

CHICKASHA MUNICIPAL AUTHORITY

AGENDA
LOCATION OF MEETING
CITY HALL COUNCIL CHAMBERS
117 NORTH FOURTH STREET
CHICKASHA, OKLAHOMA 73018

TIME OF MEETING
6:30 PM

DATE OF MEETING
DECEMBER 18, 2023

All items on this agenda, including but not limited to any agenda item concerning the adoption of any ordinance, resolution, contract, agreement, or any other item of business, are subject to amendment, including additions and/or deletions. This rule will apply to every individual agenda item without exception, and without providing this same amendment language with respect to each individual agenda item. Such amendments should be rationally related to the topic of the agenda item, or the governing body will be advised to continue the item.

The governing body may adopt, approve, ratify, deny, defer, recommend, amend, strike, or continue any agenda item. When more information is needed to act on an item, the governing body may refer the matter to its City/Trust Manager, staff, attorney or to the recommending board, commission or committee.

1. **Call to Order / Roll Call.**

2. **Consent Docket:**
 - a. Acceptance of the Claims List.
 - b. Accept and ratify action to authorize the purchase of security cameras and equipment for all municipal buildings through Verkada on State Contract not to exceed \$425,000.00
 - c. Accept Application - Right of Entry at Ada Sipuel and Union Pacific Railroad
 - d. Accept and ratify Resolution 2023-30R amending the FY 23/24 Budget.

3. **Discussion/Approval of Items Removed from Consent Docket:**

4. Consideration and Discussion Items:

- a. Discussion, consideration, and possible action to authorize Staff to solicit bids for CMA-2401 - Water Main Construction - Ada Sipuel Avenue at Union Pacific Railroad.
- b. Discussion, consideration, and possible action to authorize the Trust Manager to execute the Application for Permit to Construct Water Pollution Control or Public Water Supply Facilities and/or Supply Potable Water for the Oklahoma Department of Environmental Quality, Water Quality Division.

5. Motion for Adjournment.



City of
CHICKASHA

Meeting Type: Special CMA Meeting 12-18-2023

Meeting Date: 12/18/2023

Department: Finance

Agenda Item No. 2.a.

AGENDA ITEM: Acceptance of the Claims List.

I. BACKGROUND/DESCRIPTION:

II. RECOMMENDED ACTION:

Accept
the Claims List.

III. FISCAL INFORMATION -

IV. FUND INFORMATION:

Dept. Director:

	Fund	Account	Amount
	(To)		
	FUND	ACCOUNT	AMOUNT
Meeting Date: December 18, 2023	(From)		

V. ATTACHMENTS:



City of
CHICKASHA

Meeting Type: Special CMA Meeting 12-18-2023

Meeting Date: 12/18/2023

Department: Administration

Agenda Item No. 2.b.

AGENDA ITEM: Accept and ratify action to authorize the purchase of security cameras and equipment for all municipal buildings through Verkada on State Contract not to exceed \$425,000.00

I. BACKGROUND/DESCRIPTION:

- City Hall \$45,268.46
- Airport \$27,517.82
- Animal Control \$22,275.60
- Fire station #1 \$46,343.22
- Fire Station #2 \$50,752.22
- Library \$30,873.53
- Sports Complex \$43,344.06
- Shannon Springs \$10,048.16
- Washita Park \$ 8,164.70
- Waste Water \$ 6,156.52
- Water Treatment \$12,287.98
- Public Works \$28,814.92
- Police Station \$84,946.94

II. RECOMMENDED ACTION:

Accept and ratify action to authorize the purchase of security cameras and equipment for all municipal buildings through Verkada on State Contract not to exceed \$425,000.00

III. FISCAL INFORMATION -

IV. FUND INFORMATION:

Dept. Director:

Fund	Account	Amount
(To)		

	FUND	ACCOUNT	AMOUNT
Meeting Date: December 18, 2023	(From)		

V. ATTACHMENTS:

1. City of Chickasha Verkada Quote



Quotation

5 N. McCormick St.
Okc, Ok 73127
Telephone (405)945-9582 Fax (405)945-9599

Date November 29, 2023
Quotation # 1
Customer # 1

Bill To Information:

Customer Name City of Chickasha
Contact Name Rachel Bernish
Street Address 117 N 4th St.
City, State & Zip Code Chickasha, OK 73018
Telephone Number 405.544.8175
E-mail Address rachel.bernish@chickasha.org

Quotation valid until: December 29, 2023
Prepared by: Brent Nelson
Payment Terms: Due upon receipt of goods

Special Comments: City Hall

Product #	Product Description	Qty.	Unit List Price	*Lead Time*	Customer Discount	Customer Unit Price	Customer Extended Price
Equipment & Software					30%		
CD42-256-HW	Verkada CD42 Indoor Dome Camera, 5MP, Fixed Lens, 256GB of Storage, Maximum 30 Days of Retention	5	999.00		299.70	699.30	3,496.50
CF81-30E-HW	Verkada CF81-E Outdoor Fisheye Camera, 12MP, Fixed Lens, 512GB of Storage, Maximum 30 Days of Retention	2	1,999.00		599.70	1,399.30	2,798.60
CB61-30TE-HW	Verkada CB61-TE Outdoor Bullet Camera, 4K, Telephoto Zoom Lens, 384GB of Storage, Maximum 30 Days of Retention	1	1,899.00		569.70	1,329.30	1,329.30
CB51-30E-HW	Verkada CB51-E Outdoor Bullet Camera, 5MP, Zoom Lens, 128GB of Storage, Maximum 30 Days of Retention	2	1,399.00		419.70	979.30	1,958.60
VX52-HW	VX52-HW Verkada VX52 Viewing Station	1	499.00		149.70	349.30	349.30
ACC-MNT-8	Verkada Pendant Cap Mount	7	69.00		20.70	48.30	338.10
ACC-MNT-2	Verkada Arm Mount	2	89.00		26.70	62.30	124.60
ACC-MNT-3	Verkada L-Bracket Mount	5	129.00		38.70	90.30	451.50
AD32-HW	Verkada AD32 Multi-format Card Reader	3	349.00		104.70	244.30	732.90
AC41-HW	Verkada AC41 4 Door Controller	1	1,799.00		539.70	1,259.30	1,259.30
ACC-PROX-1	Verkada Proximity Access Control Cards, 100 Pack	1	599.00		179.70	419.30	419.30



Quotation

5 N. McCormick St.
Okc, Ok 73127
Telephone (405)945-9582 Fax (405)945-9599

Date November 29, 2023
Quotation # 1
Customer # 1

Bill To Information:

Customer Name City of Chickasha
Contact Name Rachel Bernish
Street Address 117 N 4th St.
City, State & Zip Code Chickasha, OK 73018
Telephone Number 405.544.8175
E-mail Address rachel.bernish@chickasha.org

Quotation valid until: December 29, 2023
Prepared by: Brent Nelson
Payment Terms: Due upon receipt of goods

Special Comments: Fire Station #1

Product #	Product Description	Qty.	Unit List Price	*Lead Time*	Customer Discount	Customer Unit Price	Customer Extended Price
Equipment & Software				30%			
CD42-256-HW	Verkada CD42 Indoor Dome Camera, 5MP, Fixed Lens, 256GB of Storage, Maximum 30 Days of Retention	6	999.00		299.70	699.30	4,195.80
CF81-30E-HW	Verkada CF81-E Outdoor Fisheye Camera, 12MP, Fixed Lens, 512GB of Storage, Maximum 30 Days of Retention	3	1,999.00		599.70	1,399.30	4,197.90
VX52-HW	VX52-HW Verkada VX52 Viewing Station	1	499.00		149.70	349.30	349.30
ACC-MNT-2	Verkada Arm Mount	3	89.00		26.70	62.30	186.90
ACC-MNT-8	Verkada Pendant Cap Mount	3	69.00		20.70	48.30	144.90
AD32-HW	Verkada AD32 Multi-format Card Reader	3	349.00		104.70	244.30	732.90
AC41-HW	Verkada AC41 4 Door Controller	1	1,799.00		539.70	1,259.30	1,259.30
ACC-BAT-4AH	4AH Backup Battery	1	129.00		38.70	90.30	90.30
MS120-24P-HW	MERAKI MS120-24P 1G L2 CLD MNGD 24X GIGE	1	3,588.91		1,076.67	2,512.24	2,512.24
LIC-MS120-24P-5YR	MERAKI MS120-24P ENT LIC AND SUP 5YR	1	643.24		192.97	450.27	450.27
Sub Total Equipment				\$	3,049.24	\$	7,114.91
Licensing					30%	\$	14,119.81



Quotation

5 N. McCormick St.
Okc, Ok 73127
Telephone (405)945-9582 Fax (405)945-9599

Date November 29, 2023
Quotation # 1
Customer # 1

Bill To Information:

Customer Name City of Chickasha
Contact Name Rachel Bernish
Street Address 117 N 4th St.
City, State & Zip Code Chickasha, OK 73018
Telephone Number 405.544.8175
E-mail Address rachel.bernish@chickasha.org

Quotation valid until: December 29, 2023
Prepared by: Brent Nelson
Payment Terms: Due upon receipt of goods

Special Comments: Fire Station #2

Product #	Product Description	Qty.	Unit List Price	*Lead Time*	Customer Discount	Customer Unit Price	Customer Extended Price
Equipment & Software				30%			
CD42-256-HW	Verkada CD42 Indoor Dome Camera, 5MP, Fixed Lens, 256GB of Storage, Maximum 30 Days of Retention	4	999.00		299.70	699.30	2,797.20
CF81-30E-HW	Verkada CF81-E Outdoor Fisheye Camera, 12MP, Fixed Lens, 512GB of Storage, Maximum 30 Days of Retention	2	1,999.00		599.70	1,399.30	2,798.60
CD52-256E-HW	Verkada CD52-E Outdoor Dome Camera, 5MP, Zoom Lens, 256GB of Storage, Maximum 30 Days of Retention	2	1,399.00		419.70	979.30	1,958.60
VX52-HW	VX52-HW Verkada VX52 Viewing Station	1	499.00		149.70	349.30	349.30
ACC-MNT-8	Verkada Pendant Cap Mount	6	69.00		20.70	48.30	289.80
ACC-MNT-2	Verkada Arm Mount	2	89.00		26.70	62.30	124.60
ACC-MNT-3	Verkada L-Bracket Mount	4	129.00		38.70	90.30	361.20
AD32-HW	Verkada AD32 Multi-format Card Reader	3	349.00		104.70	244.30	732.90
AC41-HW	Verkada AC41 4 Door Controller	1	1,799.00		539.70	1,259.30	1,259.30
ACC-BAT-4AH	4AH Backup Battery	1	129.00		38.70	90.30	90.30
MS120-24P-HW	MERAKI MS120-24P 1G L2 CLD MNGD 24X GIGE	1	3,588.91		1,076.67	2,512.24	2,512.24
LIC-MS120-24P-5YR	MERAKI MS120-24P ENT LIC AND SUP 5YR	1	643.24		192.97	450.27	450.27



Quotation

5 N. McCormick St.
Okc, Ok 73127
Telephone (405)945-9582 Fax (405)945-9599

Date November 29, 2023
Quotation # 1
Customer # 1

Bill To Information:

Customer Name City of Chickasha
Contact Name Rachel Bernish
Street Address 117 N 4th St.
City, State & Zip Code Chickasha, OK 73018
Telephone Number 405.544.8175
E-mail Address rachel.bernish@chickasha.org

Quotation valid until: December 29, 2023
Prepared by: Brent Nelson
Payment Terms: Due upon receipt of goods

Special Comments: Library

Product #	Product Description	Qty.	Unit List Price	*Lead Time*	Customer Discount	Customer Unit Price	Customer Extended Price
Equipment & Software					30%		
CD42-256-HW	Verkada CD42 Indoor Dome Camera, 5MP, Fixed Lens, 256GB of Storage, Maximum 30 Days of Retention	2	999.00		299.70	699.30	1,398.60
CF81-30E-HW	Verkada CF81-E Outdoor Fisheye Camera, 12MP, Fixed Lens, 512GB of Storage, Maximum 30 Days of Retention	5	1,999.00		599.70	1,399.30	6,996.50
VX52-HW	VX52-HW Verkada VX52 Viewing Station	1	499.00		149.70	349.30	349.30
ACC-MNT-8	Verkada Pendant Cap Mount	5	69.00		20.70	48.30	241.50
ACC-MNT-2	Verkada Arm Mount	5	89.00		26.70	62.30	311.50
AD32-HW	Verkada AD32 Multi-format Card Reader	1	349.00		104.70	244.30	244.30
AC41-HW	Verkada AC41 4 Door Controller	1	1,799.00		539.70	1,259.30	1,259.30
ACC-BAT-4AH	4AH Backup Battery	1	129.00		38.70	90.30	90.30
Sub Total Equipment					\$ 1,779.60	\$ 4,152.40	\$ 10,891.30
Licensing					30%		
LIC-5Y	Verkada 5-Year Camera License	7	899.00		269.70	629.30	4,405.10

LIC-VX-5Y	Verkada 5-Year Viewing Station License	1	1,999.00	-	-	-
				599.70	1,399.30	1,399.30
LIC-AC-5Y	Verkada 5-Year Door License	1	999.00	-	-	-
				299.70	699.30	699.30
				Sub Total Smartnet \$	1,169.10 \$	2,727.90 \$
						6,503.70
Cabling				0%		
6P4P24BLPMOHAPCE	CAT 6 PLENUM CABLE MOHAWK	2000	0.52	-	-	-
61110-RI6	LEVITON CAT 6 IVORY INSERT	14	13.81	-	0.52	1,040.00
49255-H24	LEVITON 24 PORT BLANK PATCH PANEL	1	69.99	-	13.81	193.34
CT50400C0	15.5 X .18 IN 50 LB tie wraps	1	36.68	-	69.99	69.99
RJ45	RJ45	14	7.50	-	36.68	36.68
Cable Labor	Cable Labor	7	148.00	-	7.50	105.00
				-	148.00	1,036.00
				-	276.50	2,481.01
Door Materials				0%		
Materials and Equipment	Materials, Equipment	1	3,283.08	-	-	-
				-	3,283.08	3,283.08
				-	-	-
				-	-	-
				-	-	-
				Sub Total Peripherals \$	- \$	3,836.08 \$
						3,283.08
CTI-INST-LBR	Freight and Shipping			\$	-	-
	Installation, Configuration and Training	1	7,714.44	\$	7,714.44	7,714.44
					TOTAL \$	30,873.53

THANK YOU FOR YOUR BUSINESS

Ship To Information:

Customer Name City of Chickasha
Contact Name Rachel Bernish
Street Address 117 N 4th St.
City, State & Zip Code Chickasha, OK 73018
Telephone Number 405.544.8175
E-mail Address rachel.bernish@chickasha.org

If you have a project deadline please let us know when you place the order.

* Lead time is a Cisco estimate in business days plus shipping.
All Sales are final. No returns without Manufacturer's approval.

Account Manager: Brent Nelson
Direct Telephone # : 405.945.9582
Cell # 405.315.7229
Federal Identification # : 73-1354410
Service Provider ID (SPIN) # : 143028698

Important Confidentiality Notice

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Quotation

5 N. McCormick St.
Okc, Ok 73127
Telephone (405)945-9582 Fax (405)945-9599

Date November 29, 2023
Quotation # 1
Customer # 1

Bill To Information:

Customer Name City of Chickasha
Contact Name Rachel Bernish
Street Address 117 N 4th St.
City, State & Zip Code Chickasha, OK 73018
Telephone Number 405.544.8175
E-mail Address rachel.bernish@chickasha.org

Quotation valid until: December 29, 2023
Prepared by: Brent Nelson
Payment Terms: Due upon receipt of goods

Special Comments: Police Station

Product #	Product Description	Qty.	Unit List Price	*Lead Time*	Customer Discount	Customer Unit Price	Customer Extended Price
Equipment & Software				30%			
CD42-256-HW	Verkada CD42 Indoor Dome Camera, 5MP, Fixed Lens, 256GB of Storage, Maximum 30 Days of Retention	12	999.00		299.70	699.30	8,391.60
CF81-30E-HW	Verkada CF81-E Outdoor Fisheye Camera, 12MP, Fixed Lens, 512GB of Storage, Maximum 30 Days of Retention	1	1,999.00		599.70	1,399.30	1,399.30
CD52-256E-HW	Verkada CD52-E Outdoor Dome Camera, 5MP, Zoom Lens, 256GB of Storage, Maximum 30 Days of Retention	5	1,399.00		419.70	979.30	4,896.50
VX52-HW	VX52-HW Verkada VX52 Viewing Station	1	499.00		149.70	349.30	349.30
ACC-MNT-8	Verkada Pendant Cap Mount	1	69.00		20.70	48.30	48.30
ACC-MNT-2	Verkada Arm Mount	2	89.00		26.70	62.30	124.60
ACC-MNT-7	Verkada Angle Mount	3	149.00		44.70	104.30	312.90
ACC-MNT-3	Verkada L-Bracket Mount	5	129.00		38.70	90.30	451.50
AD32-HW	Verkada AD32 Multi-format Card Reader	7	349.00		104.70	244.30	1,710.10
AC41-HW	Verkada AC41 4 Door Controller	2	1,799.00		539.70	1,259.30	2,518.60
ACC-BAT-4AH	4AH Backup Battery	1	129.00		38.70	90.30	90.30

Date	November 29, 2023
Quotation #	1
Customer #	1

Quotation valid until: December 29, 2023
Prepared by: Brent Nelson
Payment Terms: Due upon receipt of goods

Special Comments: Shannon Springs

Confidential and Proprietary Information



Quotation

5 N. McCormick St.
Okc, Ok 73127
Telephone (405)945-9582 Fax (405)945-9599

Date November 29, 2023
Quotation # 1
Customer # 1

Bill To Information:

Customer Name City of Chickasha
Contact Name Rachel Bernish
Street Address 117 N 4th St.
City, State & Zip Code Chickasha, OK 73018
Telephone Number 405.544.8175
E-mail Address rachel.bernish@chickasha.org

Quotation valid until: December 29, 2023
Prepared by: Brent Nelson
Payment Terms: Due upon receipt of goods

Special Comments: Airport

Product #	Product Description	Qty.	Unit List Price	*Lead Time*	Customer Discount	Customer Unit Price	Customer Extended Price
Equipment & Software				30%			
CD42-256-HW	Verkada CD42 Indoor Dome Camera, 5MP, Fixed Lens, 256GB of Storage, Maximum 30 Days of Retention	4	999.00		299.70	699.30	2,797.20
CF81-30E-HW	Verkada CF81-E Outdoor Fisheye Camera, 12MP, Fixed Lens, 512GB of Storage, Maximum 30 Days of Retention	2	1,999.00		599.70	1,399.30	2,798.60
CB61-30TE-HW	Verkada CB61-TE Outdoor Bullet Camera, 4K, Telephoto Zoom Lens, 384GB of Storage, Maximum 30 Days of Retention	1	1,899.00		569.70	1,329.30	1,329.30
VX52-HW	VX52-HW Verkada VX52 Viewing Station	1	499.00		149.70	349.30	349.30
ACC-MNT-8	Verkada Pendant Cap Mount	2	69.00		20.70	48.30	96.60
ACC-MNT-2	Verkada Arm Mount	2	89.00		26.70	62.30	124.60
ACC-MNT-3	Verkada L-Bracket Mount	1	129.00		38.70	90.30	90.30
MS120-24P-HW	MERAKI MS120-24P 1G L2 CLD MNGD 24X GIGE	1	3,588.91		1,076.67	2,512.24	2,512.24
LIC-MS120-24P-5YR	MERAKI MS120-24P ENT LIC AND SUP 5YR	1	643.24		192.97	450.27	450.27
Sub Total Equipment				\$	2,974.54	\$	6,940.61
Licensing					30%		10,548.41

Cabling	0%
---------	----

	Sub Total Peripherals	\$ -	\$ 257.00	\$ -
Freight and Shipping			\$ -	\$ -

Ship To Information:

If you have a project deadline please let us know when you place the order.

Account Manager: Brent Nelson
Direct Telephone #: 405.945.9582
Cell #: 405.315.7229
Federal Identification #: 73-1354410
Service Provider ID (SPIN) #: 143028698

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5 N. McCormick St.
Okc, Ok 73127
Telephone (405)945-9582 Fax (405)945-9599

Date November 29, 2023
Quotation # 1
Customer # 1

Bill To Information:

Customer Name City of Chickasha
Contact Name Rachel Bernish
Street Address 117 N 4th St.
City, State & Zip Code Chickasha, OK 73018
Telephone Number 405.544.8175
E-mail Address rachel.bernish@chickasha.org

Quotation valid until: December 29, 2023
Prepared by: Brent Nelson
Payment Terms: Due upon receipt of goods

Special Comments: Water Treatment

Product #	Product Description	Qty.	Unit List Price	*Lead Time*	Customer Discount	Customer Unit Price	Customer Extended Price
Equipment & Software				30%			
CF81-30E-HW	Verkada CF81-E Outdoor Fisheye Camera, 12MP, Fixed Lens, 512GB of Storage, Maximum 30 Days of Retention	1	1,999.00		599.70	1,399.30	1,399.30
CD52-256E-HW	Verkada CD52-E Outdoor Dome Camera, 5MP, Zoom Lens, 256GB of Storage, Maximum 30 Days of Retention	2	1,399.00		419.70	979.30	1,958.60
ACC-MNT-8	Verkada Pendant Cap Mount	1	69.00		20.70	48.30	48.30
ACC-MNT-2	Verkada Arm Mount	3	89.00		26.70	62.30	186.90
MS120-8P-HW	MERAKI MS120-24P 1G L2 CLD MNGD 24X GIGE	1	1,644.92		493.48	1,151.44	1,151.44
LIC-MS120-8P-5YR	MERAKI MS120-24P ENT LIC AND SUP 5YR	1	290.01		87.00	203.01	203.01
Sub Total Equipment				\$	1,647.28	\$ 3,843.65	\$ 4,947.55
Licensing				30%			
LIC-5Y	Verkada 5-Year Camera License	3	899.00		269.70	629.30	1,887.90
Sub Total Smartnet				\$	269.70	\$ 629.30	\$ 1,887.90
Cabling				0%			
6P4P24BLPMOHAPCE	CAT 6 PLENUM CABLE MOHAWK	450	0.52		-	0.52	234.00

Door Materials	0%
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THANK YOU FOR YOUR BUSINESS		TOTAL	\$	12,287.98
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Account Manager:	Brent Nelson
Direct Telephone # :	405.945.9582
Cell #	405.315.7229
Federal Identification # :	73-1354410
Service Provider ID (SPIN) # :	143028698

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Page 21 of 106

Date	November 29, 2023
Quotation #	1
Customer #	1

Quotation valid until: December 29, 2023
Prepared by: Brent Nelson
Payment Terms: Due upon receipt of goods

Special Comments: Wastewater Treatment

Confidential and Proprietary Information

CTI-INST-LBR	Freight and Shipping Installation, Configuration and Training
--------------	--



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5 N. McCormick St.
Okc, Ok 73127
Telephone (405)945-9582 Fax (405)945-9599

Date November 29, 2023
Quotation # 1
Customer # 1

Bill To Information:

Customer Name City of Chickasha
Contact Name Rachel Bernish
Street Address 117 N 4th St.
City, State & Zip Code Chickasha, OK 73018
Telephone Number 405.544.8175
E-mail Address rachel.bernish@chickasha.org

Quotation valid until: December 29, 2023
Prepared by: Brent Nelson
Payment Terms: Due upon receipt of goods

Special Comments: Washita Park

Product #	Product Description	Qty.	Unit List Price	*Lead Time*	Customer Discount	Customer Unit Price	Customer Extended Price
Equipment & Software					30%		
CD52-256E-HW	Verkada CD52-E Outdoor Dome Camera, 5MP, Zoom Lens, 256GB of Storage, Maximum 30 Days of Retention	3	1,399.00		419.70	979.30	2,937.90
					-	-	-
ACC-MNT-9	Verkada Pole Mount, 2nd Generation	3	209.00		62.70	146.30	438.90
					-	-	-
					-	-	-
					-	-	-
					-	-	-
Sub Total Equipment					\$ 482.40	\$ 1,125.60	\$ 3,376.80
Licensing					30%		
LIC-5Y	Verkada 5-Year Camera License	3	899.00		269.70	629.30	1,887.90
					-	-	-
					-	-	-
Sub Total Smartnet					\$ 269.70	\$ 629.30	\$ 1,887.90
Cabling					0%		
					-	-	-
					-	-	-
					-	-	-
					-	-	-
Door Materials					0%		
					-	-	-
					-	-	-
					-	-	-

CTI-INST-LBR Freight and Shipping
Installation, Configuration and Training

THANK YOU FOR YOUR BUSINESS

		-	-	-
		-	-	-
		-	-	-
	Sub Total Peripherals	\$	-	\$
		\$	-	\$
1	2,900.00	\$	2,900.00	2,900.00
			TOTAL	\$ 8,164.70

Ship To Information:

Customer Name City of Chickasha
Contact Name Rachel Bernish
Street Address 117 N 4th St.
City, State & Zip Code Chickasha, OK 73018
Telephone Number 405.544.8175
E-mail Address rachel.bernish@chickasha.org

If you have a project deadline please let us know when you place the order.

* Lead time is a Cisco estimate in business days plus shipping.
All Sales are final. No returns without Manufacturer's approval.

Account Manager: Brent Nelson Direct Telephone # : 405.945.9582 Cell # 405.315.7229 Federal Identification # : 73-1354410 Service Provider ID (SPIN) # : 143028698

Important Confidentiality Notice

This document is proprietary to Chickasaw Telecom and contains Chickasaw Telecom confidential information. It may not be disclosed in whole or in part without the express written authorization of Chickasaw Telecom.
No portion of this document may be duplicated or used for any purposes other than to receive product, services or deliverables from Chickasaw Telecom, described herein.



Quotation

5 N. McCormick St.
Okc, Ok 73127
Telephone (405)945-9582 Fax (405)945-9599

Date November 29, 2023
Quotation # 1
Customer # 1

Bill To Information:

Customer Name City of Chickasha
Contact Name Rachel Bernish
Street Address 117 N 4th St.
City, State & Zip Code Chickasha, OK 73018
Telephone Number 405.544.8175
E-mail Address rachel.bernish@chickasha.org

Quotation valid until: December 29, 2023
Prepared by: Brent Nelson
Payment Terms: Due upon receipt of goods

Special Comments: Public Works

Product #	Product Description	Qty.	Unit List Price	*Lead Time*	Customer Discount	Customer Unit Price	Customer Extended Price
Equipment & Software				30%			
CD42-256-HW	Verkada CD42 Indoor Dome Camera, 5MP, Fixed Lens, 256GB of Storage, Maximum 30 Days of Retention	1	999.00		299.70	699.30	699.30
CF81-30E-HW	Verkada CF81-E Outdoor Fisheye Camera, 12MP, Fixed Lens, 512GB of Storage, Maximum 30 Days of Retention	1	1,999.00		599.70	1,399.30	1,399.30
CD52-256E-HW	Verkada CD52-E Outdoor Dome Camera, 5MP, Zoom Lens, 256GB of Storage, Maximum 30 Days of Retention	4	1,399.00		419.70	979.30	3,917.20
VX52-HW	VX52-HW Verkada VX52 Viewing Station	1	499.00		149.70	349.30	349.30
ACC-MNT-8	Verkada Pendant Cap Mount	1	69.00		20.70	48.30	48.30
ACC-MNT-2	Verkada Arm Mount	1	89.00		26.70	62.30	62.30
ACC-MNT-3	Verkada L-Bracket Mount	5	129.00		38.70	90.30	451.50
MS120-24P-HW	MERAKI MS120-24P 1G L2 CLD MNGD 24X GIGE	1	3,588.91		1,076.67	2,512.24	2,512.24
LIC-MS120-24P-5YR	MERAKI MS120-24P ENT LIC AND SUP 5YR	1	643.24		192.97	450.27	450.27
Sub Total Equipment				\$	2,824.54	\$ 6,590.61	\$ 9,889.71
Licensing				30%			



Quotation

5 N. McCormick St.
Okc, Ok 73127
Telephone (405)945-9582 Fax (405)945-9599

Date November 29, 2023
Quotation # 1
Customer # 1

Bill To Information:

Customer Name City of Chickasha
Contact Name Rachel Bernish
Street Address 117 N 4th St.
City, State & Zip Code Chickasha, OK 73018
Telephone Number 405.544.8175
E-mail Address rachel.bernish@chickasha.org

Quotation valid until: December 29, 2023
Prepared by: Brent Nelson
Payment Terms: Due upon receipt of goods

Special Comments: Sports Complex

Product #	Product Description	Qty.	Unit List Price	*Lead Time*	Customer Discount	Customer Unit Price	Customer Extended Price
Equipment & Software				30%			
CD42-256-HW	Verkada CD42 Indoor Dome Camera, 5MP, Fixed Lens, 256GB of Storage, Maximum 30 Days of Retention	5	999.00		299.70	699.30	3,496.50
CF81-30E-HW	Verkada CF81-E Outdoor Fisheye Camera, 12MP, Fixed Lens, 512GB of Storage, Maximum 30 Days of Retention	2	1,999.00		599.70	1,399.30	2,798.60
CB61-30TE-HW	Verkada CB61-TE Outdoor Bullet Camera, 4K, Telephoto Zoom Lens, 384GB of Storage, Maximum 30 Days of Retention	1	1,899.00		569.70	1,329.30	1,329.30
CB51-30E-HW	Verkada CB51-E Outdoor Bullet Camera, 5MP, Zoom Lens, 128GB of Storage, Maximum 30 Days of Retention	2	1,399.00		419.70	979.30	1,958.60
VX52-HW	VX52-HW Verkada VX52 Viewing Station	1	499.00		149.70	349.30	349.30
ACC-MNT-8	Verkada Pendant Cap Mount	7	69.00		20.70	48.30	338.10
ACC-MNT-2	Verkada Arm Mount	2	89.00		26.70	62.30	124.60
ACC-MNT-3	Verkada L-Bracket Mount	5	129.00		38.70	90.30	451.50
MS120-24P-HW	MERAKI MS120-24P 1G L2 CLD MNGD 24X GIGE	1	3,588.91		1,076.67	2,512.24	2,512.24
LIC-MS120-24P-5YR	MERAKI MS120-24P ENT LIC AND SUP 5YR	1	643.24		192.97	450.27	450.27
					-	-	-
					-	-	-
					-	-	-

Date	November 29, 2023
Quotation #	1
Customer #	1

Quotation valid until: December 29, 2023
Prepared by: Brent Nelson
Payment Terms: Due upon receipt of goods

Special Comments: Animal Control

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Page 30 of 106

TERMS AND CONDITIONS

1. The amount due does not include the cost of installation unless installation is specifically included in the pricing quotation to the customer. Telephone numbers, listings and access lines are not included. No other item is included unless specifically stated on a schedule.
2. Customer hereby grants Chickasaw Telecom, Inc. (CTI's) a security interest in the equipment and/or parts described on this agreement and subsequent invoice in the amount shown as "Total Amount Due" therein. A copy of this agreement may be filed with CTI at any time after signature by customer as a financing statement to protect CTI's security interest. Such filing does not constitute acceptance by CTI. Customer agrees to execute a standard form financing statement if requested by CTI.
3. Customer will provide or arrange for: (A) necessary floor plans and accessible equipment locations; (B) separate electric source, circuits and power at its own expense; (C) suitable space meeting operating environment requirements; (D) heat, air conditioning, light and security; (E) reasonable access; and (F) where to otherwise provided herein, raceway, conduit, holes and wire ways. Customer will make CTI its agent and representative to arrange for cutover to the public telephone network, to identify, and order with Customer necessary facilities, and to coordinate installation and cutover. CUSTOMER WILL PAY ALL CHARGES OF THE LOCAL TELEPHONE COMPANY AND OTHER CARRIER.
4. Customer assumes the risk of loss and damage to the equipment or any part from the date of its delivery to the premises. So long as any part of the cash price is unpaid. Customer will maintain adequate insurance against fire, theft or other loss for the equipment's full insurable value, with CTI as additional insured. Risk of loss will not affect title to the equipment. Title passes on full payment of the cash price.
5. When Acceptance is required, customer agrees to sign an acceptance certificate that (A) the equipment has been installed and/or delivered in good condition; (B) the equipment is accepted as installed and/or delivered; and (C) payment is due without setoff or abatement. CTI may elect to suspend equipment support and/or maintenance until the acceptance certificate is delivered to CTI.
6. CTI will provide reasonable end user instruction and training if specifically included in the customers pricing quotation as per CTI's standard practices. Subsequent training and instruction will be provided from time to time at CTI's prevailing rates.
7. If customer cancels an order, refuses to accept the equipment, or to permit CTI to install the equipment if included in pricing quotation, customer will pay CTI as fixed, settled and liquidated damages, and not as a penalty, its down payment, or 20% of the cash price, whichever is greater.
8. For the period of 90 days from the delivery date, CTI warrants that the equipment will be free from defects and material in workmanship, and CTI will keep the equipment in good working condition and repair if warranty work is necessary, CTI will, at its option, repair the equipment in place or accept the return of equipment for repair or replacement with the exception of batteries. Smartnet must be purchased as part of the original order for this warranty provision to be active. This warranty excludes repairs made necessary by misuse, negligence, accident, theft or unexplained loss, abuse, connection to direct electric current, fire, flood, wind, lightning, act of God or public enemy, or improper wiring, installation, repair or alteration by anyone other than CTI. CTI may elect to perform repairs necessitated by any excluded cause at Customer's request at CTI's then prevailing rates. This is Customer's sole and exclusive remedy and CTI's liability in all events will cease and terminate at the expiration of the warranty period. THE ABOVE WARRANTY IS IN LIEU OF AND EXCLUDES ALL OTHER EXPRESSED OR IMPLIED WARRANTIES, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS. NO OTHER WARRANTY EXISTS IN THIS AGREEMENT.
9. CTI will be responsible only for death, injury, or damage to tangible physical property which is caused during installation or maintenance solely by its agents or employees, and which is reported to CTI in writing within ten working days. Customer agrees to release, indemnify and hold harmless CTI from and against all other claims, liability, loss and use, break down of, interruption of, failure to maintain or incomplete communication through the equipment, whether by itself or with other equipment. In no event will CTI be responsible for special, consequential or incidental damages, including those for loss of business or profits or other commercial loss.
10. In the event customer fails to pay any sums when due, CTI, in addition to all other remedies available to it at law or in equity and not in limitation thereof, may at its option cease installing the equipment until paid in full, enter Customer's premises with or without notice and take possession of and remove the equipment, and either (A) terminate this agreement, retaining all sums paid; or (B) dispose of the equipment for customer's account at the best price obtainable at public or private sale with customer to remain liable for any deficiency.
11. This Agreement is not assignable without prior written consent of CTI. Any attempt to assign any of the rights, duties or obligations under this agreement without such consent will, at CTI's option, be deemed void or a default, or accepted in CTI's sole discretion.
12. The waiver by CTI of any default by customer will not operate as a waiver of any default at any subsequent time.
13. CTI's obligation is contingent upon a credit report satisfactory to CTI and correct arithmetic calculations of quantity and price. This Agreement supersedes all prior or contemporaneous proposals, quotations and negotiations and constitutes the entire agreement between CTI and customer with respect to the purchase of the equipment. No representations or statement not expressed herein is binding upon CTI. Any modification must be in writing and executed by an authorized representative of the party against whom enforcement is sought.



City of
CHICKASHA

Meeting Type: Special CMA Meeting 12-18-2023

Meeting Date: 12/18/2023

Department: Public Works

Agenda Item No. 2.c.

AGENDA ITEM: Accept Application - Right of Entry at Ada Sipuel and Union Pacific Railroad

I. BACKGROUND/DESCRIPTION:

II. RECOMMENDED ACTION:

Accept Application - Right of Entry at Ada Sipuel and Union Pacific Railroad

III. FISCAL INFORMATION -

IV. FUND INFORMATION:

Dept. Director: Jim Crosby, Public Works Director	Fund	Account	Amount
	(To)		
	FUND	ACCOUNT	AMOUNT
Meeting Date: December 18, 2023	(From)		

V. ATTACHMENTS:

1. Application - Right of Entry - Ada Sipuel and Union Pacific Railroad

APPLICATION – RIGHT OF ENTRY

(Please allow 30-45 days for processing)

1. Name of Licensee Chickasha Municipal Authority
(Exact Name of the Owner of the Utility)

State of Incorporation OK; if not incorporated, please list entity's legal status

2. Address, email, phone and Fax number of Licensee
117 N. 4th Street, Chickasha, Ok 73018

Email jim.crosby@chickasha.org Phone (405) 222-6080 Fax (405) 222-6084
3. Name, address and phone number of individual to whom agreement is to be mailed
if different than Item 2.

4. Contact information for individual to contact in the event of questions.
R. Scott Vaughn, P.E.

Email rscottv11@gmail.com Phone 580-467-8130 Fax N/A
5. Project site location:
Ada Sipuel Avenue (aka Idaho Ave) at UPRR, Chickasha, Grady Co., OK
(City, County and State)
6. Railroad site location information:
Near Mile Marker 436.9, b/w Blk 156, Chickasha Original Townsite and Blk 2, East Side Addn
(Railroad Mile Post, Subdivision, or any other pertinent location detail.)
7. Time period for your project use of Railroad Company's property:
Start Date: March 1, 2024 Stop Date: May 31, 2024
8. Will there be any activity or equipment within 25 feet of a Railroad track in connection with this property?
☒ No ☐ Yes (If Yes, a Flagman will be required on site at your cost.)
9. Will there be any excavation involved?
☐ No ☒ Yes (If Yes, include shoring plans within Railroad standards.)

10. Purpose of your request:
(This must be detailed & complete; attach engineering plans, shoring plans and any pertinent supporting details, including maps or prints.)

Install encased water main under railroad tracks.

- Additional Fees and charges may be applicable to your request. These changes cannot be determined until your project is approved.

**UNION PACIFIC RAILROAD
1400 DOUGLAS STREET MS 1690
OMAHA NE 68179**



City of
CHICKASHA

Meeting Type: Special CMA Meeting 12-18-2023

Meeting Date: 12/18/2023

Department: Finance

Agenda Item No. 2.d.

AGENDA ITEM: Accept and ratify Resolution 2023-30R amending the FY 23/24 Budget.

I. BACKGROUND/DESCRIPTION:

II. RECOMMENDED ACTION:

III. FISCAL INFORMATION -

IV. FUND INFORMATION:

Dept. Director:	Fund	Account	Amount
	(To)		
	FUND	ACCOUNT	AMOUNT
Meeting Date: December 18, 2023	(From)		

V. ATTACHMENTS:

1. Res. 2023-30R Budget Amendment
2. Res 2023-30R Exhibits A-D

RESOLUTION NO. 2023-30R

**A RESOLUTION OF THE MAYOR AND COUNCIL OF THE CITY OF CHICKASHA,
GRADY COUNTY, STATE OF OKLAHOMA, AMENDING THE CITY OF
CHICKASHA ADOPTED BUDGET FOR FISCAL YEAR 2023-24**

WHEREAS, pursuant to the Oklahoma Municipal Budget Act, 11 O.S. Section 17-201 through 17-216, all steps in the process of developing the City's Budget for FY 2023-24 were followed, culminating the adoption of the Budget by the Mayor and Council on June 20, 2023; and

WHEREAS, Sections 17-215 and 17-216 of the Oklahoma Municipal Budget Act specifically authorizes amendments to the adopted budget; and

WHEREAS, the Mayor and Council have determined a need to amend the adopted budget; and

NOW THEREFORE, be it resolved by the Mayor and Council of the City of Chickasha, Grady County, Oklahoma, that:

Section 1. The adopted FY 2023-24 Budget for the GENERAL Fund #11 is hereby amended and attached hereto as "Exhibit A"; and
FY 2023-24 Budget for the CHICKASHA MUNICIPAL AUTHORITY Fund #31 is hereby amended and attached hereto as "Exhibit B"; and
FY 2023-24 Budget for the CHICKASHA MUNICIPAL AIRPORT AUTHORITY Fund #39 is hereby amended and attached hereto as "Exhibit C"; and
FY 2023-24 Budget for the COMBINED INSURANCE Fund #71 is hereby amended and attached hereto as "Exhibit D".

This Resolution shall be in full force and effect from and after the passage and approval by the Mayor and Council of the City of Chickasha, Grady County, Oklahoma.

Adopted this 18th day of December 2023.

Chris Mosley, Mayor

ATTEST:

Susan M. McDaniel, CMC - City Clerk

(SEAL)

Exhibit A

CITY OF CHICKASHA

BUDGET AMENDMENT FORM

☒ INCREASE	☐ DECREASE	☐ TRANSFER
--	-----------------------------------	-----------------------------------

Fund: GENERAL
 Fund No.: 11
 Amendment No.: 9
 Fiscal Year: 2023-2024

Account #	Account Name	Estimated Revenue(s)		Appropriation(s)	
		Increase	Decrease	Increase	Decrease
4500-071	TRANSFER-COMBINED INSURANCE	342,500.00			
501-6000-301	SECURITY CAMERA SYSTEM			45,300.00	
502-6000-301	SECURITY CAMERA SYSTEM			46,400.00	
503-6000-301	SECURITY CAMERA SYSTEM			85,100.00	
508-6000-301	SECURITY CAMERA SYSTEM			30,900.00	
521-6000-301	SECURITY CAMERA SYSTEM			50,800.00	
543-6000-301	SECURITY CAMERA SYSTEM			22,300.00	
551-6000-301	SECURITY CAMERA SYSTEM			10,100.00	
551-6000-301	SECURITY CAMERA SYSTEM			8,200.00	
552-6000-301	SECURITY CAMERA SYSTEM			43,400.00	
TOTALS		342,500.00	-	342,500.00	-

EXPLANATION: Security Camera System

Approved by City Manager:

 Date Signature

Approved by City Council:

 Date Signature

Exhibit B

CITY OF CHICKASHA

BUDGET AMENDMENT FORM

<u> X </u> INCREASE	<u> </u> DECREASE	<u> </u> TRANSFER
-----------------------	------------------------	------------------------

Fund: CHICKASHA MUNICIPAL AUTHORITY (CMA)
Fund No.: 31
Amendment No.: 5
Fiscal Year: 2023-2024

Account #	Account Name	Estimated Revenue(s)		Appropriation(s)	
		Increase	Decrease	Increase	Decrease
4500-071	TRANSFER-COMBINED INS	47,500.00			
532-6000-301	SECURITY CAMERA SYSTEM			29,000.00	
534-6000-301	SECURITY CAMERA SYSTEM			12,300.00	
535-6000-301	SECURITY CAMERA SYSTEM			6,200.00	
TOTALS		47,500.00	-	47,500.00	-

EXPLANATION:

Security Camera System

Approved by City Manager:

Date _____ Signature _____

Approved by City Council:

Date _____ Signature _____

Exh. 5: +C
CITY OF CHICKASHA

BUDGET AMENDMENT FORM

<u> X </u> INCREASE	<u> </u> DECREASE	<u> </u> TRANSFER
-----------------------	------------------------	------------------------

Fund: CHICKASHA MUNICIPAL AIRPORT AUTHORITY (CMAA)
Fund No.: 39
Amendment No.: 5
Fiscal Year: 2023-2024

Account #	Account Name	Estimated Revenue(s)		Appropriation(s)	
		Increase	Decrease	Increase	Decrease
4500-071	TRANSFER-COMBINED INSURANCE	27,800.00			
539-6000-301	SECURITY CAMERA SYSTEM			27,800.00	
TOTALS		27,800.00	-	27,800.00	-

EXPLANATION:

Security Camera System

Approved by City Manager:

Date

Signature

Approved by City Council:

Date

Signature

Exhibit D
CITY OF CHICKASHA

BUDGET AMENDMENT FORM

<u> X </u> INCREASE	<u> </u> DECREASE	<u> </u> TRANSFER
-----------------------	------------------------	------------------------

Fund: COMBINED INSURANCE
Fund No.: 71
Amendment No.: 3
Fiscal Year: 2023-2024

Account #	Account Name	Estimated Revenue(s)		Appropriation(s)	
		Increase	Decrease	Increase	Decrease
571-5500-011	TRANSFER-GENERAL			342,500.00	
571-5500-031	TRANSFER-CMA			47,500.00	
571-5500-039	TRANSFER-CMAA (AIRPORT)			28,000.00	
4700-001	AVAILABLE FUND BALANCE	418,000.00			
TOTALS		418,000.00	-	418,000.00	-

EXPLANATION:

To return previous transfer of insurance for purchase of Security Camera System

Approved by City Manager:

Date Signature

Approved by City Council:

Date Signature



City of
CHICKASHA

Meeting Type: Special CMA Meeting 12-18-2023

Meeting Date: 12/18/2023

Department: Public Works

Agenda Item No. 4.a.

AGENDA ITEM: Discussion, consideration, and possible action to authorize Staff to solicit bids for CMA-2401 - Water Main Construction - Ada Sipuel Avenue at Union Pacific Railroad.

I. BACKGROUND/DESCRIPTION:

II. RECOMMENDED ACTION:

Authorize Staff to solicit bids for CMA-2401 - Water Main Construction - Ada Sipuel Avenue at Union Pacific Railroad.

III. FISCAL INFORMATION -

IV. FUND INFORMATION:

Dept. Director:

Jim Crosby, Public Works Director

Meeting Date:

December 18, 2023

Fund	Account	Amount
(To)		
FUND	ACCOUNT	AMOUNT
(From)		

V. ATTACHMENTS:

1. RFP CMA-2401



**RFP CMA-2401
WATER MAIN CONSTRUCTION
ADA SIPUEL AVENUE AT UNION PACIFIC RAILROAD**

CHICKASHA MUNICIPAL AUTHORITY

CHICKASHA, OKLAHOMA

TECHNICAL SPECIFICATIONS

Prepared by:



CHISHOLM TRAIL CONSULTING, LLC

CA 7771
2124 Scott Lane
Duncan, Ok 73533
580-467-8130
rscottv11@gmail.com



Randall Scott Vaughn, OK P.E., 15194

November 29, 2023
Date

**RFP CMA-2401
WATER MAIN CONSTRUCTION
ADA SIPUEL AVENUE AT UNION PACIFIC RAILROAD
TECHNICAL SPECIFICATIONS**

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Chickasha Municipal Authority, Oklahoma

RFP CMA-2401 WATER MAIN CONSTRUCTION SPECIFICATIONS

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SECTION 500 – WATER MAINS

SECTION 500 – CONSTRUCTION REQUIREMENTS

500.01 – DESCRIPTION

This section covers general requirements for construction of water lines and appurtenances as described herein. The intent of these specifications is to provide for complete installation including materials, labor and equipment necessary to complete the work. These specifications shall apply to water mains with nominal diameter of 6" through 12" only.

All design, materials, construction, sampling and testing shall comply with ODEQ rules and regulations and AWWA Standards. ODEQ rules and regulations found at OAC 252:626, latest addition, shall govern. Construction compliance shall specifically include, but not will not be limited to, compliance with paragraphs 252:626-19-2 (h) (1) and (2) regarding horizontal and vertical separation between water mains and contamination sources. That is, maintain 1) at least 10 feet horizontally between the water main and any existing or proposed sanitary sewer mains and 2) at least two (2) feet vertically between the water main and any existing or proposed sanitary sewer mains. In the event these separation distances cannot be maintained, refer to the plans for details regarding installation.

The work to be done under this contract consists in general of the installation of pipe, fittings, specials, valves, and other pipe line appurtenances, shall include unloading such material at the point of delivery, hauling, distribution and installation thereof; the furnishing and installation of all jointing materials, gate valves, air valves and appurtenances, structures, concrete and all other materials required by the plans and specifications; making all specified and necessary connections with existing mains; making all required tests; restoration of all roadways, streets, driveways, sidewalks, crosswalks, and street crossing surfaces, and replacement or repair of all drains, sewers, conduits, water, oil and gas lines, fences, culverts, bridges and other structures which may be damaged in the prosecution of the work; maintenance of traffic across sites of the work where required, with all necessary barricades, lights and other safety provisions; making of all repairs to coatings and linings of pipe under the supervision of a representative of the pipe manufacturer; and the performance of all other work required by the plans and as specified herein.

500-02 - EXCAVATION AND BACKFILLING

- A.) DEFINITION – The terms "excavation" and "trenching", as used herein or in any other reference to the work under contract shall refer to and mean any and all material excavated, for whatever purpose, in accordance with the terms of the specifications, plans, proposal and contract, and shall include all subsequent handling, backfilling, compacting, disposal of excess excavation materials, and the preparation of all sub-grades, etc., necessary for a first-class job.
- B.) EXCAVATION WORK – Excavation work shall include clearing and preparation of the trench or excavation size, including the removal of all surface vegetation, stumps and debris; all sheeting, shoring, bracing, protection of adjacent property, preparation of all sub-grades, storage of excavated materials off of the excavation site where necessary, backfilling, tamping and otherwise compacting of backfill and specified embankments, grading and surfacing; moving, hauling or otherwise transporting excavated materials from whatever source, where materials are to be returned to the excavation site for backfill purposes, as directed by the Engineer; and all other excavation stipulated in this specification.

C.) CLASSIFICATION OF EXCAVATION – There shall be no classification of excavated materials (except as otherwise provided for in the proposal) and the term “excavation” shall include all materials excavated or removed on the several sites of the work regardless of the type, character, composition or condition of the materials so excavated; and shall further include all debris, junk, broken concrete and all other materials within the excavation limits.

D.) PIPE TRENCH EXCAVATION – Pipe lines shall be installed to the alignment, grades and elevations shown on the drawings. Grade and alignment of pipe and pipe sub-grades will ordinarily be obtained from offset (hub) stakes. Trenches shall be dug by means of a backhoe, trackhoe or trenching machine wherever practicable. The use of any other type of power excavating equipment such as drag line or power shovel will not be permitted except with special authorization by the Engineer and under such requirements relative to uniformity of trench width and vertical trench banks as they may require. Hand digging will be required where the operation of trench digging machinery will damage trees, buildings, surface or subsurface structures.

The minimum width of trench cut for each size of pipe shall be as follows:

<u>SIZE OF PIPE</u>	<u>WIDTH OF TRENCH</u>
6"	20"
8"	22"
10"	24"
12"	28"

The trenching machine shall be maintained on a sufficiently level roadbed to provide substantially vertical trench walls. The maximum horizontal offset of the trench bottom from the trench top (undercutting) shall be two inches.

E.) Where soft foundation is encountered in the trench bottom, the Contractor shall excavate below grade and provide either a gravel cushion or a concrete cradle for the purpose of supporting the pipe, as directed by the Engineer.

F.) All bell holes shall be of ample size

G.) All excavated materials shall be deposited on the sides of trenches at such a distance that no additional load due to surcharge is placed on the bank, and shall also be deposited or moved after original deposit in such a manner that the pipe laying crew and the public, when the trench is in highway or city streets, will be inconvenienced as little as possible.

H.) It will be the Contractor's responsibility to maintain the trench banks in a stable and vertical position by use of all necessary bracing or sheeting required for safety.

I.) The Contractor will be required to keep the pipe trenches free from water and shall keep the natural ground water table or surface not less than four (4) inches below the elevation of the finished sub-grade, from the time the sub-grade preparation is started until the pipe has been backfilled. No work shall be done in trenches after rough excavation is completed if the sub-grade is submerged or within four (4) inches of ground water. All water removed in the dewatering of trenches and other excavations shall be disposed of in a satisfactory manner.

The Contractor shall be liable for all damages to private property caused by such disposal of water.

- J.) Rock Excavation – In rock excavation, the Contractor shall over-excavate six (6) inches and place 6 inches of screenings in the trench upon which the pipe is laid. The Contractor shall further backfill over pipe with same or earth free from stone or rocks, to a depth of 6 inches.
- K.) BACKFILLING TRENCHES. Except where water mains lie under drives, streets, or alleys, backfill shall be brought up around the pipe in six inches (6") loose measurement layers from materials selected from the trench excavation, compacted by means of mechanical or hand tampers to twelve inches (12") above the top of the pipe, compaction shall be to ninety percent (90%) standard proctor density. Where water main crosses under drives, streets or alleys, the backfill shall be brought up from the point twelve inches (12") above the pipe as outlined above in six inch (6") layers compacted by mechanical or hand tampers to a minimum of ninety (90%) standard proctor density with the exception that the top twelve inches (12") the backfill under the drive shall be compacted to ninety-five percent (95%).

Where the main crosses or lies within the paved portion of a street or alley, special construction details as shown on the plans shall govern. In open areas the back fill from the point twelve inches above the top of the pipe shall be placed within the trench by either hand or machine method and the top of the trench shall be left slightly mounded to allow for future settlement. All tamping and backfill shall be to the approval of the Engineer. In compacted backfill driveways, streets, or alleys, the backfill shall extend three feet (3') on each side of the driveway, street or alley.

- L.) DISPOSAL OF EXCESS EXCAVATION MATERIALS. In general, excess excavated materials from trenches located in open fields and unimproved property will be distributed directly back over the pipe line and within the pipe line right-of-way, to a maximum depth above the original ground elevation at any point of six (6) inches, at and across the trench, and sloping uniformly each way therefrom. Materials so wasted shall be carefully finished with a drag or blade machine to have a neat and uniform appearance without obstructing drainage at any point.

Except as stated in the above paragraph, all excess excavated material remaining after final settlement of the trenches has occurred shall be removed and disposed of by and at the expense of the Contractor, and to the satisfaction of the Engineer.

- M.) REPLACEMENT OF SOD. Where shown on the plans, the Contractor shall replace sod removed or destroyed in the excavation of pipe trenches with new sod of a quality and condition and from a source approved by the Engineer. All such sod furnished shall be equal to or better than the original sod removed. Sod replaced shall be kept watered for a period of one month after installation.
- N.) TREES AND SHRUBBERY. The Contractor shall use every possible precaution to prevent injury to trees and shrubbery on and adjacent to the site of work. He shall replace, at his own expense, any such trees or shrubbery damaged or destroyed by him, unless the removal thereof is required by the plans or is authorized by the Engineer. When tree roots one and one-half inches (1 ½") or larger are encountered in making the excavation the roots are not to be cut. Hand excavation shall be used, and any damaged root or roots 1 ½" or larger shall be treated with a creosote paint as directed by the Engineer.

O.) LENGTH OF DITCH TO BE OPENED. In no case shall more than three hundred (300) feet of ditch be opened at one time in advance of the pipe laid, without consent of the Engineer.

P.) DRIVEWAYS. When the water main passes underneath any private driveway, tunneling shall not be used, unless special permission is given by the Engineer. Driveway pavement shall be saw cut to the pipe trench width to allow the main to be laid and for the proper backfilling of the ditch. After the main is laid and ditch is properly backfilled, the driveway shall be restored to as good a condition as found. See standard detail drawings.

Where driveways are cut to private residences, they shall be cut, the pipe installed, and trench properly backfilled all in the same day.

Where the water main passes underneath any private or public driveway, where the driveway is used for parking cars such as at shopping centers, large business buildings, stores, etc., the Contractor shall confer with the Engineer for an approved method of procedure in doing work in order to minimize the interference of traffic to and from the parking area.

Q.) PUBLIC STREETS AND ROADS. All public streets and roads which are closed to traffic, under authority of proper permit, shall be protected in accordance with the requirements of the authority having jurisdiction over the street or road by means of effective barricades on which shall be placed acceptable warning signs.

Materials stored upon or alongside public streets and highways shall be so placed and the work at all times shall be conducted so as to cause the minimum obstruction and inconvenience to the traveling public.

All barricades, signs, warning lights and other protective devices shall be installed and maintained in conformity with applicable statutory requirements.

500.03 – MATERIALS CERTIFICATIONS

The Contractor, in all cases, shall furnish required samples without charge. A laboratory approved by the City shall perform all tests. When the Standard Specifications require testing of prefabricated products or any other materials, the City Engineer may waive local testing requirements in lieu of a certification from the manufacturer that the material or product furnished conforms to the appropriate Specifications as called for in the Standard Specifications.

GENERAL REQUIREMENTS

The Contractor shall be responsible for obtaining all certifications and arranging for their delivery to the proper destinations as required by this specification. A responsible representative of the company that issues the certification shall sign materials certifications. The official company title of the signer must be clearly shown immediately beneath the Contractor's signature.

All certifications shall be furnished in duplicate and each copy shall show the following information:

- A) City's Project Name or Number
- B) Name of Contractor
- C) Identification Markings on Shipment
- D) Quantity of Material Represented by the Certification

When certified mill tests are submitted as a Type A certification the quantity information need not be

furnished provided that the identifying heat number is permanently rolled, stamped or otherwise permanently affixed to each individual piece of material in the shipment covered by the certification.

TYPES OF CERTIFICATIONS

Unless otherwise specified, a certification shall be one of the following types:

A) Type A certification shall be prepared by the manufacturer and shall consist of a certified copy of a report covering tests conducted by an approved laboratory. Such tests shall have been conducted on samples obtained from the lot or lots of material in the shipment.

B) Type B certification shall consist of a certification prepared by the manufacturer and shall show the limits of test values as determined by an approved manufacturer's laboratory, a qualified commercial laboratory or other approved laboratory.

C) Type C certification shall be prepared by the manufacturer and shall certify that the material in the shipment conforms to the same formula and/or is essentially the same as the material previously approved by the City Engineer.

D) Type D certification shall be prepared by the manufacturer and shall state that the materials meet the applicable Specifications. These Specifications shall be listed by number, section reference or other appropriate identification acceptable to the City Engineer.

DISTRIBUTION OF CERTIFICATIONS

Certifications shall be mailed in triplicate to the Public Works Director and the Engineer designated by the Public Works Director.

These certifications will be checked for conformance with the applicable Specifications.

BASIS OF ACCEPTANCE

Whenever a certification as defined above is required or requested by the City Engineer, such material may be accepted on the basis of certification provided that all applicable requirements are met. Visual inspection at delivery and installation will also be used to verify the Workmanship and condition of the material to be satisfactory.

All material furnished under certification shall be tagged, stenciled, stamped or otherwise marked with a lot number, heat number, order number, or other appropriate identification which can be readily recognized and checked against the certification. Material accepted on certification shall not be incorporated in the Work until the City Engineer has approved the certificates.

STORED MATERIALS

Stored materials shall be located and protected to preserve their quality and fitness for the Work. Materials shall be placed on wooden platforms or other hard, clean surfaces and not on the ground and shall be placed under cover as required. Stored materials shall be located to facilitate prompt inspection. The City assumes no responsibility for materials located on the site or off-site. The Contractor assumes full responsibility for any damage or loss to any stored materials. No stored material shall be located off-site unless approved by the City Engineer. Material shall be insured prior to payment for stored materials.

All aggregates shall be handled in such a manner as to preserve their quality, gradation and fitness for the work. The provisions for transporting aggregates shall be such to assure a continuous and adequate supply of material to the work. Aggregate stockpiles shall be built up in such a manner that acceptable materials will be delivered to the plant or the Project. Aggregates from different sources and different gradations shall not be stockpiled together. The gradation requirements for the individual

stockpiles and proportioning from the stockpiles, shall be the responsibility of the Contractor. Aggregates that have become segregated, or mixed with earth or other foreign material, shall be considered unacceptable, and will not be utilized in the work until Contractor causes aggregate piles to be integrated, and all foreign materials to be removed.

500.04 – MISCELLANEOUS REQUIREMENTS

- A) All salvageable water pipe and fittings removed from the existing water mains and not re-used during construction of the new water mains shall remain the property of the City of Chickasha.
- B) Contractor shall remove and reset existing mailboxes as necessary during construction to avoid damaging them during the work. Contractor shall relocate the mailboxes to maintain access by the mail carrier and residents at all times. Contractor shall relocate mailboxes to original location after water main construction is complete. Cost to be included in the price bid for other items of work.

Any excavation within street right-of-way shall be backfilled with soil, temporary construction entrance materials and/or permanent pavement within 72 hours of starting such excavation. The applicant shall ensure that any water that accumulates within any excavation within street right-of-way that has not been backfilled shall be removed by pumping or other approved means within 24 hours of the beginning of such accumulation.

- C) All concrete used in making pavement repairs shall be Class A (HES), meeting the requirements of 2009 ODOT Standard Specifications. All concrete used in making sidewalk repairs shall be Class C, meeting the requirements of 2009 ODOT Standard Specifications. All asphalt used in making pavement repairs shall be Type B Asphalt meeting the requirements of ODOT Standard Specifications. TBSC Type E meeting 2009 ODOT Standard Specifications shall be used to repair gravel driveways. All repairs shall be made in accordance with City of Chickasha standard detail drawings.
- D) When water main shut down is required, CONTRACTOR shall coordinate the shut-down with OWNER'S water department staff and shall give a minimum 72-hour notice to said staff and the Public Works Director. OWNER'S water department staff will be responsible for operation of all valves which require closing.

500.05 – PROGRESS OF CONSTRUCTION

The Contractor shall work at enough different locations to complete the entire contract within the time limit specified. Water Line appurtenances shall be constructed as soon as the Water Line that they serve is constructed. Postponing the construction of appurtenances until the Water Line has been completed, or the building of appurtenances in advance of the construction of the Water Line, will not be permitted.

- A) The construction of Water Lines for more than six hundred feet (600') in advance of appurtenances which are incomplete or the construction of which has not been started, will not be permitted.
- B) All water lines that are to be abandoned in place shall be cut to the nearest connections and either capped or plugged as required to provide a tight connection. The Contractor shall be responsible for providing the appropriate plug or cap for the job. The cost of this work is considered incidental.

500.06 – DELIVERY OF MATERIALS

Construction materials shall not be delivered to the site of the work more than three (3) days in advance of their anticipated use nor shall the quantity of pipe or other materials on hand at the site of the work at any time be in excess of the amount required to complete six hundred feet (600') of Water Line unless with special permission of the Engineer.

500.07 – SURFACE DRAINAGE STRUCTURES

Unless otherwise specified or called for on the plans, all surface drainage structures and appurtenances shall not be disturbed.

500.08 – CONCRETE

Unless otherwise approved by the Engineer, all concrete used in construction of waterlines and their appurtenances shall be High Early Strength Concrete and shall have a minimum three (3) day compressive strength of three thousand five hundred pounds per square inch (3,500 psi). It is recognized that some situations may occur in which different requirements may be more suitable for completion of the work. The contractor shall receive approval from the Engineer prior to proceeding with the work in such situations.

500.09 – DEPTH OF COVER

Where not otherwise indicated on plans, the pipe shall be laid at an elevation that will provide after completion, a minimum depth of cover over the top of pipe of forty-eight (48) inches below the surface.

500.10 – STANDARD DESIGN CONDITIONS

A) **Standard Design Pressures** - Unless otherwise specified, all pipes and fittings shall be designed for the following minimum pressure conditions:

Minimum Internal Pressure (psi)		
Working	Surge	Design
150	100	250

B) **Live Loading** -Unless otherwise specified or called for on the plans, minimum pipe design corresponding to the specified design pressure shall be for highway live loading condition and where waterline is crossing or running parallel to the railroad, corresponding minimum pipe design for railroad live loading condition shall govern (with or without casing).

C) Water main pipe materials shall be ductile iron pipe (DIP) or polyvinyl chloride (PVC) pipe. All water main pipe shall be new.

500.11 – CLEAN-UP

Clean-up operations shall follow excavation and construction a distance not to exceed six hundred feet.

SECTION 505 – PIPE AND FITTINGS INSTALLATION

505.01 – DESCRIPTION

This section covers installation of pipes in open cuts, in conformity with the lines, grades, and dimensions and as provided in applicable sections of these specifications.

505.02 – MATERIALS

505.02.01 – PIPE AND FITTINGS

Acceptable pipe materials and fittings shall meet the requirements of the appropriate sections listed below:

Pipe Material	Section
Ductile Iron Pipe (DIP)	524

Polyvinyl Chloride (PVC) Pipe	525
High Density Polyethylene (HDPE) Pipe	529

All pipe and fittings shall be new.

505.02.02 – EMBEDMENT

- A) **General** -Embedment material shall be 3/8" screenings. Prior to delivery, the Contractor shall submit laboratory sieve analysis test reports for materials to be used for embedment. Materials shall be approved by the Engineer prior to placement.
- B) **Delivery Tickets** - The Contractor shall submit delivery tickets for the purpose of verifying use of minimum quantities necessary to complete installation pursuant to the appropriate standard details and the minimum dimensions specified.

505.04 – CONSTRUCTION METHODS

- A) **Polyvinyl Chloride (PVC) Pipe** – All PVC pipe shall be embedded in accordance with ASTM D-2274, "Standard Recommended Practice for Underground installation of Thermoplastic Pressure Piping", and ASTM D-2321, "Standard Recommended Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe", and as shown on Detail "Typical Bedding and Trench Detail for PVC Pipe" and meeting the requirements of Section 525.
- B) **Ductile Iron Pipe (DIP)** – All ductile iron pipe shall be embedded as shown on Detail "Typical Bedding and Trench Detail for Ductile Iron Pipe.
- C) **High Density Polyethylene (HDPE)** pipe if laid by direct burial shall be embedded as directed by the Engineer; if place by the directional drilling method, no embedment is required.

505.04.01 – Place blue polyethylene Underground Warning Tape over all water mains. Warning tape shall have black lettering stating "Caution Buried Water Line Below" imprinted on it. Use 6-inch wide tape. See standard drawings for placement location.

505.04.02 – INSTALLATION REQUIREMENTS

- A) **Shipping, Handling and Storage** -Pipe shall be transported from the plant, where it is manufactured, to the job site employing special methods of packaging to prevent damage to the pipe. After the pipe is received at the job site, it shall be carefully inspected for any damage that may have occurred in transit. The pipe shall be handled at all times with care using padded slings or hooks. The pipe shall not be dropped, skidded or rolled against pipe already on the ground. If any damage occurs to pipe, the pipe shall be rejected. All pipe and accessories shall be stored on flat, level ground with no rocks or other objects under the pipe. Gaskets for push-on joints and pipe shall be stored in cool location out of direct sunlight in accordance with the manufacturer's recommendations.
 - 1. Pipe, fittings, specials, and other accessories shall be unloaded at the point of delivery, hauled to and distributed at the site of the project by the Contractor, and shall at all times be handled with extreme care to avoid damage thereto. Equipment, tools and methods used in unloading, reloading, hauling, and laying pipe and accessories shall be such that no damage is done to the pipe or any lining therein.

2. Cement lining in pipes or fittings which is broken or loosened in unloading or subsequent handling shall be repaired by and at the expense of the Contractor, under the direct supervision of the representative of the pipe manufacturer. All outside pipe coating which is damaged by the contractor shall be repaired, prior to laying the pipe or placing the backfill, by removing all damaged coating, wire brushing the exposed metal, and applying two coats of a permanently elastic coal tar paint of a type and quality equal to that used in originally coating the outside of the pipe and preferably of the same brand and formula. This paint shall be sufficiently hard before backfilling so that it will not be damaged thereby.
3. Pipe lines shall be accurately installed to the alignment and profile indicated on the approved pipe installation drawings furnished for the purpose. Grades and elevations shall be determined by the pipe sub-grade prepared as specified.
4. The maximum deflection of any pipe joint, made necessary by vertical and horizontal curves or offsets, shall not exceed the amount as recommended by the manufacturer of the pipe.
5. PLACING PIPE IN TRENCH. Proper equipment, implements, tools, and facilities satisfactory to the Engineer shall be provided and used by the Contractor for the safe and convenient prosecution of the work. All pipe, fittings, hydrants and valves shall be carefully lowered into the trench, piece by piece, by means of cranes, derricks, tongs, slings, ropes or other suitable tools and equipment, in such a manner that no damage occurs to the pipe, pipe coating, pipe lining or to the trench sub-grade. Under no circumstances shall pipe or accessories be dropped or dumped into the trench.
6. PIPE TO BE KEPT CLEAN. All earth, rubbish, dirt and other foreign matter shall be removed from the inside of all pipe and other appurtenances (and from the outside of the spigots), before lowering into the trench, and shall be kept clean by approved means during and after laying. At times when pipe laying is not in progress, all open ends of pipe and fittings shall be closed by approved means, and no trench water shall be permitted to enter the pipe.
7. INSPECTION OF PIPE. Before lowering, and while still suspended, the pipe shall be inspected for defects. Any defective, damaged or unsound pipe shall be rejected.
8. CUTTING PIPE. Cutting of pipe for closure pieces or for other reasons shall be done in a neat and workmanlike manner by a method which will not damage either the pipe or the pipe lining.

B) Pipe Foundation - No waterline shall be laid unless the foundation is in a condition satisfactory to the Engineer. Where trenches are excavated in soft, unsuitable, or rock material, trench bottom shall be stabilized as directed by the Engineer.

C) Laying Requirements -All pipes, specials, fittings and other appurtenances shall be examined carefully for damage and other defects before installation. The City retains the right to reject damaged and defective materials.

The pipe ends shall be free of all lumps, blisters and they shall be wiped clean of foreign materials such as dirt and sand before installation.

Pipe shall be laid with the bell ends facing in the direction of laying unless directed otherwise by the Engineer. Where pipe is laid on a slope of ten (10%) percent or greater laying shall start at the bottom and proceed up the slope.

When laying pipe is not in progress during the noon hour or overnight, the open ends of the pipe shall

be closed by watertight plugs. If water is in the trench the plugs shall be left in place until the trench is pumped dry.

Bell holes for bell-and-spigot pipe shall be excavated at proper intervals so that the barrel of the pipe will rest for its entire length upon the bottom of the trench. Bell holes shall be large enough to permit proper installation of pipe. Bell holes shall not be excavated more than ten (10) joints ahead of pipe laying. Filling and ramming earth or other material beneath the pipe to raise it to grade shall not be permitted.

The Contractor shall use every precaution at all times during construction of the pipeline. All pipe, specials, fittings, and other appurtenances shall be lowered carefully into the trench with suitable equipment, to prevent damage to the waterline materials. In rock trenches, plywood shields or other approved means shall be used to prevent the cradled pipe from swinging against the sides of the trench.

All joint preparation and joining operations shall comply with the instructions and recommendations of the pipe manufacturer and meet the joint requirements in the appropriate material section. Rubber gaskets shall be positioned on the joint in accordance with the manufacturer's recommendations. Immediately before joints are pushed together, all joint surfaces shall be coated with the lubricant furnished with the pipe.

Any damage to the pipe, from any cause during installation of the pipeline shall be cause for replacement, as directed by the Engineer, and at the expense of the Contractor.

After a section of pipe is properly installed and approved for backfill, the trench shall be backfilled and compacted.

505.06 – METHOD OF MEASUREMENT

Payment for "Water Line" shall be made at the unit price bid per lineal foot of pipe installed for each size. The price established shall be full compensation for all materials including pipe, short pieces and specials, trench excavation, embedment material, backfilling, labor, tools, equipment and incidentals necessary to complete this item of work. "Water Line" shall be measured along the pipe.

Payment for fitting shall be paid for by the pound. The price established shall be full compensation for all materials including fittings, trench excavation, backfilling, embedment material, concrete thrust blocks, labor, tools, equipment and incidentals necessary to complete this item of work.

505.07 – BASIS OF PAYMENT

(SIZE) (TYPE) WATERLINE
FITTINGS

L.F.
LB.

Such payment shall be compensation in full for furnishing all materials, labor, equipment, tools and incidentals, and for performing the work in accordance with these specifications.

SECTION 510 – WATER SERVICE LINE CONNECTIONS

510.01 – DESCRIPTION

510.01.01 – GENERAL

This section covers water service line connections in sizes five-eighths inch (5/8") through two inches (2") for use in buried service lines from the main to the meter valve or meter setting appurtenance in accordance with ANSI/AWWA C-800 Standard for Underground Service Line

Valves and Fittings or as modified herein. All water service lines and connections shall be installed as per city ordinances and standards.

510.01.02 – DEFINITIONS

The following definitions shall apply:

- A) **Adapter** -A fitting used to connect pipe, tubing, or other fittings with differing characteristics such as sizes, diameters, or material type.
- B) **Chamfer** - A bevel made on the end of a thread to facilitate thread engagement.
- C) **Corporation valve (stop)** - A valve attached to the water main to start a service connection, which is used to interrupt flow during installation or maintenance of the service line.
- D) **Coupling** - A fitting for connecting two pipes or tubing sections together.
- E) **Curb valve** -A valve installed in the water service line and accessible for operation from the surface of surface of the ground for routinely interrupting flow through the service line.
- F) **Driving thread** - A thread installed on the outlet end of corporation valves and used to hold the valve during installation.
- G) **Dry seal** -A type of pipe thread covered by ANSI/ASME B1.20.3. Dryseal pipe threads are based on the USA (American) pipe thread. They differ from the USA (American) pipe thread in that they are designed to seal pressure-tight joints without the need for sealing compounds.
- H) **Fitting** - A part used to connect piping or tubing.
- I) **Inlet** - The opening in a valve or fitting through which flow from the water main enters the valve or fitting.
- J) **N.P.T.** - National Pipe Thread as specified in ANSI/ASME B1.20.1.
- K) **Outlet** -The opening in a valve or fitting through which flow from the water main leaves the valve or fitting.
- L) **Tapping Clamp** - A fitting that attaches circumferentially to a pipe to provide for attachment of a corporation valve.

510.02 – MATERIALS

Fitting and valve materials in contact with potable water shall be copper or brass. No more than a weighted average of 0.25% of the wetted surface of pipes, pipe fittings, plumbing fittings and fixtures shall contain lead.

All service lines shall be seamless CTS pressure pipe meeting ANSI/AWWA C-901 and ASTM D2737. All corporation stops, curb stops and inlets and adapters shall be Mueller brand or approved equivalent Brass Fittings, unless noted otherwise. All service line installations, taps and connections shall comply with the City of Chickasha standards.

Component Parts - Component parts such as fasteners, seals, and packing may be of other materials selected for adequate endurance, corrosion resistance, and strength.

510.02.01 – DESIGN OF VALVES AND FITTINGS

General - Valves, fittings, and parts thereof shall be machined to the sizes and tolerances defined in

AWWA C-800. End connections shall be designed for the type of service line.

Pressure Rating - Service line valves and fittings shall be suitable for use with water at one hundred (100) degree F and one hundred fifty pounds per square inch pressure. (150 psi)

510.02.02 – DETAILED DESIGN OF VALVES AND FITTINGS

Dimensions of Corporation Valves:

A) **General** -Corporation valves shall be installed with drilling or tapping machines. Unless otherwise specified, the minimum inside diameter of the waterway through a corporation valve shall be large enough to accommodate the maximum drill sizes herein. Maximum drill sizes for installation of corporation valves and service clamps or saddles with a driving machine shall be as shown below.

Corporation Valve Size (inches)	Maximum Drill Size	
	Corporation Valve with AWWA Thread inlet	Corporation Valve with N.P.T Thread Inlet
3/4	1 1/16	1 1/16
1	1 5/16	1 5/16
1 1/2	1 7/16	1 7/16
2	1 15/16	1 3/4

B) **Overall Body Dimensions** -For corporation valves to be installed by a tapping machine, overall body dimensions shall conform with the dimensions listed below.

Corporation Valve Size (inches)	Maximum Radius (inches)	Maximum Length (less nut) (inches)
3/4	1.50	4
1	1.50	4
1 1/2	2.50	9 1/16
2	2.50	9 1/16

C) **Tapping Clamps** -Tapping Clamps shall conform to the requirements of Section 533.

D) Service Line Fittings

a. **General** -The fittings used in service lines shall be designed for connection to the service line. Small waterways and abrupt corners causing water turbulence and pressure drop shall be minimized.

510.02.03 – END CONNECTIONS

End connections shall be in conformance with AWWA C-800.

510.04 – CONSTRUCTION METHODS

510.04.01 – GENERAL

The following are general connection requirements only. Additional plumbing code and other requirements may be applicable, which are not included herein.

- A) Single taps shall be made at forty-five degree angles (45°) from crown of distribution main. When two (2) or more taps are to be made, they shall be a minimum of thirty-six (36") inches

apart and alternate from forty-five degrees (45°) to thirty degrees (30°) from crown of distribution main.

- B) Back/reverse tap may be allowed only under adverse conditions and only when approved by the Engineer.
- C) No tap shall be allowed on fire hydrant leads except under adverse conditions and only when approved by the Engineer.
- D) Direct taps shall be allowed into cast iron or ductile iron mains only.
- E) Tapping clamps shall be Mueller Single Section Servi-Seal All Stainless Steel Pipe Repair Clamps with integral CC Threaded service outlet, minimum 15" length or approved equal for three quarter inch (¾") to two inch (2") service line connections. Tapping clamp shall also conform with the requirement of Section 533. All other taps shall be accomplished using tapping sleeves in accordance with Section 532.
- F) When tapping clamps are installed a pressure test shall be performed. Tapping clamps shall hold a minimum of one hundred pounds per square inch (100 psi) of pressure for thirty (30) minutes.
- G) Service connections two (2") inches and smaller shall be by corporation valve (stop) of the same size as the service line and meter to be installed. Corporation valves shall be as specified in Section 510.02. Service connections to the main for service lines larger than two (2") inches shall be a branch connection.
- H) When tapping mains where it is necessary to remove part of the polyethylene wrapping, the polyethylene wrap shall be repaired or replaced in such a manner as to protect both the pipe and corporation valve. Any bedding material removed during excavation shall be replaced in kind and compacted.
- I) No tees shall be connected to existing water service lines three inches (3") and smaller in diameter providing water to a single meter of the same size.

510.04.02 – MATERIAL CERTIFICATION

Contractor shall provide a Type D certification for all materials used in service lines and service line connections.

510.05 – TESTING

Any valves or fittings found to be defective shall be replaced with new valves or fittings at the Contractor's expense.

510.07 – BASIS OF PAYMENT

All cost of service line connections shall be included in the price bid for water services.

SECTION 511 – WATER SERVICE LINES

511.01 – DESCRIPTION

511.01.01 – GENERAL

This section covers water service lines intended to be used from the connection to the meter valve for meter setting appurtenance in accordance with AWWA C-800 Standard for Underground Service Line Valve and Fitting or as modified herein. All water service lines shall be connected as per city ordinances.

511.01.02 – TYPES

Long Service (EA) is for one service line from the new water meter to a meter or meters on the opposite side of the street, irrespective of the number of meters served by one line. Short Service (EA) is for one service line from the new water main to a meter or meters on the same side of the street, irrespective of the number of meters served by one line.

511.02 – MATERIALS

All service lines shall be seamless CTS pressure pipe meeting ANSI/AWWA C-901 and ASTM D2737. All corporation stops, angle ball valves, curb stops and inlets and adapters shall be Mueller brand or approved equivalent Brass Fittings. All service line installations, taps and connections shall comply with the City of Chickasha Standards.

511.04 – CONSTRUCTION METHODS

The following are general construction requirements only. Additional plumbing code and other requirements may be applicable, which are not included herein.

A) Boring

1. Lines for all long services will be bored or punched under the existing road.
2. Service lines under street pavement shall not be spliced.
3. Street bores shall be a minimum of thirty (30") inches below the bottom of the street.
4. Service line bores shall be level.

B) Warning tape

Place blue polyethylene Underground Warning Tape over all service lines. Warning tape shall have black lettering stating "Caution Buried Water Line Below" imprinted on it. Use 6-inch wide tape.

511.06 – METHOD OF MEASUREMENT

The price established shall be full compensation for all materials including copper service lines, boring, fittings, connections to meter, labor, tools, equipment, and incidentals necessary to complete this item of work.

511.07 – BASIS OF PAYMENT

The items measured as provided above will be paid for at the contract unit price bid:

SHORT SERVICE (SIZE)	EA.
LONG SERVICE (SIZE)	EA.

Such payment shall be compensation in full for furnishing all materials, labor, equipment, tools and incidentals, and for performing the work in accordance with these specifications.

SECTION 513 - WET CONNECTIONS

513.01 – DESCRIPTION

This section covers wet connections for tie-in to existing mains. The connections shall be either a cross or tee as called for on the plans where tapping is not allowed.

513.04 – CONSTRUCTION METHODS

The wet connection shall begin with isolating the point of tie-in by closing of valves. The existing main shall then be cut where wet connection is to be made and the line drained. Contractor shall prevent all non-potable water and foreign materials from entering the water main by use of adequate pumps

and other necessary means.

513.06 – METHOD OF MEASUREMENT

"Wet Connection" will not be measured separately.

513.07 – BASIS OF PAYMENT

All cost of making wet connections shall be included in the price bid for fittings.

SECTION 514 – TAPPING CONNECTIONS

514.01 – DESCRIPTION

This section covers water main tapping for connections to existing water mains.

514.02 – MATERIALS

The following materials shall be used and meet the requirements of the appropriate Sections listed below.

Tapping Mechanism	Section
Tapping Sleeve	532
Tapping Valves	520.02.02

514.04 – CONSTRUCTION METHODS

A) Description - A tap is the cutting of a coupon, utilizing a tapping sleeve or saddle with tapping valve for a connection.

B) Methods

1. Direct taps -Direct taps shall be made when the main to be tapped is on the same horizontal plane as the branch. The cutting operation is to be done with a sharp shell-cutter tool, which shall be lubricated with the manufacturer's recommended cutting tool lubricant.

2. Swing Ties - Swing ties shall be made when the main to be tapped is either above or below the branch when called for on the plans or specified. A swing tie may consist of

- i. Waterline pipe
- ii. Tapping sleeve as necessary;
- iii. Tapping valve and Box;
- iv. Tap;
- v. Solid sleeve;
- vi. Forty-five degree (45°) bends.

514.06 – METHOD OF MEASUREMENT

Tapping Connection will not be measured separately.

514.07 – BASIS OF PAYMENT

All cost of making tap connections shall be included in the price bid for tapping valve with sleeve.

SECTION 516 – FIRE HYDRANTS

516.01 – DESCRIPTION

This section covers fire hydrants intended to be used for fire protection when specified or called for on the plans. The hydrant shall be located and positioned in such a way as to be accessible and protected from traffic.

516.02 – MATERIALS

516.02.01 – GENERAL

All fire hydrants furnished shall conform to AWWA C-502, as amended, or as modified herein. Fire hydrants shall be Mueller Super Centurion A-423, 3-way fire hydrant, 5 ¼" valve opening, 2-2 ½" hose nozzles, 1-4 1/2" pumper nozzle, 6" M.J. Shoe, red color, City of Chickasha threads or approved equal.

516.02.02 – SUBMITTALS

The Contractor shall provide three (3) copies of all submittals for fire hydrants. The submittal shall clearly identify the make, model, design, and metal characteristics for approval by the Engineer prior to installation.

Drawings shall show principal dimensions, metal thickness, construction details, materials used in all parts of the fire hydrant with ASTM designation and structural properties. Net assembled weight of hydrants shall be shown.

Specifications shall include comprehensive parts list with sufficient drawings or details to clearly identify parts.

516.02.03 – AFFIDAVIT OF COMPLIANCE

The Contractor shall provide an Affidavit of Compliance that fire hydrants furnished comply with all provisions of these specifications.

516.02.04 – TYPE OF SHUT-OFF

Type of shut-off shall be of the compression type with the flow.

516.02.05 – DELIVERY CLASSIFICATION

All hydrants shall be equipped with two (2) hose nozzles and one (1) steamer nozzle. Leaded in nozzles shall not be acceptable.

516.02.06 – INLET CONNECTION

Unless otherwise specified, the inlet connection shall be a mechanical joint hub complete with all joint accessories. All mechanical joint gland bolts shall be high strength, low alloy, corrosion resistant material, such as Cor-Ten or equal, as specified in ASTM A-252. The inlet valve opening shall be five and one-quarter (5¼") inches net.

516.02.07 – OUTLET CONNECTIONS

The outlet connections shall be two (2) hose nozzles, two and one-half inches (2½") in nominal I.D. 8-274 I.P. thread and one (1) pumper nozzle four and one-half inches (4 1/2") in nominal I.D. with NST threads.

516.02.08 – RESTRAINED JOINTS

Restrained Joints shall be furnished when specified or called for on the plans.

516.02.09 – NOZZLE CAP GASKET

Gaskets shall be furnished on all nozzle caps. Gaskets shall be neoprene.

516.02.10 – DRAIN VALVE AND OUTLET

A positive operating drain valve or valves shall be provided.

516.02.11 – PAINT

Fire hydrants shall be painted with two (2) coats of red enamel paint manufactured by Pittsburgh Paint or approved equal. Each coat of paint shall have a minimum dry thickness of two (2) mils.

516.02.12 – SHAPE AND SIZE OF OPERATING AND CAP NUTS

The operating and cap nuts shall be 1-1/2" Pentagonal nuts.

516.02.13 – BREAKABLE TYPE

Breakable type (traffic models) shall be furnished. A breakable type hydrant is one that requires no excavation and shall break at the design point.

516.02.14 – STAND PIPE, FLANGES, AND EXTENSIONS

Breakable parts of standpipe shall be located approximately three inches (3") but not more than five inches (5") above the ground line. These parts shall be of the breakable flange type, breakable coupling or integral flange with sawed bolts. Breakable flanges screwed to the standpipe shall not be accepted. The flange on each end shall have at least eight (8) bolts, or other acceptable method to permit proper orientation of nozzles in forty-five degree (45°) increments and shall be designed so that a wrench can be used on nuts and bolts. Extension of hydrant shall be made by adding at the ground line flange a new coupling and stem section equal to the length of the extension. Stem extensions made by adding new section of stem to the threaded section of the stem at the top of the hydrant shall not be acceptable.

516.02.15 – STEM

Provisions shall be made in the design of the stem to disconnect the stem from the hydrant parts above the standpipe break point in the event of traffic accidents.

516.02.16 – COUPLINGS

If breakable or sleeve type couplings are used, they shall have sufficient torsional strength such that a torsional failure of the stem shall occur at some point other than coupling. Design of the coupling shall be such that when the coupling is broken, no parts shall come loose and fall into hydrant, and the break shall not occur through the pins or bolts holding the coupling to the stem.

516.02.17 – GROUND LINE GASKETS

Gaskets furnished for ground line flanges shall be full face, or flange shall be recessed.

516.02.18 – MAIN AND VALVE SEATS

Main valve seats on the hydrant shall be of such design that incorrect positioning is impossible and

that the threads shall be adequately guided into position. Arrangements shall also be made to hold the main valve gasket in place during assembly. The main valve seat shall be made of bronze and threaded into a bronze retainer ring or it may be threaded into a heavy bronze bushing in the hydrant base. All bronze parts in constant contact with the water shall be of type "A", "D", or "E" bronze in accordance with Table 1, AWWA C-212.

516.02.19 – NOZZLE CAP CHAINS

All fire hydrants shall be equipped with nozzle cap chains.

516.02.20 – FLANGES

All flanges shall have a minimum thickness of seven-eighths inch (7/8"). Bolt hole edge distance shall be sufficient to provide full support for the bolt heads and nuts.

516.02.21 – OPERATING STEMS

Operating stems shall be high grade bronze, wrought iron or steel. Stem nuts shall be bronze. Where passing through O-rings, iron or steel stems shall have a bronze, stainless steel, or other non-corrodible metal sleeve. Operating threads shall be sealed against contact with water regardless of open or closed position of the main valve. An internal lubricant chamber shall be provided as a part of the dry top construction. An external access for adding lubricant shall be provided.

516.02.26 – O-RINGS

Fire hydrants shall be equipped with O-rings in lieu of stem packing.

516.02.27 – CAP NUTS

The hydrants shall have a cap nut to seal the bottom end of the stem threads against contact with water.

516.04 – CONSTRUCTION METHODS

516.04.01 – BURY LENGTH

Unless otherwise specified, hydrants shall be furnished with a depth of bury to match the water main depth.

516.04.02 – TAPPING OF DRAIN OPENING

Tapping of drain opening shall not be required.

516.04.03 – DIRECTION OF OPENING

The direction of opening shall be to the left or Counter-Clockwise. An arrow and the word "OPEN" shall be cast in relief to be clearly visible on the top of the hydrant, to designate the direction of opening. A minimum number of turns to open shall be ten (10).

516.04.04 – INSTALLATION

The hydrant shall be inspected and cleaned prior to installation. It shall be placed on a concrete mat not less than four inches (4") thick and sixteen inches (16") square. The rear side of the hydrant, opposite the pipe, shall be blocked with concrete between the hydrant and a vertical face of undisturbed earth. A minimum of seven (7) cubic feet of crushed rock shall be placed around and below the hydrant to allow the hydrant to properly drain. The hydrant shall be firmly supported prior to backfill.

516.05 – TESTING

Hydrostatic tests outlined in AWWA C-502 shall be complied with.

516.06 – METHOD OF MEASUREMENT

Payment for "Fire Hydrant Assembly" shall be made at the unit price bid per each. Price bid for "Fire Hydrant Assembly" shall be full compensation for equipment, labor and materials for complete and acceptable installation of a fire hydrant per City of Chickasha standards, including fire hydrant, TEE, Gate valve, extension pipe, riser pipe and up to five (5) linear feet of 6" diameter ductile iron pipe connection between fire hydrant and water main.

516.07 – BASIS OF PAYMENT

The items measured as provided above will be paid for at the contract unit price bid:

FIRE HYDRANT ASSEMBLY EA.

Such payment shall be compensation in full for furnishing all materials, labor, equipment, tools and incidentals, and for performing the work in accordance with these specifications.

SECTION 518 – THRUST BLOCKS

518.01 – DESCRIPTION

This section covers thrust blocks intended to be used to transmit unbalanced thrust forces into undisturbed soil.

518.02 – MATERIALS

High Early Strength Concrete shall be used for thrust blocks. Compressive strength of concrete shall be minimum 3500 psi at three (3) days.

518.04 – CONSTRUCTION METHODS

All construction shall be in accordance with the Standard Details for Thrust Blocks.

518.06 – METHOD OF MEASUREMENT

"Thrust Blocks" will not be measured separately.

518.07 – BASIS OF PAYMENT

All cost of installing thrust blocks shall be included in the price bid for water line.

SECTION 519 – BLOW-OFF CONNECTIONS

519.01 – DESCRIPTION

This section covers blow-off connections intended to be used to provide outlets for draining waterlines at dead ends.

519.04 – CONSTRUCTION METHODS

Blow-off connections shall be constructed of the size, detail and location shown on the plans. Blow-offs shall be provided with a shut-off valve. Blow off connections shall be constructed in accordance with standard details in contract.

519.06 – METHOD OF MEASUREMENT

Blow-off Connections will not be measured separately.

519.07 – BASIS OF PAYMENT

All costs of providing and installing blow-off connections shall be included in the price bid for waterline.

SECTION 520 – WATER VALVES

520.01 – DESCRIPTION

This section covers water valves of size and type specified or called for on the plans. Unless otherwise specified, all valves shall be gate valves. Valves specified shall be of the types shown in the following table:

Valve Type	Reference Standard
Gate (Resilient Seated)	AWWA C-509, C-550 and C111
Tapping	AWWA C-509, C-550 and C111
Check	AWWA C-508

520.02 – MATERIALS

The Contractor shall submit the following for approval prior to installation:

- A) Valve make and model
- B) Valve detail drawings
- C) Type "A" and "D" Certifications.

520.02.01 – GATE VALVES

- A) General - Gate valves shall conform to the requirements of AWWA C-509, C-550 and C-111 and shall be, bronze mounted, outside screw and yolk, non-rising stem, open counter-clockwise, close clockwise, mechanical joint both ends, resilient seated, "O-ring" for non-rising stem, and shall have 2" square operating nut.
- B) Pressure Rating - Valves produced conforming to AWWA C-509, C-550, and C-111 shall have a design working pressure of two hundred pounds per square inch (200 psi).
- C) Acceptable Manufacturers – Gate valves shall be Mueller or approved equal.

520.02.02 – TAPPING VALVES

- A) General - Valves to be used with tapping sleeves shall have connecting flanges (Standard Class 125) with centering lip on the valve flange to fit recess or counterbore on the outlet tapping sleeve flange. The outlet end of the valve shall have a combination mechanical joint end and tapping machine flange.
- B) Tapping valves shall conform to AWWA C-509 and C-550, except as modified for passage and clearance of tapping machine cutters. The opening through the valve shall be at least one-quarter inch (¼") larger than nominal valve diameter. The outlet end of the valve shall have the desired joint connection for the intended pipe. Tapping Valves shall be Mueller Tapping Valve, or approved equivalent.

Tapping valves shall allow full size cutters to be used. Seating of the disc gate shall not require any sliding or wedging to achieve a zero leakage. A maximum of three (3) internal moving parts shall be required for operation of the valve. The stem collar shall be protected from outside grit, sand, etc., by dual O-rings above stem collar. There shall be an O-ring below stem collar sealing off lubrication chamber from line fluid. Pressure energized O-rings may be used in place of flat gaskets on flanged joints in valve body/bonnet.

All interior and exterior ferrous surfaces shall be protected against corrosion by factory-coated fusion-bonded epoxy coating. Coating shall be applied prior to assembly to insure coverage of all exposed areas, including bolt holes.

c) Acceptable Manufacturers - Tapping valves shall be Mueller or an approved equal:

520.02.04 – CHECK VALVES

A) General - Check valves shall conform to the requirements of AWWA C-508 Standard for Swing-Check Valves for Waterworks Service, two (2") inches through twenty-four (24") inches NPS. Check Valves shall be Mueller A2600-06BB Gravity operated Swing Check Valve or approved equal.

B) Pressure Ratings – Check valves conforming to AWWA C-550 shall have a working pressure rating of one hundred seventy-five pounds per square inch (175 psi).

C) Acceptable Manufacturers - Check valves shall be Mueller or approved equal.

D) Pressure Rating- Tapping valves manufactured conforming to AWWA C-509 and C-550 shall have 200 psi working pressure rating

520.04 – CONSTRUCTION METHODS

Gate valves shall be set with the stems plumb.

Check valves shall be set horizontally.

Tapping valves shall be installed in accordance with the recommendations of the pipe manufacturer being tapped.

Other types of valves shall be set in position shown on the plans or as directed by the Engineer.

At the site of the work and just prior to placing the valve in the trench, the valve shall be fully opened and closed and a record of the number of turns required for full operation shall be furnished to the Engineer. The inside of the valve shall be thoroughly cleaned before installation.

The valve shall be set on a firm base. Valves in PVC pipelines shall be supported by concrete independently of the pipe. The valve and the valve box shall be firmly supported and centered prior to backfill. Installation of valves shall also comply with the appropriate standard detail.

520.06 – METHOD OF MEASUREMENT

Payment for valves, valve boxes and valve vaults shall be made at the unit price bid per each for each type and size of valve. The price established shall be full compensation for all material including valve, valve boxes, valve vaults, installation, labor, tools, equipment and incidentals necessary to complete this item of work.

520.07 – BASIS OF PAYMENT

Unless otherwise called out on plans, the item measured as provided above will be paid for at the contract unit price bid:

(SIZE) (GATE) VALVE WITH BOX EA.
(SIZE) TAPPING VALVE AND SLEEVE EA.
(SIZE) CHECK VALVE AND VAULT EA.

Such payment shall be compensation in full for furnishing all materials, labor, equipment, tools and

incidentals, and for performing the work in accordance with these specifications.

SECTION 521 – VALVE BOXES

521.01 – DESCRIPTION

This section covers valve boxes intended to provide means to operate the valve.

521.02 – MATERIALS

- A) Valve Boxes - All valve boxes shall be Chickasha Standard three (3) piece cast iron of the extension type suitable for a depth of cover over the pipeline as required by the backfill requirements at each valve. Each valve box shall be provided with a suitable cast iron base and cover. All parts of valve boxes, bases, and covers shall be coated by dipping in hot bituminous base material. Covers shall have cast thereon an appropriate name designating the service for which the valve is to be used.

521.07 – BASIS OF PAYMENT

Payment for valve boxes shall be paid for as per Section 520.07.

SECTION 522 – HYDROSTATIC PRESSURE TESTING

522.01 – DESCRIPTION

This section covers hydrostatic pressure testing of installed water mains in accordance with the requirements specified herein.

All pipelines shall be tested by means of hydrostatic pressure of not less than 150 pounds per square inch. If test plugs are used, they shall be furnished and installed by the Contractor at his own expense, together with all necessary anchors, braces and other devices necessary to withstand the hydrostatic pressure on such plug or plugs without placing any hydraulic thrust on the pipe line or any part thereof. The Contractor shall be solely responsible for any and all damage to the pipeline and public and private property, which might be caused by the failure of such test plugs or supports therefore. The allowable leakage shall not exceed 10 gallons per inch diameter per mile of pipe per 24 hours at 150 psi testing pressure.

After the section of line to be tested has been filled with water, the specified test pressure shall be applied by means of a force pump of such design and capacity that such pressure can be applied and maintained for the duration of the test period, which shall be not less than two (2) hours.

All water supplied to the line, after the initial filling thereof shall be metered by means of a tested water meter approved by the Engineer.

If any section of pipeline including specials, fitting and appurtenances are discovered to be damaged after the hydrostatic test, they shall be repaired or replaced with sound material and the test shall be repeated to the satisfaction of the Engineer. If any test of pipe installed indicates leakage greater than the allowable leakage, the contractor shall, at his own expense, locate and repair the source of leak in the pipeline until the leakage is within the specified allowance. All visible leaks are to be repaired regardless of the amount of leakage.

All pipelines shall meet the requirements of this section before any service taps are made, unless otherwise approved by the Engineer.

522.06 – METHOD OF MEASUREMENT

All costs for Hydrostatic Pressure Testing shall be included in the price bid for water line.

SECTION 523 – DISINFECTION

523.01 – DESCRIPTION

This section covers disinfection of water mains.

523.04 – CONSTRUCTION METHODS

523.04.01 – GENERAL

- A) Water Mains -All new water mains shall be disinfected before they are placed in service. All water mains taken out of service for inspecting, repairing, or other activity that might lead to contamination of water shall be disinfected before they are returned to service. All work shall comply with ODEQ regulations AWWA C-651 Standard for Disinfecting Water Mains and as described herein.
- B) Continuous-feed method disinfection per AWWA 651, Sec. 4.4.3 shall be used only. Contractor shall be responsible for collecting all water drained from the existing water main and from the new water main and disposing of it in accordance with all appropriate State and Federal regulations.
- D) All water mains shall meet the requirements of this section before any service taps are made.
- E) The City Engineer may require the water line be disinfected and tested for acceptance in sections less than 1,000 long.

523.04.02 – FLUSHING

Prior to chlorination, the line shall be completely flushed through all available hydrants and blow-offs with potable water at a velocity sufficient to adequately clean the pipe, hydrants and blow-offs. Valves shall be operated through their extreme open and closed positions during disinfection. During operations to collect samples for bacteriological testing, the Contractor shall completely flush the main through all available hydrants and blow-offs with potable water at a velocity sufficient to adequately clean the pipe, hydrants and blow-offs.

All water necessary for flushing shall be provided by the City.

523.04.03 – DISINFECTION

The disinfection of the pipeline and the bacteriologic and chemical tests shall be provided by the Contractor. The Contractor shall furnish the necessary equipment and materials for disinfection and testing. The Contractor shall furnish labor to make the necessary connections and shall provide any temporary drainage measures for disposal of the flushed water. Contractor shall obtain safe bacteriological samples on two consecutive days before placing the waterline into service.

All water mains shall meet the requirements of this section before any service taps are made.

523.06 – METHOD OF MEASUREMENT

Unless provide for otherwise, all costs of Disinfection shall be included in the price bid for water line. Contractor shall provide all material including disinfectants, flushing, de-chlorination, disinfection, hydrostatic pressure testing, labor, tools, equipment and incidentals necessary to complete this item of work.

SECTION 524 – DUCTILE IRON PIPE (DIP)

524.01 – DESCRIPTION

This section covers ductile iron pipe and fittings, for pressure applications, intended to be used for conveyance of potable water, in sizes six inches (6") through twelve inches (12").

524.02 – MATERIALS

524.02.01 – GENERAL

All ductile iron pipe and fittings and installation of same shall conform to the requirements of the following standards listed below or as modified herein.

- A) ANSI/AWWA C-150/A 21.50, Thickness design of Ductile Iron Pipe
- B) ANSI/AWWA C-151/A 21.51, Ductile Iron Pipe, Centrifugally Cast
- C) ANSI/AWWA C-111/A 21.11, Rubber Gasket Joints for Ductile Iron and Gray Iron Pressure Pipe and Fittings.
- D) ANSI/AWWA C-104/A 21.4, Cement Mortar Lining for Ductile Iron Pipe for Water.
- E) ANSI/AWWA C-600, Installation of Ductile Iron Water Mains and Their Appurtenances.
- F) ANSI/AWWA C-115/A 21.15, Flanged Ductile Iron Pipe with Threaded Flanges.
- G) ANSI/AWWA C-116/A 21.16, Protective Fusion-Bonded Epoxy Coatings for Interior and Exterior surface of Ductile Iron and Gray Iron Fitting
- H) ANSI/AWWA C-153/A 21.53, Ductile Iron Compact Fittings
- I) NSF/ANSI 61, Drinking Water System Components –Health Effects

524.02.02 – SUBMITTALS

The Contractor shall submit the following and shall receive approval of same from the Engineer prior to incorporating any materials into the work.

Review and approval of the Contractor submittals, by the Engineer, shall not be construed in any way as relieving the Contractor and the manufacturers of their responsibilities for manufacturing ductile iron pipe and fittings as described herein.

- A) General - Detail drawings of pipes, specials, fittings, and joints.
- B) Certification - Type "A" and "D" certification for pipe, specials, fittings, gaskets, and lining material pursuant to, but not limited to, applicable standards in Section 524. The affidavits of compliance and test reports shall be certified by a registered professional engineer.
- C) Copies - The Contractor shall provide three (3) copies of all submittals.

524.02.03 – DESIGN BASIS

- A) General - All ductile iron pipes are designed in accordance with AWWA C-150/ANSI 21.50. The designs are based on prism load of ordinary clay backfill with a unit weight of one hundred twenty pound per cubic feet (120 pcf), maximum horizontal ring deflection of three (3%) percent, design factor safety of two (2), and for AASHTO HS-20 truck highway (HWY) or Cooper axle E-80 railroad (RR) live loading conditions.

- B) Depth of Cover - The minimum design depth of cover shall be five (5') feet. Pipe to be installed inside a casing shall be designed for full cover including live load (a single H-20 or Railroad E-80) neglecting the casing.
- C) Deflection – The allowable deflection for the specified mortar lining system is three (3%) percent. Deflection calculation is in accordance with AWWA C-150.
- D) Bending and Hoop Stresses -The bending and hoop stress requirements are met in accordance with AWWA C-150.
- E) Buckling
1. Buried Installations - The controlling load for buried pipes is determined from the greater of hydrostatic and earth loads plus vacuum or hydrostatic and earth load plus live load with a factor of safety of two (2.0) as determined in accordance with Section 6.3 of AWWA M-11. It is assumed that the groundwater level is equal to natural ground surface and the ground is fully saturated.
 2. Unburied Installations - For unburied pipes, the internal collapsing vacuum pressure is used in determining the minimum wall thickness(es) in accordance with equation 4-2 of AWWA M11 for a factor of safety of 1.5 against buckling. The Poisson's ratio is 0.28 and modulus of elasticity is 52×10^6 psi.
 3. Vacuum Pressure - For both buried and unburied installations, the internal collapsing vacuum pressure is taken as 14.7 psi.

524.02.04 – MINIMUM PIPE DESIGN FOR DUCTILE IRON PIPE

Unless otherwise specified, ductile iron pipe and fittings for buried installations, including boring, shall have the following minimum nominal thickness(es), shown below.

For boring, installations, the minimum pipe design shall be equal to or greater than the minimum pipe design on either side of the installation.

Minimum Pipe Design for Ductile Iron Pipe		
Pipe Size (inches)	Nominal Push on Joint Wall Thickness Class 50 (Inches)	Flange Joints Class 53 (inches)
6"	0.25"	0.34"
8"	0.27"	0.36"
10"	0.29"	0.38"
12"	0.31"	0.40"

524.02.06 – PIPE JOINTS AND FITTINGS

- A) General - All specials and fittings may be used with push-on, mechanical, or flanged joints conforming to the requirements of AWWA/ANSI C-110/A 21.16. Fittings with push-on joints shall be installed with thrust blocks. Mechanical joints shall be adequately protected against unbalanced forces. All joints shall have the same pressure rating as the pipe of which they are a part and shall meet the requirements of AWWA/ANSI C-111/A 21.11. All pipe shall be marked in accordance with Sec. 4.7 of AWWA C-151.
- B) Push-on Joints - Push-on joints are a rubber gasket compression type joint meeting the requirements of AWWA C-111. Push-on joints shall have a deflection capability of three degrees

(3°).

C) Mechanical Joints - A mechanical joint is a bolted joint of the stuffing-box type. Each joint shall consist of a bell that is cast integrally with the pipe or fitting and provided with an exterior flange having bolt holes or slots, and a socket with annular recesses for the sealing gasket and the plain end of the pipe or fitting, a pipe or fitting plain end, a sealing gasket, a follower gland with bolt holes, and T-head and hexagonal nuts.

D) Flanged Joints - The flanged joints for ductile iron pipe shall be in accordance with AWWA C-111. Bolts, gaskets, and installation shall meet the requirements of AWWA C-115, Appendix A. The flanged joints for specials and fittings shall meet the requirements of AWWA C-110.

The flanges shall be rated for two hundred fifty (250 psi) pounds per square inch working pressure with bolt-hole drillings as for Class 125 flanges for service at temperatures ranging from twenty degrees (20°) to one hundred fifty degrees F (150°F) are pressure temperature rated for one hundred fifty (150) to two hundred pounds per square inch (200 psi) as shown in ANSI B 16.1. All flanged joints shall be made with single piece, red rubber gaskets one-eighth (1/8") inch thick. Gaskets shall be full face for exposed installations and ring type or full faced for buried service meeting AWWA C-110, Appendix A requirements. As directed by the Engineer or shown on plans, flange joints meeting the requirements of ASME/ANSI B-16.1 may be used.

E) Mechanical Joint Restraints

Mechanical Joint Restraints may be used only at locations approved by the Engineer. Typical examples where the Engineer may permit use of Mechanical Joint Restraints are: creek crossings, locations where excavation depth exceeds five feet and bends greater than 22 1/2° are required to match new pipe to existing pipes and locations where required connections or other laying conditions do not permit sufficient time to complete thrust blocks prior to returning water mains to service.

Mechanical Joint Restraints will not be used in lieu of thrust blocks.

Mechanical Joint Restraints, if permitted, shall be as follows or approved equal. Mechanical Joint Restraints such as Ford Meter Box Company Uni-Flange Retainer Glands, EBAA Iron Sales Mega-Lug Series 1100 and other models that require set screws or bolts in direct contact with the pipe will not be permitted for use on PVC pipe.

Restrained Joints		
Company	Size	Type
American Cast Iron Pipe Co.	6" to 12"	Flex-Ring
EBAA Iron Sales Co.	6" to 12"	Mega-Lug Series 1100
Ford Meter Box Co.	6" to 12"	Uni-Flange
US Pipe and Foundry Co.	6" to 12"	TR-Flex
N/A	6" to 12"	¾" all thread with Duc Lug

F) Sleeve Couplings - All sleeve couplings, except as noted on the plans or otherwise specified, shall be restrained with tie rods and shall be designed for the pipe design pressure and maximum allowable stress not to exceed sixty-five percent (65%) of minimum yield strength of steel used. Sleeve couplings shall be:

Dresser Style 38
Rockwell Steel Coupling 511
Smith Blair
Approved Equal

Sleeve Couplings shall be compact fittings meeting the requirements of AWWA C-153 and AWWA C-110

524.02.07 – COATING AND LINING

- A) Exterior Coating - The exterior of ductile-iron pipe, specials and fittings shall be coated with the asphalt coating in accordance with AWWA C-151, Section 516. The coating shall have a minimum thickness of one (1) mil. The finished coating shall be smooth, continuous and strongly adherent to the pipe. Any damage to the outside coating during shipping, storage, handling and installation shall be field repaired with a fresh coating in accordance with the manufacturer's recommendations.
- B) Interior Lining - Unless otherwise called for on the plans or specified, the interior of ductile-iron pipe, specials and fittings shall be cement mortar lined in the shop, with centrifugally spun lining in accordance with AWWA C-104. The Portland cement for cement mortar lining shall be in accordance with the requirements of ASTM C-150, Type I cement. Field repair of lining shall be made in accordance with AWWA C-104, Section 4-7.2.

524.02.08 – CORROSION PROTECTION

When specified or called for on the plans, all ductile-iron pipe, specials, fittings and other appurtenances shall be polyethylene encased in accordance with AWWA C-105/ANSI A 21.5. Exposure to sunlight of polyethylene wrapped pipe shall be kept to a minimum to prevent deterioration of polyethylene. Damage to polyethylene wrapping shall be prevented during backfilling operations. The minimum thickness for polyethylene is eight (8) mils.

524.05 – SOURCE QUALITY CONTROL TESTING

- A) Ductile Iron Pipe shall be tested at the manufacturer's plant by the manufacturer in accordance with Sec. 5.2 of AWWA C-151.
- B) Ductile Iron fittings shall be tested at the manufacturer's plant by the manufacturer in accordance with Sec. 5.2 of AWWA C-153.
- C) Joint Testing – Joints shall be tested and meet the performance requirements established in AWWA C-111/ANSI A 21.11, Section 11-9 and as modified herein. The working pressure rating of the joint shall be established by subjecting the joints to three (3%) percent of the pipe produced to hydrostatic pressure of twice the rated working pressure, but in no event less than twice the minimum working pressure rating shown below. At least two (2) joints shall be hydrostatically tested at a deflected angle of the degrees (3°) at the above specified pressure rating.

The minimum working pressure ratings for joints shall be 350 psi.

- D) Contractor shall provide certifications stating the pipe and fittings meet these requirements.
- E) Welding - All welding shall be done by qualified welders. The ductile-iron pipe manufacturer shall be responsible for quality control and testing of all welding done in the plant during fabrication of special fittings.

Inspection - The City retains the right to inspect the pipe, specials and fittings, all work performed and materials furnished, at the manufacturer's plant and at the project site and to independently monitor the fabrication of the pipe, specials and fittings. Such inspection shall not relieve the Contractor or the manufacturer of their responsibilities to furnish material and perform work in accordance with these

specifications.

524.06 – METHOD OF MEASUREMENT

Payment shall be made pursuant to Section 505 for water line.

524.07 – BASIS OF PAYMENT

Such payment shall be compensation in full for furnishing all materials, labor, equipment, tools and incidentals, and for performing the work in accordance with these specifications.

SECTION 525 – POLYVINYL CHLORIDE (PVC) PIPE

525.01 – DESCRIPTION

This section covers polyvinyl chloride (PVC) pipe for pressure applications, intended to be used for conveyance of potable water, in sizes six inch (6") through twelve inch (12") diameter.

525.02 – MATERIALS

PVC pipe shall be produced by extrusion from Class 12454-A or 12454-B PVC compound providing a hydrostatic design basis (HDB) of four thousand pounds per square inch (4,000 psi).

525.02.01 – GENERAL

All PVC pipe and installation of same shall conform to the requirements of the following standards listed below or as modified herein.

AWWA C605 – Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for water

AWWA C-900-PVC pressure pipe, 4 inch through 12 inch for water distribution.

AWWA M-23 – PVC pipe Design and Installation.

ASTM D-2774-Recommended Practice for Underground Installation of Thermoplastic Pressure Piping.

ASTM D-2827-Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials.

ASTM D-3139-Specifications for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.

ASTM F-477-Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

NSF 14-Plastic Piping System Components and Related Materials. PPI TR3-Policies and Procedures for Developing Recommended Hydrostatic Design Stresses for Thermoplastic Pipe Materials.

NSF/ANSI 61 Drinking Water System Components – Health Effects.

525.02.02 – SUBMITTALS

The Contractor shall submit the following and shall receive approval of same from the Engineer prior to incorporating any materials into the work.

Review and approval of the Contractor submittals, by the Engineer, shall not be construed in any way as relieving the Contractor and the manufacturers of their responsibilities for manufacturing PVC pipe and fittings as described herein.

A) General -Detail drawings of pipes

B) Certification - Type "A" and "D" certification for pipe, specials, fittings, gaskets, and lining material. The affidavits of compliance and test reports shall be certified by a registered professional engineer.

C) Guides - The manufacturer's pipe installation guide, standard pipe material repair guide, and

written quality control manual shall be provided by all suppliers who have not previously provided same to the City of Chickasha, or if same has been revised since last provided to the City of Chickasha.

D) Mill Test Reports - Mill test reports of materials used in the fabrication of pipe.

E) Copies - The Contractor shall provide three (3) copies of all submittals.

525.02.03 – DESIGN BASIS

A) General - The PVC pipe is designed in accordance with AWWA M23, or as modified herein, and shall conform to DR 14.

B) Depth of Cover - The minimum design depth of cover shall be five feet (5'). The pipe to be installed inside a casing shall be designed for full cover including live load (a single H-20 or Railroad E-80) neglecting the casing.

C) Allowable Stresses – For pipes six (6") inches through twelve 12" inches, the allowable design stress is sixteen hundred pounds per square inch (1,600 psi), as established per AWWA C-900.

D) Dimension Ratio (DR) - Pipe DR shall be DR 14.

E) Deflection - The allowable deflection is five (5%) percent of the nominal diameter. Deflections are determined based on the following:

a. Deflection lag factor = 1.0

b. Bedding Constant = 0.10

c. Modulus of soil reaction, $E' = 1000$ psi

d. Earth load considered is the prism load of ordinary clay backfill with a unit weight of one hundred and twenty (120 pcf) pounds per cubic foot, compacted to 90% density (ASTM D-698).

e. A highway live loading of AASHTO HS-20 truck, or railroad live loading of Cooper Axle E-

80.

525.02.04 – DIMENSION RATIO (DR)

PVC pipe for buried installations including boring, shall have dimension ratio (DR 14).

For boring installations, the minimum dimension ratio shall be equal to or greater than the minimum dimension ratio on either side of the installation.

525.02.05 – DIMENSIONS

All PVC pipe shall have Cast-Iron-Pipe equivalent (C.I.) outside diameter (O.D.) dimensions.

525.02.06 – PIPE JOINTS AND FITTINGS

A) Fittings for use with PVC pipe shall conform to provisions of AWWA C110/A21.10 and shall be short-bodied style. Fittings shall be mechanical joint type. Pressure rating shall conform to the requirements of Section 524.02.06 for ductile iron pipes and fittings. The outside coating for fittings shall conform to the requirements of Section 524.02.07.

B) Mechanical Joint Restraints -

Mechanical Joint Restraints may be used only at locations approved by the Engineer. Typical examples where the Engineer may permit use of Mechanical Joint Restraints are: creek crossings, locations where excavation depth exceeds five feet and bends greater than $22\frac{1}{2}^\circ$ are required to match new pipe to existing pipes and locations where required connections or other laying conditions do not permit sufficient time to complete thrust blocks prior to returning water mains to service.

Mechanical Joint Restraints will not be used in lieu of thrust blocks.

Mechanical Joint Restraints, if permitted, shall be as follows or approved equal. Mechanical Joint Restraints such as Ford Meter Box Company Uni-Flange Retainer Glands, EBAA Iron Sales Mega-Lug Series 1100 and other models that require set screws or bolts in direct contact with the pipe will not be permitted for use on PVC pipe.

Restrained Joints		
Company	Size	Type
American Cast Iron Pipe Co.	6" to 12"	Flex-Ring
Ford Meter Box Co.	6" to 12"	Uni-Flange
US Pipe and Foundry Co.	6" to 12"	TR-Flex
N/A	6" to 12"	¾" all thread with Duc Lug

525.03 – SOURCE QUALITY CONTROL TESTING

- A) Polyvinyl chloride Pipe shall be tested at the manufacturer's plant by the manufacturer in accordance with Sec. 5.1 of AWWA C-900.
- B) Ductile Iron Fittings shall be tested in accordance with Section 524.05 B)
- C) Contactor shall provide certifications stating the pipe meets the requirements of these specifications.

525.04 – CONSTRUCTION METHODS

The owner retains the right to inspect the pipe, specials and fittings, all work performed and materials furnished at the manufacturer's plant and at the project site and to independently monitor the fabrication of the pipe, specials and fittings. Such inspection shall not relieve the Contractor or the manufacturer of their responsibilities to furnish material and perform the work in accordance with these specifications.

During installation of PVC pipe, the contractor shall place a locator wire along with the pipe in accordance with the standard drawings. The wire is to be placed continuously throughout the extent of the pipeline. Wire shall be copper 14 AWG single conductor type THHN or THWN. All field splices shall be in waterproof couplings for underground installations. Wire shall extend up into access points as directed by the Engineer. Cost of locator wire shall be included with the price bid for water line.

525.05 – DISINFECTION AND HYDROSTATIC PRESSURE TESTING

Disinfection and Hydrostatic Pressure Testing shall be accomplished in accordance with Section 522 and Section 523.

525.07 – BASIS OF PAYMENT

Payment shall be made pursuant to Section 505.

SECTION 526 – TRACE WIRE INSTALLATION

526.01 - GENERAL

This Section governs trace wire installation on PVC water mains. Contractor shall provide and install a trace wire and trace wire access boxes. A 14 gauge or larger trace wire shall be installed on all PVC water mains.

Typical hydrant branches, that are perpendicular to the water main, do not require trace wire. Trace wire shall be installed on non-typical hydrant branches (i.e. dog-legged hydrant branch).

Take care to protect the wire insulation and repair it with electrical tape if the insulation is damaged.

Refer to the standard drawings for additional details.

526.02 - APPROVED TRACE WIRE MATERIAL

A.) Trace Wire

1. Trace wire for direct bury installations shall be #14 AWG Copper Clad Steel wire as manufactured by Copperhead Industries, LLC #14 AWG solid Copper wire with 30 mil high molecular weight polyethylene insulation as manufactured by Agave Wire LTD, or approved equal.
2. Direct Bury Splice Kits DBR/Y-6 as manufactured by 3M or approved equal.

A.) Trace Wire Access Box shall be Snake Pit Roadway Box as manufactured by Copperhead Industries, LLC or approved equal.

526.03 - TRACE WIRE CONNECTIONS

Joining Ends of Trace Wire: Connections into existing trace wire, connections between one spool of trace wire to another, and other similar connections shall be made using a direct bury splice kit.

Joining Trace Wire - Branch to Main: Connections of trace wire at tees, crosses, and at locations where the trace wire will be brought to the surface shall be conducted using a direct bury splice kit.

526.04 - INSTALLATION

Trace wire shall be installed in a continuous fashion. Install trace wire in the bottom of the trench along the centerline of the trench prior to placing bedding.

Bring trace wire to surface at every valve box, and dead end and as called out in the drawings. Trace wire shall be brought to the surface at least every five hundred (500) feet. Take care not to damage the wire coating. Repair damaged coating with electrical tape.

Trace wire shall be brought to the surface in a separate access box. The trace wire shall be brought to the surface according to standard drawings.

Testing – all trace wire shall be tested for continuity by the Contractor in the presence of the inspector prior to acceptance.

526.06 – METHOD OF MEASUREMENT

Trace wire and Trace wire access boxes will not be measured separately.

526.07 – BASIS OF PAYMENT

All costs of trace wire and access boxes shall be included in the price bid for waterline.

SECTION 527 – BORING

527.01 – DESCRIPTION

This section covers furnishing of pipe by boring and casing as shown on the plans or specified.

Boring and casing consists of the initial installation of a steel casing pipe, installed mechanically, and with a suitable assembly designed to produce a smooth, straight shaft at the established line and grade. The pipe is then installed inside the casing pipe pursuant to the Standard Detail for Boring.

527.02 – MATERIALS

For casing pipe materials and submittal requirements, refer to section 528.

527.04 - CONSTRUCTION METHODS

A) General – Where pipe is required to be installed under railroad embankments, highways, streets, or other facilities by boring and casing, construction shall be made in such a manner that will not interfere with the operation of the railroad, street, highway, or other facility, and shall not weaken or damage any embankment or structure. During construction operations, barricades and lights to safeguard traffic and pedestrians shall be furnished and maintained, until such time as the backfill has been completed after which the barricades and lights shall be removed from the site.

The Contractor shall take proper precautions to avoid excavating earth or rock or shattering rock beyond the limits of excavation shown on the plans. All damages caused by the construction to either surface or subsurface structures, shall be repaired or replaced by the Contractor at his own cost and expense.

Suitable pits, shafts, or trenches shall be excavated for the purpose of conducting the boring and casing operations and for placing end joints of the pipe. Wherever end trenches are cut in the sides of the embankment or beyond it, such work shall be sheeted securely and braced in a manner satisfactory to the Engineer to prevent earth caving.

The removal of any obstruction that may be found to conflict with the placing of the pipe shall not be measured for payment nor paid for as a separate contract pay item. The removal of any such obstruction shall be included in the cost of other items.

Once the casing installation has commenced it shall be continued uninterrupted around the clock until the pipe has been installed between the specified limits.

Any pipe damaged during operations shall be removed and replaced by the contractor at his expense.

The pits or trenches excavated to facilitate the operations shall be backfilled immediately after the pipe has been installed.

B) Boring Requirements - Work shall comply with the Standard Detail for Boring. The excavation and backfill for pits shall be as outlined in Section 500.

Boring without the concurrent installation of a casing pipe shall not be permitted, unless shown on plans or directed by the Engineer. All joints in casing pipe shall be welded. Casing pipe shall extend through the entire fill and be installed in a manner that shall not disrupt traffic nor damage roadway grade and surface. The introduction of water into the excavation shall be prohibited.

The size of the bored hole shall not exceed the outside diameter of the pipe bell or casing pipe more than one inch (1"). The use of water or other fluids in connection with the boring operation shall only be permitted when approved by the Engineer.

Nothing contained herein shall be construed as relieving the Contractor from his responsibility for the safety of the work and for all damage to persons and property.

C) Skid Supports

Plastic or rubber skid supports, shall be used and fastened securely to the carrier pipe with steel strapping, cables or clamps. Use of petroleum products shall not be allowed as a lubricant to ease installation. Skid support spacing and position shall be in accordance with the Standard Detail for Boring.

D) Casing Pipe End Seals - Both ends of the casing pipe shall be sealed with a pull-on type EPDM, neoprene or comparable material flexible end seal manufactured for this purpose. End Seals shall be secured with stainless steel straps or clamps.

E) Filling Annular Space - The annular space between the waterline pipe and the steel casing pipe shall not be filled.

527.06 – METHOD OF MEASUREMENT

Bored and cased pipe shall be measured by the lineal foot of pipe bored and cased. Payment shall be made at the unit price bid per lineal foot for each size. The price established shall be full compensation for furnishing and placing all materials including steel casing pipe, carrier pipe, grout or concrete, excavation and backfill, sheeting, shoring, bracing and drainage, disposal of all surplus materials, labor, tools, equipment, and incidentals necessary to complete this item of work

527.07 – BASIS OF PAYMENT

The items measured as provided above will be paid for at the contract unit price bid:

(PIPE SIZE) Bored/Cased..... L.F.

Such payment shall be compensation in full for furnishing all materials, labor, equipment, tools and incidentals, and for performing the work in accordance with these specifications.

SECTION 528 – STEEL CASING PIPE

528.01 - DESCRIPTION

This section covers steel pipe intended to be used as a casing pipe for boring installations.

528.02 – MATERIALS

528.02.01 – SUBMITTALS

The Contractor shall submit the following, provided that all applicable requirements are met, and that visual inspection at destination shows the workmanship and condition of material to be satisfactory.

- A) Type "A" certification for pipe
- B) Shop drawings of pipe, joints and seams
- C) Documentation of manufacturer's on-going quality control program.

528.02.02 – GENERAL

- A) General -Steel pipe shall conform to ASTM A-139, Standard Specification for Electric-Fusion (ARC)-Welded Steel Pipe (NPS 4 and Over). The steel material shall be new, smooth wall, carbon steel, Grade B, with minimum sixty thousand pounds per square inch (60,000 psi)

tensile strength, and minimum thirty-five thousand pounds per square inch (35,000 psi) yield strength.

The Pipe shall be straight seam pipe, shall be one hundred (100%) percent welded, and the weld's height over the outside wall surface shall be equal to or less than three-sixteenths (3/16") inch. All steel pipe shall be square cut and shall have a roundness such that the difference between the major and minor outside diameters shall not exceed one percent (1%) of the specified nominal outside diameter or one-fourth inch (1/4"), whichever is less. The outside circumference must be within plus or minus (±) one percent (1%) of the nominal circumference or within plus or minus (±) one-half inch (1/2"), which is less. The pipe shall have a maximum allowable straightness deviation in any ten foot (10') length of one-eighth inch (1/8"). Steel pipe joints shall be continuously welded with an approved butt weld. The welds shall attain the full strength of the pipe and shall result in a fully watertight section. The welded joints shall conform to the requirements of AWWA C-206.

B) Boring Installation

1. Casing Pipe Size – Steel casing pipe shall have the follow minimum inside diameters:

Pipe Nominal Size (inches)	Casing Pipe Inside Diameter (inches)
6	10
8	14
10	16
12	20

2. Casing Pipe Thickness - Steel casing pipe wall thickness shall be 3/8" minimum.

528.07 – BASIS OF PAYMENT

Payment shall be made pursuant to the appropriate Section of 505.

SECTION 529 – HIGH DENSITY POLYETHYLENE (HDPE) PIPE

529.01 – DESCRIPTION

This specification lists the requirements for the material (pipe and fittings) and joining methods for high density polyethylene pipe (HDPE) piping systems for potable water supply, in sizes six inches (6") through twelve inches (12").

529.02 – MATERIALS

529.02.01 – GENERAL

Unless otherwise specified, references to documents shall mean the latest published edition of the referenced document in effect at the bid date of the project.

- ANSI/AWWA C906 Polyethylene (PE) Pressure Pipe and Fittings, 4 In. through 65 In., for Waterworks
- AWWA M55 Manual of Water Supply Practices, PE Pipe–Design and Installation
- PPI Handbook of Polyethylene Pipe
- PPI Material Handling Guide for HDPE Pipe and Fittings
- PPI TR-38 Bolt Torque for Polyethylene Flanged Joints
- PPI TN-42 Recommended Minimum Training Guidelines for PE Pipe Butt Fusion Joining Operators for Municipal and Industrial Projects
- ASTM F 714 Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside

Diameter

- ASTM F 1055 Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene and Crosslinked Polyethylene (PEX) Pipe and
- ASTM F 1290 Standard Practice for Electrofusion Joining Polyolefin Pipe and Fittings
- ASTM F 2164 Standard Practice for Field Leak Testing of Polyethylene (PE) Pressure Piping Systems Using Hydrostatic Pressure
- ASTM F2206 Standard Specification for Fabricated Fittings of Butt-Fused Polyethylene (PE) Plastic Pipe, Fittings, Sheet Stock, Plate Stock, or Block Stock
- ASTM F 2620 Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings
- ASTM D 2683 Standard Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing
- ASTM D 2737 Standard Specification for Polyethylene (PE) Plastic Tubing
- ASTM F 2880 Standard Specification for Lap-Joint Type Flange Adapters for Polyethylene Pressure Pipe in Nominal Pipe Sizes 3/4 in. to 65 in.
- ASTM F 3124 Standard Practice for Data Recording the Procedure Used to Produce Heat Butt Fusion Joints
- ASTM D 3261 Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing
- ASTM D 3035 Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter
- ASTM D 3350 Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
- NSF/ANSI 61, Drinking Water System Components –Health Effects

529.02.02 – HIGH DENSITY POLYETHYLENE MATERIALS

A) Resin and Material Requirements

All material shall be manufactured from a PE 4710 resin listed in Plastic Pipe Institute (PPI) TR-4. The resin material shall meet the specifications of ASTM D 3350 with a minimum cell classification of 445474C. HDPE pipe and fittings shall contain no recycled compounds except that generated in the manufacturer's own plant from resin of the same specification from the same raw material. HDPE products shall be homogeneous throughout and free of visible cracks, holes, foreign inclusions, voids, or other injurious defects.

B) HDPE Pipe

1. Pipe shall be made of HDPE material with a minimum material designation code of PE4710 and with a minimum Cell Classification as noted above. The polyethylene compound shall be suitably protected against degradation by ultraviolet light by means of carbon black of not less than 2 percent. The manufacture of the HDPE resin shall certify the cell classification indicated.
2. Pipe sizes 3" and larger shall have a manufacturing standard of ASTM F 714. Pipe Dimension Ratio (DR) shall be as specified on plans. Pipe Outside Diameter shall be DIOD (ductile iron OD).
3. Pipe shall meet AWWA C906 (4" to 65"), and shall be listed as meeting NSF-61.
4. Pipe shall be manufactured by a manufacturer certified for such manufacture by the Plastic Pipes Institute.

C) HDPE Fittings

1. Butt Fusion Fittings- Fittings shall be made of HDPE material with a minimum material designation code of PE4710 and with a minimum Cell Classification as noted above. Fittings shall have a minimum long-term pressure rating equal to or greater than the pipe to which they are joined unless otherwise specified on the plans or accepted by owner/engineer. All fittings

shall meet the requirements of AWWA C906.

- a. Molded fittings shall comply with the requirements of ASTM D 3261.
 - b. Each fitting will be marked per ASTM F 2206.
 - c. Fusion pressure and temperature of fabricated fittings shall be recorded and such data shall be provided in the product submittal. Each fitting shall be stamped with unique joint number that corresponds to the joint report.
 - d. Socket fittings shall meet ASTM D 2683
2. Electrofusion Fittings - Fittings shall be made of HDPE material with a minimum material designation code of PE 4710 and with a minimum Cell Classification as noted in 2.01.A. Electrofusion Fittings shall have a manufacturing standard of ASTM F1055. Fittings shall have a minimum long-term pressure rating equal to or greater than the pipe to which they are joined unless otherwise specified on the plans.
 3. Bolted Connections – Flanged and Mechanical Joint Adapters can be made to ASTM D 3261 or if machined, must meet the requirements of ASTM F 2206. Flanges and MJ Adapters shall be fused onto the pipe and have a minimum long-term pressure rating equal to or greater than the pipe unless otherwise specified on the plans.

529.02.03 – SUBMITTALS

The Contractor shall submit the following and shall receive approval of same from the Engineer prior to incorporating any materials into the work. Review and approval of the Contractor submittals, by the Engineer, shall not be construed in any way as relieving the Contractor and the manufacturers of their responsibilities for manufacturing ductile iron pipe and fittings as described herein.

- A) General - Detail drawings of pipes, specials, fittings, and joints.
- B) Certification - Type "A" and "D" certification for pipe, specials, fittings, gaskets, and lining material pursuant to, but not limited to, applicable standards in Section 529.02.01. The affidavits of compliance and test reports shall be certified by a registered professional engineer.
- C) Copies - The Contractor shall provide three (3) copies of all submittals.

529.02.04 – DESIGN BASIS

- A) General - All HDPE pipes are to be designed in accordance with AWWA Manual M55.
- B) Depth of Cover - The minimum design depth of cover shall be five (5') feet. Pipe to be installed inside a casing shall be designed for full cover including live load (a single H-20 or Railroad E-80) neglecting the casing.

529.03 – SOURCE QUALITY CONTROL TESTING

A) High Density Polyethylene Pipe shall be tested at the manufacturer's plant by the manufacturer in accordance with Section 5 of AWWA C-906.

B) Contractor shall provide certifications stating the pipe and fittings meet these requirements.

Inspection - The Owner retains the right to inspect the pipe, specials and fittings, all work performed and materials furnished, at the manufacturer's plant and at the project site and to independently monitor the fabrication of the pipe, specials and fittings. Such inspection shall not relieve the Contractor or the manufacturer of their responsibilities to furnish material and perform work in

accordance with these specifications.

529.04 – TRANSPORTATION, HANDLING AND STORAGE

- A) General - All HDPE pipe and fittings shall be cut, joined, and installed in accordance with the manufacturer's recommendations. Joining, laying, and pulling of polyethylene pipe shall be accomplished by personnel experienced in working with polyethylene pipe systems.

B) TRANSPORTATION, UNLOADING AND STORAGE

1. The manufacturer shall package product in a manner designed to deliver the pipe and fittings to the project neatly, intact and without physical damage. During transportation each pipe shall rest on suitable pads, strips skids, or blocks securely wedged or tied in place. The transportation carriers shall use appropriate methods and intermittent checks to insure the pipe is properly supported, stacked and restrained during transportation such that the pipe is not nicked, gouged, or physically damaged. The transportation carrier shall provide tarpaulins to cover any potable water pipe subject to exposure to diesel exhaust or smoke.
2. During loading, transportation, and unloading, every precaution should be taken to prevent damage to the pipe. Cuts or gouges that reduce the wall thickness by more than 10% is not acceptable. Locations with such damage shall be cut out and discarded at the expense of the contractor.
3. Handle the pipe in accordance with the PPI Handbook of Polyethylene Pipe. All pipe and accessories shall be loaded and unloaded by lifting with hoists or by skidding in order to avoid shock or damage. Under no circumstances shall materials be dropped. Pipe handled on skidways shall not be rolled or skidded against pipe on the ground. Slings, hooks or pipe tongs shall be padded and used in such a manner as to prevent damage to the exterior surface or interior of the pipe. All pipe and fittings shall be subjected to visual inspection at time of delivery and before they are lowered into the trench to be laid. Joints or fittings that do not conform to these specifications will be rejected and must be removed immediately by the Contractor.
4. The interior of the pipe as well as all sealing surfaces of mating components (i.e. flange faces) shall be kept free from dirt or foreign matter at all times.
5. Pipe shall not be stacked higher than the limits recommended by the manufacturer. The bottom tiers shall be kept off the ground on timbers, rails, or concrete. Pipe shall not be stored close to heat sources.
6. The open ends of all sections of joined and/or installed pipe (not in service) shall be plugged to prevent animals or foreign material from entering the pipe line or pipe section. The practice of stuffing cloth or paper in the open ends of the pipe will not be permitted. Waterproof nightcaps of approved design may be used but they shall be so constructed that they will prevent the entrance of any type of natural precipitation into the pipe and will be secured to the pipe in such a manner that the wind cannot blow them loose.
7. Where possible, the pipe shall be raised and supported at a suitable distance from the open end such that the open end will be below the level of the pipe at the point of support.

C) PIPE INSPECTION

All pipe and fittings shall be subjected to visual inspection at time of delivery and before they are installed or lowered into the trench to be laid. Defective, damaged, or unsound pipe will be rejected. Cuts, punctures, or gouges that penetrate or reduce the wall thickness by 10% or more are not acceptable. Locations with such damage shall be cut out and discarded at the expense of the contractor. Joints or fittings that do not conform to these specifications will be rejected and must be removed immediately by the Contractor.

D) HANDLING PIPE

1. The handling of the pipeline shall be in such a manner that the pipe is not damaged by dragging it over sharp and cutting objects. Sections of the pipes with cuts and gouges exceeding 10 percent of the pipe wall thickness or kinked sections shall be removed and the ends rejoined.
2. Refer to the PPI Material Handling Guide for HDPE Pipe and Fittings for recommendations, guidelines and instructions regarding the handling, lifting, loading, storing and installing polyethylene pipe and fittings.

529.05 – FUSING PIPE AND FITTINGS

E) FUSION JOINING REQUIREMENTS

1. All HDPE pipe shall be joined to itself by the heat fusion process which produces homogeneous, seal, leak tight joints. Tie-ins between sections of HDPE pipe shall be made by butt fusion whenever possible.
2. Butt Fusion: The pipe shall be joined by the butt fusion procedure outlined in ASTM F 2620 or PPI TR-33. All fusion joints shall be made in compliance with the pipe or fitting manufacturer's recommendations. Fusion joints shall be made by qualified fusion technicians per PPI TN-42. A record or certificate of training for the fusion operator must be provided that documents training to the fundamentals of ASTM F 2620. Considerations should be given to and provisions made for adverse weather conditions, such as temperatures below freezing, precipitation, or wind, which is accepted by the owner/engineer.

F) FUSION OPERATORS

1. The employer of the fusion machine operator is responsible for the fusion joint quality of the fusion weld made by that individual. The employer is responsible for documenting all qualification and training records of that individual.
2. All HDPE fusion equipment operators shall be qualified to the procedure used to perform pipe joining for the type(s) and size(s) of pipes to be used in the project. Fusion equipment operators shall have current, formal training on all fusion equipment employed on the project. Training received more than two years prior to operation with no evidence of activity within the past 6 months shall not be considered current.
3. For Projects with at least 5,000 feet or with pipe larger than 24 inches, operators or their supervisor must have a current McElroy Fusion Training Certificate for the equipment to be used on the project.

D) BUTT FUSION EQUIPMENT

1. For 6" and larger pipe sizes, the pipe butt fusion machine shall be a self-contained hydraulic fusion machine capable of butt fusing HDPE pipe. The carriage must be removable from the chassis for in-ditch use. The machine must be compatible with an electronic data recording device. Accessories will include all butt fusion inserts for the specified range of pipe sizes, a pyrometer kit for checking the surface temperature of the heater, extension cord (25' minimum), and hydraulic extension hoses (minimum of four). The butt fusion machine will be McElroy, or approved equivalent.
2. In areas where there may be insufficient space to layout the entire length of fused pipe to be pulled-back, the Contractor shall utilize a continuous HDPE pipe fusion equipment such as a PolyHorse by McElroy or other means in order to fuse the length of pipe necessary for the installation. The Contractor shall be responsible for securing and obtaining permission/permits from adjacent property if necessary, for staging and/or fusing of the pipe and HDD equipment at no additional cost to the Owner.

E) FUSION DATA RECORDING

1. For 6" and larger pipe sizes, McElroy DataLogger or equivalent fusion data recorder shall be used to record all fusion welds on hydraulically operated fusion machines. The device shall be capable of meeting the requirements of ASTM F 3124, "Standard Practice for Data Recording the Procedure used to Produce Heat Butt Fusion Joints in Plastic Piping Systems or Fittings". The device, or combination of devices, shall record the following variables of each fused joint:
 - a. Heater surface temperature immediately before inserting the heater plate. Alternatively, the heater plate may be measured with a pyrometer and entered into the weld record.
 - b. Gauge pressure during the initial heat cycle
 - c. Gauge pressure and elapsed time during the heat-soak cycle
 - d. Heater removal (dwell) time
 - e. Gauge pressure and elapsed time during the fusing/cool cycle
 - f. Drag pressure
 - g. Pipe diameter and wall thickness
 - h. Type of HDPE material (Specification and Classification) and manufacturer
 - i. Fusion Machine Identification
2. The device shall record the operator, a unique operator ID number, the date and time of each weld.
3. Records showing the device is up to date on all required calibration shall be available for presentation when requested.
4. All fusion welds should be traceable to the report (via operator and weld ID) with an indentation weld stamp or by permanent paint marker/pen next to fusion weld.
5. When requested prior to commencement of work, a weld location map may be requested by the owner or owner's representative.

F) BUTT FUSION EXAMINATION AND TESTING

1. Examinations
 - a. Visual: For pipe sections, examine the full exterior circumference for bead uniformity before cutting. After cutting the pipe section, review the interior bead. All beads should have visually acceptable bead formation as shown in Fig 4 and Appendix X2 of ASTM F 2620. In addition, the following characteristics are expected:
 - 1) There shall be no evidence of cracks or incomplete fusing
 - 2) There shall be no evidence of captured objects (e.g., pipe shavings, facer ribbons) between bonded surfaces.
 - 3) Variations in upset bead heights on opposite sides of the cleavage and around the circumference of fused pipe joints are acceptable.
 - 4) The apex of the cleavage between the upset beads of the fused joint shall remain above the base material surface
 - 5) Fused joints shall not display visible angular misalignment, and outside diameter mismatch shall be less than 10% of the nominal wall thickness
 - 6) Fusion data record review that meet criteria as listed below can be used as additional verification of visual indicators.
 - b. Fusion Data Record Review: The fusion data record for each fused joint shall be compared to the approved fusion procedure. The reviewer shall verify the following:
 - 1) That all data required by section 529.02.05E) was recorded
 - 2) Interfacial pressure was within the acceptable range

- 3) Heater surface temperature was within the acceptable range
- 4) Butt fusion pressure applied during the fusing/cool cycle was correctly calculated to include drag pressure, fell within the acceptable range for the applicable size and agrees with the recorded hydraulic fusing pressure.
- 5) Butt fusing pressure was reduced to a value less than or equal to drag pressure at the beginning of the heat soak cycle.
- 6) Fusing machine was opened at the end of the heat soak cycle, the heater was removed, and the end were brought together at the fusion pressure with the acceptable time range
- 7) Cooling time at butt fusing pressure met the minimum time specified
- c. If the recorded data in section 529.02.05 F) is outside the limits of the acceptable range, the joint is unacceptable.
- d. Frequency. Records for test fusion joints should be reviewed immediately after the joint is completed. Fusion joints for jobsite fusions should be reviewed daily or before being covered with backfill.

2. Mechanical Tests

- a. The Owner reserves the right to require the Contractor to mechanically test the fused pipe if any other test or inspection indicates noncompliance with approved procedures.
- b. If Mechanical tests are required:
 - 1) The fusion shall be allowed to cool completely, then fusion test straps shall be cut out.
 - 2) All samples shall be labeled with operator information. Testing must be done at 73 degrees F plus or minus 5 degrees. The test temperature and sample size are critical to testing. Testing performed at cold or elevated temperatures may not give similar results to tests performed at ambient temperatures.
 - 3) Each pipe sample weld shall be subjected to testing at two locations 180 degrees apart from each other in the joint weld. All specimens shall be tested by one of the following methods:
 - 4) Reverse Bend Test are allowed for pipe sizes 4" IPS or smaller. The specimens shall be removed and tested in accordance with ASTM F 2620, Appendix X4.
 - 5) Guided Side Bend Test are allowed for all pipe sizes 4" IPS and larger. The specimens shall be removed and tested.
 - 6) Hydrostatic Burst Test is allowed for pipe sizes 2"-24". The specimen length should measure 6 times pipe diameter with the butt fusion joint in the center of the specimen. The specimen should be tested in a tank filled with water, and testing conditions monitored and recorded with computerized equipment. The specimen will be tested at 4 times pipe rated pressure for 5 minutes with no failure of joint allowed.
- c. Results of any mechanical test shall be documented. Information on the weld and operator shall be transferred from the sample to the testing record.

529.06 – INSTALLATION

A) INSTALLATION

1. Safety: The Contractor shall carry out his operations in strict conformance with all Occupational

Safety and Health Administration and manufacturers' safety requirements.

2. Direct Burial

- a. Buried HDPE pipe and fittings shall be installed in accordance with ASTM D 2321 or ASTM D 2774 for pressure systems and AWWA Manual of Practice M55 Chapter 8. The Design Window identified in AWWA M55 Chapter 5 (page 65 of 2006 version) shall be considered acceptable design and installation conditions.
- b. Unless noted otherwise, no thrust blocks shall be placed in the HDPE pipe system since the fused system is fully restrained.

3. Trenchless Installation Methods

- a. Installation of HDPE Pipe by Horizontal Directional Drilling shall follow the guidelines of ASTM F1962 or PPI TR-46 and the following requirements. If the following requirements conflict with ASTM F1962 or PPI TR-46, the following requirements shall govern.
 - 1.) HDD Subcontractor shall be a firm actively engaged in horizontal directional drilling for a minimum of five (5) years. Submit documentation verifying compliance prior to beginning work.
 - 2.) Contractor and its HDD Subcontractor shall be responsible for all Design Considerations, Construction Safety, Construction Practices and Drilling Fluid Containment and Disposal related to HDD installation of the steel casing. Contractor and its HDD Subcontractor shall follow the North American Society of Trenchless Technology (NASTT) Horizontal Directional Drilling (HDD) Good Practices Guidelines, latest edition.
 - 3.) Prior to beginning work, Contractor shall submit to the Owner a typewritten Work Plan providing detail of the proposed procedure and schedule to execute the project. The work plan will be comprehensive, realistic, and based on actual working conditions for this particular project. The work plan shall document the planning required to successfully complete the project. The work plan shall include complete descriptions of proposed plans, procedures, equipment, personnel, and if applicable, supporting material, for the following:
 - a.) Drilling operations: describe the pilot hole drilling procedure, the reaming operation, the pullback procedure and illustrate the plan.
 - b.) Profile of the bore plotted at a scale appropriate for the crossing and acceptable to the Engineer.
 - c.) HDD site layout including entry and exit points.
 - d.) Directional drilling equipment list to include at a minimum: drilling rig, drill bit, back-reamer, mud mixing and pumping systems, down-hole tools, guidance system, and rig safety system. Provide calibration records for guidance equipment.
 - e.) Drilling fluid management plan: drilling fluid types and specifications, cleaning and recycling equipment, estimated flow rates, procedures for minimizing drilling fluid escape, and the method/location for final disposal of waste drilling fluids. Provide the MSDS for all drilling fluid additives that will be used.
 - f.) Pipe storage and handling details.
 - g.) Pipeline assembly and installation procedures.
 - h.) MSDS of any potentially hazardous substances to be used.
 - i.) Contingency plans for possible problems.
 - 4.) Contractor shall clean the work site of all excess slurry or spoils within forty-eight (48) hours of completing installation.
 - 5.) Contractor shall submit to the Owner a bore log to the Owner within seven (7) days

of the completion of each bore path. The bore log shall include all of the following:

- a.) Name of person collecting data, including title, position and company name.
 - b.) The detection method used, bore diameter, utility diameter, drilling fluid composition, composition of any other materials used to fill the annular void between the bore and the utility diameter, or utilities placed out of service.
 - c.) A plan view of the bore path showing depths and offset dimensions to an accuracy of within one (1) inch of the physically exposed beginning and end points of the bore and other exposed points along the path and indicate if the bore failed.
 - d.) A profile or log of the bore depths to the nearest inch of the facility. Said profile or log shall be referenced to the benchmarks() shown on the plans.
- 6.) Bore or reaming hole diameter shall not exceed 1.5 times the casing O.D.
- 7.) Contractor shall conduct reaming and back-pulling operations continuously until completion of the installation of casing.
- 8.) Contractor shall dispose of or recycle drilling fluids consistent with local, state and federal regulations.
4. Pipe Assembly: Pipe lengths shall be stored in such a location and manner as to eliminate the possibility of scoring, gouges or otherwise damaging the pipe.
- a. Sections of the pipe shall be assembled and joined together prior to insertion of the pipe. Assembly shall be accomplished above ground. If the liner is to be dragged when transported or inserted, then sleds, rollers or other similar devices shall be furnished and utilized by the contractor to protect the pipe wall from damage due to cuts, gouges, or scrapes.
 - b. Joining shall be accomplished by the Thermal Butt Fusion method, in strict accordance with the Manufacturer's recommendations and with ASTM F 2620 or PPI TR-33. During fusion, pipes shall be given adequate support on rollers to allow them free movement.
 - c. All completed joints shall be watertight at the rated pressure for the pipe and shall have strength characteristics equal to or greater than the pipe itself. Improperly made or damaged joints shall be repaired or replaced as directed by the Owner at the Contractor's expense. The Owner shall be provided with samples of butt fused joints for testing upon request.
 - d. Mechanical connection of HDPE to auxiliary equipment such as valves, pumps and fittings shall use mechanical joint adapters and other devices in conformance with the PPI Handbook of Polyethylene Pipe and AWWA Manual of Practice M55.
 - e. Mechanical coupling shall be made by qualified technicians. Qualification of the field technician shall be demonstrated by evidence of mechanical coupling training with the past year. This training shall be on the equipment and pipe components to be utilized for this project.
5. Installation of HDPE pipe and fittings shall be completed in accordance with ASTM D2321 or ASTM2774 for pressure systems and AWWA Manual of Practice M55.
- a. The HDPE shall be lubricated in such a manner and with such materials as recommended by the pipe manufacturer.
 - b. A pulling head shall be attached to the leading end of the polyethylene liner with a power winch cable connected thereto. The power winch and cable shall be of sufficient

rating to pull the liner through the existing pipeline. Winching forces shall be continuously monitored. The Contractor shall provide all pulleys, rollers, bumpers, and other equipment required to protect the existing pipeline and the pipe from damage during the pulling operation. Any damage to the existing pipeline or lining shall be rectified by the Contractor at his own expense.

- c. Caution must be taken not to stretch the pipe beyond its elastic limit in the event of an impediment. The Contractor shall maintain on hand such equipment as might be required to withdraw the liner.
- d. Once insertion is initiated, the Contractor shall complete the pull without interruption.
- e. After insertion, the liner shall be allowed a minimum of twelve hours (or as otherwise recommended by the pipe manufacturer) to reach temperature equilibrium with the existing pipeline and to stress-relieve itself. After the liner has reached temperature equilibrium and stress-relieved itself, the lining shall be cut and finished, as required.

B) FLUSHING, CLEANING AND DISINFECTING

- 1. All mains shall be cleaned and flushed to remove all foreign matter.
- 2. Cleaning and disinfecting of potable water systems shall be in accordance with AWWA C651 and AWWA Manual of Practice M55 Chapter 9, and PPI Handbook of Polyethylene Pipe Chapter 2 (2nd Edition). The disinfection chemicals should be limited to less than 12% active chlorine. The duration of the disinfection should not exceed 24 hours. Upon completion, the system should be thoroughly flushed with fresh water, and sampled to verify the disinfectant chlorine level has been reduced to potable drinking water concentrations in all service water tubing and branch lateral pipes.
- 3. Obtain safe bacteriological samples on two consecutive days before placing the waterline into service.

C) TESTING AND LEAKAGE

- 1. All pumps, valves, temporary connections, temporary bulkheads, meters, gauges and other measuring devices shall be furnished, installed and operated by the Contractor and all such equipment and devices and their installation shall be approved by the Owner's Representative. The contractor shall restrain pipe, components, and test equipment as required to insure testing can be accomplished in a safe manner, including protection of personnel, equipment, and public in the event of a failure during testing.
- 2. The pressure gauges or data recorders should be calibrated and sufficiently sized to provide mid-range data (pressure tested will not be below 10% or greater than 90% of gauge capacity) that result in easy reading, interpretation. Gauges shall be accurate to within 2% of full scale with increments no greater than 10 psi.
- 3. Pressure Pipelines-Pressure testing shall be conducted in accordance with requirements and recommendations of ASTM F 2164 (Field Leak Testing of Polyethylene Pressure Piping Systems Using Hydrostatic Pressure), AWWA Manual of Practice M55 Chapter 9, and PPI Handbook of Polyethylene Pipe Chapter 2 (2nd Edition). Pneumatic (compressed air) leakage testing of HDPE pressure piping is prohibited for safety reasons.
 - a. The section of pipe to be tested shall be filled with potable approved by the Owner/Engineer. While the system is being filled with water, air shall be carefully and completely exhausted. If permanent air vents are not located at all high points, the Contractor shall install fittings and valves at such points so the air can be expelled as the pipe system is slowly filled with water.
 - b. If the Contractor elects to perform hydrostatic testing against valves in an existing

distribution system, it does so at his own risk and will bear the cost of any damages to the existing valve, piping system, private or public property, or the new pipeline under test.

- c. The test procedure for HDPE pipe consists of two steps: 1) the initial phase or expansion phase and 2) the test phase. During the initial/expansion phase, sufficient make-up water shall be added hourly for 3 hours to return to the test pressure. During the test phase, the expansion phase pressure is reduced by 10 psi to test phase pressure and monitored for at least one hour (3 hours maximum).
- d. Under no circumstances shall the total time under test exceed eight (8) hours. If the test is not completed due to leakage, equipment failure or any other reason, depressurize the test section and permit the system to "relax" for eight (8) hours prior to the next testing sequence.
- e. The test pressure should be related to the lowest point in elevation along the test section's vertical pipeline profile.
- f. All pressure and leakage testing shall be done in the presence of a representative of the Owner.
- g. The test pressure shall be 1.5 times the operating pressure at the lowest point in the system. In accordance with section 9.8 of ASTM F 2164, the pipe shall pass if the final pressure is within 5% of the test phase pressure for the testing period (3 hours maximum). If the test section fails this test, the Contractor shall repair or replace all defective materials and/or workmanship at no additional cost to the Owner.
- h. Leakage must not exceed 10 gal/inch diameter per mile of pipe per 24 hours at 150 psi testing pressure.

529.07 – METHOD OF MEASUREMENT

Payment shall be made pursuant to Section 505 for water line.

529.08 – BASIS OF PAYMENT

Such payment shall be compensation in full for furnishing all materials, labor, equipment, tools and incidentals, and for performing the work in accordance with these specifications.

532 – TAPPING SLEEVES

532.01 - DESCRIPTION

This section covers tapping sleeves intended to be used for tapping water mains.

532.02 - MATERIALS

Tapping sleeves shall be manufactured in accordance with AWWA C-110 and equipped with gaskets made in accordance with AWWA C-111. Tapping Sleeve shall be Ductile Iron. Tapping sleeves shall be Mueller H-615 M. J. Tapping sleeve, or approved equivalent. Stainless Steel sleeves will not be permitted.

532.04 – CONSTRUCTION METHODS

The installation shall conform to the recommendation of the manufacturer of the pipe being tapped. Tapping sleeves shall be pressure tested. Sleeves shall maintain 150 psi for a minimum of two hours.

532.06 – METHOD OF MEASUREMENT

Payment for "Tapping Sleeve" shall be included in the unit price bid per each for Tapping Valve and Sleeve. The price established shall be full compensation for furnishing and placing of all materials including tapping sleeve, labor, tools, equipment, and incidentals necessary to complete this item of work.

532.07 – BASIS OF PAYMENT The items measured as provided above will be paid for at the contract unit price bid:

(SIZE) TAPPING VALVE AND SLEEVE..... EA.

Such payment shall be compensation in full for furnishing all materials, labor, equipment, tools and incidentals, and for performing the work in accordance with these specifications.

SECTION 533 – TAPPING CLAMPS

533.01 – DESCRIPTION

This section covers tapping clamps used for tapping water mains.

533.04 – CONSTRUCTION METHODS

- A) General -Tapping clamps shall have a body with a threaded outlet, seal, and suitable means for attachment to the main. The body shall be made to conform to the outside configuration of the main. Tapping clamps shall be designed to provide a drip-tight connection when used as a service connection to the main.
- B) Tapping clamps shall be required when tapping other than cast iron or ductile iron pipe. Clamps may be required on older cast-iron and ductile iron as directed by the Engineer. Tapping clamps shall be the same size as the service line. The reducing of tapping clamps shall not be allowed.
- C) Tapping Clamps shall meet the requirements of Section 510.

533.06 – METHOD OF MEASUREMENTS

Tapping clamp(s) will not be measured separately.

533.07 – BASIS OF PAYMENT

All cost of tapping clamps shall be included in the price bid for water services.

Such payment shall be compensation in full for furnishing all materials, labor, equipment, tools and incidentals, and for performing the work in accordance with these specifications.



Chickasha Municipal Authority, Oklahoma

**RFP CMA-2401
WATER MAIN
CONSTRUCTION
SPECIFICATIONS
SUPPLEMENT
LARGE WATER MAINS**

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SECTION 500 – WATER MAINS

SUPPLEMENT – LARGE WATER MAINS

SECTION 500 – CONSTRUCTION REQUIREMENTS

500.01 – DESCRIPTION

This supplement to Section 500 provides general requirements for construction of water mains with nominal diameter of 16" through 20" as described herein. The intent of this supplement is to contain requirements specific to these sizes of water mains, in addition to those requirements listed in Section 500. The specifications listed herein, where in conflict with Section 500 specifications for water mains in size 6" through 12", shall supersede those contained in Section 500 for water mains in size 6" through 12".

All design, materials, construction, sampling and testing shall comply with ODEQ rules and regulations and AWWA Standards.

500.02 - EXCAVATION AND BACKFILLING

A.) PIPE TRENCH EXCAVATION

The minimum width of trench cut for each size of pipe shall be as follows:

SIZE OF PIPE (inches)	WIDTH OF TRENCH (inches)
16	32
18	34
20	36

500.09 – DEPTH OF COVER

Where not otherwise indicated on plans, the pipe shall be laid at an elevation that will provide after completion, a minimum depth of cover over the top of pipe of thirty inches (30") below the surface. Maximum depth of cover over the top of the pipe shall be 14 feet.

500.10 – STANDARD DESIGN CONDITIONS

A) **Standard Design Pressures** - Unless otherwise specified, all pipes and fittings shall be designed for the following minimum pressure conditions:

Minimum Internal Pressure (psi)		
Working	Surge	Design
150	100	250

B) **Live Loading** -Unless otherwise specified or called for on the plans, minimum pipe design corresponding to the specified design pressure shall be for highway live loading condition and where waterline is crossing or running parallel to the railroad, corresponding minimum pipe design for railroad live loading condition shall govern (with or without casing).

C) Large water main pipe materials shall be ductile iron pipe (DIP). All water main pipe shall be new.

END OF SECTION

SECTION 505 – PIPE AND FITTINGS INSTALLATION

505.01 – DESCRIPTION

This section covers installation of pipes in open-cuts, in conformity with the lines, grades, and dimensions and as provided in applicable sections of these specifications.

505.02 – MATERIALS

505.02.01 – PIPE AND FITTINGS

Acceptable pipe materials and fittings shall meet the requirements of the appropriate sections listed below:

Pipe Material	Section
Ductile Iron Pipe (DIP)	524

All pipe and fittings shall be new.

SECTION 518 – THRUST BLOCKS

518.01 – DESCRIPTION

This section covers thrust blocks intended to be used to transmit unbalanced thrust forces into undisturbed soil.

518.02 – MATERIALS

High Early Strength Concrete shall be used for thrust blocks. Compressive strength of concrete shall be minimum 3500 psi at three (3) days.

518.04 – CONSTRUCTION METHODS

All construction shall be in accordance with the Large Water Main Standard Details for Thrust Blocks.

518.06 – METHOD OF MEASUREMENT

"Thrust Blocks" will not be measured and paid for separately.

518.07 – BASIS OF PAYMENT

All cost of installing thrust blocks shall be included in the price bid for water line.

SECTION 524 – DUCTILE IRON PIPE (DIP)

524.01 – DESCRIPTION

This section covers ductile iron pipe and fittings, for pressure applications, intended to be used for conveyance of potable water, in sizes sixteen inches (16") through twenty inches (20").

524.02 – MATERIALS

524.02.01 – GENERAL

All ductile iron pipe and fittings and installation of same shall conform to the requirements of the following standards listed below or as modified herein.

- A) ANSI/AWWA C-150/A 21.50, Thickness design of Ductile Iron Pipe
- B) ANSI/AWWA C-151/A 21.51, Ductile Iron Pipe, Centrifugally Cast
- C) ANSI/AWWA C-111/A 21.11, Rubber Gasket Joints for Ductile Iron and Gray Iron Pressure Pipe and Fittings.
- D) ANSI/AWWA C-104/A 21.4, Cement Mortar Lining for Ductile Iron Pipe for Water.

- E) ANSI/AWWA C-600, Installation of Ductile Iron Water Mains and Their Appurtenances.
- F) ANSI/AWWA C-115/A 21.15, Flanged Ductile Iron Pipe with Threaded Flanges.
- G) ANSI/AWWA C-116/A 21.16, Protective Fusion-Bonded Epoxy Coatings for Interior and Exterior surface of Ductile Iron and Gray Iron Fitting
- H) ANSI/AWWA C-153/A 21.53, Ductile Iron Compact Fittings
- I) NSF/ANSI 61, Drinking Water System Components –Health Effects

524.02.02 – SUBMITTALS

The Contractor shall submit the following and shall receive approval of same from the Engineer prior to incorporating any materials into the work.

Review and approval of the Contractor submittals, by the Engineer, shall not be construed in any way as relieving the Contractor and the manufacturers of their responsibilities for manufacturing ductile iron pipe and fittings as described herein.

- A) General - Detail drawings of pipes, specials, fittings, and joints.
- B) Certification - Type "A" and "D" certification for pipe, specials, fittings, gaskets, and lining material pursuant to, but not limited to, applicable standards in Section 524. The affidavits of compliance and test reports shall be certified by a registered professional engineer.
- C) Copies - The Contractor shall provide three (3) copies of all submittals.

524.02.03 – DESIGN BASIS

- A) General

All ductile iron pipes are designed in accordance with AWWA C-150/ANSI 21.50. The designs are based on prism load of ordinary clay backfill with a unit weight of one hundred twenty pound per cubic feet (120 pcf), maximum horizontal ring deflection of three (3%) percent, design factor safety of two (2), and for AASHTO HS-20 truck highway (HWY) or Cooper axle E-80 railroad (RR) live loading conditions.
 - B) Depth of Cover

The minimum design depth of cover shall be thirty inches (30"). Pipe to be installed inside a casing shall be designed for full cover including live load (a single H-20 or Railroad E-80) neglecting the casing.
 - C) Laying Condition

Type 3 Laying Conditions, as defined in AWWA C150 shall be used for all Large Water Mains. In accordance with AWWA C150, the description of Type 3 Laying Conditions is pipe-bedded in four inches minimum loose soil, with backfill lightly consolidated to top of pipe. Loose soil is defined as "native soil excavated from the trench free of rocks, foreign material, and frozen earth"
 - D) Deflection

The allowable deflection for the specified mortar lining system is three (3%) percent. Deflection calculation is in accordance with AWWA C150.
 - E) Bending and Hoop Stresses

The bending and hoop stress requirements are met in accordance with AWWA C150.
 - F) Buckling
1. Buried Installations
- The controlling load for buried pipes is determined from the greater of hydrostatic and earth loads plus vacuum or hydrostatic and earth load plus live load with a factor of safety of two (2.0) as determined in accordance with Section 6.3 of AWWA M-11. It is assumed that the groundwater level is equal to natural ground surface and the ground is fully saturated.

2. Unburied Installations

For unburied pipes, the internal collapsing vacuum pressure is used in determining the minimum wall thickness in accordance with equation 4-2 of AWWA M11 for a factor of safety of 1.5 against buckling. The Poisson's ratio is 0.28 and modulus of elasticity is 52×10^6 psi.

3. Vacuum Pressure

For both buried and unburied installations, the internal collapsing vacuum pressure is taken as 14.7 psi.

524.02.04 – MINIMUM PIPE DESIGN FOR DUCTILE IRON PIPE

Unless otherwise specified, ductile iron pipe and fittings for buried installations, including boring, shall have the following minimum nominal wall thickness, shown below.

For boring, installations, the minimum pipe design shall be equal to or greater than the minimum pipe design on either side of the installation.

Minimum Pipe Design for Ductile Iron Pipe		
Pipe Size (inches)	Nominal Push-on Joint Wall Thickness Pressure Class 250 (Inches)	Flange Joints Class 53 (inches)
16	0.30	0.43
18	0.31	0.44
20	0.33	0.45

524.02.06 – PIPE JOINTS AND FITTINGS

A) General

All specials and fittings may be used with push-on, mechanical, or flanged joints conforming to the requirements of AWWA/ANSI C-110/A 21.16. Fittings with push-on joints shall be installed with thrust blocks or mechanical joint restraints. Mechanical joints shall be adequately protected against unbalanced forces. All joints shall have the same pressure rating as the pipe of which they are a part and shall meet the requirements of AWWA/ANSI C-111/A 21.11. All pipe shall be marked in accordance with Sec. 4.7 of AWWA C-151.

B) Push-on Joints

Push-on joints are a rubber gasket compression type joint meeting the requirements of AWWA C-111. Push-on joints shall have a deflection capability of three degrees (3°).

C) Mechanical Joints

A mechanical joint is a bolted joint of the stuffing-box type. Each joint shall consist of a bell that is cast integrally with the pipe or fitting and provided with an exterior flange having bolt holes or slots, and a socket with annular recesses for the sealing gasket and the plain end of the pipe or fitting, a pipe or fitting plain end, a sealing gasket, a follower gland with bolt holes, and T-head and hexagonal nuts.

D) Flanged Joints

The flanged joints for ductile iron pipe shall be in accordance with AWWA C-111. Bolts, gaskets, and installation shall meet the requirements of AWWA C-115, Appendix A. The flanged joints for specials and fittings shall meet the requirements of AWWA C-110.

The flanges shall be rated for two hundred fifty (250 psi) pounds per square inch working pressure with bolt-hole drillings as for Class 125 flanges for service at temperatures ranging from twenty degrees (20°) to one hundred fifty degrees F (150°F) are pressure temperature rated for one hundred fifty (150) to two hundred pounds per square inch (200 psi) as shown in ANSI B 16.1. All flanged joints shall be made with single piece, red rubber gaskets one-eighth (1/8") inch thick. Gaskets shall be full face for exposed installations and ring type or full faced for buried service meeting AWWA C-110, Appendix A requirements. As directed by the Engineer or shown on plans, flange joints meeting the requirements of ASME/ANSI B-16.1 may be used.

E) Mechanical Joint Restraints

Mechanical Joint Restraints may be used in conjunction with, or in lieu of, thrust blocks. Use of Mechanical Joint Restraints in lieu of thrust blocks relies in part on minimum lengths of restrained pipe. The procedure for determining the minimum length of restrained pipe shall follow "Thrust Restraint Design for Ductile Iron Pipe", Sixth Edition as published by the Ductile Iron Pipe Research Association, or other design procedure approved by the City Engineer.

Use of Mechanical Joint Restraints in conjunction with or in lieu of thrust blocks shall be designed by a Professional Engineer registered in the State of Oklahoma. All design calculations and resultant dimensions and installation information shall be submitted to the City Engineer for review and approval prior to use.

Mechanical Joint Restraints, if used, shall be as follows or approved equal.

Company	Type
EBAA Iron Sales Co.	Mega-Lug Series 1100
N/A	3/4" all thread with Duc Lug

F) Sleeve Couplings

All sleeve couplings, except as noted on the plans or otherwise specified, shall be restrained with tie rods and shall be designed for the pipe design pressure and maximum allowable stress not to exceed sixty-five percent (65%) of minimum yield strength of steel used. Sleeve couplings shall be:

Dresser Style 38
Smith Blair
Approved Equal

Sleeve Couplings shall be compact fittings meeting the requirements of AWWA C-153 and AWWA C-110

524.02.07 – COATING AND LINING

A) Exterior Coating

The exterior of ductile-iron pipe, specials and fittings shall be coated with the asphalt coating in accordance with AWWA C-151, Section 516. The coating shall have a minimum thickness of one (1) mil. The finished coating shall be smooth, continuous and strongly adherent to the pipe. Any damage to the outside coating during shipping, storage, handling and installation shall be field repaired with a fresh coating in accordance with the manufacturer's recommendations.

B) Interior Lining

Unless otherwise called for on the plans or specified, the interior of ductile-iron pipe, specials and fittings shall be cement mortar lined in the shop, with centrifugally spun lining in accordance with AWWA C-104. The Portland cement for cement mortar lining shall be in accordance with the requirements of ASTM C-150, Type I cement. Field repair of lining shall be made in accordance with AWWA C-104, Section 4-7.2.

524.02.08 – CORROSION PROTECTION

When specified or called for on the plans, all ductile-iron pipe, specials, fittings and other appurtenances shall be polyethylene encased in accordance with AWWA C-105/ANSI A 21.5. Exposure to sunlight of polyethylene wrapped pipe shall be kept to a minimum to prevent deterioration of polyethylene. Damage to polyethylene wrapping shall be prevented during backfilling operations. The minimum thickness for polyethylene is eight (8) mils.

524.05 – SOURCE QUALITY CONTROL TESTING

A) Ductile Iron Pipe shall be tested at the manufacturer's plant by the manufacturer in accordance with Sec. 5.2 of AWWA C-151.

B) Ductile Iron fittings shall be tested at the manufacturer's plant by the manufacturer in accordance with Sec. 5.2 of AWWA C-153.

C) Joint Testing

Joints shall be tested and meet the performance requirements established in AWWA C-111/ANSI A 21.11, Section 11-9 and as modified herein. The working pressure rating of the joint shall be established by subjecting the joints to three (3%) percent of the pipe produced to hydrostatic pressure of twice the rated working pressure, but in no event less than twice the minimum working pressure rating shown below. At least two (2) joints shall be hydrostatically tested at a deflected angle of the degrees (3°) at the above specified pressure rating.

The minimum working pressure ratings for joints shall be 350 psi.

D) Contractor shall provide certifications stating the pipe and fittings meet these requirements.

E) Welding

All welding shall be done by qualified welders. The ductile-iron pipe manufacturer shall be responsible for quality control and testing of all welding done in the plant during fabrication of special fittings.

F) Inspection

The City retains the right to inspect the pipe, specials and fittings, all work performed and materials furnished, at the manufacturer's plant and at the project site and to independently monitor the fabrication of the pipe, specials and fittings. Such inspection shall not relieve the Contractor or the manufacturer of their responsibilities to furnish material and perform work in accordance with these specifications.

524.06 – METHOD OF MEASUREMENT

Payment shall be made pursuant to Section 505 for water line.

524.07 – BASIS OF PAYMENT

Such payment shall be compensation in full for furnishing all materials, labor, equipment, tools and incidentals, and for performing the work in accordance with these specifications.

SECTION 528 – STEEL CASING PIPE

528.01 - DESCRIPTION

This section covers steel pipe intended to be used as a casing pipe for boring installations.

END OF PAGE

528.02 – MATERIALS

528.02.01 – SUBMITTALS

The Contractor shall submit the following, provided that all applicable requirements are met, and that visual inspection at destination shows the workmanship and condition of material to be satisfactory.

- A) Type "A" certification for pipe
- B) Shop drawings of pipe, joints and seams
- C) Documentation of manufacturer's on-going quality control program.

528.02.02 – GENERAL

A) General

Steel pipe shall conform to ASTM A-139, Standard Specification for Electric-Fusion (ARC)-Welded Steel Pipe (NPS 4 and Over). The steel material shall be new, smooth wall, carbon steel, Grade B, with minimum sixty thousand pounds per square inch (60,000 psi) tensile strength, and minimum thirty-five thousand pounds per square inch (35,000 psi) yield strength.

The Pipe shall be straight seam pipe, shall be one hundred (100%) percent welded, and the weld's height over the outside wall surface shall be equal to or less than three-sixteenths (3/16") inch. All steel pipe shall be square cut and shall have a roundness such that the difference between the major and minor outside diameters shall not exceed one percent (1%) of the specified nominal outside diameter or one-fourth inch (1/4"), whichever is less. The outside circumference must be within plus or minus ($\pm$) one percent (1%) of the nominal circumference or within plus or minus ($\pm$) one-half inch (1/2"), which is less. The pipe shall have a maximum allowable straightness deviation in any ten foot (10') length of one-eighth inch (1/8"). Steel pipe joints shall be continuously welded with an approved butt weld. The welds shall attain the full strength of the pipe and shall result in a fully watertight section. The welded joints shall conform to the requirements of AWWA C-206.

B) Boring Installation

1. Casing Pipe Size – Steel casing pipe shall have the follow minimum inside diameters:

Pipe Nominal Size (inches)	Casing Pipe Inside Diameter (inches)
16	24
18	28
20	30

2. Casing Pipe Thickness - Steel casing pipe wall thickness shall be 3/8" minimum.

528.07 – BASIS OF PAYMENT

Payment shall be made pursuant to the appropriate Section of 505.



Chickasha Municipal Authority, Oklahoma

**RFP CMA-2401
WATER MAIN
CONSTRUCTION
SPECIFICATIONS
PRESSURE-REDUCING
VALVE (PRV)**

PRESSURE REDUCING VALVES

1.01 PRESSURE REDUCING VALVE

- A. Supply and install a 6-inch Singer Model S106-PR-X107 Pressure Reducing Control Valve, Singer Valve schematic A-0306C or approved equivalent. All incidentals shall be included in the contract price. The following specifications shall be considered as the minimum requirements. All components shall be factory-installed and tested.
- B. The following items shall be included and will not be considered as optional items requiring additional purchase:
 - a. Stem-mounted visual valve position indicator with bleed/vent cock.
 - b. Inlet and outlet pressure gauges - Stainless steel, liquid filled, rated 0 - 200 psi, Winters PFQ-LF Series or approved equal.
- C. All valves and components shall be rated lead-free compliant.
- D. All valves and components shall comply with NSF/ANSI 61.
- E. Function: The valve shall be a pilot operated pressure reducing valve which will reduce a high inlet pressure to a low outlet pressure. The valve shall maintain a relatively constant downstream pressure regardless of fluctuations in supply pressure or flow rate.
- F. Operation: The pilot shall be a normally open pressure reducing pilot that reacts to changes in downstream pressure, acting to modulate the main valve bonnet pressure to hydraulically adjust the inner valve assembly position and maintain a constant downstream pressure.
- G. Provide full product documentation with project submittals verifying compliance with these specifications.

1.02 Quality Assurance

- A. The control valve shall be tested prior to shipment. The standard test shall include a functional stroke, pressure and leak test of valve body, seat, fitted pilots and accessories.
- B. The control valve shall be covered by a minimum three (3) year warranty against defects in materials and workmanship. The AISI 316 stainless steel seat ring shall be covered by a lifetime guarantee.
- C. All control valve maintenance and repairs shall be possible without removing the main valve body from the line, when installed in accordance with manufacturer's recommendations.

1.03 Main Valve

- A. The main valve shall be a globe style body, single chamber, diaphragm actuated full port model.
- B. The main valve shall have flanged connections. Flanged connections shall be ANSI/ASME B16.42 Class 150# flange rated, drilled and faced, 250 psi maximum working pressure.
- C. Threaded connections shall be NPT.
- D. Main valves shall provide smooth frictionless motion to ensure a low flow stability to approximately one (1) USGPM.
- E. Preference may be given to using SRD-Single Rolling Diaphragm technology.
- F. The main valve, bonnet and removable stem cap shall be constructed of ASTM A536 (Grade 65/45/12) ductile iron.
- G. Main valves shall have a removable stem cap for access to the main valve stem for alignment check, spring installation and ease of service and assembly.
- H. The main valve bonnet shall be located using two or more locating guide pins to maintain the inner valve assembly alignment and for ease of maintenance.
- I. The main valve trim, consisting of seat ring and stem shall be constructed of AISI 316 stainless steel. The valve stem shall have wrench flats for ease of maintenance.
- J. The main valve shall provide a drip-tight seal using a mechanically retained resilient disc, having a rectangular cross section, against the stationary AISI 316 stainless steel seat ring.
- K. The stationary AISI 316 stainless steel seat ring of main valves shall be held in place using Spiralock® self locking screws and seat ring retainers, or approved equal.

- L. All internal and external ferrous components, including all mating surfaces, shall be coated with an NSF-61 approved fusion bonded epoxy to a minimum of 10 mils DFT-Dry Film Thickness.
- M. The main valve elastomers: diaphragm, resilient disc and seals, shall be of EPDM or Buna-N.
- N. All main valve fasteners (bolts, nuts, studs, cap screws) shall be supplied as AISI 18-8 or 304 stainless steel. All bonnet bolts shall be fitted with stainless steel washers to prevent damage to the bonnet coating.

1.04 Pilot Controls

- A. The pressure reducing pilot shall be a normally open pilot with a spring to adjust the pressure setting. The pilot shall be self-cleaning and self-flushing with the outlet of the pilot located at the bottom of the pilot flow with the pilot stem out of the waterway and guide free from any debris build-up.
- B. The pilot trim, consisting of a seat ring, stem and yoke shall be constructed of AISI 316 stainless steel.
- C. The pilot elastomers: diaphragm, inner valve and seals, shall be of EPDM or Buna-N.
- D. The adjustable pilot spring range shall be supplied with a minimum spring range of 30 to 200 psi. The pilot shall be factory preset at 65 psi.
- E. The pilot body and spring casing shall be constructed of ASTM A351 CF8M stainless steel.
- F. A fixed restriction shall be supplied as AISI 303 stainless steel with an orifice bore selected by the manufacturer based on the valve size and operation.
- G. The adjustable flow stabilizer shall be a self-cleaning opening speed control, supplied as a stainless steel assembly.
- H. The pilot fittings shall be AISI 316 stainless steel.
- I. The pilot tubing shall be PTFE lined flexible braided stainless steel.
- J. Three (3) pilot isolation ball valves shall be supplied as standard. Pilot isolation ball valves shall be constructed of 316 stainless steel with stainless steel handle operators.
- K. A pilot strainer shall be supplied as standard. Strainer material to be ASTM A351 CF8M stainless steel with a 40-mesh or 80-mesh 316 stainless steel screen. The external pilot strainer shall have a removable plug for easy maintenance access to the pilot screen and have provision for installation of a ball valve for pilot screen flushing.



City of
CHICKASHA

Meeting Type: Special CMA Meeting 12-18-2023

Meeting Date: 12/18/2023

Department: Public Works

Agenda Item No. 4.b.

AGENDA ITEM: Discussion, consideration, and possible action to authorize the Trust Manager to execute the Application for Permit to Construct Water Pollution Control or Public Water Supply Facilities and/or Supply Potable Water for the Oklahoma Department of Environmental Quality, Water Quality Division.

I. BACKGROUND/DESCRIPTION:

II. RECOMMENDED ACTION:

Authorize the Trust Manager to execute the Application for Permit to Construct Water Pollution Control or Public Water Supply Facilities and/or Supply Potable Water for the Oklahoma Department of Environmental Quality, Water Quality Division.

III. FISCAL INFORMATION -

IV. FUND INFORMATION:

Dept. Director: Jim Crosby, Public Works Director	Fund	Account	Amount
	(To)		
	FUND	ACCOUNT	AMOUNT
Meeting Date: December 8, 2023	(From)		

V. ATTACHMENTS:

1. Application for Permit to Construct Water Pollution Control or Public Water Supply Facilities and or Supply Potable water



Oklahoma Department of Environmental Quality
Water Quality Division | (405) 702-8100
707 N. Robinson, OKC, OK 73102-6010
P.O. Box 1677, OKC, OK 73101-1677

Check type(s) of
Construction Proposed

- ☐ Water Wells
☒ Waterlines
☐ Water Treatment
☐ Sanitary Sewer
☐ Wastewater Treatment
☐ Water Reuse

DEQ Form 583-B | July 2013

**Application for Permit to Construct Water Pollution Control
or Public Water Supply Facilities and/or Supply Potable Water**

A. Supply Potable Water: Date: _____, 20 ____ ONLY complete if construction is for potable water supply other than applicant 1. Applicant: _____ 2. PWS ID #: _____ 3. Phone #: _____ 4. Email: _____ 5. Purchaser: _____	B. Supply Reclaimed Water: Date: _____, 20 ____ ONLY complete if construction is for reclaimed water other than supplier 1. Supplier: _____ 2. S-#: R: _____ 3. Phone #: _____ 4. Email: _____ 5. User: _____ 6. Category: _____ (Attach Forms 627-WRP and 627 LAP if applicable)																											
C. Construction Facilities: Date: <u>November 29</u> , 20 <u>23</u> 1. Applicant: <u>Chickasha Municipal Authority</u> 2. S-# or PWSID #: <u>OK1010821</u> 3. Phone #: <u>405-222-6086</u> Email: <u>jim.crosby@chickasha.org</u> 4. Engineer's: Email: <u>rscottv11@gmail.com</u> Phone #: <u>580-467-8130</u> Fax #: <u>N/A</u> 5. Construction Proposal: <u>Construct 16-inch and 6-inch water mains</u> 6. Serves: <u>City of Chickasha</u> 7. Legal Description: Quarter ____/4 ____/4 <u>NW</u> /4 Section <u>34</u> Township <u>7</u> N Range <u>7</u> W County <u>Grady</u> Quarter ____/4 ____/4 <u>SW</u> /4 Section <u>27</u> Township <u>7</u> N Range <u>7</u> W County <u>Grady</u>																												
D. Fee: Enclosed is a check or money order (no cash) in the amount of \$ <u>305.91</u> . (Make checks and money orders payable to the Oklahoma Department of Environmental Quality, Water Quality Division). If exempt from permit fees provide the Oklahoma Water Resources Board REAP Grant No. _____ and/or Emergency Grant No. _____.																												
<table border="0" style="width: 100%;"><tr><td style="width: 80%;">E. In making this application, the applicant certifies and states the following:</td><td style="width: 10%; text-align: center;">Yes</td><td style="width: 10%; text-align: center;">No</td></tr><tr><td>1. The applicant has been supplied with copies of all rules and standards promulgated by the Oklahoma Department of Environmental Quality for the construction and operation of the facility in question.</td><td style="text-align: center;">☒</td><td style="text-align: center;">☐</td></tr><tr><td>2. To the best of the knowledge and belief of the applicant the plans, specifications, and engineering report comply with the requirements of the aforementioned rules and standards.</td><td style="text-align: center;">☒</td><td style="text-align: center;">☐</td></tr><tr><td>3. The applicant agrees to provide inspection and be responsible for the construction and operation of the facility in accordance with the aforementioned rules and standards, and in accordance with state law agrees that the Oklahoma Department of Environmental Quality shall have access to the facility at any time during and after construction for the purpose of inspection for compliance with the provisions of the Environmental Code, 27A O.S. § 2-1-101 and following et seq.</td><td style="text-align: center;">☒</td><td style="text-align: center;">☐</td></tr><tr><td>4. The applicant intends to own and operate the facility after construction is completed. If "No," provide information on responsibility for operation.</td><td style="text-align: center;">☒</td><td style="text-align: center;">☐</td></tr><tr><td>5. The applicant is holder of or will obtain a deed or easement to the land upon which construction is planned. If "No," explain. _____</td><td style="text-align: center;">☒</td><td style="text-align: center;">☐</td></tr><tr><td>6. The land upon which construction is planned is within the corporate limits of a municipality. If "Yes," application should be executed by authorized agent of the municipality. If "Yes" and applicant is other than a municipality, PRIVATE APPLICANT WITHIN MUNICIPALITY section must be completed.</td><td style="text-align: center;">☒</td><td style="text-align: center;">☐</td></tr><tr><td>7. The wastewater is treated by an on-site sewage disposal systems. If "No," the entity receiving, transporting, or treating the wastewater generated by the area is the applicant. If "No," the RECEIVE, TRANSPORT, OR TREAT section must be completed for sanitary sewer projects.</td><td style="text-align: center;">☐</td><td style="text-align: center;">☒</td></tr><tr><td>8. All local zoning and other ordinances of public entities having jurisdiction concerning the construction of the proposed improvements have been satisfied. If "No" explain. _____</td><td style="text-align: center;">☒</td><td style="text-align: center;">☐</td></tr></table>		E. In making this application, the applicant certifies and states the following:	Yes	No	1. The applicant has been supplied with copies of all rules and standards promulgated by the Oklahoma Department of Environmental Quality for the construction and operation of the facility in question.	☒	☐	2. To the best of the knowledge and belief of the applicant the plans, specifications, and engineering report comply with the requirements of the aforementioned rules and standards.	☒	☐	3. The applicant agrees to provide inspection and be responsible for the construction and operation of the facility in accordance with the aforementioned rules and standards, and in accordance with state law agrees that the Oklahoma Department of Environmental Quality shall have access to the facility at any time during and after construction for the purpose of inspection for compliance with the provisions of the Environmental Code, 27A O.S. § 2-1-101 and following et seq.	☒	☐	4. The applicant intends to own and operate the facility after construction is completed. If "No," provide information on responsibility for operation.	☒	☐	5. The applicant is holder of or will obtain a deed or easement to the land upon which construction is planned. If "No," explain. _____	☒	☐	6. The land upon which construction is planned is within the corporate limits of a municipality. If "Yes," application should be executed by authorized agent of the municipality. If "Yes" and applicant is other than a municipality, PRIVATE APPLICANT WITHIN MUNICIPALITY section must be completed.	☒	☐	7. The wastewater is treated by an on-site sewage disposal systems. If "No," the entity receiving, transporting, or treating the wastewater generated by the area is the applicant. If "No," the RECEIVE, TRANSPORT, OR TREAT section must be completed for sanitary sewer projects.	☐	☒	8. All local zoning and other ordinances of public entities having jurisdiction concerning the construction of the proposed improvements have been satisfied. If "No" explain. _____	☒	☐
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F. Funding Source(s) - Check the following source(s) that will be used to fund this construction project:

- | | |
|---|---|
| ☐ Oklahoma Department of Environmental Quality | ☐ Oklahoma Department of Commerce |
| ☐ Drinking Water State Revolving Fund (DWSRF) | ☐ Community Development Block Grant (CDBG) |
| ☐ Oklahoma Water Resources Board | ☐ U.S. Department of Agriculture (USDA-RD) |
| ☐ Clean Water State Revolving Fund (CWSRF) | ☐ Council of Government (COG) |
| ☐ Rural Economic Action Plan Grant (REAP) | ☒ Local Funds |
| ☐ Emergency Grant | ☐ Other Funding Sources: _____ |
| ☐ State Revenue Bond Program (FAP) | |

Applicant Signature or Private Applicant Within Municipality

- Note:**
1. Application must be signed by the chief elective or executive officer of the applicant, or by the applicant himself if a sole proprietorship. Information must be legible.
 2. To be completed if proposed construction lies within the boundaries of a municipality or other responsible public entity and is to be owned, operated, and maintained by a private entity.

CMA _____, hereby indicates awareness and approval of the proposed construction within its jurisdiction boundaries of the facilities address by this application. The concept plans, and specifications have been reviewed and are approved in accordance with this entities rules, regulations, laws, and ordinances, where applicable.

Signature (1)

Chickasha Municipal Authority

Name of Organization (Print or Type)

Keith Johnson

Name of Authorized Signature (Print or Type)

117 N. 4th Street

Street Address (Print or Type)

General Manager

Title

Chickasha, Ok 73018

City/State/Zip Code

Notary Public/Corporate Secretary/City Clerk

Private Entity Signature (1) or (2)

Name of Organization (Print or Type)

Name of Authorized Signature (Print or Type)

Street Address (Print or Type)

Title

City/State/Zip Code

Notary Public/Corporate Secretary/City Clerk

NOTARY SEAL

NOTARY SEAL

Receive, Transport, or Treat

Note: To be completed if proposed construction involves receiving, transporting, or treating wastewater by an entity other than the applicant.

_____, facility ID No. S-_____, hereby agrees to receive transport, and treat the wastewater generated from the area serviced by the proposed construction of this application. It further states that this entity's facilities have sufficient capacity to provide this service and are permitted under the rules and regulations of the Department of Environmental Quality.

Signature

Name of Authorized Signature

Title

Name of Organization

Mailing Address

City/State/Zip Code

Notary Public/Corporate Secretary/City Clerk

NOTARY SEAL