

**ADDENDUM NO. 1
TO PROSPECTIVE BIDDERS
CITY OF MIDWEST CITY
CONSTRUCTION PLANS FOR NORTHSIDE UTILITIES WATER PROJECT
PROJECT NO. 3435-003-01**

Date: July 12, 2024
From: Plummer Associates, Inc.
To: Prospective Bidders
RE: Addendum No. 1

This Addendum is a part of the contract documents and clarifies, corrects, or modifies the original Bid Documents, dated 5/20/2024. Items in this Addendum take precedence over the original bidding documents and previously issued addenda. Acknowledge receipt of this addendum in the space provided on this form and include with your Bid Documents; failure to do so may subject bidder to disqualification.

This addendum consists of 4 Specification Sections and 2 Plan sheets for a total of 34 page(s).

A. Questions and Clarifications/Responses

CivCast Question 1:

Any pre-qualifications on this Project? Or a pre-bid meeting?

Clarification/Response:

There are no pre-qualifications for this project. There will not be a pre-bid meeting either.

CivCast Question 2:

Midwest City specs call for C900 DR14, but this job shows to be C900 DR18. Will the pipe be DR18 per the plans/specs or will it follow the city standards?

Clarification/Response:

The PVC pipe for the project will be DR 14 per the City of Midwest City Specifications. All references to DR 18 have been updated to reflect DR14.

CivCast Question 3:

There are conflicting specs for the ductile iron fittings. Fitting specs under DI pipe call for zinc coating with plain MJ t-bolts and the fittings under PVC pipe call for a regular bit coating and 316SS MJ t-bolts. The pay item description for each fitting calls out a coating/lining but doesn't specify what is required. Will you clarify the coating and hardware requirements for the project?

Clarification/Response:

The Ductile Iron Fittings shall have exterior epoxy coating, interior cement mortar lining, and 304 stainless steel nuts and bolts. The project will not require fittings arc-sprayed zinc per ISO 8179. See Attachment AD1 – ATT. 3, SECTION 33 11 13.13 PIPING SYSTEM, DUCTILE IRON PIPE and Attachment AD1 – ATT. 4 SECTION 33 11 13.19 PIPING SYSTEM, POLYVINYL CHLORIDE PIPE.

CivCast Question 4:

Item No. 20 - 12" Tapping Valve and Box - 6ea, But there are no 12" Tapping Sleeves for the Tapping Valves, Please explain?

Clarification/Response:

Bid Item 20 -12-inch Gate Valve and Box (MJ) is for in line valves. There are no 12-inch taps on the project.

CivCast Question 5:

Per sheet G-003 under piping schedule you have indicated that all gaskets on PVC shall be petroleum resistant. Does this include gaskets made in PVC C900 belled end pipe as well as MJ gaskets for fittings?

Clarification/Response:

This includes all gaskets used for PVC push on joint and flange fittings. Historically, the project area has been used for oil and natural gas exploration, and transportation. The owner is unaware of any hydrocarbons in the soil, but the risk of hydrocarbons in the soil warrants the use of petroleum resistant gaskets.

CivCast Question 6:

Is there any BABA/AIS -domestic requirements for material?

Clarification/Response:

This project does not have BABA/AIS requirements.

CivCast Question 7:

Please confirm that materials will be tax exempt on this project.

Clarification/Response:

Per Specification 01 31 00 Project Administration, 7.,j. "Materials incorporated into the project are tax-exempt. Contractor is responsible for all taxes related to construction of this project."

CivCast Question 8:

Please confirm that Davis/Bacon wage rates will not be required for this project.

Clarification/Response:

The Engineer's Opinion of Probable Cost is below the threshold that would require Davis/Bacon on this project. Davis/Bacon requirements are not required.

CivCast Question 9:

Will Certa-Lok restrained pipe be allowed as an alternate to fusible PVC?

Clarification/Response:

Certa-Lok restrained pipe will not be considered an alternative for fusible PVC pipe. The required bending radius for the HDD portion of the project exceeds the capabilities of Certa-Lok.

Emailed Question 1:

Is there additional work, materials, and boring for plan sheets C-300 through C-302 or is there additional pay items (Alternate)?

Clarification/Response:

Sheets C-300 to C-302 are HDD detail sheets and represent the same scope of work as the HDD installations shown on the C-100 and C-200 series sheets.

Emailed Question 2:

Plan sheet C-205 STA 51+00: Proposed construction route is going through already installed lime stabilized gravel drive and lift station pad. Will there also be a pay item added for removing and replacing lime stabilized drive and pad site?

Clarification/Response:

The repair of the gravel road is subsidiary to Bid Item 1, 12-Inch C-900 PVC (DR 14) Water Pipe (Open Cut).

Emailed Question 3:

Can manhole flow lines and top of rims be given for pay item 21?

Clarification/Response:

See Detail 205 "Gate Valve with Manhole" on C-904. The Contractor is to install the top of the manhole 18-inches to 24-inches above the existing grade.

Emailed Question 4:

Can fire hydrant flow lines and steamer nozzles be given for pay item 22?

Clarification/Response:

See "Typical Fire Hydrant Installation" detail on sheet C-900. The minimum height of the steamer nozzle shall be 1'-6" above the existing ground. The maximum height of the steamer nozzle shall be 2'-6" above the existing ground.

B. Specifications Revisions:

1. Detailed Bid Form:

- a. Delete Specification "Detail Bid Form" in its entirety and replace with "Detail Bid Form (AD1 – ATT. 1) as included in this addendum. Bid item modifications include:
 - i. Pay Item 1:
 - A. Delete Item 1: 12-inch C-900 PVC (DR-18) Water Pipe (Open Cut), Replace with Item 1: 12-inch C-900 PVC (DR-14) Water Pipe (Open Cut)
 - ii. Pay Item 2:
 - A. Delete Item 2: 12-inch Fusible C-900 PVC (DR-18) Water Pipe (Horizontal Directional Drill), Replace with Item 2: 12-inch Fusible C-900 PVC (DR-14) Water Pipe (Horizontal Directional Drill)
 - iii. Pay Item 3:
 - A. Delete Item 3: 12-inch C-900 Fusible PVC (DR 18) Water Pipe with 18-inch Steel Encasement (Bore), Replace with Item 3: 12-inch C-900 Fusible PVC (DR 14) Water Pipe with 18-inch Steel Encasement (Bore)
 - iv. Pay Item 4:
 - A. Delete Item 4: 12-inch C-900 PVC (DR 18) Water Pipe with 18-inch Steel Encasement (Open Cut), Replace with Item 4: 12-inch C-900 PVC (DR 14) Water Pipe with 18-inch Steel Encasement (Open Cut)
 - B. Delete Estimated Quantity "80" and replace with Estimated Quantity "70"
 - v. Pay Item 5:
 - A. Delete Estimated Quantity "2" and replace with Estimated Quantity "7"
 - vi. Pay Item 18:
 - A. Delete Estimated Quantity "1", Replace with Estimated Quantity "2"
 - vii. Pay Item 31:
 - A. Delete Estimated Quantity "22", Replace with Estimated Quantity "28"
 - viii. Pay Item 36:
 - A. Delete Estimated Quantity "220", Replace with Estimated Quantity "232"

2. Section 01 29 00, MEASUREMENT AND PAYMENT:
 - a. Delete Specification "SECTION 01 29 00 - MEASUREMENT AND PAYMENT" in its entirety and replace with "SECTION 01 29 00 - MEASUREMENT AND PAYMENT (AD1 – ATT. 2) as included in this addendum. Bid item modifications include:
 - i. Bid Item 1: Add text: "removal of existing gravel roadway and replacement with lime-stabilized gravel roadway"
 - ii. Bid Item 2: Add text: "vertical fittings"
 - iii. Bid Item 20: Add text "tapping sleeve"
 - iv. Bid Item 25: Add text "4-inch double check valve"
 - v. Change all references to DR-18 to DR-14.
3. Section 33 11 13.13, PIPING SYSTEM, DUCTILE IRON PIPE:
 - a. PART 2-Products, 2.1, B., 2.
 - i. Delete Steel Bolts
 - ii. Replace with 304 stainless steel bolts.
 - b. PART 2-Products, 2.3,B.
 - i. Delete "1. Provide exterior coating arc sprayed zinc per ISO 8179. The mass of zinc applied shall be 200 g/m² of pipe surface area."
 - ii. Delete "or synthetic resin topcoat compatible with zinc"
 - iii. Delete "3. Any necessary repairs to the zinc coating shall be made in accordance with ISO 8179."
 - c. Renumber PART 2 - Products, 2.3,B.
4. Section 33 11 13.13, PIPING SYSTEM, POLYVINYL CHLORIDE PIPE:
 - a. Part 2 Products, 2.1:
 - i. Delete "2. PVC Fabricated Fittings: AWWA C900, with bell and spigot or double-bell ends. Include gasket in each bell.
 - ii. Delete "3. PVC Molded Fittings: AWWA C907, Class 150, with bell and spigot or double bell ends. Include elastomeric in each bell."
 - iii. 4., Delete "316" and replace with "304"
 - iv. 4.a, Delete "AWWA C111, rubber" Replace with "NSF 61 Petroleum Resistant Gaskets"
 - v. Renumber Part 2 – Products, 2.1 PVC PIPE AND FITTINGS, 4-inch through 12-inch, Pressure

C. Plan Revisions:

1. Plan Sheet G-003, SYMBOLS AND ABBREVIATIONS
 - a. Delete "DR 18" in the table, Replace with "DR 14"
2. Plan Sheet G-004, CITY OF MIDWEST CITY GENERAL NOTES
 - a. Delete G-004, "CITY OF MIDWEST CITY GENERAL NOTES" entirely.
 - b. Replace with G-004, "CITY OF MIDWEST CITY GENERAL NOTES AD1-ATT.5"
3. Plan Sheet G-007, BID QUANTITIES
 - a. Item 1:
 - i. Delete Item 1: 12-inch C-900 PVC (DR-18) Water Pipe (Open Cut), Replace with Item 1: 12-inch C-900 PVC (DR-14) Water Pipe (Open Cut)
 - b. Item 2:
 - i. Delete Item 2: 12-inch Fusible C-900 PVC (DR-18) Water Pipe (Horizontal Directional Drill), Replace with Item 2: 12-inch Fusible C-900 PVC (DR-14) Water Pipe (Horizontal

Directional Drill)

- c. Item 3:
 - i. Delete Item 3: 12-inch C-900 Fusible PVC (DR 18) Water Pipe with 18-inch Steel Encasement (Bore), Replace with Item 3 12-inch C-900 Fusible PVC (DR 14) Water Pipe with 18-inch Steel Encasement (Bore)
 - d. Item 4:
 - i. Delete Item 4: 12-inch C-900 PVC (DR 18) Water Pipe with 18-inch Steel Encasement (Open Cut), Replace with Item 4 12-inch C-900 PVC (DR 14) Water Pipe with 18-inch Steel Encasement (Open Cut)
 - e. Item 5: "12-inch 11.25 DEGREE DUCTILE IRON BEND"
 - i. Delete Quantity "2" and replace with Quantity "7"
 - f. Item 18: "8-INCH TAPPING VALVE AND VALVE BOX"
 - i. Delete Quantity "1", Replace with Quantity "2"
 - g. Item 31: "UTILITY DOME MARKER"
 - i. Delete Quantity "22", Replace with Quantity "28"
 - h. Item 36:
 - i. Delete Estimated Quantity "220", Replace with Estimated Quantity "232"
4. Plan Sheet C-902, CIVIL STANDARD DETAILS I
- a. DETAIL 106 BORE/TUNNEL WITH CASING FOR FUSIBLE PVC PIPE
 - a. Delete "C-900 DR-18 FUSIBLE PVC CASING PIPE", Replace with "Steel Casing Pipe"
 - b. DETAIL 107 TYPICAL END SEAL DETAIL:
 - a. Delete "C-900 DR-18 FUSIBLE PVC CASING PIPE", Replace with "Steel Casing Pipe"

D. Attachments

Attachment AD1 – ATT. 1	DETAILED BID FORM
Attachment AD1 – ATT. 2	SECTION 01 29 00, MEASUREMENT AND PAYMENT
Attachment AD1 – ATT. 3	SECTION 33 11 13.13, PIPING SYSTEM, DUCTILE IRON PIPE
Attachment AD1 – ATT. 4	SECTION 33 11 13.19, PIPING SYSTEM, POLYVINYL CHLORIDE PIPE
Attachment AD1 – ATT. 5	SHEET G-004, CITY OF MIDWEST CITY GENERAL NOTES
Attachment AD1 – ATT. 6	SHEET G-007, BID QUANTITIES

This addendum consists of 34 pages.


Approved by ENGINEER



Approved by BIDDER

END OF SECTION

DETAILED BID FORM

NORTH SIDE UTILITIES WATER PROJECT

Detailed bids shown below shall reflect all related project costs including, but not limited to, equipment, materials, labor, overhead and profit for installation and construction of each item per the drawings and specifications. Contractor is responsible for verifying quantities. See Appendix I to the Instructions to Bidders for directions and a sample Detailed Bid Form.

<u>Pay Item</u>	<u>Estimated Quantity</u>	<u>Unit</u>	<u>Item</u>	<u>Unit Price</u>	<u>Item Total</u>
1.	7,130	Linear Foot	12-inch C-900 PVC (DR 14) Water Pipe (Open Cut)		
				Dollars	\$ _____ \$ _____
<i>(Dollars per unit written)</i>					
2.	1,680	Linear Foot	12-inch Fusible C-900 PVC (DR 14) Water Pipe (Horizontal Directional Drill)		
				Dollars	\$ _____ \$ _____
<i>(Dollars per unit written)</i>					
3.	60	Linear Foot	12-inch C-900 Fusible PVC (DR 14) Water Pipe with 18-inch Steel Encasement (Bore)		
				Dollars	\$ _____ \$ _____
<i>(Dollars per unit written)</i>					
4.	70	Linear Foot	12-inch C-900 PVC (DR 14) Water Pipe with 18-inch Steel Encasement (Open Cut)		
				Dollars	\$ _____ \$ _____
<i>(Dollars per unit written)</i>					
5.	7	Each	12-inch 11.25° Ductile Iron Bend (MJ)		
				Dollars	\$ _____ \$ _____
<i>(Dollars per unit written)</i>					
6.	2	Each	12-inch 22.5° Ductile Iron Bend (MJ)		
				Dollars	\$ _____ \$ _____
<i>(Dollars per unit written)</i>					
7.	21	Each	12-inch 45° Ductile Iron Bend (MJ)		
				Dollars	\$ _____ \$ _____
<i>(Dollars per unit written)</i>					

8. 4 Each 12-inch 90° Ductile Iron Bend (MJ)
_____ Dollars \$ _____ \$ _____
(Dollars per unit written)
9. 1 Each 6-inch x 6-inch Ductile Iron Tee (MJ)
_____ Dollars \$ _____ \$ _____
(Dollars per unit written)
10. 15 Each 12-inch x 6-inch Ductile Iron Tee (MJ)
_____ Dollars \$ _____ \$ _____
(Dollars per unit written)
11. 1 Each 12-inch x 12-inch Ductile Iron Tee (MJ)
_____ Dollars \$ _____ \$ _____
(Dollars per unit written)
12. 1 Each 12-inch x 4-inch Ductile Iron Reducer (MJ)
_____ Dollars \$ _____ \$ _____
(Dollars per unit written)
13. 1 Each 12-inch x 6-inch Ductile Iron Reducer (MJ)
_____ Dollars \$ _____ \$ _____
(Dollars per unit written)
14. 1 Each 8-inch x 4-inch Ductile Iron Reducer (MJ)
_____ Dollars \$ _____ \$ _____
(Dollars per unit written)
15. 1 Each 12-inch x 8-inch Ductile Iron Reducer (MJ)
_____ Dollars \$ _____ \$ _____
(Dollars per unit written)
16. 1 Each 8-inch x 8-inch Tapping Sleeve (MJ)
_____ Dollars \$ _____ \$ _____
(Dollars per unit written)
17. 2 Each 12-inch Solid Sleeve (MJ)
_____ Dollars \$ _____ \$ _____
(Dollars per unit written)
18. 2 Each 8-inch Tapping Valve and Valve Box (MJ)
_____ Dollars \$ _____ \$ _____
(Dollars per unit written)

19.	15	Each	6-inch Gate Valve and Valve Box (MJ)	Dollars	\$ _____	\$ _____
<hr/>						
<i>(Dollars per unit written)</i>						
20.	6	Each	12-inch Tapping Valve and Valve Box (MJ)	Dollars	\$ _____	\$ _____
<hr/>						
<i>(Dollars per unit written)</i>						
21.	3	Each	12-inch Gate Valve (MJ) in Manhole (4')	Dollars	\$ _____	\$ _____
<hr/>						
<i>(Dollars per unit written)</i>						
22.	15	Each	Fire Hydrant Assembly	Dollars	\$ _____	\$ _____
<hr/>						
<i>(Dollars per unit written)</i>						
23.	15	Each	12-inch Fire Hydrant Riser	Dollars	\$ _____	\$ _____
<hr/>						
<i>(Dollars per unit written)</i>						
24.	6	Each	2-inch Combination Air Release Valve and Vault	Dollars	\$ _____	\$ _____
<hr/>						
<i>(Dollars per unit written)</i>						
25.	1	Each	4-inch Water Meter Vault	Dollars	\$ _____	\$ _____
<hr/>						
<i>(Dollars per unit written)</i>						
26.	1	Each	6-inch Water Meter Vault	Dollars	\$ _____	\$ _____
<hr/>						
<i>(Dollars per unit written)</i>						
27.	1	Each	Connection to Existing 8-inch Water Line Secondary Feed at Sta 1+00	Dollars	\$ _____	\$ _____
<hr/>						
<i>(Dollars per unit written)</i>						
28.	1	Each	Connection to Existing 12-inch Water Line on Primary Feed at 1+00	Dollars	\$ _____	\$ _____
<hr/>						
<i>(Dollars per unit written)</i>						
29.	1	Each	Connection to Existing 12-inch Water Line on Primary Feed at 36+87.40	Dollars	\$ _____	\$ _____
<hr/>						
<i>(Dollars per unit written)</i>						

30.	1	Each	Connection to Existing 8-inch Water Line on Secondary Feed at Sta 32+75	_____ Dollars	\$ _____	\$ _____
	<i>(Dollars per unit written)</i>					
31.	28	Each	Utility Dome Marker	_____ Dollars	\$ _____	\$ _____
	<i>(Dollars per unit written)</i>					
32.	1	LS	Sediment and Erosion Control	_____ Dollars	\$ _____	\$ _____
	<i>(Dollars per unit written)</i>					
33.	7,500	LF	Trench Safety	_____ Dollars	\$ _____	\$ _____
	<i>(Dollars per unit written)</i>					
34.	7,270	LF	Utility Location and Support	_____ Dollars	\$ _____	\$ _____
	<i>(Dollars per unit written)</i>					
35.	1	LS	Seeding	_____ Dollars	\$ _____	\$ _____
	<i>(Dollars per unit written)</i>					
36.	232	SY	Pavement Cut and Permanent Repair	_____ Dollars	\$ _____	\$ _____
	<i>(Dollars per unit written)</i>					
37.	1	LS	Pressure Testing of Pipelines	_____ Dollars	\$ _____	\$ _____
	<i>(Dollars per unit written)</i>					
38.	1	LS	Disinfection of Pipelines	_____ Dollars	\$ _____	\$ _____
	<i>(Dollars per unit written)</i>					
39.	1	LS	Stormwater Pollution Prevention Plan Documentation and Management	_____ Dollars	\$ _____	\$ _____
	<i>(Dollars per unit written)</i>					
40.	1	LS	Mobilization and Demobilization	_____ Dollars	\$ _____	\$ _____
	<i>(Dollars per unit written)</i>					

**SECTION 01 29 00
MEASUREMENT AND PAYMENT**

PART 1 - GENERAL

The "Bid Price" for each item, as set forth in the Proposal, shall include the furnishing of all labor, tools, materials, machinery, appliances, plant and equipment appurtenant to and necessary for the construction and completion in a first class, workmanlike manner of all work as herein specified in strict accordance with these Specifications and accompanying Plans. The "Bid Price" shall include any amount or class of excavation, backfilling, dewatering, bypass pumping, drainage, sheeting, shoring and bracing, disposal of any and all surplus materials, protection of all overhead, surface or underground structures; removal and replacement of any poles, conduits, pipelines, appurtenances and connections, clean up, overhead expense, bond, public liability and compensation and property damage insurance, patent fees, and royalties, risk due to the elements, and profits, unless otherwise specified.

The Bid price shall also include all other incidentals not specifically mentioned above that may be required to fully construct each and every item complete in place in accordance with the true intent and meaning of the Specifications and accompanying Plans.

The Contractor shall take all measures necessary to protect existing structures, lawns, trees, shrubbery, etc., on the areas adjacent to the work which is not necessary to cut as a part of the construction, and if damaged, shall replace them in as good condition or better than previously existed at his own cost and expense without additional compensation from the Owner.

The Contractor shall protect and attempt to save all trees noted in the Plans and as instructed by the Owner without additional compensation by the Owner.

Listed below are descriptions of items as listed in the Proposal and the manner in which payment shall be awarded for each. If there is not a specific measurement and/or payment section, paragraph or item associated with each Technical Specification contained in this Contract Document, then the following descriptions shall be used to describe measurement and payment. If there is not a bid item provided for work identified on plans or in specifications, it shall be understood to be subsidiary to construction, measurement, and payment of one of the following Bid Items provided below.

PART 2 - BASE BID ITEMS

BID ITEM 1 – 12-INCH C-900 PVC (DR 14) WATER PIPE (OPEN CUT)

This per linear foot bid item shall include furnishing all labor, equipment, and materials necessary to install, BY OPEN CUT, the 12-inch C-900 DR 14 PVC pipe as shown in the plans, standard details, and specifications. The cost of all pipe, trench excavation, pipe embedment, tracer wire, warning tape, backfill, compaction, hydrostatic testing, site clearing, top soil stripping and stock piling, topsoil redistribution, relocating or supporting all existing conflicting utilities, ground water control planning and dewatering activities, closure pieces, geotextile fabric, removal of existing gravel roadway and replacement with lime-stabilized gravel roadway, temporary construction access to the site, and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 2 – 12-INCH C-900 FUSIBLE PVC (DR 14) WATER PIPE (HORIZONTAL DIRECTIONAL DRILL)

This per linear foot bid item shall include furnishing all labor, equipment, and materials necessary to install, BY HORIZONTAL DIRECTIONAL DRILL, the 12-inch fusible PVC pipe as shown in the plans, standard details, and specifications. The cost of pipe, pipe fusion, vertical fittings, excavation, bore pits, shoring, dewatering, horizontal directional drilling, carrier pipe installation, joint restraints, embedment, backfill, compaction, tracer wire, warning tape and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 3 – 12-INCH C-900 PVC (DR 14) WATER PIPE WITH 18-INCH STEEL ENCASEMENT (BORE)

This per linear foot bid item shall include furnishing all labor, equipment, and materials necessary to install, BY HORIZONTAL AUGER BORE, the 12-inch PVC pipe with 18-inch welded steel encasement as shown in the plans, standard details, and specifications. The cost of all pipe, excavation, bore pits, shoring, dewatering, boring, steel casing, casing spacers, joint restraints, vents, end seals, grouting, embedment, backfill, compaction, tracer wire, warning tape and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 4 – 12-INCH C-900 PVC (DR 14) WATER PIPE WITH 18-INCH STEEL ENCASEMENT (OPEN CUT)

This per linear foot bid item shall include furnishing all labor, equipment, and materials necessary to install the 12-inch PVC pipe inside an 18-inch welded steel encasement pipe by OPEN CUT. The cost of all pipe, excavation, shoring, dewatering, steel casing, casing spacers, joint restraints, vents, end seals, grouting, embedment, backfill, compaction, tracer wire, warning tape and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 5 – 12-INCH 11.25° DUCTILE IRON BEND (MJ)

This per each bid item shall include furnishing all labor, equipment, and materials necessary to install the restrained mechanical joint (MJ) 12-inch 11.25° ductile iron bend as shown in the plans, standard details, and specifications. The cost of fitting, installation, thrust restraints, stainless steel bolts, stainless steel nuts, accessories, epoxy coatings and cement mortar lining, and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 6 – 12-INCH 22.5° DUCTILE IRON BEND (MJ)

This per each bid item shall include furnishing all labor, equipment, and materials necessary to install the restrained mechanical joint (MJ) 12-inch 22.5° ductile iron bend as shown in the plans, standard details, and specifications. The cost of fitting, installation, thrust restraints, stainless steel bolts, stainless steel nuts, accessories, required coatings and lining, and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 7 – 12-INCH 45° DUCTILE IRON BEND (MJ)

This per each bid item shall include furnishing all labor, equipment, and materials necessary to install the restrained mechanical joint (MJ) 12-inch 45° ductile iron bend as shown in the plans, standard details, and specifications. The cost of fitting, installation, thrust restraints, stainless steel bolts, stainless steel nuts, accessories, required coatings and lining, and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 8 – 12-INCH 90° DUCTILE IRON BEND (MJ)

This per each bid item shall include furnishing all labor, equipment, and materials necessary to install the restrained mechanical joint (MJ) 12-inch 90° ductile iron bend as shown in the plans, standard details, and specifications. The cost of fitting, installation, thrust restraints, stainless steel bolts, stainless steel nuts, accessories, required coatings and lining, and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 9 – 6-INCH x 6-INCH DUCTILE IRON TEE (MJ)

This per each bid item shall include furnishing all labor, equipment, and materials necessary to install the 6-inch x 6-inch restrained mechanical joint (MJ) ductile iron tee as shown in the plans, standard details, and specifications. The cost of fitting, installation, thrust restraints, stainless steel bolts, stainless steel nuts, accessories, required coatings and lining, and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 10 – 12-INCH x 6-INCH DUCTILE IRON TEE (MJ)

This per each bid item shall include furnishing all labor, equipment, and materials necessary to install the 12-inch x 6-inch restrained mechanical joint (MJ) ductile iron tee as shown in the plans, standard details, and specifications. The cost of fitting, installation, thrust restraints, stainless steel bolts, stainless steel nuts, accessories, required coatings and lining, and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 11 – 12-INCH x 12-INCH DUCTILE IRON TEE (MJ)

This per each bid item shall include furnishing all labor, equipment, and materials necessary to install the 12-inch x 12-inch restrained mechanical joint (MJ) ductile iron tee as shown in the plans, standard details, and specifications. The cost of fitting, installation, thrust restraints, stainless steel bolts, stainless steel nuts, accessories, required coatings and lining, and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 12 – 12-INCH x 4-INCH DUCTILE IRON REDUCER (MJ)

This per each bid item shall include furnishing all labor, equipment, and materials necessary to install the 12-inch x 4-inch restrained mechanical joint (MJ) ductile iron reducer as shown in the plans, standard details, and specifications. The cost of fitting, installation, thrust restraints, stainless steel bolts, stainless steel nuts, accessories, required coatings and lining, and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 13 – 12-INCH x 6-INCH DUCTILE IRON REDUCER (MJ)

This per each bid item shall include furnishing all labor, equipment, and materials necessary to install the 12-inch x 6-inch restrained mechanical joint (MJ) ductile iron reducer as shown in the plans, standard details, and specifications. The cost of fitting, installation, thrust restraints, stainless steel bolts, stainless steel nuts, accessories, required coatings and lining, and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 14 – 8-INCH x 4-INCH DUCTILE IRON REDUCER (MJ)

This per each bid item shall include furnishing all labor, equipment, and materials necessary to install the 8-inch x 4-inch restrained mechanical joint (MJ) ductile iron reducer as shown in the plans, standard details, and specifications. The cost of fitting, installation, thrust restraints, stainless steel bolts, stainless steel nuts, accessories, required coatings and lining, and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 15 – 12-INCH x 8-INCH DUCTILE IRON REDUCER (MJ)

This per each bid item shall include furnishing all labor, equipment, and materials necessary to install the 12-inch x 8-inch restrained mechanical joint (MJ) ductile iron reducer as shown in the plans, standard details, and specifications. The cost of fitting, installation, thrust restraints, stainless steel bolts, stainless steel nuts, accessories, required coatings and lining, and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 16 – 8-INCH x 8-INCH TAPPING SLEEVE

This per each bid item shall include furnishing all labor, equipment, and materials necessary to install the 8-inch x 8-inch ductile iron tapping sleeve as shown in the plans, standard details, and specifications. The cost of fitting, installation, thrust restraints, stainless steel bolts, stainless steel nuts, accessories, required coatings and lining, and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 17 – 12-INCH DUCTILE IRON SOLID SLEEVE (MJ)

This per each bid item shall include furnishing all labor, equipment, and materials necessary to install the 12-inch restrained mechanical joint (MJ) ductile iron solid sleeve as shown in the plans, standard details, and specifications. The cost of fitting, installation, thrust restraints, stainless steel bolts, stainless steel nuts, accessories, required coatings and lining, and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 18 – 8-INCH TAPPING VALVE AND VALVE BOX (MJ)

This per each bid item shall include furnishing all labor, equipment, and materials necessary to install the 8-inch restrained mechanical joint (MJ) ductile iron tapping valve and valve box as shown in the plans, standard details, and specifications. The cost of valve, valve box, cover, excavation, backfill, compaction, grading, thrust restraints, stainless steel bolts, stainless steel nuts, accessories, required coatings and lining, stem extension, stabilizer ring, concrete collar, and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 19 – 6-INCH GATE VALVE AND VALVE BOX (MJ)

This per each bid item shall include furnishing all labor, equipment, and materials necessary to install the 6-inch mechanical joint (MJ) ductile iron gate valve and valve box as shown in the plans, standard details, and specifications. The cost of valve, valve box, cover, excavation, backfill, compaction, grading, thrust restraints, stainless steel bolts, stainless steel nuts, accessories, required coatings and lining, stem extension, stabilizer ring, concrete collar, and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 20 – 12-INCH GATE VALVE AND VALVE BOX (MJ)

This per each bid item shall include furnishing all labor, equipment, and materials necessary to install the 12-inch mechanical joint (MJ) ductile iron gate valve and valve box as shown in the plans, standard details, and specifications. The cost of valve, valve box, cover, excavation, backfill, compaction, grading, thrust restraints, stainless steel bolts, stainless steel nuts, accessories, required coatings and lining, stem extension, stabilizer ring, concrete collar, and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 21 – 12-INCH GATE VALVE (MJ) INSIDE 4-FOOT MANHOLE

This per each bid item shall include furnishing all labor, equipment, and materials necessary to install the 12-inch mechanical joint (MJ) gate valve and 4-foot manhole as shown in the plans, standard details, and specifications. The cost of valve, valve box, stem extension, stabilizer ring, concrete manhole base, concrete manhole risers, concrete lid section, grading rings, watertight frame and cover, excavation, backfill, compaction, grading, thrust restraints, bolts, nuts, accessories, required coatings and lining, and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 22 – FIRE HYDRANT ASSEMBLY

This per each bid item shall include furnishing all labor, equipment, and materials necessary to install the fire hydrant assembly as shown in the plans, standard details, and specifications. The cost of fire hydrant, 6-inch restrained MJ gate valve and valve box, thrust restraint, excavation, backfill, disinfection, testing, crushed rock, fittings, as shown on the detail in the plans, and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 23 – 12-INCH FIRE HYDRANT RISER

This per each bid item shall include furnishing all labor, equipment, and materials necessary to install the 12-inch fire hydrant riser as shown in the plans, standard details, and specifications. The cost of fitting, installation, thrust restraints, stainless steel bolts, stainless steel nuts, accessories, required coatings and lining, and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 24 – 2-INCH COMBINATION AIR RELEASE VALVE AND VAULT

This per each bid item shall include furnishing all labor, equipment, and materials necessary to install the 2-inch air release valve and vault as shown in the plans, standard details, and specifications. The cost of excavation, foundation preparation, formwork, rebar, concrete, precast vault, vault cover, fittings, spool pieces, bolts, nuts, gaskets, 2-inch air release valve, bollards, corporation stop, curb stop, copper tubing, backfill, compaction and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 25 – 4-INCH WATER METER VAULT

This per each bid item shall include furnishing all labor, equipment, and materials necessary to connect the proposed 12-inch primary water feed to the proposed 4-inch water meter vault (4-inch SENSUS OMNI T2 Water Meter by others) as shown in the plans, standard details, and specifications. The cost of precast meter vault, steel door, 4-inch double check valve, 4-inch ductile iron piping, 4-inch tees, 4-inch 90 degree bends, 4-inch gate valves, couplings, stainless steel hardware, protection of existing utilities and service connections, excavation, sheeting, shoring and bracing, dewatering, backfill, compaction, grading, restoration and clean-up, and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 26 – 6-INCH WATER METER VAULT

This per each bid item shall include furnishing all labor, equipment, and materials necessary to connect the proposed 12-inch primary and secondary water feed to the proposed 6-inch water meter vault (6-inch SENSUS OMNI T2 Water Meter by others) as shown in the plans, standard details, and specifications. The cost of precast meter vault, steel door, 6-inch ductile iron piping, 6-inch tees, 6-inch 90 degree bends, 6-inch gate valves, couplings, stainless steel hardware, protection of existing utilities and service connections, excavation, sheeting, shoring and bracing, dewatering, backfill, compaction, grading, restoration and clean-up, and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 27 – CONNECTION TO EXISTING 8-INCH WATER LINE ON SECONDARY FEED AT STA 1+00

This per each bid item shall include furnishing all labor, equipment, and materials necessary to connect the proposed 12-inch secondary water feed to the existing 8-inch water line at STA 1+00 as shown in the plans, standard details, and specifications. The cost of fittings, 8-inch restrained solid sleeves, 12-inch x 8-inch restrained mechanical joint (MJ) reducer, stainless steel hardware, protection of existing utilities and service connections, cutting pipe, excavation, dewatering, backfill, compaction, grading, restoration and clean-up, and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 28 – CONNECTION TO 12-INCH WATER LINE ON PRIMARY FEED AT STA 1+00

This per each bid item shall include furnishing all labor, equipment, and materials necessary to connect the proposed 12-inch primary water feed to the 12-inch water line at STA 1+00 as shown in the plans, standard details, and specifications. The cost of fittings, 12-inch restrained solid sleeves, stainless steel hardware, protection of existing utilities and service connections, cutting pipe, excavation, dewatering, backfill, compaction, grading, restoration and clean-up, and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 29 – CONNECTION TO EXISTING 12-INCH WATER LINE ON PRIMARY FEED AT STA 36+87.40

This per each bid item shall include furnishing all labor, equipment, and materials necessary to connect the proposed 12-inch secondary water feed to the existing 12-inch water line at STA 36+87.40 as shown in the plans, standard details, and specifications. The cost of fittings, 12-inch restrained solid sleeves, stainless steel hardware, protection of existing utilities and service connections, cutting pipe, excavation, dewatering, backfill, compaction, grading, restoration and clean-up, and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 30 – CONNECTION TO EXISTING 8-INCH WATER LINE ON SECONDARY FEED AT STA 32+75.00

This per each bid item shall include furnishing all labor, equipment, and materials necessary to connect the proposed 12-inch secondary water feed to the existing 8-inch water line at STA 32+75 as shown in the plans, standard details, and specifications. The cost of fittings, 8-inch restrained tapping sleeves, 8-inch tapping valve and valve box, 4-inch water meter and vault, 4-inch double check valve and vault, 12-inch x 4-inch restrained mechanical joint (MJ) reducer, 8-inch x 4-inch restrained MJ reducer, stainless steel hardware, protection of existing utilities and service connections, cutting pipe, excavation, dewatering, backfill, compaction, grading, restoration and clean-up, and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 31 – UTILITY DOME MARKER

This per each bid item shall include furnishing all labor, equipment, and materials necessary for the utility dome markers as shown in the plans, standard details, and specifications. The cost of dome markers, excavation, backfill, compaction, and all other incidental items necessary for a complete and workable installation are included in this item.

BID ITEM 32 – SEDIMENT AND EROSION CONTROL

This lump sum bid item shall include furnishing all labor, equipment, and materials necessary for the sediment and erosion control as shown in the plans, standard details, and specifications. The cost of sediment erosion control and all other incidental items necessary for a complete and workable installation are included in this item.

BID ITEM 33 – TRENCH SAFETY

The unit price bid per linear foot shall include furnishing all labor, equipment, and materials necessary to design, furnish, install, and maintain a trench safety system. The cost shall include the design (must be sealed by a Professional Engineer licensed in the State of Oklahoma), all necessary geotechnical work, labor, all shoring (including any special shoring), sheeting, bracing and any other equipment or incidental items necessary for a complete and workable installation are included in this pay item. This Bid Item shall be paid per linear foot and will be measured along the centerline of the pipe and the outside edge of any vaults or structures.

BID ITEM 34 – UTILITY LOCATION AND SUPPORT

The unit price bid per linear foot shall include furnishing all labor, equipment, and materials necessary to locate and support all existing private, public and franchise utilities that will be crossed or encountered on this project as shown in the plans, standard details, and as described in the specifications. The cost of excavation, recording the horizontal and vertical utility location with GPS survey equipment, establishment of size and material, temporary support of the utility, flowable fill, embedment, compaction, backfill and all other incidental items necessary for a complete and workable installation are included in this pay item. This Bid Item shall be paid per linear foot and will be measured along the centerline of the pipe.

BID ITEM 35 – SEEDING

This lump sum bid item shall include furnishing all labor, equipment, and materials necessary for seeding as shown in the plans, standard details, and specifications. The cost of final grading, seed mixture, fertilizer, water, pulp, maintenance watering, and all other incidental items necessary for a complete and workable installation are included in this item.

BID ITEM 36 – PAVEMENT CUT AND PERMANENT REPAIR

This per square yard bid item shall be measured based on the amount of concrete pavement removed and replaced and shall be paid at the unit price in the Detailed Bid Form. This item shall include furnishing all materials, labor, and equipment to properly remove and replace existing concrete pavement in accordance with the plans, standard details, and specifications. The cost of saw cutting, concrete removal and disposal, aggregate base, subgrade preparation, compaction, formwork, rebar, dowels, concrete, and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 37 – PRESSURE TESTING OF PIPELINES

This per lump sum bid item shall be measured based on the percentage of the pipeline that has been installed and shall include all labor, equipment, and materials necessary for the pressure testing of the 12" diameter primary water feed and 12" diameter secondary water feed as shown in the plans, standard details, and specifications. The cost of pressure testing and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 38 – DISINFECTION OF PIPELINES

This per lump sum bid item shall be measured based on the percentage of the pipeline that has been installed and shall include all labor, equipment, and materials necessary for the disinfection of the 12” diameter primary water feed and 12” diameter secondary water feed as shown in the plans, standard details, and specifications. The cost of disinfection, sampling laboratory verification and all other incidental items necessary for a complete and workable installation are included in this pay item.

BID ITEM 39 – STORMWATER POLLUTION PREVENTION PLAN DOCUMENTATION AND MANAGEMENT

This per lump sum bid item shall be measured based on the percentage of the pipeline that has been installed. This item shall include all material, labor and equipment to design, install, and maintain an approved Stormwater Pollution Prevention Plan (SWPPP), in accordance with project standard details and specifications. The SWPPP must be approved by Engineer and erosion control measures must be installed prior to any construction. This item shall include filing the Notice of Intent (NOI) and the Notice of Termination (NOT) with the Oklahoma Department of Environmental Quality (DEQ). The cost of permitting, SWPPP preparation, installation, maintenance and removal of erosion control devices, sediment handling and all other incidental items necessary to restore the ground surface are included in this item.

BID ITEM 40 – MOBILIZATION AND DEMOBILIZATION

This per lump sum bid item shall include furnishing materials and equipment, permits and labor necessary to move all machinery and personnel required onto, and off, the job site to perform construction in accordance with the plans, standard details, and specifications. The cost of the insurance, bonds, mobilization, demobilization, and all other incidental items are included in this lump sum pay item. This item shall not exceed 5% of the total bid. No more than 90% of this item shall be paid until Substantial Completion.

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 33 11 13.13
PIPING SYSTEM, DUCTILE IRON PIPE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section provides requirements for ductile iron piping system for exposed and buried applications and includes:
 - 1. Mechanical joint, push-on and flanged ductile iron pipe, sizes 4-inch through 30 inch.
 - 2. Mechanical joint and flanged ductile iron fittings, sizes 4-inch through 30-inch.
 - 3. Gaskets and fasteners.
 - 4. Protective coatings, linings and encasements.
- B. Related Sections:
 - 1. Refer to Division 00 and Division 33 for information regarding submittals; coordination; material delivery, handling, and storage; projection conditions; design requirements; other materials; installation of piping systems; field testing; and related work.
 - 2. This Section contains material requirements for pipe, fittings, specials, and appurtenances for the ductile iron piping systems, as well as Part 1 – General and Part 3 – Execution additional requirements not specified in the above referenced Section.

1.3 REFERENCES

- A. American Water Works Association (AWWA):
 - 1. C104/A21.4 – Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
 - 2. C105/21.5 – Polyethylene Encasement for Gray and Ductile Cast-Iron Piping for Water and Other Liquids.
 - 3. C110-C21.10 – American National Standard for Gray-Iron and Ductile-Iron Fittings, 3-inch through 48-inch for Water and Other Liquids.
 - 4. C111/A21.11 – American National Standard for Rubber Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings.
 - 5. C115/A21.15 – American National Standard for Flanged Cast-Iron and Ductile-Iron Pipe with Threaded Flanges.
 - 6. C150/A21.50 – American National Standard for the Thickness Design of Ductile Iron Pipe.
 - 7. C151/A21.51 – American National Standard for Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water and Other Liquids.
 - 8. C153/A21.10 – Ductile-Iron Compact Fittings for Water Service.
 - 9. C600 – Installation of Ductile Iron Water Mains and Their Appurtenances.
 - 10. C606 – Grooved and Shouldered Joints.
 - 11. M41 – Manual Ductile Iron Pipe and Fittings.

- B. ASTM International, Inc. (ASTM):
 - 1. A48 – Specification for Gray Iron Castings.
 - 2. A193 – Specification for Alloy-Steel and Stainless Steel bolting Materials for High Temperature or High Pressure Service and Other Special Purpose Applications.
 - 3. A194 – Specification for Carbon and Alloy Steel Nuts for Bolts for High-Pressure or High-Temperature Service, of Both.
 - 4. A307 – Specification for Carbon Steel Bolts and Studs, 60000 PSI Tensile Strength.
 - 5. A320 – Specification for Alloy-Steel and Stainless Steel Bolting Materials for Low Temperature Service.
 - 6. A536 – Specification for Ductile Iron Castings.
 - 7. A563 – Specification for Carbon and Alloy Steel Nuts.
 - 8. A674 – Standard Practice for Polyethylene Encasement for Ductile Iron Pipe for Water or other Liquids.
 - 9. D1330 – Specification for Rubber Sheet Gaskets.
- C. National Sanitation Foundation (NSF):
 - 1. NSF/ANSI 61 – Drinking Water Components – Health Effects.
- D. International Organization for Standardization (ISO):
 - 1. ISO 8179 – Ductile Iron Pipes, Fittings, Accessories and their Joints – External Zinc-Based Coating

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings:
 - 1. Prior to the fabrication of the pipe and laying shop drawings, the Contractor shall submit fabrication and lay drawings to the Engineer as shop drawings showing the northing, easting, and top of pipe elevation at each joint location where the proposed pipe connects to existing pipes.
 - 2. Prior to the fabrication of the pipe, submit fabrication and lay drawings to the Engineer as Shop Drawings. Shop drawings shall include a complete description of the pipe offered, including cuts, tabulated layout and pertinent design data. Shop drawings shall reference stationing on the plan/profile sheets and shall incorporate changes necessary to avoid conflicts with existing utilities and structures and adjustments necessary to make tie-ins. Details for the design and fabrication of all fittings and specials and provisions for thrust shall be included. Manufacturer and Contractor shall field verify pipe tie-in connections for adequate thrust restraint.
 - 3. In addition to lay drawings as required above, provide modified vertical profile as needed to incorporate standard fitting angles required in the plans. This includes at minimum a markup of the plan and profile drawings with revised pipe elevations, fitting locations (stations) and angles. Pipe shall maintain a minimum cover of 5 feet and not introduce any new high points in the profile.
 - 4. Schedule of materials furnished.
- C. Material Certificates:
 - 1. Certificate of Compliance with all applicable and appropriate reference standards certifying that all pipe, fittings, and specials, and other products and materials

- furnished, comply with the applicable provision of the Specification.
2. Certification of Adequacy of Design: The Certificate of Adequacy of Design shall show the necessary provisions required in the design of the pipe to comply with applicable sections of this Specification. A Professional Engineer registered in the state where the Project is located shall seal the Certificate of Adequacy of Design.
- D. Hydraulic Thrust Restraint – Provide calculations detailing the restraint required for all pipe assemblies, fittings, valves, and plugs. Calculations shall detail the restrained joint length required at all necessary points on the piping schedule. Separate details including materials, size, assembly ratings and pipe attachment methods shall be provided. Thrust restraint requirements shall be prepared and sealed by a Professional Engineer licensed in the State of Oklahoma.
- E. Field quality-control test reports.
- F. Prior to final completion, submit as-built, top-of-pipe survey as Record Data. Top-of-pipe survey shall include station and top-of-pipe elevation for each pipe joint. Survey information shall be provided on the Contractor’s “As-Built” drawings.

1.5 PROJECT REQUIREMENTS

- A. Restrained Pipe and Fitting Joints, Buried Piping:
1. Restrained joints shall be used for a sufficient distance from each bend, tee, elbow, plug, or other fitting to resist thrust that will develop at the design pressure.
 2. CONTRACTOR shall provide restraint length calculations in accordance with AWWA M41 based on the laying conditions, soil conditions, depth of cover, and pressures as follows to determine the number of restrained joints that will be required.
 - a. Design Pressure: 150 psi
 - b. Suggested soil parameters, unless otherwise specified: Coh-gran as indicated in Table 8-2 of the latest edition of M41.
 - c. Unit Weight of Soil: 60 pcf (maximum value used)
 - d. Height of cover: as shown in plans
 - e. Safety factor: 1.5
 3. For the purposes of thrust restraint, design pressures shall be the working pressure shown, plus the additional surge allowance for potable water, service water, and pump discharge piping. The design pressure for joint restraint shall be 1.5 times the pressure class.

PART 2 - PRODUCTS

2.1 PIPE AND FITTINGS

- A. General: Ductile iron with a thickness design for the pressures and laying conditions complying with the requirements of AWWA C150 and the manufactured in accordance with AWWA C151.
1. Comply with the following minimum thickness class, unless otherwise indicated in the Pipe Schedule.
 - a. Pressure Class 250, pipe up to 8-inches.
 - b. Pressure Class 200, pipe 8-inch and larger.
- B. Mechanical-Joint, Ductile-Iron Pipe: AWWA C151, with mechanical-joint bell and plain

spigot end unless grooved or flanged ends are indicated.

1. Mechanical-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.
 2. Glands, Gaskets, and Bolts: AWWA C111, ductile- or gray-iron glands, rubber gaskets, and ~~steel bolts~~-304 Stainless Steel bolts
- C. Push-on-Joint, Ductile-Iron Pipe: AWWA C151, with push-on-joint bell and plain spigot end unless grooved or flanged ends are indicated.
1. Push-on-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.
 2. Gaskets: AWWA C111, rubber.
- D. Flanged-Joint, Ductile-Iron Pipe: AWWA C151, flanged ends.
1. Flange Joints: Comply with the requirements of AWWA C115.
 - a. Class 250 as designated on Drawings or Pipe Schedule.
 2. Bolting:
 - a. ASTM A193 or ASTM A320, Type 304 stainless steel bolts; ASTM A194, Type 316, nuts; and washers of the same material as the bolts. Nuts shall be PTFE coated.
 - b. Gaskets:
 - 1) Flange, Flat Face: Full-faced, AWWA C111, 1/8-inch thick rubber, factory cut.
 3. All ductile iron piping associated with the lift station and valve vault shall have flanged ends.

2.2 SPECIAL PIPE FITTINGS

- A. Flange adapter: For joining steel pipe to cast iron, provide Dresser Style 127 or equal. Gasket to be Buna-S, Grade 27.
- B. Reducing and Transition Coupling: Required for making reduction in sizes of piping; changing classes of piping; or joining steel and cast iron pipe, provide Dresser Style 62 or equal.

2.3 PROTECTIVE COATINGS, LININGS, AND ENCASEMENT

- A. Pipe and Fittings Interior:
 1. Mortar: Unless otherwise specified in the Piping Schedule, all ductile iron pipe and fittings shall be provided with a cement-mortar lining in accordance with AWWA C104.
- B. Pipe and Fittings Exterior:
 1. Pipe and fittings associated with the lift station and valve vault shall receive an epoxy coating in accordance with Division 09 Section 09 91 00 for ferrous metals submerged or intermittently submerged in non-potable water.
 2. For all other ductile iron pipe, provide exterior coating of arc-sprayed zinc per ISO 8179. The mass of the zinc applied shall be 200 g/m² of pipe surface area.
 3. Finishing Layer (Topcoat): A finishing layer of asphalt paint or synthetic resin topcoat compatible with zinc shall be applied. The mean dry film thickness of the finishing layer shall not be less than 3 mils with a local minimum not less than 2 mils.
 4. Any necessary repairs to the zinc coating shall be made in accordance with ISO 8179.

- C. Encasement for Underground Metal Piping: ASTM A674 or AWWA C105.
 - 1. Form: Tube.
 - 2. Material: V-Bio Enhanced Polyethylene Encasement.
 - 3. Polyethylene encasement shall consist of three layers of coextruded linear low-density polyethylene fused into a single thickness of not less than 8 mils.
 - 4. The inside surface of the polyethylene wrap to be in contact with the pipe exterior shall be infused with a blend of antimicrobial biocide to mitigate microbiologically influenced corrosion and a volatile corrosion inhibitor to control galvanic corrosion.
- D. Color: Black.

2.4 INSULATED CONNECTIONS

- A. Provide dielectric insulation kits, including gaskets, insulating sleeves and washers for each bolt and nut, where flanges are to be cathodically insulated. Refer to the Contract Documents for the individual locations. Metal hardware such as backup washers shall be Type 304 stainless steel. Refer to Division 40 Section 40 46 00 "Corrosion Monitoring" for additional information.

2.5 ADDITIONAL SPARE PARTS

- A. At completion of construction, contractor shall provide the following spare parts to the OWNER.
 - 1. 2 solid sleeves
 - 2. Full circle clamp

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with the requirements of Division 40 Section 40 05 00. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Laying Buried Pipe:
 - 1. Install pipe to the lines, grades and elevations shown on the Drawings, complying with the requirements of AWWA C600.
 - 2. Unless otherwise shown on the Drawings, bury lines 12 inches and smaller with a minimum cover of 4-feet and lines 14 inches and larger with a minimum cover of 5-feet.
 - 3. Do not lay pipe in water, or when the trench or weather is unsuitable for work. Keep water out of trench until jointing is complete. When work is not in progress, close ends of pipe and fittings securely so no trench water, earth or other substances will enter pipes or fittings.
 - 4. Keep the inside of the pipe free from foreign matter during operations by plugging or other approved method.
 - 5. Provide pipe bedding in accordance with the Drawings and Section 31 23 33 "Trenching, Backfill, and Compacting". Place pipe so that the full length of each section rests solidly upon the pipe bed, with recesses excavated to accommodate bells and joints. Take up and relay pipe when the grade or joint is disturbed after laying.
 - 6. Lay pipe with bells facing the direction of the laying except when making enclosures.

7. Buried pipe and fittings shall be V-Bio Enhanced Polyethylene Encasement wrapped in accordance with AWWA C105 Installation Method A or Ductile Iron Pipe Research Association Modified Installation Method A.

C. Restrained Joints:

1. Thrust blocks will not be allowed as the primary method of restraint. The CONTRACTOR, at his option, may install thrust blocking in addition to individual joint restraint, but it shall not constitute a replacement for individual joint restraint.
2. Fittings:
 - a. Unless otherwise indicated on the drawings, the CONTRACTOR shall use mechanical restrained pipe joints or push on style at all buried fittings (no thrust blocks). The length of pipe requiring thrust restraint shall be calculated as described in Chapter 13 of AWWA M41.
 - b. All restrained joints shall have a working pressure equal to or greater than the pipe pressure class.
 - c. Mechanical joint restraint
 - d. Mechanical joints shall be mechanically restrained
 - 1) Available manufacturer:
 - a) Ebaa Iron Series 1100 MEGALUG
 - b) Approved equal
3. Pipe Joints:
 - a. Unless otherwise indicated on the drawings, the CONTRACTOR shall use restrained bell and spigot pipe to achieve the restrained joint length required for the pipe design. Push on style with boltless pipe joints. All restrained joints shall have a working pressure equal to or greater than the pipe pressure class.
4. Exposed pipe:
 - a. Unless otherwise indicated on the drawings, all exposed pipe shall be flanged.
5. CONTRACTOR shall design restrained joints based on the specified pressures as shown in the Piping Schedule or Drawings and in accordance with AWWA M41.
6. The design for restrained joints, including the length necessary to resist the design thrust, for the embedded conditions, shall be performed and sealed by a Professional Engineer in the state where the Project is being constructed.
7. CONTRACTOR shall bear all costs for the design and will not receive reimbursement from the OWNER.

3.2 HYDROSTATIC TESTING

- A. Installed pipeline shall be hydrostatically tested in accordance with Division 01 Section 01 45 00 "Quality Control".

3.3 FIELD QUALITY CONTROL

- A. All piping systems shall be thoroughly cleaned and flushed, and all construction debris or foreign material removed. The CONTRACTOR shall provide all temporary connections, equipment and the like for cleaning.

3.4 SITE CLEAN-UP

- A. All excavations shall be backfilled and compacted per the Contract Documents. All disturbed

areas shall be restored to preconstruction conditions or better and to the lines and grades shown in the Contract Documents. All disturbed areas shall be seeded or sodded per the Contract Documents. Any disturbed pavement will be repaved to as good or better condition per the Contract Documents.

3.5 PIPING SCHEDULE

- A. As shown on the Drawings.

END OF SECTION

SECTION 33 11 13.19
PIPING SYSTEM, POLYVINYL CHLORIDE (PVC)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section provides requirements for PVC piping systems for exposed and buried applications, pressure and gravity applications and includes:
1. Polyvinyl Chloride (PVC) pressure pipe and fittings in sizes 1/2-inch through 48-inch.
 2. PVC, Schedule 40 and 80, pressure pipe and fittings.
 3. PVC gravity sewer and drain pipe and fittings.
- B. Related Work:
1. Refer to Division 40 Section 40 05 00 "Piped Utilities: Basic Materials and Methods" for information regarding submittals; coordination; material delivery, handling, and storage; projection conditions; design requirements; other materials; installation of piping systems; and related work.
 2. This Section contains material requirements for pipe, fittings, specials, and appurtenances for PVC piping systems, as well as Part 1 – General and Part 3 – Execution additional requirements not specified in the above referenced Section.

1.3 REFERENCES

- A. References:
1. American Waterworks Association (AWWA):
 - a. C110 – Standard for Ductile-Iron and Gray-Iron Fittings, 3-In. Through 48-In. (76 mm Through 1,219 mm) for Water
 - b. C111 – American National Standard for Rubber Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings
 - c. C153 – Ductile-Iron Compact Fittings for Water Service
 - d. C219 – Standard for Bolted, Sleeve-Type Couplings for Plain-End Pipe
 - e. C900 – Standard for Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4-in. – 60-in. (100 mm-1,500 mm)
 - f. C907 – Standard for Injection-Molded Polyvinyl Chloride (PVC) Pressure Fittings, 4-in. Through 12-in. (100 mm Through 300 mm)
 - g. F477 – Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
 - h. F1417 – Test Method for Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air
 - i. F1668 – Guide for Construction Procedures for Buried Plastic Pipe
 - j. F1674 – Test Method for Joint Restraint Products Used With PVC Pipe.
 2. ASTM International, Inc. (ASTM):
 - a. D1785 – Specification for Poly(Vinyl Chloride)(PVC) Plastic Pipe, Schedule 40, 80,

- and 120
- b. D2466 – Specification for Poly(Vinyl Chloride)(PVC) Plastic Pipe Fittings, Schedule 40
 - c. D2467 – Specification for Poly(Vinyl Chloride)(PVC) Plastic Pipe Fittings, Schedule 80
 - d. D2564 – Specifications for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems
 - e. D3034 – Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and fittings
 - f. F477 – Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
 - g. F679 – Specification for Poly(Vinyl Chloride)(PVC) Large-Diameter Gravity Sewer Pipe and Fittings
 - h. F794 – Specification for Poly(Vinyl Chloride)(PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter
 - i. F891 - Specification for Coextruded Poly(Vinyl Chloride)(PVC) Plastic Pipe With a Cellular Core
 - j. F493 – Specification for Solvent Cements for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe and Fittings
3. National Science Foundation (NSF):
- a. NSF/ANSI 61 – Drinking Water Systems Components – Health Effects

1.4 SUBMITTALS

- A. Comply with Section 01 33 10 “Submittal Procedures.”
- B. Product Data: For each type of product indicated.
- C. Shop Drawings:
 - 1. Pipe layout drawings shall include plan, elevations, sections, details, and attachments to other work.
 - 2. Pipe layout schedule/drawings including pipeline stationing, elevation, and restrained joint locations.
 - 3. Schedule of materials furnished.
 - 4. Pipe layout drawings and data shall clearly indicate where pipe requiring special provisions are to be located, connections to equipment, valves, and related items.
 - 5. Thrust restraint calculations signed and sealed by a Professional Engineer licensed in the state where the project is to be constructed.
- D. Material Certificates:
 - 1. Certificate of Compliance with all applicable and appropriate reference standards certifying that all pipe, fittings, and specials, and other products and materials furnished, comply with the applicable provision of the Specification.
 - 2. Certification of Adequacy of Design: The Certificate of Adequacy of Design shall show the necessary provisions required in the design of the pipe to comply with applicable sections of this Specification. A Professional Engineer registered in the state where the Project is located shall seal the Certificate of Adequacy of Design.
- E. Field quality-control test reports.




1.5 PROJECT REQUIREMENTS

A. Restrained Pipe and Fitting Joints, Buried Piping:

1. Restrained joints shall be used for a sufficient distance from each bend, tee, elbow, plug, or other fitting to resist thrust that will develop at the design pressure. Unless otherwise indicated on the drawings, the CONTRACTOR shall use mechanical restrained pipe joints and fittings (no thrust blocks).
2. CONTRACTOR shall provide restraint length calculations in accordance with AWWA M23 based on the laying conditions, soil conditions, depth of cover, and pressures to determine the number of restrained joints that will be required. The calculations shall be performed and sealed by a Professional Engineer in the state where the Project is being constructed.
3. For the purposes of thrust restraint, design pressures shall be the working pressure shown, plus the additional surge allowance for potable water, service water, and pump discharge piping. The design pressure shall be 1.5 times the design test pressure indicated for all other piping.
4. CONTRACTOR shall bear all costs for the restraint length design/calculations and will not receive reimbursement from the OWNER.

PART 2 - PRODUCTS

2.1 PVC PIPE AND FITTINGS, 6-INCH THROUGH 48-INCH, PRESSURE

- A. PVC Pressure Pipe: AWWA C900, Class 150 and/or Class 200 (as shown on Drawings or in Pipe Schedule), with bell end with gasket, and with spigot end.
1. Comply with UL 1285 for fire-service mains if indicated.
 -  2. ~~PVC Fabricated Fittings: AWWA C900, with bell and spigot or double bell ends. Include elastomeric gasket in each bell.~~
 -  3. ~~PVC Molded Fittings: AWWA C907, Class 150, with bell and spigot or double bell ends. Include elastomeric gasket in each bell.~~
 4. Push-on-Joint, Ductile-Iron Fittings: AWWA C110 or C153 ductile iron glands, rubber gaskets, and 316 304 stainless steel bolts with epoxy coating per AWWA C116.
 - a.  Gaskets: ~~AWWA C111, rubber.~~ NSF 61, Petroleum Resistant Gaskets
 5. Mechanical-Joint, Ductile-Iron Fittings: AWWA C110, ductile- or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.
 - a. Glands, Gaskets, and Bolts: AWWA C110 or C153, ductile- or gray iron glands, rubber gaskets, and 316 Stainless Steel Bolts.
 6. PVC Integral Joint Restraint System:
 - a. Integral joint restraint system located in the bell designed for integration into PVC pipe manufactured to AWWA C900 and performance when tested in accordance with ASTM F1674.
 - b. Consists of a ductile iron casing that sits adjacent to the ASTM F477 gasket in the bell; casing is molded into the raceway of the bell during pipe belling; and a ductile iron grip-ring is inserted into the casing after factory hydro-testing.
 - c. Available Manufacturer: BullDog™ Integral Joint Restrain System.
 7. PVC Mechanical Joint Restraint System:
 - a. EBAA IRON Megalug Series

- b. Or approved equivalent

2.2 PVC PIPE AND FITTINGS, 6-INCH AND SMALLER, PRESSURE

- A. PVC Pipe and Fittings: ASTM D 1785, Schedule 40 and Schedule 80 pipe, with plain ends for solvent-cemented joints or threaded ends conforming to ASTM D 2466, Schedule 40 or ASTM D 2467, Schedule 80, socket-type or threaded fittings. Use Schedule 80 for all pipes to be threaded. Use Schedule 80 for all pipes to be threaded.
- B. Solvent Cement: As recommended by the pipe and fitting manufacturer conforming to D2564 for PVC piping systems and ASTM F493 for CPVC piping systems.

2.3 PVC PIPE AND FITTINGS, GRAVITY SEWER AND DRAIN

- A. PVC Cellular-Core Pipe and Fittings: ASTM F 891, Sewer and Drain Series, PS 50 minimum stiffness pipe with ASTM D 3034, SDR 26, socket-type fittings for solvent-cemented joints.
- B. PVC Sewer Pipe and Fittings, NPS 15 and Smaller: ASTM D 3034, SDR 26, with bell-and-spigot ends for gasketed joints with ASTM F 477, elastomeric seals.
- C. PVC Sewer Pipe and Fittings, NPS 18 and Larger: ASTM F 679, T-1 wall thickness, with bell-and-spigot ends for gasketed joints with ASTM F 477, elastomeric seals.
- D. PVC Profile Gravity Sewer Pipe and Fittings: ASTM F 794 pipe, with bell-and-spigot ends; ASTM D 3034 fittings, with bell ends; and ASTM F 477, elastomeric seals.

2.4 JOINING MATERIALS

- A. Refer to Division 40 Section "Piping System, Basic Materials and Methods" for commonly used joining materials.
- B. Plastic Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.

2.5 PIPING SPECIALTIES

- A. Transition Fittings: Manufactured fitting or coupling same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.
- B. Tubular-Sleeve Pipe Couplings:
 - 1. Description: Metal, bolted, sleeve-type, reducing or transition coupling, with center sleeve, gaskets, end rings, and bolt fasteners and with ends of same sizes as piping to be joined.
 - a. Standard: AWWA C219.

2.6 CORROSION-PROTECTION PIPE FITTINGS ENCASEMENT

- A. Encasement for Underground Metal Pipe Fittings: ASTM A 674 or AWWA C105.
 - 1. Form: Sheet or tube.
 - 2. Material: LLDPE film of 0.008-inch minimum thickness or high-density, cross-laminated PE film of 0.004-inch minimum thickness.
 - 3. Color: Black.

2.7 INSTALLATION, CLEANING, AND TESTING

- A. Piping shall be leakage tested in accordance with Division 01 Section 01 45 00 "Quality

Control".

2.8 PIPING SCHEDULE

A. Piping Schedule shall as shown on the Drawings.

PART 3 - EXECUTION (NOT USED)

END OF SECTION

GENERAL CONSTRUCTION NOTES:

- G1 THE CONTRACTOR IS RESPONSIBLE FOR THE LOCATION OF ALL UTILITIES AND MUST HAVE ALL UTILITIES LOCATED PRIOR TO COMMENCING ANY EXCAVATION. THE CONTRACTOR SHALL VERIFY THE INVERT AND FLOWLINE ELEVATIONS OF ALL WATER LINES, SANITARY SEWERS, STORM DRAINS, DRAINAGE STRUCTURES, AND SURFACE DRAINAGE COURSES PRIOR TO LAYING ANY NEW PIPE.
THE CONTRACTOR MUST CALL OKIE AT (405) 840-5032 TO HAVE ALL PUBLIC UTILITIES (WATER AND SANITARY SEWER LINES) AND FRANCHISED UTILITIES (ELECTRIC LINES, TELEPHONE CABLES, FIBER OPTIC LINES, CABLE TELEVISION, GAS LINES AND OIL PIPELINES) LOCATED AT LEAST TWO (2) DAYS PRIOR TO STARTING CONSTRUCTION.
- G2 THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL UTILITY LINES AND STRUCTURES, WHETHER SHOWN OR NOT, BOTH PUBLIC AND PRIVATE. ANY DAMAGE TO A UTILITY LINE OR STRUCTURE, BECAUSE OF THE CONTRACTOR'S ACTIONS, SHALL BE REPAIRED SOLELY AT THE CONTRACTOR'S EXPENSE TO A CONDITION AS GOOD OR BETTER THAN THAT PRIOR TO THE DAMAGE.
THE CONTRACTOR MUST CALL 9-1-1 IMMEDIATELY IF A NATURAL GAS PIPELINE IS CUT, DAMAGED OR OTHERWISE DISTURBED. THE MIDWEST CITY FIRE DEPARTMENT AND OKLAHOMA NATURAL GAS CO. MUST INSPECT THE PIPE BEFORE WORK CAN RESUME AT THAT LOCATION.
- G3 THE CONTRACTOR MUST NOTIFY THE FOLLOWING PERSONS AT LEAST FORTY-EIGHT (48) HOURS IN ADVANCE OF PLACING OR REMOVING ANY BARRICADES OR OTHERWISE MODIFYING EXISTING TRAFFIC CONTROL DEVICES OR PLACING ANY TEMPORARY TRAFFIC CONTROL DEVICE:
ENGINEER (405) 739-1215
CONSTRUCTION INSPECTOR- (405) 739-1226
- G4 THE CONTRACTOR MUST NOTIFY ALL AFFECTED CITY UTILITY CUSTOMERS AT LEAST TWO (2) WORKING DAYS PRIOR TO ANTICIPATED SERVICE INTERRUPTION. ALL WORK MUST BE CARRIED OUT CAREFULLY TO MINIMIZE CUSTOMER SERVICE INTERRUPTION DURING CONSTRUCTION. STREETS TEMPORARILY CLOSED TO THROUGH TRAFFIC DURING CONSTRUCTION SHALL REMAIN OPEN TO LOCAL TRAFFIC TO THE MAXIMUM EXTENT PRACTICAL DURING THE WORK. DETOUR ROUTES SHALL BE FURNISHED BY THE ENGINEER. THE CONTRACTOR SHALL FURNISH AND ERECT ALL DETOUR SIGNAGE AS DIRECTED.
WHERE WORK IS CARRIED ON, IN OR ADJACENT TO ANY STREET, ALLEY OR PUBLIC PLACE, THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, FURNISH AND ERECT SUCH BARRICADES, FENCES, LIGHTS AND/OR OTHER PROTECTIVE BARRIERS, AND TAKE SUCH OTHER PRECAUTIONARY MEASURES FOR THE PROTECTION OF PERSONS OR PROPERTY AND OF THE WORK AS ARE NECESSARY. A SUFFICIENT NUMBER OF BARRICADES SHALL BE ERECTED TO KEEP VEHICLES FROM BEING DRIVEN INTO ANY WORK UNDER CONSTRUCTION. FAILURE TO COMPLY WITH THIS REQUIREMENT WILL RESULT IN THE ENGINEER SHUTTING DOWN WORK UNTIL THE CONTRACTOR HAS PROVIDED THE NECESSARY PROTECTION. ALL SUCH BARRICADES AND SIGNS AND THE USE THEREOF SHALL BE IN STRICT COMPLIANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, PART IV - TRAFFIC CONTROLS FOR STREET AND HIGHWAY CONSTRUCTION AND MAINTENANCE OPERATIONS.
- G5 ALL CONSTRUCTION MATERIALS AND WORK SHALL CONFORM TO THE APPLICABLE CITY OF MIDWEST CITY AND THE 1996 OKLAHOMA DEPARTMENT OF TRANSPORTATION (ODOT) STANDARDS AND SPECIFICATIONS WITH THE ADDITIONAL SUPPLEMENTS, AS REFERENCED IN THE PROJECT DOCUMENTS.
- G6 ALL ELEVATIONS SHOWN ARE ON THE MEAN SEA LEVEL (M.S.L.) DATUM. ALL DIMENSIONS TO CURB ARE TO THE BACK OF CURB. ALL DIMENSION TO STREET "CENTERLINES" ARE TO THE CENTERLINE OF THE RIGHT-OF-WAY OR SECTION LINE.
- G7 THE CONTRACTOR SHALL DEVELOP AND MAKE ALL DETAIL SURVEYS NEEDED FOR CONSTRUCTION. THE COST OF THE CONSTRUCTION SURVEY AND STAKING SHALL BE INCLUDED IN THE PRICE BID FOR OTHER ITEMS OF WORK.
- G8 ALL FENCES REMOVED AS A RESULT OF THE CONTRACTOR'S ACTIONS SHALL BE REPLACED IN KIND WITH FENCING EQUAL TO OR BETTER THAN THE ORIGINAL FENCE. ALL COSTS FOR FENCE REMOVAL AND REPLACEMENT SHALL BE INCLUDED IN THE PRICE BID FOR OTHER ITEMS OF WORK.
- G9 ALL WORK NOT CLASSIFIED AS A CONTRACT PAY ITEM SHALL BE CONSIDERED INCIDENTAL CONSTRUCTION AND THE COST FOR SUCH SHALL BE INCLUDED IN THE PRICE BID FOR OTHER ITEMS OF WORK.
- G10 SEDIMENT CONTROL FOR UTILITY CONSTRUCTION IS REQUIRED. TRENCHES MUST BE BACKFILLED AT THE END OF EACH DAY'S WORK. NO MORE TRENCH SHALL BE OPENED THAN CAN BE COMPLETED IN THE SAME DAY UNLESS TEMPORARY SILT FENCE IS PLACED IMMEDIATELY DOWNSTREAM OF ANY AREA INTENDED TO REMAIN DISTURBED FOR MORE THAN ONE DAY. EXCAVATED MATERIALS SHALL BE PLACED ON THE HIGH SIDE OF THE TRENCH.
- G11 CITY PERSONNEL ARE NOT PERMITTED TO ENTER ANY TRENCH OR EXCAVATION MORE THAN FIVE (5) FEET DEEP, FOR ANY REASON, UNLESS IT IS SLOPED OR SHORED IN ACCORDANCE WITH 29 CFR 1926 OSHA SUBPART P, "EXCAVATIONS AND TRENCHES."
- G12 ALL DISTURBED, UNPAVED AREAS WITHIN EASEMENTS AND RIGHT-OF-WAY SHALL BE SEEDED, FERTILIZED, AND WATERED IN ACCORDANCE WITH ODOT SPECIFICATIONS SECTION 232, "SEEDING", AS REQUIRED UNDER THE "REVEGETATION" PAY ITEM IF PROVIDED OR AS NOTED OTHERWISE IN THE PLANS. SEEDED AREAS SHALL BE REPAIRED AND MAINTAINED UNTIL ALL PORTIONS OF THE PROJECT ARE COMPLETE AND APPROVED FOR FINAL ACCEPTANCE. ALL OTHER AREAS DISTURBED AS A RESULT OF THE CONTRACTOR'S ACTIONS SHALL BE RESTORED IN A MANNER ACCEPTABLE TO THE ENGINEER TO A CONDITION AS GOOD OR BETTER THAN THAT PRIOR TO THE DISTURBANCE AT NO EXPENSE TO THE CITY.
- G13 THE CITY SHALL FURNISH BACTERIOLOGICAL WATER LINE TESTING AT NO EXPENSE TO THE CONTRACTOR FOR MUNICIPALLY FUNDED PROJECTS.
- G14 ALL REMOVED SALVAGEABLE ITEMS SHALL REMAIN PROPERTY OF THE CITY AND SHALL BE STOCKPILED IN AN AREA WITHIN THE PROJECT LIMITS DESIGNATED BY THE ENGINEER FOR COLLECTION BY CITY FORCES.
- G15 ALL DITCHES DISTURBED DURING CONSTRUCTION SHALL BE RESHAPED AND SLOPED TO DRAIN. SOLID SLAB SOD SHALL BE USED IN ALL AREAS WHERE SOIL HAS BEEN EXPOSED AND POSITIVE MEANS OF SOD STABILIZATION SHALL BE USED TO PREVENT DISPLACEMENT OF SOD BY STORM WATERS.
- G16 EROSION CONTROL DEVICES IN THE FORM OF SEDIMENT FENCES ARE REQUIRED AT DRIVEWAY CULVERTS, STREET CULVERTS, DRAINAGE STRUCTURES, STORM SEWER MANHOLES AND SANITARY SEWER MANHOLES LOCATED IN DITCHES WHERE SOIL HAS BEEN DISTURBED. THOSE ITEMS SHALL BE PLACED AS DIRECTED BY THE ENGINEER AND THE COST SHALL BE INCLUDED IN OTHER ITEMS.

WATER LINE MATERIALS AND CONSTRUCTION NOTES:

- W1 WATER LINE SHALL BE POLYVINYL CHLORIDE (PVC) PIPE MANUFACTURED IN ACCORDANCE WITH AWWA C-900. ALL WATER LINE FITTINGS SHALL BE CEMENT MORTAR LINED DUCTILE IRON MANUFACTURED IN ACCORDANCE WITH AWWA C110. ALL WATER LINE SHALL BE THICKNESS DR14 UNLESS NOTED OTHERWISE.
- W2 ALL WATER LINE FITTINGS AND VALVES SHALL BE PHYSICALLY RESTRAINED BY MEANS OF RESTRAINED JOINT FITTINGS THIS WILL BE ACCOMPLISHED BY USE OF "MEGALUG" JOINT RESTRAINT PRODUCTS OR AN APPROVED EQUAL. PIPE JOINTS THAT LIE WITHIN THE "RESTRAINED LENGTH", AS INDICATED IN THE "POLYVINYL CHLORIDE (PVC) PIPE RESTRAINED LENGTH" TABLE OF THE SPECIFICATIONS WILL BE RESTRAINED BY "MEGALUG" PRODUCTS, OR AN APPROVED EQUAL, IF MECHANICAL JOINT PIPE IS AVAILABLE. THE USE OF PIPE MANUFACTURERS' "RESTRAINED JOINT" GASKETS FOR USE IN PUSH-ON DUCTILE IRON PIPE, SUCH AS AMERICAN FAST-GRIP GASKETS, OR AN APPROVED EQUAL, IS ALSO ACCEPTABLE.
- W3 SAND BACKFILL SHALL BE PLACED IN ALL TRENCHES UP TO GROUND LEVEL WHERE WATER LINES CROSS BELOW PROPOSED OR EXISTING PAVEMENTS. PAVEMENT CUTS SHALL BE RESTORED IN ACCORDANCE WITH THE CITY'S STANDARD DETAILS.
- W4 SERVICE LINE SHALL BE 3/4" TYPE K COPPER TUBING MANUFACTURED IN ACCORDANCE WITH AWWA C800. SPLICES IN NEW SERVICE LINES ARE NOT PERMITTED. CORPORATION STOPS SHALL BE 3/4" STRAIGHT BODY BALL TYPE VALVES WITH AN AWWA STANDARD TAPERED THREADED INLET AND TUBE COMPRESSION TYPE OUTLET. CORPORATION STOPS SHALL BE FORD FB1000-3-G (WITH GRIP JOINT OUTLET CONNECTION), A.Y. MCDONALD 4701-BT, MUELLER 300 PART NUMBER B-250008 WITH "CC" INLET AND "110" OUTLET, OR AN APPROVED EQUAL. METER VALVES SHALL BE 3/4" - 90° ANGLE BALL TYPE VALVES HAVING PADLOCK WINGS WITH A TUBE COMPRESSION TYPE INLET AND COUPLING NUT OUTLET FOR CONNECTION TO 5/8"x3/4" OR 3/4" WATER METERS. METER VALVES SHALL BE FORD BA43-332W-G (WITH GRIP JOINT OUTLET CONNECTION), A.Y. MCDONALD 4602-BT, MUELLER 300 PART NUMBER B-24273 WITH "11" INLET, OR AN APPROVED EQUAL.
- W5 METER BOXES SHALL BE OF U.V. STABILIZED HIGH DENSITY POLYETHYLENE AND SHALL CONFORM TO THE FOLLOWING PART NUMBERS OR APPROVED EQUAL: FOR 5/8" OR 1" SHALL BE DFW 1730C-18C-3DA. THE METER BOXES ARE REQUIRED TO BE INSTALLED BY THE CONTRACTOR AND SHALL BE SUBJECT TO INSPECTION BY THE CITY.
- W6 FIRE HYDRANTS SHALL MEET OR EXCEED ALL APPLICABLE REQUIREMENTS OF ANSI/AWWA C502. HYDRANTS SHALL BE DRY BARREL TYPE HAVING ONE PUMPER NOZZLE AND TWO HOSE NOZZLES. FIRE HYDRANTS SHALL BE MUELLER "CENTURION", KENNEDY "GUARDIAN", U.S. PIPE AND FOUNDRY "METROPOLITAN", OR AN APPROVED EQUAL. ALL HYDRANTS PROVIDED FOR FIRE PROTECTION SHALL RECEIVE TWO (2) COATS OF SILVER PAINT. ALL HYDRANTS INSTALLED FOR FLUSHING DEAD END LINES AND NOTED AS SUCH ON THE PLANS SHALL BE INSTALLED WITH THE STEAMER NOZZLE TURNED AWAY FROM THE STREET AND SHALL BE PAINTED RED.
- W7 ALL EXISTING WATER LINES HAVING A DIAMETER LARGER THAN 2" SHALL BE DISCONNECTED FROM THE WATER DISTRIBUTION SYSTEM AND SHALL BE PLUGGED WITH CONCRETE. DISCONNECTED WATER LINES 2" IN DIAMETER AND SMALLER SHALL BE PERMANENTLY CAPPED IN A MANNER ACCEPTABLE TO THE ENGINEER.
- W8 ALL WATER LINES SHALL BE PRESSURE AND LEAKAGE TESTED AND DISINFECTED IN ACCORDANCE WITH THE REQUIREMENTS OF OKLAHOMA ADMINISTRATIVE CODE (OAC) TITLE 252, CHAPTER 625, PUBLIC WATER SUPPLY CONSTRUCTION STANDARDS 252:626-19-2 (5) AND (6). PRESSURE AND LEAKAGE TESTING SHALL BE IN ACCORDANCE WITH AWWA C600. ALL NEW, CLEANED, OR REPAIRED WATERLINES SHALL BE DISINFECTED IN ACCORDANCE WITH OAC 252:630, PUBLIC WATER SUPPLY OPERATION.
- W9 ALL WATER LINE INSTALLED WITHIN A CASING PIPE SHALL BE SUPPORTED BY MEANS OF PERMANENTLY ATTACHED SKIDS OR CASING SPACERS. CASING SPACERS SHALL BE ADVANCED PRODUCTS AND SYSTEMS, INC. (APS), STEEL BAND CASING SPACER MODEL S1 OR AN APPROVED EQUAL. CASING SPACERS SHALL BE AT LEAST 11" LONG AND RUNNERS SHALL BE AT LEAST 1" WIDE. SPACERS SHALL BE INSTALLED WITHIN 1 FOOT OF ALL JOINTS ON BOTH SIDES OF THE JOINT AND AT INTERVALS ALONG THE PIPE BARREL NOT EXCEEDING 12 FEET ON CENTER. SPACERS WILL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. ALL CASING ENDS WILL BE SEALED UTILIZING A MODULAR MECHANICAL SEAL AND ALL CASINGS WILL HAVE AT LEAST ONE (1) 2" VENT PIPE. ALL PIPE JOINTS WITHIN THE CASING PIPE MUST BE RESTRAINED.
- W10 ALL AIR RELIEF VALVES SHALL BE 2" COMBINATION VACUUM/RELEASE VALVES.
- W11 ALL NEW WATERLINE SHALL HAVE BE INSTALLED WITH A CONTINUOUS TRACER WIRE. WIRE SHALL BE A MINIMUM OF 12 GAUGE SOLID COPPER WITH THERMOPLASTIC INSULATION RECOMMENDED FOR DIRECT BURIAL. WIRE CONNECTORS SHALL BE 3M DBR OR APPROVED EQUAL, AND BE WATERTIGHT. ACCESS POINTS FOR WIRE SHALL BE LOCATED AT ALL VALVE BOXES, TERMINAL ENDS, AND EVERY 500 FT OF CONTINUOUS RUNS. ACCESS POINTS SHALL CONSIST OF A BOX SECURELY FASTENED TO VALVES CONTAINING A LOOP OF WIRE. TRACER WIRE SHALL BE LAID FLAT AND SECURELY AFFIXED TO PIPE AT 10 FT INTERVALS. CONTRACTOR IS REQUIRED TO TEST CONTINUITY OF TRACER WIRE IN PRESENCE OF INSPECTOR.

POLYVINYL CHLORIDE (PVC) PIPE RESTRAIN LENGTH (FT.)

PIPE SIZE	HORIZONTAL BEND				VERTICAL BEND			TEE	PLUG	REDUCER				
	11.25"	22.5"	45"	90"	11.25"	22.5"	45"			x6"	x8"	x12"	x18"	x24"
6"	20	20	20	20	20	20	20	20	40	N	20	40	60	80
8"	20	20	20	20	20	20	20	20	40	20	N	40	60	80
12"	20	20	30	40	20	20	20	20	40	40	40	N	40	60
18"	20	20	20	40	20	20	20	20	60	60	60	40	N	40
20"	20	20	20	60	20	20	20	60	20	60	80	80	60	N

CASING SIZE TABLE

NOMINAL INSIDE PIPE DIA.	CASING SIZE INSIDE DIA.
4"	8" TO 10"
6"	10" TO 12"
8"	14" TO 16"
10"	16" TO 18"
12"	18" TO 20"
15"	20" TO 22"
18"	24" TO 26"
24"	31" TO 33"

PAVING CONSTRUCTION NOTES:

- P1 ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE "STANDARD SPECIFICATIONS FOR CONSTRUCTION OF PUBLIC IMPROVEMENTS" MIDWEST CITY, OKLAHOMA AND SHALL BE UNDER THE SUPERVISION OF THE DEVELOPMENT SERVICES DEPARTMENT.
- P2 ANY CONSTRUCTION ITEMS THAT ARE NOT LISTED IN THE SUMMARY OF QUANTITIES SHALL BE CONSIDERED INCIDENTAL CONSTRUCTION ITEMS. THE COST OF INCIDENTAL CONSTRUCTION SHALL BE INCLUDED IN THE COST OF OTHER BID ITEMS.
- P3 PAVING SUBGRADE SHALL BE COMPACTED TO A DENSITY OF AT LEAST 95% OF THE MINIMUM DRY DENSITY OBTAINED BY THE STANDARD COMPACTION TEST (ASTM D-698). TEST REPORTS SHALL BE SUBMITTED TO THE MIDWEST CITY ENGINEER'S OFFICE.
- P4 REFER TO THE STANDARD TYPICAL SECTIONS FOR CONCRETE PAVING DESIGN STANDARDS SHEET FOR RESIDENTIAL COLLECTOR STREET PAVING.
- P5 THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING AND COORDINATING WITH ALL PUBLIC OR PRIVATE UTILITY COMPANIES IN THE VICINITY OF CONSTRUCTION.
- P6 THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING AND MAINTAINING CONSTRUCTION TRAFFIC CONTROL SIGNS AND DEVICES AS REQUIRED BY THE CITY OF MIDWEST CITY AND THE LATEST EDITION OF PART VI OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (M.U.T.C.D.).
- P7 THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPLACEMENT OR REPAIR OF TRAFFIC CONTROL DEVICES DAMAGED DUE TO CONSTRUCTION. THE CONTRACTOR SHALL COORDINATE ALL WORK THROUGH THE CITY OF MIDWEST CITY ENGINEER. NEW MATERIALS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL PRIOR TO USE.
- P8 UNLESS OTHERWISE SPECIFIED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS OWN CONSTRUCTION STAKING.
- P9 ALL PAVEMENT REMOVAL CONTIGUOUS TO THE PAVEMENT REMAINING SHALL BE SAWED IN STRAIGHT LINES TO THE FULL DEPTH OF THE EXISTING PAVEMENT. ALL DEBRIS FORM THE REMOVAL OPERATIONS SHALL BE REMOVED FROM THE SITE AT THE TIME OF EXCAVATION. STOCKPIILING OF DEBRIS WILL NOT BE PERMITTED.
- P10 IN AREAS OF EXCAVATION, THE SUBGRADE SHALL BE SCARIFIED TO THE DEPTH SHOWN ON THE DETAIL, AND RECOMPACTED TO A DRY DENSITY OF AT LEAST 95% OF THE MAXIMUM DRY DENSITY OBTAINED BY THE STANDARD COMPACTION TEST (ASTM D-698) AT A WATER CONTENT WITHIN 3% OF THE OPTIMUM.
- P11 UNLESS OTHERWISE STATED IN THE GENERAL CONDITIONS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TESTING. THE RESULTS OF THE TEST SHALL BE FORWARDED TO THE ENGINEER FOR HIS REVIEW AND APPROVAL. THE SOILS LABORATORY SHALL DETERMINE THE SUITABILITY OF EXISTING ON SITE MATERIAL PRIOR TO BEGINNING ANY FILL OPERATIONS.
- P12 SOD SHALL BE PLACED 18" BEHIND THE CURB FOR EROSION PROTECTION.



531 COUCH DR, STE 200 | OKLAHOMA CITY, OK 73102
405.440.2725 | OKLAHOMA FIRM NO. 1097

NO.	DATE	REVISION	BY
1	7/12/24	ADDENDUM #1	ADS

CITY OF MIDWEST CITY
NORTH SIDE UTILITIES PROJECT PHASE I
GENERAL
CITY OF MIDWEST CITY
100 N MIDWEST BOULEVARD, MIDWEST CITY, OK 73110

THE SEAL THAT ORIGINALLY APPEARED ON THIS DOCUMENT WAS AUTHORIZED BY CHRISTOPHER FERGUSON OKLAHOMA P.E. NO. 25576 ON 05/20/2024

ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION OF THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE OKLAHOMA ENGINEERING PRACTICE ACT.

IF THIS BAR DOES NOT MEASURE ONE INCH, DRAWING IS NOT TO LABELED SCALE

DESIGNED C. FERGUSON
DRAWN F. CAVE
CHECKED G. FARAH
REVIEWED A. SWARTZ

Seq. _____
Dwg. No. **G-004**

ITEM	DESCRIPTION	QTY	UNIT
1	12-INCH C-900 PVC (DR 18) WATER PIPE (OPEN CUT)	7130	LF
2	12-INCH FUSIBLE C-900 PVC (DR 18) WATER PIPE (HORIZONTAL DIRECTION DRILL)	1680	LF
3	12-INCH FUSIBLE C-900 PVC (DR18) WATER PIPE WITH 18-INCH STEEL ENCASEMENT (BORE)	60	LF
4	12-INCH C-900 (DR18) WATER PIPE WITH 18-INCH STEEL ENCASEMENT (OPEN CUT)	70	LF
5	12-INCH 11.25° DUCTILE IRON BEND (MJ)	7	EA
6	12-INCH 22.5° DUCTILE IRON BEND (MJ)	2	EA
7	12-INCH 45° DUCTILE IRON BEND (MJ)	21	EA
8	12-INCH 90° DUCTILE IRON BEND (MJ)	4	EA
9	6-INCH X 6-INCH TEE (MJ)	1	EA
10	12-INCH X 6-INCH TEE (MJ)	15	EA
11	12-INCH X 12-INCH TEE (MJ)	1	EA
12	12-INCH X 4-INCH REDUCER (MJ)	1	EA
13	12-INCH X 6-INCH REDUCER (MJ)	1	EA
14	8-INCH X 4-INCH REDUCER (MJ)	1	EA
15	12-INCH X 8-INCH REDUCER (MJ)	1	EA
16	8-INCH X 8-INCH TAPPING SLEEVE (MJ)	1	EA
17	12-INCH SOLID SLEEVE (MJ)	2	EA
18	8-INCH TAPPING VALVE AND VALVE BOX (MJ)	2	EA
19	6-INCH GATE VALVE AND VALVE BOX (MJ)	15	EA
20	12-INCH GATE VALVE AND VALVE BOX (MJ)	6	EA
21	12-INCH GATE VALVE (MJ) IN MANHOLE (4')	3	EA
22	FIRE HYDRANT ASSEMBLY	15	EA
23	12-INCH FIRE HYDRANT RISER	15	EA
24	2-INCH COMBINATION AIR RELEASE VALVE AND VAULT	6	EA
25	PROPOSED 4-INCH WATER METER VAULT	1	EA
26	PROPOSED 6-INCH WATER METER VAULT	1	EA
27	CONNECTION TO EXISTING 8-INCH WATER LINE ON SECONDARY FEED AT STA 1+00	1	EA
28	CONNECTION TO EXISTING 12-INCH WATER LINE ON PRIMARY FEED AT STA 1+00	1	EA
29	CONNECTION TO EXISTING 12-INCH WATER LINE ON PRIMARY FEED AT STA 36+87.40	1	EA
30	CONNECTION TO EXISTING 8-INCH WATER LINE ON SECONDARY FEED AT STA 32+75	1	EA
31	UTILITY DOME MARKER	28	EA
32	SEDIMENT AND EROSION CONTROL	1	LS
33	TRENCH SAFETY	7500	LF
34	UTILITY LOCATION AND SUPPORT	7270	LF
35	SEEDING	1	LS
36	PAVEMENT CUT AND PERMANENT REPAIR	232	SY
37	PRESSURE TESTING OF PIPELINES	1	LS
38	DISINFECTION OF PIPELINES	1	LS
39	STORMWATER POLLUTION PREVENTION PLAN DOCUMENTATION AND MANAGEMENT	1	LS
40	MOBILIZATION AND DEMOBILIZATION	1	LS



531 COUCH DR, STE 200 | OKLAHOMA CITY, OK 73102
405.440.2725 | OKLAHOMA FIRM NO. 1097

NO.	DATE	REVISION	ADDED BY
1	7/17/24	ADDENDUM #1	

CITY OF MIDWEST CITY
100 N MIDWEST BOULEVARD, MIDWEST CITY, OK 73110

CITY OF MIDWEST CITY
NORTH SIDE UTILITIES PROJECT PHASE I
GENERAL
BID QUANTITIES

THE SEAL THAT ORIGINALLY APPEARED ON THIS DOCUMENT WAS AUTHORIZED BY CHRISTOPHER FERGUSON OKLAHOMA P.E. NO. 25576 ON 05/20/2024
ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION OF THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE OKLAHOMA ENGINEERING PRACTICE ACT.

IF THIS BAR DOES NOT MEASURE ONE INCH, DRAWING IS NOT TO LABELED SCALE

DESIGNED C. FERGUSON
DRAWN F. CAVE
CHECKED G. FARAH
REVIEWED A. SWARTZ

Seq. No. G-007
3435-003-01

ATTACHMENT AD1 - ATT. 6

PRINTED: 5/20/2024 9:51 AM C:\Users\gcbow\OneDrive\Documents\Plummer Associates\3435-003-01\WWC_Utility_Ph1\Project Files\Plummer\Sheets\General\G-BID QUANTITIES.dwg SAVER: 5/17/2024 5:04 PM SAVED BY: Dcbrow USER: Schow, Denver