BE 3:1. ALL FILLS SHALL BE MADE IN 8" LIFTS AND COMPACTED, AT OPTIMUM MOISTURE CONTENT TO 95% OF MODIFIED PROCTOR DENSITY (ASTM D-1557), AS DETERMINED BY IN-PLACE DENSITY TESTS. BORROW AND FILL MATERIAL SHALL BE SELECT CLAY SAND OR SANDY CLAY HAVING A LIQUID LIMIT LESS THAN 40 OR OTHER APPROVED FILL. FILL SOILS CLASSIFYING AS SC OR GC ACCORDING TO THE UNIFIED SOILS CLASSIFICATION SYSTEM ARE CONSIDERED SUITABLE. SHALE MATERIAL USED IN FILL SHALL BE COMPACTED AT 3% ABOVE OPTIMUM MOISTURE CONTENT WITH A VIBRATORY SHEEPS FOOT COMPACTOR.
4. THE CONTRACTOR SHALL COORDINATE WITH EACH UTILITY COMPANY PRIOR TO ANY EXCAVATION. ANY DAMAGE TO UTILITY LINES CAUSED BY THE CONTRACTORS OPERATIONS SHALL BE REPAIRED AT THE CONTRACTORS EXPENSE. THE CONTRACTOR SHALL VERIFY THE HORIZONTAL AND VERTICAL ALIGNMENT OF EXISTING AND PROPOSED STORM SEWER, SANITARY SEWER AND WATER LINES TO ENSURE THAT THEY ARE INSTALLED WITH ADEQUATE COVER AND CLEARANCE. ALL ROUGH GRADING SHALL BE COMPLETE BEFORE INSTALLATION OF STORM SEWER, SANITARY SEWER AND APPURTENANCES, WATER MAINS, SERVICES AND APPURTENANCES. ALL UTILITY TRENCHES SHALL BE BACKFILLED AND COMPACTED WITH SELECT MATERIAL AS SPECIFIED IN NOTE #3 ABOVE.
5. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LAWS, CODES AND ORDINANCES GOVERNING WORK OF THIS TYPE.
6. THE INSTALLATION OF ALL CULVERT PIPE TO BE IN ACCORDANCE WITH AHTD SPECIFICATIONS.
7. ALL EXISTING IMPROVEMENTS WHICH INTERFERE WITH THE WORK, AND ARE NOT TO BE SAVED SHALL BE REMOVED AND DISPOSED OF. IMPROVEMENTS IN THE RIGHT-OF-WAY WHICH ARE TO REMAIN SHALL BE PROTECTED BY THE CONTRACTOR.
8. ALL REINFORCED CONCRETE PIPE (RCP) SHALL BE CLASS III WITH BELL AND SPIGOT TYPE JOINTS. PIPE, MATERIAL AND INSTALLATION SHALL BE IN CONFORMANCE WITH APPLICABLE ARKANSAS HIGHWAY AND TRANSPORTATION DEPARTMENT (AHTD) STANDARD CONSTRUCTION.
9. ALL WATER MAINS AND SEWER MAINS AND THEIR APPURTENANCES INCLUDING INSTALLATION, SHALL COMPLY WITH THE LATEST MAUMELLE WATER CORP SPECIFICATIONS AND THE PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 (PARADISE VALLEY SUBDIVISION). CONNECTIONS SHALL NOT BE MADE TO EXISTING LINES UNTIL NEW CONSTRUCTION HAS BEEN TESTED AND APPROVED BY THE UTILITY.
10. THE CONTRACTORS ATTENTION IS SPECIFICALLY CALLED TO THE LOCATION OF THE EXISTING IMPROVEMENTS. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR DAMAGING ANY EXISTING IMPROVEMENTS WHICH ARE TO REMAIN. PRIOR TO SUBMITTING HIS BID, THE CONTRACTOR SHALL REVIEW THE PLANS AND SPECIFICATIONS. HE SHALL VISIT THE SITE AND INSPECT THE CONDITION OF THE SITE AND THE ADJACENT IMPROVEMENTS.
11. THE CONTRACTOR SHALL CALL "ONE-CALL" FOR LOCATION OF ALL UTILITIES PRIOR TO COMMENCEMENT OF ANY EXCAVATION.
12. ANY EXCESS EXCAVATED MATERIAL, NOT REQUIRED FOR CONSTRUCTION OF FILLS SHALL BE DISPOSED OFFSITE.
13. THE PULASKI COUNTY PROPERTY OWNER'S MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 (PARADISE VALLEY SUBDIVISION) IS RESPONSIBLE FOR THE MAINTENANCE AND OPERATION OF THE WASTEWATER TREATMENT PLANT. THE SEWER IMPROVEMENT DISTRICT SHALL ALSO BE RESPONSIBLE FOR THE SEWER COLLECTION SYSTEM OF THE SUBDIVISION.
14. THE CURRENT OWNERSHIP OF THE WWTP SITE IS CAPITAL CITY PROPERTY HOLDINGS, LLC, BUT THE UNDERLYING OWNERSHIP OF THE PROPERTY IS BEING TRANSFERRED TO SOUTHWEST EQUITY IMPROVEMENTS, LLC. THE VARIOUS OWNERSHIPS IN THE DISTRICT INCLUDE WATERVIEW ESTATES, LLC, WATERVIEW MEADOWS, LLC AND SOUTHWEST EQUITY INVESTMENTS, LLC.



SCALE IN FEET

DATE	DESCRIPTION	BY

C11A - WASTEWATER TREATMENT PLANT

PARADISE VALLEY PHASE 1

LOTS 101-128, BLOCK 1
 LOTS 201-223, BLOCK 2
 LOTS 301-325, BLOCK 3
 TRACTS A & B

AN ADDITION TO PULASKI COUNTY
 BEING PART OF SECTION 17, T-3-N, R-14-W



DATE:	10-06-2021	SCALE:	1" = 20'
PROJECT NUMBER:	21-038J		

NOTE:
TOP OF WETWELL & VALVE VAULT TO BE
A MINIMUM OF 6" ABOVE THE FINISHED GRADE.

267.50'

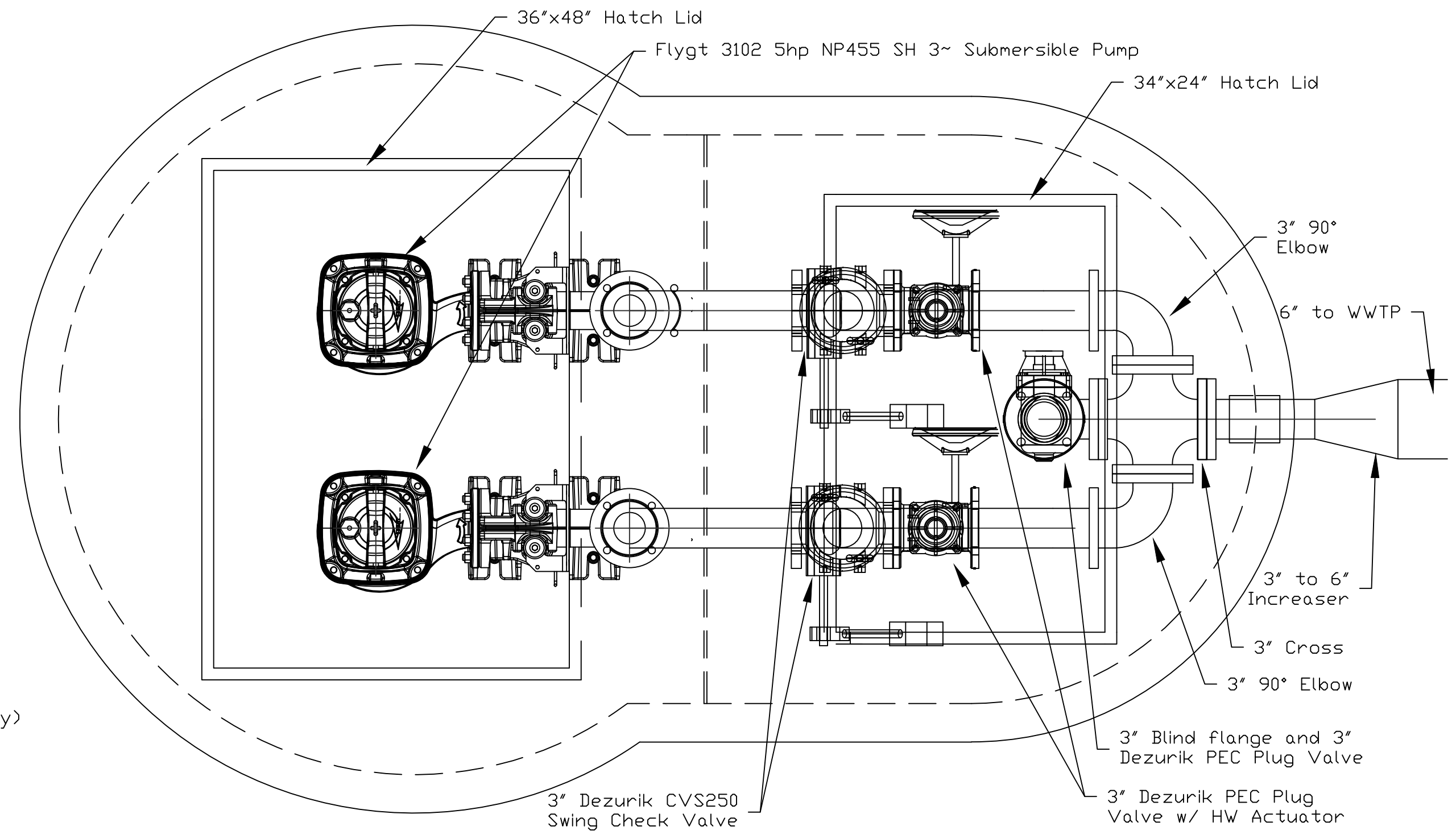
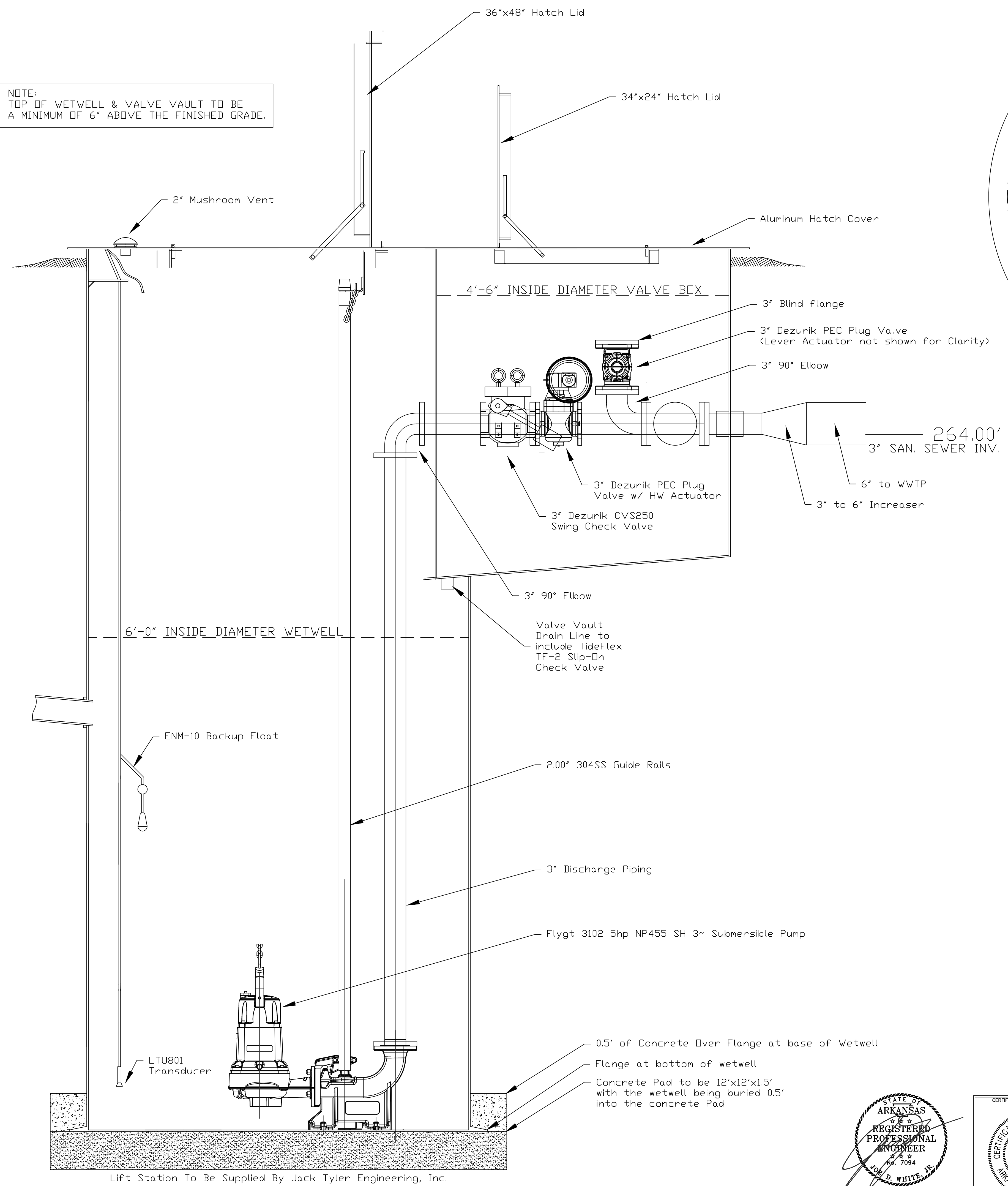
257.48'
12" SAN. SEWER INV.

256.48'
CENTER FLOAT

254.28'
TOP PUMP

252.65'
TRANSDUCER

252.00'
BOTTOM WETWELL



Lift Station Details As Built And Supplied By Jack Tyler Engineering, Inc. "Or Equals" Are Not Permitted.

- Basin To Be 72"x180" FRP, Keyhole Style With Attached 54"x54" Valve Vault And Anti-Flotation Ring.
- Pumps To Be Flygt 3102, 5HP, NP 455 SH3~ Adaptive Pump 460V 3Ph. Rated At 107GPM At 25' TDH.
- Pump Guide Rail System To Be Flygt Standard with 316ss Upper Guide Rail Bracket, A35 Cast Iron Metal to Metal Discharge Elbow and, 2" 304ss Guide Rails..
- Duplex Control Panel To Have The Following Features:
NEMA 4X Stainless Steel Enclosure, Aluminum Inner Door And Backplate, Pump Alternation, Surge Suppression, Audible And Flashing Alarms. Pumps to be controlled with the utilization of Flygt Smartrun Intelligent Pump Control Drives
- Controls to utilize Flygt LTU801 Transducer and ENM-10 Backup Float.
- Guide Rails To Be 304 Stainless Steel.
- Lifting Chain To Be 3/8" 316SS Chain.
- 3" Dezurik Swing Check and Plug Valves to be Supplied for each pump.
- One (1) 3" Plug Valve shall be supplied with a blind flange to allow for emergency bypass pumping.
- Pass-Through Sleeves From Basin To Valve Vault and Valve Vault To Discharge Line To Use Link-Seals For Sealing.
- Alarms to have battery backup power

Electrical Note: For ease of service panel to be mounted on unistrut, no more than 10 feet from the edge of the basin. Panel may not be mounted directly to the basin.

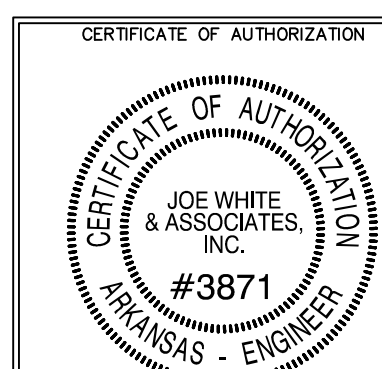
C11B - LIFT STATION DETAIL

**PARADISE VALLEY
PHASE 1**

LOTS 101-128, BLOCK 1
LOTS 201-223, BLOCK 2
LOTS 301-325, BLOCK 3
TRACTS A & B

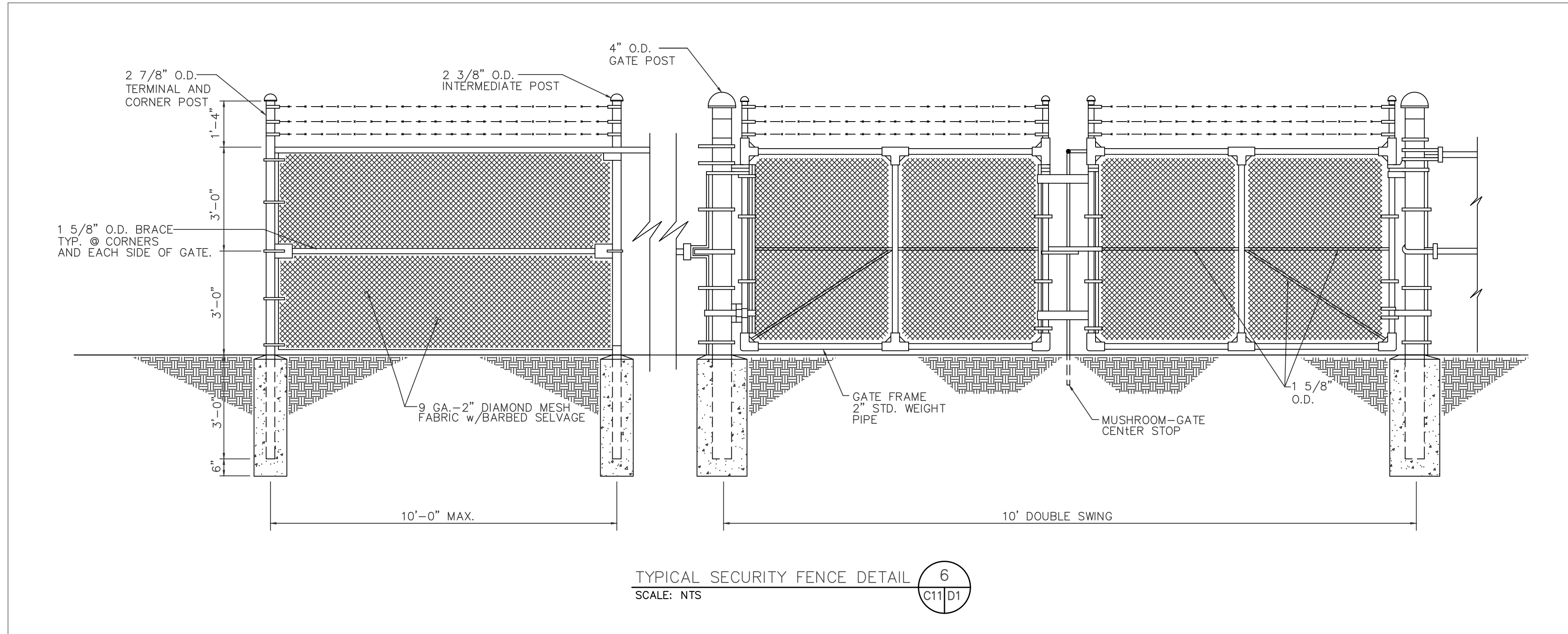
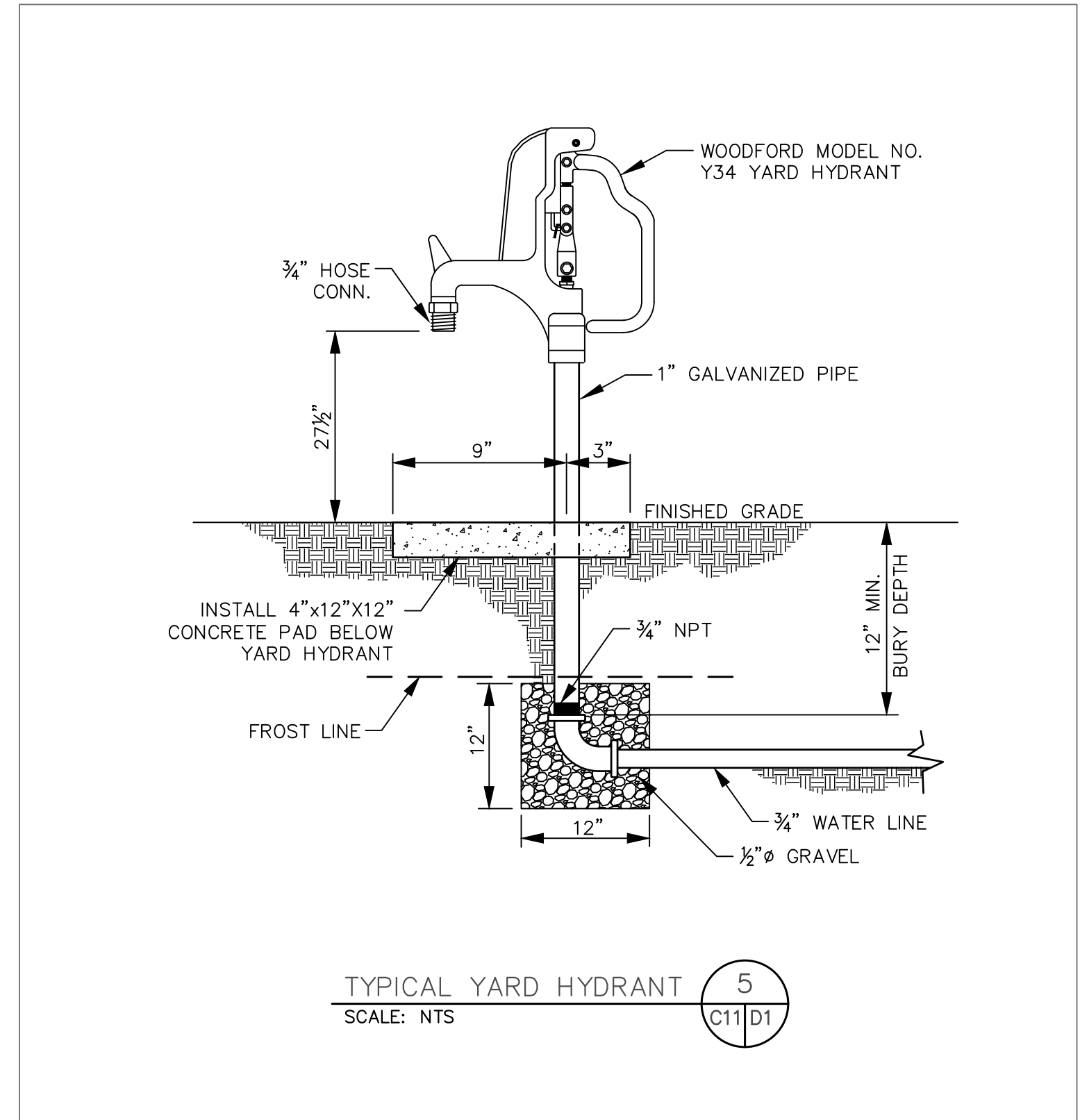
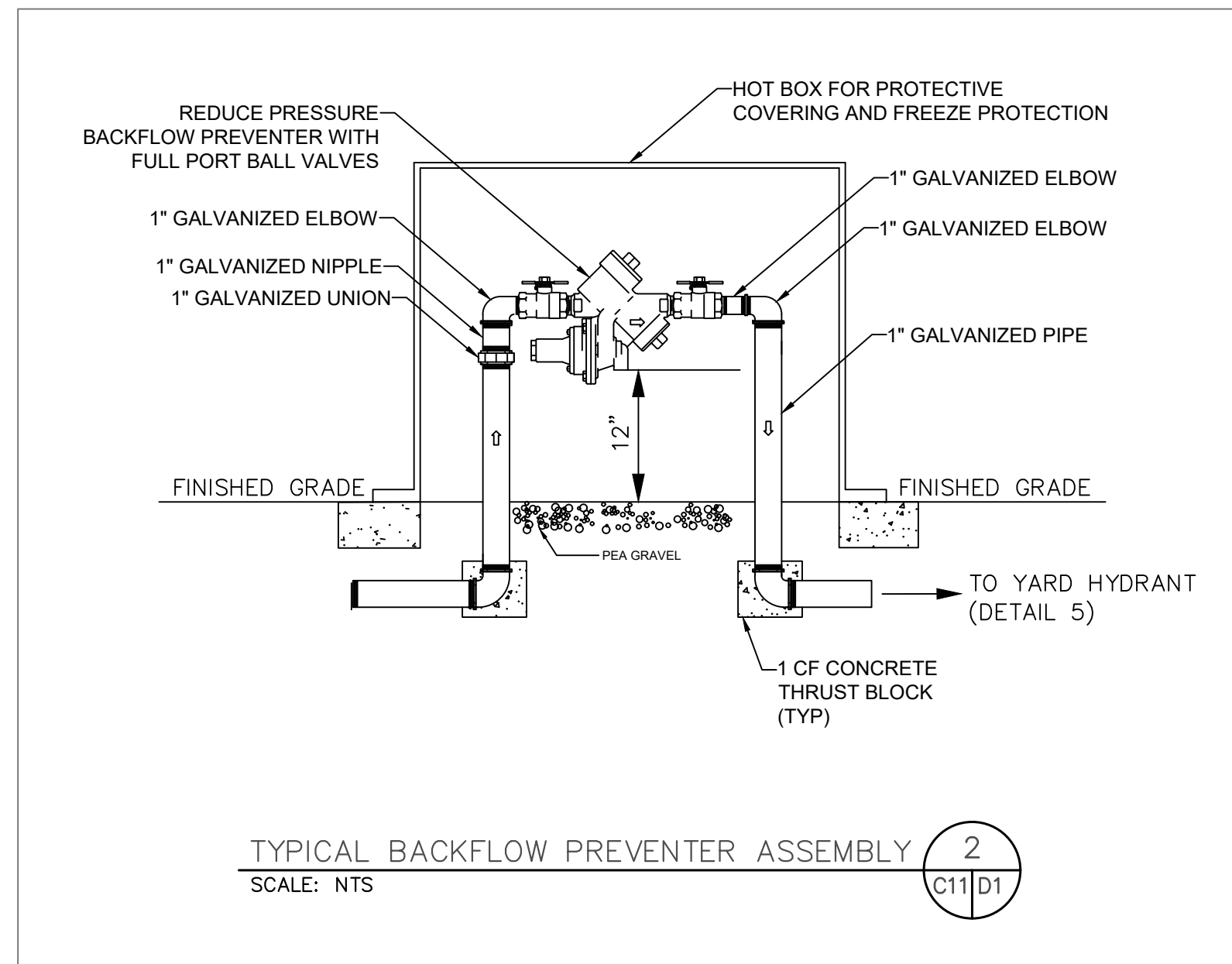
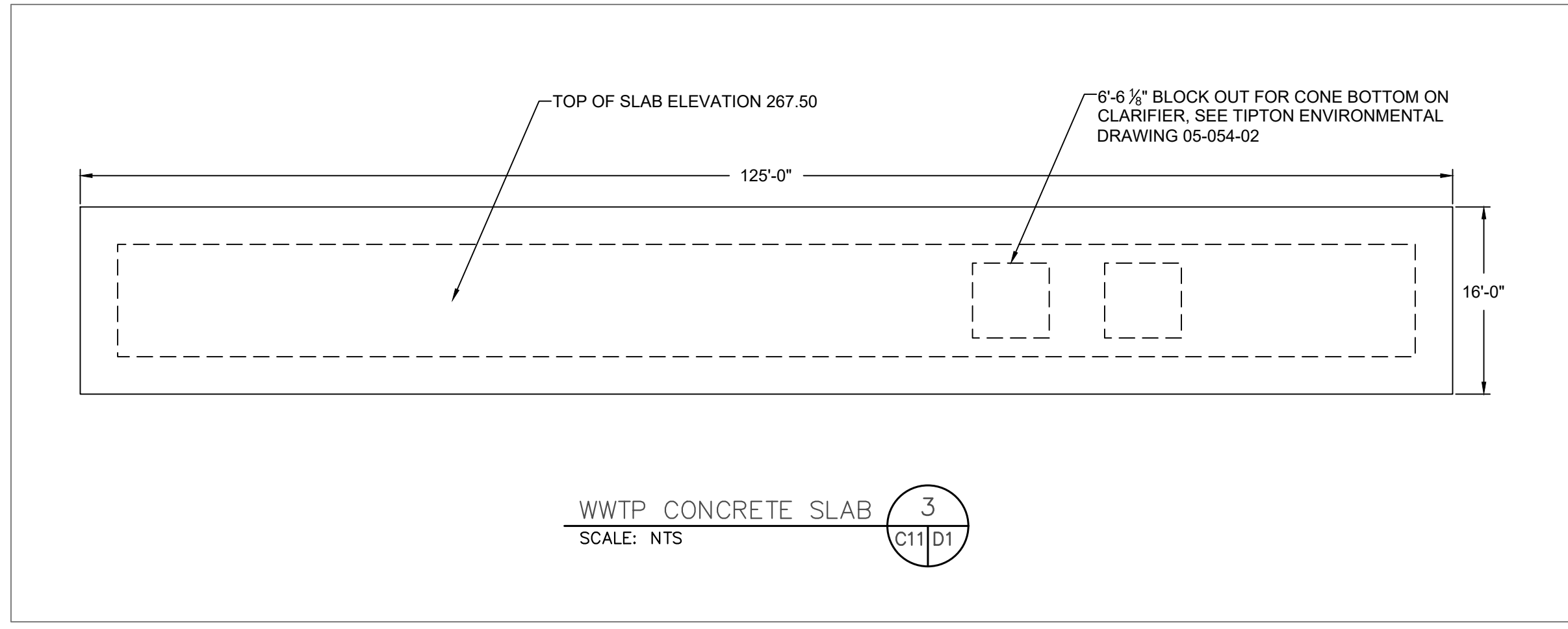
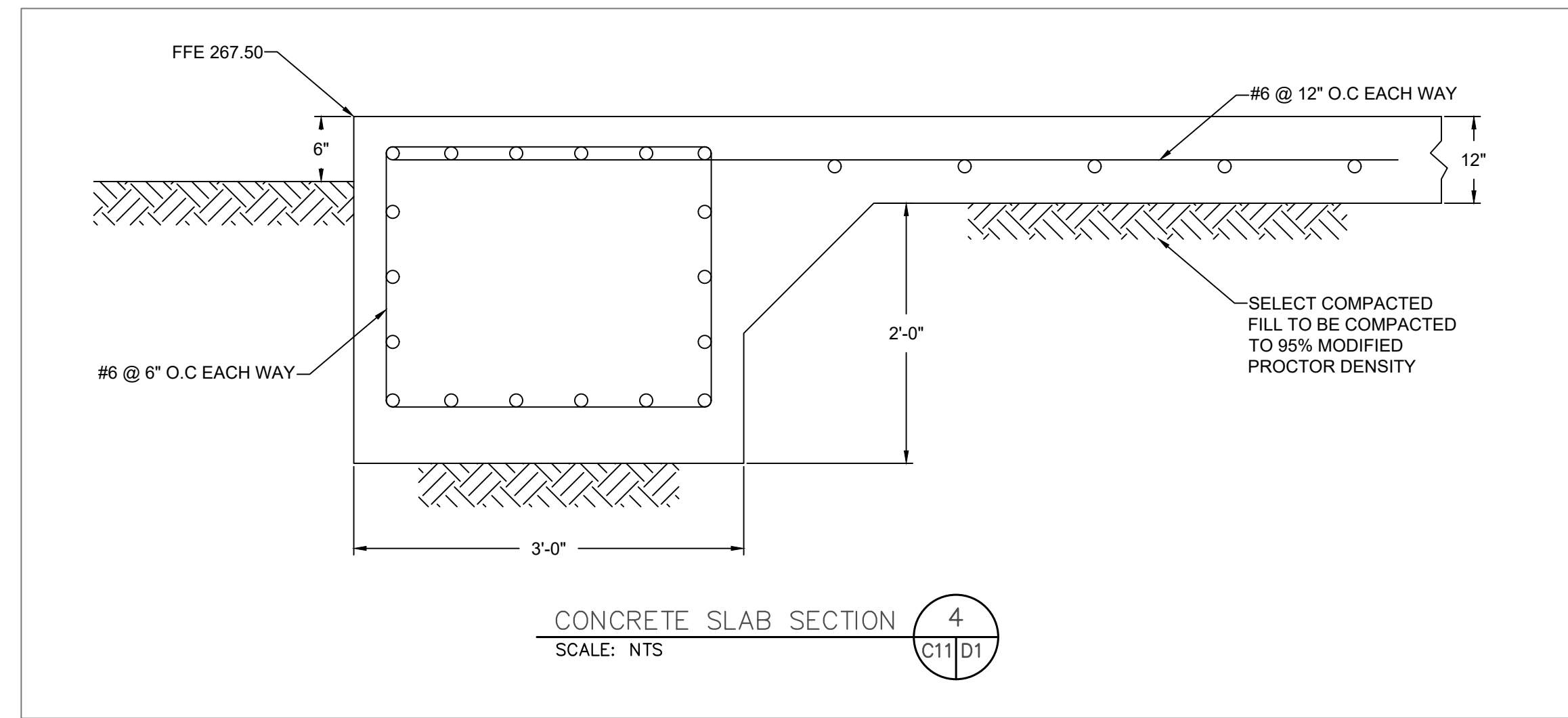
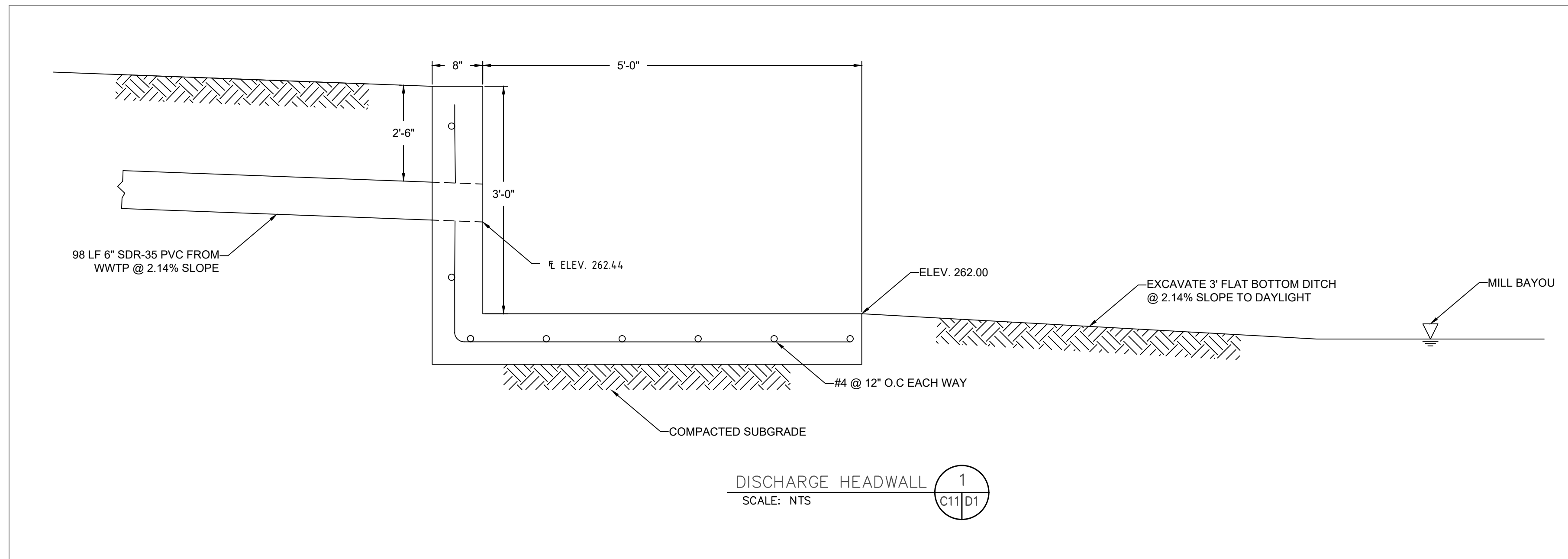
AN ADDITION TO PULASKI COUNTY
BEING PART OF SECTION 17, T-3-N, R-14-W

JOE WHITE & ASSOCIATES, INC.
CIVIL ENGINEERING - CONSULTING SERVICES - LAND SURVEYING
25 RAHLING CIRCLE, SUITE A-2 LITTLE ROCK, ARKANSAS 72223
PHONE: (501) 214-9141



DATE	DESCRIPTION	BY

DATE:	10-21-2021	SCALE:	N.T.S.
PROJECT NUMBER:	21-038J		



**C11C - STANDARD DETAILS
WASTEWATER TREATMENT PLANT**

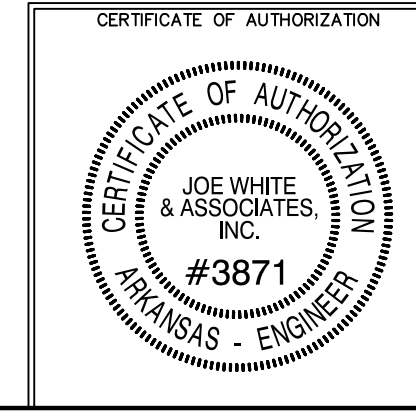
**PARADISE VALLEY
PHASE 1**

LOTS 101-128, BLOCK 1
LOTS 201-223, BLOCK 2
LOTS 301-325, BLOCK 3
TRACTS A & B

AN ADDITION TO PULASKI COUNTY
BEING PART OF SECTION 17, T-3-N, R-14-W

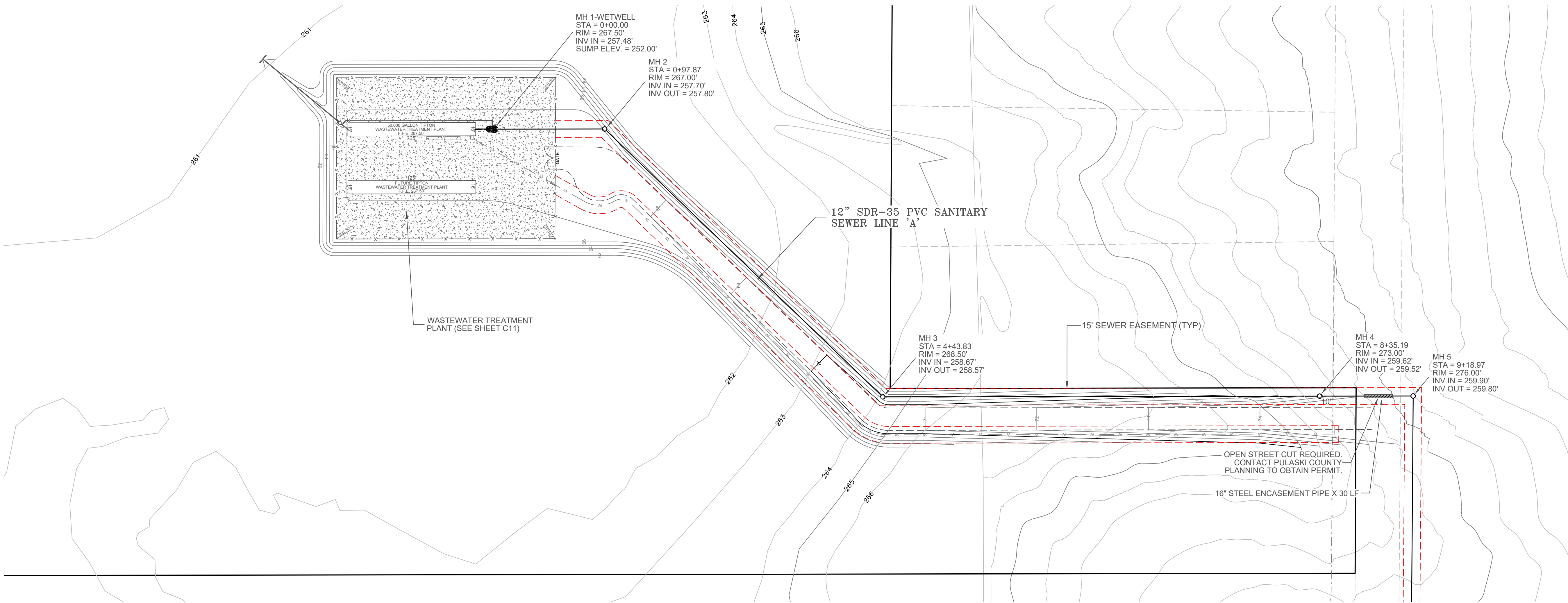
JOE WHITE & ASSOCIATES, INC.
CIVIL ENGINEERING - CONSULTING SERVICES - LAND SURVEYING

25 RAHLING CIRCLE, SUITE A-2 LITTLE ROCK, ARKANSAS 72223
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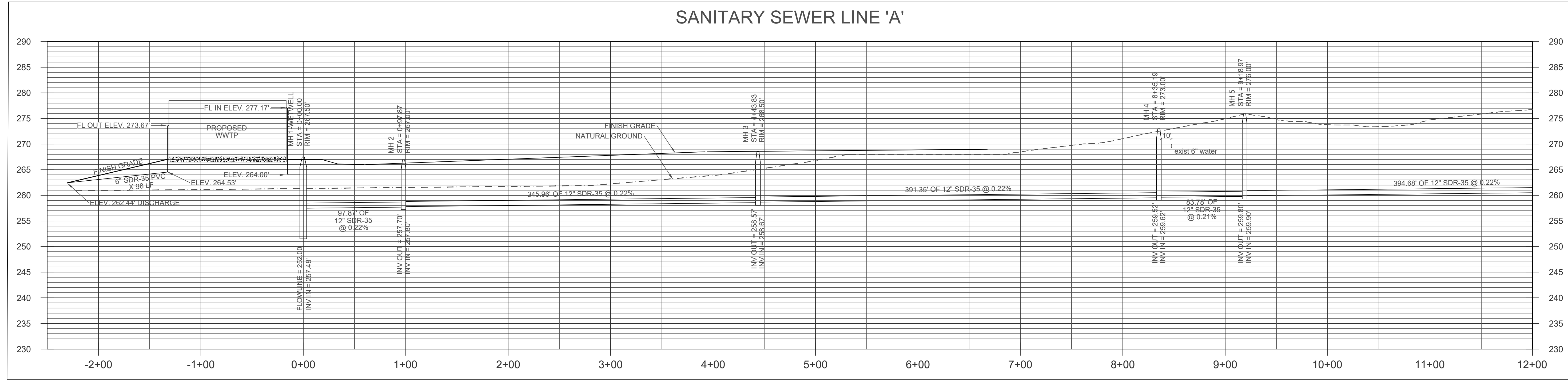


DATE	DESCRIPTION	BY

DATE:	10-06-2021	SCALE:	N.T.S.
PROJECT NUMBER:	21-038J		



- GENERAL UTILITY NOTES**
- The latest "Standard Pipeline Specifications" of Maumelle Water Corporation shall apply.
 - The latest "Specification Requirements for Sanitary Sewers" of the Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 (Paradise Valley Subdivision) shall apply.
 - The contractor shall locate all existing utilities before beginning construction.
 - Maumelle Water Corporation requires a minimum of 36" of ground cover over all water mains. Water mains and sanitary sewers shall be constructed as far apart as practical, and shall be separated by undisturbed and compacted earth. A minimum horizontal distance of 10-feet should be maintained between water lines and sewer lines or other sources of contamination. Water mains necessarily in close proximity to sewer must be placed so that the bottom of the water line will be at least 18-inches above the top of the sewer line. If this distance must unavoidably be reduced, the water line or the sewer line must be encased in watertight pipe with sealed, watertight ends extending at least 10-feet either side of the crossing. Where a water line must unavoidably pass beneath the sewer line, at least 18-inches separation must be maintained between the outside of the two pipes in addition to the preceding encasement requirement.
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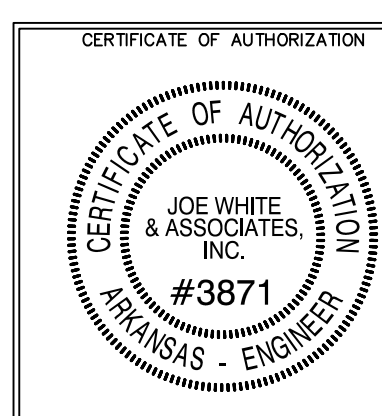
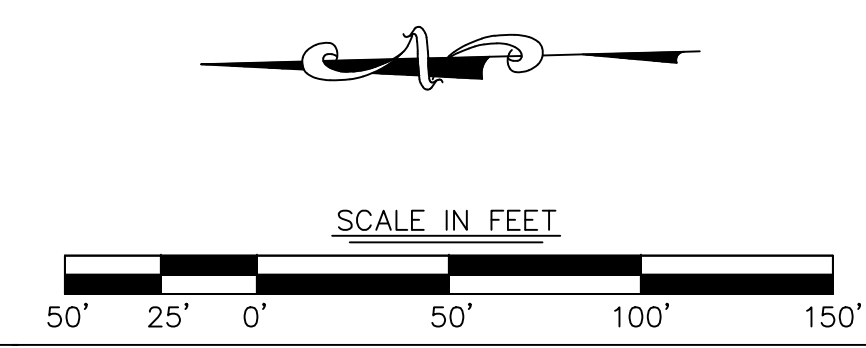
C12 - SANITARY SEWER LINE 'A'

**PARADISE VALLEY
PHASE 1**

LOTS 101-128, BLOCK 1
LOTS 201-223, BLOCK 2
LOTS 301-325, BLOCK 3
TRACTS A & B

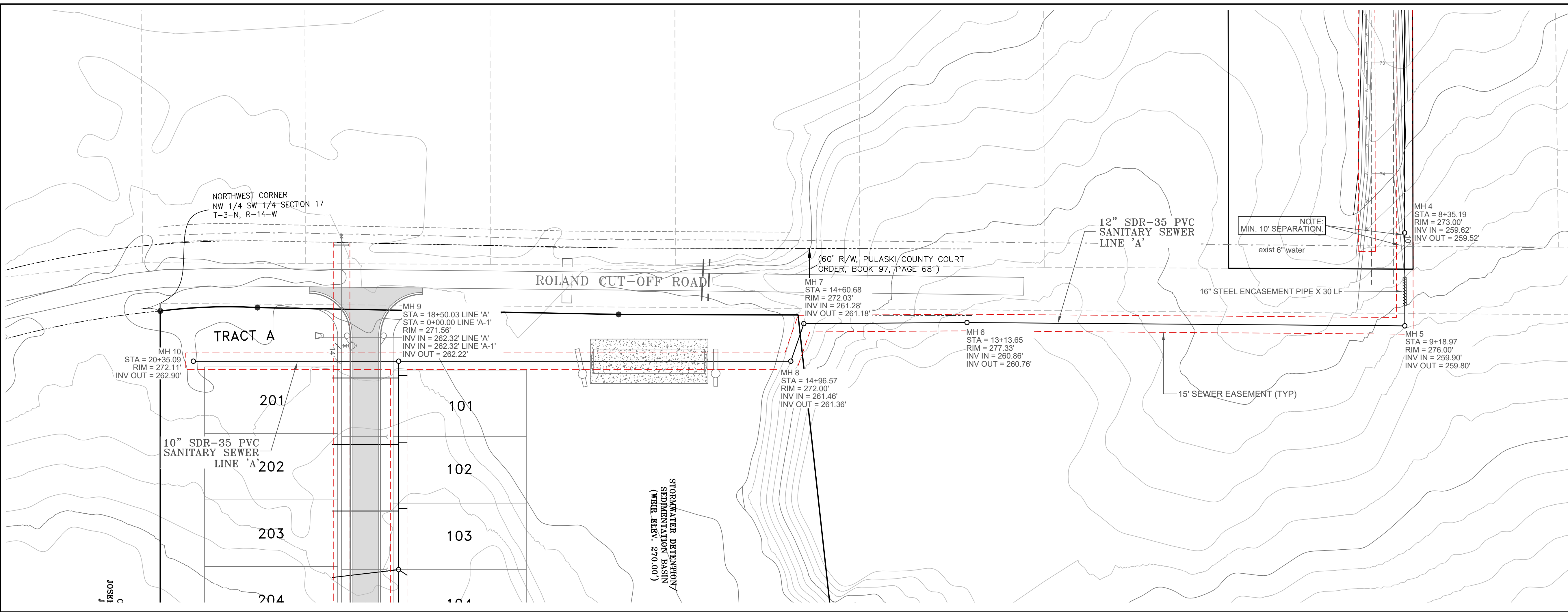
AN ADDITION TO PULASKI COUNTY
BEING PART OF SECTION 17, T-3-N, R-14-W

JOE WHITE & ASSOCIATES, INC.
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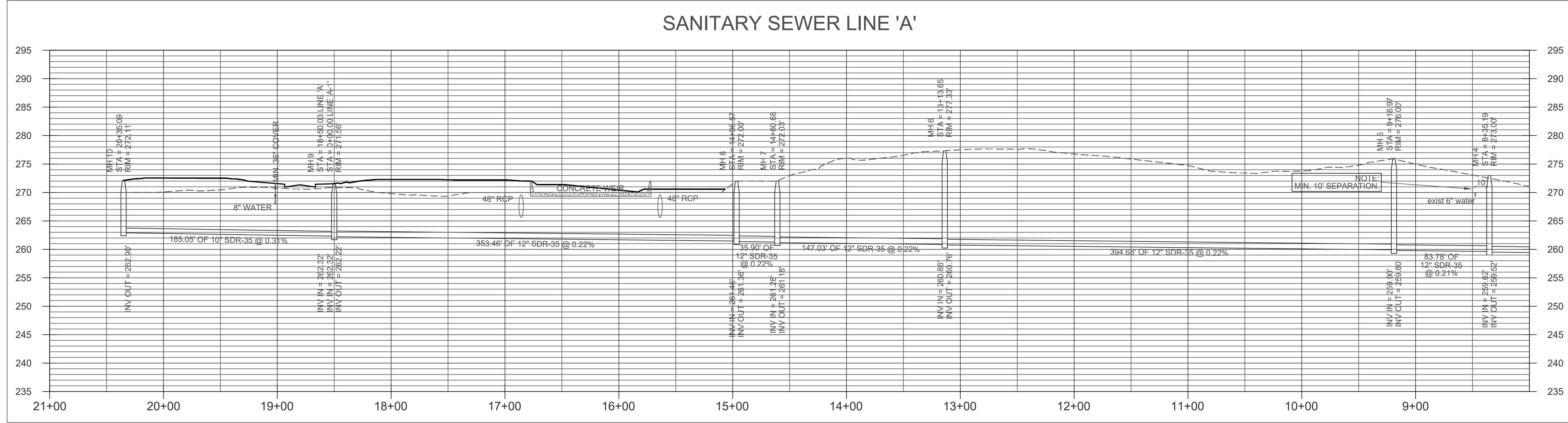


DATE	DESCRIPTION	BY

DATE:	10-06-2021	SCALE:	H: 1" = 50' V: 1" = 10'
PROJECT NUMBER:	21-038J		



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C13 - SANITARY SEWER LINE 'A'

**PARADISE VALLEY
PHASE 1**

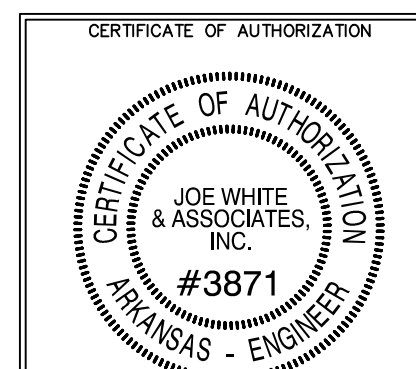
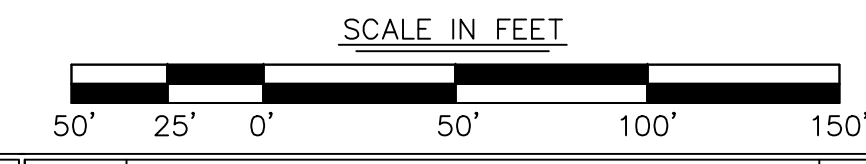
LOTS 101-128, BLOCK 1
LOTS 201-223, BLOCK 2
LOTS 301-325, BLOCK 3
TRACTS A & B

AN ADDITION TO PULASKI COUNTY
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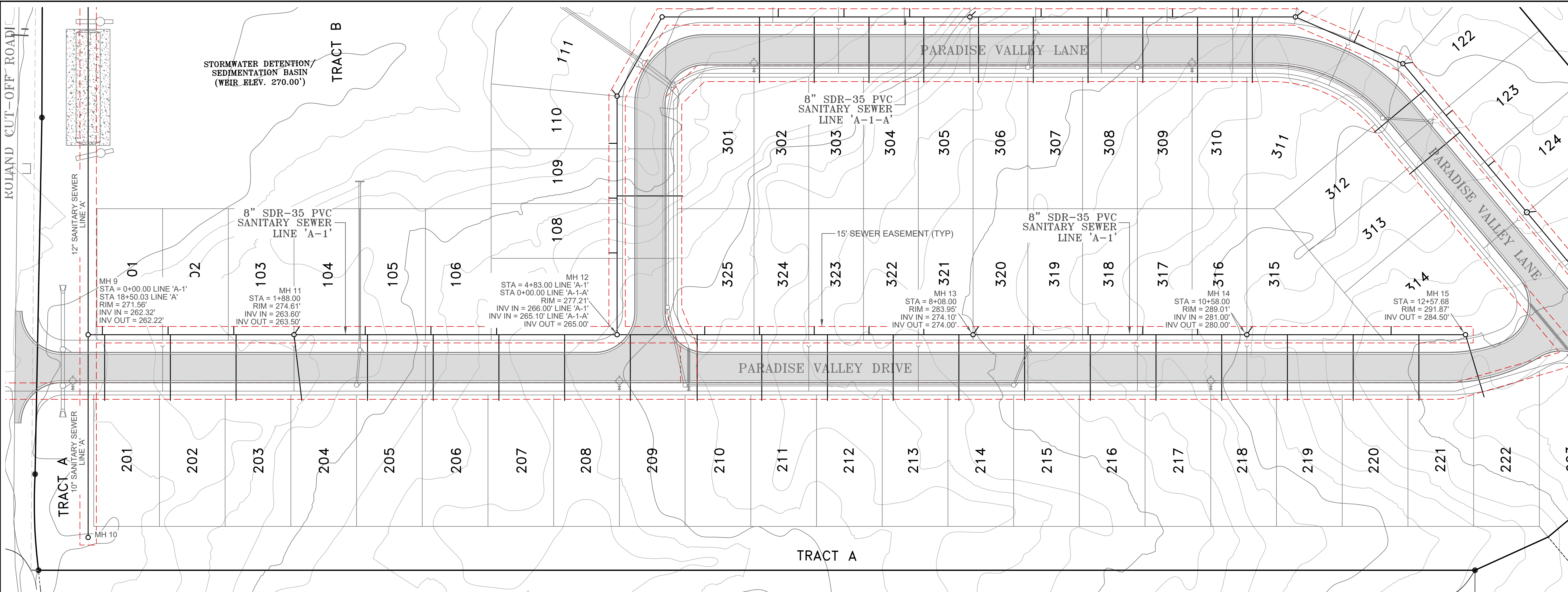
JOE WHITE & ASSOCIATES, INC.
CIVIL ENGINEERING - CONSULTING SERVICES - LAND SURVEYING
25 RAHLING CIRCLE, SUITE A-2 LITTLE ROCK, ARKANSAS 72223
PHONE: (501) 214-9141

DATE: 10-06-2021 SCALE: H: 1" = 50' V: 1" = 10'

PROJECT NUMBER: 21-038J

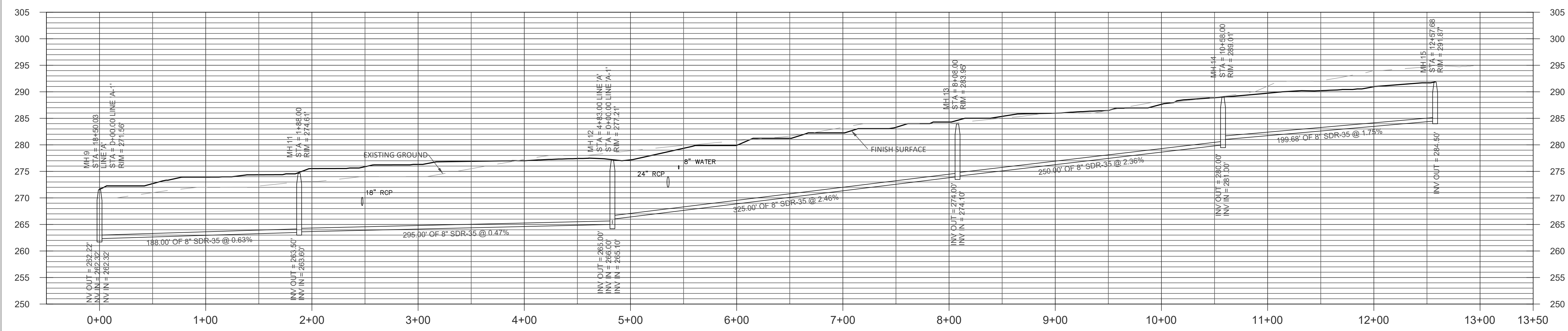


DATE	DESCRIPTION	BY



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SANITARY SEWER LINE 'A-1'



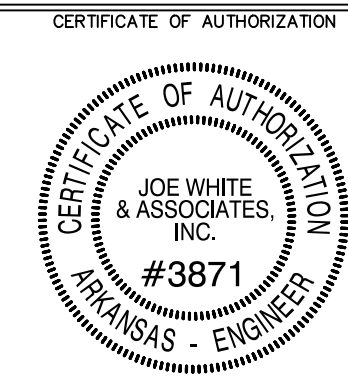
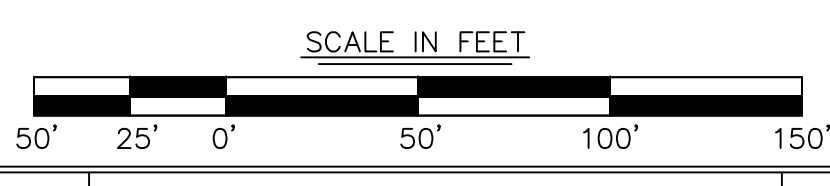
C14 - SEWER LINE 'A-1'

PARADISE VALLEY PHASE 1

LOTS 101-128, BLOCK 1
 LOTS 201-223, BLOCK 2
 LOTS 301-325, BLOCK 3
 TRACTS A & B

AN ADDITION TO PULASKI COUNTY
 BEING PART OF SECTION 17, T-3-N, R-14-W

JOE WHITE & ASSOCIATES, INC.
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 25 RAHLING CIRCLE, SUITE A-2 LITTLE ROCK, ARKANSAS 72223
 PHONE: (501) 214-9141

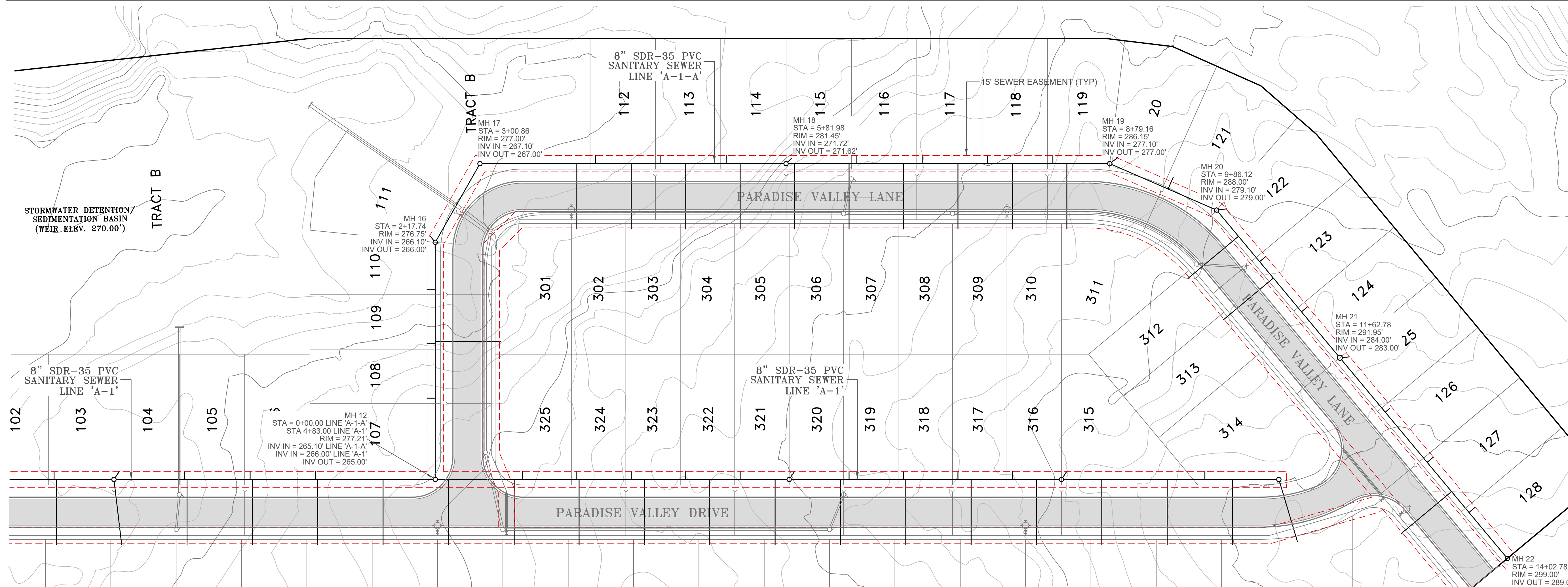


DATE	DESCRIPTION	BY

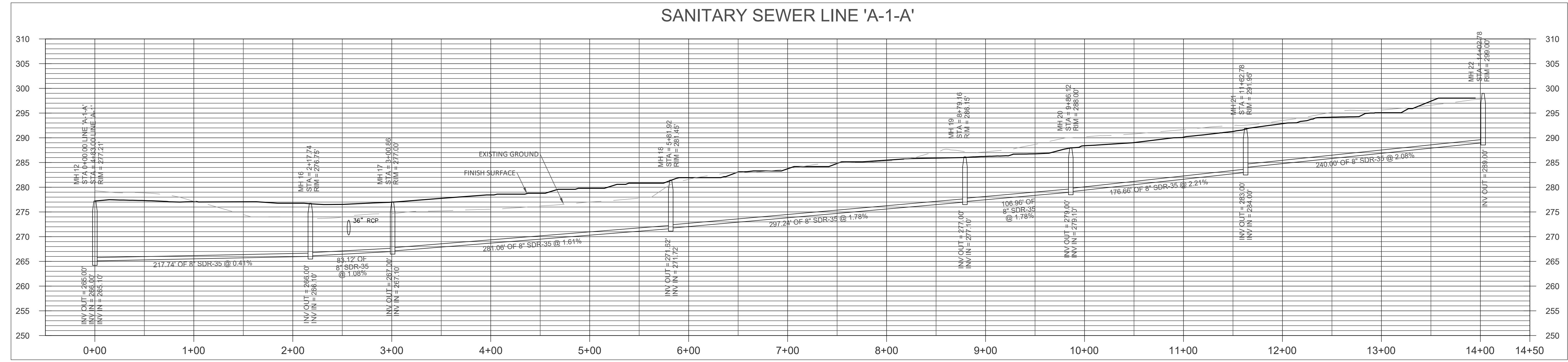
DATE: 10-06-2021 SCALE: H: 1" = 50' V: 1" = 10'
 PROJECT NUMBER: 21-038J

GENERAL UTILITY NOTES

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SANITARY SEWER LINE 'A-1-A'



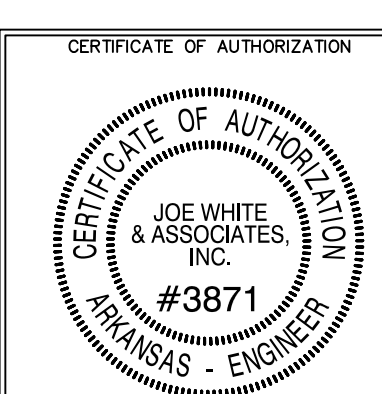
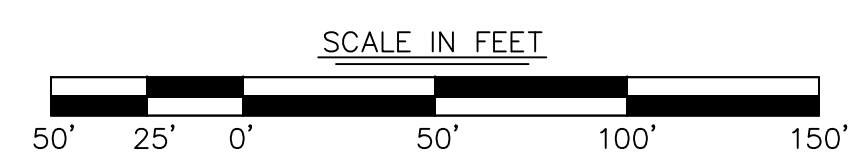
C15 - SEWER LINE 'A-1-A'

PARADISE VALLEY PHASE 1

LOTS 101-128, BLOCK 1
 LOTS 201-223, BLOCK 2
 LOTS 301-325, BLOCK 3
 TRACTS A & B

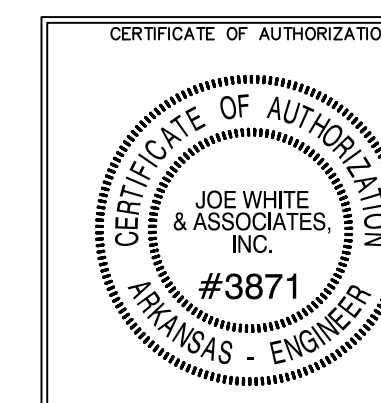
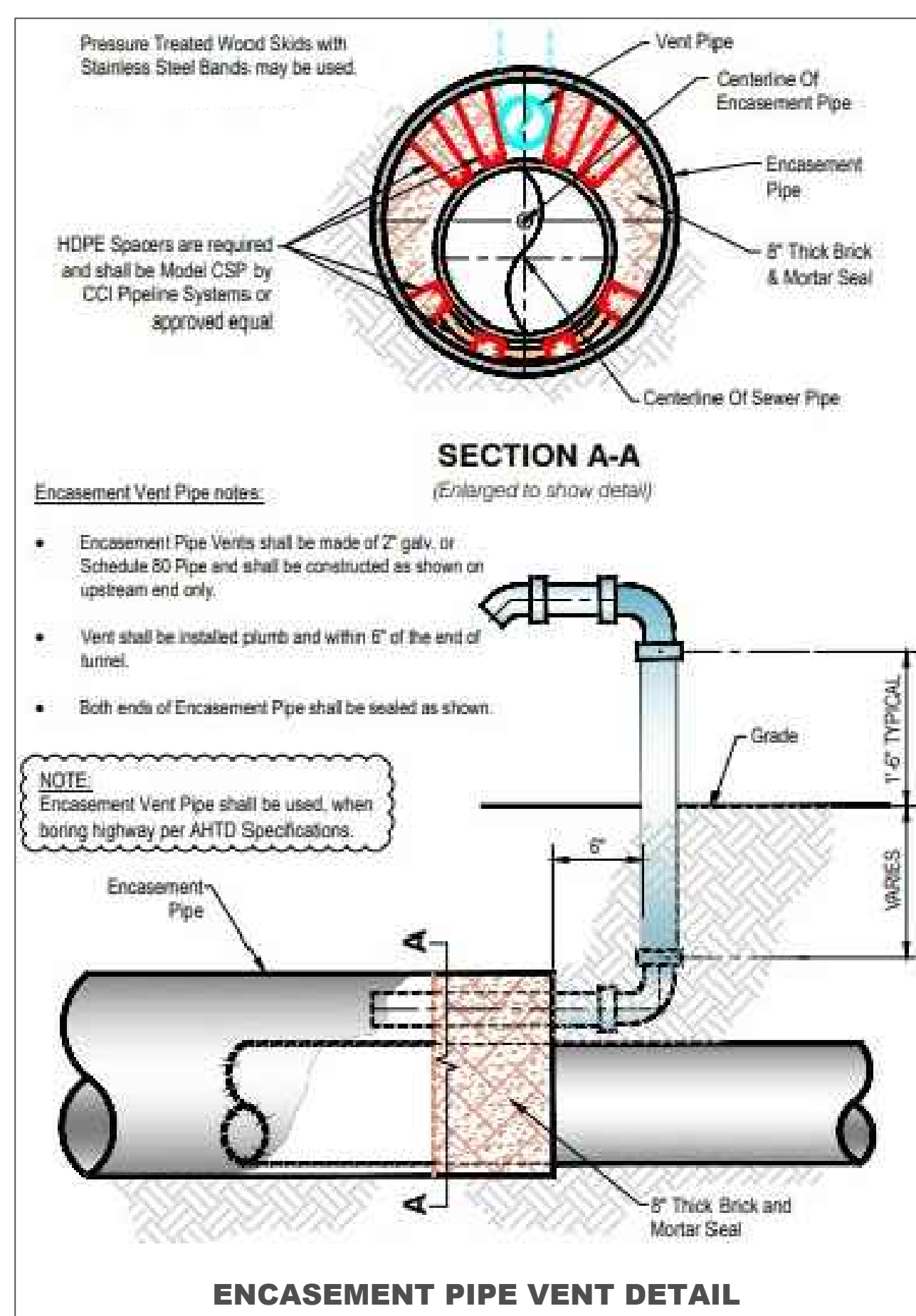
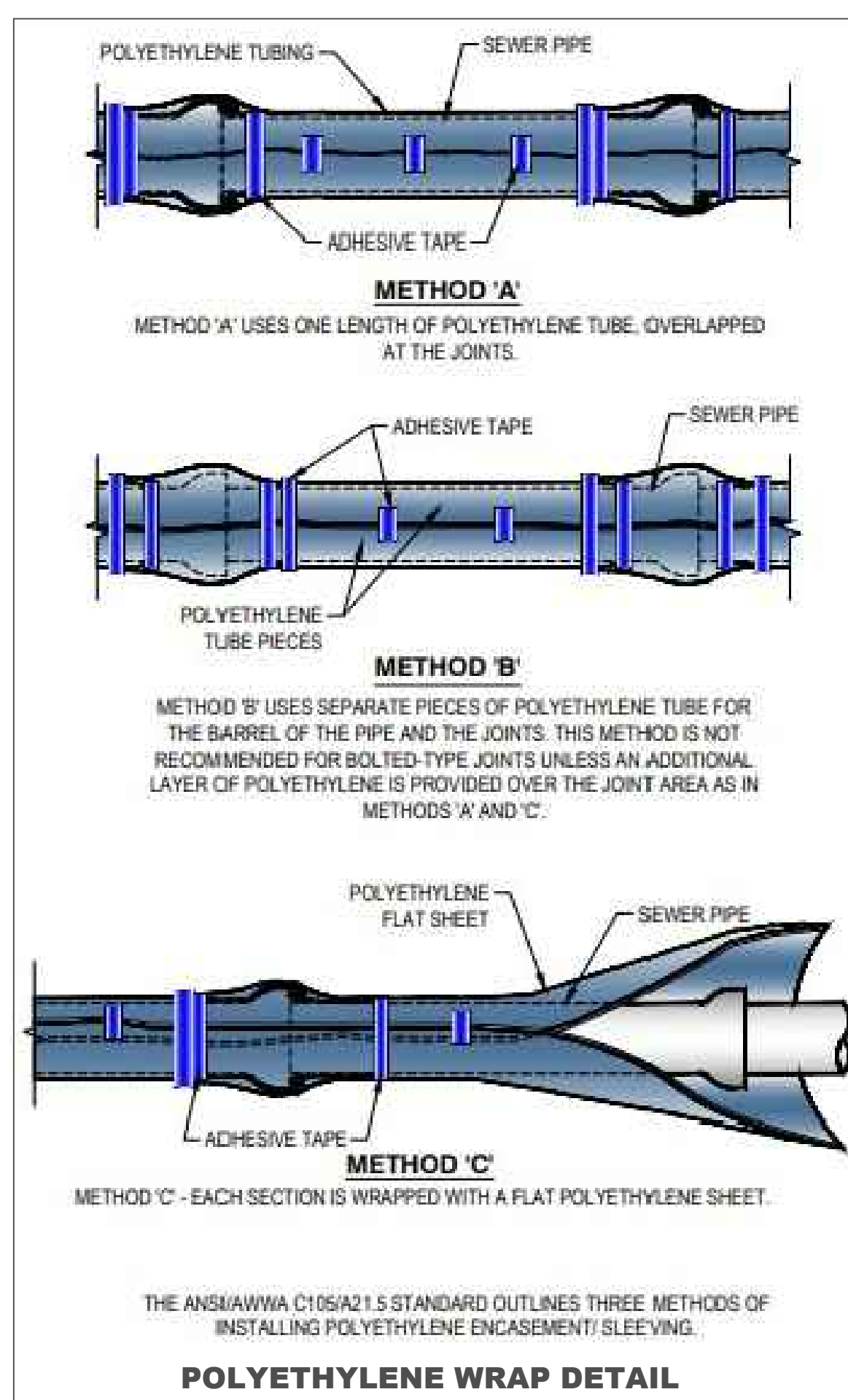
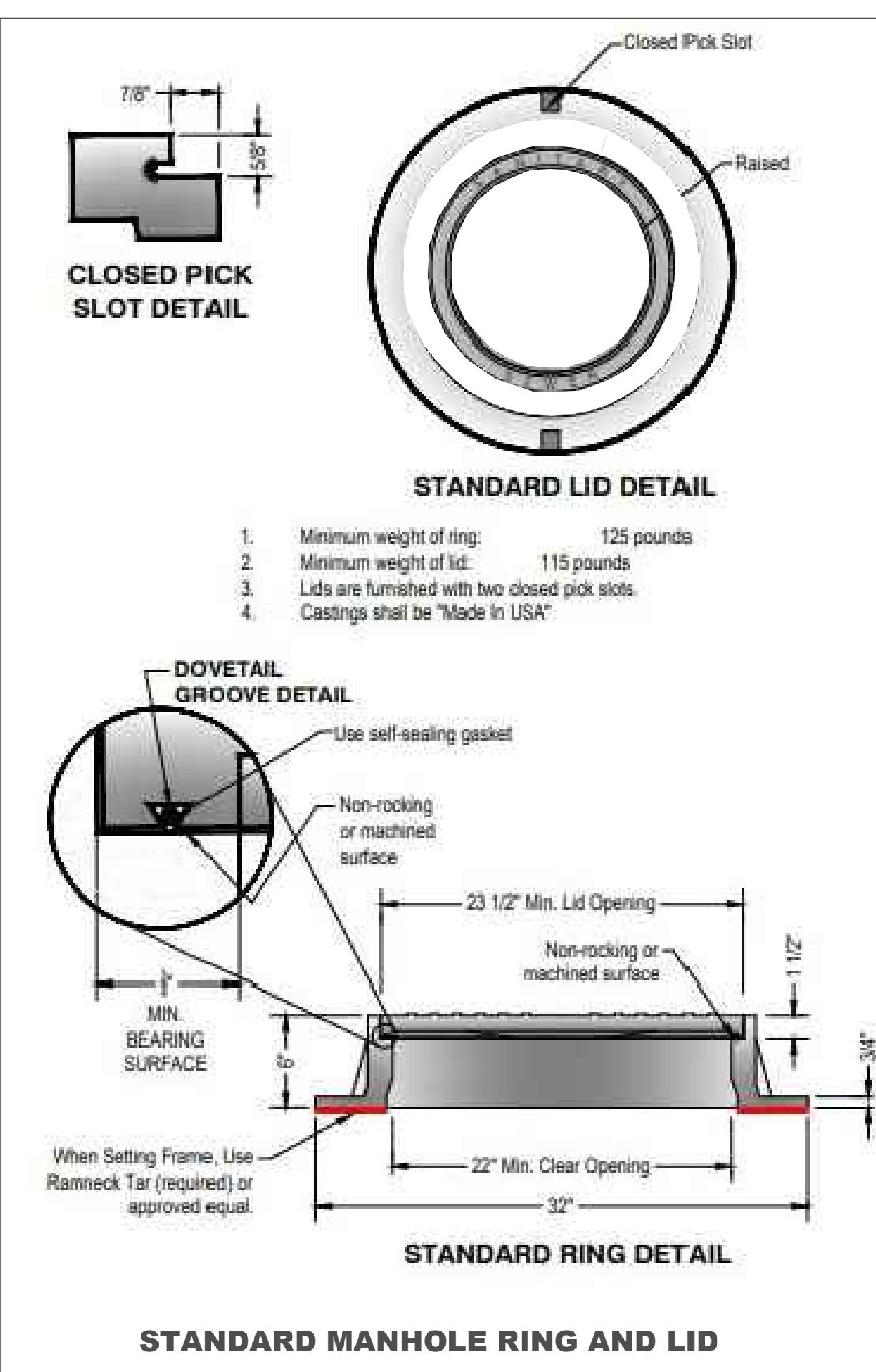
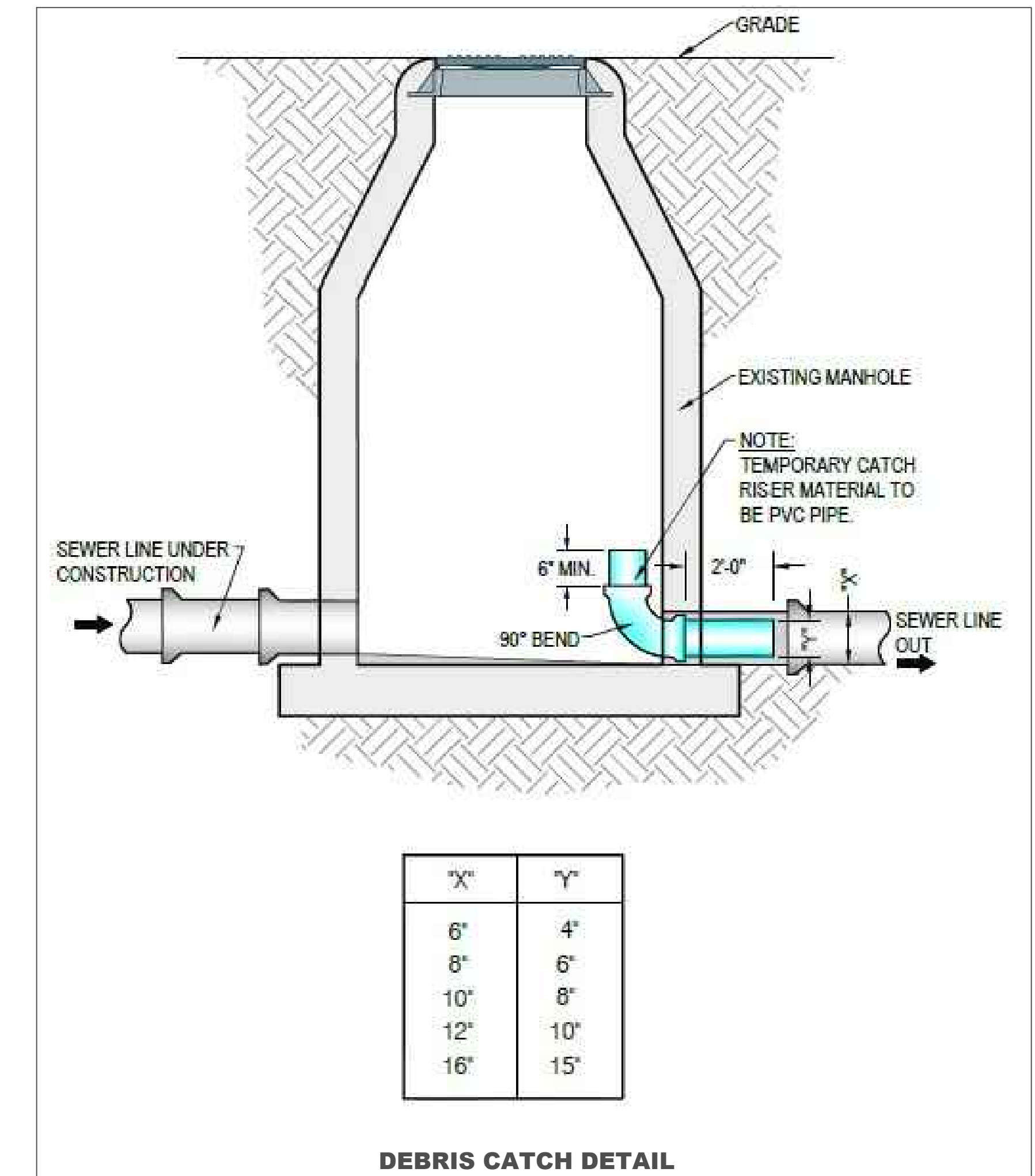
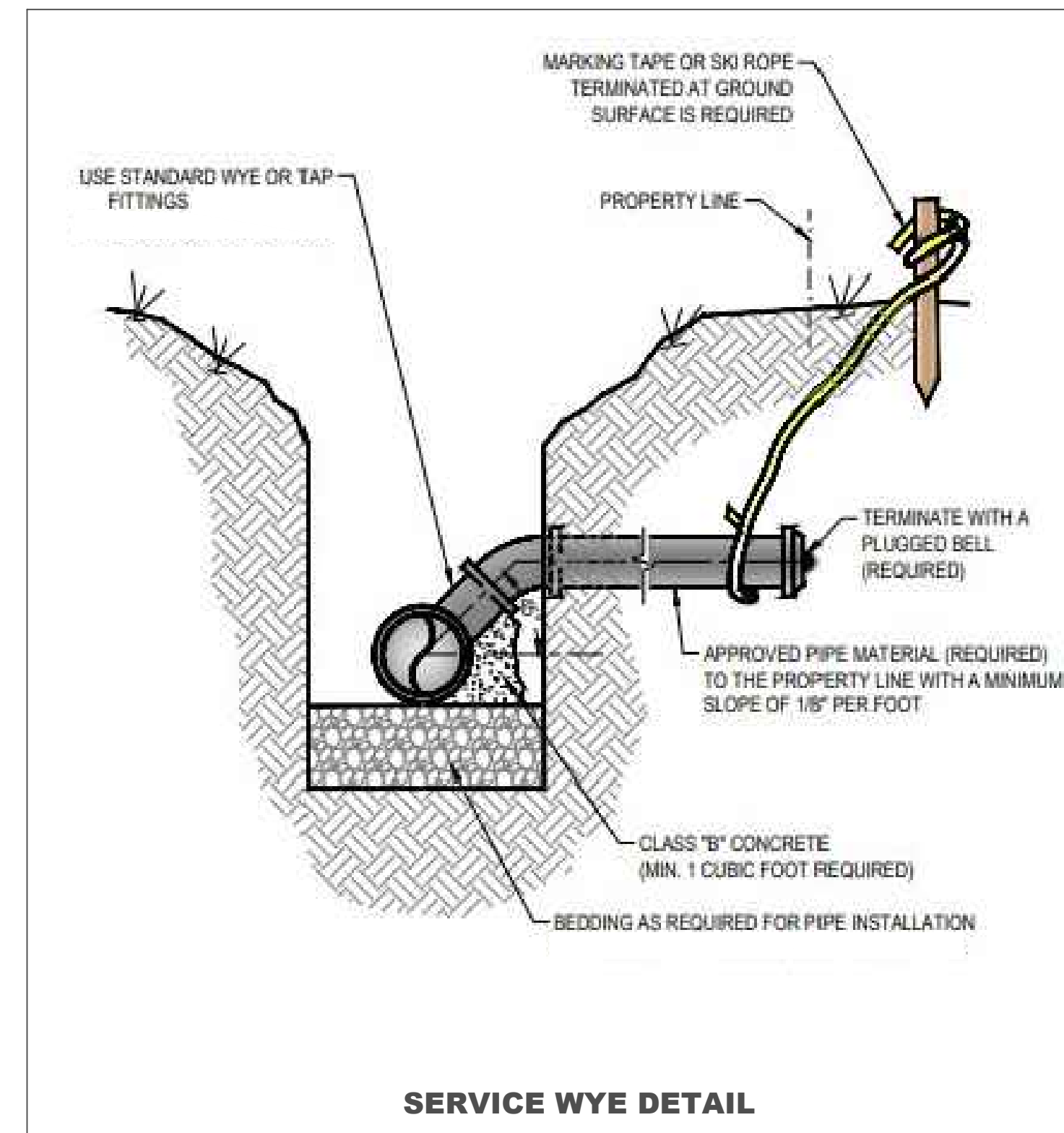
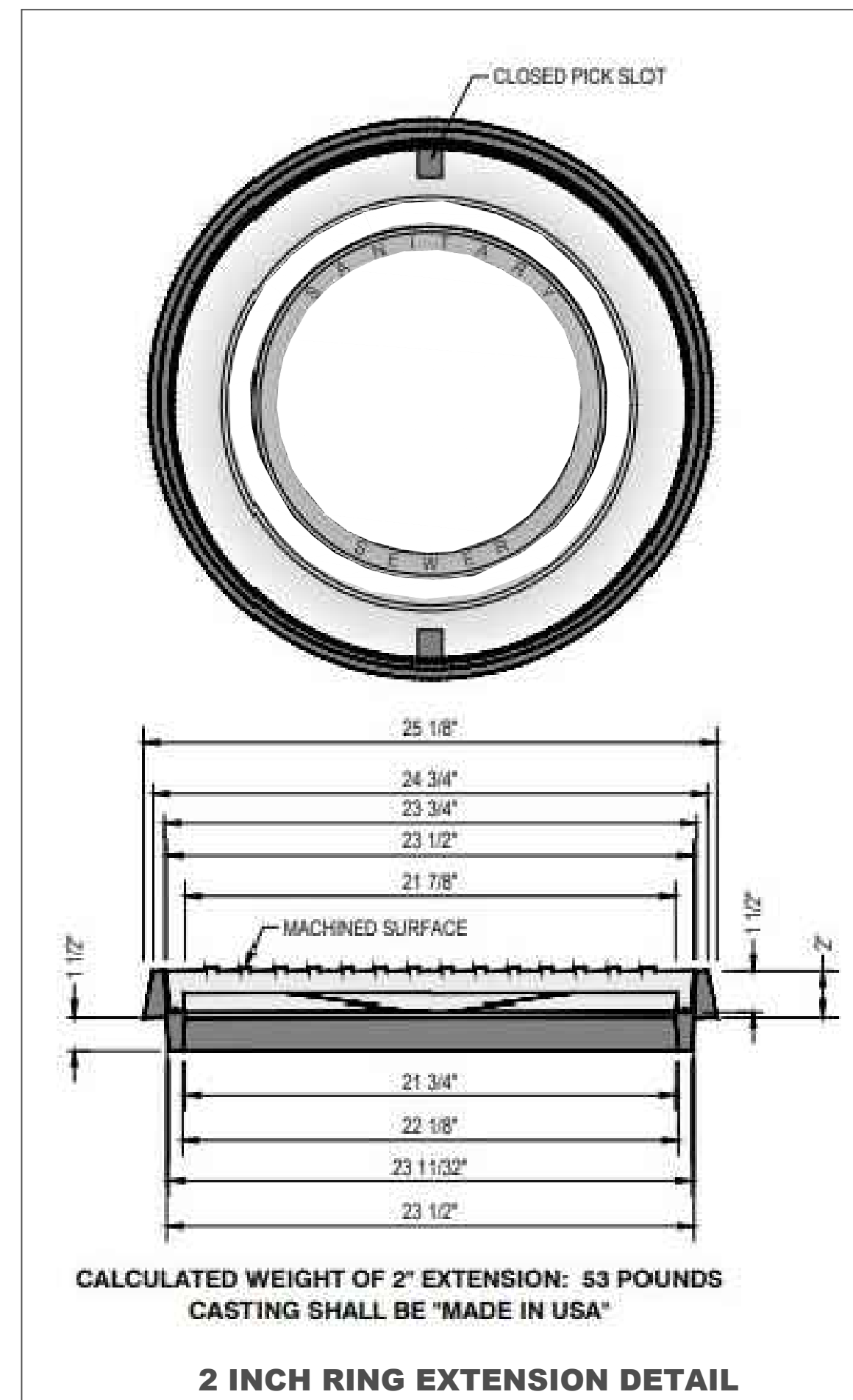
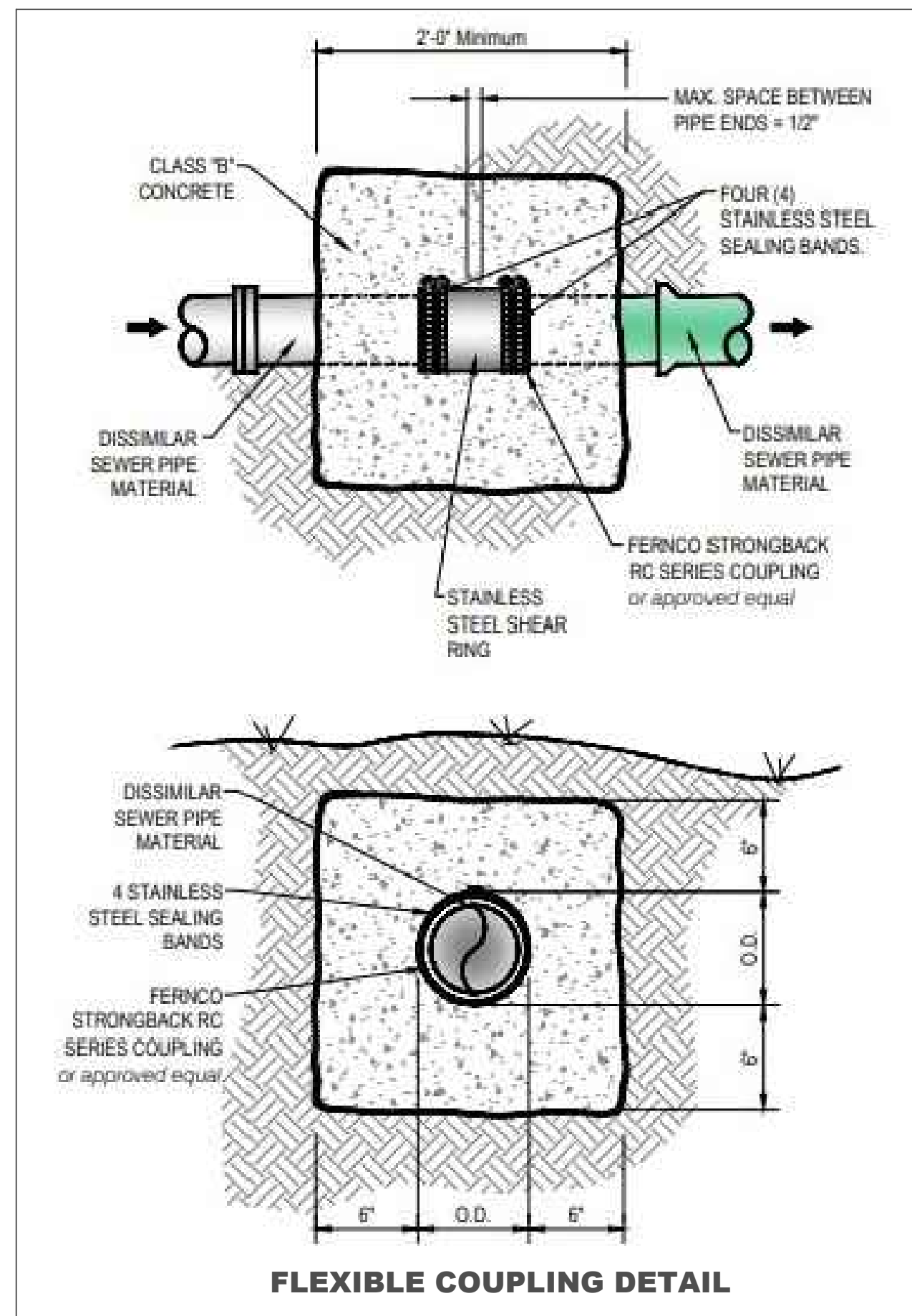
AN ADDITION TO PULASKI COUNTY
 BEING PART OF SECTION 17, T-3-N, R-14-W

JOE WHITE & ASSOCIATES, INC.
 CIVIL ENGINEERING - CONSULTING SERVICES - LAND SURVEYING
 25 RAHLING CIRCLE, SUITE A-2 LITTLE ROCK, ARKANSAS 72223
 PHONE: (501) 214-9141



DATE	DESCRIPTION	BY

DATE:	09-10-2021	SCALE:	H: 1" = 50' V: 1" = 10'
PROJECT NUMBER:	21-038J		



DATE	DESCRIPTION	BY



**C16 - STANDARD DETAILS
SANITARY SEWER SYSTEM**

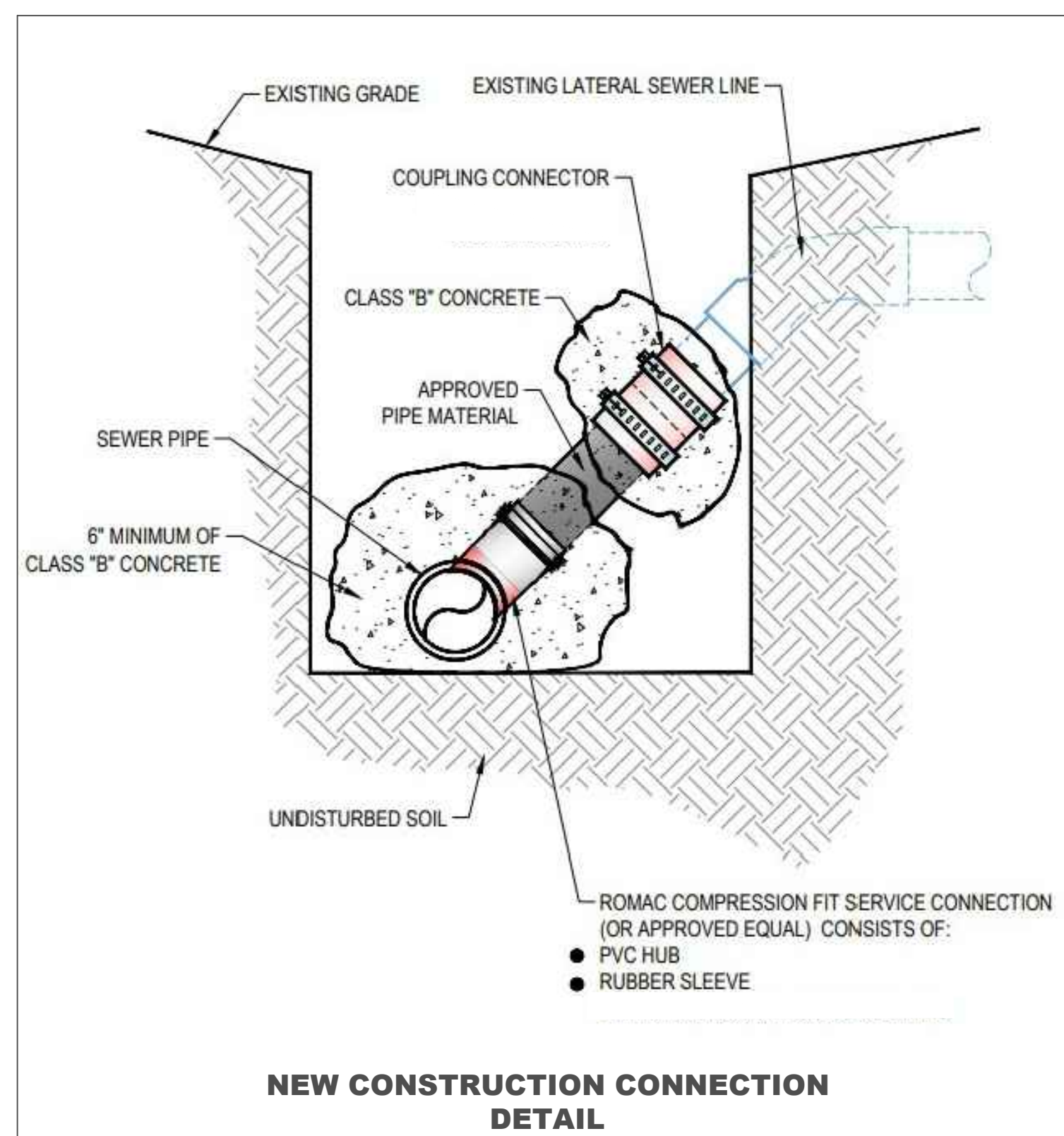
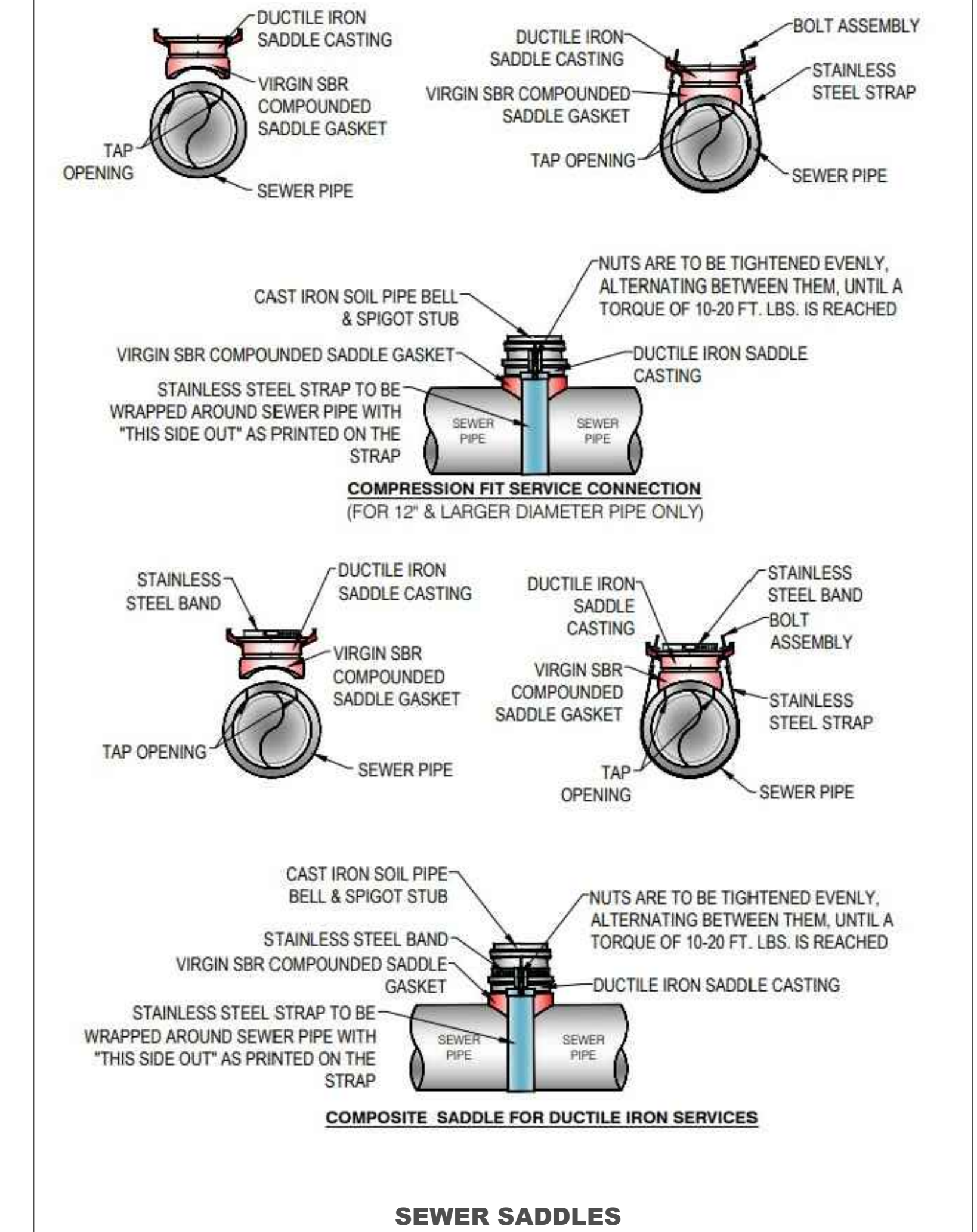
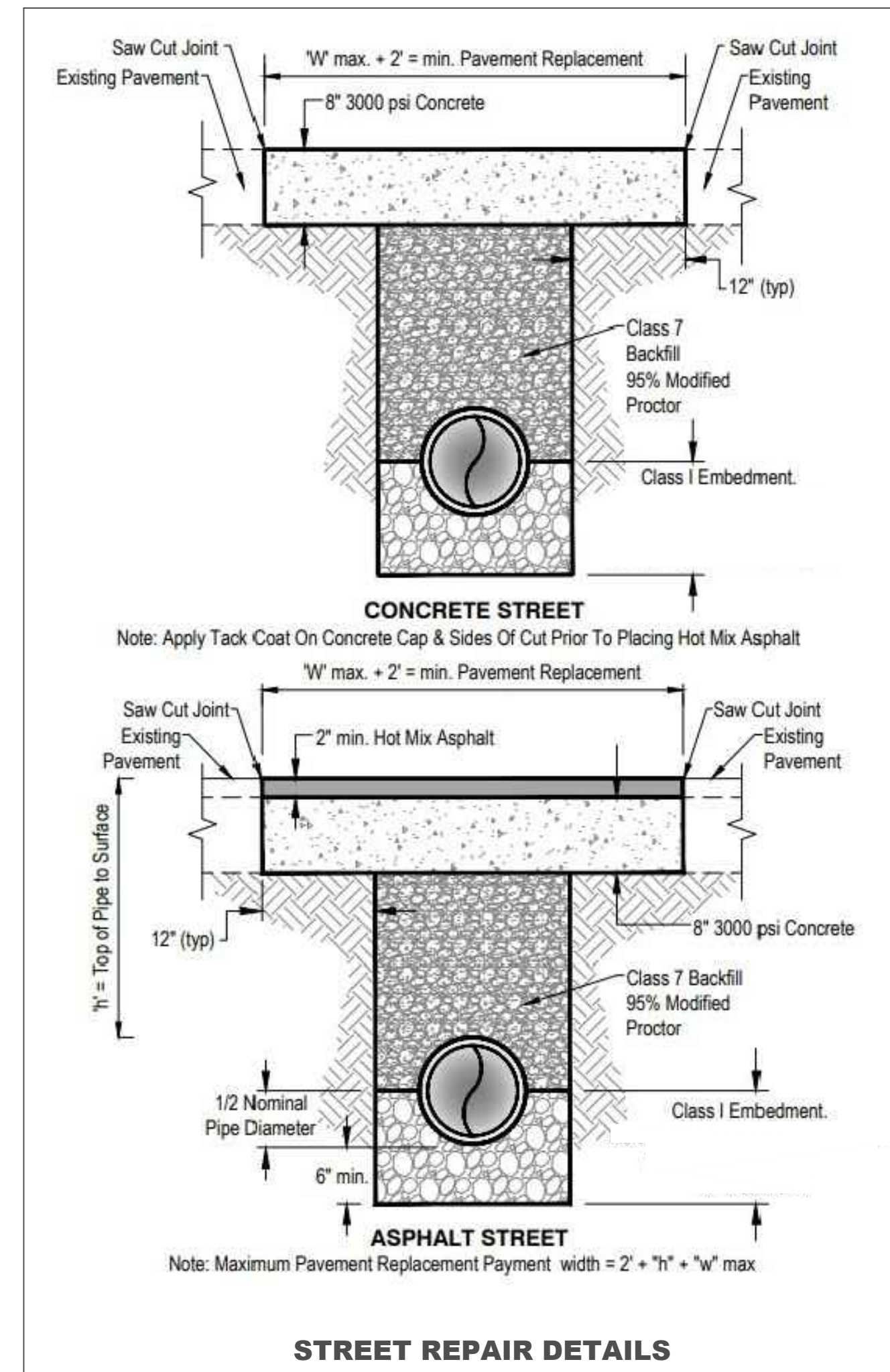
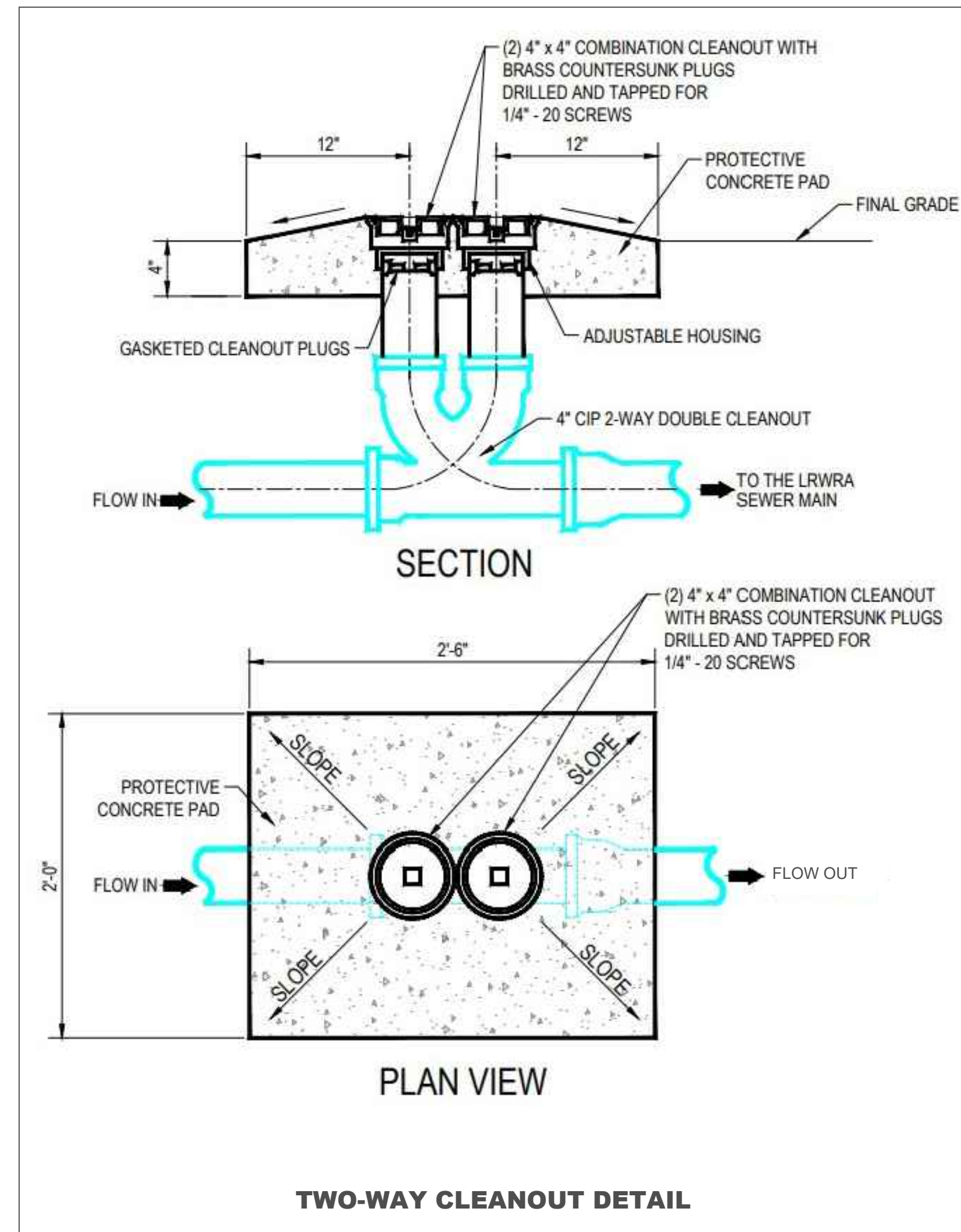
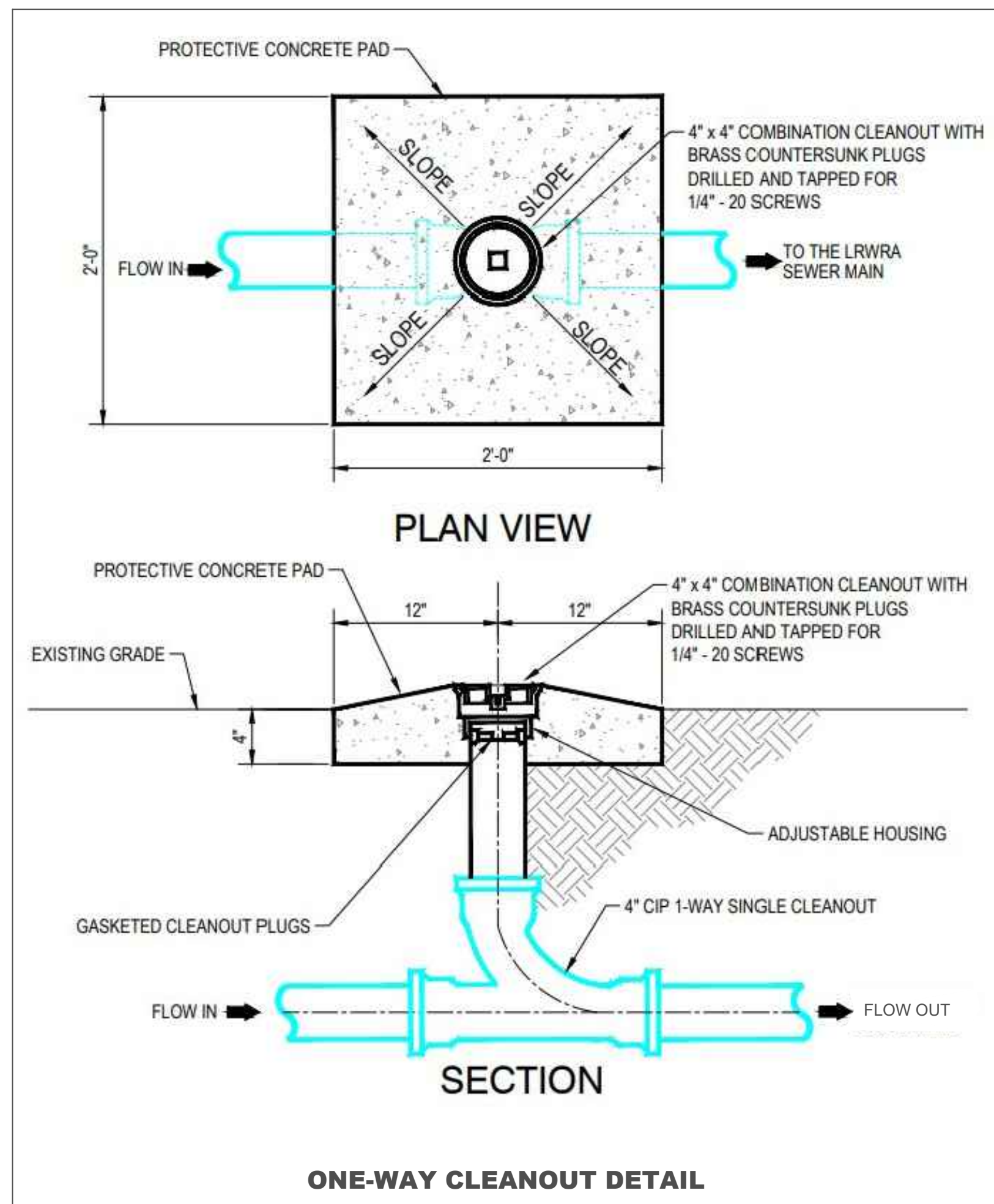
**PARADISE VALLEY
PHASE 1**

LOTS 101-128, BLOCK 1
LOTS 201-223, BLOCK 2
LOTS 301-325, BLOCK 3
TRACTS A & B

AN ADDITION TO PULASKI COUNTY
BEING PART OF SECTION 17, T-3-N, R-14-W

JOE WHITE & ASSOCIATES, INC.
CIVIL ENGINEERING - CONSULTING SERVICES - LAND SURVEYING
25 RAHLING CIRCLE, SUITE A-2 LITTLE ROCK, ARKANSAS 72223
PHONE: (501) 214-9141

DATE: 10-06-2021 SCALE: N.T.S.
PROJECT NUMBER: 21-038J



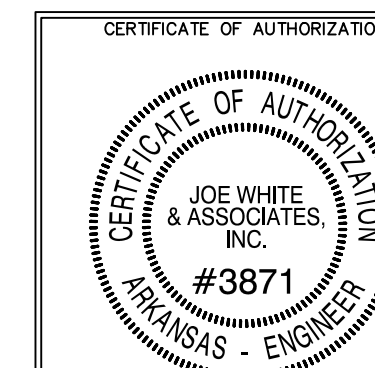
**C17 - STANDARD DETAILS
SANITARY SEWER SYSTEM**

**PARADISE VALLEY
PHASE 1**

LOTS 101-128, BLOCK 1
LOTS 201-223, BLOCK 2
LOTS 301-325, BLOCK 3
TRACTS A & B

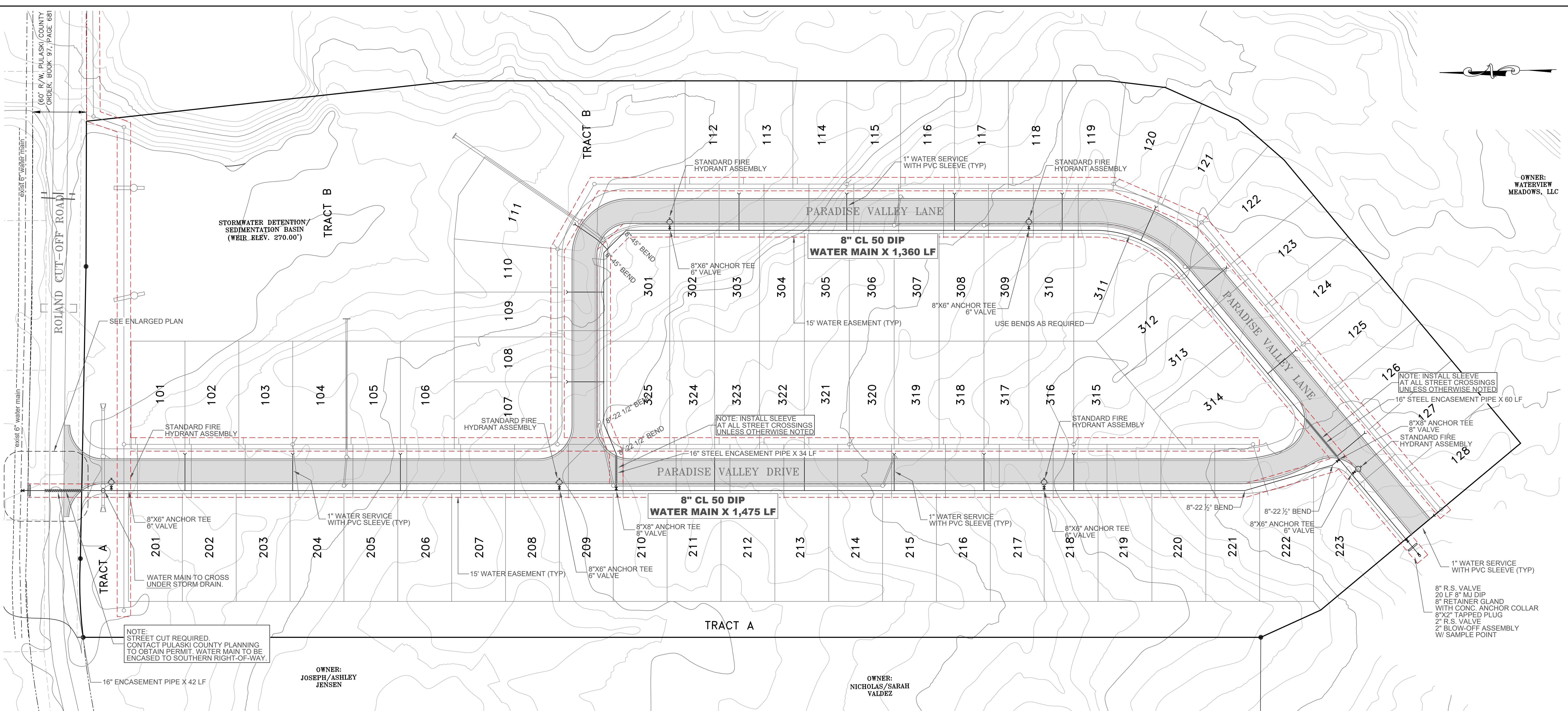
AN ADDITION TO PULASKI COUNTY
BEING PART OF SECTION 17, T-3-N, R-14-W

JOE WHITE & ASSOCIATES, INC.
CIVIL ENGINEERING - CONSULTING SERVICES - LAND SURVEYING
25 RAHLING CIRCLE, SUITE A-2 LITTLE ROCK, ARKANSAS 72223
PHONE: (501) 214-9141



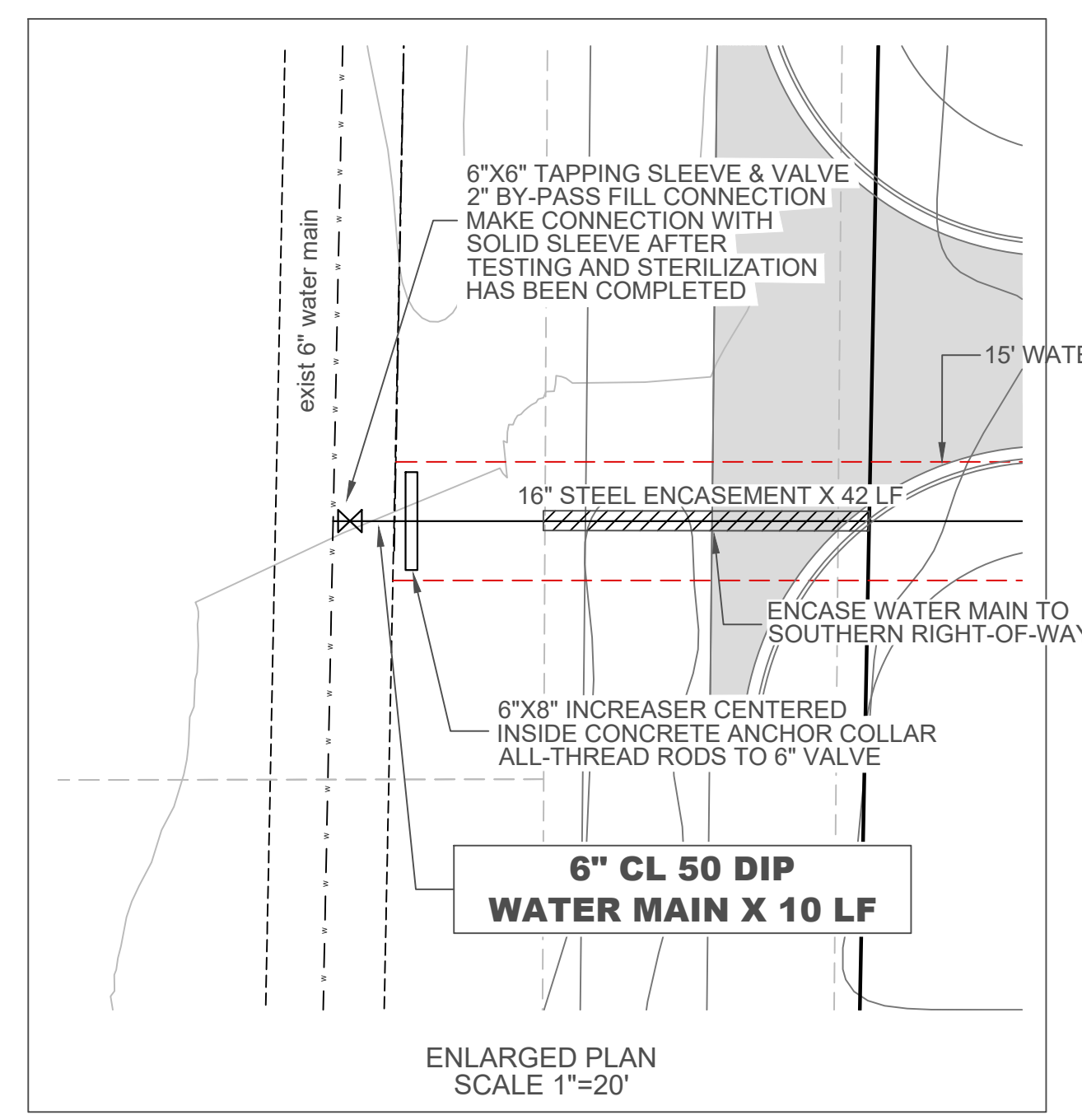
DATE	DESCRIPTION	BY

DATE: 10-06-2021 SCALE: N.T.S.
PROJECT NUMBER: 21-038J



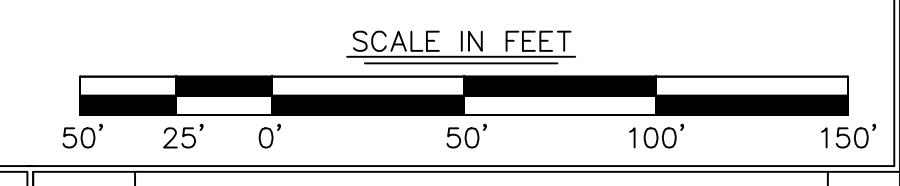
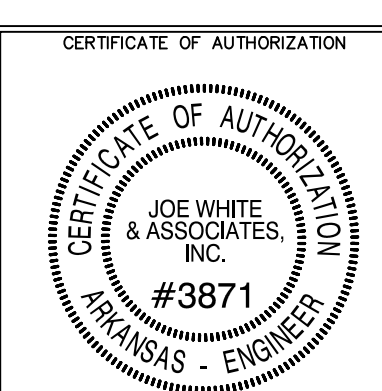
GENERAL UTILITY NOTES

- The latest "Standard Pipeline Specifications" of Maumelle Water Corporation shall apply.
- The contractor shall locate all existing utilities before beginning construction.
- Water lines shall have a minimal horizontal separation of ten (10') feet from all sewer lines except for crossings. The water line shall pass above the sewer line with a minimum of 18" vertical separation and maintain a minimum ground cover of 36". If ground cover cannot be maintained or where the water line passes under the sewer line, than either the water line, or the sewer line, shall be encased as per Arkansas Department of Health and Maumelle Water Corporation requirements. Where a water line must unavoidably pass beneath the sewer line, at least 18-inches separation must be maintained between the outside of the two pipes in addition to the encasement requirements.
- The contractor shall verify horizontal and vertical alignment of storm sewer, sanitary sewer and water lines to ensure that they are installed with adequate cover and clearance. Rough grading shall be complete before storm sewer, sanitary sewer, water mains and service.
- The contractor shall make connection to existing sanitary sewer and water mains after they are cleaned, tested and construction approved by utility inspector.
- All trench backfill shall be made in 8" lifts and compacted to 95% of modified proctor density (ASTM D-1557), as determined by in-place density tests. In transition areas between cuts and fills the top 8" in the cut shall be broken and compacted to a minimum of 95% modified proctor density.
- The contractor shall coordinate with each utility company prior to any excavation. Any damage to existing utility lines caused by contractor's operations shall be repaired at the contractor's expense.
- Concrete shall have a minimum 28 day compressive strength of 3000 psi unless noted.
- All reinforcing steel shall be grade 40 unless noted.
- All water mains to go over drainage and sewer crossings unless otherwise noted.
- All parallel storm drain flow lines shall be installed prior to and below all water main flow lines unless otherwise noted on the plans.
- Marking tape shall be used on all water and sewer lines.
- 8" Water main and 6" Water main shall be CL 50 DIP. All DIP must be polywrapped.
- Water service lines under street shall be encased with 2" PVC SDR 21 Class 200.
- Megalugs and thrust blocking is required on all fittings. All thrust blocking shall be protected of excavation of other utilities.



NOTE: REFER TO NEXT TWO SHEETS FOR ALL STANDARD WATER DETAILS.

CONTRACTOR SHALL NOTIFY "ONE-CALL" BEFORE CONSTRUCTION BEGINS.



DATE	DESCRIPTION	BY

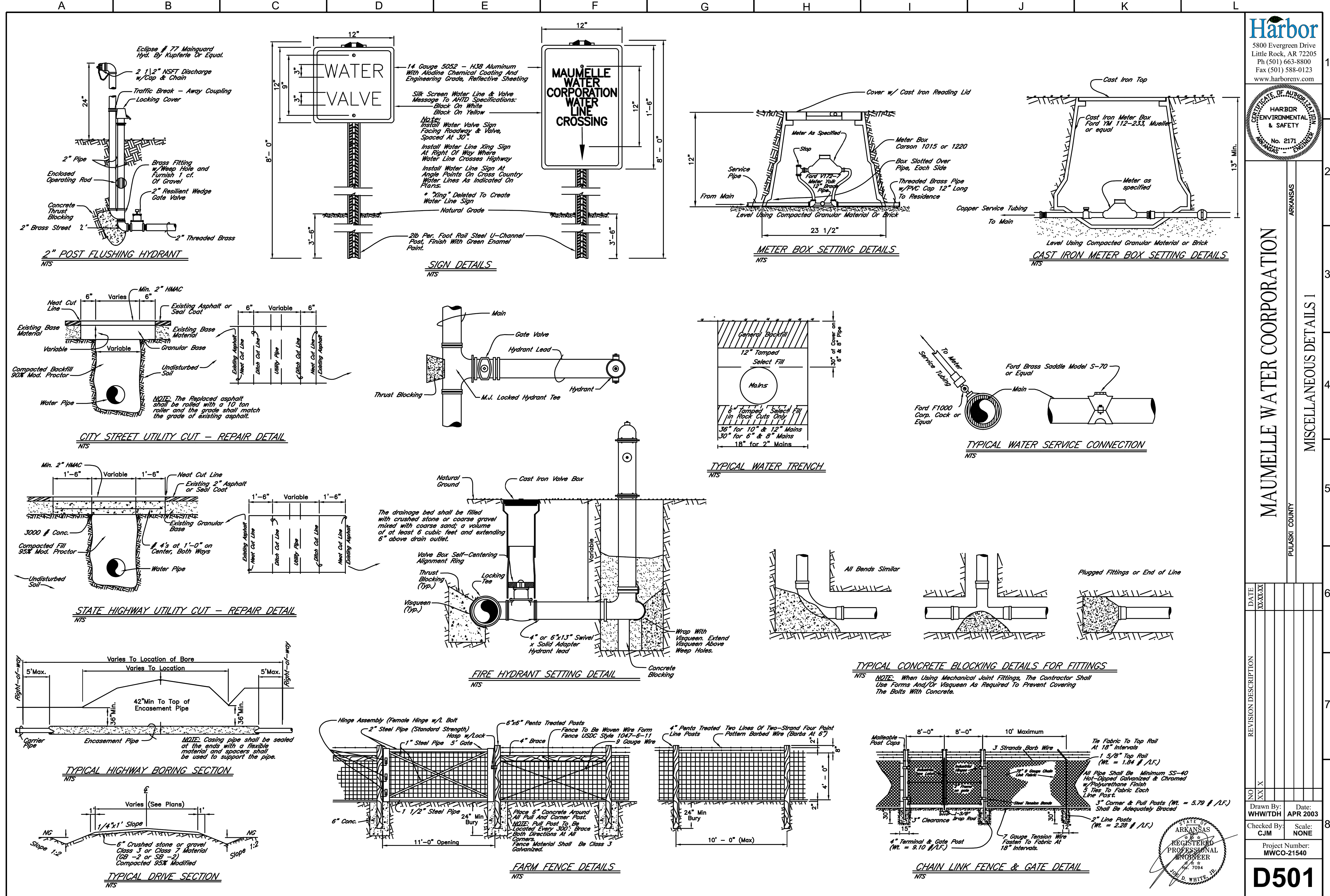
LEGEND	
8" DIP WATER MAIN	FIRE HYDRANT
1" SVC W/ 2" SLEEVE	RETAINER GLAND W/ CONCRETE COLLAR
2" BLOW-OFF	VALVE
1" BLOW-OFF	BEND
	TEE

C18 - WATER PLAN
PARADISE VALLEY
PHASE 1
 LOTS 101-128, BLOCK 1
 LOTS 201-223, BLOCK 2
 LOTS 301-325, BLOCK 3
 TRACTS A & B

AN ADDITION TO PULASKI COUNTY
 BEING PART OF SECTION 17, T-3-N, R-14-W

JOE WHITE & ASSOCIATES, INC.
 CIVIL ENGINEERING - CONSULTING SERVICES - LAND SURVEYING
 25 RAHLING CIRCLE, SUITE A-2 LITTLE ROCK, ARKANSAS 72223
 PHONE: (501) 214-9141

DATE: 10-06-2021 SCALE: 1" = 50'
 PROJECT NUMBER: 21-038J



Harbor
 5800 Evergreen Drive
 Little Rock, AR 72205
 Ph (501) 663-8800
 Fax (501) 588-0123
 www.harborenv.com



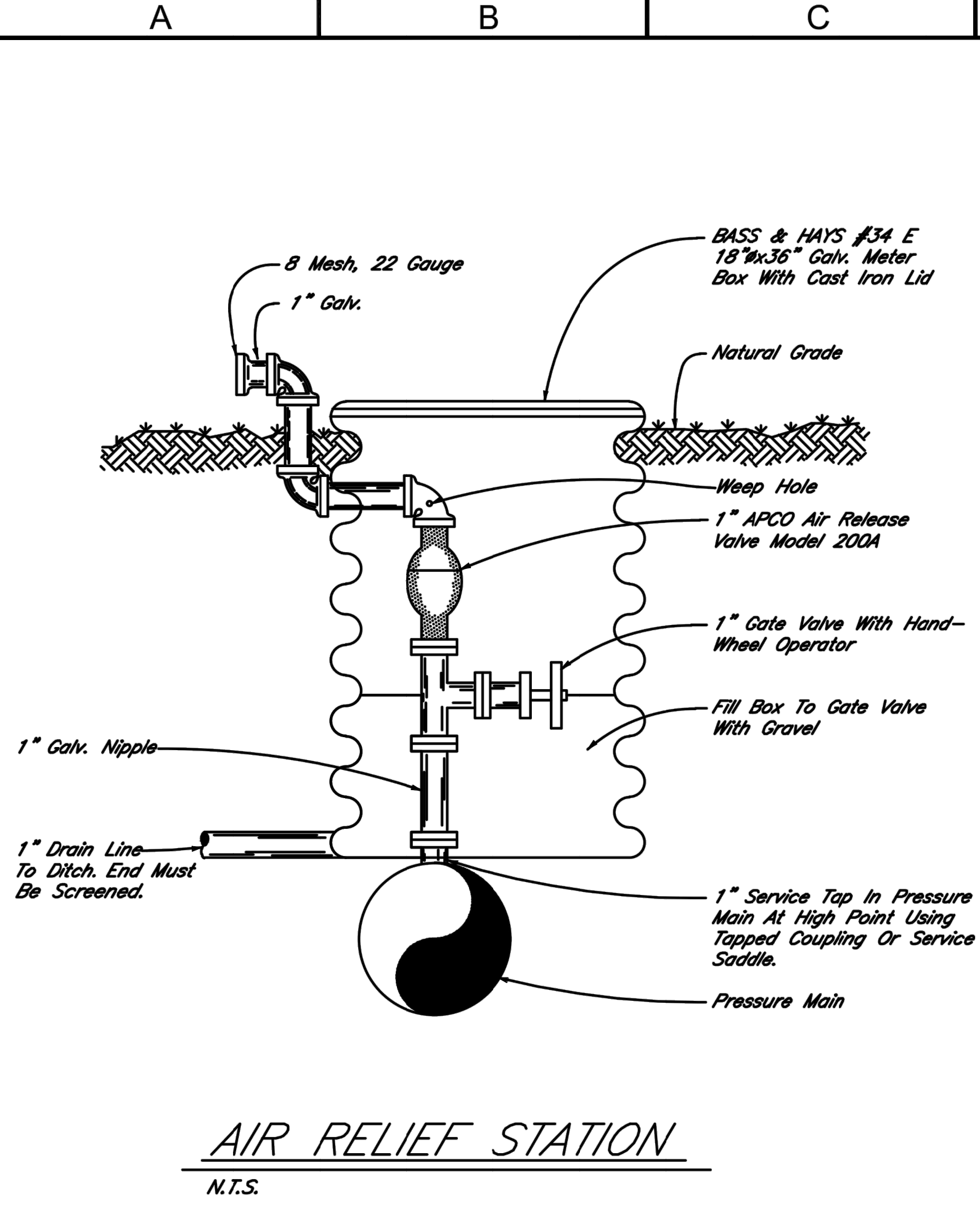
MAUELLE WATER CORPORATION
 PULASKI COUNTY

MISCELLANEOUS DETAILS 1

NO.	REVISION DESCRIPTION	DATE
XX		XXXX
XX		
XX		

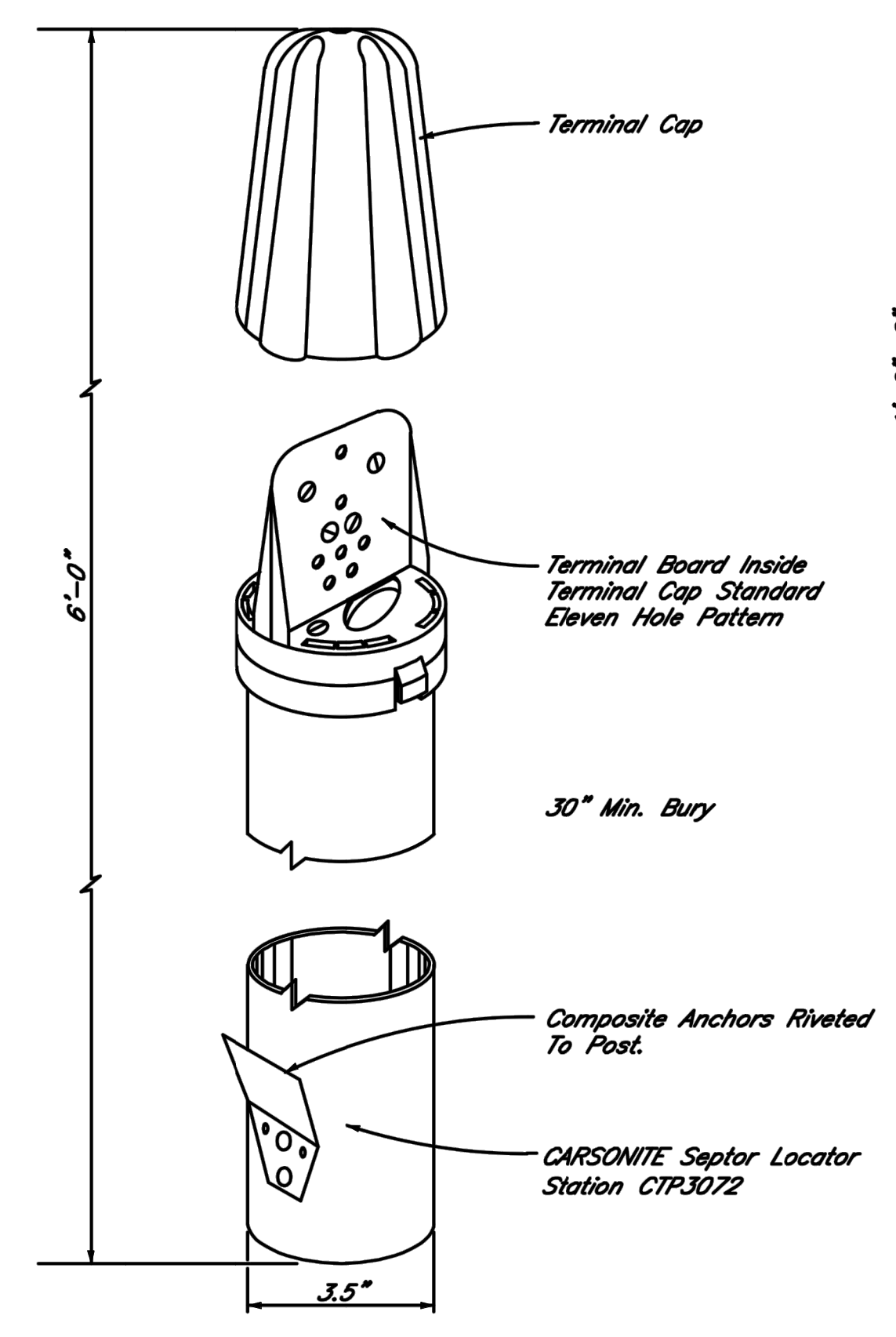
Drawn By: WHW/IDH Date: APR 2003
 Checked By: CJM Scale: NONE
 Project Number: MWCO-21540

D501



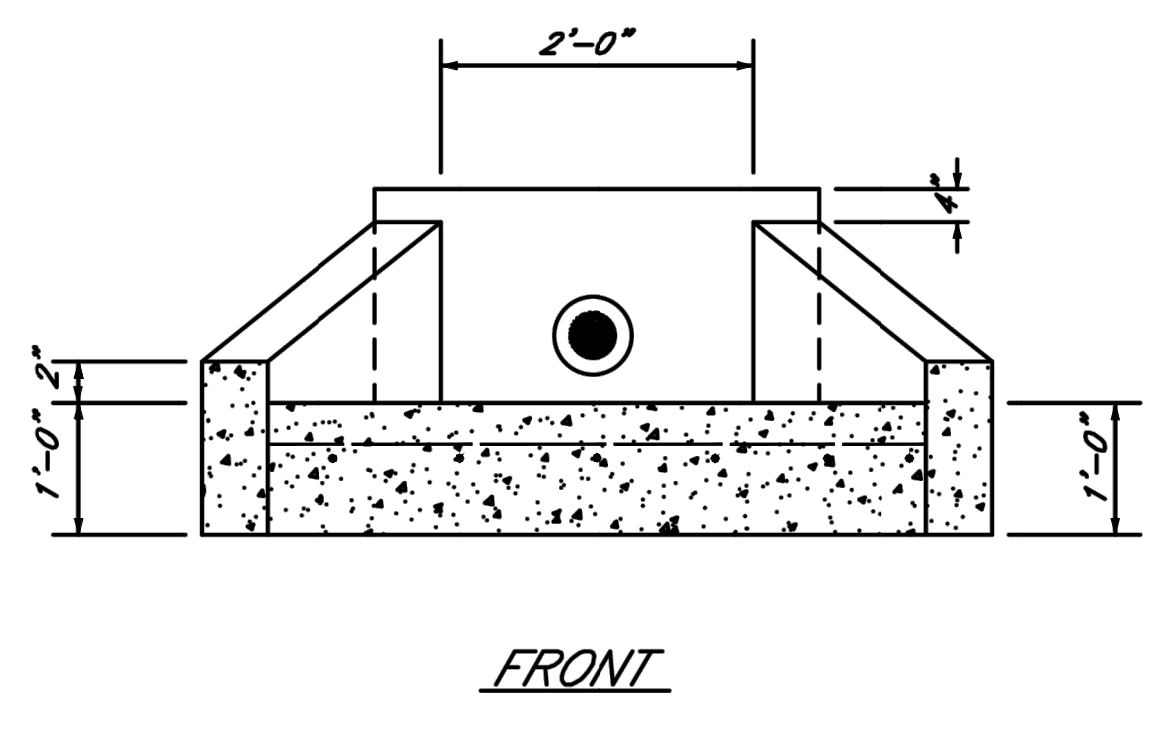
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N.T.S.

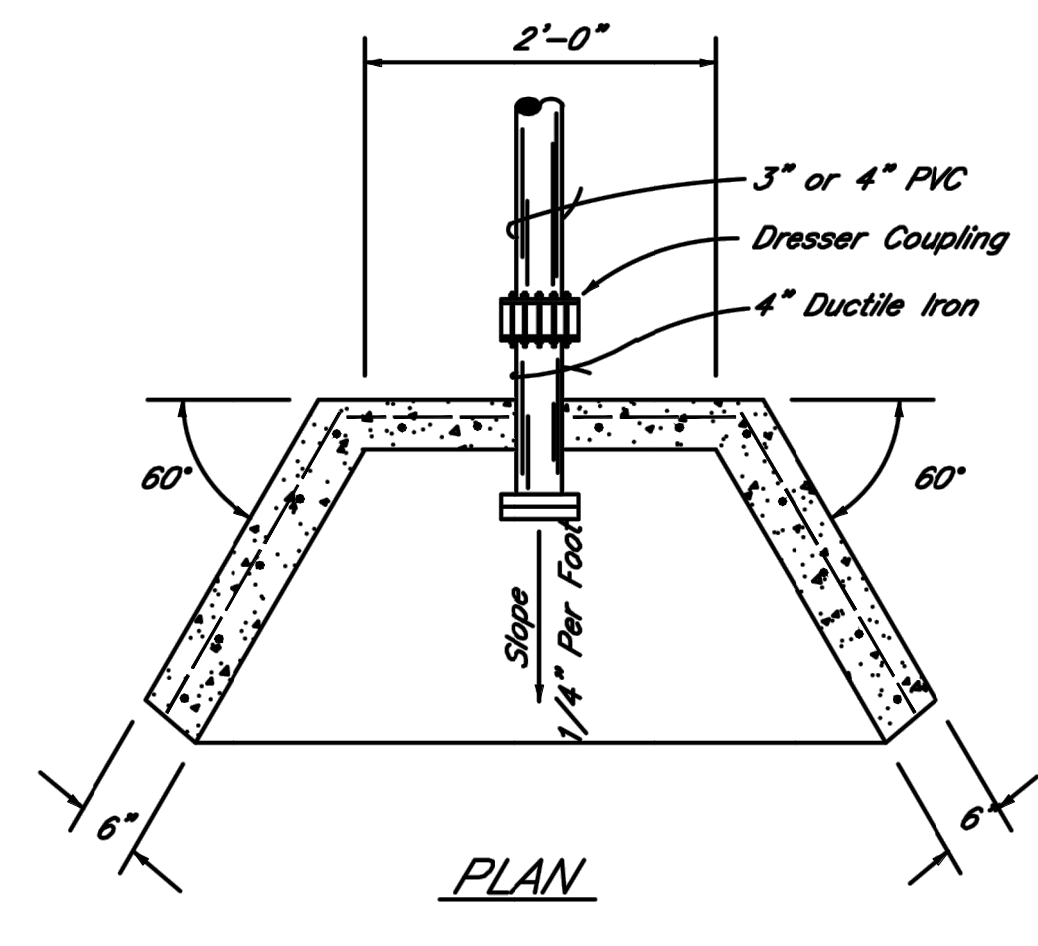


LOCATOR TEST STATION

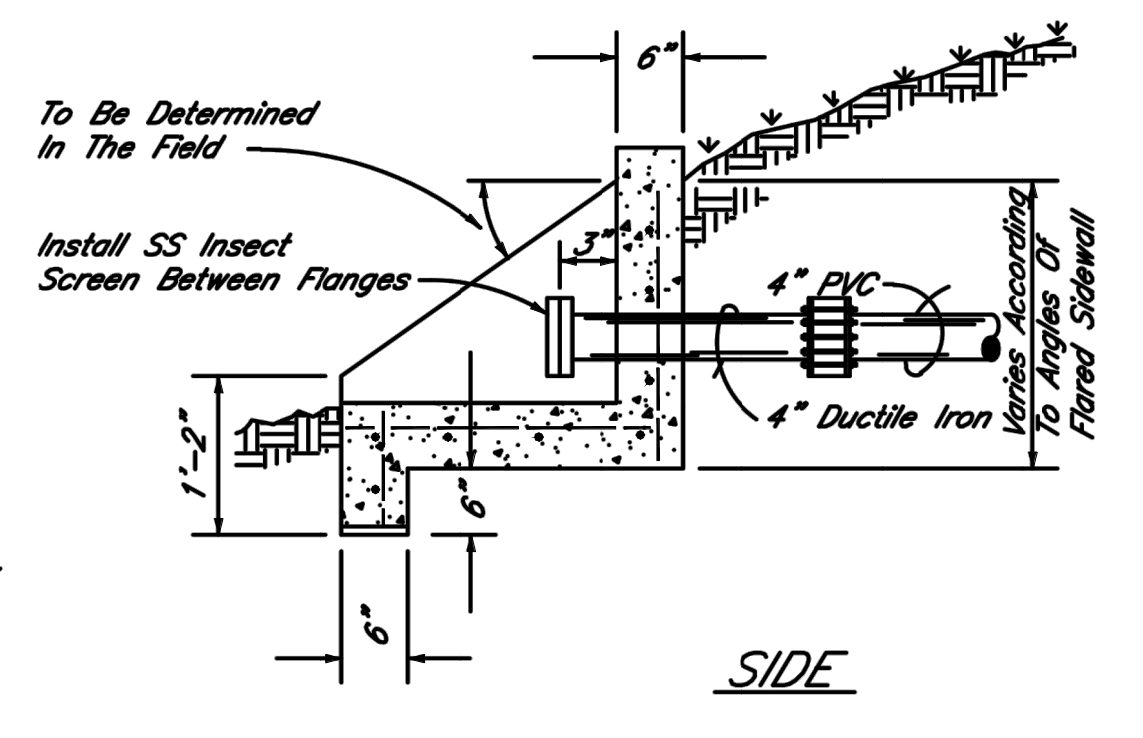
N.T.S.



FRONT



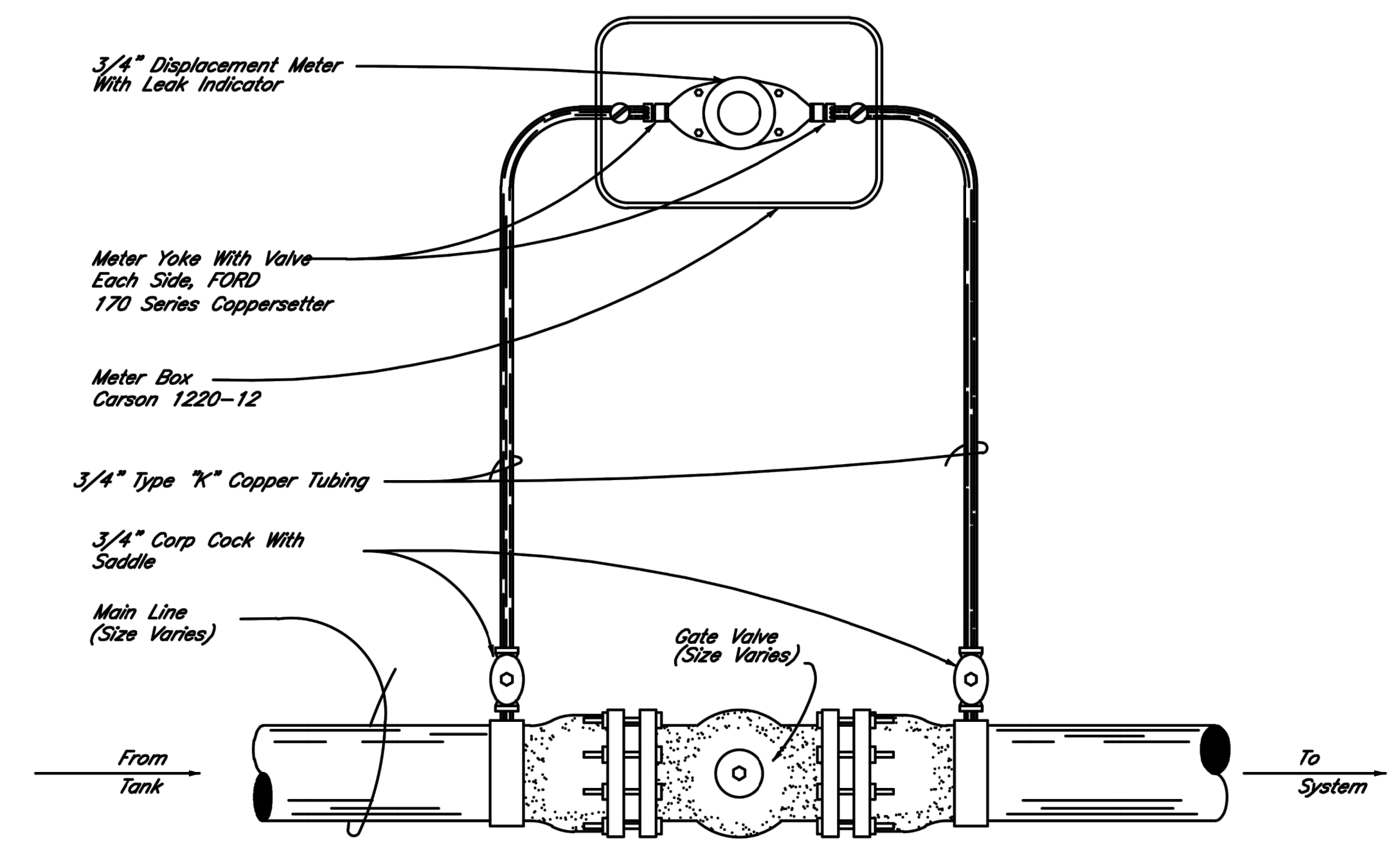
PLAN



SIDE

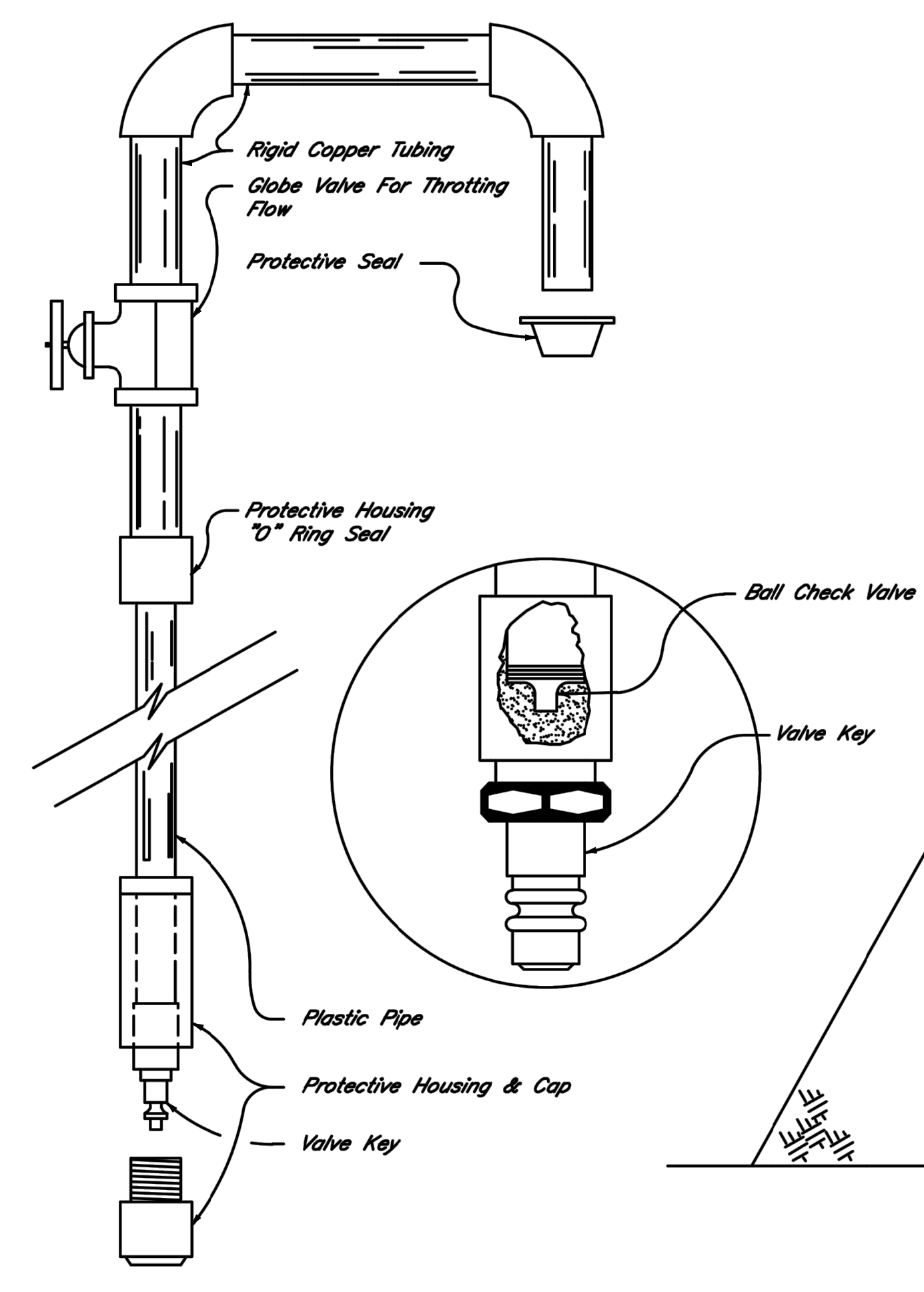
HEADWALL DETAIL

N.T.S.

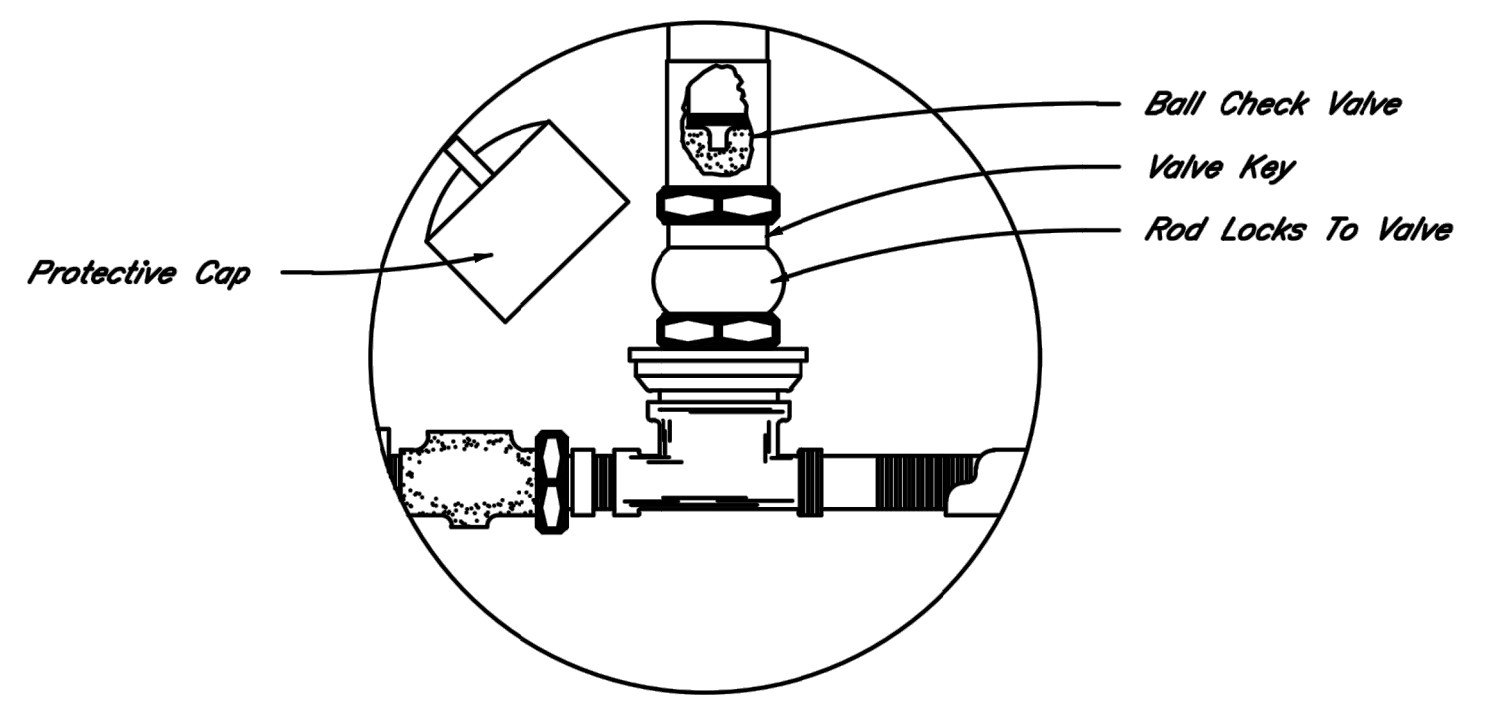


LEAK DETECTION STATION

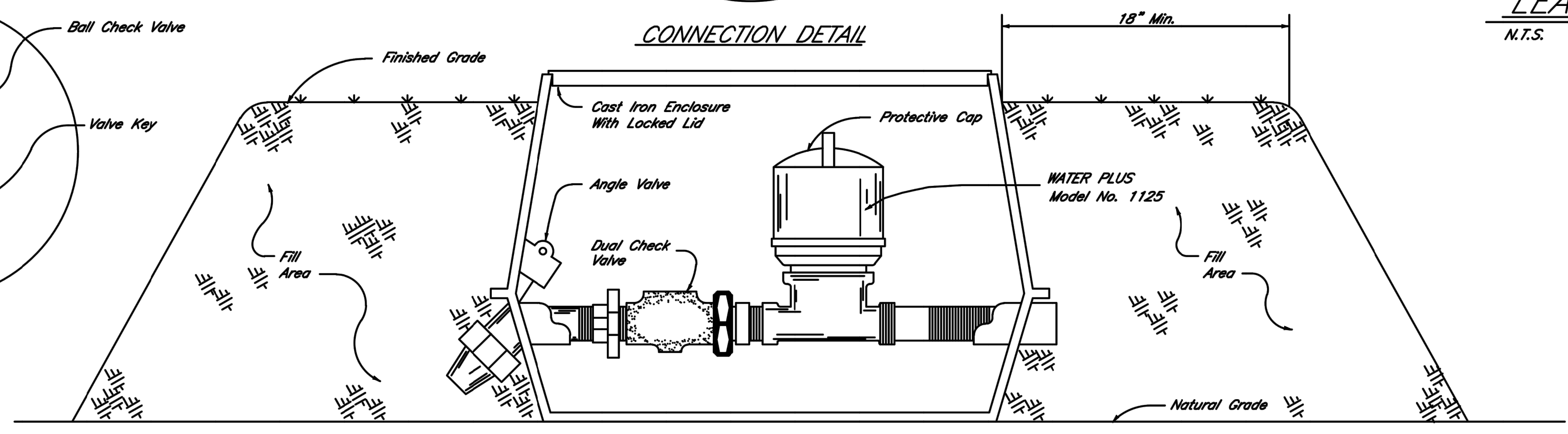
N.T.S.



PORTABLE PROBE ROD



CONNECTION DETAIL

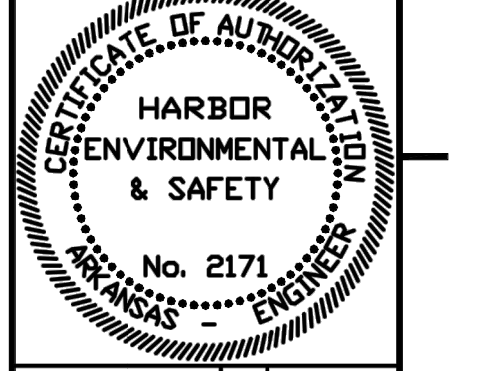


WATER SAMPLING STATION

WATER SAMPLING STATION DETAILS

N.T.S.

Harbor
 5800 Evergreen Drive
 Little Rock, AR 72205
 Ph (501) 663-8800
 Fax (501) 588-0123
 www.harboirenv.com



MAUMELLE WATER CORPORATION
 PULASKI COUNTY, ARKANSAS
 MISCELLANEOUS DETAILS 2

NO.	REVISION DESCRIPTION	DATE
XXX X		XX/XX/XX

Drawn By: **WHWTDH** Date: **APR 2003**
 Checked By: **CJM** Scale: **NONE**

Project Number: **MWCO-21540**
D502



**STANDARD SPECIFICATIONS FOR
SEWER CONSTRUCTION**

FOR

PARADISE VALLEY SUBDIVISION WASTEWATER

PREPARED BY

**PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT
DISTRICT NO. 2021-2
LITTLE ROCK, ARKANSAS**



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SECTION 01100
REQUIREMENTS FOR DEVELOPER FUNDED PROJECTS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This part of these specifications stipulates general requirements for the preparation of reports, drawings, specifications, inspections, and final approval of any proposed sanitary sewer lines, appurtenances, or other structures that are within the jurisdiction of the Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2. Any deviations from the requirements set forth herein will be approved only by written authorization from the Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2. Special conditions may arise on any project that are not covered in these specifications or that may require special consideration. In such cases complete details as to materials, methods of construction, or other procedures shall be submitted to the Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 for their review and approval prior to the start of any construction.
- B. Standard construction details are incorporated and made a part of these specifications in **Section 05000** and shall become a part of the standard requirements for the construction of manholes, sewer lines, building sewers, and special structures.
- C. Where reference is made to a particular industry specification (ASTM, etc.), it is hereby understood that reference is made to the latest revision in effect.

1.02 DEFINITIONS

A. Pulaski County Property Owners' Multipurpose Improvement District
No. 2021-2 - The sewer collection system, treatment facilities,
operational equipment and staff of the Wastewater Utility under the

jurisdiction of the City of Bauxite, Arkansas.

- B. Chief Executive Officer - The chief executive officer of the Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2.
- C. Developer - Individual, partnership, corporation, or other legal entity such as an improvement district desiring to construct sanitary sewer facilities for immediate or contemplated future inclusion in the Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2.
- D. Engineer of Record - Individual registered to practice engineering in the State of Arkansas responsible for the design and construction inspection of the project.
- E. ASTM - American Society for Testing and Materials
- F. AASHTO - American Association of State Highway and Transportation Officials.
- G. ANSI - American National Standard Institute
- H. Resident Inspector - Individual with at least 2 years experience in the following: Construction of Sanitary Sewers or related construction.

1.03 CONFORMITY

All drawings, specifications, and construction procedures shall conform to the standards as established by Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2. All drawings and specifications shall be completed under the supervision of a Professional Engineer registered in the State of Arkansas. The Engineer's seal shall be on all drawings and specifications submitted as approval drawings or as As-Built drawings.

PART 2 - JURISDICTION

2.01 AREA OF JURISDICTION

These general requirements for sanitary sewer lines shall be required for any area within the city limits of Bauxite, Arkansas, as may be changed from time to time and those areas outside the city limits whose sanitary sewer is to be treated by Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 treatment facilities or may at some time in the future become a part of Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2.

PART 3 - DRAWINGS AND SPECIFICATIONS

3.01 DESCRIPTION

This part of the specifications covers the requirements of submission to Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 of drawings and specifications in order to obtain approval of a Developer Funded Project and the procedures required to have the Project accepted into the Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 System.

3.02 DESIGN STANDARDS

All projects submitted to Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 shall be designed according to the following criteria:

$$Q(\text{Max}) = [P * A * D * 100 \text{gpcd}] + [1500 \text{ gpda} * A]$$

WHERE:

- Q(Max) = Design Flow
- P = Ten State Standards Peaking Factor
- D = Projected Population Density of the fully developed watershed (Persons/Acre)
- A = Total acreage of the upstream watershed
- 100 gpcd = 100 gallons per person per day domestic flow (Ten State

Standards)

- 1500 gpda = 1500 gallons per day per acre of watershed for Infiltration/Inflow
Population projections should be based upon proposed "zoning" of the development. In areas where "zoning" information is not available population densities less than eight (8) persons per acre will not be accepted without supporting documentation.

3.03 PRELIMINARY REPORT

- A. When requested by PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 , the Engineer shall prepare and submit a preliminary engineering report prior to approval of construction plans. The report shall conform to accepted engineering criteria including the "Recommended Standards for Sewage Works", published by the Great Lakes - Upper Mississippi Valley Board of State Sanitary Engineers, latest revision. This publication is commonly referred to as "The Ten States Standards".
- B. The size, scope, and contemplated land use of the proposed development will determine the need for a preliminary report.

3.04 SPECIAL DESIGN REQUIREMENTS

- A. All public gravity mains and force mains constructed within the jurisdiction of Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 shall be constructed in such a way that Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 Maintenance Crews shall have access by a paved surface to all manholes contained in the proposed project for cleaning and maintenance. Accessible by a paved surface to manholes will be defined as the manhole being within 500 feet of a paved surface constructed to handle Utility

Cleaning and Inspection Vehicles with a minimum turning radius of thirty-seven feet. Such paved surfaces located

in areas other than public right of ways will be constructed within easements restricting the construction of any fence, wall or gate that would restrict Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 's free access to the paved surface at all times.

- B. If in the design of a residential, commercial, or industrial facility in compliance with Section 3.04 A. above the construction of paved access is not possible contact Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 for alternatives.
- C. All developments within the Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 's System should be served by gravity sewer. If the design of a project does not make it feasible to serve the facilities by gravity sewer, prior approval from Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 will be required for any force main project prior to submittal of the project. See Section 002730 Subsection 3.14 for required Force Main Marking Requirements.
- D. Developer and/or Engineer of Record shall be responsible for obtaining all geotechnical investigations relating to the construction and appurtenances of the proposed sanitary sewer.

3.04 SUBMITTAL REQUIREMENTS FOR CONSTRUCTION PLAN APPROVAL

- A. A Letter of Transmittal shall be submitted detailing all items submitted to PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 for review and approval of the project. The project name and the date submitted to PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 shall be shown on the Letter of Transmittal. The Owner's name and total acreage of the project shall also be included in the Letter of Transmittal.
- B. An 8 1/2 x 11 copy of a quad-sheet showing the drainage basin being served by the proposed main extension. The total number of acres served

should be shown on the drawing.

- C. A preliminary unit cost breakdown which must match plan quantities submitted on the construction drawings.

D. Three sets of D size (24x36) construction drawings containing the following:

1. An Overall Project Map including the following items:

- Vicinity Map
- Lot breakdown and proposed lots to be served. All lots to be served shall be capable of obtaining service by means of gravity flow through individual service lines. If any lot cannot be served by gravity flow it should be noted on the plans and approval must be obtained from PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2. A lot will be considered to be served by gravity when the ground level of the proposed residence or commercial building can be served by gravity without the aid of any pumping apparatus. No service line to a lot shall cross any adjoining lot without approval from PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2.
- Location and size of existing sewers
- Location, size, length, material, and grade of proposed sewer segments.
- Bar scale and north arrow
- Title block containing project name, project number, Engineer of Record performing the design, and date.
- Location of all storm water detention facilities required for the project

2. Plan Profile sheets of sewers including the following items:

- Vertical scale of 1" = 10' or 1" = 5'
- Plan scale of 1" = 100' or larger
- Elevations based on Mean Sea Level (NGVD-29 Datum)
- Location of other Utilities and storm drainage on both the plan and the profile

3. Standard Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 Detail Sheets are incorporated in this document. Reference will be made on the plans to incorporate these Detail Sheets as part of the Engineer of Record's Plans for the project.

4. In lieu of the submittal of three sets of plans the Engineer may submit a set of plans on disk to PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 in a format compatible with PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 's latest version of AutoCad.
- E. Two (2) sets of specifications on construction procedures, materials, and testing, or a statement by the Engineer contained on the drawings that the work will conform to Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 Standard Specifications.
- F. A review fee of 1.0% of the estimated cost of the proposed sanitary sewer work with a maximum of \$750.00 and a minimum of \$50.00.
- G. All submittals not conforming to these requirements shall be returned to the Engineer for corrections and resubmittal.
- H. Preliminary sanitary sewer drawings located in the City of Bauxite public rights of way must be submitted to the City of Bauxite, Director of Public Works for review and approval, if required by the City of Bauxite Standards.

3.05 CONSTRUCTION PLAN APPROVAL LETTER

- A. Upon approval of the project by PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 , one (1) set of drawings will be returned to the Engineer along with an approval letter stating any specific items that must be adhered to for PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 's approval of the project. The drawings shall be stamped by PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 as reviewed and accepted for construction. Any items that are required to be added or changed will be shown on the drawings. The project shall be constructed in accordance with the approved drawings. Any portion of the project constructed in any way other than shown on the

approved drawings shall not be accepted by PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 unless prior written approval is given by PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 for any major change in alignment, grade, elevation, or type of pipe. Minor field changes that do not change the original concept of the project may be made with the approval of the Engineer of Record. If the plans are submitted to PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 on disk, the plans with any corrections required shown on a separate layer, will be returned to the Engineer of Record on disk.

- B. No construction shall begin on the project until the Approval Letter is signed by the Owner of the Project and returned to PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2.
- C. If applicable the owner shall be eligible to enter into a Reimbursement Agreement (See Section 01120 of these Specifications) at the end of the construction period. A representative of the Engineering Services Department of PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 will be available to meet with the owner of the project and the Engineer of Record to discuss the procedure for entering into a Reimbursement Agreement prior to final acceptance of the project. Reimbursement Agreement must be entered into by the owner of the project within 30 days of the date of acceptance by the Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2.
- D. The approval letter shall be in force for a period of one (1) year. If construction of the project has not begun within the one (1) year period PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 's approval of the project will expire. The project will be resubmitted to PULASKI COUNTY

PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 for its review when the project is ready for construction. Resubmittal of an expired project must follow the same procedure as if the project had never been submitted previously, including a new review fee.

PART 4 - INSPECTION AND LAYOUT OF THE PROJECT

4.01 ENGINEER RESPONSIBILITY

The Engineer of Record who prepared and submitted the construction drawings and specifications and to whom the approval letter was sent shall be responsible for construction layout, general supervision, and resident inspection of the project. Continuous project responsibility shall be an expressed condition of project approval. The Engineer of Record's responsibility shall extend through submittal of "as built" drawings and final acceptance of the project by PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2. Should the Engineer of Record be removed from the project by the Owner for any reason, no construction will be performed on the project until the Owner has acquired the services of another Engineer and notified PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 in writing of such action.

Construction of any portion of a project without the assistance of an Engineer of Record shall be cause for rejection of that portion of the project by PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2.

4.02 CONSTRUCTION LAYOUT

The layout and staking of the construction work shall be completed by trained and qualified survey personnel under direct supervision of the Engineer of Record.

Such layout and staking shall consist of all items necessary to attain proper alignment and grade of the project.

4.03 GENERAL SUPERVISION

All Developer Funded Projects shall be constructed under the general supervision of a Professional Engineer registered in the State of Arkansas. General supervision shall consist of, but not limited to, periodic visits to the project to determine if the work is proceeding in accordance with the approved plans and specifications and with the standards set forth by Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2. Any defects, deficiencies or irregularities in the project found by the Engineer of Record or reported to the Engineer of Record by his inspector shall be reported to Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2. Actions shall be taken to correct any and all deficiencies and the Engineer of Record shall notify PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 of any action taken.

4.04 RESIDENT INSPECTION

- A. Project inspection is an integral part of the Engineer of Record's responsibility. The Engineer of Record may choose between providing full time resident inspection or periodic inspection, but whichever he chooses it shall be his duty through his inspector to ensure that the project complies with the approved drawings and specifications. The Engineer of Record nor his inspector shall give permission for any major changes in the approved drawings without obtaining written permission from PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2.

- B All projects within the jurisdiction of these requirements shall at all times be subject to the general inspection by Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2. The frequency of visits and the number of hours required for Wastewater personnel at the project site shall be determined by the nature of the project being constructed.

PART 5 - EXISTING UTILITIES

5.01 PROXIMITY

All drawings shall be drawn in such a manner that all known utilities are shown using the best available information including utility maps, field surveys, or other sources of information. Sanitary sewer lines shall be kept a minimum horizontal distance of five (5) feet from all underground utilities including storm drains except water lines. Relation to water lines shall be as stated in Section 5.02. No sewer main will be constructed underneath or within ten feet of the top bank of any storm water detention pond.

5.02 SEWER MAIN IN RELATION TO WATER LINES

- A Whenever possible, sewers should be laid at least ten (10) feet, horizontally, from any existing or proposed water main. Should local conditions prevent a lateral separation of ten (10) feet, a sewer may be laid closer than ten (10) feet to the water line if:
1. It is laid in a separate trench.
 2. Approval is obtained from Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 and the Arkansas Department of Health.
 3. In all cases the elevation of the crown of the sewer must be at least eighteen (18) inches below the invert of the water main.

- B Whenever sewers must cross under water mains, the sewer shall be laid at such an elevation that the top of the sewer is at least eighteen (18) inches below the bottom of the water main. When the elevation of the sewer cannot be buried to meet the above requirement, the sewer main shall be constructed using ductile iron pipe for a distance of ten (10) feet on each side of the water main. One full Joint of the ductile iron sewer main should be centered under the water main so that both joints will be as far from the water as possible.
- C When it is impossible to obtain proper horizontal and vertical separation as stipulated above, the sewer main shall be constructed of mechanical joint ductile iron pipe. All construction shall be subject to review and inspection by both Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 and Sardis Water Association.

PART 6 - RULES AND REGULATIONS

6.01 LAWS, REGULATIONS AND ORDINANCES

All Federal, State, County, or City Laws, Regulations, or Ordinances shall be complied with on all sewer projects. This shall include, but not limited to obtaining approval from the Arkansas State Health Department and the ADEQ. The Engineer of Record will be responsible for submission to and obtaining approval from the Arkansas State Health Department and the ADEQ, including payment of any applicable fees.

6.02 PERMITS AND LICENSES

- A. All permits and licenses required by any Federal, State, County, or Local Governing Body shall be obtained in strict accordance with the requirements of the governing agency. When required by the licensing agency, Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 will assist in application for permits and licenses, but the

cost of any permit, fee, or bond required will be borne by the Developer.

- B** Any installation of sewer lines or sewer facilities proposed by the Developer may be subject to connection fees, additional charges, or approval by adjoining or nearby property owners or third parties, such as a sewer improvement district. Such an improvement district is a separate, distinct legal entity which Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 does not operate or control. Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 hereby disclaim any duty, obligation, or liability of any nature whatsoever to determine the existence, status or amount of any fees which may be due third parties such as improvement districts which may be owed in addition to those fees due to Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 for Sewer lines and/or sewer facilities installation proposed by Developer.

PART 7 - PROJECT ACCEPTANCE BY THE UTILITY

7.01 GENERAL

This part of the specifications covers the requirements for final inspection and acceptance of the sanitary sewerage facilities upon completion of the project. No connection of customer facilities or other utilization of sewer main extensions will be permitted by PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 until a letter of acceptance is issued. The following sections describe the requirements that must be met before an acceptance letter can be issued by the Utility.

7.02 LEAKAGE TEST

- A** Methods of testing the sewer mains and manholes are outlined in Section 02734 of these specifications. All leakage and vacuum tests shall be conducted in the presence of a representative of the Engineer of Record.

The Engineer of Record will be required to certify in writing that the required leakage and vacuum tests have been performed on all line segments and manholes and that all line segments and manholes passed the required tests. Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 will require the Engineer of Record to submit documented proof of the leakage and vacuum test performed on each line segment. The form used in this submittal will be acceptable to Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2.

- B. When leakage and vacuum tests are being conducted by the Engineer of Record he will be required to notify Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2. Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 , at their discretion, may send a representative to witness the test.
- C. When the proposed sewer mains and manholes have successfully passed all the required Leakage and Vacuum Tests PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 personnel will conduct a Preliminary Inspection of the project and complete a "Punch List" of all deficiencies found on the project. This list of deficiencies will be forwarded to the Engineer of Record for the project.

7.03 VISUAL INSPECTION/TELEVISIONING

After the leakage and vacuum test have been successfully completed and As Builds submitted to Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 , the Developer will have the project internally televised to assess installed quality. **Contractor used by the Developer for this purpose must be able to televise the sewer mains in accordance with Section 02762 of these specifications.** PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 's Inspector must be present at the time the televising of the mains is being performed. Contractor will submit video which

will be reviewed by PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 's Engineering Services Section and will be kept on file as a reference. Any defects caused by poor materials or workmanship will be cause for rejection. A list of defects will be forwarded to the Engineer of Record for the project. The project will not be accepted until mains have been televised to PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 's satisfaction and Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 has been submitted a video confirming that the construction conforms with these specifications.

7.04 AS BUILT DRAWINGS

- A. After completion of the project, one complete set of As Built Drawings shall be submitted Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 for review and approval. As in the submittal of a project, the Engineer of Record may elect to submit the As Built Drawings on disk to PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2. Any corrections or changes required by PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 will be sent to the Engineer of Record for change and resubmittal to PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2. Upon acceptance of the As Built Drawings the Engineer of Record will be notified by PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2.
- B The size and scale of the drawings shall be the same as described in Section 01100 Part 3.04 of these specifications for construction plan approval. The size and type of pipe for each section of sewer main shall be shown on the as built. Manhole stations shall be shown on all As Built drawings including the Overall Project Map.

- C. The following items shall be shown on the as built drawings and shall be checked by PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 personnel before accepting the as built drawings as complete:
1. The length, slope, of each section of the project shall be shown on the as built drawings.
 2. Elevations of all manhole rims and pipe inverts shall be shown on the as built drawings. All elevations shall be tied to the National Geodetic Vertical Datum 1929 Adjustment (NGVDD29).
 3. All manholes shall be located with coordinates using the Arkansas State Plane Coordinate System - North Zone - NAD-83 Adjustment with a maximum allowable positional error of 1.0 foot. Copies of As Built field notes and calculations showing how each manhole was located will be submitted to PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 with the As Built drawings if required by PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2.
 4. All sanitary sewer service lines shall be shown on the as built drawings both in distances from manholes and in distance from property corners along the street right of way or along lot lines. The depth of the end of the service below natural ground shall be clearly shown on the as built drawings. The exact location of all sanitary sewer service lines shall be accurately identified in the field at the property line, as shown in PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 Detail Drawings, in order that the location can be easily found when the connection is made. Service lines should be installed to provide sufficient clearance from other utilities and provide sewer service by means of gravity flow for each property within the project.
- D. Only sewer mains as they were constructed shall be on the as built drawings. The as built drawings shall be clean of all unnecessary items and

shall show only the sewer lines and services as they were constructed.

7.05 FINAL INSPECTION

A. Before sanitary sewer extensions are accepted by Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 and new service line connections to these extensions approved, a final inspection will be made by PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 personnel. The final inspection will not take place until the as built drawings are submitted to PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 and have been reviewed by PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 personnel.

B. The final inspection shall not be scheduled until requested by the Engineer of Record for the project. The final inspection shall be scheduled by the Engineer of Record with PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 at least twenty four (24) hours in advance. Prior to the Engineer of Record scheduling the final inspection the Engineer of Record shall assure himself that all discrepancies noted on the video tapes and on the preliminary inspection performed by PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 have been corrected.

A list of workmanship and material defects, if any, will be forwarded to the Engineer of Record. Defects noted must be corrected before acceptance.

D. Improvements found not as depicted on the submitted as built drawings shall not be accepted. No portion of a project will be accepted prior to acceptance of the entire project.

7.06 FINAL PAY ESTIMATE

Upon completion of the project the Engineer of Record shall submit one (1) copy of the final construction pay estimate to Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2. The estimate should clearly match the as built quantities and unit prices. If Lump Sum Payment is used a letter stating the Contractor was paid on a Lump Sum Basis will be required and shall include the as built quantities for the project. The project will not be accepted by Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 until either the Final Construction Pay Estimate or the Letter on Lump Sum Payment has been submitted to Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2.

7.07 SEWER MAINTENANCE BOND

- A. Upon completion of the project and after all defects have been corrected in accordance with the final inspection, a maintenance bond in an amount equal to 50% of the construction cost as indicated on the final pay estimate shall be forwarded to Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2.
- B. The period of the bond shall be for one year and shall cover all defects in materials and workmanship. The bond shall be binding on the developer or the contractor.
- C. If, in the judgment of Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 , construction of a sewer main which totals less than eight hundred (800) linear feet or the total construction cost is less than \$10,000 meets the applicable specifications stated herein the maintenance bond may be waived.

- D. An inspection of the project may be made by Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 before the expiration of the maintenance bond. A list of all defects in material or workmanship found during this inspection will be forwarded to the contractor and if the contractor fails to act on the list of defects a notice will be sent to the bonding company. As soon as all defects found are corrected, Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 will release the maintenance bond.

7.08 EASEMENTS

- A. Where sanitary sewer lines are not placed in public rights of way or platted easement in a platted subdivision, a permanent easement shall be acquired for Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 and dedicated for the purpose of maintaining the sewer lines. The easement shall be an exclusive sanitary sewer easement and common utility easements shall not be accepted.
- B. Sanitary sewer easements shall have a minimum width of 10' or the maximum depth to the sewer flowline whichever is greater. Where practicable, easements of maximum width possible will be provided to allow access to all manholes.
- C. All easements shall be on the standard Bauxite Sanitary Sewer Easement form. All easements for sanitary sewer lines shall be in favor of the City of Bauxite, Arkansas for the use and benefit of the Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 Department. No changes to the Standard Form will be allowed without approval from PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2.
- D. A digital copy of the final plat of the subdivision that contains the sewer mains may be filed with PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 in lieu of easements. The final plat must meet all requirements of the City of

Bauxite's Ordinance concerning final plat's (latest revision). All easements used for the installation of sewer mains on the plat shall be shown as "Utility Easements".

- E. Easements or Final Plats may not be filed with PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 until construction of the project is complete and the project has met all other requirements for acceptance listed in these specifications. Easements should be submitted to Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 for review and approval prior to being recorded by the Engineer of Record.

7.09 BILL OF SALE

- A. Upon completion of the project the Developer shall complete a Bill of Sale. The form used for the Bill of Sale will be PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 's Standard Bill of Sale. The Bill of Sale shall transfer ownership of the project to the City of Bauxite for the use and benefit of the Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 and be signed by the Developer (Owner) and notarized by a Notary Public prior to delivery to the Utility. No changes to the Standard Form will be allowed without approval from PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2.
- B. No project will be accepted by PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 for connection to PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 's system until such time as the Bill of Sale has been delivered and accepted by PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2.

7.10 AFFIDAVIT OF COMPLETION

- A. Upon completion of the project the Developer and the Engineer of Record shall complete an Affidavit of Completion. The Affidavit of Completion shall be delivered to PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 after the Owner and the Engineer of Record have completed the appropriate sections of the document. No changes to the Standard Form will be allowed without approval from PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2.
- B. The total sum of the project as shown on the Affidavit of Completion shall match the Final Cost Estimate prepared by the Engineer of Record and submitted to PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2.
- C. No project will be accepted by PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 for connection to PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 's system until such time as the Affidavit of Completion has been delivered and accepted by the Utility.

7.11 ENGINEER'S AFFIDAVIT OF ACCURACY FOR SANITARY SEWER EASEMENTS & FACILITIES

- A. Upon completion of the project the Engineer of Record shall complete an Engineer's Affidavit of Accuracy For Sanitary Sewer Easements and Facilities. The Engineer's Affidavit of Accuracy For Sanitary Sewer Easements and Facilities shall be delivered to PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 after the Engineer of Record has completed the appropriate sections of the document and the document has been notarized by a Notary

Public. No changes to the Standard Form will be allowed without approval from PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2.

- B. No project will be accepted by PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 for connection to PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 's system until such time as the Engineer's Affidavit of Accuracy For Sanitary Sewer Easements and Facilities has been delivered and accepted by the Utility.

7.12 ACCEPTANCE LETTER

- A. All projects will be issued an acceptance letter from Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 when they have completed or submitted all items listed above and the final connection of the project to the PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 System has been made and approved by PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2. No portion of a project shall be put into service without approval from Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2.
- B. Approval of the use of a completed portion of a project will only be given in the best interest of PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 and such approval for the use of completed portions of the project does not constitute acceptance of the entire project by PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2.

SECTION 02220

EXCAVATION, BACKFILLING, AND COMPACTING

PART 1- GENERAL

1.01 WORK INCLUDED

- A. Excavation, backfilling, and compaction for sanitary sewer pipelines, service lines, manholes and incidental construction.

1.02 RELATED WORK

- A. Section 02575 - Pavement Repair
- B. Section 02605 - Manholes
- C. Section 02730 - Sanitary Sewer Pipelines
- D. Section 02732 - Sanitary Sewer Service Lines
- E. Section 02930 - Lawns & Grasses
- F. Section 02935 - Ground Cover

1.03 QUALITY ASSURANCE

- A. If required, laboratory analysis shall be provided for moisture density relation for material per AASHTO Designation T-180.
- B. Determine the field density of backfill in accordance with AASHTO Designation T-147.

1.04 REFERENCES

- AASHTO Designation T-99
- AASHTO Designation T-147

AASHTO Designation T-180

ASTM D 2487

ASTM D 2321

ASTM D 33

Standard Specifications of the Arkansas Highway & Transportation Department

1.05 PROTECTION

The Work included in this Project may require excavation and related activities in close proximity to existing buried and aerial utility lines and facilities, such as water lines, sewer lines, storm drains, natural gas lines, electrical power lines, telephone cables, and TV cables. Where their presence is known, the approximate location of such utilities should be shown on the Drawings, but all such utilities and individual service lines are not known. The Contractor shall be aware of the potential for such utility lines to conflict with intended construction efforts, and the Contractor shall use appropriate precautionary measures to locate and protect such utility lines and services so as to avoid damage and interruptions to service. The Contractor shall contact the owners of the various existing utility lines and services as may be affected by the construction and solicit their assistance in identifying, locating, marking, and protecting these facilities prior to the beginning of any excavation or other work which might endanger the existing utilities. If such utilities are damaged or impaired because of the Contractor's actions or omissions, the Contractor shall be responsible for the cost of repairs or replacements of the affected or damaged utility or service line.

- C. The Contractor shall comply with the Arkansas One-Call System and shall alert potentially conflicting utility systems accordingly.
- D. In all cases, the Contractor is responsible for protecting public and private property; and, protecting any person or persons who might be injured as a result of the Contractor's work.

PART 2 - PRODUCTS

2.01 EMBEDMENT MATERIALS - GENERAL

- A. Embedment materials are restricted to Class I materials as described below and in accordance with ASTM D 2487, latest edition.
- B. Gravel material for select backfill across streets, roads, driveways, and for placement of "gravel" surfaced areas, shall be Class 7 material conforming to the Standard Specifications of the Arkansas Highway & Transportation Department, latest edition.

2.02 CLASS I EMBEDMENT MATERIAL

- A. Class I embedment material shall conform to class IA embedment materials in accordance with ASTM **D** 2321, latest edition. Material shall meet the grading requirements of ASTM C 33, gradation 67, commonly referred to as ASTM #67 or 3/4" concrete aggregate. Maximum aggregate size shall be 3/4 inch. This includes materials such as crushed stone or rock, broken coral, crushed slag, cinders, or crushed shells.

2.03 SELECT NATIVE BACKFILL MATERIAL

- A. Select native material shall be good earth, sand, or gravel that is free from large rocks, stumps or hard lumpy materials. Never use materials of perishable, spongy or otherwise unsuitable nature as select material.

2.04 FLOWABLE FILL MATERIAL

Flowable fill material for select backfill across streets, roads, and driveways shall be Flowable Select Material conforming to the Standard Specifications of the Arkansas Highway & Transportation Department, latest edition. Flowable Fill material will only be used when written permission is obtained from Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2.

PART 3 - EXECUTION

3.01 EXCAVATION - GENERAL

- A. All excavation shall be carried accurately to the line and grade shown on the Plans as established by the Engineer of Record.
- B. When excavation is carried below or beyond that required, fill the over-excavated space with compacted Class I material, or with concrete as approved by the Engineer of Record.
- C. The Contractor shall use a trench box or provide and install shoring where necessary to protect the labor, the work, or adjacent property. Shoring shall be maintained in place until the backfill has proceeded to a point where it can be safely removed.
- D. Dewater all excavations before any construction is undertaken. Install pipe only in dry trenches. Place concrete upon dry, firm foundation material only.

3.02 DISPOSAL OF EXCAVATED MATERIALS

- A. The Contractor shall be responsible for disposal of excess material and disposal of excavated material unsuitable for backfilling.

- B. Disposal of excess material shall only be allowed on private property with written permission of the owner of the property. A copy of the written permission must be forwarded to the Engineer of Record and Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2.

3.03 SEWER FLOW CONTROL

- A. **Plugging or Blocking:** A sewer line plug shall be inserted into the line upstream of the section or sections being worked. The plug shall be designed so that all or any portion of the sewerage can be released. After the work has been completed, flow shall be restored to normal.
- B. **Pumping and Bypassing:** The Contractor shall supply the pumps, conduits, and other equipment to divert the flow of sewage around the manhole section or sections in which work is to be performed. The bypass system shall be of sufficient capacity to handle existing flow plus additional flow that may occur during a rainstorm. The Contractor shall be responsible for furnishing the necessary labor and supervision to set up and operate the pumping and bypassing system. If pumping is required on a 24-hour basis, engines shall be equipped in a manner to keep noise to a minimum.
- C. **Flow Control Precautions:** When flow in sewer line is plugged, blocked, or bypassed, sufficient precautions must be taken to protect the sewer lines from damage that might result from sewer surcharging. Further, precautions must be taken to insure that sewer flow control operations do not cause flooding or damage to public or private property being served by the sewers involved.
- D. The Sewer Flow Control plan shall be submitted to Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 and written approval obtained prior to commencing work.

3.04 EXPLOSIVES

- A. Notify the Engineer of Record in advance if the use of explosives is necessary for

the efficient execution of the work.

- B. All work pertaining to the use of explosives shall be performed by qualified personnel.
- C. The Contractor shall obtain all the necessary permits from all governmental bodies. Copies of permits must be submitted to the Engineer of Record and the Contractor shall keep a copy of all permits on the job site at all times.
- D. Follow all governing OSHA safety regulations.
- E. Exercise every precaution to prevent damage to adjoining improvements or property.
- F. Always use a blasting shield or mat.
- G. Any damage to private property resulting from the use of explosives is the liability of the Contractor.

3.05 TRENCH DEWATERING

- A. Dewater all trenches to the extent that sanitary sewer pipe can be placed on a dry and firm trench bottom. Never place pipe in a wet or unstable trench. The allowable dewatering methods are:
 - 1. Well pointing; and,
 - 2. Over Excavation and Sump Pumping.Submit for approval other trench dewatering procedures.
- B. Well Pointing Procedure
 - 1. Install well points where required to keep the excavation dry and the subgrade stable.
 - 2. Install well points when the excavation is within two (2) feet of the water table.
 - 3. Provide sufficient pumping equipment, in good working order and available at all times, to remove any water that accumulates in excavations so a stable subgrade is obtained.
 - 4. Keep all dewatering equipment in continuous operation until backfill is completed.

- C. Pump, pipe, and drain all water resulting from dewatering operations in accordance with ADEQ requirements. Prevent flooding of streets or private property.
- D. In soils that cannot be properly dewatered, excavate and install Class I bedding material tamped in place to such a depth to provide a firm trench bottom.
- E. Divert surface runoff water away from the excavation. Where the excavation crosses natural drainage channels, care should be taken to prevent unnecessary damage or delays. Route diverted surface water into existing drainage structures, such as storm sewers, ditches, or streams per ADEQ requirements. Prevent flooding of streets or private property.

Discharge of trench water or surface runoff into a sanitary sewer is a violation of City of Bauxite Ordinance and violators will be prosecuted as prescribed by law.

3.06 SHEETING AND SHORING

- A. Provide sheeting and shoring of trenches to:
 - 1. Protect the safety of workers;
 - 2. Provide suitable means for constructing the sewer line;
 - 3. To maintain the trench free from slides or cave-ins;
 - 4. And, to protect public or private property, including existing utilities, buildings, streets, or other structures that are close to the trench.
- B. Follow all governing OSHA safety regulations.
- C. Keep shoring in place until the backfill has proceeded to a point where it can safely be removed.

3.07 EXCAVATION — SEWER LINE TRENCHES

- A. Keep the trench widths within the limits specified below. This requirement is to avoid superimposed loading in excess of the designed and specified pipe

strength; and to provide sufficient room for proper installation and bedding of sewer pipe.

Inside Pipe Diameter (Inches)	Maximum Width of Trench
	From Top of Pipe to 2' Above Top of Pipe
6, 8, 10	2' - 6"
12, 14, 15, 16	3' - 0"
18, 21	3' - 6"
24, 30	4' - 0"
36	4' - 6"

- B. If necessary to prevent sliding and caving cut, the trench banks back on a slope above an elevation two (2) feet above the outside top of the pipe to reduce the earth load on the trench sides. Never exceed the specified maximum width until 2 feet above the outside top of the pipe.
- C. Do not advance trench excavation more than three hundred (300) feet ahead of the completed pipe work and backfill.

3.08 OVER EXCAVATION

- A. Over excavate below the required subgrade only under the conditions as listed below.
 - 1. The soil at the bottom of the trench is mucky or in such condition that it cannot be properly shaped and graded.
 - 2. The subgrade material is too soft to properly support the pipe.
- B. After over excavating, provide and install a fill consisting of Stone Backfill (B Stone) material thoroughly tamped into place in a maximum of twelve (12) inch lifts up to an elevation sufficient to prepare the subgrade for the particular bedding class required.

3.09 BEDDING AND BACKFILLING - GENERAL

- A. Install all sewer pipe using Class I embedment materials. Refer to Standard Detail Drawings.
- B. It is essential that the complete backfill be done in such a manner to minimize voids in the backfill.
- C. Backfilling includes refilling and consolidating the fill in the excavation up to the surrounding ground surface or road grade.
- D. Use select native materials for backfilling in unpaved areas.
- E. Where trenches are to be located beneath existing or proposed streets, drives, and parking areas, all backfilling procedures shall be in accordance with the Standard Detail Drawings.
- F. Use mechanical compaction devices to compact backfill materials in trenches.

3.10 BEDDING AND BACKFILLING RIGID PIPE

- A. Bed rigid pipe as described below and in accordance with the standard trench details shown in Standard Detail Drawings. The intent of the bedding is to create a uniform support which will protect the pipe from localized stress points and to provide for a well graded trench bottom.
- B. Extend the trench excavation to a minimum depth of six (6) inches below the bottom of the pipe.
- C. Install bedding material in no greater than eight (8) inch lifts.
- D. Compact all bedding material to a minimum density of 95% modified proctor as outlined in AASHTO T-99.
- E. Install pipe in accordance with Section 02730 - Sanitary Sewer Pipelines.
- F. Backfill the excavation.

3.11 BEDDING AND BACKFILLING FLEXIBLE (PVC) PIPE

- A. Bed flexible (PVC) pipe as described below in accordance with Standard Detail Drawings. The intent of this bedding is to provide uniform support for the flexible pipe.
- C. Extend the trench excavation to a minimum depth of six (6) inches below the bottom of the pipe.
- D. Install bedding materials in no greater than eight (8) inch compacted lifts. Install bedding from six (6) inches below the pipe to six (6) inches above the pipe. Shovel slice bedding beneath the pipe haunches.
- E. Compact all bedding material to a minimum density of 95% modified proctor as outlined in AASHTO T-99.
- F. The maximum depth of bury for PVC pipe is sixteen (16) feet. Any depths greater than sixteen (16) feet require rigid pipe.
- G. Backfill and compact the excavation.

3.12 MANHOLE EXCAVATION

- A. Excavate the base area no larger than necessary to provide an adequate base.
- B. Dewater all excavations if required before starting any permanent construction.
- C. Provide sheeting and shoring as required.
- D. Leave at least twelve (12) inches between the outer surface of manholes and the excavation or shoring.
- E. If over excavation occurs, bring the excavation back to proper grade with either:
 - 1. Stone Backfill (B Stone) material compacted to 95% modified proctor; or,
 - 2. Concrete poured monolithically with the base.

3.13 BACKFILLING MANHOLES

- A. Do not backfill around manholes until adequate strength has been obtained from the manhole to support the backfill without damage to the manhole.
- B. Never backfill poured-in-place manholes until the concrete has cured 48 hours.
- C. Backfill manholes with select native material compacted to a density sufficient to prevent excessive settlement.
- D. In public streets or roads, backfill and compaction requirements shall be the same as for trench crossings.

3.14 EXCAVATION, BACKFILLING AND COMPACTION FOR SEWER FORCE MAINS

- A. Excavate trenches for force mains to:
 - 1. Provide a minimum cover of thirty (30) inches over the top of pipe barrel; and,
 - 2. Allow for the proper bedding material to be installed.
- B. Excavate trenches wide enough for pipe installation and joint makeup. The trench width at the top of the pipe must never exceed the outside diameter of the pipe plus two (2) feet.
- C. Where no bedding is required, accurately grade the trench so that the pipe will be in continuous and uniform contact with undisturbed soil for the full length of the pipe.
- D. Excavate for pipe bells to ensure a smooth bearing surface.
- E. If the soil at the bottom of the trench is mucky or unstable so that it cannot properly support the pipe, over excavate and backfill as described above for gravity pipelines.
- F. Backfill the trench and compact the materials as stated above for gravity lines.

3.15 EXCAVATION, BACKFILLING AND COMPACTION FOR MISCELLANEOUS STRUCTURES

- A. Excavate a sufficient distance from walls and footings to allow for forms and for proper inspection.
- B. Leave at least (12) inches between the outer surface of miscellaneous structures and the excavation or shoring.

3.16 EXCAVATION, BACKFILLING AND COMPACTION FOR SEWER SERVICE LINES

- A. Backfilling and compaction requirements for service lines shall be the same as the requirements listed above for the type of sewer pipe installed.
- B. All excavation, backfill and compaction of sewer service lines in public right-of-way shall be made in accordance with the regulations of the City of Bauxite.

END OF SECTION 02220

**SECTION 02575
PAVEMENT REPAIR**

PART 1- GENERAL

1.01 WORK INCLUDED

- A. This section covers the materials and procedures used in the repair of roads, streets, or other public rights-of-way where a sewer line or structure is proposed.

1.02 RELATED WORK

- A. Section 02220 - Excavation, Backfilling and Compacting.

1.03 REGULATIONS AND STANDARDS

- A. All permanent repairs of streets, roads, or other public rights-of-way shall comply with the requirements shown in the Standard Detail Drawings and Tables. The Contractor is responsible for following the requirements of all local Ordinances, Regulations, or Codes governing the repairs to roads, streets, or other public rights of way. In particular:
 - 1. Repair of State Highways: per requirements of the Arkansas State Highway Commission.
 - 2. Repair of county roads: per requirements of the County Roads Department.
 - 3. Repair of City of Bauxite streets: per the requirements of City Ordinance 17512 or the latest revision of said ordinance.
 - 4. Permit for street cut and repairs shall be obtained by the Contractor.

- B. Temporary Repairs: Per requirements of the governmental agency having jurisdiction and these specifications. Must provide a minimum of a cold mix temporary patch for all temporary repairs.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Per the applicable standards referenced above.

PART 3 - EXECUTION

3.01 ASPHALT PAVEMENT REPAIRS

- A. Asphalt pavement shall be replaced in accordance with details shown in the Standard Details and all materials shall be furnished and installed in accordance with the Arkansas Highway and Transportation Department "Standard Specifications for Highway Construction." Before replacing paved surfacing, the existing pavement shall be cut, sawed, or trimmed along straight and vertical lines. The condition of the backfill and base course material, with special regard to the degree of compaction, may be checked and approved by the Owner before any surfacing is replaced.
- B. Before placement of new surface material, all excess material shall be removed to a minimum depth of ten (10) inches. A minimum of eight (8) inches of 3000 psi concrete shall be placed within two (2) inches of the street surface. Before placing asphalt, the concrete and sides of the cut shall be primed with MC-30 at the rate of 0.3 gallon per square yard.
- C. Minimum thickness of asphalt surface replacement shall be two (2) inches, unless shown otherwise. Hot mix asphalt material shall be delivered to the site in covered vehicles, at 275 deg-F (minimum), and immediately spread to a thickness

to match adjacent surfaces after rolling. Compaction shall be by steel-wheel roller to a smooth, uniform surface matching adjacent surfaces.

- D. Any settlement or failure of surface replacement shall be repaired or replaced by the Contractor.
- E. All pavement repairs shall be in accordance with the Standard Detail Drawings.
- F. All pavement markings shall be restored to new conditions per the requirements of the governmental agency having jurisdiction.

3.02 CONCRETE PAVEMENT REPAIRS

- A. Concrete pavement shall be replaced in accordance with details shown on the Drawings and all materials shall be furnished and installed in accordance with the Arkansas Highway and Transportation Department "Standard Specifications for Highway Construction." Before replacing paved surfacing, the existing pavement shall be cut, sawed, or trimmed along straight and vertical lines. The condition of the backfill and base course material, with special regard to the degree of compaction, may be checked and approved by the Owner before any surfacing is replaced.
- B. Before placement of concrete street material, all excess material shall be removed to a minimum depth of eight (8) inches. A minimum of eight (8) inches of 3000 psi concrete shall be placed to match the line and grade of existing street surface.
- C. Paved walkways disturbed or damaged in the process of construction shall be replaced in kind. Walkway shall be replaced to same width and thickness as original but in no case less than 4-inches thick. Joint system in replacement shall be at same style and interval as that in the undisturbed walkway.
- D. All pavement repairs shall be in accordance with the Standard Detail Drawings.
- E. All pavement markings shall be restored to new conditions per the requirements of the governmental agency having jurisdiction.

3.04 GRAVEL SURFACING

- A. Gravel surfacing shall be replaced to at least the compacted thickness of the original surface. All excavated material shall be removed from gravel surfaces affected by construction and sufficient new gravel material shall be placed to restore the original surfaced area.
- B. Gravel material for placement of "gravel" surfaced areas, shall be Class 7 material conforming to the Standard Specifications of the Arkansas Highway & Transportation Department, latest edition.

3.05 TEMPORARY SURFACING

- A. Comply with the requirements stated above or as otherwise approved to adequately maintain traffic and proper drainage.

3.06 TRAFFIC CONTROL

- A. Whenever traffic flow restrictions of any kind are anticipated, the Contractor will be required to contact the City of Bauxite Traffic Control Division to be given permission to obstruct traffic flow.
- B. Street closing permits must be obtained from proper government agencies.
- C. Construction signs shall be placed immediately adjacent to the Work, at such locations as traffic demands.
- D. The Contractor shall notify law enforcement agencies, fire departments, and other impacted agencies and personnel.
- E. Contractor will be required to submit a barricade plan to Bauxite Public Works and the Engineer of Record.

END OF SECTION 02575

SECTION 02605

MANHOLES

PART 1- GENERAL

1.01 WORK INCLUDED

- A. This section covers the materials and procedures used in the construction and repair of sanitary sewer manholes.

1.02 RELATED WORK

- A. Section 02220 - Excavation, Backfilling, and Compacting.
- B. Section 02610 — Pipe and Fittings
- C. Section 02730 - Sanitary Sewer Pipelines
- D. Section 02734 — Inspection and Testing of Sanitary Sewer Pipelines, Manholes, and Service Lines.
- E. Section.3300 — Cast In Place Concrete

1.03 SUBMITTALS

- A. Furnish Shop Drawings and Submittal Data for approval prior to the delivery of any pre-cast manhole sections to the Engineer of Record.
Submit for approval any materials not listed specifically below to the Engineer of Record.

1.04 REFERENCES

AASHTO M85
ASTM C 443

ASTM C 478

ASTM C 361

ASTM A 48

ASTM A 536

1.05 MANHOLE DIMENSIONS AND LAYOUT

- A. Construct all manholes in accordance with the Standard Manhole Details in Standard Detail Drawings.
- B. The required dimensions on manholes are:
 - 1. Cone section height: 24 inches, minimum; 30 inches, maximum.
 - 2. Throat section height: 12 inches, maximum.
- C. Locate the manhole so the centerlines of all pipelines entering and leaving pass through the center of the manhole.

1.06 PROTECTION

- A. In all cases, the Contractor is responsible for protecting public and private property; and, protecting any person or persons who might be injured as a result of the Contractor's work.
- B. All utilities shown on the plans may not represent the exact location; however, the Contractor is responsible for verifying these locations and contacting "Arkansas One Call System" before excavating.

PART 2 - PRODUCTS

2.01 WATER FOR MORTAR AND GROUT

- A. Water: Potable water free from injurious amounts of acids, alkalis, oils, sewage, vegetable matter, and dirt.

2.02 CEMENT

- A. Portland Cement, conforming to AASHTO M 85, Type I.

2.03 PRECAST CONCRETE MANHOLES

- A. Conform to the latest requirements of ASTM C478.
- B. Never transport sections to the site until they have cured for at least ten **(10)** days.
- C. Mark each piece plainly with manhole numbers and date of manufacture so it can be installed in the proper location, as shown on the plans.
- D. Make sure factory-installed cutouts in the bottom section are appropriate for the pipe being laid.
- E. Pipe connections at manhole - Cutouts should be equipped with rubber boots to ensure a watertight connection. Material shall be equal to Kor-N-Seal connector, as manufactured by NPC, Inc.
- F. Joint Sealant - Flexible rubber sealant for joints in pre-cast manhole sections shall provide permanently flexible watertight joints, shall remain workable over a wide temperature range and shall not shrink, harden or oxidize upon aging. Material shall be equal to Tylox Superseal and shall meet ASTM C 443 and ASTM C 361 requirements.
- G. The frame for the lid shall be installed when cone section is cast.
- H. Heat-Shrinkable Encapsulation:
 - 1. Wrapid Seal as manufactured by Canusa CPS
 - 2. BIDCO Wrap as manufactured by NPC.
 - 3. Or Approved Equal

2.04 CAST-IN-PLACE MANHOLES

- A. Construct with Class A concrete only as outlined in Section 03300 - Cast-In-Place Concrete.

- B. Reinforcement shall be as outlined in Section 03300 - Cast-in-Place Concrete.
The frame for the lid shall be installed when the manhole is constructed.

2.05 MANHOLE — 2' DIAMETER

- A. 2' Diameter Manholes will only be allowed at locations specifically approved by the Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2.
2' Diameter Manholes will only be approved for 6", 8", or 10" sewer mains.
- B. Submittal of type of 2' Diameter Manholes is required. Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 will have final approval as to location and type of 2' Diameter Manholes used in PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 's System.

2.06 MANHOLE DROP

- A. Drop on the outside of the manhole: Ductile iron pipe with mechanical joint fittings as specified in Section 02610 - Pipe and fittings.

2.08 STANDARD MANHOLE RING AND COVER

- A. Cover must have the words BAUXITE SANITARY SEWER cast in the top. Cover shall also have the words CONFINED SPACE PERMIT REQUIRED cast in the top. Also, include two closed pick holes in top side of cover.
- B. Minimum combined weights of the manhole ring and cover is 240 pounds. Minimum cover weight is 115 pounds. Minimum ring weight is 125 pounds.
- C **All** castings shall be cast with the approved foundry's name, manufacturing foundry mark, part number, and production date in mm/dd/yy format. All castings shall be manufactured in the USA.
- D. All castings: Free from porosity, blowholes, hard spots, shrinkage, distortion and other defects; smooth and well cleaned by sandblasting; manufactured true to

pattern.

- E. Ring and cover dimensions: Refer to Standard Detail Drawings. Final casting dimensions may vary one-half the maximum shrinkage possessed by the metal or no more than +1/16 inch per foot.

Lid and ring bearing surface: smooth finish, non-rocking design or machined bearing surfaces to prevent rocking and rattling under traffic.

- G. Cast Iron: ASTM A 48, Class 35B.
- H. Ductile Iron: ASTM A 536, Grade 80-55-06.

2.08 WATERTIGHT MANHOLE RING AND COVER

- A. Dimensions, casting quality, material: Same as Standard manhole ring and cover,
- B. Cover: machined with dovetail groove in cover for self sealing rubber gasket.

2.09 MANHOLE STEPS

- A. Manhole steps will not be accepted in manholes constructed within the jurisdiction of the Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 Utility.

2.10 RUBBER WATERSTOP GASKETS (CAST — IN - PLACE)

- A. Waterstop gaskets shall be required at **ALL** manhole connections. Manhole seals shall be concrete manhole adapter by Fernco, or approved equal

2.11 MANHOLE GROUT

- A. Cementitious non-shrink grout for use in manholes shall be one specially formulated for stopping active infiltration and filling voids in manholes and similar locations. Grout mix shall provide a quick-setting, volume-stable, cementitious product suitable for patching the interior of manholes when mixed

and applied according to the manufacturer's recommendations. Grout mix shall be Strong Seal QSR, or equal.

2.12 MANHOLE RISER RING

- A. Manhole riser rings shall be compatible with the size and type of manhole cover with which it will be used.
- B. Manhole riser rings shall only be used with written approval from Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2.

PART 3 - EXECUTION

3.01 MANHOLES - GENERAL

- A. Perform excavation and prepare base area in accordance with Section 02220 - Excavation, Backfilling, and Compacting for Sanitary Sewer Pipelines.
- B. Never install base in a water filled excavation.
- C. Place base per the Standard Detail Drawings and Section 03300 - Cast-in-Place Concrete. Extend base a minimum of six inches beyond finished sides of manhole.
- D. Extend all pipes entirely through the manhole wall so that a joint occurs approximately six inches, but no greater than 12 inches, outside the manhole wall.
- E. After manhole is constructed, wait no less than 48 hours, then backfill per Section 02220 - Excavation, Backfilling, and Compacting.

3.02 CAST-IN-PLACE MANHOLES

- A. Dimension shall be as per Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 Standard Detail Drawings. The top section or cone must be concentric with the barrel unless otherwise noted.
- B. The frame shall be set in accordance with Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 Standard Details.
- C. Install rubber waterstop gaskets in the walls around all pipes.
- D. Interior finish: Smooth, free of fins or sharp edges.
- E. Invert to be constructed in accordance with Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 Standard Details.
- F. Care should be taken to prevent the end of the pipe from deflecting, due to loads imposed by the weight of the concrete.
- G. Construction joints on manholes of excessive depth shall be connected with reinforcement approved by the Engineer of Record.

3.03 PRECAST MANHOLES

- A. Dimension shall be as per Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 Detail Drawings. The top section or cone must be concentric with the barrel unless otherwise noted.
- B. The bottom section for pre-cast manholes shall be manufactured as an integral part of the manhole base slab.
- C. Install remaining sections in a truly vertical plane.
- D. Fill space between pipe and periphery of cutout entirely with grout.
- E. Grout joints between sections inside and outside.
- F. Interior finish: smooth, free of fins or sharp edges.
- G. Invert to be constructed the same as a cast-in-place manhole.
- H. Grout lifting eyes for manholes.
- I. Heat-Shrinkable Encapsulation:

1. Apply an external 18" sheet of heat-shrinkable encapsulation around the manhole frame in accordance with manufacturer's specifications and Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 Details.
2. Apply an external 6" sheet of heat-shrinkable encapsulation around all cold joints in accordance with manufacturer's specifications and Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 Details.

J Butyl Mastic Wrap

1. All wrapping shall occur after pre-cast manhole has been cleaned and free of debris that would inhibit the seal.
2. Butyl Mastic Wrap shall be NPC's Bidco Wrap or approved equal.

3.04 FIBERGLASS MANHOLE — 2' DIAMETER

- A. Installation of 2' diameter manhole must be within strict accordance with the manufacturer's specifications.

3.05 DROP MANHOLES

- A. Install a drop manhole when the vertical difference between the pipe entering and leaving the manhole exceeds two (2) feet.
- B. Construct manhole base, barrel, and top per the requirements for cast-in-place or pre-cast manholes.
- C. Construct drop of ductile iron pipe with mechanical joint fittings as per Standard Details.
- D. Encase the 90-degree bend in Class A or B concrete as per Standard Details.
- E. Extend the ductile iron pipe a minimum of five (5) feet beyond the manhole excavation before changing pipe materials.

3.06 MANHOLE FRAME AND COVER

- A. Set the manhole frame in Class A concrete as shown on the Standard Details as an integral part of the manhole construction.
- B. Set manhole frame and cover top level and to the elevation shown on the Drawings. In public rights-of-way, set the ring and cover flush with pavements, sidewalks, or other paved surfaced areas

3.07 MANHOLE INVERT

- A. Invert depth at the flow line: Approximately one-half the pipe diameter.
- B. In curved inverts, make curves with the longest possible radius to facilitate smooth flow.
- C. Invert shape: Semicircular.
- D. Invert materials and finish: Class A Concrete, smooth finish.
- E. Invert grade: Constant, smooth grade; no offsets.
- F. Bench: Slope grout upward from the edge of the invert to the manhole wall.
- G. Form a flow channel in the bench for any services stubbed into manhole. Form invert and finish per above.
- H. Cut the upper half of any pipe extending inside the manhole wall flush with the wall. Smooth rough edges with grout.

3.08 MANHOLE REPAIRS

- A. Make all repairs in accordance with these specifications.
- B. Use manhole grout in patching around new taps.
- C. Plaster all brickwork with mortar.

3.11 MANHOLE RISER RING

- A. Manhole riser rings may be used to raise manhole covers to grade.
- B. The throat section height shall not exceed 12 inches. The throat section shall be defined as the distance from the bottom of the integral cast manhole ring to the top of the manhole cover.
- C. Manhole riser rings may be constructed of concrete, polyethylene, or approved equal.

END OF SECTION 02605

SECTION 02607
UTILITY LINE BORES

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Provide encasement pipe jacked through bored tunnel for crossing of utility pipe lines under roadways where necessary.
- B. Pulling or jacking carrier pipe through encasement pipe.
- C. Providing brick closures at ends of encasement pipe.

1.02 RELATED WORK

- A. Section 02220 — Excavating, Backfilling, and Compacting For Sanitary Sewer Pipelines
- B. Section 02730 - Sanitary Sewer Pipelines

1.03 REFERENCES

- A. ASTM A139 Specification for Electric-Fusion (Arc) - Welded Steel Pipe (sizes 4" and over).
- B. ASTM A211 Specifications for Spiral-welded Steel or Iron Pipe.
- C. AWS D1.1 Structural Welding Code.
- D. AWWA C 202 (Grade B)
- E. Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 Detail Drawings

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Encasement pipe: Smooth wall steel pipe conforming to ASTM A139 (Grade **B**), ASTM A211, or AWWA C202 (Grade B), with ends prepared for welded joints.
- B. Welding materials: Type required for materials being welded and conforming to applicable AWS Specifications.
- C. Sand: Clean, industrial sand, concrete sand, masonry sand, or other type approved by Engineer.
- D. Skids chocks: Pressure treated wood shaped to fit outer circumference of carrier pipe and inner circumference of encasement pipe. Spacers: HDPE Model CSP by CCI Pipeline Systems or approved equal.
- E. Furnish stainless steel bands to secure skids or chocks to carrier pipe.
- F. Brick: New or used dry brick or concrete brick.
- G. Mortar: Type "M".

2.01 MINIMUM THICKNESS

- A Minimum thickness for encasement shall be as follows:

<u>Diameter of Casing Pipe</u>	<u>Minimum Thickness</u>
12" OR LESS	.2500"
OVER 12" — 18"	.3125"
OVER 18" — 22"	.3750"
OVER 22" — 28"	.4375"
OVER 28" — 34"	.5000"
OVER 34" — 42"	.5625"
OVER 42" — 48"	.6250"

PART 3 - EXECUTION

3.01 EXCAVATION

- A. Highway Bore: Do not set up equipment or begin excavating pit on state highway without permission of Arkansas Highway and Transportation Department District Engineer or his authorized representative.
- B. Railroad Bore: Do not set up equipment or begin excavating pit on or near railroad property without permission of the respective railroad company.
- C. Railroad permits will be obtained by the Engineer of Record. Engineer of Record shall coordinate with Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 on obtaining Right-of-way permit from Arkansas Highway and Transportation Department and shall conform to all requirements there in.

3.02 INSTALLATION, ENCASEMENT PIPE

- A. General: Install encasement pipe at grade and alignment shown on Drawing. Allow for height of skids or chocks when establishing grade for gravity line encasement pipe. Refer to Standard Detail Sheet.
- B. B o r e s :
 - 1. Excavate pits and trenches required at each side of crossing to minimum width and length necessary for boring and jacking operation and carrier pipe installation.
 - 2. Carefully set timber or steel guide rails in pit to attain specified grade and alignment.
 - 3. Keep pit pumped free of standing water. Maintain pit bottom to provide stable base for rails and equipment and firm footing for workmen.
 - 4. Provide temporary sheeting and bracing as necessary to prevent earth slides.

5. Bore tunnel and simultaneously jack encasement pipe forward one section at a time. Connect sections by full penetration butt welding performed in accordance with AWS D1.1.
6. Remove excavated soil from boring operation as it enters pit and dispose of it offsite.

3.03 INSTALLATION, CARRIER PIPE

- A. General: Joint pipe as specified in Section 02730 Sanitary Sewer Pipelines. Pull or jack carrier pipe through encasement pipe. Do not allow cables or jacks to be in direct contact with carrier pipe while pulling or jacking pipe. Use timber or padded steel member.

3.04 BACKFILL

- A. Prior to backfill, seal ends of encasement pipe with brick and mortar and install vent as shown in Standard Detail Sheet.
- B. Use material excavated from pit.
- C. Backfill against ends of encasement pipe.
- D. Backfill pit and carrier pipe in same manner as specified in Section 02730 Sanitary Sewer Pipelines.

3.05 CLEANUP

- A. Clean up ground surface around work area in same manner as specified for line work in Section 02220 - Excavation, Backfilling and Compacting.

END OF SECTION 02607

SECTION 02610
PIPE AND FITTINGS

PART 1- GENERAL

1.01 WORK INCLUDED

- A. This section covers the manufacture, transportation, and storage of pipe, pipe joints, and fittings for sanitary sewer pipelines and service lines.
Use only pipe, fittings, and adapters approved by the Engineering Services Division of the Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2.

- C. Use bends, tees, plugs, wyes, or other approved fittings constructed from the same material as the pipe in which they are installed. Use only standard, approved fittings.

1.02 RELATED WORK

- A. Section 02605 - Manholes
- B. Section 02730 - Sanitary Sewer Pipelines
- C. Section 02732 - Sanitary Sewer Service Lines
- D. Section 02734 - Inspection and Testing of Sanitary Sewer Pipelines, Manholes, and Service Lines

1.03 SUBMITTALS

- A. Use of materials other than those specifically listed below is prohibited.
- B. Submit the manufacturer's certificate that the pipe meets with these Specification requirements including material testing requirements to the Engineer of Record.

1.04 REFERENCES

ASTM A74	ASTM C 564	ASTM A 746	ASTM F794
ASTM D3034	ASTM D 3915	ASTM D 3212	ASTM F 1803
ASTM D 1784	ASTM F 949	ASTM D 2000	ASTM A 536
ASTM C 443	ANSI A 21.51	AWWA C104	AWWA C150
AWWA C111	AWWA C606	AWWA C105	

PART 2 - PRODUCTS

2.01 PROHIBITED PIPE MATERIALS

- A. The following materials are specifically forbidden for use either in city sewers or service lines:
1. Asphalt impregnated fiber tube pipe.
 2. Concrete pipe.
 3. Open profile PVC pipe as defined in ASTM F794 less than 24" in diameter.
 4. "No Hub" cast iron soil pipe or other non bell and spigot pipe.
 5. Corrugated Metal Pipe

2.02 SERVICE LINES

- A. Service lines are four (4) inches in diameter or larger.
- Furnish one of the following:
1. Cast iron soil pipe: per ASTM A 74 - Bell and Spigot pipe with rubber gaskets, ASTM C 564. Joints: push on equipped with a rubber gasket.
 2. Ductile iron pipe: per ANSI A 21.51 with joints same as water main pipe.
 3. Ductile Iron pipe: per ASTM A 746 with push on, rubber gasket joints.
 4. Polyvinyl chloride (PVC) pipe for service lines shall be SDR 21, 200 psi and shall be bedded as required for larger PVC pipe.
 5. Polyethylene pipe SDR 17 or thicker.

2.03 DUCTILE IRON PIPE FOR GRAVITY MAINS

- A. Minimum wall thickness: Thickness Class 50 or 51 according to ANSI/AWWA-C150/A 21.50: Thickness Design of Ductile Iron Pipe
- B. Gravity Sanitary Sewer ASTM A 746: Ductile Iron Pipe Gravity Sewer Pipe
- C. Cement lining (Double Thickness): ANSA/AWWA C 104/A 21.4: Cement Mortar Lining for Gray and Ductile Iron Pipe.
- D. Joint connections, pipe and fittings:
 - 1. Push on and mechanical rubber gasket joints: ANSI/AWWA CI 11/A21.11.
 - 2. Flanged: ANSI/AWWA C115/A21.15, ANSI B16.1.
 - 3. Grooved and shouldered ANSUAWWA C606.
- E. Corrosion Control
 - 1. Polyethylene wrap in tube or sheet form conforming to the requirements of ANSI/AWWA C105/A21.5.

2.04 POLYVINYL CHLORIDE (PVC) GRAVITY SEWER PIPE (Solid Wall)

- A. Pipe eight (8) inches in diameter and larger: conform to ASTM D 3034 and D 3915. Minimum standard dimension ratio (SDR) shall be thirty five (SDR35).
- B. Pipe six (6) inches in diameter: conform to ASTM D 3034. Minimum standard dimension ratio (SDR) shall be twenty six (SDR26).
- C. Joint connections: push on, elastomeric gasket type conforming to ASTM D 3212.

2.05 POLYVINYL CHLORIDE (PVC) GRAVITY SEWER PIPE REPAIR COUPLINGS

- A. Use PVC repair couplings instead of flexible rubber coupling when connecting two PVC pipes.
- B. Install repair couplings in accordance with manufacturer's recommendations.

2.06 PVC LARGE DIAMETER (24" & LARGER) CLOSED PROFILE GRAVITY SEWER PIPE

- A. PVC closed profile pipe and fittings shall be manufactured in accordance with requirements of ASTM F794, latest edition and ASTM F1803, latest edition.
- B. PVC closed profile wall pipe shall be made from a compound meeting the requirements of cell classification 123464A as defined by ASTM D1784.
- C. Maximum long term deflection is five percent. Lag factor to be 1.5 and soil modulus of 500 psi. Factor of safety to be 2.5.
- D. Minimum stiffness factor to be 46 psi.
- E. Manufactured by Lamson Vylon, or equal. All large diameter closed profile wall gravity sewer pipe must be approved by the Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 prior to being installed.

2.07 PVC LARGE DIAMETER (24" & LARGER) DUAL WALL CORRUGATED PROFILE GRAVITY SEWER PIPE

- A. PVC dual wall corrugated profile pipe and fittings shall be manufactured in accordance with requirements of ASTM F794, latest edition and ASTM F949, latest edition
- B. PVC dual wall corrugated profile wall pipe shall be made from a compound meeting the requirements of cell classification 12454 as defined by ASTM D1784.
- C. Maximum long term deflection is five percent. Lag factor to be 1.5 and soil modulus of 500 psi. Factor of safety to be 2.5.
- D. Minimum stiffness factor to be 46 psi.
- E. Manufactured by Contech, or equal. All large diameter open profile wall gravity sewer pipe must be approved by the Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 prior to being installed.

2.08 CENTRIFUGALLY CAST FIBERGLASS GRAVITY SEWER PIPE

- A. Pipe shall conform to all requirements of ASTM 3262 for fiberglass pipe.
- B. Pipe stiffness shall meet or exceed manufacturer's recommendations. Minimum pipe stiffness shall be 46 psi.
- C. Manufactured by Hobas USA, Inc. or equal.

2.09 REINFORCED COUPLINGS

- A. Materials: Chemical resistant rubber. Reinforced Adjustable Repair Couplings shall be Mission Flex-Seal or equal.
- B. Coupling shall be made of stainless steel utilizing a nut and bolt clamp design and an "O" ring seal under the sealing clamp band..
- C. Dimensions: Inside diameter to fit the outside diameter of the different pipe materials being connected: take care that proper alignment is maintained and the spacing between pipes does not exceed 1/2 inch as shown in the Standard Details.
- D. Any other Coupling other than specified above must be approved by the Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 prior to use.

2.10 SERVICE SADDLES

- A. A composite saddle using a Virgin SBR compound gasket (ASTM D-2000 3 BA715) and a ductile iron saddle casting (ASTM A 536 Grade 65-44-12) as shown in the Standard Details.
- B. A compression fit three piece service connection consisting of an ASTM D-3034 PVC hub, a Stainless Steel band, and a rubber sleeve conforming to ASTM C-443. Refer to the Standard Details.
- C. All saddles other than those shown above shall be approved by the Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 prior to

installation.

2.11 SERVICE WYES

- A. The wye material and joint type must match that of the mainline pipe.
- B. Wyes shall terminate in a bell suitable for connection of a 4 inch service line pipe as specified herein.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Sanitary Sewer Pipelines: Refer to Section 02730
- B, Sanitary Sewer Service Lines: Refer to Section 02732

END OF SECTION 02610

SECTION 02730
SANITARY SEWER PIPELINES

PART 1- GENERAL

101 WORK INCLUDED

- A. Installation of sanitary sewer pipelines.
- B. Point repairs on existing sanitary sewer pipelines.

102 RELATED WORK

- A. Section 02220 - Excavation, Backfilling, and Compacting.
- B. Section 02575 - Pavement Repair.
- C. Sections 02605 - Manholes.
- D. Section 02610 - Pipe and Fittings.
- E. Section 02732 - Sanitary Sewer Service Lines
- F. Section 02734 - Inspection and Testing of Sanitary Sewer Pipelines, Manholes, and Service Lines.
- G. Section 03300 - Cast-in-place Concrete.

103 DEFINITIONS

- A. New Pipelines - Pipelines installed in such a manner that there is no sewage flow during construction.
- B. Replacement Pipelines - Pipelines installed in a trench while there is a flow from "live" service connections.
- C. Point Repairs - Replacement of a short section (less than 50 feet in length) in an existing pipeline.

- D. Force Mains - Sewer pipelines that transport wastewater under pressure from a pump station to a discharge point.

1.04 QUALITY ASSURANCE

- A. Inspect all pipelines per Section 02734 - Inspection and Testing of Sanitary Sewer Pipelines, Manholes, and Service Lines.

1.05 SUBMITTALS

- A. Submit to the Engineer of Record all materials and procedures not described in these specifications. Approval from Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 is required prior to installation of any materials not described in these specifications.

1.06 REFERENCES

Not Used.

1.07 PROTECTION

- A. In all cases, the Contractor is responsible for protecting public and private property and protecting any person or persons who might be injured as a result of the Contractors' Work.
- B. All utilities shown on the plans may not represent the exact location; however, the Contractor is responsible for verifying these locations and contacting "Arkansas One Call System" before excavating.

PART 2 - PRODUCTS

2.01 BEDDING AND BACKFILL

- A. Refer to Section 02220 - Excavation, Backfilling, and Compacting.

2.02 PIPE AND FITTINGS

- A. Refer to Section 02610 - Pipe and Fittings.

2.03 MANHOLES, MANHOLE RINGS, AND LIDS

- A. Refer to Section 02605 - Manholes.

2.04 CONCRETE

- A. Refer to Section 03300 - Cast-in-place Concrete.

PART 3 - EXECUTION

3.01 EXCAVATION - GENERAL

- A. Perform excavation and prepare bedding in accordance with Section 02220 - Excavation, Backfilling, and Compacting.
- B. Never lay pipe in a water-filled trench, or when trench conditions or weather are unsuitable for such Work.
- C. Divert surface water and de-water trenches during excavation.
- D. Excavate for bells so that the entire barrel of the pipe will be uniformly supported on the pipe bedding before placing pipe in the trench.

3.02 LAYOUT

- A. The Contractor shall install sewer lines, wyes, and manholes as shown on the Plans.

3.03 SHALLOW BURY

- A Ductile iron pipe shall be required when the existing grade or the proposed finish grade, whichever is less, provides less than 30 inches of cover. The ductile iron pipe shall, whenever feasible, extend from manhole to manhole. The ductile iron pipe shall meet the requirements of Section 02610 - Pipe and Fittings, of these Specifications.

3.04 PIERS

- A. Install concrete piers as indicated on the plans per Section 03300 - Cast-in-place Concrete.

3.05 STEEP GRADES

- A Whenever the grade of the sewer line exceeds 15 percent, ductile iron pipe shall be required. The ductile iron pipe shall meet the requirements of Section 02610 - Pipe and Fittings, of these Specifications.
- B. Sewers on 20 percent slopes or greater shall be anchored securely with concrete anchors spaced as follows:
 - 1. Not over 36 feet center to center on grades 20 percent and up to 35 percent.
 - 2. Not over 24 feet center to center on grades 35 percent and up to 50 percent.
 - 3. Not over 16 feet center to center on grades 50 percent and over.

3.06 PIPE INSTALLATION

- A. Inspect each joint of pipe carefully before it is placed in the trench. Plainly mark and separate from the remaining pipe any joint found to be cracked, warped, or otherwise damaged. Remove these damaged joints from the project site as soon as possible.
- B. Cut pipe in a neat and workmanlike manner without damage to pipe or pipe lining when trimming joint length.
- C. Lay all pipe with the bell upstream.
- D. Use proper equipment for lowering sections of pipe into trenches. Lower pipe carefully into the trench so the spigot and bell will not become contaminated.
- E. Lay each pipe joint to line and grade using laser beam grade light, keeping a minimum of six inches between the pipe and the trench wall.
- F. Keep the pipe joints' interior clean from all dirt and other foreign matter as the Work progresses. Maintain the pipe's interior cleanliness until accepted or put in service. Close the open ends of the pipeline temporarily with an appropriate manufactured plug at the end of each day's Work or when discontinuing pipe laying for an appreciable period.

3.07 PIPE TO PIPE CONNECTIONS

- A. Make all pipe joints in strict accordance with the manufacturer's recommendation and as stated below for the particular type of connection. Make all joints watertight in accordance with the latest ASTM Standards.
- B. Slip-type or Push-on Joints Connection Procedure
 1. Clean the bell and spigot end of the pipes prior to jointing thoroughly with a brush. Exercise particular care to clean the gasket seat.
 2. Apply pipe lubricant and attach gasket in strict accordance with the specific joint manufacturer's recommendations. Clean and insert the rubber gasket in the gasket seat within the bell. Insert the spigot end of the upstream pipe in

the bell of the downstream pipe. Push the upstream joint until it is in firm contact with the shoulder of the bell.

C Mechanical Joints Connection Procedure

1. Clean thoroughly the spigot end of the pipe, the bell of the connecting pipe, and the rubber gasket as specified for slip-type or push-on joints. Clean the gland in a similar manner.
2. After the gland and gasket are placed on the spigot end of the pipe, a sufficient distance from the end to avoid fouling the bell, insert the spigot end in the fitting bell to the point of firm contact with the bell shoulder. Then advance the rubber gasket into the bell and seat in the gasket seat. Exercise care to center the spigot end within the bell. Bring the gland into contact with the gasket, enter all bolts, and make all nuts hand tight. Exercise continued care to keep the spigot centered in the bell.
3. Make the joints tight by turning the nuts with a torque wrench: First partially tightening a nut, then partially tightening the nut 180 degrees away from it. Work around the pipe with uniformly applied tension until the required torque is applied to all nuts. Required torque ranges and indicated wrench lengths for standard cast iron bolts are as follows:

Diameter <u>Inches</u>	Range of Torque		Length of Wrench <u>Inches</u>
	<u>Foot</u>	<u>Pounds</u>	
5/8	40 — 60		8
1/4	60 — 90		10
1	70 — 100		12
1-1/4	90 — 120		14

D. Reinforced Rubber Couplings

1. Install reinforced rubber coupling only where dissimilar pipe materials are connected.
2. Take care that proper alignment is maintained and a minimum spacing between pipes does not exceed one-half inch.
3. Encase rubber coupling in Class B concrete as shown on the Standard Details.

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WYE FITTINGS FOR SERVICE CONNECTIONS

- A. Use in-line wye fittings for all service connections except on ductile iron pipe.
- B. The wye material and joint type must match that of the mainline pipe.
- C. Use taps instead of wyes only on ductile iron pipe.
- D. Install wye branches at the location of live services or as indicated on the construction plans. Install wye connections for services in accordance with the manufacturer's recommendations.
- E. Place Class "B" concrete under each wye branch to prevent cracking or twisting under earth loads.
- F. Mark wyes for future connections using detectable tape or ski rope terminated at the ground surface. Install on each service wye either:
 1. A service stub terminated with a plugged bell; or,
 2. A plugged adapter capable of connecting to a four-inch cast iron service.
- G. Terminate wyes for future connections in a bell suitable for connection of a four-inch service line pipe as specified herein. Securely plug all wyes and service stubs for future connections.
- H. For Service Wye Details, see the Standard Details.

3.09 BACKFILLING AND INSPECTION

- A. Before backfilling, place concrete encasement at transitions between different types of pipe and around all reinforced rubber couplings as shown in the Project Plans. Use Class B concrete per Section 03300-Cast-in-place Concrete.
- B. Before backfilling, install concrete anchor collars in accordance with the details at the location and interval and shown on the Plans. Use Class A concrete and reinforce with steel bars per Section 03300-Cast-in-place Concrete.
- C. After the pipeline is installed and visually inspected by the Engineer of Record, backfill the trench per Section 02220-Excavation, Backfilling, and Compacting.
- D. Test the pipeline per Section 02734-Inspection and Testing of Sanitary Sewer Pipelines, Manholes, and Service Lines.
- E. Repair all pavements per Section 02575-Pavement Repair.
- F. Repair all incidental damage to buildings, structures, utilities, pavements, landscaping, etc.
- G. Repair sodded and grass areas to original condition.

3.10 CONNECTION OF NEW SEWER PIPELINES TO EXISTING SANITARY SEWERS

- A. Construct, clean, test, and obtain Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 approval before connecting new pipeline to the existing sewer.
- B. Connection of new sewer pipelines to existing sanitary sewers cannot be made until the entire project is ready for final acceptance by the Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2.
- C. All new pipelines must connect to the existing system at a new or existing manhole. If a new manhole is built over an existing sewer line, do not break out the top of the existing pipe until the new line is accepted. New pipelines cannot be connected to an existing manhole prior to final acceptance without permission from the Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2.
- D. If a new pipeline is to discharge into an existing manhole, divert the sewage flow around the existing manhole while the tie-in is under construction. Intercept the

sewage flow at the existing manhole first upstream from the tie-in construction. Provide suitable pumping equipment and re-routing conduit to pump the sewage around the tie-in construction. Discharge into an appropriate manhole downstream from the construction.

- E Connect new pipelines to existing manholes in a neat, workmanlike manner, to ensure a watertight connection.

3.11 GRAVITY SEWER PIPELINE INSTALLATION — LIVE SEWER PIPELINES AND POINT REPAIRS

- A. Install sewer pipeline and point repairs as detailed above for new pipelines with the following exceptions:
 1. Divert all upstream flow around the section to be replaced with plugs or pumps. The bedding must be kept dry during installation. If trench bottom is too wet, excavate wet portion and replace with suitable bedding material.
 2. Make transitions to original pipe using materials and procedures specified. Take care that replacement pipe is aligned properly with no offsets. Install concrete encasement around transitions. Take care that no concrete from the encasement enters the existing pipeline. If this occurs, remove the concrete.
 3. At the end of each day's work, and when for any reason the laying of pipe will be discontinued for an appreciable period, place a temporary section of pipe in the live line.
 4. Pressure testing is not required. Visual and television testing are required.
 5. Mandrel testing may be required.
 6. Service line pressure testing is not required.
 7. A temporary debris catcher, as shown in the Standard Details, shall be used in the downstream manhole.

3.12 GRAVITY SEWER PIPELINE INSTALLATION - AERIAL CROSSINGS

- A. Construct piers as shown on Plans.
- B. Install pipe on piers to grade.

3.13 FORCE MAIN PIPELINE INSTALLATION

- A. Install all pipe and fittings to the line and grade as detailed on the Plans. Submit fitting substitution requests to the Engineer of Record for approval.
- B. Remove all dirt and other foreign matter from the inside of pipe and fittings before they are lowered into the trench. Keep pipe and fittings clean during and after laying. Take care to keep dirt out of the bells. Plug all pipe openings at the end of each days work or when pipe laying is discontinued.
- C. Use proper equipment for lowering sections of pipe into trenches. Lower pipe carefully into the trench so the spigot and bell will not become contaminated.
- D. Cut pipe in a neat and workmanlike manner without damage to pipe or pipe lining when trimming joint length.
- E. Install pipe with bell ends facing in the direction of laying. Face bells upgrade on lines on an appreciable slope.
- F. When necessary to deflect pipe from a straight line in either the horizontal or vertical plan to avoid obstructions, do not deflect the pipe beyond the point recommended by the pipe manufacturer.

Before backfilling, install concrete thrust blocking in accordance with Standard Details on Plans.

Test the pipeline per Section 02734-Inspection and Testing of Sanitary Sewer Pipelines, Manholes, and Service Lines.

Install all flushing stations, check valves, air and vacuum release valves, and all necessary fittings according to manufactures recommendation.

- J. After the pipeline is installed and visually inspected by the Engineer of Record, backfill the trench per Section 02220-Excavation, Backfilling, and Compacting. Repair all pavements per Section 02575-Pavement Repair. Repair all incidental damage to buildings, structures, utilities, pavements, landscaping, etc.
- K. Repair sodded and grass areas to original condition.

3.14

FORCE MAIN MARKING

- A. All force mains shall be fitted with tracing wire installed during construction.
 - 1. Tracing wire shall be 14 gauge or larger, solid core insulated copper wire. Stranded wire will not be allowed.
 - 2. Tracing wire shall be buried directly under the pipeline for depths not to exceed six (6) feet. For depths exceeding six (6) feet the tracing wire shall be buried directly over the centerline of the pipe at a depth no greater than six (6) feet and a minimum of four (4) feet.
 - 3. The tracing wire shall be brought to the surface, at intervals not to exceed 1000 feet, and secured within termination boxes suitable for recovery and affixing electronic locator transmitters to locate the force main in the future. All termination boxes and their locations shall be approved by Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 prior to installation.
- B. Electronic Marking Devices (EMD) shall be installed along the route of all force mains.
 - 1. EMDs shall be placed at all force main tees, bends, and changes in direction, including both vertical and horizontal fixtures.
 - 2. EMDs shall be placed at intervals not to exceed 400 feet along sections between valves, bends, tees or other fixture requiring the placement of EMDs.
 - 3. Where force mains are constructed along curved routes, EMDs shall be placed at the beginning and end of all curve sections and at intervals along the curve sections not to exceed 200 feet.
 - 4. EMDs shall be buried directly over the centerline of the pipe with a minimum of 6 inches of backfill between the top of the pipe and the EMD. EMDs shall be buried at a minimum depth of 2 feet and a maximum depth of 5 feet.
 - 5. Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 will provide all EMDs for placement along force mains. It shall be the responsibility of the Engineer of Record to get approval from Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 , prior to construction, for the locations and approximate quantity of EMDs required for the project. Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 will acquire and provide EMDs to the Engineer of Record for placement of EMDs during construction.
- C. As Built Drawings submitted by the Engineer of Record shall provide stationing for all tracing wire termination boxes and stationing for all EMDs installed along the force main route.

END OF SECTION 02730

SECTION 02732
SANITARY SEWER SERVICE LINES

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. This section covers:
 - 1. Installation of sanitary sewer service lines.
 - 2. Point repairs on existing sanitary sewer service lines.
- B. Sewer lines 6 inches in diameter and larger are constructed under the requirements of Section 02730 - Sanitary Sewer Pipelines.

1.02 RELATED WORK

- A. Standard Detail Drawings
- B. Section 01100 - Requirements For Developer Funded Projects
- C. Section 02220 - Excavation, Backfilling, and Compacting
- D. Section 02575 - Pavement Repair
- E. Section 02605 - Manholes
- F. Section 02610 - Pipe and Fittings
- G. Section 02730 - Sanitary Sewer Pipelines
- H. Section 02734 - Inspection and Testing of Sanitary Sewer Pipelines, Manholes, and Service Lines
- I. Section 03300 - Cast-In-Place Concrete

1.03 DEFINITIONS

- A. City Sewer Main - A public sanitary sewer in which all owners of abutting properties have equal rights and is maintained and controlled by the Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2. No sewer line smaller than six (6) inches in diameter is a city sewer.

- B. Service Line - The sewer which conveys the discharge from a building's plumbing system or other approved waste system to the city sanitary sewer system. The service line begins at the connection to the city sanitary sewer and ends at the building foundation.
- C. Permit - Written authorization issued to a plumber or contractor upon request allowing installation of a service line to connect to the Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 system. No work shall be allowed on any service line (Gravity or Force Main) until a permit is issued by Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2. Permit issued by Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 is valid for one year from the date of issue. If permit is not used within the one year period a new permit must be purchased at the Fee Schedule in effect at that time.
- D. Plumbing Permit - Written authorization issued to a plumber or contractor upon request allowing work on existing plumbing in an existing structure or to install plumbing in a new or existing structure.

1.04 QUALITY ASSURANCE

- A. Inspect all service lines per Section 02734 - Inspection and Testing of Sanitary Sewer Pipelines, Manholes, and Service Lines.

1.05 SUBMITTALS

- A. Submit to the Engineer of Record all materials and procedures not described in these specifications. Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 's approval required for all materials not described in these specifications.

1.06 REFERENCES

- A. Arkansas State Plumbing Code

B. City of Bauxite Plumbing Code

1.07 SPECIAL REQUIREMENTS CONCERNING FIELD LOCATION OF PIPE, BENDS, CLEANOUTS, AND MANHOLES ON SERVICE LINES

- A. Bends
 - 1. Avoid using short radius ninety degree bends on 4" service lines.
 - 2. Use only long sweep bends where bends are absolutely necessary.
- B. Cleanouts
 - 1. Cleanouts are required at the building foundation per the Bauxite Plumbing Code.
 - 2. On lines longer than one hundred (100) feet, cleanouts are required at one hundred (100) foot spacing.
 - 3. Install cleanouts adjacent to any ninety degree bend.
 - 4. Install pipe on cleanout riser up to finish grade.
 - 5. The cleanout shall be the same diameter as the pipe on which it is installed.
- C. Backwater Traps (Sewage check valve)
 - 1. Provide backwater traps as required by Section 6.14 of the Arkansas Plumbing Code or as shown on the plans.
 - 2. Backwater Traps shall be Mainline "Adapt-A-Valve" or approved equal.

1.08 PROTECTION

- A. In all cases the Contractor is responsible for protecting public and private property and protecting any person or persons who might be injured as a result of the Contractor's work.
- B. All utilities shown on the plans may not represent the exact location; however, the contractor is responsible for verifying these locations and contacting "Arkansas One Call System" before excavating.

PART 2 - PRODUCTS

2.01 BEDDING AND BACKFILL

- A. Refer to Section 02220 - Excavation, Backfilling, and Compacting.

2.02 PIPE AND FITTINGS

- A. Refer to Section 02610 - Pipe and Fittings for allowable materials.

2.03 BACKFILL AND ASPHALT FOR PAVEMENT REPAIRS

- A Refer to Section 02575 - Pavement Repair

2.04 MANHOLES, MANHOLE RINGS AND LIDS

- A Refer to Section 02605 - Manholes

2.05 CONCRETE

- A. Refer to Section 03300 - Cast-In-Place Concrete

PART 3 - EXECUTION

3.01 EXCAVATION

- A. Perform excavation and prepare bedding in accordance with Section 02220 - Excavation, Backfilling, and Compacting for Sanitary Sewer Pipelines.
- B. Never lay pipe in a water filled trench.
- C. Excavate for bells so that the entire barrel of the pipe will be uniformly supported before placing pipe in the trench

3.02 PIERS

- A. Install concrete piers as indicated on the plans in accordance with Section 03300 - Cast-In-Place Concrete.
- B. Use only ductile iron pipe on piers.

3.03 PIPE INSTALLATION

- A. Inspect each joint of pipe carefully before it is placed in the trench. Discard damaged joints.
- B. If trimming joint length is required, cut pipe in a neat and workmanlike manner without damage to pipe or pipe lining.
- C. Lay all pipe with the bell upstream.
- D. Lower pipe carefully into the trench so the spigot and bell will not become contaminated.
- E. Lay the service line on a straight alignment and at a constant slope. Install pipe a minimum slope of one percent (1.00%); this equals one-eighth inch fall per lineal foot (1/8" / LF). The maximum allowable deflection in a horizontal plane is one inch per lineal foot (1.00"/LF).
- F. Install bends on 4" service lines at all changes in alignment and slope. Cleanouts are required at 90 degree bends and every 100 feet on lines longer than 100 feet. Bends on 6" and larger service lines are only permitted within 5 feet of the building foundation and 2 feet from the manhole being connected to; if longer than 150 feet, bends are not allowed and manholes must be built.
- G. Keep the pipe joints' interior clean from all dirt and other foreign matter as the work progresses. Maintain the pipe's interior cleanliness until accepted or put in service.

- H At the end of each day's work, and when for any reason the laying of pipe will be discontinued for an appreciable period, close the open ends of the pipeline temporarily with an appropriate manufactured plug.

3.04 PIPE TO PIPE CONNECTIONS

- A. Make all pipe joints in strict accordance with the manufacturer's recommendation and these specifications as stated below for the particular type of connection. Make all joints watertight in accordance with the latest ASTM Standards.
- B. 'No-Hub" type pipe connections are not permitted.

Slip-Type Or Push-On Joints Connection Procedure

1. Clean the bell and spigot end of the pipes prior to jointing thoroughly by whatever means necessary to remove all foreign matter and attain the required cleanliness. Use a brush as necessary. Exercise particular care to clean the gasket seat.
2. Apply lubricant and attach gasket in strict accordance with the specific joint manufacturer's recommendations. Clean and insert the rubber gasket in the gasket seat within the bell. Insert the spigot end of the pipe in the bell of the pipe to which connection is being made, and force a firm contact with the shoulder of the bell.

Mechanical Joints Connection Procedure

1. Clean thoroughly the spigot end of pipe, the bell of fitting, and the rubber gasket as specified for slip-type or push-on joints. Clean the gland in a similar manner.
2. After the gland and gasket are placed on the spigot end of the pipe a sufficient distance from the end to avoid fouling the bell, insert the spigot end in the fitting bell to the point of firm contact with the bell shoulder. Then advance the rubber gasket into the bell and seat in the gasket seat. Exercise care to center the spigot end within the bell.

3. Bring the gland into contact with the gasket, enter all bolts, and make all nuts hand tight. Exercise continued care to keep the spigot centered in the bell.
4. Make the joints tight by turning the nuts with a wrench - first partially tightening a nut, then partially tightening the nut 180 degrees therefrom and working thus around the pipe with uniformly applied tension until the required torque is applied to all nuts. Required torque ranges and indicated wrench lengths for standard cast iron bolts are shown in Section 02730 - Sanitary Sewer **Pipelines**.

E Reinforced Rubber Couplings

1. Install a reinforced rubber coupling only where dissimilar pipe materials are connected.
2. Take care that proper alignment is maintained.
3. Encase reinforced rubber coupling in Class B concrete as shown on the Standard Details.

3.05 SERVICE LINE CONNECTIONS TO CITY SEWER PIPELINES

- A. Wye connection - Use existing wye or other prefabricated outlet if one has been left in the city sewer for sewer service to a lot unless it can be shown that the dwelling unit or building cannot drain by gravity to the wye.
- B. Taps
 1. Where a wye or other prefabricated outlet in the city sewer is not available to serve a lot, a tap connection shall be installed at a location approved by the Utility to connect the building sewer to the city sewer.
 2. The Contractor shall install all taps using approved materials and equipment.
- C. Manhole Taps
 1. Make manhole tap connections into existing manholes as indicated on the plans.

2. Install manhole taps no more than twenty-four (24) inches or 2/3 of the main line pipe diameter whichever is greater above the manhole invert.
3. Make manhole tap watertight and flush with inside surface of manhole.
4. Manhole taps are considered as part of the service line and are subject to inspection.

3.06 BACKFILLING AND INSPECTION

- A. Before backfilling, place concrete encasement at transitions between different types of pipe and around all flexible rubber couplings as shown on the Standard Details.
- B. Install backwater traps (Sewage check valve) if required.
- C. Before backfilling, install concrete anchor collars in accordance with the details at the location and interval and shown on the plans. Use Class "A" concrete and reinforce with steel bars per Section 03300 - Cast-In-Place Concrete.
- D. After the pipeline is installed and visually inspected by the Engineer, backfill the trench and clean up the site per Section 02220 - Excavation, Backfilling, and Compacting.
- E. Test the service line per Section 02734 - Inspection and Testing of Sanitary Sewer Pipelines, Manholes, and Service Lines.
- F. Repair all pavements per Section 02575 - Pavement Repair.
- G. Repair all incidental damage to buildings, structures, utilities, pavements, landscaping, etc.

3.07 SERVICE LINE REPLACEMENT/REPAIRS

- A. Obtain permit per Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 requirements.
- B. When possible, the existing tap or wye should be used to connect a repaired or replaced service line.

- C. When the existing wye or tap cannot be used, then the Contractor shall seal original wye or tap (to prevent entrance of rainwater or debris into the city sewer) and contact PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 Engineering Services to arrange for inspection of seal.
- D. Repair damaged portion in accordance with these specifications.
- E. If reinforced rubber couplings are required, be sure to encase them in Class **B** Concrete as shown in the Standard Details.
- F. Contact PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 Engineering Services to arrange for inspection of service line repair.

3.08 PIPE BURSTING SERVICE LINES

- A. Pipe bursting of existing service lines shall be done only with prior approval from Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 personnel. Submittal of location, depth, method used, pipe material to be installed and reason for bursting service line instead of conventional relay will be required prior to approval.
- B. Pre and Post televising of existing service line will be required.
- C. Connections at each end of pipe bursting shall be inspected by Utility personnel. All normal inspection fees will be charged for pipe bursting installations.

3.08 RELOCATE SERVICE EXIT

- A. Obtain Plumbing Permit from the Bauxite Public Works Permit Section. A copy of the permit shall be given to the Utility.
- B. Relocate where the sanitary sewer line exits the structure and plug the old sewer line where it was cut to be rerouted.
- C. Have the work inspected by the City Plumbing Inspector and provide the

PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE
IMPROVEMENT DISTRICT NO. 2021-2 a copy of the Approval Slip.

END OF SECTION 02732

SECTION 02734
INSPECTION AND TESTING OF
SANITARY SEWER PIPELINES, MANHOLES, AND SERVICE LINES

PART 1- GENERAL

1.01 WORK INCLUDED

- A. This section covers the inspection and testing of pipelines, manholes, and service lines. Testing is required before final acceptance of pipelines and service lines by Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2.

1.02 RELATED WORK

- A. Section 02605 - Manholes
- B. Section 02610 - Pipe and Fittings
- C. Section 02730 - Sanitary Sewer Pipelines
- D. Section 02732 - Sanitary Sewer Service Lines
- E. Section 02766 - Cured-In-Place Pipe Installed Using The Inversion Method
- F. Section 02769 — Polyethylene Pipe Installed Using the Pipe Bursting Method
- G. Section 03700 - Manhole Rehabilitation

1.03 SCOPE OF WORK

All pipelines shall be inspected and tested before final acceptance. The methods to be used are as follows:

- A. New Gravity Sewer Pipelines
 - 1 Visual inspection during installation and before backfill.
 - 2 Low pressure air test.

3. Television inspection.
4. Mandrel test (Flexible pipes only) If Required by Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2
5. Final Visual Inspection
6. Infiltration/exfiltration if Required by Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2.

B Manholes

1. Visual inspection during installation and before backfill.
2. Vacuum testing.
3. Exfiltration test if required by Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2.
4. Final Visual Inspection.

C Replacement Pipelines and Point Repairs

1. Visual inspection during installation and before backfill.
2. Low pressure air test.
3. Television inspection.
4. Mandrel test (Flexible pipes only) if required by Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2
5. Final Visual Inspection.

D Force Mains

1. Visual inspection during installation and before backfill.
2. Hydrostatic pressure test.

E. Service Lines

1. Visual inspection during installation and before backfill.
2. Low pressure air test if required by Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2.
3. Exfiltration test if required by Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2.
4. Television inspection for pipe bursting existing service lines.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.01 VISUAL INSPECTION DURING INSTALLATION AND BEFORE BACKFILL

- A. The Engineer of Record will inspect pipelines, manholes, and service lines during all phases of construction. The level of inspection is at the discretion of the Engineer of Record and will be based partly on the Contractor's ability, experience, and past performance. All work not conforming to these specifications that is discovered during this inspection phase will be corrected by the Contractor.

3.02 PRESSURE TEST FOR GRAVITY SEWER PIPELINES

- A. The Contractor will perform pressure tests on all gravity sewer pipelines in the presence of the Engineer of Record
- B. Lines will not be accepted until they pass all required tests.
- C. Perform the tests in the presence of the Engineer of Record's representative. Provide Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2's representative at least 24 hours notice before beginning testing.
- D. The primary test method is the Low Pressure Air Loss test for lines smaller than 24 inches in diameter. Under special conditions and when approved in advance by Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 the exfiltration/infiltration test procedure may be used.

3.03 LOW PRESSURE AIR LOSS PROCEDURE FOR GRAVITY SEWER PIPELINES

- A. Plug all pipe outlets with suitable test plugs. Brace each plug securely.
- B. Pipe air supply to pipeline to be tested so that air supply may be shut off, pressure observed, and air pressure released from the pipe without entering the manhole.

Install a valved branch in the supply line past the shut-off valve terminating in a 1/4" female pipe thread for installation of the test gauge.

- C. Add air slowly to portion of pipe under test until test gauge reads at least 4 psig, but less than 5 psig.
- D. Shut air supply valve and allow at least two minutes for internal pressure to stabilize.
- E. Determine time in seconds for pressure to fall 1 psig so that pressure at the end of time of the test is at least 2.5 psig.
- F. Compare observed time with minimum allowable times in the following chart for pass/fail determination.

TEST CHART FOR AIR TESTING SEWERS
 Leakage Testing of Sewers by Low Pressure Air Loss
 (Time Pressure Drop Method)

Table 1 - Minimum Test Times in Seconds for 1 psig drop (3.5 psig to 2.5 psig)								
Distance Between Manholes	Nominal Pipe Diameter (inches)							
	6	8	10	12	15	18	21	24
100	40	70	110	155	245	350	480	625
150	60	105	165	235	365	500	595	680
200	80	140	220	315	425	510	595	680
250	100	176	270	340	425	510	595	680
300	120	215	283	340	425	510	595	680
350	140	226	283	340	425	510	595	680
400	160	226	283	340	425	510	595	680
450	170	226	283	340	425	510	595	680
500				340	425	510	595	680
550						510	595	680
600							595	680

NOTE: Due to force resisted by plug restraints, testing of sewers larger than 24" is not recommended.

- G. Where groundwater level is above the crown of the pipe being tested, increase test pressure at the rate of 1 psi for every 2.5 feet of water above the crown.

H. Air Testing Safety Requirements:

1. Securely brace plugs used to close the sewer pipe for the air test; this is to prevent the unintentional release of a plug which can become a high velocity projectile. For example: four pounds (gauge) air pressure develops a force against the plug in a 12" diameter pipe of approximately 450 pounds; this force can propel a 12-inch plug weighing 10 pounds to supersonic speeds.
2. Locate gauges, air piping manifolds, and valves at the top of the ground. Entry by anyone into a manhole where a plugged pipe is under pressure is strictly prohibited.
3. Do not use the air test on gravity sewer pipes larger than 24" in diameter because of the difficulty of adequately blocking the plugs.

3.04 WATER LOSS TEST PROCEDURE (USE ONLY IF APPROVED IN ADVANCE BY PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 UTILITY)

- A. Perform the water test procedure to determine the quality of the sewer line against infiltration and exfiltration only when specifically approved by Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2. The Low Pressure Air Loss Test outlined above is the standard test procedure. Where approved, follow the procedure below.
- B. Infiltration Test: Minimum test time is 2 hours. The allowable pipeline leakage rate under exterior ground water pressures is:
 1. For all pipe materials: 100 gallons (or less) per inch of nominal pipe diameter per mile of pipeline per 24 hours. Submit procedure to Engineer for approval if this test is used.
- C. Exfiltration Test: This test will be used if Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 decides the ground water table at the time of testing is too low to produce dependable results

from the infiltration test. This test will not be used if Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 decides the ground water table is too high. The allowable pipeline leakage rates

are the same as stated for the Infiltration Test. Submit procedure to Engineer for approval if this test is used.

3.05 TELEVISION INSPECTION

All newly installed sewer mains shall be televised as follows:

- A. The Contractor shall clean all lines thoroughly prior to the start of televising.
- B. Each segment of pipe shall be televised.
- C. The sewer main shall be televised to reveal possible defects in material or workmanship.
- D. The Contractor shall correct any defects discovered during the television inspection at the Contractor's expense.
- E. Any televising of line segments by the Contractor will be made in the presence of the representative of the Engineer of Record and final videos shall be delivered to the Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 for review and approval. Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 's representative will be notified in advance of all televising of line segments performed by the Contractor.

3.06 MANDREL TEST (FLEXIBLE PIPE ONLY)

- A. The maximum allowable pipe deflection is five (5) percent of the inside pipe diameter.
- B. Any sewer pipe which fails the mandrel test prior to final acceptance will not be accepted by PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 until the defects are corrected.
- C. All mandrel tests shall be performed by the Contractor while observed by the Engineer of Record's representative.

3.07 SUPPLEMENTAL MANDREL TESTING

- A. PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 may at any time after final acceptance perform supplemental mandrel testing on pipelines constructed of flexible pipe material. These supplemental tests will be performed as detailed above with a maximum allowable long term deflection of five percent (5%).
- B. Any sewer pipe which fails the mandrel test prior to expiration of the maintenance bond will be corrected by the Contractor at the Contractor's expense. If the Contractor fails to correct these defects after a reasonable time, the Utility will correct the defects and file a claim with the bonding company.

3.08 FINAL VISUAL INSPECTION

- A. Upon completion of the above tests the Engineer of Record will perform a final visual inspection of pipelines and manholes.
A punch list of defects (including obvious running leaks) will be prepared and sent to the Contractor for correction at the Contractors' expense.

3.09 INSPECTION FOR SERVICE LINES

- A. All building sewer installations shall be inspected and approved by an authorized PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 inspector.
Backfill may only be placed on the completed portions of a building sewer following inspection. No approval certificate shall be issued until all portions of a building sewer from the main connection to the building foundation have been inspected and approved by an authorized inspector. At the time of inspection, the pipe should be in place in the trench and "safed-up", but the top half of the pipe barrel exposed. No approval will be given for building sewers all or a portion of which are

covered at the time of inspection.

C. All building sewers are subject to testing to insure water tightness. All tests must be performed in the presence of a representative of Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2. Tests may be either by:

1. Water Loss Test Procedure; or,
2. Low Pressure Air Loss Procedure.

If, in the opinion of the Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2, the line in question is properly installed and free from open joints and breaks, building sewers constructed entirely of cast iron soil pipe may be connected to the city sewer without testing. Water Loss Test Procedure

1. Plug the section of line to be tested at the lower end and fill section with water so that at least four (4) feet of head is obtained.
2. The maximum acceptable water loss while so filled is not more than 100 gallons per twenty-four hours per inch of pipe diameter per mile of pipe. This is approximately 3/16 gallon for a one hundred (100) foot long section of four (4) inch pipe tested thirty minutes.

F Low Pressure Air Loss Procedure

1. Plug securely both ends of the line to be tested.
2. Charge the line with air to a pressure of 4.5 psig.
3. Allow at least five minutes for the temperature in the pipe to stabilize.
4. Measure the time required for a one (1.0) psi drop in pressure.
5. The minimum time for a one psi loss is $28.5 \times d$ seconds where d = the nominal diameter in inches of the pipe being tested.

3.10 PRESSURE TEST FOR FORCE MAINS

- A. Perform hydrostatic leakage tests for force mains by filling the force main with water and increasing the pressure to a testing pressure of 150% of the working pressure with a minimum of 100 psi.
- B. The duration of the leakage test shall be two hours or as specified by the Engineer

of Record.

- C. The force main will not be accepted until the actual leakage is equal to or less than the allowable. In addition, all obvious leaks shall be repaired.
- D. The allowable leakage rate per hour for ductile iron, PVC, or concrete pipe shall be calculated by the following formula:
Force main allowable leakage (L) shall be according to the following equation:

$$Q = LD(P)^{0.5} / 148,000$$

where Q = quantity of makeup water in gallons per hour
 L = length of pipe section being tested, in feet
 D = nominal diameter of the pipe, in inches
 P = average test pressure during the hydrostatic test in pounds per square inch (gauge)

$$L = \frac{ND \times P^5}{7400}$$

3.11 MANHOLE TESTING

- A. The Contractor shall vacuum test all new manholes constructed.
- B. The Contractor shall vacuum test all manholes that have been sealed (waterproofed).
- C. The Contractor shall vacuum test all manholes that have been epoxy lined.
- D. Manholes shall be tested in accordance with ASTM C 1244-93. Vacuum test shall not be performed earlier than 7 days after construction or installation. The Contractor shall provide all testing equipment, pump, hosing, seal, and other incidentals. Vacuum test head shall be positioned at the top of the casting (the surface on which the manhole cover rests, to include grade rings) in accordance with the equipment manufacturer's instructions. A vacuum of 10-inches of mercury shall be drawn and the vacuum pump isolated by the shut-off valve on the test head connection. When valve is closed, time measurement shall commence, and the time required for vacuum drop to 9-inches of mercury shall be

observed and recorded. Manholes shall pass if the time for the vacuum reading to drop from 10-inches of mercury to 9-inches of mercury meets or exceeds the time values in seconds in the following table.

Table 1 - Minimum Test Times for Various Manhole Diameters (seconds)										
Depth (feet)	Diameter (inches)									
	30	33	36	42	48	54	60	66	72	
<10	11	12	14	17	20	23	26	29	33	
10	14	15	18	21	25	29	33	36	41	
12	17	18	21	25	30	35	39	43	49	
14	20	21	25	30	35	41	46	51	57	
16	22	24	29	34	40	46	57	58	67	
18	25	27	32	38	45	52	59	65	73	
20	28	30	35	42	50	53	65	72	81	
22	31	33	39	46	55	64	72	79	89	
24	33	36	42	51	59	70	78	87	97	
26	36	39	46	55	64	75	85	94		
28	39	42	49	59	69	81	91	101	113	
30	42	45	53	63	74	87	98	108	121	

- E Manholes showing greater than the allowable leakage shall be repaired and re-tested until a satisfactory leakage result is obtained.
- F The Engineer of Record will be required to certify that all manholes on a project have been vacuum tested and have passed the test criteria. Copies of the test results will be supplied Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 if requested.

END OF SECTION 02734

SECTION 02760
PIPELINE CLEANING

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. This Section covers the cleaning of sanitary sewer lines.

1.02 RELATED WORK

- A. Section 02605 - Manholes
- B. Section 02730 - Sanitary Sewer Pipelines
- C. Section 02732 - Sanitary Sewer Service Lines
- D. Section 02762 - Pipeline Television Inspection
- E. Section 02766 - Cured-In-Place Pipe Installed Using the Inversion Method
- F. Section 02769 — Polyethylene Pipe Installed Using the Pipe Bursting Method
- G. Section 03350 - Manhole Rehabilitation

1.03 SUBMITTALS

- A. The Contractor shall submit for approval manufacturer's brochures and specifications for his proposed cleaning equipment. The equipment and methods selected for cleaning shall be approved by the Engineer of Record.

PART 2 - PRODUCTS

2.01 EQUIPMENT

- A. Equipment selected for cleaning shall be of a type generally recognized by the trade for the purpose being used and that has proved satisfactory. The equipment shall be capable of removing all roots, dirt, grease, rock and other deleterious material and obstructions from the sewer lines and manholes that would prevent efficient use of the inspection equipment.
- B. Hydraulic cleaning equipment shall be of a movable dam type and shall be constructed in such a way that a portion of the dam may be collapsed at any time during the cleaning operation to protect against flooding of the sewer. Sewer cleaning balls or other such equipment which cannot be collapsed instantly will not be considered acceptable cleaning equipment. The moveable dam shall be of the same diameter as the pipe being cleaned and shall provide a flexible scraper around the outer periphery to insure total removal of grease. If a line segment is found to be completely stopped up or plugged or heavily intruded with roots, then a mechanical root cutter shall be used.
- C. High velocity hydro-cleaning equipment shall be truck mounted for ease of operation. The equipment shall have minimum of 600 feet of 1 inch **I.D.** high pressure hose with a selection of two or more high velocity nozzles. The nozzles shall have a capacity of 60 GPM at a minimum working pressure of 1000 pounds per square inch (psi). The nozzles shall be capable of producing a scouring action from 15 degrees to 45 degrees in all size lines designated to be cleaned. Equipment shall also have a high velocity gun for washing and scouring manhole walls and floor. The equipment shall carry its own water tank capable of holding corrosive or caustic cleaning or sanitizing chemicals, auxiliary engines, pump and a hydraulically driven hose reel. All controls shall be located so that equipment can be operated above ground with minimal interference to traffic and/or danger to the operator.

- D. Mechanical cleaning equipment shall be used to remove heavy accumulations of silt, sludge, etc., and roots. Bucket machines shall be operated in pairs with each machine powered by an engine with a minimum of 16 horsepower (HP) to ensure sufficient pulling power. Machines shall be capable of operating at least two speeds to match job conditions. Sufficient accessories and tools shall be furnished to accomplish the required cleaning in a complete and efficient manner.
- E. Power rodding machines shall be of a continuous rod type, capable of holding a minimum of 1000 feet of rod. The rod shall be specifically treated steel. The machine shall have a positive rod drive and produce a 2000 pound rod pull. To insure safe operation, the machine shall have a fully enclosed body and an automatic safety throw-out clutch.
- F. Cleaning equipment shall be provided that includes an air conveying vacuum system to provide for the simultaneous removal of the debris flushed to the manhole.
- G. A temporary debris catcher, as approved by the Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2, shall be used in the downstream manhole if the project is tied to existing sewer mains. See Standard Details.

2.02 PERSONNEL

- A Contractor personnel shall be thoroughly familiar with all phases of sewer line cleaning to insure satisfactory end results without causing damage to the sewer lines or adjacent property.

PART 3 - EXECUTION

3.01 CLEANING EQUIPMENT

- A. The importance of the cleaning operation cannot be too strongly emphasized. The equipment selected for cleaning shall be capable of removing all dirt, grass, rocks and other deleterious materials from the sewer lines and manholes.
- B. The Contractor shall make an inspection of the lines to be cleaned in order to determine the type of cleaning equipment that is required. It is anticipated that hydraulic cleaning will be adequate for most of the line segments.

3.02 CLEANING REQUIREMENTS

Prior to inspection, all sewer mains will be thoroughly cleaned as specified below:

- A. The sewer lines shall be cleaned by using standard mechanically powered or hydraulically propelled cleaning tools or combinations thereof, such as rodding machines, boring machines, hydraulic balls, cones, ferrets, or other similar devices.
- B. All roots, sludge, dirt, sand, rock, grease and other solid or semi-solid material resulting from the cleaning operations shall be removed at the downstream manhole without passing the material to existing sewer mains. When cleaning equipment is used, a debris catch riser, as approved by Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 , shall be used in the downstream manhole so that both solids and water shall be trapped. All solids or semi-solids resulting from the cleaning operations shall be removed from the site and disposed of by the Contractor. It is the responsibility of the Contractor to secure a legal dump site for the disposal of this material. Contractor will be responsible for any material allowed to enter Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 's System as a result of this cleaning process. Contractor will be responsible for any damages resulting, either private or public,

from any material

entering PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 's System. All costs incurred to remove such material will be paid by the Contractor.

- C. Satisfactory precautions shall be taken to protect the sewer lines from damage that might be inflicted by the improper use of cleaning equipment. Whenever hydraulically propelled cleaning tools, which depend upon water pressure to provide their cleaning force or any tools which retard the flow of water in the sewer lines are used, precautions shall be taken to insure that the water pressure created does not cause any damage or flooding to public or private property. When quantities of water from fire hydrants are necessary to avoid delay in normal working procedures, the water shall be conserved and not used unnecessarily. No fire hydrant shall be obstructed or used when there is a fire in the area. Before using any water from the City water supply system, the Contractor shall apply for and receive permission from Sardis Water Association. The Contractor shall be responsible for the water meter and related charges for the set up, including the water usage bill. All expenses shall be considered incidental to cleaning.
- D. UNDER NO CIRCUMSTANCES SHALL SEWAGE OR SOLIDS REMOVED FROM THE SEWER SYSTEM BE DUMPED ONTO STREETS OR INTO DITCHES, CATCH BASINS, STORM DRAINS OR EXISTING SANITARY SEWER MANHOLES.**

END OF SECTION 02760

SECTION 02762
PIPELINE TELEVISION INSPECTION

PART 1 - GENERAL

1.01 WORK INCLUDED

This section covers the television inspection of sanitary sewer lines.

- A. The inspection of each line shall be by a television (TV) camera especially designed to accurately show the condition of the lines from the interior and with the ability to pinpoint the locations of line faults and necessary repairs.
- B. A sewer line joint means the junction of two adjacent lengths of sewer pipe. The term "manhole section" as used in these specifications shall mean the length of pipe connection two manholes.

1.02 RELATED WORK

- A. Section 02730 - Sanitary Sewer Pipelines
- B. Section 02732 - Sanitary Sewer Service Lines
- C. Section 02760 - Pipeline Cleaning

1.03 SUBMITTALS

- A. The Contractor shall submit for approval manufacturer's brochures and specifications for proposed TV equipment to the Engineer of Record. Upon request this information will be submitted to Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 for their review.

- A. Immediately upon cleaning the sewer line, it will be televised to determine the condition of the line and location of existing service connections, etc.
- B. The sewer lines shall be visually inspected by TV camera. The section being inspected shall be suitably isolated from the remainder of the sewer line as necessary.
- C. The camera shall be moved through the line in either direction at a uniform slow rate not to exceed 60 feet per minute, by means of cable winches, or similar mechanisms. **Under no circumstances shall the camera be tethered to a hydraulically propelled or high-velocity jet cleaning device while the cleaning device is on.**
- D. The camera shall stop at each service connection and provide a view up the service line.
- E. Telephone, or similar suitable means of communications, shall be set up between the two winches, the pumping unit and the monitor control.
- F. TV inspection will be done one manhole section at a time and the flow in the section being inspected will be suitably controlled. Sewer flow will not exceed those shown below as measured in the manhole:

6" - 10" Pipe	1 inch
12" - 14" Pipe	2 inches
14" - 24" Pipe	3 inches
Over 24" Pipe	4 inches

- G. The Contractor will make all provisions for pumping or bypassing the flow around the manhole section and the cost shall be incidental to TV inspection. Contractor shall not be allowed to float the camera unless permitted by the Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2.

PART 2 - PRODUCTS

2.01 TELEVISION INSPECTION EQUIPMENT

- A. The television camera and monitoring equipment shall be specifically designed and constructed to perform the work as specified. The camera shall be operative in conditions of 100% humidity and/or under water. The camera shall be small enough to pass through a 6 inch diameter sewer and shall be waterproof with a self contained lighting system capable of producing enough light to produce clear, bright, sharp pictures on the monitor. The lighting and camera quality shall be suitable to allow a clear, in focus picture of a minimum of 6 linear feet of the entire inside periphery of the sewer pipe. Picture quality and definition shall be to the satisfaction of the Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 ; otherwise, the equipment shall be removed from the line.

- B. The monitor shall be located within a temperature controlled television unit that will accommodate three people to watch the sewer line inspection. The monitor will have a 12 inch minimum viewing screen. The Engineer of Record and a representative of the Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 will have access to view the television monitor at all times.

PART 3 - EXECUTION

3.01 GENERAL

All television inspection will be performed by Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 crews during the initial phase of the television inspection. The Owner/Contractor will use the services of a company of his choice, that meets the specifications listed above, if any addition television inspection is required. See Section 01100 Subsection 7.03.

3.02 TELEVISION INSPECTION BY THE CONTRACTOR

A When additional television inspection is required, the Contractor shall furnish videos of the lines televised to the Engineering Services Department of the Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2 for review and comments. The video media shall be CD, or DVD format. Software used in viewing the video will be provided the Utility if necessary. Each video media shall be permanently labeled with the following information furnished:

1. Project Name
2. Manhole to Manhole Designation
3. Name of Contractor
4. Date Televised

B. The following information shall be recorded and visible onscreen for 10 seconds immediately before the start of televising each line segment:

1. Project Name
2. Manhole to Manhole Designation (Number, Pipe Material, Size of Line, and Direction of Televising)
3. Name of Contractor
4. Date Televised
5. Street and or Easement Location

C. A continuous uninterrupted recording of distance from the insertion manhole shall be visible at the lower left corner of the screen at all times during inspection.

D.

tape:

1. Project Name
2. Name of Contractor
3. Date Televised
4. Street or Other Location
5. Upstream Manhole Designation
6. Downstream Manhole Designation

7. Pipe Material
8. Pipe Diameter
9. Direction of Televising (Downstream or Upstream)
10. Location of Service Connections

E Videos will become the property of the PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 and will be retained by the

Department of Engineering Services. If the videos are of such poor quality that the PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2 is unable to evaluate the condition of the sewer line or to locate service connections, the Contractor will be required to re-televising and provide an adequate video of the line.

END OF SECTION 02762

SECTION 03300
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. This section covers cast-in-place concrete materials, reinforcing steel, forms, and finishing in conjunction with sanitary sewer pipeline construction.
- B. Use Class A Concrete in all manholes and other structures.
- C. Use Class B Concrete for bedding and encasement only.

1.02 RELATED WORK

- A. Section 02220 - Excavation, Backfilling, and Compacting
- B. Section 02575 - Pavement Repair
- C. Section 02605 - Manholes
- D. Section 02730 - Sanitary Sewer Pipelines
- E. Section 02732 - Sanitary Sewer Service Lines

1.03 QUALITY ASSURANCE

ASTM C94	ASTM A82	ASTM A185	ASTM A615
ASTM A617	AASHTO M85	AASHTO T27	

1.04 SUBMITTALS

- A. Submit mix design, equipment details, and vendor name for field batched concrete.

PART 2 - PRODUCTS

2.01 CONCRETE

- A. Concrete: composed of Portland Cement; fine and coarse aggregate; water; and, an air entraining agent. Provide either Class A concrete or Class B concrete as described below.
- B. For Class A concrete use ready-mixed concrete; conform to ASTM C 94, latest edition; deliver and place within one hour after all materials have been placed in the mixing drum.
- C. For Class B concrete use ready-mixed or field mixed concrete.
- D. Proportion components, except water, by weight. Water may be measured by volume. One sack of Portland Cement consists of one cubic foot or 94 pounds.
Proportion components to meet these requirements:
 - 1 Class A Concrete:
 - a. Minimum sacks of cement per cubic yard: six (6)
 - b. Slump range: 2 - 4 inches
 - c. Minimum 28 day compressive strength: 4000 PSI
 - d. Air Content: 4 - 7 percent
 - 2 Class B Concrete:
 - a. Minimum sacks of cement per cubic yard: five (5)
 - b. Slump range: 2 - 4 inches
 - c. Minimum 28 day compressive strength: 3000 PSI
 - d. Air Content: Not Applicable
- E. Cement: Portland Cement conforming to AASHTO M 85, Type I. Use Type **III** cement (high early strength) only if approved by the Pulaski County Property Owners' Multipurpose Improvement District No. 2021-2.
- F. vegetable matter and dirt.

- G. Air entraining agent: use in all Class A concrete; conform to AASHTO M 154; add to the mixing water in solution; proportion to provide four (4) to seven (7) percent air in the concrete.
- H. Fine aggregate: clean, hard, durable particles of natural sand free from injurious amounts of organic impurities; conform to the gradation requirements of AASHTO T 27.
- I. Coarse aggregate: clean, hard and durable crushed stone or washed gravel; reasonably well graded from course to fine; per AASHTO T 27.

2.02 REINFORCING STEEL

- A. Steel bars: deformed, conforming to ASTM A 615 or A 617.
- B. Steel wire: conform to ASTM A 82, Cold-Drawn Steel Wire for Concrete Reinforcement.
- C. Wire mesh: conform to ASTM A 185; gauge and mesh per plans.
- D. Submit reinforcing steel bars shop drawings for approval.
- E. All steel reinforcement: free from rust, scale, mortar, dirt, or other objectionable coatings.

PART 3 - EXECUTION

- A. Perform excavation per Section 02220 - Excavation, Backfilling, and Compacting.
- B. Build forms neat, square, and flat so concrete will have smooth finish when forms are pulled. Construct forms to provide finished concrete to dimensions shown on plans.
- C. Place reinforcing steel accurately in accordance with details shown on the plans and properly secure in position.
- D. Vibrate all structural concrete as it is placed using internal vibrators capable of transmitting vibration to the concrete at frequencies not less than 4,500 impulses per minute. Do not use form vibrators. Limit vibration to provide satisfactory

consolidation without causing segregation. Do not insert vibrator more than six (6) inches into the lower courses previously vibrated. Use vibrators in a substantially vertical position; insert at uniformly spaced points no farther apart than the visible effectiveness of the vibrator.

- E. Vibration is not required in manhole bases and pipe encasements; consolidate concrete in these places with a tamping rod so a dense void free mass is formed.
- F. Allow concrete to cure for at least 48 hours before stripping forms. If concrete is in a structural member, do not remove forms until the concrete can withstand safely all superimposed loads.
- G. On all exposed surfaces, including the inside surface of manholes, remove all fins and projections so the surface is smooth. Cut out and fill with grout any honeycombed areas. Extensive honeycombing is not allowable.

END OF SECTION 03300

SECTION 03400
CLEARING FOR CONSTRUCTION ACCESS

PART 1- GENERAL

1.01 WORK INCLUDED

- A. Excavation, grading, cutting and removal of trees, shrubs and underbrush, and the removal of any debris existing above natural ground surface and within the cleared area necessary to permit the construction of the improvements.

1.02 RELATED WORK

- A.. Section 02605 - Manholes
- B. Section 02730 - Sanitary Sewer Pipelines
- C. Section 02732 - Sanitary Sewer Service Lines
- D. Section 02734 - Inspection and Testing of Sanitary Sewer Pipelines, Manholes and Service Lines

1.03 PROTECTION

- A. In all cases the Contractor is responsible for protecting public and private property and protecting any person or persons who might be injured as a result of the Contractor's work.
- B. The Contractor is responsible for verifying locations of all utilities and contacting the Arkansas One Call System before excavating.

PART 2 - MATERIALS

Not used

PART 3 - EXECUTION

3.01 GENERAL

- A. The Contractor will be required to submit a plan to build access roads/trails for approval by the Engineer of Record.
- B. Trees, shrubs, underbrush and debris removed from the improvement right of way shall be disposed of by the Contractor in a manner approved by the Engineer of Record.

END OF SECTION 03400

SECTION 03500
GROUT FILL ABANDONED SEWER PIPELINES

PART 1 - GENERAL

1.01 GENERAL

- A. This section covers the materials and procedures used in grout filling abandoned sewer pipelines with a lightweight, pumpable cementitious mix.

1.02 RELATED WORK

- A. Section 02220 - Excavation, Backfilling, and Compacting
- B. Section 02730 - Sanitary Sewer Pipelines

1.03 SUBMITTALS

- A. Submit to the Engineer of Record for review and approval all materials and procedures to be used in grout filling of abandoned lines.

PART 2 - PRODUCTS

2.01 CEMENTITIOUS GROUT

- A. Cementitious grout shall consist of a preblend of lightweight aggregate, cement, fly ash and admix to prevent segregation and promote expansion upon setting. Loose bulk density for the dry mix materials shall be 30 to 35 pounds per cubic foot. Grout shall equal or exceed Strong-Seal Grout 250 - Product Code 2133 and shall be packaged in 2 cubic foot bags.

2.02 FLOWABLE FILL

- A. Flowable fill shall conform to Section 206 — Flowable Select Material of the Arkansas State Highway and Transportation Department's Standard Specifications for Highway Construction, latest edition.

2.03 WATER

- A. Potable water free from injurious amounts of acids, alkalies, oils, sewage, vegetable matter and dirt shall be used.

PART 3 - EXECUTION

3.01 GENERAL

- A. Components shall be combined and thoroughly mixed in an approved mixer to a uniform pumpable mix. Equipment shall be of special design to insure proper mixing in as short a duration as possible. A water meter or measuring tank shall be utilized to ensure that a correct and consistent mix is produced for pumping and flow to fill voids. Mixing and pumping shall be continuous and at such a rate as to ensure that voids are filled prior to setting of mix. A pressure gauge shall be used to insure a continuous uniform flow of high quality grout without shutdowns or delays.

END OF SECTION 03500

SECTION 05000
STANDARD DETAILS & EAD SPECIFICATION DETAILS

PART 1- GENERAL

1.01 GENERAL

- A. This section provides all the Standard Drawings and details associated with these specifications.

1.02 RELATED WORK

- A. All Sections

PART 2 — Drawings

**Section 1 PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE
IMPROVEMENT DISTRICT NO. 2021-2 Standard Specification Detail Sheets**

- 1.0 Standard Precast Manhole
- 1.1 Standard Cast In Place Manhole
- 1.2 Precast Eccentric Manhole
- 1.3 Cast In Place Eccentric Manhole
- 1.4 Standard Drop Manhole
- 1.5 Standard 2 Foot Manhole
- 1.6 10 Foot Diameter Manhole
- 1.7 Standard Joint Wrap
- 1.8 Adjust Manhole To Grade
- 1.9 Manhole Abandonment
- 1.10 Manhole Disconnect And Seal
- 1.11 Temporary Debris Catch Riser and Table
- 1.12 Standard Manhole Ring And Lid

- 1.13 2 Inch Ring Extension
- 1.14 Standard Manhole Frame Replacement
- 1.15 32 Inch Manhole Lid
- 1.16 32 Inch Manhole Ring
- 1.17 38 Inch Reversible Frame And Lid
- 1.18 Seal HDPE At Manhole Detail
- 1.19 Seal HDPE Outside Drop Detail
- 1.20 Typical Private Residence Sewer System Layout
- 1.21 Typical Trench Bedding Details For Flexible And Rigid Pipe
- 1.22 Trench Bedding For Flexible and Rigid Pipe With Stone Backfill
- 1.23 Service Line Replacement In Right Of Way
- 1.24 New Construction Service Connection
- 1.25 New Construction Service Wye
- 1.26 Flexible Coupling
- 1.27 Saddles
- 1.28 Two Way Double Cleanout Detail
- 1.29 Miscellaneous Details
- 1.30 City And County Street Repairs
- 1.31 Alley Repair
- 1.32 Asphalt And Concrete Driveway And Parking Area Repair
- 1.33 Gravel Alley Or Street Repair
- 1.34 Curb And Gutter
- 1.35 Pipe Bursting
- 1.36 HDPE Splice
- 1.37 Installation of HDPE Encasement
- 1.38 Force Main Laying Conditions
- 1.39 Concrete Thrust Block And Anchor Collar Bering Tables
- 1.40 Blocking
- 1.41 Pier Details
- 1.42 Type D Encasement Detail And Tables

- 1.43 Encasement Pipe Details
- 1.44 Chain Link Fence Details
- 1.45 Wood Privacy Fence Details
- 1.46 Rip Rap Detail
- 1.47 Splash Block Detail
- 1.48 Anchor Collar
- 1.49 Gate Valve
- 1.50 Combination Sewage Air Release Valve

Section 2 PULASKI COUNTY PROPERTY OWNERS' MULTIPURPOSE IMPROVEMENT DISTRICT NO. 2021-2

EAD Specification Details

- 2.0.A Example Grease Interceptor Site Plan & Piping Layout
- 2.0.B Example Plumbing Riser Diagram When Grease Interceptors Are Used
 - 2.1 New Construction — Flex Space/Strip Mall — Plumbing Configuration
 - 2.2 Joint Wrap Detail
 - 2.3 Trap Control & Miscellaneous Details
 - 2.4 Two Way Double Cleanout Details
 - 2.5 Standard Ring & Lid Details
 - 2.6 Standard One Tank — Two Compartment Grease Interceptor Detail
 - 2.7 Fiberglass Sampling/Inspection Manhole Details
 - 2.8 Concrete Sampling/Inspection Manhole Details
 - 2.9 Example Vehicle Wash Piping Layout For Use With Exterior Sand/Oil Interceptor & Catch Basins
- 2.10 Catch Basin Details
- 2.11 Standard Exterior One Tank — Three Compartment Sand/Oil Interceptor Details
- 2.12 Standard Interior One Tank — Three Compartment Sand/Oil Interceptor Details
- 2.13 Typical Commercial Laundry Lint Interceptor Details
- 2.14 Grease Interceptor Abandonment & Seal Details
- 2.15 Sand/Oil Interceptor Abandonment & Seal Details
- 2.16 Lint Trap Abandonment & Seal Details
- 2.17 Catch Basin Abandonment & Seal Details

2.18 Floor Drain & Floor Sink Abandonment & Seal Details

2.19 Septic Tank Abandonment & Seal Details

END OF SECTION 05000