

**ADDENDUM NO. 2****DATE:** December 11, 2023**PROJECT:** Pine Street Water & Sewer Relocations
Arkadelphia Water Utility
Arkadelphia, Arkansas**BID DATE:** December 19, 2023, 1:00 PM

This Addendum forms a part of the Contract Documents and modifies the original documents provided to Bidders, as noted below. Acknowledge receipt of this Addendum in the space provided in the BID FORM. Failure to do so may subject the Bidder to disqualification.

The Contract Documents for the above Project are hereby amended as follows:

Supplemental Information to Bidders:

This electronic data is provided to Bidders for the Arkadelphia Water Utility Pine Street Water & Sewer Relocations as supplemental information only and not considered to be a part of the contract documents. The interpretation of this electronic information attached hereto is at the sole discretion of the Bidder.

1. Unsecured Portable Digital File (PDF) Soil Survey.

ITEM #1: Contract Documents - Bid Form

Delete in its entirety and replace with Bid Form – Addendum No. 2, attached hereto.

ITEM #2: Specifications – Section 012200 – Measurement and Payment

Replace specification section 012200 – Measurement and Payment with the revised specification, attached hereto.

ITEM #3: Specifications – Section 015000 – Temporary Facilities and Controls

Modify Part 2.2 – ENGINEER'S FIELD OFFICE as follows:

1.1 ENGINEER'S FIELD OFFICE

- A. ~~None Required.~~ Contractor shall furnish one (1) security office unit for exclusive use of Engineer and its representatives.
- B. Equipment furnished shall be new or like new in appearance and function.
- C. Security Office Unit:
 1. Minimum Size: 20 feet long, 8 feet wide, 8-foot ceilings.
 2. Steel frame, side panels and roof.

3. Insulated double walls, floors, and roof.
 4. Desks: Three (3) 36-inch x 60-inch
 5. 125-amp breaker panel.
 6. 120-volt lighting and wall outlets.
 7. Fluorescent ceiling lights.
 8. Electric heating and self-contained air-conditioning unit.
 9. Windows (2): 36-inch x 48-inch screened horizontal sliders with security bars.
 10. Steel exterior door with deadbolt locks.
 11. Railed stairways and landings at entrance.
- D. The Contractor shall provide, install, and maintain all utility connections to the office during construction.
- E. The field office for the Engineer shall not be a part of the same trailer as the Contractor.

ITEM #4: Specifications – Section 330523 – Bores with Steel Encasement

Modify Part 2.2 – CASING SPACERS as follows:

2.2 CASING SPACERS

- A. The casing spacers shall be designed to “center and restrain” the carrier pipe in the center of the encasement.
- B. The casing spacers ~~band and insulators shall be injection-molded polyethylene~~ **T-304 stainless steel**.
- C. Bolts, nuts, and washers shall be T-304 stainless steel.
- D. The spacers shall be designed with risers and runners to support the carrier pipe within the casing.
- E. The casing spacers shall be model ~~G~~ **SSI** “Centered and Restrained” by Advanced Products and Systems, Inc. of Lafayette, Louisiana, Cascade Model CCS by Cascade Waterworks Mfg. Co., or approved equal.

ITEM #5: Specifications – Section 331113 – Water Line Pipe and Fittings

Replace specification section 331113 – Water Line Pipe and Fittings with the revised specification, attached hereto.

ITEM #6: Specifications – Section 333100 – Sanitary Sewer (Gravity)

Modify section 2.2.D as follows:

- D. ~~Protector 401-Epoxy~~ **Cement Mortar** Lining

Delete sections 2.6.A and 2.6.B in their entirety.

ITEM #7: Appendices – Appendix B – Special Considerations

Add Appendix B – Special Considerations, attached hereto.

ITEM #8: Drawings – Sheet 1

Add SEWER SERVICE LINE REPLACEMENT NOTES as follows:

SEWER SERVICE LINE REPLACEMENT NOTES

1. THE CONNECTION LOCATION OF NEW SEWER SERVICE LINES TO EXISTING SEWER SERVICE LINES SHALL BE DETERMINED IN THE FIELD ON A CASE BY CASE BASIS.
2. CONTRACTOR SHALL REPLACE EXISTING CLEANOUTS WITH NEW CLEANOUTS WHEN DETERMINED NECESSARY BY THE OWNER AND/OR ENGINEER.

ITEM #9: Drawings – Sheet 10

Modify this drawing as shown on Addendum No. 2 – PLAN – STA. 139+00 – 144+00, attached hereto.

ITEM #10: Drawings – Sheet 11

Modify this drawing as shown on Addendum No. 2 – PLAN – STA. 145+00 – 150+00, attached hereto.

ITEM #11: Drawings – Sheet 20

Replace drawing sheet 20, WATER LINE BORE PROFILES III with the revised drawing sheet 20, attached hereto.

ITEM #12: Drawings – Sheet 27

Modify Detail E, Note 6 on plan sheet 27 as follows:

6. STEEL CASING SHALL BE ~~CONSTRUCTED~~ **CONSTRUCTED** OF SPIRAL OR STRAIGHT WELDED STEEL WITH A MINIMUM DIAMETER AND THICKNESS AS SHOWN IN THE ~~TABLE BELOW~~ **SPECIFICATIONS**.

Delete the CARRIER AND CASING SIZES table on Detail E, sheet 27.

Attachments:

1. Supplemental Information – Soil Survey
2. Contract Documents – Bid Form.
3. Specification Section 012200 – Measurement and Payment
4. Specification Section 331113 – Water Line Pipe and Fittings
5. Appendix B – Special Considerations
6. Drawing Exhibit – Sheet 10
7. Drawing Exhibit – Sheet 11
8. Drawings – Sheet 20

END OF ITEMS

All other provisions of the Contract Documents remain unchanged. Acknowledge receipt of this Addendum on the BID FORM.

CRIST ENGINEERS, INC.



Matthew D. Dunn, P.E.
President



ARKANSAS DEPARTMENT OF TRANSPORTATION

ARDOT.gov | IDriveArkansas.com | Scott E. Bennett, P.E., Director

MATERIALS DIVISION

11301 West Baseline Road | P.O. Box 2261 | Little Rock, AR 72203-2261 | Phone: 501.569.2185 | Fax: 501.569.2368

November 9, 2018

TO: Mr. Trinity Smith, Engineer of Roadway Design

SUBJECT: Job No. 070439
26th St. – Hwy. 67 (Pine St.) (Arkadelphia) (S)
Route 51 Section 1
Clark County

Transmitted herewith is the requested Soil Survey, strength data and Resilient Modulus test results for the above referenced job. The project consists of widening approximately 1.4 miles of Highway 51 between 26th Street and Highway 67 to three lanes and adding sidewalks. Samples were obtained in the existing travel lanes, and ditch line. The shoulders were not paved within the project limits.

Based on laboratory results of samples obtained, the subgrade soils consist primarily of moderately plastic sandy clay. Isolated locations of highly plastic sandy clay were encountered within the project limits. Cross sections are not currently available, but it is assumed the construction grade line will closely match that the existing roadway. The subgrade soils are expected to provide a stable working platform with conventional processing if the weather is favorable during construction. If soil remediation is need to allow construction to proceed during adverse weather conditions or if a stable working platform cannot be obtained with normal drying and compactive effort; stabilization with Portland cement is the most appropriate remediation technique. It is recommended that the addition of 9% Portland cement (by dry weight) mixed to a depth to of 16 inches be used for quantity estimation purposes. However, if the Engineer determines that stabilization is necessary, field trials or local experience may dictate that a stable working platform can be achieved at a lower cement content.

Additional earthwork recommendations will be made upon request when plans are further developed and cross sections become available.

Listed below is the additional information requested for use in developing the plans:

1. The Qualified Products List (QPL) indicates that Aggregate Base Course (Class CL-7) is available from commercial producers located in the vicinity of Bismarck.

2. Asphalt Concrete Hot Mix

Type	Asphalt Cement %	Mineral Aggregate %
Surface Course	5.3	94.7
Binder Course	4.4	95.6
Base Course	4.0	96.0



Michael C. Benson
Materials Engineer

MCB:pt:bjj

Attachment

cc: State Constr. Eng. – Master File Copy
District 7 Engineer
System Information and Research Div.
G. C. File

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS
MATERIALS DIVISION
MICHAEL BENSON, MATERIALS ENGINEER
*** SOIL SURVEY STRENGTH TEST REPORT ***

DATE - 10/18/2018
JOB NUMBER - 070439

SEQUENCE NO. - 1
MATERIAL CODE - SSRV
SPEC. YEAR - 2014
SUPPLIER ID. - 1
COUNTY/STATE - 10
DISTRICT NO. - 07

JOB NAME - 26TH ST. - HWY.67 (PINE ST.) (ARKADELPHIA) (S)

* STATION LIMITS R-VALUE AT 240 psi *

BEGIN JOB - END JOB 10

RESILIENT MODULUS
STA. 129 + 00 13038

REMARKS -

AASHTO TESTS : T190

**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION**

**AASHTO T 307-99 - RESILIENT MODULUS OF SUBGRADE SOILS
RECOMPACTED SAMPLES**

Job No.	070439	Material Code	SSRVPS
Date Sampled:	8/29/2018	Station No.:	129+00
Date Tested:	September 18, 2018	Location:	18'RT
Name of Project:	26TH ST. - HWY. 67 (PINE ST.)(ARKADELPHIA)(S)		
County:	Code: 10	Name:	CLARK
Sampled By:	DICKERSON/FRAZIER		Depth: 0-5
Lab No.:	20181961	AASHTO Class:	A-4(2)
Sample ID:	RV503	Material Type (1 or 2):	2
LATITUDE:		LONGITUDE:	

1. Testing Information:

Preconditioning - Permanent Strain > 5% (Y=Yes or N= No)	N
Testing - Permanent Strain > 5% (Y=Yes or N=No)	N
Number of Load Sequences Completed (0-15)	15

2. Specimen Information:

Specimen Diameter (in):	
Top	3.94
Middle	3.94
Bottom	3.94
Average	3.94
Membrane Thickness (in):	0.01
Height of Specimen, Cap and Base (in):	8.03
Height of Cap and Base (in):	0.00
Initial Length, Lo (in):	8.03
Initial Area, Ao (sq. in):	12.12
Initial Volume, AoLo (cu. in):	97.31

3. Soil Specimen Weight:

Weight of Wet Soil Used (g):	3145.80
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4. Soil Properties:

Optimum Moisture Content (%):	16.3
Maximum Dry Density (pcf):	109.6
95% of MDD (pcf):	104.1
In-Situ Moisture Content (%):	N/A

5. Specimen Properties:

Wet Weight (g):	3145.80
Compaction Moisture content (%):	16.6
Compaction Wet Density (pcf):	123.18
Compaction Dry Density (pcf):	105.64
Moisture Content After Mr Test (%):	16.4

6. Quick Shear Test (Y=Yes, N=No, N/A=Not Applicable): #VALUE!

7. Resilient Modulus, Mr: $14428(S_c)^{-0.10082}(S_3)^{0.16387}$

8. Comments

9. Tested By:

LB

Date: September 18, 2018

**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION**

**AASHTO T 307-99 - RESILIENT MODULUS OF SUBGRADE SOILS
RECOMPACTED SAMPLES**

Job No. 070439
Date Sampled: 8/29/2018
Date Tested: September 18, 2018
Name of Project: 26TH ST. - HWY. 67 (PINE ST.)(ARCADELPHIA)(S)
County: Code: 10 Name: CLARK
Sampled By: DICKERSON/FRAZIER
Lab No.: 20181961
Sample ID: RV503
LATITUDE:

Material Code SSRVPS
Station No.: 129+00
Location: 18'RT

Depth: 0-5
AASHTO Class: A-4(2)
Material Type (1 or 2): 2
LONGITUDE:

PARAMETER	Chamber Confining Pressure	Nominal Maximum Axial Stress	Actual Applied Max. Axial Load	Actual Applied Cyclic Load	Actual Applied Contact Load	Actual Applied Max. Axial Stress	Actual Applied Cyclic Stress	Actual Applied Contact Stress	Average Recov Def. LVDT 1 and 2	Resilient Strain	Resilient Modulus
DESIGNATION UNIT	S ₃ psi	S _{cyclic} psi	P _{max} lbs	P _{cyclic} lbs	P _{contact} lbs	S _{max} psi	S _{cyclic} psi	S _{contact} psi	H _{avg} in	ε _r in/in	M _r psi
Sequence 1	6.0	2.0	25.0	22.3	2.7	2.1	1.8	0.2	0.0080	0.00010	18,402
Sequence 2	6.0	4.0	47.1	44.5	2.7	3.9	3.7	0.2	0.00169	0.00021	17,472
Sequence 3	6.0	6.0	69.5	66.1	3.4	5.7	5.5	0.3	0.00261	0.00032	16,795
Sequence 4	6.0	8.0	93.2	87.4	5.9	7.7	7.2	0.5	0.00371	0.00046	15,588
Sequence 5	6.0	10.0	116.7	108.3	8.4	9.6	8.9	0.7	0.00486	0.00061	14,758
Sequence 6	4.0	2.0	25.0	22.2	2.8	2.1	1.8	0.2	0.00088	0.00011	16,773
Sequence 7	4.0	4.0	47.0	44.2	2.8	3.9	3.6	0.2	0.00183	0.00023	16,025
Sequence 8	4.0	6.0	68.7	65.8	2.9	5.7	5.4	0.2	0.00281	0.00035	15,507
Sequence 9	4.0	8.0	92.4	87.2	5.1	7.6	7.2	0.4	0.00386	0.00048	14,990
Sequence 10	4.0	10.0	116.0	108.5	7.6	9.6	9.0	0.6	0.00506	0.00063	14,211
Sequence 11	2.0	2.0	24.9	22.1	2.8	2.1	1.8	0.2	0.00100	0.00012	14,680
Sequence 12	2.0	4.0	46.9	44.1	2.8	3.9	3.6	0.2	0.00206	0.00026	14,166
Sequence 13	2.0	6.0	68.5	65.7	2.8	5.7	5.4	0.2	0.00314	0.00039	13,851
Sequence 14	2.0	8.0	91.5	87.2	4.3	7.5	7.2	0.4	0.00429	0.00053	13,476
Sequence 15	2.0	10.0	114.6	107.9	6.7	9.5	8.9	0.6	0.00548	0.00068	13,038

TESTED BY _____
REVIEWED BY _____

LB _____
DATE _____
DATE _____
September 18, 2018

**ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
MATERIALS DIVISION**

**AASHTO T 307-99 - RESILIENT MODULUS OF SUBGRADE SOILS
RECOMPACTED / THINWALL TUBE SAMPLES**

Job No.	070439	Material Code	SSRVPS
Date Sampled:	8/29/2018	Station No.:	129+00
Date Tested:	September 18, 2018	Location:	18'RT
Name of Project:	26TH ST. - HWY. 67 (PINE ST.)(ARKADELPHIA)(S)		
County:	Code: 10	Name:	CLARK
Sampled By:	DICKERSON/FRAZIER		Depth: 0-5
Lab No.:	20181961	AASHTO Class:	A-4(2)
Sample ID:	RV503	Material Type (1 or 2):	2
LATITUDE:		LONGITUDE:	

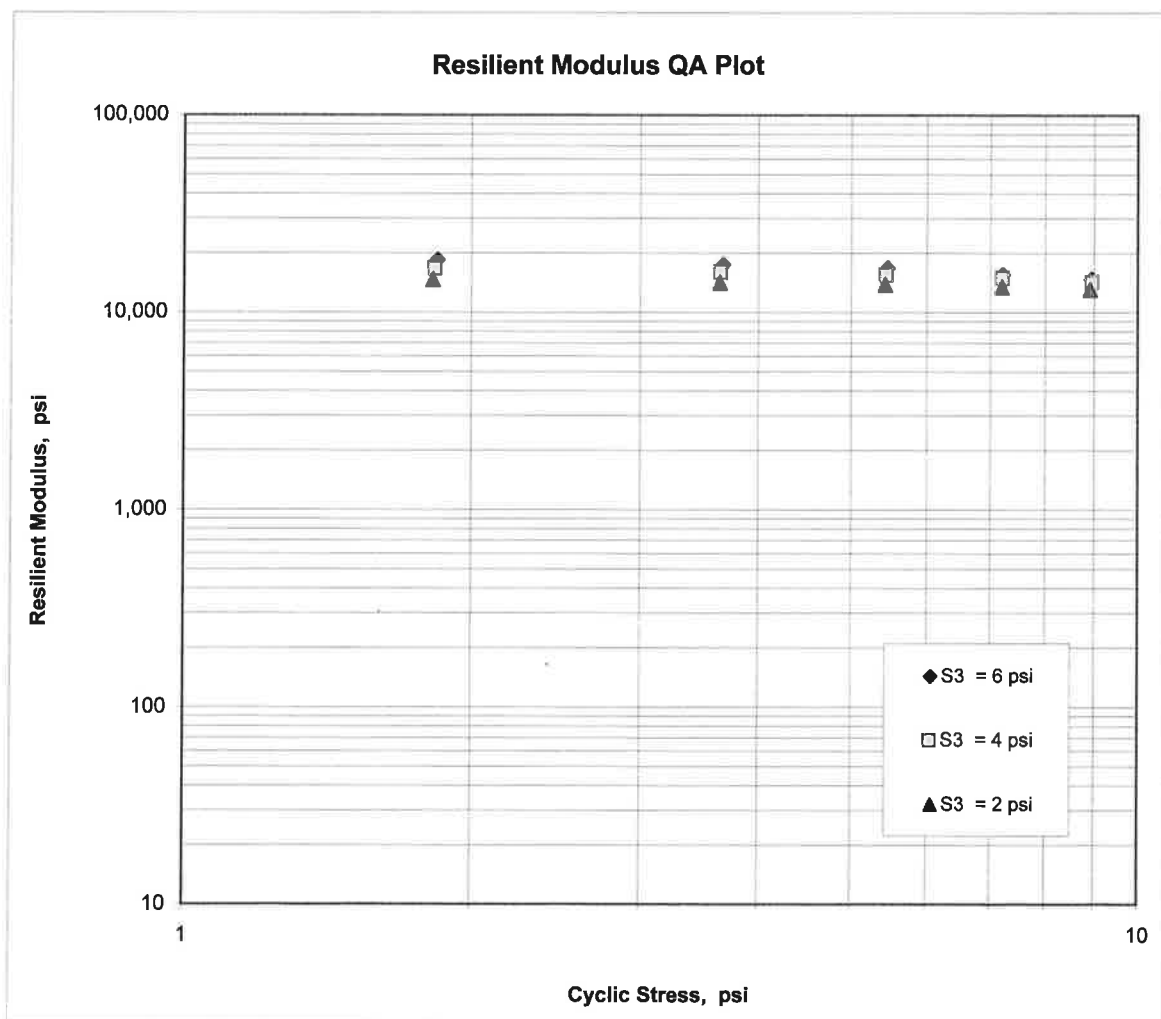
$$M_R = K_1 (S_C)^{K_2} (S_3)^{K_5}$$

$$K_1 = 14,428$$

$$K_2 = -0.10082$$

$$K_5 = 0.16387$$

$$R^2 = 0.94$$



JOB: 070439**Arkansas State Highway Transportation Department****JOB NAME: 26TH ST. - HWY.67 (PINE ST.)(ARKADELPHIA)(S)****Materials Division****COUNTY NO. 10 DATE TESTED 10/18/2018****Michael Benson, Materials Engineer**

STA.#	LOC.	DEPTH	COLOR	#4	#10	#40	#80	#200	L.L.	P.I.	SOIL CLASS	LAB #:	%MOISTURE
				S	I	E	V	E					
129+00	18 RT	0-5	RD/BR	95	93	92	86	52	27	10	A-4(2)	RV503	
105+50	06 RT	0-5	RD/BR	99	98	91	81	43	ND	NP	A-4(0)	S489	16.6
105+50	24 RT	0-5	BROWN	89	84	80	66	34	ND	NP	A-2-4(0)	S490	17.8
113+00	06 LT	0-5	BR/GR	100	99	96	71	42	42	24	A-7-6(5)	S491	24.1
121+00	06 RT	0-5	RD/BR	100	99	99	96	56	45	26	A-7-6(11)	S492	31.5
121+00	18 RT	0-5	RD/BR			100	98	61	45	27	A-7-6(14)	S493	21.7
129+00	06 RT	0-5	RD/BR	98	96	90	85	52	39	24	A-6(9)	S494	21.1
129+00	18 RT	0-5	RD/BR	89	87	80	76	49	31	13	A-6(13)	S495	15.3
137+00	06 RT	0-5	RD/BR	99	98	96	92	43	32	16	A-6(3)	S496	19.7
137+00	18 RT	0-5	RD/BR	98	98	96	90	55	31	14	A-6(5)	S497	21.1
145+00	21 LT	0-5	BROWN	99	99	98	94	56	25	12	A-6(3)	S498	21.2
153+00	06 RT	0-5	RD/BR	99	98	93	88	69	27	12	A-6(6)	S499	26.5
153+00	15 RT	0-5	BROWN	87	82	75	66	33	21	5	A-2-4(0)	S500	20.4
161+00	06 LT	0-5	BROWN	93	89	83	80	63	27	14	A-6(6)	S501	18.6
161+00	15 LT	0-5	RD/BR	92	87	79	75	59	22	8	A-4(2)	S502	18.3

comments: W=MULTIPLE LAYERS, X=STRIPPED**Wednesday, October 31, 2018**

JOB: 070439

JOB NAME: 26TH ST. - HWY 67 (PINE ST.) (ARKADELPHIA)(S)

Arkansas State Highway Transportation Department
Materials Division

COUNTY NO. 10

Michael Benson, Materials Engineer

DATE TESTED
10/18/2018

STA.#		LOC.		PAVEMENT SOUNDINGS	
-------	--	------	--	--------------------	--

105+50	06 RT	ACHMSC 12.0W	ACHMBC 1.5	AGG. BASE CRS. CL-7 4.0
105+50	24 RT	ACHMSC	ACHMBC	AGG. BASE CRS. CL-7
113+00	06 LT	ACHMSC 5.0W	ACHMBC 2.0	AGG. BASE CRS. CL-7 6.0
121+00	06 RT	ACHMSC 6.0WX	AGG. BASE CRS. CL-7 3.0	
121+00	18 RT	ACHMSC	AGG. BASE CRS. CL-7	
129+00	06 RT	ACHMSC 5.25WX	AGG. BASE CRS. CL-7 7.0	
129+00	18 RT	ACHMSC	ACHMBC	AGG. BASE CRS. CL-7
137+00	06 RT	ACHMSC 5.5W	ACHMBC 1.0	AGG. BASE CRS. CL-7 6.0
137+00	18 RT	ACHMSC	ACHMBC	AGG. BASE CRS. CL-7
145+00	21 LT	ACHMSC	AGG. BASE CRS. CL-7	
153+00	06 RT	ACHMSC 6.5WX	AGG. BASE CRS. CL-7 8.0	
153+00	15 RT	ACHMSC	AGG. BASE CRS. CL-7	
161+00	06 LT	ACHMSC 4.0X	PCCP 5.5	AGG. BASE CRS. CL-7 6.0
161+00	15 LT	ACHMSC	PCCP	AGG. BASE CRS. CL-7

comments: W=MULTIPLE LAYERS, X=STRIPPED

Wednesday, October 31, 2018

Page 1 of 1

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS
MATERIALS DIVISION

MICHAEL BENSON, MATERIALS ENGINEER

*** SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT ***

DATE	- 10/18/18	SEQUENCE NO.	- 1
JOB NUMBER	- 070439	MATERIAL CODE	- SSRVPS
FEDERAL AID NO.	- TO BE ASSIGNED	SPEC. YEAR	- 2014
PURPOSE	- SOIL SURVEY SAMPLE	SUPPLIER ID.	- 1
SPEC. REMARKS	- NO SPECIFICATION CHECK	COUNTY/STATE	- 10
SUPPLIER NAME	- STATE	DISTRICT NO.	- 07
NAME OF PROJECT - 26TH ST. - HWY.67 (PINE ST.) (ARKADELPHIA) (S)			
PROJECT ENGINEER - NOT APPLICABLE			
PIT/QUARRY	- ARKANSAS		
LOCATION	- CLARK, COUNTY	DATE SAMPLED	- 08/29/18
SAMPLED BY	- DICKERSON/FRAZIER	DATE RECEIVED	- 08/30/18
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 10/18/18
MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS			

LAB NUMBER	- 20181947	- 20181948	- 20181949
SAMPLE ID	- S489	- S490	- S491
TEST STATUS	- INFORMATION ONLY	- INFORMATION ONLY	- INFORMATION ONLY
STATION	- 105+50	- 105+50	- 113+00
LOCATION	- 06 RT	- 24 RT	- 06 LT
DEPTH IN FEET	- 0-5	- 0-5	- 0-5
MAT'L COLOR	- RD/BR	- BROWN	- BR/GR
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 34 7 23.10	- 34 07 22.90	- 34 7 23.50
LONGITUDE DEG-MIN-SEC	- 93 04 47.80	- 93 04 47.80	- 93 04 39.00
% PASSING	2 IN. -	-	-
	1 1/2 IN. -	-	-
	3/4 IN. -	- 100	-
	3/8 IN. - 100	- 97	-
	NO. 4 - 99	- 89	- 100
	NO. 10 - 98	- 84	- 99
	NO. 40 - 91	- 80	- 96
	NO. 80 - 81	- 66	- 71
	NO. 200 - 43	- 34	- 42
LIQUID LIMIT	- ND	- ND	- 42
PLASTICITY INDEX	- NP	- NP	- 24
AASHTO SOIL	- A-4 (0)	- A-2-4 (0)	- A-7-6 (5)
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	- 16.6	- 17.8	- 24.1
ACHMSC (IN)	- 12.0W	- ---	- 5.0W
ACHMBC (IN)	- 1.5	- ---	- 2.0
AGG. BASE CRS. CL-7 (IN)	- 4.0	- ---	- 6.0
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-

REMARKS - W=MULTIPLE LAYERS, X=STRIPPED

MICHAEL BENSON, MATERIALS ENGINEER
*** SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT ***

DATE	- 10/18/18	SEQUENCE NO.	- 2
JOB NUMBER	- 070439	MATERIAL CODE	- SSRVPS
FEDERAL AID NO.	- TO BE ASSIGNED	SPEC. YEAR	- 2014
PURPOSE	- SOIL SURVEY SAMPLE	SUPPLIER ID.	- 1
SPEC. REMARKS	- NO SPECIFICATION CHECK	COUNTY/STATE	- 10
SUPPLIER NAME	- STATE	DISTRICT NO.	- 07
NAME OF PROJECT - 26TH ST. - HWY.67 (PINE ST.) (ARKADELPHIA) (S)			
PROJECT ENGINEER - NOT APPLICABLE			
PIT/QUARRY	- ARKANSAS		
LOCATION	- CLARK, COUNTY	DATE SAMPLED	- 08/29/18
SAMPLED BY	- DICKERSON/FRAZIER	DATE RECEIVED	- 08/30/18
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 10/18/18
MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS			

[illegible]

REMARKS - W=MULTIPLE LAYERS, X=STRIPPED

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS
MATERIALS DIVISION

MICHAEL BENSON, MATERIALS ENGINEER

*** SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT ***

DATE	- 10/18/18	SEQUENCE NO.	- 3
JOB NUMBER	- 070439	MATERIAL CODE	- SSRVPS
FEDERAL AID NO.	- TO BE ASSIGNED	SPEC. YEAR	- 2014
PURPOSE	- SOIL SURVEY SAMPLE	SUPPLIER ID.	- 1
SPEC. REMARKS	- NO SPECIFICATION CHECK	COUNTY/STATE	- 10
SUPPLIER NAME	- STATE	DISTRICT NO.	- 07
NAME OF PROJECT - 26TH ST. - HWY.67 (PINE ST.) (ARKADELPHIA) (S)			
PROJECT ENGINEER - NOT APPLICABLE			
PIT/QUARRY	- ARKANSAS		
LOCATION	- CLARK, COUNTY	DATE SAMPLED	- 08/29/18
SAMPLED BY	- DICKERSON/FRAZIER	DATE RECEIVED	- 08/30/18
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 10/18/18
MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS			

LAB NUMBER	- 20181953	- 20181954	- 20181955
SAMPLE ID	- S495	- S496	- S497
TEST STATUS	- INFORMATION ONLY	- INFORMATION ONLY	- INFORMATION ONLY
STATION	- 129+00	- 137+00	- 137+00
LOCATION	- 18 RT	- 06 RT	- 18 RT
DEPTH IN FEET	- 0-5	- 0-5	- 0-5
MAT'L COLOR	- RD/BR	- RD/BR	- RD/BR
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 34 7 23.10	- 34 07 23.40	- 34 7 23.20
LONGITUDE DEG-MIN-SEC	- 93 04 19.50	- 93 04 10.40	- 93 04 10.40
% PASSING	2 IN. -	-	-
	1 1/2 IN. -	-	-
	3/4 IN. - 100	-	- 100
	3/8 IN. - 93	- 100	- 99
	NO. 4 - 89	- 99	- 98
	NO. 10 - 87	- 98	- 98
	NO. 40 - 80	- 96	- 96
	NO. 80 - 76	- 92	- 90
	NO. 200 - 49	- 43	- 55
LIQUID LIMIT	- 31	- 32	- 31
PLASTICITY INDEX	- 13	- 16	- 14
AASHTO SOIL	- A-6(13)	- A-6(3)	- A-6(5)
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	- 15.3	- 19.7	- 21.1
ACHMSC (IN)	- ---	- 5.5W	- ---
ACHMBC (IN)	- ---	- 1.0	- ---
AGG. BASE CRS. CL-7 (IN)	- ---	- 6.0	- ---
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-

REMARKS - W=MULTIPLE LAYERS, X=STRIPPED

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS
MATERIALS DIVISION

MICHAEL BENSON, MATERIALS ENGINEER

*** SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT ***

DATE	- 10/18/18	SEQUENCE NO.	- 4
JOB NUMBER	- 070439	MATERIAL CODE	- SSRVPS
FEDERAL AID NO.	- TO BE ASSIGNED	SPEC. YEAR	- 2014
PURPOSE	- SOIL SURVEY SAMPLE	SUPPLIER ID.	- 1
SPEC. REMARKS	- NO SPECIFICATION CHECK	COUNTY/STATE	- 10
SUPPLIER NAME	- STATE	DISTRICT NO.	- 07
NAME OF PROJECT - 26TH ST. - HWY.67 (PINE ST.) (ARKADELPHIA) (S)			
PROJECT ENGINEER - NOT APPLICABLE			
PIT/QUARRY	- ARKANSAS		
LOCATION	- CLARK, COUNTY	DATE SAMPLED	- 08/29/18
SAMPLED BY	- DICKERSON/FRAZIER	DATE RECEIVED	- 08/30/18
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 10/18/18
MATERIAL DESC. - SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS			

LAB NUMBER	- 20181956	- 20181957	- 20181958
SAMPLE ID	- S498	- S499	- S500
TEST STATUS	- INFORMATION ONLY	- INFORMATION ONLY	- INFORMATION ONLY
STATION	- 145+00	- 153+00	- 153+00
LOCATION	- 21 LT	- 06 RT	- 15 RT
DEPTH IN FEET	- 0-5	- 0-5	- 0-5
MAT'L COLOR	- BROWN	- RD/BR	- BROWN
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 34 7 23.40	- 34 07 22.80	- 34 7 22.70
LONGITUDE DEG-MIN-SEC	- 93 04 1.30	- 93 03 51.90	- 93 03 51.90
% PASSING	2 IN. -	-	-
	1 1/2 IN. -	-	-
	3/4 IN. -	-	-
	3/8 IN. - 100	- 100	- 100
	NO. 4 - 99	- 99	- 87
	NO. 10 - 99	- 98	- 82
	NO. 40 - 98	- 93	- 75
	NO. 80 - 94	- 88	- 66
	NO. 200 - 56	- 69	- 33
LIQUID LIMIT	- 25	- 27	- 21
PLASTICITY INDEX	- 12	- 12	- 5
AASHTO SOIL	- A-6(3)	- A-6(6)	- A-2-4(0)
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	- 21.2	- 26.5	- 20.4
ACHMSC (IN)	- ---	- 6.5WX	- ---
AGG. BASE CRS. CL-7 (IN)	- ---	- 8.0	- ---
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-

REMARKS - W=MULTIPLE LAYERS, X=STRIPPED

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS
MATERIALS DIVISION

MICHAEL BENSON, MATERIALS ENGINEER

*** SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT ***

DATE	- 10/18/18	SEQUENCE NO.	- 5
JOB NUMBER	- 070439	MATERIAL CODE	- SSRVPS
FEDERAL AID NO.	- TO BE ASSIGNED	SPEC. YEAR	- 2014
PURPOSE	- SOIL SURVEY SAMPLE	SUPPLIER ID.	- 1
SPEC. REMARKS	- NO SPECIFICATION CHECK	COUNTY/STATE	- 10
SUPPLIER NAME	- STATE	DISTRICT NO.	- 07
NAME OF PROJECT	- 26TH ST. - HWY.67 (PINE ST.) (ARKADELPHIA) (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- CLARK, COUNTY	DATE SAMPLED	- 08/29/18
SAMPLED BY	- DICKERSON/FRAZIER	DATE RECEIVED	- 08/30/18
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 10/18/18
MATERIAL DESC.	- SOIL SURVEY - R VALUE- PAVEMENT SOUNDINGS		

LAB NUMBER	- 20181959	- 20181960	-
SAMPLE ID	- S501	- S502	-
TEST STATUS	- INFORMATION ONLY	- INFORMATION ONLY	-
STATION	- 161+00	- 161+00	-
LOCATION	- 06 LT	- 15 LT	-
DEPTH IN FEET	- 0-5	- 0-5	-
MAT'L COLOR	- BROWN	- RD/BR	-
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 34 7 21.30	- 34 07 21.40	-
LONGITUDE DEG-MIN-SEC	- 93 03 42.50	- 93 03 42.50	-
% PASSING	2 IN. -	-	-
	1 1/2 IN. -	-	-
	3/4 IN. - 100	- 100	-
	3/8 IN. - 98	- 97	-
	NO. 4 - 93	- 92	-
	NO. 10 - 89	- 87	-
	NO. 40 - 83	- 79	-
	NO. 80 - 80	- 75	-
	NO. 200 - 63	- 59	-
LIQUID LIMIT	- 27	- 22	-
PLASTICITY INDEX	- 14	- 8	-
AASHTO SOIL	- A-6(6)	- A-4(2)	-
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	- 18.6	- 18.3	-
ACHMSC	(IN) - 4.0X	- ---	-
PCCP	(IN) - 5.5	- ---	-
AGG. BASE CRS. CL-7	(IN) - 6.0	- ---	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-

REMARKS - W=MULTIPLE LAYERS, X=STRIPPED

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT - LITTLE ROCK, ARKANSAS
MATERIALS DIVISION

MICHAEL BENSON, MATERIALS ENGINEER

*** SOIL SURVEY / PAVEMENT SOUNDING TEST REPORT ***

DATE	- 10/18/18	SEQUENCE NO.	- 1
JOB NUMBER	- 070439	MATERIAL CODE	- RV
FEDERAL AID NO.	- TO BE ASSIGNED	SPEC. YEAR	- 2014
PURPOSE	- SOIL SURVEY SAMPLE	SUPPLIER ID.	- 1
SPEC. REMARKS	- NO SPECIFICATION CHECK	COUNTY/STATE	- 10
SUPPLIER NAME	- STATE	DISTRICT NO.	- 07
NAME OF PROJECT	- 26TH ST. - HWY.67 (PINE ST.) (ARKADELPHIA) (S)		
PROJECT ENGINEER	- NOT APPLICABLE		
PIT/QUARRY	- ARKANSAS		
LOCATION	- CLARK, COUNTY	DATE SAMPLED	- 08/29/18
SAMPLED BY	- DICKERSON/FRAZIER	DATE RECEIVED	- 08/30/18
SAMPLE FROM	- TEST HOLE	DATE TESTED	- 10/18/18
MATERIAL DESC.	- SOIL SURVEY - RESISTANCE R-VALUE ACTUAL RESULTS		

LAB NUMBER	- 20181961	-	-
SAMPLE ID	- RV503	-	-
TEST STATUS	- INFORMATION ONLY	-	-
STATION	- 129+00	-	-
LOCATION	- 18 RT	-	-
DEPTH IN FEET	- 0-5	-	-
MAT'L COLOR	- RD/BR	-	-
MAT'L TYPE	-	-	-
LATITUDE DEG-MIN-SEC	- 34 7 23.10	-	-
LONGITUDE DEG-MIN-SEC	- 93 04 19.50	-	-
% PASSING	2 IN.	-	-
	1 1/2 IN.	-	-
	3/4 IN.	- 100	-
	3/8 IN.	- 95	-
	NO. 4	- 95	-
	NO. 10	- 93	-
	NO. 40	- 92	-
	NO. 80	- 86	-
	NO. 200	- 52	-
LIQUID LIMIT	- 27	-	-
PLASTICITY INDEX	- 10	-	-
AASHTO SOIL	- A-4 (2)	-	-
UNIFIED SOIL	-	-	-
% MOISTURE CONTENT	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-
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REMARKS - W=MULTIPLE LAYERS, X=STRIPPED

BID FORM

**ARKADELPHIA WATER UTILITIES
ARKADELPHIA, ARKANSAS**

**PINE STREET WATER AND SEWER RELOCATIONS
ARDOT JOB NO. 070439**

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ARTICLE 1 – BID RECIPIENT

1.01 This Bid is submitted to:

**Arkadelphia Water Utilities
700 Clay Street
Arkadelphia, Arkansas 71923**

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 of 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 60 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:

<u>Addendum No.</u>	<u>Addendum, Date</u>
_____	_____
_____	_____
_____	_____
_____	_____

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 any thing 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
4. "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 complete the Work in accordance with the Contract Documents for the following price(s):

BID SCHEDULE Pine Street Water and Sewer Relocations Arkadelphia Water Utilities Arkadelphia, Arkansas					
Item No.	Description	Unit	Estimated Quantity	Unit Price	Total for Item
Bid Schedule					
1	10" C900 PVC Water Line	LF	90		
2	10" C900 PVC Water Line, Restrained Joint	LF	90		
3	8" C900 PVC Water Line	LF	7,200		
4	8" C900 PVC Water Line, Restrained Joint	LF	60		
5	8" SDR 26 PVC Gravity Sewer	LF	5,750		
6	8" SDR 26 PVC Gravity Sewer, Restrained Joint	LF	850		
7	8" D.I. Gravity Sewer, Restrained Joint	LF	90		
8	6" C900 PVC Water Line	LF	260		
9	6" C900 PVC Water Line, Restrained Joint	LF	450		

EJCDC® C-410, Bid Form for Construction Contracts.

BID SCHEDULE Pine Street Water and Sewer Relocations Arkadelphia Water Utilities Arkadelphia, Arkansas					
Item No.	Description	Unit	Estimated Quantity	Unit Price	Total for Item
10	4" C900 PVC Water Line	LF	90		
11	4" C900 PVC Water Line, Restrained Joint	LF	80		
12	2" DR 21 PVC Water Line	LF	2,300		
13	2" DR 21 PVC Water Line, Restrained Joint	LF	140		
14	20" Steel Encasement, Bored	LF	70		
15	16" Steel Encasement, Bored	LF	750		
16	16" Steel Encasement, Open Cut	LF	80		
17	12" Steel Encasement, Bored	LF	390		
18	8" Steel Encasement, Bored	LF	80		
19	4" Steel Encasement, Bored	LF	130		
20	10" MJ Gate Valve	EA	1		
21	8" MJ Gate Valve	EA	2		
22	6" MJ Gate Valve	EA	8		
23	4" MJ Gate Valve	EA	3		
24	2" MJ Gate Valve	EA	11		

BID SCHEDULE Pine Street Water and Sewer Relocations Arkadelphia Water Utilities Arkadelphia, Arkansas					
Item No.	Description	Unit	Estimated Quantity	Unit Price	Total for Item
25	Fire Hydrant Assembly	EA	21		
26	Water Meter Replacement	EA	77		
27	Reconnect Existing Water Service	EA	7		
28	Water Service Tubing	LF	750		
29	Water Service Tubing, Slick Bored	LF	700		
30	Connect to Ex. 10" Water Line	EA	2		
31	Connect to Ex. 8" Water Line	EA	4		
32	Connect to Ex. 6" Water Line	EA	5		
33	Connect to Ex. 4" Water Line	EA	3		
34	Connect to Ex. 2" Water Line	EA	12		
35	4 ft. Diameter Concrete Manhole	EA	44		
36	4 ft. Diameter Concrete Manhole, Extra Depth	VF	75		
37	Sewer Service Connection	EA	60		
38	4-inch or 6-inch Sch. 40 PVC Sewer Service Line	LF	3,200		
39	Connect to Existing Manhole	EA	2		

BID SCHEDULE					
Pine Street Water and Sewer Relocations					
Arkadelphia Water Utilities					
Arkadelphia, Arkansas					
Item No.	Description	Unit	Estimated Quantity	Unit Price	Total for Item
40	Abandon Existing Manhole	EA	21		
41	Flowable Fill	CY	240		
42	Gravel Surface Replacement	LF	310		
43	Asphalt Pavement Replacement	SY	2,600		
44	Concrete Pavement Replacement	SY	1,900		
45	Traffic Control Plan	Lump Sum			
46	Miscellaneous & Incidental Work	Lump Sum			
47	Acceptance Testing & Disinfection	Lump Sum			
48	Storm Water Permit, Pollution Prevention Plan, and Erosion Control	Lump Sum			
49	Seeding, Sodding, Final Cleanup	Lump Sum			
50	Mobilization, Demobilization, Bonds, Insurance	Lump Sum			
51	Trench Excavation and Safety	Lump Sum			
Total Bid:					
_____ Dollars					

Contract award shall be made based on the Total Bid.

Bidder acknowledges that (1) each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each

separately identified item, and (2) estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all unit price Bid items will be based on actual quantities, determined as provided in the Contract Documents.

ARTICLE 6 – TIME OF COMPLETION

- 6.01 Bidder agrees that the Work will be substantially complete within 365 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 395 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. Required Bid security
 - B. Evidence of authority to do business in the state of Arkansas
 - C. Contractor's License No.: _____

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: _____

Fax Number: _____

Contact Name and e-mail
address: _____

Bidder's License
No.: _____

SECTION 012200

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 installed and approved by the Owner for payment.

1.3 MEASUREMENT AND PAYMENT PROCEDURES

- A. **Item No. 1 - 10" C900 PVC Water Line** - 10" C900 PVC Water Line shall be measured and paid for by the linear footage of pipe as called for in the Bid Form, as finally installed as approved by the Engineer. Measurement will be along the centerline of the route of the water line, with measurement continuous through fittings and in-line valves. The Unit Contract Price shall be inclusive of the cost of all labor, tools, equipment, pipe, pipe zone bedding material, pipe fittings, permits, cleanup, disposal of waste materials, installation, trenching, thrust blocking, anchor collars, backfill, compaction, route clearing, restoration of right-of-way, and all other work incidental thereto except for that work for which separate Unit Prices are stated in the Bid Form. All trench excavation shall be "unclassified"; and no separate or special payment will be made for rock excavation encountered in trenching for pipe installation.
- B. **Item No. 2 – 10" C900 PVC Water Line, Restrained Joint** - 10" C900 PVC Water Line, Restrained Joint shall be measured and paid for by the linear footage of pipe as called for in the Bid Form, as finally installed as approved by the Engineer. Measurement will be along the centerline of the route of the water line, with measurement continuous through fittings and in-line valves. The Unit Contract Price shall be inclusive of the cost of all labor, tools, equipment, pipe, pipe zone bedding material, pipe fittings, permits, cleanup, disposal of waste materials, installation, trenching, thrust blocking, anchor collars, backfill, compaction, route clearing, restoration of right-of-way, and all other work incidental thereto except for that work for which separate Unit Prices are stated in the Bid Form. All trench excavation shall be "unclassified"; and no separate or special payment will be made for rock excavation encountered in trenching for pipe installation.
- C. **Item No. 3 – 8" C900 PVC Water Line** - 8" C900 PVC Water Line shall be measured and paid for by the linear footage of pipe as called for in the Bid Form, as finally installed as approved by the Engineer. Measurement will be along the centerline of the route of the water line, with measurement continuous through fittings and in-line valves. The Unit Contract Price shall be inclusive of the cost of all labor, tools, equipment, pipe, pipe zone bedding material, pipe fittings, permits, cleanup, disposal of waste materials, installation, trenching, thrust blocking, anchor collars, backfill, compaction, route clearing, restoration of right-of-way, and all other work incidental thereto except for that work for which separate Unit Prices are stated in the Bid Form. All trench excavation shall be "unclassified"; and no separate or special payment will be made for rock excavation encountered in trenching for pipe installation.

- D. **Item No. 4 - 8" C900 PVC Water Line, Restrained Joint** - 8" C900 PVC Water Line, Restrained Joint shall be measured and paid for by the linear footage of pipe as called for in the Bid Form, as finally installed as approved by the Engineer. Measurement will be along the centerline of the route of the water line, with measurement continuous through fittings and in-line valves. The Unit Contract Price shall be inclusive of the cost of all labor, tools, equipment, pipe, pipe zone bedding material, pipe fittings, permits, cleanup, disposal of waste materials, installation, trenching, thrust blocking, anchor collars, backfill, compaction, route clearing, restoration of right-of-way, and all other work incidental thereto except for that work for which separate Unit Prices are stated in the Bid Form. All trench excavation shall be "unclassified"; and no separate or special payment will be made for rock excavation encountered in trenching for pipe installation.
- E. **Item No. 5 – 8" SDR 26 PVC Gravity Sewer** - 8" SDR26 PVC Gravity Sewer shall be measured and paid for by the linear footage of pipe as called for in the Bid Form, as finally installed as approved by the Engineer. Measurement will be along the centerline of the route of the gravity sewer, with measurement continuous through manholes. The Unit Contract Price shall be inclusive of the cost of all labor, tools, equipment, pipe, pipe zone bedding material, pipe fittings, permits, cleanup, disposal of waste materials, installation, trenching, thrust blocking, anchor collars, backfill, compaction, route clearing, restoration of right-of-way, and all other work incidental thereto except for that work for which separate Unit Prices are stated in the Bid Form. All trench excavation shall be "unclassified"; and no separate or special payment will be made for rock excavation encountered in trenching for pipe installation.
- F. **Item No. 6 – 8" SDR 26 PVC Gravity Sewer, Restrained Joint** - 8" SDR26 PVC Gravity Sewer, Restrained Joint shall be measured and paid for by the linear footage of pipe as called for in the Bid Form, as finally installed as approved by the Engineer. Measurement will be along the centerline of the route of the gravity sewer, with measurement continuous through manholes. The Unit Contract Price shall be inclusive of the cost of all labor, tools, equipment, pipe, pipe zone bedding material, pipe fittings, permits, cleanup, disposal of waste materials, installation, trenching, thrust blocking, anchor collars, backfill, compaction, route clearing, restoration of right-of-way, and all other work incidental thereto except for that work for which separate Unit Prices are stated in the Bid Form. All trench excavation shall be "unclassified"; and no separate or special payment will be made for rock excavation encountered in trenching for pipe installation.
- G. **Item No. 7 – 8" D.I. Gravity Sewer, Restrained Joint** - 8" D.I. Gravity Sewer, Restrained Joint shall be measured and paid for by the linear footage of pipe as called for in the Bid Form, as finally installed as approved by the Engineer. Measurement will be along the centerline of the route of the gravity sewer, with measurement continuous through manholes. The Unit Contract Price shall be inclusive of the cost of all labor, tools, equipment, pipe, pipe zone bedding material, pipe fittings, permits, cleanup, disposal of waste materials, installation, trenching, thrust blocking, anchor collars, backfill, compaction, route clearing, restoration of right-of-way, and all other work incidental thereto except for that work for which separate Unit Prices are stated in the Bid Form. All trench excavation shall be "unclassified"; and no separate or special payment will be made for rock excavation encountered in trenching for pipe installation.

- H. **Item No. 8 – 6” C900 PVC Water Line** – 6” C900 PVC Water Line shall be measured and paid for by the linear footage of pipe as called for in the Bid Form, as finally installed as approved by the Engineer. Measurement will be along the centerline of the route of the water line, with measurement continuous through fittings and in-line valves. The Unit Contract Price shall be inclusive of the cost of all labor, tools, equipment, pipe, pipe zone bedding material, pipe fittings, permits, cleanup, disposal of waste materials, installation, trenching, thrust blocking, anchor collars, backfill, compaction, route clearing, restoration of right-of-way, and all other work incidental thereto except for that work for which separate Unit Prices are stated in the Bid Form. All trench excavation shall be “unclassified”; and no separate or special payment will be made for rock excavation encountered in trenching for pipe installation.
- I. **Item No. 9 – 6” C900 PVC Water Line, Restrained Joint** – 6” C900 PVC Water Line, Restrained Joint shall be measured and paid for by the linear footage of pipe as called for in the Bid Form, as finally installed as approved by the Engineer. Measurement will be along the centerline of the route of the water line, with measurement continuous through fittings and in-line valves. The Unit Contract Price shall be inclusive of the cost of all labor, tools, equipment, pipe, pipe zone bedding material, pipe fittings, permits, cleanup, disposal of waste materials, installation, trenching, thrust blocking, anchor collars, backfill, compaction, route clearing, restoration of right-of-way, and all other work incidental thereto except for that work for which separate Unit Prices are stated in the Bid Form. All trench excavation shall be “unclassified”; and no separate or special payment will be made for rock excavation encountered in trenching for pipe installation.
- J. **Item No. 10 – 4” C900 PVC Water Line** – 4” C900 PVC Water Line shall be measured and paid for by the linear footage of pipe as called for in the Bid Form, as finally installed as approved by the Engineer. Measurement will be along the centerline of the route of the water line, with measurement continuous through fittings and in-line valves. The Unit Contract Price shall be inclusive of the cost of all labor, tools, equipment, pipe, pipe zone bedding material, pipe fittings, permits, cleanup, disposal of waste materials, installation, trenching, thrust blocking, anchor collars, backfill, compaction, route clearing, restoration of right-of-way, and all other work incidental thereto except for that work for which separate Unit Prices are stated in the Bid Form. All trench excavation shall be “unclassified”; and no separate or special payment will be made for rock excavation encountered in trenching for pipe installation.
- K. **Item No. 11 – 4” C900 PVC Water Line, Restrained Joint** – 4” C900 PVC Water Line, Restrained Joint shall be measured and paid for by the linear footage of pipe as called for in the Bid Form, as finally installed as approved by the Engineer. Measurement will be along the centerline of the route of the water line, with measurement continuous through fittings and in-line valves. The Unit Contract Price shall be inclusive of the cost of all labor, tools, equipment, pipe, pipe zone bedding material, pipe fittings, permits, cleanup, disposal of waste materials, installation, trenching, thrust blocking, anchor collars, backfill, compaction, route clearing, restoration of right-of-way, and all other work incidental thereto except for that work for which separate Unit Prices are stated in the Bid Form. All trench excavation shall be “unclassified”; and no separate or special payment will be made for rock excavation encountered in trenching for pipe installation.

- L. **Item No. 12 - 2" DR 21 PVC Water Line** – 2" DR 21 PVC Water Line shall be measured and paid for by the linear footage of pipe as called for in the Bid Form, as finally installed as approved by the Engineer. Measurement will be along the centerline of the route of the water line, with measurement continuous through fittings and in-line valves. The Unit Contract Price shall be inclusive of the cost of all labor, tools, equipment, pipe, pipe zone bedding material, pipe fittings, permits, cleanup, disposal of waste materials, installation, trenching, thrust blocking, anchor collars, backfill, compaction, route clearing, restoration of right-of-way, and all other work incidental thereto except for that work for which separate Unit Prices are stated in the Bid Form. All trench excavation shall be "unclassified"; and no separate or special payment will be made for rock excavation encountered in trenching for pipe installation.
- M. **Item No. 13 – 2" DR 21 PVC Water Line, Restrained Joint** – 2" DR 21 PVC Water Line, Restrained Joint shall be measured and paid for by the linear footage of pipe as called for in the Bid Form, as finally installed as approved by the Engineer. Measurement will be along the centerline of the route of the water line, with measurement continuous through fittings and in-line valves. The Unit Contract Price shall be inclusive of the cost of all labor, tools, equipment, pipe, pipe zone bedding material, pipe fitting, permits, cleanup, disposal of waste materials, installation, trenching, thrust blocking, anchor collars, backfill, compaction, route clearing, restoration of right-of-way, and all other work incidental thereto except for that work for which separate Unit Prices are stated in the Bid Form. All trench excavation shall be "unclassified"; and no separate or special payment will be made for rock excavation encountered in trenching for pipe installation.
- N. **Item No. 14 – 20-inch Steel Encasement, Bored** – Installation of 20" Bore and steel encasement installed by directional boring or dry boring (auger) and jacking method shall be measured and paid for by the linear footage of encasement pipe as finally installed as approved by the Engineer. Measurement of pipe shall be "end-to-end" straight line measurement of the encasement as finally installed. Unit Contract Price shall be inclusive of the cost of the labor, tools, materials, delivery, boring equipment, boring and jacking procedure, jointing, welding, steel encasement pipe, casing spacers, end seals, excavation and backfilling of the boring pit, and all other work incidental thereto. Carrier pipe through the encasement pipe shall be measured and paid for separately. Repairs to paved surfaces caused by settlement or the boring process shall be included in this unit price.
- O. **Item No. 15 - 16-inch Steel Encasement, Bored** – Installation of 16" Bore and steel encasement installed by directional boring or dry boring (auger) and jacking method shall be measured and paid for by the linear footage of encasement pipe as finally installed as approved by the Engineer. Measurement of pipe shall be "end-to-end" straight line measurement of the encasement as finally installed. Unit Contract Price shall be inclusive of the cost of the labor, tools, materials, delivery, boring equipment, boring and jacking procedure, jointing, welding, steel encasement pipe, casing spacers, end seals, excavation and backfilling of the boring pit, and all other work incidental thereto. Carrier pipe through the encasement pipe shall be measured and paid for separately. Repairs to paved surfaces caused by settlement or the boring process shall be included in this unit price.
- P. **Item No. 16 - 16-inch Steel Encasement, Open Cut** – Installation of 16" Bore and steel encasement installed by open cut method shall be measured and paid for by the linear footage of encasement pipe as finally installed as approved by the Engineer. Measurement of pipe shall be "end-to-end" straight line measurement of the encasement as finally installed. Unit Contract Price shall be inclusive of the cost of the labor, tools, materials, delivery, trenching, jointing, welding, steel encasement pipe, casing spacers, end seals, excavation, backfilling, compaction, and all other work incidental thereto. Carrier pipe through the encasement pipe shall be measured and paid for separately.

- Q. **Item No. 17 - 12-inch Steel Encasement, Bored** – Installation of 12" Bore and steel encasement installed by directional boring or dry boring (auger) and jacking method shall be measured and paid for by the linear footage of encasement pipe as finally installed as approved by the Engineer. Measurement of pipe shall be "end-to-end" straight line measurement of the encasement as finally installed. Unit Contract Price shall be inclusive of the cost of the labor, tools, materials, delivery, boring equipment, boring and jacking procedure, jointing, welding, steel encasement pipe, casing spacers, end seals, excavation and backfilling of the boring pit, and all other work incidental thereto. Carrier pipe through the encasement pipe shall be measured and paid for separately. Repairs to paved surfaces caused by settlement or the boring process shall be included in this unit price.
- R. **Item No. 18 - 8-inch Steel Encasement, Bored** – Installation of 8" Bore and steel encasement installed by directional boring or dry boring (auger) and jacking method shall be measured and paid for by the linear footage of encasement pipe as finally installed as approved by the Engineer. Measurement of pipe shall be "end-to-end" straight line measurement of the encasement as finally installed. Unit Contract Price shall be inclusive of the cost of the labor, tools, materials, delivery, boring equipment, boring and jacking procedure, jointing, welding, steel encasement pipe, casing spacers, end seals, excavation and backfilling of the boring pit, and all other work incidental thereto. Carrier pipe through the encasement pipe shall be measured and paid for separately. Repairs to paved surfaces caused by settlement or the boring process shall be included in this unit price.
- S. **Item No. 19 - 4-inch Steel Encasement, Bored** – Installation of 16" Bore and steel encasement installed by directional boring or dry boring (auger) and jacking method shall be measured and paid for by the linear footage of encasement pipe as finally installed as approved by the Engineer. Measurement of pipe shall be "end-to-end" straight line measurement of the encasement as finally installed. Unit Contract Price shall be inclusive of the cost of the labor, tools, materials, delivery, boring equipment, boring and jacking procedure, jointing, welding, steel encasement pipe, casing spacers, end seals, excavation and backfilling of the boring pit, and all other work incidental thereto. Carrier pipe through the encasement pipe shall be measured and paid for separately. Repairs to paved surfaces caused by settlement or the boring process shall be included in this unit price.
- T. **Item No. 20 – 10-inch MJ Gate Valve** – Installation of 10" MJ Gate Valve shall be measured and paid for by the quantity as called for in the Bid Form, as finally installed as approved by the Engineer. This item shall compensate the Contractor for installation of gate valves including the labor, tools, materials, gate valve, cast iron valve box, concrete collar, tracer wire, water valve sign, and all other work incidental thereto except for that work for which separate Unit Prices are stated in the Bid Form.
- U. **Item No. 21 - 8-inch MJ Gate Valve** – Installation of 8" MJ Gate Valve shall be measured and paid for by the quantity as called for in the Bid Form, as finally installed as approved by the Engineer. This item shall compensate the Contractor for installation of gate valves including the labor, tools, materials, gate valve, cast iron valve box, concrete collar, tracer wire, water valve sign, and all other work incidental thereto except for that work for which separate Unit Prices are stated in the Bid Form.
- V. **Item No. 22 – 6-inch MJ Gate Valve** – Installation of 6" MJ Gate Valve shall be measured and paid for by the quantity as called for in the Bid Form, as finally installed as approved by the Engineer. This item shall compensate the Contractor for installation of gate valves including the labor, tools, materials, gate valve, cast iron valve box, concrete collar, tracer wire, water valve sign, and all other work incidental thereto except for that work for which separate Unit Prices are stated in the Bid Form.

- W. **Item No. 23 - 4-inch MJ Gate Valve** – Installation of 4" MJ Gate Valve shall be measured and paid for by the quantity as called for in the Bid Form, as finally installed as approved by the Engineer. This item shall compensate the Contractor for installation of gate valves including the labor, tools, materials, gate valve, cast iron valve box, concrete collar, tracer wire, water valve sign, and all other work incidental thereto except for that work for which separate Unit Prices are stated in the Bid Form.
- X. **Item No. 24 - 2-inch MJ Gate Valve** – Installation of 2" MJ Gate Valve shall be measured and paid for by the quantity as called for in the Bid Form, as finally installed as approved by the Engineer. This item shall compensate the Contractor for installation of gate valves including the labor, tools, materials, gate valve, cast iron valve box, concrete collar, tracer wire, water valve sign, and all other work incidental thereto except for that work for which separate Unit Prices are stated in the Bid Form.
- Y. **Item No. 25 - Fire Hydrant Assembly** – Fire hydrant assemblies shall be measured and paid for by the units installed as finally approved by the Engineer. Unit Contract Price shall be inclusive of the cost of the fire hydrant, 6" gate valve, swivel adapters, joint accessories, cast iron valve box, labor, tools, excavation, equipment, permits, cleanup, disposal of waste materials, installation, backfill, gravel weep, concrete bearing block, route clearing, restoration of right-of-way, and all other work incidental thereto except for that work for which separate Unit Prices are stated in the Bid Form.
- Z. **Item No. 26 – Water Meter Replacement** – Water Meter Replacement shall be measured and paid for by the units installed as finally approved by the Engineer. Water meter replacements and service connections shall be as shown in the Drawings. Unit Contract Price shall be inclusive of the cost of all labor, tools, equipment, and appurtenances required to remove the existing water meter, meter box and meter setter, pavement cutting as required, cutting and capping existing service line, installation of new service saddle, corporation stop, water meter, meter box, meter setter, ball valve, radio, bedding, backfilling, compaction, and all other work incidental thereto. Water service tubing shall be measured and paid for separately.
- AA. **Item No. 27 – Reconnect Existing Water Service** – Reconnect existing water service shall be measured and paid for by the quantity installed as finally approved by the Engineer. This item shall compensate the Contractor for pavement cutting and excavation to expose the existing water meter, installation of new service saddle, corporation stop, connection to existing water meter, bedding, backfill, compaction, and all other work incidental thereto. Water service tubing shall be measured and paid for separately.
- BB. **Item No. 28 - Water Service Tubing** – Water service tubing shall be measured and paid for by the linear footage of pipe as called for in the Bid Form, as finally installed as approved by the Engineer. Measurement will be along the centerline of the route of the water service line, with measurement continuous through fittings. The Unit Contract Price shall be inclusive of the cost of all labor, tools, equipment, water service tubing, fittings, delivery, installation, trenching, bedding material, backfill, compaction, permits, cleanup, disposal of waste materials, route clearing, restoration of right-of-way, and all other work necessary to completely install new service tubing from new water mains to new and existing water meters, and all work incidental thereto except for that work for which separate Unit Prices are stated in the Bid Form. All trench excavation shall be "unclassified"; and no separate or special payment will be made for rock excavation encountered in trenching for service tubing installation.

- CC. **Item No. 29 – Water Service Tubing, Slick Bored** – Water service tubing, slick bored shall be measured and paid for by the linear footage of bored pipe as shown on the Drawings as finally installed and approved by the Engineer. Unit Contract Price shall be inclusive of the cost of all labor, tools equipment, service tubing, excavating and backfilling bore pits, slick boring paved surfaces without encasement pipe, boring the hole and installing service tubing, filling annular space around tubing after installation, compaction, repairs to paved surfaces due to settlement of the boring process, and all other work incidental thereto.
- DD. **Item No. 30 - Connect to Existing 10-inch Water Line** – Connect to Existing 10-inch Water Line shall be measured and paid for by the quantity as called for in the Bid Form, as finally installed as approved by the Engineer. The Unit Contract Price shall include of the cost of all labor, tools, equipment, materials, pipe, fittings, tapping sleeves, excavation, trenching, dewatering, thrust blocking, anchor collars, tracer wire, locating tape, cutting and capping existing water lines, bedding, backfilling, compaction, restoration of property, and all other work necessary to connect to existing 10-inch water line except for that work for which separate Unit Prices are stated in the Bid Form.
- EE. **Item No. 31 - Connect to Existing 8-inch Water Line** – Connect to Existing 8-inch Water Line shall be measured and paid for by the quantity as called for in the Bid Form, as finally installed as approved by the Engineer. The Unit Contract Price shall include of the cost of all labor, tools, equipment, materials, pipe, fittings, tapping sleeves, excavation, trenching, dewatering, thrust blocking, anchor collars, tracer wire, locating tape, cutting and capping existing water lines, bedding, backfilling, compaction, restoration of property, and all other work necessary to connect to existing 8-inch water line except for that work for which separate Unit Prices are stated in the Bid Form.
- FF. **Item No. 32 - Connect to Existing 6-inch Water Line** – Connect to Existing 6-inch Water Line shall be measured and paid for by the quantity as called for in the Bid Form, as finally installed as approved by the Engineer. The Unit Contract Price shall include of the cost of all labor, tools, equipment, materials, pipe, fittings, tapping sleeves, excavation, trenching, dewatering, thrust blocking, anchor collars, tracer wire, locating tape, cutting and capping existing water lines, bedding, backfilling, compaction, restoration of property, and all other work necessary to connect to existing 6-inch water line except for that work for which separate Unit Prices are stated in the Bid Form.
- GG. **Item No. 33 - Connect to Existing 4-inch Water Line** – Connect to Existing 4-inch Water Line shall be measured and paid for by the quantity as called for in the Bid Form, as finally installed as approved by the Engineer. The Unit Contract Price shall include of the cost of all labor, tools, equipment, materials, pipe, fittings, tapping saddles, excavation, trenching, dewatering, thrust blocking, anchor collars, tracer wire, locating tape, cutting and capping existing water lines, bedding, backfilling, compaction, restoration of property, and all other work necessary to connect to existing 4-inch water line except for that work for which separate Unit Prices are stated in the Bid Form.
- HH. **Item No. 34 - Connect to Existing 2-inch Water Line** – Connect to Existing 2-inch Water Line shall be measured and paid for by the quantity as called for in the Bid Form, as finally installed as approved by the Engineer. The Unit Contract Price shall include of the cost of all labor, tools, equipment, materials, pipe, fittings, tapping sleeves, excavation, trenching, dewatering, thrust blocking, anchor collars, tracer wire, locating tape, cutting and capping existing water lines, bedding, backfilling, compaction, restoration of property, and all other work necessary to connect to existing 2-inch water line except for that work for which separate Unit Prices are stated in the Bid Form.

- II. **Item No. 35 – 4 ft. Diameter Concrete Manhole (0 ft. to 6 ft. Deep)** - 4 ft. diameter manholes 0 ft. to 6 ft. deep shall be measured and paid for separately by the units installed as approved by the Engineer. Manholes up to 6 feet deep will be considered 1 unit. Measurement of manhole depth will be from the top of the manhole ring to the invert of the lowest sewer exiting the manhole, with measurement made to the nearest 0.10 foot. Unit contract price shall be inclusive of labor, tools, equipment, materials, concrete manhole structure, installation, excavation, placement, backfill, gaskets, sealants, concrete bottom, ring and cover, cleanup, route clearing, restoration of right-of-way, connection to existing sewer lines, flow control and bypass pumping, and all other work incident thereto except for that work for which separate unit prices are stated in the Bid Form.
- JJ. **Item No. 36 – 4 ft. Diameter Concrete Manhole, Extra Depth** - Extra depth in new 4 ft. diameter manholes shall be measured and paid for by the vertical foot (v.f.) for the depth that exceeds 6 feet. Measurement of manhole depth will be from the top of the manhole ring to the invert of the lowest sewer exiting the manhole and subtracting 6 feet, with measurement made to the nearest 0.10 foot. Unit Contract Price shall be inclusive of the cost of labor, tools, equipment, materials, flow control and bypass pumping, concrete manhole structure that exceeds 6 feet in depth, installation, excavation, placement, sealants, gaskets, concrete, cleanup, route clearing, restoration of right-of-way, and all other work incident thereto except for that work for which separate Unit Prices are stated in the Bid Form. The manhole depth from 0 to 6 feet and the ring and cover shall be paid for as stated in other Bid Items.
- KK. **Item No. 37 – Sewer Service Connection** – Sewer Service Connections shall be measured and paid for by the units finally installed as approved by the Engineer. Sewer service connections shall be as shown in the Drawings and shall extend from the new sewer main and replace up to 5 ft. of service line. The Unit Contract Price shall include all labor, tools, equipment, materials, fittings, wyes, saddles, compression fittings, bedding, backfill, shielded flexible couplings, concrete encasement, bends, installation, excavation, flow control and bypass pumping, compaction, identification and location of live services **by CCTV or other appropriate method**, route clearing and all other work incident thereto and necessary to externally reinstate the live service to the sewer main. Service lines in excess of 5 feet shall be paid for separately as stated in other Bid Items.
- LL. **Item No. 38 – 4-inch or 6-inch Sch. 40 PVC Sewer Service Line** – 4-inch or 6-inch Sch. 40 PVC sewer service line shall be measured and paid for by the linear footage of pipe as called for in the Bid Form, as finally installed as approved by the Engineer. Measurement will be along the centerline of the route of the service line through fittings, subtracting the 5 feet as paid for in other Bid Items. The Unit Contract Price shall include all labor, tools, equipment, materials, pipe, fittings, bends, cleanouts, bedding, backfill, compaction, concrete, installation, excavation, permits, flow control and bypass pumping, identification and location of live services, route clearing, and all other work incident thereto except for that work for which separate Unit Prices are stated in the Bid Form. All trench excavation shall be “unclassified”; and no separate or special payment will be made for rock excavation encountered in trenching for service line installation.
- MM. **Item No. 39 – Connect to Existing Manhole** - Connections to existing manholes shall be measured and paid for separately by the units installed as approved by the Engineer. The Unit Contract Price shall include all necessary labor, tools, equipment, materials, excavation, perforating and/or cutting and/or coring hole in existing manhole, reshaping existing manhole invert, special pipe seals, pipe entry, sleeves, gaskets, grouting, sealant, installation, cleanup, disposal of waste materials, backfill, compaction, and any other incidental work, except for tasks with separate Unit Prices stated in the Bid Form.

- NN. **Item No. 40 – Abandon Existing Manhole** – Abandon existing manhole shall be measured and paid for by the units demolished as approved by the Engineer. Unit Contract Price shall be inclusive of labor, tools, equipment, materials, flow control and bypass pumping, excavation removal of top 3 ft. of concrete manhole structure, disposal of debris, permits, cleanup, route clearing, restoration of right of way, flowable fill used for backfill material under asphalt and concrete and all other work incidental thereto. Flowable fill used for filling the existing manhole shall be paid for as stated in Bid Item No. 41.
- OO. **Item No. 41 – Flowable Fill** – Flowable Fill as utilized for filling the existing pipelines to be abandoned, filling demolished manholes and other purposes as authorized by the Engineer shall be measured and paid for by the cubic yards actually used in the work. Quantity will be determined from the invoiced quantity, with all invoices as verified and approved by the Engineer. The Unit Contract Price shall include the cost of the flowable fill material, delivery, placement, forming, and all other work incidental thereto.
- PP. **Item No. 42 – Gravel Surface Replacement** – Gravel surface repair for driveways and parking lots shall be measured and paid for by the linear footage of replacement actually installed as approved by the Engineer. The Unit Contract Price shall include the cost of labor, equipment, tools, materials, ARDOT Class 7 crushed stone, delivery, placement, compaction, cleaning, and all other incidental work necessary to completely replace gravel surfaces as shown on the drawings, except for tasks with separate Unit Prices stated herein.
- QQ. **Item No. 43 - Asphalt Pavement Replacement** - Asphalt pavement replacement for highways, streets, driveways, and parking lots due to water and sewer installation shall be measured and paid for by the square yards of replacement actually installed as approved by the Engineer. Quantity will be determined by measurement of the centerline length multiplied by the average width of the surface replaced. Maximum width for pavement replacement for payment purposes shall be the width of trench at the top of the pipe plus two (2) feet unless otherwise approved by the Engineer/Owner. The Unit Contract Price shall include the cost of labor, tools, equipment, materials, concrete, asphalt, curb and gutter forming and placement, reinforcement, ARDOT Class 7 crushed stone, delivery, placement, forming, finishing, saw-cutting existing pavement, expansion joints, disposal of debris, and all other incidental work necessary to completely repair and/or replace asphalt/concrete streets and roads surfacing in accordance with the contract documents and as shown on the drawings.
- RR. **Item No. 44 - Concrete Pavement Replacement** - Concrete pavement replacement for highways, streets, driveways, parking lots, and sidewalks due to water and sewer installation shall be measured and paid for by the square yards of replacement actually installed as approved by the Engineer. Quantity will be determined by measurement of the centerline length multiplied by the average width of the surface replaced. Maximum width for pavement replacement for payment purposes shall be the width of trench at the top of the pipe plus two (2) feet unless otherwise approved by the Engineer/Owner. The Unit Contract Price shall include the cost of labor, tools, equipment, materials, concrete, curb and gutter forming and placement, reinforcement, ARDOT Class 7 crushed stone, delivery, placement, forming, finishing, saw-cutting existing pavement, expansion joints, disposal of debris, and all other incidental work necessary to completely repair and/or replace asphalt/concrete streets and roads surfacing in accordance with the contract documents and as shown on the drawings.
- SS. **Item No. 45 – Traffic Control Plan** – Traffic Control Plan 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, signs, barricades, personnel, permits, materials, and plans necessary to comply with all traffic requirements in accordance with city and state regulations and as specified herein.

- TT. **Item No. 46 – Miscellaneous & Incidental Work** - Miscellaneous and incidental work shall be paid for at the stated lump sum amount to cover the cost of incidental work that is not included in the other unit or lump sum prices as stated in the Bid Form, including any special considerations. This lump sum amount shall be paid based upon the percentage of pipe that is installed and completed.
- UU. **Item No. 47 – Acceptance Testing & Disinfection** - Acceptance testing & disinfection shall be paid for at the stated lump sum amount for the job requirements as stated in the Bid Form as approved by the Engineer. The lump sum amount shall include all labor, tools, equipment, materials, preparation, flow control and bypass pumping, water and power for testing, **CCTV inspection**, cleanup, disposal of waste materials, chemicals for disinfection, and all other work incidental and necessary to perform all acceptance testing of the gravity sewer mains and manholes as specified herein, and all other work incidental and necessary to disinfect and perform all acceptance testing of the water lines in accordance with the contract documents.
- VV. **Item No. 48 - Storm Water Permit, Pollution Prevention Plan, and Erosion Control** - Preparation of the Storm Water Permit, Pollution Prevention Plan, and erosion control 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, cost of storm water permit fees, preparation of storm water permit and pollution prevention plan, erosion and siltation control, berms, barriers and filters, silt fencing, geotextile separator fabric, riprap, straw, stormwater inlet and outlet protection, sediment traps, compliance with all aspects of the storm water permit and pollution prevention plan, and all other costs related to the work called for in the specifications.
- WW. **Item No. 49 – Seeding, Sodding, Final Cleanup** – This item shall compensate the Contractor for establishment of grass and final cleanup in all disturbed areas and shall be paid for at the lump sum amount for the job requirement as stated in the Bid Form. The lump sum amount shall include the cost of seed, sod, mulch, fertilizer, equipment, finish grading, watering, raking, tackifiers, and all other work incidental thereto. This lump sum amount shall be paid based upon the percentage of seeding, sodding, and cleanup that is completed.
- XX. **Item No. 50 – Mobilization, Demobilization, Bonds, Insurance** – Mobilization, Demobilization, Bonds, Insurance 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 preparatory work and operations necessary for movement of personnel, equipment, supplies, and incidentals to the project site; establishment of temporary offices, storage, buildings, sanitary facilities, and other facilities necessary to undertake the project; work or operations which must be performed, or for expenses incurred prior to beginning work on the project; bonds and insurance costs; and preconstruction costs not directly attributable to other pay items in this section. A portion of this lump sum amount shall be paid after mobilizing to the project site. No additional payment shall be allowed for multiple mobilization operations, site visits, delivery, transportation, or other mobilization related activities, and shall be as required to provide a complete and functional system as required by the Contract Documents. A maximum of 60% of the total lump sum amount for this bid item will be paid in the first progress payment unless otherwise approved by engineer.
- YY. **Item No. 51 - Trench Excavation and Safety** - 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. The lump sum amount shall include all labor, equipment, tools, materials, sheeting, shoring, bracing, permits, and all appurtenances necessary to comply with all safety standards in accordance with the requirements of both OSHA and the Contract Documents. This lump sum amount shall be paid based upon the percentage of pipe that is installed and completed.

PART 2 - MATERIALS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 331113

WATER LINE PIPE AND FITTINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall furnish and install water line 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 pipe and fittings shall be of the same specification and furnished by the same manufacturer.
- C. All pipe, fittings and other materials shall be new.

1.2 REFERENCES

- A. Ductile Iron Pipe Research Association (DIPRA), 245 Riverchase Parkway, Birmingham, AL.
 - 1. Handbook of Ductile Iron Pipe, Latest Edition.
- B. Uni-Bell PVC Pipe Association, 2655 Villa Creek Drive, Suite 155, Dallas, TX.
 - 1. Handbook of PVC Pipe, Fourth Edt.
- C. American Society for Testing and Materials (ASTM), 100 Barr Harbor Drive, West Conshohocken, Pennsylvania 19428.
 - 1. ASTM A126 - Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
 - 2. ASTM B61 - Specification for Steam of Valve Bronze Castings.
 - 3. ASTM C150 - Specification for Portland Cement.
 - 4. ASTM D2241 - Specification for Rigid Poly(Vinyl Chloride)(PVC) Pressure Rated Pipe (SDR-Series).
 - 5. ASTM D3139 - Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.
 - 6. ASTM F477 - Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
- D. American Water Works Association (AWWA), 6666 West Quincy Avenue, Denver, CO 80235.
 - 1. AWWA C104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings.
 - 2. AWWA C105 - Polyethylene Encasement for Ductile-Iron Pipe Systems.
 - 3. AWWA C110 - Ductile-Iron and Gray-Iron Fittings, 3-in through 48-in for Water and Other Liquids.
 - 4. AWWA C111 - Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings.
 - 5. AWWA C115 - Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
 - 6. AWWA C150 - Thickness Design of Ductile-Iron Pipe.

7. AWWA C151 - Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds.
 8. AWWA C500 - Gate Valves for Water and Sewerage Systems.
 9. AWWA C605 - Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water
 10. AWWA C651 - Standard for Disinfecting Water Mains.
 11. AWWA C900 - Standard for Poly(Vinyl Chloride)(PVC) Pressure Pipe, 4 Inch through 24 Inch, for Water Distribution.
- E. American Welding Society (AWS), 8669 North West 36 Street, Number 130, Miami, Florida 33166.
1. AWS D11.2 Guide for Welding Iron Casting.
- F. Manufacturers Standardization Society (MSS)
1. MSS SP-60- Connecting Flange Joint between Tapping Sleeves and Tapping Valves.
 2. MSS SP-111- Gray Iron and Ductile Iron Tapping Sleeves.
- G. Ten States Standards
1. Recommended Standards for Water Works, most recent published edition.

1.3 SUBMITTALS

- A. Submit in accordance with Section 013300 – Submittal Procedures.

1.4 QUALITY ASSURANCE

- A. Tests: Except as modified herein, all materials used in the manufacture of the pipe shall be tested in accordance with requirements as applicable.
- B. Third Party Inspection: All pipe material suppliers shall be ISO 9001 or 9002 registered or provide the services of an independent inspection agency. Prior to the start of manufacturing, any manufacturer not meeting the ISO registration requirements shall submit to the Engineer the name of an independent inspection agency for approval. The independent inspection agency shall be responsible for sample monitoring of chemical and mechanical test, sample visual inspection of quality assurance tests performed on in-process pipe and fittings, and a sample visual and dimensional inspection on finished product for this project. A certified inspection report from the independent inspection agency of all witnessed tests shall be supplied to the Engineer within ten (10) days of completion of pipe manufacturing. Chemical samples shall be taken from each ladle of iron and the Manufacturers' chemical control limits shall be maintained for at least the following elements: carbon, sulfur, phosphorus, silicon, magnesium, chromium, manganese, tin, aluminum, cerium, copper, and lead. When chemical values fall outside the Manufacturers' control limits, additional mechanical property test shall be performed to assure minimum mechanical properties are met. All this shall be done at the Owner's discretion.
- C. Field Quality Assurance: Every effort shall be taken to assure the pipe is undamaged before installation. The contractor shall carefully unload pipe from the trucks when stringing alongside the trench. Use only slings or harness made of webbing or other material which will not damage the outside or the inside of the pipe. Do not use fork lifts that may damage the lining of the pipe or fittings.

PART 2 - PRODUCTS

2.1 BUILD AMERICA, BUY AMERICA ACT

- A. All water line pipe, fittings, and materials shall comply with the requirements, terms and conditions of Build America, Buy America Act (BABA) (23 U.S.C. 313, 23 CFR 635.410) under the Infrastructure Investment and Jobs Act (IIJA)/Bipartisan Infrastructure Law (BIL) (Pub. Law 117-58, Nov. 15, 2021).

2.2 DUCTILE IRON PIPE

- A. Ductile iron pipe shall conform to the requirements of AWWA C150 and AWWA C151.
- 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. Joints: Pipe shall be furnished as follows unless otherwise noted on the Drawings.
- Buried Pipe: Push-on joint and integral bell complying with AWWA C111.
 - Exposed Pipe: Flanged joint complying with AWWA C110 and AWWA C115, 125 lb. standard. Bolts for flanged connections shall comply with ANSI B16.1.
 - Restrained joint ductile iron pipe shall be Flex Ring, Lok-Ring, or Field Flex Ring restrained joint by American Ductile Iron Pipe or approved equal.
- D. Cement Mortar Lining
- Ductile iron pipe shall be internally lined with cement-mortar lining in accordance with AWWA C104.
 - 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.
- 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.
- Pipe shall be furnished with standard bitumastic coating per AWWA standard.
 - Exposed pipe shall be coated with Tnemec 140-1211 primer or equal.
- G. Manufacturers approved for push-on and restrained joint ductile iron pipe include American Pipe, McWane Pipe, U.S. Pipe, or approved equal.

2.3 DUCTILE IRON FITTINGS

- General: 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.

2. Cement Lining: All fittings shall be internally lined with cement mortar lining in accordance with AWWA C104. The cement lining thicknesses shall be equal to or greater than those for comparable size pipe.
1. Joints: Fittings shall be furnished as follows unless noted otherwise on the Drawings.
 1. Buried Pipe Fittings: 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.
- E. Coatings
 1. Buried pipe fittings shall be furnished with standard bitumastic coating per AWWA standard.
 2. Exposed pipe fittings shall be coated with Tnemec 140-1211 primer or equal coating.
- F. Fittings 2 Inches and Larger: Where taps are shown on fittings, tapping bosses shall be provided.
- G. Fittings shall have distinctly cast on them the manufacturer's identification, pressure rating, nominal diameter of openings, and the number of degrees or fraction of the circle on bends.
- H. Buried fittings shall be wrapped in polyethylene material.
- H. Buried fittings shall be wrapped in polyethylene material.

2.4 **C900 PVC PIPE**

- A. PVC pressure pipe with gasket joints and integral bell for buried piping shall conform to the requirements of AWWA C900 for **235** psi working pressure (**DR 18**).
- B. PVC pipe shall be PVC 1120 pressure pipe made from class 12454-A or 12454-B material as defined by ASTM D 1784. PVC compounds shall be treated and certified as suitable for potable water products by the National Sanitation Foundation (NSF) Testing Laboratory.
- C. Pipe and couplings 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. Dimension Ratio.
 6. AWWA pressure class
- 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 blue in color.

2.5 **DR-21 PVC PIPE**

- A. **General: PVC pressure pipe with gasket joints and integral bell for buried water piping.**

- B. **Manufactured to meet requirements of ASTM D2241.**
 - 1. **Pressure rating of 200 psi (DR-21)**
 - 2. **Outside diameter of steel pipe.**
- C. **PVC pipe shall be PVC 1120 pressure pipe made from class 12454-A or 12454-B material as defined by ASTM D1784. PVC compounds shall be treated and certified as suitable for potable water products by the National Science Foundation (NSF) Testing Laboratory.**
- D. **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**
- E. **Pipe shall have push-on rubber gasketed joints designed in accordance with ASTM D3139 and rubber gaskets complying with ASTM F-477.**

2.6 **RESTRAINED JOINT PVC PIPE**

- B. **Restrained joint PVC pipe shall conform to the requirements of ASTM D1785, ASTM D2665, and AWWA C900 for 235 psi working pressure (DR 18) and shall be fully restrained joint pipe.**
- F. **PVC pipe shall be PVC 1120 pressure pipe made from class 12454-A or 12454-B material as defined by ASTM D 1784. PVC compounds shall be treated and certified as suitable for potable water products by the National Sanitation Foundation (NSF) Testing Laboratory.**
- G. **Pipe and couplings 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. **Dimension Ratio.**
 - 6. **Pressure Rating**
- H. **Pipe shall be joined using non-metallic couplings to form an integral system for maximum reliability and interchangeability. High strength, flexible thermoplastic splines shall be inserted into mating, precision machined grooves in the pipe and coupling to provide full 360 degree restraint with evenly distributed loading. Couplings shall be designed for use at or above the pressure class of the pipe with which they are utilized, and shall incorporate twin elastomeric sealing gaskets meeting the requirements of ASTM F 477. Joints shall be designed to meet the zero leakage test requirements of ASTM D3139.**
- I. **Pipe for slick bores shall be C900 RJIB PVC (Certa-Lok) restrained joint pipe by Westlake Pipe & Fittings, or approved equal.**
- J. **Pipe location devices**

1. All buried PVC piping to have an electrically conductive tracer wire at least 12 gauge with a HDPE jacket to locate the pipe from grade level. All grade level connection points for the purpose of locating buried pipe to be identified and submitted to the municipality.
2. Tracer wire to be secured to the PVC pipe at 10 ft. maximum intervals.
3. Solder tracer wire intersections to provide continuity and be electrically isolated from ground.
4. Subsurface waterproof connectors specifically designed for buried service to be used.

2.7 POLYETHYLENE ENCASEMENT

- A. Polyethylene encasement shall be used on all ductile iron pipe except for pipe within levees and within lagoons.
- 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.

2.8 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 ductile iron pipe, mechanical joint restraining glands provide 1100 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. The devices shall have a working pressure rating of 350 psi for 3-16 inch and 250 psi for 18-48 inch. Ratings shall be for water pressure and shall include a minimum safety factor of 2 to 1 in all sizes.
 3. Gland body, wedges and wedge actuating components shall be cast from ductile iron in accordance with ASTM A536.
 4. Ductile iron gripping wedges shall be heat treated within a range of 370 to 470BHN.
 5. Proper actuation of the gripping wedges shall be ensured with torque limiting twist off nuts.
 6. 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 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.
- E. 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.
- 2.9 LOCATING TAPE
- A. Water line locating tape shall be blue in color and include the words "Water Line Below" in black print.
 - B. Water line locating tape shall be Terra Tape "Extra Stretch", or equal.
- 2.10 TEMPORARY PIPE PLUGS
- A. Non-pressure polyethylene plugs with handles sized to fit bells or spigots or sizes 6 to 60" shall be Taylor Made Plastics or equal.
- 2.11 TRACER WIRE
- A. Tracer wire shall be 12-gage insulated copper, with fittings, splice kits, and accessories as required.
 - B. 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.
 - C. Splice repair kits shall be 3M Model DBY-6 electrical/telephone direct bury splice kit or equal.
 - D. Trace wire splice caps shall be Carsonite Model LCTSI508.
 - E. Trace wire splice poles shall be Carsonite Model CTP307201.
- 2.12 FIBERGLASS POST MARKERS FOR WATER LINE
- A. Fiberglass post utility markers shall be fiberglass reinforced composite, 3.75 inches wide, and 72 inches long.
 - B. Fiberglass post markers shall be blue in color.
 - C. Fiberglass post utility markers shall have decals for visible identification of buried water line day or night.

- D. Signs shall be Carsonite International, or equal.

2.13 PIPE TRENCH EXCAVATION, BACKFILL AND COMPACTING

- A. Trench excavation, backfill, compacting and pipe zone material shall be in accordance with Section 312333 "Trench Excavation, Backfill and Compacting."

2.14 CONCRETE FOR THRUST BLOCKING

- A. Concrete shall be ready mixed concrete conforming to ASTM C94. Concrete used for thrust blocking and concrete encasement shall be 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 shall not be permitted.

2.15 BOLT-THRU MJ RESTRAINT

- A. Mechanical joint (MJ) valves and fittings shall be connected using a bolt-through positive restraint mechanism manufactured of U. S. A. ductile iron conforming to ASTM A536, 65-45-12. The positive restraint device shall connect the valves and/or fittings at a linear distance not to exceed three (3) inches and without attachment to pipe. The device shall come complete with all accessories, including standard styrene butadiene rubber (SBR) MJ gaskets conforming to the latest revision of AWWA C111/ASTM F-477 and weathering steel (Corten) bolts conforming to AWWA C111/A21.11 and ASTM A242. Nuts for 3 through 12-inch sizes shall be SAE Grade 5 steel with black oxide coating. Nuts for 14-inch and larger adaptors shall be heavy hex Corten steel conforming to ASTM A242. Sizes 3-12-inch of the bolt-through MJ positive restraining device shall be supplied with an NSF 61 asphaltic seal coating in accordance with ANSI/AWWA C104/A21.4. Sizes 14-36-inch shall be supplied with NSF 61, 7-mil. fusion bonded epoxy conforming to AWWA C116/A21.16-09 as well as the coating, surface preparation and application requirements of ANSI/AWWA C550. The device shall be used with standard mechanical joint fittings (AWWA C110 or C153) and valves.
- B. Bolt-Thru MJ restraint shall be Foster Adaptor by Infact Corporation, or approved equal.

2.16 THREADED PIPE AND FITTINGS

- A. Threaded pipe and fittings shall be Schedule 80 PVC or as noted on the Drawings.

2.17 SERVICE LINES

- A. Service lines shall be 1" or 3/4" HDPE, PVC, or Poly tubing with tracer wire.

2.18 METERS, METER SETTERS, METER BOXES

- A. Meters shall be 5/8"x1/2" as specified in section 331233 – Water Meters.
- B. Meter setters shall be 3/4"x1/2" Ford.
- C. Meter boxes in unpaved areas shall be DFW 37C or HDPE.
- D. Meter boxes in concrete or asphalt paved areas shall be precast concrete with a steel frame and cover and be traffic rated for 16,000 lb design load.

2.19 CORP STOP

- A. Corp stops shall be Ford with c.c. threads.

PART 3 - EXECUTION

3.1 STRINGING THE PIPE

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

3.2 HANDLING AND LAYING PIPE AND FITTINGS

- A. Trench and backfill shall be in accordance with Section 312300 - Trench Excavation, Backfill, and Compacting.
- B. Water line pipe shall be transported, unloaded, stored, stacked, cut, handled, and installed in accordance with the pipe manufacturer's recommendations. Do not place anything, such as forklift fork, inside pipe for the purpose of handling. Use only equipment recommended by the manufacturer, Uni-Bell, or DIPRA for safe handling of the pipe.
- C. Each joint of pipe shall be inspected immediately before laying and any pipe found to be faulty or damaged shall be marked in an obvious and permanent manner and removed from site. A faulty or damaged joint 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 protrude into the path of the pipe when it enters.
- F. Apply lubricant 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.

- I. 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.
- J. Contractor shall keep the interior of the pipe free from dirt, rocks, and other debris during construction.
- K. Pipe shall not be left unattended with an open end. Plug the open end with a temporary plastic plug.

3.3 MINIMUM DEPTH OF COVER

- A. Pipe shall be installed with a minimum cover of 30 inches over the top of the pipe, unless otherwise shown on the Drawings.

3.4 SEPARATION FROM EXISTING UTILITIES

- A. Maintain 12-inches minimum vertical separation between proposed water main and all existing utilities (except sewer).
- B. Maintain 18-inches minimum vertical separation (water over sewer) and 10-feet minimum horizontal separation between proposed water main and existing sanitary sewer mains.
- C. If minimum separation distances cannot be maintained, construct water main from ductile iron pipe and provide a pressure tested steel encasement around water main using casing spacers inside and end seals.

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 ductile iron pipe and fittings.
- B. Fittings and appurtenances shall be completely encased in polyethylene material. It is not the intent that the material form an enclosure that is absolutely air and water tight, but to prevent pipe to soil contact.
- C. Polyethylene material shall be applied to ductile iron 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 of the 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 1 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 1 foot; make snug and secure each end.

- D. Ductile iron pipe shaped appurtenances such as bends, reducers, offsets and other pipe shaped appurtenances shall be covered with polyethylene in the same manner as pipe.
- E. 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.
- F. 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.
- G. 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.
- H. The polyethylene material shall be secured around the pipe and appurtenances by at least three circumferential wraps of tape.
- 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 or with a short length of polyethylene tube cut open and wrapped around the pipe or appurtenance and secured in place.
- 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 THRUST BLOCKS

- A. Concrete thrust blocking shall be in accordance with details on the Drawings.
- B. Install 3,000 psi thrust blocks at bends, wyes, tees, tapping sleeves, and other thrust points.
- 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. Concrete shall not be placed where it interferes with the removal of any joint accessories such as bolts, threads, collars, couplings, etc.
- F. The top of the concrete thrust block shall be struck off with a wood straight edge or float.
- G. Concrete shall not be placed when the temperature is below 40 degrees F and dropping or below 35 degrees F if the temperature is rising, unless approved by the Engineer.
- H. 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.
- I. Backfill over thrust blocking shall not be placed before the concrete has attained initial set.
- J. Thrust blocking shall not be less than 6-inches thick between the pipe line or appurtenances and undisturbed soil in the direction of thrust.
- K. The excavation shall be free of water before concrete is placed.
- L. The pipe or appurtenance shall be cleaned before placing concrete when the concrete is to be in direct contact with the pipe or appurtenance.

3.7 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. Fittings including glands and bolts shall be encased in polyethylene material.

3.8 LOCATING TAPE

- A. Locating tape shall be used on all pipe including ductile iron pipe.
- B. Install 12" to 18" above the sewage force main pipe as shown on the Drawings.
- C. The locating tape shall be in addition to trace wire.

3.9 TRACE WIRE

- A. All pipe including ductile iron pipe shall be installed with copper trace wire.
- B. Run wire continuous from valve box to valve box, meter box, or other access point. If no access point is available and a splice is required, provide a tracer wire splice pedestal consisting of a tracer wire splice pole and cap at nearest property line or at a location as approved by the Engineer.
- C. Pipe testing shall include tracer wire. Contractor shall replace the trace wire along the pipe route for any areas in which the pipe cannot be located from the original trace wire installation.

- D. Wire breaks shall be repaired with repair kit at no additional expense to the Owner. Repair kits are to be used only to repair wire breaks that occur on tracer wire which has already been backfilled. The splice kit is used because there is not enough slack available in the tracer wire to splice the wire in a tracer wire splice pedestal. If the tracer wire is broke during installation, the Contractor should splice the wire in a tracer wire splice pedestal.

3.10 DISINFECTION

- A. Disinfect the pipe per Section 331300 - Disinfection of Water Distribution System.

3.11 FENCE RESTORATION

- A. The Contractor shall remove and replace fencing as required for pipe installation.
- B. The Contractor shall be responsible for maintenance of fences during construction. The Contractor shall provide as necessary temporary fencing, gates, etc., as may be required to afford access to the construction site and maintain the full integrity of the fence.
- C. All fences disturbed by construction activity shall be restored to their original condition or better using fencing materials that are of the same size, type, metal gauge, and character as the original fence.

3.12 CONNECTION TO EXISTING LINES

- A. Connection to the existing water distribution system shall me made in the manner as detailed on the Drawings. Contractor shall provide all necessary temporary caps, plugs, and restraints in order to pressure test and disinfect the proposed water lines.
- B. The work shall be planned and executed so as to minimize the interruption of service to the water distribution system.
- C. Contractor shall notify the Arkadelphia Water Utility 48 hours in advance of any interruption of service.
- D. The Contractor shall not operate any existing valves in the Arkadelphia Water Utility water distribution system without the approval of the Arkadelphia Water Utility.
- E. If requested, the Contractor shall make connections to the existing water distribution system at a time in which water demands are minimal.

3.13 TESTING

- A. Pressure lines shall be hydrostatically tested in accordance with Section 331400.
- B. Engineer and Owner shall observe and document tests.
- C. Use pipe-locating equipment to test continuity of trace wire.

3.14 FIELD REPAIRS

- A. In the event that testing reveals a leak either at the joint or anywhere in between field repairs shall utilize mechanical joint solid sleeves conforming to AWWA C153 and C110 respectively. Leaks originating with improperly installed or defective gaskets shall not be repaired with bell joint leaks clamps or other similar device. Leaks originating from a perforation in the pipe wall shall not be repaired with full circle clamps or similar. Instead

the source of the leak shall be cut out and suitable length of new pipe inserted in place of the cut out section and then coupled together with the solid sleeves.

3.15 INSPECTION

- A. Construction of the water line will be inspected by the Engineer and the Owner. Do not cover any work without approval of Inspector. Work covered prior to inspection will be uncovered and reworked as required at Contractor's expense.

END OF SECTION

APPENDIX B

SPECIAL CONSIDERATIONS

City of Arkadelphia
Utility Department
SPECIAL CONSIDERATIONS

Job Title: Pine Street Water and Sewer Relocations

RPID # 19784

Book # 2019 Page # 818

Property Owner: Bross Inc DBA Ozark Cleaners & Brayden Sanders

Property Address:

Pine St

Phone No. _____

Mailing Address:

1525 Pine St Arkadelphia, AR 71923

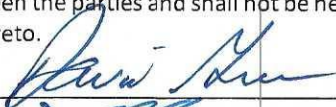
Phone No. _____

In consideration for the Permanent Utility Easement, the City of Arkadelphia agrees to the following:

Both an entrance and an exit will be accessible at all times during construction. A temporary access drive shall be maintained on the west side of the property at all times during construction. All construction on the east side of the property shall take place on weekends only. Acceptable working hours on weekends are 7:00 AM to 7:00 PM, Saturday and Sunday.

Total Compensation for the above listed items shall be in the amount of \$ _____

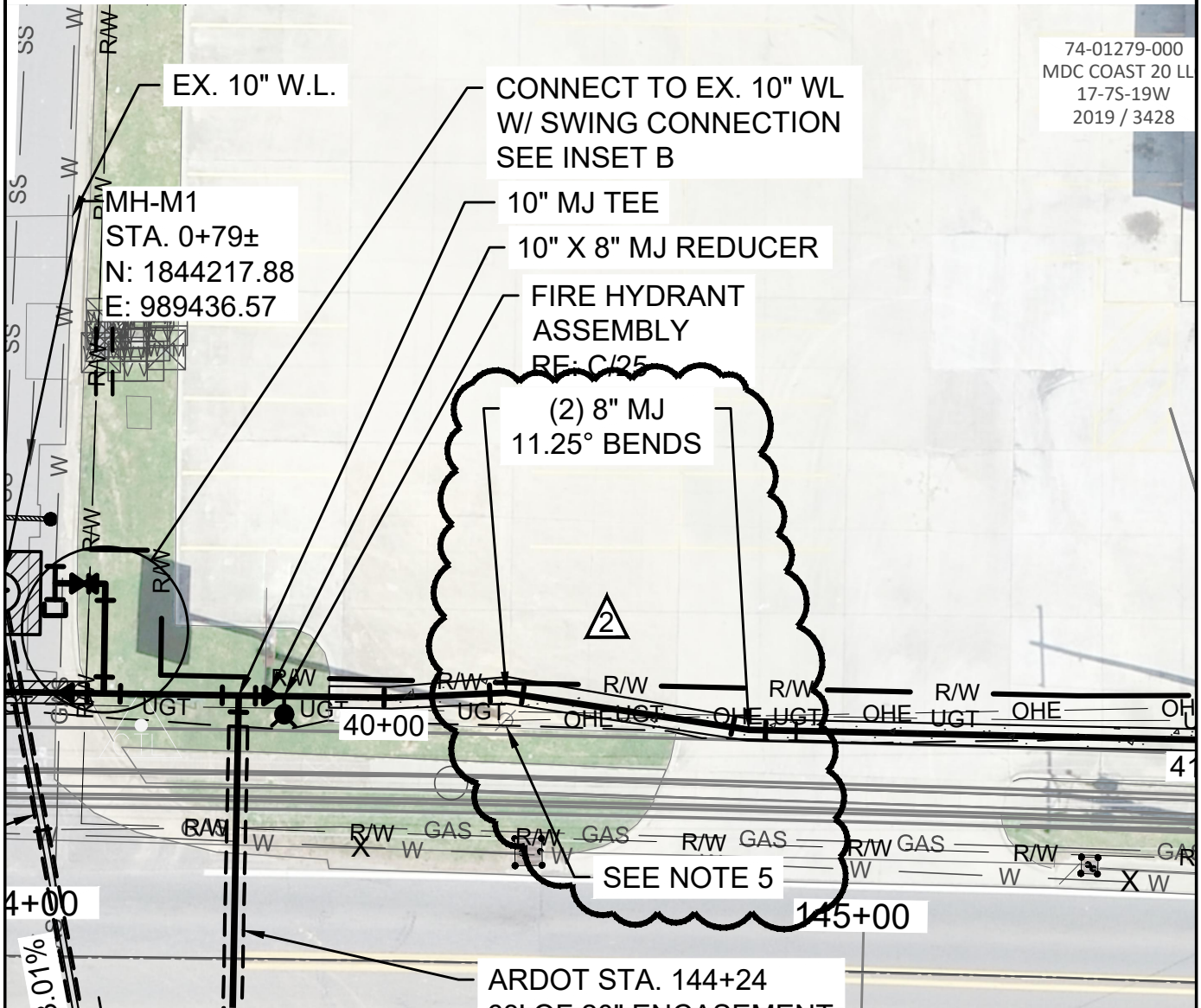
It is agreed that neither party hereto is relying upon any oral or written information or representations made by the other prior to the signing of the easement unless expressly provided herein, and that easement constitutes the entire agreement between the parties and shall not be hereafter amended or modified unless reduced to writing and signed by the parties hereto.

Acting Agent:  Date: 11-28-2023

Property Owner(s):  Date: 11-29-23

Date: _____

74-01279-000
MDC COAST 20 LL
17-7S-19W
2019 / 3428



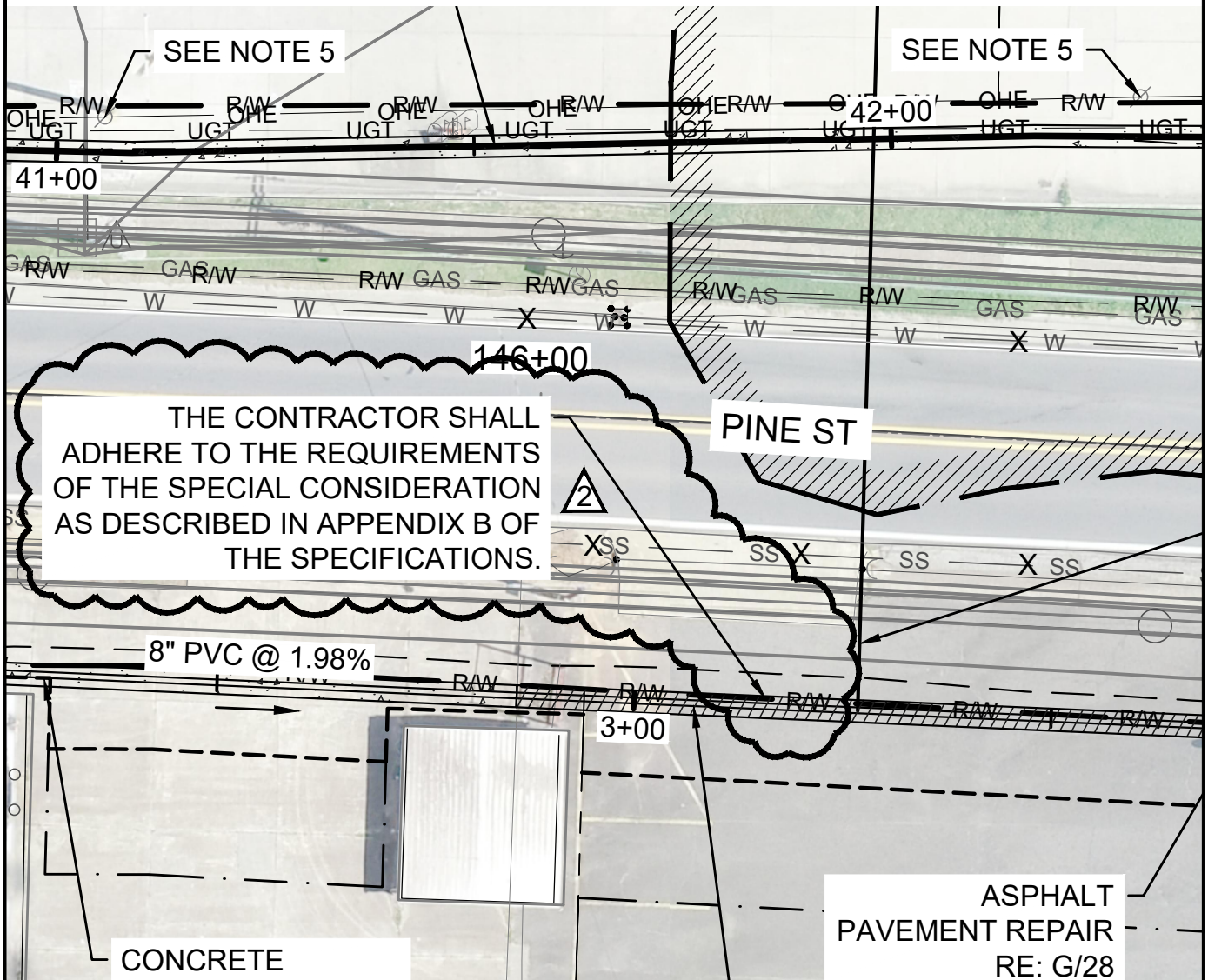
10 - PLAN - STA 139+00 - 145+00

PLAN

SCALE: 1" = 20'



 CRIST ENGINEERS, INC. CONSULTING ENGINEERS LITTLE ROCK, ARKANSAS			
ARKADELPHIA, ARKANSAS PINE STREET WATER AND SEWER RELOCATIONS ARDOT JOB NO. 070439 PLAN - STA 139+00 - 145+00			
DESIGNED: MPA	JOB NO. 1970	DATE DEC. 2023	ADD. NO. 2
DRAFTED: ATV	SCALE: NOT TO SCALE	REF SHEET 10	
CHECKED: MDD			



11 - PLAN - STA 145+00 - 150+00

PLAN

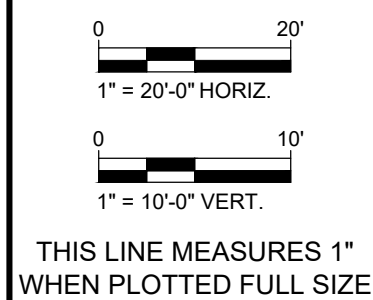
SCALE: 1" = 20'



 CRIST ENGINEERS, INC. CONSULTING ENGINEERS LITTLE ROCK, ARKANSAS			
ARKADELPHIA, ARKANSAS PINE STREET WATER AND SEWER RELOCATIONS ARDOT JOB NO. 070439 PLAN - STA 145+00 - 150+00			
DESIGNED: MPA	JOB NO. 1970	DATE DEC. 2023	ADD. NO. 2
DRAFTED: ATV	SCALE:	NOT TO SCALE	REF SHEET 11
CHECKED: MDD			



1. THE LOCATION OF EXISTING AND PROPOSED UTILITIES ARE APPROXIMATE. CONTRACTOR SHALL FIELD VERIFY DEPTH & LOCATION OF ALL UTILITIES AND MARK PRIOR TO CONSTRUCTION.
2. CONTRACTOR SHALL EXPOSE ALL UTILITIES THAT CROSS THE PROPOSED LINE. IF AN EXISTING UTILITY CONFLICTS WITH THE LINE AND GRADE AS SHOWN, THEN THE CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO CONSTRUCTION.
3. MAINTAIN 18-INCHES VERTICAL SEPARATION (WATER OVER SEWER) AND 10-FOOT HORIZONTAL SEPARATION BETWEEN WATER MAINS AND SEWER LINES, EXISTING AND PROPOSED.
4. CARRIER PIPE SHALL BE AWWA C900 RESTRAINED JOINT PVC PRESSURE CLASS 200/DR21.
5. PROPOSED 18" RCP, GAS, AND U.G.T. BY OTHERS.

[illegible]

DESIGNED:	MPA
DRAFTED:	WRC
CHECKED:	MDD
DATE:	OCT 2023



205 EXECUTIVE COURT
LITTLE ROCK, ARKANSAS 72205
TELEPHONE: (501) 664-1552
FAX: (501) 664-8579
WWW.CRISTENGINEERS.COM

WATER LINE BORE PROFILES III

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