



ADDENDUM NO. 01

To: Prospective Bidders & Plan Holders

From: Craig A. Johnson, P.E.
Crist Engineers, Inc.

Date: April 28, 2023

Project: Wastewater System Improvements
Kansas Street Parallel Force Main - Phase 1 and 2
Pine Bluff, Arkansas

Bid Date: May 9, 2023

Bid Time: 10:00 AM

Location: City Clerk's Office
200 East 8th Avenue, Room 202
Pine Bluff, Arkansas 71601

The BIDDER shall properly acknowledge Addendum No. 01 as required in Article 3 of Document 004100 on the Bid Form as confirmation that the BIDDER has examined the following Addenda and the related changes to the Contract Documents. Lack of proper acknowledgement on the Bid Form may deem a bid non-responsive.

The Contract Documents dated April 12, 2023, are hereby amended as follows:





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IMPORTANT REMINDERS:

The bid opening for this project is 10:00 AM on May 9, 2023.

Please reference Section 002113 - Instructions to Bidders, provided in the contract documents for information required for the bid submission.

CLARIFICATIONS:

1. Clarify Owner Material Stockpile

- A. Pine Bluff Wastewater Utility (PBWU) will relocate all material currently stored inside the fence of Kansas Street Pump Station where conflicting with construction activities upon receiving written request by the Contractor. Contractor will be required to clearly indicate work limits by staking/flagging or other means prior to requesting Owner to move materials.

2. Clarify River Height

- A. Base Flood Water Surface Elevation of 211 feet shown on plans is based on 100-year flood elevation. USACE work restriction water level of 42 feet outlined in Appendix D is equal to a water surface elevation of 206.71 feet. Reference USGS River gauge No. 07263650, Arkansas River at Pine Bluff located at US 79B Hwy.

3. Clarify Check Valve Vault

- A. Precast concrete will be allowed for the check valve vault.

4. Pine Bluff Contractor Policy

- A. Living Wage: Does NOT apply to this project.
- B. Occupancy Tax: Does NOT apply to this project.
- C. Inspection & Zoning Permits: Do NOT apply to this project.

5. Bid Opening

- A. The location of the Bid Opening is at City Clerk's Office, 200 East 8th Ave. Room 202, Pine Bluff, Arkansas, 71601 as stated in Advertisement for Bids.
- B. Mailed Bids shall be addressed as indicated in Article 15 on page 8 of Instructions to Bidders.

6. DBE Subcontractors

- A. A list of Owner identified local DBE subcontractors and contact information is attached as supplemental information for contractors use.



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7. Valve Orientation

- A. Where insufficient ground cover is present, valves shall be oriented on their side to provide the minimum depth of cover required.

8. Clarify Bypassing

- A. Pumping during bypassing activities will be provided by Owner.

9. Contractor Questions

- A. A list of all contractor questions received to date is attached to this addendum as supplemental information for contractors use.

BID DOCUMENTS:

1. Section 000110 - Table of Contents

- A. Delete in its entirety and replace with Table of Contents, attached hereto.

2. Section 001112 – Sequence of Construction

- A. Page 1, Section 2.: Add the following:

- i. **C. Tie-In Schedule**

- a. **Tie-In #1: 42-inch Tie-In – North of Lake Crossing**
 - b. **Tie-In #2: 16-inch Tie-In – Emergency Pump Connection**
 - c. **Tie-In #3*: 42-inch Tie-In – Pump Station Yard Piping**
 - d. **Tie-In #4**: 24-inch Tie-In – South of Pump Station**

***Tie-in #3 cannot be made until Tie-Ins #1 and #2 are complete.**

****Tie-In #4 is not dependent on other tie-ins and can be completed at Contractors discretion.**

- ii. **D. Tie-In / Bypassing Weather Restrictions**

- a. **All bypassing for making tie-in connections shall not be performed during wet weather. Coordination with Owner required prior to scheduling.**

- B. Page 2.: Delete in its entirety.

3. Section 002114 – Bidders Checklist

- A. Add Bidders Checklist, attached hereto.



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4. Section 004100 – Bid Form
 - A. Delete in its entirety and replace with Bid Form, attached hereto.
5. Section 004512 – Statement of Compliance
 - A. Add Statement of Compliance, attached hereto.
6. Section 005106 – PBWU Contractor Policy & Living Wage Ordinance
 - A. Delete Part 5.6 – Living Wage Ordinance
 - B. Delete Part 5.7 – Occupational Tax Requirements

SPECIFICATIONS:

1. Specification 010250 – Measurement and Payment
 - A. Delete in its entirety and replace with Measurement and Payment, attached hereto.
2. Specification 013543 – Environmental Protection Procedures:
 - A. Paragraph 1.3.: Add the following:
 - i. **B. Contractor shall meet the requirements of the Short Term Activity Authorization (STAA) as described at the following hyperlink to ADEQ's website:**
https://www.adeg.state.ar.us/water/planning/instream/default.aspx?desktop_version=y
3. Specification 083100 – Horizontal Access Doors:
 - A. Add Specification 083100 – Horizontal Access Doors, attached hereto.
4. Specification 311000 – Clearing and Grubbing:
 - A. Paragraph 3.5.B.: Modify as follows:
 - i. **Burning waste materials on the job site ~~is not permitted~~ will be allowed pending approval from Owner. Coordination of burning activities will be required with Pine Bluff Sand and Gravel. The contractor shall be responsible for obtaining a burn permit from the City of Pine Bluff Fire Department. Contractor shall provide owner with a minimum of 72 hours written notice prior to burning.**
5. Specification 331400 – Hydrostatic Testing:
 - A. Paragraph 3.2.C.: Modify as follows:
 - i. **Water source for the pump suction shall be provided by the Contractor; vessel used shall be approved by the Engineer. Use of river water is permitted for testing.**



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6. Specification 333400 – Sewage Force Main Pipe and Fittings:
 - A. Some hard copies of the bid documents sent out omitted portions of this section.
 - B. Delete in its entirety and replace with Sewage Force Main Pipe and Fittings, attached hereto.
7. Specification 333500 – Subaqueous Crossing / Underwater Pipeline Construction:
 - A. Some hard copies of the bid documents sent out omitted this section.
 - B. Delete in its entirety and replace with Section 333500, attached hereto.

DRAWINGS:

1. Drawing G1-02 - General Notes:
 - A. Delete General Note 2.E in its entirety.
 - B. Add the following Permits note:
 - i. **C. Contractor is responsible for paying all permit fees. Reference specification section 013514 – Environmental Protection Procedures.**
2. Drawing G1-03 - General Notes & Legend:
 - A. Add the following Subaqueous Crossing Note:
 - i. **7. LAND USE AGREEMENTS WILL BE REQUIRED BETWEEN CONTRACTOR AND LANDOWNER FOR OBTAINING ACCESS NORTH OF LAKE CROSSING. CONTRACTOR SHALL BEAR ALL COSTS ASSOCIATED WITH LAND USE. LAND USE AGREEMENT(S) SHALL BE PROVIDED TO ENGINEER/OWNER PRIOR TO MOBILIZING.**

LANDOWNER CONTACT INFORMATION:
JAMES DANNAHER: 870-550-3816
RICHARD METCALF (BOYD POINT FARMS): 870-550-2399
 - B. Modify Subaqueous Crossing Note 7 as follows:
 - i. ~~7.~~ **8. SEE SPECIFICATIONS 355333. SEE SHEET C1-02 FOR ADDITIONAL NOTES.**
3. Drawing G1-04 – Overall Plan & Profile:
 - A. Modify this drawing as shown on Addendum No. 1 – Overall Plan & Profile, attached hereto.
4. Drawing G1-05 – Vicinity Map – Phase 1:
 - A. Modify this drawing as shown on Addendum No. 1 – Vicinity Map – Phase 1, attached hereto.



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5. Drawing C1-01 - Bathymetric Survey:

A. Modify this drawing as shown on Addendum No. 1 – Bathymetric Survey, attached hereto.

6. Drawing C1-02 - Plan & Profile 7+00 – 19+00:

A. Modify this drawing as shown on Addendum No. 1 – Plan & Profile 7+00 – 19+00, attached hereto.

7. Drawing CZ1-01 - Details I:

A. Modify this drawing as shown on Addendum No. 1 – Details I, attached hereto.

8. Drawing G2-03 – Overall Plan & Profile:

A. Modify this drawing as shown on Addendum No. 1 – Overall Plan & Profile, attached hereto.

9. Drawing G2-04, Vicinity Map – Phase 2:

A. Modify this drawing as shown on Addendum No. 1 – Vicinity Map – Phase 2, attached hereto.

10. Drawing C2-01 – South Bank Tie-In & Proposed Yard Piping:

A. Modify this drawing as shown on Addendum No. 1 - South Bank Tie-In & Proposed Yard Piping, attached hereto.

11. Drawing C2-02 – Plan & Profile 24 Inch Force Main & 0+00 – 7+00:

A. Modify this drawing as shown on Addendum No. 1 - Plan & Profile 24 Inch Force Main & 0+00 – 7+00, attached hereto.

12. Drawing C2-04 – Tie-In Connection at STA 24+69:

A. Modify this drawing as shown on Addendum No. 1 – Tie-In Connection at STA 24+69, attached hereto.

13. Drawing CZ2-01 – Details I:

A. Modify this drawing as shown on Addendum No. 1 – Details I, attached hereto.

14. Drawing CZ2-03 – Details III:

A. Modify this drawing as shown on Addendum No. 1 – Details III, attached hereto.

END ADDENDUM NO. 01

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PINE BLUFF WASTEWATER UTILITY
PINE BLUFF, ARKANSAS

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B	Record Drawings
C	City of Pine Bluff – Construction Permit Application
D	Letter of Permission from USACE Vicksburg District (Phase 2 – Levee Crossing)

ATTACHMENTS

1	Geotechnical Report (Provided for reference under separate cover)
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Bidder's Checklist of Required Items

**PINE BLUFF WASTEWATER UTILITY
KANSAS STREET PARALLEL FORCE MAIN
PHASE 1 AND 2**

This Bidder's Checklist is provided to ensure all required forms are completed, signed and returned as a part of the bid submission. All forms must be included as indicated for a bid to be considered a complete and responsive bid. Appropriate signatures and date are required on each document. If an item is missing, the bid may be declared unresponsive and therefore rejected.

This sheet will serve as the cover sheet for the bid submission.

	Required	Submitted
Acknowledgement of All Addenda	X	
Bid Form SIGNED (with Unit Price Schedule)	X	
Bid Bond	X	
Copy of current Contractors License	X	
List of Proposed Subcontractors	X	
Qualifications Statement	X	
Statement of Compliance	X	

BID FORM

**PINE BLUFF WASTEWATER UTILITY
PINE BLUFF, ARKANSAS**

**Kansas Street Parallel Force Main
PHASE 1 AND 2
Kansas Street Pump Station to North bank of Lake Langhofer**

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ARTICLE 1 – BID RECIPIENT

1.01 This Bid is submitted to:

**Pine Bluff Wastewater Utility
1520 South Ohio Street
Pine Bluff, Arkansas 71601-6055**

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 – BIDDER’S ACKNOWLEDGEMENTS

2.01 Bidder accepts all the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 90 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

ARTICLE 3 – BIDDER’S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

- A. Bidder has examined and carefully studied the Bidding Documents, and any data and reference items identified in the Bidding Documents, and hereby acknowledges receipt of the following Addenda:

Addendum No.

Addendum, Date

_____	_____
_____	_____
_____	_____
_____	_____

- B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
- C. Bidder is familiar with and has satisfied itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work.
- D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary

Conditions, especially with respect to Technical Data in such reports and drawings.

- E. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and any Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs.
- F. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.
- G. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
- H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and confirms that the written resolution thereof by Engineer is acceptable to Bidder.
- I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work.
- J. The submission of this Bid constitutes an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, and that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 4 – BIDDER'S CERTIFICATION

4.01 Bidder certifies that:

- A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and

- D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:
1. “corrupt practice” means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process;
 2. “fraudulent practice” means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
 3. “collusive practice” means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and
“coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

ARTICLE 5 – BASIS OF BID

- 5.01 Bidder will refer to Section 010250 Measurement and Payments prior to preparing the bid schedule.
- 5.02 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

BID SCHEDULE – BASE BID – PHASE 1 & 2 42" DUCTILE IRON & PVC PIPE Kansas Street Parallel Force Main: Phase 1 - Lake Langhofer Subaqueous Crossing & Phase 2 – Levee Crossing, Kansas Street Pump Station Yard Piping and Tie-ins with existing Force Main City of Pine Bluff, Arkansas					
Item No.	Description	Units	QTY	Unit Price	Item Total
1-1	42" Ductile Iron Pipe, Epoxy Lined, Class 150, Raw Sewage Force Main, Restrained, Lake Langhofer Subaqueous Crossing	LF	630	\$	\$
1-2	42" Ductile Iron Pipe, Epoxy Lined, Class 350 Ball Joint, Sewage Force Main, Restrained, Lake Langhofer Subaqueous Crossing	LF	235	\$	\$
1-3	42" Ductile Iron Pipe, Epoxy Lined, Class 150, Raw Sewage Force Main, Restrained, Non-Roadway	LF	235	\$	\$
1-4	42" MJ DI 45° Bend, Restrained	EA	2	\$	\$
1-5	42" MJ DI 22.5° Bend, Restrained	EA	6	\$	\$
1-6	42" MJ DI 11.25° Bend, Restrained	EA	6	\$	\$
1-7	42" MJ Plug, Restrained	EA	2	\$	\$
1-8	Bathymetric Surveying	LS	1	\$	\$

1-9	Articulating Concrete Mats and Accessories	EA	147	\$	\$
1-10	Muck Removal (20 FT Wide x 3 FT Deep) for entire length of lake crossing.	CY	1,860	\$	\$
1-11	Bank Stabilization Mats, Silt Fencing, Etc.	Lump Sum	1	\$	\$
1-12	Shoreline Restoration	Lump Sum	1	\$	\$
1-13	Pipeline Crossing Sign Removal	Each	2	\$	\$
1-14	Pipeline Crossing Sign Installation	Each	4	\$	\$
1-15	Gravel Surface Repair	CY	12	\$	\$
1-16	Bonds and Insurance	LUMP SUM		\$	\$
1-17	Mobilization & Demobilization	LUMP SUM		\$	\$
1-18	Clearing & Grubbing	LUMP SUM		\$	\$
1-19	Route Clearing	LUMP SUM		\$	\$
1-20	Seeding, Mulching, Final Cleanup	LUMP SUM		\$	\$
1-21	Storm Water Permit & S.W.P.P.P.	LUMP SUM		\$	\$
1-22	Maintenance of Traffic	LUMP SUM		\$	\$
1-23	Excavation and Trench Safety System	LUMP SUM		\$	\$
1-24	Miscellaneous & Incidental Work	LUMP SUM		\$	\$
SUB-TOTAL BASE BID FOR ITEMS 1-1 THRU 1-24 (ALL PHASE 1 WORK) (TO BE USED FOR THE DEDUCTIVE ALTERNATE CALCULATIONS)					\$

2-1	42" PVC Pipe, DR21, Class 200, Raw Sewage Force Main, Restrained, Non-Roadway	LF	1,450	\$	\$
2-2	42" MJ 45° WYE, Restrained	EA	1	\$	\$
2-3	42" MJ TEE, Restrained	EA	3	\$	\$
2-4	42" MJ SLEEVE, Restrained	EA	4	\$	\$
2-5	42" x 36" MJ TEE, Restrained	EA	2	\$	\$
2-6	42" Plug Valve, buried, manual operator.	EA	4	\$	\$
2-7	42" MJ 45° BEND, Restrained	EA	3	\$	\$
2-8	42" MJ 22.5° BEND, Restrained	EA	7	\$	\$
2-9	42" MJ 11.25° BEND, Restrained	EA	2	\$	\$
2-10	42" x 24" MJ Reducer, Restrained	EA	1	\$	\$
2-11	54" HDPE Encasement (Gas Line X-ing's)	LF	50	\$	\$
2-12	36" PVC Pipe, DR21, Class 200, Raw Sewage Force Main, Restrained, Non-Roadway	LF	50	\$	\$
2-13	36" MJ 45° BEND, Restrained	EA	4	\$	\$
2-14	36" Plug Valve, buried, manual operator	EA	1	\$	\$
2-15	24" PVC Pipe, DR21, CL200, Non-Restrained, Non-Roadway	LF	450	\$	\$
2-16	24" MJ 45° Wye, Restrained	EA	1	\$	\$
2-17	24" MJ Plug Valve, buried, manual operator	EA	3	\$	\$
2-18	24" MJ Sleeve, Restrained	EA	4	\$	\$
2-19	24" MJ 45° Bend, Restrained	EA	3	\$	\$

2-20	24" MJ 22.5° Bend, Restrained	EA	1	\$	\$
2-21	Levee Crossing per USACE Typical Utility Crossing Detail	Lump Sum	1	\$	\$
2-22	8" Air/Vacuum Release Valves	Each	2	\$	\$
2-23	Install (2) 42" Line Stops and 30" bypass line above grade for bypassing FM during Tie-In @ STA 25+00.	Lump Sum	1	\$	\$
2-24	16" Emergency Bypass Pump Connection	Lump Sum	1	\$	\$
2-25	Connect to Existing 42" DIP Force Main @ STA 0+00.	Lump Sum	1	\$	\$
2-26	Bypass Pumping During Tie-In @ Station 0+00	Lump Sum	1	\$	\$
2-27	24" Tie-In @ STA 0+00 (24" PVC)	EA	1	\$	\$
2-28	24" FL Check valve, concrete vault, and incidentals	Lump Sum	1	\$	\$
2-29	Fence Removal and Replacement	Lump Sum	1	\$	\$
2-30	Asphalt Street Repair	LF	36	\$	\$
2-31	Gravel Surface Replacement (Class 7)	CY	81	\$	\$
2-32	Seeding, Mulching, Final Cleanup	Lump Sum	1	\$	\$
2-33	Route Clearing	Lump Sum	1	\$	\$
2-34	SWPPP Erosion Control	Lump Sum	1	\$	\$
2-35	Trench Excavation and Safety Systems	Lump Sum	1	\$	\$

2-36	Misc. and Incidental Work	Lump Sum	1	\$	\$
SUB-TOTAL BASE BID FOR ITEMS 2-1 THRU 2-36 (ALL PHASE 2 WORK) (TO BE USED FOR THE DEDUCTIVE ALTERNATE CALCULATIONS)					\$
<i>TOTAL BASE BID PRICE – PHASE 1 & 2</i> _____ _____ Dollars					\$

DEDUCTIVE ALTERNATE # 1 – SUBAQUEOUS CROSSING ONLY	
The purpose of this deductive alternate bid is to provide a price reduction to the Owner to install <u>42-inch ductile iron pipe</u> and appurtenances at the Lake Langhofer (Phase 1) only. The Levee crossing, pump station yard piping, and tie-ins to existing 42-inch force main (all Phase 2 work) are hereby removed as shown on the Drawings and priced in the Base Bid (Bid Items #2-1 to 2-36). Bidder should translate total base bid price and phase 2 subtotal price from the Base Bid to fill in 'Line A and B' below. The total for this deductive alternate is Line A minus Line B.	
<u>A</u> - TOTAL BASE BID PRICE - PHASE 1 & 2 (Total Base Bid Price taken from above)	\$
<u>B</u> - TOTAL DEDUCTION FOR ALTERNATE #1 – REMOVE PHASE 2 WORK (Sub-Total of Bid Items 2-1 Thru 2-36 taken from above)	\$
<u>BASE BID LESS DEDUCTIVE ALTERNATE #1:</u> <i>Line A (Base Bid Pricing) – Line B (Alternate Bid Pricing)</i> _____ _____ Dollars	\$

DEDUCTIVE ALTERNATE # 2 – 36" DUCTILE IRON PIPE @ LAKE CROSSING

The purpose of this deductive alternate bid is to provide a price reduction to the Owner to install 36-inch epoxy lined ductile iron pipe and appurtenances at the lake crossing in lieu of 42-inch force main and appurtenances as shown on the Drawings and priced in the Base Bid. Bidder should provide the unit pricing below and total in "Line B".

Bidder should calculate subtotal from Base Bid unit prices (Subtotal of Bid Items #1-1 to 1-7) to 'Line A' below. The total deduction for this alternate is Line A minus Line B.

The total bid price for deductive alternate #2 is calculated as follows:

= Total Base Bid Price – (Total deduction for Alt #1 + Total deduction for Alt #2)

Item No.	Description	Units	QTY	Unit Price	Item Total
1	36" Ductile Iron Pipe, Epoxy Lined, Class 150, Raw Sewage Force Main, Restrained, Lake Langhofer Subaqueous Crossing	LF	630	\$	\$
2	36" Ductile Iron Ball Joint Pipe, Epoxy Lined, Class 350, Raw Sewage Force Main, Restrained, Lake Langhofer Subaqueous Crossing	LF	235	\$	\$
3	36" Ductile Iron Pipe, Epoxy Lined, Class 150, Raw Sewage Force Main, Restrained, Non-Roadway	LF	235	\$	\$
4	36" MJ DI 45° Bend, Restrained	EA	2	\$	\$
5	36" MJ DI 22.5° Bend, Restrained	EA	6	\$	\$
6	36" MJ DI 11.25° Bend, Restrained	EA	6	\$	\$
7	36" MJ Plug, Restrained	EA	2	\$	\$
<u>B</u> - TOTAL BID FOR THESE ITEMS FOR ALTERNATE BID #2 (36" PIPE & FITTINGS)					\$
<u>A</u> - SUB-TOTAL BASE BID FOR ITEMS 1-1 THRU 1-7 (42" PIPE AND FITTINGS) (To be calculated by Bidder From Base Bid unit pricing)					\$

<i>TOTAL DEDUCTION FOR ALTERNATE #2</i> <i>Line A (Base Bid Pricing) – Line B (Alternate Bid Pricing)</i> _____ _____ Dollars	\$
<u>TOTAL BASE BID PRICE LESS DEDUCTIVE</u> <u>ALTERNATES #1 + #2:</u> _____ _____ Dollars	\$

The Owner reserves the right to select the alternate bid it so chooses.

5.03 The pipe supplier for **PVC pipe** that was used as the basis for this bid is

_____.

The pipe supplier for **Ductile Iron pipe** that was used as the basis for this bid is

_____.

The valve supplier for **Valves** that was used as the basis for this bid is

_____.

Changes in supplier can only be made with Owner approval.

ARTICLE 6 – TIME OF COMPLETION

6.01 Bidder agrees that the Work will be substantially complete within **300 consecutive calendar days** after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions and–will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within **330 consecutive calendar days** after the date when the Contract Times commence to run.

6.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 7 – ATTACHMENTS TO THIS BID

7.01 The following documents are submitted with and made a condition of this Bid:

- A. Bid Bond;
- B. Copy of current Contractor's License;
- C. List of Proposed Subcontractors;
- D. Qualifications Statement;
- E. Statement of Compliance.

ARTICLE 8 – DEFINED TERMS

8.01 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 9 – BID SUBMITTAL

BIDDER: *[Indicate correct name of bidding entity]*

By: _____

[Signature] _____

[Printed name] _____

(If Bidder is a corporation, a limited liability company, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest: *[Signature]* _____

[Printed name] _____

Title: _____

Submittal Date: _____

Address for giving notices: _____

Telephone Number: _____

Contact Name and e-mail address: _____

Bidder's License No.: _____

STATEMENT OF COMPLIANCE

Bidder shall read all attachments and instructions carefully. Failure to completely become familiar with all attachments and notes will not be deemed just cause for claims or errors.

Any EXCEPTIONS to specifications, individual data sheets, drawings, terms and conditions or any other documents forming part of this Invitation to Bid must be clearly defined and set forth in Bidder's response on this form. To be considered for an award, the Bidder must certify to either A or B below and explain exceptions, if any, on this form (and attachments, if needed).

☐ A. "This bid is in exact accordance with the specifications, drawings, terms and conditions and other requirements of this Invitation to Bid with NO EXCEPTIONS."

*** OR ***

☐ B. "This bid is in exact accordance with the specifications, drawings terms and conditions and other requirements of this Invitation to Bid with the EXCEPTIONS listed below:" (List the number of or restate the specification excepted and in detail explain the exception. Add additional pages if necessary.)

Specification Number	DESCRIPTION (MARK EITHER "A" OR "B" ABOVE. IF "B" SHOW HERE AND/OR ATTACH A SHEET DETAILING EXCEPTIONS)

Bidder's Signature

Bidder's Trade Name (Company, Individual, etc.)

Date Signed

SECTION 010250

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. This Section stipulates the method of measurement and payment for items of Work for which Unit Prices and Lump Sum Prices are stated in the Bid Form.

1.2 SCOPE OF PAYMENT

- A. Units of measurement of items of Work for which Unit and/or Lump Sum Prices are stated will be as herein subsequently defined.
- B. The estimated quantities for items of Work for which Unit Prices are given in the Bid Form are subject to variation, and payment shall be based upon the final measurement of the items of work actually installed and approved by the Owner for payment.

1.3 MEASUREMENT AND PAYMENT PROCEDURES

A. POLYVYNL CHLORIDE (PVC) SEWER FORCE MAIN

- 1. Unit of Measure: Linear feet.
- 2. Measurement determined by actual field measurement along the centerline of the pipe.
- 3. This item shall compensate the Contractor for installation of polyvinyl chloride pipe sewer force main including the cost of the pipe, trenching, backfilling, tracer wire, locate tape, utility markers, pressure testing, and compaction effort associated with installing the pipe.
 - a. Pipe shall be measured and paid for at the stated lump sum amount. The stated lump sum amount shall be inclusive of pipe, delivery, labor, tools, equipment, materials, gravel bedding material, marker tape, trenching, backfill, clearing, flow control, disposal of waste materials, installation of pipe, and all other work incidental thereto except for that work for which separate Unit or Lump Sum Prices are stated in the Bid Form. All trench excavation shall be "unclassified"; and no separate or special payment will be made for removal of unsuitable materials from project site. This lump sum amount shall be paid based upon the percentage of work that is installed and completed as approved by the Engineer.
 - b. Acceptance Testing – Pressure and leakage testing, all labor, tools, equipment, materials, sewer preparation, plugs and all other work incidental and necessary to perform all required testing in accordance with the contract documents are inclusive of this item.
 - c. The cost for thrust blocking at fittings and anchor collars shall be included in this item.
 - d. The cost for caps, Megalugs, and temporary pipe, restraints, kickers required for installation and testing are included in this item.
- 4. The cost for ductile iron fittings and installation is not included in this item.

B. EPOXY LINED DUCTILE IRON PIPE (DIP) SEWER FORCE MAIN

- 1. Unit of Measure: Linear feet.
- 2. Measurement determined by actual field measurement along the centerline of the pipe.

3. This item shall compensate the Contractor for installation of epoxy lined ductile iron pipe sewer force main including the cost of the pipe, trenching, crushed stone for constructing subbase and pipe bedding at lake crossing, backfilling, polyethylene encasement, utility markers, pressure testing, and compaction effort associated with installing the pipe.
 - a. Pipe shall be measured and paid for at the stated lump sum amount. The stated lump sum amount shall be inclusive of pipe, delivery, labor, tools, equipment, materials, gravel bedding material, marker tape, trenching, backfill, clearing, flow control, disposal of waste materials, installation of pipe, and all other work incidental thereto except for that work for which separate Unit or Lump Sum Prices are stated in the Bid Form. All trench excavation shall be "unclassified"; and no separate or special payment will be made for removal of unsuitable materials from project site. This lump sum amount shall be paid based upon the percentage of work that is installed and completed as approved by the Engineer.
 - b. Acceptance Testing – Pressure and leakage testing, all labor, tools, equipment, materials, sewer preparation, plugs and all other work incidental and necessary to perform all required testing in accordance with the contract documents are inclusive of this item.
 - c. The cost for thrust blocking at fittings and anchor collars shall be included in this item.
 - d. The cost for caps, Megalugs, and temporary pipe, restraints, kickers required for installation and testing are included in this item.
4. The cost for epoxy lined ductile iron fittings and installation is not included in this item.

C. EPOXY LINED DI FITTINGS

1. Unit of Measure: Each.
2. Measure: Installed quantity.
3. This item shall compensate the Contractor for installation of epoxy lined fittings including bends, **sleeves**, reducers, megalugs, gaskets, and transition gaskets where applicable.

D. HDPE ENCASEMENT PIPE

1. Unit of Measure: Linear feet.
2. Measurement determined by actual field measurement along the centerline of the pipe.
3. This item shall compensate the Contractor for installation of encasement pipe to house the force main carrier pipe including the cost of the pipe, trenching, backfilling, and compaction effort associated with installing the pipe and carrier pipe.
4. The cost for casing spacers and encasement end seals shall be included in this item.

E. PLUG / GATE VALVE

1. Unit of Measure: Each.
2. Measure: Installed quantity.
3. This item shall compensate the Contractor for installation of gate valves including the gate valve, cast iron valve box, and concrete collar.

F. LEVEE CROSSING

1. Unit of Measure: Lump Sum.
2. Measurement: Percentage of construction complete.
3. This item shall compensate the Contractor for installation of 42" force main up and over the levee and repairing levee access road in accordance with USACE standard levee crossing detail as shown on the drawings. Compacted fill, re-grading road subbase, compaction, testing, and class 7 gravel for levee access road are included in this item.

G. 42" LINESTOPS (TAPPING SLEEVE, VALVE, AND PIPING)

1. Unit of Measure: Lump Sum.
2. Measure: Percentage of Work Complete.
3. This item shall compensate the Contractor for installation of tapping sleeves and valves including tapping sleeves, concrete thrust blocking, tapping valve, temporary bypass piping, excavation, **connections required to connect line stop discharges to bypass piping**, and pipe tapping procedure.

H. 16" EMERGENCY PUMP CONNECTION

1. Unit of Measure: Lump Sum.
2. Measurement: Percentage Complete.
3. This item shall compensate the Contractor for installation of 16" emergency pump connection including 16" MJ tee, **16" MJ sleeves**, 16-inch gate valve, cast iron valve box, concrete collar, concrete pad, piping, fittings, thrust blocking, quick connects, dust caps, pipe bollards, concrete blocks, and gravel.

I. BYPASS PIPING AND CONNECTIONS DURING 42" TIE-IN (@ STA 0+00)

1. Bypass Piping and connections - Bypass shall be paid for at the stated lump sum amount for the job requirement as stated in the Bid Form. The lump sum amount shall include all labor, equipment, tools, hoses, fittings, plugs, and all other work incidental thereto. Excavation, backfilling, installation of temporary above ground bypass piping temporary fittings, and transition gaskets required to for 16" connection to 24" reducer and 16" connection to tee or emergency pump connection as shown on the drawings are included in this item. This lump sum amount shall be paid after all bypass pumping is completed.

J. CONCRETE VALVE VAULT (W/ 24" CHECK VALVE)

1. Construction of the reinforced concrete valve vault shall be paid for at the stated lump sum amount for the job requirement as stated in the Bid Form.
2. The lump sum amount shall include all excavation, clearing, grubbing, concrete, reinforcement, gravel, stone, access hatches, grout, painting, valves, grating, sump pump, **sump pump piping, 24" flanged x plain end ductile iron piping**, bracing and shoring, labor, equipment, tools, disposal of waste materials, startup, testing, and materials necessary to construct the vault in accordance with the Contract Documents.
3. This lump sum amount shall be paid based upon the percentage of work that is installed and completed as approved by the Engineer.

K. BATHYMETRIC SURVEY

1. Bathymetric Surveys performed by licensed professional engineer competent and experienced in performing bathymetric surveys. Surveys shall be paid for at the

- stated lump sum amount for the job requirement as stated in the Bid Form.
2. The lump sum amount shall include all labor, equipment, tools, cost of materials and establishing all required survey control, and compliance with survey notes as listed on drawings, and all other work incidental and necessary to perform surveys in accordance with the contract documents.
 3. The lump sum amount shall be paid based upon the percentage of construction that is completed.
 4. QA/QC by contractor is included in this item for confirming existing conditions and conformity of design during construction.

L. MUCK REMOVAL

1. Muck removal (spoils) will be measured on a unit basis in cubic yards (CY) and quantity in bid form was calculated using a maximum trench width of 20-feet by 3-feet deep for the entire length of the lake crossing. Muck depth is expected to vary. The actual quantity will be verified with bathymetric survey. Payment for muck excavation will be made by the cubic yard. Actual quantity to be verified by survey. Unit Contract Price shall be inclusive of dredging, equipment rental, etc., and all labor, materials, tools, equipment, and incidentals necessary to complete the work.
2. Classification: Muck removal is defined as all organic unstable material deposited on sand / silt lake bottom, that in the opinion of the Engineer, cannot be left in place while providing a suitable stable base for pipe installation.

M. ARTICULATING CONCRETE MATS AND ACCESSORIES

1. Unit of Measure: Each.
2. Measure: Installed quantity.
3. This item shall compensate the Contractor for installation of concrete mats on channel bottom and mats placed over the top of pipe including material, equipment, delivery, installation, stainless steel connectors, and installation for pipe weight and armorment.

N. BANK STABILIZATION MATS, SILT FENCING, ETC.

1. Unit of Measure: Lump Sum.
2. Measure: Percentage of construction complete.
3. This item shall compensate the Contractor for material, delivery and installation of open cell mats placed on bank over pipe at land to water transitions as shown on the drawings and specified in section 355333. Material and installation for implementing silt fencing, erosion control measures, and other best management practices (BMP's) are included in this item.

O. FENCE REMOVAL AND REPLACEMENT

1. Fence removal and replacement – shall be paid for at the stated lump sum amount for the job requirement as stated in the Bid Form and as shown on the Drawings. Remove existing site security fencing where conflicting with construction and replace. Install new fencing where required. New fencing shall match existing fencing. The lump sum amount shall include all labor, equipment, tools, concrete, fence posts, fabric, gates, and materials necessary to install new fencing in accordance with the Contract Documents to replace existing.
2. Payment for this item will be based on percentage of construction complete.
3. The contractor is responsible for maintaining site security. The cost of providing temporary fencing during construction is included in this item.

P. ASPHALT DRIVE STREET REPAIR

1. Unit of Measure: Each.
2. Measure: Installed quantity.
3. This item shall compensate the Contractor for removal and replacement of reinforced concrete and asphalt as shown on the drawings. To include reinforced concrete cap overlapping trench and asphalt surfacing in accordance with ARDOT HWY Construction standards to be utilized at Pine Bluff Sand and Gravel where force main crosses main entrance.

Q. CLASS 7 (SB2) GRAVEL SURFACE REPLACEMENT

1. Class 7 gravel base course material shall be measured and paid for by the tonnage as installed as approved by the Engineer. Quantity will be determined from invoiced quantity, with all invoices as verified and approved by the Engineer.
2. The Unit Contract Price shall include the cost of the gravel material, delivery, placement, and all other work incident thereto.

R. GRANULAR BEDDING MATERIAL

1. Granular bedding material shall be measured and paid for by the tonnage as installed as approved by the Engineer. Quantity will be determined from invoiced quantity, with all invoices as verified and approved by the Engineer.
2. The Unit Contract Price shall include the cost of the bedding material, delivery, placement, and all other work incident thereto.

S. CLEARING AND GRUBBING

1. Clearing and grubbing shall be paid based upon the percentage of construction that is completed excluding materials stored.
2. The lump sum amount for clearing and grubbing will be inclusive of the cost of clearing operations, disposal, and cleanup as approved by the Engineer.

T. SEEDING, MULCHING, FINAL CLEANUP

1. This item shall compensate the Contractor for establishment of grass in all disturbed areas other than drives, final cleanup activities, and all other items required for completion of the work, but not included in other unit prices.
2. Payment shall include fertilizing, seeding, hydroseeding, mulching, watering and maintenance.
3. Payment shall be made on a percentage of completion basis as determined by the Engineer.

U. TRAFFIC CONTROL PLAN

1. Traffic control plan shall be paid for at the stated lump sum amount for the job requirement as stated in the Bid Form.
2. Progress payments will be made based upon the percentage of estimated total time that traffic control will be required.
3. Payment will constitute full compensation for all flaggers, labor, materials, equipment, and all other items necessary and incidental to completion of the work.

V. EXCAVATION AND TRENCH SAFETY SYSTEM

1. Excavation and trench safety systems shall be paid for at the stated lump sum amount for the job requirement as stated in the Bid Form.

2. The lump sum amount shall include all labor, equipment, tools, and materials necessary to comply with all safety standards in accordance with the Contract Documents.
3. This lump sum amount shall be paid based upon the percentage of pipe that is installed and completed.

W. MISCELLANEOUS AND INCIDENTAL WORK

1. The Bidder/Contractor may enter in the Proposal a separate "Lump Sum Amount" to cover the cost of incidental work that he has not included in the other Unit or Lump Sum Prices as stated in the Bid Form. This Lump Sum amount will be paid to the Contractor in the final progress payment or as determined by the Engineer.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

SECTION 083100
HORIZONTAL ACCESS DOORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Work included: Furnishing and installing factory fabricated aluminum access doors.

1.2 SUBMITTALS

- A. Procedures for Submittals refer to Section 013300 "Submittal Procedures".
- B. Product Data: Provide manufacturer's product data for all materials in this Specification.
- C. Shop Drawings: Show profiles, accessories, location, and dimensions.

1.3 PRODUCT HANDLING

- A. All materials shall be delivered in manufacturer's original packaging.
- B. Store materials in a dry, protected, well-vented area. The Contractor shall thoroughly inspect product upon receipt and report damaged material immediately to delivering carrier and note such damage on the carrier's freight bill of lading.
- C. Remove protective wrapping immediately after installation.

1.4 JOB CONDITIONS

- A. Verify that other trades with related work are complete before installing access doors.
- B. Mounting surfaces shall be straight and secure; substrates shall be of proper width.
- C. Refer to the construction documents, shop drawings, and manufacturer's installation instructions.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Halliday Products, Inc.
Orlando, FL 32810
800-298-1027
Fax: 407-298-4534
www.HallidayProducts.com
- B. Approved Equal.

2.2 ACCESS DOORS

A. Furnish and install where indicated on the Drawings floor access doors as follows:

Location	Size	Quantity
Check Valve Vault	6'-0" x 6'-0" (double)	1

1. The floor access door shall be pre-assembled from the manufacturer.

B. Performance characteristics:

1. Cover: Shall be reinforced to support a minimum live load of 300 psf with a maximum deflection of 1/150th of the span.
2. Operation of the cover shall be smooth and easy with controlled operation throughout the entire arc of opening and closing.
3. Operation of the cover shall not be affected by temperature.

C. Cover: Shall be 1/4" aluminum diamond pattern plate.

D. Frame: Shall be 1/4" extruded aluminum with strap anchors bolted to the exterior.

E. Hinges: Shall be specifically designed for horizontal installation and shall be bolted to the underside of cover.

F. Lifting mechanisms: Cam-action hinges shall pivot on torsion bars to provide, smooth, easy, and controlled cover operation throughout the entire arc of opening and to act as a check in retarding downward motion of the cover when closing.

G. A removable exterior turn/lift handle with a spring loaded ball detent shall be provided to open the cover.

H. Hardware:

1. Hinges: Heavy duty cast steel cam-action hinges which pivot on torsion bars shall be provided.
2. Cover shall be equipped with a hold open arm which automatically locks the cover in the open position.
3. Cover shall be fitted with the required number and size of torsion bars.
4. A Type 316 stainless steel snap lock with fixed handle shall be mounted on the underside of the cover.
5. Hardware: Shall be Type 316 stainless steel hardware.
6. Temper proof attaching hardware.
7. Locking system to be non-corrosive locking bar to be used with owner-provided padlock
8. Access hatch on valve vault shall be provided with fall protection grating.

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

PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify that the access door installation will not disrupt other trades.
- B. Verify that the substrate is dry, clean, and free of foreign matter.
- C. Report and correct defects prior to any installation.
- D. The Contractor shall check as-built conditions and verify the manufacturer's access door details for accuracy to fit the application prior to fabrication.

3.2 INSTALLATION

- A. The Contractor shall comply with the access door manufacturer's installation instructions.
- B. The Contractor shall furnish mechanical fasteners consistent with the access door manufacturer's instructions.
- C. Install horizontal access doors level with floor.

END OF SECTION

SECTION 333400

SEWAGE FORCE MAIN PIPE AND FITTINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall furnish and install pipe and all appurtenances, complete in place, all in accordance with the requirements of the Drawings and Specifications. Where standards, specifications or methods are cited without dates, the reference shall be construed to apply to the latest revision in effect at the time of contract.
- B. All ductile iron pipes and fittings shall be epoxy lined.
- C. Reference Section 355333 of these Specifications for additional requirements related to subaqueous crossing.

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM A126 - Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
 - 2. ASTM A240 - Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
 - 3. ASTM A536 - Ductile Iron Castings.
 - 4. ASTM C94 - Ready-Mix Concrete.
 - 5. ASTM C150 - Portland Cement.
 - 6. ASTM C923 - Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals.
 - 7. ASTM D1784 - Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds.
 - 8. ASTM D2241 - Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series).
 - 9. ASTM D3139 - Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.
 - 10. ASTM F477 - Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
- B. American Water Works Association (AWWA):
 - 1. AWWA C104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings.
 - 2. AWWA C110 - Ductile-Iron and Gray-Iron Fittings.
 - 3. AWWA C150 - Thickness Design of Ductile-Iron Pipe.
 - 4. AWWA C153 - Ductile-Iron Compact Fittings.
- C. American Welding Society (AWS).

1.3 SUBMITTALS

- A. Submit in accordance with Section 013300 "Submittals Procedures".

1.4 QUALITY ASSURANCE

- A. Pipe and fittings furnished and installed shall be inspected and tested by the manufacturer. The manufacturer shall furnish to the Engineer, prior to delivery, certificates stating that all pipe and fittings is manufactured in accordance with these Specifications. The certificate shall fully describe the pipe proposed to be furnished.

- B. If evidence appears that all provisions of the applicable AWWA and ASTM Standards have not been complied with after the pipe has been delivered, the Owner will require field testing and sampling as necessary for certified statements of compliance to the provisions of said standards to be furnished by an approved independent laboratory. The cost for the testing and sampling or job delay shall be the responsibility of the Contractor. The independent laboratory shall be one which may be chosen by the pipe manufacturer and approved by the Owner.
- C. All materials are subject to inspection and approval at the manufacturing plant at the discretion of the Owner.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All pipe of the same material shall be of the same specification and furnished by the same manufacturer.
- B. All pipe and other materials shall be new.

2.2 PVC PIPE (DR21)

- A. PVC Pipe shall conform to the requirements of AWWA C905 for 200 psi working pressure (DR21). The outside diameter shall be equivalent to cast iron pipe.
- B. Pipe shall be made from quality PVC resin compounded to provide physical and mechanical properties that equal or exceed cell class 12454 as defined in ASTM D1784.
- C. Pipe shall be permanently marked at 5-foot intervals with the following information:
 - 1. Nominal size.
 - 2. Material code designation.
 - 3. Manufacturer's name or trademark and production record code.
 - 4. ASTM or AWWA certification.
 - 5. DR designation.
- D. Pipe shall have push-on rubber gasketed joints designed in accordance with ASTM D3139 and rubber gaskets complying with ASTM F477.
- E. Pipe shall be GREEN in color for sewer.

2.3 DUCTILE IRON PIPE

- A. Ductile iron pipe shall conform to the requirements of AWWA C150 and AWWA C151 and shall be made in the USA.
- B. Pipe shall have a minimum pressure rating as indicated below, or higher ratings as indicated on the drawings.

<u>Pipe Sizes (inch)</u>	<u>Pressure Class (psi)</u>
4-12	350
14-20	250
24	200
30-64	150

- C. Pipe shall be furnished as follows unless otherwise noted on the Drawings.
1. Buried Pipe: Push-on joint and integral bell complying with AWWA C111.
 2. Exposed Pipe: Flanged joint complying with AWWA C110 and AWWA C115, 125 lb. standard. Bolts for flanged connections shall comply with ANSI B16.1.
 3. Submerged Pipe: Pressure Class 350 Ball Joint pipe, American Flex-Lok or Approved Equal shall be used for subaqueous crossing at locations shown on drawings. Pressure Class 150 Flexible Restrained Joint Pipe, American Flex-Ring or approved equal shall be used for subaqueous crossing at locations/spacing as shown on drawings.
- D. Epoxy Lining (for DIP)
1. Ductile iron pipe shall be internally lined with **an ceramic** epoxy lining in accordance with coating manufacturers recommendations.
 2. ~~Ceramic Hollow Microspheres at 20% by volume. No silica fume, fly ash or alumina dust. 100% Volume solids material, no coal tar content allowed.~~
 3. ~~Epoxy liner must show results of ASTM G 210-13 Severe Wastewater Analysis-Testing.~~
 4. ~~Uniformly rotary abrasive blast the entire interior surface using angular abrasive to an NAF 500-03-04: "Internal Pipe Surface Condition, with full removal of annealing oxide layer", when viewed without magnification. The surface shall contain a minimum angular anchor profile of 3.0 mils~~
 5. All repairs of handling or other damage shall be made in accordance with the recommendations of the Manufacturer and shall be reasonably smooth and may not project into the waterway.
 6. Epoxy coating used for lining pipe shall be Tnemec Perma-Shield PL Series 431 or Protecto 401 (P401).
- E. Gaskets shall be red sheet rubber or cloth inserted rubber gaskets of the ring gasket style unless designated to be otherwise.
- F. Ductile iron pipe shall be furnished as follows unless otherwise noted on the Drawings:
1. Buried Pipe shall be furnished with standard bitumastic coating per AWWA standard.
 2. Exposed pipe shall be coated with Tnemec 140-1211 primer or equal coating.
- G. All buried Ductile iron pipe shall be wrapped in polyethylene material.

2.4 DUCTILE IRON FITTINGS

- A. Unless noted otherwise on the Drawings, fittings shall be ductile iron compact fittings in accordance with AWWA C153, latest revision. Glands and rubber gaskets shall be furnished with fittings.
- B. Fittings shall be internally lined with **an ceramic** epoxy coating in accordance with coating manufacturers recommendations. The epoxy lining nominal thicknesses shall be equal to 40 mils. ~~Uniformly abrasive blast the interior and exterior surfaces to a NAF 500-03-05: "Fitting Blast Clean #1 Condition, No Staining". When viewed without magnification. The surface shall contain a minimum angular anchor profile of 3.0 mils.~~ Epoxy coating used for lining fittings shall be Tnemec Perma-Shield PL Series 431 or Protecto 401 (P401).

- C. Fitting joints shall be furnished as follows unless noted otherwise on the Drawings:
1. Buried Pipe: Mechanical Joint (MJ) complying with AWWA C153 and AWWA C111.
 2. Exposed Pipe: 125 lb. flanged joint complying with ANSI/AWWA C153 and ANSI B16.1.
- D. Coatings:
1. Buried pipe shall be furnished with standard bitumastic coating per AWWA standard.
 2. Exposed pipe shall be coated with Tnemec 140-1211 primer or approved equal and painted in accordance with specification section 099000.
- E. Where taps are shown on fittings 2-inches and larger, tapping bosses shall be provided.
- F. Fittings shall have distinctly cast on them the manufacturer's identification number, pressure rating, nominal diameter of openings, and the number of degrees or fraction of the circle on bends.
- G. All MJ fittings shall be furnished with restraining glands (Megalugs or approved equal) in accordance with these specifications.
- H. All buried fittings shall be wrapped in polyethylene material, as specified herein.

2.5 POLYETHYLENE ENCASEMENT

- A. Polyethylene encasement shall be used on all buried pipe and fittings.
- B. Polyethylene encasement shall be manufactured and installed in accordance with ANSI/AWWA C105/A21.5 and shall be a tube or in the form of flat sheet or rolls.
- C. Tape shall be provided with polyethylene encasement.
- D. Polyethylene encasement is not required for DI Pipe and Fittings installed under water.

2.6 RESTRAINING GLANDS

- A. Restraining glands designed to use radially oriented cupped screws that indent the pipe barrel with points are not allowed.
- B. Restraining glands shall be made in the USA.
- C. For PVC pipe, provide 2000 PV Series MEGALUG® restraints by EBAA Iron of Eastland, TX, or approved equal.
1. Restraint devices shall consist of multiple gripping wedges incorporated into a follower gland meeting the requirements of ANSI/AWWA C110/A21.10.
 2. Gland body, wedges and wedge actuating components shall be cast from ductile iron in accordance with ASTM A536.
 3. Ductile iron gripping wedges shall be heat treated within a range of 370 to 470BHN.
 4. Proper actuation of the gripping wedges shall be ensured with torque limiting twist off nuts.

5. All wedge assemblies and related parts shall be processed through a phosphate wash, rinse and drying operation prior to coating application. The coating shall consist of a minimum of two coats of liquid fluoropolymer coating with heat cure to follow each coat. All casting bodies shall be surfaced pretreated with a phosphate wash, rinse and sealer before drying. The coating shall be electrostatically applied and heat cured. The coating shall be a polyester based powder to provide corrosion, impact and UV resistance.
- D. For restrained flanged ductile iron fittings, provide MEGAFLANGE® restraining glands by EBAA Iron of Eastland TX, or approved equal.
 1. Flange adapters shall be made of ductile iron conforming to ASTM A536 and have flange bolt circles that are compatible with ANSI/AWWA C110/A21.10.
 2. Restraint for the flange adapter shall consist of individual actuating gripping wedges to maximize restraint capability. Torque limiting actuating screws shall be used to ensure proper initial set of gripping wedges.
 3. The flange adapter shall be capable of deflection during assembly or permit lengths of pipe to be field cut, to allow a minimum of 0.6-inch gap between the end of the pipe and the mating flange without affecting the integrity of the seal.
 4. For ductile iron pipe, the flange adapter shall have a safety factor of 2:1 minimum.

2.7 BELL RESTRAINT HARNESS

- A. Bell restraints shall be installed where shown on the Drawings.
- B. Restraint for PVC pipe at the bell shall be manufactured of ductile iron conforming to ASTM A536. A backup ring shall be used behind the PVC bell. A restraint ring, incorporating a plurality of individual actuating gripping surfaces, shall be used to grip the pipe, and a sufficient number of bolts shall be used to connect the bell ring and the gripping ring.
- C. The restraint devices shall be Series 2800 as manufactured by EBAA Iron, Inc. or approved equal.

2.8 LOCATING TAPE

- A. Sewer line locating tape shall be green in color and include the words "Sewer Line Below" in black print.
- B. Sewage force main locating tape shall be Terra Tape "Extra Stretch" or approved equal.

2.9 TRACER WIRE

- A. Tracer wire shall be provided for all non-metallic pipe and shall be designed and manufactured for direct burial service.
- B. Trace wire insulating jacket shall be GREEN in color for sewer lines.
- C. Typical THHN or nylon coated electrical wire is not allowed. Tracer wire for open trench installation shall be 12-gauge, insulated solid copper wire. The insulating jacket shall be a minimum of 30 mil polyethylene complying with ASTM D1248, 30-volt rating. Tracer wire shall be Copperhead® SuperFlex 1230 or approved equal.

- D. Tracer wire for directional bores or jacking shall be 12-gauge hard drawn, solid extra-high-strength copper-clad steel tracer wire (EHS-CCS), with an average tensile break strength of at least 1150#, and a minimum of 45 mil polyethylene jacket complying with ASTM D1248, 30-volt rating. Tracer wire shall be Copperhead® SoloShot 1245 EHS or approved equal.
- E. At Contractor's option, CCS wire can also be used for open trench installation.
- F. Contractor shall supply tracer wire system, including necessary fittings, splice caps, splice poles, splice kits, and other accessories, as required.
- G. Splices along the continuous run of tracer wire for repair of a wire break or replacement of failed segment of wire shall use 3M Brand Direct Bury Splice Kit DBR/Y-6 or approved equal. Approved alternatives must securely connect two or more wires, effectively moisture seal by means of a dielectric non-hardening silicone sealant, manufacturer approved for direct burial and rated for a minimum of 50-volts.
- H. Branch connections for laterals, turnouts, services, and appurtenances shall use Dry Conn Direct Bury Lug Aqua or approved equal. Approved alternatives must securely connect one or two wires to the main tracer wire without cutting the main tracer wire, effectively moisture seal by means of a dielectric non-hardening silicone sealant, manufacturer approved for direct bury and rated for a minimum of 50-volts.
- I. Wire shall be new and shall have the size, grade of insulation, voltage, and manufacturer's name permanently marked on outer covering at regular intervals. Insulation shall be type THHN, THWN, or XHHW and rated **600 volt**, 75 degrees C or higher for wet locations.

2.10 TEMPORARY PIPE PLUGS

- A. Non-pressure polyethylene plugs with handles sized to fit bells or spigots or sizes 6-inch to 60-inch shall be Taylor Made Plastics or approved equal.

2.11 MANHOLE GASKETS

- A. Pipe penetrations through manhole walls shall be provided with a watertight gasket suitable for the size of pipe being installed.
- B. Manhole gaskets shall be installed in accordance with the manufacturer's recommendations.
- D. Manhole gaskets shall be as specified in Section 333913 "Sanitary Sewer Manholes".

2.12 CEMENTITIOUS NON-SHRINK GROUT

- A. Cementitious non-shrink grout shall be in accordance with Section 333913 "Sanitary Sewer Manholes".

2.13 CONCRETE FOR THRUST BLOCKING

- A. Concrete shall be ready mixed concrete conforming to ASTM C94. Concrete used for thrust blocking and concrete encasement shall Class "B" concrete containing not more than 7 gallons of water per sack of cement, including the water in the aggregate, and not less than 5 sacks of cement per cubic yard of concrete.
- B. Cement: Portland Cement conforming to ASTM C150, Type 1

- C. Water used shall be clean and free from injurious amounts of oil, acids, alkalis, salt, organic matter, or other deleterious substances.
- D. Compressive Strength: 3,000 psi at 28 days.
- E. The concrete shall be delivered and placed within 45 minutes after all materials including mixing water have been placed in the mixing drum.
- F. Bagged concrete mix shall not be permitted.

2.14 TAPPING SLEEVE AND SADDLE

- A. Provide stainless steel tapping sleeve Smith Blair Model 663 or approved equal.
- B. Provide double bite tapping saddle Smith Blair Model 313 or approved equal.

2.15 FLANGE COUPLING ADAPTER

- A. Provide Smith Blair Model 920 or approved equal.

PART 3 - EXECUTION

3.1 GENERAL

- A. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for lubricants, cements, and other installation requirements.
- B. Flow control and bypass pumping shall be in accordance with specification Section 010000 "Basic Requirements".
- C. 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 live lines.

3.2 STRINGING THE PIPE

- A. The contractor shall properly and safely chock the strung pipe so that it cannot roll loose and strike either personnel, livestock, or property.
- B. Do not place anything inside pipe for the purpose of handling.

3.3 HANDLING AND LAYING PIPE AND FITTINGS

- A. Trench and backfill shall be in accordance with specification Section 312302 "Trench Excavation, Backfill, and Compacting". Pipe bedding shall be in accordance with details on the Drawings.
- B. All materials shall be transported, unloaded, stored, stacked, cut, handled, and installed in accordance with the manufacturer's recommendations and in a manner to prevent damage to the materials and material coating and lining. Do not place anything, such as forklift fork or hook, inside pipe for the purpose of handling. Pipe and fittings shall not be dragged along the ground or dropped into the trench.

- C. All material shall be carefully inspected immediately before installation and any found to be faulty or damaged shall be marked in an obvious and permanent manner and removed from the site. A faulty or damaged length of pipe may be used in the Work if the fault or damaged area is removed by cutting the pipe leaving a shortened section of sound pipe.
- D. Pipe joints shall be assembled in accordance with procedures recommended by the pipe manufacturer, using proper gaskets, lubricants, tools, and jointing techniques. All surfaces of the joint including the socket and bell of the pipe or fitting shall be cleaned before the pipe is laid and the joint started. Use clean rags for this purpose.
- E. No gasket loops or bulges shall protrude into the path of the pipe when it enters.
- F. Apply gasket lubricant supplied by the manufacturer to both the spigot end and to the gasket. Use a clean applicator brush.
- G. Each spigot shall be properly centered in the bell of the preceding pipe and that the entire length of each pipe section is solidly bedded so as to prevent displacement during subsequent backfill and settlement.
- H. Deflections from a straight line or grade, as required by horizontal or vertical curves shall not exceed limits as recommended by the pipe manufacturer. If pipe alignment requires deflection in excess of the recommended limits, standard bend fittings or a sufficient number of shorter lengths of pipe shall be installed to provide angular deflections. Deviation of any type, from true alignment, shall be approved by the Owner.
- I. Pipe inserted into valves and fittings shall be cut at an angle of 90 degrees to the pipe centerline. When pipe is cut, the plain ends shall be beveled similar to the bevel on full lengths of pipe from the manufacturer. After beveling, stop marks shall be applied to the ends. Pipe and/or pipe lining shall not be damaged when cutting or trimming.
- J. If the joint is incorrectly made, disassemble it and correct the problem. Do not attempt to pressure test a joint that is improperly put together.
- K. Contractor shall keep the interior of the pipe free from dirt, rocks, and other debris during construction.
- L. Pipe shall not be left unattended with an open end. Plug the open end with a temporary plastic plug or cap to prevent trench water, foreign matter, debris, and dirt from entering the pipe.
- M. Under no circumstances shall pipe be laid in water, and no pipe shall be laid in trenches when conditions or weather are not suitable for work. Diversion of drainage and dewatering of trenches during construction shall be the Contractor's responsibility and shall be in accordance with Section 010000 "Basic Requirements" and Section 015713 "Temporary Erosion and Sediment Control".
- N. Under no circumstances shall pipe be laid in water, and no pipe shall be laid in trenches when conditions or weather are not suitable for work. Diversion of drainage and dewatering of trenches during construction shall be the Contractor's responsibility and shall be in accordance with Section 010000 "Basic Requirements" and Section 015713 "Temporary Erosion and Sediment Control".
- O. All joints shall be watertight in accordance with ASTM standards.

3.4 JOINTING MECHANICAL JOINT FITTINGS

- A. Pipe joints shall be assembled in accordance with procedures recommended by the pipe manufacturer, using proper gaskets, lubricants, tools, and jointing techniques. All surfaces of the joint including the socket and bell of the pipe or fitting shall be cleaned before the pipe is laid and the joint started. Use clean rags for this purpose.
- B. Joints shall be made tight by advancing the nuts with a wrench, 180-degrees apart, until a tight joint is made.
- C. Buried fittings, including glands and bolts, shall be encased in polyethylene material.

3.5 INSTALLATION OF POLYETHYLENE PROTECTION MATERIAL

- A. Polyethylene material, either in tubing form or in the form of flat sheet or rolls shall be placed around all mechanical joints of pipe and fittings, all valves, sleeves and couplings, saddles, and any other appurtenances with exposed bolts.
- B. Fittings and appurtenances shall be completely encased in polyethylene material. It is not the intent that the material forms an enclosure that is absolutely air and water tight, but to prevent pipe to soil contact. Polyethylene material shall be installed so that no dirt or bedding material comes in contact with the pipe. All lumps of clay, mud, cinders, etc. on the pipe surface shall be removed before pipe is covered with polyethylene.
- C. Polyethylene material shall be applied to pipe, fittings, and appurtenances by one of the following methods:
 - 1. Method A - Cut polyethylene tubing material to a length approximately 2-feet longer than the length of pipe section. Slip the tube around the pipe centering it to provide a one-foot overlap on each adjacent pipe section and bunching it accordion fashion lengthwise until it clears the pipe ends. Lower the pipe section into the trench and make up the pipe joint with the preceding section of pipe. A shallow bell hole must be made at joints to facilitate installation of the polyethylene tube. After assembling the pipe joint, take bunched polyethylene from the preceding length of pipe, slip it over the end of the new length of pipe, and secure in place. Then slip the end of the polyethylene from the new pipe section at the end of the first wrap until it overlaps the joint at the end of the preceding length of pipe. Secure the overlap in place. Take up the slack width to make snug, but not tight, fit along the barrel of the pipe, securing the fold at quarter points with tape.
 - 2. Method B - Cut polyethylene tube to a length approximately one-foot shorter than the length of the pipe section. Slip the tube around the pipe, centering it to provide 6-inches of bare pipe at each end. Make polyethylene snug, but not tight and secure the ends. Before making up a joint, slip a 3-foot length of polyethylene tube over the end of the preceding pipe section, bunching it accordion fashion lengthwise. After completing the joint, pull the 3-foot length of polyethylene over the joint, overlapping the polyethylene previously installed on each adjacent section of pipe by at least one-foot; make snug and secure each end. Pipe shaped appurtenances such as bends, reducers, offsets and other pipe shaped appurtenances shall be covered with polyethylene in the same manner as pipe.

- D. Odd shaped appurtenances such as valves, tees, crosses and other odd shaped pieces which cannot practically be wrapped in a tube, shall be wrapped with a flat sheet or split length of polyethylene tube. The sheet shall be passed under the appurtenance and brought up around the body. Seams shall be made by bringing the edges together, folding over twice, and taping down. Slack width and overlaps at joints shall be handled as described above. Tape polyethylene securely in place at valve stem and other penetrations.
- E. Openings in tubing material for branches, service taps, blow-offs, air valves, and similar appurtenances shall be made by making an X-shaped cut in the polyethylene and temporarily folding the film back. After the appurtenance is installed, tape the slack securely to the appurtenance and repair the cut, as well as any other damaged areas in the polyethylene with tape.
- F. At junctions between wrapped and unwrapped pipe - Where polyethylene wrapped pipe joins a pipe which is not wrapped, extend the polyethylene tube to cover the unwrapped pipe a distance of at least 2 feet and secure the end.
- G. The polyethylene material shall be secured around the pipe and appurtenances by at least three circumferential wraps of tape.
- H. When installing polywrap below the water table, seal as thoroughly as possible both ends of polyethylene material with adhesive tape or plastic tie straps at the joint overlap. Also, place tape or plastic tie straps at two (2) foot intervals around the polyethylene wrapped pipe with the excess material folded over the top of the pipe.
- I. All tongs, cables or chains that are used for lifting pipe and appurtenances that have been encased in polyethylene material shall be adequately padded to prevent damage to the material.
- J. Repair any rips, punctures, or other damage to the polyethylene with tape (for small tears and holes) or with additional polyethylene material wrapped around the pipe or appurtenance and secured in place with tape (for large holes or tears). All damaged polyethylene shall be repaired before the trench is backfilled.
- K. Polyethylene material shall be stored on the project site in such a manner that it is not exposed to direct sunlight. Exposure during installation shall not exceed 48-hours.
- L. Backfill material shall be the same as specified and shown on the Drawings for pipe or appurtenances without polyethylene wrapping. Special care shall be taken to prevent damage to the polyethylene wrapping when placing backfill.

3.6 MINIMUM DEPTH OF COVER

- A. Pipe shall be installed with a minimum cover of 36-inches over the top of the pipe, unless otherwise shown on the Drawings.

3.7 SEPARATION FROM EXISTING UTILITIES

- A. Maintain 18-inches minimum vertical separation (water over sewer) between water mains and sewer mains. The vertical distance shall be measured from the bottom of the water main to the top of the sewer. Any crossing shall be arranged so that the sewer joints are equidistant and as far as possible from the water main joints.
- B. Maintain 10-feet minimum horizontal separation between water mains and sewer mains. The distance shall be measured from edge of pipe to edge of pipe.

- C. Contractor shall notify Engineer immediately if these separation requirements cannot be met, or as soon as any such crossing is found but not identified on the Drawings.

3.8 CONNECTIONS TO EXISTING MANHOLES

- A. Sewage flow through existing manholes shall be controlled by temporary plugs or bypass pumping as necessary to facilitate the new connection and grouting of the manhole invert. The existing flow of sewage shall be maintained in a manner to prevent overflow or discharge of sewage onto the ground surface and prevent damage caused by excessive surcharge in upstream sewer mains and service connections. Control of existing sewage flow shall be in accordance with this section and with Section 010000 "Basic Requirements".
- B. Connections to existing manholes shall be in accordance with Section 333913 "Sanitary Sewer Manholes".
- C. Cut opening in the wall of existing manhole of sufficient size to permit proper installation of the new pipe at the designated line and grade.
- D. The opening in the wall around the new pipe shall be filled with non-shrink grout, if specified by manhole gasket manufacturer, and properly finished inside and outside with cement mortar, so that leakage does not occur.
- E. The invert of the existing manhole shall be chipped out and re-grouted with cement mortar as necessary to provide a smooth transition between the invert of the new pipe and the other pipes entering and leaving the manhole.
- F. No connections shall be made to the existing sewer system without the presence of the Owner, Engineer, and/or their representative(s).

3.8 THRUST BLOCKS

- A. Concrete thrust blocking shall be in accordance with details on the Drawings.
- B. Install 3,000 psi concrete thrust blocks at bends, wyes, tees, tapping sleeves, and other thrust points on pressure piping.
- C. Thrust blocking shall bear against undisturbed soil. The excavation shall be hand shaped and free of loose material. Forms shall be used to confine the concrete in areas other than that part that is in contact with undisturbed soil in the direction of thrust.
- D. Size thrust blocking in the field based on actual field conditions, such as estimated allowable soil bearing, and information provided on the Drawings.
- E. Where directed by the Engineer the thrust block shall be formed in order to efficiently transfer the thrust forces to the soil and to conserve room in the trench or easement for future use.
- F. Concrete shall not be placed where it interferes with the removal of any joint accessories such as bolts, followers, threads, collars, couplings, etc.
- G. The top of the concrete thrust block shall be struck off with a wood straight edge or float.
- H. Concrete shall not be placed when the temperature is below 40 degree F and dropping or below 35 degrees F if the temperature is rising, unless approved by the Engineer.
- I. All placement of concrete shall be in the presence of the Engineer or his representative.

The Contractor is cautioned that he may be required to remove, without compensation, any concrete placed in the absence of the Engineer or his representative.

- J. Backfill over concrete thrust blocking shall not be placed before the concrete has attained initial set.
- K. Thrust blocking shall not be less than 6 inches thick between the pipe line or appurtenances and undisturbed soil in the direction of thrust.
- L. The excavation shall be free of water before concrete is placed.
- M. The pipe or appurtenance shall be cleaned before placing concrete when the concrete is to be in direct contact with the pipe or appurtenance.

3.9 LOCATING TAPE

- A. Locating tape shall be used on all pipe including ductile iron.
- B. Install 18" above the sewage force main pipe as shown on the Drawings.
- C. The locating tape shall be in addition to trace wire.

3.10 TRACER WIRE

- A. All PVC pipe shall be installed with copper trace wire.
- B. Tracer wire shall be installed on short intermittent segments of ductile iron used at locations such as creek crossings.
- C. Tracer wire shall be installed with all pipe. The wire shall be installed in such a manner as to be able to properly trace all pipelines and services without loss or deterioration of signal or without the transmitted signal migrating off the tracer wire.
- D. Tracer wire shall be installed in the same trench and inside bored holes and casing with pipe during pipe installation. It shall be secured to the pipe as required to ensure that the wire remains adjacent to the pipe. The tracer wire shall be securely bonded together at all wire joints with an approved watertight connector to provide electrical continuity, and it shall be accessible at all tracer wire access points.
- E. Except for approved spliced-in repair or replacement connections, tracer wire shall be continuous and without splices from each tracer wire access point.
- F. Provide and install tracer wire access box at every manhole, blowoff, ARV, access manhole, and valve box. Access boxes shall provide a connection point to the tracer wire. Tracer wire test stations as detailed on the drawings, shall be installed every 1,000 feet minimum and at every fiberglass post utility marker. Tracer wire test stations do not need to be installed next to gate valves, air release valves, or clean-out stations.
- G. Wire breaks shall be spliced together by joining and twisting the tracer wire together then installing a silicon filled twist on connector, as specified herein.

- H. If the spacing of valves and meters is greater than 1,000 feet, the Contractor shall install test wire station. The test wire station shall include the tracer wire which shall be looped up in a 2-inch PVC pipe to be located at a right-of-way fence line or at a cross fence line, as applicable, for protection. A PVC cap shall be placed on the 2-inch pipe when used, but it shall not be solvent welded onto the pipe.
- I. Fiberglass post utility markers shall be installed at every tracer wire test station and at every 1,000 feet.
- J. At the point of connection between ductile iron pipe, with any non-iron pipe, the tracer wire shall be properly connected to the iron pipe with a cad weld or approved equivalent. Tracer wire welds shall be completely sealed with the use of an approved mastic type sealer specifically manufactured for underground use. Mastic shall be applied in a thick coat a minimum of one-quarter-inch (1/4") thick and shall be protected from contamination by the backfill material with the use of a plastic membrane.
- K. Tracer wire shall be laid flat and securely affixed to the pipe at 10-foot intervals. The wire shall be protected from damage during the execution of the works. No breaks or cuts in the tracer wire or tracer wire insulation shall be permitted.
- L. A minimum of 6-feet of tracer wire shall be extended beyond the end of newly installed pipe, coiled and secured for future use. The end of the tracer wire shall be spliced to the wire of a six-pound zinc anode and buried at the same elevation as the pipe.
- M. Branched Connections: Connections between the main line tracer wire and branch connection tracer wire shall only be allowed at services, ARVs, and blowoffs. The branch connection tracer wire shall be a single tracer wire properly spliced to the main line tracer wire. Water tight connectors shall be used to provide electrical continuity.
- N. Directional Boring: For directional boring installations, two #12 tracer wires shall be installed with the pipe and connected to the tracer wire at both ends, or cad welded to the existing iron pipe at both ends. The tracer wires shall be laid flat and securely affixed to the top and side of the pipeline at five-foot (5') intervals to insure its placement during boring operations.
- O. Testing Requirements: The Contractor shall perform a continuity test on all tracer wire in the presence of the Engineer or the Engineers' representative. If the tracer wire is found to be not continuous after testing, the Contractor shall repair or replace the failed segment of the wire.
- P. At all locations where existing tracer wire is found the tracer wire shall be properly reconnected and spliced as outlined above.

3.11 TESTING

- A. The sewage force main shall be subjected to a pressure and leakage test after installation and completion of backfill. **Reference specification section 331400 – Hydrostatic Testing for testing requirements.**
- B. ~~Engineer and Owner shall observe and document tests.~~

- C. ~~Contractor shall fill piping with water at a controlled rate so as to avoid surging, and all air shall be expelled from the piping. If necessary to properly expel air prior to test, Contractor shall tap the sewage force main at high points with corporation stops. To accommodate the initial pipe expansion, the pipe shall be pumped up to test pressure and allowed to sit for a minimum of four hours while adding water to the pipe at hourly intervals to maintain the test pressure. Once the pipe expansion and pressure has stabilized, the testing phase may commence.~~
- D. ~~Contractor shall provide all test apparatus, plugs, taps, valves, and temporary connections used for testing.~~
- E. ~~The Contractor shall contact the Owner of the water distribution system for any water that is required and/or necessary during construction. The Contractor shall connect to the water distribution system in accordance with all requirements of the Owner of the water distribution system. The Contractor shall install a backflow prevention device and meter as required by the water distribution system owner.~~
- F. ~~The Contractor shall supply all water for the test procedure. The Contractor shall be responsible for all water costs and fees associated with testing the force main. Contractor shall not needlessly waste water.~~
- G. ~~Sewage force main shall be tested at 90 psi gauge pressure. Test pressure shall be applied for a minimum continuous period of 2 hours and shall not vary more than 5 psi for the duration of test. Pressure shall be applied to the force main by means of a pump, pipe connections, and all other necessary apparatus for applying pressure and measuring the resultant leakage from the line under test.~~
- H. ~~All interior valves shall be open during testing.~~
- I. ~~Measured leakage from the sewage force main shall not be greater than that determined by the following formula:~~

$$Q = \frac{LD\sqrt{P}}{148000}$$

Q = Allowable leakage (gallons per hour)

L = Length of pipe tested (feet)

D = Nominal diameter of pipe (inches)

P = Test pressure (psi)

~~Leakage is defined as the quantity of water that must be supplied into the test section to maintain the specified test pressure, after the air in the pipe has been expelled and the line completely filled with water.~~

- J. ~~While the pipe being tested is under pressure, check for leakage appearing at the surface of the ground or from or from any exposed appurtenances. Any leaking joints, fittings, etc. shall be repaired or replaced at the contractor's expense and the test repeated until satisfactory results are achieved.~~
- K. ~~When leaks are in excess of the above formula, the Contractor shall, at his own expense, perform whatever work and/or replace whatever material that is required in order to remedy the defect and stop the leaks. All corrective work shall be approved by the Engineer and Owner.~~

END OF SECTION

SECTION 355333

UNDERWATER PIPELINE CONSTRUCTION

PART 1 - GENERAL

1.1 SUMMARY

- A. This section contains guidelines and specifications applicable to the installation of welded steel or ductile iron pipelines using such trenchless installation methods as determined by the installing contractor. It includes minimum requirements for design, materials, and equipment used for the substantially trenchless construction of pipelines. This section also includes materials, dimensions, and other pertinent properties of pipe and required accessories. These properties provide minimum performance requirements for various components including joints.
- B. The Contractor shall install a raw sewage pipeline following the route shown on the plans across and old river channel of the Arkansas River formerly known as Lake Langhofer.
- C. Permits have been obtained for the water crossing through US Army Corps of Engineers (USACE) – Little Rock District and necessary easements obtained to provide for sufficient laydown and installation of the water crossing. The contractor shall comply with all requirements of the permits and easements and will include in the Bid all cost associated with complying with these requirements. A copy of the permit is included in Appendix D.
- D. Contractor shall comply with all requirements of the Owner of the right-of-way. If the Owner has more stringent construction requirements, those shall apply.
- E. Prior to starting construction, required labor, materials, and equipment shall be on the site.

1.2 QUALIFICATIONS

- A. This work shall be performed by a contractor who can provide evidence of qualifications to perform the work. The minimum requirements for qualification shall include the following:
 - 1. Shall have experience of construction, as a company, in subaqueous areas which required special construction techniques of a similar nature to those necessary for the crossings to be performed in this work.
 - 2. Evidence provided for Paragraph 1 shall include, but is not necessarily limited to, the Project name, location, description, Owner and Engineer. Include respective addresses, phone numbers and appropriate person to contact for verification purposes.
 - 3. The contractor shall be licensed as a contractor by the State of Arkansas.
 - 4. If required, specialty personnel, such as divers, shall have experience in this type of work and shall be certified.

1.3 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- A. American Society for Testing and Material, 100 Barr Harbor Drive, West Conshohocken, Pennsylvania 19428.
 - 1. ASTM C900 - Test Method for Pullout Strength of Hardened Concrete.
 - 2. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft³ (600 kN-m/m³)).
 - 3. ASTM D1157 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).

1.3 SUBMITTALS

- A. Prior to beginning work, the Contractor shall submit to the Engineer a work plan detailing the procedure and schedule to be used to execute the project. The work plan shall include a description of all equipment to be used, a list of personnel and their qualifications and experience (including backup personnel in the event that an individual is unavailable), list of subcontractors, a schedule of work activity, a safety plan (including MSDS of any potentially hazardous substances to be used), traffic control plan (if applicable), an environmental protection plan and contingency plans for possible problems. Work plan shall be comprehensive, realistic and based on actual working conditions for this particular project. Plan shall document the thoughtful planning required to successfully complete the project.
- B. Contractor shall submit specifications on equipment to be used and provide an estimate of pulling or pull-back thrust of the pipe soil. This is required to assure the Owner and Engineer that the equipment will be adequate to complete the project. Calibration records for guidance equipment (if applicable) shall be included.
- C. Specifications on material to be used shall be submitted to Engineer and material shall include the pipe, fittings, and any other item, which is to be an installed component of the project or used during construction. Including but not limited to optimum individual pipe length (20' Standard), pipe bell and barrel diameters and maximum deflection capabilities of the joint to be used.
- D. All submittal shall be in conformance with Specification Section 013300 - Submittals Procedures.
- E. Provide copies of all permits that the Contractor is required to obtain.

PART 2 - MATERIALS

2.1 PIPE

- A. Ductile Iron Pipe shall be provided in accordance with Section 333400 of these Specifications.
- B. Flexible restrained joints shall be as recommended by pipe manufacturer and shall be provided at locations or spacings as shown on the Drawings.

2.3 JOINTS, INTERCONNECTIONS, AND PULLING BELL ASSEMBLIES

- A. Pipe and joint seals, when properly assembled and installed, shall be capable of dependably handling the specified internal pressure, as well as vacuum, and external pressure that can occur in pipeline operation. Joints shall exhibit such performance attributes in straight alignment or at maximum rated joint deflection. Pipe pulling bell assemblies shall be designed and furnished by the pipe manufacturer. The pulling bell assembly shall have the same performance characteristics as the pipe to which it is connecting. It shall also be fabricated with filling/test ports, of appropriate size, for testing of the pipe after it is pulled. After complete installation, the pulling head may also be helpful, with or without further connection of piping, in normal higher-pressure hydrostatic testing of the installed piping.

2.4 PROOF-OF DESIGN TESTS

- A. The pipe manufacturer shall have representative proof-of design tests of flexible restrained joints as well as of the pipe pulling bell assemblies that establish the basis for the maximum allowable pulling loads.

2.5 OTHER EQUIPMENT

- A. Pipe rollers of sufficient size to fully support the weight of the pipe while being hydro tested and during pulling operations shall be used. Sufficient number of rollers shall be used to prevent excess sagging of the pipe. Rollers or a rack system further described in part 3.1.B of this section shall be used as necessary to assist pulling operations and in layout/jointing of the pipe.
- B. Other devices or utility placement systems for providing horizontal thrust other than those previously defined in the preceding sections shall not be used unless approved by the Engineer prior to commencing of the work. Consideration for approval shall be made on an individual basis for the specified location. The proposed device or system shall be evaluated prior to approval or rejection on its potential ability to complete the utility placement satisfactory without undue stoppage and to maintain line and grade within the tolerances prescribed by the particular conditions of the project.

2.6 CABLED EROSION CONTROL MATS

- A. Mats made of open cell block strung together with corrosion resistant cabling shall be provided as cover over the pipe at the land to water transitions as shown on the drawings. Cable shall be comprised of polyester or other corrosion resistant material. Open cell blocks shall be made of concrete or engineer approved equal.

2.7 ARTICULATING CONCRETE MAT SYSTEM

- A. General – All closed cell concrete mats shall be manufactured as 160 single elements cast onto a 5/8" diameter three-strand fiber rope with nominal mat dimensions of eight (8) feet by twenty (20) feet. Each element shall have a minimum thickness of 4.5". Open areas of the mat shall not exceed 10%.
- B. Individual elements will be twelve inches square when measured through the center of the horizontal plane of the mat. The elements will have tapered edges on top and bottom to allow articulation of the mat in every direction. The concrete shall be cast onto the three-strand fiber rope in such a way that removal of any individual mat element will not cause sliding of another mat element on the rope. Individual elements can be removed from the mat so that the mat may be placed over stumps, piles, or other structures without destabilizing the remainder of the mat.
- C. Closed cell elements will have the following nominal characteristics.

Physical Requirements:

1. Nominal Thickness – 4.5-inches
 2. Compressive Strength: 4,000 psi
 3. Concrete Density: 142-147 lbs/ft³
 4. Gross Area Element: 0.95 ft²
 5. Element Weight: 37-38 lbs
 6. Open Area: <10%
- D. Fiber Rope - 5/8" x Three Strand Fiber Rope – Fiber rope shall connect each element to all adjacent elements. The rope on the mat perimeter elements shall form lifting loops on all four sides of the mat. The rope shall be an ultra-violet stabilized copolymer extruded

three-strand fiber rope. Minimum tensile strength shall be 9,500 pounds. The rope shall have a good to excellent resistance to concentrated acids alkalis, and solvents. The rope shall be impervious to rot, mildew, and degradation due to marine organisms. The rope material shall be affected by continuous immersion in water.

- E. Connections (Mat to Mat) – Connectors shall be provided to connect adjacent mats. All connectors that are metallic shall be made of 316-grade stainless steel. Connections from mat to mat shall be by stainless steel cable or stainless-steel banding. Connectors shall be provided by the mat manufacturer.
- F. Wear Pads – Mats coming into contact with pipe shall be provided with wear pads made of PVC to protect the exterior coating of the pipe.
- G. Closed cell concrete mats shall be Submar Revetment Mattress as manufactured by Submar, Inc., Houma, Louisiana 985-868-0001, or approved equal.

PART 3 – EXECUTION

3.1 GENERAL

- A. The Engineer must be notified 72 hours in advance of starting work. The installation of the pipeline shall not begin until the Engineer is present at the job site and agrees that proper preparations for the operation have been made. The Engineer's approval for beginning the installation shall in no way relieve the Contractor of the ultimate responsibility for the satisfactory completion of the work as authorized under the Contract.

3.2 METHODOLOGY

- A. The contractor is solely responsible for determining and implementing the means, methods, equipment, techniques, and sequences of construction to complete the crossing within the permit stipulations.
- B. Should the Contractor elect to install the pipeline which would require inducement of an axial tension force on the pipe, which could be produced by pulling the pipe, this force shall be limited to 140,000 pounds for 42-inch pipe. Should the Contractor elect to assemble the pipe joints on land and pull the pipe into position via floatation, the pipe shall be assembled on a rail or skid type system that would reduce the frictional force induced. The beam load on the pipe shall be minimized by limiting the length of pipe, which is not uniformly supported on the pipe barge or floatation system, to 80 feet or the distance between the joints, whichever is less.
- C. The Contractor may construct the crossings utilizing sectional barges to support the equipment and materials, or may utilize specialty equipment which provides self-contained buoyancy.

3.3 ACCESS

- A. The Contractor shall determine what access to the project site is required and shall obtain such access if not already available through the acquired easements.

3.4 RESTRICTIONS

- A. Comply with the terms and conditions of the permits issued by the agencies which have jurisdiction over the project area.
- B. The Contractor shall provide silt fences and turbidity curtains as shown on the drawings and where required to prevent erosion and subsequent sedimentation of the excavation into the adjacent waters. Contractor does not have to remove excavated soil from the water.
- C. Temporary access roads where required to facilitate construction shall be constructed and removed by the Contractor.
- D. Contractor shall ensure the pipeline is continuously supported on the lake floor and no high points or rock penetrations will cause premature wear on the exterior wall of the pipe. Excavation of the lake bottom via trenching should be expected where required to properly prepare the trench bed for pipe installation. Pipe bedding material placed to 1/3 depth of pipe shall be installed by chute or trimming into place. Backfilling of the trench within the subaqueous portion of the pipeline installation is not required. Contractor shall verify that the pipeline installation elevation is per what is shown on the Drawings by means of divers, ROV, bathymetric survey or other.

3.5 PIPE FLOATATION

- A. The Contractor is hereby alerted to the fact that the pipe specified will float when filled with air.
- B. The Contractor shall attach sufficient weight, concrete or other such ballast, so that the pipe cannot float when it is filled with air. See part 2.7 of these specifications.
- C. The Contractor may attach barrels or other floatation devices to facilitate the installation of the pipeline if Contractor so desires.

3.6 JOINT ASSEMBLY

- A. Joints shall be assembled in strict accordance with the pipe manufacturers' written recommendations.
- B. The Contractor shall be responsible for the proper assembly of all pipe and appurtenances in accordance with the Manufacturers written procedure and as supplemented by these Specifications. Prior to joint assembly, all joints and joint components shall be thoroughly cleaned and examined to ensure proper assembly and performance. In the event that the Contractor is not experienced with the assembly of the type of flexible restrained joint being used, it shall be the responsibility of the Contractor to contact a factory-trained representative for recommendations on the proper and efficient installation of the joint.
- C. Joints shall not be assembled underwater unless approved by the Engineer.

3.7 HANDLING MATERIALS

- A. Pipe shall be handled in strict accordance with the pipe manufacturer's written installation recommendations.

3.8 PRESSURE AND LEAKAGE TEST

- A. At the option of the Contractor, during installation of the pipeline into place, periodic diagnostic air testing shall be carried out at a maximum pressure of 4 psi. Any failures shall be investigated and remedied immediately.

- B. Upon successful installation, this segment of the pipeline shall be pressure tested as specified in Section 331400 of these Specifications.

3.9 RESTORATION

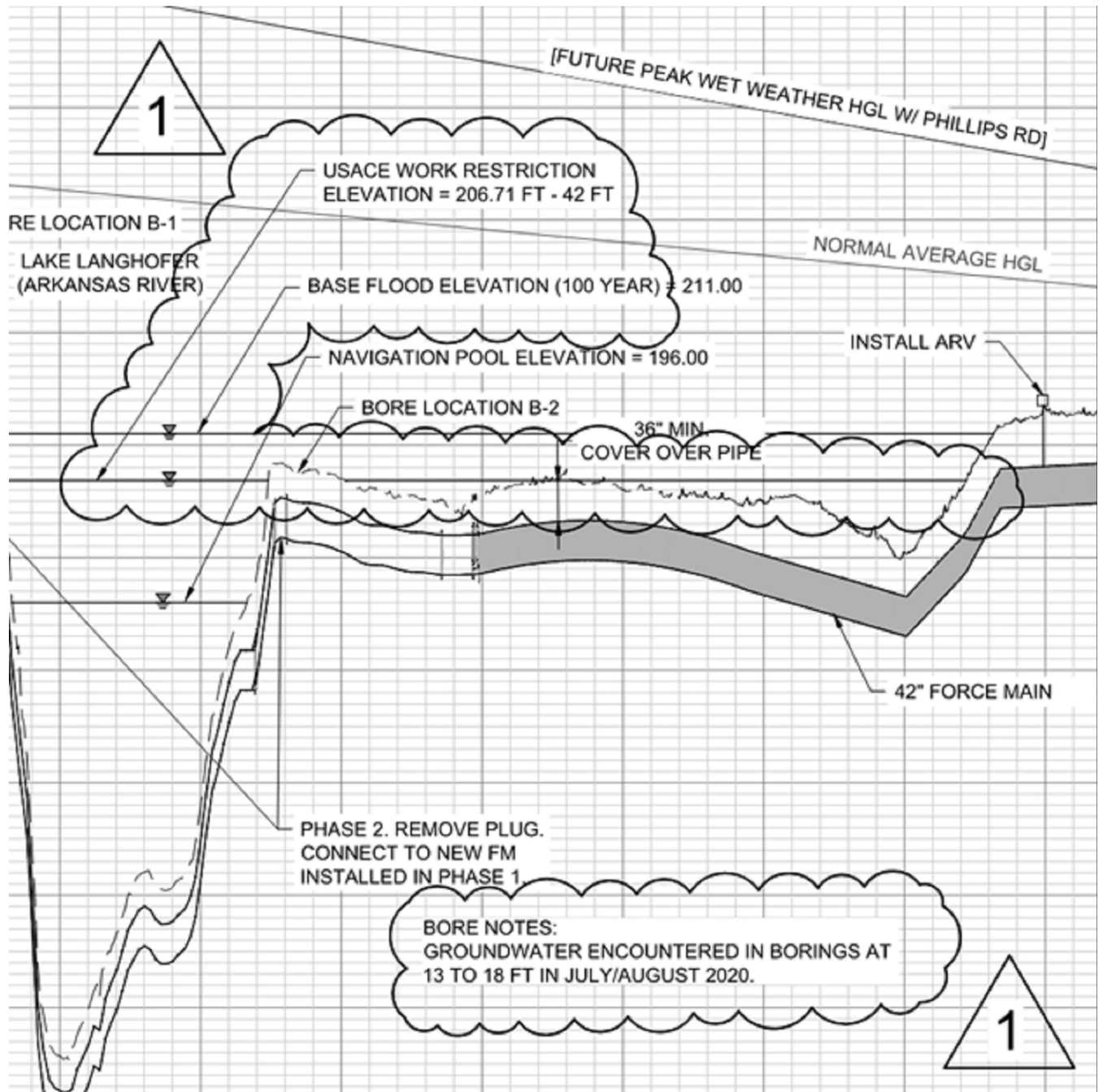
- A. Following the pipeline installation, the Contractor shall demobilize equipment and restore the work site to original conditions. Any noticeable surface defects, due to the related construction activities, shall be repaired by the Contractor. The Contractor shall restore any damage due to the construction of this project.

3.10 RECORD KEEPING

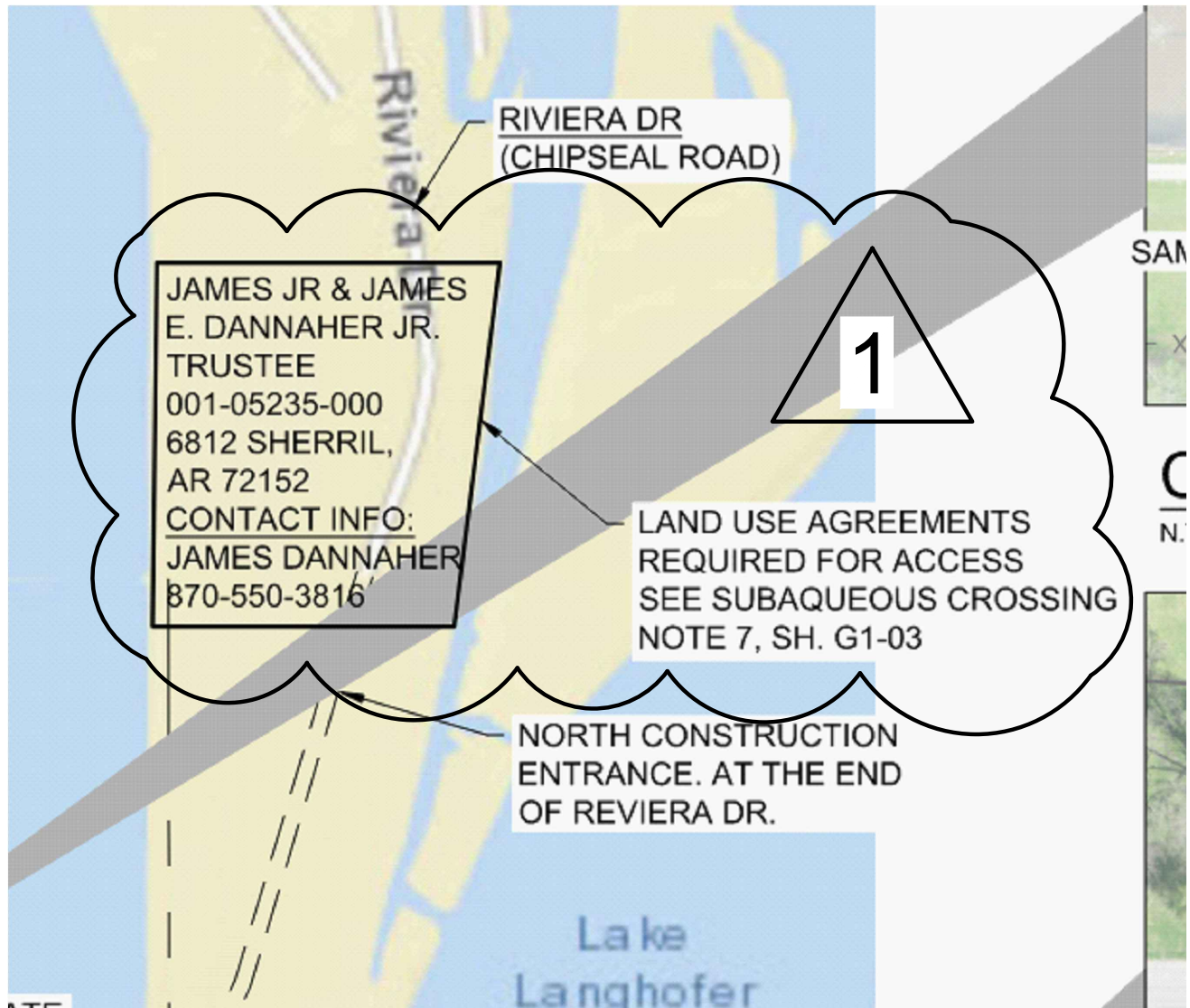
- A. Contractor shall maintain a daily project log of construction operations and a guidance system log (if applicable) with a copy given to the Engineer in accordance with Section 013200 of these Specifications at the completion of the subaqueous installation. As-Built drawings shall be certified by the contractor, for accuracy, as required in Specification Section 013300.

END OF SECTION

P:\2021 Projects\2155 - City of Pine Bluff - Kansas St. Pump Station\06 - CAD\02 - Civil\2155 - OVERALL - Plan & Profile.dwg



		CRIST ENGINEERS, INC.	
CONSULTING ENGINEERS		LITTLE ROCK, ARKANSAS	
PINE BLUFF, ARKANSAS			
PINE BLUFF WASTEWATER UTILITY			
KANSAS ST PARALLEL FORCE MAIN			
OVERALL PLAN & PROFILE			
DESIGNED: JPK	JOB NO. 2155	DATE APRIL 2023	ADD. NO. 1
DRAFTED: RDW	SCALE:		REF SHEET
CHECKED: CAJ	NOT TO SCALE		G1-04



 CRIST ENGINEERS, INC. CONSULTING ENGINEERS LITTLE ROCK, ARKANSAS		PINE BLUFF, ARKANSAS	
		PINE BLUFF WASTEWATER UTILITY KANSAS ST PARALLEL FORCE MAIN	
VICINITY MAP - PHASE 1			
DESIGNED: JPK	JOB NO. 2155	DATE APRIL 2023	ADD. NO. 1
DRAFTED: RDW	SCALE:	REF SHEET	
CHECKED: CAJ	NOT TO SCALE		G1-05

B&F ENGINEERING
JOHNATHAN HAMMER

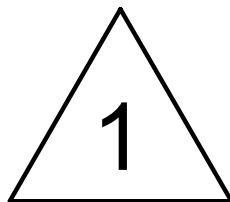
CONTACT INFORMATION

JONATHAN HAMMER, PS

OFFICE: 501.767.2366 EXT. 105
WWW.BNFENG.COM

1

		CRIST ENGINEERS, INC.	
CONSULTING ENGINEERS		LITTLE ROCK, ARKANSAS	
PINE BLUFF, ARKANSAS			
PINE BLUFF WASTEWATER UTILITY			
KANSAS ST PARALLEL FORCE MAIN			
BATHYMETRIC SURVEY			
DESIGNED: JPK	JOB NO. 2155	DATE APRIL 2023	ADD. NO. 1
DRAFTED: RDW	SCALE:	NOT TO SCALE	REF SHEET C1-01
CHECKED: CAJ			



USACE WORK RESTRICTION FLOOD
STAGE = 206.71 FT ~ 42 FT

BASE FLOOD ELEVATION (100 YEAR) = 211.00

NAVIGATION POOL ELEVATION = 196.00

DEPTH ±

MUC

INSTALL 1100' OF 42" DIA RJ,
EPOXY LINED DIP FORCE MAIN

0+50 11+00 11+50 12+00 12+50 13+00 13+50 14+



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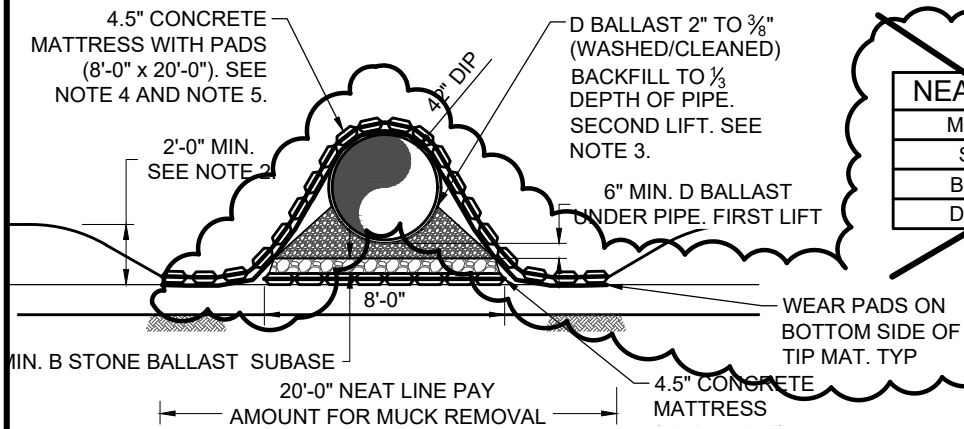
PINE BLUFF, ARKANSAS

**PINE BLUFF WASTEWATER UTILITY
KANSAS ST PARALLEL FORCE MAIN**

PLAN & PROFILE 7+00 - 19+00

DESIGNED: JPK	JOB NO. 2155	DATE APRIL 2023	ADD. NO. 1
DRAFTED: RDW	SCALE: NOT TO SCALE	REF SHEET	C1-02
CHECKED: CAJ			

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NEATLINE QTY SCHEDULE	
MATERIAL	QTY. (NEAT)
SPOILS	
B-STONE	
D-STONE	

1



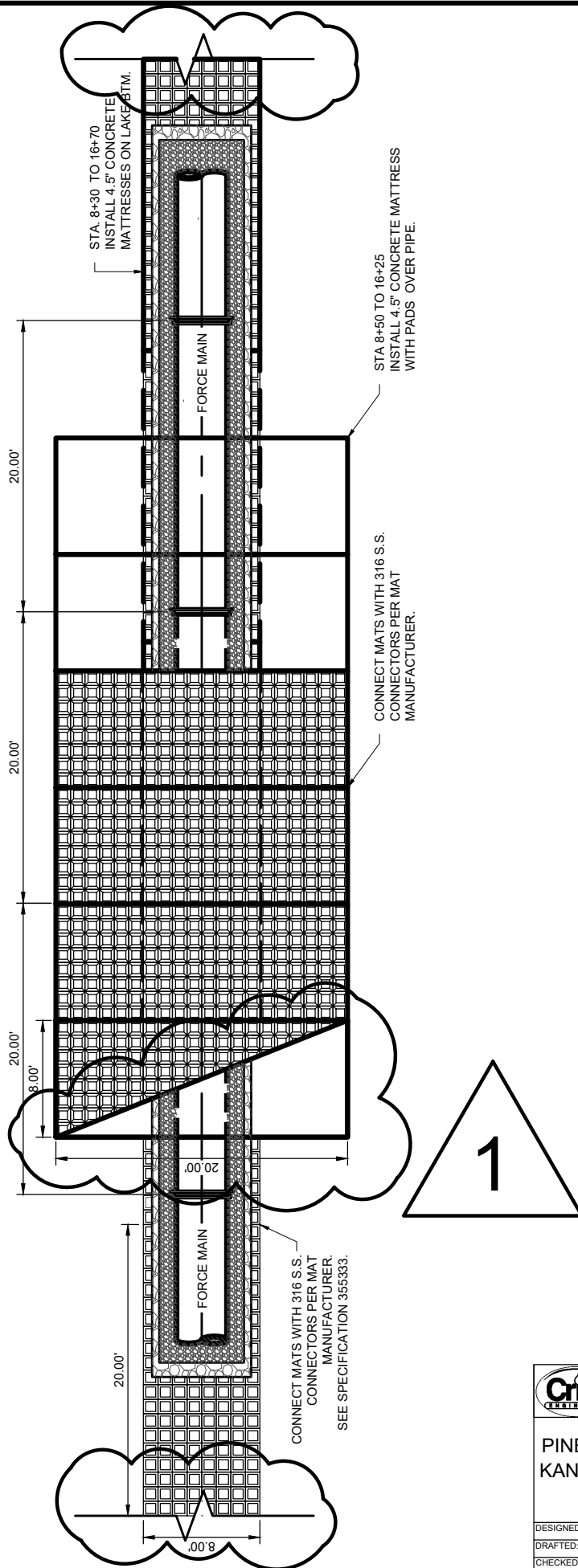
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CONSULTING ENGINEERS LITTLE ROCK, ARKANSAS

PINE BLUFF, ARKANSAS

**PINE BLUFF WASTEWATER UTILITY
KANSAS ST PARALLEL FORCE MAIN**

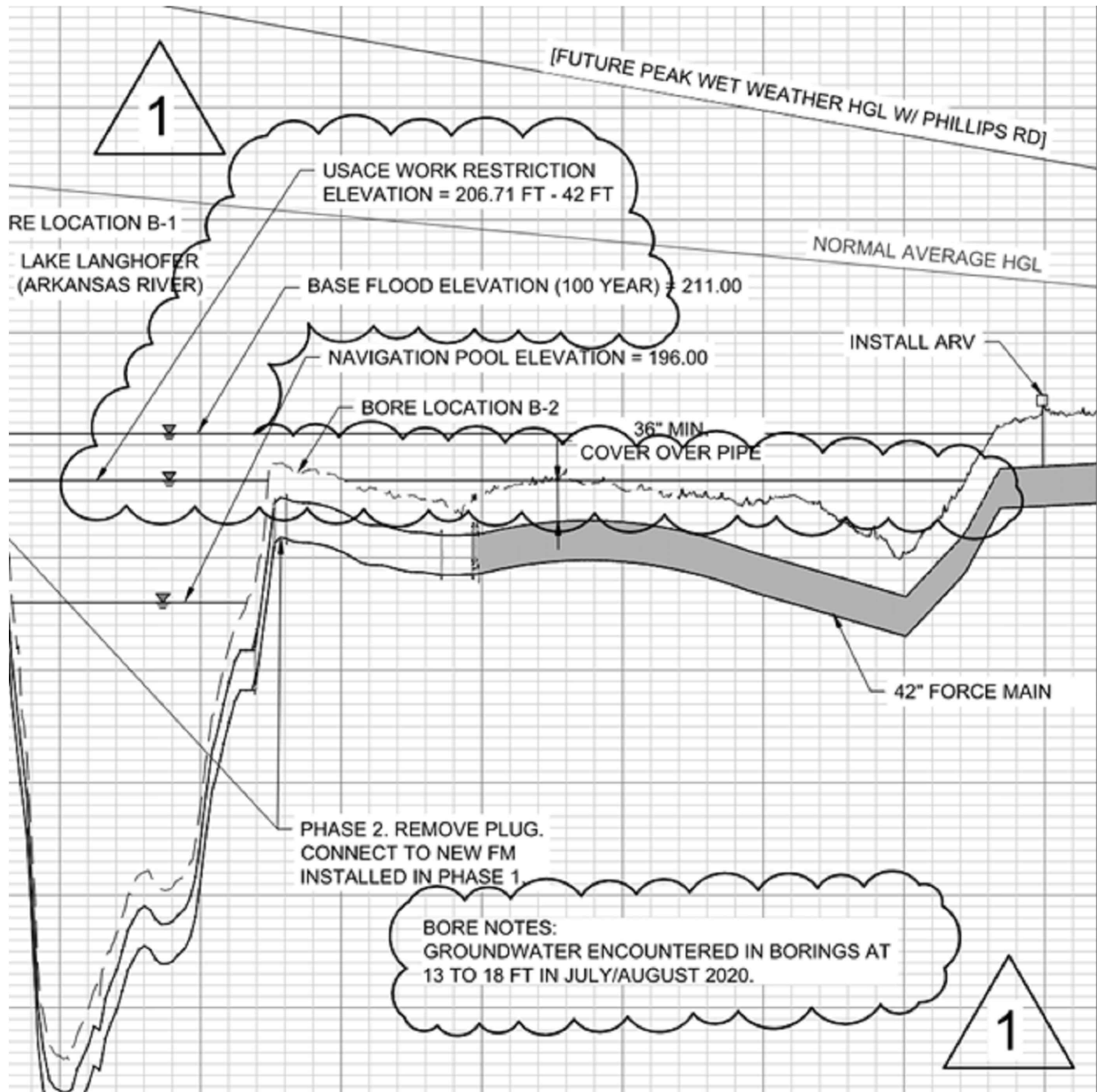
DETAILS I

DESIGNED: JPK	JOB NO. 2155	DATE APRIL 2023	ADD. NO. 1
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CHECKED: CAJ			

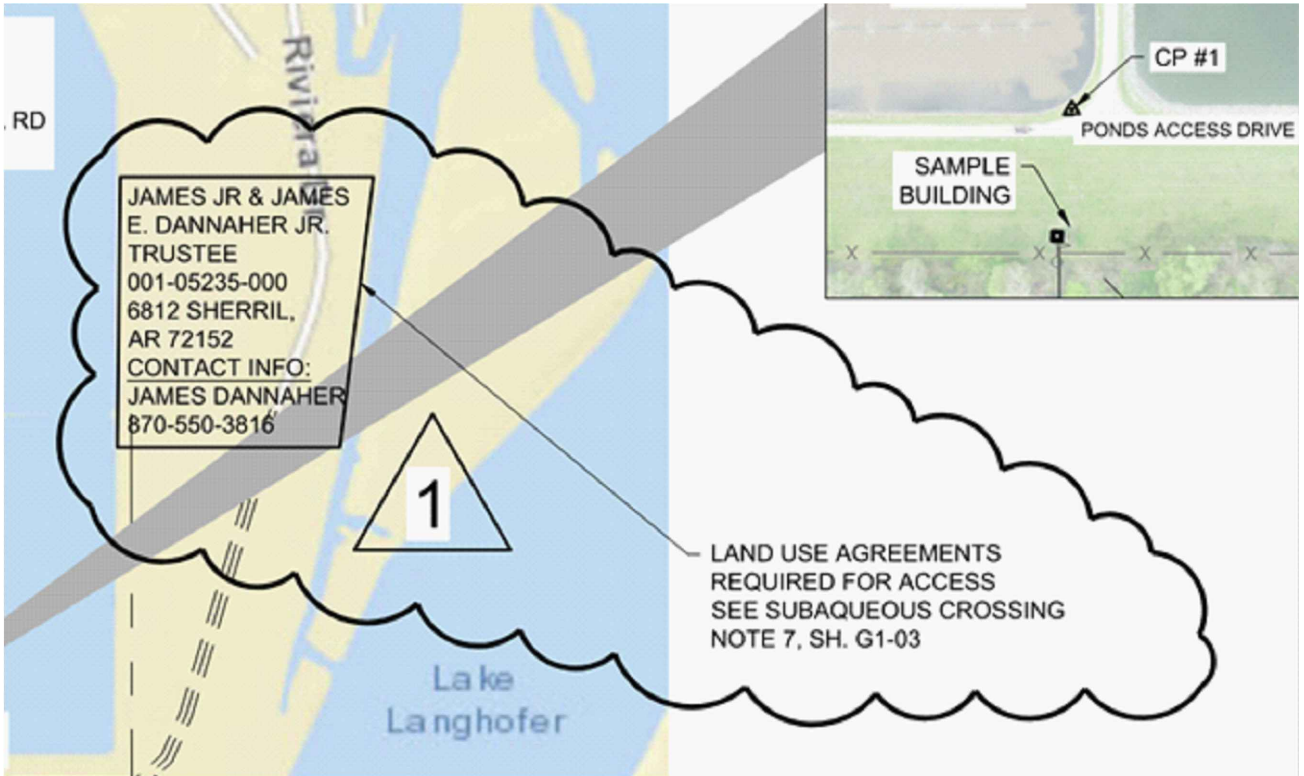


 CRIST ENGINEERS, INC. CONSULTING ENGINEERS LITTLE ROCK, ARKANSAS	
PINE BLUFF, ARKANSAS	
PINE BLUFF WASTEWATER UTILITY KANSAS ST PARALLEL FORCE MAIN	
DETAILS I	
DESIGNED: JPK	JOB NO. 2155
DRAFTED: RDW	DATE APRIL 2023
CHECKED: CAJ	SCALE: NOT TO SCALE
ADD. NO. 1 REF SHEET CZ1-01	

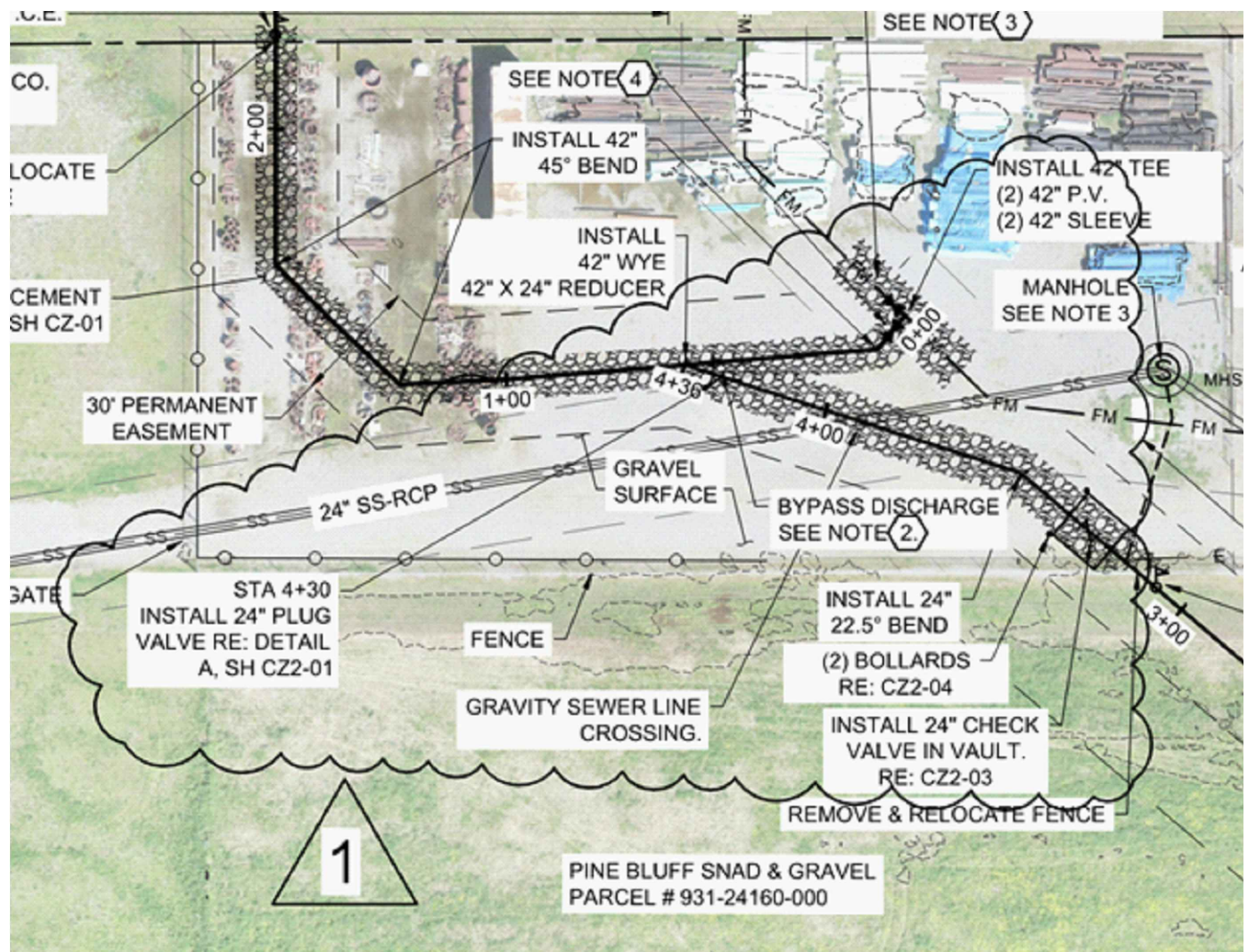
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CONSULTING ENGINEERS		LITTLE ROCK, ARKANSAS	
PINE BLUFF, ARKANSAS			
PINE BLUFF WASTEWATER UTILITY KANSAS ST PARALLEL FORCE MAIN			
OVERALL PLAN & PROFILE			
DESIGNED: JPK	JOB NO. 2155	DATE APRIL 2023	ADD. NO. 1
DRAFTED: RDW	SCALE:	NOT TO SCALE	REF SHEET
CHECKED: CAJ			G2-03

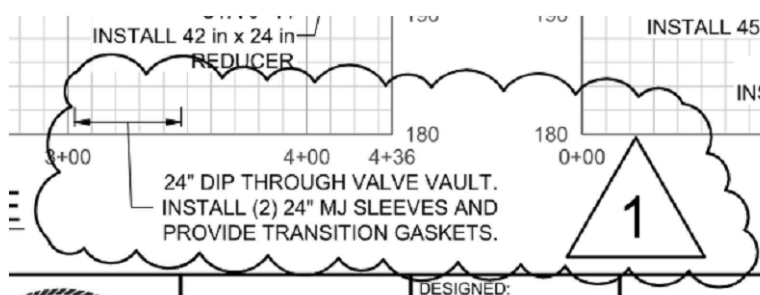
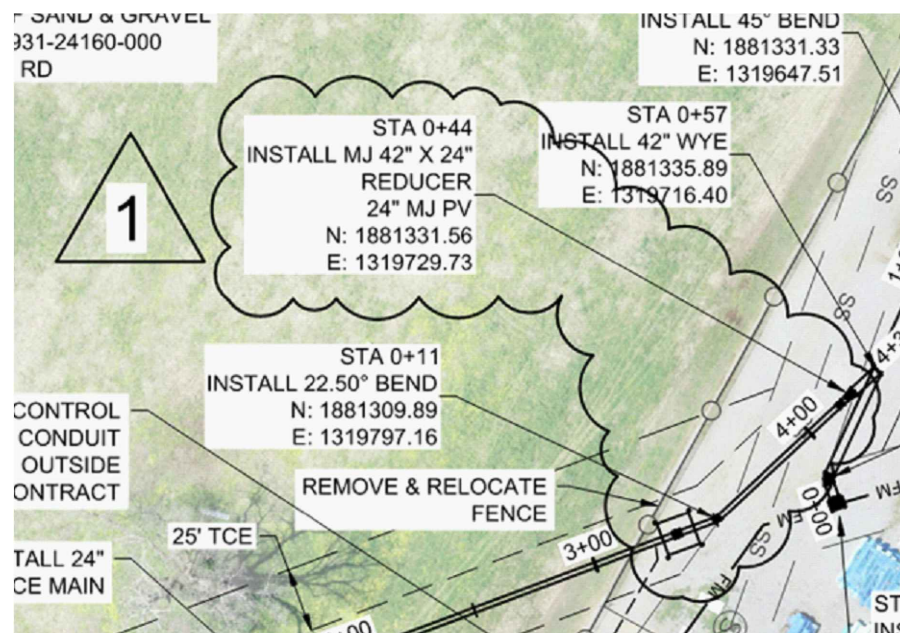
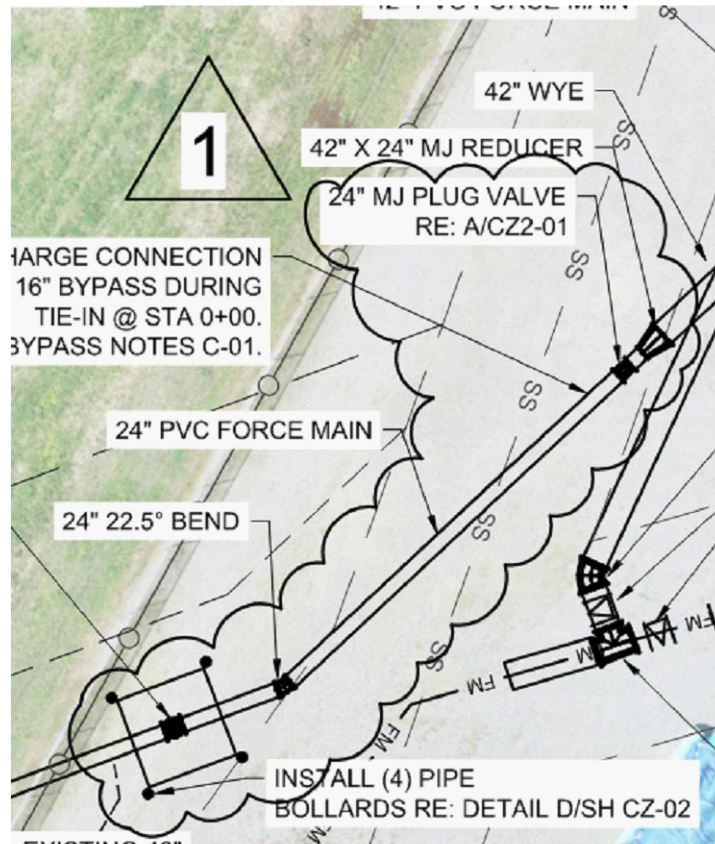


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PINE BLUFF, ARKANSAS	
PINE BLUFF WASTEWATER UTILITY KANSAS ST PARALLEL FORCE MAIN	
VICINITY MAP - PHASE 2	
DESIGNED: JPK	JOB NO. 2155
DRAFTED: RDW	DATE APRIL 2023
CHECKED: CAJ	SCALE: NOT TO SCALE
ADD. NO. 1	
REF SHEET G2-04	

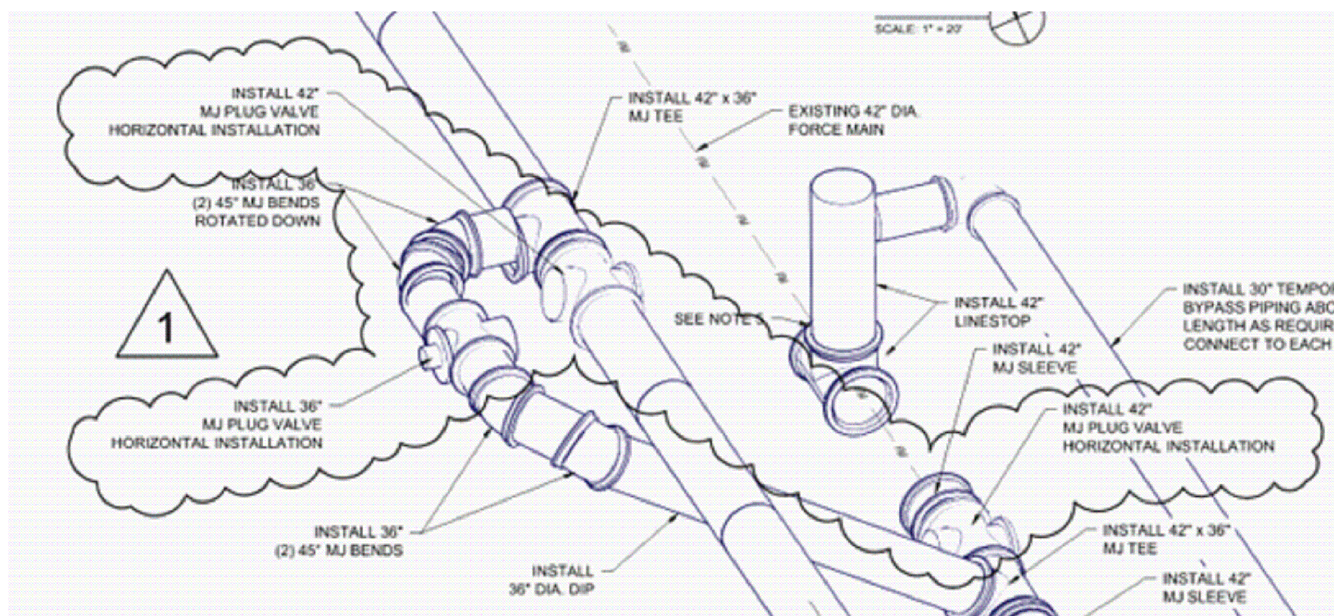
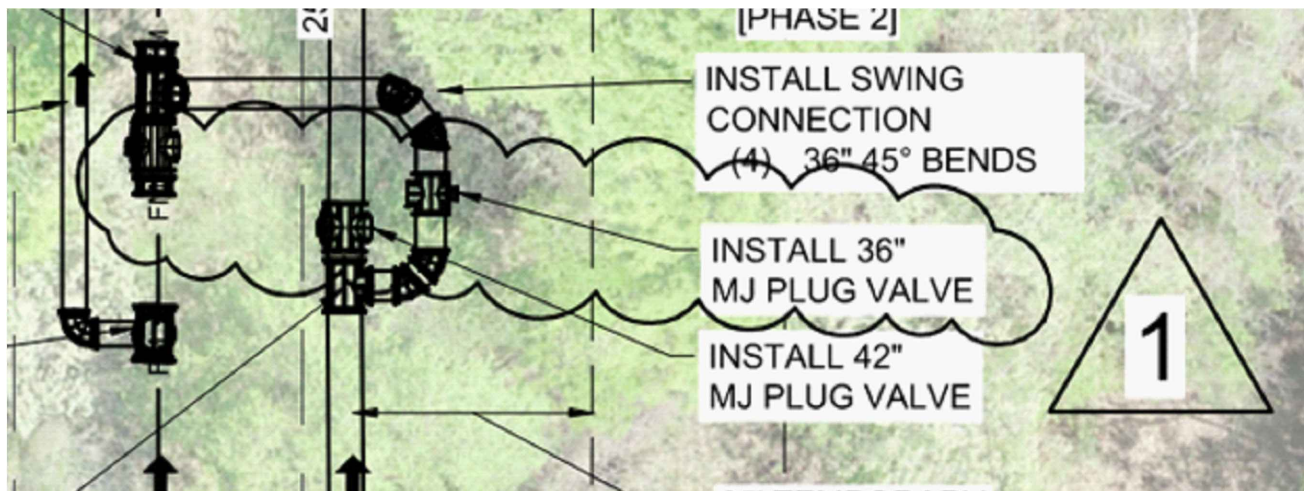


2. STOCKPILES LOCATED WITHIN TOL LIMITS TO BE RELOCATED, IF REQUIRED, PRIOR TO CONSTRUCTION.
 3. CORE DRILL EXISTING MH AS REQUIRED TO ACCOMMODATE SUMP PUMP DISCHARGE PIPING FROM VALVE VAULT. PROVIDE LINK SEAL AROUND PIPE AND SEAL PENETRATIONS WITH NON-SHRINK GROUT.
 4. ALL MATERIAL STORED INSIDE FENCE SHALL BE RELOCATED BY OWNER. CONTRACTOR TO INDICATE LIMITS OF CONSTRUCTION BY STAKING PRIOR TO OWNER RELOCATING MATERIAL.
- 1

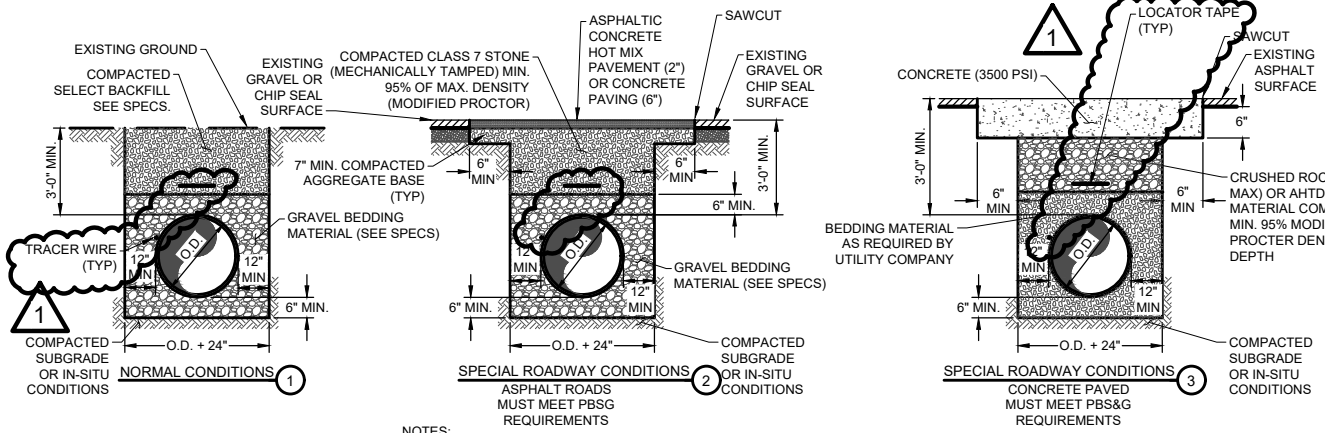
		CRIST ENGINEERS, INC. CONSULTING ENGINEERS LITTLE ROCK, ARKANSAS	
PINE BLUFF, ARKANSAS			
PINE BLUFF WASTEWATER UTILITY KANSAS ST PARALLEL FORCE MAIN			
SOUTH BANK TIE-IN & PROPOSED YARD PIPING			
DESIGNED: JPK	JOB NO. 2155	DATE APRIL 2023	ADD. NO. 1
DRAFTED: RDW	SCALE:		REF SHEET
CHECKED: CAJ	NOT TO SCALE		C2-01



 CRIST ENGINEERS, INC. CONSULTING ENGINEERS LITTLE ROCK, ARKANSAS PINE BLUFF, ARKANSAS	
PINE BLUFF WASTEWATER UTILITY KANSAS ST PARALLEL FORCE MAIN	
PLAN & PROFILE 24 INCH FORCE MAIN & 0+00 - 7+00	
DESIGNED: JPK	JOB NO. 2155
DRAFTED: RDW	DATE APRIL 2023
CHECKED: CAJ	SCALE: NOT TO SCALE
ADD. NO. 1 REF SHEET C2-02	

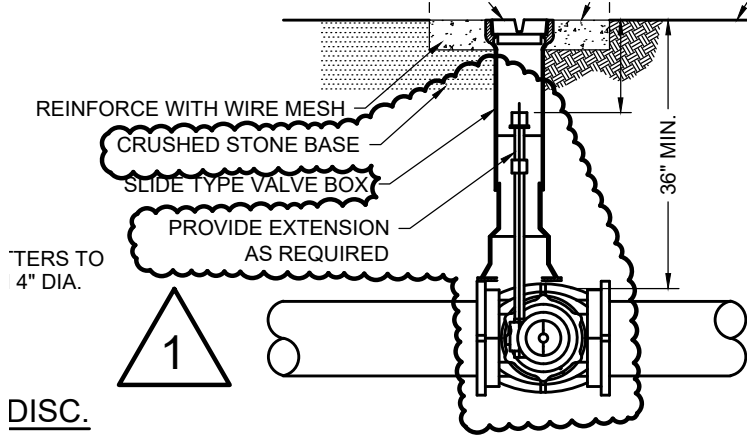


 CRIST ENGINEERS, INC. CONSULTING ENGINEERS LITTLE ROCK, ARKANSAS		PINE BLUFF, ARKANSAS	
		PINE BLUFF WASTEWATER UTILITY KANSAS ST PARALLEL FORCE MAIN	
TIE-IN CONNECTION AT STA 24+69			
DESIGNED: JPK	JOB NO. 2155	DATE APRIL 2023	ADD. NO. 1
DRAFTED: RDW	SCALE:	REF SHEET	
CHECKED: CAJ	NOT TO SCALE		C2-04



NOTES:

1. USE ROADWAY CONDITIONS WHEN INSTALLING PIPE IN AREAS SUBJECT TO TRAFFIC LOADS.
2. SEE BEDDING SPECS.
3. NO ROCKS LARGER THAN 4" DIAMETER IN BACKFILL.
4. CONTRACTOR TO CONSTRUCT TRENCH USING METHODS ALLOWED BY LOCAL, STATE, OR FEDERAL REQUIREMENTS TO MAINTAIN A SAFE WORKING CONDITION.
5. SEE DETAIL D THIS SHEET.
6. LOCATOR TAPE AND TRACER WIRE REQUIRED FOR ALL PVC PIPE.

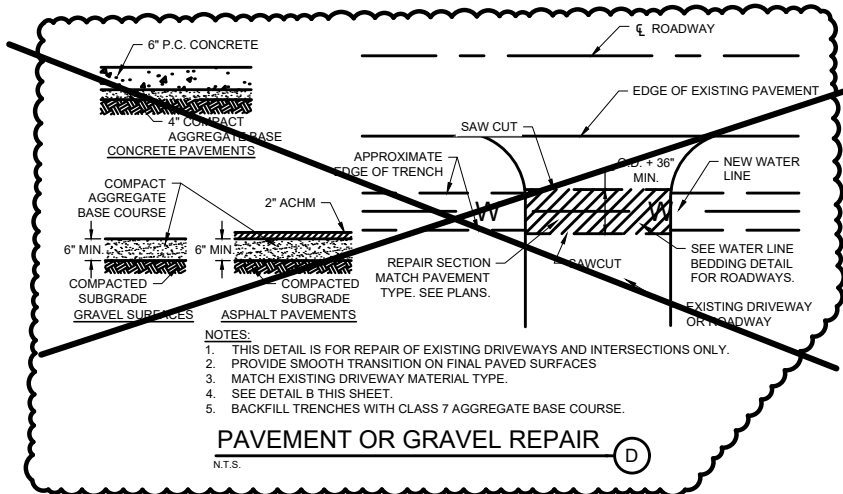


**PLUG VALVE
DETAIL** **(A)**
N.T.S.

6	1	10" SPOOL PIECE
7	1	10' FL PLUG VALVE
8	1	10" FL TEE
9	2	10" x 8" FL RED 90° BEND
10	1	8" FL PLUG VALVE
11	2	8" COMBINATION AIR RELEASE VALVE W/ NON-SLAM

NOTES:

1. DIELECTRIC ISOLATION TO BE PROVIDED BETWEEN DISSIMILAR MATERIALS.



- NOTES:**
1. THIS DETAIL IS FOR REPAIR OF EXISTING DRIVEWAYS AND INTERSECTIONS ONLY.
 2. PROVIDE SMOOTH TRANSITION ON FINAL PAVED SURFACES
 3. MATCH EXISTING DRIVEWAY MATERIAL TYPE.
 4. SEE DETAIL B THIS SHEET.
 5. BACKFILL TRENCHES WITH CLASS 7 AGGREGATE BASE COURSE.

PAVEMENT OR GRAVEL REPAIR **(D)**
N.T.S.

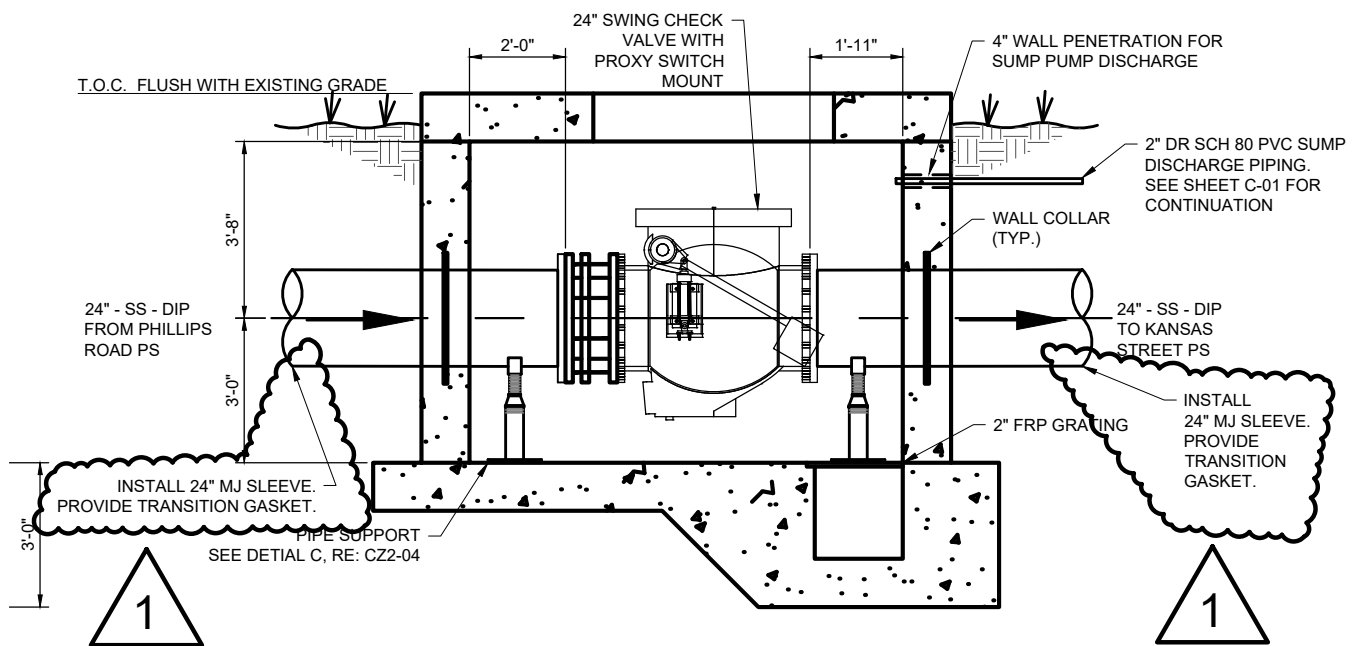
CRIST ENGINEERS, INC.
CONSULTING ENGINEERS LITTLE ROCK, ARKANSAS
PINE BLUFF, ARKANSAS

**PINE BLUFF WASTEWATER UTILITY
KANSAS ST PARALLEL FORCE MAIN**

DETAILS I

DESIGNED: JPK	JOB NO. 2155	DATE APRIL 2023	ADD. NO. 1
DRAFTED: RDW	SCALE:	NOT TO SCALE	REF SHEET C72-01
CHECKED: CAJ			

P:\2021 Projects\2155 - City of Pine Bluff - Kansas St. Pump Station\06 - CADD\02 - Civil\2155 - DETAILS-PHASE 2.dwg



CHECK VALVE VAULT

SECTION 2
1/4" = 1'

		CRIST ENGINEERS, INC.	
CONSULTING ENGINEERS		LITTLE ROCK, ARKANSAS	
PINE BLUFF, ARKANSAS			
PINE BLUFF WASTEWATER UTILITY			
KANSAS ST PARALLEL FORCE MAIN			
DETAILS III			
DESIGNED: JPK	JOB NO. 2155	DATE APRIL 2023	ADD. NO. 1
DRAFTED: RDW	SCALE:	NOT TO SCALE	REF SHEET C22-03
CHECKED: CAJ			

LIST OF OWNER IDENTIFIED LOCAL DBE SUBCONTRACTORS

1. Henry Dabner - Henry Dabner Consultant and Trucking LLC

711 West 28th Street, Pine Bluff, AR 71603

Phone: 870-718-1748

Email: hen2dabner@yahoo.com

2. Jeff Edwards - Chestnut Enterprises LLC

8606 Earl Chadick Road, Sherrill, AR 72152

Phone: 870-489-3909

Email: jbjinc01@yahoo.com

3. John Wilbert - W Trucking

437 Dixie Road, Grady, AR 71644

Phone: 870-718-3237

Other Possible Contacts(daughters possibly?): Tina-870-377-4684, Jackie-870-413-1536

Email: None

4. Hosea Jackson - 1911 Construction Company, Inc.

516 S Cherry Street, Pine Bluff, AR 71601

Phone: 870-329-2400

Email: hosea@1911construction.com

**Pine Bluff Wastewater Utility
Kansas Street Parallel Force Main
Phase 1 and 2**

CONTRACTOR QUESTIONS RECEIVED TO DATE:

1. Permits- State, City, County; The permit(s) outlined in Appendix C, will fee's be charged, or will they be waived, as this is a City project? **Inspection and Zoning Permits will NOT apply to this project.**
2. Appendix D; The USACE permission letter states that work cannot progress once water elevation reaches 42 ft. on the Pine Bluff Arkansas gage, what elevation does this equate to in relation to our work area? Is the water level elevation the only work restriction to date, there are no restrictions based on time of year and disturbance within the levee system? Prior experiences with USACE (not this jurisdiction office) had calendar year work restrictions. **USACE Work Restrictions apply when water surface elevation of river is at 206.71 FT. Reference USGS River Gauge at US 79B Hwy. No calendar year work restrictions have been identified from Vicksburg district. The permit from Little Rock District has not been received and may include calendar year work restrictions but none are anticipated.**
3. Spec. Section 015713; Please confirm section 1.1-D is the protocol, as other parts of the specifications conflict with who is responsible for the NOI. As well, confirm the Contractor will be responsible for fee's, or will the Owner (City) be paying those fee's? **Confirmed. Contractor is responsible for all fees.**
4. Spec. Section 329219; Paragraph 3.9-A, will maintenance be needed by the Contractor, or can seed be placed and allowed to be watered from reoccurring rain events? **Maintenance may not be needed. Any failed areas will be reseeded at Contractors expense. Contractor is encouraged to consider implementing temporary irrigation measures using river water.**
5. Bid Form, Page 11; Bid item 16 does not match the bid quantity item 16 on page 5. **See revised bid form issued via addendum no. 1 dated April 28, 2023.**
6. Bid Form, Page 12- Alt. Deduct #2; Totals for "A" and "B" are not setup correctly, as they will equal zero in the following bid item total. **See revised bid form issued via addendum no. 1 dated April 28, 2023.**
7. Spec. Section 311000; Spec. calls out for material to be removed and disposed of, can removed material be chipped and left in place? **Yes.** Can it be burned, even though not allowed by paragraph 3.5-B? **Yes.** Can removed stumps be buried along the perimeter boundary of the easement, outside the trench/pipe profile? This would apply on the north side of Lake Langhofer. **Items are addressed via addendum 1 dated April 28, 2023.**
8. Drawing Sheet No. CZ2-03; Would a precast vault be acceptable for the "Check Valve Vault", if provided as an or equal? **Yes.**
9. Drawing Sheet No. C2-04; The bid form does not have an item for 42"x36" MJ Tee's (2 ea.), should there be a bid item, or covered by Bid Item 36- Misc. & Incidentals? **See revised bid form issued via addendum no. 1 dated April 28, 2023.**

List of Contractor Questions
Kansas Street Parallel Force Main – Phase 1 and 2

10. Drawing Sheet No. C2-02 & 04; Bid Item 5, the bid quantity is 3 ea., but there are 4 ea. shown on the C2-02 & 04. What is the correct quantity? **See revised bid form issued via addendum no. 1 dated April 28, 2023.**
11. Drawing C2-04; The Line Stop Contractors are stating that the outlet flange on the line stop valve is 24" and the bypass piping is shown as 30", will this be a problem with bypass flows? **No. Bypass piping will be 30" as shown. Contractor is responsible for providing temporary piping and fittings as required to connect to linestop discharges to facilitate bypass during tie-in. Linestop bypassing will be required to be performed during relatively dry weather.**
12. Does the contractor need to bid both phases? **Reference Section 002113 - Instructions to bidders.**
13. What survey outfit did the plan topo's of the channel? **Addressed via addendum 1 dated April 28, 2023.** Did they provide coordinate locations for the existing FM and can those be provided? **No.**
14. Is contractor required to do additional Geotech borings for engineer? **No.**
15. G1-02 2e Will owner require additional training for safety? **No. Note 2e is removed via addendum 1.**
16. G1-02 3a Permits—I see appendix attached to specs, are there any other permits required? **Yes. Contractor shall pay for all permits required.**
17. Burning of timber debris is up to local fire chief, yes or no. **Yes.**
18. Disposal of all broken concrete or asphalt offsite, is there any bury onsite allowed? **No.**
19. Laydown area for contractor—are we required to pay Pine Bluff Sand & Gravel a fee? **Negotiations for activities beyond Temporary and Permanent Easements secured shall be at the discretion of the contractor. A land use agreement with PBSG will be required.**
20. Field office not required by specs. **Correct.**
21. USACE permit, assume will be sent (addendum) out prior to bid and address excavation, fill, stone, gravel, pipe, etc. **Correct.**
22. Access to Boyd Point side is available by contacting? **Addressed via addendum no. 1 dated April 28, 2023.** UTV or boat? **Either.**
23. Approximately how far upstream is the new FM located? **100 ft. Reference plans.** Boyd point side? PBSG side?

List of Contractor Questions
Kansas Street Parallel Force Main – Phase 1 and 2

24. C1-02 2 Does USACE permit require turbidity curtain, cofferdam, etc. **USACE permit for lake crossing will stipulate Contractor is responsible for using Best Management Practices (BMP) to construct project. No special provisions outside of BMPs have been indicated.**
25. C1-02 7 Is more Geotech info required? **No.**
26. C1-02 10 To be clear contractor is to furnish 2 new signs and remove old? **Remove 2 Existing, Install 4 new. Reference Bid Form.**
27. C1-02 9 Appears top weight mats only go a short distance Sta. 10+50 profile conflicts, CZ1-01 Plan view indicates Top Mats required from 8+50 to 16+25, C1-02 indicates same, please clarify. **Reference lake crossing profile and station callouts on detail.**
28. C21-01 5 Submar mats 3/8 PVC wear pad , is this required for all mats bottom and top? **Wear pads required for top mats only. Wear pads will be on one side of all top mats covering the entire surface of the mat.**
29. Testing of pipeline, Can it be tested 1 time, or each Phase tested as completed? **Not Specified. Pipe must pass pressure testing.**
30. Please verify test pressure of FM Sewage, 150 PSI or 90 PSI section 333400 14g. **150 psi.**
31. Water for testing provided by contractor, is a fire hydrant nearby? **Hydrostatic testing section is modified via addendum 1 to allow river water to be used for testing. Contractor is responsible for all cost. Estimated cost?**
32. In Ph 2 G2-03 it appears well points will be required near the tie-ins, does the engineer have a specified water elevation below the new pipe that ground water should maintain? **Reference Geotechnical Report provided with Bid Documents under separate cover. Also reference profile on sheet C2-02.**
33. Does engineer have any boring information in the area for Ph 2 around Sta. 0+00 or Sta 1+00? **All available geotechnical information is provided under Geotechnical Report provided with Bid Documents under separate cover.**
34. For the 16-inch bypass pumping PH 2, can engineer provide GPD that will need to be pumped? **Pumping will be provided by PBWU. Contractor is responsible for providing all temporary piping and connections required to facilitate bypass to complete tie-in.**