City of Bentonville
Bentonville Utility Board Meeting
Tuesday, October 15th – 11:30 am
Bentonville City Hall 305 SW "A" St.
City Council Chambers

AGENDA

Call to Order
Pledge of Allegiance
Attendance
Approval of Minutes: October 1st, 2024

New Business

1. Ordinance & Waiver of Bid – 1/0 Wire Order – Travis Matlock, PE (page 2-3).
2. Resolution – Bid Award IFB24-65 – 161 kV switch interrupters – Travis Matlock, PE (pages 4-49)
3. Resolution – Contract of Obligation for Financial Assurance Agmt WRRF – Chris Earl (page 50-56)
4. Resolution – Spring Creek Sewer Rehab – Mike Bender, PE (page 57-72)
5. Ordinance – BWU spec update – Preston Newbill (page 73-219)
6. Adjournment

City of Bentonville, Arkansas Agenda Item Form

Item Details

Council Meeting Date:	10/22/2024	**Submitted By:**	Travis Matlock
Phone:	479-271-5941	**For Department(s):**	Inventory Warehouse
Email:	tmatlock@bentonvillear.com		

Item Type (Check all that apply)

☐ Informational ☐ Bid Award ☐ Enter into an Agreement ☐ Change Order
☐ Recognizing Funds ☐ Budget Adjustment ☑ Waiver of Bid ☑ Emergency Clause
☑ Ordinance ☐ Resolution ☐ Informational

Title, Recommendation & Justification

Title:	Ordinance to waive competitive bids to order 1/0 Underground Wire
Action Recommendation & Justification:	Approval of an Ordinance to waive competitive bidding to purchase 1/0 UG Wire from Techline. Unit Prices and estimated quantities attached, plus applicable taxes. Due to market volatility and lead times related to these products, it would be neither practical or feasible to solicit competitive bids.
Additional Comments for Consideration (Optional):	Award is based on the low responsive quote per line item, for estimated totals: Techline in the estimated amount of $380,000.00 plus applicable taxes.
Amount for Approval:	**$** 380,000.00

Budget Impact

Is this Item Budgeted? ☑ **YES** ☐ **NO** ☐ **ITEM HAS NO COST** ☐ **OTHER:**_____

Budget Adjustment *(to be completed by Finance when applicable)*

		$	$
Account Number (ORG-OBJECT)	Account Description	Expense	Revenue
		$	$
Account Number (ORG-OBJECT)	Account Description	Expense	Revenue
		$	$
Account Number (ORG-OBJECT)	Account Description	Expense	Revenue
		$	$
Account Number (ORG-OBJECT)	Account Description	Expense	Revenue

Fund(s) Impacted (check all that apply) ☐ **General Fund** ☐ **Utility Fund** ☐ **Street Fund** ☐ **Other(s):**_____

Budget Impact Notes for Consideration (Optional):

City of Bentonville Electric Utilities Department
15KV Underground Primary Cable
Quote Form

BEUD Inventory Part Number	Wire Size	Feet Required	Price Per Foot Techline	Price Per Foot Irby	Price Per Foot AECI
2147	1/0 Full Neutral AL	100,000	$3.80	$4.49	$4.57
		40 reels @ 2500' on each			
			$380,000.00	$449,400.00	$457,000.00

City of Bentonville, Arkansas Agenda Item Form

Item Details

Council Meeting Date:	10/22/2024	**Submitted By:**	Travis Matlock
Phone:	479-271-5941	**For Department(s):**	Electric
Email:	tmatlock@bentonvillear.com		

Item Type (Check all that apply)

☐ **Informational** ☑ **Bid Award** ☐ **Enter into an Agreement** ☐ **Change Order**
☐ **Recognizing Funds** ☐ **Budget Adjustment** ☐ **Waiver of Bid** ☐ **Emergency Clause**
☐ **Ordinance** ☑ **Resolution** ☐ **Informational**

Title, Recommendation & Justification

Title:	Resolution to award IFB-24-65 for 161 kV GOAB Switch Interrupters
Action Recommendation & Justification:	Resolution to award bid IFB-24-65 for 161 kV GOAB Switch Interrupters for transmission materials to MVA Power, Inc. in the amount of $33,391.05 plus applicable tax. MVA Power, Inc. was the sole bid received.
Additional Comments for Consideration (Optional):	
Amount for Approval:	**$** 33,391.05 plus applicable taxes

Budget Impact

Is this Item Budgeted? ☑ **YES** ☐ **NO** ☐ **ITEM HAS NO COST** ☐ **OTHER:**_____

Budget Adjustment *(to be completed by Finance when applicable)*

		$ Expense	**$** Revenue
Account Number (ORG-OBJECT)	Account Description		
		$ Expense	**$** Revenue
Account Number (ORG-OBJECT)	Account Description		
		$ Expense	**$** Revenue
Account Number (ORG-OBJECT)	Account Description		
		$ Expense	**$** Revenue
Account Number (ORG-OBJECT)	Account Description		

Fund(s) Impacted (check all that apply) ☐ **General Fund** ☐ **Utility Fund** ☐ **Street Fund** ☐ **Other(s):**_____

Budget Impact Notes for Consideration (Optional):

CITY OF BENTONVILLE, ARKANSAS PURCHASING DEPARTMENT

FORMAL SEALED BID TABULATION

Date of Bid Opening:	9/12/2024	Time of Bid Opening:	1:00 PM	IFB-24-65

Solicitation Title: Electric Material

	Bidders:	MVA Power, Inc.

Line Item	Quantity	Structure Number	Description	Unit Price	Extended Price
1	2	48, 51	D-T816-2625	$11,130.35	$22,260.70
2	1	1	D-T816-2624	$11,130.35	$11,130.35
			Total Bid Price:		$33,391.05

purchasing@bentonvillear.com - (479) 271-3115

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Administrative Services
Purchasing Department
1000 SW 14th Street
Bentonville, AR 72712

CITY OF BENTONVILLE, ARKANSAS

City Hall
305 SW A Street
Bentonville, AR 72712

NOTICE OF AWARD

To: MVA Power, Inc.
1 Holly Road
Montreal, Quebec H3X3K6

Date: 9/17/24

Solicitation Number and Title: 161kV GOAB Switch Interrupters

Date of Award : 9/17/24

The City of Bentonville has considered the Bid submitted by MVA Power, Inc. for the above-described Solicitation in response to its Advertisement for Bids dated 8/18/24 and Bidding Documents.

You are hereby notified that your Bid has been accepted in the amount of: $33,391.05
Thirty-three thousand three hundred ninety-one dollars and five cents
(Written amount)

You are required to return an acknowledged copy of this Notice of Award to the City.

Dated this September 28, 2024 | 4:54 AM CDT (Month/Day/Year).

By: [redacted]
(Signature)
Printed Name: Stephanie Orman

Title: Mayor

Acceptance of Notice

Receipt of the above Notice of Award is hereby acknowledged by: MVA POWER INC

this the 30 day of September, 2024.

By: [redacted]
(Signature)

Printed Name: Charly-Marc Hadid

Title: Sales and Marketing associate

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CITY OF BENTONVILLE, ARKANSAS
PURCHASING DEPARTMENT
ADMINISTRATIVE SERVICES BUILDING
1000 SW 14TH STREET BENTONVILLE, AR 72712
(479)-271-3115 – purchasing@bentonvillear.com

EXECUTION OF BID PAGE (REQUIRED)

Upon signing this Bid, the Bidder certifies that he/she has read and agrees to the requirements set forth in this Bid proposal including specifications, conditions and pertinent information regarding the articles being Bid on, and agrees to furnish these articles at the prices stated. All information on this page must be completed.

Unsigned Bids will be rejected - no exceptions.

Name of Firm: MVA POWER INC **Phone Number:** 450 589 0445

Business Address (Full Street/City/State/Zip): 1 HOLLY ROAD, MONTREAL, QUEBEC H3X3K6

Is this address able to accept mail deliveries (for the purpose of returning Bid bonds etc.): X **Yes** __ **No**

Name of Contact Person: Charly-Marc Hadid **Email:** chadid@mvapower.com

Signature of Authorized Person: [redacted] **Date:** 30 August 2024

Printed or Typed Name: Charly-Marc Hadid **Title:** Sales & Marketing associate

Arkansas Contractor's License Number: _____ **(Not required)**

Sales or Use Tax ID Number: Please see attached our W-8BEN-E

Bid Bond Included: X **Yes** _ _ **No (Required)**

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FOR PUBLICATION

PUBLICATION DATES: AUGUST 18, 2024

NOTICE TO BIDDERS

161KV GOAB SWITCH INTERRUPTERS

Invitation For Bid (IFB)-24-65

The City of Bentonville, Arkansas is accepting formal, sealed bids for the one-time purchase and delivery of 161kV GOAB Switch Interrupters as specified, for the City of Bentonville Electric Utility Department.

All Bids must be accompanied by a Bid Guarantee in the form of a bid bond, certified check, or cashier's check in the amount of 5% (five percent) of the Total Bid Price, payable without condition to the City of Bentonville, as a guarantee that the Bidder will enter into a contract and execute performance and payment bonds after the Notice of Award has been issued. The Bid Guarantee shall provide that the Bidder or surety must pay the damage, loss, cost, and expense subject to the amount of the Bid Bond directly arising out of the Bidder's default in failing to execute and deliver the Contract and bonds. Personal checks and company checks are NOT acceptable as a Bid Guarantee. Any bid submitted shall be void unless accompanied by a cashier's check drawn upon a bank or trust company doing business in the State of Arkansas or by a corporate bid bond. Bidders shall adhere to the bonding requirements as specified in the IFB-24-65 Bidding Documents.

The City reserves the right to cancel this request at any time in accordance with the City's best interest, to reject any Bid received, and to waive irregularities in accordance with the City's best interest. Submitters agree that such rejection shall be without liability on the part of the City of Bentonville for any damage or claim brought by any Bidder because of such rejections, nor shall the Submitter seek any recourse of any kind against the City because of such rejections. The filing of any Bids in response to this Invitation shall constitute an agreement of the Bidder to these conditions.

The City encourages all qualified small, minority owned, and women owned business enterprises to submit Bids for capital improvements, projects, and purchases. Encouragement is also made to all general (prime) contractors that in the event they subcontract portions of their work, consideration is given to the identified groups.

Interested parties can obtain the required Bid Packet by emailing purchasing@bentonvillear.com, by calling 479-271-3115, or from visiting the address below. The Bid Packet may also be downloaded from the Purchasing Page of the City's website (http://www.bentonvillear.com/211/Purchasing) by clicking 'Review Open Bids'. Bidders are encouraged to notify Purchasing that they have downloaded the Bid Packet to ensure they are on the distribution list for Addenda and/or Q&A. There may be a 24-48 hour delay from the date of publication for the documents to be available on the City's website.

There will be a Public Bid Opening for IFB-24-65 held at 1:30 PM CST on Thursday, September 5, 2024; the Bid Opening will be held at the City of Bentonville Administrative Services Building in Room A239 on the 2nd floor, located at 1000 SW 14th Street Bentonville, AR 72712. All Bid Submissions must be received by Purchasing prior to the Public Bid Opening time. Late and unsigned Submissions will be rejected, without exception. In accordance with Arkansas Procurement Law and Rules, it is the responsibility of vendors to submit responses at the designated location before the Bid Opening date and time. Bidders who wish to deliver a Bid Submission prior to the Bid Opening date/time may do so by delivering the Bid Submission to the Purchasing Department located at the address above.

Questions must be submitted via written communication only to purchasing@bentonvillear.com. The deadline to submit questions related to this Invitation is August 30, 2024, at 4:30 PM CST, after this time the City will only provide clarifications or responses pertaining to items in the Bidding Documents that do not result in a change or Addendum (see Bidding Documents for additional information).

DEPARTMENT RESPONSIBLE FOR ADVERTISING COSTS: LEGAL

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CITY OF BENTONVILLE, ARKANSAS
PURCHASING DEPARTMENT
ADMINISTRATIVE SERVICES BUILDING
1000 SW 14TH STREET BENTONVILLE, AR 72712
(479)-271-3115 – purchasing@bentonvillear.com

INVITATION FOR BID (IFB) SOLICITATION

SOLICITATION INFORMATION			
Bid Number:	IFB-24-65	**Date of Issuance:**	AUGUST 18, 2024
Description:	161KV GOAB SWITCH INTERRUPTERS		
Requesting Department:	CITY OF BENTONVILLE ELECTRIC UTILITY DEPARTMENT		
Purchasing Department (Buyer):	KELSI FREDERICK, PURCHASING MANAGER		
Pre-Bid Meeting Information:	NO PRE-BID MEETING SCHEDULED FOR THIS SOLICITATION		
Bid Bond Requirement:	5% BID BOND REQUIRED		

BID OPENING DATE & TIME	
Bid Opening Date and Time:	**September 5, 2024 AT 1:30 PM CST**
Bid Opening Location:	**City of Bentonville Administrative Services Building** Bid Opening Room – 2nd Floor – Room A239 1000 SW 14th Street Bentonville, AR 72712

DELIVERY OF BID SUBMISSION	
Location (and mailing address) for Bid Submission Delivery:	**City of Bentonville Administrative Services Building** **Purchasing – 2nd Floor** 1000 SW 14th Street. Bentonville, AR 72712
Bid Submission Requirements:	All Bids must be received by the Purchasing Office prior to the date and time listed herein for the Bid opening, in a sealed envelope with the following information clearly marked on the outer envelope: - Solicitation ID (IFB Number) - Bidder's Name/Company Name & Phone Number Bids which must be opened to be identified may be rejected. Bids which are not sealed or are opened upon delivery will not be accepted. Late Bids, unsigned Bids, or Bids which do not contain a Bid bond (when required) will be rejected, without exception. In accordance with Arkansas Procurement Laws and Rules, it is the responsibility of the Bidder to submit their Bid submission correctly and to the designated location prior to the Bid opening time.

Deadline for Submission of Requests for Information, Questions or Clarifications:	August 30, 2024– 4:30 PM CST
Questions should be submitted only to the Purchasing Office via written communication only to purchasing@bentonvillear.com.	

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EXECUTION OF BID PAGE (REQUIRED)

Upon signing this Bid, the Bidder certifies that he/she has read and agrees to the requirements set forth in this Bid proposal including specifications, conditions and pertinent information regarding the articles being Bid on, and agrees to furnish these articles at the prices stated. All information on this page must be completed.

Unsigned Bids will be rejected - no exceptions.

Name of Firm: MVA POWER INC **Phone Number:** 450 589 0445

Business Address (Full Street/City/State/Zip): 1 HOLLY ROAD, MONTREAL, QUEBEC H3X3K6

Is this address able to accept mail deliveries (for the purpose of returning Bid bonds etc.): X **Yes** __ **No**

Name of Contact Person: Charly-Marc Hadid **Email:** chadid@mvapower.com

Signature of Authorized Perso [redacted] **Date:** 30 August 2024

Printed or Typed Name: Charly-Marc Hadid **Title:** Sales & Marketing associate

Arkansas Contractor's License Number: _____ **(Not required)**

Sales or Use Tax ID Number: Please see attached our W-8BEN-E

Bid Bond Included: X **Yes** _ _ **No** (Required)

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SECTION 1: OVERVIEW

1. INTENT

The intent of this Invitation for Bid (IFB) is for the one-time purchase and delivery of 161kV GOAB Switch Interrupters as specified, for Substation G – Substation I.

All items shall be delivered to the City in accordance with this IFB Document and all attached Appendixes.

2. REQUIRED RESPONSE DOCUMENTS

The following documents must be complete to provide a complete Bid response package:

- Invitation for Bid (IFB) document, all response fields complete. This includes but is not limited to the Non-Collusion Affidavit (requires notary), and Vendor Disclosure.
- 5% Bid Bond Required.

3. APPENDIXES

- **APPENDIX A: NON-COLLUSION AFFIDAVIT** (REQUIRED RESPONSE DOCUMENT)
- **APPENDIX B: CONTRACTOR/VENDOR DISCLOSURE** (REQUIRED RESPONSE DOCUMENT)
- **APPENDIX C: SWITCHES DETAIL SHEETS (SPECIFICATIONS DOCUMENT)**
- **APPENDIX D: BEUD SWITCH SPECIFICATIONS (SPECIFICATIONS DOCUMENT)**

SECTION 2: REQUIREMENTS, TERMS & CONDITIONS

BIDDERS: THIS SECTION CONTAINS REQUIRED RESPONSE FIELDS

1. GUARANTEE OF BID

Bidders may not withdraw their Bids for a period of sixty (60) days after the Public Bid Opening. The City of Bentonville has sixty (60) days from the Bid Opening date in which to evaluate Bids and recommend award to City Council if it is determined to be in the City's best interest. Bidders may only withdraw their Bids in accordance with the Terms and Conditions herein.

2. BONDS

A. BID BOND (BID GUARANTEE)

Bidders are required to include a Bid Bond as specified when the 'Bid Bond Required' field below has an "x" mark or when otherwise required in this document.

__X__ Bid Bond Required **__ Bid Bond Not Required for this Solicitation**

All Bids must be accompanied by a Bid Bond/Bid Guarantee in the form of a Bid bond, certified check, or cashier's check in the amount of five percent (5%) of the Total Bid Price, payable without condition to the City of Bentonville. The Bond shall not have an expiration date of less than the number of days specified in the Guarantee of Bid section of this IFB document. Personal checks and company checks are NOT acceptable as a Bid guarantee.

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B. PERFORMANCE & PAYMENT BOND

The awarded Bidder is required to submit Performance and Payment Bonds at the time of Contract signing when the 'Performance & Payment Bonds Required' field below has an "x" mark or when otherwise required in this document.

___Performance and Payment Bond Required _X_Performance and Payment Bond Not Required for this Solicitation

The awarded Bidder shall furnish Performance and Payment Bonds after the Notice of Award is issued and upon the time of signing the binding Contract, each in an amount at least equal to the Total Bid Price as security for the faithful performance and payment of all of the awarded Bidder's obligations under this Invitation for Bid and the awarded binding Contract. These Bonds shall remain in effect for a period of one (1) year after a formal Completion of Work Notice is issued by the City. The awarded Bidder may elect to transfer the Performance Bond to a Maintenance Bond upon conclusion of the Project for the one-year guarantee period.

C. BONDS – GENERAL

All bonds shall be executed by such sureties as are named in the list of Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and Management Service, Surety Bond Brand, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.

If the surety on any bond furnished by the awarded Bidder is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of set forth herein, the awarded Bidder shall promptly notify the City and shall, within twenty (20) days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements set forth herein.

All bonds and insurance required by this Invitation for Bid and by the binding contract documents executed after the Notice of Award, to be purchased and maintained by the awarded Bidder, shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the work defined herein is to be performed.

3. SPECIFICATIONS

All items shall be delivered as specified in this Invitation for Bid Document and all attached appendixes. Deviations from Specifications or any item(s) proposed to be equivalent or substitute must be noted in the Bid Submission.

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4. WARRANTIES (REQUIRED RESPONSE)

The awarded Bidder shall assume that the City prefers all work (workmanship and materials) and/or items furnished to the City to be warrantied and shall furnish any and all applicable workmanship/material/product warranties to the City.

Bidders are required to include any applicable warranties for the materials/items proposed, in the space provided below:

18 Months from Delivery or 12 Months from Energizing, which event comes first

5. LAWS AND REGULATIONS

The Bidder's attention is directed to the fact that all applicable Federal and State Laws, and the rules and regulations of all authorities having jurisdiction over the construction of the project or the purchase or sale of the item(s) shall apply to the contract throughout, and they will be deemed to be included herein and in any awarded contract the same as though herein written out in full.

6. ENCOURAGEMENT FOR PARTICIPATION

Pursuant to Arkansas Code Annotated § 22-9-203, the City encourages all qualified small, minority owned, and women owned business enterprises to submit Bids for capital improvements. Encouragement is also made to all general (prime) contractors that in the event they subcontract portions of their work, consideration is given to the identified groups.

The City of Bentonville Purchasing Department encourages qualified small, minority and women owned businesses to participate and submit Bids for City projects/purchases.

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7. QUESTIONS/REQUESTS FOR INFORMATION (RFIs)/REQUESTS FOR CLARIFICATION (RFCs)/ADDENDA

All questions or requests related to this Invitation for Bid shall be directed solely to the Purchasing Department via written communication only, via one of the methods below. A copy of the question and the City's response will be distributed to all known document holders via an 'RFI (Request for Information) Response' or via Addenda (Addendum 1,2 etc.).

All questions should reference the IFB number when submitted

Submit Via Email: purchasing@bentonvillear.com

Submit Via Mail: City of Bentonville Administrative Service ATTN: Purchasing Office (solicitation number) 1000 SW 14th Street Bentonville, AR 72712

For Phone Calls: (479) 271-3115

The Purchasing Department will not respond to or otherwise acknowledge requests received after the deadline for submission of these requests stated herein, unless the response pertains to items in the Bidding Documents that do not result in a change or Addendum, such as, but not limited to: Bid Bond requirements, Bid Opening location, Bid Opening Date and Time, location of documents, Plan Holders/Known Document Holders Lists, issued addenda requests, etc. Questions requesting the Bid Opening date, Bid Bond requirement, and other details clearly outlined herein will not be included in RFI Responses or Addenda unless there are changes in the information after the Advertisement has published.

NOTE: No information communicated verbally or in any other form than a formal RFI Response or Addendum shall be considered firm or contractual; only information contained herein or otherwise in an RFI Response or Addendum shall be contractual.

Bidders are required to acknowledge any Addenda issued in their Bid Submission, per the requirements in the Addendum; Bidders are not required to acknowledge RFI Responses in their Bid Submissions.

8. EQUIVALENT ITEMS/REFERENCED SPECIFICATIONS

Whenever these specifications mention an item by name and use specific descriptions as reference thereto (such as model, part, brand names etc.), it is intended to convey to the Bidder an understanding of the standard of excellence required. Items that Bidders believe to be of equal type, quality, and size that will conform substantially to the standard of excellence established to provide equivalent merit, strength, durability, and to perform the required function in accordance with these specifications may be offered. Bids containing items proposed as equivalent (or alternate) shall clearly describe the equivalent (or alternate) article being offered and indicate how it differs from the City's original specification and how it conforms to the specification. Descriptive literature or manufacturer's specifications, in addition to any supplemental information necessary for comparison purposes should also be submitted with the Bid. It is the Bidder's responsibility to demonstrate to the City that a equivalent (or alternate)/substitute offer is equivalent to and meets the standard of quality indicated by the City's specifications. The City of Bentonville shall have the final approval of whether a substitute (or alternate) item is equal to the item specified. Submitting false claims that an item is 'as specified' when the item is an alternate or is otherwise not conforming to the specification shall be considered a lack of responsibility and the Bid from that Bidder may be rejected.

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EQUIVALENT ITEMS/REFERENCED SPECIFICATIONS CONTINUED

If no substitute or equivalent item will be accepted by the City due to existing equipment or processes in place, the specified item will have "NO SUB" included. When the City specifies "NO SUB", no substitute or alternate item will be accepted.

9. MULTIPLE BIDS

Bidder's attention is called to Section 6, Number 3 of this IFB Document. Bidders are prohibited from submitting multiple Bids for the same product in response to a competitive sealed Bid solicitation. In the event that a Bidder submits multiple Bids for the same product, all Bids from that Bidder will be rejected. Multiple Bids received for the same product, but with packaging variations will be rejected (considered as multiple pricing options for the same product and not allowed).

10. INDEMNIFICATION

Due to the City's statutory tort Immunity, the City does not carry liability insurance for such claims. Accordingly, any contract entered into with the awarded Bidder may not include a clause in which the City agrees that it or its' officials or employees will indemnify the other party.

The awarded Bidder agrees to indemnify the City and hold it harmless against all claims, liability, loss, damage or expense, including but not limited to counsel fees, arising from or by reason of any actual or claimed trademark, patent or copyright infringement or litigation based thereon, with respect to the service or any part thereof covered by this order, and such obligation shall survive acceptance of the services and payment thereof by the City.

11. PAST PERFORMANCE/REFERENCES

The City reserves the right to request references and to contact those references as part of the evaluation of Bids submitted to this Invitation for Bid. The City reserves the right to use the information gained from contacting references or from reviewing a Bidder's prior performance with the City in the evaluation of Bids, including but not limited to evaluating a Bidder's prior performance of the same or similar scope of work or delivery of items for the City or any other entity for whom the Bidder has performed work. The City reserves the right to request additional information from the apparent low Bidder if it is deemed to be in the City's best interest, and use that information in the evaluation for award based on what is in the City's best interest.

12. TOBACCO PRODUCTS AND LITTERING

The use of tobacco products is only permitted in designated areas marked with proper cigarette disposal containers on site. No disposal of tobacco products or littering of any kind shall be tolerated on the work premises or during performance of work for the City.

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13. ARKANSAS FREEDOM OF INFORMATION ACT (FOIA)

By submitting a Bid in response to this IFB, Bidder acknowledges and understands that the City is subject to the Arkansas Freedom of Information Act (FOIA) and City contracts and documents prepared while performing City work are subject to this Act. In the event that a FOIA request is presented to the City, the awarded Bidder agrees to do everything possible to provide any requested documents that they may be in possession of in a prompt and timely manner as prescribed in A.C.A. §25-19-101. Only legally authorized photocopying costs pursuant to the FOIA may be assessed for this compliance.

14. BIDDER'S DOCUMENTS

The only terms and conditions that will become part of the award/awarded Contract are those documents issued by the City as part of this IFB, including any contract, or documents furnished by the awarded Bidder (such as a contract) that are in accordance with the terms and conditions contained in this IFB and approved for Mayor's signature by the City's Legal Department.

Bidder's inclusion of their terms and conditions or other types of documents containing terms and conditions regarding payment, invoicing, indemnification or any other type of term are not accepted based on inclusion in the Bid Submission and will not be acknowledged as conditions to the Bid.

Bidders are required to use ONLY the prescribed City forms in their Bid Submission unless Bidder has included additional information for the City's consideration of an 'equivalent'/'alternate' item (i.e. product data sheets etc. are acceptable) or additional description of their products or services.

15. INVOICING

The awarded Bidder shall provide an invoice to the City for review and approval prior to payment. The City will not pay from any document other than an invoice (i.e. payments will not be processed based on contracts etc.).

The awarded Bidder shall include IFB-24-65 on all invoices submitted pertaining to work performed for this contract.

The invoicing option(s) available to Bidders for this IFB are indicated below by an "x" mark in the option(s) available.

_X__Invoice upon 100% completion (As approved by the City)

Payment will not be made for incomplete work or for item(s) delivered out of spec (not as specified). Any return or correction shall be at the awarded Bidder's expense. The City reserves the right to cancel an order due to receiving out of spec item(s) or request a replacement, whatever is in the City's best interest.

Unless otherwise specified, invoices will be paid within fourteen (14) days of receipt of an approved invoice.

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INVOICING CONTINUED

All invoices should be submitted to the City of Bentonville Accounts Payable Office, address and email below:

City of Bentonville Administrative Services
ATTN: Accounts Payable
1000 SW 14th ST
Bentonville, AR 72712
accountspayable@bentonvillear.com

All invoices must reflect City of Bentonville, Arkansas Sales Tax, and any other applicable tax, as required or as applicable (this may include showing the tax calculation or including a statement that Bentonville, AR sales tax is included). Required correction in invoices may result in delayed payment. The awarded Bidder is encouraged to contact the City's Accounts Payable Department (via the above email) with any advanced questions regarding invoicing and invoicing requirements prior to submitting their first invoice.

16. BIDDER REQUESTED PAYMENT TERMS

Bidders must use the space provided below to communicate their requested payment terms. Requests are not guaranteed for approval.

___NET 30 Days from Invoice Submission ___NET 60 Days from Invoice Submission __Other (Specify Below)
AS YOUR SPEC.

17. TERM

The Section with an "x" mark below shall apply to this Invitation for Bid.

_X_Single Purchase (for an item(s) ordered at one time)

The awarded Bidder(s) will receive a single or multiple Purchase Order(s), based on the Line Item(s) awarded, from the City of Bentonville for the one-time purchase and delivery of the Item(s).

A. Delivery shall be made in accordance with the City's delivery date/time specified herein or otherwise accepted (if alternate delivery dates/times are requested by the Bidder and accepted by the City in the form of award of the Bid or other written agreement).

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SECTION 3: SCOPE OF WORK & DELIVERY

BIDDERS: THIS SECTION CONTAINS REQUIRED RESPONSE FIELDS

1. SCOPE OF WORK

The awarded Bidder shall furnish all labor, materials, equipment, tools, supervision, insurance, and all other necessary components indicative of the type of work or supply of item(s) or services specified herein and as required to perform the work to 100% completion and/or to deliver all item(s) and/or services to the City as specified.

All items require 48 hour delivery notice from Awarded Bidder. If a Crane is required for delivery then the Awarded Bidder is required to give a 72 hour delivery notice. Shipper shall give total number of units to be shipped and the weight of the heaviest unit(s).

Delivery will only be accepted between 9:00 AM and 3:00 PM, Monday through Friday, with the exception of City holidays. It is the Awarded Bidder's responsibility to ensure City staff will be present for a delivery.

All delivery equipment shall be applicable to the materials and items being hauled, shall be sufficiently protected during shipping, and all required offloading needs must be communicated to the City either within the Bid Submission or within seven (7) days from receipt of the Notice of Award. The awarded Bidder is solely responsible for transportation of the items to the City's warehouse (destination), and as such is responsible for all paperwork (such as Bills of Lading etc.). Any transportation companies used by the awarded Bidder shall be adequately insured and capable to perform the work. The awarded Bidder is responsible for coordination with the City's warehouse staff. The City will be responsible for unloading the units from the delivery vehicle.

All other delivery instructions and specifications shall be in accordance with Appendix D, inclusive of advanced delivery of the anchor bolt cage and other detailed delivery requirements.

Bidders are responsible for submitting delivery questions to the Purchasing Department prior to submitting a bid, via the instructions included in this document (email purchasing@bentonvillear.com) prior to the question deadline.

Units not delivered in accordance with these Bidding Documents, including all attached Appendixes, will not be accepted by the City based on the City's determination. Awarded Bidder shall be solely liable for all excess costs involved in proper redelivery of said units, including but not limited to, labor and equipment costs incurred by the City in accepting and off-loading said units.

Delivery time frame and requirements may be taken into consideration in the award of this Bid.

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2. DELIVERY (REQUIRED RESPONSE)

The City of Bentonville requests (specifies) the below completion and or delivery date(s) as indicated by an "x" mark in the applicable field. Alternate or extended delivery dates may be considered when in the best interest of the City.

Estimated Award Date (not guaranteed, subject to change): September 24, 2024

Delivery Address: 5500 SW Barron Rd, Bentonville, AR 72712

*Bidders note that a change in the estimated award date will not release Bidder from the specified delivery date(s).

_X__**One-Time Order Item(s) Delivery Specified Date(s)**

One-Time Order (Purchase Order): **All item(s) shall be delivered prior to _____ or within 45 day(s) from receipt of the City's Purchase Order.**

The City will process payment for the item(s) once ALL items within the Purchase Order have been delivered.

SECTION 4: BIDDER ACKNOWLEDGEMENTS

Bidders are required to verify that the following required documents and bonds have been included with their Bid submission or will be furnished when due.

Description	Bidder's Initials
Invitation for Bid document, executed with all fields complete and thoroughly reviewed.	MVA
APPENDIX A: NON-COLLUSION AFFIDAVIT (Completed and Notarized)	MVA
APPENDIX B: CONTRACTOR/VENDOR DISCLOSURE (Completed)	MVA
5% Bid Bond	MVA
Addenda: Bidders are required to acknowledge all addenda issued for this IFB. Bidders may acknowledge issued addenda either by inclusion in their Bid Submission or by noting the Addendum Number and Date of Issuance below in the fields provided. **ADDENDUM NUMBER** **DATE OF ISSUANCE** _____ _____ _____ _____	MVA

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SECTION 5: BID PRICING

Bidder, having examined this Invitation for Bid document in its entirety and having performed a thorough examination of the work site(s) and/or product specifications hereby agrees to furnish all labor, products, materials, equipment, staging, transportation, and supervision of such, and all other components to produce 100% completion of the project in accordance with the specifications contained herein and as are industry standard and best practice when performing the type of work described herein.

Bid prices shall include all costs, including but not limited to: all labor, products material, equipment, disposal fees, transportation, staging, mobilization, overhead, profit, insurance, shipping and handling and all other costs to the City of Bentonville, Arkansas to cover the finished work and/or delivered products.

BID PRICES SHALL NOT INCLUDE SALES TAX. THE CITY OF BENTONVILLE IS NOT EXEMPT FROM SALES TAX, HOWEVER SALES TAX WILL BE CALCULATED AS PART OF AWARD.

AWARD OF THIS INVITATION FOR BID WILL BE BASED ON (applicable award method marked with an "x"):

_X__Total Bid Price: The award will be based on the lowest and most responsible Total Bid Price with all factors considered. The Total Bid Price shall be written in words and in figures. In case of discrepancy between the written amount and the figures, the written amount shall govern. In case of discrepancy between the Unit Price and the Extended Price, the Unit Price shall govern. The Total Bid Price is used for comparison purposes only; final payments will be based on actual work performed and materials supplied. If the required quantities of the items listed are increased or decreased by Change Order, the unit prices set forth shall apply to such quantities. Bid prices shall be rounded to the nearest cent.

Deductive Alternates apply when indicated by an "x" in the fields below
___Deductive Alternates Included _X__Deductive Alternates not included in this IFB

The City reserves the right to award the project in any manner that is deemed in its best interest, or to reject any or all Bids and to waive any irregularities.

No Bid shall be withdrawn for a period of sixty (60) days after the opening of Bids without the consent of the City; sixty (60) days shall be allowed to the City in which to determine the manner in which to award or not award the Contract.

Unit of Measure Definitions:

LS – Lump Sum

THE BID FORM IS LOCATED ON THE FOLLOWING PAGE

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INTERRUPTERS

Material Requirements:

The interrupters listed are to be furnished for the price indicated.

Item	Structure Number	Preliminary Approval Drawing	Str. Qty	Unit Price	Extended Price
1-1	48, 51	D-T816-2625	2	$ 11130.35	$ 22260.70
1-2	1	D-T816-2624	1	$ 11130.35	$ 11130.35
				Total Amount:	**$** 33391.05

BIDDER DECLARATION

The Undersigned hereby declares that they have carefully examined the Invitation, Scope of Work, Specifications and all other information related to the performance of the work or delivery of materials or items as described herein, have visited the actual location of the work (when applicable), have consulted their sources of supply, has satisfied themselves as to all quantities and conditions, and understands that in signing this proposal, they waive all right to pleas of any misunderstanding regarding the same.

Company Name: MVA POWER INC By (Authorized Person's Signature): [redacted]

Printed Name and Title: Charly-Marc Hadid Sales and Marketing associate

Date: 30 August 2024

State of incorporation (required if Company is a corporation): QUEBEC

Full names of all partners (required if Company is a partnership): _____

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SECTION 6: INVITATION FOR BID ADDITIONAL TERMS & CONDITIONS/INSTRUCTIONS TO BIDDERS

1. **SCOPE:** These instructions and conditions shall be in force unless otherwise modified by the City in this Bid Document. Bidders shall be advised that the City of Bentonville is not responsible for the content of any Bid package received through any 3rd party Bid service. It is the sole responsibility of the vendor to ensure the completeness of the documents received from any 3rd party source.

2. **DEFINITIONS (AS USED HEREIN):**
   a. The term "Invitation For Bid" means a solicitation for formal, competitive sealed Bids. The acronym "IFB" means Invitation for Bid. "Solicitation" may also be used throughout to refer to the Invitation for Bid.
   b. The term "Bid" means the offer by the Bidder.
   c. The term "Bidder" means the person or organization responding to the Invitation for Bid.
   d. The term "Contractor" means a person or organization who is the successful Bidder and who enters into a contract with the City.
      *At times in this document the terms Bidder and Contractor are interchangeable.
   e. The term "Change Order" means a written order from or approved by the Purchasing Department directing the Contractor to make changes to a Contract.
   f. The term "City" means the City of Bentonville, Arkansas.
   g. The term "City Council" means the governing body of the City of Bentonville, Arkansas.

3. **PREPARATION OF BIDS:** Bidders shall review the specifications, drawings, and all special and general conditions and any other documents included as part of this Invitation for Bid. Bidders are responsible for field verifying work or other means of familiarizing themselves with the Scope of Work of this Invitation for Bid. Failure to do so will be at the Bidder's risk.

   Each Bidder shall furnish the information required in the solicitation. The Bidder shall provide their name, address, e-mail address, and telephone number where indicated in the solicitation documents. All signatures must be by an officer or employee having the authority to bind the company or organization by his/her signature and included with the Bid response.

   Unit price for each unit offered must be provided. The unit price will be presumed correct.

   The Bidder must state a definite time for delivery of supplies or performance of services; in cases where the Bidder does not state a definite time, the City's specified timeline shall apply.

   Multiple Bids: Bidders are prohibited from submitting multiple Bids for the same product in response to a competitive sealed Bid solicitation. In the event that a Bidder submits multiple Bids for the same product, all Bids from that Bidder will be rejected.
   Exception for Different Models: In the event that the Bidder believes they have multiple different models or products (such as equivalent items) that meet the City's specifications, the Bidder may submit multiple Bids in response to a competitive sealed Bid solicitation as long as the following requirements are met:
   (1) The Bids are submitted in separate sealed envelopes;
   (2) The products being proposed in each submission are different makes, models or otherwise types of products.

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4. **SUBMITTING A BID:** Bids must be received by the City of Bentonville Purchasing Department **BEFORE** the time of opening indicated in the solicitation. All references to time shall be Bentonville, Arkansas time (Central Time Zone). Late Bids will be rejected without exception. Any exceptions or additional information required on a solicitation will be noted in the Bid documents or issued via clarification or Addendum. Failure to provide any requested information or to follow these procedures may result in the rejection of your Bid.

5. **BID DOCUMENT MISTAKES:** The Bidder shall not be allowed to modify or correct mistakes in the Bid document after the opening of the Bid, unless the mistake is determined to be non-judgmental by the Purchasing Manager. Failure to complete the entire Bid accurately may result in declaring the Bid as non-responsive and the Bid may be rejected.

   Bids may be withdrawn by the Bidder after submission for revisions or modifications at any time prior to the deadline for receipt of Bids (or Bid opening). Any such request for withdraw must be in writing either by email or other acceptable electronic manner as outlined in the Bidding documents, hand delivered or mailed communication. After Bids are opened, they shall be irrevocable for the period specified in the Bid documents, unless a nonjudgmental mistake (such as a math error), as determined by the Purchasing Manager, is suspected by the Purchasing Manager or the Bidder, or unless Bidder is permitted to withdraw their Bid pursuant to Arkansas State Law. If a nonjudgmental mistake is suspected, such as a math error, the Bidder shall submit a written request to the Purchasing Department requesting either to withdraw their Bid submission or to correct the nonjudgmental mistake. In the event that the City becomes aware of the mistake prior to the Bidder, the Bidder shall respond within two (2) days of receiving notification of the discovery with a written request to the Purchasing Department to verify a correction or requesting to withdraw their Bid. Any such request for withdraw or correction must be in writing either by email (or other acceptable electronic manner as outlined in the Bidding documents), hand delivered or mailed communication. Once a Bid has been verified, it shall be considered submitted, as verified.
   (1) In the event of discrepancy between a unit price and an extended price, the unit price shall govern.
   (2) At no point shall a correction of a mistake result in reduction or increase of a Bidder's unit price(s). If correction of the mistake would result in either an increase or decrease in the unit price, the Bid shall be considered nonresponsive and shall be rejected.

   The City shall permit a Bidder to withdraw its Bid without penalty or forfeiture of Bid security if: (a) a nonjudgmental mistake is evident on the face of the Bid, or (b) the Bidder establishes by clear and convincing evidence that a nonjudgmental mistake was made.

6. **ACCEPTANCE OF OFFER:** The submitted Bid is considered an offer on the part of the Bidder; such offer is deemed accepted upon issuance by the City of a Purchase Order, Notice of Award, Contract or other contractual or otherwise binding document.

   Bidders accept all terms and conditions herein upon submission of their signed Bid.

7. **FIRM PRICES:** By submitting the Bid, Bidder signifies that the prices, terms and conditions quoted in their Bid will be firm for acceptance for a period of not less than the bid guarantee Bid stated herein unless otherwise specified in the solicitation. Prices quoted must remain firm for the period of performance of any resulting purchase order or contract to be performed over a specified period of time as indicated in the solicitation.

   UNIT PRICES: Unit prices and all other pricing shall be rounded to the nearest cent. In the event of discrepancy between the unit price and the extended price, the unit price shall govern. At no point shall a correction of a mistake result in reduction or increase of a Bidder's unit price(s). If correction of the mistake would result in either an increase or decrease in the unit price, the Bid shall be considered nonresponsive and shall be rejected.

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8. **CONTRACT RENEWAL**: The City reserves the right to renew any contract resulting from this solicitation at the same prices, specifications, terms and conditions, upon mutual agreement between the City and the contractor.

9. **ESTIMATED QUANTITIES**: Whenever a Bid requests prices to be firm for a period of performance, the quantities or usages shown are estimated only with no guarantee made by the City. The quantities are for the Bidder's information only, and the City will be bound only for actual quantities ordered.

10. **DISCOUNTS**: Cash discounts will be considered in determining the award. Unless otherwise indicated in the IFB, discounts offering 10 days or more will be taken by the City's Accounts Payable Division, with payment made on the nearest pay period after receipt, inspection and acceptance of articles, and receipt of correct invoice(s).

11. **SAMPLES**: Samples of items, when required, must be submitted within the time specified at no expense to the City. If not destroyed by testing, samples may be returned at the Bidder's expense unless otherwise indicated in the solicitation.

12. **AWARD**: Award will be made to the lowest most responsive and responsible Bidder, which will be judged on the basis of price, conformance to specifications, quality, delivery time, references, past performance, payment terms, and in the best interest of the City of Bentonville, all factors being considered.

    The City reserves the right to accept or reject any or all Bids or part of Bids, to waive irregularities and technicalities, and to request rebids on the material described in the solicitation for any reason.

    The Purchasing Manager has the authority to cancel award of a solicitation if, in their discretion and the City Department's (over the project) discretion, Bids received do not meet the City's needs or for any other reason where award would not be in the City's best interest.

    The City reserves the right to award the contract on a split-order basis, lump-sum or individual-item basis, or any other combination that is in the best interest of the City unless otherwise specified herein.

    Conditional Bids are not acceptable and are subject to rejection in whole or in part at the sole discretion of the City.

    In the event of two (2) or more identical low Bids, award will be made to the lowest and most responsible and responsive Bidder as determined by the City through the Bid evaluation process.

    No order or contract resulting from this solicitation may be assigned, transferred, or delegated to another party without the written approval of the Purchasing Manager and Finance Director.

13. **BRAND NAMES:** If brand names, make, name of any manufacturer, trade name, or vendor catalog number are specified in these Bid documents, it is for the purpose of establishing a grade or quality of material only. When the City does not wish to rule out other brands or makes, the phrase OR EQUAL (OR EQUIVALENT, OR ALTERNATE) is added. However, if a product other than that specified is Bid, it is the Bidder's responsibility to identify such product in their Bid and prove to the City that the product is equal to or better than the product specified. Unless otherwise indicated, evidence in the form of samples may be requested if the proposed brand is other than that specified by the City. Such samples are to be furnished as specified in the solicitation or upon request of the City. Any samples requested by the City must be received by the City no later than four (4) days after formal request is made. The decision to accept a proposed item is solely the City's.

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14. **VARIATIONS OF SPECIFICATIONS**: For purposes of evaluation, Bidder must indicate any variances from any provision, specification, or condition stated in this solicitation, no matter how slight. If Bidder does not indicate any variations, it will be assumed that the product or service fully complies with the provisions, specifications, or conditions as stated. If the City determines that variances exist in the specification which the Bidder did not indicate (or falsely represented a lack of variances), the City reserves the right to declare the Bid non-responsive and reject the Bid from that Bidder. If satisfactory Bids are not received for the City's specifications, the City reserves the right to consider alternate Bids containing deviations from stated specifications.

15. **QUALITY:** Unless otherwise identified in the solicitation, all materials used in the manufacture or construction of supplies, materials or equipment covered by this solicitation shall be new. The items Bid must be the latest make or model in current production, as offered to commercial trade, and of the highest quality material and workmanship. Used, shopworn, demonstrator, prototype, or discontinued models are not acceptable.

16. **ECO-FRIENDLY (GREEN) PRODUCTS:** The City of Bentonville supports the use of products that are ecologically friendly to the environment. Bidders are urged to include information with their Bid that describes the human health and environmental impact of products proposed. This eco-friendly approach takes into account, but is not limited to, waste production, energy and water use, greenhouse gas emissions, indoor air quality, recycled and reused content and packaging, and the presences of hazardous substances. Consideration may be given to these eco-friendly products when compared to mainstream products in cost and packaging.

17. **MATERIAL SAFETY DATA SHEET (MSDS):** It is mandatory for a manufacturer, supplier, or distributor of hazardous material to supply an MSDS as required by 29CFR 1910.1200 with the first shipment. Any time the content of an MSDS is revised, the vendor is required to provide a new MSDS to the City.

18. **ACCEPTANCE OF MATERIAL**: The material delivered under this Bid shall remain the property of the seller until a physical inspection and actual usage of this material and/or service is made and is accepted by the City. It must comply with the terms of this IFB, and fully comply with specifications, and be of the highest quality. In the event the material and/or services supplied to the City is found to be defective or does not conform to specifications, the City reserves the right to cancel the order upon written notice to the contractor and return product to contractor at the contractor's expense. In the event that the City does not cancel the order but requests Bidder to bring the item(s), material(s) or service(s) to specification (correct the items), the corrections must be made at the awarded Bidder's expense and responsibility and must be completed within a timely manner as indicated by the City. If Bidder attempts to correct the item, material or service but fails to do so, or fails to do so in a timely manner, the City may elect to cancel the order at the awarded Bidder's expense.

19. **CODES AND REGULATIONS:** All products supplied and work performed within the scope of this request shall be supplied by the successful Bidder to all applicable current prevailing City, State and Federal codes and regulations.

20. **DELIVERY:** Bidders must complete the Delivery Section of this IFB. Delivery time may be considered in making an award. The City reserves the right to cancel any order, or any part of that order, without obligation if delivery is not made within the time(s) specified on in this IFB.

    The City may grant additional time for delivery if the City is satisfied the delay is beyond the control of the awarded Bidder. Any request for time extension must be in writing and approved by the City's authorized representative.

    All deliveries shall be FOB Destination to the location listed on the purchase order , contract, other approved form or as specified in this IFB unless otherwise specified by the City. Bidders may be requested to provide separate pricing for delivery of all items in this solicitation.

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21. **THIRD PARTY FREIGHT SERVICE:** The City of Bentonville may, at its discretion, use a third party freight service to arrange for delivery of the goods ordered as a result of this solicitation. In this case, the freight terms will be FOB Destination/Third Party Prepaid.

22. **PRICE CHANGES ON CONTRACTS:** If this solicitation is for an estimated quantity of supplies, consideration in awarding Bid for yearly contracts will be given:
    - First to Bidder offering firm prices for full contract period; and
    - Second to Bidder offering firm prices subject to market price adjustment.

24. **COPYRIGHT OR PATENT RIGHTS:** By submitting the Bid, Bidder signifies that there has been no violation of copyrights or patent rights in manufacturing, producing or selling the goods shipped or ordered as a result of the Bid, and Bidder agrees to hold the City harmless from any and all liability, loss, or expense caused by any such violation.

24. **CONFLICT OF INTEREST:** The contractor, by signing the Bid form in the solicitation or by acceptance of any purchase order resulting from this solicitation, certifies that to the best of their knowledge or belief, no elected or appointed official of the City is financially interested, directly or indirectly, in the purchase of the goods or services specified on this order or in the contract.

25. **TAXES:** The City of Bentonville is not tax exempt from any taxes imposed by the State and/or Federal Government. Applicable taxes should be included on all bids.

    The City of Bentonville sales tax rate is 9.5%; all products shall be delivered to the City of Bentonville or work shall be performed within City limits.

    It is the responsibility of the Bidder to include sales tax in their Bid when applicable regardless of the Bidder's ability to remit sales tax to the State of Arkansas. In no event should applicable taxes cause the City to pay more than the submitted Bid price.

26. **MANUFACTURER'S CERTIFICATION:** The City reserves the right to request from Bidders a separate manufacturer certification of all statements made in the Bid. Failure to provide any requested certification may result in rejection of Bid or termination of contract for which the Bidder must bear full liability.

27. **TERMINATION:** Subject to the following provisions, any contract resulting from this solicitation may be terminated by either party upon thirty (30) days advance written notice to the other party; but if any work or service is in progress but not completed as of the date of termination, then said contract may be extended upon written approval of the City until said work or services are completed and accepted. Types of termination include, but are not limited to:

    1. Termination for Convenience
       In the event that the contract is terminated or cancelled upon request and for the convenience of the City, without the required thirty (30) days advance written notice, then the City shall negotiate reasonable termination costs, if applicable.

    2. Termination for Cause
       Termination by the City for cause, default or negligence on the part of the contractor shall be excluded from the foregoing provision; termination costs, if any, shall not apply. The thirty (30) days advance notice requirement is waived in the event of termination for cause.

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(479)-271-3115 – purchasing@bentonvillear.com

3. Termination Due to Unavailability of Funds
When funds are not appropriated or otherwise made available to support continuation of performance, the contract shall be cancelled at the discretion of the City and without penalty to the City.

28. **W-9 REQUIREMENT:** The City of Bentonville requires a Form W-9 (Request for Taxpayer Identification Number and Certification), updated annually, from all contractors that do business with the City of Bentonville. The Form W-9 verifies the Tax Identification Number of the contractor so the City can correctly report to the IRS all funds paid to the contractor.

29. **DEFAULT OF CONTRACT:** In case of default by the contractor, the City may procure the items or services from other sources and hold the contractor responsible for any excess costs caused by such procurement. Failure of a Bidder to furnish the equipment, supplies, material, and/or services as specified is cause for elimination of the Bidder from the active Bidder's list for the products or services concerned.

30. **BID BOND:** If required in this solicitation, Bidders shall include a Bid guarantee in the form of a Bid bond, certified check, cashier's check in the amount specified herein, payable without condition to the City of Bentonville. Personal or company checks are not acceptable. The Bid bond shall be accompanied by a power of attorney showing the authority of the person executing the bond on behalf of the surety company and shall adhere any other requirements regarding Bid Bonds as set forth in this IFB document. Failure to include a Bid bond or Bid guarantee with your Bid submission when required will result in automatic rejection of the Bid. Bid guarantees (submitted by certified or cashier's checks) will be returned to unsuccessful Bidders when the successful Bidder is determined and the contract is executed.

31. **PERFORMANCE & PAYMENT BOND:** At the discretion of the City, a performance bond may be required under the contract resulting from this solicitation. Such bond must be of a type and amount suitable for the nature of the commodity or services purchased and for the full dollar amount of the contract as indicated in this solicitation. The performance bond shall be for the duration of the contract, guaranteeing the faithful performance of the contract and payment of all of Contractor's subcontractors and/or vendors, and otherwise conditioned as required by law. The Performance and Payment Bonds shall be accompanied by a power of attorney showing the authority of the person executing the bond on behalf of the surety company and shall conform to all other requirements for these bonds as specified in this IFB document. Bond forms must be executed with a surety company licensed to do business in the State of Arkansas. The cost of the bond shall be included in the Bidder's offer; at no time will the City be liable for the costs associated with a Performance and/or Payment Bond.

32. **MODIFICATIONS FOR CHANGES**: No agreement or understanding to modify this solicitation and resultant purchase orders or contract shall be binding upon the City unless made in writing by the Purchasing Department of the City of Bentonville.

33. **ORDER OF PRECEDENCE:** In the event of an inconsistency between provisions of the solicitation, the inconsistency will be resolved in the following order: (a) the IFB document; (b) Additional Terms and Conditions and Instructions to Bidders ; (c) special provisions; (d) other provisions of the contract, whether incorporated by reference or otherwise; and, (e) the specifications.

34. **WARRANTY:** Supplies or services furnished as a result of this solicitation shall be covered by the most favorable commercial warranties, expressed or implied, that the Bidder and/or manufacturer gives to any customer. The rights and remedies provided herein are in addition to and do not limit any rights afforded to the City by any other clause of this Bid. The City reserves the right to request from Bidders a separate manufacturer certification of all statements made in the Bid.

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CITY OF BENTONVILLE, ARKANSAS
PURCHASING DEPARTMENT
ADMINISTRATIVE SERVICES BUILDING
1000 SW 14TH STREET BENTONVILLE, AR 72712
(479)-271-3115 – purchasing@bentonvillear.com

35. **PAYMENT**: Payment for materials or services received under this contract will be made upon completion of delivery for each purchase order and submission of invoice to the Accounts Payable Department, 1000 SW 14th Street, Bentonville, AR 72712. Normal payment terms are payment via check within fourteen days from receipt of invoice.

36. **GOVERNING LAW:** Any agreement resulting from this solicitation shall be interpreted under and governed by the laws of the State of Arkansas.

37. **ESCALATION/DE-ESCALATION CLAUSE**: In the event prevailing market conditions warrant an adjustment in contract pricing, the following escalation/de-escalation clause shall be the only clause acceptable to the City:

    1. Contractor shall give written notice to the Purchasing Department of any proposed changes from contract prices not less than fifteen (15) calendar days prior to the effective date of price changes.
    2. Such notice must be accompanied by a copy of the supplier's notification to the contractor of a justifiable price change.
    3. No price escalation will be authorized in excess of the amount of the increase indicated on the supplier's notice.
    4. The approved price change shall be honored for all orders received by the contractor after the effective date of such price change.
    5. Approved price changes are not applicable to orders already issued and in process at time of price change.
    6. The City reserves the right to audit and/or examine any pertinent books, documents, papers, records, or invoice relating directly to the price increase after reasonable notice and during normal business hours.
    7. The Purchasing Department retains the right to determine whether or not such proposed price changes are in the best interests of the City.
    8. If in the opinion of the Procurement Department any proposed increase is found unacceptable, the Purchasing Department reserves the right to cancel the contract upon fifteen (15) calendar days' written notice.
    9. Contractors must tie any price change clause to an industry-wide or otherwise nationally recognized index or some other form of verifiable document. Contractor will put the Procurement Department on the mailing lists for such publications so the Purchasing Department can monitor said changes. Such membership will be at no cost to the City.
    10. If parties to the contract cannot agree on renewal terms, it is understood that the contract will be cancelled and a new contract will be solicited.

38. **ADDITIONAL INFORMATION:** Additional information may be obtained from the Purchasing Department at (479) 271-3115.

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CITY OF BENTONVILLE, ARKANSAS
PURCHASING DEPARTMENT
ADMINISTRATIVE SERVICES BUILDING
1000 SW 14TH STREET BENTONVILLE, AR 72712
(479)-271-3115 – purchasing@bentonvillear.com

APPENDIX A

NON-COLLUSION AFFIDAVIT

(REQUIRED RESPONSE DOCUMENT)

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CITY OF BENTONVILLE, ARKANSAS
PURCHASING DEPARTMENT
ADMINISTRATIVE SERVICES BUILDING
1000 SW 14TH STREET BENTONVILLE, AR 72712
(479)-271-3115 – purchasing@bentonvillear.com

NON-COLLUSION AFFIDAVIT

BID INVALID IF THIS AFFIDAVIT IS NOT SIGNED AND NOTARIZED AND SUBMITTED WITH THE BID

State of QUEBEC

County of MONTREAL

I Elizabeth Yanez (Printed Name of Authorized Representative/Agent) of lawful age, being first duly sworn, on oath says that:

1.They are the duly authorized representative/agent of the Bidder and/or contractor submitting the Competitive Bid and/or procuring the contract which is attached to this statement, for the purpose of certifying the facts pertaining to the existence of collusion among Bidders and between Bidders and City officials or employees, as well as, facts pertaining to the giving or offering of things of value to government personnel in return for special consideration in the letting of any contract pursuant to the Invitation for Bids to which this statement is attached;

2. They are fully aware of the facts and circumstances surrounding the making of the Bid and/or the procurement of the contract to which this statement is attached and have been personally and directly involved in the proceedings leading to the submission of such Bids;

3. Neither the Bidder/contractor nor anyone subject to the Bidder/contractor's direction or control has been a party;

a. to any collusion among Bidders in restraint of freedom of competition by agreement to bid at a fixed rate or to refrain from submitting;

b. to any collusion with any City official or employee as to quantity, quality or price in the prospective contract, or as to any other terms of such prospective contract, nor

c. in any discussions between Bidders and any City official concerning exchange of money or other thing of value for special consideration in the letting of a contract;

d. to paying, giving, donating or agreeing to pay, give or donate to any officer or employee of the City of Bentonville, any money or other thing of value, either directly or indirectly, in procuring the contract to which their statement is attached.

To be completed by Company (Authorized Representative/Agent):

Signature of Authorized Representative/Agent: [redacted]

Title (of Authorized Representative/Agent): Assistant Administrative

To be completed by Notary (include Seal):

Subscribed and sworn before me this: 30 day of august, 2024

Notary Public Signature: [redacted] My commission expires: 2026/05/15

Seal:

Isabelle Léveillé
241929
COMMISSAIRE À L'ASSERMENTATION
Québec

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CITY OF BENTONVILLE, ARKANSAS
PURCHASING DEPARTMENT
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APPENDIX B

CONTRACTOR/VENDOR DISCLOSURE

(REQUIRED RESPONSE DOCUMENT)

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CITY OF BENTONVILLE, ARKANSAS
PURCHASING DEPARTMENT
ADMINISTRATIVE SERVICES BUILDING
1000 SW 14TH STREET BENTONVILLE, AR 72712
(479)-271-3115 – purchasing@bentonvillear.com

Contractor/Vendor Disclosure

THIS DOCUMENT MUST BE COMPLETED AND INCLUDED IN ANY SUBMISSION

Company Name: MVA POWER INC

Identify each employee of the City Of Bentonville to whom you, any of your Employees owning more than 5% interest in your Company, or are a Director/Executive/Decision Maker of your Company are immediately related.

Immediate Relation includes:

- Spouse/Domestic Partner
- Parents-Natural or Legal/Step/In Laws
- Children/Step, Siblings-Whole/Half/Step/ In Laws
- Grandchildren/Step, Great Grandchildren.

_____

_____

_____

_____

OR

[X] Check this box if there are no applicable relationships to disclose.

Failure to disclose shall be considered a material breach and grounds for immediate termination of this contract/agreement. **Note: Any change in circumstances resulting in a conflict or appearance of a conflict shall be reported within 30 days of change of circumstance.**

MVA Initials

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Bond No. 7911790-24-031

AIA Document A310 - Electronic Format

Bid Bond

THIS DOCUMENT HAS IMPORTANT LEGAL CONSEQUENCES: CONSULTATION WITH AN ATTORNEY IS ENCOURAGED WITH RESPECT TO ITS COMPLETION OR MODIFICATION. AUTHENTICATION OF THIS ELECTRONICALLY DRAFTED AIA DOCUMENT MAY BE MADE BY USING AIA DOCUMENT D401.

KNOW ALL MEN BY THESE PRESENTS, that we

MVA Power Inc.
1, Holly Street
Montréal, QC H3X 3K6

as Principal, hereinafter called the Principal, and

Atlantic Specialty Insurance Company
One State Street Plaza, 31st Floor
New York, NY 10004

a corporation duly organized under the laws of the State of New York as Surety, hereinafter called the Surety, are held and firmly bound unto

City of Bentonville
1000 SW 14th Street
Bentonville, AR, 72712

as Obligee, hereinafter called the Obligee, in the sum of five percent (5%) of the tender amount, for the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a bid for: 24-65 RE-BID - 161kV GOAB Switch Interrupters.

NOW, THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the bidding or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such Contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the Obligee may in good faith contract with another party to perform the Work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect.

Signed and sealed this 5th day of September 2024.

[redacted]

MVA Power Inc. [redacted]

(Principal) (Seal)

President

(Title)

[redacted]

Natalie Harkin (Witness)

Atlantic Specialty Insurance Company

(Surety) (Seal)

[redacted]

Daniel Leclerc, Attorney-in-Fact

AIA DOCUMENT A310 - BID BOND - AIA - FEBRUARY 1970 EDITION - THE AMERICAN INSTITUTE OF ARCHITECTS, 1735 NEW YORK AVENUE N.W., WASHINGTON D.C. 20006-5292. Unlicensed photocopying violates U.S. copyright laws and is subject to legal prosecution. This document was electronically produced with permission of the AIA and can be reproduced without violation until the date of expiration as noted below.

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intact INSURANCE

Power of Attorney

KNOW ALL MEN BY THESE PRESENTS, that ATLANTIC SPECIALTY INSURANCE COMPANY, a New York corporation with its principal office in Plymouth, Minnesota, does hereby constitute and appoint: **Annie Deschatelets, Benoit Phenix, Candice Archer, Caroline Giroux-Bernard, Charles Hébert, Daniel Leclerc, Francois Forget, Jerome Caron, Lucie Carpentier, Mark Donahue, Martine Watson Monette, Maryse Caissy, Natalie Harkin, Olivier Turcotte, Pascal Tessier, Philippe Sirois, Pierre-Olivier Naud, Sophie Paré, Sylvain Darsigny, Sylvie Mendonca, Yves Boilard**, each individually if there be more than one named, its true and lawful Attorney-in-Fact, to make, execute, seal and deliver, for and on its behalf as surety, any and all bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof; provided that no bond or undertaking executed under this authority shall exceed in amount the sum of: **unlimited** and the execution of such bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof in pursuance of these presents, shall be as binding upon said Company as if they had been fully signed by an authorized officer of the Company and sealed with the Company seal. This Power of Attorney is made and executed by authority of the following resolutions adopted by the Board of Directors of ATLANTIC SPECIALTY INSURANCE COMPANY on the twenty-fifth day of September, 2012:

Resolved: That the President, any Senior Vice President or Vice-President (each an "Authorized Officer") may execute for and in behalf of the Company any and all bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof, and affix the seal of the Company thereto; and that the Authorized Officer may appoint and authorize an Attorney-in-Fact to execute on behalf of the Company any and all such instruments and to affix the Company seal thereto; and that the Authorized Officer may at any time remove any such Attorney-in-Fact and revoke all power and authority given to any such Attorney-in-Fact.

Resolved: That the Attorney-in-Fact may be given full power and authority to execute for and in the name and on behalf of the Company any and all bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof, and any such instrument executed by any such Attorney-in-Fact shall be as binding upon the Company as if signed and sealed by an Authorized Officer and, further, the Attorney-in-Fact is hereby authorized to verify any affidavit required to be attached to bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof.

This power of attorney is signed and sealed by facsimile under the authority of the following Resolution adopted by the Board of Directors of ATLANTIC SPECIALTY INSURANCE COMPANY on the twenty-fifth day of September, 2012:

Resolved: That the signature of an Authorized Officer, the signature of the Secretary or the Assistant Secretary, and the Company seal may be affixed by facsimile to any power of attorney or to any certificate relating thereto appointing an Attorney-in-Fact for purposes only of executing and sealing any bond, undertaking, recognizance or other written obligation in the nature thereof, and any such signature and seal where so used, being hereby adopted by the Company as the original signature of such officer and the original seal of the Company, to be valid and binding upon the Company with the same force and effect as though manually affixed.

IN WITNESS WHEREOF, ATLANTIC SPECIALTY INSURANCE COMPANY has caused these presents to be signed by an Authorized Officer and the seal of the Company to be affixed this first day of January, 2023.

ATLANTIC SPECIALTY INSURANCE COMPANY CORPORATE SEAL 1986 NEW YORK

By [redacted]
Sarah A. Kolar, Vice President and General Counsel

STATE OF MINNESOTA
HENNEPIN COUNTY

On this first day of January, 2023, before me personally came Sarah A. Kolar, Vice President and General Counsel of ATLANTIC SPECIALTY INSURANCE COMPANY, to me personally known to be the individual and officer described in and who executed the preceding instrument, and she acknowledged the execution of the same, and being by me duly sworn, that she is the said officer of the Company aforesaid, and that the seal affixed to the preceding instrument is the seal of said Company and that the said seal and the signature as such officer was duly affixed and subscribed to the said instrument by the authority and at the direction of the Company.

ALISON DWAN NASH-TROUT
NOTARY PUBLIC - MINNESOTA
My Commission Expires
January 31, 2025

[redacted]
Notary Public

I, the undersigned, Secretary of ATLANTIC SPECIALTY INSURANCE COMPANY, a New York Corporation, do hereby certify that the foregoing power of attorney is in full force and has not been revoked, and the resolutions set forth above are now in force.

Signed and sealed. Dated 5th day of September, 2024.

ATLANTIC SPECIALTY INSURANCE COMPANY CORPORATE SEAL 1986 NEW YORK

This Power of Attorney expires
January 31, 2025

[redacted]
Kara L.B. Barrow, Secretary

Please direct bond verifications to surety@intactinsurance.com

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Product Specifications for Type 1M 2M 3M Multi Bottle Vacuum Interrupters

1. General

a) This specification covers the design and manufacture of multi bottle vacuum interrupters, which provide interrupting capability for line dropping, load dropping and breaking parallel currents when used in conjunction with SEECO disconnect switches.
b) All multi bottle vacuum interrupters furnished shall conform to applicable IEEE, NEMA and ANSI standards
c) The interrupter manufacturer shall furnish all parts required to perform a complete installation including the interrupter unit(s), hardware, auxiliary stationary and moving contacts and blade mounted pick-up arms.
d) The disconnect switch will be provided by others unless requested in the RFQ.

2. Materials and Workmanship

a) The equipment shall be new and of standard commercial, first-grade quality as to materials, workmanship, and design, in accordance with the best engineering practice, and shall be such as has been proven suitable for the intended purpose.
b) All units shall pass hi-pot and continuity tests before shipment; all test reports shall remain on file and available for customer review. All units shall pass rigorous factory acceptance testing during production, including critical adjustment dimensions and leakage current.

3. Environmental Conditions

a) Temperature - Equipment supplied shall be adequate for an operating range of –50 degrees C to +85 degrees C.
b) Humidity - Equipment supplied shall be operable under humidity of up to 95% at a temperature of 40 degrees C
c) Environment - Equipment supplied shall provide reliable performance in environments with high exposure to salt, minerals, chemicals, or windborne particulate.

4. Ratings and Type

a) Type - interrupter unit shall employ multiple vacuum bottles in series
b) Ratings - multi bottle vacuum interrupters shall meet or exceed the following ratings

c) General Ratings

Rated Voltage	46 kV through 230 kV (line to line)
Rated Max Interrupting Current	2000 amp; optional 3000 amp with alternate bottle
Rated Frequency	50 or 60 Hz
Rated Number of Operations	10,000

d) Performance Ratings - Line Dropping

kV	Bottles	Amps	kV	Bottles	Amps
46	2	100	138	5	20
69	3	100	138	6	100
115	4	40	161	6	25
115	5	100	230	8	40

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Product Specifications for Type 1M, 2M, 3M Multi Bottle Vacuum Interrupters

e) Performance Ratings - Loop Splitting/Breaking Parallel

2000 amps at 38 kV recovery voltage; optional 3000 amp with alternate bottle

f) Performance Ratings - Load Dropping

kV	Bottles	Amps**	kV	Bottles	Amps**
46	2	2000	138	5	2000
69	3	2000	138	6	2000
115	4	2000	161	6	2000
115	5	2000	230	8	2000

** optional 3000 amp with alternate bottle

5. Interrupter Unit Design and Construction

a) Interrupter units shall be light weight in design, so as to preclude switch insulator deflection and resulting misalignment of switch contacts
b) Operating effort shall be minimal, suitable for manual swing handle operation
c) Installation shall be simple with no field adjustment of the trip mechanism required
d) Interrupter shall provide a mechanism to test each vacuum bottle independently
e) Interrupter shall not require special safety, disposal or reporting procedures; shall not pose a hazard to personnel or the environment; shall not emit greenhouse or toxic gases
f) Interrupter shall be in the circuit only during the open operation of the disconnect switch; interrupter shall be out of the circuit but at potential when the disconnect switch is closed
g) Interrupter design shall utilize proven vacuum bottle technology
h) Interrupter design shall employ voltage grading to insure even distribution of voltage across all bottles

6. Vacuum Bottles

a) Gap distance and rate of contact opening to match the bottle manufacturer's mechanical requirements
b) Service life to be at least 10,000 operations

7. Dialectric

a) The dielectric shall be a fluid with the following characteristics: low fire hazard, low reactivity and vapor pressure, good heat stability, high water repelency, odorless, tasteless, non-toxic
b) In the event that the dielectric leaks, there must be a visual indication of such
c) The dielectric shall not pose a hazard to health or the environment at any point in the life cycle of the interrupter
d) Dielectric shall not be restricted in Canada and other foreign markets
e) SF6 is not permissible; inert gasses are not permissible

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Product Specifications for Type 1M, 2M, 3M Multi Bottle Vacuum Interrupters

8. Housing

a) The housing shall be a filament wound, fiber glass tube
b) The tube exterior shall be painted Skytone Gray and incorporate a proven UV inhibitor for long life
c) Housing to be properly sealed to prevent loss of dielectric or ingress of moisture

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Form **W-8BEN-E**
(Rev. July 2017)
Department of the Treasury
Internal Revenue Service

Certificate of Status of Beneficial Owner for United States Tax Withholding and Reporting (Entities)

▶ For use by entities. Individuals must use Form W-8BEN. ▶ Section references are to the Internal Revenue Code.
▶ Go to *www.irs.gov/FormW8BENE* for instructions and the latest information.
▶ Give this form to the withholding agent or payer. Do not send to the IRS.

OMB No. 1545-1621

Do NOT use this form for: — **Instead use Form:**

- U.S. entity or U.S. citizen or resident W-9
- A foreign individual . . . . . W-8BEN (Individual) or Form 8233
- A foreign individual or entity claiming that income is effectively connected with the conduct of trade or business within the U.S. (unless claiming treaty benefits) W-8ECI
- A foreign partnership, a foreign simple trust, or a foreign grantor trust (unless claiming treaty benefits) (see instructions for exceptions) . . W-8IMY
- A foreign government, international organization, foreign central bank of issue, foreign tax-exempt organization, foreign private foundation, or government of a U.S. possession claiming that income is effectively connected U.S. income or that is claiming the applicability of section(s) 115(2), 501(c), 892, 895, or 1443(b) (unless claiming treaty benefits) (see instructions for other exceptions) . . . . . W-8ECI or W-8EXP
- Any person acting as an intermediary (including a qualified intermediary acting as a qualified derivatives dealer) W-8IMY

Part I Identification of Beneficial Owner

1 Name of organization that is the beneficial owner
MVA POWER INC

2 Country of incorporation or organization
CANADA

3 Name of disregarded entity receiving the payment (if applicable, see instructions)

4 Chapter 3 Status (entity type) (Must check one box only):
☑ Corporation ☐ Disregarded entity ☐ Partnership
☐ Simple trust ☐ Grantor trust ☐ Complex trust ☐ Estate ☐ Government
☐ Central Bank of Issue ☐ Tax-exempt organization ☐ Private foundation ☐ International organization

If you entered disregarded entity, partnership, simple trust, or grantor trust above, is the entity a hybrid making a treaty claim? If "Yes" complete Part III. ☐ Yes ☐ No

5 Chapter 4 Status (FATCA status) (See instructions for details and complete the certification below for the entity's applicable status.)

- ☐ Nonparticipating FFI (including an FFI related to a Reporting IGA FFI other than a deemed-compliant FFI, participating FFI, or exempt beneficial owner).
- ☐ Participating FFI.
- ☐ Reporting Model 1 FFI.
- ☐ Reporting Model 2 FFI.
- ☐ Registered deemed-compliant FFI (other than a reporting Model 1 FFI, sponsored FFI, or nonreporting IGA FFI covered in Part XII). See instructions.
- ☐ Sponsored FFI. Complete Part IV.
- ☐ Certified deemed-compliant nonregistering local bank. Complete Part V.
- ☐ Certified deemed-compliant FFI with only low-value accounts. Complete Part VI.
- ☐ Certified deemed-compliant sponsored, closely held investment vehicle. Complete Part VII.
- ☐ Certified deemed-compliant limited life debt investment entity. Complete Part VIII.
- ☐ Certain investment entities that do not maintain financial accounts. Complete Part IX.
- ☐ Owner-documented FFI. Complete Part X.
- ☐ Restricted distributor. Complete Part XI.
- ☐ Nonreporting IGA FFI. Complete Part XII.
- ☐ Foreign government, government of a U.S. possession, or foreign central bank of issue. Complete Part XIII.
- ☐ International organization. Complete Part XIV.
- ☐ Exempt retirement plans. Complete Part XV.
- ☐ Entity wholly owned by exempt beneficial owners. Complete Part XVI.
- ☐ Territory financial institution. Complete Part XVII.
- ☐ Excepted nonfinancial group entity. Complete Part XVIII.
- ☐ Excepted nonfinancial start-up company. Complete Part XIX.
- ☐ Excepted nonfinancial entity in liquidation or bankruptcy. Complete Part XX.
- ☐ 501(c) organization. Complete Part XXI.
- ☐ Nonprofit organization. Complete Part XXII.
- ☐ Publicly traded NFFE or NFFE affiliate of a publicly traded corporation. Complete Part XXIII.
- ☐ Excepted territory NFFE. Complete Part XXIV.
- ☐ Active NFFE. Complete Part XXV.
- ☐ Passive NFFE. Complete Part XXVI.
- ☐ Excepted inter-affiliate FFI. Complete Part XXVII.
- ☐ Direct reporting NFFE.
- ☐ Sponsored direct reporting NFFE. Complete Part XXVIII.
- ☐ Account that is not a financial account.

6 Permanent residence address (street, apt. or suite no., or rural route). **Do not use a P.O. box or in-care-of address** (other than a registered address).
1 HOLLY

City or town, state or province. Include postal code where appropriate.
MONTREAL,QC,H3X3K6

Country
CANADA

7 Mailing address (if different from above)

City or town, state or province. Include postal code where appropriate.

Country

8 U.S. taxpayer identification number (TIN), if required

9a GIIN

b Foreign TIN
131074437RC0001

10 Reference number(s) (see instructions)

Note: Please complete remainder of the form including signing the form in Part XXX.

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Part II **Disregarded Entity or Branch Receiving Payment.** (Complete only if a disregarded entity with a GIIN or a branch of an FFI in a country other than the FFI's country of residence. See instructions.)

11 Chapter 4 Status (FATCA status) of disregarded entity or branch receiving payment

☐ Branch treated as nonparticipating FFI. ☐ Reporting Model 1 FFI. ☐ U.S. Branch.

☐ Participating FFI. ☐ Reporting Model 2 FFI.

12 Address of disregarded entity or branch (street, apt. or suite no., or rural route). **Do not use a P.O. box or in-care-of address** (other than a registered address).

City or town, state or province. Include postal code where appropriate.

Country

13 GIIN (if any)

Part III **Claim of Tax Treaty Benefits** (if applicable). (For chapter 3 purposes only.)

14 I certify that (check all that apply):

a ☐ The beneficial owner is a resident of _____ within the meaning of the income tax treaty between the United States and that country.

b ☐ The beneficial owner derives the item (or items) of income for which the treaty benefits are claimed, and, if applicable, meets the requirements of the treaty provision dealing with limitation on benefits. The following are types of limitation on benefits provisions that may be included in an applicable tax treaty (check only one; see instructions):

☐ Government
☐ Tax exempt pension trust or pension fund
☐ Other tax exempt organization
☐ Publicly traded corporation
☐ Subsidiary of a publicly traded corporation
☐ Company that meets the ownership and base erosion test
☐ Company that meets the derivative benefits test
☐ Company with an item of income that meets active trade or business test
☐ Favorable discretionary determination by the U.S. competent authority received
☐ Other (specify Article and paragraph): _____

c ☐ The beneficial owner is claiming treaty benefits for U.S. source dividends received from a foreign corporation or interest from a U.S. trade or business of a foreign corporation and meets qualified resident status (see instructions).

15 **Special rates and conditions** (if applicable—see instructions):

The beneficial owner is claiming the provisions of Article and paragraph _____

of the treaty identified on line 14a above to claim a _____ % rate of withholding on (specify type of income): _____

Explain the additional conditions in the Article the beneficial owner meets to be eligible for the rate of withholding: _____

Part IV **Sponsored FFI**

16 Name of sponsoring entity: _____

17 **Check whichever box applies.**

☐ I certify that the entity identified in Part I:

- Is an investment entity;
- Is not a QI, WP (except to the extent permitted in the withholding foreign partnership agreement), or WT; **and**
- Has agreed with the entity identified above (that is not a nonparticipating FFI) to act as the sponsoring entity for this entity.

☐ I certify that the entity identified in Part I:

- Is a controlled foreign corporation as defined in section 957(a);
- Is not a QI, WP, or WT;
- Is wholly owned, directly or indirectly, by the U.S. financial institution identified above that agrees to act as the sponsoring entity for this entity; **and**
- Shares a common electronic account system with the sponsoring entity (identified above) that enables the sponsoring entity to identify all account holders and payees of the entity and to access all account and customer information maintained by the entity including, but not limited to, customer identification information, customer documentation, account balance, and all payments made to account holders or payees.

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Part V Certified Deemed-Compliant Nonregistering Local Bank

18 ☐ I certify that the FFI identified in Part I:

- Operates and is licensed solely as a bank or credit union (or similar cooperative credit organization operated without profit) in its country of incorporation or organization;
- Engages primarily in the business of receiving deposits from and making loans to, with respect to a bank, retail customers unrelated to such bank and, with respect to a credit union or similar cooperative credit organization, members, provided that no member has a greater than 5% interest in such credit union or cooperative credit organization;
- Does not solicit account holders outside its country of organization;
- Has no fixed place of business outside such country (for this purpose, a fixed place of business does not include a location that is not advertised to the public and from which the FFI performs solely administrative support functions);
- Has no more than $175 million in assets on its balance sheet and, if it is a member of an expanded affiliated group, the group has no more than $500 million in total assets on its consolidated or combined balance sheets; **and**
- Does not have any member of its expanded affiliated group that is a foreign financial institution, other than a foreign financial institution that is incorporated or organized in the same country as the FFI identified in Part I and that meets the requirements set forth in this part.

Part VI Certified Deemed-Compliant FFI with Only Low-Value Accounts

19 ☐ I certify that the FFI identified in Part I:

- Is not engaged primarily in the business of investing, reinvesting, or trading in securities, partnership interests, commodities, notional principal contracts, insurance or annuity contracts, or any interest (including a futures or forward contract or option) in such security, partnership interest, commodity, notional principal contract, insurance contract or annuity contract;
- No financial account maintained by the FFI or any member of its expanded affiliated group, if any, has a balance or value in excess of $50,000 (as determined after applying applicable account aggregation rules); **and**
- Neither the FFI nor the entire expanded affiliated group, if any, of the FFI, have more than $50 million in assets on its consolidated or combined balance sheet as of the end of its most recent accounting year.

Part VII Certified Deemed-Compliant Sponsored, Closely Held Investment Vehicle

20 Name of sponsoring entity: _____

21 ☐ I certify that the entity identified in Part I:

- Is an FFI solely because it is an investment entity described in Regulations section 1.1471-5(e)(4);
- Is not a QI, WP, or WT;
- Will have all of its due diligence, withholding, and reporting responsibilities (determined as if the FFI were a participating FFI) fulfilled by the sponsoring entity identified on line 20; **and**
- 20 or fewer individuals own all of the debt and equity interests in the entity (disregarding debt interests owned by U.S. financial institutions, participating FFIs, registered deemed-compliant FFIs, and certified deemed-compliant FFIs and equity interests owned by an entity if that entity owns 100% of the equity interests in the FFI and is itself a sponsored FFI).

Part VIII Certified Deemed-Compliant Limited Life Debt Investment Entity

22 ☐ I certify that the entity identified in Part I:

- Was in existence as of January 17, 2013;
- Issued all classes of its debt or equity interests to investors on or before January 17, 2013, pursuant to a trust indenture or similar agreement; **and**
- Is certified deemed-compliant because it satisfies the requirements to be treated as a limited life debt investment entity (such as the restrictions with respect to its assets and other requirements under Regulations section 1.1471-5(f)(2)(iv)).

Part IX Certain Investment Entities that Do Not Maintain Financial Accounts

23 ☐ I certify that the entity identified in Part I:

- Is a financial institution solely because it is an investment entity described in Regulations section 1.1471-5(e)(4)(i)(A), **and**
- Does not maintain financial accounts.

Part X Owner-Documented FFI

Note: This status only applies if the U.S. financial institution, participating FFI, or reporting Model 1 FFI to which this form is given has agreed that it will treat the FFI as an owner-documented FFI (see instructions for eligibility requirements). In addition, the FFI must make the certifications below.

24a ☐ (All owner-documented FFIs check here) I certify that the FFI identified in Part I:

- Does not act as an intermediary;
- Does not accept deposits in the ordinary course of a banking or similar business;
- Does not hold, as a substantial portion of its business, financial assets for the account of others;
- Is not an insurance company (or the holding company of an insurance company) that issues or is obligated to make payments with respect to a financial account;
- Is not owned by or in an expanded affiliated group with an entity that accepts deposits in the ordinary course of a banking or similar business, holds, as a substantial portion of its business, financial assets for the account of others, or is an insurance company (or the holding company of an insurance company) that issues or is obligated to make payments with respect to a financial account;
- Does not maintain a financial account for any nonparticipating FFI; **and**
- Does not have any specified U.S. persons that own an equity interest or debt interest (other than a debt interest that is not a financial account or that has a balance or value not exceeding $50,000) in the FFI other than those identified on the FFI owner reporting statement.

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Part X Owner-Documented FFI *(continued)*

Check box 24b or 24c, whichever applies.

b ☐ I certify that the FFI identified in Part I:

- Has provided, or will provide, an FFI owner reporting statement that contains:
  - (i) The name, address, TIN (if any), chapter 4 status, and type of documentation provided (if required) of every individual and specified U.S. person that owns a direct or indirect equity interest in the owner-documented FFI (looking through all entities other than specified U.S. persons);
  - (ii) The name, address, TIN (if any), and chapter 4 status of every individual and specified U.S. person that owns a debt interest in the owner-documented FFI (including any indirect debt interest, which includes debt interests in any entity that directly or indirectly owns the payee or any direct or indirect equity interest in a debt holder of the payee) that constitutes a financial account in excess of $50,000 (disregarding all such debt interests owned by participating FFIs, registered deemed-compliant FFIs, certified deemed-compliant FFIs, excepted NFFEs, exempt beneficial owners, or U.S. persons other than specified U.S. persons); **and**
  - (iii) Any additional information the withholding agent requests in order to fulfill its obligations with respect to the entity.
- Has provided, or will provide, valid documentation meeting the requirements of Regulations section 1.1471-3(d)(6)(iii) for each person identified in the FFI owner reporting statement.

c ☐ I certify that the FFI identified in Part I has provided, or will provide, an auditor's letter, signed within 4 years of the date of payment, from an independent accounting firm or legal representative with a location in the United States stating that the firm or representative has reviewed the FFI's documentation with respect to all of its owners and debt holders identified in Regulations section 1.1471-3(d)(6)(iv)(A)(2), and that the FFI meets all the requirements to be an owner-documented FFI. The FFI identified in Part I has also provided, or will provide, an FFI owner reporting statement of its owners that are specified U.S. persons and Form(s) W-9, with applicable waivers.

Check box 24d if applicable (optional, see instructions).

d ☐ I certify that the entity identified on line 1 is a trust that does not have any contingent beneficiaries or designated classes with unidentified beneficiaries.

Part XI Restricted Distributor

25a ☐ (All restricted distributors check here) I certify that the entity identified in Part I:

- Operates as a distributor with respect to debt or equity interests of the restricted fund with respect to which this form is furnished;
- Provides investment services to at least 30 customers unrelated to each other and less than half of its customers are related to each other;
- Is required to perform AML due diligence procedures under the anti-money laundering laws of its country of organization (which is an FATF-compliant jurisdiction);
- Operates solely in its country of incorporation or organization, has no fixed place of business outside of that country, and has the same country of incorporation or organization as all members of its affiliated group, if any;
- Does not solicit customers outside its country of incorporation or organization;
- Has no more than $175 million in total assets under management and no more than $7 million in gross revenue on its income statement for the most recent accounting year;
- Is not a member of an expanded affiliated group that has more than $500 million in total assets under management or more than $20 million in gross revenue for its most recent accounting year on a combined or consolidated income statement; **and**
- Does not distribute any debt or securities of the restricted fund to specified U.S. persons, passive NFFEs with one or more substantial U.S. owners, or nonparticipating FFIs.

Check box 25b or 25c, whichever applies.

I further certify that with respect to all sales of debt or equity interests in the restricted fund with respect to which this form is furnished that are made after December 31, 2011, the entity identified in Part I:

b ☐ Has been bound by a distribution agreement that contained a general prohibition on the sale of debt or securities to U.S. entities and U.S. resident individuals and is currently bound by a distribution agreement that contains a prohibition of the sale of debt or securities to any specified U.S. person, passive NFFE with one or more substantial U.S. owners, or nonparticipating FFI.

c ☐ Is currently bound by a distribution agreement that contains a prohibition on the sale of debt or securities to any specified U.S. person, passive NFFE with one or more substantial U.S. owners, or nonparticipating FFI and, for all sales made prior to the time that such a restriction was included in its distribution agreement, has reviewed all accounts related to such sales in accordance with the procedures identified in Regulations section 1.1471-4(c) applicable to preexisting accounts and has redeemed or retired any, or caused the restricted fund to transfer the securities to a distributor that is a participating FFI or reporting Model 1 FFI securities which were sold to specified U.S. persons, passive NFFEs with one or more substantial U.S. owners, or nonparticipating FFIs.

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Part XII Nonreporting IGA FFI

26 ☐ I certify that the entity identified in Part I:

- Meets the requirements to be considered a nonreporting financial institution pursuant to an applicable IGA between the United States and _____. The applicable IGA is a ☐ Model 1 IGA or a ☐ Model 2 IGA; and
- is treated as a _____ under the provisions of the applicable IGA or Treasury regulations (if applicable, see instructions);
- If you are a trustee documented trust or a sponsored entity, provide the name of the trustee or sponsor _____.

The trustee is: ☐ U.S. ☐ Foreign

Part XIII Foreign Government, Government of a U.S. Possession, or Foreign Central Bank of Issue

27 ☐ I certify that the entity identified in Part I is the beneficial owner of the payment, and is not engaged in commercial financial activities of a type engaged in by an insurance company, custodial institution, or depository institution with respect to the payments, accounts, or obligations for which this form is submitted (except as permitted in Regulations section 1.1471-6(h)(2)).

Part XIV International Organization

Check box 28a or 28b, whichever applies.

28a ☐ I certify that the entity identified in Part I is an international organization described in section 7701(a)(18).

b ☐ I certify that the entity identified in Part I:

- Is comprised primarily of foreign governments;
- Is recognized as an intergovernmental or supranational organization under a foreign law similar to the International Organizations Immunities Act or that has in effect a headquarters agreement with a foreign government;
- The benefit of the entity's income does not inure to any private person; **and**
- Is the beneficial owner of the payment and is not engaged in commercial financial activities of a type engaged in by an insurance company, custodial institution, or depository institution with respect to the payments, accounts, or obligations for which this form is submitted (except as permitted in Regulations section 1.1471-6(h)(2)).

Part XV Exempt Retirement Plans

Check box 29a, b, c, d, e, or f, whichever applies.

29a ☐ I certify that the entity identified in Part I:

- Is established in a country with which the United States has an income tax treaty in force (see Part III if claiming treaty benefits);
- Is operated principally to administer or provide pension or retirement benefits; **and**
- Is entitled to treaty benefits on income that the fund derives from U.S. sources (or would be entitled to benefits if it derived any such income) as a resident of the other country which satisfies any applicable limitation on benefits requirement.

b ☐ I certify that the entity identified in Part I:

- Is organized for the provision of retirement, disability, or death benefits (or any combination thereof) to beneficiaries that are former employees of one or more employers in consideration for services rendered;
- No single beneficiary has a right to more than 5% of the FFI's assets;
- Is subject to government regulation and provides annual information reporting about its beneficiaries to the relevant tax authorities in the country in which the fund is established or operated; **and**

(i) Is generally exempt from tax on investment income under the laws of the country in which it is established or operates due to its status as a retirement or pension plan;

(ii) Receives at least 50% of its total contributions from sponsoring employers (disregarding transfers of assets from other plans described in this part, retirement and pension accounts described in an applicable Model 1 or Model 2 IGA, other retirement funds described in an applicable Model 1 or Model 2 IGA, or accounts described in Regulations section 1.1471-5(b)(2)(i)(A));

(iii) Either does not permit or penalizes distributions or withdrawals made before the occurrence of specified events related to retirement, disability, or death (except rollover distributions to accounts described in Regulations section 1.1471-5(b)(2)(i)(A) (referring to retirement and pension accounts), to retirement and pension accounts described in an applicable Model 1 or Model 2 IGA, or to other retirement funds described in this part or in an applicable Model 1 or Model 2 IGA); **or**

(iv) Limits contributions by employees to the fund by reference to earned income of the employee or may not exceed $50,000 annually.

c ☐ I certify that the entity identified in Part I:

- Is organized for the provision of retirement, disability, or death benefits (or any combination thereof) to beneficiaries that are former employees of one or more employers in consideration for services rendered;
- Has fewer than 50 participants;
- Is sponsored by one or more employers each of which is not an investment entity or passive NFFE;
- Employee and employer contributions to the fund (disregarding transfers of assets from other plans described in this part, retirement and pension accounts described in an applicable Model 1 or Model 2 IGA, or accounts described in Regulations section 1.1471-5(b)(2)(i)(A)) are limited by reference to earned income and compensation of the employee, respectively;
- Participants that are not residents of the country in which the fund is established or operated are not entitled to more than 20% of the fund's assets; **and**
- Is subject to government regulation and provides annual information reporting about its beneficiaries to the relevant tax authorities in the country in which the fund is established or operates.

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Part XV Exempt Retirement Plans *(continued)*

d ☐ I certify that the entity identified in Part I is formed pursuant to a pension plan that would meet the requirements of section 401(a), other than the requirement that the plan be funded by a trust created or organized in the United States.

e ☐ I certify that the entity identified in Part I is established exclusively to earn income for the benefit of one or more retirement funds described in this part or in an applicable Model 1 or Model 2 IGA, or accounts described in Regulations section 1.1471-5(b)(2)(i)(A) (referring to retirement and pension accounts), or retirement and pension accounts described in an applicable Model 1 or Model 2 IGA.

f ☐ I certify that the entity identified in Part I:

- Is established and sponsored by a foreign government, international organization, central bank of issue, or government of a U.S. possession (each as defined in Regulations section 1.1471-6) or an exempt beneficial owner described in an applicable Model 1 or Model 2 IGA to provide retirement, disability, or death benefits to beneficiaries or participants that are current or former employees of the sponsor (or persons designated by such employees); **or**

- Is established and sponsored by a foreign government, international organization, central bank of issue, or government of a U.S. possession (each as defined in Regulations section 1.1471-6) or an exempt beneficial owner described in an applicable Model 1 or Model 2 IGA to provide retirement, disability, or death benefits to beneficiaries or participants that are not current or former employees of such sponsor, but are in consideration of personal services performed for the sponsor.

Part XVI Entity Wholly Owned by Exempt Beneficial Owners

30 ☐ I certify that the entity identified in Part I:

- Is an FFI solely because it is an investment entity;
- Each direct holder of an equity interest in the investment entity is an exempt beneficial owner described in Regulations section 1.1471-6 or in an applicable Model 1 or Model 2 IGA;
- Each direct holder of a debt interest in the investment entity is either a depository institution (with respect to a loan made to such entity) or an exempt beneficial owner described in Regulations section 1.1471-6 or an applicable Model 1 or Model 2 IGA.
- Has provided an owner reporting statement that contains the name, address, TIN (if any), chapter 4 status, and a description of the type of documentation provided to the withholding agent for every person that owns a debt interest constituting a financial account or direct equity interest in the entity; **and**
- Has provided documentation establishing that every owner of the entity is an entity described in Regulations section 1.1471-6(b), (c), (d), (e), (f) and/or (g) without regard to whether such owners are beneficial owners.

Part XVII **Territory Financial Institution**

31 ☐ I certify that the entity identified in Part I is a financial institution (other than an investment entity) that is incorporated or organized under the laws of a possession of the United States.

Part XVIII Excepted Nonfinancial Group Entity

32 ☐ I certify that the entity identified in Part I:

- Is a holding company, treasury center, or captive finance company and substantially all of the entity's activities are functions described in Regulations section 1.1471-5(e)(5)(i)(C) through (E);
- Is a member of a nonfinancial group described in Regulations section 1.1471-5(e)(5)(i)(B);
- Is not a depository or custodial institution (other than for members of the entity's expanded affiliated group); **and**
- Does not function (or hold itself out) as an investment fund, such as a private equity fund, venture capital fund, leveraged buyout fund, or any investment vehicle with an investment strategy to acquire or fund companies and then hold interests in those companies as capital assets for investment purposes.

Part XIX Excepted Nonfinancial Start-Up Company

33 ☐ I certify that the entity identified in Part I:

- Was formed on (or, in the case of a new line of business, the date of board resolution approving the new line of business) _____ (date must be less than 24 months prior to date of payment);
- Is not yet operating a business and has no prior operating history or is investing capital in assets with the intent to operate a new line of business other than that of a financial institution or passive NFFE;
- Is investing capital into assets with the intent to operate a business other than that of a financial institution; **and**
- Does not function (or hold itself out) as an investment fund, such as a private equity fund, venture capital fund, leveraged buyout fund, or any investment vehicle whose purpose is to acquire or fund companies and then hold interests in those companies as capital assets for investment purposes.

Part XX Excepted Nonfinancial Entity in Liquidation or Bankruptcy

34 ☐ I certify that the entity identified in Part I:

- Filed a plan of liquidation, filed a plan of reorganization, or filed for bankruptcy on _____;
- During the past 5 years has not been engaged in business as a financial institution or acted as a passive NFFE;
- Is either liquidating or emerging from a reorganization or bankruptcy with the intent to continue or recommence operations as a nonfinancial entity; **and**
- Has, or will provide, documentary evidence such as a bankruptcy filing or other public documentation that supports its claim if it remains in bankruptcy or liquidation for more than 3 years.

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Part XXI 501(c) Organization

35 ☐ I certify that the entity identified in Part I is a 501(c) organization that:

- Has been issued a determination letter from the IRS that is currently in effect concluding that the payee is a section 501(c) organization that is dated _____; **or**
- Has provided a copy of an opinion from U.S. counsel certifying that the payee is a section 501(c) organization (without regard to whether the payee is a foreign private foundation).

Part XXII Nonprofit Organization

36 ☐ I certify that the entity identified in Part I is a nonprofit organization that meets the following requirements.

- The entity is established and maintained in its country of residence exclusively for religious, charitable, scientific, artistic, cultural or educational purposes;
- The entity is exempt from income tax in its country of residence;
- The entity has no shareholders or members who have a proprietary or beneficial interest in its income or assets;
- Neither the applicable laws of the entity's country of residence nor the entity's formation documents permit any income or assets of the entity to be distributed to, or applied for the benefit of, a private person or noncharitable entity other than pursuant to the conduct of the entity's charitable activities or as payment of reasonable compensation for services rendered or payment representing the fair market value of property which the entity has purchased; **and**
- The applicable laws of the entity's country of residence or the entity's formation documents require that, upon the entity's liquidation or dissolution, all of its assets be distributed to an entity that is a foreign government, an integral part of a foreign government, a controlled entity of a foreign government, or another organization that is described in this part or escheats to the government of the entity's country of residence or any political subdivision thereof.

Part XXIII Publicly Traded NFFE or NFFE Affiliate of a Publicly Traded Corporation

Check box 37a or 37b, whichever applies.

37a ☐ I certify that:

- The entity identified in Part I is a foreign corporation that is not a financial institution; **and**
- The stock of such corporation is regularly traded on one or more established securities markets, including _____ (name one securities exchange upon which the stock is regularly traded).

b ☐ I certify that:

- The entity identified in Part I is a foreign corporation that is not a financial institution;
- The entity identified in Part I is a member of the same expanded affiliated group as an entity the stock of which is regularly traded on an established securities market;
- The name of the entity, the stock of which is regularly traded on an established securities market, is _____; **and**
- The name of the securities market on which the stock is regularly traded is _____.

Part XXIV Excepted Territory NFFE

38 ☐ I certify that:

- The entity identified in Part I is an entity that is organized in a possession of the United States;
- The entity identified in Part I:
  - (i) Does not accept deposits in the ordinary course of a banking or similar business;
  - (ii) Does not hold, as a substantial portion of its business, financial assets for the account of others; **or**
  - (iii) Is not an insurance company (or the holding company of an insurance company) that issues or is obligated to make payments with respect to a financial account; **and**
- All of the owners of the entity identified in Part I are bona fide residents of the possession in which the NFFE is organized or incorporated.

Part XXV Active NFFE

39 ☐ I certify that:

- The entity identified in Part I is a foreign entity that is not a financial institution;
- Less than 50% of such entity's gross income for the preceding calendar year is passive income; **and**
- Less than 50% of the assets held by such entity are assets that produce or are held for the production of passive income (calculated as a weighted average of the percentage of passive assets measured quarterly) (see instructions for the definition of passive income).

Part XXVI Passive NFFE

40a ☑ I certify that the entity identified in Part I is a foreign entity that is not a financial institution (other than an investment entity organized in a possession of the United States) and is not certifying its status as a publicly traded NFFE (or affiliate), excepted territory NFFE, active NFFE, direct reporting NFFE, or sponsored direct reporting NFFE.

Check box 40b or 40c, whichever applies.

b ☑ I further certify that the entity identified in Part I has no substantial U.S. owners (or, if applicable, no controlling U.S. persons); **or**

c ☐ I further certify that the entity identified in Part I has provided the name, address, and TIN of each substantial U.S. owner (or, if applicable, controlling U.S. person) of the NFFE in Part XXIX.

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Part XXVII Excepted Inter-Affiliate FFI

41 ☐ I certify that the entity identified in Part I:

- Is a member of an expanded affiliated group;
- Does not maintain financial accounts (other than accounts maintained for members of its expanded affiliated group);
- Does not make withholdable payments to any person other than to members of its expanded affiliated group;
- Does not hold an account (other than depository accounts in the country in which the entity is operating to pay for expenses) with or receive payments from any withholding agent other than a member of its expanded affiliated group; **and**
- Has not agreed to report under Regulations section 1.1471-4(d)(2)(ii)(C) or otherwise act as an agent for chapter 4 purposes on behalf of any financial institution, including a member of its expanded affiliated group.

Part XXVIII Sponsored Direct Reporting NFFE (see instructions for when this is permitted)

42 Name of sponsoring entity:

43 ☐ I certify that the entity identified in Part I is a direct reporting NFFE that is sponsored by the entity identified on line 42.

Part XXIX Substantial U.S. Owners of Passive NFFE

As required by Part XXVI, provide the name, address, and TIN of each substantial U.S. owner of the NFFE. Please see the instructions for a definition of substantial U.S. owner. If providing the form to an FFI treated as a reporting Model 1 FFI or reporting Model 2 FFI, an NFFE may also use this part for reporting its controlling U.S. persons under an applicable IGA.

Name	Address	TIN

Part XXX Certification

Under penalties of perjury, I declare that I have examined the information on this form and to the best of my knowledge and belief it is true, correct, and complete. I further certify under penalties of perjury that:

- The entity identified on line 1 of this form is the beneficial owner of all the income or proceeds to which this form relates, is using this form to certify its status for chapter 4 purposes, or is submitting this form for purposes of section 6050W or 6050Y;
- The entity identified on line 1 of this form is not a U.S. person;
- This form relates to: (a) income not effectively connected with the conduct of a trade or business in the United States, (b) income effectively connected with the conduct of a trade or business in the United States but is not subject to tax under an income tax treaty, (c) the partner's share of a partnership's effectively connected taxable income, or (d) the partner's amount realized from the transfer of a partnership interest subject to withholding under section 1446(f); **and**
- For broker transactions or barter exchanges, the beneficial owner is an exempt foreign person as defined in the instructions.

Furthermore, I authorize this form to be provided to any withholding agent that has control, receipt, or custody of the income of which the entity on line 1 is the beneficial owner or any withholding agent that can disburse or make payments of the income of which the entity on line 1 is the beneficial owner.

I agree that I will submit a new form within 30 days if any certification on this form becomes incorrect.

☑ **I certify that I have the capacity to sign for the entity identified on line 1 of this form.**

Sign Here [redacted]

Signature of individual authorized to sign for beneficial owner

Marc Hadid President

Print Name

12-12-2023

Date (MM-DD-YYYY)

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Total Quality. Assured.

CERTIFICATE
OF REGISTRATION

This is to certify that the management system of:

MVA Puissance Inc / MVA Power Inc

Main Site: 734 rue Saint Étienne,
L'Assomption, Québec, J5W 1Z1, Canada

has been registered by Intertek as conforming to the requirements of:

ISO 9001:2015

The management system is applicable to:

Design, manufacturing and supply of structures for the power transmission, power distribution, power substations, telecommunications, and light rail networks;design, manufacture and supply of equipment, materials and components for the high voltage and medium voltage power networks, light rail and fiber optic networks individually or for turnkey packages.

Certificate Number:
0097401

Initial Certification Date:
19 December 2019

Date of Certification Decision:
18 November 2022

Issuing Date:
18 November 2022

Valid Until:
18 December 2025

ISO 9001:2015 CERTIFICATION
intertek
ANAB
ANSI National Accreditation Board
ACCREDITED
ISO/IEC 17021-1:2015
MANAGEMENT SYSTEMS CERTIFICATION BODY

[redacted]

Calin Moldovean
President, Business Assurance

Intertek Testing Services NA, Inc.
900 Chelmsford Street, Lowell
MA 01851, USA

In the issuance of this certificate, Intertek assumes no liability to any party other than to the Client, and then only in accordance with the agreed upon Certification Agreement. This certificate's validity is subject to the organization maintaining their system in accordance with Intertek's requirements for systems certification. Validity may be confirmed via email at certificate.validation@intertek.com or by scanning the code to the right with a smartphone. The certificate remains the property of Intertek, to whom it must be returned upon request.

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CITY OF BENTONVILLE, ARKANSAS
PURCHASING OFFICE

1000 SW 14TH STREET BENTONVILLE, AR 72712 – (479) 271-3115 – PURCHASING@BENTONVILLEAR.COM

ADDENDUM TO SOLICITATION

Solicitation ID:	IFB-24-65	**Solicitation Title:**	161kV GOAB Switch Interrupters
Addendum Number:	1	**Date of Issuance:**	September 4, 2024

TO: Prospective Bidders

This Addendum modifies the original Bidding Document(s) dated August 19, 2024.

Bidders are required to acknowledge this Addendum by including it in their Bid Submission. Failure to acknowledge this Addendum may result in rejection of the Bid Submission.

Any Amended Bidding Documents contained herein shall replace those same documents in the original Bid Packet. In the event that an Amended Required Response document (such as a Bid Pricing Sheet) is included herein, Bidders must use only the Amended Form in their Bid Submission.

This Addendum Number 1 consists of 1 page(s).

Bid Opening Date:

1.0 The Bid Opening Date and Time listed in the original Advertisement and Bidding Documents was September 5, 2024 at 1:30 PM.

1.1 The City received a request to extended the bid opening date and time as the City inadvertently left switch manufacturer information off of the bidding documents. Therefore, the City wishes to accommodate Bidder's requests, and allow additional time for bid submissions with the updated switch manufacturer information included below.

1.2 The Bid Opening Date amended to allow additional time for Bidders to submit bids.

1.3 The Bid Opening Date and Time is amended as follows:

September 12, 2024 at 1:00PM

Line Number	Submitted Question	City's Response
1	What is the switch brand that these interrupters will be mounted on (Turner, SEECO, etc).	The switch manufacture is SEECO.

Docusign Envelope ID: 96CE14BD-ED47-4F33-9A60-F01B91498FF6

City of Bentonville, Arkansas Agenda Item Form

Item Details

Council Meeting Date:	10/22/2024	**Submitted By:**	Chris Earl
Phone:	479-696-0273	**For Department(s):**	Water Resource Recovery Facility (WRRF)
Email:	cearl@bentonvillear.com		

Item Type (Check all that apply)

☐ **Informational** ☐ **Bid Award** ☑ **Enter into an Agreement** ☐ **Change Order**

☐ **Recognizing Funds** ☐ **Budget Adjustment** ☐ **Waiver of Bid** ☐ **Emergency Clause**

☐ **Ordinance** ☑ **Resolution** ☐ **Informational**

Title, Recommendation & Justification

Title:	Contract of Obligation
Action Recommendation & Justification:	Staff request CIty Council approval of a Resolution authorizing the Mayor and City Clerk to enter into a Contract of Obligation for Financial Assurance Agreement in the amount of $755,000.00. This will be in the form of a Letter of Credit.
Additional Comments for Consideration (Optional):	Contract of Obligation for Financial Assurance is required for owners of a Solid Waste Facility. This CO is in accord with the provisions of the state and with Arkansas Polution Control and Ecology Commision Rule 22.1405. This is an agreement that states should for any reason we have to close the Compost Facility that we have the monies to remove, dispose and clean the facility.
Amount for Approval:	**$**

Budget Impact

Is this Item Budgeted? ☐ **YES** ☑ **NO** ☐ **ITEM HAS NO COST** ☐ **OTHER:**_____

Budget Adjustment *(to be completed by Finance when applicable)*

		$ Expense	**$** Revenue
Account Number (ORG-OBJECT)	Account Description		
		$ Expense	**$** Revenue
Account Number (ORG-OBJECT)	Account Description		
		$ Expense	**$** Revenue
Account Number (ORG-OBJECT)	Account Description		
		$ Expense	**$** Revenue
Account Number (ORG-OBJECT)	Account Description		

Fund(s) Impacted (check all that apply) ☐ **General Fund** ☐ **Utility Fund** ☐ **Street Fund** ☐ **Other(s):**_____

Budget Impact Notes for Consideration (Optional):

MUNICIPALITY SOLID WASTE FACILITY FINANCIAL ASSURANCE AGREEMENT --
§8-6-1603(d)(4) (CONTRACT OF OBLIGATION)

1. The **CITY OF BENTONVILLE** (MUNICIPALITY), a Municipality government of the State of Arkansas, is owner or operator of a solid waste management facility permitted by Arkansas Department of Energy and Environment, Division of Environmental Quality (DEQ) Permit No. **0297-SC-R2 (**Permit). Pursuant to Ark. Code Ann. § 8-6-1603, MUNICIPALITY is required to provide financial assurance to ensure that sufficient funds are available to meet the costs of corrective action, closure and post-closure care of the permitted solid waste facility.

2. The current required amount of financial assurance for corrective action, closure and post-closure care as provided by Ark. Code Ann. § 8-6-1603(a), (b), and (c) for the MUNICIPALITY's permitted solid waste management facility is **SEVEN HUNDRED AND FIFTY FIVE THOUSAND ($755,000).**

3. To satisfy its statutory obligations, MUNICIPALITY hereby elects to execute this binding agreement (AGREEMENT) described in Ark. Code Ann. § 8-6-1603(d)(4) as a "Contract of Obligation" in accord with the provisions of that statute and with Arkansas Pollution Control and Ecology Commission (APC&EC) Rule 22.1405(n) as codified in the Code of Arkansas Rules, 8 CAR §60-1405(o).

4. By this AGREEMENT, pursuant to the provisions of Ark. Code Ann. § 8-6-1603(d)(4) and Rule 22.1405(n) as codified in 8 CAR §60-1405(o), MUNICIPALITY pledges general revenues equal to the amount of the required financial assurance in Paragraph 2 of this AGREEMENT, and authorizes the Director of DEQ to collect any general revenues being disbursed or to be disbursed from the State to MUNICIPALITY pursuant to Rule 22.1406(b) as codified in 8 CAR §60-1406(b)

should MUNICIPALITY fail to properly perform corrective action, closure or post-closure of the permitted solid waste management facility as required by state law, agency rule, or the Permit.

5. This AGREEMENT is for one fiscal year of MUNICIPALITY and shall automatically renew for each subsequent fiscal year. MUNICIPALITY agrees that the amount of financial assurance required at the time of each annual renewal shall be based upon the latest available annual reporting mechanisms submitted for the permitted facility and reviewed and approved by DEQ. This amount may be increased or decreased upon each annual renewal as required to reflect estimated costs for corrective action, closure, and post-closure care.

6. MUNICIPALITY acknowledges that this AGREEMENT is legally valid, binding, and enforceable and is irrevocable unless terminated upon written approval from the DEQ Director that:

a. The solid waste management facility has closed in compliance with the law; and

b. MUNICIPALITY has completed post-closure care in compliance with the law; or

c. MUNICIPALITY provides an alternate financial assurance mechanism acceptable to DEQ and in compliance with applicable law.

7. MUNICIPALITY shall file a copy of this AGREEMENT with the Commissioner of Revenues, Department of Finance and Administration and the Local Government Services Division, Arkansas State Treasury, no later than the tenth (10th) calendar day following the effective date of this AGREEMENT. MUNICIPALITY shall provide the DEQ Director with file-marked copies of this AGREEMENT no later than the fifteenth (15th) calendar day following the effective date of this AGREEMENT.

8. COUNTY represents and affirms that it has sufficient funds on-hand, appropriated by the annual budget, and available to comply with the terms and conditions of this AGREEMENT.

9. All notices required by this AGREEMENT shall be made by certified mail, return receipt requested, and addressed as follows:

Arkansas Department of Energy and Environment, DEQ
Attn: Bailey Taylor, Division of Environment Quality, Director
5301 Northshore Drive
North Little Rock, Arkansas 72118-5317

City of Bentonville, Arkansas
Attn: The Honorable Stephanie Orman, Mayor
305 SW "A" St.
Bentonville, Arkansas 72712

Arkansas Department of Finance and Administration
Attn: Commissioner of Revenues
P.O. Box 1272
Little Rock, Arkansas 72203

Arkansas State Treasury
Attn: Local Government Services Division
220 State Capitol
Little Rock, Arkansas 72201

10. Funds collected through this AGREEMENT will be used for closure and post-closure activities in accordance with Rule 22. In the event that there are funds remaining after DEQ certifies the necessary closure and post-closure activities are completed then DEQ will return those funds to the MUNICIPALITY.

11. Nothing herein shall prevent DEQ from initiating any enforcement proceeding against MUNICIPALITY. Nothing herein is construed to relieve MUNICIPALITY from any closure or post-closure action resulting from the solid waste management facility that is the subject of the Permit.

Nothing herein is construed to limit the liability of MUNICIPALITY for any closure or post-closure resulting from the subject solid waste management facility to the amount established by this AGREEMENT.

12. This AGREEMENT shall be effective upon the DEQ Director's signature.

13. This AGREEMENT has been reviewed and approved by the governing body of the MUNICIPALITY in a duly called and convened meeting with a quorum present.

14. The governing body of the MUNICIPALITY has authorized the MUNICIPALITY JUDGE to sign this AGREEMENT on the behalf of MUNICIPALITY as evidenced by the attached resolution.

IN WITNESS WHEREOF the parties hereto have set their hands and seals.

Arkansas Department of Energy and Environment,
Division of Environmental Quality

_____ _____
Bailey Taylor Date
Division of Environment Quality, Director

MUNICIPALITY

_____ _____
Stephanie Orman Date
Mayor

Attest:

_____
[RECORDER/CLERK/DIRECTOR]

WHAT IS REQUIRED AT A MINIMUM:

- ✓ The financial assurance mechanism must ensure that the amount of funds assured is sufficient to cover the costs of closure, post-closure care, and corrective action when needed.

- ✓ The maximum amount pledged under the contract cannot exceed the total amount of general revenue disbursed to the County or Municipality in the last fiscal year, or, if approved by the DEQ Chief Administrator, the amount currently projected by the State to be disbursed during the current fiscal year.

- ✓ The contract of obligation must be irrevocable and issued for a period of at least one year.

- ✓ The owner or operator shall submit the contract of obligation on forms developed by DEQ and provided to the DEQ Director for approval.

RESOLUTION TO EXECUTE AGREEMENT TO PROVIDE FINANCIAL ASSURANCE PER §8-6-1603(d)(4) (CONTRACT OF OBLIGATION)

WHEREAS __City Of Bentonville_____, Arkansas, as owner or operator of a solid waste management facility permitted by Arkansas Department of Energy and Environment, Division of Environmental Quality (DEQ), is required by Ark. Code Ann. § 8-6-1603 to provide financial assurance to ensure that sufficient funds are available to meet the costs of corrective action, closure and post-closure care of its permitted solid waste facility; and

WHEREAS Ark. Code Ann. § 8-6-1603(d)(4) provides that an allowable mechanism for a municipality or county that owns or operates a solid waste management facility to demonstrate financial assurance and ensure that funds necessary to meet the costs of closure, post-closure care, and corrective action is for the county to execute a statutory contract of obligation as described therein;

NOW, THEREFORE, BE IT RESOLVED by the above named municipality that

_____, as the Signatory Agent of
Mayor

_____, is hereby authorized to execute a
Municipality

statutory contract of obligation as set out in the Agreement affixed hereto.

PASSED, APPROVED, AND ADOPTED this _____ day of _____, 20____.

_____

Signature and Title of Governing Body Official

Attest: _____
Signature of Municipal Clerk

City of Bentonville, Arkansas Agenda Item Form

Item Details

Council Meeting Date:	10/22/2024	**Submitted By:**	Mike Bender
Phone:	479-271-3140	**For Department(s):**	Sewer Rehab 503040
Email:	mbender@bentonvillear.com		

Item Type (Check all that apply)

☐ Informational ☐ Bid Award ☑ Enter into an Agreement ☐ Change Order

☐ Recognizing Funds ☐ Budget Adjustment ☐ Waiver of Bid ☐ Emergency Clause

☐ Ordinance ☑ Resolution ☐ Informational

Title, Recommendation & Justification

Title:	Spring Creek- Vaughn Gravity Sewer Design Agreement with Crafton Tull & Associates
Action Recommendation & Justification:	Staff request the Mayor and City Clerk to enter into an agreement with Crafton, Tull & Associates to perform the design services for 6,700 feet of sewer utility upgrades to Spring Creek - Vaughn Gravity Sewer. The contract amount is $117,500.00. Crafton, Tull & Associates was selected following the City's Purchasing Policy for professional services. This is a budgeted project for 2024.
Additional Comments for Consideration (Optional):	This project is the result of a sewer analysis of the Spring Creek & Vaughn Sewer Basin. The Vaughn Lift station and gravity sewer is currently at capacity. This project will remove the lift station and up size the existing gravity line to help facilitate future growth. The sewer line has been sized according to the future land use plan and is expected to be adequate for all future development.
Amount for Approval:	**$** 117,500.00

Budget Impact

Is this Item Budgeted? ☑ **YES** ☐ **NO** ☐ **ITEM HAS NO COST** ☐ **OTHER:**_____

Budget Adjustment *(to be completed by Finance when applicable)*

		$	$
Account Number (ORG-OBJECT)	Account Description	Expense	Revenue
		$	$
Account Number (ORG-OBJECT)	Account Description	Expense	Revenue
		$	$
Account Number (ORG-OBJECT)	Account Description	Expense	Revenue
		$	$
Account Number (ORG-OBJECT)	Account Description	Expense	Revenue

Fund(s) Impacted (check all that apply) ☐ **General Fund** ☐ **Utility Fund** ☐ **Street Fund** ☐ **Other(s):**_____

Budget Impact Notes for Consideration (Optional):

PROFESSIONAL SERVICES AGREEMENT

PROJECT NAME: Professional Civil Engineering Services for the **Spring Creek - Vaughn Gravity Sewer – Lift Station to NACA** for City of Bentonville Water Utility Department (BWU) ("PROJECT")

THIS AGREEMENT ("AGREEMENT") is made in Benton County, Arkansas, by and between the City of Bentonville, Arkansas, hereinafter referred to as "CITY", and Crafton Tull & Associates, hereinafter referred to as "PROFESSIONAL CONSULTANT" (collectively, the "PARTIES").

The PARTIES have caused this AGREEMENT to be effective this ____day of _____, 20___ ("EFFECTIVE DATE").

RECITALS:

A. WHEREAS, the CITY has a need for professional civil engineering services for the design of **Spring Creek - Vaughn Gravity Sewer – Lift Station to NACA**; and
B. WHEREAS, The CITY has selected the PROFESSIONAL CONSULTANT and negotiated this AGREEMENT in accordance with the City's Purchasing Policy; and
C. WHEREAS, the CITY wishes to contract for Professional Services; and
D. WHEREAS, The PROFESSIONAL CONSULTANT has the skill, experience, ability, background, certifications and knowledge to provide these services; and
E. WHEREAS, The PROFESSIONAL CONSULTANT wishes to perform such professional services under this AGREEMENT with the CITY.

NOW, THEREFORE, in consideration of the terms in this AGREEMENT, the CITY and PROFESSIONAL CONSULTANT agree to the following:

ARTICLE I - PROJECT DESCRIPTION

The PROJECT shall be as described in APPENDIX A, "Proposal and Scope of Work", attached hereto and incorporated herein by reference.

ARTICLE II - SCOPE OF SERVICE

Upon issuance of a written Notice to Proceed by the CITY, PROFESSIONAL CONSULTANT agrees to provide the CITY the necessary professional services related to the PROJECT, as set forth in APPENDIX A, "Proposal and Scope of Work", attached hereto and incorporated herein by reference.

ARTICLE III - STANDARD OF CARE

PROFESSIONAL CONSULTANT shall at all times material hereto adhere to the generally accepted standard of care typically exhibited by similarly situated professionals performing similar scope(s) of service on projects of like size, scope, nature, cost, schedule, and complexity, at the same time and in the same general regional locale ("Standard of Care").

ARTICLE IV - ADDITIONAL SERVICES

A. Any service outside of the work described herein or included by reference hereto must be pre-approved by the CITY and executed as an AMENDMENT to this AGREEMENT by the Parties prior to any such work being completed; any such AMENDMENT shall be in accordance with the CITY'S purchasing laws and guidelines and may require approval from the Bentonville City Council.

B. PROFESSIONAL CONSULTANT shall make no claims for additional services or changes in the services until an AMENDMENT has been fully executed by the Parties.

ARTICLE V - SCHEDULE OF FEES, SERVICES AND PAYMENT

A. The term of this AGREEMENT shall commence on the EFFECTIVE DATE and shall proceed in accordance with APPENDIX A, "Proposal and Scope of Work", attached hereto and incorporated herein by reference.

B. The cost of this AGREEMENT shall be in accordance with APPENDIX A, more specifically according to the "Fee Schedule Summary" Table.

C. The cost of this AGREEMENT shall not exceed **$117,500** without approval by the Bentonville Utility Board and Bentonville City Council.

D. CITY agrees to pay PROFESSIONAL CONSULTANT for all services authorized by inclusion in this AGREEMENT which have been properly performed by PROFESSIONAL CONSULTANT in accordance with this AGREEMENT and approved by CITY.

E. All fees paid to PROFESSIONAL CONSULTANT shall be based on invoices submitted by PROFESSIONAL CONSULTANT for work performed under this AGREEMENT, less any previous payments. PROFESSIONAL CONSULTANT shall submit invoices for services related to this AGREEMENT on a monthly basis.

F. CITY reserves the right to delay, without penalty, any partial payment when, in the opinion of the CITY, PROFESSIONAL CONSULTANT has not made satisfactory progress on the Project based on the SCOPE. If CITY objects to any portion of an invoice, the CITY shall notify PROFESSIONAL CONSULTANT and shall pay all other portions of the invoice which are not in dispute. In the event of dispute, CITY and PROFESSIONAL CONSULTANT shall immediately make every effort to settle the disputed portion of the invoice.

G. In the event that the CITY becomes credibly informed that any representations of PROFESSIONAL CONSULTANT provided in its invoicing are wholly or partially inaccurate, CITY may withhold payment of sums then, or in the future, otherwise due to PROFESSIONAL CONSULTANT until the inaccuracy and the cause thereof is corrected to the CITY's reasonable satisfaction.

H. If the CITY fails to make any payment, not in dispute, due to PROFESSIONAL CONSULTANT within thirty (30) days after receipt of an invoice, then the amount due to the PROFESSIONAL CONSULTANT will increase at the lesser of one percent (1 %) per month or the maximum amount allowed by law after the 30th day. In addition, PROFESSIONAL CONSULTANT may, after giving seven (7) days' written notice to CITY, suspend its services and any deliverables until PROFESSIONAL CONSULTANT has been paid in full for all amounts outstanding more than thirty (30) days.

ARTICLE VI - INSURANCE

A. PROFESSIONAL CONSULTANT shall during the term hereof maintain in full force and effect the following insurance:

1. A comprehensive general liability policy of insurance for bodily injury, death and property damage insuring against all claims, demands or actions relating to the PROFESSIONAL CONSULTANT's performance of services pursuant to this AGREEMENT with a combined single limit of not less than $1,000,000.00 per occurrence and $2,000,000 in the aggregate for injury to persons (including death), and for property damage;

2. A policy of automobile liability insurance covering any vehicles owned and/or operated by PROFESSIONAL CONSULTANT, its officers, agents, and employees, and used in the performance of this AGREEMENT with policy limits of not less than $1,000,000.00 combined single limit and aggregate for bodily injury and property damage;

3. Statutory Worker's Compensation Insurance at the statutory limits and Employers Liability covering all of PROFESSIONAL CONSULTANT's employees involved in the provision of services under this AGREEMENT with policy limit of not less than $1,000,000.00; and

4. Professional Liability/Errors and Omissions coverage covering negligent acts, errors and omissions in the performance of professional services with policy limit of not less than $1,000,000.00.

B. All insurance and certificate(s) of insurance shall contain the following provisions:

1. Include CITY as additional insured as to all applicable coverage with the exception of Workers Compensation Insurance and Professional Liability/Errors and Omissions coverage; and

2. Provide for at least thirty (30) days prior written notice to CITY for cancellation or non-renewal of the insurance;

3. Provide for a waiver of subrogation against CITY for injuries, including death, property damage, or any other loss to the extent the same is covered by the proceeds of insurance, except for Professional Liability/Errors and Omissions coverage.

C. PROFESSIONAL CONSULTANT shall provide 30 day written notice to CITY of any material change of or to the insurance required herein.

D. All insurance companies providing the required insurance shall be authorized to transact business in Arkansas and rated at least "A" by AM Best or other equivalent rating service. A certificate of insurance evidencing the required insurance and all endorsements required by this Agreement shall be submitted prior to commencement of services.

E. In the event that additional or greater insurance requirements are warranted, these requirements shall be included as an Appendix, which will be attached hereto and incorporated by reference.

ARTICLE VII - RIGHT OF ACCESS

A. CITY will obtain and/or furnish right-of-access for PROFESSIONAL CONSULTANT to perform any required studies, surveys, tests or other necessary investigations in relation to the PROJECT.

B. PROFESSIONAL CONSULTANT will take reasonable precautions to minimize damage to the personal or real property in the performance of such surveys, tests, studies and investigations.

C. CITY recognizes that PROFESSIONAL CONSULTANT's operations and use of equipment may unavoidably alter existing conditions or affect the environment at the PROJECT site. The cost of repairing such damage shall be the responsibility of PROFESSIONAL CONSULTANT, at no additional cost to the CITY. In the event that PROFESSIONAL CONSULTANT fails to correct such damages, CITY is entitled to utilize CITY forces or other labor to repair the damage; any costs incurred by CITY for such work shall be deducted from the monies due to PROFESSIONAL CONSULTANT.

ARTICLE VIII - RECORDS AND RETENTION

A. All surveys, studies, proposals, applications, drawings, plans, specifications and other documents, including those in electronic form, prepared by PROFESSIONAL CONSULTANT and its PROFESSIONAL CONSULTANTs, subcontractors, agents, representatives, and/or employees in connection with this AGREEMENT ("PROJECT DOCUMENTS") are intended for the use and benefit of CITY. PROFESSIONAL CONSULTANT and its PROFESSIONAL CONSULTANTs, subcontractors, agents, representatives, and/or employees shall be deemed the authors of their respective part of the PROJECT DOCUMENTS. Notwithstanding anything to the contrary, CITY shall own, have, and retain all rights, title and interest in and to all PROJECT DOCUMENTS, whether in draft form or final form, which are produced at CITY's request or otherwise produced from PROFESSIONAL CONSULTANT's performance of the work described herein for CITY. The CITY's ownership of PROJECT DOCUMENTS shall not apply to PROFESSIONAL CONSULTANT's proprietary standard details that were developed by the PROFESSIONAL CONSULTANT prior to the commencement of this PROJECT.

B. CITY shall have full authority to reuse, reproduce, publish, disclose and distribute PROJECT DOCUMENTS, as needed, according to Arkansas State Law.

C. PROFESSIONAL CONSULTANT shall, upon completion of the services and full payment for the PROFESSIONAL CONSULTANT'S services by the CITY, or earlier termination and appropriate compensation as provided by this AGREEMENT, provide the CITY with all PROJECT DOCUMENTS prepared by PROFESSIONAL CONSULTANT pursuant to this AGREEMENT in formats requested by the CITY.

D. All instruments of service (including plans, specifications, drawings, reports, designs, computations, computer programs, estimates, surveys, other data or work items, etc.) prepared under this AGREEMENT shall be submitted for approval to the CITY. All instruments of service shall be professionally sealed in accordance to applicable laws or at CITY's request.

E. Acceptance and approval of the PROJECT DOCUMENTS by the CITY shall not constitute nor be deemed a release of the responsibility and liability of PROFESSIONAL CONSULTANT, its employees, associates, agents and PROFESSIONAL CONSULTANT's for the accuracy or competency of their designs, working drawings and specifications, or other documents and work; nor shall such approval be deemed to be an assumption of such responsibility by the CITY for any defect in the designs, working drawings and specifications, or other documents prepared by PROFESSIONAL CONSULTANT, its employees, contractor, agents and PROFESSIONAL CONSULTANT's.

F. PROFESSIONAL CONSULTANT will retain the PROJECT DOCUMENTS for a period of three years following project completion. During this three year period, any requests for document recovery and reproduction will be assessed a fee in accordance with PROFESSIONAL CONSULTANT's FEES.

ARTICLE IX - SAFETY

A. CITY agrees to inform PROFESSIONAL CONSULTANT of any applicable site safety procedures and regulations known to CITY as well as any special safety concerns or dangerous conditions at the site of which the CITY is aware, which PROFESSIONAL CONSULTANT shall communicate to its employees. PROFESSIONAL CONSULTANT and its employees shall adhere to such procedures and regulations once notice has been given by the CITY.

B. Unless specifically provided in the SCOPE, PROFESSIONAL CONSULTANT shall not have any responsibility for overall job safety at the site. If in the PROFESSIONAL CONSULTANT's opinion, its field personnel are unable to access required locations or perform required services in conformance with applicable safety standards, PROFESSIONAL CONSULTANT may immediately suspend performance until such safety standards can be attained.

C. PROFESSIONAL CONSULTANT agrees to indemnify and hold harmless the CITY for any safety conditions that may arise out of PROFESSIONAL CONSULTANT's performance of this AGREEMENT.

ARTICLE X - TERMINATION

A. CITY may suspend or terminate this AGREEMENT for cause or without cause at any time by giving written notice to PROFESSIONAL CONSULTANT. In the event suspension or termination is without cause, payment to PROFESSIONAL CONSULTANT, in accordance with the terms of this AGREEEMENT, will be made on the basis of services reasonably determined by the CITY to be satisfactorily performed to the date of suspension or termination. Such payment will be due upon delivery of all instruments of service to CITY.

B. Should the CITY require a modification of this AGREEMENT with the PROFESSIONAL CONSULTANT, and in the event the CITY and PROFESSIONAL CONSULTANT fail to agree upon a modification to this AGREEMENT, the CITY shall have the option of terminating this AGREEMENT and the PROFESSIONAL CONSULTANT's services hereunder at no additional cost other than the payment to PROFESSIONAL CONSULTANT, in accordance with the terms of this AGREEMENT, for the services reasonably determined by the CITY to be properly performed by PROFESSIONAL CONSULTANT prior to such termination date.

C. If, for whatever reason adequate funding is not made available by CITY to support or justify continuation of the level of services to be provided by PROFESSIONAL CONSULTANT under this AGREEMENT, CITY may terminate or reduce the amount of services to be provided by PROFESSIONAL CONSULTANT under this AGREEMENT. In such event, CITY will notify PROFESSIONAL CONSULTANT in writing at least thirty (30) days in advance of such termination or reduction of services for lack of funds.

D. In no event shall the CITY pay to PROFESSIONAL CONSULTANT fees for termination outside of payment for services reasonably determined by the City to be properly performed prior to termination.

ARTICLE XI - INDEMNIFICATION

A. For purposes of this AGREEMENT, PROFESSIONAL CONSULTANT agrees to indemnify, hold harmless the CITY, its officers and employees from any loss, damage, liability or expense, of any nature whatsoever to the extent caused by the negligence, willful misconduct, or other actionable fault of PROFESSIONAL CONSULTANT, its affiliates, subsidiaries, employees, agents, assignees, and subcontractors and their respective employees and agents. PROFESSIONAL CONSULTANT is not required hereunder to defend the CITY, its officers, appointees, employees, or agents from assertions that they were negligent, nor to indemnify and hold them harmless from liability based on the CITY's negligence

B. Nothing contained herein shall waive any governmental immunity CITY may be entitled to by law.

C. This provision shall survive the termination of this AGREEMENT.

ARTICLE XII - CONTINGENCY CLAUSE

A. NOT USED

ARTICLE XIII - RELATIONSHIP OF THE PARTIES

It is understood and agreed by and between the parties that the PROFESSIONAL CONSULTANT, in satisfying the conditions of this AGREEMENT, is acting independently, and that the CITY assumes no responsibility or liabilities to any third party in connection with PROFESSIONAL CONSULTANT's actions. All services to be performed by the PROFESSIONAL CONSULTANT pursuant to this AGREEMENT shall be in the capacity of an Independent Contractor, and not as an agent or employee of CITY. The PROFESSIONAL CONSULTANT shall supervise the performance of its services and shall be entitled to control the manner and means by which its services are to be performed, subject to the terms of this AGREEMENT. There is no intended third party beneficiary to the AGREEMENT and nothing contained herein shall create a contractual relationship with, or any rights in favor of, any third party.

ARTICLE XIV - DISPUTE RESOLUTION

A. CITY and PROFESSIONAL CONSULTANT agree that disputes relative to the services will first be addressed by negotiations between the Parties. If direct negotiations fail to resolve the dispute, the Party initiating the claim that is the basis for dispute may take such steps as it deems necessary to protect its interests; provided, however, that notwithstanding any such dispute, PROFESSIONAL CONSULTANT will proceed with the services as per this AGREEMENT as if no dispute existed, and CITY will continue to make payment for PROFESSIONAL CONSULTANT's completed services; and provided further that no dispute will be submitted to arbitration without both Parties' express written consent.

ARTICLE XV - OPINIONS OF PROBABLE COST

A. Since the PROFESSIONAL CONSULTANT has no control over the cost of labor, materials, equipment or services furnished by others, or over methods of determining prices, or over competitive bidding or market conditions, the PROFESSIONAL CONSULTANT's estimates of PROJECT costs and construction costs provided for herein are to be made on the basis of the PROFESSIONAL CONSULTANT's experience and qualifications and represent the PROFESSIONAL CONSULTANT's judgement in accordance with the "Standard of Care". The PROFESSIONAL CONSULTANT cannot and does not guarantee that proposals, bids or actual PROJECT or construction costs will not vary from estimates prepared by the PROFESSIONAL CONSULTANT.

B. The CITY understands that the construction cost estimates developed by the PROFESSIONAL CONSULTANT do not establish a limit for construction contract amount. If the actual amount of the low construction bid exceeds the construction budget established by the CITY, the PROFESSIONAL CONSULTANT will not be required to re-design the PROJECT or any part thereof without additional compensation.

ARTICLE XVI - APPLICABLE LAWS

PROFESSIONAL CONSULTANT shall comply with all Federal, State, Local laws, ordinances, resolutions, specifications, regulations and all other laws or regulations relating or applicable to service to be performed under this AGREEMENT. Interpretation of this AGREEMENT and disputes arising out of or related to this AGREEMENT will be subject to and governed by the laws of the State of Arkansas. Jurisdiction and venue for any suit arising out of or related to this AGREEMENT will be in the District Court of Benton County, Arkansas.

ARTICLE XVII - PRECEDENCE

This AGREEMENT shall take precedence over any inconsistent or contradictory provisions contained in any proposal, contract, purchase order, requisition, notice to proceed, or any other like document regarding the PROJECT or PROFESSIONAL CONSULTANT's services.

ARTICLE XVIII - SEVERABILITY

A. In the event that one or more provisions contained herein shall, for any reason, be deemed invalid, illegal, void or unenforceable, in whole or in part, the remaining provisions hereof shall remain in full force and effect.

B. In the event that any provision hereof is in conflict with any statutory provision of the State of Arkansas, said provision, which may be in conflict therewith, shall be deemed inoperative, null and void insofar as it may be in conflict therewith, and shall be deemed modified to conform to such statutory provisions; provided, however, that the remaining provisions of this AGREEMENT will be unaffected and will continue to be valid and enforceable.

ARTICLE XIX - SURVIVAL OF OBLIGATIONS

The obligations of the Parties contained in this AGREEMENT, which by their nature survive after the term of the AGREEMENT, shall survive the termination or expiration of this AGREEMENT and continue indefinitely or as otherwise provided by this AGREEMENT.

ARTICLE XX – ENTIRE AGREEMENT

This AGREEMENT, including all documents and Appendices included by reference herein, constitutes the entire agreement between the PARTIES and supersedes all prior agreements, whether oral or written, covering the same subject matter. This AGREEMENT may not be modified or amended except in writing, mutually agreed upon and accepted by both PARTIES to this AGREEMENT.

[This space has been intentionally left blank]

The cost of this AGREEMENT including all reimbursable expenses as described in the FEES AND SCHEDULE, **shall not exceed** One hundred & thirteen thousand dollars ($117,500), unless otherwise approved by the CITY through an official AMENDMENT agreed and executed by CITY and PROFESSIONAL CONSULTANT.

IN WITNESS THEREOF, the CITY and PROFESSIONAL CONSULTANT have executed this AGREEMENT, the EFFECTIVE DATE of which is indicated on page 1 of this AGREEMENT.

CITY OF BENTONVILLE	**CRAFTONT TULL & ASSOCIATES**
CITY	PROFESSIONAL CONSULTANT
	[redacted]
BY	BY
MAYOR	**VICE PRESIDENT**
TITLE	TITLE
	10/04/2024
DATE SIGNED	DATE SIGNED

APPENDIX A

PROPOSAL AND SCOPE OF WORK

Crafton Tull
architecture | engineering | surveying

Exhibit "A1"
Scope of Basic Services For:

Project:	Spring Creek – Vaughn Gravity Sewer – Lift Station to NACA	
Client:	Bentonville Water Utilities	
Location of Project:	SW Regional Airport Boulevard – Bentonville, AR	
Discipline:	*Surveying*	
Discipline Manager:	James Montgomery	
Project Manager:	Sean Johnson	
Proposal Date:	9/11/2024	
Billing Type:	Hourly Basis Not to Exceed, with reimbursable expenses	
Fee:	Topographic Design Survey Survey Exhibits & Descriptions: Reimbursable Expenses: Total NTE:	 $38,000 $5,000 $43,000
Description of the Construction Project:	50-ft strip topographic survey to support the engineering design for the proposed sewer (i.e. 6,700± L.F. with estimated 17 parcels), as shown on Exhibit "C".	

The Service to be Provided by the Surveyor are as Outlined Below:

Topographic Design Survey:

- A title company will be employed to provide a title search of the property to be surveyed. The title search will include record plats, deeds and easement documents. The title company fee will be a reimbursable expense to the client.
- A representative from our survey department will mark the survey areas, and we will submit a request to the local utility 1-Call System to mark all underground utilities within the survey areas.
- Our GPS survey crew will set a minimum of four (4) semi-permanent survey control monuments adjacent to each street. The control monuments will be tied to the city state plane coordinates and elevation datum to which all survey data for this project will be referenced.
- We will provide a 50-ft strip topographic survey as shown on Exhibit "C". Sufficient ground elevation shots will be taken for the creation of 1'-contours across the survey area.
- We will locate all visible utility lines and those as marked by the utility 1-Call System. All flow lines of drainage inlets and pipes will be measured, and the invert elevation of sanitary sewer manholes will be recorded. All pipe sizes will be measured and shown on the topographic survey.
- We will locate all trees in the topographic design survey areas.
- We will prepare an AutoCAD base survey drawing of the topographic design survey of the site, which will be used for engineering design purposes. This base survey drawing will include property boundary lines and any easement lines discovered by the examination of the title search for the property or any other provided documents.
- We will prepare legal descriptions with exhibits for easement documents.

Scope of Basic Services does NOT Include the Following:

- As-built built survey
- Preparation of a final subdivision plat, easement dedication plat, easement documents, tract or lot split plats, tract or lot combination plats, or similar type plats as may be required by the governing agency for approval of this project.
- Surveys and plats of the property for financing, sales, or other purposes such as an ALTA or as-built survey.
- Surveys of offsite utility, street or drainage improvements not within the survey site.
- Surveys for environmental studies, including wetland delineation.
- Surveys for flood data or studies for Corps of Engineer, FEMA or other special government agency permitting.
- Surveys for location of geotechnical soil borings or pits.
- Surveying related to construction services or construction staking.
- Phase 1 Environmental Site Assessment
- Cultural Resources Survey
- Threatened & Endangered Species Habitat Assessment
- A separate tree location or landscape plat.
  Note: Services listed can be provided for additional fee.

Client Shall Provide:

- Access for our survey crew personnel to enter the property to conduct the surveys.

This is the scope of services for the Project. Should there be additions to this scope of services, those services shall be compensated for additional fee.

NOTE: The scope references 17 parcels for exhibits. However, if additional parcels for easement docs, it will be considered additional services.

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architecture | engineering | surveying

Exhibit "A2"
Scope of Basic Services for:

Project:	Spring Creek – Vaughn Gravity Sewer – Lift Station to NACA	
Client:	Bentonville Water Utilities	
Location of Project:	SW Regional Airport Boulevard – Bentonville, AR	
Discipline:	*Civil Engineering*	
Discipline Manager:	Luke Jost, PE	
Project Manager:	Luke Jost, PE	
Proposal Date:	September 2024	
Billing Type:	Hourly Not-to-Exceed, with reimbursable expenses	
Fee:	Civil Design:	$62,500
	Geotechnical Investigation (GTS):	$11,500
	Reimbursable Expenses:	$500
	Total (NTE):	$74,500
Description of the Construction Project:	Design of a gravity sewer main along SW Regional Airport Blvd. between the lift station at the Benton County Fairgrounds and the Little Osage Creek Interceptor. Anticipated alignment and pipe sizes are shown on the attached map (Exhibit C). Total project length is roughly 6500 LF.	

The Service to be Provided by the Engineer are as Outlined Below:

- Project will include review at 30%, 60%, 90% and Final plan sets
- AACE Class 2 Cost estimates
- Plan set for construction of an 18", 21" & 24" Sanitary sewer main as outlined in Exhibit C including the following sheets:
    - Title Sheet
    - Overall Map
    - Sewer Plan & Profiles
    - Lift Station Demo Plan
    - Erosion Control Plans
    - Details
- Specifications & contract documents
- Bidding assistance
- Coordination of reviews with client
- Permit Coordination with ADEQ & ARDOT
- ADH Review/Permitting coordination

Additional Items that can be provided by CTA under amendment or separate contract:

- Construction Administration
- Construction Observation
- FEMA Studies & Map Revision Applications (CLOMR/LOMR)
- Wetland Determinations
- Corps of Engineers Permitting
- ROW Acquisition Services
- As-built Drawings

This is the scope of services for the Project. Should there be additions to this scope of services, those services shall be compensated for additional fee.

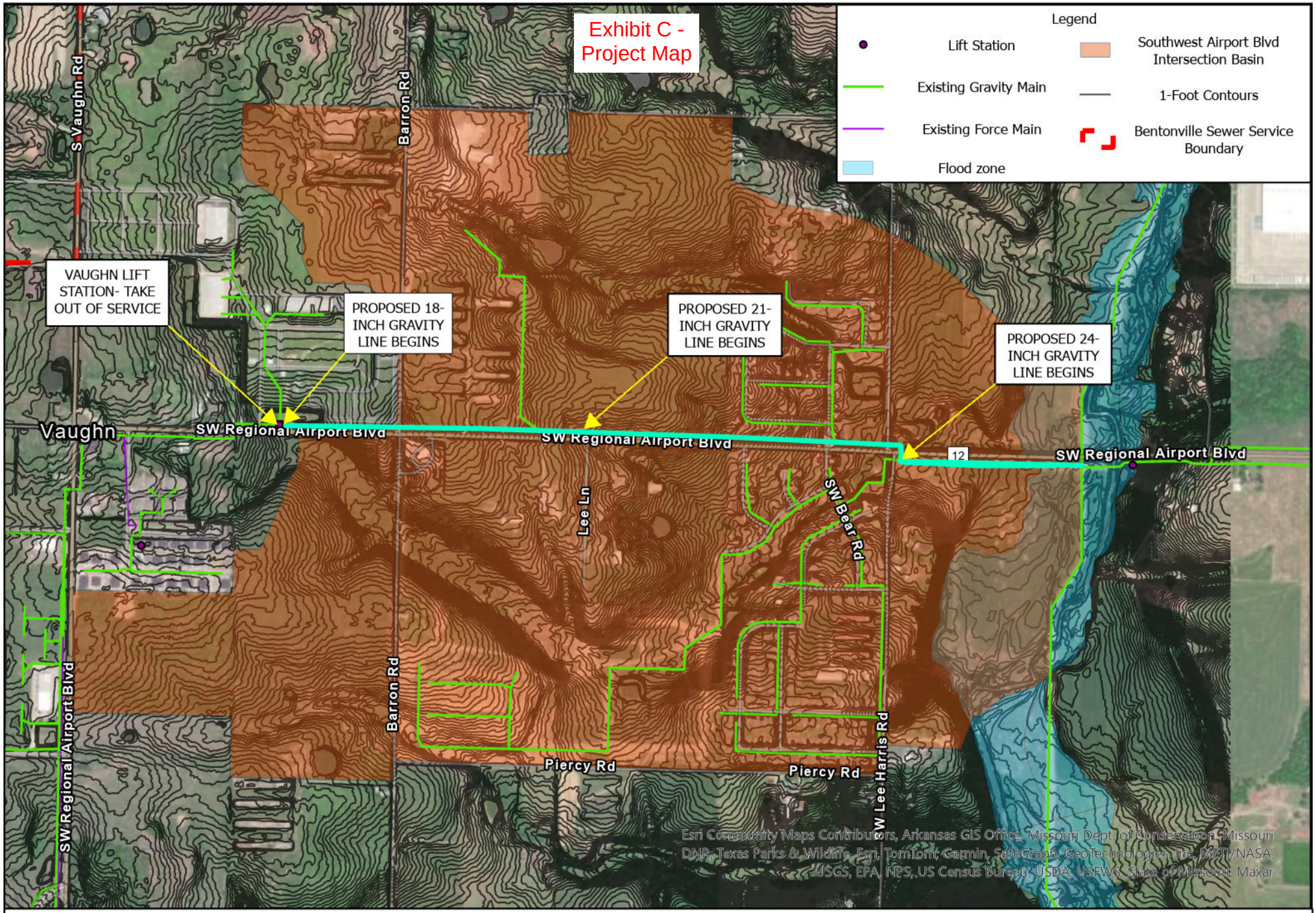
Crafton Tull

Exhibit "B"
Standard Hourly Rate Schedule
Effective January 1, 2024

Category	Hourly Rate
CIVIL ENGINEERING	
ENGINEERING PRINCIPAL	$ 250
SR. ENGINEERING MANAGER	$ 225
ENGINEERING MANAGER	$ 190
SR. PROJECT ENGINEER	$ 165
PROJECT ENGINEER	$ 145
ENGINEER INTERN III	$ 135
ENGINEER INTERN II	$ 125
ENGINEER INTERN I	$ 115
SR. ENGINEERING DESIGNER	$ 165
ENGINEERING DESIGNER III	$ 130
ENGINEERING DESIGNER II	$ 110
ENGINEERING DESIGNER I	$ 100
ENGINEERING CAD TECHNICIAN III	$ 90
ENGINEERING CAD TECHNICIAN II	$ 80
ENGINEERING CAD TECHNICIAN I	$ 70
ENVIRONMENTAL	
ENVIRONMENTAL MANAGER	$ 200
SR. ENVIRONMENTAL SCIENTIST	$ 150
PROJECT ENVIRONMENTAL SCIENTIST	$ 120
ENVIRONMENTAL SCIENTIST II	$ 100
ENVIRONMENTAL SCIENTIST I	$ 80
INSPECTION	
SR. INSPECTOR	$ 115
INSPECTOR II	$ 100
INSPECTOR I	$ 80
LANDSCAPE ARCHITECTURE	
LANDSCAPE ARCHITECTURE MANAGER	$ 170
SR. LANDSCAPE ARCHITECT	$ 150
PROJECT LANDSCAPE ARCHITECT	$ 130
LANDSCAPE ARCHITECT INTERN II	$ 110
LANDSCAPE ARCHITECT INTERN I	$ 90
LANDSCAPE ARCHITECTURE DESIGNER	$ 85
ADMINISTRATIVE	
ADMINISTRATIVE PRINCIPAL	$ 220
ADMINISTRATIVE MANAGER	$ 165
ADMINISTRATIVE IV	$ 105
ADMINISTRATIVE III	$ 85
ADMINISTRATIVE II	$ 65
ADMINISTRATIVE I	$ 50

Category	Hourly Rate
PLANNING	
PLANNING MANAGER	$ 210
SR. PLANNER	$ 190
PROJECT PLANNER	$ 130
PLANNER II	$ 110
PLANNER I	$ 95
SURVEYING	
SURVEYING PRINCIPAL	$ 230
SR. SURVEYING MANAGER	$ 195
SURVEYING MANAGER	$ 175
SR. PROJECT SURVEYOR	$ 155
PROJECT SURVEYOR	$ 140
SURVEYOR INTERN II	$ 125
SURVEYOR INTERN I	$ 110
SURVEY COORDINATOR	$ 115
CREW CHIEF II	$ 105
CREW CHIEF I	$ 95
FIELD SURVEYOR III	$ 85
FIELD SURVEYOR II	$ 75
FIELD SURVEYOR I	$ 65
SURVEY CAD TECHNICIAN III	$ 105
SURVEY CAD TECHNICIAN II	$ 80
SURVEY CAD TECHNICIAN I	$ 70
UAV SERVICES	
UAV TEAM LEAD	$ 120
UAV PILOT	$ 80
GEOGRAPHIC INFORMATION SYSTEMS	
SR. GIS MANAGER	$ 175
GIS MANAGER	$ 130
GIS ANALYST	$ 105
GIS TECHNICIAN II	$ 80
GIS TECHNICIAN I	$ 55
REIMBURSABLE EXPENSES	
GPS Equipment	$35/Hour
Robotic Survey Equipment	$20/Hour
LiDAR Scanning Equipment	$35/Hour
UAV	$1000/Unit
Job Related Mileage	$0.67/Mile
Per Diem for Out of Town Crews	Per GSA Allowable
Airfare and other travel related expenses	At Cost
Black and white 8.5"x11" Copies	$0.15/sheet
Color 8.5"x11" Copies	$1.50/sheet
Photo Paper Color Plan Sheet Copies	$0.75/sq. ft.
Reproducible Plan Copies (Vellum)	$1.50/sq. ft
Reproducible Plan Copies (Bond)	$0.35/sq. ft.

All rates are subject to change without notice.



olsson

Figure 3.5. Southwest Regional Airport Boulevard Basin: Alternative 1 - Vaughn Lift Station Decommissioning and Gravity Line Replacement.

City of Bentonville, Arkansas Agenda Item Form

Item Details

Council Meeting Date:	10/22/2024	**Submitted By:**	Preston Newbill
Phone:	479-271-3140	**For Department(s):**	Water Utilities
Email:	pnewbill@bentonvillear.com		

Item Type (Check all that apply)

☐ Informational ☐ Bid Award ☐ Enter into an Agreement ☐ Change Order
☐ Recognizing Funds ☐ Budget Adjustment ☐ Waiver of Bid ☑ Emergency Clause
☑ Ordinance ☐ Resolution ☐ Informational

Title, Recommendation & Justification

Title:	2024 Water Utilities Department Specifications Update
Action Recommendation & Justification:	Staff requests council approval of an ordinance adopting revised Water Utilities Department Specifications, which will replace the existing version. The revisions are focused on reducing water loss from the distribution system and limiting inflow and infiltration into the sewer collection system while minimizing operations and maintenance expenses.
Additional Comments for Consideration (Optional):	A separate memo has been provided detailing the revision.
Amount for Approval:	$ 0

Budget Impact

Is this Item Budgeted? ☐ YES ☐ NO ☑ ITEM HAS NO COST ☐ OTHER:_____

Budget Adjustment *(to be completed by Finance when applicable)*

		$ Expense	$ Revenue
Account Number (ORG-OBJECT)	Account Description		
		$ Expense	$ Revenue
Account Number (ORG-OBJECT)	Account Description		
		$ Expense	$ Revenue
Account Number (ORG-OBJECT)	Account Description		
		$ Expense	$ Revenue
Account Number (ORG-OBJECT)	Account Description		

Fund(s) Impacted (check all that apply) ☐ General Fund ☐ Utility Fund ☐ Street Fund ☐ Other(s):_____

Budget Impact Notes for Consideration (Optional):

Memo

To: City Council, Mayor Orman

From: Beau Thompson, Joey Ingle

CC:

Date: October 04, 2024

Re: 2024 Water Utilities Department Specifications Update

Ordinance. - Staff requests council approval of an ordinance adopting revised Water Utilities Department Standard Specifications, which will replace the existing version.

Aiming to reduce water loss from the distribution system and limit inflow and infiltration into the sewer collection system, staff began to gather information for the revision in 2022.

In the summer of 2024, Water Utilities sent the revision to the Arkansas Department of Health for review. All comments were addressed by staff and we received approval of the Water and Sewer Specifications on October 02, 2024, pending submittal of a final signed and sealed copy following council approval of the ordinance.

Bentonville Water Utilities staff is confident the installation practices, materials, and testing procedures outlined in the specifications will protect the public health and minimize long term maintenance cost.

Significant amendments to the Bentonville Water Utilities Specifications are as follows:

GENERAL

- Multiple quality assurance organizations' references were updated including ASTM, AWWA and ANSI standards.
- Updated references to City processes and departments throughout to match current terminology.
- Removed requirement for paper copy of as-builts to be provided at final inspection.
- Reorganization of some sections for clarity and ease of reading.
- Correction of minor spelling and grammar errors throughout.
- Updated obsolete part number references throughout.

WATER

- ❖ Updated allowable service line materials.
  - o Remove C901 polyethylene from specifications.
  - o C904 PEX-A, added in 2022 as alternate to C901 PE, to remain.
  - o Add polyethylene coating requirement to copper service lines.
- ❖ Updated service fittings.
  - o Expanded available fittings for connection of service line to meter setter. Connections are now able to made at a 90, or 45 degree angle in addition to straight in. A 45 degree connection will be standard.
  - o Added clarity that service fittings are only allowed at the connection to the meter setter. No in-line fittings are allowed.
  - o Added requirement for short plastic stiffeners at all PEX-A connections.
  - o Removed fittings no longer required for new services.
- ❖ Updated hydrostatic test pressures in accordance with latest AWWA standards. Engineers must specify testing pressure on the utility sheet.

SEWER

- ❖ Added composite manhole lids by CAP ONE and East Jordan. Specified to be used when a manhole is lined due to corrosion concerns or rehabilitation.
- ❖ Removed thickness and preparation requirements for manhole linings. Will allow staff to review and approve new and innovative products case by case. Specification will require preparation and application in accordance with the manufacturer's recommendations.
- ❖ Added new products and improved methods for ensuring water-tight manholes.
  - o Requirement for Kor-N-Seal connector and application of an approved lining product from the invert to 1 foot above the pipe for cored manhole connections.
  - o Requirement for water stop and application of an approved lining product 1 foot either side of a cold joint in manhole wall. Applies to height adjustment of existing infrastructure and multiple pour new construction manholes.
- ❖ Updated required mandrel diameters for ASTM F679 sewer pipe.
- ❖ Force Mains
  - o Removed Cla-Val air/vacuum combination valves and replaced with Crispin.
  - o Updated air valve manhole requirements to increase longevity and accessibility for maintenance.
  - o Specified C900 PVC as required material for force mains, rather than preferable.
  - o Updated hydrostatic test pressures in accordance with latest AWWA standards. Engineers must specify testing pressure on the utility sheet.

BACKFLOW

- ❖ Updated backflow prevention requirements for frost free hydrants to include a lower cost option in low hazard situations, as determined by the department. An RPZ assembly is still required where a high hazard is present, but a dual in-line check valve device may be installed where low level hazards exist.

CITY OF BENTONVILLE

WATER UTILITIES DEPARTMENT SPECIFICATIONS

Water Utilities Department – (479) 271-3140

Wastewater Treatment – (479) 271-3160

Fire Department – (479) 271-3151

www.bentonvillear.com

2024

CITY OF BENTONVILLE
WATER UTILITIES
1000 SW 14TH STREET
(3200 SW MUNICIPAL DR)
BENTONVILLE, AR 72712

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Appendix A Detailed Drawings

BENTONVILLE WATER UTILITIES
CONSTRUCTION SPECIFICATIONS

SECTION 1 GENERAL INFORMATION

1.1 ALL MATERIALS SHALL BE DOMESTICALLY MADE

Any deviation to require DEPARTMENT approval, and certificate(s) of materials origin shall be provided at the pre-construction meeting.

1.2 The intent of this publication is to simplify and expedite the process of water and sewer construction within the jurisdiction of the City of Bentonville. This publication specifically applies, but is not limited to "Subdivision" and "Large Scale Development". All rules and regulations set forth by the ADH - Division of Engineering, shall be the minimum standard of all construction and development practices to be approved by the Bentonville Water Utilities. In such case as the standard specifications herein set forth exceeds the Arkansas Department of Heath specifications, this document as approved by the City Council of Bentonville, Arkansas shall govern.

1.3 These general and detailed specifications shall govern the handling and installation of pipe and appurtenances for the City of Bentonville Water Utilities. Specifications stipulate general requirements for the preparation of reports, plans, specifications, methods of construction, inspection, testing, and final approval of any proposed water and/or sanitary sewer lines, appurtenances, or other structures that are within the jurisdiction of Bentonville Water Utilities. Any requested deviation from the specifications herein set forth, shall be reviewed on a case-by-case basis by the DEPARTMENT and approved or denied by written authorization of the MANAGER.

1.4 Special conditions may arise on projects that are not covered in these specifications or that may require special handling. In case of such special conditions, complete detail as to materials, method of construction or other procedures shall be submitted to the Bentonville Water Utilities for review and approval. Standard construction details are incorporated and made a part of the specifications and shall become a part of the standard requirements for water line, sewer line and lift station construction. The standard details are included in these appendices at the back of these specifications. Where reference is made to a particular industry specification (ASTM, etc) it is hereby understood that reference is made to the latest specification revision in effect.

1.5 These specifications are intended to set forth minimum standards of quality for the construction of water and sewer facilities which are to be accepted by the Bentonville Water Utilities. These specifications do not replace the ENGINEERS specifications and contract documents; however, construction of all water and sewer facilities must meet these standards of quality as a minimum. The Bentonville Water Utilities shall not be responsible nor shall it bear any liability for CONTRACTOR'S means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, nor shall the Bentonville Water Utilities be responsible for any actions resulting from direction of the project by a City of Bentonville ENGINEER/INSPECTOR. The Bentonville Water Utilities shall not be responsible for the acts or omissions of the CONTRACTOR, Sub-Contractor, supplier, or of any other person or organization performing or furnishing any of the work. Nothing contained in these specifications shall be construed as an endorsement or warranty by the Bentonville Water Utilities of any product, material, or workmanship. The Bentonville Water Utilities shall not be responsible nor shall it bear any liability for the durability of any material or method of construction. Material used on any project shall be warranted against defects and workmanship by responsible CONTRACTOR for one calendar year from date of acceptance.

SECTION 2 DEFINITIONS AND ABBREVIATIONS

2.1 DEPARTMENT: Refers to the Bentonville Water Utilities, under the jurisdiction of the Bentonville City Council, hereinafter referred to as "DEPARTMENT"; having full and complete authority to manage, operate, improve, extend and maintain the City water distribution system and sewer collection system.

2.2 ENGINEERING DEPARTMENT: City of Bentonville Engineer.

2.3 MANAGER: Bentonville Water Utilities Manager.

2.4 DEVELOPER: Industrial partnership, corporation, or other legal entity such as an improvement district, desiring to construct water and/or sanitary sewer facilities for immediate or contemplated future inclusion in the city system.

2.5 ENGINEER: Individual registered to practice Engineering in the State of Arkansas who is responsible for the preparation of reports, plans, specifications and inspection of the work herein approved.

2.6 CONTRACTOR: The person, firm or corporation with whom the DEVELOPER has entered into an agreement to construct the water and/or sewer improvements.

2.7 CITY INSPECTOR: City of Bentonville Water Utilities Department Inspector responsible for inspection, and notification of proposed reconstruction or alterations and inspections involving the City of Bentonville's water and sewer system.

2.8 RESIDENT INSPECTOR: An authorized representative of the ENGINEER responsible for the inspection of construction for compliance with approved plans, specifications and other contract documents.

2.9 NORMAL WORK SCHEDULE: The City of Bentonville's normal work schedule is Monday through Friday 7:30 AM to 4:00 PM except HOLIDAYS.

2.10 HOLIDAYS: New Year's Day, Martin Luther King Day, President's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, Friday following Thanksgiving Day, Christmas Eve and Christmas Day.

2.11 TERMS: "As specified" shall mean as specified by the DEPARTMENT in plans, proposals, specifications, and other written instructions.

2.11.1 The term "or equal" shall mean that the proposed material or item shall perform adequately the duties imposed by the general design and is of the same or equal design, substance and junction to that specified by using the name of a product, manufacturer, or vendor. Use of the term "equal" shall mean any party proposing to substitute an "equal" shall obtain an approval from the DEPARTMENT. The DEPARTMENT shall make final approval of such items or materials judged to be "equal".

2.11.2 The term "these specifications" shall refer to the "Design Materials and Construction Specification of Water and Sewer Facilities", latest revision, written by the DEPARTMENT. It is the responsibility of the CONTRACTOR, ENGINEER, DEVELOPER or OWNER, etc. to obtain copies and to comply with the latest revision of these specifications.

2.12 Abbreviations used throughout these specifications have meanings as follows:

ASTM.....American Society for Testing and Materials
AASHTO.....American Association State Highway & Transportation Officials
ARDOT .....Arkansas Highway Transportation Department
DEQ.....Arkansas Department of Energy Environment, Division of Environmental Quality
ADH .....Arkansas Department of Health
ADL.....Arkansas Department of Labor
ANSI.....American National Standards Institute
AWWA.....American Water Works Association (Latest Revision)
CTS.....Copper Tubing Size
CI .....Gray Cast Iron
CS or CC .....AWWA (Mueller Corp Stop Thread)
DI .....Ductile Iron
DFT .....Film Thickness
FCCCHR .....Foundation for Cross Connection Control & Hydraulic Research
FIP .....Female Iron Pipe
HDPE.....High Density Polyethylene
ID .....Inside Diameter
IP .....Iron Pipe
MIP.....Male Iron Pipe
NFPA .....National Fire Protection Association
OD .....Outside Diameter
OSHA .....Occupational Safety and Health Administration
PE .....Polyethylene
PSI/PSIG .....Pounds per Square Inch (gauge)
PVC .....Polyvinyl Chloride
SSPC.....Steel Structures Painting Council
USACE.....U.S. Army Corps of Engineers

SECTION 3 LAWS, REGULATIONS AND ORDINANCES

3.1 This section covers such rules and regulations as required by statute for the completion of plans, specifications and construction work on any and all proposed water and/or sanitary sewage facilities.

3.2 All Federal, State, County and City Laws, Regulations or Ordinances shall be complied with on all projects. This shall include, but not be limited to the obtaining of approval from ADH, DEQ, and USACE. Submission to and approval by ADH, DEQ, and USACE shall be the ENGINEERS responsibility, including payment of any applicable fees. Approved plans and specifications shall be returned to the City of Bentonville for file and inspection prior to the pre-construction meeting.

SECTION 4 PERMITS AND LICENSES

4.1 All permits and licenses required by a Federal, State, County or City shall be obtained in strict accordance with requirements of the governing agency. When required by the licensing agency, the DEPARTMENT will assist in application for permits and licenses, but the cost of any permit, fee or bond required will be borne by the DEVELOPER. The DEPARTMENT shall charge 10% of the bond fee as a handling charge. Permits for all street bores within the City of Bentonville's corporate limits shall be permitted by the Bentonville Street Department. Permits for boring of state highways will be permitted via the DEPARTMENT as to obtaining permission from ARDOT. The project ENGINEER shall provide footage's, profiles, and any other documented information necessary to the DEPARTMENT for State boring permits. Project ENGINEER may

obtain permit and obtain ARDOT permit without going through the DEPARTMENT. ARDOT will require a check for the full amount of bond to ARDOT. Project ENGINEER to submit copy of approved permit to DEPARTMENT when received.

SECTION 5 PLANS AND SPECIFICATIONS

5.1 RECORD DRAWING STANDARDS

5.1.1 Prior to site final of the project, one (1) complete set of "As-Built" drawings shall be PDF and furnished or emailed to the DEPARTMENT for record purposes by the same ENGINEER who prepared and submitted the construction plans and specifications. Change of ENGINEERING firm shall warrant re-submittal both to CITY ENGINEERING and ADH. CITY ENGINEERING shall be notified in writing of change in Engineering Firm, additional requirements considered on a case-by-case basis. Record Drawing Standards shall be as outlined below:

5.1.2 All files associated with acceptance of the record drawings found in this section shall be received prior to site final. If any are found to be incorrect or inconsistent during review or at the site final, all files shall be revised as necessary and the corrected files sent to the DEPARTMENT for review and acceptance prior to approval of the site final.

5.1.3 Record Drawings shall include the site plan, construction plan sheets, and any supplementary drawings and shop drawings. Plan of lift stations or other special features should be shown if applicable. "Record Drawing" is to be stamped in large clear print on plans.

5.1.4 Public vs. Private Infrastructure shall be delineated on the PDF plans as well as the digital and data (.shp & .csv) files. Public vs. Private utilities shall clearly be identified on the PDF plan when both are present. If private utilities are present, then two (2) sets of data files will be required with the submittal. One set for public only, as outlined in these standards, and the other shall include private infrastructure only.

5.1.5 Piping line work for both water and sewer infrastructure shall be drawn as continuous segments without breaks. Breaks shall only occur at constructed locations of valves, manholes or other assets along a pipe segment.

5.1.6 Material Quantity Table – Utility Sheet to include a material quantity table of all public infrastructure that was installed during construction for each project. Table information shall quantify the entire water and sewer infrastructure that was constructed. To include all water and sewer lines, bends, tees, hydrants, valves, meter sets, manholes, etc. Table 5.8.

5.1.7 All plans shall be drawn to a scale suitable for adequately showing the facilities proposed, except as stipulated herein. All plans and profiles of sewer lines shall be drawn to scale with the profile vertical scale at **1" = 5'** and plan horizontal scale for water and/or sewer lines of **1" = 30'** or larger. All drawings shall be no larger than **24" X 36" sheets**. All elevations shall be based on mean sea level. An overall project map shall be a minimum 24" X 36" and shall depict the entire project and show all proposed water and/or sewer lines properly labeled as to size and pipe material. All other utilities shall be shown along with the proposed road profile if applicable. A vicinity map at a scale **of 1" = 2,000'** shall be furnished indicating the location of the project in relation to arterial streets and major highways. Reduced size drawings may be allowed for inspection purposes after all approvals have been obtained.

5.2 **Cad Files - .dwg & .dxf**

5.2.1 Submit one or more AutoCAD / Civil 3D (.dwg format AND .dxf) drawing files that contain the entire utility infrastructure (water and sewer,) that was constructed with the project, as well as all other pertinent reference lines, project information, and survey control data. The following layers are requested to be used for all "Water" features: BWD-WATER & BWD-WATERTXT and the following layers are requested to be used for all "SEWER" features; BWD-SEWER & BWD-SEWERTXT." The infrastructure shall be drawn in the file at the as-built locations as surveyed and certified by the Professional Land Surveyor. The AutoCAD file(s) shall be placed into a folder named "CAD" on the submitted media. Please note: the delivered CAD files should not be of the Plan/Profile sheets, but should be the overall working drawing in "model space" that is registered to AR North State Plane, NAD 1983.

5.3 **Shape Files - .shp**

5.3.1 Submit as-built data for direct import into the City's Geographic Information System (GIS). Submit four (4) shape (.shp) files; One (1) shape file (points), named "WTR_F" that contains all of the water infrastructure features that was constructed with the project; One (1) shape file (lines), named "WTR_L" that contains all of the water infrastructure lines that was constructed with the project; One (1) shape file (points), named "SWR_F" that contains all of the sanitary sewer infrastructure features that was constructed during the project; One (1) shape file (lines), named "SWR_P" that contains all of the sanitary sewer infrastructure lines that was constructed during the project. Each shape file shall include all features and line work that was constructed with the project only. Correctly name the files as outlined above. The shape files shall match the data files (.csv)

5.4 **Data Files - .csv**

5.4.1 Data shall consist of files in an ASCII Comma Separated Value (CSV) file format. The preferred horizontal coordinate system for the digitally submitted data as described below shall be AR NORTH State Plane (NAD83), U.S. Survey Feet. The preferred vertical coordinate system for the digitally submitted data as described below shall be North American Vertical Datum, 1988 (NAVD 1988), U.S. Survey Feet. All of these file(s) shall be placed into a folder named "DATA" on the submitted media.

5.5 **Water Features**

5.5.1 The file shall be named "Water_Features" and contains various elements that connect and control the distribution of water within and among various water lines. These features include both buried fittings (bends, crosses, end caps, reducers, and tees) and features that are accessible and/or visible at the surface (meters, valves, and hydrants). Buried features should be located similar to the method our utility locators use: (a paint dot is placed on the pavement at the approximate location of the feature and then surveyed location is taken at the paint mark.)

Water line locations are required only if the water line curves. These locations shall be surveyed at 25 foot stations along the length of the water line.

Each line of the file shall contain the following information:

ID, Type, Northing, Easting, Elevation, Description (all on first line of the file)

Where:

ID - A unique ID number assigned to each feature noted on the as-built plan and profile sheets (e.g. GV1, HYD1, etc.)

Type - The type of feature. Provide the following codes as indicated in the table below:

5.5.2 Water Features Descriptions

Feature Description	Type
Air Release Valve	ARV
Backflow Preventer	BFP, RPZ, RPA, etc.
Bend	BEND
Blow Off	BLOWOFF
Cross	CROSS
Demarcation Valve	DMV
Encasement	ENCASE
End Cap	CAP
Fire Department Connection	FDC
Fire Hydrant	HYDRANT
Post Indicator Valve	PIV
Reducer/Increaser	REDUCER
Tee/Tapping Sleeve	TEE
Water Valve	VALVE
Water Line	WATERLINE
Water Meter	METER

Northing – North coordinate value (+/- 2.0’ if buried, +/- 0.1’ otherwise)
Easting – East coordinate value (+/- 2.0’ if buried, +/- 0.1’ otherwise)
Elevation – Elevation, collected as follows: (+/- 2.0’ if buried, +/- 0.1’ otherwise)

5.5.3 Water Feature Elevation Locations

Feature Type	Elevation Location
BEND/BLOWOFF/CROSS/END CAP/REDUCER/TEE	Surface, at the mark that indicates the approximate location of the buried feature.
HYDRANT	Top of the fire hydrant.
METER/VALVE	Center of the access structure.
WATERLINE	Surface, at the mark that indicates the approximate location of the buried line, at 25 foot stations. *Only required if a water line is curved.*

Description - The description of the item for the feature; encoded as follows:

5.5.4 Water Feature Descriptions

Feature Type	Description
BEND	Degree of bend (e.g. 11.25/22.5/45/90).
BLOWOFF	Size (in inches) of the blow off.
CROSS	Size (in inches) of each water line that connects to the cross (e.g. "12x12x8x8").
ENDCAP	Size (in inches) of the water line.
HYDRANT	Manufacturer and year of manufacture. This information will be on the hydrant (e.g. "CLOW- 2004").
METER	The size (in inches).
REDUCER	The size (in inches) of the lines on either side of the reducer (e.g. "8x4").
TEE	The sizes (in inches) of each water line that connects to the tee (e.g. "12x12x8").
VALVE	The size (in inches) and type of the valve (e.g. 6 GV, 12 BFV)
WATERLINE	No description required.

Example file format:

ID	Type	Northing	Easting	Elevation	Description
GV1	VALVE	749862.3433	653776.6033	1215.05	8 GV
BEND1	BEND	749818.6838	653805.9192	1214.15	22.5 BEND

5.5.6 Water Lines

The file shall be named "Water_Lines" and shall contain the following data. There is one line of data for each water line that connects two water features.

ID, Size, Material, FeatureID1, FeatureID2 (all on first line of the file)
Where:

ID – A unique number assigned to each section of water line noted on the as-built plan and profile sheets (e.g. "WL1")

Material – Water line material

Size – The size (in inches) of the water line

FeatureID1 - The ID of the feature on the near end of the water line as shown on the as- built plans (e.g. "GV1")

FeatureID2 - The ID of the feature on the far end of the water line as shown on the as- built plans (e.g. "HYD1")

Example file format:

ID	Material	Size	FeatureID1	FeatureID2
WL1	PVC	8	GV1	GV2
WL2	PVC	8	GV10	GV1

5.6 Sewer Features

The file shall be named "Sewer_Features" and shall contain information about manholes, cleanouts, and other features listed in the table below. There is one line of data for each sewer feature.

Buried features such as force main bends and tees should be located similar to the method our utility locators use: (a paint dot is placed on the pavement at the approximate location of the feature and then surveyed location is taken at the paint mark.)

Force main locations (see the "FORCEMAIN" type in the table below) are required only if the force main curves. These locations will be surveyed at 25 foot stations along the length of the water line.

End of service locations shall be the location at which the stub-out connection point is to be made. Section 14.2.7

ID, Type, Northing, Easting, Elevation, Invert, Material (all on first line of file)

Where:

ID – If the feature is a manhole then the number as shown on the as-built drawings (e.g. "MH1"). If feature is a clean out then a lot number or street address (e.g. "LOT10" or "123 Street Name").

Type – The feature type, coded according to the following table:

5.6.1 Sanitary Sewer Features Descriptions

Feature Description	Type
Clean Out	CLEANOUT
Drain	DRAIN
End Of Service	SERV
Force Main Valve	FMVALVE
Force Main Tee	FMTEE
Force Main Bend	FMBEND
Force Main	FORCEMAIN
Grease Trap	GREASETRAP
Manhole	MANHOLE
Sand / Oil Separator	SOS
Tracer Wire Port	TWPORT

Northing – North coordinate value at the center of cover (+/- 0.1').
Easting – East coordinate value at the center of cover (+/- 0.1').
Elevation – Rim elevation at the center of cover (+/- 0.1')

5.6.2 Sanitary Sewer Features Elevation Locations

Feature Type	Elevation Location
CLEANOUT	Surface adjacent to the cleanout.
DRAIN	Center of the drain grate.
FMVALVE	Center of the access structure.
FMTEE/FMBEND	Surface, at the mark that indicates the approximate location of the buried feature.
FORCEMAIN	ark that indicates the approximate location of the buried main, at 25 foot stations. *Only required if a force main curves.*
GREASETRAP/OWS	Center of the structure
MANHOLE	Center of Rim

Invert Elevation– Invert elevation (+/- 0.1', bottom of manholes)
Material – Construction material

Example file format:

ID	Type	Northing	Easting	Elevation	Invert	Material
MH1	MANHOLE	751915.787	662437.91	1282.86	1277.71	CIP
CLEANOUT1	CLEANOUT	751927.504	662217.212	1285.37	1280.13	PVC

5.6.3 Sewer Pipes

The file shall be named "Sewer_Pipes" and shall contain the following data. There is one line of data for each sewer pipe.

If the pipe is a force main, values for Size, Material, USId, and DSId only need to be provided.

ID, Size, Material, USId, DSId, USInv, DSInv, Slope, Length (all on first line of the file)

Where:

ID – A sequential pipe number as noted on the as-built drawings (e.g. "SSP1").

Size – Inside pipe diameter (inches).

Material – Pipe material

USId – Upstream manhole number as shown on the as-built drawings (e.g. "MH1").

DSId - Downstream manhole number as shown on the as-built drawings (e.g. "MH2").

USInv – Invert elevation at the upstream end.

DSInv – Invert elevation at the downstream end. If downstream end is a drop connection, provide both elevations separated by a slash (e.g. 1100.05 / 1100.15).

Slope – The as-built grade of the pipe, expressed as a percentage and carried out to two decimal places.

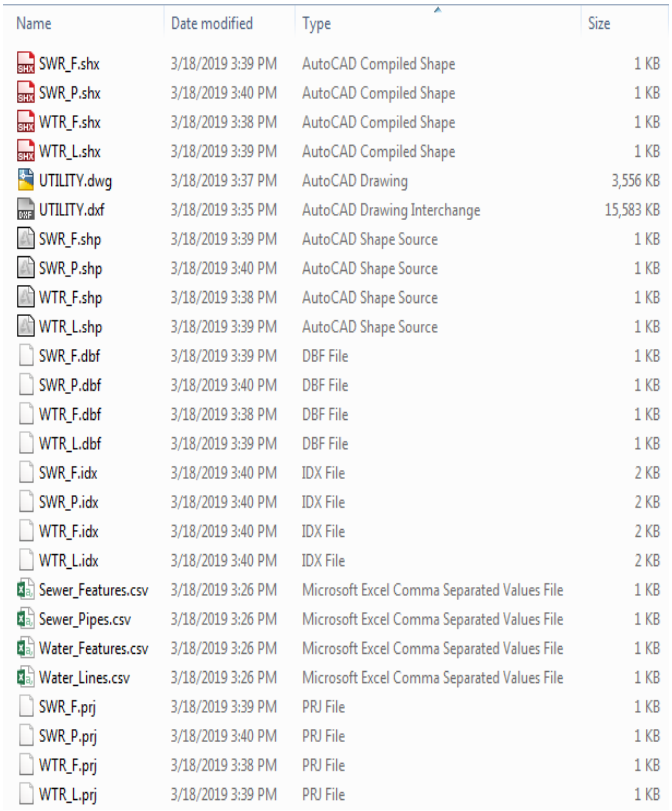
Length – The length (in linear feet) of the pipe as indicated on the as-built carried out two decimal places.

Example file format:

ID	Size	Material	USID	DSID	USINV	DSINV	Slope	Length
SSP1	8"	PVC	MH1	MH2	1233.15	1228.41	6.02%	78.76

5.7 REQUIRED DATA FOLDER FILE FORMAT:

Example file format:



Name	Date modified	Type	Size
SWR_F.shx	3/18/2019 3:39 PM	AutoCAD Compiled Shape	1 KB
SWR_P.shx	3/18/2019 3:40 PM	AutoCAD Compiled Shape	1 KB
WTR_F.shx	3/18/2019 3:38 PM	AutoCAD Compiled Shape	1 KB
WTR_L.shx	3/18/2019 3:39 PM	AutoCAD Compiled Shape	1 KB
UTILITY.dwg	3/18/2019 3:37 PM	AutoCAD Drawing	3,556 KB
UTILITY.dxf	3/18/2019 3:35 PM	AutoCAD Drawing Interchange	15,583 KB
SWR_F.shp	3/18/2019 3:39 PM	AutoCAD Shape Source	1 KB
SWR_P.shp	3/18/2019 3:40 PM	AutoCAD Shape Source	1 KB
WTR_F.shp	3/18/2019 3:38 PM	AutoCAD Shape Source	1 KB
WTR_L.shp	3/18/2019 3:39 PM	AutoCAD Shape Source	1 KB
SWR_F.dbf	3/18/2019 3:39 PM	DBF File	1 KB
SWR_P.dbf	3/18/2019 3:40 PM	DBF File	1 KB
WTR_F.dbf	3/18/2019 3:38 PM	DBF File	1 KB
WTR_L.dbf	3/18/2019 3:39 PM	DBF File	1 KB
SWR_F.idx	3/18/2019 3:40 PM	IDX File	2 KB
SWR_P.idx	3/18/2019 3:40 PM	IDX File	2 KB
WTR_F.idx	3/18/2019 3:40 PM	IDX File	2 KB
WTR_L.idx	3/18/2019 3:40 PM	IDX File	2 KB
Sewer_Features.csv	3/18/2019 3:26 PM	Microsoft Excel Comma Separated Values File	1 KB
Sewer_Pipes.csv	3/18/2019 3:26 PM	Microsoft Excel Comma Separated Values File	1 KB
Water_Features.csv	3/18/2019 3:26 PM	Microsoft Excel Comma Separated Values File	1 KB
Water_Lines.csv	3/18/2019 3:26 PM	Microsoft Excel Comma Separated Values File	1 KB
SWR_F.prj	3/18/2019 3:39 PM	PRJ File	1 KB
SWR_P.prj	3/18/2019 3:40 PM	PRJ File	1 KB
WTR_F.prj	3/18/2019 3:38 PM	PRJ File	1 KB
WTR_L.prj	3/18/2019 3:39 PM	PRJ File	1 KB

5.8 **Material Quantity Table**

WATER SYSTEM IMPROVEMENTS	TYPE	QUANTITY
16" ENCASEMENT	LF	20
8" PVC WATER LINE	LF	1200
GATE VALVES (8")	EA	16
TAPPING SLEEVE & VALVE	EA	2
FIRE HYDRANTS	EA	8
45° BEND	EA	4
METER SETS	EA	36
SEWER SYSTEM IMPROVEMENTS		
8" PVC	LF	880
8" DIP	LF	40
CIP SMH	EA	10
CLEANOUT	EA	2
4" FM	LF	180

SECTION 6 INSPECTION

6.1 This section covers the requirements of inspection for the construction of water and sewer facilities.

6.2 The responsible ENGINEER who prepared and submitted the construction plans and specifications shall be responsible for construction layout, general direction, resident inspection and site final as described in more detail in the following sections. Continuous project responsibility shall be an express condition of plan approval. The ENGINEERS responsibility shall extend through site final approval and submittal of "As-Built" drawings for acceptance of the project by the DEPARTMENT for maintenance.

6.3 All water and sewer facilities proposed shall be constructed by a licensed utility CONTRACTOR with the correct classification and inspected by the responsible ENGINEER as defined under definitions. Inspection shall consist of, but not be limited to, periodic visits to the construction site to observe the progress and quality of the executed work to determine if the work is proceeding in accordance with the approved plans and specifications and with the standards set forth by the DEPARTMENT. Any defects, deficiencies or irregularities in the work found by the ENGINEER or reported by the RESIDENT INSPECTOR shall be reported to the CITY INSPECTOR. Such action, as deemed appropriate, and as approved by the DEPARTMENT, shall be taken to correct such deficiencies. All work performed, shall at all times be subject to general inspection by the MANAGER or representative.

6.4 If deemed necessary by the DEPARTMENT to insure conformance with the approved plans and specifications, full time resident inspection may be required during all or part of the project and shall be performed by qualified personnel under the direct supervision of the ENGINEER. The name(s) of the RESIDENT INSPECTOR shall be furnished to the DEPARTMENT, any changes shall be notified to the DEPARTMENT in writing with all contact information included. It shall be the responsibility of the RESIDENT INSPECTOR to safeguard the DEPARTMENT'S interest by checking the construction work for compliance with the approved plans, specifications and other standards. The responsible ENGINEER shall provide an inspector for each location within a project that would use more than one pipe laying crew (e.g. two pipe laying crews on two different sites, two inspectors, one for each site). The CITY INSPECTOR or DEPARTMENT

representative and the RESIDENT INSPECTOR shall witness all test procedures. The RESIDENT INSPECTOR shall provide a documented report of results, conditions, and time of test to the DEPARTMENT for its use and approval. If the CONTRACTOR intends to work outside of the normal work schedule or on a holiday, the RESIDENT INSPECTOR shall be required to be on the job site at all times and shall notify the DEPARTMENT. **Refer to Section 2.**

6.5 Any defects, deficiencies or irregularities shall be reported to the ENGINEER. A job diary shall be kept, outlining all aspects of the construction project and shall be made available to the DEPARTMENT upon request.

SECTION 7 CONSTRUCTION LAYOUT

7.1 The layout and staking of the construction work shall be completed by trained and qualified survey personnel under the supervision of the ENGINEER. Construction layout shall consist of staking (physical monuments) necessary to determine alignment and elevations to properly construct the proposed facilities. All depths shall be approved by the DEPARMENT during plan review.

SECTION 8 SITE FINAL PROCEDURES

8.1 Before acceptance of new construction involving water lines or sewer main extensions, a physical site inspection will be scheduled by the ENGINEERING DEPARTMENT referred to as a "Site Final".

8.2 All lot corners shall be in place and witnessed by a survey marker. Said marker shall bear the number of the respective lot it represents. If lot lines do not coordinate with newly constructed utilities, it shall be the DEVELOPER'S responsibility to make the appropriate adjustments. If said situation exists at time of site final, approval shall be withheld until lot lines and utility locations coordinate. If these requirements have not been met, then site final shall be cancelled.

8.3 Water valve boxes will be to final ground elevation or paving grade centered directly over operator nut. Water valves and valve boxes shall be positioned in a manner to allow operability at all times. A continuous locator wire shall be present and operable in all valve boxes.

8.4 Fire hydrants shall be set at bury line at finished grade. Hydrants shall be positioned 3' to 9' from back of curb or edge of any driving surface (measured from the steamer cap nut) or as directed by the DEPARTMENT during plan review.

8.4.1 All public fire hydrants shall be painted Industrial Safety Yellow. All private fire hydrants not maintained by the DEPARTMENT shall be painted Industrial Safety Red. Fire hydrants shall be painted prior to inspection unless otherwise instructed by the DEPARTMENT.

8.4.2 All fire hydrant assemblies shall have an auxiliary gate valve installed at the point of connection serving the hydrant. Hydrant lead lines in excess of 50' shall have an additional auxiliary gate valve installed at the fire hydrant or as designated by the DEPARTMENT during plan review.

8.5 Fire Department Connection (FDC) for each sprinkler or standpipe system shall be located not more than 100' from the nearest public fire hydrant connected to an approved public water supply. The FDC height shall be between 36" and 48" from the finished grade with a 30° bend and a 5" Storz connection. There shall be #10 tracer wire taped every 10 feet on the top of FDC line. Additional fire hydrants may need to be installed as required by the Fire Chief or his designated representative. With respect to hydrants, driveways, buildings and landscaping, fire department connections shall be so located that the fire apparatus and hose connected to supply the system will not obstruct access to the buildings for other fire apparatus. The location of the fire department

connections and/or fire hydrants shall be approved by the Fire Chief or his designated representative. This fire hydrant will be solely used for the FDC. (**Or per newest Fire Department Ordinance**).

8.5.1 FDC's shall be located on address side of building and shall be approved by the Fire Department's Inspection Division prior to installation.

8.5.2 Butterfly valves are not approved for use in fire suppression systems. Only approved Post Indicator gate valves (P.I.V.) or wall indicator valves shall be utilized and approved. P.I.V. needs to be 30" to 36" above final grade to the sight glass. There shall be #10 tracer wire taped at 10' intervals on top of the fire line. PIV shall to be shown on construction plans.

8.6 Residential Meter boxes shall be set at 3" above proposed final grade or as directed by the DEPARTMENT during plan review. All meter setters inside the box shall not touch the sides of the box and shall be located where the turn-on and turn-off valves are easily accessible and operable by meter personnel. All meter sets shall have a minimum 3' stub-out service line for each service placed in such a manner to minimize disturbing meter box in the process of plumbing connection from pigtail to the customer's service line. All damage to meter boxes shall be the responsibility of the owner or builder after final acceptance has been completed. Meter personnel reserve the right to refuse placement of meters if setters or boxes are damaged, misaligned, or if finished grades have changed. All meter box lids shall have one or two pre-drilled holes, depending on the number of meter setters installed within the meter box. The holes are for use with the DEPARTMENT'S meter reading system. Failure to install predrilled lids will lead to acceptance failure.

8.7 All meter vault plans and installations shall be approved by the DEPARTMENT during plan review. All meter vaults are to be installed by designated CONTRACTOR of the project. **Section 12.18.4**

8.8 All pipe and fittings shall meet the DEPARTMENT'S specifications. All DI pipe shall be cement lined and tar coated, all fittings shall be epoxy coated. Meter by-pass material shall be rigid copper or DI pipe. Valves shall meet specifications herein. Vault depth shall not exceed 5' unless approved by the DEPARTMENT.

8.9 The vault cover shall be removable to allow full access to the vault. Four recessed lifting points shall be provided. An access door shall be installed in the center of the vault. The lid shall have pre-drilled holes for meter capability. Approved doors shall be similar or equal to Bilco or Halladay and shall be a minimum of 36" x 36".

8.10 Water meters shall not be installed within buildings without prior approval by the DEPARTMENT. If approved, meters inside buildings shall meet the following criteria, **Section 8.11,** which shall be furnished and guaranteed by owner of future development prior to approval.

8.11 Meters must have capability via outside of building and accessible to meter personnel, (no obstructions). Meters 4" and larger are to be purchased by OWNER with direction of the DEPARTMENT.

8.12 Sewer stub-outs installed for a domestic sewer connection shall be marked and made visible by installing a metal tee post painted green at the precise location above said sewer line end, at a height of 3' exposed above ground and buried a minimum of 3' below ground.

8.13 All trees planted in large scale projects and subdivisions shall be planted at a minimum of 5' from any water or sewer mains.

8.14 ENGINEER shall contact the DEPARTMENT by email to schedule televising of sewer mains and tracer wire inspections before roadways have been completed and before 1st full inspection is requested. Full CCTV inspection shall be completed and 1st tracer wire inspection shall be completed before site final. ENGINEER shall provide revised "as-built" drawing of utility sheet with sewer profile before testing will be scheduled.

8.15 The OWNER/CONTRACTOR/DEVELOPER shall pay any outstanding (3 or more months) invoice issued by the Water Utilities Office prior to final acceptance of the current project. This includes previous projects, water/sewer line repairs, fire hydrant contracts, discontinue services, replace meter tiles, re-inspection fees, survey fees, etc. – Does not include Utility Bills.

8.16 The DEPARTMENT shall charge for each re-inspection. **Refer to current fee ordinance**.

SECTION 9 GENERAL REGULATIONS FOR CONSTRUCTION PURPOSES

9.1 **Refer also to current Transportation Department Specifications.**

9.1.1 This section outlines minimum construction procedures and standards for the installation of water and sewer extensions.

9.1.2 Any CONTRACTOR/DEVELOPER/CUSTOMER/RESIDENT that requests the use of a hydrant meter will be required to fill out a Contract and pay for a Fire Hydrant Meter at the Water Utilities Office. The CONTRACTOR/DEVELOPER/CUSTOMER/RESIDENT of the City of Bentonville will determine the location for the hydrant meter with the DEPARTMENTS approval. The current contract may also be found online on the City of Bentonville Water Utilities Department website.

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9.2 UNDERGROUND UTILITY NOTIFICATION

9.2.1 It is the CONTRACTOR'S responsibility to notify **"Arkansas One-Call" (1-800-482-8998 or 811)** two days in advance of any excavation. Location of utility requests for surveying purposes will be charged to the requesting party. A notice of at least 2 working days (normal work schedule) should be expected before locates are performed by the DEPARTMENT. **Refer to current fee ordinance**.

9.3 WATER OUTAGES

9.3.1 In the event that the CONTRACTOR must have a water main out of service in order to connect to the water system, the CONTRACTOR shall notify the DEPARTMENT of impending loss of service at least 5 days in advance. All shutdowns shall be coordinated and scheduled by the DEPARTMENT. Notifying customers will be accomplished by means of approved door hanger notices supplied by the DEPARTMENT, however it is the CONTRACTOR'S responsibility to notify the customers a minimum of 24 hours ahead of time. **Section 13.1.2**

9.4 TRENCH DEWATERING

9.4.1 The CONTRACTOR shall install dewatering systems as necessary that will be required to construct the proposed utilities in a manner that will prevent groundwater contamination. Must meet current City of Bentonville Storm Water Regulations. For 12" and larger pipe sizes, ground water encountered shall be prevented from migrating along the trench with either clay or flowable fill mitigation dams and wrapping pipe bedding with filter fabric as approved by the DEPARTMENT, in accordance with geotechnical recommendations.

9.5 LOCATION, ALIGNMENT AND GRADE

9.5.1 The pipe, fittings, valves, fire hydrants, meter boxes, manholes, and other appurtenances shall be constructed to conform to the location, line size and material, and grades specified or as shown on the Plans.

9.5.2 Valves and fire hydrants shall be set with operating stem and nut plumb.

9.5.3 Horizontal and vertical control points will be established along or adjacent to the construction area. It shall be the responsibility of the CONTRACTOR to make necessary measurements from these control points in order to maintain the proper alignment and grade of the structures. The CONTRACTOR shall preserve all stakes and markers established by the ENGINEER.

9.5.4 In a residential or commercial subdivision, the water and sewer mains will be placed at 12' back of curb or 2' behind master plan street right-of-way. The manholes and fire hydrants will be placed on the lot line and water and sewer services will be placed 3' off the lot line. Water services that are on the same side as the water main will be placed at 14' back of curb and the water services across the road from the water main will be placed in the green space centered between the curb and proposed sidewalk. The 1" tubing going to the meter set will be installed without excess tubing wrapping around the meter tile. The sewer services are to extend to the building setback or the back edge of the utility easement. The fire hydrants that are placed on the lot line need to meet the back of curb measurement that is shown on the fire hydrant installation **Details W04 and W05**. The manholes that are street side need to have a final rim elevation that is 4" to 6" above final grade and any manholes that are at the back of lots or along drainage areas need to be 12" above final grade. Please keep in mind that the maximum vertical extension above the cone is 24". If the vertical extension is greater than 24" it will be necessary to take the cone off, extend the walls, re-pour the cone and do a vacuum test on the manhole. Any variation from the above described layout needs to be submitted to the DEPARTMENT for approval during the plan review process.

9.6 PUBLIC TRAVEL

9.6.1 Traffic control shall be in accordance with the City of Bentonville Minimum Standard Specification for Streets.

9.7 SURFACE & SUBSURFACE STRUCTURES LOCATION AND PROTECTION

9.7.1 The DEPARTMENT does not guarantee the accuracy or correctness of locations of subsurface structures. It shall be the responsibility of the CONTRACTOR to satisfy himself as to the actual location and nature of subsurface structures.

9.7.2 The CONTRACTOR shall make necessary exploratory excavations to determine the location of underground structures such as pipes, drains, conduits, and other structures. The CONTRACTOR shall be responsible for contacting the respective utility of such structures before excavating in the vicinity of these structures and shall be guided by their instructions.

9.7.3 The CONTRACTOR shall provide adequate protection and support for all surfaces and subsurface structures or other facilities encountered during the progress of the work. Whenever such structures or facilities are in the same location as the proposed pipeline or appurtenances thereto, the CONTRACTOR shall relocate or reconstruct or cause to be relocated or reconstructed, the structure or facility to the satisfaction of the DEPARTMENT and utility facility owner. Whenever requested by the DEPARTMENT or utility owner, the CONTRACTOR shall provide drawings and other plans for supporting or otherwise safeguarding surface and subsurface structures or other facilities which, in the opinion of the DEPARTMENT, or utility or facility owner, may be damaged as a result of the CONTRACTOR'S work.

9.7.4 The CONTRACTOR shall not stop or impede the flow in any pipe, sewer, surface or subsurface drain without making provisions for diverting the flow to the satisfaction of the DEPARTMENT.

9.7.5 If any utility facility or structure is damaged during the progress of the work, the CONTRACTOR shall immediately notify the appropriate owner. Repairs shall not be made by the CONTRACTOR without the prior approval of the utility facility or structure owner. The CONTRACTOR shall pay utility owners for the cost of repairing, relocating or replacing any facilities damaged by the CONTRACTOR. In addition, the CONTRACTOR shall provide all assistance available to the utility involved in making repairs under emergency conditions.

9.7.6 The CONTRACTOR shall not operate any control valve or fire hydrant in the existing water distribution system without the approval of the DEPARTMENT.

9.7.7 All existing water mains, services, appurtenances and bends shall be properly restrained in such manner so as to prevent displacement before excavating behind these appurtenances.

9.8 PROTECTION OF VEGETATION

9.8.1 The CONTRACTOR shall not remove or disturb any vegetation except that required for the execution of the work.

9.8.2 Unless otherwise specified in these specifications or in the plans, the CONTRACTOR shall replace all sod, shrubs, bushes, trees, and flowers disturbed or removed, that are located upon improved or landscaped public and private property. The CONTRACTOR shall replant vegetation and re-landscape or cause such to be performed throughout the work area as soon as possible after the water lines and appurtenances have been installed. All vegetation damaged during or after removal shall be replaced with healthy vegetation of the same kind or type. All plants shall be replanted in the original location. The CONTRACTOR shall maintain all such replanted vegetation by the application of water, fertilizers and topsoil. The vegetation shall be cultivated to prohibit the growth of foreign vegetation until a “well developed” root system has been established and transplanted vegetation has overcome the "shock" resulting from transplanting. If any vegetation dies or becomes unhealthy, it shall be replaced by the CONTRACTOR. The contour of the ground shall be left as near the original contour as possible.

9.8.3 The CONTRACTOR shall stabilize all areas where ground surface has been disturbed by water and sewer construction activities to as good or better condition.

9.9 EXCAVATION AND PREPARATION OF TRENCH

9.9.1 The CITY INSPECTOR and "Arkansas One-Call System" shall be contacted before excavation shall begin. Also, excavations shall be in accordance with the Arkansas Department of Labor requirements.

9.9.2 All trench excavation side walls greater than 5' in depth shall be sloped, shored, sheeted, braced or otherwise supported by means of sufficient strength to protect the workmen within them in accordance with the applicable rules and regulations established for construction by OSHA and ADL.

9.9.3 Before installation of pipe and appurtenances, the trench bottom shall be graded so uniform support of the pipe and appurtenances are provided. Shallow depressions shall be made in the trench bottom to accommodate bell ends. It is a requirement for bell or coupling holes to be excavated where no part of the load is supported by bells, couplings, or fittings.

9.9.4 All trenches shall be backfilled immediately after proper installation of the pipeline, tracer wire, embedment, and appurtenances. It may be necessary to backfill only a portion of the trench in order to allow adequate curing of concrete thrust blocking.

9.9.5 The trench width may vary and depend upon the depth and the nature of the excavated material encountered. The trench shall be of ample width to permit the pipe to be laid and jointed properly and the backfill to be placed and compacted properly. The minimum width of non-sheeted trench shall be at least 1' greater than the nominal diameter of the pipe. Ledge rock, boulders, large stones, and other rock formation shall be removed to provide a clearance of at least 6" on each side of pipeline and appurtenances up to and including 24" in diameter.

9.9.6 The bottom of the trench shall be prepared so as to provide a uniform and continuous bearing and support for the pipe on solid undisturbed or compacted soil. The trench shall be excavated to at least the depth specified as follows beyond the specified grade when the following described conditions exist:

9.9.7 When the bottom of the trench is at sub-grade and is found to be unstable or includes ashes, cinders, refuse, other organic material, or large pieces of inorganic material, that, in the judgment of the ENGINEERING DEPARTMENT, should be removed, the CONTRACTOR shall remove all such material to the extent required by the ENGINEERING DEPARTMENT

9.9.8 When the excavation is carried below or beyond that specified or required due to conditions described in **Section 9.9.7**, the CONTRACTOR shall backfill the trench to the proper grade with approved backfill material specified by the DEPARTMENT, unless permitted by the DEPARTMENT to install the lines and appurtenances at the undercut grade. The backfill shall be accomplished in accordance with that specified by the DEPARTMENT or elsewhere herein.

9.9.9 The use of trench-digging machinery will be permitted except in places where operations of same will cause damage to trees, buildings, or other existing structures above or below the ground; in which case hand methods shall be employed.

9.9.10 Blasting for excavation will be permitted only after the CONTRACTOR secures the approval of the Fire Department and DEPARTMENT and only when proper precautions are taken for the protection of persons and property. The Fire Department will approve the hours of blasting. Any damage caused by blasting shall be repaired by the CONTRACTOR at their expense. The method of transporting, handling, and storage of explosives and blasting procedure shall conform to Federal Regulations, local and state laws, municipal ordinances and be approved by the Fire Department in advance.

9.9.11 The CONTRACTOR shall comply with all federal, state and local laws or ordinances with respect to obtaining permits, the deposit of bonds and all other provisions of such laws and ordinances.

9.9.12 In order to prevent caving when excavating in sand, gravel, sandy soil, or other unstable material shall be adequately sheeted and braced. Where sheeting and bracing is used, the trench width may be increased accordingly. Trench sheeting shall remain in place until the pipe has been laid and jointed. Where slides or cave-ins occur, the CONTRACTOR shall, at his expense, provide proper bedding and support for the pipe to maintain line and grade.

9.9.13 All excavated material stored on the job site shall be stockpiled in a manner to avoid blocking driveways, streets or sidewalks and will not endanger workers, pedestrians or travelers. Gutters shall be kept clear or other satisfactory provisions shall be made for street drainage. If local conditions permit their re-use, all surface materials suitable for re-use in restoring the surface shall be kept separate from the general excavation material. Excess material and debris shall be removed promptly.

9.9.14 The CONTRACTOR shall maintain all temporary surfaces in good condition until permanent repairs are complete.

9.10 WORK PERFORMED BY DEPARTMENT

9.10.1 The intent of these specifications is for the CONTRACTOR to do all installation of new water and sewer infrastructure. All water and sewer taps to the existing Water Distribution or Wastewater Collection Systems shall be made by the DEPARTMENT as outlined in **Section 11.10**.

9.10.2 If damage occurs to the water or wastewater collection systems during construction, the DEPARTMENT, with its labor forces, will make all repairs to these systems. The CONTRACTOR may be requested to assist in the repairs to reduce charges for damages occurred.

9.10.3 If the DEPARTMENT assists the CONTRACTOR for any reason, the CONTRACTOR shall pay for the cost of this assistance, based on the cost of labor, equipment, materials and overhead.

9.11 CONFINED SPACES

9.11.1 The CONTRACTOR'S attention is called to the requirements for entry into confined spaces as defined by the Current Edition of the OSHA Standard for Permit Required Confined Spaces which is specifically incorporated herein by reference.

9.11.2 CONTRACTOR'S responsibilities for entry into any Permit Required Confined Space are:

(a) CONTRACTOR shall obtain from DEPARTMENT any available information regarding any hazards of entry operations for a Permit Required Confined Space.
(b) When both DEPARTMENT and CONTRACTOR'S personnel are to work in or near a Permit Required Confined Space, CONTRACTOR shall coordinate such work with DEPARTMENT.
(c) CONTRACTOR shall inform DEPARTMENT of type of Permit Required Confined Space Program used by his employees.
(d) CONTRACTOR shall inform DEPARTMENT of any hazards confronted or created in a Permit Required Confined Space.
(e) CONTRACTOR is responsible for having knowledge of and complying with all requirements of OSHA's Standard for Permit Required Confined Spaces.

9.12 PUBLIC EMPLOYEES RIGHT TO KNOW ACT

9.12.1 The CONTRACTOR'S attention is called to the requirements of the Hazard Communication Standard adopted by OSHA and State of Arkansas Act 556 of 1991: Public Employees Chemical Right to Know Act.

9.12.2 The CONTRACTOR is reminded that other obligations are imposed upon employers by the above Standard and Act.

9.13 CLEAN-UP OF JOB SITES

9.13.1 The CONTRACTOR shall remove all materials, equipment, tools, temporary structures, barricades, trees and other vegetation that have been cut or have died as a result of the work from both public and private property along the job site.

SECTION 10 GENERAL INSTALLATION INFORMATION AND PROCEDURES

10.1 HANDLING PIPELINE MATERIALS

10.1.1 The CONTRACTOR shall handle the material with the utmost care and in a manner to prevent damage to the materials, material coating and lining during loading, hauling, unloading, and installation operations. Hooks, chains, or cables shall not come in contact with the exterior/interior of pipeline materials. It is recommended to use approved nylon straps or approved clamps to handle pipeline material. Material damaged shall be replaced at the CONTRACTOR'S expense.

10.1.2 Hooks shall not be in contact with the pipe interior and to the extent possible the interior of the pipeline materials shall be kept free from dirt and foreign matter.

10.1.3 Pipeline materials, especially valves, hydrants and fittings shall be drained and stored in a manner to protect them from damage by freezing. Under no circumstances shall pipe or accessories be dropped or dumped into the trench.

10.1.4 Proper implements, tools and facilities shall be provided and used by the CONTRACTOR for the safe and convenient execution of work.

10.1.5 All foreign matter or dirt shall be removed from the inside of the pipe and appurtenances before lowering into the trench and the pipe interior shall be kept clean during and after laying. A swab shall be kept in the water line as long as the pipe is being laid. Care shall be taken to prevent dirt from entering the joint space. When pipe laying is not in progress, the open ends of the pipe shall be closed by installing a plug or cap of sufficient design to prevent trench water, foreign matter, and dirt from entering the pipeline.

10.1.6 Cutting of the pipe for inserting valves, fittings or closure pieces shall be done in a neat and workmanlike manner without damage to the pipe or pipe lining. Torch cutting is not permitted. All pipes shall be cut at an angle of 90° to the pipe centerline. Cutting at other angles to provide greater deflections at the joints shall not be permitted. Field welding or welding except by the pipe manufacturer shall not be permitted.

10.1.7 Unless otherwise approved or directed by the DEPARTMENT, all pipe shall be laid with bell ends facing the direction of laying; and for lines on an appreciable slope, bells shall face upgrade. Steep slope protection shall be provided in accordance with 10 States Standards.

10.1.8 No pipe shall be laid in water, or when the trench condition or the weather is unsuitable for such work, except by permission of the DEPARTMENT.

10.2 PIPE EMBEDMENT

10.2.1 This section covers materials used for embedment of water and sewer mains. Unless otherwise specified herein or shown on the plans, embedment materials shall be restricted to Class #67 type bedding as modified and described below with a maximum aggregate size of ¾". Installation of bedding shall be 6" under pipe and 6" over pipe. CONTRACTOR'S must provide proof of material to match required specifications.

Crushed aggregate conforming to the ASTM C33, gradation 67 and as follows:
Crushed aggregate sized from maximum ¾" to No. 8 sieves:
100% passing the ¾" sieve (maximum aggregate size ¾")
20 to 55% passing the 3/8" sieve
0 to 10% passing the No. 4 sieve
0 to 5% passing the No. 8 sieve

The required modification of the ASTM C33, gradation 67 is the clarification and potential additional requirement of 100% passing the ¾" sieve.

10.3 COMPACTION

10.3.1 All pipeline backfill shall be placed in layers of appropriate thickness and compacted using a mechanical, hydraulically-powered vibratory trench compactor or other equivalent equipment. All trench backfill (except under paved areas) shall be compacted to 95% (minimum) standard proctor density of that of the adjacent undisturbed soil Trench backfill is subject to density test as deemed necessary. In areas where the trench crosses a street, parking lot or driveway, the material shall be compacted as specified in **Section 10.3.2** to a minimum of 95% of that of the adjacent soils.

10.3.2 SB-2 crushed stone trench backfill where required shall be compacted to 95% modified proctor density (ASTM D1557). A minimum of one compaction test per crossing is required.

10.3.3 Ditch line compaction shall follow immediately after trench backfill. Topsoil shall be placed and shaped leaving the ditch line slightly rounded above existing grade.

10.4 JOINTING PVC & DUCTILE IRON PIPE AND FITTINGS

10.4.1 Prior to jointing the pipe and/or fittings, the plain ends of the pipe and the bells of the pipe and fittings shall be thoroughly cleaned using a soapy water and cloth, removing all foreign materials from the bells, especially the gasket seats. Any burrs or imperfections in that part of the plain end or bell, which will be in contact with the gasket, shall be removed.

10.4.2 The clean rubber gasket shall be inserted in the bell and a thin film of lubricant shall be applied to the inside surface of the gasket. The cleaned plain end shall initially be entered in the bell straight.

10.4.3 The plain end shall be pushed inside the gasket and bell until it strikes the end of the interior of the bell, after which the end of the pipe shall be moved sideways or as specified by the manufacturer's requirements to move it slightly away from home to allow for expansion and to provide flexibility to the completed line.

10.4.4 Pipe lubricants specified by the pipe manufacturer shall be used. No substitutes shall be made.

10.4.5 When connecting the pipe or fittings according to manufacturer's requirements, care shall be exercised to avoid damage to where the pushing device or machine part contacts the pipe. A wood block or suitable pad shall be placed between the pipe and that part of the pushing device which contacts the pipe and/or fittings.

10.4.6 All plain ends that enter a push-on bell shall be beveled as specified by manufacturer requirements. All cut pieces or ends of pipe of other classifications shall be so beveled.

10.5 JOINTING FLANGED PIPE & FITTINGS

10.5.1 The faces of all flanges shall be thoroughly cleaned and all burrs or imperfections removed and brushed with a steel brush.

10.5.2 Gaskets between flanges shall be AWWA approved of 1/16" minimum thickness.

10.5.3 Care shall be taken to prevent strain of the flanges. All bolts and nuts shall be cleaned and lubricated prior to tightening. Bolts on opposite sides shall be tightened alternately to the torque listed in **paragraph 10.6.4** herein.

10.6 **JOINTING MECHANICAL JOINT PIPE & FITTINGS**

10.6.1 Prior to jointing the pipe and/or fittings, the plain ends of the pipe and the bells of the pipe and fittings shall be thoroughly cleaned using a soapy water and cloth, removing all foreign materials from the bells, especially the gasket seats. When a pipe is being installed in a fitting, the factory bevels shall be removed.

10.6.2 The DI retainer glands shall be placed on the plain end of the pipe or fittings, followed by the rubber gasket, which has been thoroughly cleansed and lubricated with the soapy water.

10.6.3 The plain end of the pipe shall be placed in the bell, to which connection is to be made, and shouldered in back of the bell. The rubber gasket shall be advanced into the bell and seated in the gasket seat; the follower ring shall next be brought into contact with the rubber ring, and all bolts entered and nuts started.

10.6.4 Joints shall be made tight by advancing the nuts with a wrench 180° apart until a tight joint is made. The CONTRACTOR shall provide a "torque wrench" suitable for measuring tension on bolts for at least such a time as the workmen making the joints have gotten the "feel" of the required tension. At no time should handles longer than those supplied by the wrench manufacturer be permitted. The torque range shall be as follows or as directed by the manufacturer:

5/8" bolts	45 - 60 ft. lbs.
3/4" bolts	75 - 90 ft. lbs.
1" bolts	85 -100 ft. lbs.
11/4" bolts	105 -120 ft. lbs.

10.6.5 The rubber gasket and joint bolts of mechanical joint retainer glands shall be installed in accordance with above section. Set screws shall be tightened evenly to approximately 75-foot pounds or as directed by the manufacturer.

10.6.6 The entire follower, retainer gland and all bolts shall be encased in polyethylene material in accordance with **Section 13.11**.

10.7 **PIPE DEFLECTION**

10.7.1 During the pipe laying operation, deflections at joints shall not exceed the amounts indicated by the manufacturer's recommendations.

10.8 **PIPE MATERIAL**

10.8.1 For 12" and larger water and sewer pipes with pipe cover exceeding 14', the DEPARTMENT reserves the right to request geotechnical and design calculations, in accordance with AWWA design manuals. The DEPARTMENT shall be immediately notified if field conditions differ from the design and geotechnical.

SECTION 11 WATER DISTRIBUTION SYSTEM GENERAL INFORMATION

11.1 No water main shall be less than 8" in diameter unless prior approval is obtained in writing from the DEPARTMENT. Variances will be considered, on a case-by-case basis for the reduction of water main sizes.

11.2 The minimum cover over water mains 8" and less shall be 4' minimum. Mains larger than 8" shall have a minimum cover of 5' or as approved by the DEPARTMENT. The minimum cover over water services shall be 24" or as approved by the DEPARTMENT. Minimum cover shall be measured

from the ground surface or the surface of the permanent improvement to the top of the barrel of the pipe, whichever is greater. All depths of water mains shall be approved in advance by the DEPARTMENT.

11.3 In any case of signs, fencing, or structures installed near a water line, at least 5’ of separation between the water line and structure must be maintained. In any case of a permanent building installed near a water line, at least 10’ of separation must be maintained. Any deviation in separation minimums must get the approval of the DEPARTMENT prior to installation.

11.4 There shall be a 5’ minimum separation between the outside edge of a public water main, hydrant lead, fire hydrant, water meter, or other appurtenance to the outside edge of all other utilities within the utility easement. Any deviation must have approval from the DEPARTMENT prior to installation.

11.5 Each component within a project, i.e. water valves, fire hydrants, pipe, etc. shall be homogenous throughout the project and by a single manufacturer. All materials shall be domestically made. All utility mains shall be extended to property lines on all stubbed out streets. Any water main within a project that is stubbed out shall terminate at a fire hydrant assembly with a restrained gate valve connected to the downstream side of the tee. The purpose for the stub-out is to allow for connection to the utility without disturbing the existing development.

11.6 Water easements will be a minimum 20' in width or as directed by the DEPARTMENT. Easements shall be dedicated as utility easements unless required to dedicate for the exclusive use of the water mains. Water lines must be located within the center of the easement or as directed by the DEPARTMENT.

11.7 Fire hydrants shall be installed so that no distance shall be greater than 500’ apart within residential areas and 300’ apart in commercial or mixed developments or as directed by the Fire Department during plan review. Placement of fire hydrants in rural areas shall be installed so that no distance shall be greater than 1000’ apart or as directed by the DEPARTMENT. Densely constructed or industrial sites may need to meet criteria set forth by Fire Department requirements. All considerations involving the physical locations of FDC connections shall be regulated by the Fire Department. New construction of buildings must have a working fire hydrant before structure construction begins. Subject to approval from the Fire Department. Fire hydrants placed in subdivisions need to be installed at the lot line to avoid conflicts with driveways. In a situation where a fire hydrant lead is over 50’ an auxiliary gate valve shall be installed at the fire hydrant.

11.8 End of main fire hydrant locations for main extensions shall be approved by the DEPARTMENT during plan review.

11.9 The hydraulic analysis, design flows, residual pressures and static pressure of the proposed mains shall be provided as requested by the DEPARTMENT. Additional design data may be required if, in the opinion of the DEPARTMENT, it is necessary for review prior to approval of the plans.

11.10 Valves should be located not more than 500’ intervals within residential areas and 300' intervals within commercial areas or as required by the DEPARTMENT. Valves shall be provided at each quadrant of intersecting mains so as to enable two directions of flow throughout the designed system during times of maintenance or emergencies. Valves shall be installed in a manner that connects them to all fittings with an anchor coupling.

11.11 All taps 12” or smaller on existing mains shall be performed by the DEPARTMENT. Taps larger than 12” must be completed by a DEPARTMENT approved contractor, at the developer’s expense, following the procedures outlined in this section. Request for taps to be performed by the DEPARTMENT or approved contractor shall be made at least 24 hours in advance.

CONTRACTOR shall provide material for all taps and shall be responsible for excavation and installation of valve and tapping sleeves unless directed otherwise by the DEPARTMENT. CONTRACTOR shall provide two pressure tests prior to execution of the tap. Two Pressure Tests, as defined herein, at 200 psig with no loss for 15 minutes or in areas of higher pressure test to 1 ½ times the operating pressure with no loss for 15 minutes and shall be witnessed and recorded by the CITY INSPECTOR or DEPARTMENT representative. The first pressure test shall be with the valve closed and without a test plug, and the second pressure test shall be with the valve open and a test plug. Testing equipment shall be inspected by CITY INSPECTOR and shall be in proper working order at time of test. Tap locations on pipe sizes 6" to 12" will be no closer than 24" to the back end of the bell or collar of the pipeline and no closer than 24" from the insertion line on the spigot end of the pipeline. Water lines larger than 12" tap locations will be no closer than 36".

11.12 In no case shall a structure that is independently owned be allowed to connect to the same water service of another independently owned structure. Plumbing systems of two independently owned structures or properties shall not be served by the same water meter. Each individually owned plumbing system will have its own water meter to serve water for its domestic or commercial use. Each independently owned property or structure shall have a direct connection to public water and sewer. A private easement is not an acceptable means to access public water or sewer for new structures or lots. Only when approved as part of the zoning for a planned development shall two properties be served from the same 1" service line supplying water to a double meter set installed on the property line of the adjoining properties. These double meter set installations will only be allowed in these approved developments in cases where no lawns exist and/or a community irrigation system is being provided. All water and sewer service lines shall be inspected by the Bentonville Building Inspection Department.

11.13 All water meter boxes and services shall terminate as indicated on the approved plans or as directed by the DEPARTMENT. The DEVELOPER will provide 1" water service piping to each lot with a minimum single meter set and box. All service lines shall be a minimum size of 1". All 1" service lines shall include 10 gauge solid strand copper tracer wire. All service lines installed shall be backfilled with class 67 bedding as outline in **Detail W02.** Service tap locations on pipe sizes 6" to 12" will be no closer than 24" to the back end of the bell or collar of the pipeline. Water lines larger than 12" service line taps will be no closer than 36".

11.14 All water services shall include a meter yoke, meter box, and lid. All meter sets shall have a minimum 3' service "pig-tail" on the customer's side of the meter connection for each water service. The "pig-tail" shall be placed in such a manner to minimize disturbing meter box in the process of plumber connection. Ensure fiber washers are installed in all meter yokes. All 1" tubing installed for new water services will be one piece installation, no couplings or joining appurtenances permitted unless approved by the DEPARTMENT. In such cases that new 1" water services are to be installed across future streets, 2" conduit shall be installed from 1' back of curb to 1' back of curb on the opposite side of the street. The 1" tubing and 10 gauge tracer wire shall be installed within the conduit. Only one service shall be installed in each conduit. Disclaimer: "pig-tail" belongs to property owner and is not the responsibility of the CITY. Any residential lots in new developments that are 6500 square feet or larger will be required to install a double meter set for the lot and provide a 2 hole lid for the meter box.

11.15 For information related to cross-connection control and backflow prevention rules and regulations, refer to the City of Bentonville's Cross Connection Control Program Manual. **Refer to Cross Connection Control Manual – Sections 20 - 27.**

11.16 The utility main that is stubbed out shall terminate at a manhole for a sewer main or a fire hydrant assembly with a restrained gate valve connected to the downstream side of the tee for a water main. The purpose for the stub-out is to allow for connection to the utility without disturbing the existing development.

SECTION 12 WATER DISTRIBUTION SYSTEM MATERIALS

12.1 ALL MATERIALS SHALL BE DOMESTICALLY MADE

12.1.1 These material specifications are intended to set a standard of quality and design for all materials used in the construction of water mains and appurtenances. Materials shall be of types listed in these specifications. Materials not specifically authorized in these specifications are forbidden for use in the system unless prior approval is obtained in writing from the DEPARTMENT prior to construction.

12.1.2 The DEPARTMENT must approve all material prior to installation. All materials shall meet AWWA specifications.

12.2 PIPE

12.2.1 All pipe furnished shall be designed for the distribution of potable water. Lubricant furnished for lubricating joints shall be non-toxic, shall not support the growth of bacteria, shall have no deteriorating effects on the gasket or pipe material, and shall not impart taste or odor to water. The lubricant container shall be labeled with the manufacturer's name. The DEPARTMENT will determine type and size of pipe to be installed within the water distribution system during plan review.

12.2.2 In areas where the static operating water pressure is 150psi or greater or installation of water mains are within 10' of any permanent structure the DEPARTMENT reserves the right to require ductile iron water piping be installed. Request and approval will be made in the plan review process.

12.3 POLYVINYL CHLORIDE (PVC) WATER PIPE (4" – 12") (14" - 48")

12.3.1 PVC pipe in sizes 4" – 12" shall meet the requirements of AWWA C-900 DR-14 and comply with ASTM D1784 pressure classification rated class 305. Pipe joints shall be integrally molded bell ends in accordance with ASTM 3139 with factory supplied elastomeric gaskets meeting ASTM F477.Pipe to bear NSF-61 seal of approval for potable water. The pipe shall be approved by the Underwriter's Laboratories (UL) for use in underground fire protection service. The pipe shall be extruded from PVC meeting the requirements of cell classification 12454-B as defined in ASTM-D-1784, PVC compounds. The pipe shall be manufactured to cast iron size (C.I.) outside dimensions. Pipe shall bear identification markings that will remain legible during normal handling, storage and installation. Marking on pipe shall include the following and shall be applied at intervals of not more than 5':

(a) Nominal size and OD (DR-14)
(b) PVC
(c) Dimension ratio (DR-14)
(d) AWWA pressure class (for example PVC1120 or PC200)
(e) AWWA designation numbers (AWWA C-900)
(f) Manufacturer's name or trademark and production code
(g) Seal (mark) of the testing agency that verified the suitability of the pipe Material for potable water service. (for example NSF-61 or ULFM)

12.3.2 PVC pipe in sizes 14" – 60" shall meet the requirements of AWWA C-900 DR-21 and comply with ASTM D 1784 pressure classification rated class 200.

12.4 **DUCTILE IRON PIPE (DI)**

12.4.1 The pipe shall have a cement mortar lining and seal coat in accordance with ANSI/AWWA C104 A21. The pipe and flanges shall conform to ANSI/AWWA C111/A21, Class 50 rated at 350 psi unless otherwise specified. Tapping DI pipe shall conform to ANSI/AWWA C600.

12.5 **DUCTILE IRON PIPE 4" - 54"**

12.5.1 DI pipe shall conform to ANSI/AWWA C104/A21 and shall have a cement mortar lining and seal coat conforming to ANSI/AWWA C104/A21. Joints shall conform to ANSI/AWWA C111/A21 and may be mechanical joint or push-on joint unless otherwise specified. The minimum thickness class shall be Class 50 rated at 350 psi unless otherwise specified.

12.6 **CROSS-LINKED POLYETHEYLENE PRESSURE TUBING (PEX)**

12.6.1 Cross-linked Polyethylene Pressure Tubing (PEXa) shall be type A and conform to ANSI/AWWA C904 with an SDR rating of 9 and a MINIMUM pressure class rating of 200 psi. PEXa tubing shall also be certified to standards ASTM F876, NSF 14 and NSF 61, and bear a standard materials designation code of 3306. Shall be standard CTS O.D. and compatible with ANSI/AWWA C800 fittings.

12.7 **COATED COPPER PIPE**

12.7.1 **Coated** copper service pipe shall be Type "K", soft tempered, seamless, for underground installation, in accordance with ASTM B88 and Federal Specifications WW-T-799. Pipe shall be supplied witha minimum 25 mil polyethylene coating. Coated copper pipe shall meet or exceed NSF-61 requirements.

12.8 **ENCASEMENT PIPE**

12.8.1 Smooth Wall Steel Encasement Pipe - Pipe shall conform to ASTM A-139, ASTM A-21.11 or AWWA C200. The metal thickness shall be as shown in the Proposal or Plans.

12.8.2 Casing spacer systems shall be manufactured in two pieces, made from heavy gauge T-304 stainless steel with Polymer Plastic Runners (Teflon). Spacers shall be a Cascade Casing Spacer manufactured by Cascade Waterworks Manufacturing Company or equal conforming to ASTM ratings, approved by AWWA and the DEPARTMENT. Casing and utility pipes shall be sealed with synthetic rubber end seals. **Detail GWS01**.

12.8.3 Any bell located within an encasement pipe shall be restrained by an approved method.

12.8.4 Encasement for service lines crossing city streets shall be HDPE SDR9 tubing or schedule 40 pvc, suitable for underground use. End seals or other acceptable means of preventing service tubing from contacting end of conduit and preventing debris from entering the conduit shall be provided. 1-inch service lines shall require 2-inch encasement, and 2-inch service lines shall require 4-inch encasement.

12.9 **FITTINGS**

12.9.1 DI fittings shall be designed for working pressure of at least 350 psi, shall be DI and shall conform to ANSI/AWWA C153 A21. Joints shall be mechanical joint conforming to ANSI A21.11. All fittings shall be furnished with gaskets and mechanical joint fittings shall be furnished with bolts, nuts and retainer glands. All fittings shall be ANSI/AWWA C550 AND C116 6-8 mil Nominal Thickness Fusion Bonded Epoxy Coated inside and out. Fittings shall be manufactured by U.S.

Pipe “TRIM TYTE”, Tyler, Star Pipe Products, or approved equal. Any alternate manufacturer shall require DEPARTMENT approval prior to installation.

12.9.2 Mechanical Joint Retainer Glands shall be installed on all water line valves bends and couplings. Mechanical Joint Retainer Glands for DI shall be made from DI and shall be designed for a working pressure of at least 200 psig. The set screws shall be extended through the outer most part of the gland. Glands shall be designed to standard mechanical joint fittings (AWWA C111). The minimum number and minimum size set screws shall be as follows, or approved equal. Any alternate manufacturer shall require Department approval prior to installation:

Size Gland	Size Set Screw	Number of Set Screws
4"	1/2"	4
6"	5/8"	6
8"	5/8"	9
10"	5/8"	16
12"	5/8"	16
16"	5/8"	24
20"	5/8"	28
24"	5/8"	32

DESCRIPTION	SIZE	CATALOG NUMBER	MANUFACTURER
Gland Retainer (Series 1400)	18”	UFR1400-D18	Ford
Gland Retainer (Series 1100)	18”	1118	EBBA
Gland Retainer (Series 1400)	12”	UFR1400-D12	Ford
Gland Retainer (Series 1100)	12”	1112	EBBA
Gland Retainer (Series 1400)	8”	UFR1400-D8	Ford
Gland Retainer (Series 1100)	8”	1108	EBBA
Gland Retainer (Series 1400)	6”	UFR1400-D6	Ford
Gland Retainer (Series 1100)	6”	1106	EBBA
Gland Retainer (Series 1400)	4”	UFR1400-D4	Ford
Gland Retainer (Series 1100)	4”	1104	EBBA

12.9.3 Mechanical Joint Retainer Glands for PVC shall be made from DI and shall be designed for a working pressure of at least 200 psi. The set screws shall be extended through the outer most part of the gland. Glands shall be designed to standard mechanical joint fittings (AWWA C111).

DESCRIPTION	SIZE	CATALOG NUMBER	MANUFACTURER
Gland Rtnr.C900 Circle-Lock	18”	UFR1500-C-18	Ford
Gland Retainer (Series 2000 PV)	18”	2018	EBBA
Gland Retainer C900 Circle-Lock	16”	UFR1500-C-15	Ford
Gland Retainer (Series 2000 PV)	16”	2016	EBBA
Gland Retainer C900 Circle-Lock	12”	UFR1500-C-12	Ford
Gland Retainer (Series 2000 PV)	12”	2012	EBBA
Gland Retainer C900 Circle-Lock	8”	UFR1500-C-8	Ford
Gland Retainer (Series 2000 PV)	8”	2008	EBBA
Gland Retainer C900 Circle-Lock	6”	UFR1500-C-6	Ford
Gland Retainer (Series 2000 PV)	6”	2006	EBBA
Gland Retainer C900 Circle-Lock	4”	UFR1500-C-4	Ford
Gland Retainer (Series 2000 PV)	4”	2004	EBBA

12.9.4 Swivel hydrant adapters, anchor couplings, and Tees shall be designed for a working pressure of at least 250 psig and to fit standard mechanical joint fittings (ANSI/AWWA C111 A21). One end of the straight anchor coupling and the branch of the tee shall be provided with a gland that may be rotated 360° on the fitting. Lengths of swivel adapter shall be as specified on plans and conform to standard manufactured lengths.

12.10 TAPPING SLEEVES (4" TAP & LARGER)

12.10.1 Tapping Sleeves shall be stainless steel. They shall be designed for a working pressure of at least 200 psig. Steel sleeves shall be stainless steel or coated with high build, Thermo-Set Epoxy. A test plug shall be furnished through the body for hydrostatic pressure testing. The outlets shall conform to ANSI B16.1, Class 125 flanges designed to accept tapping valves described herein. All bolts shall be of corrosion resistant alloy. Sleeves may be designed for a water tight seal by the use of mechanical followers or by the use of a gasket placed in a recess between the sleeve body and the pipe barrel. Only sleeves with mechanical followers or full circle gaskets may be used. If the known working pressure of the pipe to be tapped is greater than 200 psig the DEPARTMENT may require a MUELLER H-615 Series Tapping Sleeve.

DESCRIPTION	SIZE	CATALOG NUMBER	MANUFACTURER
Tapping Sleeves:	Stainless Steel w/Carbon Steel Flange for AC		
Sleeve	16 x 6	Fast-1900-6A 18.60-1900 OD Rough Barrel AC	Ford Meter
Sleeve	16 x 8	Fast-1900-8A 18.60-1900 OD Rough Barrel AC	Ford Meter
Sleeve	16 x 12	Fast-1900-12A 18.60-1900 OD Rough Barrel AC	Ford Meter
Sleeve	12 x 12	FAST-1440-12A	Ford Meter
Sleeve	12 x 8	FAST-1440-8A	Ford Meter
Sleeve	12 x 6	FAST-1440-6A	Ford Meter
Sleeve	8 x 8	FAST-945-8A	Ford Meter
Sleeve	8 x 6	FAST-945-6A	Ford Meter
Sleeve	6 x 6	FAST-750-6A	Ford Meter
Tapping Sleeves:	Stainless Steel w/Carbon Steel Flange for CI/C900		
Sleeve	24 x 4	Fast-2600-4A	Ford Meter
Sleeve	24 x 6	Fast-2600-6A	Ford Meter
Sleeve	24 x 8	Fast-2600-8A	Ford Meter
Sleeve	24 x 12	Fast-2600-12A	Ford Meter
Sleeve	18 x 6	Fast-1992-6A	Ford Meter
Sleeve	18 x 8	Fast-1992-8A	Ford Meter
Sleeve	18 x 12	Fast-1992-12A	Ford Meter
Sleeve	16 x 8	FAST-1780-8A	Ford Meter
Sleeve	16 x 6	FAST-1780-6A	Ford Meter
Sleeve	12 x 12	FAST-1350-12A	Ford Meter
Sleeve	12 x 8	FAST-1350-8A	Ford Meter
Sleeve	12 x 6	FAST-1350-6A	Ford Meter
Sleeve	8 x 8	FAST-945-8A	Ford Meter
Sleeve	8 x 6	FAST-945-6A	Ford Meter
Sleeve	6 x 6	FAST-730-6A	Ford Meter
Sleeve	4 x 4	FAST-620-44A	Ford Meter

Tapping Sleeves: Stainless Steel

Sleeve	4”	SST OR SSTIII	Romac
Sleeve	6”	SST OR SSTIII	Romac
Sleeve	8”	SST OR SSTIII	Romac
Sleeve	10”	SST OR SSTIII	Romac
Sleeve	12”	SST OR SSTIII	Romac
Sleeve	16”	SST OR SSTIII	Romac
Sleeve	18”	SST OR SSTIII	Romac
Sleeve	24”	SST OR SSTIII	Romac

12.11 SLEEVES OR COUPLINGS

12.11.1 Sleeves shall be iron with mechanical joint followers. Couplings shall be steel or iron with gasketed ends. They shall be designed for a working pressure of at least 200 psig and sized to properly fit the type and class of pipe specified. All bolts shall be of corrosion resistance alloy. Steel couplings shall be coated internally and externally with high build, high strength, Thermo-Set epoxy coating. The Thermo-Set epoxy coating shall be 8 - 10 mils DFT and free of voids. Or approved equal, prior to construction.

DESCRIPTION	SIZE	CATALOG NUMBER	MANUFACTURER
Transition Couplings:			
Comp Coup AC/CI	16 x 12	442-19201780-400	Smith-Blair
Comp Coup AC/CI	12 x 12	442-14401350-400	Smith-Blair
Comp Coup AC/CI	8 x 12	442-09850945-400	Smith-Blair
Comp Coup AC/CI	6 x 12	442-07650722-400	Smith-Blair

12.12 TAPPING SADDLES OR SLEEVES (FEMALE IRON PIPE OR AWWA CC OUTLET)

12.12.1 Tapping Saddles/Sleeves shall be made from iron, bronze, steel or stainless steel and designed for a working pressure of at least 200 psig. Outlets shall be ANSI B16.1, Class 125 flanged tapping outlets, or as specified. Watertight seal shall be accompanied by the use of a gasket placed in a recess between the sleeve body and pipe barrel. The use of these Strap Saddle/Sleeves is restricted to taps where the branch is at least one size smaller than the run. Coatings on steel sleeves/saddles shall be as specified in **Paragraph 12.10** above.

DESCRIPTION	SIZE	CATALOG NUMBER	MANUFACTURER
Service Saddle, C.I., D.I., A.C.			
Saddle	24 x 2 IP Double Strap	FC202-2650xIP7	Ford Meter
Saddle	18 x 2 IP Double Strap	FC202-2050xIP7	Ford Meter
Saddle	16 x 2 IP Double Strap (CI)	FC202-1840xIP7	Ford Meter
Saddle	16 x 2 IP Double Strap (AC)	FC202-1925xIP7	Ford Meter
Saddle	12 x 2 IP Double Strap	FC202-1438xIP7	Ford Meter
Saddle	12 x 2 PVC Only	FC202-1320-IP7 FOR C900	Ford Meter
Saddle	8 x 2 IP Double Strap	FC202-979xIP7	Ford Meter
Saddle	8 x 2 PVC Only	FC202-905-IP7 FOR C900	Ford Meter
Saddle	6 x 2 IP Double Strap	FC202-760xIP7	Ford Meter
Saddle	6 x 2 PVC Only	FC202-690-IP7 FOR C900	Ford Meter
Saddle	4 x 2 IP Double Strap	FC202-526xIP7	Ford Meter

Saddle	24 x 1 CC Double Strap	FC202-2650xCC4	Ford Meter
Saddle	18 x 1 CC Double Strap	FC202-2050xCC4	Ford Meter
Saddle	6 x 1 CC Double Strap (CI)	FC202-1840xCC4	Ford Meter
Saddle	16 x 1 CC Double Strap (AC)	FC202-1925xCC4	Ford Meter
Saddle	12 x 1 CC Double Strap	FC202-1438xCC4	Ford Meter
Saddle	12 x 1 PVC Only	FC202-1320-CC4 FOR C900	Ford Meter
Saddle	8 x 1 CC Double Strap	FC202-979xCC4	Ford Meter
Saddle	8 x 1 PVC Only	FC202-905-CC4 FOR C900	Ford Meter
Saddle	6 x 1 CC Double Strap	FC202-760xCC4	Ford Meter
Saddle	6 x 1 PVC Only	FC202-690-CC4 FOR C900	Ford Meter
Saddle	4 x 1 CC Double Strap	FC202-526xCC4	Ford Meter
Saddle	3 x 1 CC Double Strap	FC202-425xCC4	Ford Meter
Saddle	2 x 1 CC Double Strap	FC202-250xCC4	Ford Meter

Service Saddle with nylon coating:

Saddle	4 x 2 CC Double Strap	202NS	Romac
Saddle	6 x 2 CC Double Strap	202NS	Romac
Saddle	8 x 2 CC Double Strap	202NS	Romac
Saddle	10 x 2 CC Double Strap	202NS	Romac
Saddle	12 x 2 CC Double Strap	202NS	Romac
Saddle	16 x 2 CC Double Strap	202NS	Romac
Saddle	18 x 2 CC Double Strap	202NS	Romac
Saddle	24 x 2 CC Double Strap	202NS	Romac
Saddle	4 x1 CC Double Strap	202NS	Romac
Saddle	6 x1 CC Double Strap	202NS	Romac
Saddle	8 x1 CC Double Strap	202NS	Romac
Saddle	10 x1 CC Double Strap	202NS	Romac
Saddle	12 x1 CC Double Strap	202NS	Romac
Saddle	16 x1 CC Double Strap	202NS	Romac
Saddle	18 x1 CC Double Strap	202NS	Romac
Saddle	24 x1 CC Double Strap	202NS	Romac

12.13 SERVICE FITTINGS

12.13.1 Water service fittings shall be those manufactured by the following companies, listed below, or approved equal. The screws and/or nuts shall be of corrosion resistant alloy and shall be of Hex Head configuration. Any deviation must have approval from the DEPARTMENT prior to installation.

12.13.2 Service fittings shall only be used as specified to connect the service line to the tap and meter setter or u-branch. No additional fittings shall be used unless specifically approved in writing by the DEPARTMENT. In no instance shall fittings be used to splice or lengthen a service line. The service line shall be one continuous piece of tubing from tap to setter.

12.13.3 Thermoplastic insert stiffeners shall be used with all compression fittings installed on PEX service lines. In no case shall the stiffener extend past the compression cap of the fitting when fully tightened. Stainless steel insert stiffeners shall not be used in any circumstances.

12.13.4 Corporation and curb stops shall conform to AWWA C800 (curb stops shall have 360° rotation of Tee Head) and shall be those manufactured by the company specified, or approved equal, as follows:

DESCRIPTION	SIZE	CATALOG NUMBER	MANUFACTURER
300 Ball Type Corporation Valve	1”	B-25008N	Mueller
		74701BQ 1	A.Y. McDonald
Valve Ball	1”	FB11-444NL	Ford
		76101 1	A.Y. McDonald
Valve Ball	2”	B-11-777SWM-NL	Ford
		76101W 2	A.Y. McDonald

12.13.5 PEX and Copper pipe fittings shall conform to AWWA C800 and shall be those manufactured by the listed manufacturers or approved equal, as follows. Part numbers are provided below allowing the service line to connect to the meter setter or u-branch straight in, at a 45 degree angle, or at a 90 degree angle to minimize deflection of the service line and limit the potential for leaks. The 45 degree connection shall be the standard installation, unless otherwise approved by BWU during plan review or installation of the service.

DESCRIPTION	SIZE	CATALOG NUMBER	MANUFACTURERS
U-Branch	1”x¾”x7-½”	H-15365N	Mueller
		708UFM	A.Y. McDonald
CTS x Male Adapter, Straight	1” x ¾”	H-15428N	Mueller
		74753Q	A.Y. McDonald
CTS x Male Adapter, Straight	1”x1”	H-15428N	Mueller
		74753Q	A.Y. McDonald
CTS x Male Adapter, Straight	2”x2”	H-15428N	Mueller
		74753Q	A.Y. McDonald
CTS x Male Adapter, 45	1” x ¾”	N/A	Mueller
		74750PQ	A.Y. McDonald
CTS x Male Adapter, 45	1”x1”	H-15529N	Mueller
		74750PQ	A.Y. McDonald
CTS x Male Adapter, 45	2”x2”	H-15529N	Mueller
		74750PQ	A.Y. McDonald
CTS x Male Adapter, 90	1” x ¾”	H-15531N	Mueller
		74779MQ	A.Y. McDonald
CTS x Male Adapter, 90	1”x1”	H-15531N	Mueller
		74779MQ	A.Y. McDonald
CTS x Male Adapter, 90	2”x2”	H-15531N	Mueller
		74779MQ	A.Y. McDonald

12.13.6 The following meter setters and meter connection fittings shall conform to AWWA C800 and be those manufactured by the following companies, or approved equal:

DESCRIPTION	SIZE	CATALOG NUMBER	MANUFACTURER
Meter Set w/o Dual Check*	5/8"x¾"x7"	B-2404FN	Mueller
		20-207WXLL 33	A.Y. McDonald
Meter Set w/o Dual Check*	1" x 10"	B-2404FN	Mueller
		20-410WXDD 44	A.Y. McDonald
Meter Set w/o Dual Check	2" X 17"	720R712KWFF775	A.Y. McDonald
(telescoping)**		VBB77-12HB-11-77-EXP-NL	FORD
Meter Set w/o Dual Check	2" X 17"	720B712WWFF775	A.Y. McDonald
(non-telescoping)		VV7712B-1177NL	FORD

*All 5/8" and 1" meter sets shall bebe installed with Mueller End Connection # H-14222N and Mueller End Connection # H-14227N or A.Y. McDonald equal. A fiber washer Mueller # H-48234 or A.Y. McDonald equal shall be set in each end connection of the meter set.

** All new installations of 2" services by contractors shall be the telescoping setter unless approved in writing by the DEPARTMENT during plan review or construction.

12.13.7 Section 12.13 specifically lists all fittings which are allowed for use by contractors in installation of new service lines by part number and size. BWU reserves the right to use additional fittings meeting the general requirements of this section for maintenance and repair of the existing system as necessary. Brass nipples, tees, bell reducers, ells, collars, etc. will be 150# SCH 40 Red Brass with iron pipe threads.

12.14 GATE VALVES

12.14.1 GATE VALVES - 4" THROUGH 18" WITH RESILIENT SEAT

12.14.2 Resilient seat gate valves 4" through 18" shall be designed for a working pressure of 250 psig. Valves shall conform to AWWA C515 (Thin Wall or Lightweight Ductile Spec) with non-rising stem, O-ring stem seals and 2" square operating nut. Valves shall open when the operating nut is turned to the left (counterclockwise). Valve ends shall be as specified. The resilient seat may be bonded or mechanically attached to the gate. All interior metal surfaces shall be coated with a two-part thermosetting epoxy. Gate valves larger than 18" need to be submitted to the DEPARTMENT for approval prior to installation.

12.14.3 Epoxy Coating shall be 8-mils DFT and free of voids.

12.14.4 Tapping valves shall have full size flow way accepting standard size shell cutter.

12.14.5 Valves conforming to these specifications will be accepted from the following manufacturers:

American Flow Control Model # 2500
Clow Valve Company, Model 2638
Mueller Company, Model A2361

12.15 BUTTERFLY VALVES

12.15.1 Butterfly valves shall conform to AWWA C504, having the following features and be approved by the DEPARTMENT prior to installation:

12.15.2 Class 150B

12.15.3 Suitable for complete buried service. Exterior of valve shall be epoxy coated.

12.15.4 Disc may be made from any of the materials as specified in AWWA C504. However, discs made from material other than bronze or stainless steel shall be coated with epoxy material in accordance with **Section 12.15.9**. All other interior surfaces which are not stainless steel or bronze shall also be coated with epoxy material.

12.15.5 Valve resilient seats shall be BUNA-N bonded into a self-retaining recess in the body or a natural rubber molded to an 18-8, Type 304 stainless steel retaining ring secured to the disc by self-setting screws. If the set is attached to the disc, the mating surface to the resilient seat shall be 304 or 316 stainless steel.

12.15.6 Stainless steel shafting. "O-Ring" or split-V shaft seals. Bronze, nylon or Teflon bearings and a "Manual Operator" totally enclosed for buried service shall include the following:

(a) 2" x 2" operating nut
(b) Open counter-clockwise
(c) Operators of the traveling nut type shall not have u-joints on the rods.
(d) On operators composed of worm gears; worm gears may be either bronze or DI and the worms shall be composed of hardened steel.
(e) The operator shall satisfy the valve operating torque requirements for Class 150B valves and the operator input requirements of AWWA C504.

12.15.8 Valve ends shall be as specified. If flange ends are specified, they shall conform to Class 125, ANSI B16.1.

12.15.9 Epoxy Coating for Valve Disc. Before application of coating material, all surfaces of the disc shall be thoroughly cleaned to remove dirt, grease, oil and any other substances; all sharp angles, protrusions or irregularities which would interfere with proper coating coverage shall be removed; and the entire surface grit blasted to white metal in accordance with SSPC Specification SP5 resulting in an anchor pattern of at least 1 mil. Thermo-set epoxy material shall be applied to the sand-blasted surfaces before the white metal begins to oxidize (darken in color). The thermoset epoxy shall be approved for exposure to fluids for human consumption by the Federal Food and Drug Administration. The final DFT shall be at least 8 mils DFT and free of voids. The disc shall be post-cured for a sufficient period of time to assure full polymerization. Polymerization shall be checked by a direct impact test at 60-inch-lb. with no cracking or chipping of the coating. The DFT shall be checked using an accurate magnetic DFT gauge. The entire coated surface shall be checked for voids using a wet sponge type holiday detector. Any area where the DFT is found to be less than 8 mils or where voids were detected shall be re-coated and re-checked. Valves shall be packed for shipment in such manner that the disc coating is protected from damage.

12.16 AIR RELEASE VALVES

12.16.1 Air Release Valves shall be APCO No. 200-A, or approved equal, or as specified.

12.17 VALVE BOXES, LIDS AND EXTENSIONS

12.17.1 Valve boxes shall be Tyler 6850 series or equal with 5 ¼" shafts. Length variable 10 ¼" OD bottom flange, 8" ID Bottom, 7 3/16" OD top, 6 ¾" ID top of 2 section valve box.

12.17.2 Valve box lids shall have a 7 5/16" outside diameter with 6 ½" inside diameter for 5 ¼" valve boxes. The lids shall be marked with "WATER" unless located at the tap for a fire line where a post indicator may not be installed. In this case the lid shall be marked "FIRE" and be painted safety red. The "FIRE" lid shall be locking and require only a wrench to open.

12.17.3 Extension shaft shall be required on any valve that exceeds 4' in depth. Valve stem extensions shall be adequate to transmit full torque required to open valve, and shall be secured to the valve operating nut by set screws not clips. The top of the extension shaft shall be a 2" square AWWA nut. Extensions shall be provided to bring the operating nut to within 4' of grade and have disc attached to hold operating nut in the center of valve box and shall be firmly attached to the valve.

12.17.4 Valve boxes in greenspace shall be surrounded by a precast concrete valve pad at ground level. Pads shall be 24" in diameter with a minimum thickness of 2" at the outside edge and shall be constructed of reinforced concrete with a minimum compressive strength of 4,000 psi. The space between the valve box and the pad shall be grouted with a non-shrink grout.

12.17.5 Valve boxes in or directly adjacent to hardscape where a circular pad would not be suitable for use or would require modification for use shall be surrounded by a cast in place concrete valve pad at finish grade. Pads shall be 18" square pads with a minimum thickness of 4" and shall be constructed of reinforced concrete with a minimum compressive strength of 4,000 psi. A 3/8" expansion joint or other means of isolating the pad from adjacent surfaces shall be provided as necessary.

12.18 METER BOXES, VAULTS AND LIDS

12.18.1 Water meters 5/8" and 1" shall be installed in 18" Carson Industries Oldcastle Plastic Meter Box Body Part #C22002001that are domestically manufactured, or as approved by the DEPARTMENT. Covers shall be cast iron touch read covers, East Jordan #32197099 (single set), or #32197200 (double set) that are domestically manufactured, or as approved by the DEPARTMENT.

12.18.2 Water meters 5/8" and 1" that are installed in non-deliberate and incidental traffic shall be installed with a load bearing meter tile. Water meter installations that fit this criteria will use the DFW Plastics #DFW1800F-18-1ET load rated meter tile. Prior approval for water meters installed in potential traffic loaded areas shall be obtained from the DEPARTMENT during the plan review process.

12.18.3 2" meters shall be installed in 30" outside diameter x 36" deep HDPE meter boxes, East Jordan 38003036, that are domestically manufactured, or as approved by the DEPARTMENT. Covers shall be cast iron touch read covers, East Jordan #32143006 with #32243000 outer ring, that are domestically manufactured, or as approved by the DEPARTMENT. Meter box and outer ring may be ordered together as East Jordan #32243000A05.

12.18.4 All meter vault plans and installations shall be approved by the DEPARTMENT prior to the start of construction. Meter vaults shall not be subject to flooding and shall be watertight to prevent intrusion of water and dirt. The walls of the vault shall extend above the finished grade a minimum of 3" to prevent intrusion of water or dirt. Vault to be installed by CONTRACTOR at OWNER'S expense. **Detail W12.**

12.19 **FIRE HYDRANTS**

12.19.1 All fire hydrants furnished shall be dry barrel hydrants in conformance with AWWA C502, latest revision, for "Dry Barrel Fire Hydrants", and shall be designed for a 250 psig maximum working pressure. All fire hydrants shall be equipped with a safety stem coupling and flange, which are intended to fail upon vehicle impact without damage to the stem or main valve. All fire hydrants shall conform to AWWA C502, the following specifications, and shall be the Traffic Model Fire Hydrant:

Maximum Working Pressure	250 psig
Size of Valve Opening	Minimum 5"
Diameter of Inlet Connection	6"
Type of Inlet Connection	Mechanical Joint
Number & Size of Hose Connections	2 - 2 1/2", 1 - 4 1/2"
Nozzle Arrangement	All in same place
Nozzle Thread ASA	Standard
Nozzle Cap Chains	Three
Nozzle Cap Washers	Rubber
Barrel	Ductile Iron Pipe
Operating Threads	Oil or Grease Lubricated Seals
Lubrication Chamber	Oil or Grease
Seat Rings	Bronze to Bronze
Direction to Turn to Open	Left (Counter-Clockwise)
Shape & Size of Operating & Nozzle Cap Nut	5-Sided, 1 1/2" from flat to point
Operating Nut	Bronze
Hydrant Shoe	Epoxy Coated
Color above ground - barrel and dome	Industrial Safety Yellow
Color, Nozzle Caps & Top Nut, including shield	Industrial Safety Yellow

12.19.2 Seat must be removable, using a short, lightweight wrench which will fit all depths of bury.

12.19.3 The hydrant shall have a 6" mechanical joint inlet in conformance to the dimensions shown in ANSI/AWWA C110 A21, latest revision. The lead pipe from the valve to the fire hydrant shall be an approved Mechanical Joint Swivel Anchor Coupling 6” x 13” Tyler 084150A CL 153 or approved equal for direct connections, or retainer glands as specified by type throughout these specifications. A fire hydrant anchor tee will be required for new main installation as indicated by the DEPARTMENT.

12.19.4 All fire hydrants shall be equipped with a two-piece barrel having a flange at the required elevation to meet the height requirement (18” to 24” from final grade) designated in **Detail WO4**.

12.19.5 All fire hydrant installations shall have 6” gate valve with tracer wire, valve boxes and valve box pads meeting all provisions specified elsewhere in these specifications. Auxiliary gate valves are necessary for fire hydrant leads longer than 50’.

12.19.6 All concrete used for fire hydrant blocking shall be in conformance with the concrete **Section 12.24** of these specifications.

12.19.7 Fire hydrants conforming to these specifications will be accepted from the following manufacturers:

Mueller Super Centurion 250
Clow Medallion.

12.19.8 If a fire hydrant needs to be raised only 1 extension will be approved and all parts shall be manufactured by the same company as the fire hydrant. Generic extension parts shall not be used.

12.20 POLYETHYLENE TUBING MATERIAL FOR PIPE ENCASEMENT

12.20.1 Polyethylene material for the encasement of cast IP (gray or ductile) shall conform to ANSI A21.5 (AWWA C105).

12.20.2 Tape for field application shall be Polyken #900, or Scotchrap #50, or equal, at least 2" wide.

12.21 LOCATOR WIRE

12.21.1 All water mains and sewer force mains, including DI pipe, PEX and copper water services, or other appurtenances installed shall have single #10 gauge type TW (single strand) insulated copper locator wire, on top of pipe and fastened securely with tape every 10' and buried with it. This locator wire shall be installed in conjunction with the main at the same depth as the water main or service.

12.21.2 Locator wire shall not be connected in any way to main or any other underground metal (except other tracer wires). Installation of locator wire shall be tested one time before the first site final. Tracer wire shall be tested after curbs are installed and prior to asphalt. **Section 8**

12.21.3 Wire shall be accessible at all valve boxes and meter boxes and shall extend a minimum of 6" above the valve or meter box, at the main or service, connect all locator wires together so that a continuous electrical path is ensured. Tracer wire shall be installed through the outside of the valve box bottom section then inserted through the inside of the top section of the valve box. A minimum of 6" to maximum of 12" of tracer wire is required to be extended beyond the top of the valve box. **Detail W07.**

12.21.4 To connect locator wires, the wires shall be spliced using a split bolt connector (Blackburn 9H or Kearney KS90) or equal, then covered with electrical plastic tape (Type 3M Scotch 33) so that a waterproof joint is made.

12.22 CONCRETE MATERIAL SPECIFICATIONS

12.22.1 Concrete shall have a 28-day compressive strength of at least 4,000-psi and shall contain not more than six (6) gallons of water per sack of cement, including the water in the aggregates, and not less than six (6) sacks of cement per cubic yard of concrete. A copy of all tickets from concrete company shall be presented to the DEPARTMENT.

12.22.2 Portland cement conforming to ASTM C150, Type 1, shall be used unless the DEPARTMENT approves the use of other types.

12.22.3 Water used shall be clean and free from injurious amounts of oil, acids, alkalis, salt, organic matter, or other deleterious substances.

12.22.4 Fine aggregate shall consist of clean, sound, properly graded sand conforming to ASTM Standard C33 uniformly graded from 100% passing the 3/8" sieve to not more than 8% passing the Number 100 sieve.

12.22.5 Coarse aggregate shall consist of crushed stone, gravel, or other inert material of similar characteristics, having clean, hard, strong, durable, uncoated particles with not more than 5% by weight of soft fragments, ¼ % by weight of clay lumps, and 1% by weight of material removed by decantation, except that when the material removed by decantation consists essentially of crushed

dirt the maximum amount permitted may be increased to 1 ½ % by weight. Aggregate shall conform to ASTM Standard D289. Coarse aggregate may be either of two sizes, 1 ½" and smaller or ¾" and smaller, and shall be graded within the following requirements.

12.23 **PERCENT RETAINED BY WEIGHT**

Maximum size mesh screen (sq. mesh)	0 - 3
Half-Maximum size mesh screen (sq. mesh)	30 - 65
No. 4 Sieve	94 - 100

12.23.1 In no case shall the maximum size aggregate exceed 1/3 of the design thickness of any part of a structure. Coarse aggregate for exposed aggregate surfaces shall be as follows:

Total Retained on 1 1/2" Sieve	- 0 %
Total Retained on 3/4" Sieve	25 - 60%
Total Retained on 3/8" Sieve	70 - 90%
Total Retained on #4 Sieve	95 - 100%

12.24 **CONCRETE PROPORTIONS AND CONSISTENCY**

12.24.1 The proportions of the concrete shall produce a mixture that will work readily, with the placement method most used, into the corners and angles of the forms and around reinforcement. Segregation of materials in the mixture shall not be permitted nor the collection of excess free water on the surface.

12.24.2 The slump of the concrete shall be the minimum that is practicable. When vibrators are used to consolidate the concrete, the slump shall not exceed 4"; otherwise, the slump shall not exceed 6".

12.24.3 The methods of measuring concrete materials shall be such that the proportions can be accurately controlled and easily checked. Measurement of materials for ready-mixed concrete shall conform to Specifications for Ready-Mixed Concrete (ASTM C94).

12.24.4 Ready-mix concrete shall be required and shall conform to ASTM Standard C94 and to applicable portions of these specifications for on-site mixing. The concrete shall be delivered and placed within 1-hour after all materials, including mixing water, shall have been placed in the mixing drum. The CONTRACTOR shall obtain from the supplier of the ready-mixed concrete, the supplier's agreement to inspection by the DEPARTMENT, to the full extent deemed necessary by the DEPARTMENT.

12.25 **CONCRETE TESTING**

12.25.1 As the placement of concrete progresses, the DEPARTMENT may take samples of the concrete for testing. The CONTRACTOR shall provide whatever assistance required by the DEPARTMENT in collecting and preparing samples for testing. Sampling shall be in accordance with ASTM Standard C172.

12.25.2 An independent laboratory in accordance with ASTM Standard C143 shall conduct slump tests.

12.25.3 Compression test specimen shall be prepared and cured in accordance with ASTM Standard C31. Specimens shall be tested in accordance with ASTM Standard C39.

12.25.4 All reinforcing bars shall be "Billet-Steel Concrete Reinforcement Bars" conforming to ASTM Designation A15 or "Rail-Steel Concrete Reinforcement Bars" conforming to ASTM Designation A16. Billet-Steel bars shall be intermediate grade with minimum yield point of 60,000 psi.

12.25.5 All reinforcing bars shall be deformed bars. Deformation shall comply with "Minimum Requirements of the Deformation of Deformed Steel Bars for Concrete Reinforcement - ASTM Designation A305".

12.25.6 When the volume of concrete required at the work site is less than 1/3 cubic yard, mixing may be accomplished by hand tool methods. The concrete shall be mixed in a clean, watertight vessel to the extent necessary to assure that the cement; aggregate and water are thoroughly integrated. The mix shall be at least 1 part Portland cement to 2 parts coarse aggregate, as specified in **Section 12.22.5** and 2 parts sand, as specified in **Section 12.22.4**. Only that amount of water required to provide a stiff, workable mix shall be used. The strength requirements specified in **Section 12.22.1** herein, apply.

SECTION 13 INSTALLATION CRITERIA FOR WATER MAINS AND APPURTENANCES

13.1 CONNECTIONS TO WATER DISTRIBUTION SYSTEM

13.1.1 All connections to or any operations of appurtenances to the existing distribution system must be accomplished in the presence of the CITY INSPECTOR or DEPARTMENT representative.

13.1.2 In cases where completing the connection will disrupt service to customers, the CONTRACTOR shall notify the DEPARTMENT at least 5 days in advance of the work. The customers whose service will be disrupted shall be notified by the CONTRACTOR a minimum of 24 hrs prior to disruption of services. The CONTRACTOR shall plan the work so that disruption of service is held to a minimum. The schedule shall be approved by the DEPARTMENT. **Section 9.3.1**

13.1.3 After connections have been completed, the valves shall be tightly closed. All valve operation shall be performed by the CITY INSPECTOR or DEPARTMENT personnel. At no time shall the CONTRACTOR operate valves or fire hydrants within the water distribution system.

13.1.4 A minimum horizontal distance of 10' should be maintained between water lines, and sewer lines, including edges of manholes or other sources of contamination. Water lines and sewer lines shall not be laid in the same trench except on the written approval of the ADH. Water mains necessarily in close proximity to sewers must be placed so that the bottom of the water line will be at least 18" above the top of the sewer line at its highest point. If this distance must unavoidably be reduced, the water line or the sewer line must be encased in watertight pipe with sealed watertight ends extending at least 10' either side of the crossing Where a water line must unavoidably pass beneath the sewer line, at least 18" of separation must be maintained between the outside of the two pipes in addition to the preceding encasement requirement. Exceptions to this must be approved in writing by the ADH.

13.2 INSTALLATION OF VALVES

13.2.1 Valves shall be joined in accordance with the methods of jointing pipe as specified elsewhere herein. Valve stems shall be plumb and there shall not be any obstructions which will prohibit the installation of valve boxes directly over the stem. For dead-end lines, concrete anchor collars shall be provided around an adjoining length of pipe for all valves. Mechanical joint retainer glands shall be installed on all valves with mechanical joint ends. Valves shall be installed and anchored on all sides of any Cross or Tee application. All valves shall be firmly supported on well compacted approved bedding and completely wrapped in polyethylene tubing material as specified in **Section 13.11**.

13.2.2 Valve boxes shall be installed over the operating nut of each valve and be of adequate length to reach the finished grade. The box cover shall be flush with the final grade. Tracer wire shall be installed through the outside of the valve box bottom section then inserted through the inside of the top section

of the valve box. A minimum of 6" to maximum of 12" of tracer wire is required to be extended beyond the top of the valve box. **Detail W07.**

13.2.3 When the distance between the valve operating nut and the finished surface exceeds 4', a valve stem extension shall be provided. The stem shall be round steel bar stock or steel pipe with a 2" square bar steel operating nut (except 2" valve) attached to the upper end. The stem extension shall be of adequate length to reach from the valve operating nut to a point within 4' of the final grade. A box wrench, 2 1/8" ID square, made from high grade steel 3/16" thick shall be welded * to the lower end of the stem extension which will fit over the valve operating nut. A round center guide made from 3/16" or 1/4" steel plate shall be placed on the valve stem extension approximately 6" from the upper end. The diameter of the guide shall be slightly less than the ID of the valve box. The guide shall be affixed to the stem extension in such a way that it can rotate freely on the stem. A bituminous coating shall be applied to all stem extension pieces.

13.2.3.1 ***NOTE**: Welds on stem extensions (top and bottom nut) shall be 1/8" - 3/16" fillet weld around full circumference, small - large valve stem extension.

13.2.4 Valve stem extensions shall be manufactured by Clow, or equal. Shop drawings shall be submitted to the DEPARTMENT for approval prior to installing the stem extension pieces.

13.3 INSTALLATION OF TAPPING SLEEVES & TAPPING SADDLES

13.3.1 The pipe shall be free of dirt and other debris before attaching tapping sleeve or tapping saddle. That part of the pipe barrel, which will be in contact with the gasket of tapping saddles, shall be smooth.

13.3.2 Tapping saddles or sleeves shall be bolted securely to the pipe. The face of the outlet shall be plumb. Mechanical joint glands for tapping sleeves shall be installed in accordance with **Section 12.9.3** herein. The strap bolts for tapping saddles shall be alternately tightened "snug" and then alternately tightened to a torque as required by manufacturer's requirements.

13.3.3 The tapping valve shall be bolted securely to the tapping sleeve or tapping saddle outlet flange. The tapping valve shall be supported by concrete cap blocks to remove weight from the valve and sleeve or saddle.

13.3.4 After installation of the tapping sleeve or saddle and the tapping valve, the assembly shall be hydrostatically tested at 200 psi for 15 minutes by introducing water through the sleeve or saddle test tap.

13.3.5 All tapping sleeves shall have poured-in-place concrete thrust blocking installed after pressure testing prior to tapping. **Detail GWS02**.

13.3.6 Polyethylene material shall be placed in accordance with **Section 13.11** herein.

13.4 FIRE HYDRANT INSTALLATION

13.4.1 All fire hydrants must have placement approval from the DEPARTMENT.

13.4.2 Hydrants shall be thoroughly cleaned before setting, removing all dirt and foreign matter from the barrel and bottom section up to the main valve. The main valve shall be in the "closed" position and the waste outlet shall be free of any obstructions.

13.4.3 Hydrants shall be located a safe distance from driveways, roadways and sidewalks and in a manner to provide complete accessibility. They shall stand plumb with nozzles at proper elevation and the

steamer/pumper nozzle pointed perpendicular to traffic when hydrant is adjacent to a street, roadway or parking lot drive or toward the protected building unless otherwise directed by the DEPARTMENT**. Detail W04**.

13.4.4 The large diameter nozzle shall be at right angles to the street or fire lane, with the nozzle cap at a minimum of 3' to maximum of 9' from back of curb or edge of any driving surface (measured from the steamer cap nut) or as directed by the DEPARTMENT. Under no conditions will fire hydrants be allowed in the sidewalk or radius, unless otherwise directed by the DEPARTMENT. Fire hydrants placed in subdivisions need to be installed at the lot line to avoid conflicts with driveways.

13.4.5 The CONTRACTOR shall, if necessary, rotate the hydrant barrel or nozzle section at the flanged joint to obtain the desired nozzle position as specified by the DEPARTMENT.

13.4.6 The fire hydrant shoe shall be supported firmly on the bottom and shall be well braced against unexcavated earth with formed and poured concrete blocking on the backside. If considered necessary by the DEPARTMENT, the fire hydrant shall be tied to the branch pipe with suitable rods or clamps. Rods or clamps are to be furnished by the CONTRACTOR without additional compensation.

13.4.7 All mechanical joint fittings shall be properly protected by polyethylene tubing as described in **Section 13.11**.

13.4.8 A drainage bed shall be provided under and around the base of the hydrant of at least 6 cubic feet in volume and extending at least 6" above the weep hole drain outlet and shall consist of Class #67 gravel. As defined in **Section 10.2.1**. Under no circumstances shall the waste outlet on the hydrant or the drainage bed be connected to sewer or storm drainage.

13.4.9 Backfilling and tamping around hydrant barrels shall be continuous in operation.

13.4.10 After installation, it is required that all fire hydrants shall be covered with a water resistant sack to indicate out-of-service. These may be removed after the CITY INSPECTOR or DEPARTMENT has placed the line in service.

13.5 CONCRETE PLACEMENT & FINISHING

13.5.1 All placement of concrete must be in the presence of the DEPARTMENT or representative. The CONTRACTOR is cautioned that he may be required to remove, without compensation, any concrete placed in the absence of the DEPARTMENT or representative.

13.5.2 Equipment for chuting, pumping and pneumatically conveying concrete shall be of such size and design as to ensure a practically continuous flow of concrete at the delivery end without separation of materials. All concrete in reinforced walls and columns shall be poured through tremies unless otherwise permitted by the DEPARTMENT. The free fall of concrete shall be 5' maximum.

13.5.3 Concrete shall be deposited as nearly as practicable in its final position to avoid segregation due to re-handling or flowing. The placing of concrete shall be carried on at such a rate that concrete is at all times plastic and flows readily into the spaces between the bars. Concrete that has been contaminated by foreign material shall not be used, nor shall re-tempered concrete be used.

13.5.4 When placing is once started, it shall be carried on as a continuous operation until placement of the panel or section is complete.

13.5.5 In placing concrete, care shall be taken that the freshly placed mass is so placed and vibrated that there is no tendency for the coarse aggregate to segregate from the mortar, that no rock pockets are left, that the concrete flows readily around the steel and into the extremities of the forms, and the whole freshly-placed mass becomes a plastic jelly-like mass but without free water in appreciable quantity on its surface. No concrete shall be poured without vibration with mechanical or magnetic internal vibrators.

13.5.6 Water shall be removed from place of deposit before concrete is placed unless otherwise permitted by the DEPARTMENT.

13.5.7 Concrete placed directly on the ground shall be placed in the forms on a compacted moist sub-grade and shall be vibrated until mortar covers the entire surface. Vibrating shall be given special attention in order to prevent voids in the concrete.

13.5.8 Concrete after placement and finishing shall be protected from damage while curing. Provisions shall be made for maintaining concrete in moist condition for a period of at least 72 hours after placement.

13.5.9 After removal of forms and finishing, as specified elsewhere herein, backfill shall be placed around the structure and thoroughly compacted.

13.5.10 Forms shall be constructed before placement of any concrete * unless otherwise authorized by the DEPARTMENT.

13.5.10.1 ***NOTE**: Concrete utilized for thrust blocking to be poured against undisturbed earth.

13.5.11 Forms shall conform to shapes, lines, and dimensions of the members as specified on the Plans, or as required to conform to the original shape and dimensions in the case of replacement structures, and shall be sufficiently tight to prevent leakage of mortar. They shall be properly braced or joined together so as to maintain position and shape. They may be constructed of any material with sufficient strength, which will provide the finished work a satisfactory surface and alignment.

13.5.12 Forms shall be removed in such a manner as to insure the complete safety of the structure. When the structure is supported on shores, the removable floor forms, beams and girder sides, and column and similar vertical forms may be removed after 72 hours, providing the concrete will not be injured. In no case shall supporting forms or shoring be removed until members have acquired sufficient strength to support their weight and imposed loads safely.

13.5.13 Forms shall be coated with a form oil before placement of reinforcing steel or concrete. Excessive coating material shall not be allowed to form or stand in puddles in the forms nor allowed to come in contact with concrete against which fresh concrete or reinforcing bars will be placed.

13.6 CONCRETE REINFORCEMENT

13.6.1 At the time concrete is placed, metal reinforcement shall be free from rust scale or other coatings that will destroy or reduce the bond. All bars shall be shop bent, unless otherwise permitted by the DEPARTMENT. No bars partially embedded in concrete shall be field bent except as shown on Plans or as specifically permitted by the DEPARTMENT. Field bonding of rail steel bars will not be permitted.

13.6.2 Metal reinforcement shall be accurately placed according to the Plans or as specified herein and adequately secured in position by concrete, metal, or other approved chairs, spacers or ties.

13.6.3 No splices of reinforcement shall be made except as shown on the Plans, or as specified, or as authorized by the DEPARTMENT. All welding shall conform to the American Welding Society's Recommended Practices for Welding Reinforcing Steel, Metal Inserts and Connections in Reinforced Concrete Construction (AWS D12.1), unless otherwise authorized by the DEPARTMENT. All laps and splices shall be in accordance with ACI 318, using f'_c = 3,000 psi and f_y = 60,000 psi unless otherwise shown on the Plans.

13.6.4 The reinforcement shall be protected by the thickness of concrete indicated in the Plans. Where not otherwise shown, the thickness of concrete over the reinforcement shall be as follows:

(a) Where concrete is deposited against the ground without the use of forms not less than 3", except wire mesh reinforcement for concrete slabs which may be within 1 ½" of the ground.
(b) Where concrete is to be exposed to the weather or to the ground but placed in forms not less than 2" for bars larger than No. 5 and 1 ½" for No. 5 bars or smaller.
(c) In slabs and walls not exposed to the ground or to the weather - not less than ¾".
(d) In all cases - at least equal to the diameter of the bars.

13.7 CONCRETE COLD-WEATHER REQUIREMENTS

13.7.1 Concrete may be placed when the ambient temperature is at least 35°F and rising, and the concrete is not likely to be subjected to freezing temperatures before final set has occurred. Concrete shall not be placed when the ambient temperature is 40°F and falling,or when the concrete is likely to be subjected to freezing temperatures before final set has occurred. Concrete footings or slabs shall not be placed over frozen ground. The temperatures of the concrete when placed shall not be less than 45°F. Heated materials shall be free of ice, snow and frozen lumps before entering the mixer. Methods and equipment for the heating of materials shall be subject to the DEPARTMENT'S approval. Suitable means shall be provided for maintaining the concrete at a temperature of at least 45°F for not less than 96 hours after placing.

13.7.2 Any and all concrete damaged by freezing shall be removed to the satisfaction of the DEPARTMENT, and replaced, all at the expense of the CONTRACTOR.

13.8 CONCRETE HOT-WEATHER REQUIREMENTS

13.8.1 In hot weather, suitable precautions shall be taken to avoid drying of the concrete prior to finishing operations. Use of windbreaks, sunshades, fog sprays, or other devices shall be provided as directed by the DEPARTMENT.

13.8.2 Concrete deposited in hot weather shall not have a placing temperature that will cause difficulty from loss of slump, flash set, or cold joints. Concrete temperatures shall be less than 90°F unless higher temperatures are permitted by the DEPARTMENT.

13.8.3 The use of additives shall be prohibited unless written approval of its use has been secured, in advance, from the DEPARTMENT.

13.9 CONCRETE THRUST BLOCKS & ANCHOR COLLARS

13.9.1 Concrete thrust blocks and anchors shall be provided along the pipeline in accordance with the construction details, plan sheets, or as directed by the DEPARTMENT. The concrete shall have a 28 day compressive strength of 4,000-psi.

13.9.2 Concrete for thrust blocks shall be placed against undisturbed soil. The excavation shall be hand shaped and free of loose material. Forms shall be used to confine the concrete in areas other than that part that is in contact with undisturbed soil in the direction of the thrust.

13.9.3 No concrete shall be placed around any part of a joint or placed so that it interferes with the removal of any joint accessories such as bolts, followers, threads, collars, couplings, etc. Fire hydrant weep hole drain outlets shall not be restricted.

13.9.4 The top of the concrete thrust block or anchor collar shall be struck off with a wood straight edge or float.

13.9.5 Admixtures are not to be used without the approval of the DEPARTMENT.

13.9.6 All placement of concrete must be in the presence of the CITY INSPECTOR or DEPARTMENT representative. The CONTRACTOR is cautioned that he may be required to remove, without compensation, any concrete placed in the absence of the CITY INSPECTOR or DEPARTMENT representative.

13.9.7 Backfill over concrete thrust blocks or anchor collars shall not be placed before the concrete has attained initial set.

13.9.8 No thrust blocks shall be less than 12" thick between the pipeline or appurtenances and undisturbed soil in the direction of thrust.

13.9.9 The excavation shall be free of water before concrete is placed. Steel reinforcement, as specified on the plans, shall be placed in accordance with **Section 13.6** herein.

13.9.10 The pipe or appurtenances shall be cleaned before placing concrete when the concrete is to be in direct contact with the pipe or appurtenance. Polyethylene plastic shall cover all pipes or appurtenances subject to direct contact with concrete.

13.9.11 The area of contact of the thrust blocks and anchor collars shall be sufficient to resist the thrust. This area will vary depending on the safe bearing value of the soil. Suggested safe soil bearing values are as follows:

TYPE OF SOIL	SUGGESTED SAFE BEARING VALUES (TONS\SQ.FT.)
Solid Rock	25
Hard Slate	6
Medium Shale	4
Soft Shale	2
Dry Clay Gravel	4
Soft Clay	1.5
Dry Sand or Loam	2.5
Wet Clay	0.75

13.9.12 The above values are approximate and will vary considerably and are intended to be used only as a reference. The CONTRACTOR is responsible for determining the soil bearing value or taking other action to assure that the bearing area is adequate to restrain the pipe or appurtenances.

13.9.13 Where the soil is unstable or in the case of recent fill areas, the following procedures shall apply either individually or in a combination:

(a) Thrust blocks shall be of adequate size to restrain pipe or appurtenances by mass alone without depending on horizontal bearing of the soil.
(b) The excavation shall extend deep enough to contact firm soil and the block brought up to the pipe or appurtenances and constructed so that the block acts as a beam and will provide restraint required. Such block shall be reinforced with steel reinforcing bars. **Detail GWS04**.
(c) Anchor blocks shall be constructed in a firm soil and tie rods extended to the pipe or appurtenances. **Detail GWS04**.

13.9.14 Thrust blocks for vertical bends shall be adequate to resist the thrust by mass alone when the thrust is upward.

13.9.15 Thrust blocks and anchor collars shall be adequate to restrain the pipeline and appurtenances at the specified test pressure. The following table lists the resultant thrust at certain fittings at a pressure of 100 psi. In order to determine the thrust at the test pressure these values are to be multiplied by a factor equal to the test pressure divided by 100.

13.10 PRESSURE TABLE

Thrust per 100 psi Pressure

Pipe Diameter	Tees Sq. Ft.	90 Bend Sq. Ft.	45 Bend Sq. Ft.	22½ Bend Sq. Ft.	11¼ Bend Sq. Ft.
4"	1.0	1.0	1.0	1.0	1.0
6"	1.5	2.0	1.0	1.0	1.0
8"	2.5	3.5	1.8	1.0	1.0
12"	6.0	8.0	4.0	2.0	1.5
16"	10.0	14.2	7.0	4.0	3.0
18"	21.0	21.0	12.0	6.0	4.0

13.10.1 Concrete thrust blocks or anchor collars that fail to restrain the pipe or appurtenances shall be replaced by the CONTRACTOR at his expense.

13.11 INSTALLATION OF POLYETHYLENE PROTECTION MATERIAL

13.11.1 Polyethylene material ANSI A21.5 (AWWA C105), shall be in tubing form or in the form of flat sheet or rolls, as specified herein, shall be placed around all mechanical joints of pipe and fittings; all valves and fire hydrants with mechanical joint ends and all saddles, sleeves, and couplings, tapping saddles and any other appurtenances with exposed bolts.

13.11.2 Pipe-shaped appurtenances - bends, reducers, offsets and other pipe-shaped appurtenances shall be covered with polyethylene in the same manner as the pipe.

13.11.3 Odd-shaped appurtenances - valves, tees, crosses and other odd-shaped pieces which cannot practically be wrapped in a tube, shall be wrapped with a flat sheet or split length of polyethylene tube. The sheet shall be passed under the appurtenance and brought up around the body. Seams shall be made by bringing the edges together, folding over twice, and taping down. Tape polyethylene securely in place at valve stem and other penetrations.

13.11.4 Where specified in the Plans, DI pipe and appurtenances shall be completely encased in polyethylene tubing material. It is not the intent that the material form an enclosure that is absolutely air or water tight, but to prevent pipe to soil contact.

13.11.5 Polyethylene tubing, when required, shall be applied to water lines by one of the following methods:

(a) Method "A" - Cut polyethylene tube to a length approximately 2' longer than the length of the pipe section. Slip the tube around the pipe centering it to provide a 1' overlap on each adjacent pipe section, and bunching it accordion fashion lengthwise until it clears the pipe ends. Lower the pipe into the trench and make up the pipe joint with the preceding section of pipe. A shallow bell hole must be made at joints to facilitate installation of the polyethylene tube. After assembling the pipe joint, take bunched polyethylene from the preceding length of pipe, slip it over the end of the new length of pipe and secure in place. Then slip the end of the polyethylene from the new pipe section of the end of the first wrap until it overlaps the joint at the end of the preceding length of pipe. Secure the overlap in place. Take up the slack width to make snug, but not tight, fit along the barrel of the pipe, securing the fold at quarter points with tape.

(b) Method "B" - Cut polyethylene tube to a length approximately 1' shorter than the length of the pipe section. Slip the tube around the pipe, centering it to provide 6" of bare pipe at each end. Make polyethylene snug, but not tight; secure ends. Before making up a joint, slip a 3' length of polyethylene tube over the end of the preceding pipe section, bunching it accordion fashion lengthwise. After completing the joint, pull the 3' length of polyethylene over the joint, overlapping the polyethylene previously installed on each adjacent section of pipe by at least 1'; make snug and secure each end.

13.11.6 Openings in Tubing Material - openings for branches, service taps, blow-offs, air valves, and similar appurtenances shall be made by making a x-shaped cut in the polyethylene and temporarily folding the film back. After the appurtenance is installed, tape the slack securely to the appurtenance and repair the cut, as well as any other damaged areas in the polyethylene with tape.

13.11.7 Junctions between Wrapped and Unwrapped Pipe - Where polyethylene wrapped pipe joins a pipe, which is not wrapped, extend the polyethylene tube to cover the unwrapped pipe a distance of at least 2' and secure the end.

13.11.8 The polyethylene material shall be secured around the pipe and appurtenances by at least 3 circular wraps of tape. Tape for field application shall be Polyken #900, or Scotchrap #50, or equal, at least 2” wide.

13.11.9 All tongs, cables or chains that are used for lifting pipe and appurtenances that have been encased in polyethylene material shall be adequately padded to prevent damage to the material.

13.11.10 Repair any rips, punctures, or other damage to the polyethylene with tape or with a short length of polyethylene tube cut open, wrapped around the pipe and secured in place.

13.11.11 Polyethylene material shall be stored on the job site in such a manner that it is not exposed to direct sunlight. Exposure during installation shall not exceed 48 hours.

13.11.12 Backfill material shall be the same as specified for pipe without polyethylene wrapping. Special care shall be taken to prevent damage to the polyethylene wrapping when placing backfill. Backfill material shall be free from cinders, refuse, boulders, rocks, stones and/or other material that could damage polyethylene.

13.12 METER CONNECTIONS

13.12.1 All meter sets shall be provided with approved washers at both ground union connections.

13.12.2 All fittings shall be sealed using approved pipe sealant or Teflon tape.

13.13 FILLING WATER LINES

13.13.1 After the water lines and appurtenances have been installed, all concrete thrust blocking has cured adequately and upon approval of the CITY INSPECTOR or DEPARTMENT, the water lines shall be filled with water.

13.13.2 In order to prevent circulation of water through the new water lines back into the distribution system, only one valve shall be opened to allow water to flow into the new water lines. This valve will be tightly closed after the filling operation has been completed.

13.13.3 The valve operated to fill the water lines shall be operated slowly and shall not be fully opened. All water valve and fire hydrant operation shall be performed by the CITY INSPECTOR or DEPARTMENT representative.

13.13.4 All air shall be expelled from the pipeline by opening fire hydrants and/or other openings installed at the pipeline crests by the CONTRACTOR. The location and number of such openings shall be as shown on the Plans or as directed by the DEPARTMENT.

13.14 HYDROSTATIC PRESSURE AND LEAKAGE TESTS

13.14.1 All water lines and appurtenances shall be tested by a hydrostatic pressure testafter all trenching or boring has been completed in area of water main or water services, this includes the installation of electric conduit. The hydrostatic test pressure shall not be less than 1.25 times the stated anticipated maximum sustained working pressure of the pipeline measured at the highest elevation along the test section and not less than 1.5 times the stated sustained working pressure at the lowest elevation of the test section, in accordance with AWWA standards. In no case shall the test pressure exceed the rated working pressure for any joint, thrust restraint, valve, fitting, or other connected appurtenance of the test section. The ENGINEER shall specify the appropriate minimum test pressure on the utility plan.

13.14.2 After the water lines or isolated sections of the pipeline have been filled with water, the pressure shall be increased to the test pressure by means of a pump. The leakage test shall be in accordance with the AWWA Manual of Water Supply Practice. The manual shall be chosen based on pipe material being tested. Concrete Pressure Pipe (M9), Steel Pipe (M11), PVC Pipe (M23), Ductile-Iron Pipe (M41), and PEX Pipe (M55).

13.14.3 The CONTRACTOR shall furnish a pump with meter on discharge side of pump and a 4” gauge in 2 lb. increments, and all labor for conducting the tests.

13.14.4 The duration of the hydrostatic leakage test shall be 2 hours or as specified by the CITY INSPECTOR or DEPARTMENT representative.

13.14.5 The source of water for the pump suction shall be potable water from the DEPARTMENT’S distribution system. The vessel used must be approved by the CITY INSPECTOR or DEPARTMENT representative.

13.14.6 All interior valves including valves on fire hydrants and other appurtenances shall be open during all tests.

13.14.7 The maximum leakage per hour for DI and PVC shall be as calculated from the following formula (All rubber gasket or 0-ring joints):

$$L = \frac{SD\sqrt{\quad}(P)}{148{,}000}$$

L = allowable leakage, (gallons per hour)
S = Length of pipe tested, in feet
D = nominal diameter of pipe, (inches)
P = average test pressure during leakage test, (psig)

13.14.8 After the specified test pressure has been applied the entire pipeline shall be checked in the presence of the CITY INSPECTOR or DEPARTMENT representative. After the CONTRACTOR has taken the necessary action to repair or replace any part of the pipeline or appurtenances where leaks were apparent or if no leaks were apparent, the water lines shall be subjected to a leakage test at the pressure specified with a meter inserted in the test pump discharge line.

13.14.9 If any test of pipe laid discloses leakage greater than the allowable leakage as calculated from above formula or table, the CONTRACTOR shall, at his expense, locate the leak or leaks and perform whatever work and/or replace whatever material that is required in order to remedy the defect and stop the leak. After corrective work has been completed, the section of line replaced or repaired shall be re-tested. All corrective work must be approved by the DEPARTMENT.

13.14.10 Prior to the pressure test, the ENGINEER shall present an allowable leakage report to the CITY INSPECTOR.

13.15 DISINFECTING WATER LINES AND APPURTENANCES

13.15.1 Disinfection of water lines shall be performed in accordance with AWWA C651.

13.15.2 The CONTRACTOR shall construct blow-offs and sample points, as shown on the Plans or as directed by the CITY INSPECTOR or DEPARTMENT. Temporary blow-offs shall be utilized as sample points. Openings for sample points shall be 1" with polyethylene riser pipe that extends well above the surface, **Detail W01**. The lines shall not be considered acceptable until 2 consecutive samples are negative of bacteria. Water samples are only taken on Monday's, Tuesday's, Wednesday's and Thursday's.

13.15.3 The continuous feed method is the only acceptable method for disinfection and sterilization. The DEPARTMENT shall approve any method other than the continuous feed method. The continuous feed method using liquid chlorine or granulated minimum of 60% available chlorine calcium hypochlorite. Liquid chlorine shall be used only when the CONTRACTOR has suitable equipment available and employees who are familiar with the physiological, chemical and physical properties and who are properly trained and equipped to handle any emergency that may arise. If, in the opinion of the CITY INSPECTOR or DEPARTMENT, the equipment is inadequate or the personnel are not qualified, this method shall not be used.

13.15.4 When the continuous feed method is to be used, the pipelines and appurtenances shall be thoroughly flushed prior to disinfecting. The flushing plan shall be approved by the CITY INSPECTOR or DEPARTMENT. The DEPARTMENT may halt or reduce flushing when required.

13.15.5 The operation of valves or fire hydrants for this method shall be performed by the CITY INSPECTOR or DEPARTMENT Representative.

13.15.6 The CONTRACTOR is reminded that chlorine is a powerful oxidant and reacts readily with foreign substances. All chlorine compounds shall be handled and stored in accordance with manufacturer's recommendations. Breathing of chlorine gas can be fatal. Hypochlorite solutions should not come into contact with skin or clothing. Containers used for mixing hypochlorite solution shall be clean and dry.

13.15.7 When the continuous flow method is used, the final concentration of chlorine inside the main shall be 50 parts per million and remain at this strength for a period not less than 24 hours. Calcium hypochlorite shall contain minimum 60% available chlorine by weight in granular form.

13.15.8 During application of any chlorine solution, The CITY INSPECTOR or DEPARTMENT Representative shall be present to operate valves to ensure that the solution does not flow back into the distribution system.

13.15.9 The procedure for disinfecting by the continuous flow method shall be as follows:

(a) The flow through the pipeline and the solution flow shall be regulated so that the required concentration of chlorine is attained. The flow through the main shall be measured by using a pitot gauge or meter.
(b) The introduction of the solution shall be continuous until the desired concentration is attained throughout the pipeline system. The concentration shall be checked by the Drop Dilution Method.
(c) After the required concentration has been attained all internal valves shall be operated in order to assure that the solution comes in contact with all appurtenances.
(d) The solution shall remain in the pipeline system for 24 hours after which the pipelines shall be thoroughly flushed. The chlorine concentration shall be checked before flushing. If the concentration is less than 25 parts per million, the disinfecting procedure shall be repeated if directed by the CITY INSPECTOR or DEPARTMENT representative. Extreme caution shall be taken to ensure solution does not run into a stream or pond.

13.15.10 If any of the samples collected are positive of bacteria, the disinfecting procedures shall be repeated as directed by the DEPARTMENT until negative samples are collected and approved by the ADH.

13.15.11 The cost of continuous sampling and flushing of water may be charged to the CONTRACTOR.

13.16 CLEANING LARGE PIPELINES

13.16.1 Before disinfection, hydrostatic pressure and leakage testing **- Sections 13.14 & 13.15**, water lines 16” in diameter and larger or any other water line required by the DEPARTMENT shall be cleaned by forcing a resilient high density Polyurethane foam "cleaning pig" through each segment of the pipeline by water pressure to remove any dirt or other foreign matter from the pipeline. The "pig" shall be Style III, Type C (blue, plain criss-cross), manufactured by Knapp, Inc., Houston, Texas, or equal, in good condition and shall be at least 2% larger in diameter than the ID of the pipeline being cleaned.

13.16.2 The "pig" shall be inserted in the first length of pipe installed in each segment of pipeline. After installation of the pipeline segment to be cleaned, the pipeline shall be filled at a point downstream of the "pig". The "pig" shall be forced through the pipeline by applying water pressure to the rear of the "pig" and opening blow-off valves or fire hydrants downstream of the "pig". Valve at blow-off points shall be closed immediately prior to the "pig" passing.

13.16.3 Based on past experience, the "pig" will negotiate bends and tees in the pipeline and may also be forced through the pipeline backward after a pass forward. Openings in the pipeline, as shown on the Plans for removing the "pig", are based on this assumption. If the CONTRACTOR is unable to

clean the pipeline, utilizing the openings provided, additional openings shall be provided by the CONTRACTOR, upon approval of the DEPARTMENT, at the expense of the CONTRACTOR.

13.16.4 If the need for more than one pass of the "pig" through the pipeline is indicated, the CONTRACTOR shall make additional passes as directed by the DEPARTMENT.

13.16.5 Drainage at blow-off points shall be provided so as not to create a nuisance and to avoid property damage.

SECTION 14 WASTEWATER COLLECTION SYSTEM GENERAL INFORMATION

14.1 No gravity sewer main conveying raw sewage shall be less than 8" in diameter unless prior approval is obtained from the DEPARTMENT and the ADH.

14.2 There shall be a 5' minimum separation between the outside edge of a public sewer main to the outside edge of all other utilities within the utility easement. There shall be a 3' minimum separation from the outside edge of a manhole barrel to the outside edge of any other utility within the utility easement. Any deviation must have approval from the DEPARTMENT prior to installation. Sewer STEP systems are prohibited in the City of Bentonville. There shall be no case that a property has an active septic tank directly or indirectly tied to the public sewer system.

14.3 Where the difference in invert elevation between two pipes entering a manhole is 2' or more, and no alternative exists, a drop connection shall be utilized as shown on the standard detail sheets. Internal drop connections may be utilized if top to invert elevation is greater than 15' with the DEPARTMENTS approval. For new manholes and pipes 8" and larger, drop manholes shall have a larger inside dimension than specified as directed by the DEPARTMENT. External drop connections are not permitted for manholes greater than 13' deep.

14.4 The minimum earth cover for sanitary sewer mains shall not be less than 36" from final grade unless there is prior approval from the DEPARTMENT.

14.5 In any case of signs, fencing or structures installed near a public sewer main, at least 5' of separation must be maintained. In any case of a permanent building built near a public sewer main at least a 10' separation must be maintained. Any deviation in separation minimums must get approval from the DEPARTMENT prior to installation or construction.

14.6 Sewer pipe material shall be of the types listed in these specifications. Materials not specifically authorized in these specifications are forbidden for use in the system unless otherwise approved by the DEPARTMENT in writing.

14.7 For maintenance purposes, an access road shall be provided for all off-site sanitary sewer manholes. For the purpose of this section, off-site manhole refers to manholes which are not located within 25' of a public street.

14.8 Access roads shall be a minimum of 12' wide and located within a minimum 20' wide utility and/or access easement. Street curb sections shall be modified to allow access for large vehicles including adequate turning radii. Turning radii shall also be provided to accommodate Department vehicles at any change of direction. Turn-arounds shall be provided at dead-end access roads which change direction and at any point where the slope of the road increases to 10% or steeper. Access roads with slopes up to 10% shall be minimum 6" of ARDOT Class 7 granular base compacted to 95% of standard proctor maximum dry density. Access roads steeper than 10% shall include a minimum 2" thick asphalt surface course in addition to the 6" of granular base mentioned above. Asphalt surface course shall meet the requirements of the current City of Bentonville's Minimum Standards for Streets. A rigid pavement section with equivalent structural number will

be allowed on sections steeper than 10%. Erosion and storm water controls shall be installed to prevent erosion and other road impairment.

14.9 The utility main that is stubbed out shall terminate at a manhole for a sewer main or a fire hydrant assembly with a restrained gate valve connected to the downstream side of the tee for a water main. The purpose for the stub-out is to allow for connection to the utility without disturbing the existing development.

14.10 Location of main extensions to service parcels of property shall be planned so as to minimize the length of building sewer, which must be maintained by the property owner. If sewer stub-outs are provided for each lot in a new development, said stub-out shall be placed on the lowest elevation corner of property.

14.11 In no case shall a residential building be allowed to connect to the same sewer service or building sewer of another private residential building. Each building structure shall have a separate sewer line service from the point of the utility source and in no case be interconnected with the plumbing system of another privately owned property.

14.12 All gravity sewer main extensions without regard to length shall terminate in a standard manhole. Manholes are to be spaced no greater than 400' and shall occur at all changes in direction or grade.

14.13 Sewer easements will be a minimum 20' in width. Easements shall be dedicated as utility easements unless required to dedicate for the exclusive use of the sewer lines. Sewer lines must be located within the center of the easement or as directed by the DEPARTMENT. Recorded utility easement shall be provided to the DEPARTMENT. There shall be a 5’ minimum separation between the outside edge of a public sewer main to the outside edge of all other utilities within the utility easement. Any deviation must have approval from the DEPARTMENT prior to installation. Recorded utility easement shall be provided to the DEPARTMENT.

14.14 Sewer services shall terminate at the building setback or easement. Services shall be located from lot lines as directed by the DEPARTMENT. Placement of service stub-outs should be located on lowest elevation lot corner. Termination of all stub-outs shall be clearly marked 36” above ground with a single 6’ T-Post (painted green) driven in the ground at a minimum of 36”. GPS coordinates for the end of each service shall be provided in a chart on the final as-builts plans. **Section 5**.

14.15 All efforts shall be made to design sewer systems that are accessible for future maintenance. Manholes should be located on or near streets in order to minimize difficulty of routine maintenance and all efforts should be made to eliminate manholes in ditches or drainage areas. Prior approval to locate manholes in surface runoff areas, such as drainage ditches, shall be approved by the DEPARTMENT prior to construction. All manholes located in drainage areas shall be equipped with watertight manhole rings and covers.

14.16 Access to sewer easements shall be reviewed on a case by case basis during plan review.

14.17 Sewer service lines from buildings to sewer mains shall be placed so as not to cross driveways, walks and so as to avoid permanent objects over them.

14.18 The DEPARTMENT shall perform all 4” taps on existing main lines. All 4” services tying into existing sewer infrastructure shall tie into sewer main lines and not manholes. The tap must be located no closer than 18” to the back end of the bell or collar of the pipeline and no closer than 18” to the insertion line on the spigot end of the pipeline. The excavation for a sewer tap must be safe for entry by City Crews and provide at a minimum 12” clear around the tap location in all directions.A 24 hour notice is required for sewer taps.

14.19 All services 6" and larger must tie into a manhole. All expenses for tying sewer services into existing manholes or constructing a new manhole on an existing sewer main for service access are at CONTRACTORS cost. All connections to existing manholes must be completed in accordance with requirement throughout this specification.

14.20 All customers are solely responsible for the maintenance and repair of their property's sewer privately owned service beyond the connection to the city's public sanitary sewer main or manhole, including clearing of any blockages within the service line. The City is responsible only for the public sewer main and the service tap connection; However, reserves the right to access and inspect private sewer services to ensure compliance with applicable specifications and codes in order to protect the integrity of the public sewer system.

14.21 Minimum Slope for Sewer Line Installation Table

Nominal Sewer Main Size	Minimum Slope in Feet Per 100 Feet (m/100 m)
8 inch (200 mm)	0.40
10 inch (250 mm)	0.28
12 inch (300 mm)	0.22
14 inch (350 mm)	0.17
15 inch (375 mm)	0.15
16 inch (400 mm)	0.14
18 inch (450 mm)	0.12
21 inch (525 mm)	0.10
24 inch (600 mm)	0.08
27 inch (675 mm)	0.067
30 inch (750 mm)	0.058
33 inch (825 mm)	0.052
36 inch (900 mm)	0.046
39 inch (975 mm)	0.041
42 inch (1050 mm)	0.037

SECTION 15 WASTEWATER COLLECTION SYSTEM MATERIALS

15.1 ALL MATERIALS TO BE DOMESTICALLY MADE.

15.1.1 All gravity or force sanitary sewer pipe shall be PVC. If it is deemed necessary to install DI pipe, the use of DI pipe shall be subject to approval by the DEPARTMENT prior to installation. The minimum acceptable size of all gravity sewer mains is 8" diameter, unless prior approval is obtained from the DEPARTMENT and the ADH. All pipe installed shall be of the type, size, class and thickness as indicated in these specifications and on the design plans. The design strength of pipe used shall be based on standard Engineering design principles and manufacturer or trade association recommendations. Only pipe materials listed in this section shall be used for sanitary sewer mains and service lines unless specifically authorized by the DEPARTMENT.

15.2 **POLYVINYL CHLORIDE (PVC)**

15.2.1 Pipe shall meet the requirement of SDR-26 Heavy Wall Sewer Pipe and comply with ASTM-3034 and Cell Classification 12454. Pipe joints shall be integrally molded bell ends per ASTM D-3034 Type PSM with factory supplied elastomeric gaskets and lubricant. Pipe shall be continually marked with the following:

(a) Nominal OD
(b) Dimension Ratio (SDR-26)
(c) Notation "Heavy Wall Sewer Pipe"
(d) Cell Classification: 12454
(e) SDR Rating ASTM-D3034
(f) Manufacturer's name or trademark and production code
(g) Seal (mark) of the testing agency that verified the suitability of the pipe. (such as: "PSP")

15.2.2 The DEPARTMENT prohibits all A2000 type or any "profile pipe" use.

15.2.3 Pipe joints shall be integrally molded bell ends per ASTM D 3034, Table 2, with factory supplied elastomeric gaskets and lubricant.

15.3 **DUCTILE IRON PIPE**

15.3.1 Installation of DI pipe shall be installed under the direction of the DEPARTMENT. DI pipe that meets ASTM A746, extra heavy type, inside nominal diameter as specified on plans, bell and spigot end shall be used. Jointing devices ASNI A21.11, rubber gasket joint devices.

15.3.2 All DI pipe and fittings for sewer service shall have an interior epoxy lining. The lining system shall be either Protecto 401 Ceramic Epoxy as manufactured by Vulcan Painters, Inc or Perma-Shield Series 431 manufactured by Tnemec. The lining applicator shall have a successful history of applying linings to the interior of DI pipe.

15.4 **PIPE ACCESSORIES**

15.4.1 If any pipe accessories are necessary the material being used shall be submitted to the DEPARTMENT for approval **prior to** installation. If approval has not been obtained **in writing**, the contractor is at risk of removing any accessory at the DEPARTMENTS discretion.

15.5 **FITTINGS**

15.5.1 All fittings shall be made of the same material as the sewer main whether it is Ductile Iron or Heavy Wall SDR-26. Fittings shall have a push-on gasket seal that will allow for a passing air test. All fittings shall be submitted to the DEPARTMENT for approval **prior to** installation.

15.6 **CLEANOUTS**

15.6.1 Cleanouts are strictly prohibited as a point of entry or maintenance for use in the municipal sewer system. Clean-outs shall be installed on private plumbing only. Entry into the sewer main shall be facilitated by the use of manholes only or as directed by the DEPARTMENT.

15.7 **FORCE MAINS**

15.7.1 All force mains will have a 3' minimum cover of bedding material installed according to **Detail LS09**. The installation of the force main will include a 10 gauge solid strand copper tracer wire with locator ports. The pipe material that is to be usedis C900 Pressure Class 235 psi (DR18)

PVC. Warning tape will need to be installed approximately 6" above the pipe. The warning tape will have "Force Main" written on it in order to identify the pipe. Pipe size shall be a minimum of 4".

15.7.2 Fittings shall be ductile iron, designed for working pressure of at least 350 psi, and shall conform to ANSI/AWWA C153 A21. Joints shall be mechanical joint conforming to ANSI A21.11. All fittings shall be furnished with gaskets and mechanical joint fittings shall be furnished with bolts, nuts and retainer glands. Fittings shall be manufactured by U.S. Pipe "TRIM TYTE", Tyler, Star Pipe Products, or approved equal. Any alternate manufacturer shall require DEPARTMENT approval prior to installation. All fittings shall be provided with a standard exterior asphaltic coating, and lined on the interior with either Protecto 401 Ceramic Epoxy as manufactured by Vulcan Painters, Inc or Perma-Shield Series 431 manufactured by Tnemec.

15.7.3 All manholes at or within 1000' downstream of a force main discharge, or within 500' upstream of a lift station wet well shall be lined with an approved product, and fitted with a composite ring and lid to prevent degradation of the manhole. Refer to manhole material specifications for approved products.

15.8 TRACER WIRE PORTS FOR FORCE MAINS

15.8.1 Tracer wire ports will be located no further apart than 500' and placed at every change in direction. The ports are to be laid out so that they are located by a manhole whenever possible for ease of locating in the event that they get buried. The tracer wire ports will consist of a 4" pipe resting on the bedding material and extending to the final grade elevation. The tracer wire port will include a cast iron lid and an 18" pre-castconcrete pad. The tracer wire will be brought up through the 4" pipe and extend a minimum of 12" out of the top of the pipe. The tracer wire will be installed in a manner that will allow the force main to be located in both directions from the tracer wire port.

15.8.2 Valve boxes shall be Tyler 6850 series or equal with 5 ¼" shafts. screw type, 5 ¼" drop lid with "SEWER" on lid. All valve box material shall be domestically made.

15.9 AIR/VACUUM COMBINATION VALVES FOR FORCE MAINS

15.9.1 Combination Air valves shall be heavy-duty "Universal" style single body units incorporating the functions of an air and vacuum valve with an air release valve in a single housing. Combination Air valves shall release accumulations of air at high points within a pipeline by exhausting large volumes of air as the pipeline is being filled, and then by releasing accumulated pockets of air while the pipeline is in operation and under pressure. Combination air valves shall also be designed to permit large volumes of air to enter the pipeline during pipeline drainage. The air release valves shall be specifically designed to operate with liquids carrying solid particles such as sewage and effluent. The valve body internal metal components shall be cast or fabricated 316 stainless steel. The internal float shall be of 316 stainless steel. No plastic or fiberglass components will be acceptable. The valve shall incorporate an air release orifice of 3/16" or 5/32" for use at 20-200 psi. This orifice shall be located on the outlet of the valve, and shall be drilled in a 316 stainless steel orifice plate that seals against a Buna-N rubber seat. The inlet and outlet size must be nominal, having NPT connections. The valve shall be Crispin "UX Series," or approved equal.

15.9.2 All associated plumbing for installation of air and vacuum release valves shall be 316 stainless steel.

15.10 ENCASEMENT PIPE

15.10.1 Smooth Wall Steel Encasement Pipe - Pipe shall conform to ASTM A-139, ASTM A-21.11. The metal thickness shall be as shown in the Proposal or Plans.

15.10.2 Casing spacer systems shall be manufactured in two pieces, made from heavy gauge T-304 stainless steel with Polymer Plastic Runners (Teflon). Spacers shall be a Cascade Casing Spacer manufactured by Cascade Waterworks Manufacturing Company or equal conforming to ASTM ratings, approved by AWWA and the DEPARTMENT. Encasement spacers shall be sized to eliminate the potential for the sewer main inside the encasement pipe to float. Casing and utility pipes shall be sealed with synthetic rubber end seals. Detail GWS01.

SECTION 16 SEWER MANHOLE INFORMATION AND MATERIALS

16.1 This section covers materials to be used in the construction or modification of standard manholes, drop manholes, watertight manholes, and air/vacuum valve manholes.

16.2 CONCRETE CURING AND COMPOUNDS

16.2.1 Concrete used in the construction of manholes shall conform to the requirements in **Section 12.22.** Curing compounds or covers must be approved by the DEPARTMENT. It is the responsibility of the CONTRACTOR to protect the concrete to prevent cracking during the curing process and to protect the manhole during freezing temperatures. The CITY INSPECTOR shall, at their discretion, prohibit pouring concrete during periods of extreme cold or inclement weather.

16.3 CAST-IN-PLACE-MANHOLES

16.3.1 Cast-in-place manholes shall be constructed of 4,000 psi concrete with the concrete base a minimum thickness of 8" below the invert and shall be poured on undisturbed earth. The base shall extend a minimum of 24” in all directions from the exterior of the manhole barrel. **Detail SS01**.

16.3.2 Concrete shall be deposited evenly distributed in a continuous pour in maximum layers of 18", with each layer vibrated to bond it to the preceding layer.

16.4 DROP TYPE MANHOLES

16.4.1 Drop type manholes installations shall be approved during plan review. **Detail SS02** for interior drop type manholes and **Detail SS03** for exterior drop type manholes.

16.4.2 Internal drops may be constructed in existing manholes if top to invert elevation is 15’ or greater. All requests for internal drop construction shall be approved by the DEPARTMENT. Point of intrusion shall be re-sealed with an approved water stop and grouted in place, the top section fitting shall be an all Hub SDR 26 double sanitary tee with direction of flow pointing downward. Vertical piping will be attached to concrete with 1 ¾” stainless steel bands by 5/8” X 3” stainless steel bolts with expansion anchors. Piping will terminate with a 90º long sweep bend resting on original invert base, fitting will be grouted in place on both sides to support assembly while forming new invert trough. Minimum pipe size for internal drop shall be 6”.

16.5 AIR/VACUUM COMBINATION VALVE MANHOLES

16.5.1 Manholes for air/vacuum combination valves shall be 5’ ID cast-in-place manholes with a 30” composite lid, and shall be lined with an approved product to prevent degradation of the manhole. The manhole shall be centered over the valve and constructed by pouring the walls centered on top of an 18” wide by 12” deep footing of compacted class 7 base. #67 stone bedding shall be provided from a minimum of 12” below the forcemain up to the top of pipe. All other aspects of the manhole not specifically listed in this section shall meet all requirements found elsewhere in these specifications including, but not limited to materials and construction requirements. **Detail LS08.**

16.6 SANITARY SEWER MANHOLE ABANDONMENT

The DEPARTMENT requires the entire removal of the manhole if 5' deep or less. Upon removal of the manhole, all lines going into the manhole are to be cut and filled with 4,000 psi concrete until pipe is full, to not allow any infiltration.

Any manhole that is deeper than 5' is to be abandoned according to **Detail SS07**.

16.7 MANHOLE RINGS AND LIDS

16.7.1 All cast iron manhole rings and lids must be of the best quality gray cast iron, free from cracks, holes, scale, shrinkage, distortion and other defects which might make them unfit for their intended use. They shall have a workmanlike finish, shall be non-rocking, shall have all bearing surfaces machined smooth and shall be of such quality that a blow from a hammer will produce an indentation on a rectangular edge of casting without flaking the metal. Manhole rings and lids shall have a minimum access diameter of 24". The manhole lids shall be of solid construction without any openings other than 2 concealed pick holes which shall be located on direct opposite sides of the manhole lid. The concealed pick holes shall be of such design as not to allow infiltration into the manhole. Manhole lids shall have "SANITARY SEWER" or "CITY OF BENTONVILLE SANITARY SEWER" cast on the lid. Standard manhole rings and lids shall be East Jordan Iron Works Product 00134865A01or approved equal determined by Bentonville Water Utilities, and shall have a combined weight of ring and lid equaling 250 pounds or greater. All rings and lids shall be domestically made. **Detail SS04**.

16.7.2 All composite manhole rings and lids shall be made of fiber-reinforced polymer/composite materials and must pass proof-load testing in accordance with AASHTO M306 standard specifications. Manhole rings and lids shall have a minimum access diameter of 24" or as specified on the plans. The manhole lids shall be of solid construction without any openings other than a concealed pick hole. Concealed pick holes shall be of such design as not to allow infiltration into the manhole. Manhole lids shall have "SANITARY SEWER" molded on the lid. Manhole lids shall be equipped with stainless steel quarter turn latches with a hex head. A neoprene or o-ring gasket shall be provided. Composite rings and lids shall be as manufactured by Composite Access Products or East Jordan, or equal as approved by the DEPARTMENT.

Size	Manufacturer	Product Number
24"	CAP	A-1BK24H2-C01DMDSS-H1
	EJ	COM260262A01
30"	CAP	A-1BK30H2-C01DMDSS-H1
	EJ	COM320131A01
36"	CAP	A-1BK36H2-C01DMDSS-H1
	EJ	COM380278A01

16.8 PRIVATE MANHOLE LIDS

16.8.1 The manholes along private sewer lines shall require lids with "PRIVATE SANITARY SEWER" cast or molded on the lid in addition to meeting all other manhole lid requirements elsewhere in these specifications.

16.9 WATERTIGHT MANHOLE RINGS AND LIDS

16.9.1 Watertight manhole rings and lids where required on the plans by DEPARTMENT, shall be East Jordan Iron Works, Product 00124855W02 or approved equal determined by Bentonville Water Utilities and be domestically made. **Detail SS05**.

16.10 **MANHOLE STEPS**

16.10.1 Manhole steps are strictly prohibited within the Bentonville Wastewater Collection System.

16.11 **WATER STOPS**

16.11.1 Water stops for cast in place pipe connections to new manholes shall be Fernco Concrete Manhole Adapters, or approved equal determined by Bentonville Water Utilities, furnished in the appropriate size for the type and class pipe used. Water stops are required for all sewer pipes entering manhole walls or bases.

16.11.2 Connections to existing manholes shall utilize a domestic Kor-N-Seal wedge style Pipe-to-Manhole connector as manufactured by Trelleborg, or DEPARTMENT approved equal. The connector shall be installed in accordance with the manufacturer's requirements and procedures.

Pipe Size	Series
6" to 15"	106/406
18" +	206

16.12 **MANHOLE CONFIGURATIONS AND CONSTRUCTION**

16.12.1 Manholes shall be of such construction so that the finished manhole will have an ID of 4' 0" plus or minus ½". Concrete used to pour the manhole shall be 4,000 psi with a slump of approximately 3". Wall thickness shall be a minimum of 6". **Detail SS01**

16.12.2 Before the forms are set in place, any water that may have accumulated in the excavated area shall be pumped out.

16.12.3 All manholes shall be a monolithic pour. Pouring the base and walls with one continuous pour. The manhole shall not be backfilled less than 24 hours after the forms have been removed. Extra care shall be taken to compact all backfill to the top of the highest pipe entering the manhole. After these pipes have been put in place, the barrel shall be repaired using a grout mixture. If honeycombing of the barrel is found to be present after removal of the forms, they shall be repaired as directed by the ENGINEER, DEPARTMENT or CITY INSPECTOR.

16.12.4 Manholes greater than 10 feet deep may be poured in two sections with prior approval from the DEPARTMENT. A 3" X 3" construction joint with water stop and #4 rebar on 12" centers shall be provided.Manhole is to be inspected by CITY INSPECTORS before additional pour is done.

16.13 **MANHOLE SHAPE AND INSIDE DIMENSIONS**

16.13.1 Manhole shapes shall be cylindrical and 48" diameter for sewer mains 12" and less, 60" diameter for sewer mains larger than 15" to 24", and 72" diameter for sewer mains larger than 24".

16.14 **MANHOLE DESIGN DEPTH, HEIGHT AND PLACEMENT**

16.14.1 Manhole depth shall be as indicated on plans. The DEPARTMENT requires accessibility to all manholes, the responsible ENGINEER shall design the sanitary sewer system in a manner so as to eliminate backyard placements between buildings, behind permanent structures, or other locations not accessible for normal street side maintenance.

16.14.2 Street side manhole rim elevations shall be 4" above the proposed final grade and offsite or non-street side manhole top rim elevations shall be 12" above proposed final grade. Manhole risers used in vertical adjustment must have Ram-Nek installed with the new riser. It must be heated in

a manner that allows workability so it can be pressed into the receiving ring or inset of additional risers used to achieve proper rim elevation. Any risers added must be seated fully, "squeeze out" is proof of a water tight joint and a proper installation. All manhole rim elevations shall be shown as such on the sewer profile sheet and noted in the general construction notes. The DEPARTMENT, during site final, will address finished manhole elevations and may require additional height elevations. All manholes constructed in ravines, drainage or runoff areas will require the installation of a watertight ring and lid or rim shall be 12" above 100 year flood.

16.14.3 After sewer construction is complete, the vertical adjustment shall be no more than 24" plus the lid. A maximum of (2) risers may be utilized to achieve the 24" of adjustment.Adjustments greater than 24" require the reconstruction of the manhole cone. A cold joint requires installation of a water stop and application of an acceptable lining product extending 1' either side of the joint to prevent infiltration. Refer to manhole lining specifications for approved products.

16.15 MAIN AND SERVICE PIPES

16.15.1 All main and service pipes shall be neatly cut flush with inside of manhole or inlet where they enter structure walls, and correct irregularities and rough edges with non-shrinking grout.

16.16 CONNECTIONS TO MANHOLES

16.16.1 To ensure that pipe will not sag or break immediately adjacent to the manhole, care shall be taken that excavation for the manhole bottom is limited to the area to be filled with concrete. The CONTRACTOR shall support pipe entering the manhole all the way to solid bedding by placing approved backfill under the pipe and up to the mid spring-line with Class B concrete.

16.16.2 Connection of new sewer mains and services to existing manholes in acceptable condition shall be completed by core-drilling the manhole wall and utilizing a Kor-N-Seal connector and non-shrink grout to repair the intrusion. The manhole shall also be lined from invert to 1 foot above the top of the highest intrusion with an acceptable lining product. In the case that a manhole being cored is already lined, the lining shall be repaired in accordance with the original product manufacturers requirements and recommendations. Refer to manhole lining specifications. Manholes core-drilled for new connections shall undergo vacuum testing after installation of the Kor-N-Seal, but prior to installation of non-shrink grout or lining. A vacuum test on the existing manhole is also recommended prior to starting work. A manhole with a passing test prior to work, or where a pre test was not completed will be required to pass a vacuum test when work is complete.

16.17 INVERTS

16.17.1 The invert of the manhole shall be hand-placed and shaped using the same 4,000-psi concrete mixture used to pour the base and walls of the manhole. The invert shall be shaped and smoothed so that the manhole will be self-cleaning and free of areas where solids may be deposited as sewage flows through the manhole and from service lines that enter the manhole base. Inverts shall be shaped, formed and brushed smooth from the concrete poured for the base prior to the initial set of the base. In all cases the diameter of each pipe entering the manhole barrel shall be cut smooth with the inside edge of the manhole barrel and the invert shaped throughout from all inlet pipes to the outside pipe. Shape inverts for smooth flow across structure floor as shown on drawings.

16.18 MANHOLE LINING

16.18.1 When specified, manholes shall be lined with a product or system designed and proven to stop infiltration and prevent biological corrosion in sanitary sewer manholes. The lining shall be applied in accordance with the manufacturer's recommendations, including the preparation and

restoration of the existing structure as necessary. The lining product or system to be used shall be approved in writing by the DEPARTMENT prior to application.

16.18.2 CONTRACTOR shall at its own expense supply the DEPARTMENT with industry standard test results as requested.

16.18.3 All manholes requiring lining shall be constructed with a composite ring and lid. In the event that existing manholes are being lined that do not meet this requirement, it shall be the contractor's responsibility to remove the manhole cone and reconstruct with a composite lid. This remediation shall conform to all requirements in this specification.

16.18.4 The DEPARTMENT reserves the right to require remediation or rehabilitation of existing structures including, but not limited to invert and wall repair, application of cementitious lining, and replacement of ring and lid as deemed necessary by the department prior to application of any approved lining. In cases where the manhole cannot feasibly be rehabilitated, replacement may be required.

SECTION 17 SEWER SYSTEM GENERAL INSTALLATION INFORMATION

17.1 ALL MATERIALS SHALL BE DOMESTICALLY MADE

17.2 FIELD QUALITY CONTROL

17.2.1 Compaction testing will be performed in accordance with ANSI/ASTM D698, ASTM D2922, ASTM D3017 or ASTM D1557.

17.2.2 Test sanitary sewer pipe system installed below grade and outside building in accordance with the following procedures:

(a) The CONTRACTOR shall perform the testing of manhole construction, pipe materials and/or other materials incorporated into the construction of the sanitary sewer system to determine leakage and water tightness. Testing to be supervised by design ENGINEER and inspected by the CITY INSPECTOR.

17.3 AIR TESTING OF GRAVITY SEWER LINES

17.3.1 All gravity sewer lines shall be tested in accordance with the following procedures after all trenching and boring in area of sewer mains and sewer services:

(a) Plug all pipe outlets with suitable test plugs. Brace each plug securely.
(b) Pipe air supply to the pipeline to be tested in such a manner that the air supply may be shut off, pressure observed and air pressure released from the pipe without workmen entering the manhole.
(c) Add air slowly to the portion of pipe under test until the internal pressure of the line is raised to approximately 4 psig but less than 5 psig.
(d) Shut the air supply off and allow at least 2 minutes for the air pressure to stabilize.
(e) When the pressure has been bled down to 3 1/2 psig and stabilized, start the test.
(f) If the pipe section does not decrease from 3.5 psi to 2.5 psi in less time than is allotted the section passes the test.

17.4 GRAVITY SEWER AIR TESTING TIME REQUIREMENTS

Table 1 - Minimum Specified Time Required for a 1.0 psig Pressure Drop for Size and Length of Pipe Indicated for $Q = 0.0015$

Pipe Diameter, In.	Minimum time, min:s	Length for Minimum Time, ft	Time for Longer Length, s	Specification Time for length (L) Show, min:s							
				100 ft	150 ft	200 ft	250 ft	300 ft	350 ft	400 ft	450 ft
4	3:46	597	0.380 L	3:46	3:46	3:46	3:46	3:46	3:46	3:46	3:46
6	5:40	398	0.854 L	5:40	5:40	5:40	5:40	5:40	5:40	5:42	6:24
8	7:34	298	1.520 L	7:34	7:34	7:34	7:34	7:36	8:52	10:08	11:24
10	9:26	239	2.374 L	9:26	9:26	9:26	9:53	11:52	13:51	15:49	17:48
12	11:20	199	3.418 L	11:20	11:20	11:24	14:15	17:05	19:56	22:47	25:38
15	14:10	159	5.342 L	14:10	14:10	17:48	22:15	26:42	31:09	35:36	40:04
18	17:00	133	7.692 L	17:00	19:13	25:38	32:03	38:27	44:52	51:16	57:41
21	19:50	114	10.470 L	19:50	26:10	34:54	43:37	52:21	61:00	69:48	78:31
24	22:40	99	13.674 L	22:47	34:11	45:34	56:58	68:22	79:46	91:10	102:33
27	25:30	88	17.306 L	28:51	43:16	57:41	72:07	86:32	100:57	115:22	129:48
30	28:20	80	21.366 L	35:37	53:25	71:13	89:02	106:50	124:38	142:26	160:15
33	31:10	72	25.852 L	43:05	64:38	86:10	107:43	129:16	150:43	172:21	193:53
36	34:00	66	30.768 L	51:17	76:55	102:34	128:12	153:50	179:29	205:07	230:46

Table 2 - Minimum Specified Time Required for a 0.5 psig Pressure Drop for Size and Length of Pipe Indicated for $Q = 0.0015$

Pipe Diameter, In.	Minimum time, min:s	Length for Minimum Time, ft	Time for Longer Length, s	Specification Time for length (L) Show, min:s							
				100 ft	150 ft	200 ft	250 ft	300 ft	350 ft	400 ft	450 ft
4	1:53	597	0.190 L	1:53	1:53	1:53	1:53	1:53	1:53	1:53	1:53
6	2:50	398	0.427 L	2:50	2:50	2:50	2:50	2:50	2:50	2:51	3:12
8	3:47	298	0.760 L	3:47	3:47	3:47	3:47	3:48	4:26	5:04	5:42
10	4:43	239	1.187 L	4:43	4:43	4:43	4:57	5:56	6:55	7:54	8:54
12	5:40	199	1.709 L	5:40	5:40	5:42	7:08	8:33	9:58	11:24	12:50
15	7:05	159	2.671 L	7:05	7:05	8:54	11:08	13:21	15:35	17:48	20:02
18	8:30	133	3.846 L	8:30	9:37	12:49	16:01	19:14	22:26	25:38	28:51
21	9:55	114	5.235 L	9:55	13:05	17:27	21:49	26:11	30:32	34:54	39:16
24	11:20	99	6.837 L	11:24	17:57	22:48	28:30	34:11	39:53	43:35	51:17
27	12:45	88	8.653 L	14:25	21:38	28:51	36:04	43:16	50:30	57:42	64:54
30	14:10	80	10.683 L	17:48	26:43	35:37	44:31	53:25	62:19	71:13	80:07
33	15:35	72	12.926 L	21:33	32:19	43:56	53:52	64:38	75:24	86:10	96:57
36	17:00	66	15.384 L	25"39	38:28	51:17	64:06	76:55	89:44	102:34	115:23

17.5 HYDROSTATIC PRESSURE AND LEAKAGE TEST OF FORCE MAINS

17.5.1 All force mains and appurtenances shall be tested by a hydrostatic pressure test after all trenching or boring has been completed in area of the force main. The hydrostatic test pressure shall not be less than 1.25 times the stated anticipated maximum sustained working pressure of the pipeline measured at the highest elevation along the test section and not less than 1.5 times the stated sustained working pressure at the lowest elevation of the test section, in accordance with AWWA standards. In no case shall the test pressure exceed the rated working pressure for any joint, thrust restraint, valve, fitting, or other connected appurtenance of the test section. The ENGINEER shall specify the appropriate minimum test pressure on the utility plan.

17.5.2 After the sewer force mains have been filled with water, the pressure shall be increased to the test pressure by means of a pump. The leakage test shall be in accordance with AWWA M23.

17.5.3 The CONTRACTOR shall furnish a pump, and all labor for conducting the test.

17.5.4 The duration of the hydrostatic leakage test shall be 2 hours or as specified by the CITY INSPECTOR or DEPARTMENT representative.

17.5.5 The source of water for the pump suction shall be potable water from the DEPARTMENT'S distribution system. The vessel used must be approved by the CITY INSPECTOR or DEPARTMENT representative.

17.5.6 The maximum leakage per hour for DI and PVC shall be as calculated from the following formula (All rubber gasket or 0-ring joints):

$$L = \frac{SD\sqrt{\quad}(P)}{148{,}000}$$

L = allowable leakage, (gallons per hour)
S = length of pipe tested, in feet
D = nominal diameter of pipe, (inches)
P = average test pressure during leakage test, (psig)

17.5.7 After the specified test pressure has been applied the entire pipeline shall be checked in the presence of the CITY INSPECTOR representative giving particular attention to that part of the pipeline and those appurtenances that are exposed. After the CONTRACTOR has taken the necessary action to repair or replace any part of the pipeline or appurtenances where leaks were apparent or if no leaks were apparent, the sewer force mains shall be subjected to a leakage test at the pressure specified with a meter inserted in the test pump discharge line.

17.5.8 If any test of pipe laid discloses leakage greater than the allowable leakage as calculated from above formula or table, the CONTRACTOR shall, at his expense, locate the leak or leaks and perform whatever work and/or replace whatever material that is required in order to remedy the defect and stop the leak and re-test the line. All corrective work must be approved by the DEPARTMENT.

17.5.9 Prior to the pressure test, the ENGINEER shall present an allowable leakage report to the CITY INSPECTOR.

17.6 TESTING SAFETY PRECAUTIONS

17.6.1 The low-pressure air test may be dangerous to personnel if, through lack of understanding or carelessness, a line is over pressurized or plugs are installed improperly. It is extremely important that the various plugs be installed so as to prevent the sudden expulsion of a poorly inflated plug. As an example of the hazard, a force of 250 pounds is exerted on an 8" plug by an internal pressure of 5 psi. Observe the following safety precautions:

(a) No person shall be allowed in the manholes during the test or when a plugged pipe is under pressure.
(b) Gauges, air piping manifolds and valves shall be located at the top of the ground. Install and brace all plugs securely.

17.7 GROUND WATER ELEVATION

17.7.1 If the pipeline to be tested is below the ground water level, the starting test pressure shall be increased by 0.433 psi for each foot the groundwater level is above the invert of the sewer pipe. In no case shall the starting test pressure exceed 9.0 psig.

17.8 TEST EQUIPMENT

17.8.1 All necessary equipment to perform the air test in accordance with this specification shall be provided by the CONTRACTOR. The test gauge shall be 4" and have incremental division of 0.10 psig and have an accuracy of at least $\pm$ 0.04 psig. In no case shall a test gauge be used which has incremental divisions of greater than 0.25 psig. The gauge shall be of sufficient size in order to determine this accuracy.

17.8.2 The ENGINEER shall furnish one copy of gravity sewer and manhole test results to the DEPARTMENT upon completion of gravity sewer system approval by the CITY INSPECTOR.

17.9 MANDREL TEST

17.9.1 Flexible sewer pipe shall be mandrel tested with a rigid device sized to pass 5% or less deflection (deformation) of the pipe. The base inside diameter, as set forth in Table X1.1 of ASTM D3034 or Table X2.1 of ASTM F679, shall be used to compute the mandrel dimensions. Allowances for ovality (from shipment, heat, shipping loads, poor production, etc.) shall not be deducted from the base ASTM data but shall be counted as a part of the 5% or less deflection allowance. The OD of the mandrel shall be set according to the following table:

NOMINAL DIAMETER (IN)	MANDREL OD (IN)
8"	7.11"
10"	8.87"
12"	10.55"
15"	12.90"
18"	15.85"
21"	18.68"
24"	21.00"
27"	23.65"
30"	27.10"

17.9.2 The mandrel (go/no-go) device shall be cylindrical in shape and constructed with either 9 or 16 evenly spaced arms or prongs. Mandrels with fewer arms will be rejected as not sufficiently accurate. The contact length of the mandrel's arms shall equal or exceed the nominal ID of the sewer to be inspected. Critical mandrel dimensions shall carry a tolerance of $\pm$ 0.01". The mandrel and all necessary equipment for the mandrel test shall be provided by the CONTRACTOR. No handmade mandrel devices shall be used for testing unless prior permission is given by the DEPARTMENT or the CITY INSPECTOR.

17.9.3 The mandrel shall be hand-pulled by the CONTRACTOR through all flexible pipe sewer lines no earlier than 30 days after the trench has been completely backfilled. Any sections of the sewer not passing the mandrel shall be uncovered and the CONTRACTOR shall re-bed, re-round or replace the sewer to the satisfaction of the DEPARTMENT. Any repaired section shall be re-tested.

17.10 MANHOLE VACUUM TESTING

17.10.1 The manhole vacuum test shall be performed with suitable apparatus made for such purpose and shall draw a vacuum of 10" of mercury (Hg). The test shall pass if the vacuum remains at 10" of mercury (Hg) or drops to not less than 9" of mercury (Hg) in one minute. Vacuum test will be performed by construction CONTRACTOR. Test shall be witnessed and documented by CITY INSPECTOR. Responsible ENGINEER shall furnish test result information to the DEPARTMENT. If, after 2 attempts to perform a satisfactory vacuum test have failed, the DEPARTMENT may require that the manhole be removed and re-poured. All sewer services entering the manhole shall be vacuum tested with the manhole.

17.10.2 If existing manhole is to be adjusted – either lowered or raised – and cone is removed – manhole will require a passing vacuum test.

17.10.3 Pre-vacuum testing is recommended on existing manholes. If manhole is cored, a post vacuum test shall be required except for the below circumstances:

If pre-vacuum test passes – a post vacuum test shall pass.
If pre-vacuum test fails – a post vacuum test will not be required.

17.11 CLOSE CIRCUIT TELEVISION INSPECTION – (CCTV)

17.11.1 All sewer mains that are installed as part of a new subdivision or large scale development and for the purpose of becoming part of a public sewer system, maintained by the City of Bentonville will require a Close Circuit Television Inspection (CCTV). The inspection will be performed by City personnel after all other required sewer main line testing has been completed. The inspection consists of hydro-jet cleaning the sewer main line and allowing it to drain for a period of not less than one hour. After the sewer main line has been allowed to drain the CCTV inspection will begin. Defects that will be documented are: Pipe bell ends facing downstream, narrow or rough manhole inverts, misaligned or backward service wyes, loose or missing pipe joint gaskets, pipe joints not fully seated, crushed, or out-of-round pipe and the pooling of water in the pipe and at service wyes, joints and manhole inverts. The camera has been fitted with a measuring device that can determine the depth of the water in the event of any pooling. Any pooling of water that is deeper than ¾" will require the sewer main line to be adjusted to eliminate the problem. The only personnel allowed in the CCTV vehicle during the inspection are City of Bentonville employees.

17.11.2 A pass or fail decision is not made in the field. The camera inspection is recorded on video recording software and then reviewed at the DEPARTMENT. After review of the recording, the comments will be made available to the responsible ENGINEER for the project indicating approval of the sanitary sewer mains or a list of defects that require repair.

17.11.3 All CCTV inspections or re-inspections that are necessary are to be requested in written form by email to the DEPARTMENT by the responsible ENGINEER for the development project. The responsible ENGINEER shall provide accurate record drawing of sewer system, with profiles, at time of CCTV request.

17.11.4 One attempt will be made by City staff to adequately clean new sewer mains for proper CCTV inspection. If during construction sufficient care is not taken to keep rocks, dirt or debris from entering new sewer mains and extra cleaning is necessary, CCTV staff will not complete the inspection. Department personnel will then advise the ENGINEER of record of the condition of the pipe. The contractor shall be responsible for the additional cleaning needs. It will be the ENGINEER of record's responsibility to communicate to the contractor why the inspection was stopped and why they are now responsible for cleaning and removing obstructions in the sewer main. After the contractor has completed the necessary cleanings, the ENGINEER of record will contact the DEPARTMENT and request continuation of the CCTV inspection.

17.11.5 After the completion of the required repairs by the CONTRACTOR, a re-inspection must be performed using the same procedures as for the initial inspection. All re-inspections will be billed to the OWNER/DEVELOPER according to current fee ordinance.

17.11.6 Full CCTV inspection shall be completed and 1st tracer wire inspection shall be completed before site final.

17.12 ACCEPTANCE OF INSTALLATION

17.12.1 No gravity sewer or manhole will be accepted that does not comply with the minimum requirements of tests described within these specifications.

17.13 **WARRANTY**

17.13.1 The DEPARTMENT reserves the right to inspect by mandrel test or camera inspection any sewer line before acceptance, and also prior to expiration of the first year of operation. If a previously accepted line fails an inspection during the first year of operation, the defects must be corrected at the CONTRACTOR/DEVELOPER'S expense.

SECTION 18 SEWER LIFT STATIONS

18.1 The Wastewater Department must approve all plans.

18.1.1 The Wastewater Department lift station details contained in this specifications book are to be used as a guide only. **These details are not to be used as construction plans.**

18.2 **FINAL ACCEPTANCE**

18.2.1 The Wastewater Department, at the DEVELOPER'S expense, will purchase an alarm system at current market price. **This fee is required** and must be paid prior to the final inspection and acceptance of the lift station.

18.2.2 A spare pump must be furnished with each sewer lift station and delivered to the Wastewater Department prior to lift station final inspection and acceptance.

18.2.3 The electric and water meters shall be installed before a final inspection is requested.

18.2.4 A final lift station inspection shall be conducted at the DEVELOPER'S request once lift station construction has been completed, a pump startup has been performed and the alarm fee has been paid. Wastewater Department maintenance personnel must be present at the pump start up session. The lift station final inspection and development final inspections are separate inspections and will take place at separate appointments.

18.2.5 The DEVEOPER/CONTRACTOR shall be responsible for supplying alternate means of power for the pump start-up during final inspection.

18.2.6 Before final acceptance, 1 paper and 1 pdf copy of as-built drawing must be supplied to the Wastewater Department.

18.3 **BASIC CONTROL PANEL SPECIFICATIONS**

18.3.1 All electrical services shall meet City and State Codes.

18.3.2 A portable generator connector is required on lift station control panels. It must be an Appleton 200 Amp 4-W, 4-P style -1 type connector Cat # ADR20044 for 3Ø stations only

18.3.3 Control panel shall be NEMA 4X stainless steel mounted on a 6" X 6" stainless steel pedestal on the wet well and shall be sealed to prevent fumes from rising into control panel. Control panel and pedestal door shall open away from wet well hatch.

18.3.4 One combination circuit breaker/overload disconnect unit with magnetic trip elements sized for individual protection shall be provided for each pump. **Detail LS01 and LS02**.

18.3.5 One across the line magnetic contactor shall be provided per pump and sized in accordance with the maximum NEMA horsepower standards.

18.3.6 Control panels shall incorporate the following features as a minimum:

(a) Alternator shall be provided for duplex controls.
(b) Individual selector switches to provide "hand-off-auto" control of each pump.
(c) HAND POSITION - In this position, the pump controlled by the switch will run regardless of the wet well level. The pump will continue to run until the switch is turned to "off" or "auto" position.
(d) AUTO POSITION - In this position, the operation of the pumps is controlled automatically by the level sensors in the wet well. The control center will be designed to provide automatic operation, while maintaining motor protection.
(e) 24 or 120 volt AC control transformer protected on both the primary and secondary control circuit.
(f) Terminals shall be provided for connection of the level sensors.
(g) A hinged, removable dead-front panel is required.
(h) Pump running pilot lights (green) mounted on operator's control panel.
(i) Totalizer for each pump must be mounted on operator's control panel.

18.3.7 All operator controls, toggle switches, circuit breakers, etc., shall be accessible without removing the dead-front panel.

18.3.8 NEMA 4X stainless steel enclosures with draw pull catch, provisions for padlocking and suitable for indoor or outdoor mounting.

18.3.9 **Electrical connections in the wet well are not allowed**.

18.3.10 Coordinate with Bentonville Electric Department prior to project start to determine type of electrical service. Three-phase 480 VAC power must be used when available.

18.3.11 An approved lightning arrester must be installed.

18.3.12 3-phase power monitor must be installed to protect pump from low voltage, single phasing and phase reversal.

18.3.13 The level control system sensors must be submersible transducer, floats or equivalent. If a transducer control is installed the system shall have a float backup.

18.3.14 Electrical terminal strip must be a minimum of 4" above the bottom of the control panel.

18.4 LEVEL CONTROLS

18.4.1 Provide a switch control system incorporating a hermetically sealed liquid level indictor as a level sensing and signal control device for automatic control of lift station. The system shall monitor and control wet well level at each station as follows:

SWITCH 1 – All Stop
SWITCH 2 – Energize Lead Pump
SWITCH 3 – Energize Lag Pump
SWITCH 4 – High Level Alarm

18.4.2 **High level alarms are required. A red warning light with flasher and audible alarm shall be installed on the control panel.**

18.4.3 Contingent upon wet well level, float system shall cause indicator/controller to energize appropriate control contacts.

18.5 ACCESS ROAD

18.5.1 A paved access road shall be provided from the curb to the lift station.

18.5.2 The road leading to the lift station shall be asphalt, a minimum of 12' wide and no greater than a 10% slope. A minimum of 6" of compacted base material is required. Base material and compaction shall be in accordance with the latest edition of ARDOT Standard Specifications (Division 300). A minimum of 4" of asphalt is required. Paving materials and construction methods shall be in accordance with the latest edition of the ARDOT Standard Specifications (Division 400).

18.6 LIFT STATION AND SITE

18.6.1 Lift station site and access road shall be deeded to the City of Bentonville.

18.6.2 Minimum lot size shall be 50' X 50'.

18.6.3 Lift station lot shall be 2' above surrounding project area. Wet wells shall be 8" above the asphalt.

18.6.4 Lift station lot shall be asphalt. A minimum of 6" of compacted base material is required. Base material and compaction shall be in accordance with the latest edition of the ARDOT Standard Specification (Division 300). A minimum of 4" of asphalt is required. Paving materials and construction methods shall be in accordance with the latest edition of the ARDOT Standard Specifications (Division 400).

18.6.5 Based on the location of the lift station, the City of Bentonville Wastewater Department will determine the type of 8' fence requested to be installed. All fence poles or columns will be set 1' inside the asphalt with 14' roll back or swing type gates.

18.6.6 A pole mounted LED photocell light that conforms to the Subdivision Code for outdoor lighting shall be provided to adequately illuminate the control panel and site.

18.6.7 There shall be a frost free, 2' min bury water hydrant, at each lift station. The hydrant shall be protected by a reduced pressure zone backflow prevention device. The device must be protected from freezing by an approved enclosure. See Cross Connection Control Program Specifications. **Detail W14**

18.7 PUMP REQUIREMENTS

18.7.1 All lift stations require rail mounted submersible pumps as manufactured by Flygt or Hydromatic, or HCP and interchangeable without alteration to the piping or electrical system. **Details LS04 and LS05**.

18.7.2 Lift stations requiring less than 5-HP pumps must be grinder pumps. Larger pumps should have shredder type impellers when possible. **Detail LS05**.

18.7.3 All pumps will meet or exceed the requirements to pump the anticipated flow for the known number of houses, units, or number of persons. The pumps will meet or exceed required head values based on ENGINEERS design. At a minimum, all lift stations shall be duplex, two pumps of the same size that alternate pumping.

18.7.4 Any time it is determined through an analysis that a development or subdivision impacts or exceeds the capacity or the flow of an existing lift station, the existing lift station shall be upgraded. The

existing lift station shall be upgraded with equipment including pumps, piping and control panel components that are consistent with the existing equipment.

18.8 LIFT STATION PLUMBING

18.8.1 Plumbing shall be constructed in such a manner that the force main velocity is never below 2' per second and never above 8' per second. All lift station mounting rails, cables, chains and hardware shall be 316 stainless steel. All lift station piping shall be Type 316L stainless steel (in accordance with ASTM A312 and 150 psi minimum), and stainless steel piping shall extend from the pump to three feet outside the valve vault.

18.8.2 All lift station wet wells and valve vaults shall be concrete with aluminum hatches to allow access to pumps and valves. Wet well hatch shall open toward the control panel.

18.8.3 The lift station will be constructed of concrete with reinforcement material. All plumbing entering or leaving the wet well shall be grouted to prevent infiltration.

18.8.4 Piping shall be sized to meet flow needs.

18.8.5 Gate Valves and Check Valves are required on both discharging lines.

18.8.6 A stainless steel chain shall be hooked to each pump for removal.

18.8.7 All lift station wet wells shall be vented by a 4” stainless steel pipe with bird screen.

18.9 VALVE VAULTS AND WET WELLS FOR LIFT STATIONS

18.9.1 Wet wells shall be a minimum of 8’ in diameter and a minimum of 10’ in depth. Alternate Storage (i.e. equalization basin) may be required at certain locations, which will be determined by the Wastewater Department. EQ shall be the same size as the wet well.

18.9.2 Wet wells shall be 8” above the asphalt.

18.9.3 Wet well walls shall be a minimum of 8” thick with #4 rebar on 12” centers. The base of the wet well shall be designed to resist the buoyance/floating with the wet well empty.

18.9.4 Wet well bottom rebar spacing - #4 bar on 6” centers.

18.9.5 Wet well top shall be a minimum of 6” thick with # 4 rebar on 6” centers.

18.9.6 Wet well access shall be cast-in-place, grout will not be accepted.

18.9.7 All interior concrete walls of new lift station wet wells will be epoxy coated prior to lift station approval and being brought into service. Epoxy coating will be 100% epoxy at a minimum application thickness of 125 mils after the installation of a ½” of cementitious lining has been applied . Epoxy is added to extend the service life of the concrete wet well walls.

18.9.8 Valve vault walls shall be a minimum of 6” thick.

18.9.9 Valve vault base shall be a minimum of 6” thick.

18.9.10 Valve vault top shall be a minimum of 6” thick with # 4 rebar on 6” centers.

18.9.11 Vaults and wet wells shall be of all concrete construction incorporating a double aluminum access lid. Door shall open to 90º, lock automatically in position; have closed position lock hasp and retractable grip for opening and closing with one hand. Lid shall support a minimum live load of 150 pounds per square foot. **Details LS06 and LS07**.

18.9.12 Vaults and wet wells shall be constructed on a minimum of 6" of SB2 base material. Steps shall not be incorporated. Maximum vault depth shall be 5' from access hatch to base.

18.10 **VALVES**

18.10.1 Check valves shall be swing type with iron body and flanged ends mounted in the horizontal position only and shall be located in a valve vault not exposed to wastewater. 2" check valves may be IPT.

18.10.2 Gate valves 4" and larger shall be of the resilient seat type and meet the requirements of AWWA C515 latest revision. Valves shall have non-rising stems and close right (clockwise). Valves shall have flanged ends and have a 2" operating nut or hand wheel. Valves smaller than 2" shall meet AWWA C500. Acceptable manufacturers for all sizes include; American Darling, Clow, Kennedy, Mueller or equal. Gate valves shall be mounted horizontally in valve vault with no exposure to wastewater.

18.10.3 Plug valves are an acceptable means for isolation and shall be flanged Dezurik or Pratt equal.

SECTION 19 SEWER LIFT STATIONS – PRIVATE

19.1 Plans shall be provided to the DEPARTMENT for approval before construction begins.

19.2 **LIFT STATION SITE**

19.2.1 An unobstructed access to the lift station shall be provided and maintained.

19.2.2 The lift station shall have a minimum wet well diameter of 2' and a minimum depth of 6'.

19.3 **BASIC CONTROL PANEL SPECIFICATIONS**

19.3.1 The lift station shall have a control center to provide automatic and manual operation. A Hand – Off – Automatic switch shall be included for each pump.

19.3.2 Station shall operate on a minimum of 220 V AC.

19.3.3 One "across the line magnetic contactor" per pump sized to HP and NEMA standards shall be provided and installed.

19.3.4 Control center shall have a locking hasp.

19.3.5 Alternator shall be provided for duplex units.

19.3.6 A lighting arrester shall be installed for pump protection.

19.3.7 High level alarms are required. A red warning light with flasher and audible alarm shall be installed on the control panel for easy monitoring.

19.3.8 An identification plate listing contact information, name, address and phone number of responsible party will be attached to the control panel and a copy issued to the Wastewater Department.

19.4 PUMP REQUIREMENTS

19.4.1 Pumps shall be Flygt, Hydromatic, or HCP and must be approved in writing by the Wastewater Department.

19.4.2 Pumps shall be mounted on stainless steel slide rails and use Campbell type pump connector or equivalent.

19.4.3 Pumps shall have stainless steel lifting chains or stainless steel lifting cables for pump removal and installation.

19.4.4 All pumps shall meet or exceed the minimum requirements to pump the anticipated flow for the known number of units or number of persons. The pumps shall meet or exceed required head values based on ENGINEER's design.

19.4.5 Pump impellers shall be grinder type impellers.

19.4.6 Before final acceptance, 1 paper and 1 pdf copy of as-built drawing with contact information must be supplied to the Wastewater Department.

SECTION 20 CROSS-CONNECTION CONTROL PROGRAM MANUAL

20.1 GENERAL

This document sets forth the Bentonville Water Utilities Cross-Connection Control Program, and is adopted within the water and sewer specifications for the purpose of regulating cross-connection hazards by the operating staff and management of the DEPARTMENT.

20.2 INTRODUCTION

This program prohibits uncontrolled cross-connections within the water distribution system of the Bentonville Water Utilities, authorizes the DEPARTMENT to conduct inspections of the consumers' property, requires that cross-connection hazards be corrected or controlled and provides for enforcement.

20.3 PURPOSE

The purpose of this program is to:

20.3.1 Protect the public potable water supply of the City of Bentonville from the possibility of contamination or pollution from backflow into the Water System.

20.3.2 Promote the elimination or control of existing cross-connections, actual or potential, between the customer's potable water system(s) and nonpotable water systems, plumbing fixtures, and industrial piping systems.

20.3.3 Provide for a continuing program of cross-connection control that will systematically and effectively prevent the contamination or pollution of potable water systems.

20.4 **DEFINITIONS**

The following terms shall have the stated meanings:

20.4.1 APPROVING AUTHORITY: the DEPARTMENT or its designated agent(s).

20.4.2 AUXILIARY WATER SUPPLY: any water supply, on or available to the property other than the Water System.

20.4.3 BACKFLOW: flow of water or other liquids, mixtures or substances, under positive or reduced pressure in the distribution pipes of a potable water supply from any source other than its intended source.

20.4.4 BACKFLOW PREVENTION ASSEMBLY ("BACKFLOW PREVENTION ASSEMBLY" OR "ASSEMBLY"): a mechanical backflow preventer assembly constructed with shut-off valves, and provided as a complete assembly by a single manufacturer, used to prevent the flow of contaminants or pollutants into the Water System. **The assembly must have the approval of the FCCCHR, ADH, and the DEPARTMENT.**

20.4.5 BACKFLOW PREVENTION DEVICE: a mechanical back-flow preventer without shut-off valves on any side of the backflow prevention mechanism.

20.4.6 BYPASS: any arrangement of pipes, plumbing, or hoses designed to divert the flow around an installed device or assembly through which the flow normally passes.

20.4.7 CERTIFIED ASSEMBLY TESTING TECHNICIAN: a person certified by the Arkansas Department of Health as an Assembly Testing Technician.

20.4.8 CERTIFIED ASSEMBLY REPAIR TECHNICIAN: a person certified by the ADH as an Assembly Repair Technician.

20.4.9 CITY: the City of Bentonville, Arkansas.

20.4.10 CONSUMER: a "person" or facility receiving service from a potable water system.

20.4.11 CONTAMINANT: a biological agent or chemical compound, which can cause disease or threat to health.

20.4.12 CROSS CONNECTION: any actual or potential connection between the Water System and a source of contamination or pollution.

20.4.13 CROSS CONNECTION CONTROL: the use of backflow prevention assemblies, methods and procedures to prevent contamination or pollution of a potable water supply through cross connections.

20.4.14 DIRECT CROSS-CONNECTION: a cross-connection which is subject to both backsiphonage and backpressure.

20.4.15 DOMESTIC WATER SERVICE: refers to plumbing as defined by the State of Arkansas Plumbing Code that is not associated with designated fire protection water service lines and systems.

20.4.16 DOUBLE CHECK VALVE ASSEMBLY (DCVA): a backflow prevention assembly consisting of two (2) independently operating check valves, four (4) test cocks, and two (2) shut-off valves. DCVA's are only appropriate for use against non-health hazards.

20.4.17 DETECTOR DOUBLE CHECK VALVE ASSEMBLY (DDCVA)**:** a DCVA with an additional smaller DCVA with a flow detector meter in parallel, used to detect system leaks and unauthorized use.

20.4.18 DETECTOR REDUCED PRESSURE ZONE ASSEMBLY (DRPZA): an RPZA with an additional smaller RPZA with a flow detector meter in parallel, used to detect system leaks and unauthorized use.

20.4.19 FIRE PROTECTION SYSTEM: a fire protection system consisting of one or more of the following: pipes, sprinklers, valves, fixtures, fittings, ponds, tanks, water storage vessels and fire hydrants that are intended and used exclusively for fire protection.

20.4.20 HAZARD: any contaminant or pollutant which if it enters the potable water system causes a risk to public health or has an adverse effect on the public potable water system.

20.4.21 INDIRECT CROSS-CONNECTION: a cross-connection which is subject to backsiphonage only.

20.4.22 INSPECTOR: a person authorized by the APPROVING AUTHORITY to perform inspections of consumer's facilities to determine compliance with the Program.

20.4.23 MULTIPLE SERVICES: two or more water service connections. When two or more water suppliers are involved, the multiple service connections constitute an "auxiliary source" of water on the property.

20.4.24 NEW CONSTRUCTION: construction of a new facility, alteration of or addition to an existing facility, or modification of or addition to existing plumbing and fire protection systems.

20.4.25 PERMIT: a document issued by DEPARTMENT that allows the use of a backflow prevention assembly at the Consumer's service connection.

20.4.26 PERSON: any individual, partnership, company, public or private corporation, political subdivision or agency of the United States or any other legal entity.

20.4.27 POLLUTANT: a biological or chemical substance which do not pose a health hazard, but reduces the aesthetic quality of water.

20.4.28 POTABLE WATER: any water which, according to recognized standards, is safe for human consumption.

20.4.29 PROGRAM: the Bentonville Water Utilities Cross-Connection Control Program.

20.4.30 RESPONSIBLE MANAGING EMPLOYEE (RME): an individual or individuals who shall be designated by each company that plans, sells, installs, maintains, or services a fire protection sprinkler system on a full time basis to assure that each fire protection sprinkler system as installed, maintained, or serviced, meets the standards as provided by state law.

20.4.31 REDUCED PRESSURE ZONE ASSEMBLY (RPZA): a backflow prevention assembly consisting of four (4) test cocks, two (2) shutoff valves, two (2) independently operating, spring-loaded check valves with a reduced pressure zone between the checks valves. The zone contains a relief port, which will open to atmosphere if the pressure in the zone falls within two (2) psi of

the supply pressure. The assembly provides protection against both backpressure and back-siphonage.

20.4.32 RETROFIT: replacement of an existing device or backflow prevention assembly when the specifications or condition of the device or assembly are not adequate for the degree of hazard found on the property as defined by this program.

20.4.33 SERVICE CONNECTION: a piping connection between the water main of the Water Utilities and a consumer's system.

SECTION 21 ADMINISTRATION

21.1 AUTHORITY OF APPROVING AUTHORITY

21.1.1 APPROVING AUTHORITY is hereby authorized to:

21.1.2 Protect the public water distribution system from contamination or pollution due to the backflow or backsiphonage through the water service connection.

21.1.3 Conduct a program, which includes routine survey of commercial, institutional and industrial establishments for possible contamination or pollution.

21.1.4 Review construction plans and determine requirements for backflow prevention assemblies. This shall apply to new construction, alteration or additions, as well as, modification of existing fire protection systems.

21.1.5 Provide installation criteria for backflow prevention assemblies and issuance of permits prior to construction.

21.1.6 Conduct a final inspection of backflow prevention assembly installations to verify conformance with approved installation plans.

21.1.7 Ensure that RPZA's used for fire hydrants are performance tested and have a backflow prevention assembly permit.

21.1.8 Maintain RPZA's and meters for issue to water users needing temporary water service from fire hydrants.

21.1.9 Ensure RPZA's used by customers are tested annually and before issue/use. (Within ten (10) days of installation)

21.1.10 Verify collection of fees for permits.

21.1.11 Verify fire hydrant RPZA's and meters are set and removed by DEPARTMENT Personnel.

21.1.12 Submit all required reports, maintain a database, coordinate with other agencies to accomplish the goals of the Program and maintain the following records:

(a) Master files on customer Cross-Connection Tests.
(b) Master files on Cross-Connection Permits.
(c) Copies of permits and permit applications.
(d) Copies of lists and summaries supplied to the ADH.
(e) Number of annual tests conducted on backflow prevention assemblies.
(f) Number of cross-connection control surveys performed.

(g) Total number of each type of backflow prevention assemblies installed.
(h) The following information is required per assembly: DDCVA and DRPZA are made up of two (2) assemblies, each requiring record data.

(1) Organization or Customer's name, mailing address, phone #, contact name, assembly address, permit # and account number.
(2) Type installation, problem history, location on property, installed by, phone # and type of service.
(3) Name of the manufacturer, model number and serial number of assembly.
(4) Type of assembly, date of installation and installation specifications.
(5) Number of the DEPARTMENT meter, if any.
(6) Date of initial cross-connection survey, survey results and type of actual or potential hazard.
(7) Date of initial permit and current permit number.
(8) Test results before and after repair or maintenance and date of latest retest.
(9) Maintenance performed, repairs made, replacement parts, part numbers and date repairs were made.
(10) Information on backflow through the assembly.

21.1.13 Maintain an inventory of all commercial, institutional and industrial locations with complete information on cross connection devices or assemblies installed.

21.1.14 Ensure meters on fire protection assemblies are read and consumer advised of water usage.

21.1.15 Coordinate repairs on any damage resulting from vandalism or flooding of backflow prevention assemblies.

21.1.16 Ensure a Certified Assembly Repair Technician is responsible for all repairs performed on an assembly. A Journeyman or Master Plumber's License shall be required when installing backflow prevention assemblies within the scope of the plumbing system.

21.1.17 Verify only Certified Assembly Testing Technicians perform testing on backflow prevention assemblies.

21.2 POWERS AND AUTHORITIES OF INSPECTORS

21.2.1 The APPROVING AUTHORITY or duly authorized employees of the DEPARTMENT or the City bearing proper credentials and identification shall be permitted to enter all properties for the purposes of inspection, observation and testing to verify adherence to the provisions of this program. Authorized personnel shall have authority to inspect and copy records pertaining to the threat of a hazard to the Water System.

21.2.2 The consumer's property shall be available for inspection at all reasonable times to authorized representatives of the APPROVING AUTHORITY to determine whether cross connections or other structural or sanitary hazards, including violations of the Program, exist.

21.2.3 On request by the APPROVING AUTHORITY, the consumer shall furnish information on water use practices within the consumer's premises.

21.3 **CROSS-CONNECTION SURVEYS**

21.3.1 Personnel authorized by the APPROVING AUTHORITY will survey the property of consumers considered likely to have cross-connections to determine if backflow can occur. Routine surveys will be made periodically to determine if backflow prevention measures are maintained, are functioning properly and new cross-connections have not been created.

21.4 **SCHEDULING SURVEYS, PRIORITIES**

21.4.1 The selection of existing property for cross-connection surveys will be made on the basis of suspected hazard. Those customers suspected of having the most hazardous cross-connections will be surveyed first. Surveys shall continue until all property considered likely to have cross-connection problems have been surveyed. Information for the review process will be obtained from questionnaires sent to industrial, commercial and institutional establishments.

21.5 **OTHER SURVEYS**

21.5.1 Cross-connection surveys will continue with the aim being to survey all industrial, commercial or institutional type customers and agricultural operations that may pose a hazard. Prompt attention will be given to identifying residential type customers that may have significant cross-connection problems.

21.6 **FOLLOW-UP SURVEYS**

21.6.1 Follow up surveys shall be made on a frequency established by the Minimum Standards for a Cross-Connection Control Program from the ADH – Division of Engineering.

21.7 **ENFORCEMENT ACTION**

21.7.1 Where backflow prevention is required, the APPROVING AUTHORITY shall require the problem to be eliminated or controlled by a properly installed, approved backflow prevention assembly. Such protective measures may include but not be limited to a backflow prevention assembly on the consumer's water service line. Every effort will be made to secure the voluntary cooperation in correcting cross-connection hazards. If voluntary corrective action cannot be obtained within a reasonable period of time, the water service shall be terminated.

SECTION 22 PUBLIC WATER SYSTEMS

22.1 **AUXILIARY PUBLIC WATER SYSTEMS**

22.1.1 The Water System shall be protected as outlined in the **Arkansas Department of Health publication, "Policies and Procedures for Backflow Prevention Devices Location and Installation"** by an approved method of backflow prevention at the point of connection to the Water System if a public water supply other than the Water System is available to the premises. Backflow prevention is required regardless of actual development or cross-connection between the Water System and the other public water system.

22.1.2 RPZA Containment is required if the auxiliary water supply is not operating under the authority of the ADH.

22.1.3 Backflow prevention is not required if the auxiliary water supply is being operated under the authority of the ADH, and has properly conducted sanitary control and cross-connection control programs, and provides potable water to the Water System.

SECTION 23 DOMESTIC WATER SERVICE LINES

23.1 GENERAL

23.1.1 The information on backflow preventers described in this section is extracted from the ADH publication, "Policies and Procedures for Backflow Prevention Devices Location and Installation".

23.2 COSTS

23.2.1 The consumer of a property shall bear the expense and burden of protecting the Water System from the potential hazard through approved backflow prevention methods and procedures.

23.3 RPZA CONTAINMENT

23.3.1 Any building strictly consisting of commercial use or mixed-use shall be protected from cross-connection backflow by an approved RPZA containment assembly.

23.3.2 Any multi-story building, hotel, apartment house or private structure when a booster pump is used that furnishes water to all or part of the property, or where there is the potential for a cross-connection; it shall be protected from cross-connection backflow by an approved RPZA containment assembly.

23.3.3 Any Establishment's use such as, but not limited to the following that contain a risk to cross-connection on the premises:

Aircraft Plants (with industrial water)
Asphalt Plants
Automotive Plants
Autopsy Facilities
Baking Facility
Battery Manufacturer
Breweries
Beverage Bottling Plants
Blood Banks
Bottled Water Manufacturing
Broiler Houses
Canneries (except small plants without industrial fluids)
Car Wash Facilities
Chemical Plants
Cleaners (processing plant)
Cold Storage Plants
Colleges (with laboratories)
Compressed Gas Handling Facilities
Concrete Mixing Plants
Crime Laboratories
Dairies and Milk Distributors
Dental Facilities
Dye Works
Film Laboratories
Food Processing Plants
Funeral Homes
Golf Courses
Gravel Processing Plants
Hazardous Waste Processing
Health Clinics
Health Clubs and Fitness Centers
Hospitals
Laboratories
Landfills
Laundries (excluding Laundromats)
Liquid Gas Handling Facilities
Livestock Operations (excluding small non-commercial operations without industrial fluids)
Lumber Processing Plants
Medical Facilities, Health, Chiropractic, Veterinary
Metal Plating, Etching, Passivation or Pickling Plants
Mines and Quarries
Missile Plants (with industrial water)
Morgues
Mortuaries
Motion Picture Studios (with industrial water)
Natural Gas Handling Facilities
Nursery, Shrubbery or Garden Centers
Nursing Homes or convalescent homes
Oil Handling Facilities
Packing Houses (except small plants without industrial fluids)
Pesticide Processors or Applicators
Paper and Paper Product Plants (with industrial fluids)

Poultry Operations (excluding small non-commercial operations without industrial fluids)
Power Plants (excluding small heating or compressing systems)
Pressure Vessel Repair, Testing and Maintenance Facilities
Propane or Butane Gas Handling Facilities
Radioactive Material Plants and Handling Facilities
Railroads
Recycling Facilities
Reduction Plants
Restricted, Classified or Other Closed Facilities
Rubber Manufacturing Plants (excluding small plants)
Sand Processing Plants
Sanitariums
Schools (with laboratories)
Sod Farms
Steel Manufacturers (using Industrial Fluids)
Swimming Pools
Tank Repair, Cleaning, Testing and Maintenance Facilities
Taxidermist
Wastewater Plants and Pump Stations
Water Front Facilities and Industries, excluding:
(premises without docks-cafes, comfort stations, concessions, office buildings, or private residences)
Water Treatment Plants and Pump Stations
Zoos

23.3.4 Multiple Water Services: If there is a potential for two or more water service lines being interconnected; and there is a potential high hazard on the premises, or the water is used for other than domestic purposes.

23.3.5 Private Water System: If there is an auxiliary water supply on or available to the premises that is a potential high hazard, including a fire protection system.

23.3.6 Used Water and Industrial Fluids: If there is a used water or industrial fluid system on the premises that is a potential high hazard.

23.3.7 Solar Heating Systems: If there is a solar heating system on the premises, and chemicals are added to the solar heating system or the solar heating system is not used exclusively for once through heating (i.e. domestic hot water.)

23.3.8 Chemically Contaminated Water Systems: If chemicals are used as an additive to the water, or the water is subjected to additional treatment, or water is used on the premises to transport chemicals or chemicals are used with water on the premises in compounding or processing.

23.3.9 Sewers and Storm Drains: Any premises used for handling sewage or storm water (e.g. treatment and processing facilities, pumping plants, gauging stations, lift stations, ejector plants.)

23.3.10 Public Fire Hydrants as Temporary Water Services: The Water System shall be protected by an approved RPZA on the outlet of any fire hydrant when it is used as a water supply, except when used to extinguish a fire.

23.3.11 Irrigation System: If there is an irrigation system on the premises.

23.3.12 All RPZ backflow devices used for domestic water service will need to be a low lead device to meet the current Safe Water Drinking Act section 1417.

23.3.13 All new structures in a mixed use zoning based on the City of Bentonville zoning map that allows for a mix of uses including but not limited to commercial and industrial uses accompanied with a residential use, shall be required to have a backflow permit and an RPZ backflow assembly.

23.3.14 At the time of construction all structures within the mixed use zone may utilize a spool or like method and floor drain in lieu of installation of the backflow device if all current uses are strictly residential. In the event of a shared meter the spool or like method must be removed and an appropriate backflow assembly be installed at the first change of use within the structure.

23.3.15 All new structures shall depict the location and type of backflow assembly on the construction plans. In the event of a spool or like method, the construction plans shall depict the location. The construction plans shall be reviewed and approved by the City of Bentonville Water Utilities Department prior to construction.

23.3.16 All current buildings that change their use and are allowed commercial uses doing a remodel or renovation that requires a building or plumbing permit that does not have a current RPZ will be required to bring the existing building (or suite if metered separately) up to meet current specifications.

23.4 CONTAINMENT NOT REQUIRED

23.4.1 Residential Systems: Used exclusively for domestic purposes (without irrigation).

23.4.2 Solar Heating Systems: Used exclusively for once through heating (i.e. domestic hot water), and no chemical additives are used in the system.

23.5 RETROFIT

23.5.1 All presently installed backflow prevention assemblies and devices that do not meet the requirements of this program but were approved assemblies for the purposes described herein at the time of installation and have been properly maintained, shall, except for the inspection, testing

and maintenance requirements, be excluded from the requirements of these rules so long as the APPROVING AUTHORITY is assured that they will satisfactorily protect the Water System.

23.5.2 If the existing assembly is moved or requires more than the minimum maintenance or, the APPROVING AUTHORITY determines that the operation or maintenance of this assembly constitutes a hazard, the assembly shall be replaced by an approved backflow prevention assembly.

SECTION 24 FIRE PROTECTION SERVICE LINES

24.1 CLASSES OF FIRE PROTECTION SYSTEMS

24.1.1 Class 1 - A fire protection system directly connected to the Water System as the only water supply - no pumps, tanks or reservoirs; no physical connection to auxiliary water supplies; no antifreeze or other additives of any kind; all fire protection system drains discharging to atmosphere, dry wells or other safe outlets.

24.1.2 Class 2 - A fire protection system that is the same as a Class 1 system; except that a booster pump is installed in the fire protection system, and no outlet is located between the booster pump and the Water System. (Note - Booster pumps alone do not affect the potability of the system. In Class 2 fire protection system, it is necessary to avoid low or negative pressures that can occur by excessive flow through the booster pump. A minimum pressure of 20 psig on the inlet side of the booster pump shall be maintained through proper design, construction, operation and maintenance in addition to the use of a low pressure cutoff switch, pump modulating valve, or other automatic device.)

24.1.3 Class 3 – Direct connection from public water supply mains, plus one or more of the following: elevated storage tank, fire pump taking suction from above ground covered reservoir, tank, or pressure tank. Such storage facilities are filled or connected to public water only and the water in the tank is to be maintained in a potable condition. (Note: Unless the storage tank is owned and operated by the public water system, the assumption will be made that the water in the tank is non-potable, making it a Class 4 installation).

24.1.4 Class 4 - A fire protection system that is the same as a Class 1 or Class 2 system; except that an auxiliary water supply is on or available to the properties, or there is an auxiliary water supply designated by the DEPARTMENT within a radius of 1,700-feet from a pumper connection to the fire protection system. (Note - Connection to an auxiliary water supply cannot exist in a Class 4 fire protection system.)

24.1.5 Class 5 - A fire protection system that is connected to an auxiliary water supply which could be exposed to a high hazard (e.g. non-potable reservoirs, rivers, ponds, wells, industrial water), or that uses additives (e.g. antifreeze, wetting agents, “Foamite”), or that does not maintain a minimum pressure of 20 psig on the inlet side of a booster pump as defined for a Class 2 fire protection system.

24.1.6 Class 6 - A fire protection system that is connected to a water service line from the Water System if the water service line is not used exclusively for fire protection.

24.2 BACKFLOW PREVENTION ON FIRE PROTECTION SYSTEMS

24.2.1 The Water System shall be protected by an approved method of backflow prevention in water service lines to fire protection systems, regardless of backflow prevention requirements in other water services on the premises.

24.2.2 Classes 1, 2 & 3: An approved DDCVA is required as the minimum backflow prevention in the water service line to a Class 1, 2 or 3 fire protection system. An approved DRPZA shall be required on any system with hose drops or standpipe outlet.

24.2.3 Classes 4, 5 & 6: An approved DRPZA is required in the water service line to a Class 4, 5 or 6 fire protection system.

24.2.4 Strainers are not required to be installed on fire protection systems.

24.3 RETROFIT OF EXISTING SYSTEMS

24.3.1 This applies to an existing fire protection system, which is modified, extended, or enlarged. Such systems include a modification or extension to an existing network (distribution piping, sprinkler heads control valves, etc. are added to or replaced in an existing system), or where an additional fire protection system (new feed line, riser, control valve, distribution piping, sprinkler heads, etc.) will connect to a fire main which has an existing cross-connection control device.

24.3.2 If the existing assembly is moved, or requires more than the minimum maintenance or the APPROVING AUTHORITY determines that the operation or maintenance of this assembly constitutes a hazard, the assembly shall be replaced by an approved backflow prevention assembly.

24.3.3 The minimum protection for cross-connection control for existing systems is the same as listed for new systems, except as noted for Class 1 and 2 systems only.

24.3.4 The installation of a properly sized assembly may cause an excessive pressure loss in some altered Class 1 and 2 systems. Such loss could make the system non-compliant with **NFPA Pamphlets 13 and 14 as adopted**.

24.3.5 The RME shall document to the APPROVING AUTHORITY that reasonable modifications will not compensate for the additional loss.

24.3.6 The documentation shall contain a listing of the minimum flow and pressure, headloss summary, desired and calculated sprinkler head output and a summary of the options examined to reduce headloss.

24.3.7 For these installations, if not already installed, the existing cross-connection control device will be replaced with two check valves in series (one of which can be the alarm valve), each valve meeting AWWA C510, UL 312-88, or UL 193-88, or the latest versions thereof, and equipped with a resilient seating surface. Valves on assemblies for fire protection services shall meet the appropriate recognized standard of UL and FM Global listed or approved for use in Fire Protection Systems. The valves or adjacent piping shall be equipped with a sufficient number of resilient seated test cocks (minimum diameter of one quarter to one-half inch) to determine the effectiveness of each valve (there shall be no leakage past any check valve). Sufficient isolation valves-one valve upstream of the valves and one valve downstream of the valves - shall be present or added to the system to permit this testing.

24.3.8 Existing fire protection systems which are not being modified, enlarged, or expanded are not required to upgrade to comply with this policy unless a hazard is found within the fire protection system.

24.3.9 For Class 1 and 2 systems, if the hydraulic analysis for the modified, extended, or enlarged system demonstrates that the installation of a properly sized cross-connection control device will increase the pressure loss so as to make the system noncompliant with the Rules and Regulations for Sprinkler Systems of the Arkansas Fire Protection Licensing Board (less than the minimum flow required by state fire sprinkler regulations), and that reasonable modifications to the system cannot compensate for the additional losses, the Responsible Managing Employee (RME) of the fire protection firm will document[1] that as part of the submittal to the ADH. ([1]**Refer to Section 24.7.2**)

24.4 **ASSEMBLY INSTALLATION**

24.4.1 **The following conditions apply to Class I through Class 6 systems:**

24.4.2 Backflow preventers must be tested within 10 days of placing the fire sprinkler system "on stream" and annually thereafter by a state certified Assembly Test Technician. A copy of the test report must be sent to the local water utility.

24.4.3 Reduced pressure type backflow prevention assemblies shall not be installed in pits or vaults. Double check valve assemblies must be installed above ground, if possible. However, if review and approval by the ADH permits below grade installation of a double check valve assembly because of unique conditions at the job site then the below grade unit must be placed in a vault which is located in a well drained area.

24.4.4 Installers of fire protection equipment must be licensed by the Fire Protection Licensing Board.

24.5 **PLAN APPROVAL**

24.5.1 All plans submitted to the ADH for approval shall indicate the name and license number of the RME. **Section 5**

24.5.2 There shall be no deviation from backflow prevention assembly installation plans and specifications once approved by the ADH and the DEPARTMENT unless revised plans and specifications have been first re-submitted for review and re-approval and written consent given by said authorities.

24.5.3 Plans for connection to fire protection systems must be submitted to the ADH and the local water utility for review and approval prior to beginning installation work. Submittals must include the following elements (include the elements appropriate to the project):

(a) A utility plan showing location of the fire main, property lines, and easements.
(b) Material of construction of the fire main.
(c) Pressure class of the fire main.
(d) Fire sprinkler connection details; including the following:
(e) Test flow information at the job site; including flow rate, static and residual pressures.
(f) Location of the backflow preventer.
(g) Make, model number, size, and type DC, RP, DCDA, or RPDA.
(h) Show where the FDC line takes off from the riser or verbally describe the location.
(i) Show flow calculations or certify that the flow through the backflow preventer will not exceed the maximum rated flow for the unit as indicated in the table show below.

24.5.4 Reduced pressure type backflow prevention assemblies shall not be installed in the vertical position unless approved by the Foundation for Cross-Connection Control and Hydraulic Research (FCCCHR), University of Southern California, Los Angeles, CA.

24.6 **DEFINITIONS**

24.6.1 Double check valve assembly (DCVA): a complete assembly meeting University of Southern California and ADH standards and approval or the latest version thereof consisting of two (2) internally loaded, independently operating check valves between two (2) tightly closing resilient-seated shutoff valves, with four (4) properly placed resilient seated test cocks.

24.6.2 Reduced-pressure principle backflow-prevention assembly (RP): a complete assembly meeting University of Southern California and ADH standards and approval or the latest version thereof

consisting of a mechanical, independently operating, hydraulically dependent relief valve located between two (2) independently operating, internally loaded check valves that are located between two (2) tightly closing resilient seated shutoff valves with four (4) properly placed resilient-seated test cocks.

24.7 FLOW/PRESSURE LOSS TABLE

24.7.1 DCVA's and RP's are to be sized according to the following table:

Maximum Flow Rate - gpm	Minimum DCA/RPBP Size - inches	Maximum DCA Pressure Loss – psi	Maximum RPBP Pressure Loss - psi
50	1	10	18
75	1 ¼	10	18
100	1 ½	10	16
160	2	10	16
225	2 ½	10	15
320	3	10	14
500	4	10	14
1000	6	10	14
1600	8	10	14
2300	10	10	14
3000	12	10	14

24.7.2 **NOTE: 1** The sprinkler flow and pressure on which the calculation is based is to be the minimum required by NFPA as defined in the latest regulation of the Arkansas Fire Protection Licensing Board. Documentation to the ADH is to include a listing of that minimum flow and pressure, a headloss summary, the desired and calculated sprinkler head output, and a summary of the options examined to reduce headloss. As required per **Section 24.3.9**

SECTION 25 CONSUMER RESPONSIBILITIES

25.1 GENERAL

The consumer shall:

25.1.1 Eliminate all cross connections or install an approved backflow prevention assembly on the water service line.

25.1.2 Immediately correct any malfunction of the backflow prevention assembly.

25.1.3 Inform the APPROVING AUTHORITY of any proposed or modified cross connections and of any existing cross connections of which the consumer is aware.

25.1.4 Prior to start of construction have plans approved and permit obtained for any domestic plumbing or fire service installation requiring an approved backflow prevention assembly. Failure, refusal, or inability on the part of the customer to install, maintain, and have tested, any backflow prevention assembly on the consumer's property shall constitute grounds for discontinuing water service until such requirements have been satisfactorily met.

25.1.5 Have the type of backflow prevention assembly and manner of installation approved by the APPROVING AUTHORITY.

25.1.6 Install a backflow prevention assembly if a private water source is operational even if it is not cross-connected to the Water System.

25.1.7 Install two (2) backflow prevention assemblies in parallel if uninterrupted water service is desired during testing or repair.

25.1.8 Not install a by-pass around any backflow prevention assembly unless there is a backflow prevention assembly of the same type in the bypass.

25.1.9 Have a certified operational test within ten (10) days of installation and at intervals not to exceed one year thereafter. In those instances where the APPROVING AUTHORITY deems the degree of hazard to be great, an operational test may be required at more frequent intervals.

25.1.10 Have only personnel authorized by the ADH perform repairs, installation, maintenance and testing of domestic backflow prevention assemblies.

25.1.11 Have only personnel authorized by the ADH perform repairs, maintenance, and testing of designated fire protection service line backflow prevention assemblies.

25.1.12 Make repairs immediately upon notification by the tester that repairs are needed. Overhaul shall be performed at intervals not to exceed five (5) years.

SECTION 26 ASSEMBLY SPECIFICATIONS

26.1 GENERAL

26.1.1 Specifications for backflow prevention assemblies are essential, since no two assemblies are always reliable under every condition.

26.2 BACKFLOW PREVENTION ASSEMBLIES

26.2.1 **NOTE: Only those assemblies that are approved by the DEPARTMENT shall be used for backflow prevention in water service lines:**

26.2.2 Approved Assembly: Assemblies that have been tested and approved by the FCCCHR and certified by the ADH are approved by the DEPARTMENT.

26.2.3 Double check valve assembly (DCVA): a complete assembly meeting FCCCHR and the ADH standards and approval or the latest version thereof consisting of two (2) internally loaded, independently operating check valves between two (2) tightly closing resilient-seated shutoff valves, with four (4) properly placed resilient seated test cocks.

26.2.4 Reduced-pressure principle backflow-prevention assembly (RP): a complete assembly meeting FCCCHR and the ADH standards and approval or the latest version thereof consisting of a mechanical, independently operating, hydraulically dependent relief valve located between two (2) independently operating, internally loaded check valves that are located between two (2) tightly closing resilient seated shutoff valves with four (4) properly placed resilient-seated test cocks.

26.2.5 The following information shall be distinctly marked on every RPZA, DCVA, DDCVA and DRPZA by cast in the metal, stamped in the metal, or stamped on a brass or stainless steel nameplate permanently affixed to the assembly:

(a) Name or trademark
(b) Type (RPZA, DCVA, etc.)
(c) Size
(d) Model number
(e) Direction of flow (indicated by an arrow)
(f) Serial number
(g) Maximum working water pressure
(h) Maximum water temperature for which designed (designate degree F or degree C).

26.2.6 Every RPZA, DCVA, DDCVA and DRPZA shall be shipped completely assembled.

26.2.7 Any frost free bury hydrant installation is subject to a degree of hazard assessment to determine the required backflow prevention device(s) that shall be installed. High hazard conditions require a reduced-pressure principle backflow preventor assembly. Low hazard conditions require a hose-bib atmospheric vacuum breaker with set screw (freeze proof is recommended), and a dual in-line check valve. The appropriate backflow prevention device(s) shall be installed in a location accessible for inspection prior to installation of a water meter.

SECTION 27 ASSEMBLY INSTALLATION, RECORDS AND REPORTS

27.1 GENERAL

27.1.1 Proper installation of backflow prevention assemblies is necessary to adequately protect the Water System from backflow.

27.2 AUTHORIZED INSTALLERS & TESTERS

27.2.1 Installation of backflow prevention assemblies on domestic water service lines shall be provided by personnel licensed or certified by the ADH.

27.2.2 Installation of backflow prevention assemblies on fire protection services shall be provided by personnel licensed or certified by the Arkansas Fire Protection Licensing Board.

27.2.3 Testing of backflow prevention assemblies on domestic and fire protection services shall be provided by personnel licensed or certified by the ADH.

27.3 PERMITS

27.3.1 Consumers shall possess a permit from the APPROVING AUTHORITY prior to beginning installation of an assembly. All permits shall be obtained by Licensed Plumber installing the device.

27.3.2 A permit authorizes the use of the backflow prevention assembly and is necessary for continuing water service. Permits are non-transferable and may be revoked if the consumer fails to adhere to the conditions of the permit. Adequate records and documentation are required for continued permit usage. Consumer shall secure and hold one backflow prevention assembly "use" permit per address. Water meter shall not be set until permit is purchased and recorded at the **Bentonville Water Utilities Office** and the inspection completed.

27.4 INSTALLATION DETAIL

27.4.1 Assembly Installation

27.4.1.1 A backflow prevention assembly shall be installed in accordance with the manufacturer's instructions.

27.4.2 An assembly shall be installed on the owner's side of the water meter prior to first outlet.

27.4.3 Piping connected to the assembly shall not be used for electrical grounding.

27.4.4 Piping for risers on irrigation BFP assemblies shall be hard copper (per plumbing code) with two ground unions, one on the upstream riser and one on the downstream riser, for repair and replacement. No plastic allowed.

27.4.5 Piping connected to the assembly shall be thoroughly flushed before installing the assembly.

27.4.6 An adequate and permanent method of test water disposal shall be provided.

27.4.7 A pressure relief valve and a thermal expansion tank shall be properly installed and maintained on all water heating apparatus served by the assembly.

27.4.8 Examples of approved enclosures:

With Regulator

Standard

27.4.8.1 **IMPORTANT! Thermal Expansion Notice-**

Water expands as it heats up and is ordinarily not a problem in an open water system. However, the installation of a backflow preventer into the water system creates a closed system. This can create a potentially dangerous and/or costly situation in the water system if a provision is not allowed for the safe expansion of the heated water.

27.4.8.2 The installation of Thermal Expansion Tanks or other approved methods or devices are recommended in domestic water systems requiring backflow prevention assemblies.

27.4.8.3 Please refer to current Arkansas State Plumbing Codes or call the Bentonville Water Utilities office at 271-3140 if you have any questions.

27.4.9 The assembly installation shall be protected from vandalism and freezing. Heating and electrical wiring shall meet ASSE 1060 Standards.

27.4.10 Backflow prevention assemblies installed outdoors and subject to freezing shall be protected by an 'enclosure' which complies with the standards and specifications set forth by the American Society of Sanitary Engineering (ASSE), Code 1060.

27.4.11 Adequate support, excluding water lines, shall be provided for assemblies that are 3" or larger.

27.4.12 If not part of the approved assembly, an approved strainer shall be installed on the inlet side of the assembly prior to the assembly isolation valve, so that all water must pass through the strainer immediately before entering the assembly.

27.4.12.1 ***NOTE:*** On backflow prevention assemblies 2" and smaller, utilizing outdoor enclosures, width of enclosure and location of Y-strainer must be taken into account to allow for proper fit of enclosure. Strainers are not required on Fire Protection Systems.

27.4.13 An approved blow-off shall be installed in the water line immediately after the assembly, to allow for flushing the assembly and to allow for usage of water that is not charged a sewer fee.

27.4.13.1 ***NOTE:*** On backflow prevention assemblies 2" and smaller utilizing outdoor enclosures, the Blow-off shall be installed on the downstream riser, keeping width of assembly to a minimum to allow for proper fit of enclosure. 2" through 10" assemblies shall have a blow-off not less than 2" in diameter. Assemblies larger than 10" shall have a minimum 4" blow-off. Blow-offs installed in vaults shall have piping into the existing vault drain to prevent splashing.

27.4.14 Blow-offs in vaults may also be routed above grade and away from the vault, however, a self draining feature must be incorporated to prevent freezing damage to the blow-off piping.

27.4.15 If the assembly cannot be installed in the prescribed manner for any reason, the proposed deviations shall be submitted to the DEPARTMENT for review and approval before installation.

27.4.16 No backflow preventer assembly shall be installed above or inside a ceiling or over head in any manner, between a ceiling and sub floor or within a wall structure (between wall boards), without the express authorization of the Cross-Connection Control Program manager/agent.

27.5 RPZA & DRPZA INSTALLATION

27.5.1 The assembly shall not be buried or shall not be installed in a vertical position unless the assembly is approved for use in that position by the FCCCHR.

27.5.2 The assembly may be contained in an approved enclosure. If a shelter is desirable, plans will be reviewed on a case by case basis.

27.5.3 An adequate and permanent method of handling relief vent discharge and test water discharge shall be provided.

27.5.4 Clear unobstructed space for the relief vent shall be provided to prevent the vent from becoming blocked or flooded.

27.5.5 This discharge and drainage method shall meet all applicable codes and regulations per the ADH and the Bentonville Cross-Connection Control Program.

27.6 DDCVA & DCVA INSTALLATION

27.6.1 The assembly shall not be installed below grade, unless the following criteria can be met and accepted by the APPROVING AUTHORITY:

(a) The vault and its installation shall be approved by the DEPARTMENT before the start of construction.
(b) The vault shall not be subject to flooding.
(c) The walls of the vault shall extend above the finished grade a minimum of 3" to prevent intrusion of water or dirt.
(d) The vault shall be water-tight to prevent intrusion of water or dirt.
(e) The vault shall drain to daylight through an adequate and permanent gravity drain with a slope of at least 1º. Installation plans shall show the elevation of the vault floor and the area the water will drain to. Plans shall show drainage pipe depth and location. Drainage pipe size shall be 2" larger than the blow-off. Protection on the drainage outlet shall be provided to prevent undesirable creatures from entering.
(f) The vault cover shall be removable to allow full access to the vault. A minimum of two lifting points shall be provided.
(g) An access door will be installed in the vault cover on the testable side of the assembly. Approved doors shall be similar or equal to Bilco or Halladay and shall be a minimum of 24" x 24".
(h) Directly below the access door, steps shall be provided in the vault wall similar or equal to ICM Plastic Manhole Steps. Steps are ½" steel reinforced rod encapsulated in special polypropylene plastic.
(i) Minimum installation clearance dimensions shall be 30" between the assembly and corresponding wall and 12" on the opposite side, 8" on each end, 6" above the highest point and 12" under the assembly. Top of assembly shall not exceed 72" above finished grade.
(j) Manufactured enclosures shall be equal to or the equivalent of a "Hot Box". Enclosures shall be placed on a wire reinforced concrete pad a minimum of 4" thick and shall be removable.

27.7 TEMPORARY USE ASSEMBLIES

27.7.1 A public fire hydrant used as a temporary water source shall be protected by a check valve or air gap and metered by a flow meter which shall be obtained from and installed by the APPROVING AUTHORITY. **Refer to current fire hydrant meter contract**.

27.8 REPORTING REQUIREMENTS

27.8.1 The consumer shall be responsible for properly filing reports with the APPROVING AUTHORITY for each required backflow prevention assembly. DDCVA's and DRPZA's are composed of two (2) unique assemblies, each requiring report submission. In addition to the administrative reports, any failure, removal, modification or replacement of an assembly or suspected backflow shall be reported immediately to the APPROVING AUTHORITY. Performance tests, replacement, repair and maintenance reports shall be filed within 14 calendar days.

27.9 RECORDS

27.9.1 The consumer shall keep records for each assembly. Installation drawings, installer, test reports, manufacturer, model, serial number, date installed, copy of current permit, schedule of preventive maintenance, test reports and technical data are the minimum record requirements. These records shall be maintained for a period not less than five years.

27.10 **PROTECTION OF ASSEMBLIES**

27.10.1 No person shall maliciously, willfully, or negligently break, damage, destroy, deface or tamper with any structure, appurtenance or equipment which is a part of the backflow prevention assembly.

27.10.2 No person shall cover a backflow prevention assembly vault with earth or pavement, or otherwise render it inaccessible.

27.11 **PENALTIES**

27.11.1 The DEPARTMENT shall, within an approximate period of forty five (45) days prior to the annual test date, mail a notification letter to customers operating a backflow prevention assembly (BFP) on that customer's premises, informing them of the annual test due date of said assembly. Included in the notification letter shall be identifying information connected with the BFP assembly, i.e.; brand, model, serial number and approximate location of the BFP assembly(s). The City may also include with the notification a test form and a list of Licensed Assembly Tester Technicians that the customer may use to have the BFP assembly tested. The Licensed Assembly Tester Technician list is also available on the City of Bentonville website. The period of approximately forty five (45) days allows adequate time to secure a satisfactory test report of the BFP assembly(s) and to have a copy of the report sent to the DEPARTMENT.

27.11.2 In the event the DEPARTMENT has not received a copy of a satisfactory test report approximately fifteen (15) days prior to the due date, a second notice letter will be mailed to the customer. This letter is a reminder to the customer of the approaching due date.

27.11.3 The second notice shall also contain the same BFP assembly information.

27.11.4 If the DEPARTMENT has not received a satisfactory test result within five (5) days after the due date, the customer shall be notified by mail, hand delivery or in some cases certified mail that they are in violation of current ordinance and have 15 days to complete a satisfactory test and deliver a copy of the test report to the DEPARTMENT, or water service to this address shall be discontinued until such time a copy of said test report shall be delivered to the DEPARTMENT office.

27.11.5 Any consumer found in violation of any of the provisions of the Program, shall be served by the APPROVING AUTHORITY with written notice stating the nature of the violation, describing the penalty applicable to the violation and providing a reasonable time limit for the satisfactory correction thereof. The offender shall, within the period of time stated in such notice, permanently cease all violations. The consumer may deliver by certified mail to the APPROVING AUTHORITY, within 5 days of receipt of such notice a written request for a "just cause" meeting with the APPROVING AUTHORITY. At this meeting the consumer shall be given the opportunity to show "just cause" for the notice to be rescinded or modified.

27.11.6 Any notice issued pursuant to this sub-section may provide one or more of the following penalties:

(a) A compliance directive mandating procedures to bring the consumer into compliance with the Program within the designated time; failure to comply with the compliance directive shall result in termination of water service.
(b) A withdrawal of the Consumers backflow prevention assembly permit and termination of water service to the consumer.

27.11.7 No action to withdraw a consumer's permit shall be final until the APPROVING AUTHORITY has given notice described herein held a "just cause" meeting, if requested.

27.11.8 However, if the APPROVING AUTHORITY determines that to continue to provide water service will endanger the public health, due to possible contamination of the Water System, water service to the property shall be immediately terminated.

27.11.9 Any person violating the provisions of this Program shall become liable to the DEPARTMENT for any expense, loss or damage occurred to the DEPARTMENT by reason of such violation.

27.11.10 The listing of penalties in this Section shall not preclude other appropriate judicial remedies available to the DEPARTMENT for any violation of the Program. The DEPARTMENT may petition any Court of competent jurisdiction to grant injunctive or other legal or equitable relief by reason of a violation.

Detailed Drawings

General Water/Sewer Details

GWS01	Encasement Detail
GWS02	Thrust Blocking
GWS03	Reaction Backing Table
GWS04	Anchor Collar Specifications
GWS05	Encasement Crossing
GWS06	Subdivision Utility Placement – Black/White and Color
GWS07	Typical Bedding Detail – Per Street Department Specs

Water Details

W01	1” Temporary Blow-off Assembly/Sample Point
W02	1” Water Service
W03	5/8” Water Service
W04	Fire Hydrant with Retainer Glands
W05	Fire Hydrant with Swivel Anchor Coupling
W06	Deep Bury Fire Hydrants
W07	Valve Box Valve Stem and Tracer Wire Installation
W08	Restrained Gate Valve
W09	2” Combination Air/Vacuum Valve
W10	1” Combination Air/Vacuum Valve
W11	Swing Connection - New Main to Existing Main
W12	Meter Vault 4” – 8” Meters (Typical)
W13	Cut and Cap Detail
W14	Frost Free Hose Bibb with Vacuum Breaker
W15	Reduced Pressure (RP) Backflow Device – Exterior Irrigation Only
W16	Reduced Pressure (RP) Backflow Device – Interior Domestic or Irrigation
W17	Waterline Obstruction Crossing
W18	2” Water Service

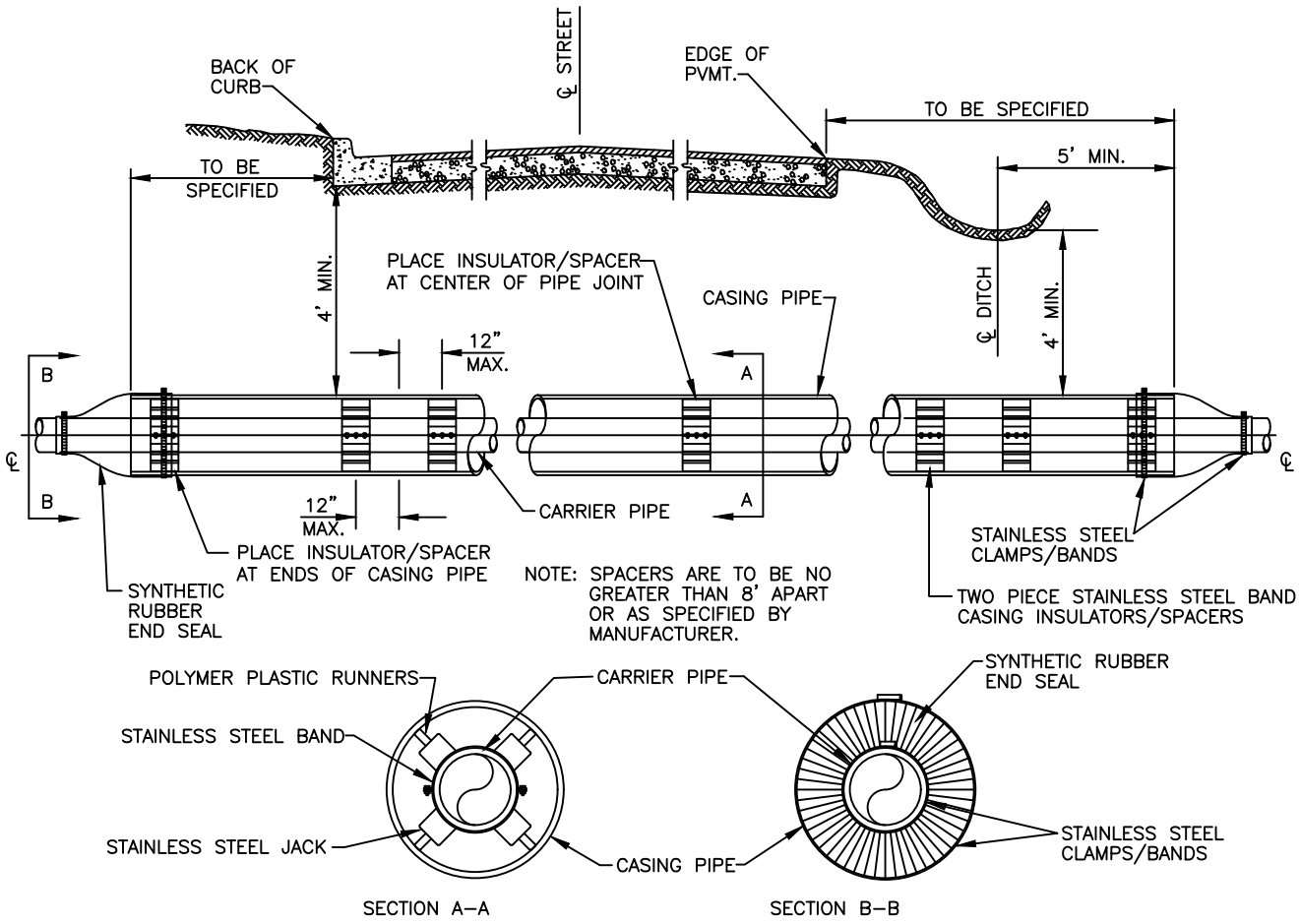
Sanitary Sewer Details

SS01	Sanitary Sewer Manhole - Cast-In-Place
SS02	Sanitary Sewer Manhole - Interior Drop
SS03	Sanitary Sewer Manhole - Exterior Drop
SS04	Heavy Duty Manhole Lid and Frame
SS05	Water Tight Bolted Lid and Frame
SS06	Sanitary Sewer Service Wye
SS07	Existing Manhole Abandonment – 5’ or deeper
SS08	Private Sewer Manhole – Ring and Lid
SS09	Manhole Adjust to Grade

Lift Station Details

LS01	Duplex Pump Control Panel 480V 3-Phase
LS02	Duplex Pump Control Panel 230V Single Phase
LS03	Lift Station Site
LS04	Lift Station Non-Clog Pumps above 5-HP
LS05	Lift Station Grinder Pumps 5-HP and Less
LS06	Lift Station Wet Well
LS07	Lift Station Valve Vault
LS08	Air Vacuum /Release Manhole for Force Main
LS09	Typical Bedding Detail for Force Main
LS10	Tracer Wire Port

ENCASEMENT DETAIL



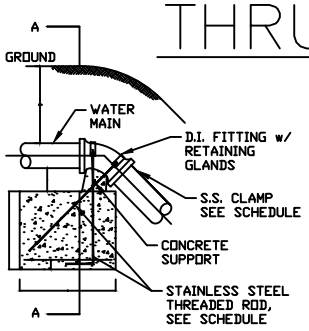
CARRIER & CASING SIZES										
CARRIER	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
CASING	16"	16"	16"	18"	24"	24"	30"	30"	36"	36"
CASING/WALL THICKNESS	.219	.219	.219	.250	.281	.344	.406	.406	.500	.500

NOTE: DUCTILE IRON, OR PVC PIPE REQUIRED FOR WATER, OR SEWER.

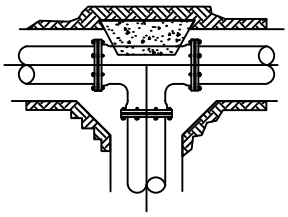
*ALL BELLS SHALL BE RESTRAINED INSIDE ENCASEMENT BY APPROVED METHOD.

THE CITY OF WATER B UTILITIES BENTONVILLE	DRAWN BY: JS	CHECKED BY: AW
	GEN WATER/SEWER DETAIL: GWS01	
	LAST REVISION DATE: 08/27/2024	
	APPROVED:	10/01/2024

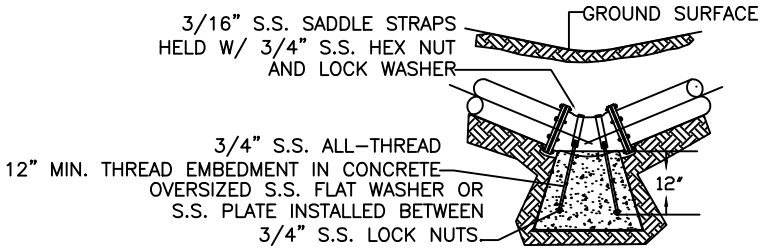
THRUST BLOCKING



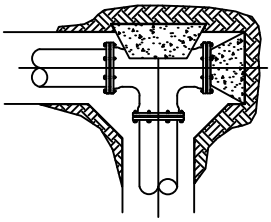
BLOCKING FOR VERTICAL TIE DOWN



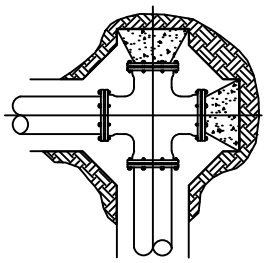
BLOCKING FOR TEE



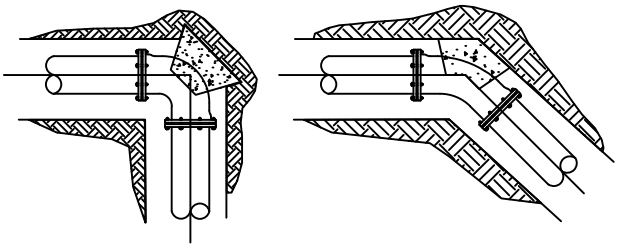
TYPICAL BLOCKING FOR VERTICAL BENDS



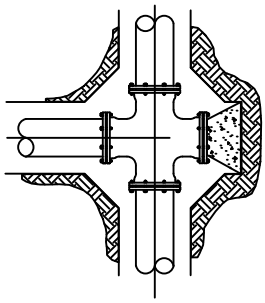
SPECIAL BLOCKING OF TEE & PLUG (WHEN DIRECTED BY WATER DEPT.)



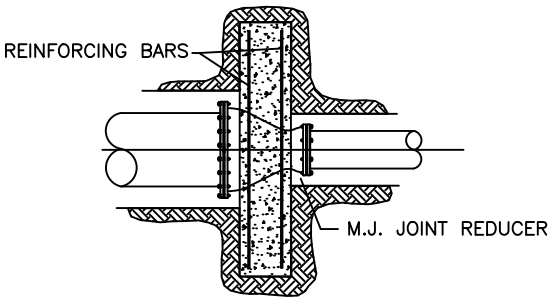
TYPICAL SECTION OF CROSS & 2 PLUG BLOCKING (WHEN DIRECTED BY WATER DEPT.)



TYPICAL BLOCKING FOR HORIZONTAL BENDS



TYPICAL SECTION OF CROSS & PLUG BLOCKING (WHEN DIRECTED BY WATER DEPT.)



THRUST SUPPORT FOR REDUCER (SIZE TO BE DETERMINED BY WATER DEPT.)

NOTES

1. ALL BLOCKING SHALL BE AGAINST UNDISTURBED SOIL USING 4,000 PSI CONCRETE.
2. WHERE SOIL CONDITIONS MAKE IT NECESSARY TO POUR CONCRETE OVER JOINTS, THE ENDS OF THE ADJACENT PIPES MUST HAVE A THRUST BLOCK TO RESIST MOVEMENT OF THESE JOINTS.
3. WEIGHT CALCULATIONS TO BE BASED ON REACTION BACKING TABLE (SEE GWS03).
4. WHEN BLOCKING AGAINST FITTINGS, FITTINGS SHALL BE COVERED WITH POLYETHYLENE WRAP TO PREVENT BONDING OF CONCRETE
5. WHERE SHEAR BECOMES A PROBLEM PROPER REINFORCING MUST BE INSTALLED INTO THE BLOCKING.
6. CLEARANCE SHALL BE A MINIMUM OF 6" BETWEEN PIPE AND OBSTRUCTIONS.
7. CLEARANCE ON PIPES BELONGING TO OIL/GAS COMPANIES SHALL BE 18" UNLESS SPECIAL PERMISSION IS GIVEN BY THESE COMPANIES AND THE DEPARTMENT.
8. 12" OF ALL THREAD EMBEDED IN CONCRETE
9. MIN. 5/8" ALL THREAD FOR SECTIONS 10FT OR UNDER

DRAWN BY: JI	CHECKED BY: PN
GEN WATER/SEWER DETAIL: GWS02	
LAST REVISION DATE: 01/27/2020	
APPROVED:	06/22/2021

REACTION BACKING TABLE

BLOCKING SCHEDULE					
PIPE SIZE	BENDS				
		45°	22 1/2°	11 1/4°	ROD DIA.
VOLUME REQ'D (CU. FT.)		98.5	50.2	25.2	3/4 IN.
8"	A (FT.)	5.00'	4.00'	3.00'	
	B (FT.)	4.00'	3.20'	2.80'	
	C (FT.)	5.00'	4.00'	3.00'	
	MIN. CLAMP (2 EA.)	3/8 IN. x 2 IN.			
VOLUME REQ'D (CU. FT.)		209.5	106.8	53.7	3/4 IN.
12"	A (FT.)	6.00'	5.00'	4.00'	
	B (FT.)	6.00'	4.25'	3.50'	
	C (FT.)	6.00'	5.00'	4.00'	
	MIN. CLAMP (2 EA.)	1/2 IN. x 2 IN.			
VOLUME REQ'D (CU. FT.)		457.2	233.1	117.1	1 IN.
18"	A (FT.)	8.00'	6.50'	5.00'	
	B (FT.)	7.25'	5.50'	4.75'	
	C (FT.)	8.00'	6.50'	5.00'	
	MIN. CLAMP (2 EA.)	5/8 IN. x 3 IN.			
VOLUME REQ'D (CU. FT.)		800.3	408.0	205.0	1 1/4 IN.
24"	A (FT.)	9.50'	7.50'	6.00'	
	B (FT.)	9.00'	7.25'	5.75'	
	C (FT.)	9.50'	7.50'	6.00'	
	MIN. CLAMP (2 EA.)	5/8 IN. x 3 IN.			

VOLUME CALCULATED ON THE BASIS OF CONCRETE REACTING THRUST ON THE RESPECTIVE BENDS UNDER AN INTERNAL PRESSURE OF 250 PSI, 50 PSI SURGE AND THE WEIGHT OF CONCRETE IS 150 POUNDS PER CU. FT.

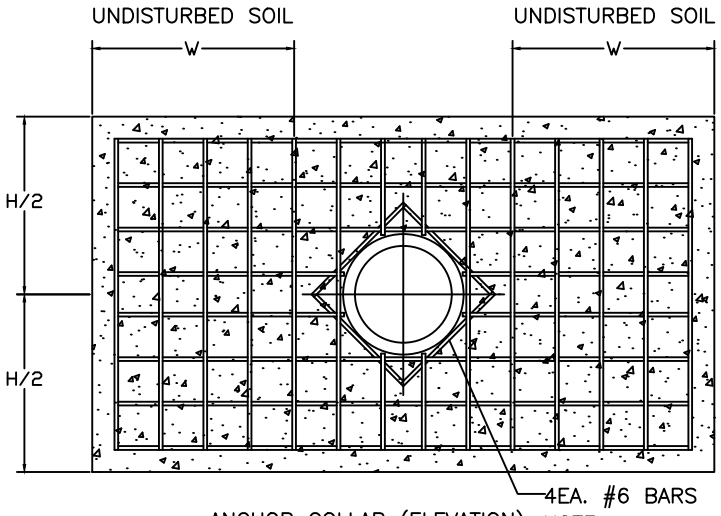
NOTES:

1. ALL FITTINGS SHALL BE MECHANICAL JOINTS.
2. DO NOT COVER BELLS OR FLANGES WITH CONCRETE.
3. WRAP ALL FITTINGS WITH POLY WRAP.
4. BACK ALL TEES ACCORDING TO SIZE OF BRANCH.
5. BACKING FUTURE LINE EXTENSIONS SHALL BE SUCH THAT LATER REMOVAL IS POSSIBLE.
6. ALL BENDS WHERE FITTINGS ARE USED, BOTH HORIZONTAL OR VERTICAL, SHALL BE BACKED WITH CONCRETE.
7. REACTION BACKING TABLE IS BASED ON 150 PSI AND SOIL BEARING PRESSURE OF 2,000 LB/SQ. FT. ADDITIONAL BACKING MAY BE REQUIRED IN SOME AREAS AS REQUIRED BY CITY WATER DEPARTMENT.

THE CITY OF WATER B UTILITIES BENTONVILLE	DRAWN BY: JI	CHECKED BY: PN
	GEN WATER/SEWER DETAIL: GWS03	
	LAST REVISION DATE: 01/27/2020	
	APPROVED:	06/22/2021

ANCHOR COLLAR SPECIFICATIONS

ANCHOR COLLAR SCHEDULE						
PIPE SIZE	DIMENSIONS				REINFORCING BARS	
	W	H	T	M	"A" BARS	"B" BARS
6"	1.5'	2.0'	1.0'	M.J. RETAINER GLAND	#6@6"	#6@6"
8"	1.5'	2.5'	1.0'	M.J. RETAINER GLAND	#6@6"	#6@6"
12"	2.0'	4.0'	1.5'	M.J. RETAINER GLAND	#6@6"	#6@6"
16"	3.0'	4.5'	1.5'	M.J. RETAINER GLAND	#6@6"	#6@6"
20"	3.0'	5.0'	2.0'	M.J. RETAINER GLAND	#6@6"	#6@6"
24"	3.5'	5.5'	2.0'	M.J. RETAINER GLAND	#7@6"	#6@10"
30"	6.5'	6.0'	2.5'	4"	#8@6"	#7@10"
36"	7.0'	7.0'	2.5'	4"	#8@6"	#7@10"



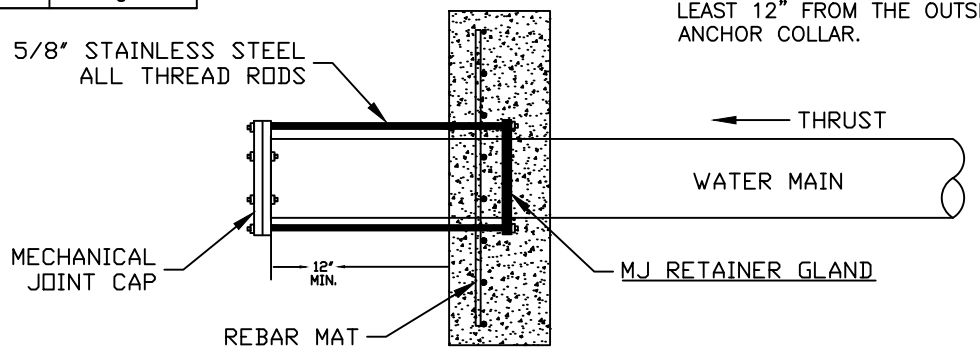
ANCHOR COLLAR (ELEVATION)

ROD REQUIREMENTS	
MAIN SIZE	NO. OF RODS
6"	2
8"	4
12"	4
16"	6
24"	6
30"	8
36"	8

NOTE:
USE M.J. RETAINER GLANDS FOR PIPE 24" AND SMALLER.

NOTE:
PIPE SURFACES SHALL BE CLEANED OF ALL FOREIGN MATERIAL BEFORE 4000 PSI CONCRETE COLLAR IS POURED.

NOTE:
ON DEAD END LINE, PIPE MUST EXTEND AT LEAST 12" FROM THE OUTSIDE EDGE OF ANCHOR COLLAR.

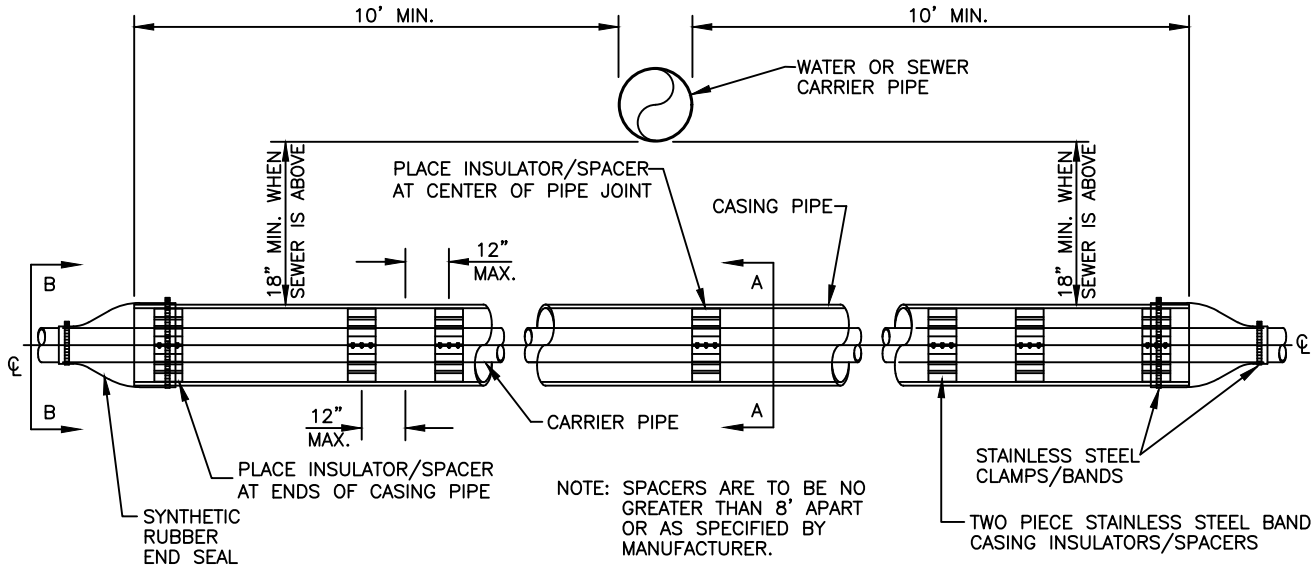


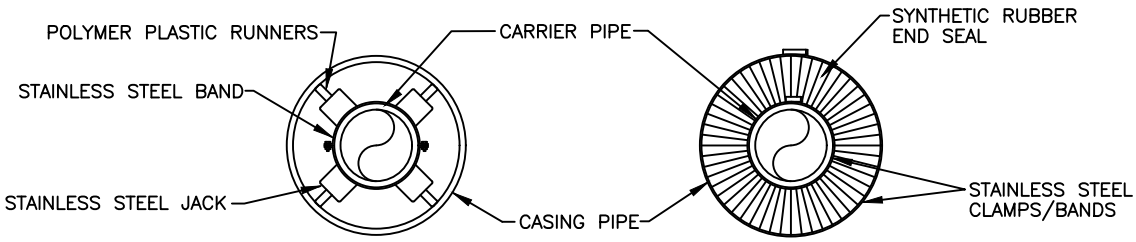
ANCHOR COLLAR (SIDE)

NOTE:
ALL-THREAD STEEL RODS SHALL BE 5/8" STAINLESS STEEL WITH STAINLESS STEEL HARDWARE.

THE CITY OF WATER B UTILITIES BENTONVILLE	DRAWN BY: JI	CHECKED BY: PN
	GEN WATER/SEWER DETAIL: GWS04	
	LAST REVISION DATE: 01/27/2020	
	APPROVED:	06/22/2021

ENCASEMENT CROSSING DETAIL





SECTION A–A SECTION B–B

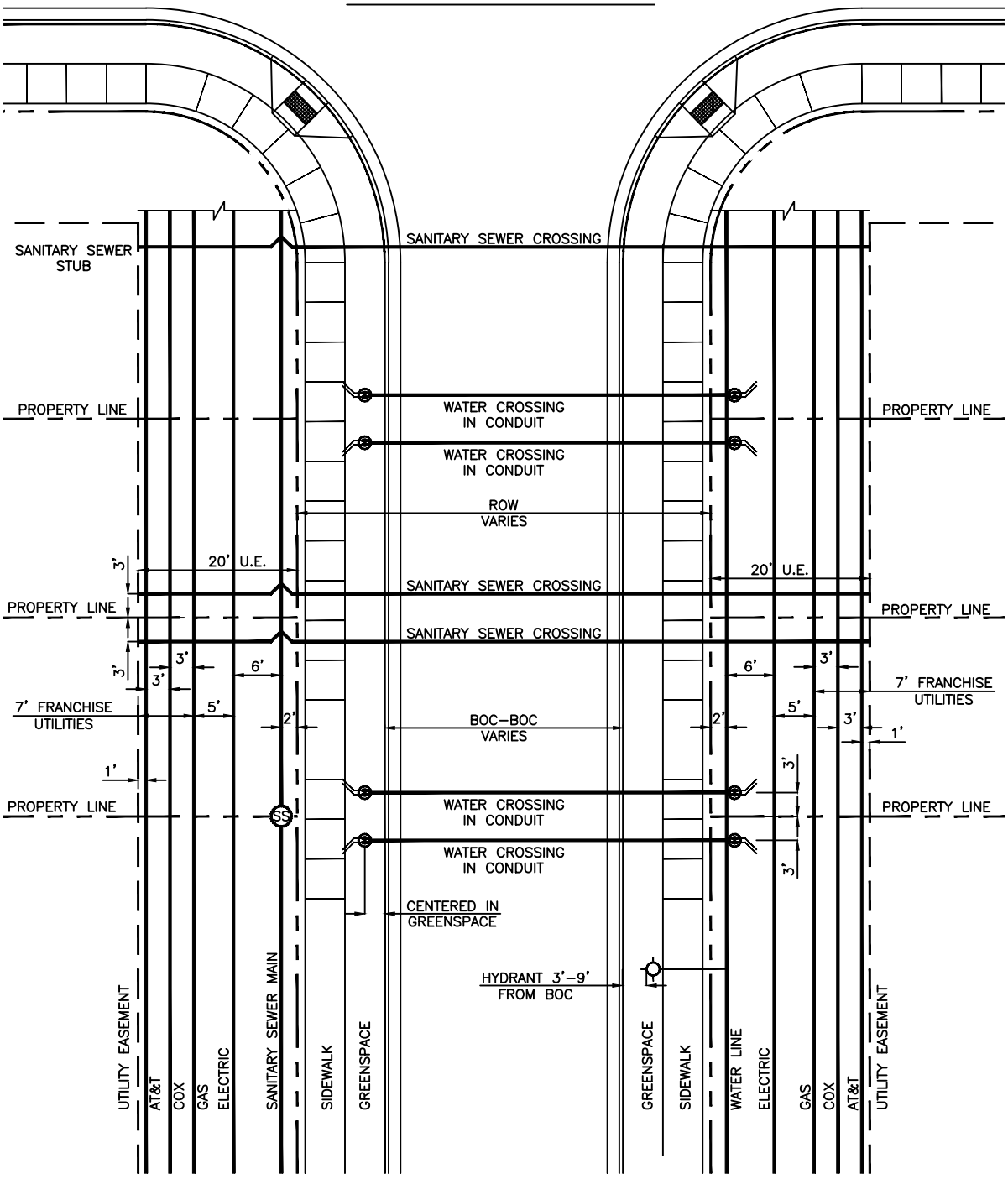
CARRIER & CASING SIZES										
CARRIER	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
CASING	16"	16"	16"	18"	24"	24"	30"	30"	36"	36"
CASING/WALL THICKNESS	.219	.219	.219	.250	.281	.344	.406	.406	.500	.500

NOTE: DUCTILE IRON, OR PVC PIPE REQUIRED FOR WATER, OR SEWER.

*ALL BELLS SHALL BE RESTRAINED BY APPROVED METHOD.

THE CITY OF WATER B UTILITIES BENTONVILLE	DRAWN BY: JS	CHECKED BY: AW
	GEN WATER/SEWER DETAIL: GWS05	
	LAST REVISION DATE: 08/27/2024	
	APPROVED:	10/01/2024

SUBDIVISION UTILITY PLACEMENT

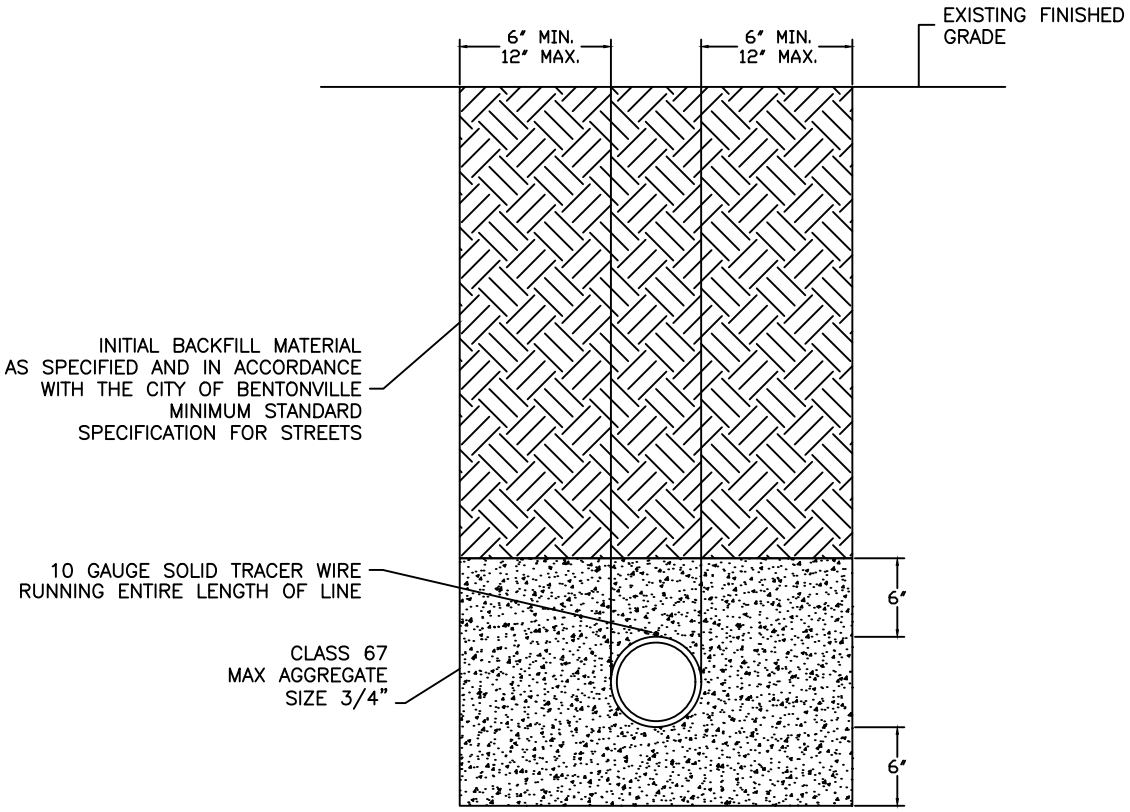


UTILITY SEPARATIONS:

10' HORZ. BETWEEN WATER & SEWER
18" VERT. BETWEEN WATER & SEWER
5' HORZ. BETWEEN ELECTRIC & WATER OR SEWER(MAINS)
18" MIN. VERT. BETWEEN ELEC. & WATER OR SEWER
12" MIN. HORZ. BETWEEN ELEC. & FRANCHISE UTIL.
12" MIN. VERT. BETWEEN SECONDARY CONDUIT AND WATER & SEWER

DRAWN BY: JS	CHECKED BY: AW
GEN WATER/SEWER DETAIL: GWS06	
LAST REVISION DATE: 08/27/2024	
APPROVED:	10/01/2024

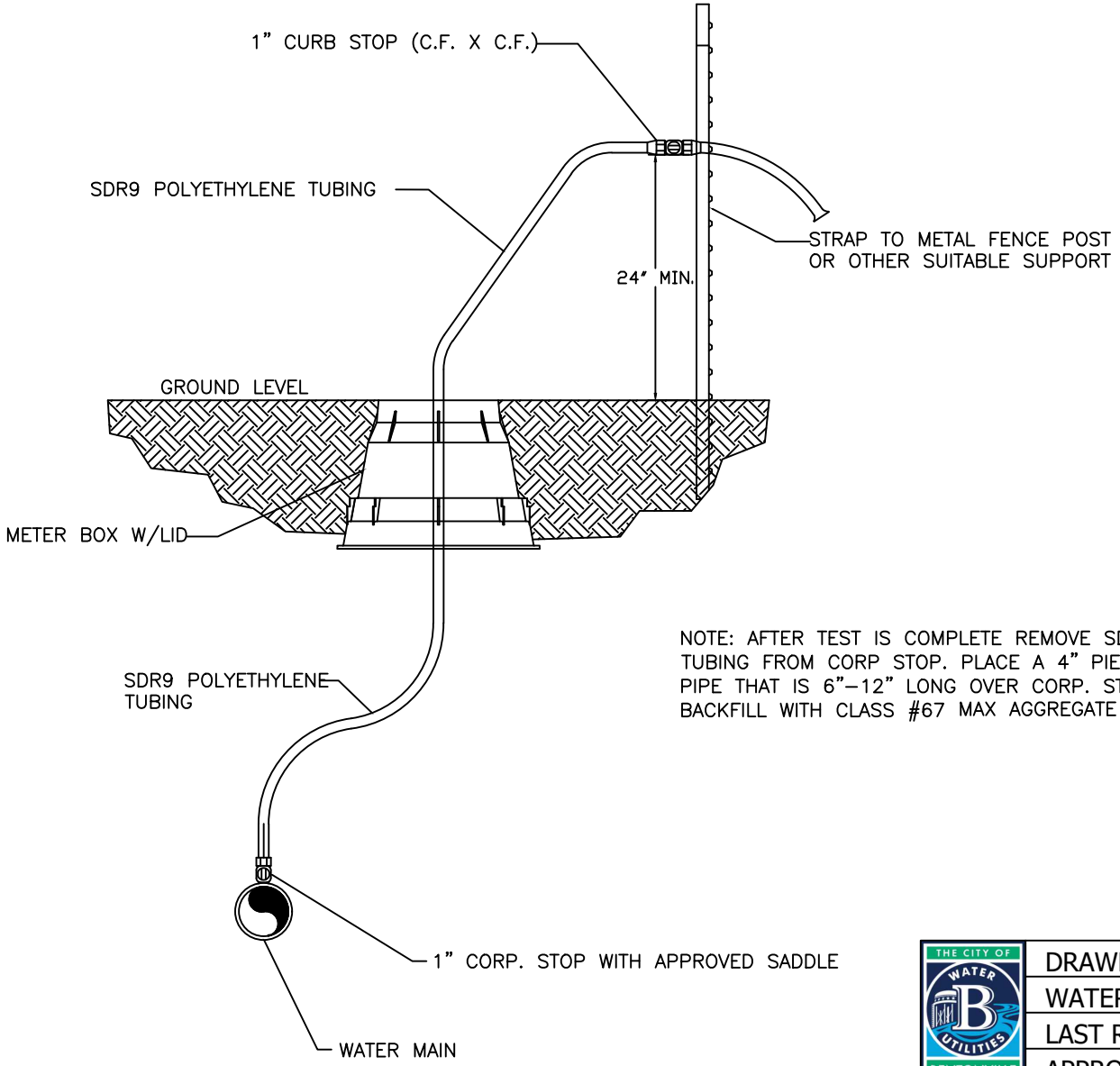
TYPICAL BEDDING DETAIL



* REFER TO STREET SPECIFICATIONS FOR STREET REPAIR INFORMATION

THE CITY OF WATER B UTILITIES BENTONVILLE	DRAWN BY: JI	CHECKED BY: PN
	GEN WATER/SEWER DETAIL: GWS07	
	LAST REVISION DATE: 01/27/2020	
	APPROVED:	06/22/2021

TEMPORARY 1" BLOW OFF ASSEMBLY
SAMPLE POINTS

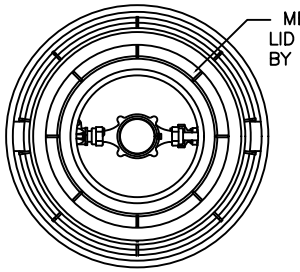


NOTE: AFTER TEST IS COMPLETE REMOVE SDR9 POLY TUBING FROM CORP STOP. PLACE A 4" PIECE OF PVC PIPE THAT IS 6"–12" LONG OVER CORP. STOP. BACKFILL WITH CLASS #67 MAX AGGREGATE SIZE 3/4".

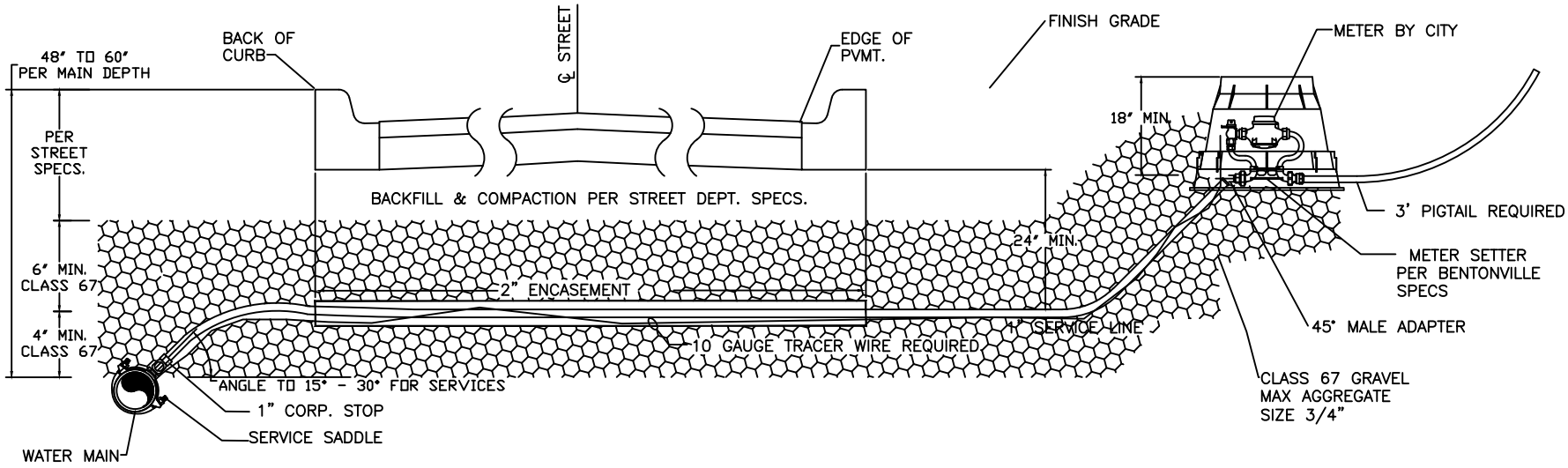
DRAWN BY: JI	CHECKED BY: PN
WATER DETAIL: W01	
LAST REVISION DATE: 01/27/2020	
APPROVED:	06/22/2021

WATER SERVICE DETAIL 1”

NOTE:
1” TUBING WILL
SUPPLY WATER ONLY TO A SINGLE
1” METER SERVICE.



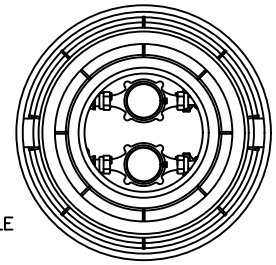
SINGLE SET



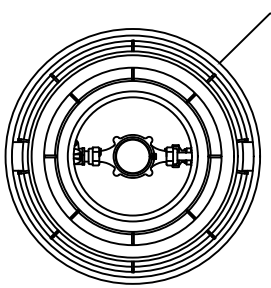
THE CITY OF WATER B UTILITIES BENTONVILLE	DRAWN BY: JS	CHECKED BY: AW
	WATER DETAIL: W02	
	LAST REVISION DATE: 08/27/2024	
	APPROVED:	10/01/2024

WATER SERVICE DETAIL 5/8”

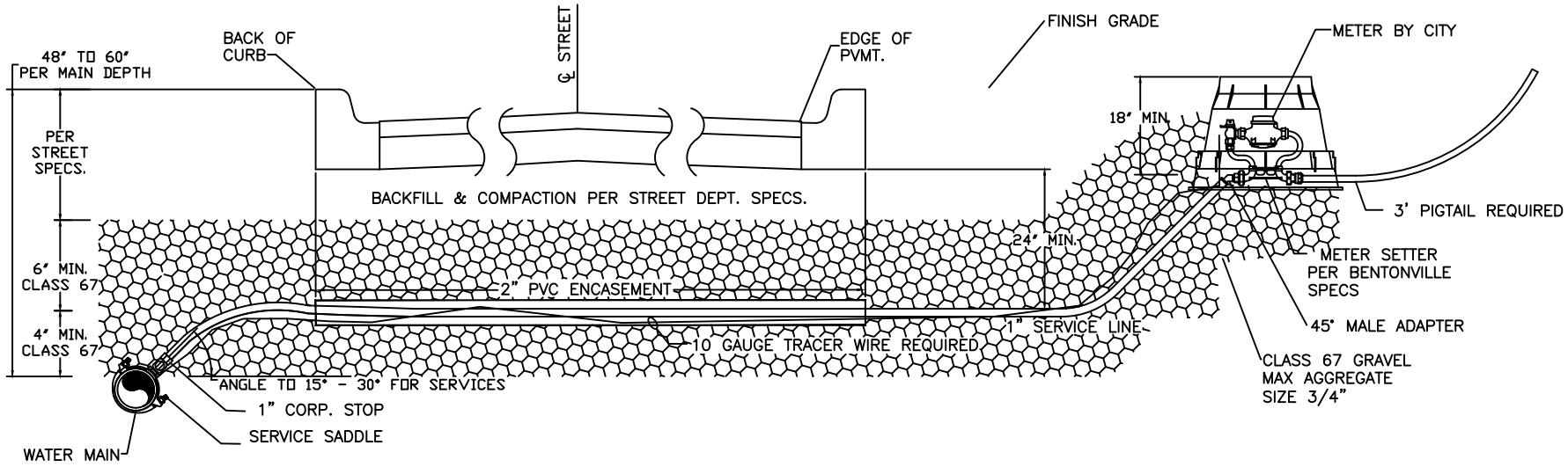
NOTE:
1” TUBING WILL SUPPLY WATER TO A SINGLE 5/8” METER SERVICE OR A DOUBLE 5/8” METER SERVICE.



DOUBLE SET

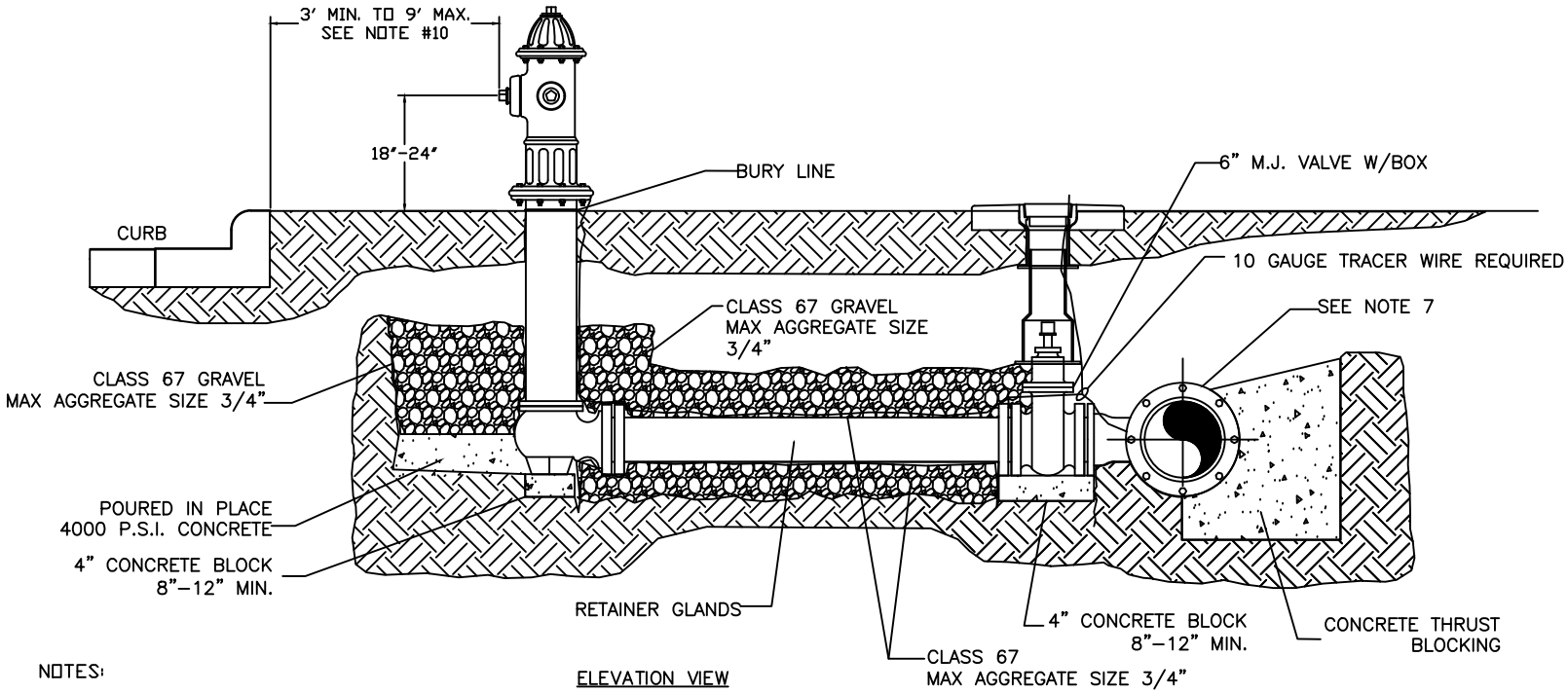


SINGLE SET



THE CITY OF WATER B UTILITIES BENTONVILLE	DRAWN BY: JS	CHECKED BY: AW
	WATER DETAIL: W03	
	LAST REVISION DATE: 08/27/2024	
	APPROVED:	10/01/2024

FIRE HYDRANT DETAIL W/ RETAINER GLANDS



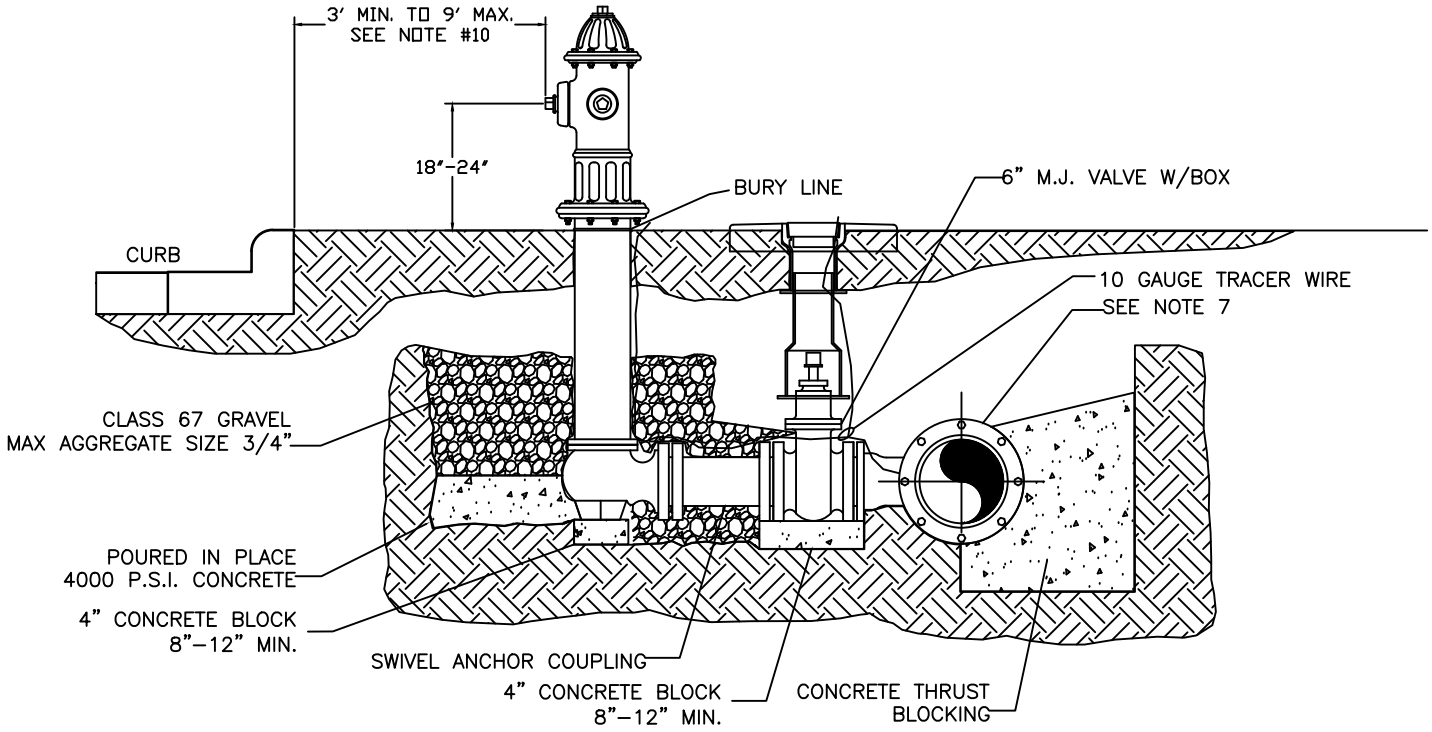
ELEVATION VIEW

NOTES:

1. DRAINAGE BED SHALL CONSIST OF CLASS 67 GRAVEL WITH A MAX AGGREGATE SIZE OF 3/4".
2. USE 6" NIPPLE WITH M.J. RETAINER GLANDS IF DISTANCE BETWEEN VALVE AND HYDRANT MUST BE GREATER THAN 13" SWIVEL ADAPTER.
3. FIRE HYDRANT TO BE BLOCKED AGAINST FIRM SOIL AS SHOWN.
4. ALL HYDRANTS SHALL BE INSTALLED PLUMB.
5. LARGE NOZZLE SHALL FACE CURB UNLESS OTHERWISE NOTED. ROTATE BARREL AS REQUIRED.
6. HYDRANT SHOULD NOT BE SET CLOSER THAN 4.0' TO OBSTRUCTIONS THAT ARE IN LINE WITH NOZZLE.
7. M.J. ANCHOR TEE, TAPPING SLEEVE OR TAPPING SADDLE MAY BE USED (SEE MATERIAL SPECIFICATIONS)
8. HYDRANTS TO BE SET AT DEPTHS GREATER THAN 6.0' SHALL BE SET WITH A MODIFIED FIRE HYDRANT SETTING.
9. POLYWRAP ENTIRE HYDRANT ASSEMBLY. DO NOT COVER WEEP HOLE DRAIN.
10. HYDRANTS WILL BE SET AT A MINIMUM OF 3' TO A MAXIMUM OF 9' BACK OF CURB OR EDGE OF DRIVING SURFACE, NOT IN SIDEWALK, FIRE LANE, OR RADIUS OR AS DIRECTED BY BENTONVILLE WATER DEPARTMENT.

THE CITY OF WATER B UTILITIES BENTONVILLE	DRAWN BY: JI	CHECKED BY: PN
	WATER DETAIL: W04	
	LAST REVISION DATE: 03/16/2021	
	APPROVED:	06/22/2021

FIRE HYDRANT DETAIL W/SWIVEL ANCHOR COUPLING



ELEVATION VIEW

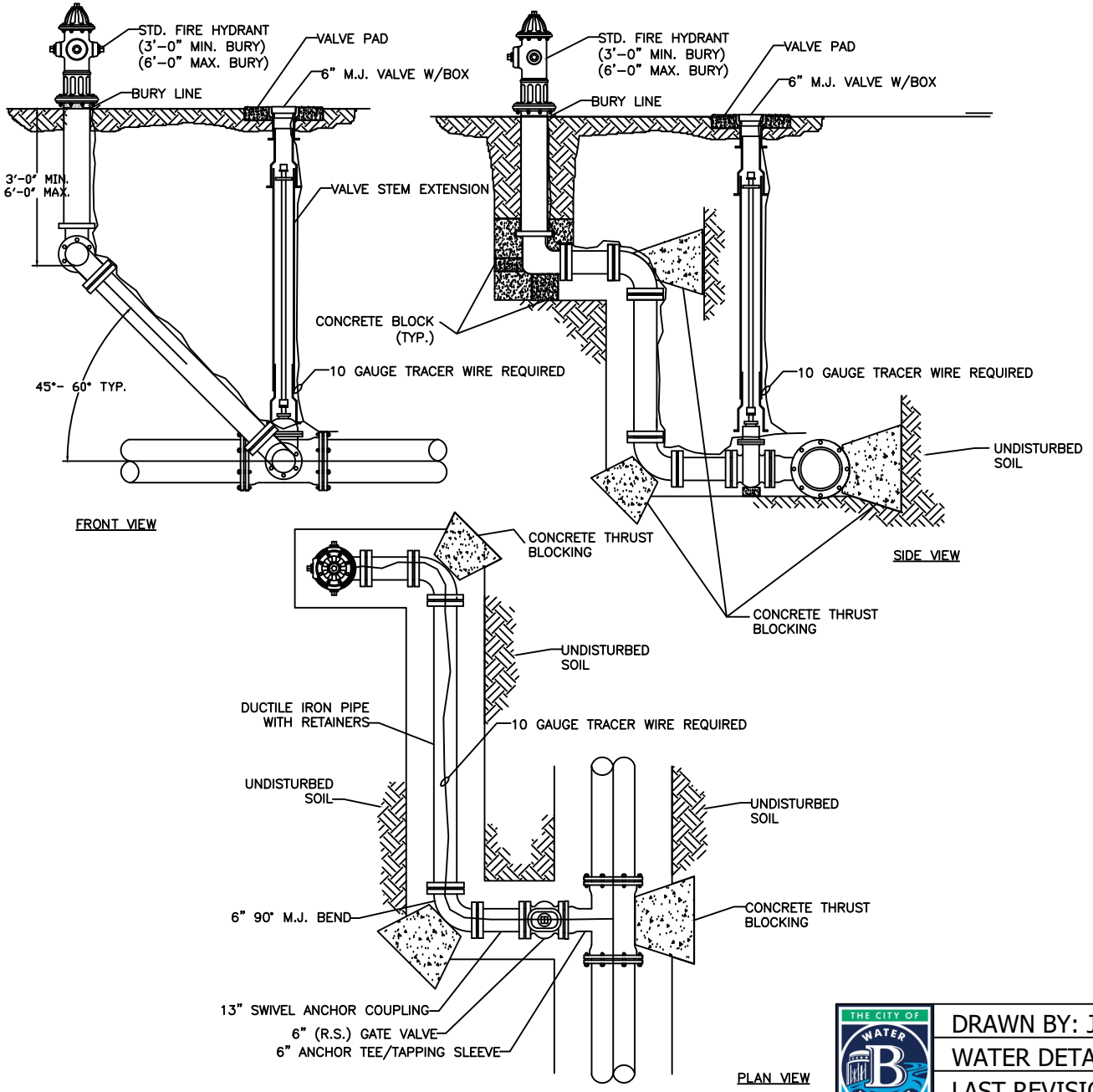
NOTES:

1. DRAINAGE BED SHALL CONSIST OF CLASS 67 GRAVEL WITH A MAX AGGREGATE SIZE OF 3/4".
2. USE 6" NIPPLE WITH M.J. RETAINER GLANDS IF DISTANCE BETWEEN VALVE AND HYDRANT MUST BE GREATER THAN 13" SWIVEL ADAPTER.
3. FIRE HYDRANT TO BE BLOCKED AGAINST FIRM SOIL AS SHOWN.
4. ALL HYDRANTS SHALL BE INSTALLED PLUMB.
5. LARGE NOZZLE SHALL FACE CURB UNLESS OTHERWISE NOTED. ROTATE BARREL AS REQUIRED.
6. HYDRANT SHOULD NOT BE SET CLOSER THAN 4.0' TO OBSTRUCTIONS THAT ARE IN LINE WITH NOZZLE.
7. M.J. ANCHOR TEE, TAPPING SLEEVE OR TAPPING SADDLE MAY BE USED (SEE MATERIAL SPECIFICATIONS)
8. HYDRANTS TO BE SET AT DEPTHS GREATER THAN 6.0' SHALL BE SET WITH A MODIFIED FIRE HYDRANT SETTING.
9. POLYWRAP ENTIRE HYDRANT ASSEMBLY. DO NOT COVER WEEP HOLE DRAIN.
10. HYDRANTS WILL BE SET AT A MINIMUM OF 3' TO A MAXIMUM OF 9' BACK OF CURB OR EDGE OF DRIVING SURFACE, NOT IN SIDEWALK, FIRE LANE, OR RADIUS OR AS DIRECTED BY BENTONVILLE WATER DEPARTMENT.

THE CITY OF WATER B UTILITIES BENTONVILLE	DRAWN BY: JS	CHECKED BY: AW
	WATER DETAIL: W05	
	LAST REVISION DATE: 08/27/2024	
	APPROVED:	10/01/2024

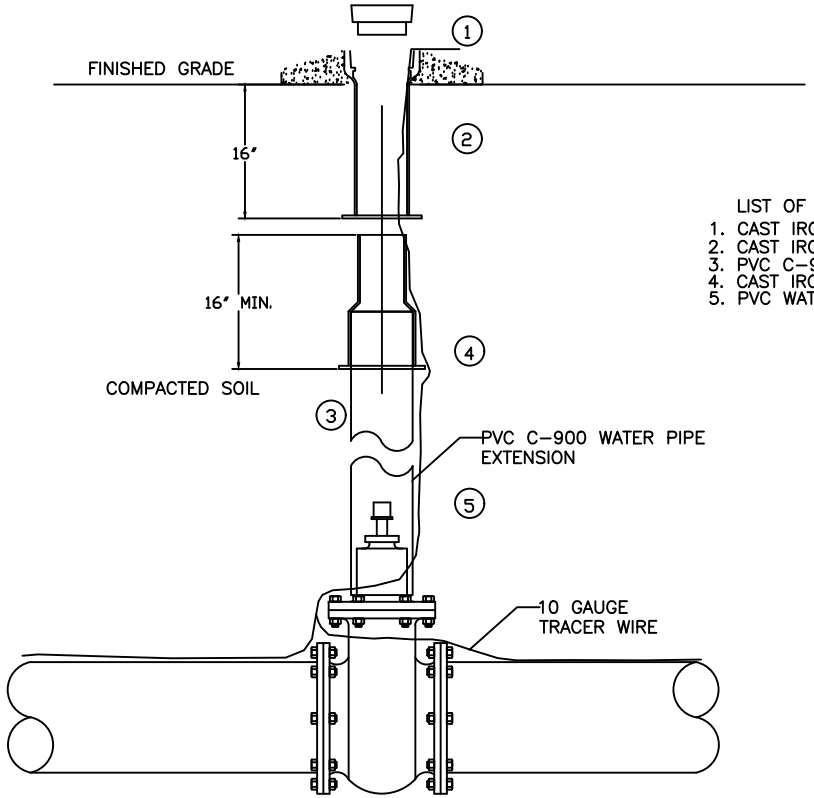
DEEP BURY FIRE HYDRANTS

(BURY DEEPER THAN 6'–0")



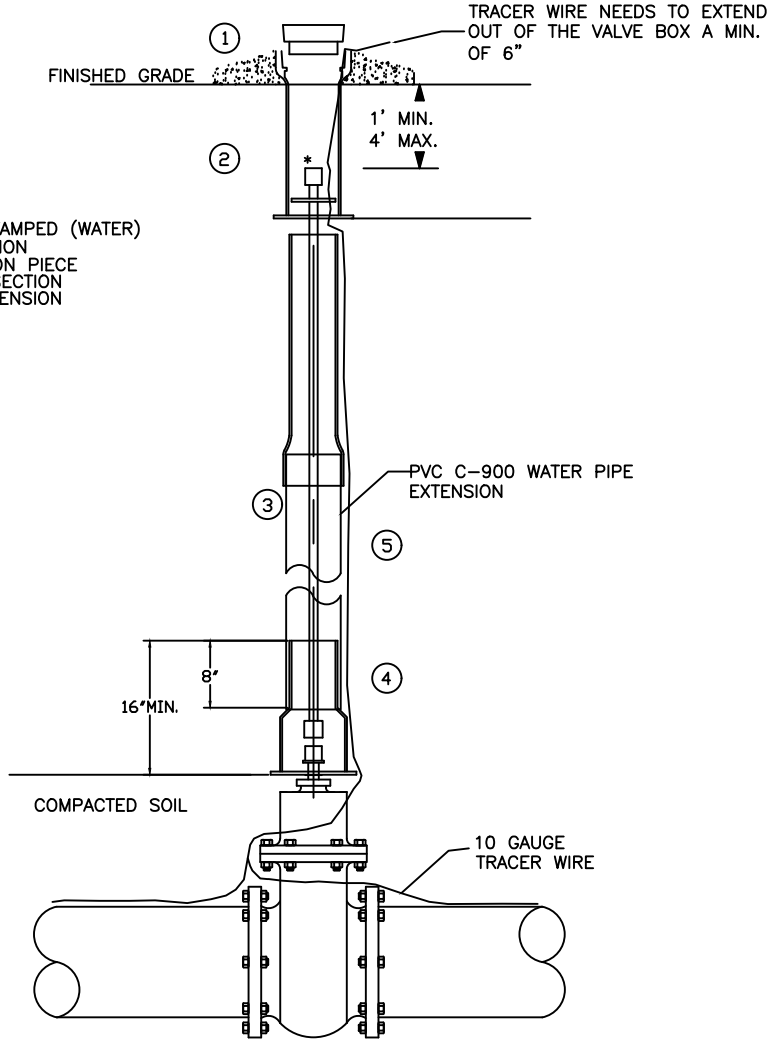
DRAWN BY: JI	CHECKED BY: PN
WATER DETAIL: W06	
LAST REVISION DATE: 03/16/2021	
APPROVED:	06/22/2021

VALVE BOX VALVE STEM & TRACER WIRE INSTALLATION



LIST OF MATERIAL

1. CAST IRON COVER STAMPED (WATER)
2. CAST IRON TOP SECTION
3. PVC C-900 EXTENSION PIECE
4. CAST IRON BOTTOM SECTION
5. PVC WATER PIPE EXTENSION



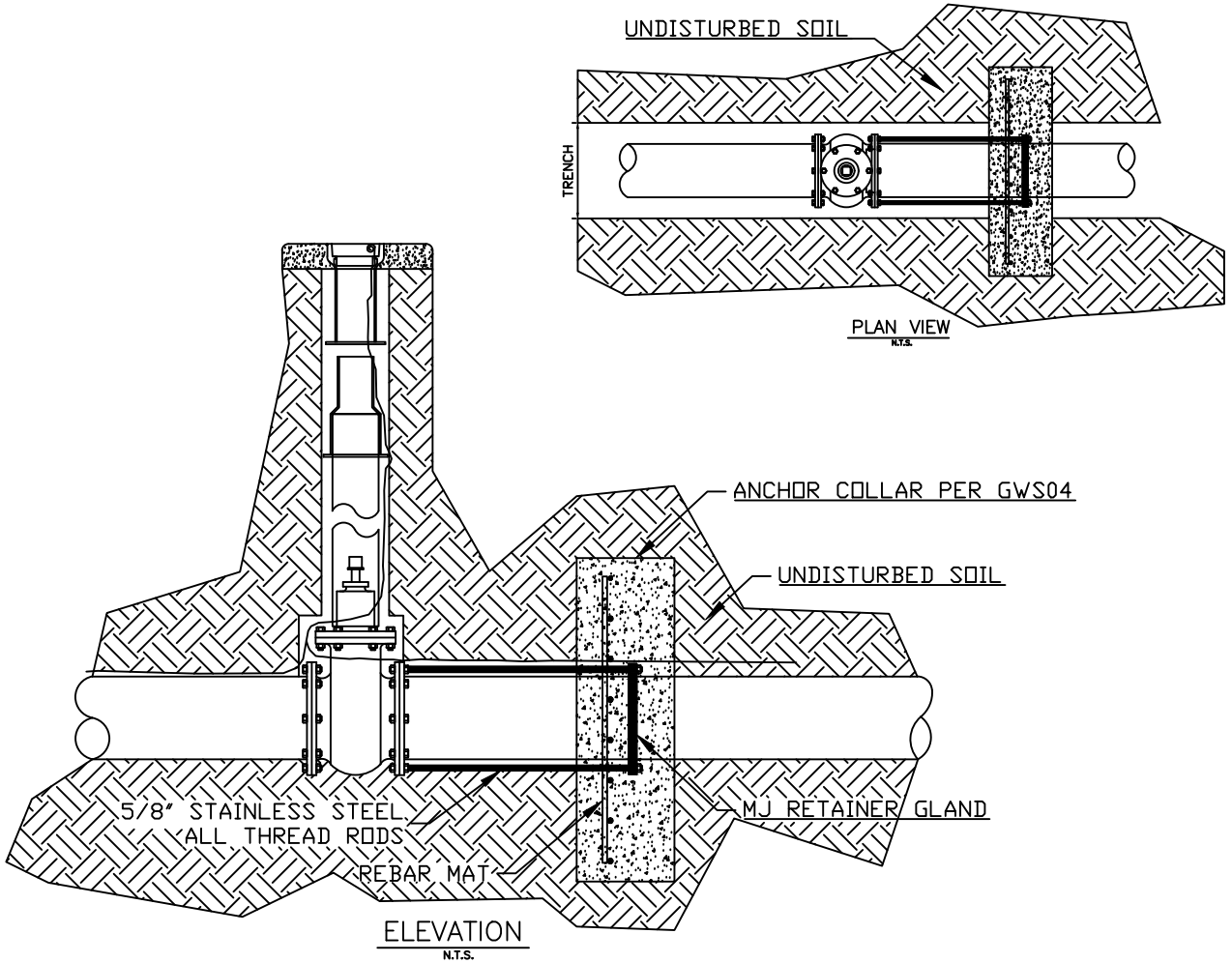
NOTES:

1. IF EXTENSION PIECE IS NEEDED, PVC C-900 WATER PIPE MAY BE USED.
2. EXTENSION PIECE CAN BE CUT TO LENGTH REQUIRED.
3. TRACER WIRE NEEDS TO EXTEND OUT OF THE VALVE BOX A MINIMUM OF 6"

**PROVIDE VALVE STEM EXTENSION WITH CENTERING DEVICE IF GREATER THAN 4.0' DEEP.*

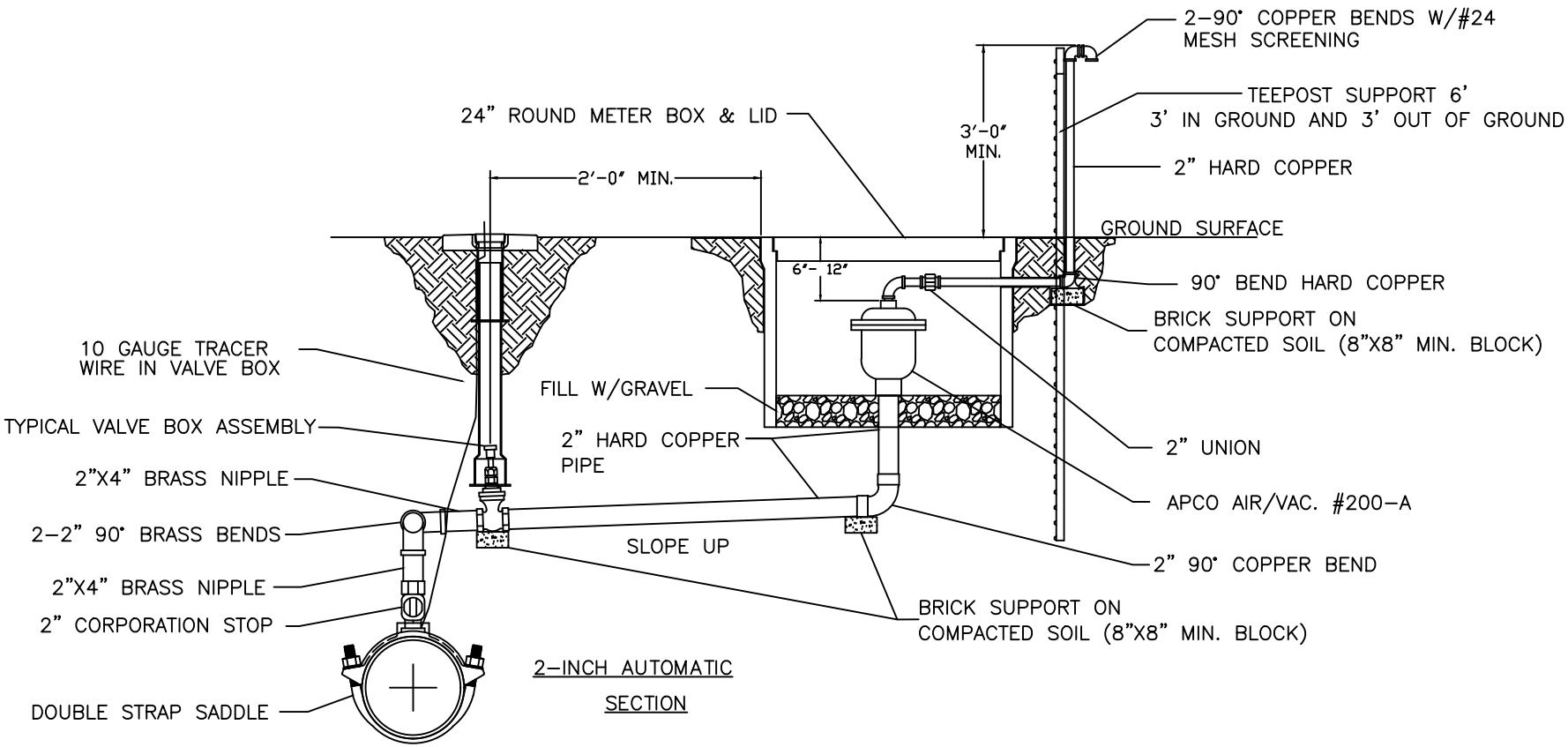
DRAWN BY: JS	CHECKED BY: AW
WATER DETAIL: W07	
LAST REVISION DATE: 08/27/2024	
APPROVED:	10/01/2024

RESTRAINED GATE VALVE



DRAWN BY: JI	CHECKED BY: PN
WATER DETAIL: W08	
LAST REVISION DATE: 01/27/2020	
APPROVED:	06/22/2021

2" COMBINATION AIR/VACUUM VALVE DETAIL

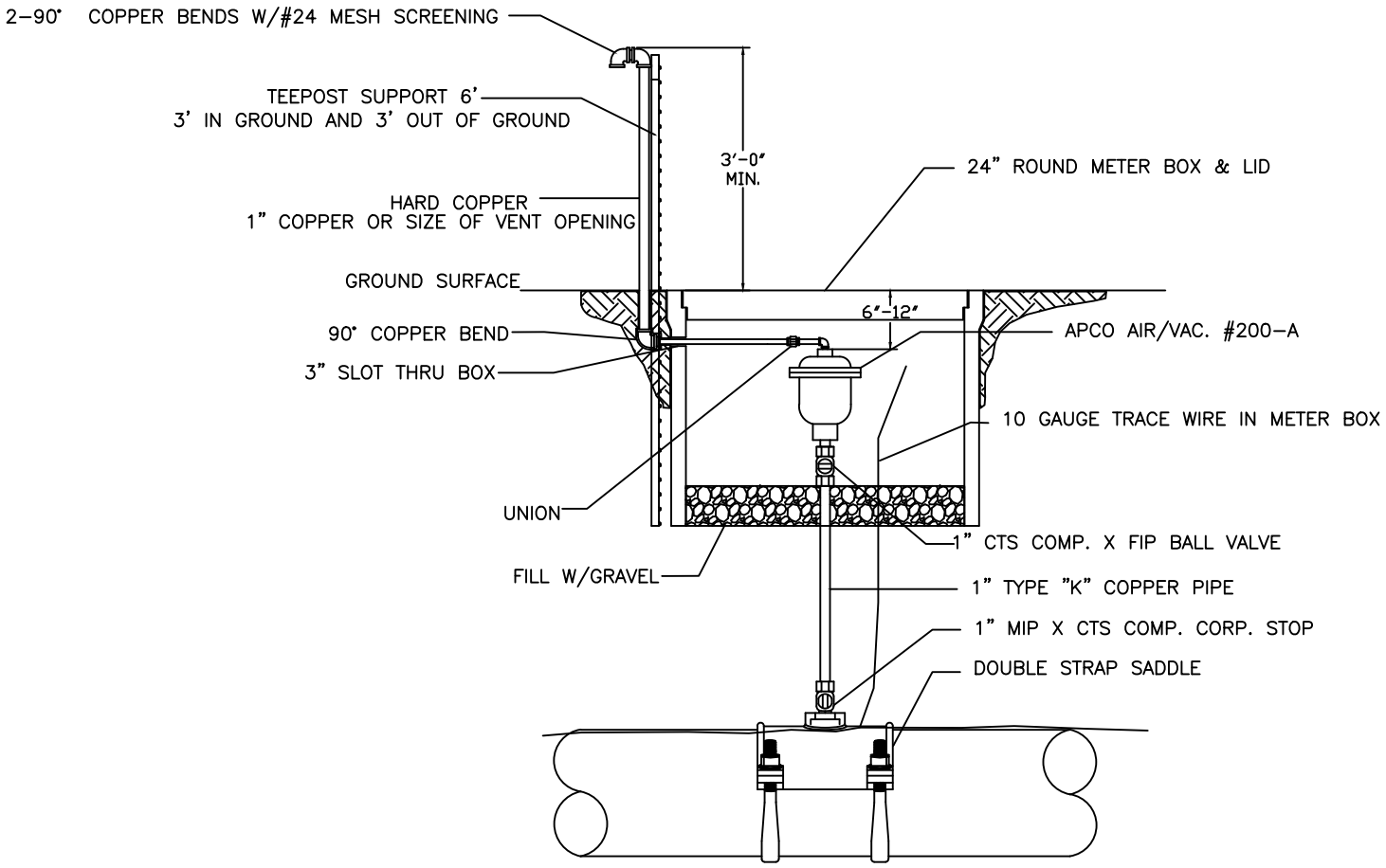


NOTES:

1. ALL THREADED CONNECTIONS SHALL HAVE A DOUBLE WRAP OF TEFLON TAPE ON THREADS.
2. DRILL HOLE IN SIDE OF METER BOX FOR OUTLET PIPING.
3. VALVES WILL BE PIPED TO POINT BEYOND PAVEMENT AND SHOULDER.

DRAWN BY: JI	CHECKED BY: PN
WATER DETAIL: W09	
LAST REVISION DATE: 01/27/2020	
APPROVED:	06/22/2021

1" COMBINATION AIR/VACUUM VALVE DETAIL

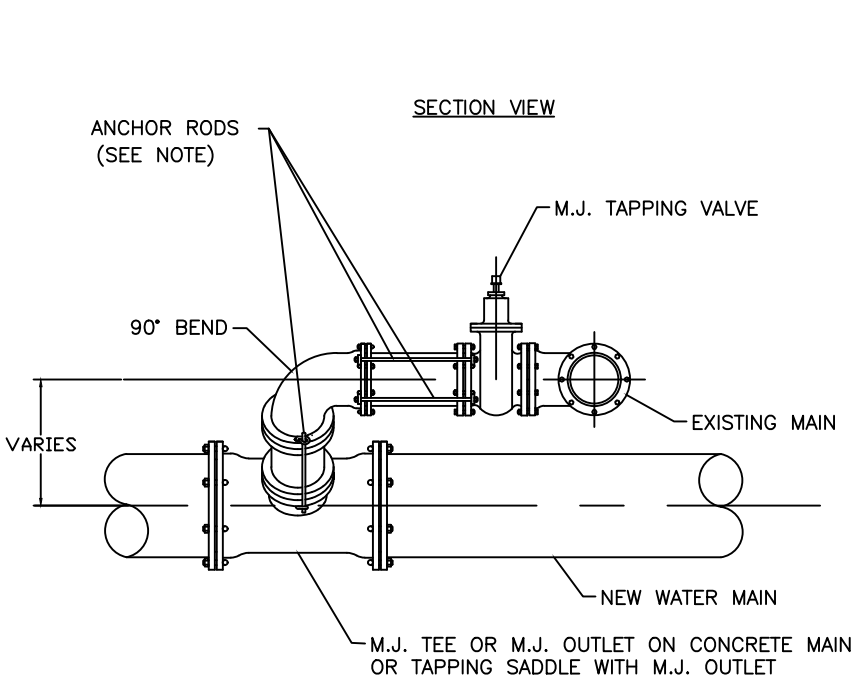


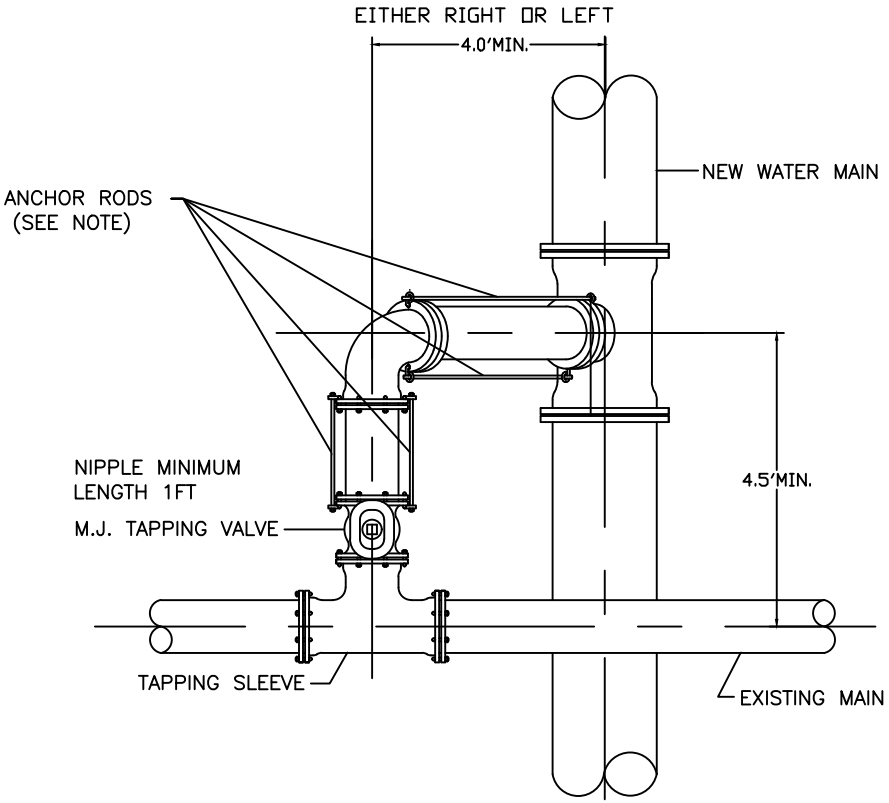
NOTES:

1. ALL THREADED CONNECTIONS SHALL HAVE A DOUBLE WRAP OF TEFLON TAPE ON THREADS.
2. DRILL HOLE IN SIDE OF METER BOX FOR OUTLET PIPING.
3. VALVES WILL BE PIPED TO POINT BEYOND PAVEMENT AND SHOULDER.

DRAWN BY: JS	CHECKED BY: AW
WATER DETAIL: W10	
LAST REVISION DATE: 08/27/2024	
APPROVED:	10/01/2024

SWING CONNECTION – NEW MAIN TO EXISTING MAIN





THRUST BLOCKING REQUIRED AT TEES AND ELBOWS.

ROD REQUIREMENTS	
MAIN SIZE	NO. OF RODS
6"	2
8"	4
12"	4
16"	6
24"	6
30"	8
36"	8

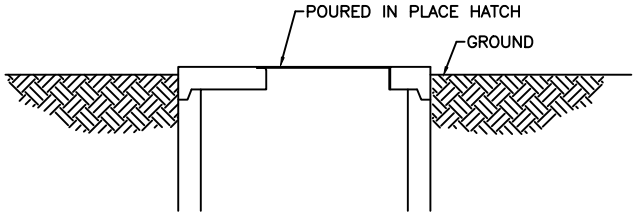
NOTES:

1. CONTRACTOR SHALL LOCATE EXISTING MAIN IN ADVANCE OF LAYING NEW LINE IN ORDER TO ASSURE ADEQUATE LENGTH TO ADJUST DEPTH OF NEW MAIN.
2. DIMENSIONS SHOWN ARE RECOMENDED MINIMUMS TO PROVIDE ADEQUATE ROOM FOR TIGHTENING BOLTS ON JOINTS. (OTHER DIMENSIONS MAY BE USED)
3. PROVIDE STAINLESS STEEL "ALL THREAD(MIN 5/8")" TIE RODS WITH EYE BOLTS FOR ANCHORING ALL JOINTS.
4. RODS SHALL BE FIELD CUT TO FIT & SHALL BE PROTECTED WITH POLYWRAP.
5. ROTATE TEE UP & ELBOW DOWN AS REQUIRED TO MATCH.
6. USE TYPICAL CONCRETE BLOCKING REQUIRED.

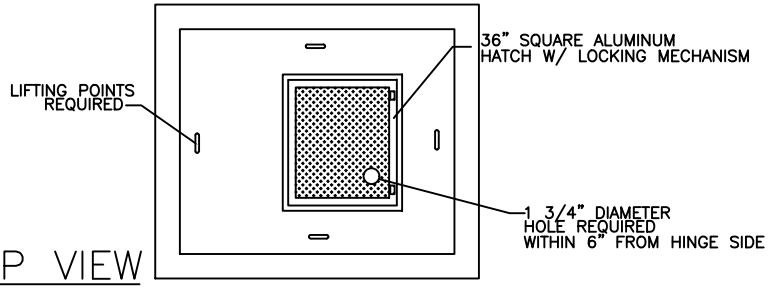
DRAWN BY: JS	CHECKED BY: AW
WATER DETAIL: W11	
LAST REVISION DATE: 08/27/2024	
APPROVED:	10/01/2024

METER VAULT DETAIL FOR 4" – 8" METERS (TYPICAL)

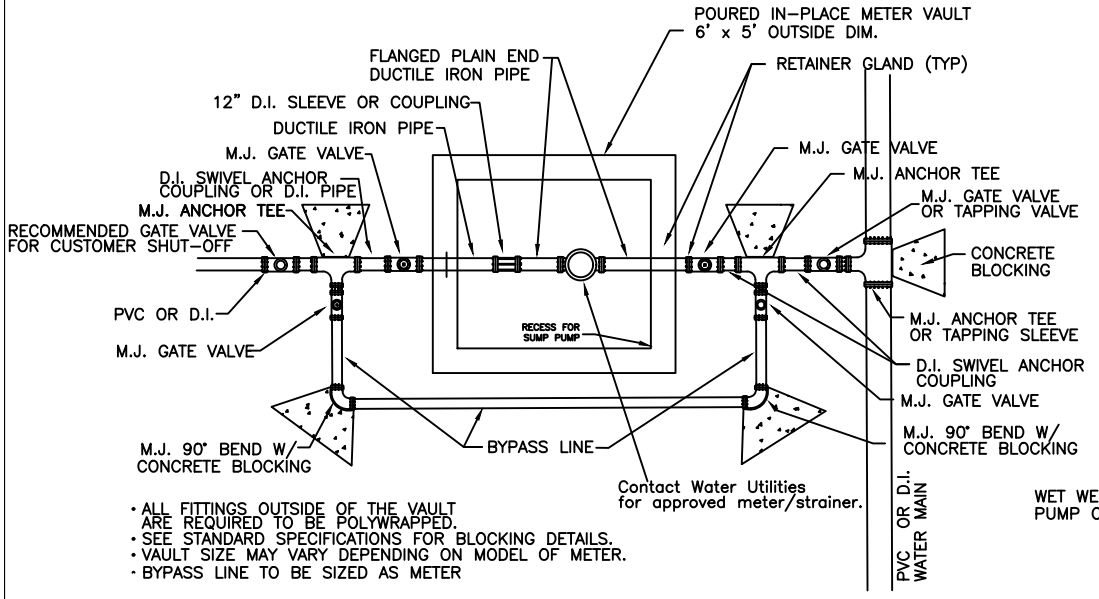
(DIMENSIONS MAY VARY FOR METER SIZES)



SIDE VIEW



TOP VIEW

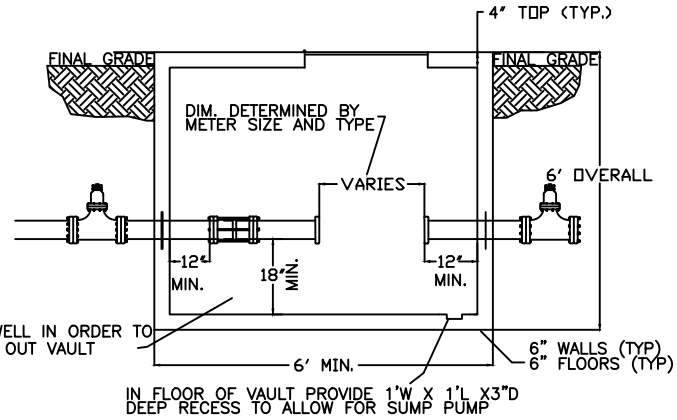


- ALL FITTINGS OUTSIDE OF THE VAULT ARE REQUIRED TO BE POLYWRAPPED.
- SEE STANDARD SPECIFICATIONS FOR BLOCKING DETAILS.
- VAULT SIZE MAY VARY DEPENDING ON MODEL OF METER.
- BYPASS LINE TO BE SIZED AS METER

PLAN VIEW

N.T.S.

- NOTE: IF VAULT IS SQUARE, REBAR IS REQUIRED.
  #4 BAR ON 12" ON CENTER EACH WAY FOR THE BOTTOM
  #4 BAR ON 8" ON CENTER EACH WAY FOR THE WALLS
  #4 BAR ON 8" ON CENTER EACH WAY FOR THE LID

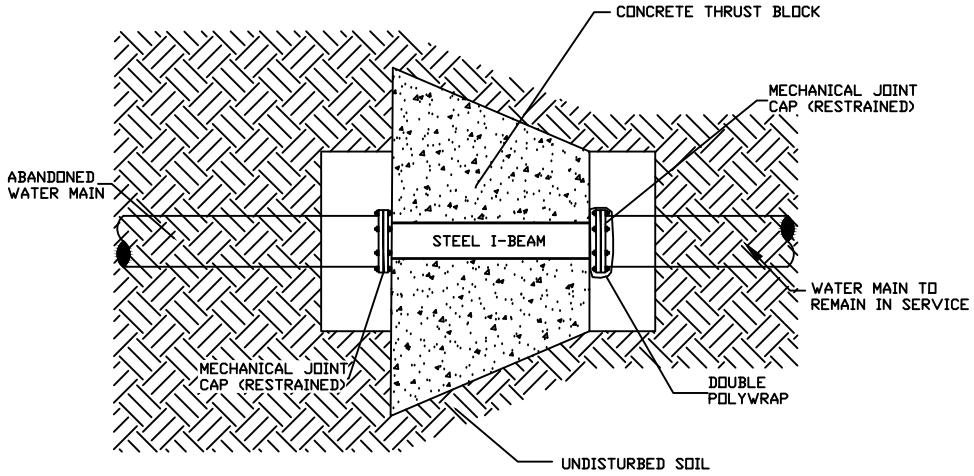


ELEVATION

N.T.S.

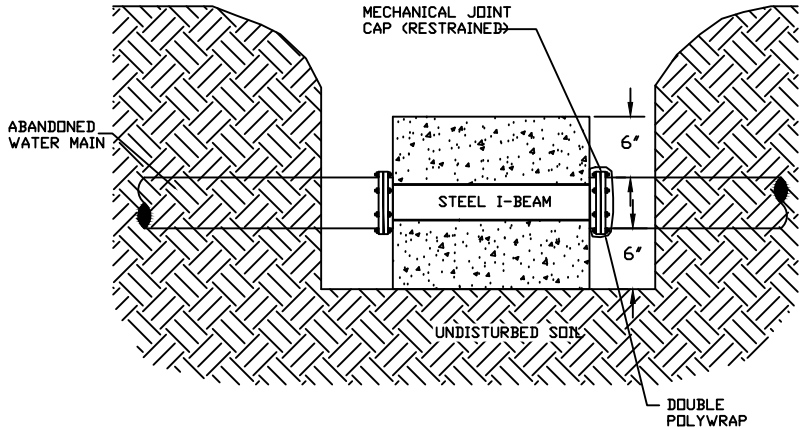
DRAWN BY: JS	CHECKED BY: AW
WATER DETAIL: W12	
LAST REVISION DATE: 08/27/2024	
APPROVED:	10/01/2024

TYPICAL CUT/CAP DETAIL



PLAN VIEW

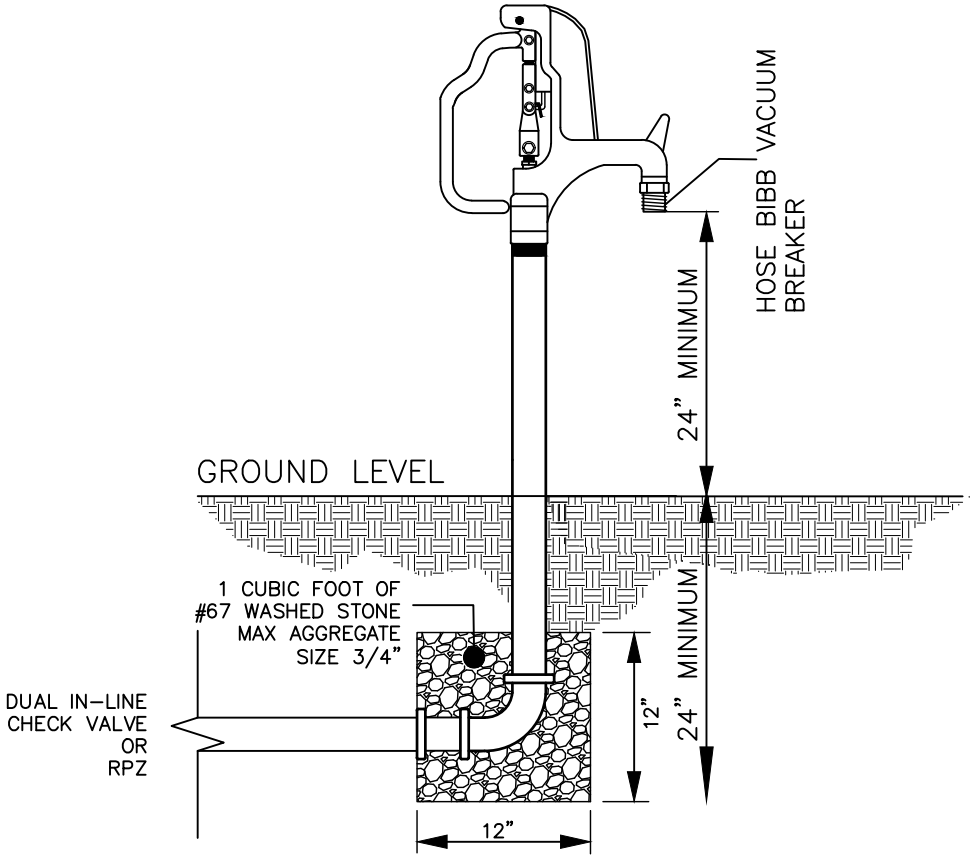
* STEEL I-BEAM TO BE SIZED BY PROJECT ENGINEER AND INCLUDED IN THE PROJECT SUBMITTAL.



PROFILE VIEW

DRAWN BY: JS	CHECKED BY: AW
WATER DETAIL: W13	
LAST REVISION DATE: 08/27/2024	
APPROVED:	10/01/2024

FROST FREE HOSE BIBB WITH BACKFLOW PREVENTION

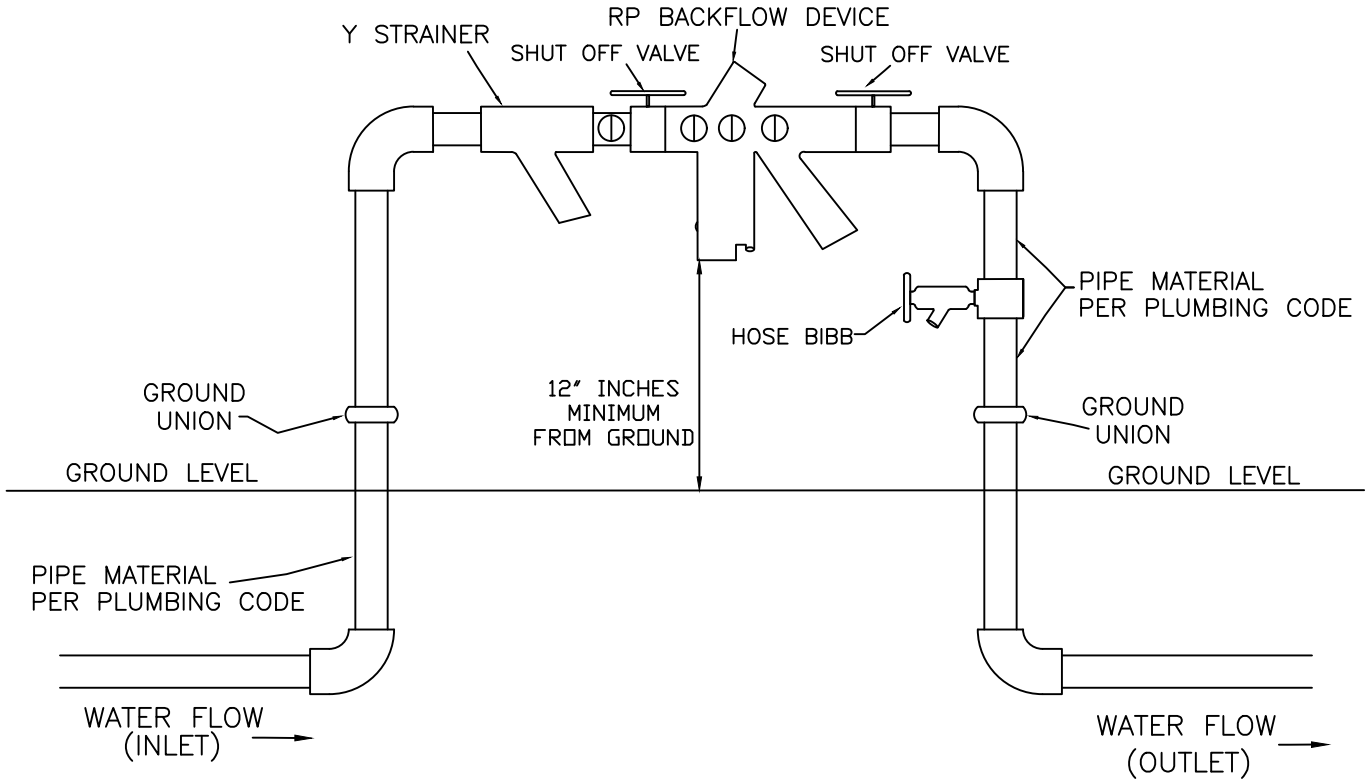


ELEVATION

N.T.S.

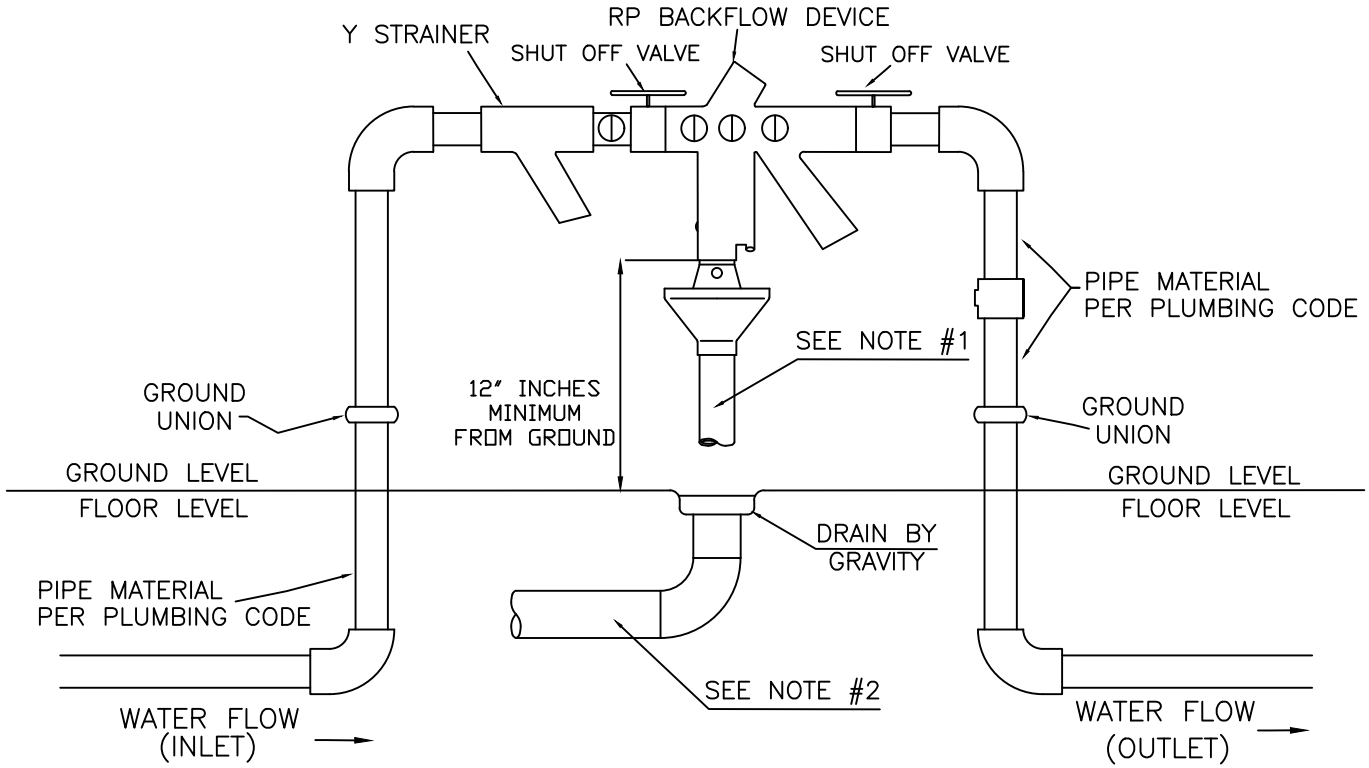
DRAWN BY: JS	CHECKED BY: AW
WATER DETAIL: W14	
LAST REVISION DATE: 08/27/2024	
APPROVED:	10/01/2024

REDUCED PRESSURE (RP) BACKFLOW
EXTERIOR IRRIGATION ONLY



DRAWN BY: JS	CHECKED BY: AW
WATER DETAIL: W15	
LAST REVISION DATE: 08/27/2024	
APPROVED:	10/01/2024

REDUCED PRESSURE (RP) BACKFLOW
INTERIOR DOMESTIC OR IRRIGATION

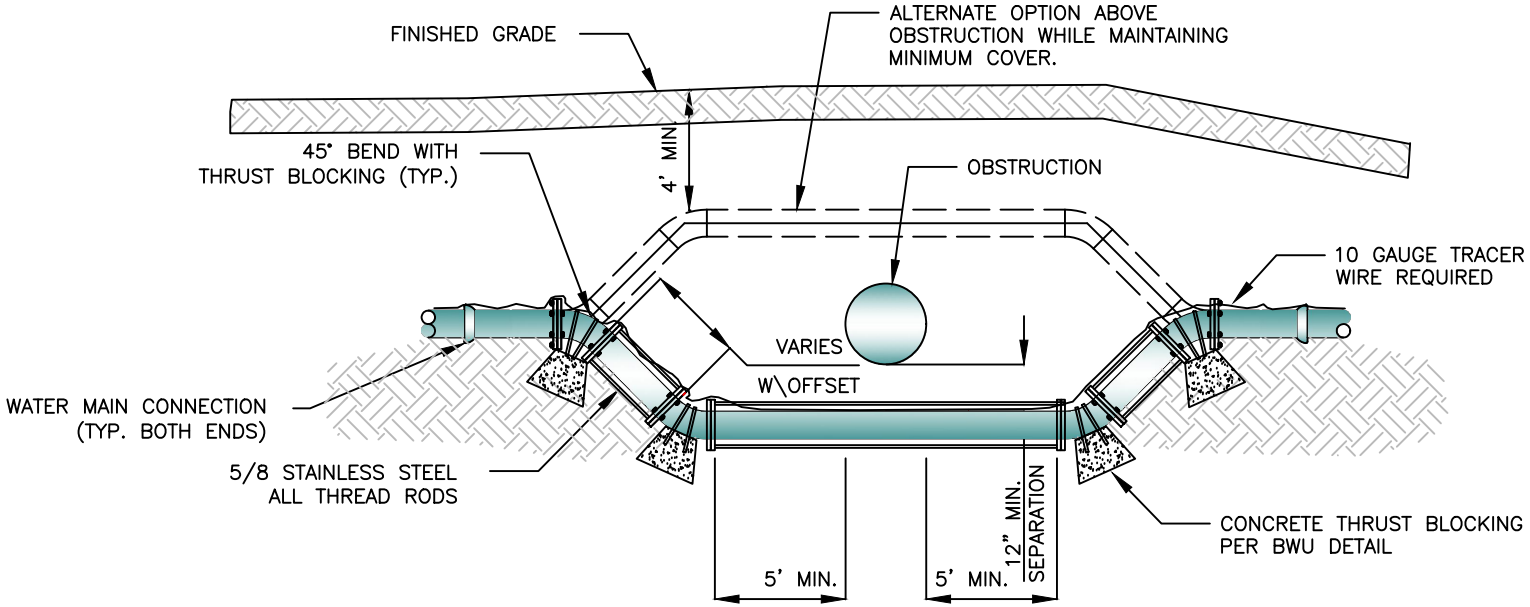


INDOOR APPLICATION ONLY NOTES:

1. AN AIR GAP DRAIN IS REQUIRED TO REDUCE SPLASHING OF MINOR DISCHARGES FROM THE RELIEF VALVE DRAIN PORT.

2. INDOOR INSTALLATION OF RP'S SHOULD PROVIDE FOR DRAINAGE CAPABLE OF HANDLING IN EXCESS OF THE MAXIMUM DISCHARGE RATE EXPECTED BY THE BACKFLOW ASSEMBLY MANUFACTURER.

DRAWN BY: JS	CHECKED BY: AW
WATER DETAIL: W16	
LAST REVISION DATE: 08/27/2024	
APPROVED:	10/01/2024



NOTE:

1. ALL VERTICAL ADJUSTMENTS TO THE EXISTING WATER MAINS SHALL BE DONE IN THIS MANNER, USING THE MATERIAL TYPE SHOWN ON THE APPROVED DRAWINGS. THE DEPARTMENT RESERVES THE RIGHT TO REQUIRE DUCTILE IRON WATER PIPING.
2. THE PROPOSED VERTICAL ADJUSTMENT MAY BE CONSTRUCTED EITHER OVER OR UNDER THE PROPOSED OBSTRUCTION HOWEVER TO GO OVER, THE NEW LOCATION OF THE WATER MAIN MUST PROVIDE A MINIMUM OF 4' OF COVER. IF THERE IS LESS COVER, GO UNDER THE PROPOSED OBSTRUCTION.
3. ALL EXISTING FITTINGS AND APPURTENANCES THAT MUST BE REMOVED TO MAKE WATERLINE ADJUSTMENT, MUST BE RELOCATED BACK ONTO MAIN IN ACCORDANCE WITH BWU SPECIFICATIONS AND REQUIRE INSPECTION.
4. ALL MATERIALS AND COATING TO BE IN ACCORDANCE WITH THE CITY OF BENTONVILLE WATER UTILITIES DEPARTMENT SPECIFICATIONS.
5. ALL APPURTENANCES MUST BE SHOWN ON RECORD DRAWINGS IN ACCORDANCE WITH SECTION 5 OF BENTONVILLE WATER UTILITY DEPARTMENT SPECIFICATIONS.

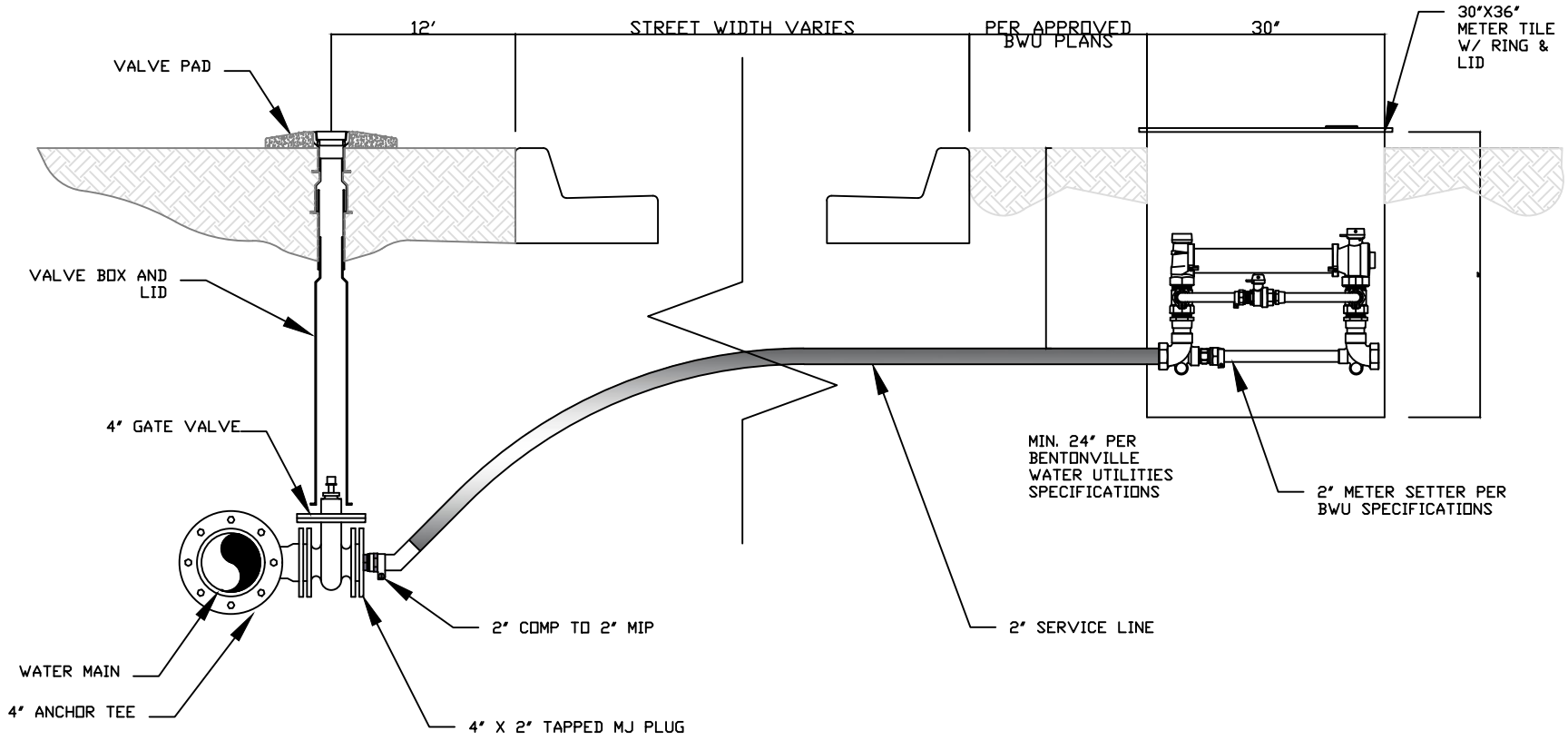
WATERLINE OBSTRUCTION CROSSING

NOT TO SCALE

DO NOT USE WITHOUT PRIOR APPROVAL
FROM BENTONVILLE WATER UTILITIES

DRAWN BY: JS	CHECKED BY: JI
WATER DETAIL: W17	
LAST REVISION DATE: 10/21/2021	
APPROVED:	10/21/2021

2" WATER SERVICE DETAIL



ELEVATION

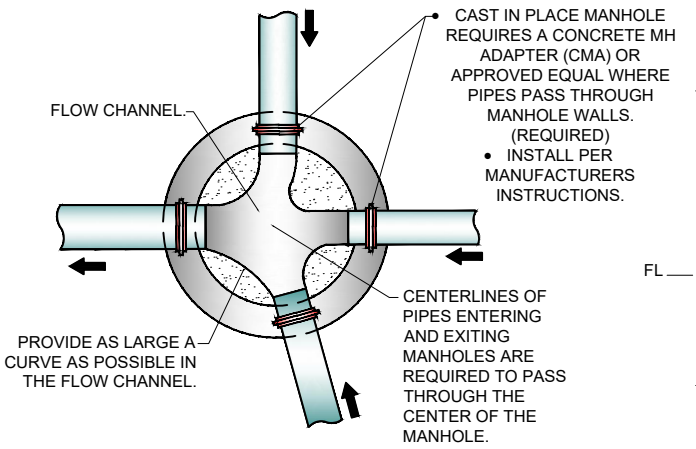
N.T.S.

*ALL FITTINGS W/O PART NUMBER SHALL BE PER SPECIFICATIONS
*ALL FITTINGS MUST BE ANCHORED TO VALVE OR METER SETTER. NO IN-LINE FITTINGS WILL BE PERMITTED.

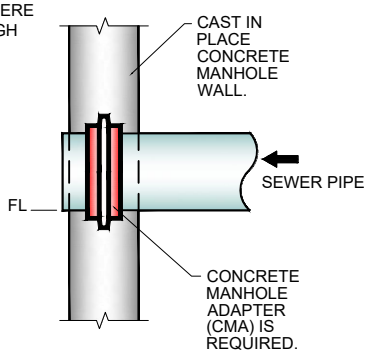
THE CITY OF WATER B UTILITIES BENTONVILLE	DRAWN BY: JS	CHECKED BY: AW
	WATER DETAIL: W18	
	LAST REVISION DATE: 08/27/2024	
	APPROVED:	10/01/2024

SANITARY SEWER
CAST IN PLACE MANHOLE

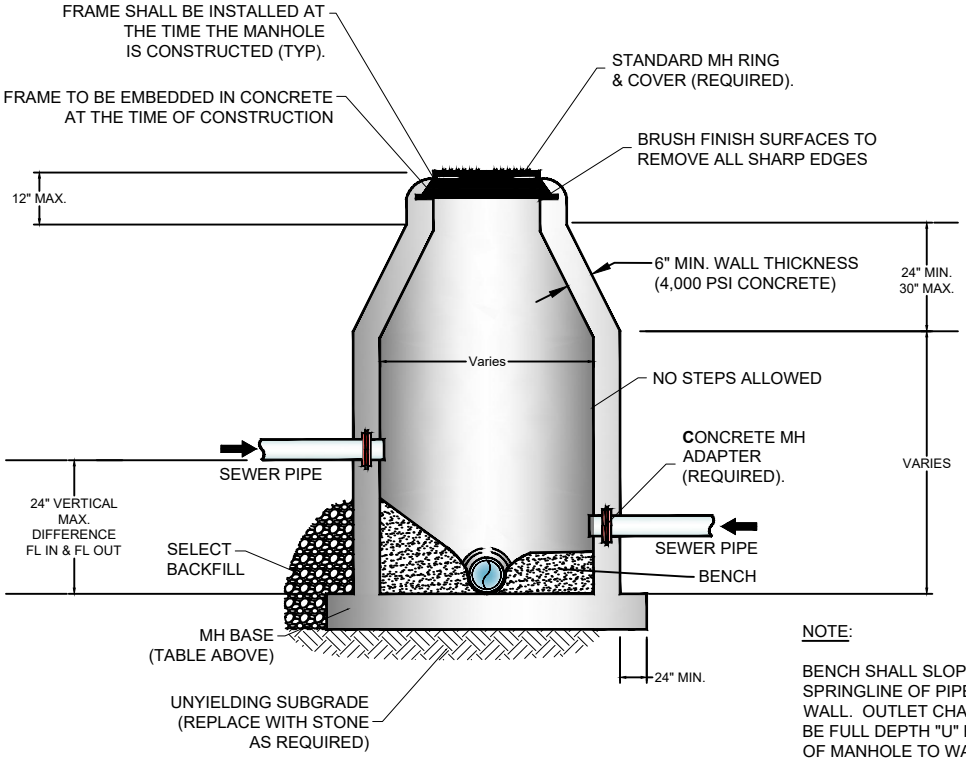
4,000 PSI CONCRETE



MANHOLE FLOW CHANNEL



CONCRETE MANHOLE ADAPTER (CMA) DETAIL



NOTE:

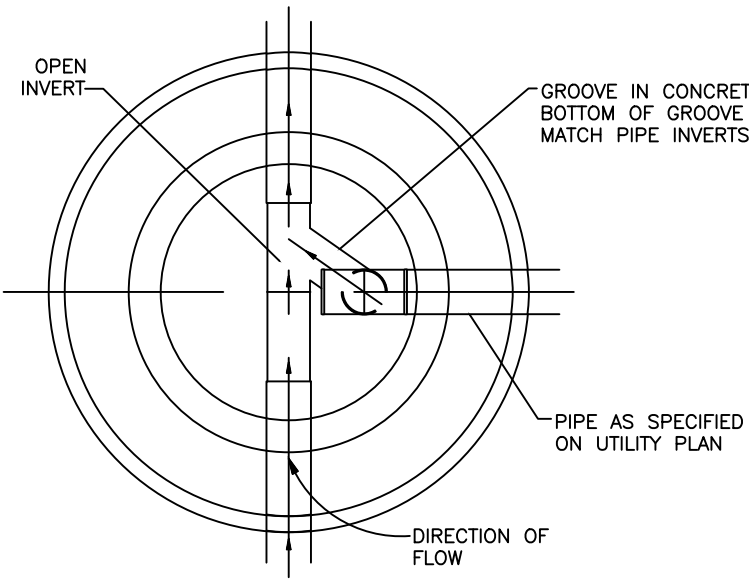
BENCH SHALL SLOPE FROM SPRINGLINE OF PIPE TO MANHOLE WALL. OUTLET CHANNEL SHALL BE FULL DEPTH "U" FROM CENTER OF MANHOLE TO WALL.

Pipe Size	Inside Diameter of Manhole	Minimum Wall Thickness	Base Thickness	Minimum Ring & Cover Size
12" OR LESS	4' DIA	6"	8"	24"
15" TO 24"	5' DIA	8"	10"	24"
>24"	6' DIA	8"	12"	30"

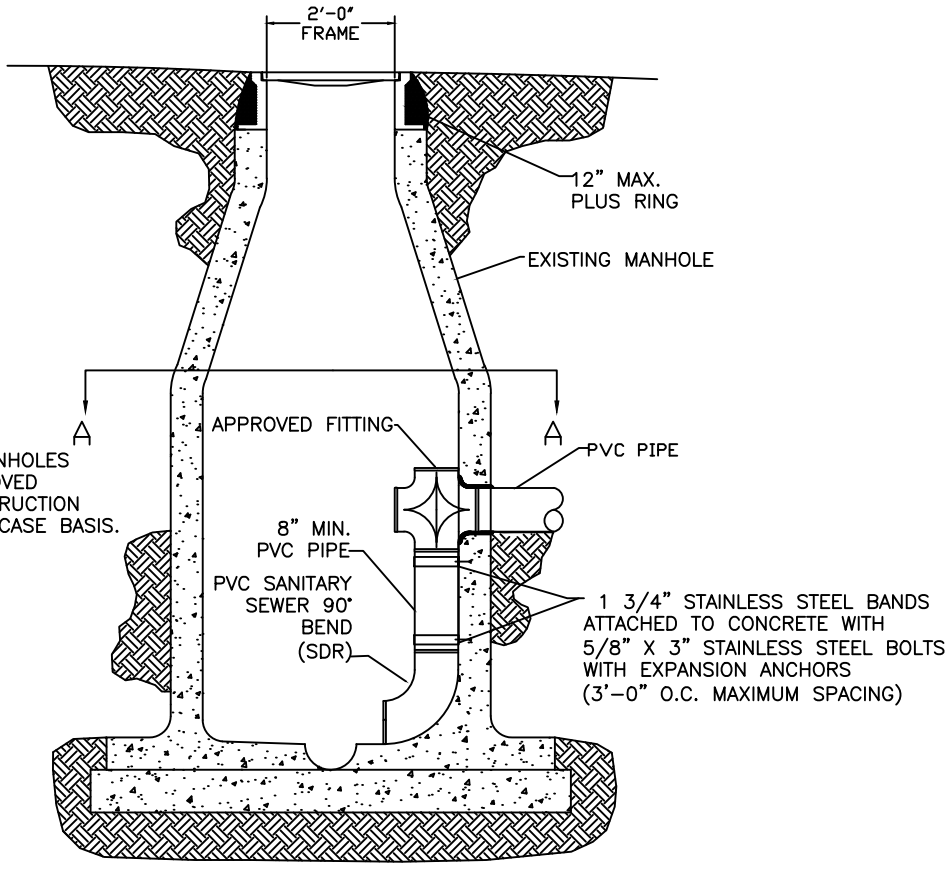
MANHOLE INFORMATION TABLE

DRAWN BY: JS	CHECKED BY: AW
SANITARY SEWER DETAIL: SS01	
LAST REVISION DATE: 08/27/2024	
APPROVED:	10/01/2024

SANITARY SEWER
INTERIOR DROP MANHOLE



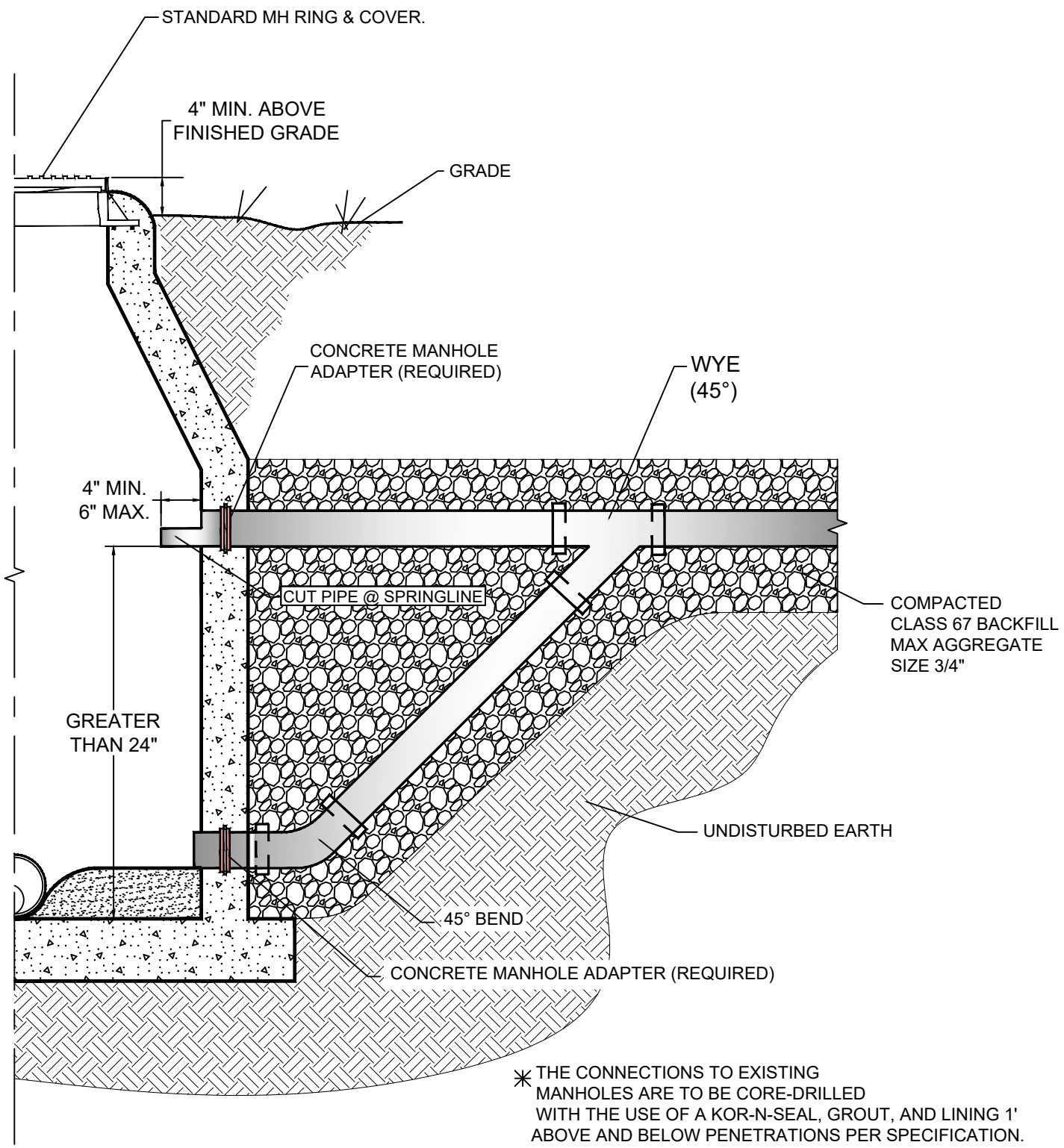
SECTION A-A



NOTE:
INSIDE DROP MANHOLES SHALL BE APPROVED PRIOR TO CONSTRUCTION ON A CASE-BY-CASE BASIS.

DRAWN BY: JI	CHECKED BY: PN
SANITARY SEWER DETAIL: SS02	
LAST REVISION DATE: 01/27/2020	
APPROVED:	06/22/2021

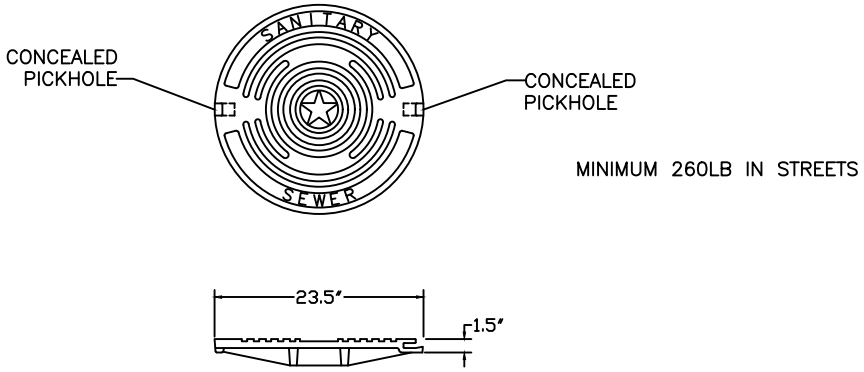
SANITARY SEWER
EXTERIOR DROP MANHOLE

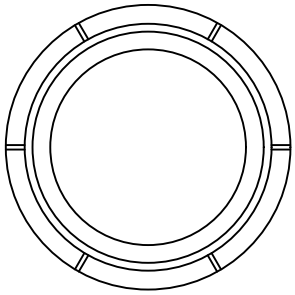


✳ THE CONNECTIONS TO EXISTING MANHOLES ARE TO BE CORE-DRILLED WITH THE USE OF A KOR-N-SEAL, GROUT, AND LINING 1' ABOVE AND BELOW PENETRATIONS PER SPECIFICATION.

DRAWN BY: JS	CHECKED BY: AW
SANITARY SEWER DETAIL: SS03	
LAST REVISION DATE: 08/27/2024	
APPROVED:	10/01/2024

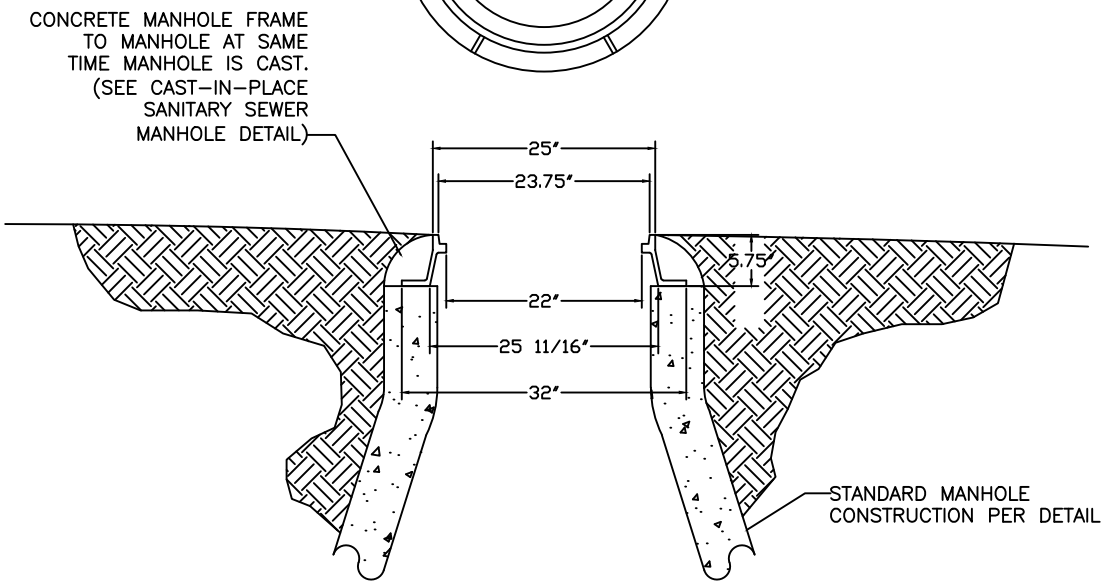
HEAVY DUTY MANHOLE LID & FRAME





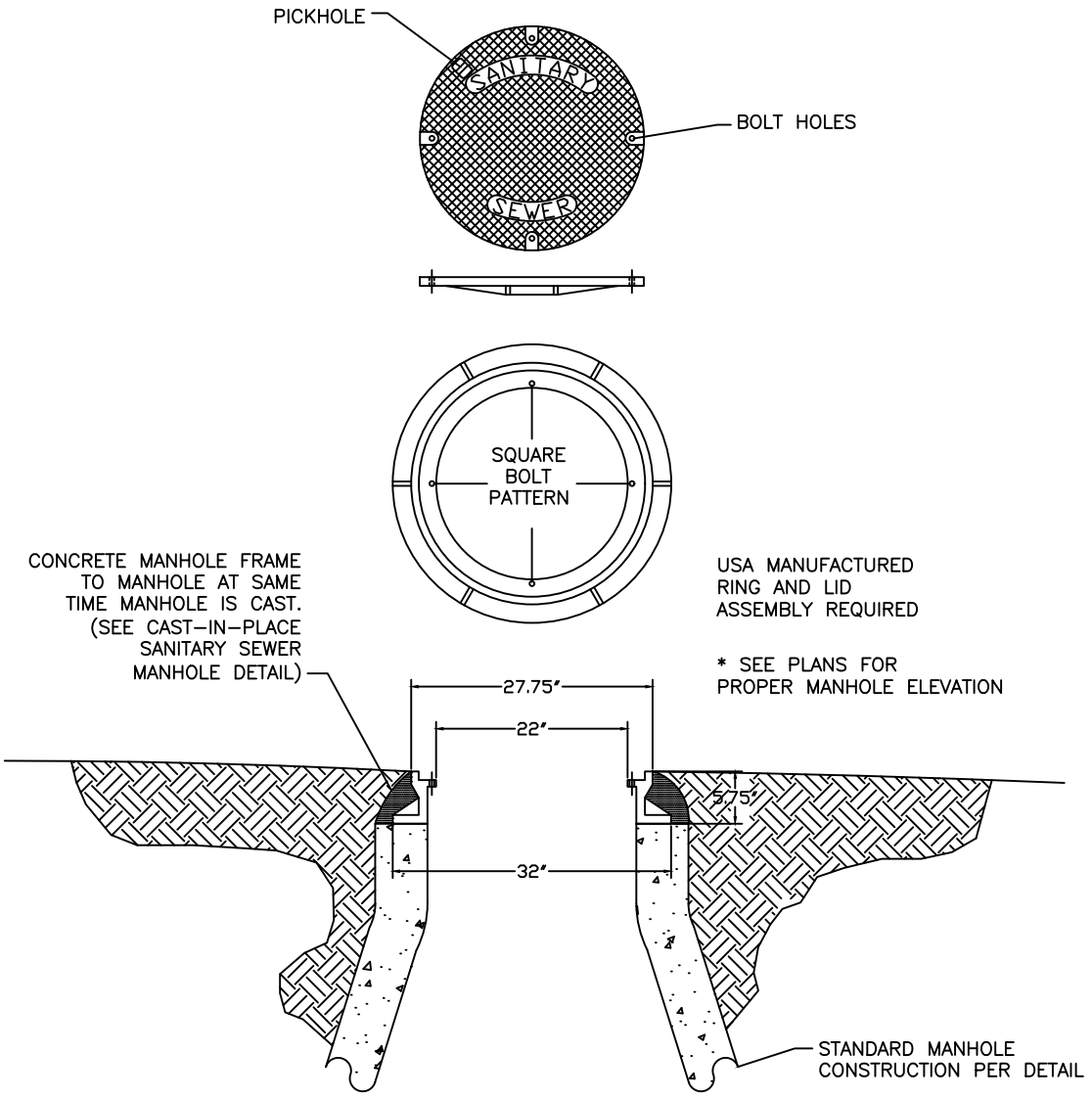
USA MANUFACTURED
RING AND LID
ASSEMBLY REQUIRED

* SEE PLANS FOR
PROPER MANHOLE ELEVATION



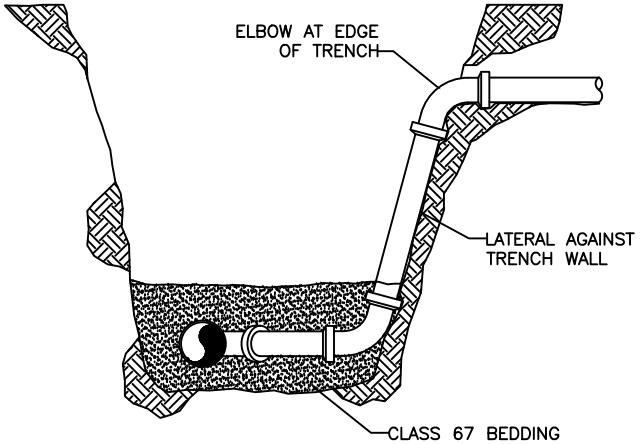
DRAWN BY: JI	CHECKED BY: PN
SANITARY SEWER DETAIL: SS04	
LAST REVISION DATE: 01/27/2020	
APPROVED:	06/22/2021

WATER TIGHT BOLTED MANHOLE LID & FRAME

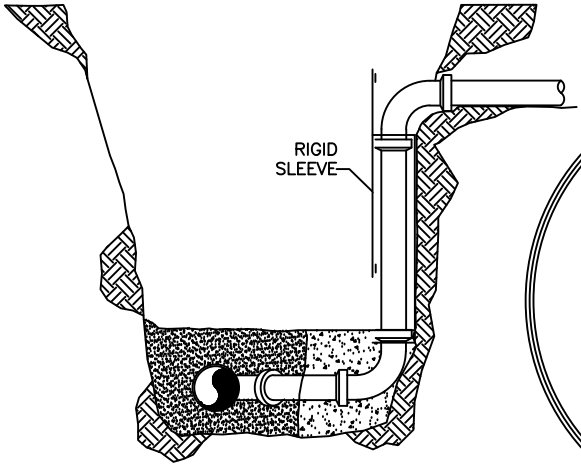


THE CITY OF WATER B UTILITIES BENTONVILLE	DRAWN BY: JI	CHECKED BY: PN
	SANITARY SEWER DETAIL: SS05	
	LAST REVISION DATE: 01/27/2020	
	APPROVED:	06/22/2021

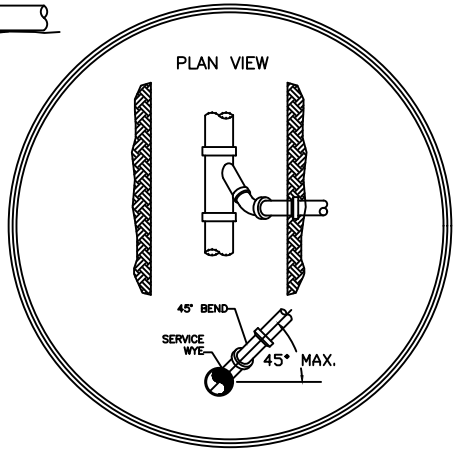
SANITARY SEWER
SERVICE WYE

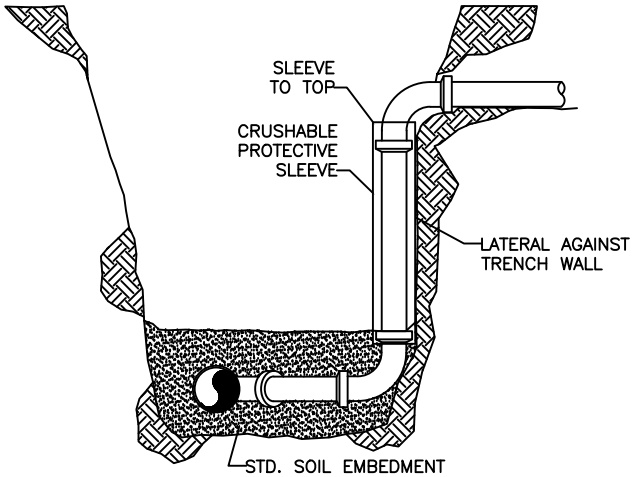


FOR MODERATE TRENCH DEPTH

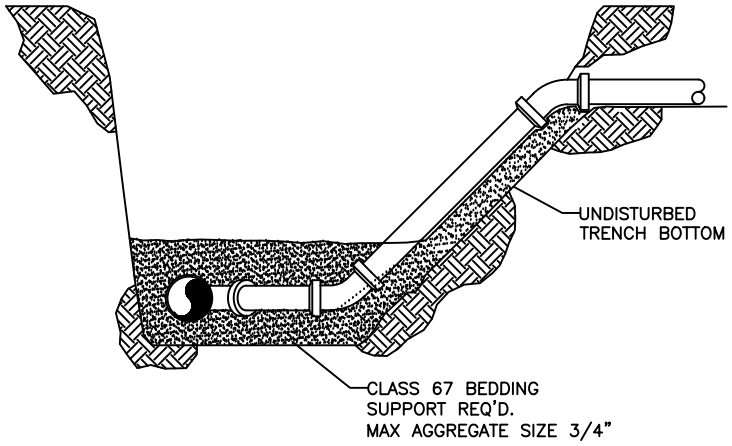


RIGID SLEEVE FOR ANY TRENCH
(CONCRETE MUST SUPPORT SLEEVE)





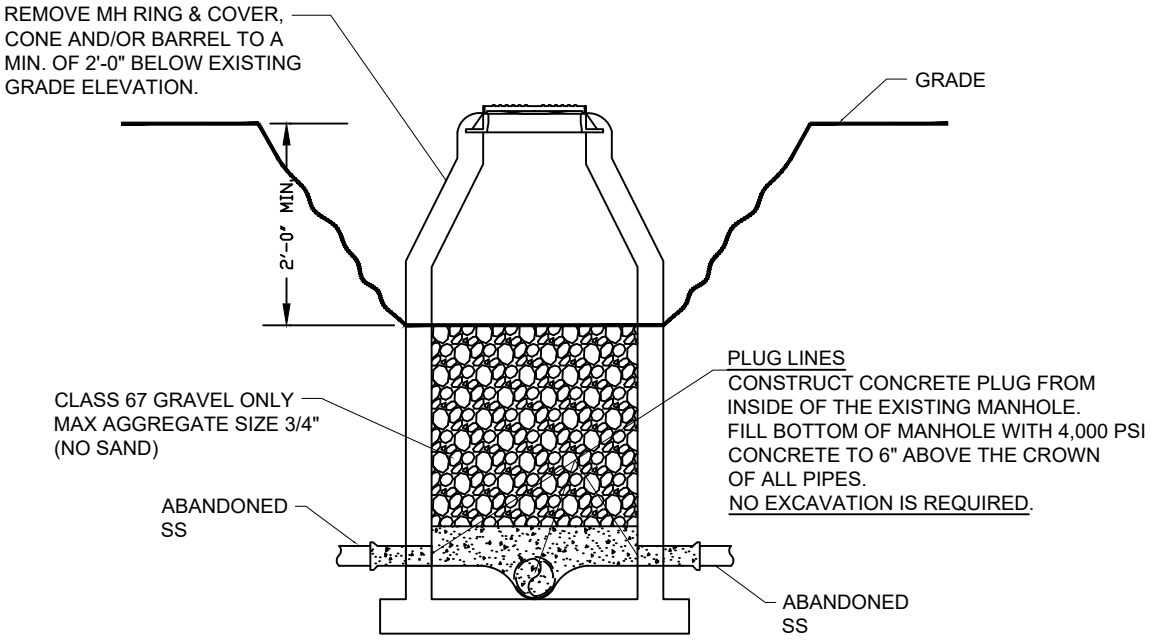
CRUSHABLE SLEEVE – ANY DEPTH
(SLEEVE OF NEAR ZERO COLUMN STRENGTH)

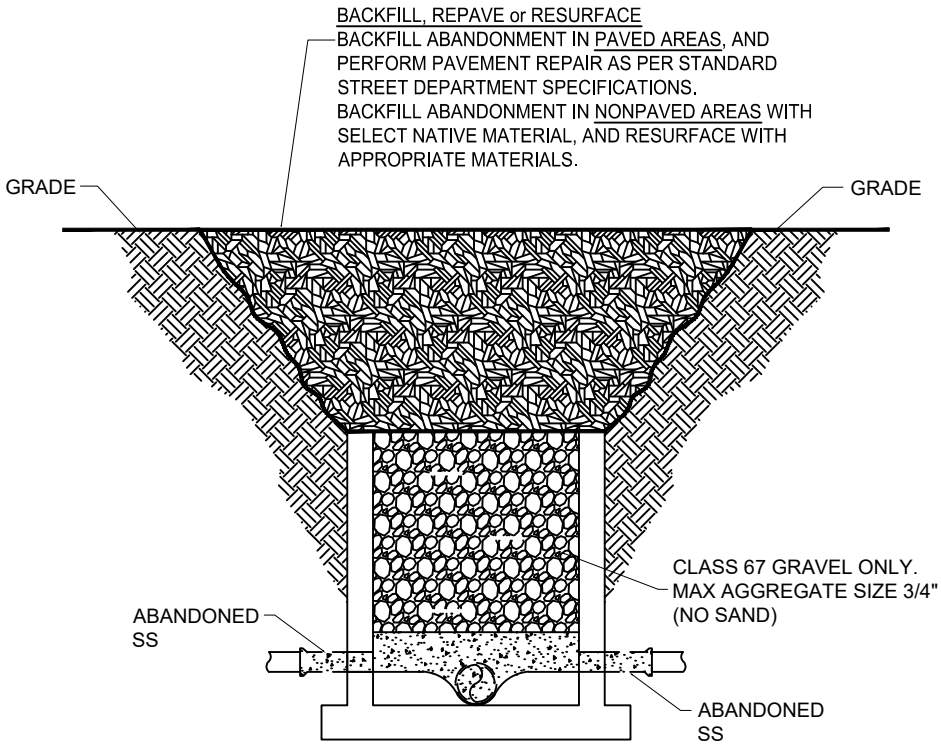


SLOPING LATERAL TRENCH – ANY DEPTH
(SLOPE AT 1:1 OR FLATTER)

DRAWN BY: JI	CHECKED BY: PN
SANITARY SEWER DETAIL: SS06	
LAST REVISION DATE: 01/27/2020	
APPROVED:	06/22/2021

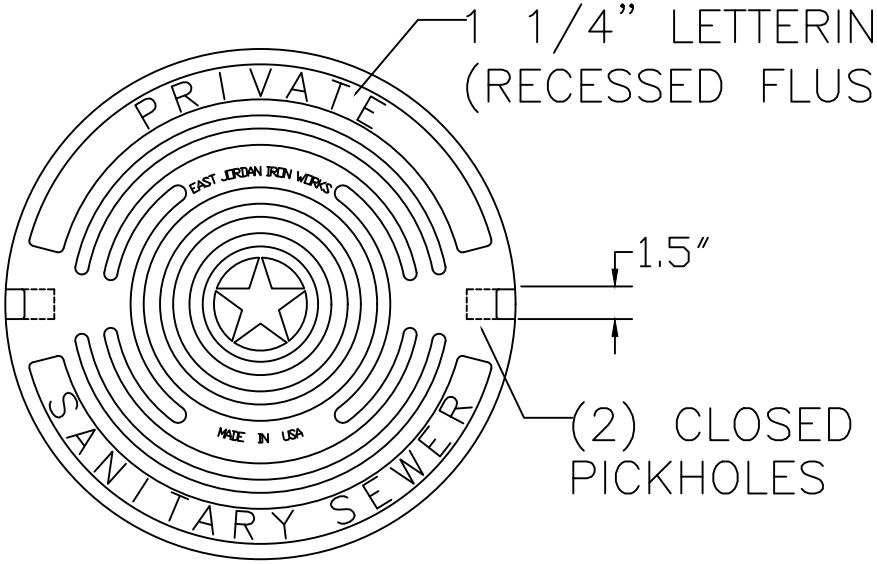
EXISTING MANHOLE ABANDONMENT DETAIL 5 FT OR DEEPER

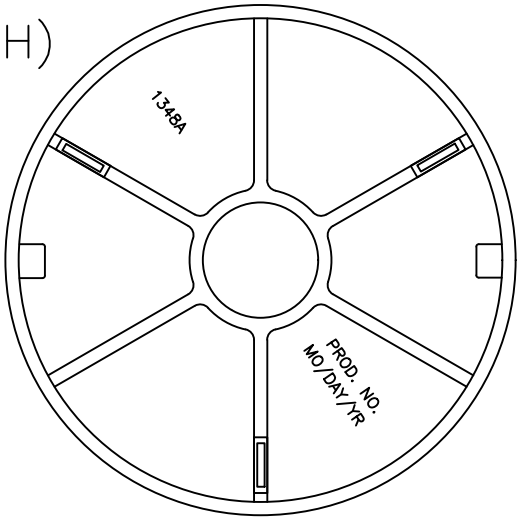




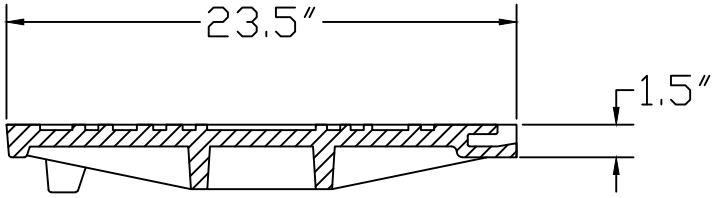
DRAWN BY: JI	CHECKED BY: PN
SANITARY SEWER DETAIL: SS07	
LAST REVISION DATE: 01/27/2020	
APPROVED:	06/22/2021

PRIVATE MANHOLE RING AND LID

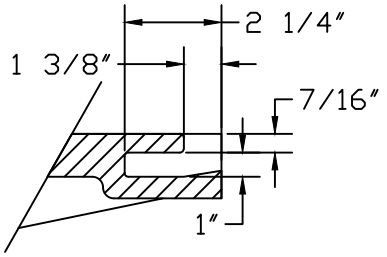




BOTTOM VIEW



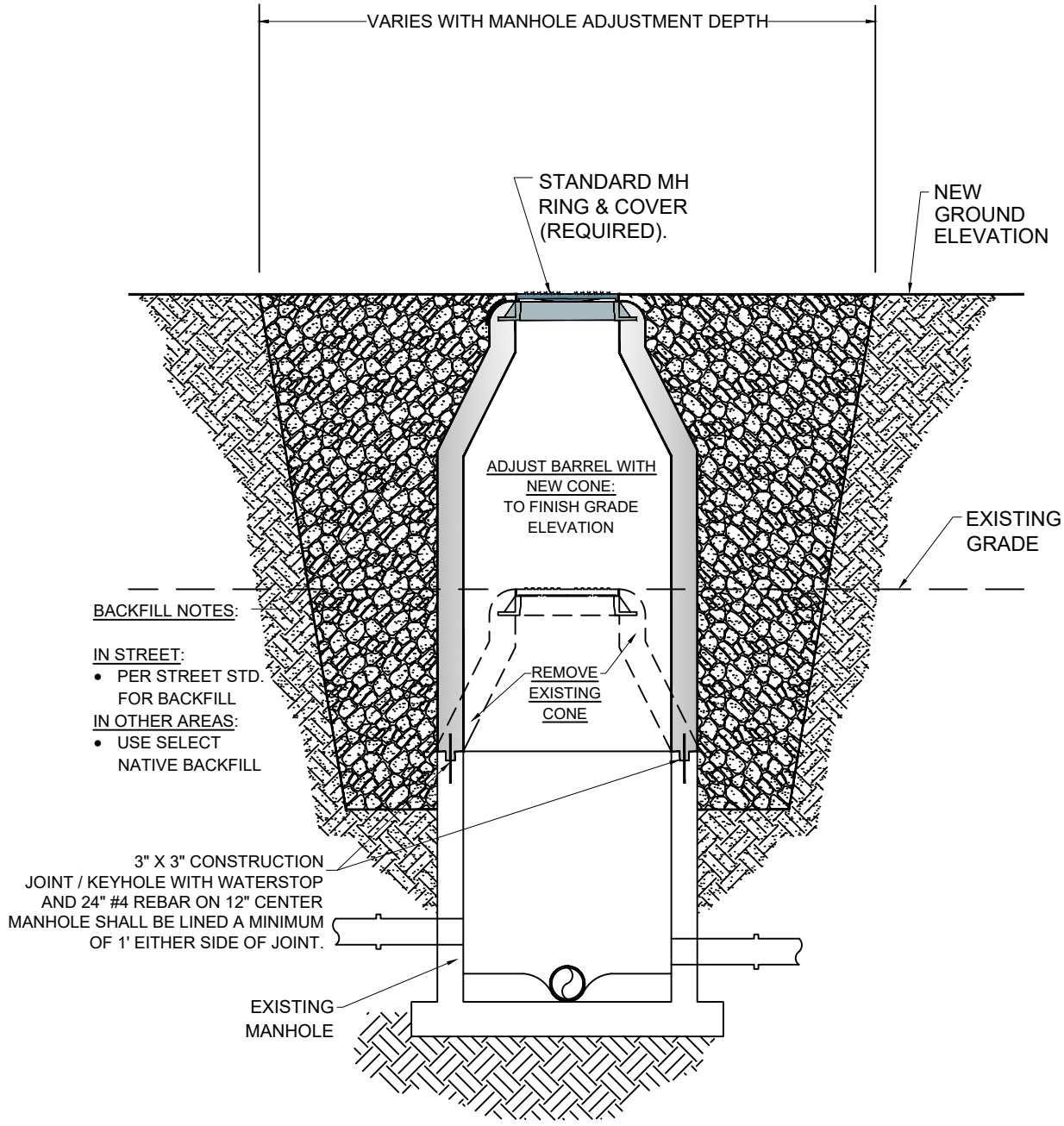
COVER SECTION



PICKHOLE DETAIL

DRAWN BY: JI	CHECKED BY: PN
SANITARY SEWER DETAIL: SS08	
LAST REVISION DATE: 01/27/2020	
APPROVED:	06/22/2021

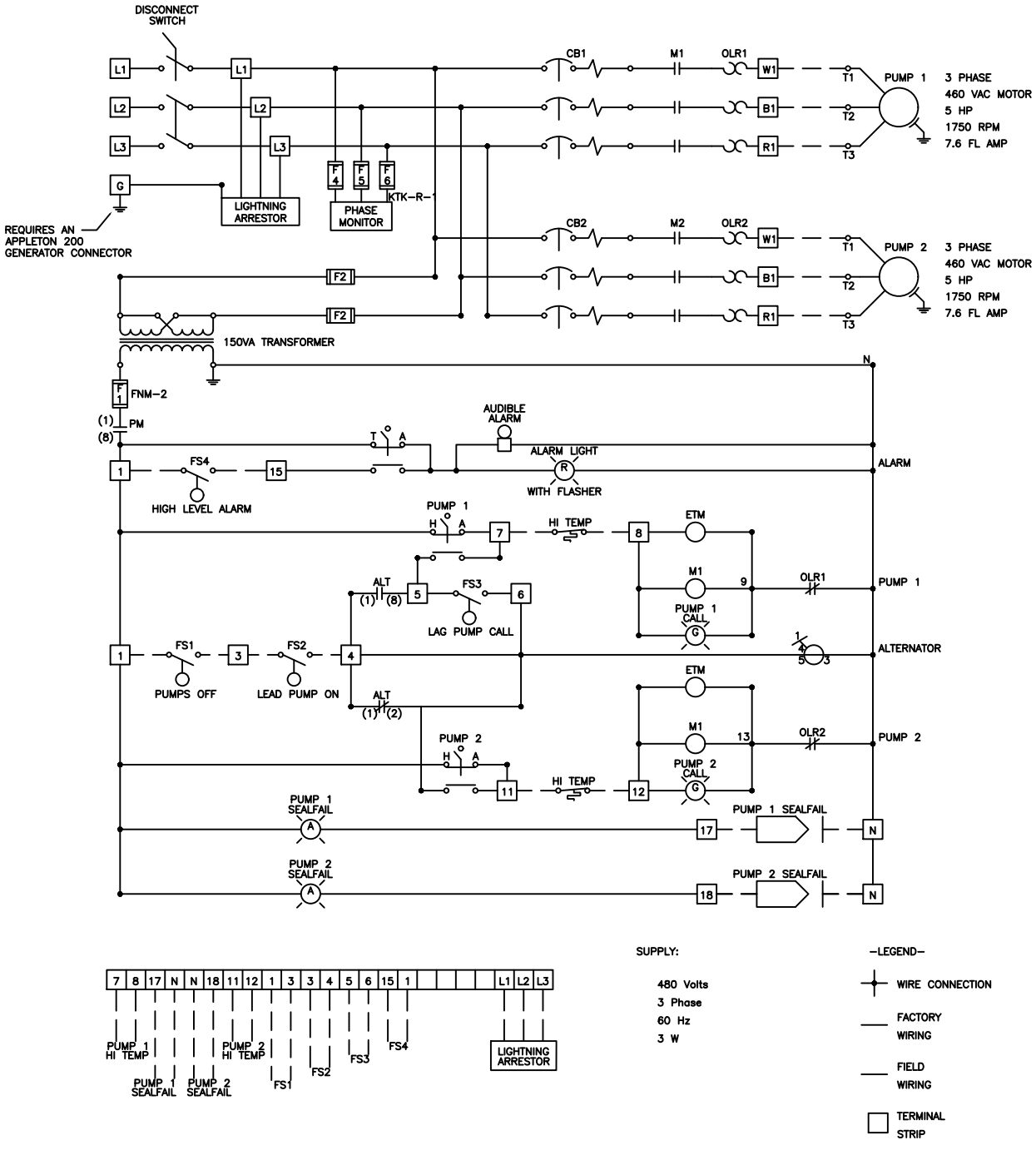
TYPICAL MANHOLE
ADJUST TO GRADE DETAIL



DRAWN BY: JS	CHECKED BY: AW
SANITARY SEWER DETAIL: SS09	
LAST REVISION DATE: 08/27/2024	
APPROVED:	10/01/2024

DUPLEX PUMP CONTROL PANEL

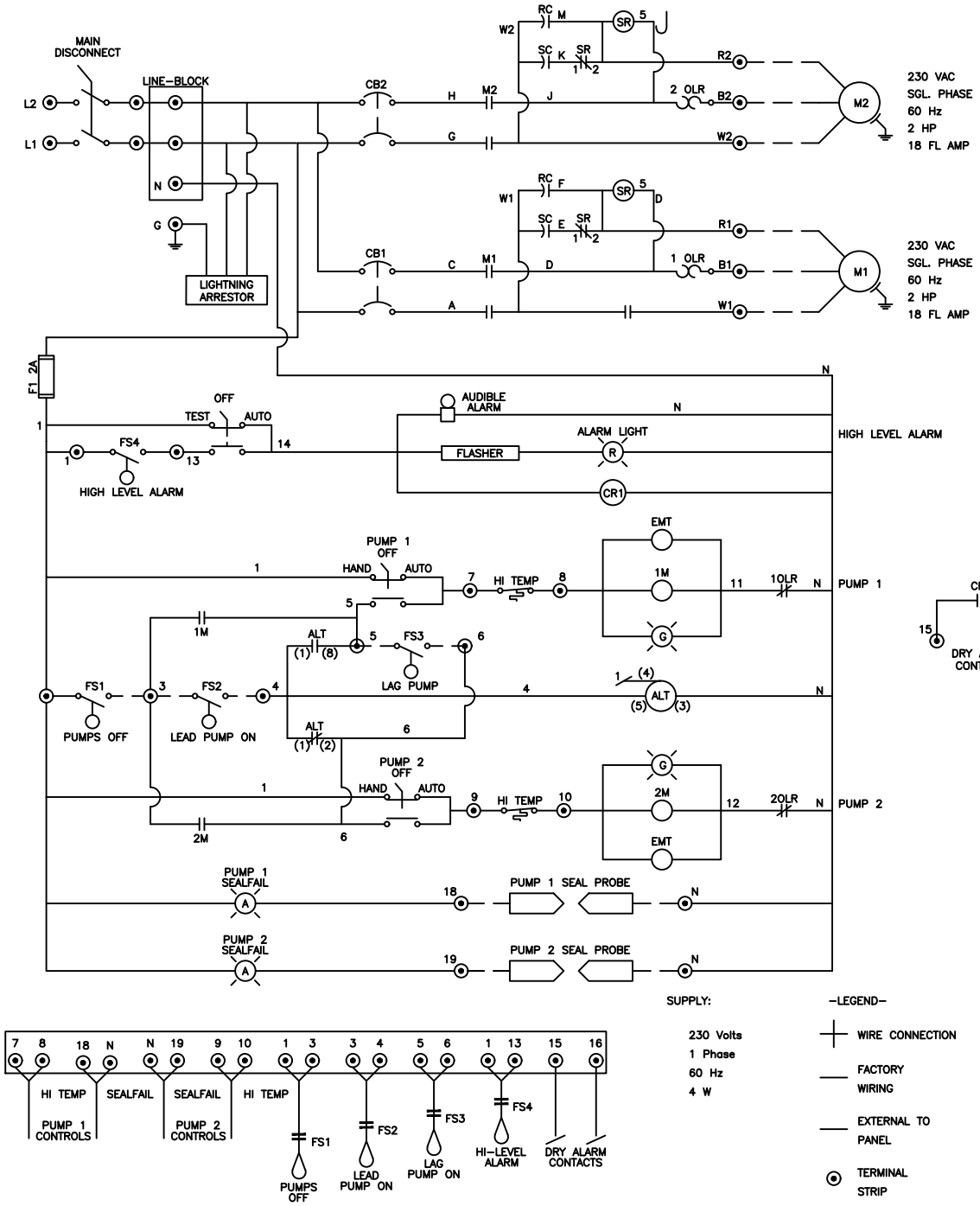
480 V / 3 PHASE



DRAWN BY: JI	CHECKED BY: PN
LIFT STATION DETAIL: LS01	
LAST REVISION DATE: 01/27/2020	
APPROVED:	06/22/2021

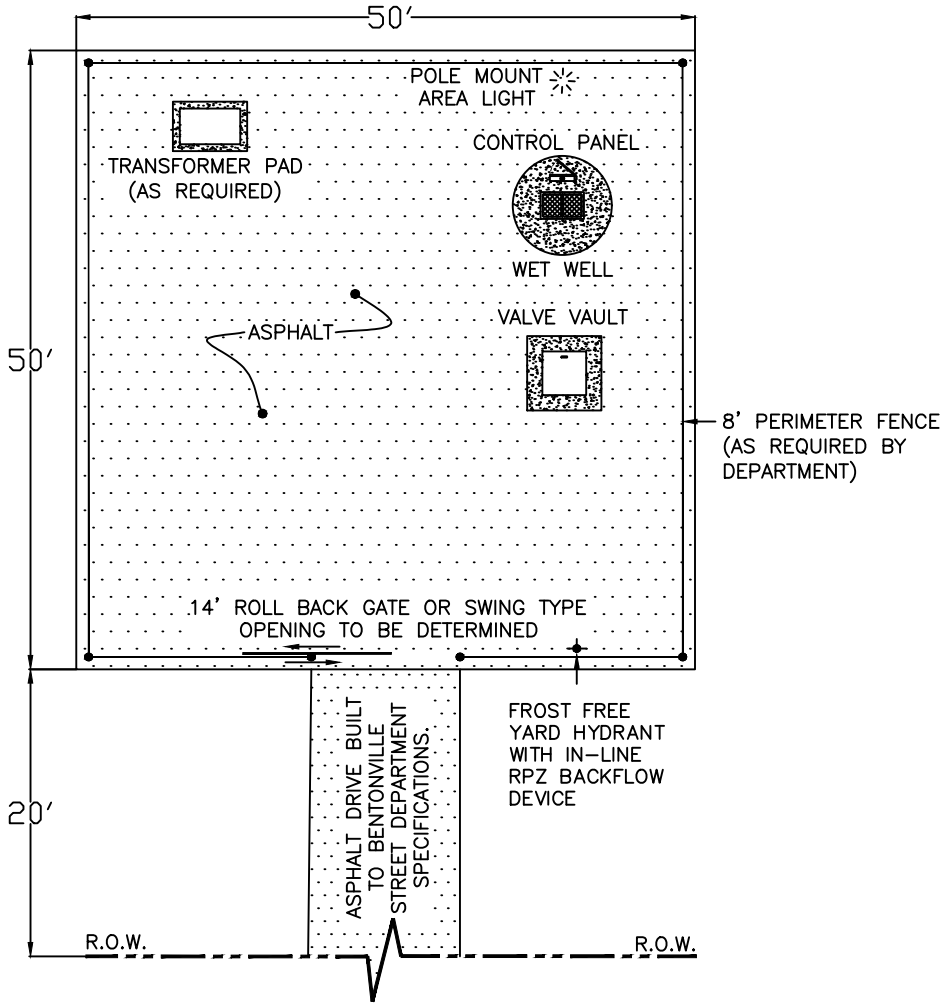
DUPLEX PUMP CONTROL PANEL

230 V / SINGLE PHASE



DRAWN BY: JI	CHECKED BY: PN
LIFT STATION DETAIL: LS02	
LAST REVISION DATE: 01/27/2020	
APPROVED:	06/22/2021

LIFT STATION SITE DETAIL



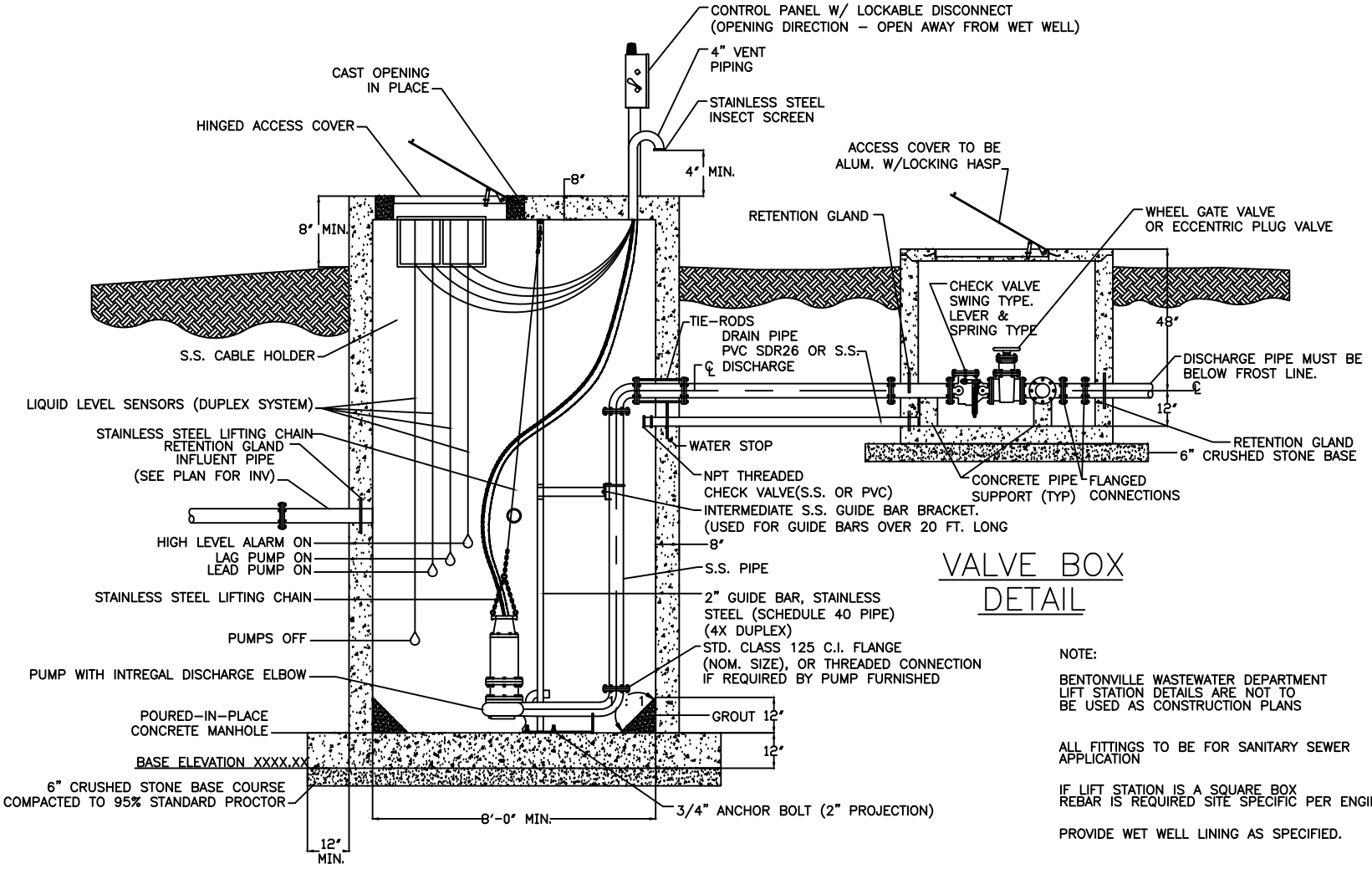
*ACTUAL SITE LAYOUT MAY VARY

BENTONVILLE WASTEWATER DEPARTMENT
LIFT STATION DETAILS ARE NOT TO
BE USED AS CONSTRUCTION PLANS

THE CITY OF WATER B UTILITIES BENTONVILLE	DRAWN BY: JI	CHECKED BY: PN
	LIFT STATION DETAIL: LS03	
	LAST REVISION DATE: 01/27/2020	
	APPROVED:	06/22/2021

LIFT STATION DETAIL

NON-CLOG PUMPS ABOVE 5 HP



VALVE BOX DETAIL

NOTE:

BENTONVILLE WASTEWATER DEPARTMENT LIFT STATION DETAILS ARE NOT TO BE USED AS CONSTRUCTION PLANS

ALL FITTINGS TO BE FOR SANITARY SEWER APPLICATION

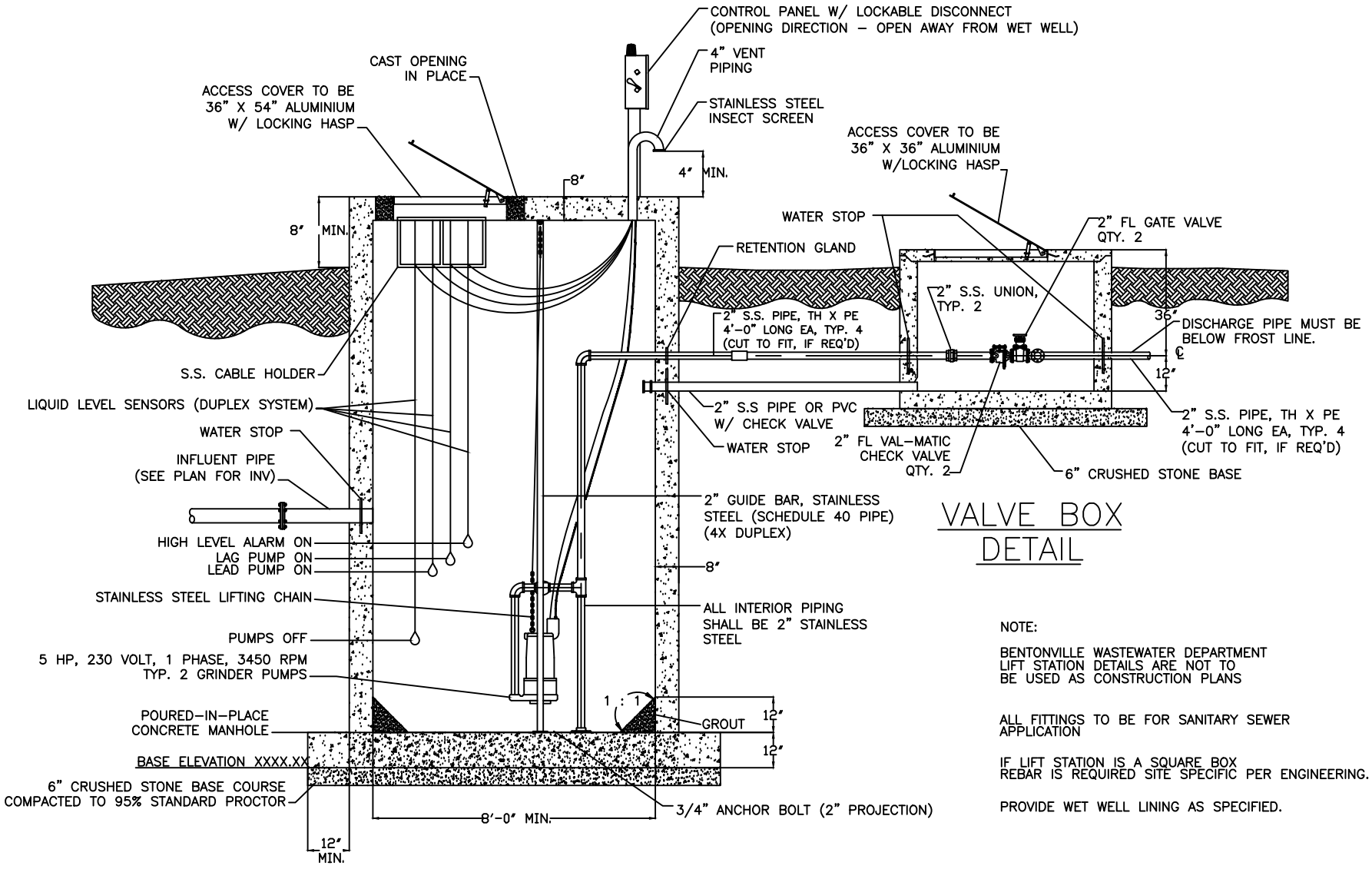
IF LIFT STATION IS A SQUARE BOX REBAR IS REQUIRED SITE SPECIFIC PER ENGINEERING.

PROVIDE WET WELL LINING AS SPECIFIED.

DRAWN BY: JI	CHECKED BY: PN
LIFT STATION DETAIL: LS04	
LAST REVISION DATE: 01/27/2020	
APPROVED:	06/22/2021

LIFT STATION DETAIL

GRINDER PUMPS 5 HP AND LESS



VALVE BOX DETAIL

NOTE:

BENTONVILLE WASTEWATER DEPARTMENT LIFT STATION DETAILS ARE NOT TO BE USED AS CONSTRUCTION PLANS

ALL FITTINGS TO BE FOR SANITARY SEWER APPLICATION

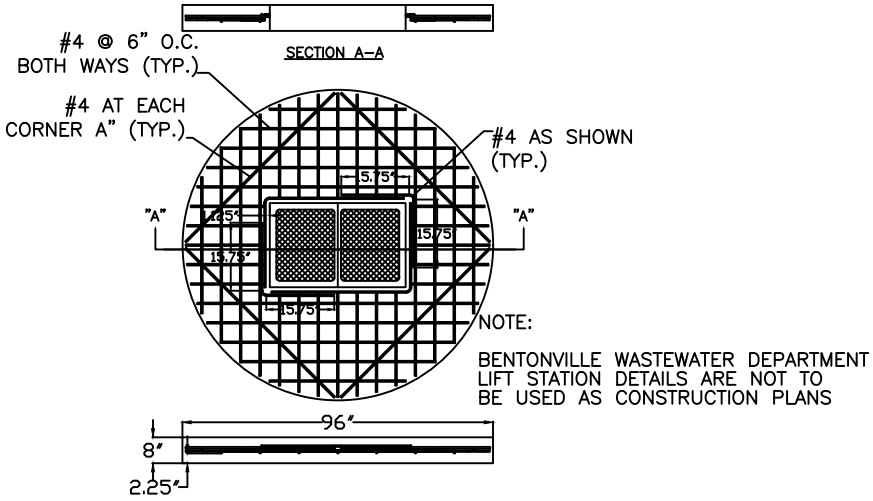
IF LIFT STATION IS A SQUARE BOX REBAR IS REQUIRED SITE SPECIFIC PER ENGINEERING.

PROVIDE WET WELL LINING AS SPECIFIED.

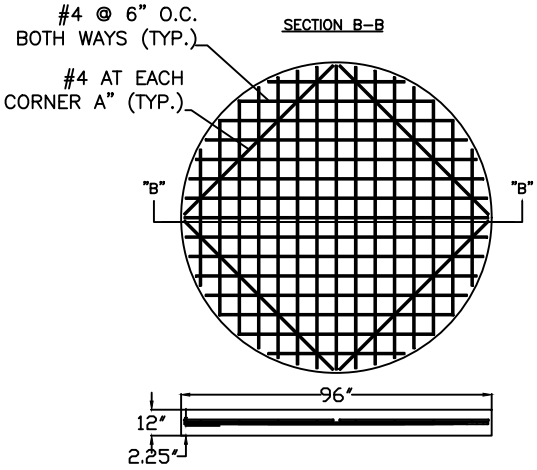
DRAWN BY: JI	CHECKED BY: PN
LIFT STATION DETAIL: LS05	
LAST REVISION DATE: 01/27/2020	
APPROVED:	06/22/2021

WET WELL

TOP SLAB REINFORCEMENT DETAIL

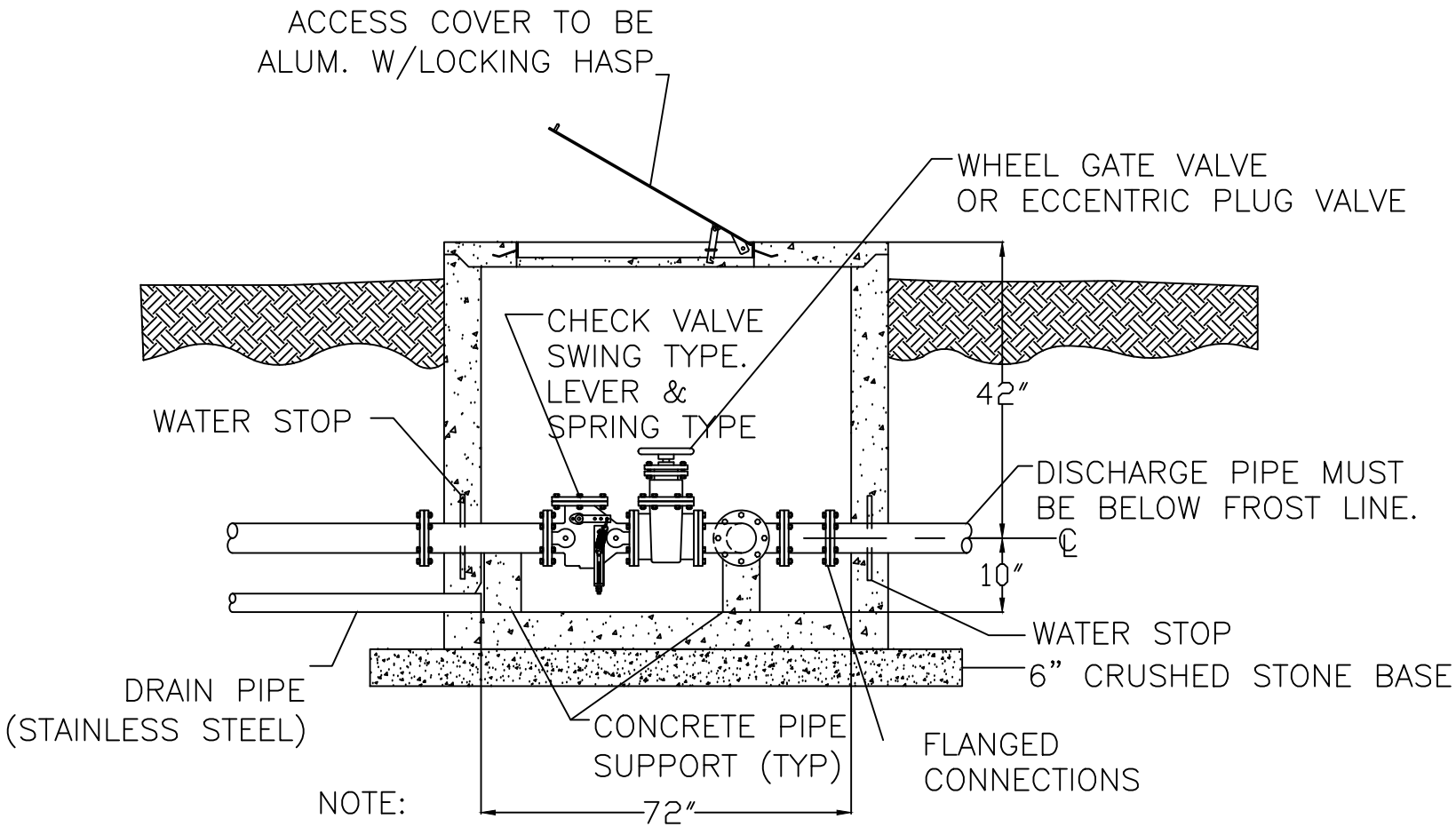


BOTTOM SLAB REINFORCEMENT DETAIL



THE CITY OF WATER B UTILITIES BENTONVILLE	DRAWN BY: JI	CHECKED BY: PN
	LIFT STATION DETAIL: LS06	
	LAST REVISION DATE: 01/27/2020	
	APPROVED:	06/22/2021

LIFT STATION VALVE VAULT DETAIL

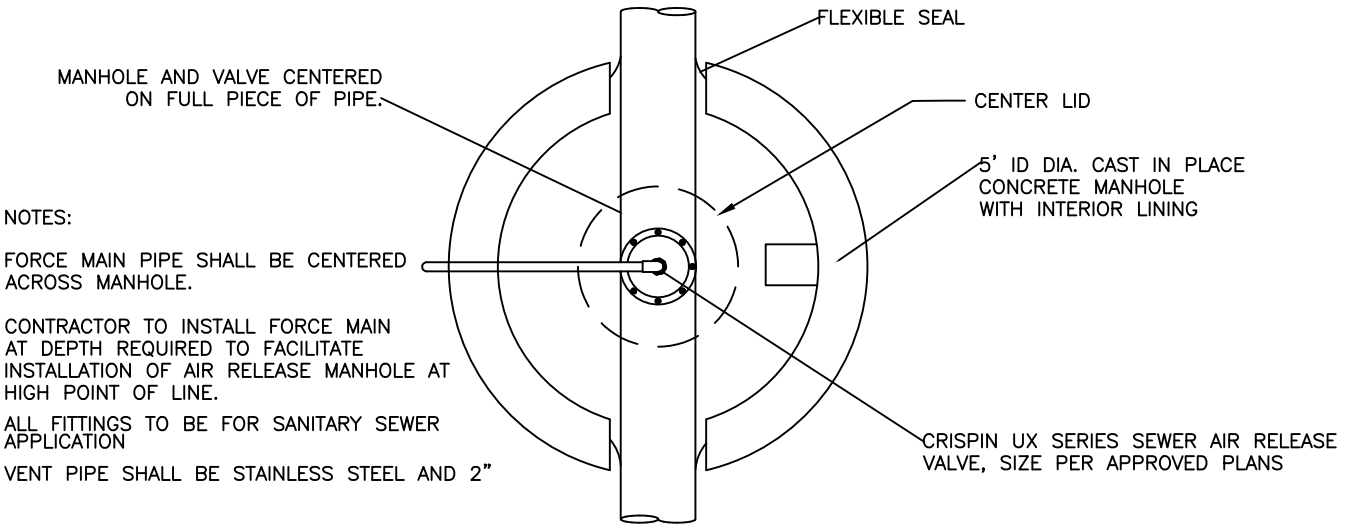


NOTE:
REBAR IS REQUIRED SITE SPECIFIC PER ENGINEERING.

THE CITY OF WATER B UTILITIES BENTONVILLE	DRAWN BY: JI	CHECKED BY: PN
	LIFT STATION DETAIL: LS07	
	LAST REVISION DATE: 01/27/2020	
	APPROVED:	06/22/2021

AIR VACUUM/RELEASE MANHOLE FOR FORCE MAIN

NOT TO SCALE



NOTES:

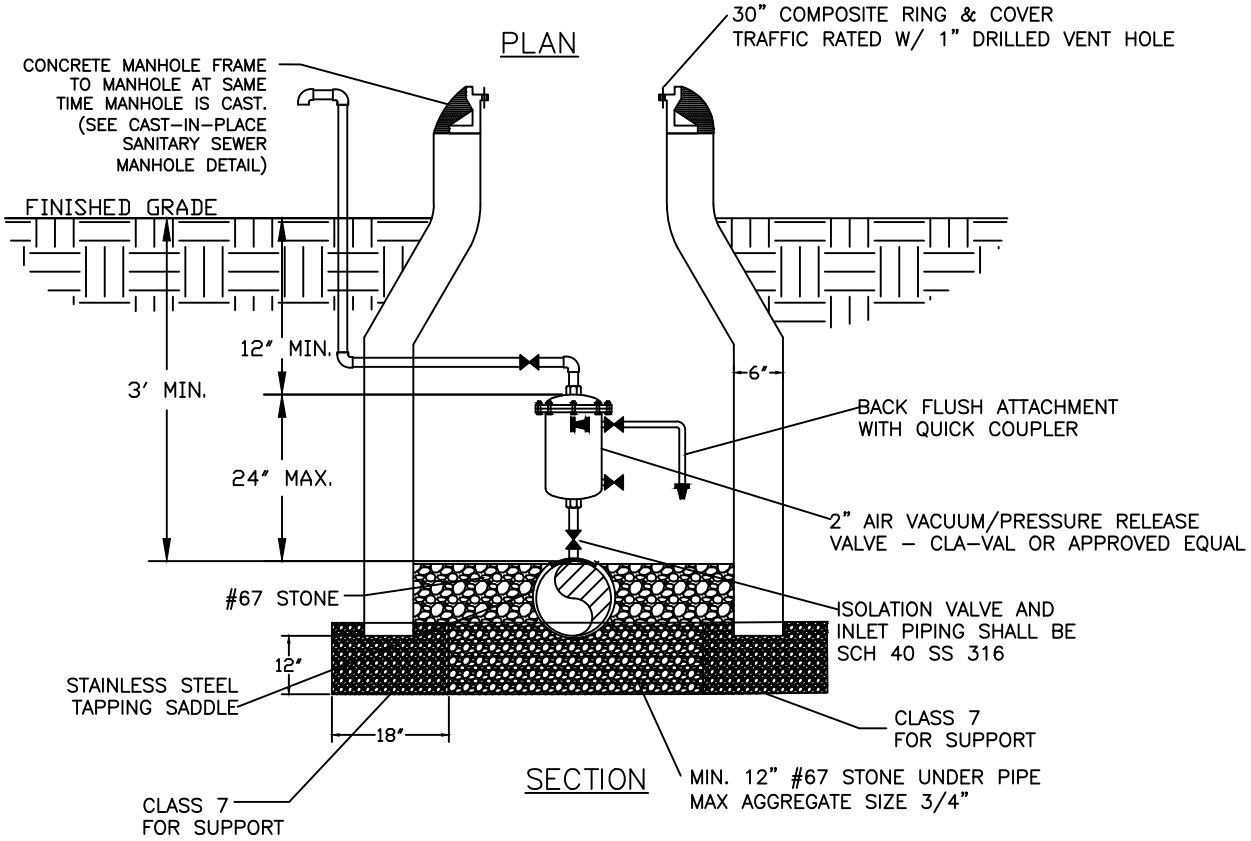
FORCE MAIN PIPE SHALL BE CENTERED ACROSS MANHOLE.

CONTRACTOR TO INSTALL FORCE MAIN AT DEPTH REQUIRED TO FACILITATE INSTALLATION OF AIR RELEASE MANHOLE AT HIGH POINT OF LINE.

ALL FITTINGS TO BE FOR SANITARY SEWER APPLICATION

VENT PIPE SHALL BE STAINLESS STEEL AND 2"

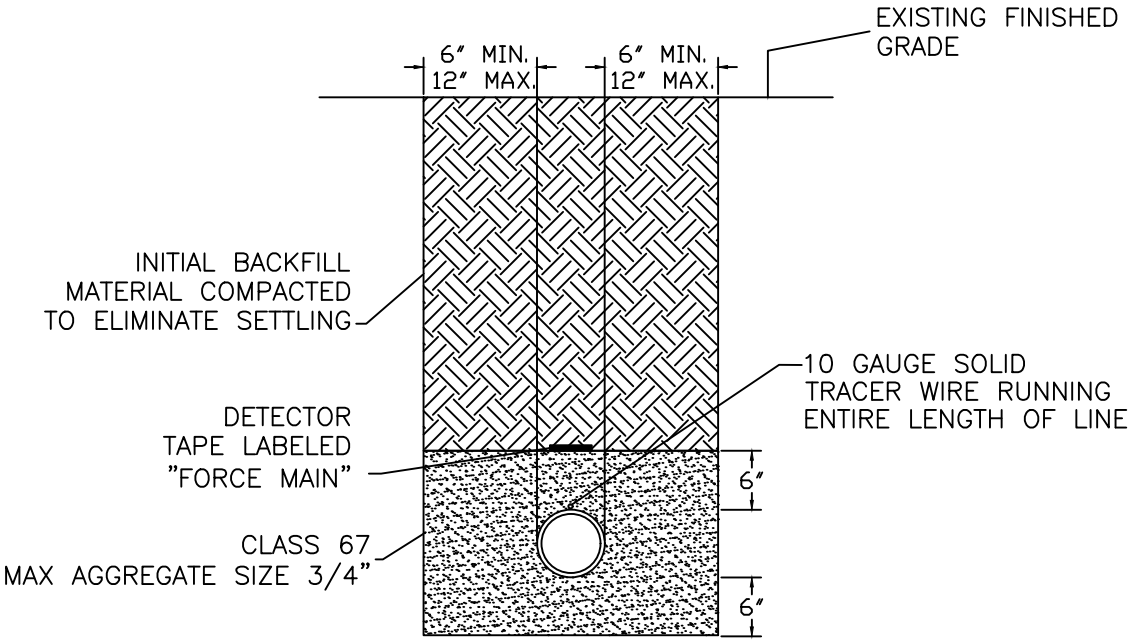
PLAN



SECTION

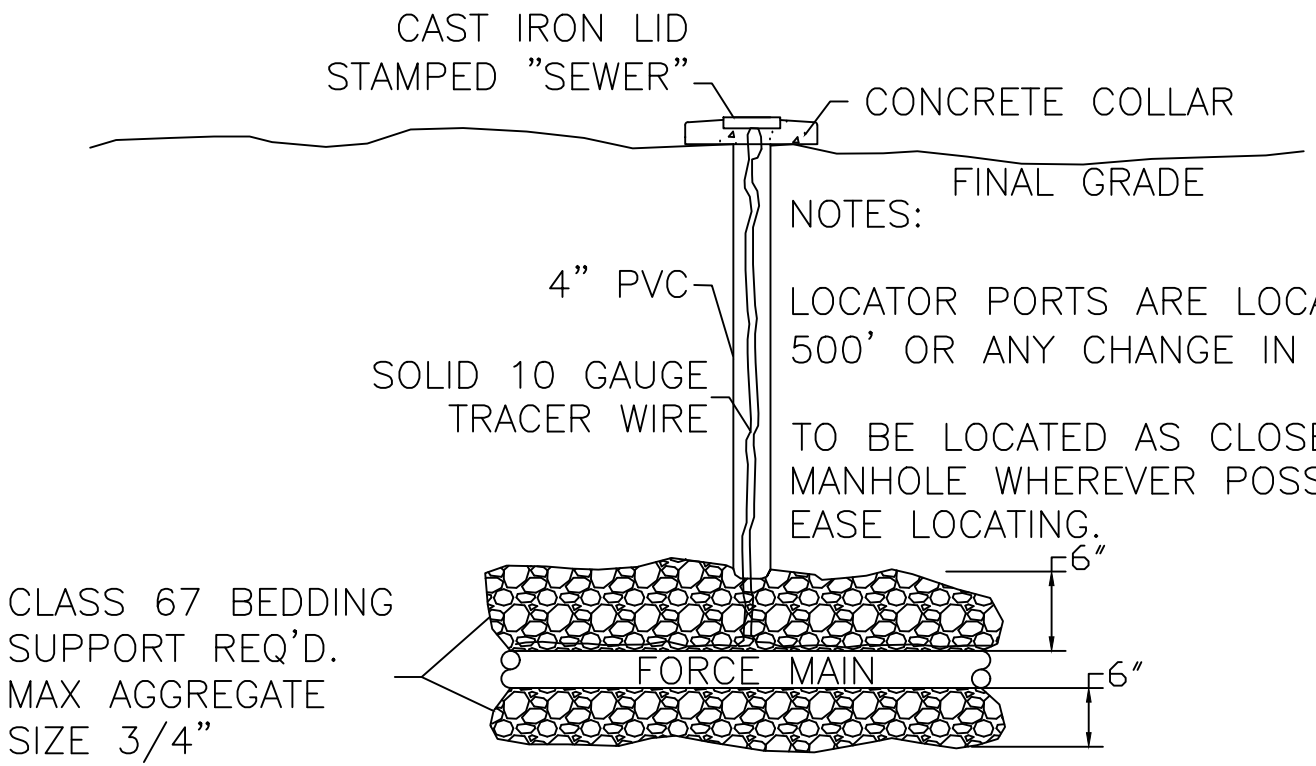
DRAWN BY: JS	CHECKED BY: AW
LIFT STATION DETAIL: LS08	
LAST REVISION DATE: 08/27/2024	
APPROVED:	10/01/2024

TYPICAL BEDDING DETAIL
FOR FORCE MAIN



THE CITY OF WATER B UTILITIES BENTONVILLE	DRAWN BY: JI	CHECKED BY: PN
	LIFT STATION DETAIL: LS09	
	LAST REVISION DATE: 01/27/2020	
	APPROVED:	06/22/2021

TRACER WIRE PORT



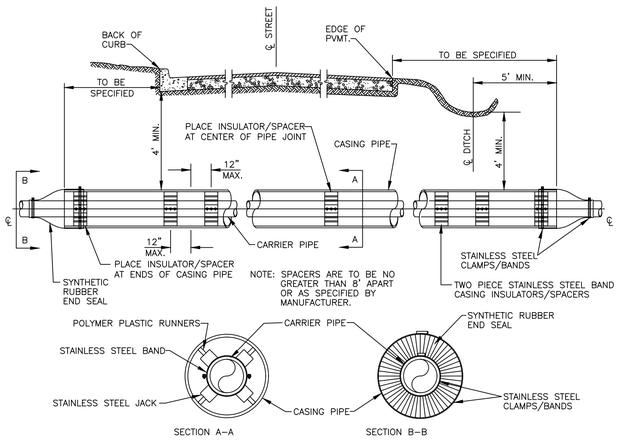
NOTES:

LOCATOR PORTS ARE LOCATED EVERY 500' OR ANY CHANGE IN DIRECTION.

TO BE LOCATED AS CLOSE TO A MANHOLE WHEREVER POSSIBLE TO EASE LOCATING.

DRAWN BY: JI	CHECKED BY: PN
LIFT STATION DETAIL: LS10	
LAST REVISION DATE: 01/27/2020	
APPROVED:	06/22/2021

ENCASEMENT DETAIL



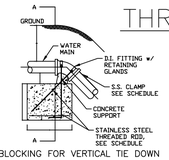
CARRIER & CASING SIZES										
CARRIER	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
CASING	16"	16"	16"	18"	24"	24"	30"	30"	36"	36"
CASING/WALL THICKNESS	.219	.219	.219	.250	.281	.344	.406	.406	.500	.500

NOTE: DUCTILE IRON, OR PVC PIPE REQUIRED FOR WATER, OR SEWER.

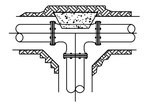
*ALL BELLS SHALL BE RESTRAINED INSIDE ENCASEMENT BY APPROVED METHOD.

GENERAL WATER/SEWER DETAIL: GWS01

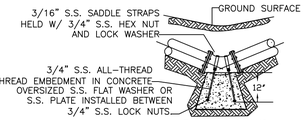
THRUST BLOCKING



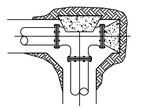
BLOCKING FOR VERTICAL TIE DOWN



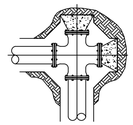
BLOCKING FOR TEE



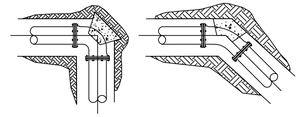
TYPICAL BLOCKING FOR VERTICAL BENDS



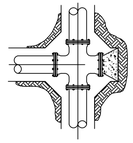
SPECIAL BLOCKING OF TEE & PLUG (WHEN DIRECTED BY WATER DEPT.)



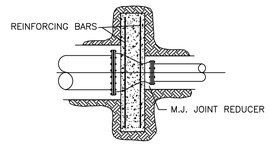
TYPICAL SECTION OF CROSS & 2 PLUG BLOCKING (WHEN DIRECTED BY WATER DEPT.)



TYPICAL BLOCKING FOR HORIZONTAL BENDS



TYPICAL SECTION OF CROSS & PLUG BLOCKING (WHEN DIRECTED BY WATER DEPT.)



THRUST SUPPORT FOR REDUCER (SIZE TO BE DETERMINED BY WATER DEPT.)

NOTES
1. ALL BLOCKING SHALL BE AGAINST UNDISTURBED SOIL USING 4,000 PSI CONCRETE.
2. WHERE SOIL CONDITIONS MAKE IT NECESSARY TO POUR CONCRETE OVER JOINTS, THE ENDS OF THE ADJACENT PIPES MUST HAVE A THRUST BLOCK TO RESIST MOVEMENT OF THESE JOINTS.
3. WEIGHT CALCULATIONS TO BE BASED ON REACTION BACKING TABLE (SEE GWS03).
4. WHEN BLOCKING AGAINST FITTINGS, FITTINGS SHALL BE COVERED WITH POLYETHYLENE WRAP TO PREVENT BONDING OF CONCRETE.
5. WHERE SHEAR BECOMES A PROBLEM PROPER REINFORCING MUST BE INSTALLED INTO THE BLOCKING.
6. CLEARANCE SHALL BE A MINIMUM OF 6" BETWEEN PIPE AND OBSTRUCTIONS.
7. CLEARANCE ON PIPES BELONGING TO OIL/GAS COMPANIES SHALL BE 18" UNLESS SPECIAL PERMISSION IS GIVEN BY THESE COMPANIES AND THE DEPARTMENT.
8. 12" OF ALL THREAD EMBEDED IN CONCRETE
9. MIN. 5/8" ALL THREAD FOR SECTIONS 10FT OR UNDER

GENERAL WATER/SEWER DETAIL: GWS02

REACTION BACKING TABLE

BLOCKING SCHEDULE					
PIPE SIZE		BENDS			ROD DIA.
		45°	22 1/2°	11 1/4°	
8"	VOLUME REQ'D (CU. FT.)	98.5	50.2	25.2	3/4 IN.
	A (FT.)	5.00'	4.00'	3.00'	
	B (FT.)	4.00'	3.20'	2.80'	
	C (FT.)	5.00'	4.00'	3.00'	
	MIN. CLAMP (2 EA.)	3/8 IN. x 2 IN.			
12"	VOLUME REQ'D (CU. FT.)	209.5	106.8	53.7	3/4 IN.
	A (FT.)	6.00'	5.00'	4.00'	
	B (FT.)	6.00'	4.25'	3.50'	
	C (FT.)	6.00'	5.00'	4.00'	
	MIN. CLAMP (2 EA.)	1/2 IN. x 2 IN.			
18"	VOLUME REQ'D (CU. FT.)	457.2	233.1	117.1	1 IN.
	A (FT.)	8.00'	6.50'	5.00'	
	B (FT.)	7.25'	5.50'	4.75'	
	C (FT.)	8.00'	6.50'	5.00'	
	MIN. CLAMP (2 EA.)	5/8 IN. x 3 IN.			
24"	VOLUME REQ'D (CU. FT.)	800.3	408.0	205.0	1 1/4 IN.
	A (FT.)	9.50'	7.50'	6.00'	
	B (FT.)	9.00'	7.25'	5.75'	
	C (FT.)	9.50'	7.50'	6.00'	
	MIN. CLAMP (2 EA.)	5/8 IN. x 3 IN.			

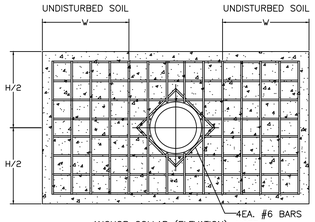
VOLUME CALCULATED ON THE BASIS OF CONCRETE REACTING THRUST ON THE RESPECTIVE BENDS UNDER AN INTERNAL PRESSURE OF 250 PSI, 50 PSI SURGE AND THE WEIGHT OF CONCRETE IS 150 POUNDS PER CU. FT.

NOTES:
1. ALL FITTINGS SHALL BE MECHANICAL JOINTS.
2. DO NOT COVER BELLS OR FLANGES WITH CONCRETE.
3. WRAP ALL FITTINGS WITH POLY WRAP.
4. BACK ALL TEES ACCORDING TO SIZE OF BRANCH.
5. BACKING FUTURE LINE EXTENSIONS SHALL BE SUCH THAT LATER REMOVAL IS POSSIBLE.
6. ALL BENDS WHERE FITTINGS ARE USED, BOTH HORIZONTAL OR VERTICAL, SHALL BE BACKED WITH CONCRETE.
7. REACTION BACKING TABLE IS BASED ON 150 PSI AND SOIL BEARING PRESSURE OF 2,000 LB/SQ. FT. ADDITIONAL BACKING MAY BE REQUIRED IN SOME AREAS AS REQUIRED BY CITY WATER DEPARTMENT.

GENERAL WATER/SEWER DETAIL: GWS03

ANCHOR COLLAR SPECIFICATIONS

ANCHOR COLLAR SCHEDULE						
PIPE SIZE	DIMENSIONS				REINFORCING BARS	
	W	H	T	M	"A" BARS	"B" BARS
6"	1.5'	2.0'	1.0'	M.J. RETAINER GLAND	#6@6"	#6@6"
8"	1.5'	2.5'	1.0'	M.J. RETAINER GLAND	#6@6"	#6@6"
12"	2.0'	4.0'	1.5'	M.J. RETAINER GLAND	#6@6"	#6@6"
16"	3.0'	4.5'	1.5'	M.J. RETAINER GLAND	#6@6"	#6@6"
20"	3.0'	5.0'	2.0'	M.J. RETAINER GLAND	#6@6"	#6@6"
24"	3.5'	5.5'	2.0'	M.J. RETAINER GLAND	#7@6"	#6@10"
30"	6.5'	6.0'	2.5'	4"	#8@6"	#7@10"
36"	7.0'	7.0'	2.5'	4"	#8@6"	#7@10"



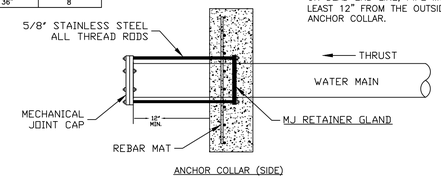
ANCHOR COLLAR (ELEVATION)

ROD REQUIREMENTS	
MAIN SIZE	NO. OF RODS
6"	2
8"	4
12"	4
16"	6
24"	6
30"	8
36"	8

NOTE:
USE M.J. RETAINER GLANDS FOR PIPE 24" AND SMALLER.

NOTE:
PIPE SURFACES SHALL BE CLEANED OF ALL FOREIGN MATERIAL BEFORE 4000 PSI CONCRETE COLLAR IS POURED.

NOTE:
ON DEAD END LINE, PIPE MUST EXTEND AT LEAST 12" FROM THE OUTSIDE EDGE OF ANCHOR COLLAR.

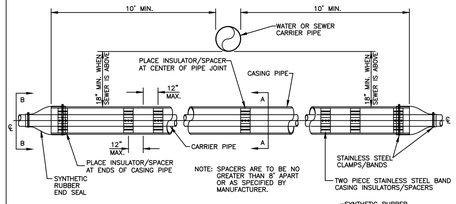


ANCHOR COLLAR (SIDE)

NOTE:
ALL-THREAD STEEL RODS SHALL BE 5/8" STAINLESS STEEL WITH STAINLESS STEEL HARDWARE.

GENERAL WATER/SEWER DETAIL: GWS04

ENCASEMENT CROSSING DETAIL



CARRIER & CASING SIZES										
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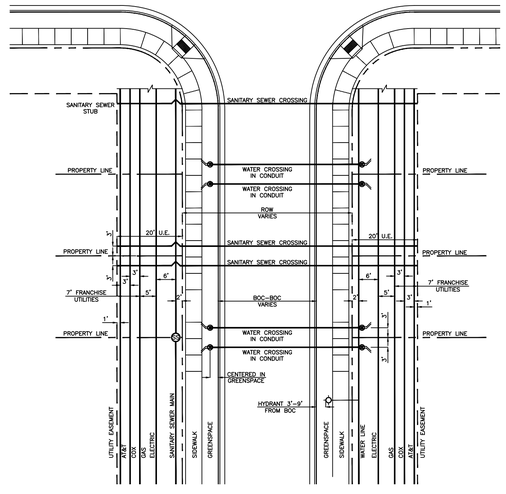
*ALL BELLS SHALL BE RESTRAINED BY APPROVED METHOD.

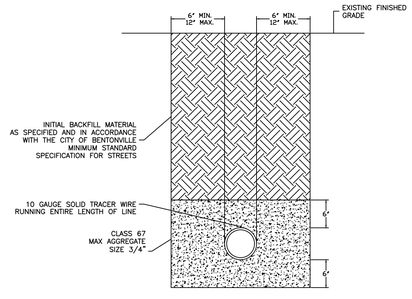
GENERAL WATER/SEWER DETAIL: GWS05

SUBDIVISION UTILITY PLACEMENT



GENERAL WATER/SEWER DETAIL: GWS06

TYPICAL BEDDING DETAIL



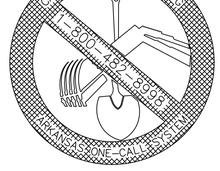
* REFER TO STREET SPECIFICATIONS FOR STREET REPAIR INFORMATION

GENERAL WATER/SEWER DETAIL: GWS07

THE CITY OF WATER B UTILITIES BENTONVILLE

3200 SW MUNICIPAL DR.
Bentonville, AR 72712
Ph: (479) 271-3140
www.bentonvillear.com

WATER/SEWER DETAILS



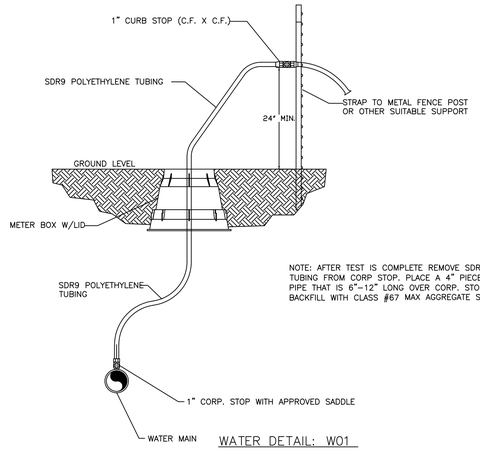
REVISIONS:

Adopted by City Council XX/XX/2024
Ordinance Number: XXXX-XXX

Changes Proposed by Water Dept. 08/27/2024

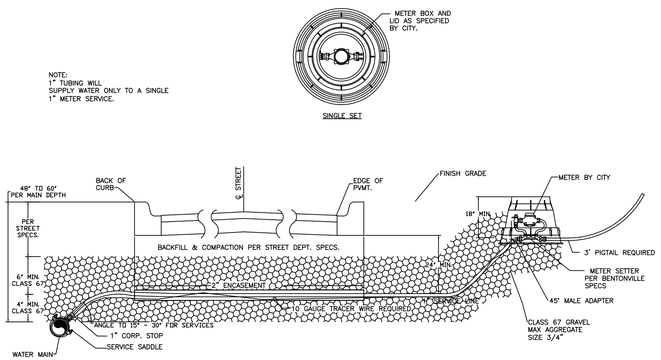
DRAWN BY:	JS	DATE:	08/27/2024
APPROVED BY:	AW	DATE:	08/27/2024
SHEET NUMBER:	1	OF	1

TEMPORARY 1" BLOW OFF ASSEMBLY SAMPLE POINTS



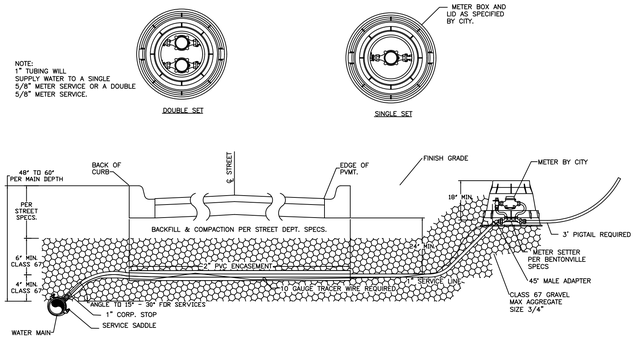
WATER DETAIL: W01

WATER SERVICE DETAIL 1"



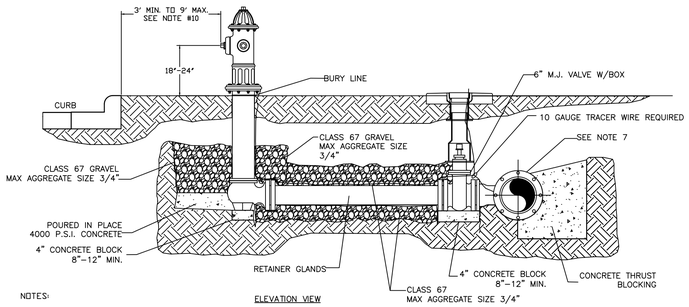
WATER DETAIL: W02

WATER SERVICE DETAIL 5/8"



WATER DETAIL: W03

FIRE HYDRANT DETAIL W/ RETAINER GLANDS



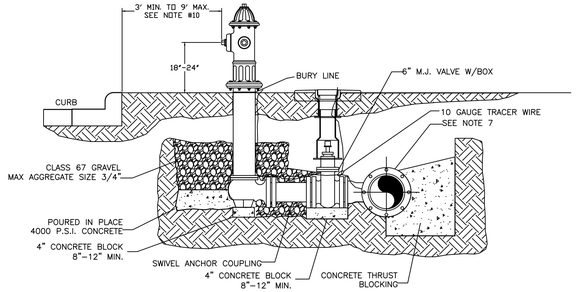
ELEVATION VIEW

NOTES:

1. DRAINAGE BED SHALL CONSIST OF CLASS 67 GRAVEL WITH A MAX AGGREGATE SIZE OF 3/4".
2. USE 6" NIPPLE WITH M.J. RETAINER GLANDS IF DISTANCE BETWEEN VALVE AND HYDRANT MUST BE GREATER THAN 13" SWIVEL ADAPTER.
3. FIRE HYDRANT TO BE BLOCKED AGAINST FIRM SOIL AS SHOWN.
4. ALL HYDRANTS SHALL BE INSTALLED PLUMB.
5. LARGE NOZZLE SHALL FACE CURB UNLESS OTHERWISE NOTED. ROTATE BARREL AS REQUIRED.
6. HYDRANT SHOULD NOT BE SET CLOSER THAN 4.0' TO OBSTRUCTIONS THAT ARE IN LINE WITH NOZZLE.
7. M.J. ANCHOR TEE, TAPPING SLEEVE OR TAPPING SADDLE MAY BE USED (SEE MATERIAL SPECIFICATIONS)
8. HYDRANTS TO BE SET AT DEPTHS GREATER THAN 6.0' SHALL BE SET WITH A MODIFIED FIRE HYDRANT SETTING.
9. POLYWRAP ENTIRE HYDRANT ASSEMBLY. DO NOT COVER WEEP HOLE DRAIN.
10. HYDRANTS WILL BE SET AT A MINIMUM OF 3' TO A MAXIMUM OF 9' BACK OF CURB OR EDGE OF DRIVING SURFACE, NOT IN SIDEWALK, FIRE LANE, OR RADIUS OR AS DIRECTED BY BENTONVILLE WATER DEPARTMENT.

WATER DETAIL: W04

FIRE HYDRANT DETAIL W/SWIVEL ANCHOR COUPLING



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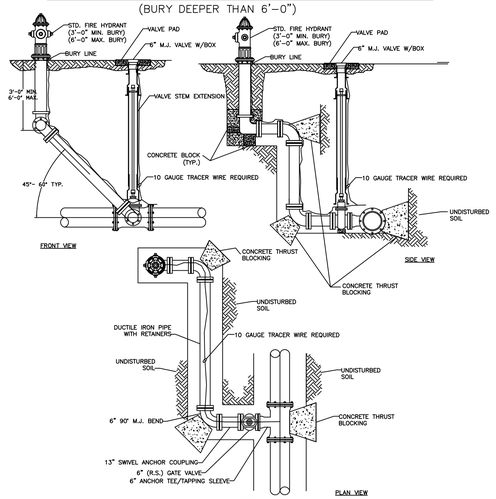
9. POLYWRAP ENTIRE HYDRANT ASSEMBLY. DO NOT COVER WEEP HOLE DRAIN.
10. HYDRANTS WILL BE SET AT A MINIMUM OF 3' TO A MAXIMUM OF 9' BACK OF CURB OR EDGE OF DRIVING SURFACE, NOT IN SIDEWALK, FIRE LANE, OR RADIUS OR AS DIRECTED BY BENTONVILLE WATER DEPARTMENT.

WATER DETAIL: W05

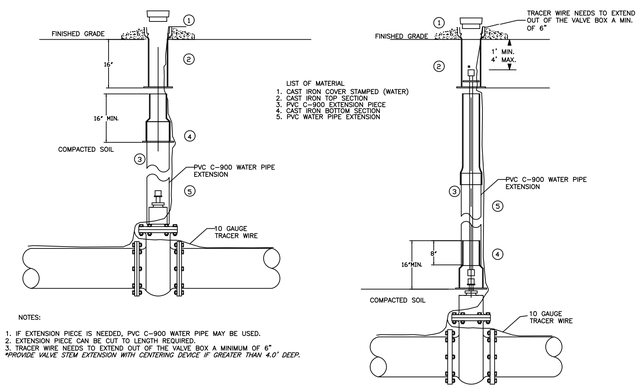
DEEP BURY FIRE HYDRANTS

(BURY DEEPER THAN 6'-0")



WATER DETAIL: W06

VALVE BOX VALVE STEM & TRACER WIRE INSTALLATION

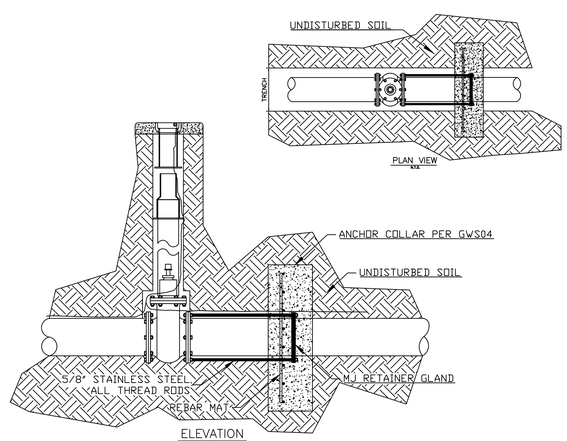


NOTES:

1. IF EXTENSION PIECE IS NEEDED, PVC C-900 WATER PIPE MAY BE USED.
2. EXTENSION PIECE CAN BE CUT TO LENGTH REQUIRED.
3. TRACER WIRE NEEDS TO EXTEND OUT OF THE VALVE BOX A MINIMUM OF 6"

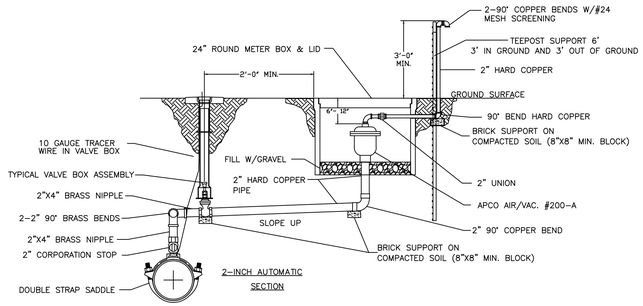
WATER DETAIL: W07

RESTRAINED GATE VALVE



WATER DETAIL: W08

2" COMBINATION AIR/VACUUM VALVE DETAIL



NOTES:

1. ALL THREADED CONNECTIONS SHALL HAVE A DOUBLE WRAP OF TEFLON TAPE ON THREADS.
2. DRILL HOLE IN SIDE OF METER BOX FOR OUTLET PIPING.
3. VALVES WILL BE PIPED TO POINT BEYOND PAVEMENT AND SHOULDER.

WATER DETAIL: W09

THE CITY OF WATER B UTILITIES BENTONVILLE

3200 SW MUNICIPAL DR.
Bentonville, AR 72712
Ph: (479) 271-3140
www.bentonvillear.com

WATER DETAILS

CALL BEFORE YOU DIG
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ARKANSAS ONE-CALL SYSTEM

REVISIONS:

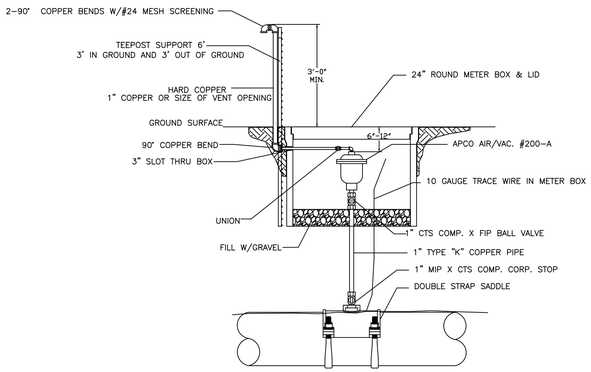
Adopted by City Council XX/XX/2024
Ordinance Number: XXXX-XXX

Changes Proposed by Water Dept. 08/27/2024

NOTES:

DRAWN BY: JS	DATE: 08/27/2024
APPROVED BY: AW	DATE: 08/27/2024
SHEET NUMBER: 1	OF 2

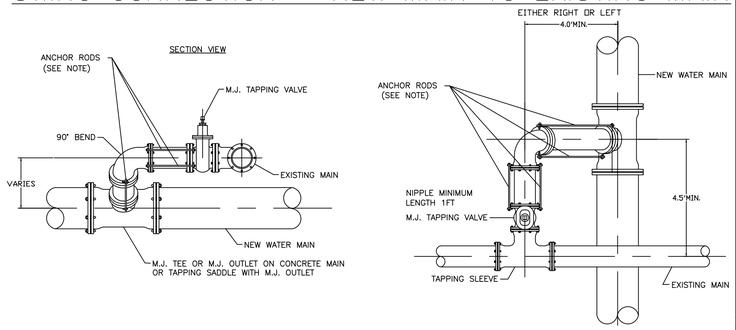
1" COMBINATION AIR/VACUUM VALVE DETAIL



NOTES:
1. ALL THREADED CONNECTIONS SHALL HAVE A DOUBLE WRAP OF TEFLON TAPE ON THREADS.
2. DRILL HOLE IN SIDE OF METER BOX FOR OUTLET PIPING.
3. VALVES WILL BE PIPED TO POINT BEYOND PAVEMENT AND SHOULDER.

WATER DETAIL: W10

SWING CONNECTION – NEW MAIN TO EXISTING MAIN



THRUST BLOCKING REQUIRED AT TEES AND ELBOWS.

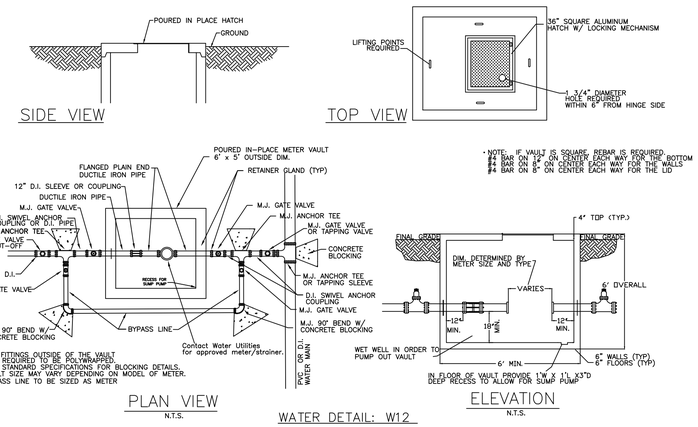
ROD REQUIREMENTS	
MAIN SIZE	NO. OF RODS
6"	2
8"	4
12"	4
16"	6
24"	6
30"	8
36"	8

NOTES:
1. CONTRACTOR SHALL LOCATE EXISTING MAIN IN ADVANCE OF LAYING NEW LINE IN ORDER TO ASSURE ADEQUATE LENGTH TO ADJUST DEPTH OF NEW MAIN.
2. DIMENSIONS SHOWN ARE RECOMENDED MINIMUMS TO PROVIDE ADEQUATE ROOM FOR TIGHTENING BOLTS ON JOINTS. (OTHER DIMENSIONS MAY BE USED)
3. PROVIDE STAINLESS STEEL "ALL THREAD(MIN 5/8")" TIE RODS WITH EYE BOLTS FOR ANCHORING ALL JOINTS.
4. RODS SHALL BE FIELD CUT TO FIT & SHALL BE PROTECTED WITH POLYWRAP.
5. ROTATE TEE UP & ELBOW DOWN AS REQUIRED TO MATCH.
6. USE TYPICAL CONCRETE BLOCKING REQUIRED.

WATER DETAIL: W11

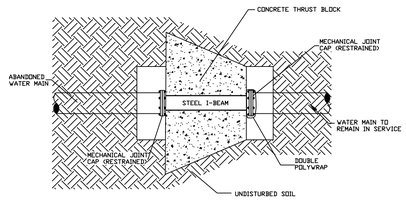
METER VAULT DETAIL FOR 4" – 8" METERS (TYPICAL)

(DIMENSIONS MAY VARY FOR METER SIZES)



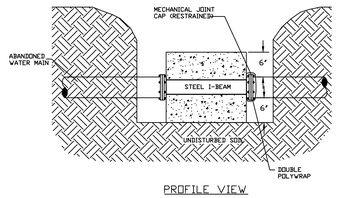
WATER DETAIL: W12

CUT/CAP DETAIL



PLAN VIEW

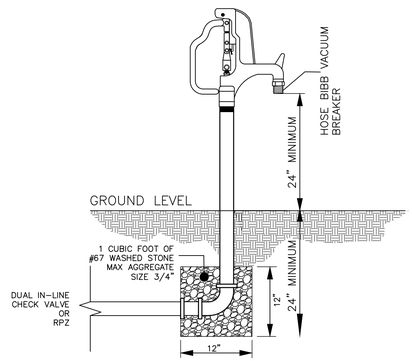
* STEEL I-BEAM TO BE SIZED BY PROJECT ENGINEER AND INCLUDED IN THE PROJECT SUBMITTAL.



PROFILE VIEW

WATER DETAIL: W13

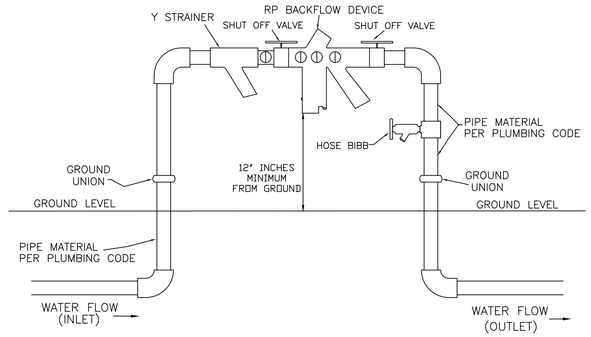
FROST FREE HOSE BIBB WITH BACKFLOW PREVENTION



ELEVATION
N.T.S.

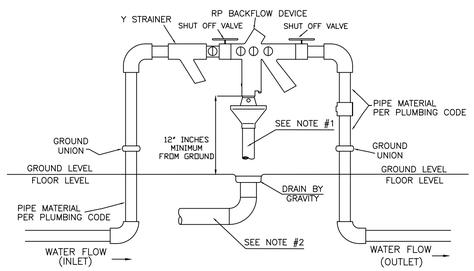
WATER DETAIL: W14

REDUCED PRESSURE (RP) BACKFLOW EXTERIOR IRRIGATION ONLY



WATER DETAIL: W15

REDUCED PRESSURE (RP) BACKFLOW INTERIOR DOMESTIC OR IRRIGATION

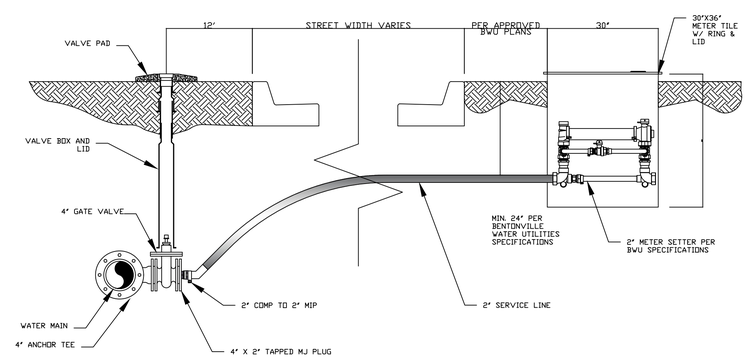


INDOOR APPLICATION ONLY NOTES:

1. AN AIR GAP DRAIN IS REQUIRED TO REDUCE SPLASHING OF MINOR DISCHARGES FROM THE RELIEF VALVE DRAIN PORT.
2. INDOOR INSTALLATION OF RP'S SHOULD PROVIDE FOR DRAINAGE CAPABLE OF HANDLING IN EXCESS OF THE MAXIMUM DISCHARGE RATE EXPECTED BY THE BACKFLOW ASSEMBLY MANUFACTURER.

WATER DETAIL: W16

WATER SERVICE DETAIL 2"



ELEVATION
N.T.S.

*ALL FITTINGS W/O PART NUMBER SHALL BE PER SPECIFICATIONS
*ALL FITTINGS MUST BE ANCHORED TO VALVE OR METER SETTER. NO IN-LINE FITTINGS WILL BE PERMITTED.

WATER DETAIL: W18

THE CITY OF WATER B UTILITIES BENTONVILLE

3200 SW MUNICIPAL DR.
Bentonville, AR 72712
Ph: (479) 271-3140
www.bentonvillear.com

WATER DETAILS

CALL BEFORE YOU DIG 1-800-482-8998 ARKANSAS ONE-CALL SYSTEM

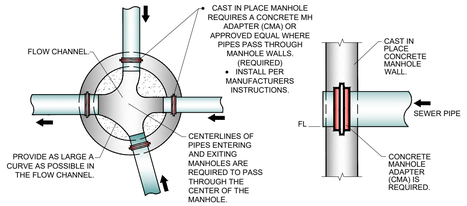
REVISIONS:
Adopted by City Council XX/XX/2024
Ordinance Number: XXXX-XXX

Changes Proposed by Water Dept. 08/27/2024

NOTES:

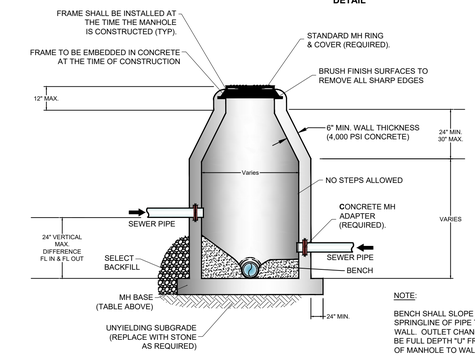
DRAWN BY: JS	DATE: 08/27/2024
APPROVED BY: AW	DATE: 08/27/2024
SHEET NUMBER: 2	OF 2

SANITARY SEWER
CAST IN PLACE MANHOLE



MANHOLE FLOW CHANNEL

CONCRETE MANHOLE ADAPTER (CMA) DETAIL



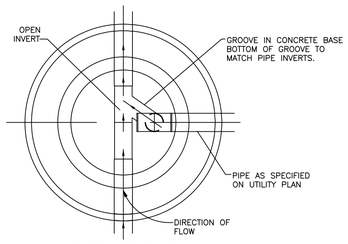
NOTE:
BENCH SHALL SLOPE FROM SPRINGLINE OF PIPE TO MANHOLE WALL. OUTLET CHANNEL SHALL BE FULL DEPTH "U" FROM CENTER OF MANHOLE TO WALL.

Pipe Size	Inside Diameter of Manhole	Minimum Wall Thickness	Base Thickness	Minimum Ring & Cover Size
12" OR LESS	4' DIA	6"	8"	24"
15" TO 24"	5' DIA	8"	10"	24"
>24"	6' DIA	8"	12"	30"

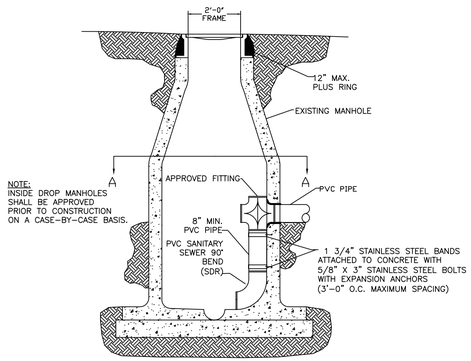
MANHOLE INFORMATION TABLE

SANITARY SEWER DETAIL: SS01

SANITARY SEWER
INTERIOR DROP MANHOLE



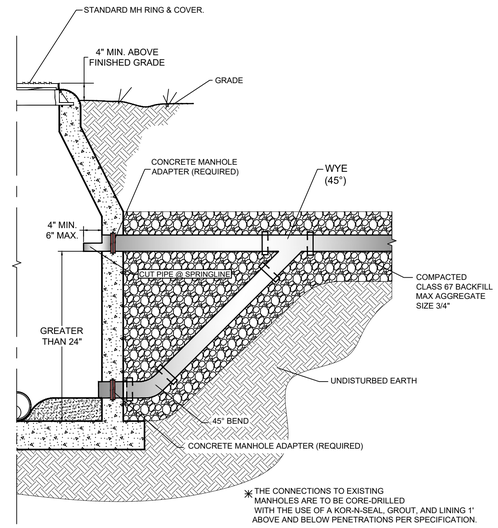
SECTION A-A



NOTE:
INSIDE DROP MANHOLES SHALL BE APPROVED PRIOR TO CONSTRUCTION ON A CASE-BY-CASE BASIS.

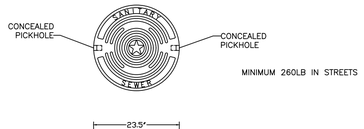
SANITARY SEWER DETAIL: SS02

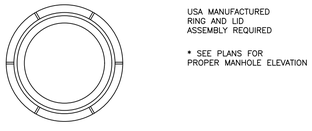
SANITARY SEWER
EXTERIOR DROP MANHOLE

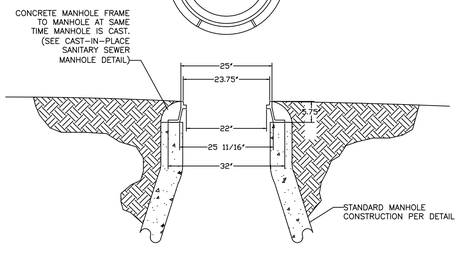


SANITARY SEWER DETAIL: SS03

HEAVY DUTY MANHOLE
LID & FRAME

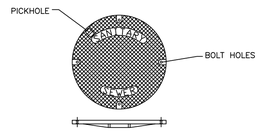


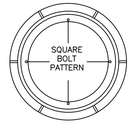


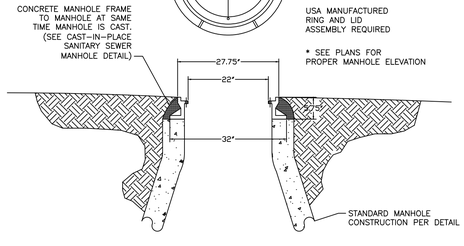


SANITARY SEWER DETAIL: SS04

WATER TIGHT BOLTED MANHOLE
LID & FRAME

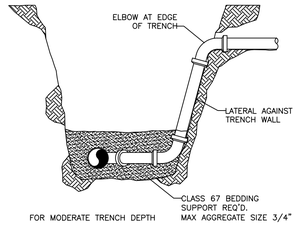




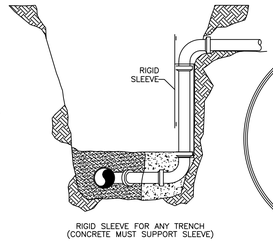


SANITARY SEWER DETAIL: SS05

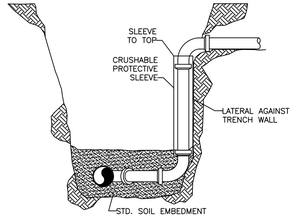
SANITARY SEWER
SERVICE WYE



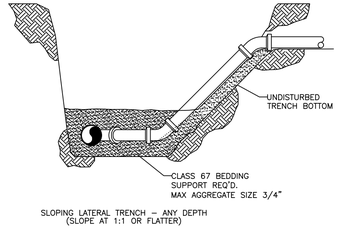
FOR MODERATE TRENCH DEPTH



RIGID SLEEVE FOR ANY TRENCH (CONCRETE MUST SUPPORT SLEEVE)



CRUSHABLE SLEEVE – ANY DEPTH
(SLEEVE OF NEAR ZERO COLUMN STRENGTH)



SLOPING LATERAL TRENCH – ANY DEPTH
(SLOPE AT 1:1 OR FLATTER)

SANITARY SEWER DETAIL: SS06

THE CITY OF BENTONVILLE WATER UTILITIES
3200 SW MUNICIPAL DR.
Bentonville, AR 72712
Ph: (479) 271-3140
www.bentonvillear.com

SAN.SEWER DETAILS

CALL BEFORE YOU DIG 1-800-482-8998 ARKANSAS ONE-CALL SYSTEM

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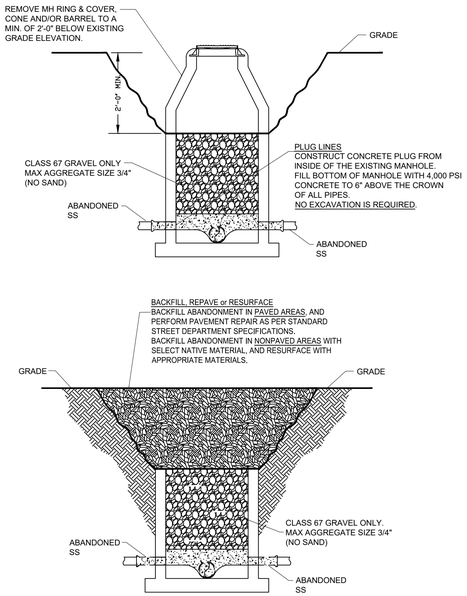
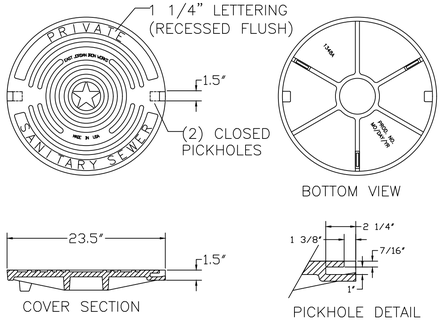
DRAWN BY: JS	DATE: 08/27/2024
APPROVED BY: AW	DATE: 08/27/2024
SHEET NUMBER: 1	OF 2

SANITARY SEWER MANHOLE ABANDONMENT



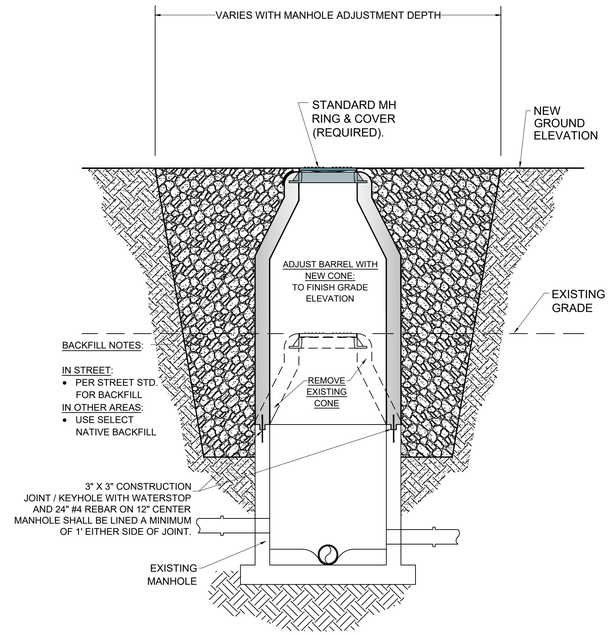
SANITARY SEWER DETAILS: SS07

PRIVATE MANHOLE RING AND LID



SANITARY SEWER DETAILS: SS08

TYPICAL MANHOLE ADJUST TO GRADE



SANITARY SEWER DETAILS: SS09

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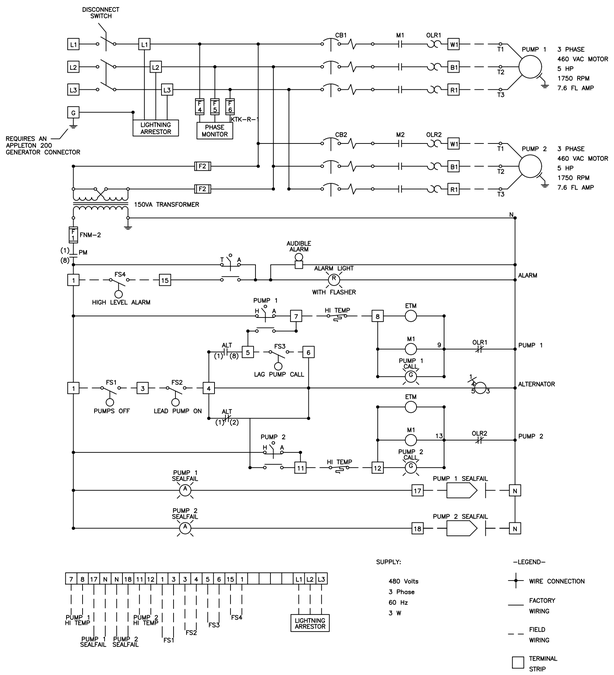
DRAWN BY: JS	DATE: 08/27/2024
APPROVED BY: AW	DATE: 08/27/2024
SHEET NUMBER: 2	OF 2

DUPLEX PUMP CONTROL PANEL

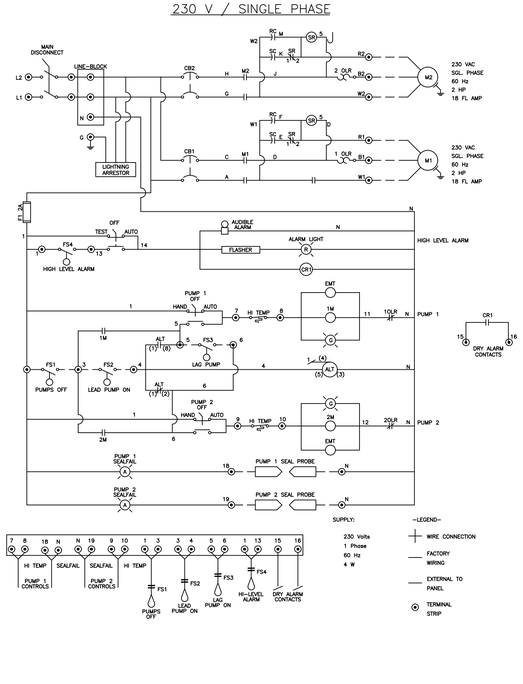
480 V / 3 PHASE



LIFT STATION DETAILS: LS01

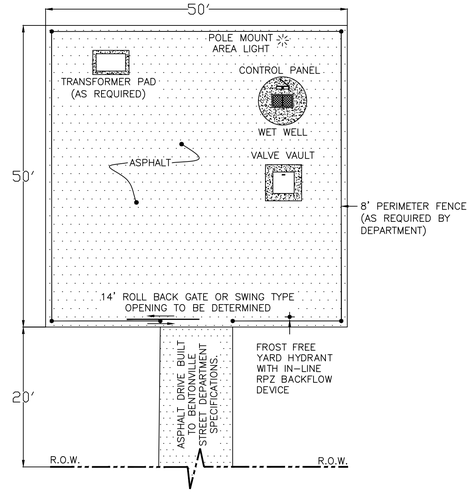
DUPLEX PUMP CONTROL PANEL

230 V / SINGLE PHASE



LIFT STATION DETAILS: LS02

LIFT STATION SITE DETAIL



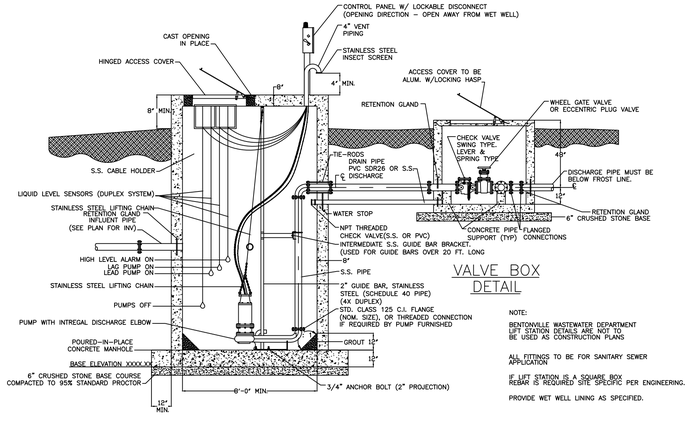
*ACTUAL SITE LAYOUT MAY VARY

BENTONVILLE WASTEWATER DEPARTMENT
LIFT STATION DETAILS ARE NOT TO
BE USED AS CONSTRUCTION PLANS

LIFT STATION DETAILS: LS03

LIFT STATION DETAIL

NON-CLOG PUMPS 5 HP AND UP



VALVE BOX DETAIL

NOTE:
BENTONVILLE WASTEWATER DEPARTMENT LIFT STATION DETAILS ARE NOT TO BE USED AS CONSTRUCTION PLANS

ALL FITTINGS TO BE FOR SANITARY SEWER APPLICATION

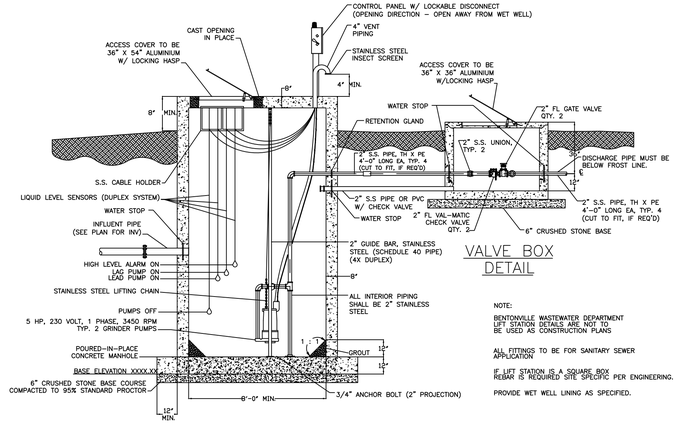
IF LIFT STATION IS A SQUARE BOX REBAR IS REQUIRED SITE SPECIFIC PER ENGINEERING.

PROVIDE WET WELL LINING AS SPECIFIED.

LIFT STATION DETAILS: LS04

LIFT STATION DETAIL

GRINDER PUMPS 5 HP AND LESS



VALVE BOX DETAIL

NOTE:
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ALL FITTINGS TO BE FOR SANITARY SEWER APPLICATION

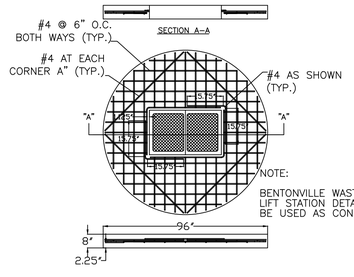
IF LIFT STATION IS A SQUARE BOX REBAR IS REQUIRED SITE SPECIFIC PER ENGINEERING.

PROVIDE WET WELL LINING AS SPECIFIED.

LIFT STATION DETAILS: LS05

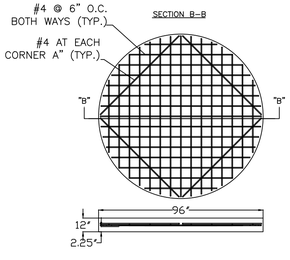
WET WELL AND VALVE VAULT

TOP SLAB REINFORCEMENT DETAIL



NOTE:
BENTONVILLE WASTEWATER DEPARTMENT LIFT STATION DETAILS ARE NOT TO BE USED AS CONSTRUCTION PLANS

BOTTOM SLAB REINFORCEMENT DETAIL

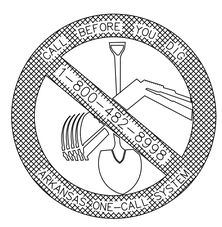


LIFT STATION DETAILS: LS06

THE CITY OF BENTONVILLE WATER UTILITIES

3200 SW MUNICIPAL DR.
Bentonville, AR 72712
Ph: (479) 271-3140
www.bentonvillear.com

LIFT STATION DETAILS



REVISIONS:

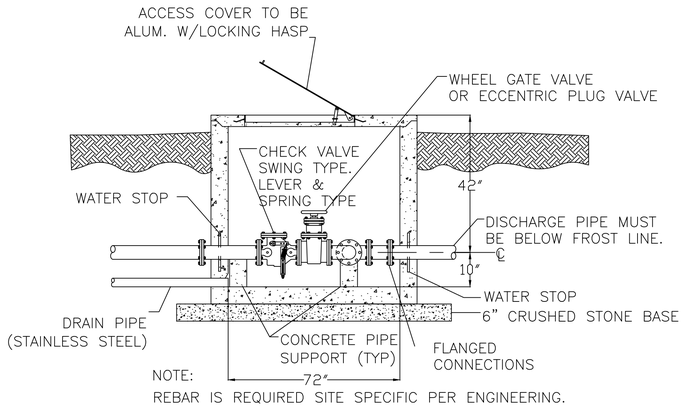
Adopted by City Council XX/XX/2024
Ordinance Number: XXXX-XXX

Changes Proposed by Water Dept. 08/27/2024

NOTES:

DRAWN BY: JS	DATE: 08/27/2024
APPROVED BY: AW	DATE: 08/27/2024
SHEET NUMBER: 1	OF 2

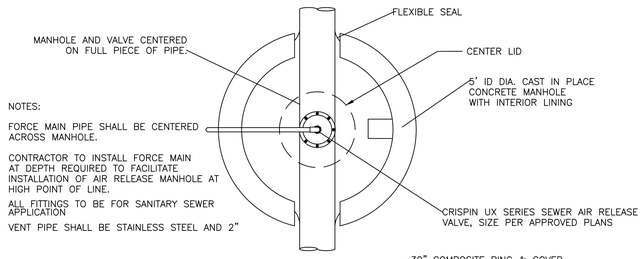
LIFT STATION VALVE VAULT DETAIL



NOTE:
REBAR IS REQUIRED SITE SPECIFIC PER ENGINEERING.

LIFT STATION DETAILS: LS07

AIR VACUUM/RELEASE MANHOLE FOR FORCE MAIN



NOTES:

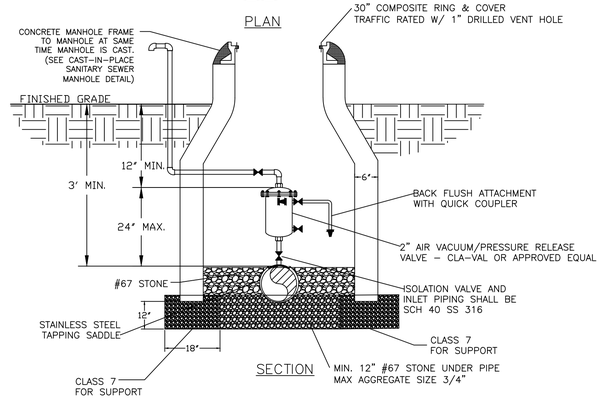
FORCE MAIN PIPE SHALL BE CENTERED ACROSS MANHOLE.

CONTRACTOR TO INSTALL FORCE MAIN AT DEPTH REQUIRED TO FACILITATE INSTALLATION OF AIR RELEASE MANHOLE AT HIGH POINT OF LINE.

ALL FITTINGS TO BE FOR SANITARY SEWER APPLICATION

VENT PIPE SHALL BE STAINLESS STEEL AND 2"

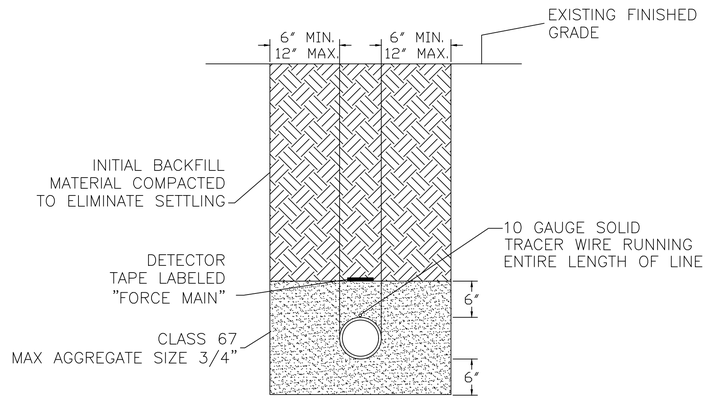
PLAN



SECTION

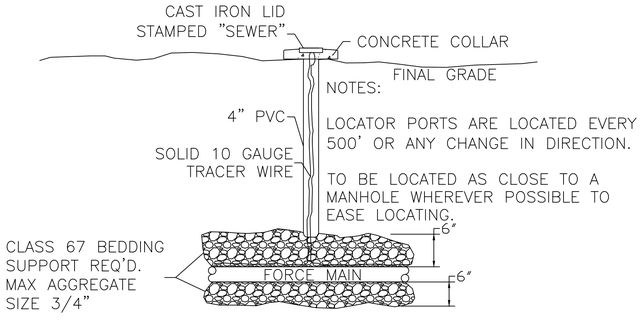
LIFT STATION DETAILS: LS08

TYPICAL BEDDING DETAIL FOR FORCE MAIN



LIFT STATION DETAILS: LS09

TRACER WIRE PORT



NOTES:

LOCATOR PORTS ARE LOCATED EVERY 500' OR ANY CHANGE IN DIRECTION.

TO BE LOCATED AS CLOSE TO A MANHOLE WHEREVER POSSIBLE TO EASE LOCATING.

LIFT STATION DETAILS: LS10

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LIFT STATION DETAILS

CALL BEFORE YOU DIG 1-800-482-8998 ARKANSAS ONE-CALL SYSTEM

REVISIONS:

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