FINAL REPORT TO CWCB WSRF
Elk Home Ditch Pipeline Improvement Project

Project Background: The Elk Home Ditch was an open earthen irrigation ditch on US Forest Service property located approximately 13 miles of Blue Mesa Reservoir above Rainbow Lake. The historical ditch contoured along a steep hillside with sections of rock and thick timber and frequently experienced high levels of seepage and blowouts. The Elk Home Ditch collects water from two western tributaries of West Steuben Creek and delivers that water to Rainbow Lake. Rainbow Lake then drains to Willow Creek, effectively dewatering the upper West Steuben Creek. West Steuben creek contains a conservation population of Colorado River cutthroat trout which are primarily limited to about 1.75 miles of stream above a 12-foot waterfall. Historical records indicate that cutthroat trout were once common on Steuben Creek. Downstream of the waterfall brook trout now predominate with some brown trout.

Project Purpose: This project converted the delivery mechanism of the Elk Home Ditch water right (7.25cfs, adjudication date of 1906) from an open-earthen ditch to a 30-inch pipeline. This project also eliminated diversions at the Elk Home 2 Ditch (7.25 cfs, adjudication date of 1906) located on US Forest Service lands within the West Elk Wilderness Area. Improved reiliability and yeld from Elk Home Ditch offset the loss of yield at the Elk Home 2 Ditch water rights which were conveyed to the Colorado Water Conservation Board for the benefit of improved instream flows downstream to Stueben Creek which supports a critical population of Colorado River Cutthroat Trout. The project also reduced ditch maintenance efforts, reduced damage to forest lands, enabled delivery of water earlier in the spring, and ensured availability of sufficient water for storage in Rainbow Lake.

Project Accomplishments:

- Replaced 4,180 linear feet of open irrigation ditch with closed 30-inch pipe and 6 linear feet with 24-inch pipe
- Restored 7,920 feet of West Stueben Creek habitat for Colorado River Cutthroat Trout
- Saved approximately 167.9 acre feet of water
- Conveyed the Elk Home No. 2 Ditch water right decreed for 7.25 cfs, absolute, with an appropriation date of 1902 and adjudication date of 1906 to the Colorado Water Conservation Board

Project Timeline:

Project Start Date: 06/29/17

Project End Date: 08/01/20

Project Budget:

Estimated Project Cost: $433,000

Funding Sources:

- WSRF Awarded: $310,000
- Upper Gunnison District Committed: $100,000

Final Project Cost: $416,604

- WSRF Paid: $273,529
- UGRWC Paid: $143,075

Exhibits:

- Project Budget and Expenditures
- Change Orders
- Project Manual
- Flow Calculations
- Forest Service Permit
- Construction plans and specifications
- Inspection report
- Certification of Completion
- Quit Claim Deeds (ROW and Water Right)

Table 1. Budget Summary

Task Description	Budget Estimated	Actual Expenditures
Task 1: Construction	400,000.00	385,103.00
Task 2: Engineering	10,000.00	31,500.80
TOTALS:	**410,000.00**	**416,603.80**

Table 2. Expenditure Detail

	Type	Date	Name	Memo	Amount
Hearne Excavating, Inc.					
	Check	08/28/2017	Hearne Excavating, Inc.		58,327.24
	Bill	09/25/2017	Hearne Excavating, Inc.	Elk Home Ditch Pipeline Project	67,224.29
	Bill	10/03/2017	Hearne Excavating, Inc.	Elk Home Ditch Pipeline Project	145,093.06
	Bill	11/29/2017	Hearne Excavating, Inc.	Elk Home Ditch Pipeline Project	75,048.44
	Bill	12/20/2018	Hearne Excavating, Inc.	Elk Home Ditch Pipeline Project	38,409.97
	Bill	09/16/2019	Hearne Excavating, Inc.	Repairs to Pipeline	1,000.00
Total Hearne Excavating, Inc.					385,103.00
Williams Engineering, LLC					
	Bill	08/21/2017	Williams Engineering, LLC	8/1/17 Statement	10,338.80
	Bill	09/06/2017	Williams Engineering, LLC	Invoice 4107	1,500.00
	Bill	09/30/2017	Williams Engineering, LLC	Invoice 4138	3,800.00
	Bill	11/07/2017	Williams Engineering, LLC	Invoice 4177	5,000.00
	Bill	12/04/2017	Williams Engineering, LLC	November	1,500.00
	Bill	12/31/2017	Williams Engineering, LLC	2017 Statement	5,662.00
	Bill	07/31/2018	Williams Engineering, LLC	4512 - Elk Home Ditch	500.00
	Bill	07/31/2020	Williams Engineering, LLC	Final Engineering services plus certificate of completion	3,200.00
Total Williams Engineering, LLC					31,500.80
TOTAL					**$ 416,603.80**

Table 3. Balance Withheld Until Receipt of Final Deliverable

BUDGET		ACTUAL	
Amount Spent	$ 416,603.80	Amount Spent	$ 416,603.80
CWCB Grant	310,000	CWCB Grant Reimbursement to Date	273,529
UGRWCD Budget	100,000	UGRWCD Paid	143,075
Overage Paid UGRWCD	$ 6,603.80		

CHANGE ORDER NUMBER 1

PROJECT: Elk Home Ditch pipeline Project

DATE: _____

CONTRACT DATE: June 26, 2017

TO: Hearn, Excavating, Inc.
1641 County road 771
Ohio City, CO 81237

The Contract is changed as follows:

1. Delete the following items on the Bid form for Hearn Excavating:
   500 lft. 12" PIP pipe in place at $30.00/lft……($15,000.00)
   1 each lake bypass assembly at $4,500…… ($4,500.00)
   160' of 30" ADS pipe below flume @ $89.18 per ft…… ($14,269.00)
2. Clarification of payment conditions in respect to availability of funds:
   Upper Gunnison River Water Conservancy District: June 26, 2017
   Colorado Water Conservation Board: August 15, 2017
4. Change all references in the contract to Elk Home Ditch Owners and change to the Upper Gunnison River Water Conservancy District as the contracting agent.

Not valid until signed by the Owner

The original (Contract Sum)	417,872.00
Net change by previously authorized Change Orders	0.00
The (Contract Sum) prior to this Change Order was	417,872.00
The (Contract Sum) unchanged by this Change Order in the amount of	(33,769.00)
The new (Contract Sum) including this Change Order will be	384,103.00
The Contract time will be (unchanged) by	Unchanged

The date of Substantial Completion as of the date of this Change Order is unchanged.

NOTE: This summary does not reflect changes in the Contract Sum, Contract Time or Guaranteed Maximum Price which have been authorized by Construction Change Directive. If any portion of this change order is not acceptable you must furnish us written notification of such non-acceptance at the address designated below with seven (7) days of issue hereof. In the absence of such notice of non-acceptance, your unqualified acceptance of this change order will be deemed conclusive seven (7) days after date of issue hereof.

Upper Gunnison River Water Conservancy District	Hearn Excavating, Inc.
CONTRACTING AGENT	**CONTRACTOR**
By: _____	BY: _____
Signature: _____	Signature: _____

SECTION 00010

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DIVISION 0 – BIDDING AND GENERAL REQUIREMENTS

DIVISION 1 - GENERAL REQUIREMENTS

DIVISION 2-SITE WORK

END OF SECTION

Invitation to Bid

Elk Home Ditch Pipeline Project

James Pike representing the Owners of the Elk Home Ditch is seeking bids from invited and qualified contractors to install approximately 4,180 feet of 30 inch ADS pipe, inlet structure, flume cover and lake by pass assembly. Construction must be completed according to the design and engineering documents.

The bid packets, including design and contract documents will be available from the Engineer on May 23, 2017 and will be emailed to Contractors and hard copies are available for pickup from Williams Engineering at 400 N Main, Gunnison Co. **A pre bid meeting for interested Contractors will be held at 2:00 PM on May 25, 2017 at the office of the Upper Gunnison River Water Conservancy District, 200 W. Spencer, Suite B, Gunnison, Colorado.** The contractors will be provided an overall review of the project including plans, specifications, project conditions, and a verbal and pictorial presentation, by James Pike representing the ditch owners, on the field conditions and the issues to be encountered in construction of the ditch pipeline. The Owner's intent is to start construction as soon as field conditions permit and waiting for the snow to melt for a field inspection will delay the start of construction.

The Owner's reserves the right to reject any or all Bids, and to waive any informalities or irregularities therein; to accept the bid for the contract which, in its judgment, best serves the Owner's.

The Bidder shall submit a single lump sum price and prices for all unit cost items shown on the Bid Form. The Contractor shall include Colorado State Sales and Use Taxes on materials and equipment to be incorporated in the Work.

The contract time is 90 days from the date of notice of award and will be included in the Agreement. The pipeline must be tested, certified and put into operation at the end of the 90 day period.

The project is being funded in part by the Upper Gunnison River Water Conservancy District and the Colorado Water Conservation Board.

Proposals must be hand carried or mailed to James Pike at the Upper Gunnison River Water Conservancy District office, or by emailed to jimmpike@msn.com. Sealed proposals must be submitted on or before 2:00 PM on June 15, 2017. Questions in respect to the project will be directed in writing addressed by email to Bob Williams with Williams Engineering at wengineer@msn.com. The Engineer will provide written clarifications or changes to the Contractors in form of an Addendum to the Contract.

END OF SECTION

N.T.S.

VICINITY MAP
ELK HOME DITCH
IMPROVEMENT PROJECT

WILLIAMS ENGINEERING L.L.C.

400 NORTH MAIN STREET
GUNNISON COLORADO 81230
PH. (970) 641-2499
EMAIL: wengineer@msn.com

SECTION 00200

BIDDING INFORMATION

PART 1 GENERAL

1.1 DEFINED TERMS

A. The term "Bidder" means one who submits a Bid directly to Owners, as distinct from a sub-bidder, who submits a bid to a Bidder. The term "Successful Bidder" means the lowest, qualified, responsible, responsive Bidder to whom Owners (on the basis of Owner's evaluation as hereinafter provided) makes an award.

1.2 PROJECT LOCATION

A. The Elk Home Ditch is located 26 miles northwest of Gunnison, CO above Rainbow Lake. The ditch is located on property owned by the United States Forest Service and is accessible through public lands 13 miles north of Hwy 50 on Forest Service Rd 724. The existing ditch contours along a steep hillside with sections of rock and thick timber. Historically this ditch has experienced high levels of seepage and blowouts. The Elk Home Ditch diverts from a tributary to West Steuben Creek and delivers water to Rainbow Lake. (See attached Google Earth image).

1.3 COPIES OF BIDDING DOCUMENTS

A. Complete sets of the Bidding Documents for use in preparing bids may be obtained in accordance with the Invitation to Bid.

B. Partial sets of Bidding Documents will not be issued. Complete sets of Bidding Documents shall be used in preparing Bids; neither the Owners nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

C. Owner and Engineer in making copies of Bidding Documents available on the above terms do so only for the purpose of obtaining Bids on the Work and do not confer a license or grant for any other use.

1.4 QUALIFICATIONS OF BIDDERS

A. The successful Bidder may be required to provide evidence of Bidder's qualification to do business in the state where the Project is located or covenant to obtain such qualification prior to award of the contract.

1.5 EXAMINATION OF CONTRACT DOCUMENTS AND SITE

A. It is the responsibility of each Bidder before submitting a Bid, to (a) examine the Contract Documents thoroughly, (b) become familiar with local conditions that may affect cost, progress, performance or furnishing of the Work, (c) consider federal, state and local Laws and Regulations that may affect cost, progress, performance or furnishing of the Work, (d) study and carefully correlate Bidder's observations with the Contract Documents, and (e) notify Engineer of all conflicts, errors or discrepancies in the Contract Documents.

B. Before submitting a Bid, each Bidder will, at Bidder's own expense, make or obtain any additional examinations, investigations, explorations, tests and studies and obtain any additional information and data which pertain to the physical conditions (surface, subsurface and underground facilities) on the project which may affect cost, progress, performance or furnishing of the Work and which Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price and other terms and conditions of the Contract Documents.

C. The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this part, that without exception the Bid is premised upon performing and furnishing the Work required by the Contract Documents and such means, methods, techniques, sequences or procedures of construction as may be indicated in or required by the Contract Documents, and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

1.6 AVAILABILITY OF LANDS FOR WORK, ETC.

A. The lands upon which the Work is to be performed, rights-of-way and easements for access thereto and other lands designated for use by Contractor in performing the Work are identified in the Contract Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment or storage of materials and equipment to be incorporated in the Work are to be obtained and paid for by Contractor. Easements for pipelines or permanent structures are to be obtained by Owners.

1.7 INTERPRETATIONS AND ADDENDA

A. All questions about the meaning or intent of the Contract Documents are to be submitted in writing to Bob Williams at Williams Engineering by email to (wengineer@msn.com). Replies will be issued only by Addenda. Questions received less than 2 days prior to the date for opening of Bids will not be answered. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

B. Addenda may also be issued to modify the Bidding Documents as deemed advisable by Owner or Engineer.

C. Addenda will be mailed or delivered electronically to all parties recorded by Owner as having received the Bidding Documents. No Addenda will be issued later than 2 days prior to the date for receipt of Bids except an Addendum, if necessary, postponing the date for receipt of Bids or withdrawing the request for Bids.

1.8 BASIS OF BIDS

A. The Bidder shall submit a single lump sum price and prices for all unit cost items shown on the Bid Form. Failure to comply may be cause for rejection.

1.9 CONTRACT TIME

A. The contract time is 90 days from the date of notice to proceed and will be included in the Agreement.

1.10 LIQUIDATED DAMAGES

A. Liquidated damages will be $500.00 per as set forth in the Agreement.

1.11 SUBSTITUTE AND "OR-EQUAL" ITEMS

A. The Contract, if awarded, will be on the basis of material and equipment described in the Drawings or specified in the Specifications without consideration of possible substitute or "or-equal" items. Whenever it is indicated in the Drawings or specified in the Specifications that a substitute or "or-equal" item of material or equipment may be furnished or used by Contractor if acceptable to Engineer, application for such acceptance will not be considered by Engineer until after the "effective date of the Agreement".

1.12 BID FORM

A. Bids Forms must be completed in ink, computer printout or by typewriter.

B. Bid by corporations must be executed in the corporate name by the president or a vice-president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal must be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown below the signature.

C. Bids by partnerships must be executed in the partnership name and signed by a partner, whose title must appear under the signature and the official address of the partnership must be shown below the signature.

D. Bids by joint ventures shall be signed by each participant in the joint venture or by an authorized agent of each participant.

E. The names of all persons signing must also be legibly printed or typed below the signature. A Bid by a person who affixes to his signature the word "president", "secretary", "agent", or other designation without disclosing his principal may be held to be the Bid of the individual signing. When requested by Owners, evidence of the authority of the person signing shall be furnished.

F. The full name of each person or company interested in the Bid shall be listed on the Bid Form.

G. The Bid shall contain an acknowledgment of receipt of all Addenda (the numbers of which shall be filled in on the Bid Form).

H. No alterations in Bids, or in the printed forms thereof, by erasures, interpolations, or otherwise will be acceptable unless each such alteration is signed or initialed by the Bidder; if initialed, Owner may require the Bidder to identify any alteration so initialed. No alternation in any Bid, or in the form on which it is submitted, shall be made after the Bid has been submitted.

I. The address to which communications regarding the Bid are to be directed must be shown.

1.13 SUBMISSION OF BIDS

A. Bids shall be submitted at the time and place indicated in the Invitation To Bid and shall be included in an opaque sealed envelope delivered or mailed to James Pike at the Upper Gunnison River Water Conservancy District office and identified on the outside with the Bidder's name, and address and with the words "Bid for Elk Home Pipeline Project". If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "BID ENCLOSED" on the face thereof.

B. Electronic bids by email will be accepted by James pike at jimmpike@

C. Bids shall be deposited at the designated location prior to the time and date for receipt of Bids indicated in the Invitation to Bid, or the modified time and date indicated by addendum. Bids received after the time and date for receipt of Bids will be returned unopened. Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

1.14 MODIFICATION AND WITHDRAWAL OF BIDS

A. Bids submitted early may be modified or withdrawn by notice to the party receiving Bids at the place and prior to the time designated for receipt of Bids. Such notice shall be in writing over the signature of the Bidder or be by letter; if by letter, written confirmation

over the signature of Bidder must have been mailed and postmarked on or before the date and before time set for receipt of Bids; it shall be so worded as not to reveal the amount of original Bid. Bids may also be modified or withdrawn in person by the Bidder or an authorized representative provided he can prove his identity and authority. Withdrawn Bids may be resubmitted up to the time designated for the receipt of Bids provided that they are then fully in conformance with these Instructions to Bidders.

B. If, within 24 hrs after Bids are opened, any Bidder files a duly signed written notice with Owners and promptly thereafter demonstrates to the reasonable satisfaction of the Owners that there was a material and substantial mistake in the preparation of his Bid, that Bidder may withdraw his Bid. Thereafter, that Bidder will be disqualified from further bidding on the Work.

1.15 BIDS TO REMAIN OPEN SUBJECT TO ACCEPTANCE

A. All Bids shall remain open and subject to acceptance for the period of time specified in the Bid Form. No right to claim mistake shall exist for Bidder following the 24 hour period after the bid opening

1.16 AWARD OF CONTRACT

A. Owner's priority is to award the contract as soon as possible after the bids are received, reviewed and approved. The Owners reserves the right to reject any and all Bids, award any or all sections, to waive any and all informalities and to negotiate contract terms with the Successful Bidder, and the right to disregard all nonconforming, nonresponsive, unbalanced, or conditional Bids. Owners reserves the right to reject the Bid of any Bidder if Owners believes that it would not be in the best interest of the Project to make an award to that Bidder, whether because the Bid is not responsive or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by Owners. Discrepancies between words and figures will be resolved in favor of words. Discrepancies between the indicated sum or product of figures and the correct sum or product thereof will be resolved in favor of the correct sum or product.

B. In evaluating Bids, Owners shall consider the qualifications of the Bidders, whether or not the Bids comply with the prescribed requirements, and unit prices provided in the Bid form.

C. Owners may conduct such investigations as he deems necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications and financial ability of the Bidders, proposed Subcontractors and other persons and organizations to do the Work in accordance with the Contract Documents to Owner's satisfaction within the prescribed time.

D. Owners reserves the right to reject the Bid of any Bidder who does not pass any such evaluation to Owner's satisfaction.

E. If the contract is to be awarded, the Owners will enter into agreement with the Bidder whose qualifications and combined cost for Bid Schedule provided in Section 00300 are deemed by the Owners to be in the best interests of the Project

F. If the contract is to be awarded, Owner will give the Successful Bidder a Notice of Award within the time specified in the Bid Form for Bids to remain open.

1.17 SIGNING OF AGREEMENT

A. When Owners gives a Notice of Award to the Successful Bidder, it will be accompanied by unsigned counterparts of the Agreement and all other Contract Documents as indicated in the Supplementary Conditions.

B. Three (3) copies of the Contract Documents will be prepared by Engineer and reviewed by Owners. All copies will be submitted to Contractor and the Contractor shall execute the Contract Agreement, and provide insurance documents and submit all copies to Owner within 2 days from date of receipt. Owners will execute all copies, insert the date of Contract on the Contract bond forms and on the power-of-attorney, and transmit all copies to Engineer within 10 days for review and distribution. Distribution of signed copies will be one copy each to Owners, Contractor and Engineer. Contractor shall be responsible for distribution of copy to Surety.

1.18 PRE-BID CONFERENCE

A. A pre bid meeting for interested Contractors will be held at 2:00 PM on May 25, 2017 at the office of the Upper Gunnison River Water Conservancy District, 200 W. Spencer, Suite B, Gunnison, Colorado. The contractors will be provided an overall review of the project including plans, specifications, project conditions, and a verbal and pictorial presentation by James Pike representing the ditch owners on the field conditions and the issues to be encountered in construction of the ditch improvements.. Any questions which, in the opinion of Engineer, cannot be answered by direct reference to the Bidding Documents will be answered by formal written Addenda as outlined above under Interpretations and Addenda.

1.19 SALES AND USE TAXES

A. All bids for the Work in this Contract shall include all sales, use, and any other taxes otherwise collected by the Colorado Department of Revenue.

1.20 STATE AND FEDERAL INTEREST EXCLUSION

A. Neither the State of Colorado, the United States, nor any of its departments, agencies or employees is or will be a party to this invitation for bids or any resulting contract.

2.0 SPECIAL PROJECT CONDITIONS

A. The Contractor shall be responsible for removing any snow from the Forest Service Road and along the pipeline.

B. The Engineer will provide control points for the construction staking of the pipeline. The Contractor shall be responsible for all construction staking.

C. The Contractor shall be responsible for repairing any damage, beyond normal wear and tear, to the US Forest Service Road.

D. The Contractor shall seed the pipe line and any disturbed areas with a seed mixture recommended by the Soil Conservation Service for the altitude.

E. The Contractor shall curtail any work out of the designated ditch easement.

F. The Contractor will be able to remove and utilize material from Rainbow Lake that is above the low water line.

G. Once completed, the pipe and inlet structure will:

1. Convey available water from the inlet structure through the pipe to Rainbow Lake without any leakage.

2. Be sealed tight to prevent water from entering the pipe when the inlet is closed.

3. Be enclosed to prevent animals and large debris from entering the pipe.

4. Not hold standing water in any parts of the pipeline.

H. The Contractor shall guarantee all workmanship and materials from completion until the end of October of 2018.

END OF SECTION

SECTION 00300
BID FORM

ELK HOME DITCH OWNERS
ELK HOME DITCH PIPELINE PROJECT

Bid line items shall include inplace cost for all labor, materials, equipment miscellaneous items, and a proportional amount of overheadand profit.

Contractor acknowleges receipt of Addendums No. _____

Qty	Units	Description	Unit price	Total
4,180	lft	30" ADS pipe in place		
6	lft	24" ADS pipe in place		
7	ea	30 " Pipe manhole access ports		
1	ea	Head gate structure in place		
2	ea	Parshall Flume pipe to flume adaptors		
1	ea	Cover for Parshall Flume		
500	lft	12" PIP pipe in place		
1	ea	Lake bypass assembly		
		TOTAL		

TOTAL IN WORDS _____

CONTRACTOR

_____

ADDRESS

_____

_____

CONTRACTOR'S SIGNATURE **DATE**

_____ _____

BID QUALIFICATIONS

_____

_____

_____

END OF SECTION

Section 00500

Owner and Contractor Construction Agreement

THIS AGREEMENT, Made as of June _____, In the Year of 2017,

Between the Owner: Elk Home Ditch Owners
James Pike Representative
c/o Upper Gunnison River Water Conservation Board
200 W. Spencer, Suite B
Gunnison CO 81230

And the Contractor: _____
_____
_____
_____

For the Project: Elk Home Ditch Pipeline Project

Engineer: Williams Engineering, LLC
400 N Main
Gunnison, CO 81230

ARTICLE 1. CONTRACT DOCUMENTS

1.1 The contract documents consist of this agreement, construction documents and specifications, Project Manual, all addenda issued prior to execution of this agreement, and all change orders or modifications issued and agreed to by both parties. All documents noted herein shall be provided to the Contractor by the Owners. These contract documents represent the entire agreement of both parties and supersede any prior oral or written agreement.

ARTICLE 2. SCOPE OF WORK

2.1 The Owner's owns the Elk Home Ditch and the Contractor hereby agrees to construct the Elk Home Ditch Pipeline Project according to the construction documents and specifications, Project Manual, all addenda issued prior to execution of this agreement, and all change orders.

ARTICLE 3. TIME OF COMPLETION

3.1 The commencement date of the project shall be 90 days. The completion date of the project shall be _____ 2017, however any change orders and/or unusual weather might delay or otherwise effect the completion date. Barring unusual weather or owner related delays, the Contractor shall pay liquidated damages of $500 per day if the project is not completed by the completion date. The parties agree that snowfall can be usual weather between for the construction site.

ARTICLE 4. THE CONTRACT PRICE

4.1 The construction contract sum shall be $_____ which shall include all labor, materials, subcontracts, permits and insurance. The contract price is based on the Contractor's Proposal and Bid Form.

4.2 The Owners and the Contractor acknowledge that the Owners will not pay any earnest money upon signing of this.

ARTICLE 5. PROGRESS PAYMENTS

5.1 The Owners will make payments to the Contractor once per month based on work completed or materials stored at the site. The progress billings shall be in accordance with the schedule of values based on the Bid Form. Owners shall not be obligated to pay any amounts requested in excess of the percentage actually completed as determined by the Engineer & Owners comparing the amount requested to Schedule of Values.

5.2 The Owners shall make payments to Contractor within 10 days after request by Contractor to Owner's Representative; provided, however that at the sole discretion of the Owner's Representative, Owners may make payments jointly payable to any subcontractors or material suppliers and Contractor, and any such payment made jointly payable shall not be unacceptable to Contractor on the sole basis that it is made jointly payable. Moreover, Owners may condition any payment on the receipt from Contractor or any subcontractor or material supplier of a release and waiver of any mechanic's lien for the work or materials compensated for by the payment. Unless previously provided, upon satisfactory payment being made for any portion of the work performed, Contractor shall furnish a full and unconditional release from any claim or mechanics' lien for that portion of the work for which payment has been made. Should the Owner fail to make any required payment at the required time, Contractor may charge a penalty of 8% annually upon the unpaid amount until paid. The Owner shall have the right to retain any payments necessary to insure completion of the work and correcting any deficient work. The Owners shall hold 10% retainage from each payment, with payment of the retainage within 30 days of final acceptance of the work.

5.3 If payment is not received by the Contractor within 30 days after delivery of payment demand for work satisfactorily completed, contractor shall have the right to stop work or terminate the contract at his option. Termination by Contractor under the provisions of this paragraph shall not relieve the Owners of the obligations of payments to Contractor for that part of the work performed prior to such termination. Termination by Owners under the provisions of this paragraph shall not relieve the Owners of the obligations of payments to Contractor for that part of the work performed prior to such termination.

ARTICLE 6. DUTIES OF THE CONTRACTOR

6.1 All work shall be in accordance to the provisions of the plans and specifications. All systems shall be in good working order.

6.2 All work shall be completed in a workman like manner, and shall comply with all applicable national, state and local building codes and laws.

6.3 All work shall be performed by licensed individuals to perform their said work, as outlined by law.

6.4 Contractor shall obtain all permits, excluding the US forest Service, necessary for the work to be completed.

6.5 Contractor shall remove all construction debris.

ARTICLE 7. OWNER

7.1 The Owner shall communicate with subcontractors only through the Contractor.

7.2 The Owner will not assume any liability or responsibility, or have control over or charge of construction means, methods, techniques, sequences, procedures, or for safety precautions and programs in connection with the project, since these are solely the Contractor's responsibility.

ARTICLE 8. CHANGE ORDERS AND FINISH SCHEDULES

8.1 A Change Order is any change to the original plans and/or specifications. All change orders need to be agreed upon in writing, including cost, additional time considerations, approximate dates when the work will begin and be completed, and signed by both parties. Additional time needed to complete change orders shall be taken into consideration in the project completion date.

8.2 Any delays or changes in finish selection schedules will delay the projected completion date.

ARTICLE 9. INSURANCE

9.1 The Contractor shall purchase and maintain needed Workman's Compensation, Automobile and Liability insurance coverage as required by law and deemed necessary for his own protection. The Ditch Owners, the Upper Gunnison River Water Conservation Board, and the Colorado Water Conservation Board shall be named as additional insured and provided with certificates of insurance.

ARTICLE 10. GENERAL PROVISIONS

10.1 If conditions are encountered at the construction site which are subsurface or otherwise concealed physical conditions or unknown physical conditions of an unusual nature, which differ naturally from those ordinarily found to exist and generally recognized as inherent in construction activities, the Owner will promptly investigate such conditions and, if they differ materially and cause an increase or decrease in the Contractor's cost of, and/or time required for, performance of any part of the work, will negotiate with the Contractor an equitable adjustment in the contract sum, contract time or both.

ARTICLE 11. ARBITRATION OF DISPUTES

11.1 Any controversy or claim arising out of or relating to this contract, or the breach thereof, shall be settled by arbitration administered by the American Arbitration Association unless the parties otherwise agree at a later date, and judgment on the award rendered by the arbitrator(s) may be entered in any court having jurisdiction thereof.

ARTICLE 12. WARRANTY

12.1 At the completion of this project, Contractor shall execute an instrument to Owners warranting the project for one year against defects in workmanship or materials utilized. The manufacturer's warranty will prevail over this warranty.

ARTICLE 13. TERMINATION OF THE CONTRACT

13.1 Should the Owners or Contractor fail to carry out this contract, with all of its provisions, the

following options and stipulations shall apply:

13.1.1 If the Owners or the Contractor shall default on the contract, the non-defaulting party may declare the contract is in default and proceed and recover against the defaulting party all damages incurred as a result of said breach of contract, including a reasonable attorney's fee.

13.1.2 In the event of a default by the Owners or Contractor, the non-defaulting party may state his intention to comply with the contract and proceed for specific performance.

ARTICLE 14. ACCEPTANCE AND OCCUPANCY

14.1 Upon completion, the project shall be inspected by the Owners and the Contractor, and any repairs necessary to comply with the contract documents shall be made by the Contractor.

ARTICLE 15. MISCELLANEOUS PROVISIONS

15.1 The Contract Documents constitute the entire and only agreement between Contractor and Owners relating to the Scope of Work detailed in Article 2. Any prior negotiations, agreements, representations and understandings, whether written or oral, are merged into and superseded by this Contract and shall be of no further force or effect.

15.2 This Contract may not be amended or modified except by an instrument executed by both parties.

15.3 This Contract shall be construed and enforced in accordance with the laws of the State of Colorado, and Contractor and Owners agree that any of the state courts located in Gunnison County, Colorado shall have jurisdiction over, and be the venue for, any action arising out of, or related to, this Contract. By executing this Contract, Contractor and Owners expressly submit to the personal jurisdiction of said court.

15.4 If any term of this Contract is held to be invalid, illegal, or unenforceable, such determination shall not affect the validity of the remaining terms.

15.5 This Agreement may be executed in two or more counterparts, each of which shall constitute an original, and all of which together shall constitute one and the same document. The parties will accept facsimile or electronic signatures as original signatures.

EXECUTED this _____ day of _____, 2017.

Signed in the presence of:

_____ _____

Witness **Witness**

_____ _____

Contractor Signature **Owners Representative Signature**

Section 00500

Owner and Contractor Construction Agreement

THIS AGREEMENT, Made as of June _____, In the Year of 2017,

Between the Owner: Elk Home Ditch Owners
James Pike Representative
c/o Upper Gunnison River Water Conservation Board
200 W. Spencer, Suite B
Gunnison CO 81230

And the Contractor: _____
_____
_____
_____

For the Project: Elk Home Ditch Pipeline Project

Engineer: Williams Engineering, LLC
400 N Main
Gunnison, CO 81230

ARTICLE 1. CONTRACT DOCUMENTS

1.1 The contract documents consist of this agreement, construction documents and specifications, Project Manual, all addenda issued prior to execution of this agreement, and all change orders or modifications issued and agreed to by both parties. All documents noted herein shall be provided to the Contractor by the Owners. These contract documents represent the entire agreement of both parties and supersede any prior oral or written agreement.

ARTICLE 2. SCOPE OF WORK

2.1 The Owner's owns the Elk Home Ditch and the Contractor hereby agrees to construct the Elk Home Ditch Pipeline Project according to the construction documents and specifications, Project Manual, all addenda issued prior to execution of this agreement, and all change orders.

ARTICLE 3. TIME OF COMPLETION

3.1 The commencement date of the project shall be 90 days. The completion date of the project shall be _____ 2017, however any change orders and/or unusual weather might delay or otherwise effect the completion date. Barring unusual weather or owner related delays, the Contractor shall pay liquidated damages of $500 per day if the project is not completed by the completion date. The parties agree that snowfall can be usual weather between for the construction site.

ARTICLE 4. THE CONTRACT PRICE

4.1 The construction contract sum shall be $_____ which shall include all labor, materials, subcontracts, permits and insurance. The contract price is based on the Contractor's Proposal and Bid Form.

4.2 The Owners and the Contractor acknowledge that the Owners will not pay any earnest money upon signing of this.

ARTICLE 5. PROGRESS PAYMENTS

5.1 The Owners will make payments to the Contractor once per month based on work completed or materials stored at the site. The progress billings shall be in accordance with the schedule of values based on the Bid Form. Owners shall not be obligated to pay any amounts requested in excess of the percentage actually completed as determined by the Engineer & Owners comparing the amount requested to Schedule of Values.

5.2 The Owners shall make payments to Contractor within 10 days after request by Contractor to Owner's Representative; provided, however that at the sole discretion of the Owner's Representative, Owners may make payments jointly payable to any subcontractors or material suppliers and Contractor, and any such payment made jointly payable shall not be unacceptable to Contractor on the sole basis that it is made jointly payable. Moreover, Owners may condition any payment on the receipt from Contractor or any subcontractor or material supplier of a release and waiver of any mechanic's lien for the work or materials compensated for by the payment. Unless previously provided, upon satisfactory payment being made for any portion of the work performed, Contractor shall furnish a full and unconditional release from any claim or mechanics' lien for that portion of the work for which payment has been made. Should the Owner fail to make any required payment at the required time, Contractor may charge a penalty of 8% annually upon the unpaid amount until paid. The Owner shall have the right to retain any payments necessary to insure completion of the work and correcting any deficient work. The Owners shall hold 10% retainage from each payment, with payment of the retainage within 30 days of final acceptance of the work.

5.3 If payment is not received by the Contractor within 30 days after delivery of payment demand for work satisfactorily completed, contractor shall have the right to stop work or terminate the contract at his option. Termination by Contractor under the provisions of this paragraph shall not relieve the Owners of the obligations of payments to Contractor for that part of the work performed prior to such termination. Termination by Owners under the provisions of this paragraph shall not relieve the Owners of the obligations of payments to Contractor for that part of the work performed prior to such termination.

ARTICLE 6. DUTIES OF THE CONTRACTOR

6.1 All work shall be in accordance to the provisions of the plans and specifications. All systems shall be in good working order.

6.2 All work shall be completed in a workman like manner, and shall comply with all applicable national, state and local building codes and laws.

6.3 All work shall be performed by licensed individuals to perform their said work, as outlined by law.

6.4 Contractor shall obtain all permits, excluding the US forest Service, necessary for the work to be completed.

6.5 Contractor shall remove all construction debris.

ARTICLE 7. OWNER

7.1 The Owner shall communicate with subcontractors only through the Contractor.

7.2 The Owner will not assume any liability or responsibility, or have control over or charge of construction means, methods, techniques, sequences, procedures, or for safety precautions and programs in connection with the project, since these are solely the Contractor's responsibility.

ARTICLE 8. CHANGE ORDERS AND FINISH SCHEDULES

8.1 A Change Order is any change to the original plans and/or specifications. All change orders need to be agreed upon in writing, including cost, additional time considerations, approximate dates when the work will begin and be completed, and signed by both parties. Additional time needed to complete change orders shall be taken into consideration in the project completion date.

8.2 Any delays or changes in finish selection schedules will delay the projected completion date.

ARTICLE 9. INSURANCE

9.1 The Contractor shall purchase and maintain needed Workman's Compensation, Automobile and Liability insurance coverage as required by law and deemed necessary for his own protection. The Ditch Owners, the Upper Gunnison River Water Conservation Board, and the Colorado Water Conservation Board shall be named as additional insured and provided with certificates of insurance.

ARTICLE 10. GENERAL PROVISIONS

10.1 If conditions are encountered at the construction site which are subsurface or otherwise concealed physical conditions or unknown physical conditions of an unusual nature, which differ naturally from those ordinarily found to exist and generally recognized as inherent in construction activities, the Owner will promptly investigate such conditions and, if they differ materially and cause an increase or decrease in the Contractor's cost of, and/or time required for, performance of any part of the work, will negotiate with the Contractor an equitable adjustment in the contract sum, contract time or both.

ARTICLE 11. ARBITRATION OF DISPUTES

11.1 Any controversy or claim arising out of or relating to this contract, or the breach thereof, shall be settled by arbitration administered by the American Arbitration Association unless the parties otherwise agree at a later date, and judgment on the award rendered by the arbitrator(s) may be entered in any court having jurisdiction thereof.

ARTICLE 12. WARRANTY

12.1 At the completion of this project, Contractor shall execute an instrument to Owners warranting the project for one year against defects in workmanship or materials utilized. The manufacturer's warranty will prevail over this warranty.

ARTICLE 13. TERMINATION OF THE CONTRACT

13.1 Should the Owners or Contractor fail to carry out this contract, with all of its provisions, the

following options and stipulations shall apply:

13.1.1 If the Owners or the Contractor shall default on the contract, the non-defaulting party may declare the contract is in default and proceed and recover against the defaulting party all damages incurred as a result of said breach of contract, including a reasonable attorney's fee.

13.1.2 In the event of a default by the Owners or Contractor, the non-defaulting party may state his intention to comply with the contract and proceed for specific performance.

ARTICLE 14. ACCEPTANCE AND OCCUPANCY

14.1 Upon completion, the project shall be inspected by the Owners and the Contractor, and any repairs necessary to comply with the contract documents shall be made by the Contractor.

ARTICLE 15. MISCELLANEOUS PROVISIONS

15.1 The Contract Documents constitute the entire and only agreement between Contractor and Owners relating to the Scope of Work detailed in Article 2. Any prior negotiations, agreements, representations and understandings, whether written or oral, are merged into and superseded by this Contract and shall be of no further force or effect.

15.2 This Contract may not be amended or modified except by an instrument executed by both parties.

15.3 This Contract shall be construed and enforced in accordance with the laws of the State of Colorado, and Contractor and Owners agree that any of the state courts located in Gunnison County, Colorado shall have jurisdiction over, and be the venue for, any action arising out of, or related to, this Contract. By executing this Contract, Contractor and Owners expressly submit to the personal jurisdiction of said court.

15.4 If any term of this Contract is held to be invalid, illegal, or unenforceable, such determination shall not affect the validity of the remaining terms.

15.5 This Agreement may be executed in two or more counterparts, each of which shall constitute an original, and all of which together shall constitute one and the same document. The parties will accept facsimile or electronic signatures as original signatures.

EXECUTED this _____ day of _____, 2017.

Signed in the presence of:

_____ _____

Witness **Witness**

_____ _____

Contractor Signature **Owners Representative Signature**

Initialed by: Owner ____ Contractor ____

SECTION 01015

SUMMARY OF WORK

PART I: GENERAL

1.01 LOCATION

The Elk Home Ditch Pipeline Project is located 26 miles northwest of Gunnison, CO above Rainbow Lake. The ditch is located on property owned by the United States Forest Service ("USFS") and is accessible through public lands 14 miles north of Hwy 50 on Forest Service Rd 724.

1.02 WORK TO BE DONE

A. The scope of work is delineated in Drawings PP1 & PP2, Titled Elk Home Ditch Pipeline Project, dated May 22, 2017.
B. Contractor is to provide all materials, labor and equipment necessary to construct the project.
C. The installation of 4,180 ft. of 30 inch ADS pipe and 6 lft of 24 inch ADS pipe.
D. The installation of 7 each 30 inch manhole pipe line access portals.
E. The installation of ditch head gate structure.
F. Concrete grouting and/or rip rap construction at Elk Home Ditch diversion.
G. The installation of adaptors and cover for existing Parshall Flume.
H. The installation of 500 ft. of 12" Plastic Irrigation pipe.
I. Installation of the Rainbow Lake bypass Pipe.
H. The Ditch Owners will not perform any work associated with the project.

END OF SECTION

SECTION 01035
CONTROL OF WORK

PART 1: GENERAL

1.01 PUBLIC LAND

A. The Contractor shall not enter or occupy us Forest service Public land outside the work limit which is 20 feet each side of ditch.
B. Access on or along the ditch pipeline will be closed to all public access during construction. The Contractor shall post signs noting the temporary access closure of the Ditch.
C. The Ditch Owners have obtained the required Permits from the Forest Service. The Contractor will be provided a copy of the permit and the conditions therein.

1.02 EASEMENTS AND STAGING LOCATIONS

A. The lands upon which the Work is to be performed, rights-of-way and easements for access thereto and other lands designated for use by Contractor in performing the Work are identified in the Contract Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment or storage of materials and equipment to be incorporated in the Work are to be obtained and paid for by Contractor.

1.03 TRAFFIC CONTROL

A. The Contractor is required to maintain access on the forest Service Road and to public lands excluding Rainbow Lake and the ditch easement.
B. Contractor shall provide all necessary barricades and signage closing the area to prevent all traffic and pedestrian access to and along the ditch and in or around Rainbow Lake. Coordinate with the Owner's Representative on closure.

1.03 CARE AND PROTECTION OF PROPERTY

A. The Contractor shall be responsible for the preservation of all public property, and shall use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public property by or on account of any act, omission, neglect, or misconduct in the execution of the work on the part of the Contractor, such property shall be restored by the Contractor, at his expense, to a condition similar or equal to that existing before the damage was done, or he shall make good the damage in a manner acceptable to the Owners and the Forest Service.

1.04 HERITAGE RESOURCES AND ENDANGERED, THREATEDED, AND SENSITIVE SPECIES.

A. The Contractor shall promptly report to the Owners discovery of any heritage, resources or threatened, endangered, or sensitive species.

1.05 WATER FOR CONSTRUCTION PURPOSES

A. Water necessary for construction can be obtained from Rainbow Lake or at the ditch head gate.

1.06 CLEANUP

A. During the course of the work the Contractor shall keep the site of his operations in as clean and neat a condition as is possible. He shall dispose of all residue resulting from the construction work, and at the conclusion of the work, shall remove and haul away any surplus excavation, broken pavement, lumber, equipment, temporary structures, and any other refuse remaining from the construction operations, and shall leave the entire site of the work in a neat and orderly condition.

1.07 CONSTRUCTION STAKING

A. The Contractor will employ, at his own expense, a competent surveyor, who shall provide construction surveying and staking as required to control the work to the intent of the Drawings.

B. The Engineer will check the lines, elevations, reference marks, etc., set by the Contractor, and the Contractor shall correct any errors disclosed by such check. The check shall not relieve the contractor of the responsibility for accurate construction of the entire work.

1.08 TESTING

A. Inspections by the Engineer and Owners Representative will be performed upon completion of the inlet structure and at the completion of each pipe line section on the same

B. Inspections by the Engineer and Owner's Representative will be performed upon completion of the inlet structure and at the completion of each pipe section. Inspections will confirm construction is completed as specified in design documents and may include, but not limited to, elevations, pipe grade, backfill, and bedding. Contractor will notify project managers on progress and projected dates when the inlet structures and each section of pipe will be completed.

END OF SECTION

SECTION 01300
SUBMITTALS

PART 1: GENERAL

1.01 This Section sets forth the submissions applicable to construction schedule, shop drawing, product data, samples and operation and maintenance manuals.

1.02 A detailed construction schedule shall be submitted prior to commencement of work on the project. The detailed schedule shall be in form acceptable to the Engineer and the Ditch Owners, and shall include all reasonably important construction items, including delivery times. The schedule shall be updated at each pay application or as requested from the Ditch Owners.

1.03 In an organized and labeled binder submit three copies of shop drawings, product data, and samples as set forth herein or as required in the specifications:

1. ADS pipe, clean out assembly and appurtenances.
2. Bedding material or screened material specifications.
3. Head gate shop drawing and coating.
4. Survey and layout data.
5. Parshall flume to ADS pipe connection and flume cover.
5. As-built drawings and notes.
6. All miscellaneous items.

END OF SECTION

SECTION 01500

TEMPORARY FACILITIES

PART I: GENERAL

1.01 SCOPE OF WORK

A. Furnish, install and maintain temporary facilities and controls as required for construction and removal on completion of work.

1.02 REQUIREMENTS OF REGULATORY AGENCIES

A. Occupational Safety & Health Administration (OSHA)

B. Comply with all requirements of the US Forest Service.

C. Comply with federal, state, and local codes and regulations and utility company requirements.

PART II: PRODUCTS

2.01 Temporary construction materials may be new or used, but must be adequate in capacity for required usage, shall not create unsafe conditions, and shall not violate requirements of applicable codes and standards.

2.02 FACILITIES

A. As required for the project the Contractor shall provide the following:

1. Electric generator as required
2. Security
3. Parking
4. Field office
5. Sanitary
6. Barricades
7. First Aid
8. Safety
9. Refuse disposal
10. Pedestrian control
11. Traffic control
12. storage and staging areas

END OF SECTION

SECTION 01560

PROTECTION OF ENVIRONMENT

PART 1: GENERAL

1.01 DESCRIPTION

A. In executing work, maintain on and off site work areas free from environmental pollution that would be in violation of any federal, state or local regulations.

1.02 PROTECTION OF WATERWAYS

A. Observe rules and regulations of State of Colorado, Gunnison County, and agencies of U.S. Government, prohibiting pollution of any lake, stream, river, or wetland, by dumping of refuse, rubbish, dredge material or debris therein.

B. The Contractor shall comply with "Colorado Water Quality Control Act", Title 25, Article 8, CRS; "Protection of Fishing Streams", Title 33, Article 5, CRS; "Clean Water Act:, 33USC1344; Regulations Promulgated and Certifications Issued.

1.03 PROTECTION OF AIR QUALITY

A. Minimize air pollution by wetting down bare soils during dry and windy periods, requiring use of properly operating combustion emission control devices on construction vehicles and equipment used by contractors, and encouraging shutdown of motorized equipment not actually in use.

B. Trash burning will not be permitted on the construction site.

C. If temporary heating devices are necessary for protection of work, such devices shall be of type that will not cause air pollution.

D. The Contractor shall comply with the "Colorado Air Quality Control Act., Title 25, Article 7, CRS and regulations promulgated thereunder.

1.04 USE OF CHEMICALS

A. Chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant, or of other classification, must show approval of either U.S. EPA or U.S. Department of Agriculture, or any other applicable regulatory agency.

B. Use of such chemicals and disposal of residues shall be in conformance with manufacturer's instructions.

1.05 NOISE AND DUST CONTROL

A. Conduct operations to cause least annoyance to residents in vicinity of work, and comply with applicable local ordinances.

B. Equip compressors, hoists, and other apparatus with such mechanical devices as may be necessary to minimize noise and dust. Equip compressors with silencers on intake lines.

C. Equip gasoline or oil operated equipment with silencers on mufflers on intake and exhaust lines.

D. Line storage bins and hoppers with material that will deaden sounds.

E. Conduct operation of dumping and carrying away materials in trucks so as to cause minimum of noise and dust.

END OF SECTION

SECTION 01700

CONTRACT CLOSEOUT

PART 1.00 - GENERAL

1.01 GENERAL REQUIREMENTS

Work under this Section shall conform to the requirements of the Contract Documents.

1.02 DESCRIPTION

A. Work included:

1. Project Record Documents.
2. Closeout Procedures.
3. Closeout Submittals.
4. Warranties.

1.03 PROJECT RECORD DOCUMENTS

A. Maintain at the job site one (1) Project record copy of the following:

1. Drawings.
2. Project Manual.
3. Addenda.
4. Change Orders and other modifications to the Contract.
5. Proposal Requests, Requests For Information, Engineer's Supplemental Instructions, field orders or written instructions.
6. Field test records.
7. Survey field notes
8. Construction Schedules.

B. File documents in accordance with the Table of Contents of this Project Manual.

C. File documents in a clean, dry, legible condition and in good order. Do not use Project Record Documents for construction purposes.

E. Make documents and Samples available at all times for review by the Owner and the Engineer.

F. Record information concurrently with construction processes.

G. Drawings:

1. Legibly mark to record actual construction:

a. Field changes with dimension and detail.
b. Changes made by Request for Information, Engineer's Supplemental Instructions, or by Change Order.

c. Details not on original Contract Drawings.
d. Substitutions and revisions.

H. Specifications and Addenda:

1. Legibly mark each Section to record:

a. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
b. Changes made by Request for Information, Engineer's Supplemental Instructions, or by Change Order.
c. Other matters not originally specified.

I. At Contract Closeout, submit Project Record Documents to the Owner with transmittal letter containing date, Project title, Contractor's name and address, list of documents and signature of the Contractor.

J. Maintain Progress by digital photographs and submit to the Owner upon completion of the project.

1.04 CLOSEOUT PROCEDURES

A. Comply with procedures stated in the General Conditions of the Contract for issuance of the Certificate of Substantial Completion.

1. When the Contractor considers that the work has reached final completion, the Contractor shall submit written certification indicating that the Contact Documents have been reviewed, the work has been inspected and that the work is complete in accordance with the Contract Documents and ready for the Owner and the Engineers inspection and review.

2. The Engineer will make a review of the work to verify the status of completion with reasonable promptness after receipt of certification.

3. Should the Engineer consider that the work is incomplete or defective.

a. The Engineer will promptly notify the Contractor in writing, listing incomplete or defective work.

b. The Contractor shall shall take immediate action to remedy deficiencies.

.

END OF SECTION

SECTION 02500

HP STORM PIPE

ADS HP STORM 12"- 60" PIPE SPECIFICATION

Scope
This specification describes 12- through 60-inch (300 to 1500 mm) ADS HP Storm pipe for use in gravity-flow storm drainage applications.

Pipe Requirements
ADS HP Storm pipe shall have a smooth interior and annular exterior corrugations.
- 12- through 60-inch (300 to 1500 mm) pipe shall meet ASTM F2881 or AASHTO M330
- Manning's "n" value for use in design shall be 0.012

Joint Performance
Pipe shall be joined using a bell & spigot joint meeting the requirements of ASTM F2881 or AASHTO M330. The joint shall be watertight according to the requirements of ASTM D3212. Gaskets shall meet the requirements of ASTM F477. Gasket shall be installed by the pipe manufacturer and covered with a removable, protective wrap to ensure the gasket is free from debris. A joint lubricant available from the manufacturer shall be used on the gasket and bell during assembly. 12- through 60-inch (300 to 1500 mm) diameters shall have an exterior bell wrap installed by the manufacturer.

Fittings
Fittings shall conform to ASTM F2881 or AASHTO M330. Bell and spigot connections shall utilize a welded or integral bell and valley or inline gaskets meeting the watertight joint performance requirements of ASTM D3212.

Field Pipe and Joint Performance
To assure watertightness, field performance verification may be accomplished by testing in accordance with ASTM F1417 or ASTM F2487. Appropriate safety precautions must be used when field-testing any pipe material. Contact the manufacturer for recommended leakage rates.

Material Properties
Polypropylene compound for pipe and fitting production shall be impact modified copolymer meeting the material requirements of ASTM F2881, Section 5 and AASHTO M330, Section 6.1.

Installation
Installation shall be in accordance with ASTM D2321 and ADS recommended installation guidelines, with the exception that minimum cover in traffic areas for 12- through 48-inch (300 to 1200 mm) diameters shall be one foot (0.3 m) and for 60-inch (1500 mm) diameter the minimum cover shall be 2 ft. (0.6 m) in single run applications. Backfill for minimum cover situations shall consist of Class 1 (compacted), Class 2 (minimum 90% SPD), or Class 3 (minimum 95%) material. Maximum fill heights depend on embedment material and compaction level; please refer to Technical Note 2.04. Contact your local ADS representative or visit our website at www.ads-pipe.com for a copy of the latest installation guidelines.

Pipe Dimensions

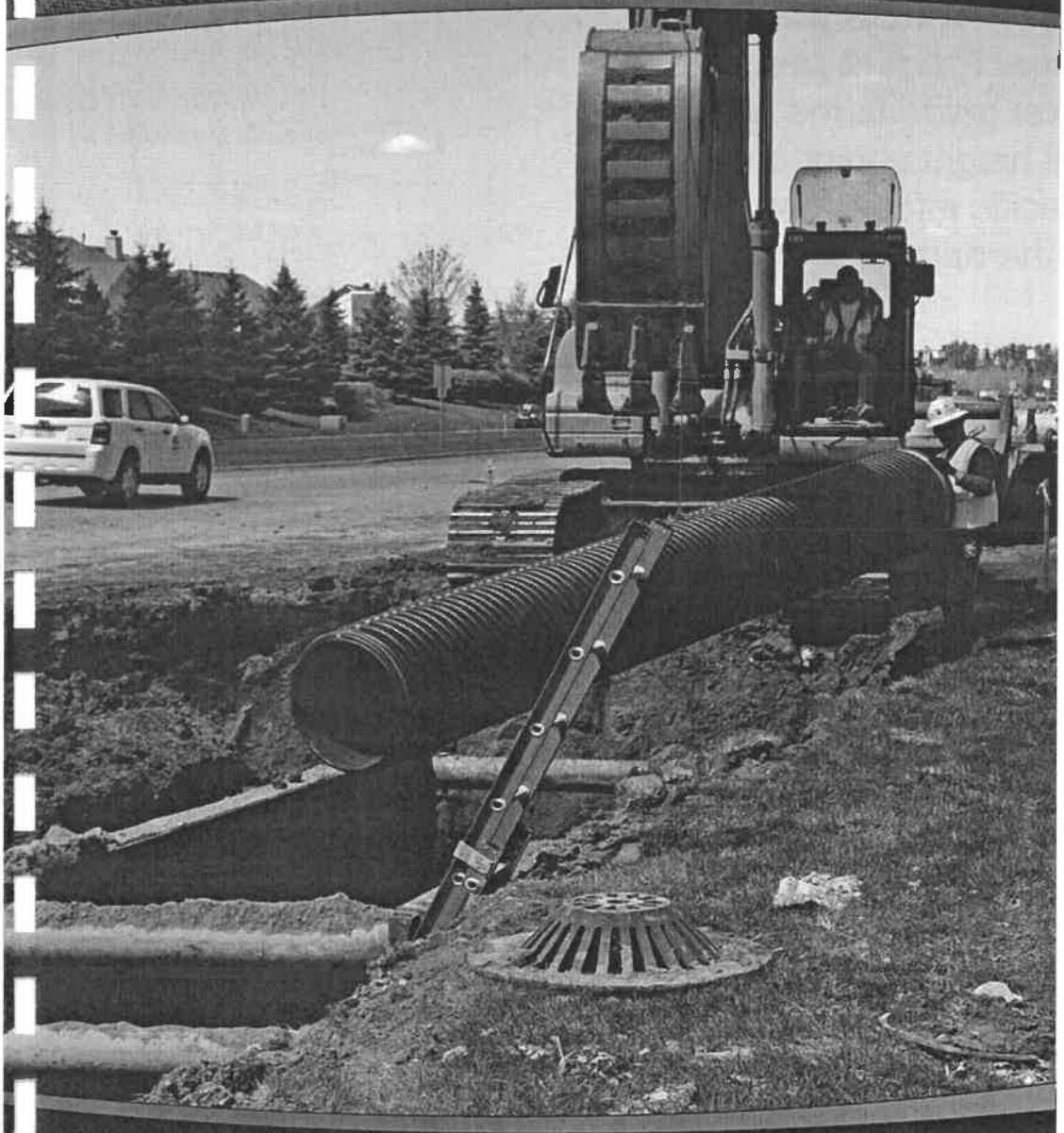
Nominal Pipe I.D. in (mm)	12 (300)	15 (375)	18 (450)	24 (600)	30 (750)	36 (900)	42 (1050)	48 (1200)	60 (1500)
Average Pipe I.D. in (mm)	12.2 (310)	15.1 (384)	18.2 (462)	24.1 (612)	30.2 (767)	36.0 (914)	42.0 (1067)	47.9 (1217)	59.9 (1521)
Average Pipe O.D. in (mm)	14.5 (368)	17.7 (450)	21.4 (544)	28.0 (711)	35.5 (902)	41.5 (1054)	47.4 (1204)	54.1 (1374)	67.1 (1704)
Minimum Pipe Stiffness * @ 5% Deflection #/in./in. (kN/m^2)	75 (517)	60 (414)	56 (386)	50 (345)	46 (317)	40 (276)	35 (241)	35 (241)	30 (207)

*Minimum pipe stiffness values listed; contact a representative for average values.

SECTION 02510

HP STORM PIPE
INSTALLATION INSTRUCTIONS

CORRUGATED PLASTIC PIPE
STORM INSTALLATION GUIDE



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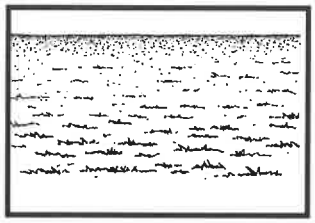
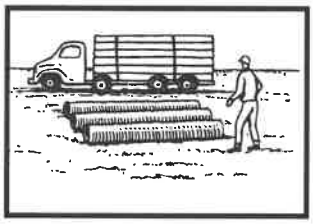
ADS

Table of Contents

Receiving Recommendations

Our distributors and customer service personnel make service and customer satisfaction their highest priority. If your order is incorrect, contact your distributor or our customer service personnel.





- Direct driver to a smooth, flat area, free of rocks and debris.
- Examine load quantities and quality immediately after unloading. Inspect pipe carefully for possible damage from transportation or unloading.
- Note damaged or missing items on delivery receipt.
- Shortages and damaged material are not automatically reshipped. Reorder replacement material.
- Do not dispose of damaged items. Check with driver for proper return method. If driver is unsure, contact our customer service personnel.

Handling Recommendations

To avoid damage to the pipe and fittings the following handling recommendations should be followed:

- OSHA safety requirements.
- Do not drop pipe.
- 18" (450mm) and smaller pipe can be moved by hand. Larger pipe requires a backhoe with a nylon sling.

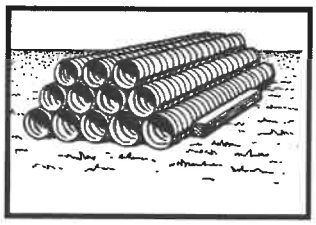
Job Site Pipe Storage

Storage Recommendations

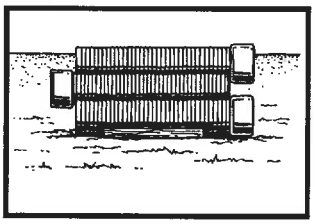
To ensure that your delivered pipe products do not become damaged during job site storage, follow these simple guidelines:

- Non-palletized pipe may be temporarily stockpiled on a flat, clear area.
- Use securing timbers (or blocks) to ensure the stockpile does not collapse.
- Failure to block pipe may result in stack collapsing, pipe damage, or personal injury.

- Stack pipe no higher than approximately 6 feet (1.8m).



- While supporting lengths of pipe evenly, alternate bells for each row of pipe.



- To prevent damage to the bell or spigot when moving pipe sections, do not drag or strike pipe ends against anything.

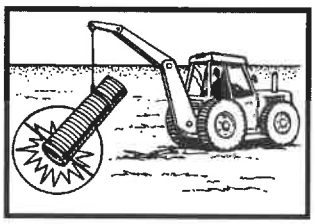
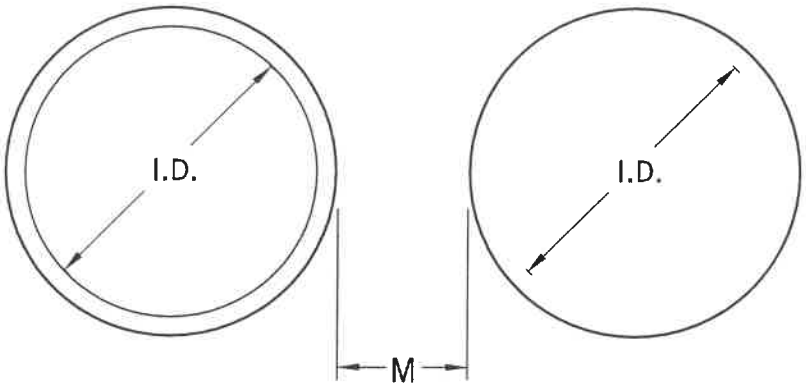
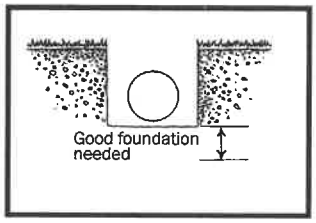


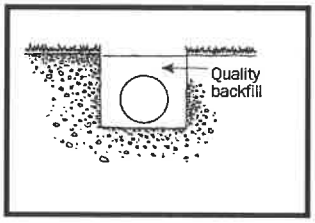
Figure 1: Parallel Pipe Installation



UP TO 24" (600MM) I.D.: M=12" (300MM)
MORE THAN 24" (600MM) I.D.: M=1/2 I.D.

- Trench or ditch bottoms containing bedrock, soft muck or refuse, or other material unable to provide long-term uniform pipe support are **unacceptable**.
- All unsuitable foundation shall be excavated before pipe installation proceeds.
- Where the trench bottom is unstable, the contractor shall excavate to a depth required by the engineer and replace with suitable material as is specified by the engineer.
- If native soil can migrate into backfill, use synthetic fabric (geotextile) to separate native soil from backfill.





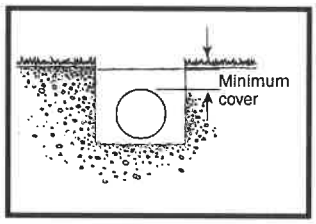
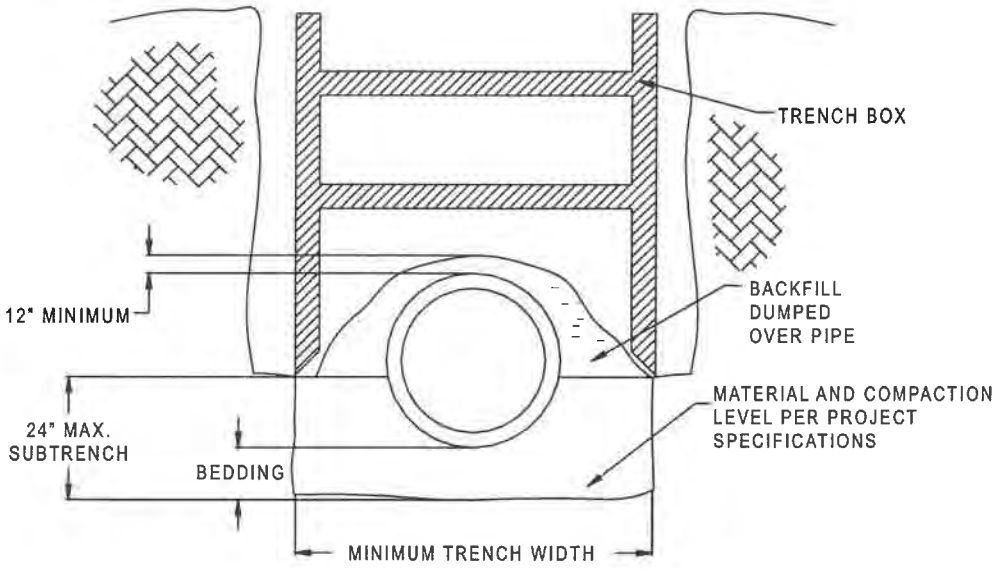


Figure 2: Subtrench Installation



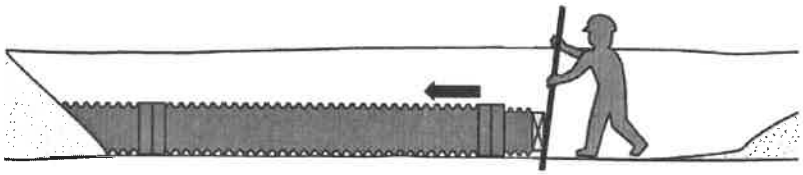
In installations not involving a subtrench, dragging a trench box should only be done if it does not damage the pipe or disrupt the backfill; otherwise, the box should be lifted vertically into its new position, again taking great care not to disturb the pipe or backfill.

Assemble joint using one of the following methods. (For smaller diameters, pipe may be joined manually.)

- For all methods, ensure bell and spigot are adequately "homed" for proper installation and tight joining seal. If no homing mark is present, measure the depth of the bell and use a crayon or other material to place a homing mark on appropriate corrugation of the spigot end.
- Installation stubs, mentioned in the assembly instructions, can be purchased or made following the information on page 15.
- Some high joint performance applications may require the joint to be held in place for a short time, immediately after insertion, to properly set the gasket.

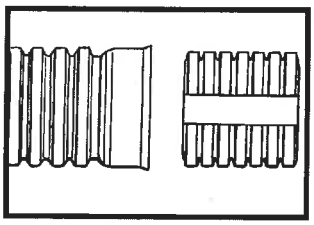
Bar & Block Method

- Place installation stub into bell end of pipe.
- Place wooden block horizontally across end of installation stub.
- With a bar, push against wooden block until pipe is fully inserted into bell.



NOTE: This method requires use of installation stub. DO NOT push directly against pipe.

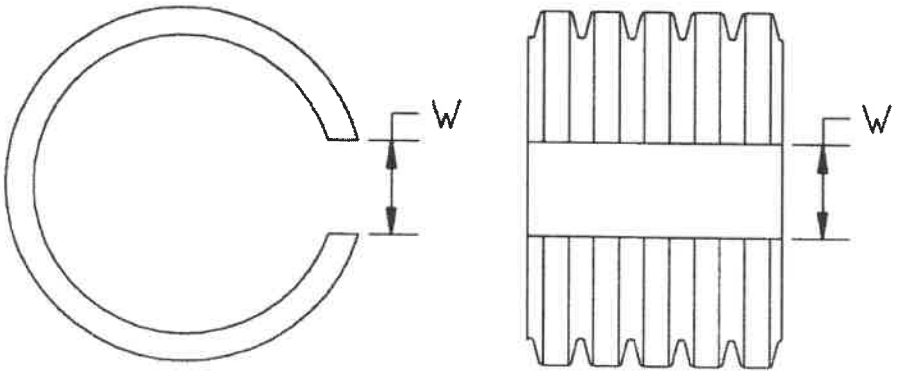
Installation Stub Fabrication



To push "home" bell-and-spigot pipe, an installation stub can be used to prevent accidental damage to the bell. Installation stubs are not required if the bell is not pushed on directly. Installation stubs in all sizes are available from your distributor, or you can fabricate your own on site by following the proceeding steps:

- Cut a section of pipe five corrugations long in the center of the corrugation valley.
- Using a saw, remove a strip of pipe wall from the short stub of pipe (Figure 3). Note: Strip width depends on pipe size. See Table 3 for recommended widths.

Figure 3: Installation Stub



- A concrete collar is formed by butting the two pipe ends tightly together, wrapping the junction with a geotextile to keep out most soil and concrete, and then pouring a concrete collar that covers both pipe ends.

Another option may be using fittings or adapters specifically designed for this application. A selection of fittings designed to make the transition from one material directly to another is available. In other cases a fitting may need to be used in combination with another manufacturer's gasket or coupler to complete the transition. Transitions made in this manner may provide for a higher performance joint than a concrete collar.

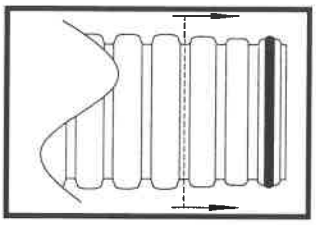
Manholes and Catch Basin/Connections

Manholes or catch basins can be used at changes in pipe material, size, grade, direction and elevation. Manholes and catch basins can be more costly than other alternatives but also allow grade and directional changes in addition to changes in pipe material and size.

- Local regulations should be consulted to determine if manholes or catch basins are required at any or all pipe changes.
- Refer to Figure 4 for the acceptable methods of connecting plastic pipe to manholes or basins.
- See appendix for references to additional product specific resources applicable to connecting pipe to manholes.

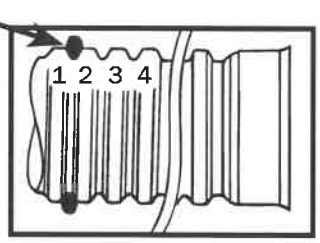
Field Gasket Assembly

When standard lengths of pipe must be cut to fit in a field application, the following instructions will ensure proper performing joints:

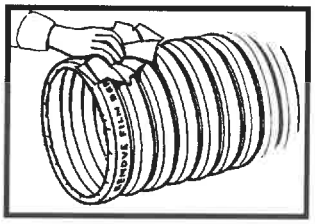


- For reduced spigot pipe ONLY, reducing spigot must be removed.
- Using a saw, cut in the center of the valley of the first full corrugation.
- Trim remaining plastic burrs from saw cut. *Note: Failure to smoothly trim burrs may compromise joint integrity.*
- Wipe clean first valley from end of pipe. *This is where gasket will be placed.*
- Hold gasket with both hands so printing is facing you.
- With printing on gasket face-up and toward spigot end of pipe, slide gasket into first corrugation valley, starting at bottom. *Note: It is easier to pull gasket up to conform to valley.*
- Slide gasket into first corrugation valley by hand.
- Ensure printing on gasket is face-up and toward spigot end of pipe.
- Vent tubes shall be appropriately scaled at joint where applicable, see *Technical Note 5.10: Integral Bell Transition for HDPE.*

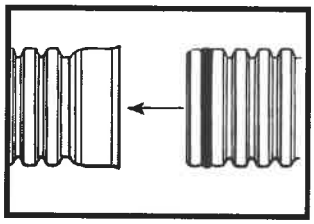
Gasket printing should be visible in this location when properly installed.



- Using clean rag or brush, lubricate exposed gasket with pipe lubricant.



- Do not let lubricated section touch dirt or backfill, as foreign material could adhere to surface and compromise joint integrity.
- Inspect fitting and remove any foreign matter.
- Align and center pipe.
- Lubricate inside of bell.
- Align fitting with pipe end.
- Use installation stub or blocking where required.



- Take care not to damage pipe or fittings.
- Ensure pipe is straight and bell reaches homing mark.
- Assemble other end of pipe or fitting as described in the pipe assembly section on page 12.
- Special care should be taken to replace and compact bedding material in bell hole to provide adequate support under the joint.

anchoring the pipe or pouring the flowable fill in lifts.

- See appendix for references to additional product specific resources that may be used when installing corrugated plastic pipe.

Table 4:

Acceptable Backfill Material and Compaction Requirements				
	Soil Classifications			Minimum Standard Proctor Density %
Description	ASTM D2321	ASTM D2487	AASHTO M43	
Graded or crushed, crushed stone, gravel	Class I	-	5 56	Dumped
Well-graded sand, gravels and gravel/sand mixtures; poorly graded sand, gravels and gravel/sand mixtures; little or no fines	Class II	GW GP SW SP	57 6	85%
Silty or clayey gravels, gravel/sand/silt or gravel and clay mixtures; silty or clayey sands, sand/clay or sand/silt mixtures	Class III	GM GC SM SC	Gravel and sand (<10% fines)	90%

* *Layer heights should not exceed 1/2 the pipe diameter. Layer heights may also need to be reduced to accommodate compaction method.*

- Place and compact backfill in layers to meet requirements of Table 4 and project requirements. Note that the large diameter pipes may require layer heights less than those indicated in the table to achieve proper compaction.
- Avoid impacting pipe with compaction equipment.
- 4" - 48" (100-1200mm) single pipe runs receiving H-25 traffic requires final backfill 6" (0.15m) above initial backfill to provide at least 12" (0.3m) of total cover as measured from the top of pipe to bottom of flexible pavement or to top of rigid pavement.
- 54" (1350mm) and 60" (1500mm) single pipe runs receiving H-25 traffic require final backfill 18" (0.5m) above initial backfill to provide at least 24" (0.6m) of total cover as measured from top of the pipe to the bottom of flexible pavement or to top of rigid pavement.
- Minimum cover may be reduced in areas with no or infrequent light traffic. These situations must first be reviewed by the pipe manufacturer.

Other Installation Considerations

All unique situations cannot be anticipated; however, several common questions are answered in the following material.

- *Vehicles exceeding these criteria must not be permitted to drive over the installation.*
- Areas receiving heavy construction equipment traffic between 30 and 60 tons require at least 3 feet (0.9m) of cover. Higher loads require cover greater than 3 feet (0.9m), depending on the load.
- If sufficient cover is not provided, mound and compact material over pipe to provide minimum cover needed for load during construction.
- For heavy duty compaction equipment, such as a hoe-pack or equivalent type compactor, a minimum of 3 feet (0.9m) of compacted backfill shall separate the pipe from the equipment.

Maximum Cover

The maximum burial depth is highly influenced by the type of backfill installed around the pipe. Maximum cover limits for dual wall HDPE pipe made to the requirements of AASHTO M252, M294 and ASTM F2306 are shown in Table 6 for a variety of backfill conditions. Greater cover heights may be possible but should be reviewed by the Engineering Department.

Vertical Installations

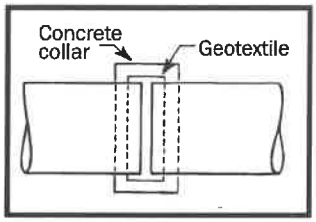
- Corrugated plastic pipe is sometimes installed vertically for use as catch basins or manholes, meter pits, and similar applications.
- Backfill should extend a minimum of 12" (0.3m) completely around the vertical structure.
- Backfill material recommendations are identical to those for a horizontal installation; compaction levels and maximum lift requirements must be strictly followed (refer to Table 4 for material selection).
- Height of the vertical structure must not exceed 8' (2.4m), unless the Engineering Department reviews the design.
- If traffic will be driving over a vertical structure, a concrete collar similar to that shown in Figure 6 shall be used to transfer the load into the ground.
- Cast iron frames holding grates or lids must be seated on a concrete collar or similar structure so that the weight of the frame and grate or lid is transferred into the ground, *not* to the vertical pipe.
- There may also be other product performance limits depending on the application. Contact Engineering for further information.

Table 7:

Required Minimum Cover* to Prevent Flotation		
	Nominal Diameter in. (mm)	Minimum Cover in. (mm)
Dual Wall HDPE & HP	4 (100)	3 (77)
	6 (150)	4 (102)
	8 (200)	5 (127)
	10 (250)	7 (178)
	12 (300)	9 (228)
	15 (375)	11 (280)
	18 (450)	13 (330)
	24 (600)	17 (432)
	30 (750)	22 (559)
	36 (900)	25 (635)
	42 (1050)	29 (737)
	48 (1200)	33 (838)
	60 (1500)	40 (1016)
Single Wall HDPE	3 (75)	2 (50)
	4 (100)	3 (77)
	6 (150)	4 (102)
	8 (200)	6 (152)
	10 (250)	7 (178)
	12 (300)	9 (228)
	15 (375)	11 (280)
	18 (450)	13 (330)
	24 (600)	17 (432)

**Based on the pipe being completely empty, water table at the ground surface, soil density of 130 pcf (2083 kg/m^3), and a soil friction angle appropriate for most sand/gravel mixtures. The average of the inside and outside diameters was used to determine soil and water displacement.*

Option 2: Concrete Collar



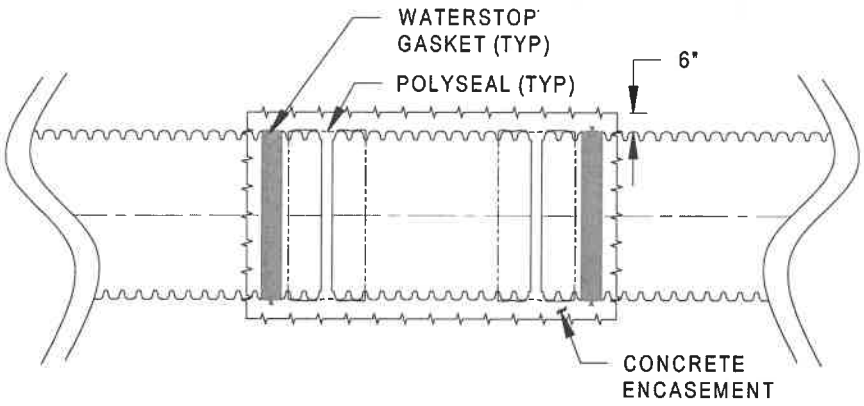
For repairs of 4" - 60" (100-1500mm) pipe with a damaged area less than 25% the diameter of pipe, use a concrete collar as described in the following steps:

- Excavate area beneath damaged section of pipe about 6" (0.15m).
- Wrap the damaged area with a geotextile to completely cover the area to be repaired.
- Strut or brace damaged section as necessary.
- Encase damaged section of pipe with a concrete collar.
- Carefully replace bedding and backfill to provide proper support for pipe.

Option 3: Mastic Banding

Typically with external sealing of 4" - 60" (100-1500mm) pipe, a mastic material is used to wrap a small section of pipe. The use of the Mar-Mac® Polyseal Pipe Coupler by Mar-Mac® Construction Products, Inc., or a comparable equal is recommended. This band is a self-adhering rubberized mastic that wraps around the damaged section or joint. A protective peelable paper is removed from the back of the band to expose a tacky mastic surface. The band is then adhered to the entire circumference of the pipe. Straps on the band tighten to provide a positive seal.
Note: Mar-Mac bands shall be installed in accordance with manufacturer's recommendations.

pipe to allow for proper application of the Polyseal coupler and a concrete encasement. If the pipe itself is damaged, the damaged area shall be removed and a replacement pipe section spliced in prior to pouring the collar.



Option 3: Chemical Grouting

For repairs of 4" - 60" (100-1500mm) pipe with improperly assembled joints, chemical grouting can be considered an optional repair method. Chemical grout creates a waterproof collar around leaking pipes and joints.

Option 4: Internal Sealing

For repairs of 18" - 60" (450-1500mm) pipe with a damaged area on the interior, a repair with internal sealing methods may be used. Internal mechanical sealing is usually comprised of a metal band with a rubber gasket, which expands to conform to the inner wall of the pipe. The feasibility of this repair method depends on the size of the damaged section or joint and available access into the pipe.

Table 8:

Base Inside Diameters for HDPE Pipe			
Nominal Pipe Diameter in. (mm)	**Base Inside Diameter in. (mm)**	**Base Inside Diameter with 5% Deflection in. (mm)**	**Base Inside Diameter With 7.5% Deflection in. (mm)**
4 (100)	3.88 (99)	3.68 (93)	3.59 (91)
6 (150)	5.82 (148)	5.53 (140)	5.38 (137)
8 (200)	7.76 (197)	7.37 (187)	7.17 (182)
10 (250)	9.69 (246)	9.21 (234)	8.97 (228)
12 (300)	11.63 (295)	11.05 (281)	10.76 (273)
15 (375)	14.54 (369)	13.82 (351)	13.45 (342)
18 (450)	17.45 (443)	16.58 (421)	16.14 (410)
24 (600)	23.27 (591)	22.10 (561)	21.52 (547)
30 (750)	29.08 (739)	27.63 (702)	26.90 (683)
36 (900)	34.90 (886)	33.16 (842)	32.28 (820)
42 (1050)	40.72 (1034)	38.68 (982)	37.66 (957)
48 (1200)	46.54 (1182)	44.21 (1123)	43.05 (1093)
54 (1350)	52.35 (1329)	49.73 (1263)	48.43 (1230)
60 (1500)	58.17 (1478)	55.26 (1404)	53.81 (1367)

** Value is per AASHTO M252[1] (4"-10" diameter) and AASHTO M294[2] (12"-60" diameter). If designing to a specific standard, please review allowable minimum diameter.*

All sales of our product are subject to a limited warranty and purchasers are solely responsible for installation and use of our products and determining whether a product is suited for any specific needs. Please consult a full copy of the Terms and Conditions of Sale for further details.

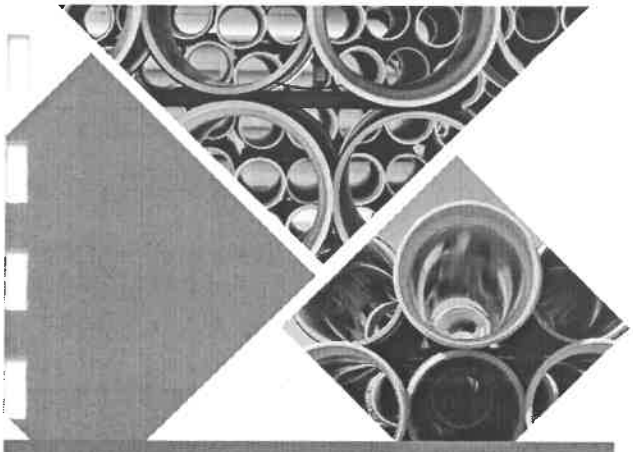
SECTION 02520

ADVANCED DRAIN SYSTEMS
SHOP DRAWINGS

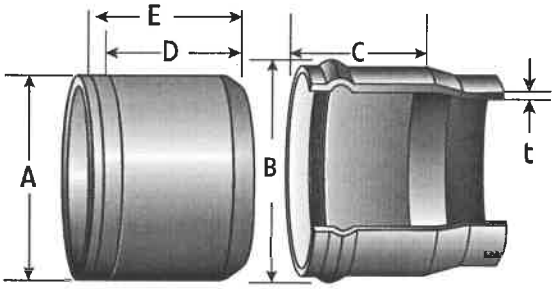
TO BE PROVIDED
AS AN INDEPENDENT DOCUMENT
ISSUED AS AN ADDENDUM

SECTION 02600

PLASTIC IRRIGATION PIPE



RIEBER JOINT ILLUSTRATION



PRESSURE RATED PIP PIPE

Diamond PIP pressure-rated pipe (6" through 27") is made of compounds conforming to material requirements of SCS 430. The pipe sizes (6" through 27") are made with an integral bell to utilize a gasket for sealing, meeting requirements as defined in ASTM F477 and ASTM 3139.

Diamond PIP pressure-rated PVC pipe meets all the dimensional, chemical and physical requirements as outlined in SCS 430. Diamond PIP pressure-rated pipe (15" through 27") meets all the dimensional, chemical and physical requirements as defined in ASTM DD2241 ANNEX.

Each male end shall be beveled, swagged or deburred to facilitate joining and shall be marked to reference proper insertion depth. Only Diamond furnished lubricant is to be used in the joining process.

It is recommended that PIP Pressure-Rated PVC Piping systems be designed and installed in accordance with SCS 430.

PRESSURE RATED PIP

ASTM D2241 ANNEX SPECIFICATION DATA. DIAMOND PIP PRESSURE-RATED PVC PIPE IS SUPPLIED IN 22-FOOT LAYING LENGTHS.

Nominal Pipe Size in. (mm)	A Outside Diameter Inches	B Bell Socket Diameter Inches	C Bell Depth Inches	D Insert Mark Inches	E Insert Mark Inches	SDR-51 80 PSI	SDR-41 100 PSI	SDR-32.5 125 PSI	SDR-26 160 PSI	SDR-21 200 PSI
						(t) Minimum Wall Inches				
6" (150)	6.140	7-1/2"	5-1/2"	3-1/2"	4-1/2"	0.120	0.150	0.189		
8" (200)	8.160	10"	5-1/2"	3-3/8"	4-3/8"	0.160	0.199	0.251		
10" (250)	10.200	12"	6-1/2"	4-3/8"	5-3/8"	0.200	0.249	0.314		
12" (300)	12.240	14"	6-1/2"	4-1/4"	5-1/4"	0.240	0.299	0.377		
15" (375)	15.300	17-1/2"	7"	4-3/4"	5-3/4"	0.300	0.373	0.471	0.588	0.728
18" (450)	18.701	21-1/2"	8"	7"	8"	0.367	0.456	0.575	0.719	
21" (525)	22.047	25-1/4"	8"	7-1/4"	8-1/4"	0.432	0.538	0.678		
24" (600)	24.803	28"	9"	8-1/2"	9-1/2"	0.486	0.605	0.763		
27" (675)	27.953	32-1/2"	12"	8-3/4"	9-3/4"	0.548	0.682	0.860		

Socket & Minimum Wall Dimensions, all dimensions are in inches.

Prices are subject to a firm policy of "Price in effect at time of shipment on regular purchases"

"Possession of this page does not constitute an offer of sale"

SECTION 02610

PLASTIC IRRIGATION PIPE
INSTALLATION INSTRUCTIONS

Recommendations for Installation of IPS & PIP Pressure Pipe

DIAMOND PVC PIPE

Diamond Plastics Corporation supplies PVC pipe of Iron Pipe Size (IPS) and Plastic Irrigation Pipe (PIP) dimensions with integral coupling that utilizes an elastomeric gasket for an assembled seal. In this guide we will outline the basic handling, storage, assembly, and installation procedures for these products.

-Installation Guide Disclaimer-

TECHNICAL DATA CONTAINED IN THIS INSTALLATION GUIDE IS FURNISHED WITHOUT CHARGE AND IS ACCEPTED BY RECIPIENT AT RECIPIENT'S SOLE RISK. EVERY EFFORT HAS BEEN MADE TO VERIFY THE INFORMATION CONTAINED IN THIS INSTALLATION GUIDE, HOWEVER, DIAMOND PLASTICS CORPORATION MAKES NO REPRESENTATION REGARDING ITS ACCURACY DIAMOND PLASTICS CORPORATION ASSUMES NO RESPONSIBILITY FOR, AND IS NOT LIABLE FOR, ANY USE OF THE INFORMATION CONTAINED IN THIS INSTALLATION GUIDE OR ANY USE MADE OF THIS INSTALLATION GUIDE FOR WHICH IT WAS NOT INTENDED. IN NO EVENT SHALL DIAMOND PLASTICS CORPORATION BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES CLAIMED ATTRIBUTABLE TO USE OF THIS INSTALLATION GUIDE. IF THIS INSTALLATION GUIDE IS UTILIZED AS A SUBMITTAL APPURTENANCE, THE USER ASSUMES ALL RESPONSIBILITY TO VERIFY THE ACCURACY OF INFORMATION CONTAINED IN THIS INSTALLATION GUIDE AND TO CONFIRM THAT THIS GUIDE IS OF CURRENT PUBLICATION.

-Receiving and Handling-

Inspection: Each pipe shipment should be inspected carefully upon arrival. The carrier is responsible for delivering the pipe. The receiver must make certain there has been no loss or damage. Should there be any errors or damage, make proper note on the delivery receipt. Make claim in accordance with the carrier's instruction. Do not dispose of any damaged material. Carrier will advise you of the procedure to follow for freight damage.

Pipe at the bottom of the stack may become out-of-round due to the weight of material above it. At normal application temperatures this corrects itself soon after the load is removed. Under freezing conditions this recovery to full initial roundness may take several hours or a few days. (Unusually hot weather conditions may also contribute to a degree of out-of-roundness. Self correction usually occurs as the temperature normalizes.)

Unloading - Cold Weather Handling: Extra care should be used in handling during cold weather.

WARNING: Carelessly unloading pipe can be hazardous. Use appropriate equipment and stay clear when removing tie-downs, banding, and dunnage material. Do not attempt to handle pipe bundles by pulling on strapping or packaging material.

Clean dirt and foreign material from the gasketed socket and the spigot end. Uniformly, apply Diamond furnished lubricant to the spigot end of the pipe up to the insert reference mark and to the gasket surface which makes contact with the spigot end of the pipe.

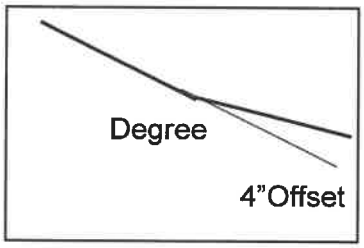
Insert the spigot end into the socket so that it is near contact with the gasket. Keep the pipe lengths in proper alignment. Proper alignment is described as no angle being formed between the spigot and bell. They should be in straight alignment. Brace the bell while the spigot end is pushed through the gasket so that previously completed joints in the line will not be "stacked," "over belled," or inserted past the insert reference mark. Push the spigot end in until the insert reference mark on the spigot end is flush with the end of the pipe. If the spigot is inserted beyond the insert reference mark, laying length will be lost. Loss of laying length can be significant on long footage projects. Also, joint flexibility is reduced when the spigot is inserted beyond the insert reference mark. Over-insertion of the spigot may lead to excessive stress and joint failure. Some joints may require barring to seat the joint. If so, use a wood block to protect the end of the pipe. A come-a-long may be preferred to the bar and block. A swinging stab is not recommended. Where the physical weight or trench conditions make the recommended methods unsafe, joints may be assembled using mechanical equipment provided that the pipe is properly lubed and aligned. The end must be protected from damage, and the joint must not be "over belled" or inserted beyond the insert reference mark.

-Lubricant-

An even, uniform application of gasket lubricant must be applied to the spigot including the bevel and to the insert reference mark as well as the contact surface of the gasket. Gasket lubricant may be applied with a swab, brush, or roller. An adequate amount of gasket lube is furnished with each truckload of pipe. Additional lubricant may be purchased from your distributor.

Curvilinear Alignment (Without Bending the Pipe.)

During construction, it may become necessary to make very slight changes of direction. When this situation is encountered, the clearance between the inside diameter of the socket and the outside diameter of the spigot may be utilized to accomplish curvilinear alignment without bending the pipe. Neither the pipe nor the joint should be axially deflected in any manner to cause stress at the joint. Assuming the spigot is not "over-inserted" beyond the insert reference mark, Diamond PVC pipe will accommodate a 1° change in direction per joint. With 20' joints this is a 4" offset. For 20' joints the minimum curve radii is 1,146 feet. If the spigot is "over-inserted" beyond the insert reference mark, allowable joint offset and laying length will be lost. On long projects, the cumulative loss of laying length can be significant.



various soils against horizontal thrust assuming a minimum of two feet of soil covers the pipe. A design engineer should be consulted regarding the specifics of each particular project.

Bearing Load

Soil Type	Pounds / sq.ft.
Soft Clay	500
Sand	1,000
Sand & Gravel	1,500
Sand & Gravel w/clay	2,000
Hard Pan	5,000

As noted above, great force is developed at the certain point previously noted. Normally, the highest forces are developed from a 90 degree elbow. The following table assumes a 90 degree elbow at 100 psi.

Thrust at 90 degree elbow*

Pipe Size	Thrust
4" PIP	2,240
6" PIP	4,830
8" PIP	8,200
10" PIP	12,750
12" PIP	18,200
15" PIP	26,000
18" PIP	38,000
21" PIP	54,000
24" PIP	67,000
27" PIP	75,000

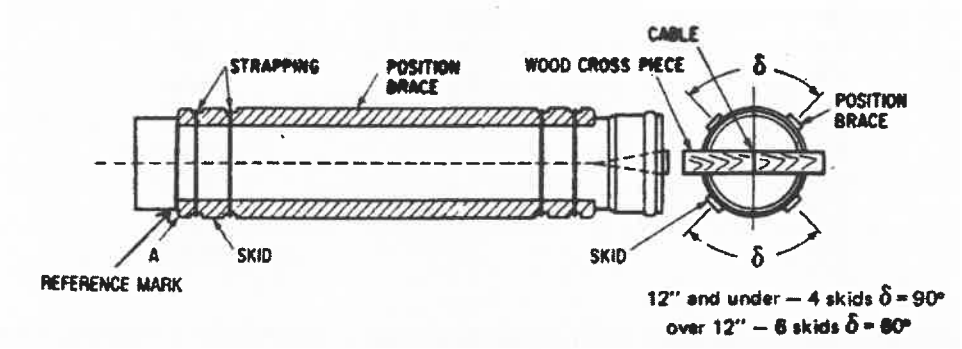
* based on 100 psi operating pressure

The size of the thrust block should be adequate to prevent pipe movement at the point of thrust. Dimensional requirements of the thrust block are specified by the designing engineer of the piping system.

Construction: Thrust blocks should be constructed directly in line with the force created by the pipe or fitting. The cavity for the thrust block should be hand dug into undisturbed soil. Simple forms are adequate to hold the freshly poured concrete. Concrete should be fluid enough to be worked around the fitting and should have compression strength not less than 2000 psi. Prior to pressurizing the pipeline, make sure the concrete has adequate time to set.

-Casings-

Casings may be installed by boring where open excavation is not desirable, for example, under highways, runways, or railways. To provide long term support to the pipe and to prevent damage to belled sockets during installation, skids or casing spacers must be attached to the pipe before the pipe is installed in casings. Casing spacers are commercially available. Untreated wood may be used as a skid. Skids should be fastened securely to the pipe with steel strapping, cables, or clamps. Care should be exercised to place skids or casing spacers at insertion mark to avoid overbelling. Use of gasket lube between the skids and the casing can ease installation into the casing. (Caution: Exposure to petroleum products can damage some elastomeric gaskets.)



-Haunching & Initial Backfill-

Initial backfill is completed in two stages and should be completed as soon as possible after the pipe has been laid. The first stage (haunching) should be placed in layers of no more than six inches at a time up to the springline of the pipe. Compact as required by the designer of the pipe system. The second stage of initial backfill is again placed in no more than six inch layers from the springline to a point 6 to 12 inches above the top of the pipe. Both stages of initial backfill material shall be free of large stones (3/4" or larger) frozen material, or debris.

-Acceptance Testing-

If portions of the pipeline are tested as they are completed, the portion to be tested must be sufficiently backfilled and braced to prevent movement while under test pressure. If contract specifications require the joints to be exposed for observation during testing, center load the pipe lengths to prevent movement. Slowly fill the pipeline, limiting the flow to approximately one foot per second, making sure that there is no imposed surge or water hammer. Entrapped air can cause tremendous surge pressures resulting in dangerous and explosive conditions. All air must be expelled from the pipeline before making

$$L = \frac{ND\sqrt{P}}{7{,}400}$$

Where: **L** = testing allowance, gal/hr
N = number of joints in the tested line (pipe and fittings)
D = nominal diameter of pipe, in
P = average test pressure, lb/in^2

The above equation calculates an allowable leakage of 10.5 gallons per inch of diameter, per mile, per day, at a pressure of 150 psi. The same precautions and procedures exercised during pressure tests should also be taken in preparing the pipeline for the leakage tests. Purge the pipeline of any entrapped air, and test in accordance with contract specifications.

-Solvent-Cement Joints-

Solvent-cement joints should be made using solvent-cements meeting the requirements of ASTM D2564 Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems in accordance with ASTM D2855 Standard Practice for Making Solvent-Cemented Joints with Poly(Vinyl Chloride) (PVC) Pipe and Fittings. These procedures include cutting and deburring, cleaning the surfaces to be joined, and applying primer and cement to the joining surfaces as outlined below.

1. Cleaning and priming are very important procedures in solvent cementing. Surface breakdown of the parts to be cemented is essential for a good joint. Apply primer according to manufacturer's recommendations over all surfaces to be cemented. Surface breakdown has occurred when a few thousandths of surface can be scraped off with a pocket knife. Cementing materials are temperature related, so periodically, check amount of material and time required for surface breakdown.
2. Use proper type of cement for the size and type of pipe, stir cement and apply a full even coat on the male end to a depth equal to the socket depth.
3. Apply a medium layer to the socket of the fitting, and avoid puddling in the socket.
4. Then, apply a second even coat to male end of the pipe. All cement layers must be without voids.
5. Push pipe and fitting together immediately while cement is wet, enough force must be used to have the male end bottom out. Twist pipe ¼ turn while inserting it.
6. Hold, to resist the inherent repelling action of the chemical bond, the assembled pipe for approximately 10 seconds, depending on the weather (hot weather will cause pipe to bond sooner.)
7. A proper cementing job will have 1/8" cement bead around the joint.
8. Remove all excess cement around the joint. Paper toweling is recommended for removing the excess cement.
9. Handle newly cemented sections carefully.

-Final Backfill-

After placement and compaction of pipe embedment materials, the balance of backfill materials may be returned to the trench. The material should not contain large stones or rocks, frozen materials, or debris. Compaction procedures of the remainder of the backfill should be in accordance with the contract specification.

TYPICAL DISCHARGE AND VENT ASSEMBLIES
Type "C" Open Stand
Low Head

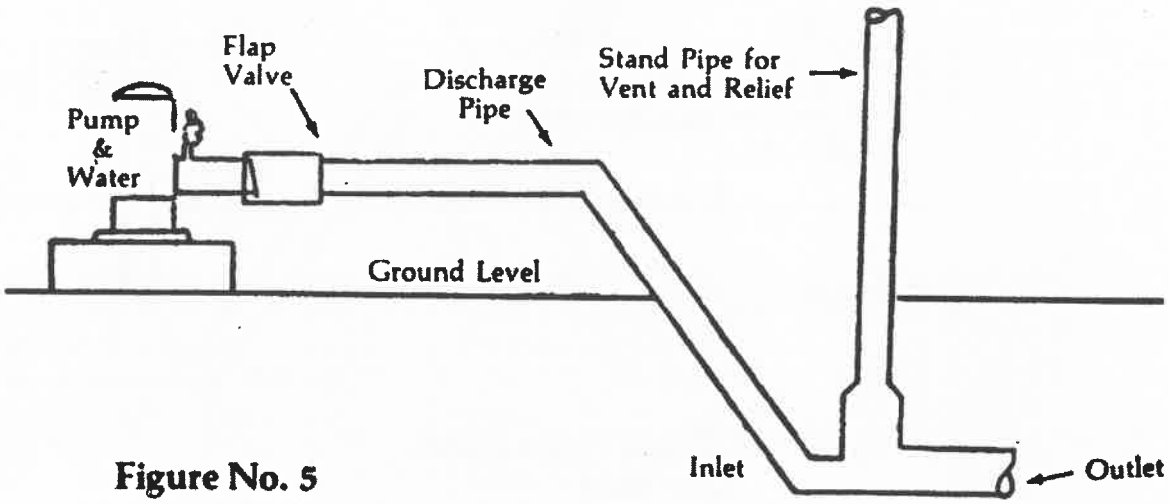


Figure No. 5

TYPICAL DISCHARGE AND VENT ASSEMBLIES
Type "C" Open Stand
Low Head

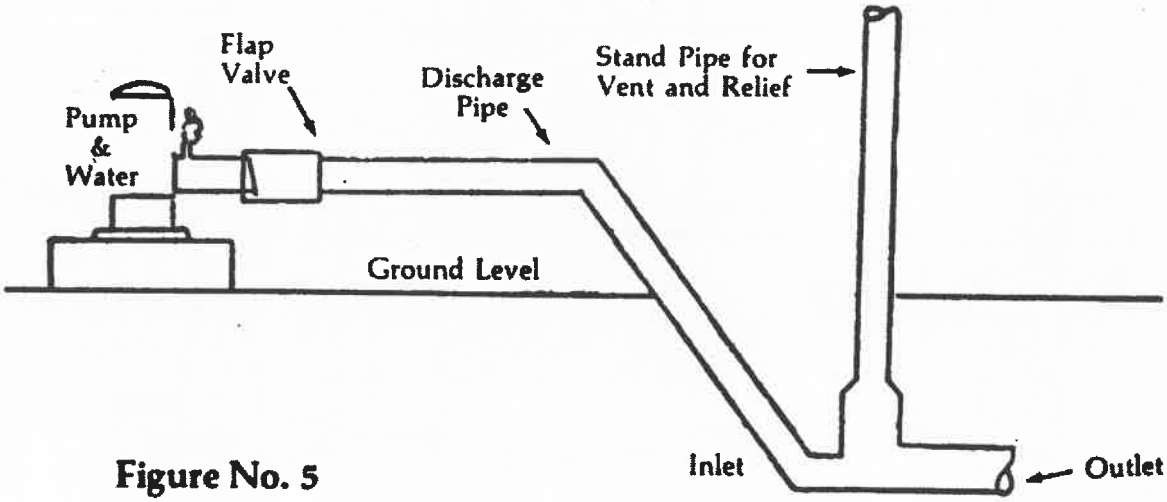
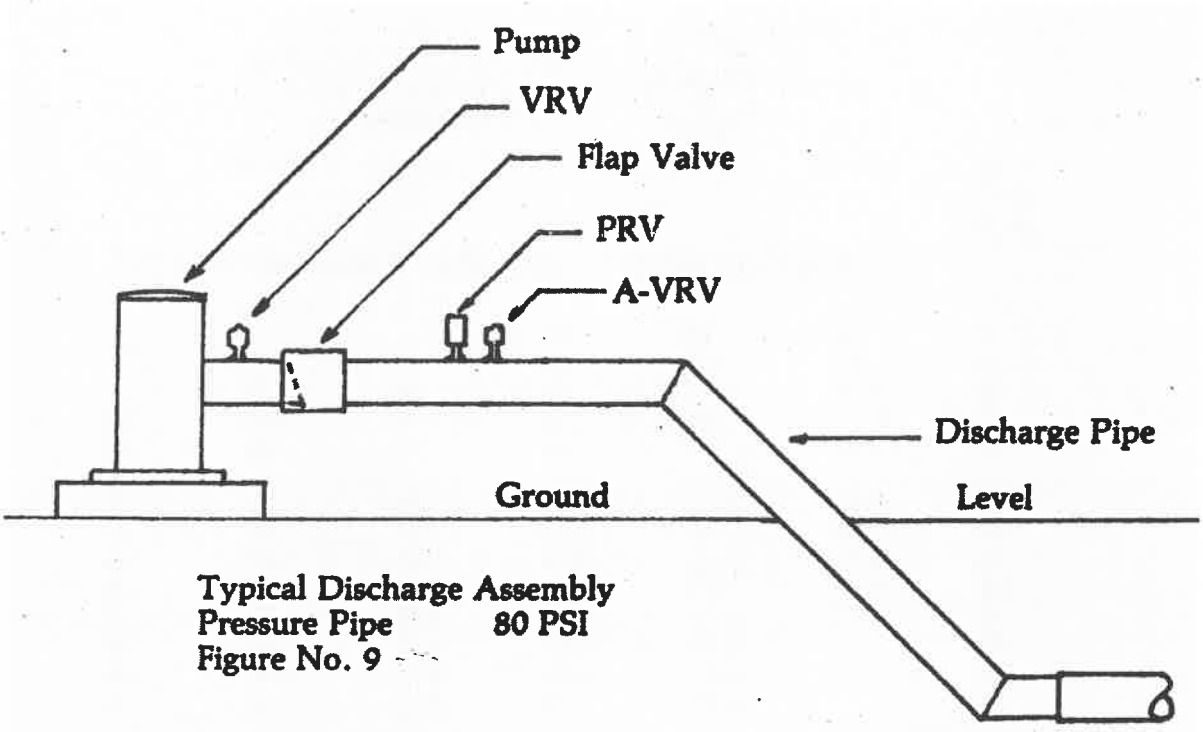


Figure No. 5



Typical Discharge Assembly
Pressure Pipe 80 PSI
Figure No. 9

Repairs may be made with bolted couplings or gasketed couplings and lengths of plain ended pipe.

FRICTION LOSS CHARTS
FOR DIAMOND PIPE
PIP DIMENSION

FRICTION HEAD LOSS IN FEET PER HUNDRED FEET

Q Gallons Per Min.	6-Inch	8-Inch	10-Inch	12-Inch	15-Inch
300	.89				
320	1.00				
340	1.12				
360	1.25				
380	1.38				
400	1.52				
420	1.66	.42	.14	.06	
440	1.81	.45	.15	.06	
460	1.96	.49	.17	.07	
480	2.13	.53	.18	.07	
500	2.29	.57	.19	.08	
550		.69	.23	.10	
600		.81	.27	.11	
650		.93	.31	.13	
700		1.07	.36	.15	
750		1.22	.41	.17	
800		1.37	.46	.19	
850		1.53	.52	.21	
900		1.71	.58	.24	
950		1.89	.64	.26	
1000		2.07	.70	.29	.12
1050			.77	.31	.12
1100			.83	.34	.15
1150			.91	.37	.15
1200			.98	.40	.15
1250			1.06	.43	.15
1300			1.14	.47	.18
1350			1.22	.50	.19
1400			1.30	.54	.19
1450			1.39	.57	.21
1500			1.48	.61	.21
1600				.69	.27
1700				.77	.28
1800				.85	.31
1900				.94	.36
2000				1.04	.36
2100				1.14	.40
2200				1.24	.44
2300				1.35	.46
2400				1.46	.52
2500				1.57	.55
2600					.58
2700					.65
2800					.68
2900					.73
3000					.78

DR	PR	F
32.5	125 PSI	.84
41	100 PSI	.785
51	80 PSI	.75
81	115 FH	.70
93.5	100 FH	.68
102	50 FH	.67

Table based on Hazen-Williams equation—C_W = 150

* To find function head loss in PVC pipe having a standard dimension ratio other than 21, the values in the table should be multiplied by the appropriate conversion factor (F) shown above.

Loss below bold line indicates velocities in excess of 5 feet per second.
Velocities which exceed 5 feet per second are not recommended.

FRICTION LOSS CHARTS
FOR DIAMOND PIPE
PIP DIMENSION

Table based on Hazen-Williams equation — $C_W = 150$

CONVERSION FACTORS FOR 18", 21", 24"

100FH-F = 1.00
115FH-F = 1.02
80PSI-F = 1.10
100PSI-F = 1.16
125PSI-F = 1.24

To find friction head loss in PVC pipe having a pressure rating other than 100 FH the values in the table should be multiplied by the appropriate conversion factor (F).

FRICTION HEAD LOSS IN FEET PER HUNDRED FEET

Q Gallons Per Min.	18"	21"	24"	27"
5600		0.2724	0.1535	0.0943
5700		0.2815	0.1587	0.0974
5800		0.2907	0.1638	0.1006
5900		0.3000	0.1691	0.1039
6000		0.3095	0.1744	0.1071
6100		0.3191	0.1799	0.1105
6200		0.3288	0.1854	0.1138
6300		0.3387	0.1909	0.1173
6400		0.3487	0.1966	0.1207
6500		0.3589	0.2023	0.1242
6600		0.3692	0.2081	0.1278
6700		0.3796	0.2140	0.1314
6800		0.3901	0.2199	0.1351
6900		0.4008	0.2259	0.1387
7000		0.4116	0.2320	0.1425
7100		0.4226	0.2382	0.1463
7200		0.4336	0.2444	0.1501
7300		0.4449	0.2507	0.1540
7400		0.4562	0.2571	0.1579
7500		0.4677	0.2636	0.1619
7600		0.4793	0.2701	0.1659
7700		0.4910	0.2767	0.1700
7800		0.5029	0.2834	0.1741
7900			0.2902	0.1782
8000			0.2970	0.1824
8100			0.3039	0.1867
8200			0.3109	0.1909
8300			0.3180	0.1953
8400			0.3251	0.1997
8500			0.3323	0.2041
8600			0.3395	0.2085
8700			0.3469	0.2130
8800			0.3543	0.2176
8900			0.3618	0.2222
9000			0.3693	0.2268
9100			0.3770	0.2315
9200			0.3847	0.2362
9300			0.3924	0.2410
9400			0.4003	0.2458
9500			0.4082	0.2507
9600			0.4162	0.2556
9700			0.4242	0.2605
9800			0.4324	0.2655
9900			0.4406	0.2706
10000			0.4488	0.2757
10100			0.4572	0.2808

Table based on Hazen-Williams equation — $C_W = 150$

CONVERSION FACTORS FOR 27"

80PSI-F = 1.00
100PSI-F = 1.05
125PSI-F = 1.13

To find friction head loss in PVC pipe having a pressure rating other than 80PSI the values in the table should be multiplied by the appropriate conversion factor (F).

18" PIP = 18.701" O.D. 21" PIP = 22.047" O.D. 24" PIP = 24.803" O.D. 27" PIP = 27.953" O.D.

Loss below bold line indicates velocities in excess of 5 feet per second.
Velocities which exceed 5 feet per second are not recommended.

FRICTION LOSS CHARTS FOR DIAMOND PIPE PIP DIMENSION

Table based on Hazen-Williams equation — $C_w = 150$

CONVERSION FACTORS FOR 18", 21", 24"

100FH-F = 1.00
115FH-F = 1.02
80PSI-F = 1.10
100PSI-F = 1.16
125PSI-F = 1.24

To find friction head loss in PVC pipe having a pressure rating other than 100FH the values in the table should be multiplied by the appropriate conversion factor (F)

CONVERSION FACTORS FOR 27"

80PSI-F = 1.00
100PSI-F = 1.05
125PSI-F = 1.13

To find friction head loss in PVC pipe having a pressure rating other than 80PSI the values in the table should be multiplied by the appropriate conversion factor (F)

FRICTION HEAD LOSS IN FEET PER HUNDRED FEET

Q Gallons Per Min.	18"	21"	24"	27"
1000	0.0251	0.0112	0.0063	0.0039
1100	0.0299	0.0134	0.0076	0.0046
1200	0.0351	0.0158	0.0089	0.0055
1300	0.0407	0.0183	0.0103	0.0063
1400	0.0467	0.0210	0.0118	0.0073
1500	0.0531	0.0238	0.0134	0.0082
1600	0.0598	0.0268	0.0151	0.0093
1700	0.0669	0.0300	0.0169	0.0104
1800	0.0744	0.0334	0.0188	0.0116
1900	0.0822	0.0369	0.0208	0.0128
2000	0.0904	0.0405	0.0229	0.0140
2100	0.0989	0.0444	0.0250	0.0154
2200	0.1078	0.0484	0.0273	0.0167
2300	0.1171	0.0525	0.0296	0.0182
2400	0.1266	0.0568	0.0320	0.0197
2500	0.1366	0.0613	0.0345	0.0212
2600	0.1469	0.0659	0.0371	0.0228
2700	0.1575	0.0706	0.0398	0.0245
2800	0.1684	0.0756	0.0426	0.0262
2900	0.1797	0.0806	0.0454	0.0279
3000	0.1914	0.0859	0.0484	0.0297
3100	0.2033	0.0912	0.0514	0.0316
3200	0.2156	0.0967	0.0545	0.0335
3300	0.2283	0.1024	0.0577	0.0354
3400	0.2412	0.1082	0.0610	0.0375
3500	0.2545	0.1142	0.0644	0.0395
3600	0.2681	0.1203	0.0678	0.0416
3700	0.2821	0.1265	0.0713	0.0438
3800	0.2963	0.1329	0.0749	0.0460
3900	0.3109	0.1395	0.0786	0.0483
4000	0.3258	0.1462	0.0824	0.0506
4100	0.3411	0.1530	0.0862	0.0530
4200	0.3566	0.1600	0.0902	0.0554
4300	0.3725	0.1671	0.0942	0.0578
4400	0.3887	0.1744	0.0983	0.0604
4500	0.4052	0.1818	0.1025	0.0629
4600	0.4220	0.1893	0.1067	0.0655
4700	0.4391	0.1970	0.1110	0.0682
4800	0.4565	0.2048	0.1154	0.0709
4900	0.4743	0.2128	0.1199	0.0737
5000	0.4924	0.2209	0.1245	0.0765
5100	0.5107	0.2291	0.1291	0.0793
5200	0.5294	0.2375	0.1339	0.0822
5300	0.5484	0.2460	0.1387	0.0852
5400	0.5677	0.2547	0.1436	0.0882
5500	0.5873	0.2635	0.1485	0.0912

18" PIP = 18.701" O.D. 21" PIP = 22.047" O.D. 24" PIP = 24.803" O.D. 27" PIP = 27.953" O.D.

Loss below bold line indicates velocities in excess of 5 feet per second.
Velocities which exceed 5 feet per second are not recommended.

LIMITED WARRANTY AND LIABILITY

Diamond Plastics Corporation, 1212 Johnstown Road, P. O. Box 1608, Grand Island, NE 68802, does hereby warrant subject to the limitations hereinafter stated, its PVC Pipe to be free from defects in material and workmanship under normal use and service for a period of twelve (12) months from the date of invoice. This limited warranty extends only to the original purchase for use, and will be void if the product is used under conditions other than those for which it was designed or if it is not used in compliance with all instructions contained in any operating manual or specification sheets provided for such product.

The sole obligation of Diamond Plastics Corporation, under this limited warranty, and the exclusive remedy of the purchaser under this limited warranty is the repair or replacement, without charge, F.O.B. shipping point, of such products or parts of products only, specifically excluding any labor or installation thereof, which Diamond Plastics Corporation, after inspection, determines to be defective. Purchase must notify Diamond Plastics Corporation, in writing at its address shown above within ten (10) days from the date of discovery of any claimed defect specifically stating the details of such defect, and, if requested by Diamond Plastics Corporation, return the defective product, freight prepaid, to Diamond Plastics Corporation, F.O.B. shipping point as shown on Diamond Plastics Corporation's order acknowledgement.

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SECTION 02700

WATER CANAL GATE

AC-31 ALUMINUM CANAL GATE

SIZES 12" - 84"

- **A SUPERBLY ENGINEERED GATE EXPRESSLY SUITABLE FOR CORROSION-RESISTANT, RUST PROOF DEMANDS.**
- **RUGGED, HEAVY DUTY CONSTRUCTION - YET LIGHTWEIGHT AND EASY TO INSTALL.**
- **ALUMINUM GATE ELIMINATES ELECTROLYSIS USUALLY FOUND IN CAST IRON GATE TO ALUMINUM PIPE CONNECTIONS.**
- **MINIMAL LEAKAGE - TIGHT CLOSURE**
- **SPECIFY:**
  - **AC-31sb... for corrugated metal pipe mounting**
  - **AC-31-4... for PVC pipe**
  - **AC-31f... for wall mounting**
  - **AC-31ff... for flange or thimble mounting**
  - **AC-31-6... for HDPE pipe**

FEATURES:

SEATING HEADS TO 30 FEET

UNSEATING HEADS TO 20 FEET

TAPERED SLIDE:
Provides wedge-type seating and low friction opening.

NEOPRENE J-BULB SEAL:
Virtual leakproof closure. Easily replaceable.

STAINLESS STEEL STEM & HARDWARE

BRONZE LIFT NUT

GUIDE INSERTS:
Reduced slide friction. Ultra high molecular weight (UHMW) polyethylene, dovetailed.

Back View Showing Spigot and Neoprene Seal

AC-31sb FRONT VIEW

AC-31-6 (shown with HDPE pipe attached)

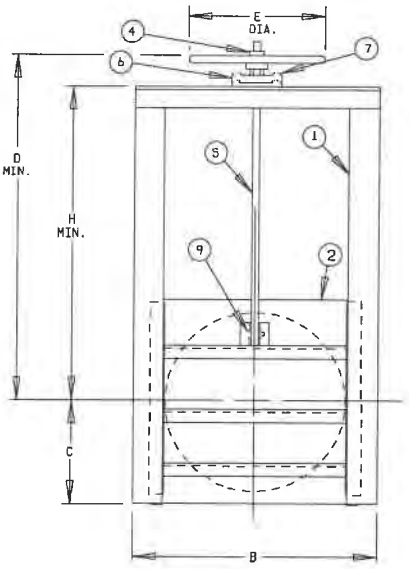
Recommended Maximum Seating Heads*

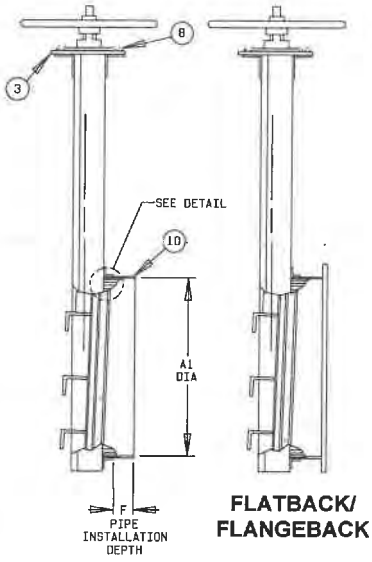
8" - 30" ..... 30 Feet
36" - 42" .... 20 Feet
48" - 60" .... 15 Feet
66" - 84" .... 10 Feet

AC-31 Flatback w/Torque Tube (Rising Stem Extension)

Waterman Industries

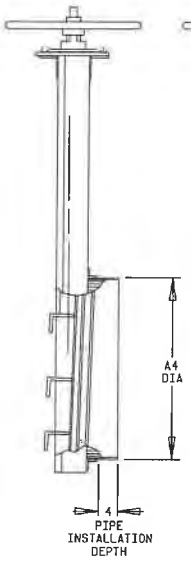
AC-31 ALUMINUM CANAL GATE





SPIGOTBACK

FLATBACK/ FLANGEBACK



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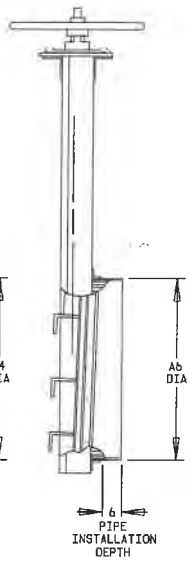

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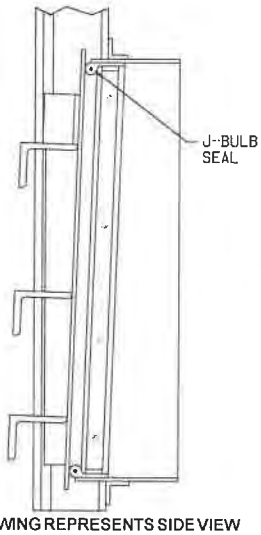
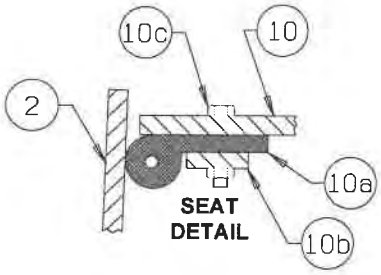
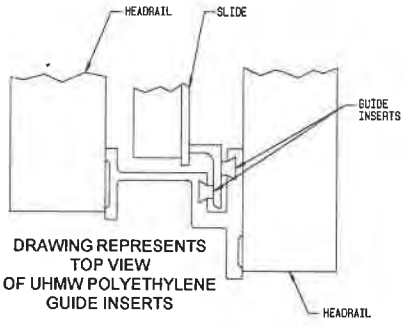


DRAWING REPRESENTS SIDE VIEW OF TAPERED SLIDE AGAINST J-BULB SEATING



SEAT DETAIL



DRAWING REPRESENTS TOP VIEW OF UHMW POLYETHYLENE GUIDE INSERTS

PARTS LIST		
No.	Name	Qty.
1	Frame (Aluminum,extruded)	1
2	Cover (Aluminum plate)	1
3	Top Plate (Aluminum)	1
4	Handwheel	1
5	Stem (Stainless steel,threaded)	1
6	Lift Housing and Nut	1
7	Lift Housing Hardware (Stainless steel)	2
8	Top Plate Hardware (Stainless steel)	4
9	Stem to Cover Attaching Hardware (Stainless steel)	1
10	Aluminum Spigot	1
10a	J-Bulb Seat Ring (Neoprene Rubber)	1
10b	Retainer Ring (Aluminum)	1
10c	Mounting Hardware (Stainless steel)	A/R

AC-31 ALUMINUM CANAL GATE									
DIMENSION IN INCHES									
GATE SIZE (DIA)	A1 I.D.	A4 O.D.	A6 O.D.	B	C	D*	E**	F	H
12	13⅛	11⅞	11 15/16	21	8	26	10	4¼	22
15	16⅛	14¾	14⅞	25	9½	32½	10	4¼	28½
18	19⅛	17¾	17⅞	28	11	37½	12	4¼	33½
24	25⅛		24	34	14	46½	12	4¼	42½
30	31⅛		30	40	18	58½	15	4¼	54½
36	37⅛			46	21	67½	15	4¼	63½
42	43⅛								72½
48	49⅛			57⅞	28½	93*	15R**	5	87
54	55⅛			63⅞	31½	101*	15R**	6	95
60	61⅛			69⅞	34½	114¼*	15R**	6	108
66	67⅛			75⅞	37½	123¼*	15R**	6	117
72	73⅛			81⅞	40½	132¼*	15R**	6	126
84	85⅛			94⅛	46½	152¾*	15R**	7	146½

* Dimension from gate centerline to centerline of lift input shaft
** 15" Handcrank

Upper Gunnison River Water Conservancy District

210 West Spencer Avenue, Suite B • Gunnison, Colorado 81230
Telephone (970) 641-6065 • Facsimile (970) 641-1162 • www.ugrwcd.org

August 3, 2017

US Forest Service
Beth Anderson, Acting District Ranger
216 North Colorado
Gunnison, CO 81230

Re: Elk Home Ditch Construction

Dear Ms. Anderson:

Thank you and your staff for meeting with the contractor, engineer and myself at Rainbow Lake today and touring the Elk Home Ditch Project. The purpose of this letter is to provide written notification of project details discussed at our meeting.

The map below shows Rainbow Lake and the revised staging area for the project which will encompass a maximum area of two acres.

The staging area will be contained below the Rainbow Lake high water line.

Hearne Excavating has provided the following details regarding their construction schedule:

Equipment List for Pipeline

Komatsu PC 158 Excavator, 8.5’ wide

Komatsu PC 138 Excavator, 8.5’ wide

Bobcat T770, 6.6’ wide

Four ATV’s to transport pipe, fuel, shovels, etc.

Two ATV trailers for pipe hauling

One 98 gallon fuel trailer (fueling necessary every 3-4 days)

Remu XO 2150 SC Screening Bucket to create bedding material

Equipment List for Staging Area

Cat 930 H Wheel Loader (Bucket and Forks)

Truck for Pipe Hauling

Small equipment trailer if needed

Staging area will also have 2-3 campers for employees, as well as a port-o-potty with lock.

We anticipate 2 work trucks and 2 employee vehicles at any given time.

We will use existing rocky road down to lake bed to keep impact minimal.

Vegetation Disturbance

Access to the pipeline will be confined to the historical ditch access road. We will do everything possible to keep the disturbance to a minimum including laying down plywood for the excavators to track on.

We will reseed according to NRCS recommendations and provide the Forest Service with type and quantities of seed used.

Pipeline Construction

The first week will be prep work, making the open ditch into a 10 foot wide road. This will be done with one excavator and the bobcat. We will only have 2-3 employees working the first week.

Our anticipated schedule details are on the previously provided ditch line map.

Pipe Transport

We do not anticipate the need for any road closures. The haul truck size is no larger than a pickup with a large camper. We will have a lead vehicle ahead of the transport truck to alert oncoming traffic. 18 pieces of pipe come in a semi load. We are hoping to bring 18 pieces up at a time, depending on how it is bundled. We will be using 205 pieces of pipe. In all we anticipate no more than 20 loads of pipe, approximately 2 loads a week.

Please let me know if you have any additional questions. We greatly appreciate your help and cooperation on this project.

Sincerely,

Frank Kugel
General Manager, UGRWCD

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

NON-FEDERAL COMMERCIAL ROAD USE PERMIT

AUTHORITY:

Section 4 and Section 6 of the National Forest Roads and Trails Act
16 U.S.C. 535 and 537

Upper Gunnison River Water Conservancy District, c/o Frank Kugel, General Manager, 210 West Spencer Avenue, Suite B, Gunnison, CO 81230 (the holder), is hereby granted use of the following roads or road segments and related transportation facilities (hereinafter "roads") on the Gunnison Ranger District and Gunnison National Forest, for commercial hauling, subject to the terms and conditions of this permit:

NFSR 7724

APPENDICES

A – Annual Operating Plan
B – Maintenance Requirements

TERMS AND CONDITIONS

I. GENERAL TERMS

A. AUTHORITY. This permit is issued pursuant to the National Forest Roads and Trails Act, 16 U.S.C. 535 and 537, and 36 CFR Part 212, Subpart A, as amended, and is subject to their provisions.

B. RESPONSIBLE OFFICIAL. The responsible official is the district ranger or a subordinate officer with delegated authority.

C. TERM. This permit shall expire at midnight on September 1, 2018, one year from the date of issuance. Expiration of this permit shall not require notice, a decision document, or any environmental analysis or other documentation.

D. RENEWAL. This permit is not renewable. Prior to expiration of this permit, the holder may apply for a new permit that would renew the use authorized by this permit. Renewal of the use shall be at the sole discretion of the responsible official.

E. AMENDMENT. This permit may be amended in whole or in part by the Forest Service when, at the discretion of the responsible official, this action is deemed necessary or desirable to incorporate new terms that may be required by law, regulation, directive, the applicable land management plan, or projects and activities implementing a land management plan pursuant to 36 CFR part 215.

F. COMPLIANCE WITH LAWS, REGULATIONS, AND OTHER LEGAL REQUIREMENTS. In exercising the rights and privileges granted by this permit, the holder shall comply with all present and future federal laws and regulations and all present and future state, county, and municipal laws, regulations, and other legal requirements, including state traffic laws, that apply to the permit area, to the extent they do not conflict with federal law, regulation, or policy The Forest Service assumes no responsibility for enforcing laws, regulations, and other legal requirements that fall under the jurisdiction of other governmental entities.

G. NON-EXCLUSIVE USE. The use authorized by this permit is not exclusive. The Forest Service reserves the right to use the roads authorized by this permit and to allow others to use them at any time. The holder shall use the roads authorized by this permit in a manner that will not unreasonably or unnecessarily interfere with their use by others, including the Forest Service. Except for any restrictions that the holder and the Forest Service agree

are necessary to protect public safety and road investments, the roads authorized by this permit shall remain open to the public for all lawful purposes.

H. ASSIGNABILITY. This permit is not assignable or transferable.

II. OPERATIONS

A. ANNUAL OPERATING PLAN. The holder shall prepare and annually revise an operating plan. The annual operating plan shall be prepared in consultation with the responsible official or the responsible official's designated representative and shall cover all operations authorized by this permit. At a minimum, the annual operating plan shall specify the date the use authorized by this permit will commence, the duration and extent of the use, the products that will be hauled, a traffic control plan per clause II.C, the names of the holder's employees, contractors, and subcontractors who will use the roads authorized by this permit on behalf of the holder, and any other information regarding the authorized use deemed necessary by the responsible official. The annual operating plan shall be submitted by the holder and approved by the responsible official or the responsible official's designated representative prior to commencement of commercial hauling under this permit and shall be attached to this permit as Appendix A. If there is any material change in the information contained in the annual operating plan, the holder shall notify the responsible official promptly in writing of the change.

B. HOLDER'S REPRESENTATIVE. The holder shall designate a representative for purposes of administration of this permit and shall notify the responsible official in writing who the holder's representative will be.

C. USE RECORDS. Every year during periods the holder is conducting commercial hauling on the roads covered by this permit, the holder shall provide scale or other records acceptable to the responsible official that document the quantity hauled, calculated in the unit of measure (e.g., thousands of board feet, tons, cubic yards, or vehicle units) used to determine payments in lieu of performance under clause III.E or the holder's investment share under section V.

D. PUBLIC SAFETY. When the holder is engaged in commercial hauling adjacent to or on National Forest System roads or National Forest System trails open to public travel, the holder shall provide users with adequate warning of hazardous conditions associated with the holder's operations. A traffic control plan for each commercial hauling project shall be approved by the responsible official in writing before commercial hauling commences. Warning devices shall be appropriate for current conditions and shall be covered or removed when not needed. Flags and other warning devices shall comply with the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) and any specifications attached to this permit.

E. TRAFFIC RULES AND USE RESTRICTIONS

1. The holder and its agents, employees, and contractors shall comply with all traffic rules and use restrictions imposed by the Forest Service, including:

a. Road closures or use restrictions prompted by weather conditions, a fire hazard, or road construction or maintenance.

b. Traffic rules for safe and effective use of roads.

c. Regulation of the number of vehicles using a road to prevent traffic congestion.

2. Unless specified in this permit or approved in writing by the responsible official, use of motor vehicles by the holder or its agents, employees, or contractors must be in accordance with the applicable motor vehicle use map (36 CFR 261.13).

3. Temporary traffic control signs, flagging, and warning devices for road construction, operation, or maintenance conducted under this permit shall comply with Part 6 of the MUTCD.

4. The holder shall not load logs on trucks parked on a road, except to recover lost logs.

5. The holder shall not operate vehicles or equipment with cleats or other tracks that will injure the road surface.

F. REQUIREMENT TO CARRY A COPY OF THE PERMIT. Drivers of all vehicles operating under this permit shall have a copy of the first sheet of this permit in their vehicle. The copy will be presented, on request, to any Forest Service officer.

G. LOAD MARKING. Unless otherwise approved in writing by the responsible official, when hauling wood products under authority of this permit, a 6" minimum size red letter "P" shall be painted on three or more ends of logs visible from the front and on three or more ends of logs visible from the back of the load.

III. PERFORMANCE AND COST RECOVERY

A. RECONSTRUCTION REQUIRED TO ACCOMMODATE USE. The holder shall perform any road reconstruction required to accommodate the holder's use under this permit, or deposit funds sufficient to cover the cost of the reconstruction, before the holder's use commences.

B. COMMENSURATE SHARE

1. The holder shall perform maintenance, or deposit funds sufficient to cover the cost of maintenance, commensurate with the holder's use of the roads authorized by this permit (the holder's commensurate share), measured, e.g., in thousand board feet, cubic yards, or vehicle units. The holder shall be entirely responsible for maintenance that is necessitated by the holder's use, i.e., maintenance which would not be necessary if the holder's use did not occur. The holder shall be proportionately responsible with other users of the roads authorized by this permit for maintenance not necessitated by traffic, i.e., maintenance that is necessary due to natural causes such as rain, wind, rock fall, and growth of brush. Maintenance that could be required or for which payment could be required by this clause includes, at a minimum, work addressed in section IV of this permit.

D. PERFORMANCE BOND FOR ROAD MAINTENANCE. As a further guarantee of the holder's commensurate share obligation, the responsible official may require the holder to furnish a surety bond or other security.

IV. REQUIREMENTS FOR CONDUCTING MAINTENANCE

A. IN GENERAL. When maintenance is performed, it shall be conducted in accordance with the following requirements and the requirements in Appendix E:

1. The holder shall perform maintenance on the roads authorized by this permit that is necessary to protect and repair the roadbed, road surface, and associated transportation facilities.

2. The holder shall resurface the roads authorized by this permit to the extent loss of surfacing is caused by the use authorized by this permit.

3. If other commercial haulers are operating on the roads authorized by this permit, the holder and those commercial haulers shall enter into an agreement for performance of maintenance on these roads. If conflicts arise regarding responsibility for the maintenance, commercial hauling on these roads shall cease until the conflicts are resolved.

B. SNOW REMOVAL. Snow removal shall be conducted in a manner that protects roads, ensures safe and efficient transportation of materials, and prevents erosion damage to roads, streams, and adjacent lands. The holder shall:

1. Remove snow from the entire width of the road surface, including turnouts.

2. Remove snow slides, earth slides, fallen timber, and boulders that obstruct the road surface.

3. Remove snow, ice, and debris from ditches and culverts so that the drainage system will function efficiently at all times.

4. Deposit all debris, except snow and ice, removed from the road surface and ditches at locations approved by the responsible official and away from stream channels.

5. Leave at least four (4) inches of snow to protect the road.

6. Restore any damage resulting from snow removal in a timely manner.

7. Ensure that snow plowing is conducted in accordance with the traffic control plan required under clause II.C.

The holder shall not:

8. Undercut constructed slopes or remove gravel or other surfacing material from the road surface.

9. Leave snow berms on the road surface. Berms on the shoulder of the road shall be removed or drainage holes shall be opened and maintained. Drainage holes shall be spaced as necessary to obtain satisfactory surface drainage without discharge on erodible fills.

10. Use equipment with cleats or other tracks to plow snow without prior written approval of the responsible official.

V. RIGHTS AND LIABILITIES

A. LEGAL EFFECT OF THE PERMIT. This permit, which is revocable and terminable, is a federal license. This permit does not constitute a contract or lease for purposes of the Contract Disputes Act, 41 U.S.C. 601. This permit is not real property, does not convey any interest in real property, and may not be used as collateral for a loan.

B. VALID OUTSTANDING RIGHTS. This permit is subject to all valid outstanding rights.

C. ABSENCE OF THIRD-PARTY BENEFICIARY RIGHTS. The parties to this permit do not intend to confer any rights on any third party as a beneficiary under this permit.

D. RISK OF LOSS. The holder assumes all risk of loss associated with use of the roads authorized by this permit, including but not limited to theft, vandalism, fire and any fire-fighting activities (including prescribed burns), avalanches, rising waters, winds, falling limbs or trees, and acts of God.

E. DAMAGE TO UNITED STATES PROPERTY. The holder has an affirmative duty to protect from damage the land, property, and other interests of the United States. Damage includes but is not limited to fire suppression costs, damage to government improvements covered by this permit, and all costs and damages associated with or resulting from the release or threatened release of a hazardous material occurring during or as a result of activities of the holder or the holder's heirs, assigns, agents, employees, contractors, or lessees on, or related to, the lands, property, and other interests covered by this permit. For purposes of this clause, "hazardous material" shall mean any hazardous substance, pollutant, contaminant, hazardous waste, oil, and/or petroleum product, as those terms are defined under any federal, state, or local law or regulation.

1. The holder shall avoid damaging or contaminating the environment, including but not limited to the soil, vegetation (such as trees, shrubs, and grass), surface water, and groundwater, while conducting commercial hauling under this permit. If the environment or any government property covered by this permit becomes damaged during the holder's use under this permit, the holder shall immediately repair the damage or replace the damaged items to the satisfaction of the responsible official and at no expense to the United States.

2. The holder shall be liable for all injury, loss, or damage, including fire suppression, or other costs in connection with rehabilitation or restoration of natural resources associated with the use authorized by this permit. Compensation shall include but not be limited to the value of resources damaged or destroyed, the costs of restoration, cleanup, or other mitigation, fire suppression or other types of abatement costs, and all administrative, legal (including attorney's fees), and other costs. Such costs may be deducted from a performance bond required under clause IV.D.

3. The holder shall be liable for damage caused by use of the holder or the holder's heirs, assigns, agents, employees, contractors, or lessees to all roads and trails of the United States to the same extent as provided under clause VI.E.1.

F. HEALTH, SAFETY, AND ENVIRONMENTAL PROTECTION. The holder shall promptly abate as completely as possible and in compliance with all applicable laws and regulations any activity or condition arising out of or relating to use of the roads authorized by this permit that causes or threatens to cause a hazard to public health or the safety of the holder's employees or agents or harm to the environment (including areas of vegetation or timber, fish or other wildlife populations, their habitats, or any other natural resources). The holder shall immediately notify the responsible official of all traffic accidents and any other serious accidents that occur in connection with the authorized use. The responsibility to protect the health and safety of all persons affected by use of the roads authorized by this permit is solely that of the holder. The Forest Service has no duty under the terms of this permit to inspect the roads authorized by this permit or authorized activities of the holder for hazardous conditions or compliance with health and safety standards.

G. COMPLIANCE WITH ENVIRONMENTAL LAWS. The holder shall in connection with use of the roads authorized by this permit comply with all applicable federal, state, and local environmental laws and regulations, including but not limited to those established pursuant to the Resource Conservation and Recovery Act, as amended, 42 U.S.C. 6901 *et seq.*, the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 *et seq.*, the Oil Pollution Act, as amended, 33 U.S.C. 2701 *et seq.*, the Clean Air Act, as amended, 42 U.S.C. 7401 *et seq.*, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, 42 U.S.C. 9601 *et seq.*, the Toxic Substances Control Act, as amended, 15 U.S.C. 2601 *et seq.*, the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, 7 U.S.C. 136 *et seq.*, and the Safe Drinking Water Act, as amended, 42 U.S.C. 300f *et seq*.

H. INDEMNIFICATION OF THE UNITED STATES. The holder shall indemnify, defend, and hold harmless the United States for any costs, damages, claims, liabilities, and judgments arising from past, present, and future acts or omissions of the holder or the holder's employees, contractors, or subcontractors in connection with use of the roads authorized by this permit. This indemnification provision includes but is not limited to acts and omissions of the holder or the holder's heirs, assigns, agents, employees, or contractors in connection with use of the roads authorized by this permit which result in (1) violations of any laws and regulations which are now or which may in the future become applicable, and including but not limited to those environmental laws listed in clause V.G of this permit; (2) judgments, claims, demands, penalties, or fees assessed against the United States; (3) costs, expenses, and damages incurred by the United States; or (4) the release or threatened release of any solid waste, hazardous waste, hazardous substance, pollutant, contaminant, oil in any form, or petroleum product into the environment. The responsible official may prescribe terms that allow the holder to replace, repair, restore, or otherwise undertake necessary curative actions to mitigate damages in addition to or as an alternative to monetary indemnification.

I. INSURANCE

1. The holder or the holder's employees, contractors, or subcontractors shall have in force automobile insurance covering losses associated with the use authorized by this permit in at least the amount of $150,000 for injury or death to one person, $300,000 for injury or death to two or more persons, and $600,000 for property damage. Minimum amounts of coverage and other insurance requirements are subject to change at the sole discretion of the responsible official on the anniversary date of this permit.

2. Any insurance policies obtained by the holder pursuant to this clause shall name the United States as an additional insured, and the additional insured provision shall provide for insurance coverage for the United States as required under clause VI.I. The policies also shall specify that the insurance company shall give 30 days prior written notice to the responsible official of cancellation of or any modification to the policies.

3. The holder shall furnish proof of insurance, such as a certificate of insurance, to the responsible official prior to issuance of this permit and each year thereafter that this permit is in effect. The Forest Service reserves the right to review and approve the insurance policy prior to issuance. The holder shall send an

authenticated copy of any insurance policy obtained pursuant to clause VI.I to the responsible official immediately upon issuance of the policy. The certificate of insurance, the authenticated copy of the insurance policy, and written notice of cancellation or modification of insurance should be sent to [address of responsible official].

VI. REVOCATION, SUSPENSION, AND TERMINATION

A. REVOCATION AND SUSPENSION. The responsible official may revoke or suspend this permit in whole or in part for:

1. Noncompliance with federal, state, or local law.
2. Noncompliance with the terms of this permit.
3. Abandonment or other failure of the holder to exercise the privileges granted.

Prior to revocation or suspension, other than immediate suspension under clause VII.B, the responsible official shall give the holder written notice of the grounds for revocation or suspension and a reasonable time, typically not to exceed 90 days, to cure any noncompliance. Revocation or suspension of this permit shall not give rise to any claim for damages by the holder against the Forest Service.

B. IMMEDIATE SUSPENSION. The responsible official may immediately suspend this permit in whole or in part when necessary to protect public health or safety or the environment. The suspension decision shall be in writing.

C. TERMINATION. This permit shall terminate when by its terms a fixed or agreed upon condition, event, or time occurs without any action by the responsible official, such as expiration of the permit by its terms on a specified date or with the consent of the holder. Termination of this permit shall not give rise to any claim for damages by the holder against the Forest Service.

VII. MISCELLANEOUS PROVISIONS

A. MEMBERS OF CONGRESS. No member of or delegate to Congress or Resident Commissioner shall benefit from this permit either directly or indirectly, except to the extent the authorized use provides a general benefit to a corporation.

B. CURRENT ADDRESSES. The holder and the responsible official shall keep each other informed of current mailing addresses, including those necessary for payment of the holder's commensurate or investment share.

C. SUPERIOR CLAUSES. If there is a conflict between any of the preceding printed clauses and any of the following clauses, the preceding printed clauses shall control.

THIS PERMIT IS ACCEPTED SUBJECT TO ALL ITS TERMS AND CONDITIONS.

BEFORE ANY PERMIT IS ISSUED TO AN ENTITY, DOCUMENTATION MUST BE PROVIDED TO THE RESPONSIBLE OFFICIAL OF THE AUTHORITY OF THE SIGNATORY FOR THE ENTITY TO BIND IT TO THE TERMS AND CONDITIONS OF THE PERMIT.

ACCEPTED:

FRANK KUGEL, GENERAL MANAGER Upper Gunnison River Water Conservancy District	SIGNATURE	8/31/17 DATE

APPROVED:

MATTHEW MCCOMBS District Ranger	SIGNATURE	8/31/17 DATE

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0596-0016. The time required to complete this information collection is estimated to have no associated burden per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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To file a discrimination complaint write USDA, Director, Office of Civil Rights, 1400 Independence Avenue, SW, Washington, DC 20250-9410 or call (800) 975-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

The Privacy Act of 1974 (5 U.S.C. 552a) and the Freedom of Information Act (5 U.S.C. 552) govern the confidentiality to be provided for information received by the Forest Service.

Appendix A. Annual Operating Plan

1. Date the use authorized by this permit will commence: August 31, 2017
2. Duration and extent of the use: One year
3. Products that will be hauled: construction equipment (excavators, bobcats, loaders), ATVs, trailers, screening bucket, campers, portable toilet, trucks and passenger cars, 4000 linear feet (approx. 205 pieces) of 30" plastic pipe, other materials to support a pipeline project.
4. Traffic control plan: to be provided
5. Holder's contractor:

   Hal Hearne
   Hearne Excavating Incorporated
   1641 County Road 771
   Ohio City, CO 81237
   (970) 641-5845
   (970) 209-7848

6. Mitigation Measures:
   A. Control noxious weeds by washing all equipment before it enters NFS land.
   B. Be approved for any tree cutting and haul trees either to Rainbow Lake or off of NFS land.
   C. Provide and use portable toilet
   D. Use NRCS seed mixture or that provided by the Gunnison Ranger District (contact Matt Vasquez) and seed prior to winter shut-down.
   E. Remove all construction equipment and debris to appropriate disposal sites off of NFS land.
   F. Lay down plywood for excavator passage to minimize vegetation disturbance and soil compaction.

Appendix B. Maintenance Requirements

MAINTENANCE LEVEL 3

Minimum conditions are provided for passenger car use. Surface to provide moderately convenient travel at prudent driving speeds between 15 and 25 mph with corresponding surface roughness tolerated. The surface meets the following conditions:

1. Potholes or washboard in wheel tracks normally do not exceed 2 inches in depth, and should not be of such frequency that traffic tends to widen traveled way to avoid the deformities.
2. Surface is drained and substantially retains its cross slope or crown.
3. A maximum of 2 inches of rutting will be allowed on existing graveled roads. Wheel ruts caused by use on native surface shall not be in excess of 3 inches.

This level is assigned to roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities. Roads at this maintenance level are typically low speed, single lane with turnouts and spot surfacing. Some roads may be fully surfaced with either native or processed material. Appropriate traffic management strategies are either "accept" or "encourage". "Discourage" or "prohibit" strategies may be employed for certain classes of vehicles or users at certain times.

The following maintenance requirements should be met:

1. **General Activities**: As needed

2. **Traveled Way Activities**: Maintain surface to provide for travel by a prudent driver in a standard passenger car. Some surface roughness is tolerated. User comfort and convenience are low priorities. Maintain traveled-way crown or cross slope to provide adequate drainage. Replace base course and surfacing as needed.

3. **Shoulder Activities**: Maintain existing shoulder commensurate with traveled way.

4. **Drainage Activities**: As necessary to keep drainage facilities functional and prevent unacceptable environmental damage.

5. **Roadway Activities**: Maintain existing vegetative cover. Control vegetation to provide sight distance. Repair and/or remove slides and slumps to provide passage by a prudent driver in a standard passenger car.

6. **Roadside Activities**: Remove hazard trees and clean up litter.

7. **Structure Activities**: Maintain all structures to provide for passage of planned traffic and to preserve structure for future use. Defer non-critical items and combine to provide for a more economical project. For example, maintain defective bridge rails, running planks, and bridge guide posts on a current basis. Defer painting of bridge rails to a logical project cycle.

8. **Traffic Service Activities**: Install and maintain route markers, warning, regulatory, and guide signs, and other traffic-control devices to provide for planned traffic.

MAINTENANCE STANDARD FOR MAINTENANCE LEVEL 3

DESCRIPTION

This level is used on roads, which are opened for public traffic, and generally applies when traffic volumes are low to moderate. Smoothness of the ride is not an overriding consideration; however, provide for user safety at design speed.

OBJECTIVE

Surface blading is necessary to provide moderately convenient passenger car travel; however, surface roughness is tolerated and spot blading may be sufficient except when traveled way crown or cross-slope needs to be maintained prior to the runoff season.

GENERAL MAINTENANCE REQUIREMENTS

Road maintenance will generally consist of:

1. Vegetative cover maintained.
2. Logging out and debris removed.
3. Brushing as required for safe sight distance.
4. Roadbed stable and maintained as constructed.
5. Slumps and gullying repaired.
6. Unsightly materials removed.
7. All structures repaired and maintained as needed for safe passage of the road users. Example: Bridges would be maintained for such items as defective bridge rails, running plank, and bridge guideposts.
8. Route, warning, directional, informational, regulatory, and other traffic control devices are in place, neat in appearance, and functional.

Bridges, bridge rails, cattleguards, fences, and trash racks are maintained to meet safety requirements. Materials resulting from work under this section are not to remain on or in structures, such as bridges, culverts, cattleguards, or drainage dips.

Maintain existing shoulders during blading operations.

Drainage structures are to meet safety requirements and pass design flows. Specific consideration is given to the disposal of materials excavated and the erosion potential caused. Specific disposal areas will be provided.

The blading pattern is to retain the surfacing on the roadbed and provide a thorough mixing of the entire surfaced area. The finished surface, including transitions between different cross sections, is to be a uniform driving surface. Upon final blading, no rock or debris is to protrude more than two inches above the surface. Material projecting more than two inches is to be removed and placed outside the roadbed so as not to obstruct drainage ways or structures.

Surfaced roads are normally crowned or cross-sloped as indicated by the existing surface to between one-fourth inch per foot and one-half inch per foot (2-4%).

Roads listed as one lane shall have a surface width of twelve feet or more, but no wider than sixteen feet,

exclusive of curve widening and turnouts. Turnouts are to have an additional surface width of ten feet and a length of fifty feet with fifty-foot tapers. Turnouts and turnout tapers should be uniformly maintained.

Roads listed as two lane shall have a surface width in excess of twenty feet, but no wider than twenty-four feet, exclusive of curve widening.

Report to the supervisor any areas where minimum width or length cannot be provided. Where the available roadbed width is greater than required, use judgment to define the location within the available roadbed width or brushed area. Ditches one-foot deep sloped at three to five feet wide per foot of depth, and out sloping at six to ten feet wide per foot of depth, are the primary means of defining excess roadbed widths. Other means to define the roadbed are to be approved by the supervisor.

Roadbed width in excess of the previously stated requirements is shaped only as needed to provide drainage away from the traveled way. DO NOT remove established grasses and other vegetation from the excess width unless necessary to provide drainage.

Do not undercut road backslopes.

Scarification

The supervisor may require scarification to thoroughly loosen the entire road surface section. Unusable materials removed shall be disposed of outside of the roadbed, or at a waste site, so as not to obstruct drainage ways or structures. Compaction by watering and rolling may be required to stabilize the loose material.

INTERSECTIONS

At intersections, blade the roadbeds of side roads which are not closed or restricted to passenger car use to assure a smooth transition. Maintenance Level 1 or 2 roads are normally closed or restricted. Cross-ditching the road surface (traveled way), earth mounds, or other devices, are used on the roads to discourage use and indicate that the road is restricted. A small scratch ditch, not to exceed 4" in depth bladed across the Level 1 or 2 road, is used to indicate the lower maintenance levels for the traveler. The scratch ditch is located so as to not interfere with drainage nor create erosion.

Berms

Existing berms are repaired to the condition of adjacent sections. New berms shall not be created unless otherwise directed. Materials resulting from work under this section are not to remain on or in structures, such as bridges, culverts, cattleguards, or drainage dips.

DITCH MAINTENANCE

This section provides for routine cleaning of various types of drainage ditches to provide a waterway. Grass and weeds in ditches are to be preserved if not causing drainage problem.

Routine Ditch Maintenance

Selective, rather than routine maintenance of the ditch is preferred, in order to create minimal soil disturbance. Minor amounts of rock or debris are tolerated if no drainage problem is evident. Grass and weeds in ditches are to be preserved if not causing a drainage problem. Upon completion, the maintained ditch shall be of the same character as abutting segments that are not required to be maintained. Material removed from the ditch may be blended into existing native road surface and shoulder or placed in a designated berm. Do not contaminate aggregate surfaced roads with unsuitable ditch material. Excess

debris and vegetation shall be hauled to a designated disposal area.

Heeling back the ditch (using the heel of the moldboard to store accumulated ditch waste against the backslope) is an acceptable practice for clearing the ditch when small amounts of debris are present, but not enough to warrant pulling the ditch. Heeling is used to "spot clean" ditches, and should not result in a continuous windrow.

Backslopes shall not be undercut by removal operations. Leadoff ditches shall be cleaned and shaped to drain away from the travel way.

Limbs and wood chunks in excess of one foot in length and three inches in diameter shall be removed from the ditch and placed outside the roadway. Concentrations of any size material, which may block ditches or culverts, shall also be removed. Planned bafflers, such as ditch dams are an exception to this, and should be left intact.

DRAINAGE STRUCTURE MAINTENANCE

Drainage structures, inlet structures, culverts, catch basins, and outlet channels are cleaned as required.

The inlet and outlet channels, inlet trash racks, and drop inlets are cleaned of loose material that could cause plugging or prevent the free flow of water throughout the structure. Catch basins shall be cleaned by removing material within the area shown on the drawing, "Catch Basins and Transition Area". The transition from the ditchline to the catch basin shall be cleaned a distance of ten feet. Outlet channels and leadoff ditches shall be cleaned a distance of six feet or cleaned to drain. Debris and vegetation are removed and placed so as not to enter drain channels, obstruct traffic, or cause a road safety problem. Ordered haul of debris and vegetation to designated disposal areas is to be in accordance with the remove and end haul materials section or as directed.

Hydraulic flushing of drainage structures is not permitted unless specifically directed.

Reconditioning is limited to the first four feet of inlet and outlet determined along the top of the structure. Ordered reconditioning of culvert would normally be by field methods such as hydraulic jacking or cutting away damaged metal, which obstructs flow to insure proper functioning. All cut edges and damage to galvanized coatings is to be cleaned and treated with a zinc-rich coating. Damage, which cannot be field maintained, shall be reported.

CUTTING ROADSIDE VEGETATION

Brush and trees less than four inches in diameter within each area treated are cut to a maximum height of six inches above the ground surface. Each area treated is to be free of encroaching limbs to a height of 20 feet above the traveled way surface elevation, as shown on attached drawings.

Clearing is to commence at the bottom of the ditch or the backslope and continue upslope four feet horizontally, unless sight distance requires more brushing in areas of curves for safety.

Limbs should normally be cut to within two inches of the trunk to produce a reasonably smooth face; however, lopping a section of a branch is permitted, provided the portion within the treated area is eliminated and at least 1/3 of the green growth of the branch remains. Debris resulting from the cutting operation in excess of one foot in length or three inches in diameter is not to remain on roadway slopes, in ditches, or within water courses.

Limbs and chunks in excess of three inches in any dimension are to be removed from the traveled way and shoulders. Materials may be scattered downslope from the roadbed, outside of the work area, unless

otherwise directed. Scattering means that only the tips may overlap. Debris concentrations shall be reduced or removed.

MAINTENANCE OF CATTLEGUARDS

The area beneath the cattleguard deck is to be cleaned of dirt and other materials for the full depth. Cleaning includes removing material to permit water flow out of the installation.

Materials removed from beneath the cattleguard deck suitable for road surfacing should normally be placed on the road and shaped unless otherwise directed. Unsuitable materials are to be hauled to a disposal area.

Roadbed and surfacing materials that have been disturbed are to be conserved, placed, and compacted to provide consistent support and surface texture with the abutting traveled way.

Tighten any loose fasteners on the cattleguard and rigid gates. Ruptured welds shall be rewelded, and localized cracks welded or reported.

SIGN MAINTENANCE

Signs shall be maintained for safety. Work may be performed at the same time as blading or backhoe operations. Examples of work are: removing brush, straightening, tightening bolts, cleaning faces, etc. When scheduled, replace signs and posts when crews are working in the area.

Where the post is usable, but the sign is gone or requires replacement, the supervisor will be informed. Report sign deficiencies which cannot be immediately corrected.

SPOT SURFACING (AGGREGATE)

This work consists of maintaining surface aggregate in areas staked on the ground, or designated by the supervisor.

The prepared area to be spot-surfaced shall be thoroughly loosened by scarification and bladed prior to placement of aggregate. Mix the aggregate until a uniform material is obtained, prior to final shaping and compaction. Water is added as necessary for compaction. Spread the aggregate on the prepared area in layers no more than four inches in depth. When more than one layer is required, each layer shall be shaped and compacted before the succeeding layer is placed.

Compaction of prepared sub grade and finished surfacing is to be by one of the following methods:

A. Operating roller over entire width of each layer.
B. Operating, spreading and hauling equipment over entire width of each layer.

MAINTENANCE OF UNPAVED SHOULDERS

Existing shoulder material shall be bladed and shaped to drain. Established grass and weeds which do not affect drainage, site distance, or maintenance operations, shall not be disturbed. Small amounts of vegetative or other unsuitable materials may be bladed onto slopes adjacent to the roadbed unless otherwise directed. Final shaping is to provide a smooth transition to the traveled way and compacted with grader wheels if necessary.

REMOVE AND END HAUL MATERIALS

Work consists of removing and disposing of minor slides, slough, or other excess materials in designated disposal sites. This also includes loading, hauling, placing, and shaping disposal site to drain, and grass seeding for erosion control.

Remove and dispose of materials such as soil, rock, which encroaches on the roadbed and ditch, or extends four feet or more horizontally from the shoulder or ditch tine along the slopes. Also, remove and dispose of vegetation which interferes with sight distance. Haul slide, slough, and other excess materials to designated sites or use materials for road repairs and improvements unless otherwise approved.

The slope which generated the slide material is to be reshaped as practical by equipment operating from the road surface. Roadside ditches are also to be reshaped. All slide materials removed and placed in disposal sites are to be shaped to drain. Sites are to be built in such a manner that they can be used In the future as a disposal site unless otherwise directed. All raw soils and disturbed ground off the roadbed are to be seeded.

PREWORK PROCEDURES

1. Place safety devices and sign.
2. Make Job hazard analysis of work site.
3. Inspect equipment for proper adjustments and conditions.
4. Be sure you have the proper tools and equipment for the job.
5. Identify approved location for dumping excess material.

ELK HOME DITCH
24-INCH ADS/PVC CALCULATIONS
OCTOBER 13, 2014

RECOMMENDED MANNING'S "N" VALUES

n = 0.013 for used ADS/HDPE/PVC pipe

n = 0.011 for new ADS/HDPE/PVC pipe

n = 0.012 for concrete

n = .024 for CMP

Manning's Equation for pipe flow

Project	Trout Unlimited - Elk Home Ditch
County	Gunnison
Date	October 13, 2014

ID of pipe (in)

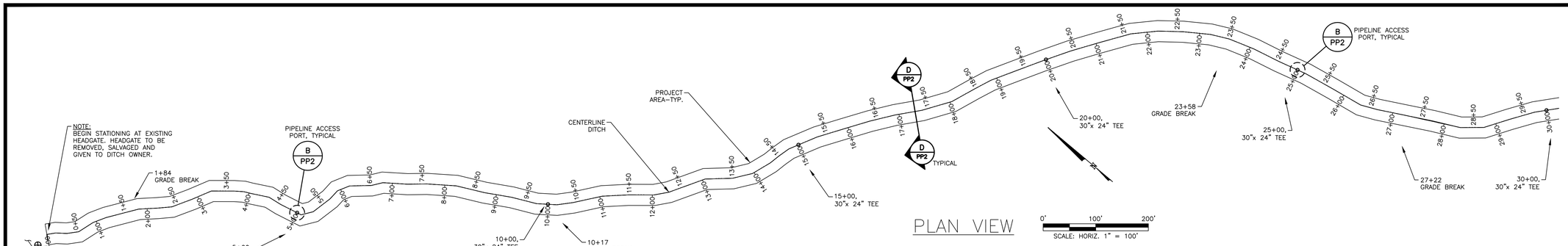
			Hydraulic			Diameter =	24.0		
Q (cfs)	**V (fps)**	**A (Sq. ft)**	**Radius r (ft)**	**% Full Pipe**	**S (%)**	**n**	**Q (gpm)**	**Q (MGD)**	**Comments**
21.28	7.45	2.86	0.90	0.75	**0.3500**	**0.011**	9550	**13.8**	

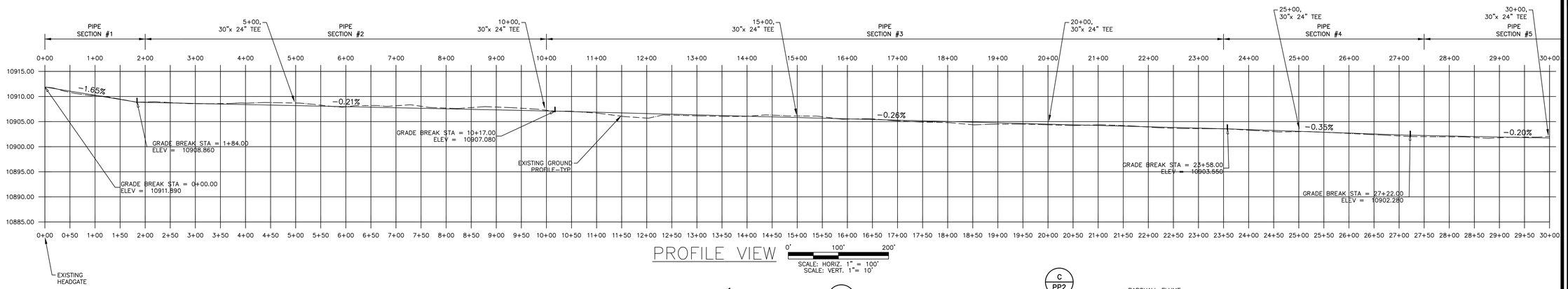
Q = VA

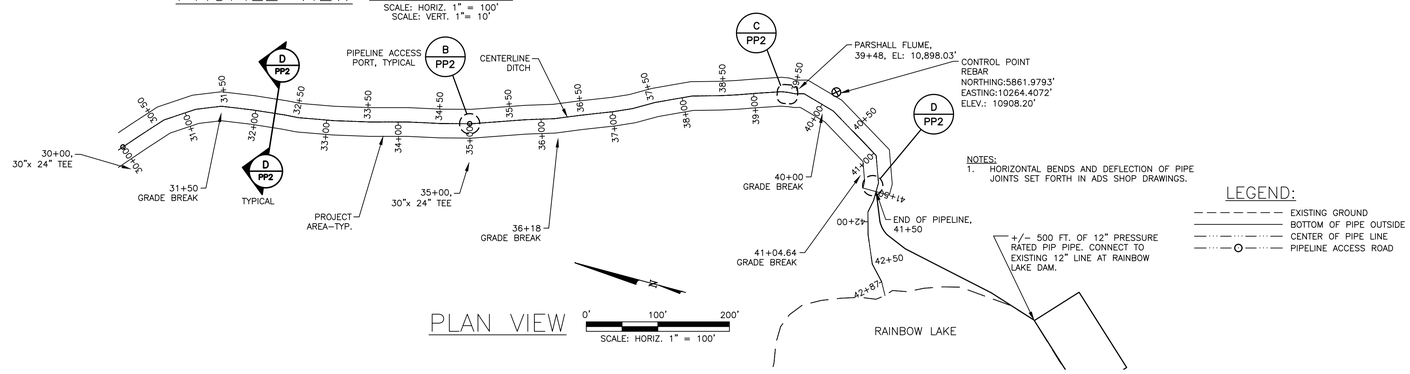
$V = (1.486/n)r^{2/3} S^{1/2}$

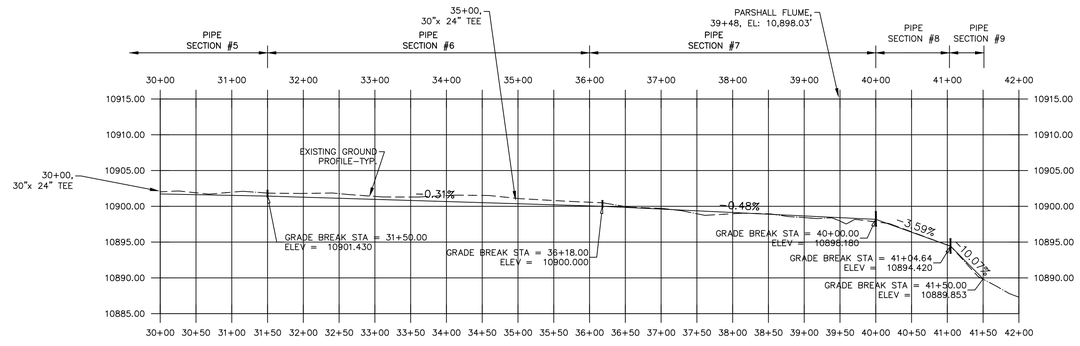
	Wetted
theta	**Perimeter**
4.71	4.71

User Defined Data









ELK HOME DITCH VERTICAL ALIGNMENT TABLE

PIPE #	Station	PVI Elev.	Pipe Slope
1	0+00.00	10911.890'	–1.65%
2	1+84.00	10908.860'	–0.21%
3	10+17.00	10907.080'	–0.26%
4	23+58.00	10903.550'	–0.35%
5	27+22.00	10902.280'	–0.20%
6	31+50.00	10901.430'	–0.31%
7	36+18.00	10900.000'	–0.48%
8	40+00.00	10898.180'	–3.59%
9	41+04.64	10894.420'	–10.07%
	41+50.00	10889.853'	(END)

ISSUED FOR CONSTRUCTION	5/23/17

WILLIAMS ENGINEERING L.L.C.
400 NORTH MAIN STREET
GUNNISON, COLORADO 81230
PH. (970) 641-2469
EMAIL: wenginee@frii.com

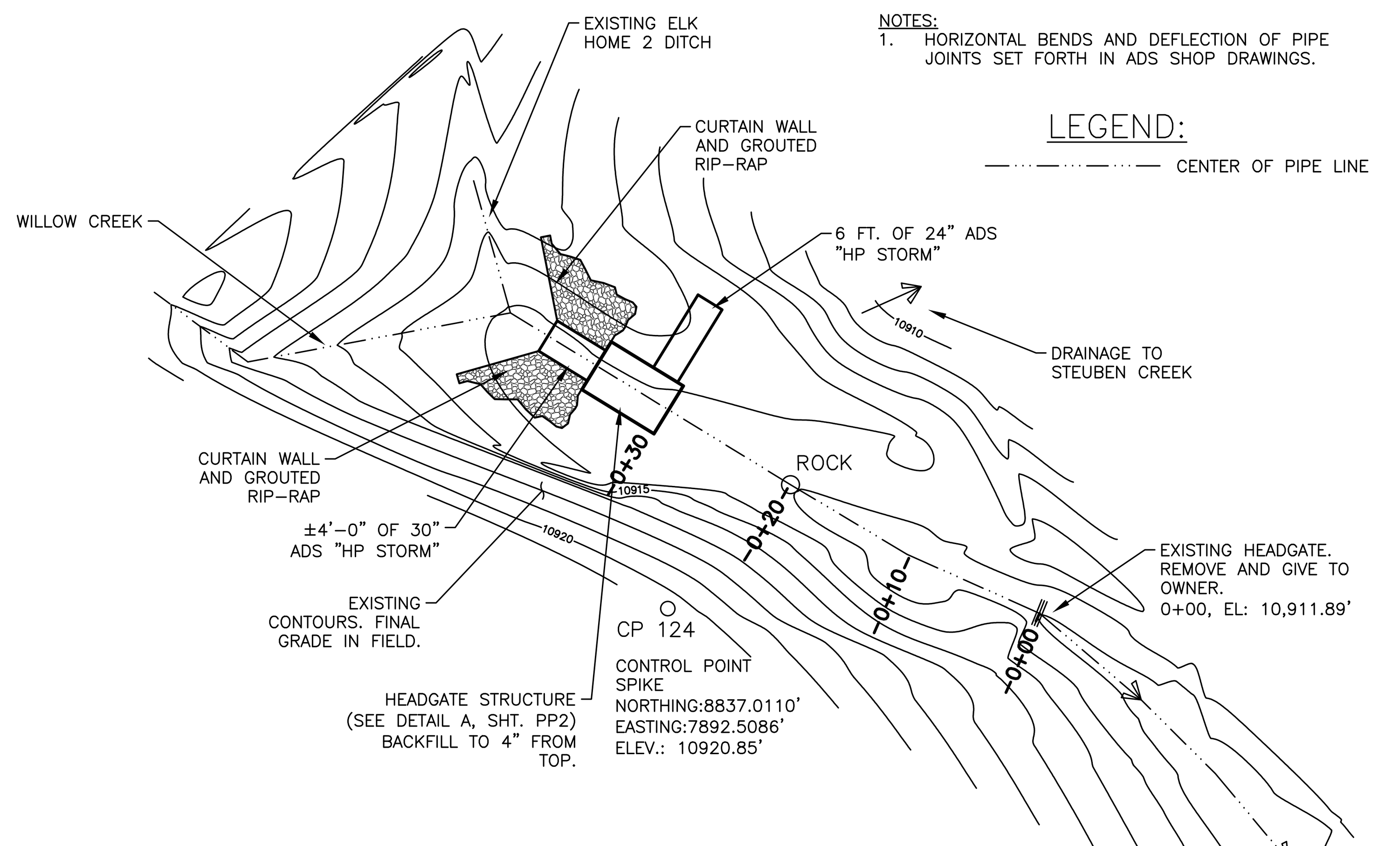
PLAN & PROFILE

ELK HOME DITCH
IMPROVEMENT PROJECT
ELK HOME DITCH OWNERS
GUNNISON COUNTY, COLORADO 81230

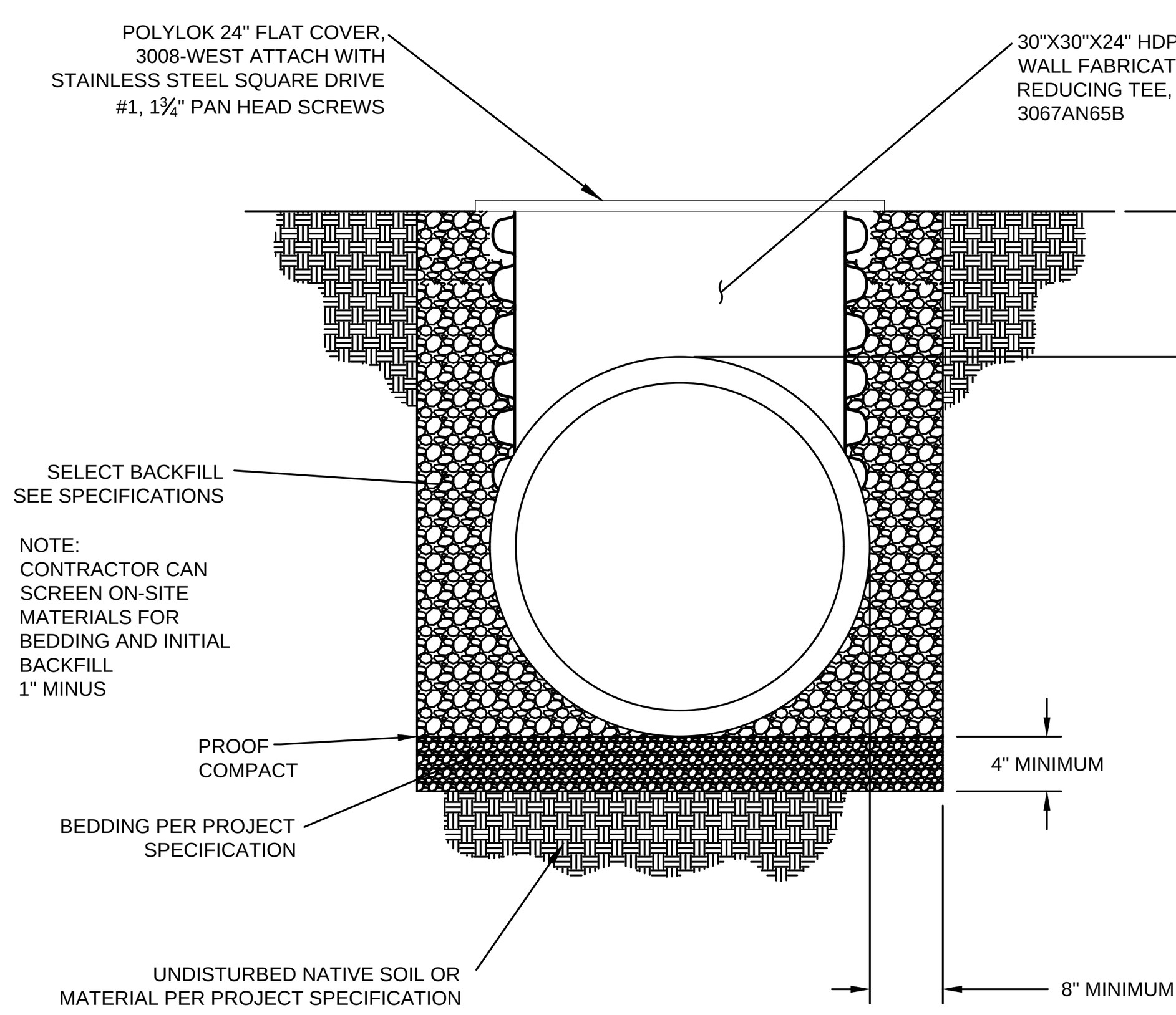
DRAWN BY: SLB/DWP
CHECKED BY: RLW
SCALE: AS NOTED
MOST CURRENT DATE: 5/23/17
JOB NO. 2492
SHEET: PP1

ENGINEER'S STAMP

NOTES:
1. HORIZONTAL BENDS AND DEFLECTION OF PIPE JOINTS SET FORTH IN ADS SHOP DRAWINGS.



PLAN VIEW

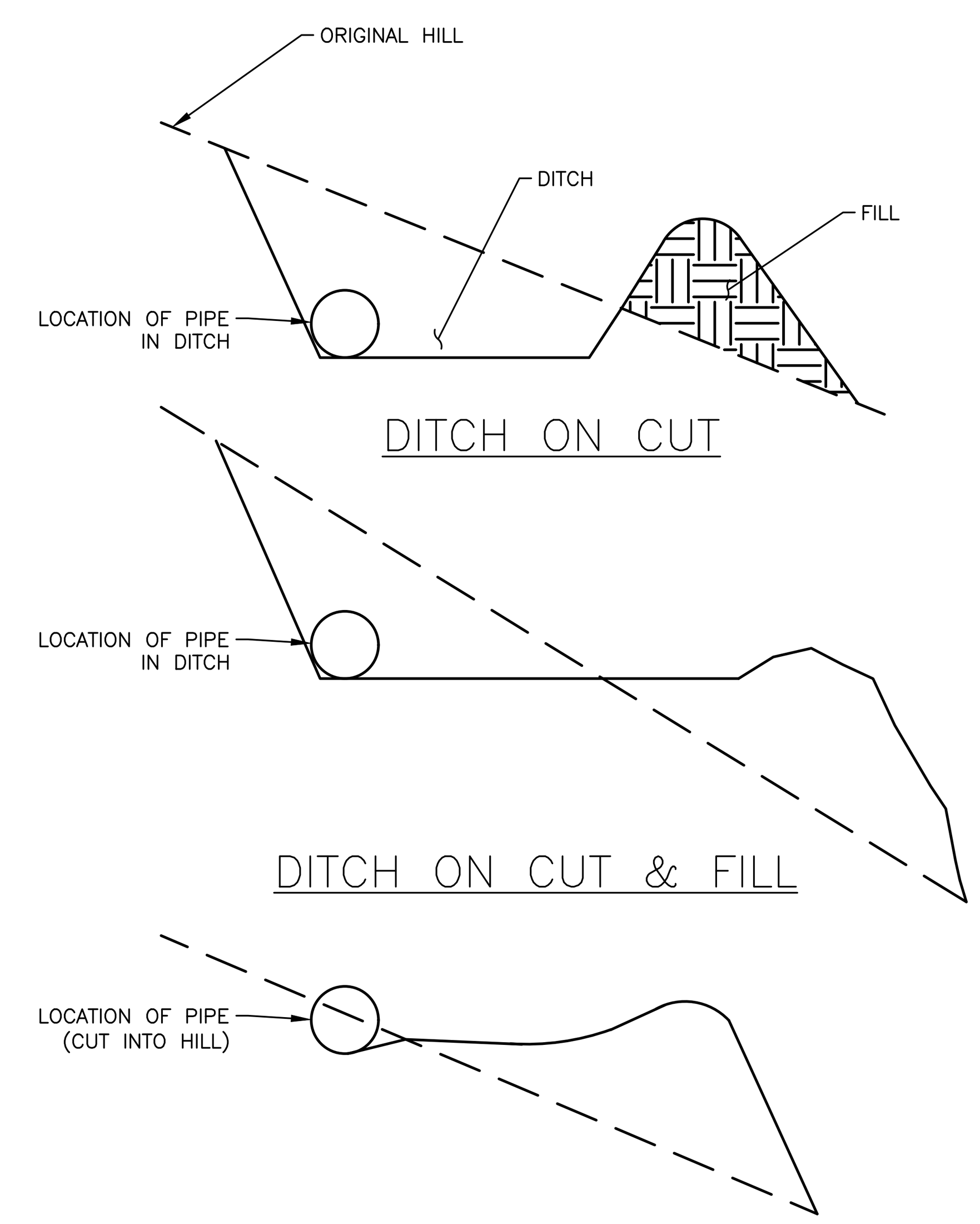


DETAIL-B PIPELINE ACCESS PORT

SCALE: N.T.S

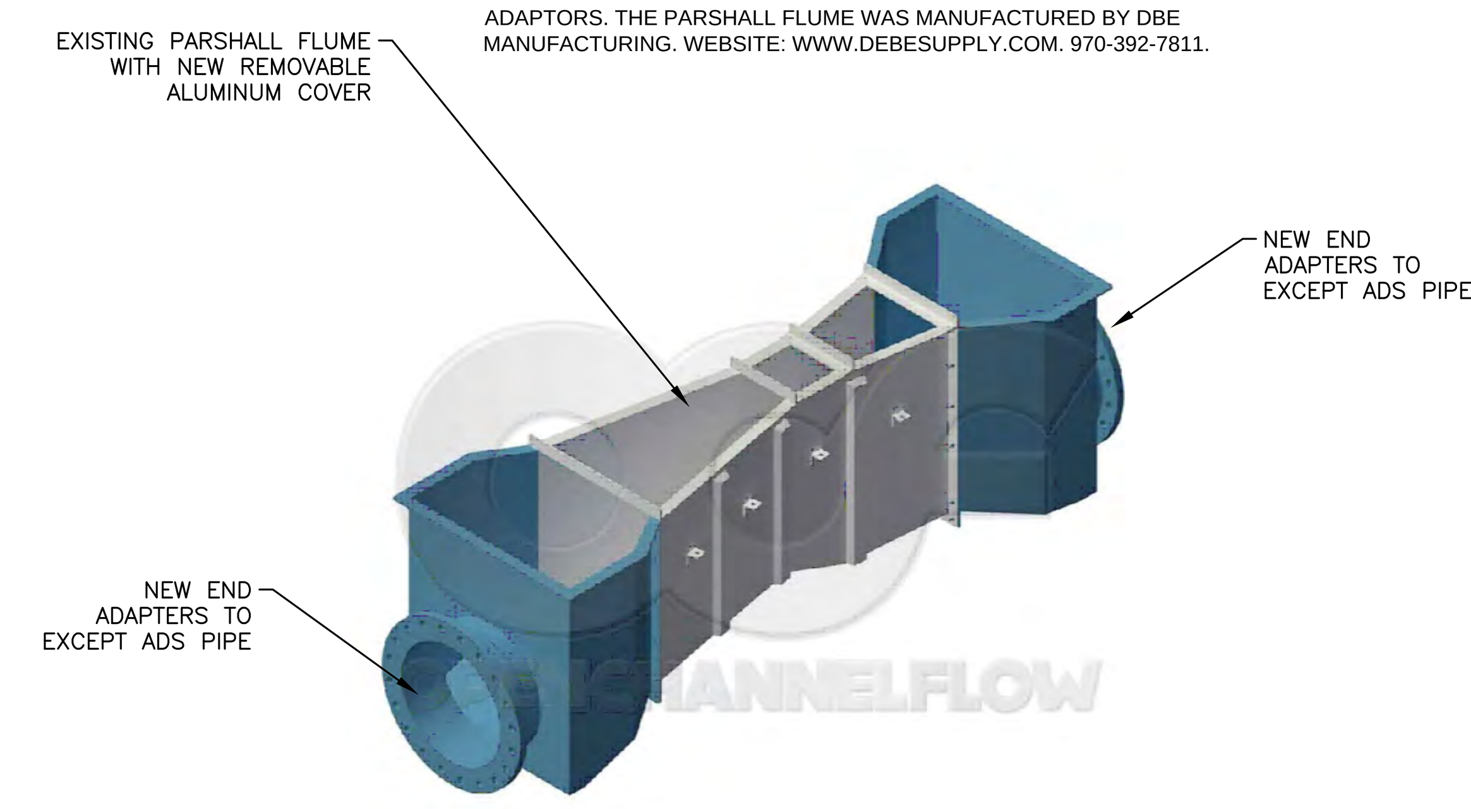
SOIL CLASSIFICATION BASED ON ASTM D2487 AND D2321

CLASS I - CRUSHED ROCK,SLAG, AND/OR CORAL
CLASS II - GRAVEL AND/OR SANDS, WITH LITTLE OR NO FINES
CLASS III - SAND/SILT AND SAND/CLAY MIXTURES
CLASS IV - INORGANIC CLAYS
CLASS V - ORGANIC SILTS, CLAYS, AND PEATS



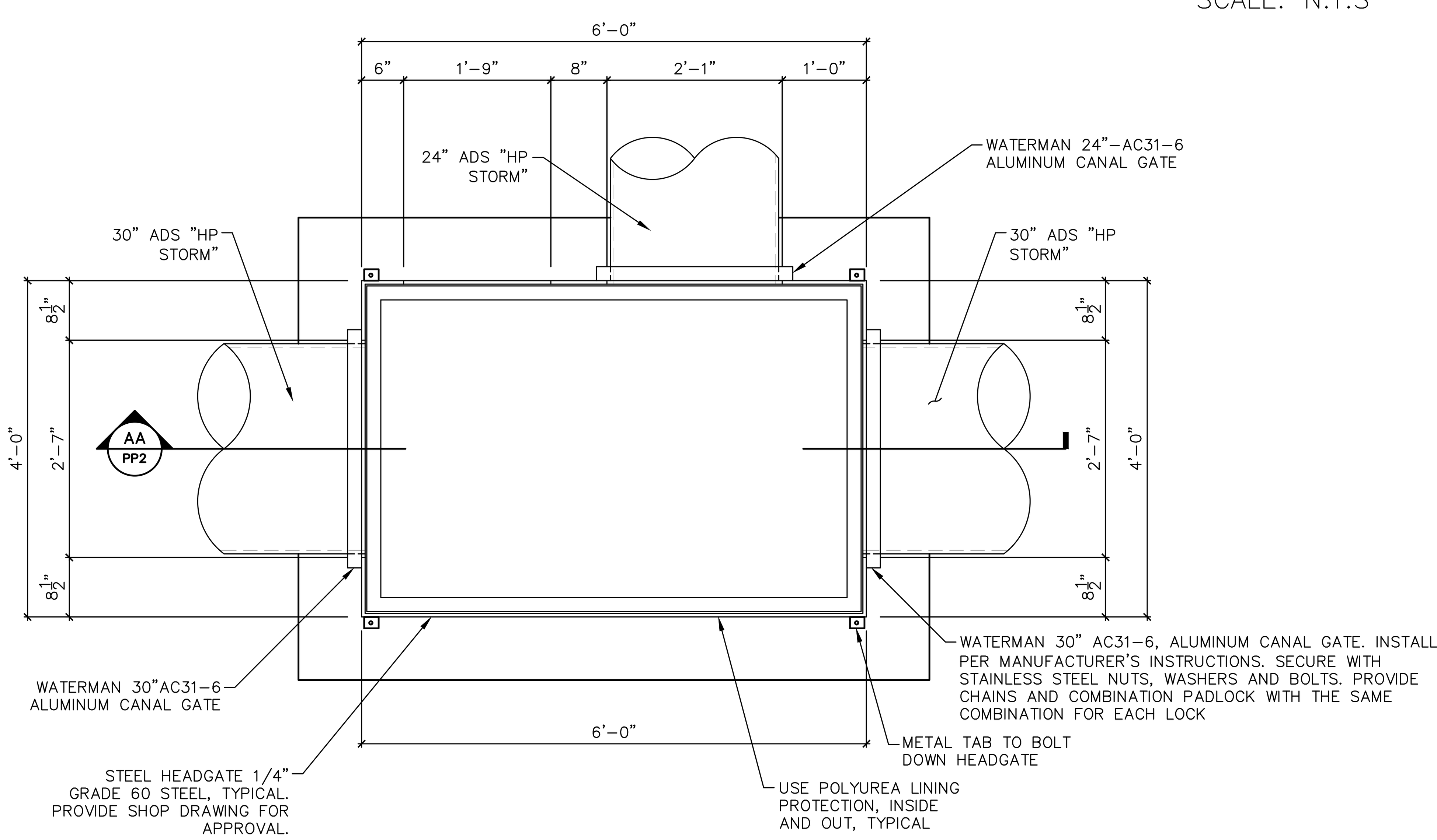
TYPICAL DITCH SECTION

THE PARSHALL FLUME SHALL REMAIN IN PLACE AND ADAPTORS INSTALLED TO CONNECT THE 30" ADS PIPE AND METAL COVER WITH REINFORCING INSTALLED ON TOP OF FLUME (METAL COVER TO BE COATED WITH POLYUREA PER SPECIFICATIONS AN DETAIL A). CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR COVER AND END ADAPTORS. THE PARSHALL FLUME WAS MANUFACTURED BY DBE MANUFACTURING. WEBSITE: WWW.DEBESUPPLY.COM. 970-392-7811.



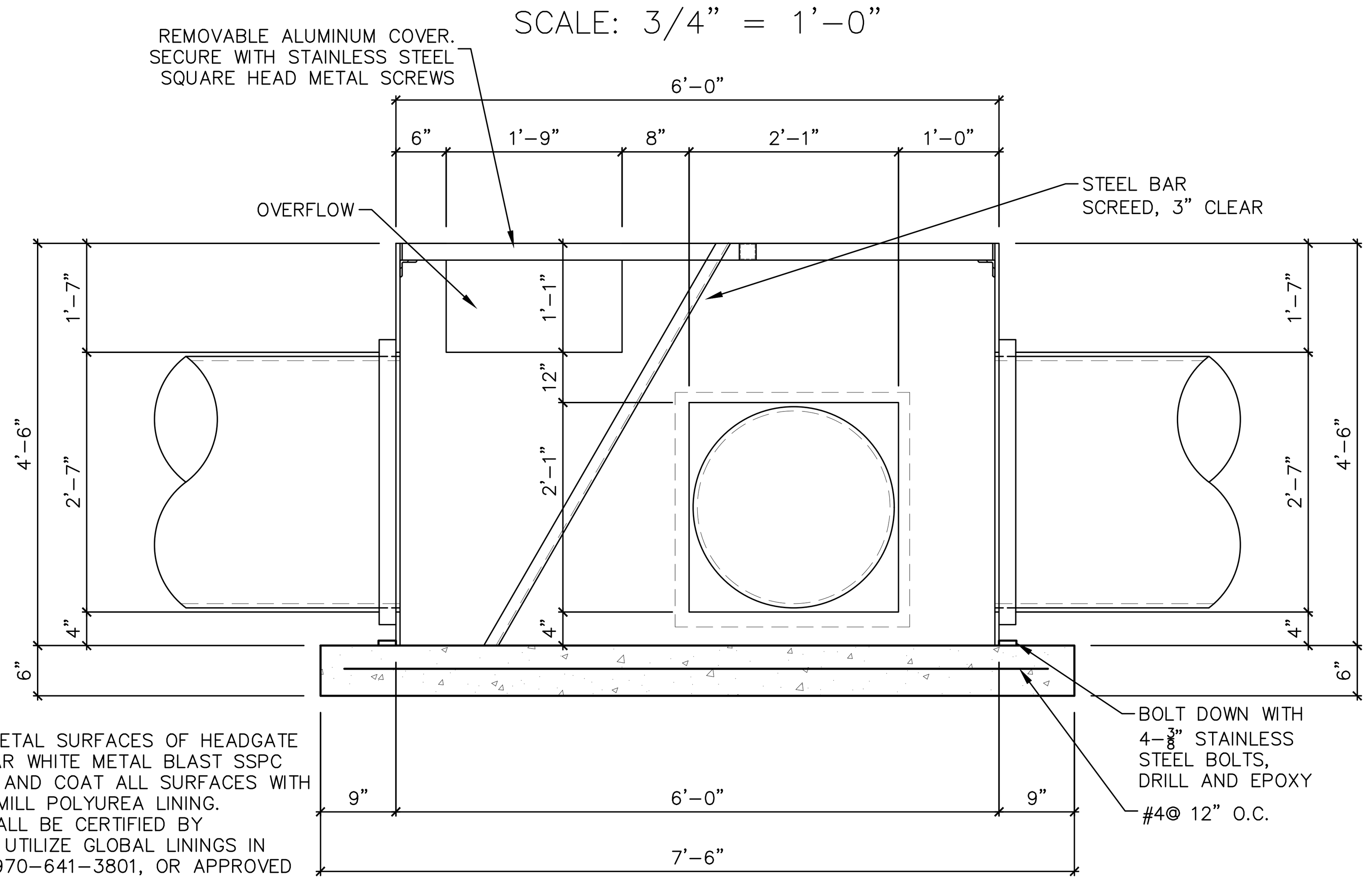
DETAIL-C PARSHALL FLUME/END ADAPTERS

SCALE: N.T.S



DETAIL-A HEADGATE

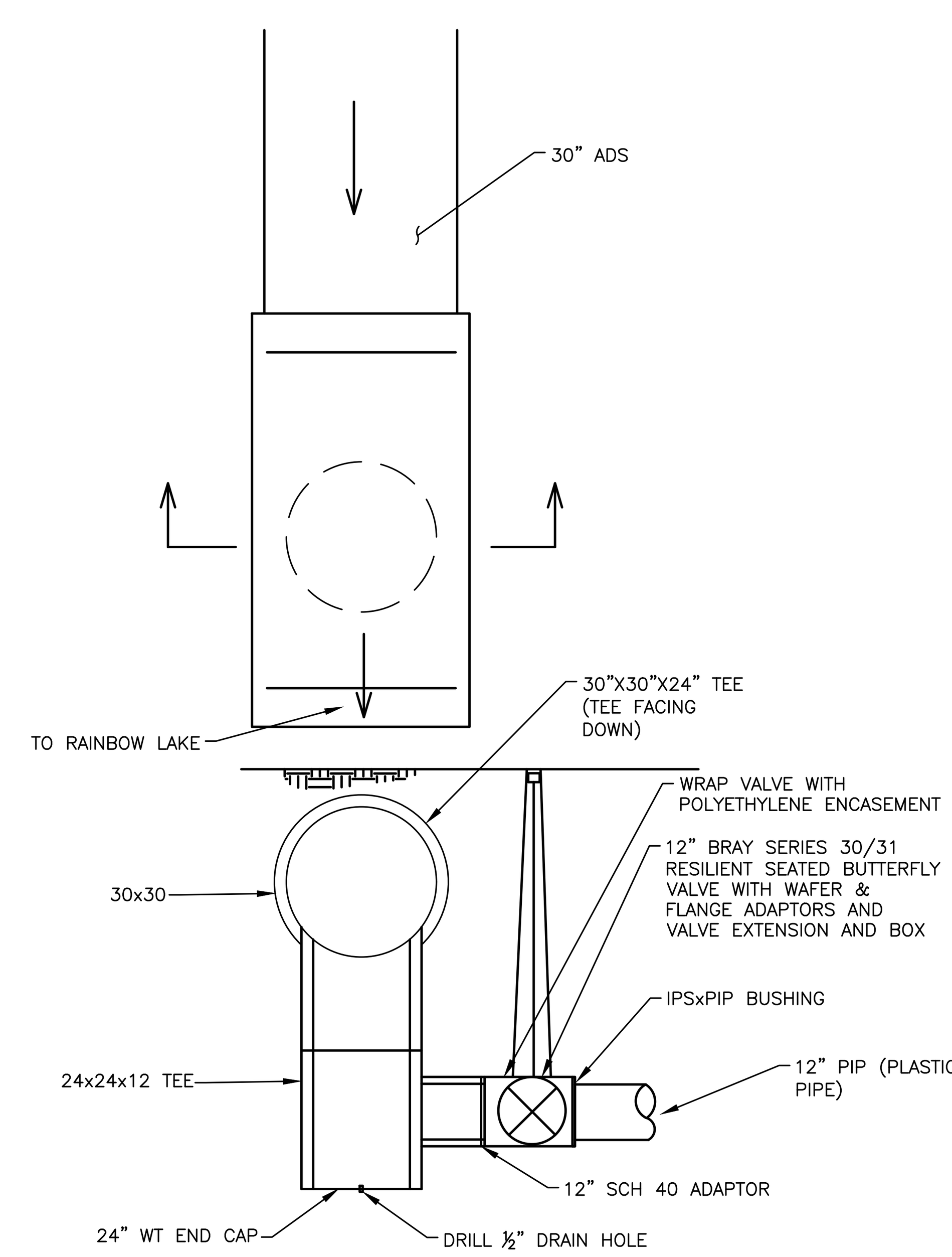
SCALE: 3/4" = 1'-0"



PREPARE ALL METAL SURFACES OF HEADGATE UTILIZING A NEAR WHITE METAL BLAST SSPC STANDARD ST1, AND COAT ALL SURFACES WITH AN 80 TO 125 MILL POLYUREA LINING. APPLICATOR SHALL BE CERTIFIED BY MANUFACTURER UTILIZE GLOBAL LININGS IN GUNNISON, CO 970-641-3801, OR APPROVED EQUAL.

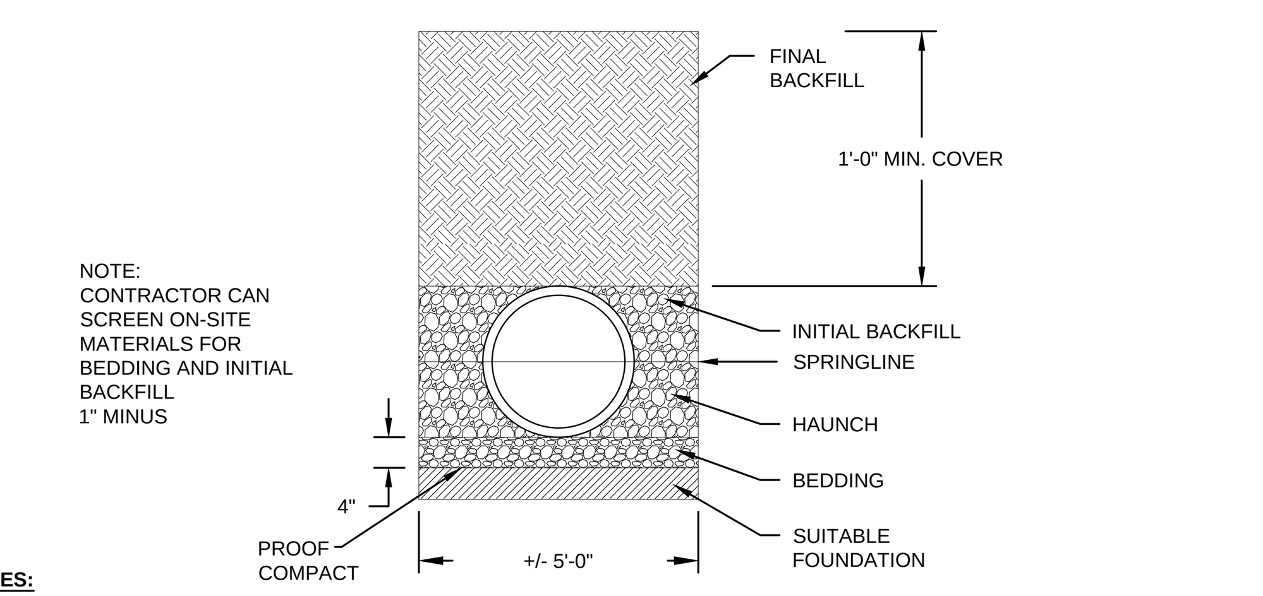
DETAIL SECTION-AA

SCALE: 3/4" = 1'-0"



DETAIL-D RAINBOW LAKE BYPASS ASSEMBLY

SCALE: N.T.S



NOTES:

1. ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST ADDITION, WITH THE EXCEPTION THAT THE INITIAL BACKFILL MAY EXTEND TO THE CROWN OF THE PIPE. SOIL CLASSIFICATIONS ARE PER THE LATEST VERSION OF ASTM D2321. CLASS IVB MATERIALS (MH, CH) AS DEFINED IN PREVIOUS VERSION OF ASTM D2321 ARE NOT APPROPRIATE BACKFILL MATERIALS.
2. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED.
3. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.
4. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I, II, III OR IV. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. COMPACTION SHALL BE SPECIFIED BY THE ENGINEER IN ACCORDANCE WITH TABLE 3 FOR THE APPLICABLE FILL HEIGHTS LISTED. UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" (100 mm) FOR 4-24" (100-600 mm); 6" (150 mm) FOR 30-60" (750-900 mm) DIAMETER PIPE. THE MIDDLE 1/3 BENEATH THE PIPE INVERT SHALL BE LOOSELY PLACED. PLEASE NOTE CLASS IV MATERIAL HAS LIMITED APPLICATION AND CAN BE DIFFICULT TO PLACE AND COMPACT; USE ONLY WITH THE APPROVAL OF A SOIL EXPERT.
5. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I, II, III OR IV IN THE PIPE ZONE EXTENDING TO THE CROWN OF THE PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION. COMPACTION SHALL BE SPECIFIED BY THE ENGINEER IN ACCORDANCE WITH TABLE 3 FOR THE APPLICABLE FILL HEIGHTS LISTED. PLEASE NOTE, CLASS IV MATERIAL HAS LIMITED APPLICATION AND CAN BE DIFFICULT TO PLACE AND COMPACT; USE ONLY WITH THE APPROVAL OF A SOIL EXPERT.
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DETAIL-E HP STORM TYPICAL TRENCH DETAIL

SCALE: N.T.S

ISSUED FOR CONSTRUCTION 5/23/17

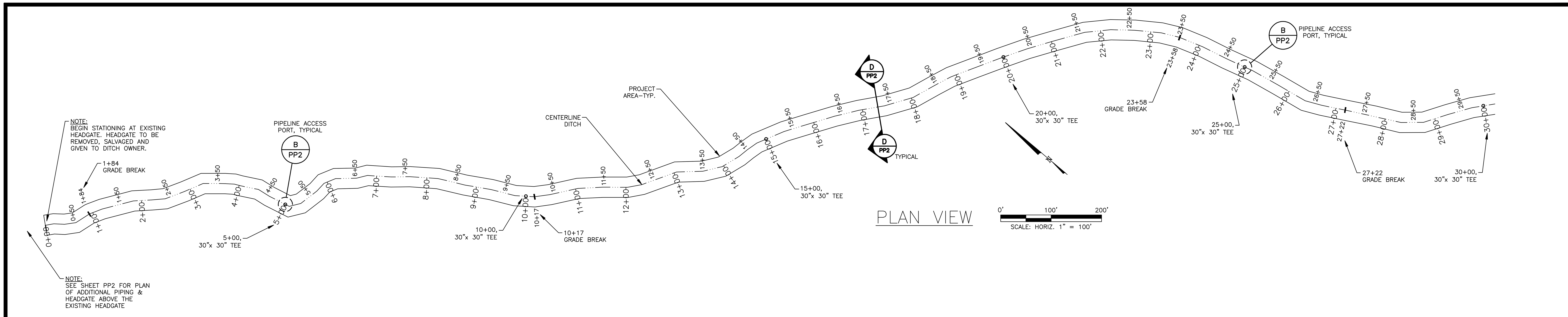
WILLIAMS ENGINEERING L.L.C.
400 NORTH MAIN STREET
GUNNISON COLORADO 81230
PH. (970) 641-2499
EMAIL: wengineer@msn.com

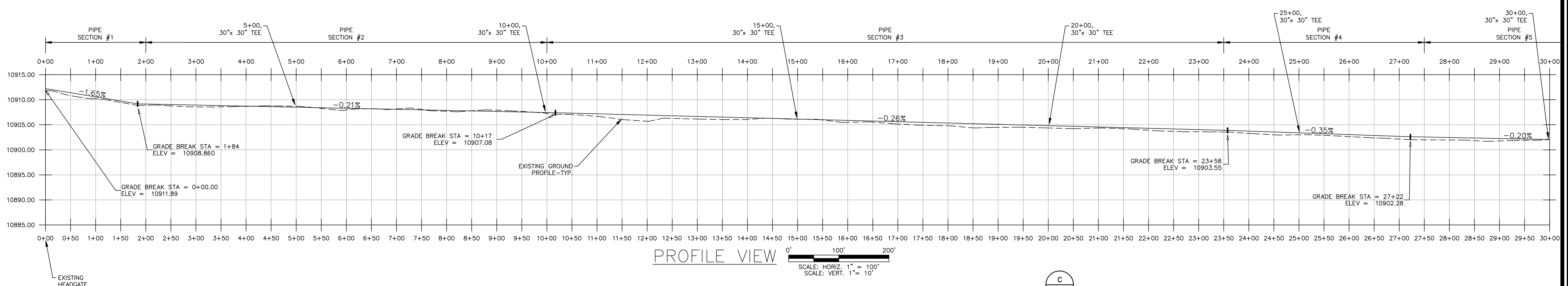
ADDITIONAL PLAN AND DETAILS

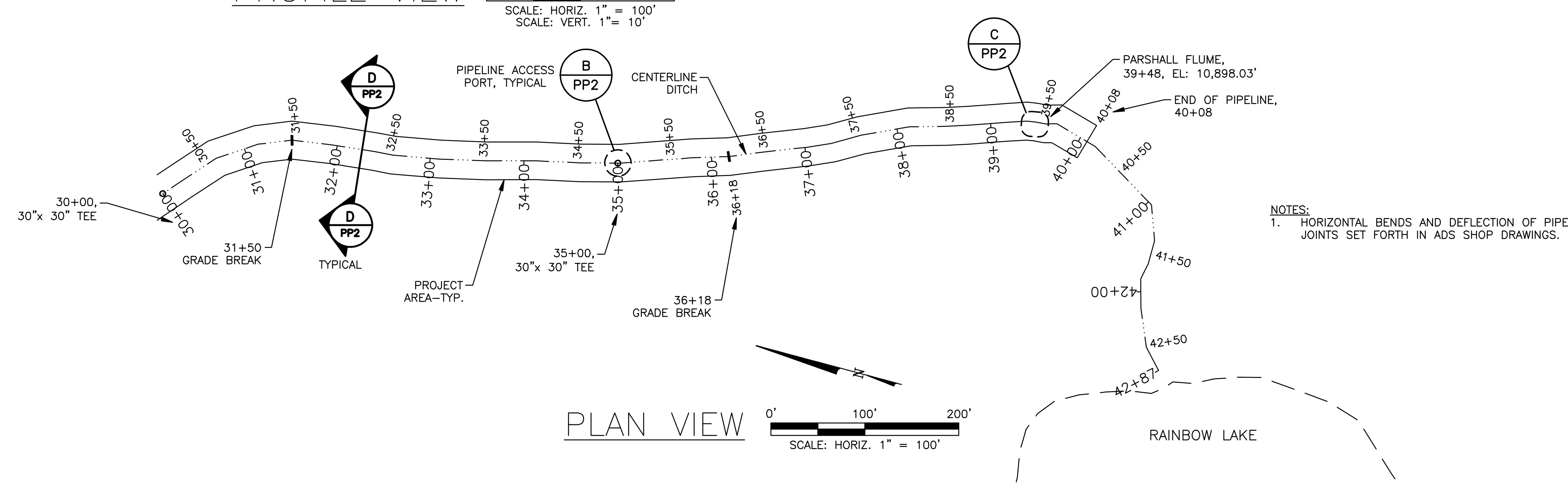
ELK HOME DITCH
IMPROVEMENT PROJECT
ELK HOME DITCH OWNERS
GUNNISON COUNTY, COLORADO 81230

DRAWN BY: SLB/DWP
CHECKED BY: RLW
SCALE: AS NOTED
MOST CURRENT DATE: 5/23/17
JOB NO. 2492
SHEET: PP2

ENGINEERS STAMP



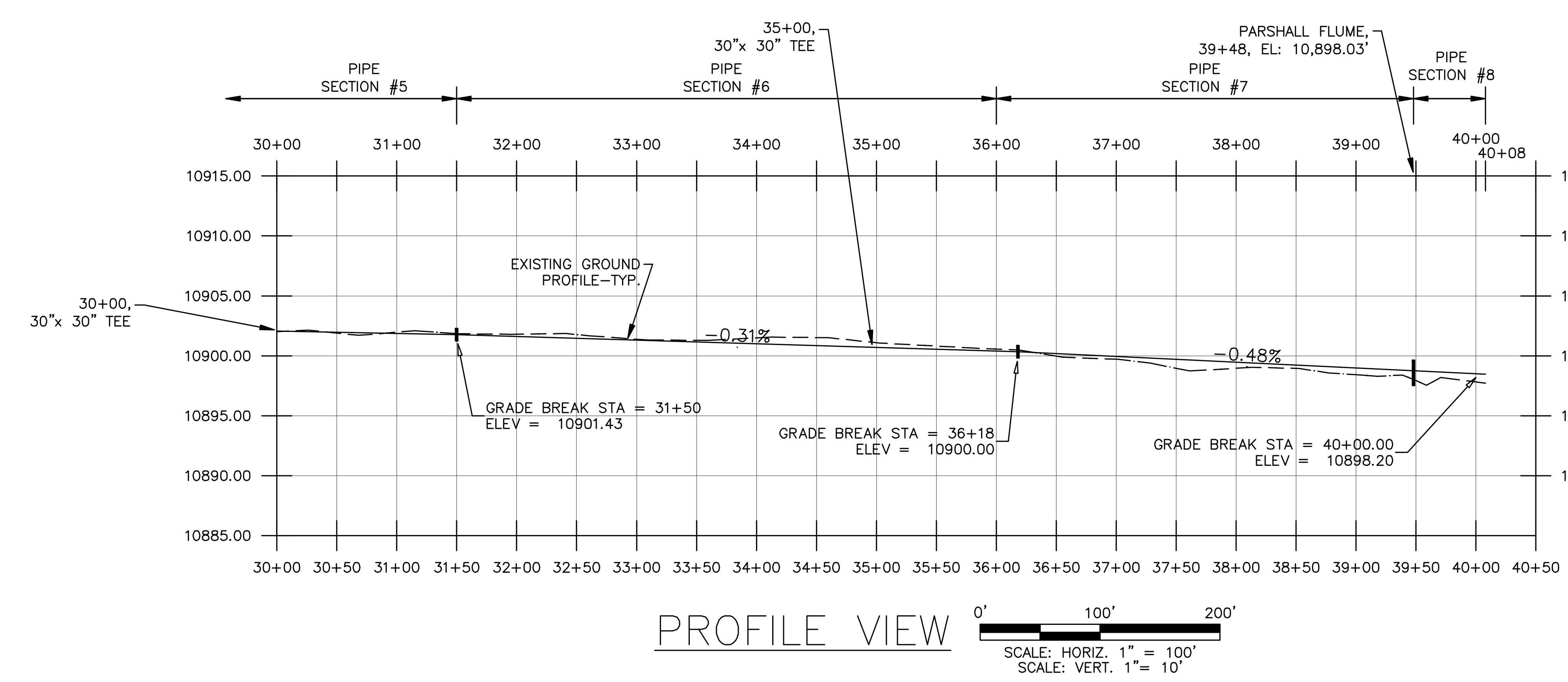




NOTES:
1. HORIZONTAL BENDS AND DEFLECTION OF PIPE JOINTS SET FORTH IN ADS SHOP DRAWINGS.

LEGEND:
- EXISTING GROUND
- BOTTOM OF PIPE OUTSIDE
- CENTER OF PIPE LINE
- PIPELINE ACCESS ROAD

ELK HOME DITCH							
VERTICAL ALIGNMENT							
PIPE							
SECTION	START	START	END	END		ELEVATION	PIPE
NUMBER	STATION	ELEVATION	STATION	ELEVATION	DISTANCE	CHANGE	SLOPE
1	0+00	10,911.89	1+84	10,908.86	183.80	3.03	1.65%
2	1+84	10,908.86	10+17	10,907.08	833.20	1.78	0.21%
3	10+17	10,907.08	23+58	10,903.55	1,340.60	3.53	0.26%
4	23+58	10,903.55	27+22	10,902.28	364.70	1.27	0.35%
5	27+22	10,902.28	31+51	10,901.43	427.70	0.85	0.20%
6	31+51	10,901.43	38+18	10,900.00	468.00	1.43	0.31%
7	36+18	10,900.00	39+48	10,898.03	330.00	1.97	0.60%
8	39+48	10,898.03	40+08		60.00	10,898.03	18163.38%



7-27-15 ISSUED FOR CONSTRUCTION

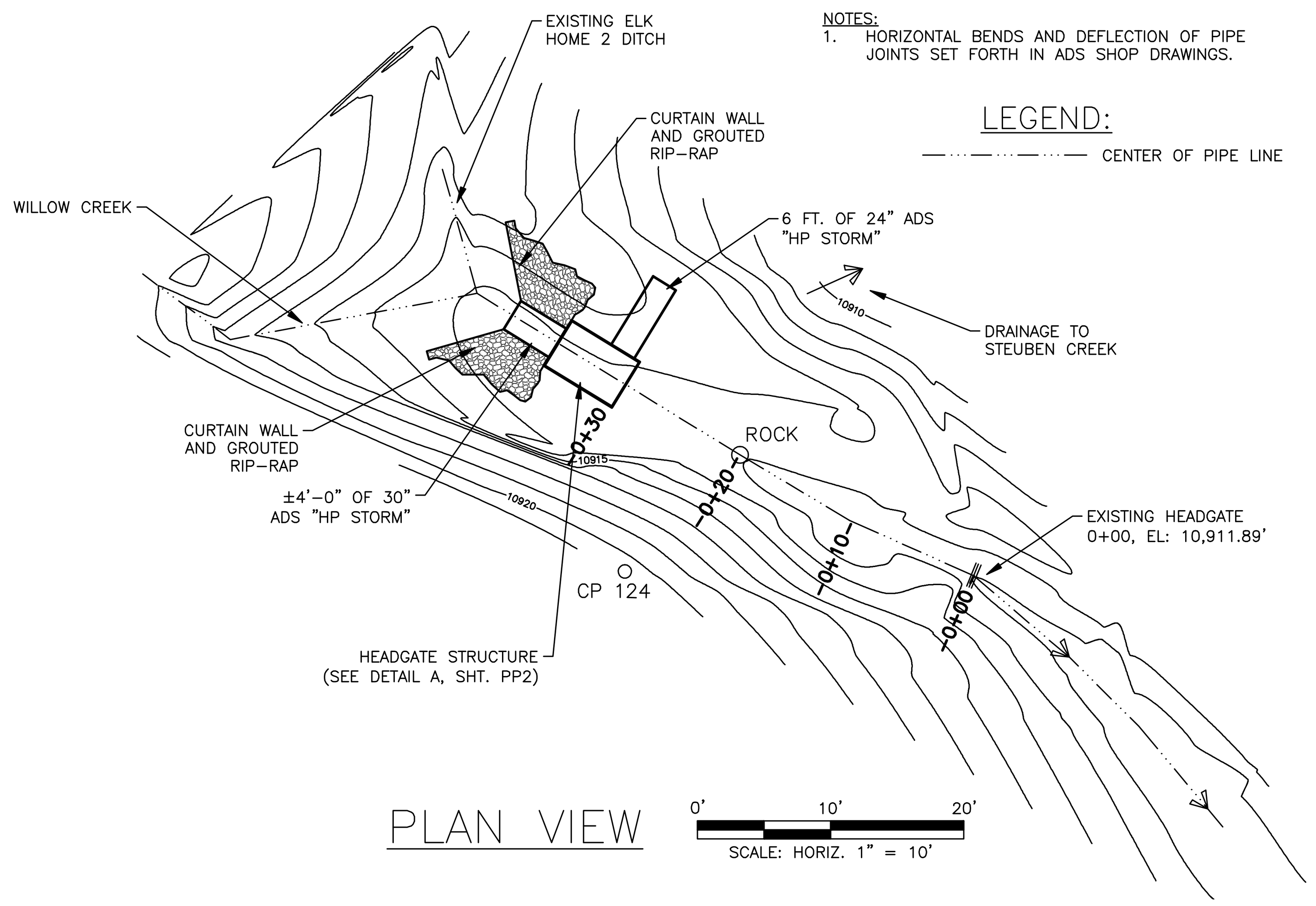
WILLIAMS ENGINEERING L.L.C.
GUNNISON, COLORADO 81230

PLAN & PROFILE

ELK HOME DITCH
IMPROVEMENT PROJECT
FOR TROUT UNLIMITED
GUNNISON COUNTY, COLORADO 81230

DRAWN BY: SLB/DWP
CHECKED BY: RLW
SCALE: AS NOTED
MOST CURRENT DATE: 7-27-15
JOB NO. 2492
SHEET: PP1

ENGINEER'S STAMP

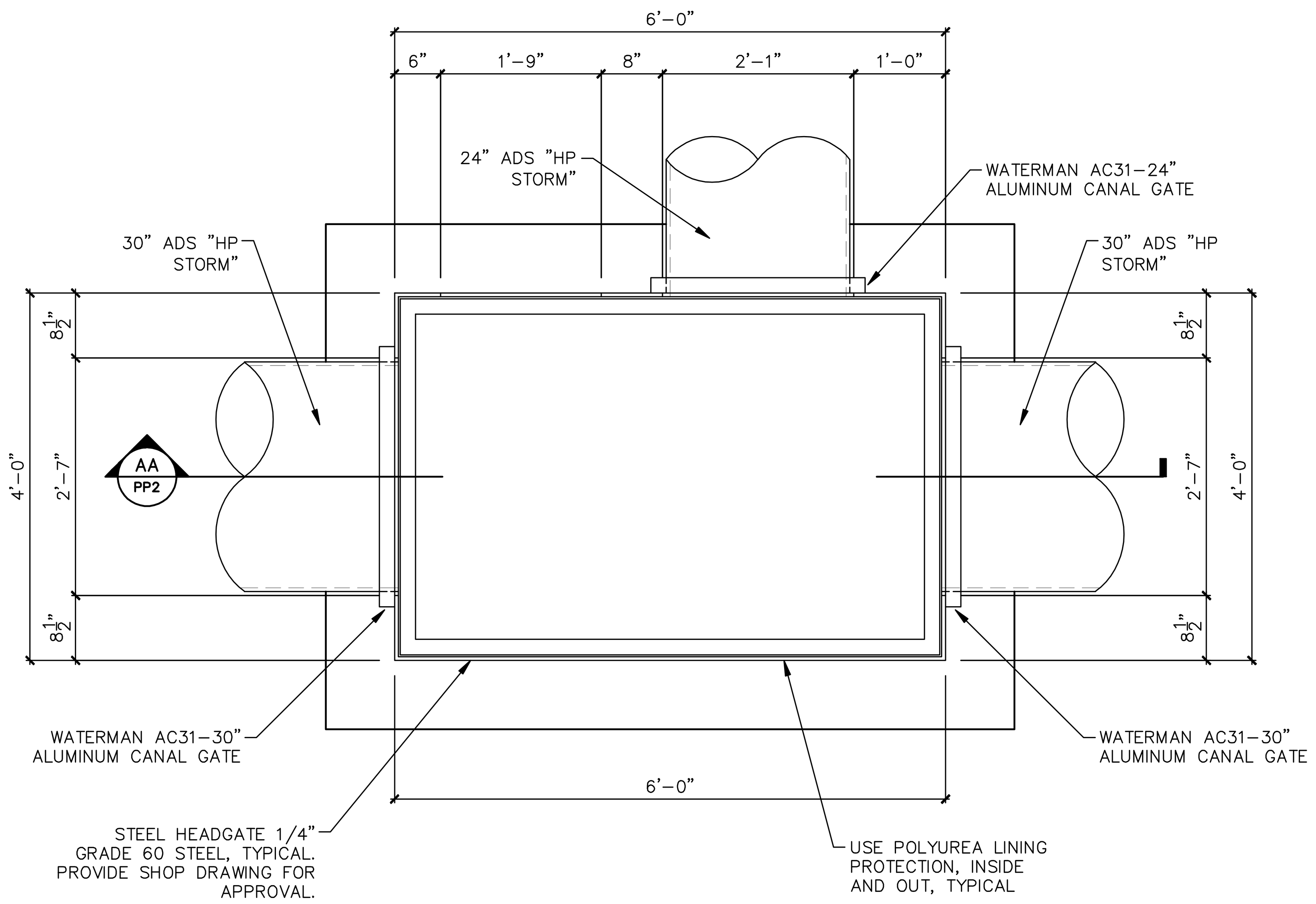


NOTES:
1. HORIZONTAL BENDS AND DEFLECTION OF PIPE JOINTS SET FORTH IN ADS SHOP DRAWINGS.

LEGEND:
— · — CENTER OF PIPE LINE

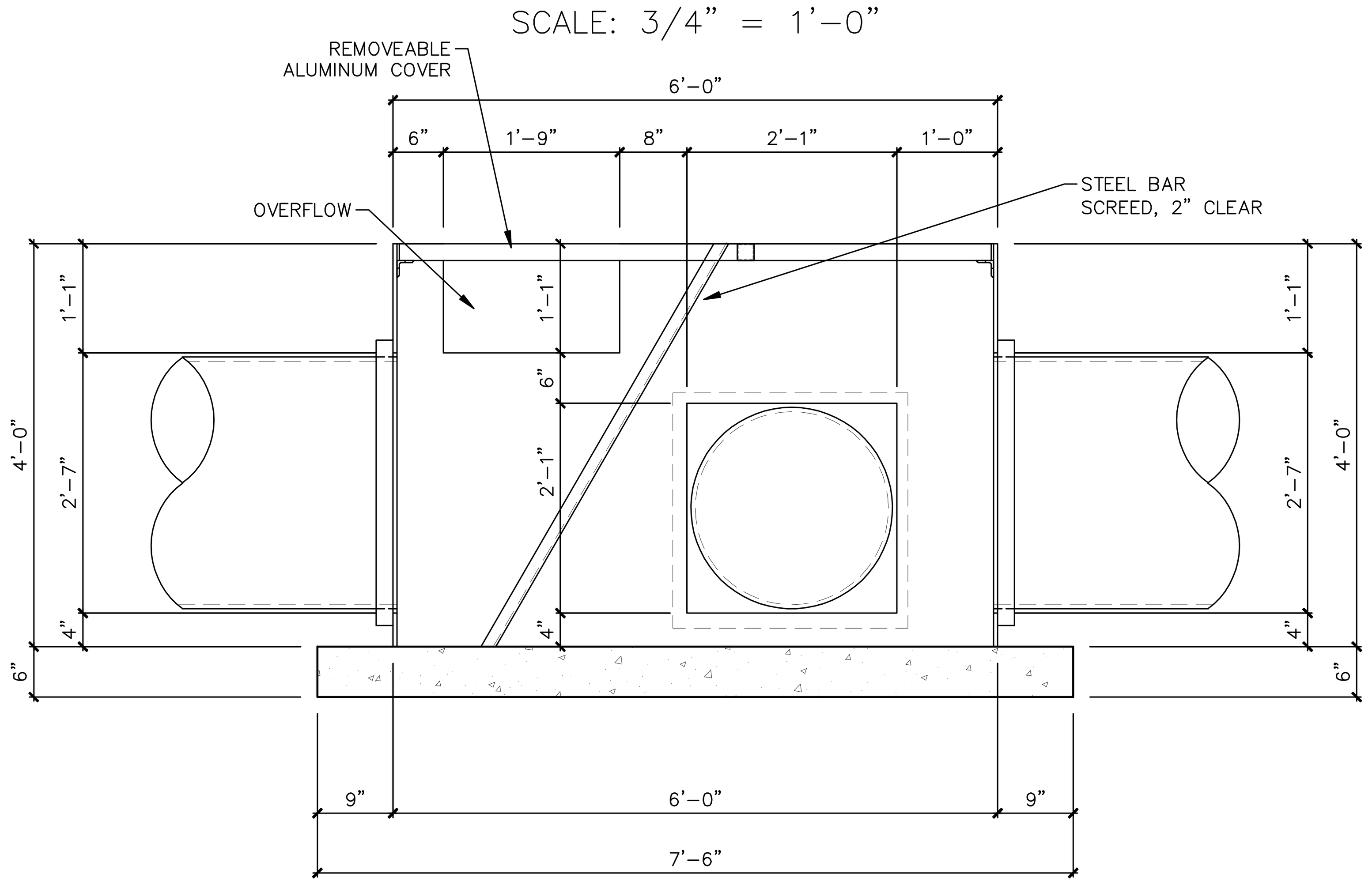
PLAN VIEW

0' 10' 20'
SCALE: HORIZ. 1" = 10'



DETAIL-A HEADGATE

SCALE: 3/4" = 1'-0"

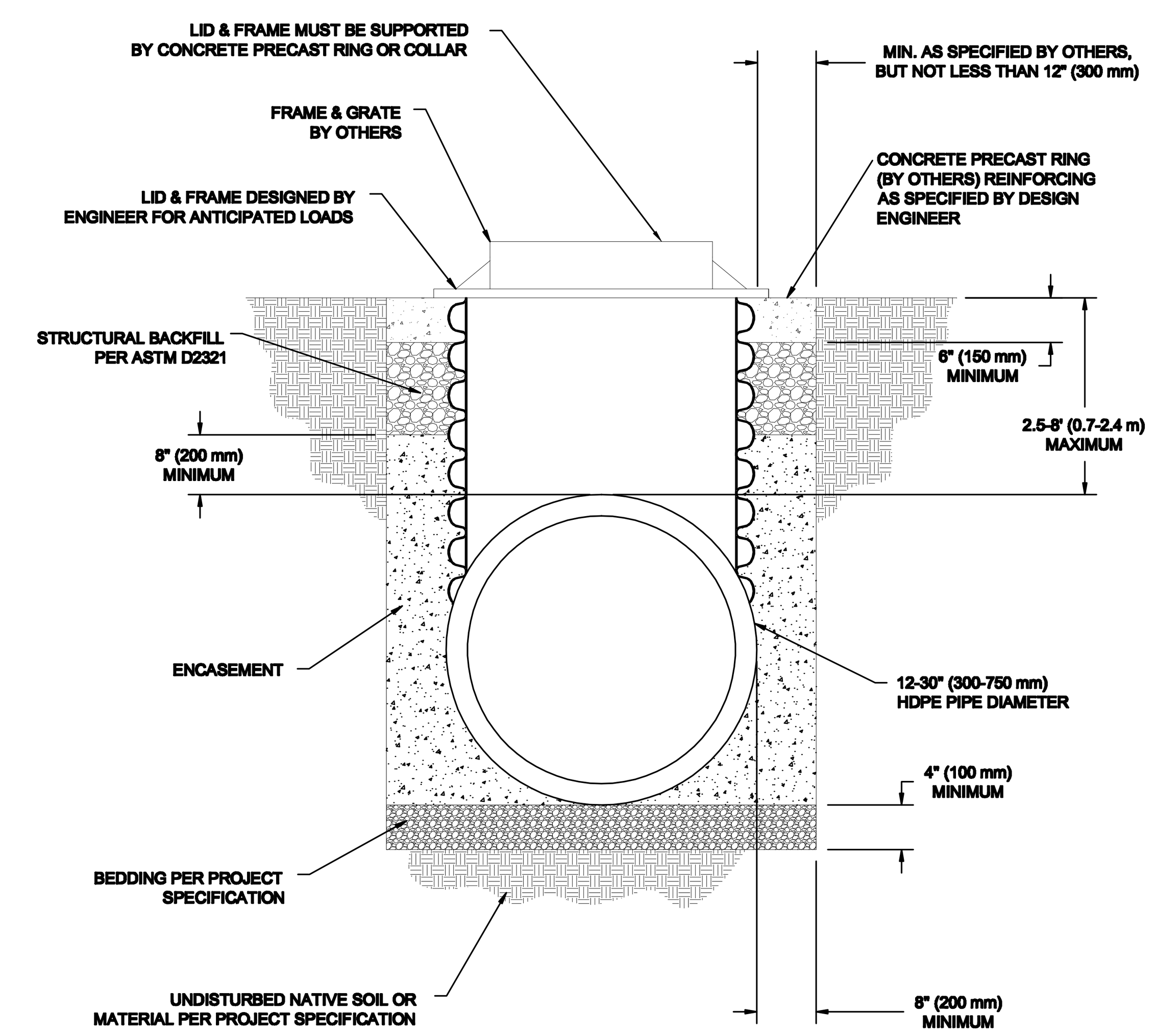


DETAIL SECTION-AA

SCALE: 3/4" = 1'-0"

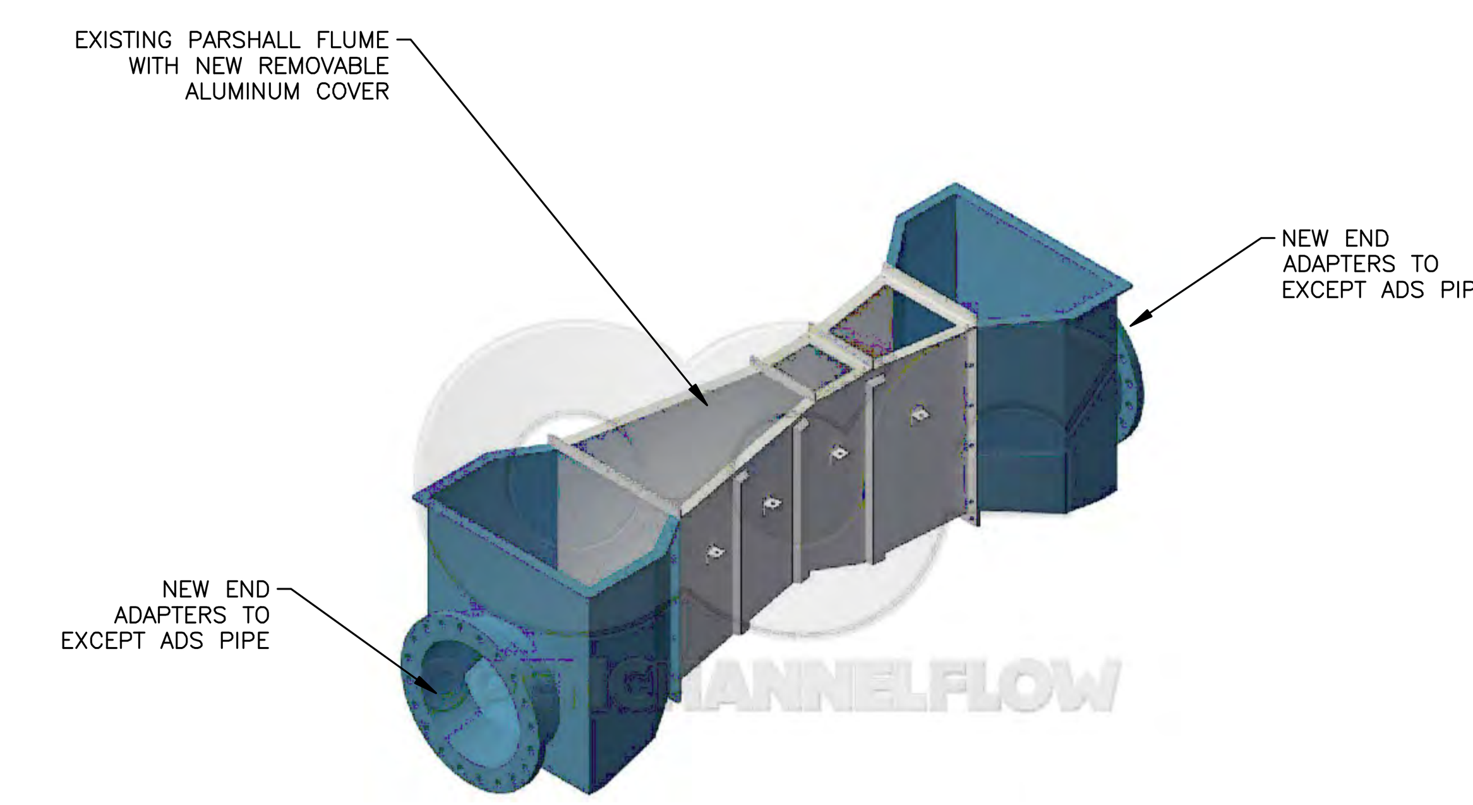
RISER TEE - 12-30" (300-750 mm) PIPE

NTS



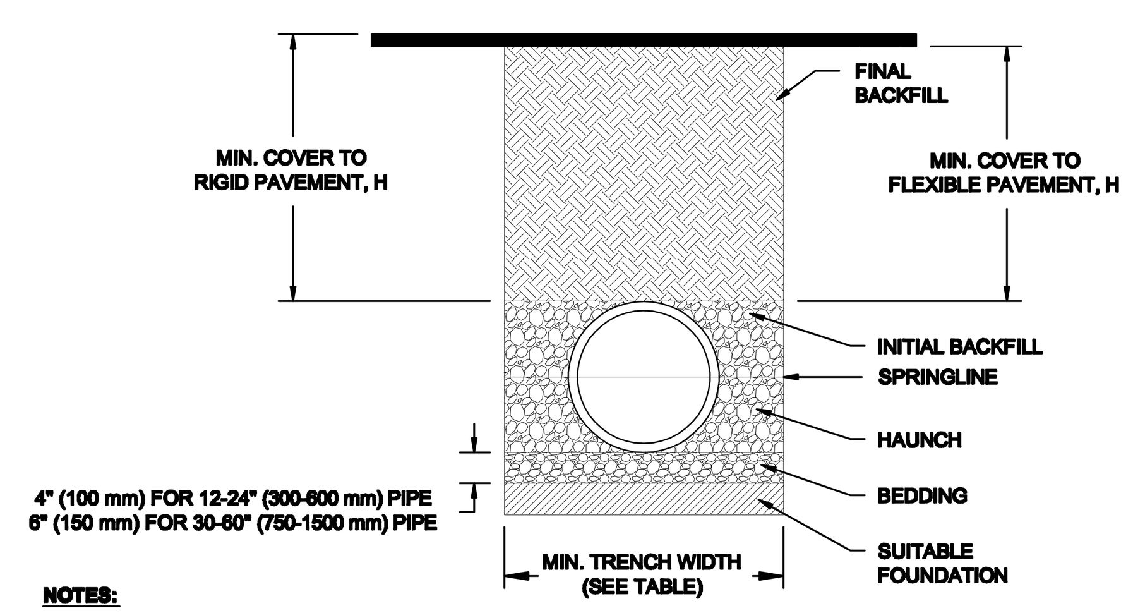
DETAIL-B PIPELINE ACCESS PORT

SCALE: N.T.S



DETAIL-C PARSHALL FLUME/END ADAPTERS

SCALE: N.T.S



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DETAIL-D HP STORM TYPICAL TRENCH DETAIL

SCALE: N.T.S

TABLE 1, RECOMMENDED MINIMUM TRENCH WIDTHS

PIPE DIAM.	MIN. TRENCH WIDTH
12" (300 mm)	30" (750 mm)
15" (375 mm)	34" (860 mm)
18" (450 mm)	39" (990 mm)
24" (600 mm)	48" (1200 mm)
30" (750 mm)	56" (1420 mm)
36" (900 mm)	64" (1620 mm)
48" (1200 mm)	80" (2020 mm)
60" (1500 mm)	96" (2440 mm)

TABLE 2, MINIMUM RECOMMENDED COVER BASED ON VECHICLE LOADING CONDITIONS

	SURFACE LIVE LOADING CONDITION	
PIPE DIAM.	H-25	HEAVY CONSTRUCTION (75T AXLE LOAD) *
12-48" (300-1200 mm)	12" (300 mm)	48" (1200 mm)
60" (1500 mm)	24" (600 mm)	60" (1500 mm)

* VEHICLES WITH AXLE LOADS IN EXCESS OF 75T MAY REQUIRE ADDITIONAL COVER

TABLE 3, MAXIMUM COVER FOR ADS HP STORM PIPE, FT (m)

	CLASS I	CLASS II			CLASS III			CLASS IV
PIPE DIAM.	COMPACTED	95%	90%	85%	95%	90%	85%	85%
12" (300 mm)	40 (12.2)	28 (8.5)	21 (6.4)	16 (4.9)	21 (6.4)	17 (5.2)	15 (4.6)	14 (4.3)
15" (375 mm)	42 (12.8)	29 (8.8)	22 (6.7)	17 (5.2)	22 (6.7)	17 (5.2)	16 (4.9)	15 (4.6)
18" (450 mm)	37 (11.3)	26 (7.9)	19 (5.8)	14 (4.3)	20 (6.1)	15 (4.6)	14 (4.3)	13 (4.0)
24" (600 mm)	32 (9.8)	23 (7.0)	17 (5.2)	13 (4.0)	17 (5.2)	13 (4.0)	12 (3.7)	11 (3.4)
30" (750 mm)	32 (9.8)	23 (7.0)	17 (5.2)	13 (4.0)	18 (5.5)	14 (4.3)	12 (3.7)	12 (3.7)
36" (900 mm)	29 (8.8)	21 (6.4)	15 (4.6)	11 (3.4)	16 (4.9)	12 (3.7)	11 (3.4)	10 (3.0)
48" (1200 mm)	24 (7.3)	18 (5.5)	14 (4.3)	10 (3.0)	14 (4.3)	11 (3.4)	10 (3.0)	9 (2.7)
60" (1500 mm)	30 (9.1)	22 (6.7)	16 (4.9)	12 (3.7)	17 (5.2)	13 (4.0)	11 (3.4)	8 (2.4)

FILL HEIGHT TABLE 3 GENERATED USING AASHTO SECTION 12, LOAD RESISTANCE FACTOR DESIGN (LRFD) PROCEDURE WITH THE FOLLOWING ASSUMPTIONS:
HEIGHT OF WATER (Hw) = CROWN + 1 FT
UNIT WEIGHT OF SOIL (Ys) = 120 PCF

ISSUED FOR CONSTRUCTION 7-27-15

WILLIAMS ENGINEERING L.L.C.
80 CAMINO DEL RIO, SUITE #1
GUNNISON COLORADO 81230
PH. (970) 641-2499
EMAIL: wengineer@msn.com

ADDITIONAL PLAN AND DETAILS

ELK HOME DITCH
IMPROVEMENT PROJECT
FOR TROUT UNLIMITED
GUNNISON COUNTY, COLORADO 81230

DRAWN BY: SLB/DWP
CHECKED BY: RLW
SCALE: AS NOTED
MOST CURRENT DATE: 7-27-15
JOB NO. 2492
SHEET: PP2

ENGINEER'S STAMP

MEMORANDUM

TO: UGRWCD Board Members

FROM: Frank Kugel, General Manager

DATE: June 26, 2018

SUBJECT: Elk Home Ditch Inspection

A construction inspection of the Elk Home Ditch Project was conducted on June 26, 2018. Attending the meeting were the following:

Jim Pike, ditch owner
Steve Pike, ditch owner
Sean, new ditch owner
Stan Stehwein, former owner
Hal Hearne, Hearne Excavating
Bob Williams, Williams Engineering
Frank Kugel, UGRWCD

The purpose of this site visit was to review the construction that took place in the fall of 2017, determine what work was needed to complete the project, and decide who was responsible for the remaining work.

We started at the upstream end of the project. A significant concern noted was the amount of leakage flowing under the catch basin upstream of the pipeline intake structure. I estimated that about 10-20 percent of the flow in the stream was leaking past the headgate. I used a nontoxic dye provided by CPW to determine that the leakage was occurring upstream of the catch basin. It was agreed that any additional work to stop the leakage would be outside the scope of the contract and that the owners and Hearne Excavating would work out an agreement to construct a cutoff trench upstream of the catch basin.

Another issue noted was the low point in the diversion dam at its far edge. Hal agreed to raise that portion to match the grade of the remainder of the structure. This would be done under the terms of the contract.

The next issue discussed was freezing inside the intake structure. At the onset of the runoff season, the owners discovered that the water inside the structure had frozen solid, preventing water from entering the pipeline. Prior to last winter, the pipeline headgate had been fully closed and the other two gates left partially open. For the upcoming winter, it was decided that the pipeline gate remain open. The owners agreed to monitor the pipeline to ensure that water was not freezing.

Fallen trees across the pipeline easement were the next topic of discussion. Although there was some sentiment to leave the trees in place to prevent ATV access, the ultimate decision was to move them to the side to allow the owner ATV access to the headgate.

The cleanouts need to have eight stainless steel screws in each of the lids.

One of the air vac installations was incomplete.

The question was raised about the coarse material used to backfill along the pipe. The particle size used was in excess of that outlined in the project specifications. A compromise solution was agreed upon that involved inspecting the interior of the conduit. This video would confirm that there are no deformations or perforations in the pipe. This compromise considered the fact that the heaviest loading over the pipe has likely already occurred. The video would also look for any ***significant*** variation in pipeline grade. The contractor will provide a video inspection. If there are any concerns about the quality or coverage of the video, an independent video will be necessary at contractor's expense.

Concern was voiced over the drainage in the breccia area of the pipeline. The potential exists for snowmelt to created erosion gullies on the downstream side of the easement. In a worst-case scenario, these gullies could cut back to the pipeline and undermine its support. This past dry winter was not a suitable test for whether further drainage improvements are necessary. The contractor will improve surface drainage in this area this year. Any future grading would be the responsibility of the owner.

The Parshall flume as installed is not capable of accurate flow measurements, particularly at the current rate of less than one-half cfs. Flow adjacent to the staff gage was flowing ***upstream.*** The flume was found to be out of level. Once the contractor levels the flume, it will be determined whether the current size flume is appropriate. A smaller flume may need to be installed further downstream.

The owners and contractor discussed digging a ditch from the pipeline outfall to the outlet of Rainbow Lake in order to avoid evaporative or seepage losses by discharging into the lake. This work would be outside the scope of the Elk Home Ditch Project.

Remaining work to be performed by contractor under terms of contract:

1. Fill in low area at diversion dam.
2. Install stainless steel screws in cleanout lids.
3. Complete air vac installation.
4. Level Parshall flume.
5. Obtain video of inside of pipe to assure there are no perforations, deformations or significant variations in grade. Video is to be of suitable quality as determined by Williams Engineering and UGRWCD.
6. Install metal plates at 100-foot intervals to delineate pipeline location.
7. Complete grading in breccia area.

Work to be performed by owner and/or contractor outside of contract:

1. Excavate cutoff upstream of catch basin at inlet.
2. Excavate ditch from pipeline discharge channel to Rainbow Lake outlet channel.

Williams Engineering L.L.C.
400 North Main Street
Gunnison, CO 81230
970-641-2499

August 25, 2020 via email schavez@ugrwcd.org

Upper Gunnison River Water Conservancy District
234 N. Main, Suite 3C
Gunnison, CO 81230

Attn: Sonja Chavez

Reference: Elk Home Ditch Hearne
Final Close out
Job No. 2791

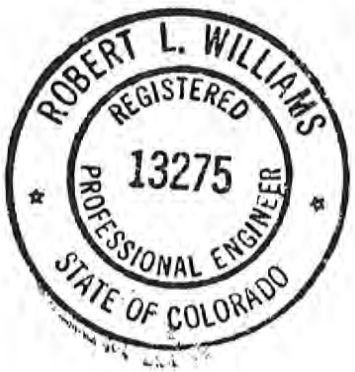
Dear Ms. Chavez:

Pursuant our recent conversation we are hereby providing final certification and inspection of the Elk Home Ditch Pipeline project. On November 29, 2017 we performed an inspection and provided a letter to Frank Kugel authorizing final payment but holding retainage until the final punch list was completed by Hearn Excavation. On June 27, 2018 I performed a final inspection of the pipeline project as contracted with Hearn Excavation. A final certification and acceptance of the pipeline project was verbally provided to the District but not in writing. This letter will serve to certify final acceptance and completion of project as being in accordance with the contract documents as amended by change orders. The pipeline project was also accepted by James Pike the Elk Home Ditch Owner.

Attached hereto is an invoice for the final engineering work on the pipeline project. If you need anything addition please contact me. Thank you.

Sincerely,

Robert L. Williams, PE
Williams Engineering. LLC



Upper Gunnison River Water Conservancy District

210 West Spencer Avenue, Suite B • Gunnison, Colorado 81230
(970) 641-6065 • www.ugrwcd.org

September 17, 2018

Corey Wong
GMUG National Forest Supervisor's Office
2250 Highway 50
Delta, CO 81416

Mr. Wong:

Consistent with the terms contained in my letter dated August 31, 2017, I have enclosed the executed and acknowledged quitclaim deed for the right of way for Elk Home Ditch No. 2.

Sincerely,

John H. McClow, General Counsel

Cc: Jim Pike
Frank Kugel

QUITCLAIM DEED (RIGHT OF WAY)

THIS QUITCLAIM DEED is made this 31st day of August, 2017, by and between **R. JAMES PIKE, GRANTOR**, and the **UNITED STATES OF AMERICA**, acting by and through the **Forest Service, Department of Agriculture**, hereinafter called **GRANTEE.**

WITNESSETH: The Grantor claims to be the owner of a right of way for a a ditch and diversion structure located on National Forest System (NFS) land described as Elk Home Ditch No. 2, which has been recognized by the Forest Service; and

WHEREAS, Grantor wishes to relinquish and abandon said right of way and convey the water rights associated therewith to the Colorado Water Conservation Board.

NOW THEREFORE, the Grantor, does hereby remise, release, and quitclaim unto the Grantee, its successors and assigns, all its right, title, interest, and claim in and to the right of way for the ditch and diversion structure described as follows:

Elk Home Ditch No. 2 located in Sections 27, 28 and 30, T. 51 N., R. 3W., NMPM, Gunnison National Forest, the headgate of said ditch is located on the South bank of the NW Fork of Sun Creek, a tributary of the Gunnison River.

IN WITNESS WHEREOF, Grantor, has executed this Deed this 31st day of August, 2017.

GRANTOR

BY: R. James Pike

R. JAMES PIKE

ACKNOWLEDGEMENT

STATE OF COLORADO)
Chaffee)ss
COUNTY OF ~~GUNNISON~~)

On this 31st day of August, 2017, before me, Jamie Pruyser, a Notary Public in and for Gunnison County, personally appeared R James Pike, , the signer of the within instrument, who acknowledged to me that (s)he executed the foregoing instrument.

JAMIE PRUYSER
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20124017768
MY COMMISSION EXPIRES MARCH 21, 2020

/s/ Jamie Pruyser
Notary Public
My commission expires 3-21-20

QUITCLAIM DEED

This Quitclaim Deed is made this 19 day of October, 2018, between **R. James Pike, Steven James Pike, Paul A. Pike,** and **28357US50 LLC,** a Colorado Limited Liability Company, **GRANTORS**, and the **Colorado Water Conservation Board,** whose address is 1313 Sherman Street, Suite 721 Denver, Colorado 80203 **GRANTEE.**

Grantors, for and in consideration of the sum of less than five hundred dollars and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, hereby remise, release, sell, and QUITCLAIM unto Grantee, its successors and assigns, all of their right, title, interest, claim, and demand to the water right decreed to the Elk Home No. 2 Ditch; Ditch No. 161, Priority No. 156, Water Division 4, District 59, Structure ID# 887; decreed for 7.25 cubic feet per second, absolute, with an appropriation date of 1902 and an adjudication date of 1906; GUNNISON COUNTY, COLORADO.

IN WITNESS WHEREOF, Grantors have executed this deed on the date set forth above.

R. James Pike

R. James Pike

Steven James Pike

Paul A. Pike

28357US50 LLC

By: Shawn Rossman, Member

STATE OF COLORADO)
) ss.
COUNTY OF Chaffee)

The foregoing instrument was acknowledged before me this 19 day of October, 2018, by R. James Pike.

Witness my hand and official seal.
My Commission expires: 6-11-2020

VALARIE R. AUSTIN
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20124035770
MY COMMISSION EXPIRES 06/11/2020

Valarie Austin

Notary Public

STATE OF COLORADO)
) ss.
COUNTY OF Gunnison)

The foregoing instrument was acknowledged before me this 23rd day of October, 2018, by Steven James Pike.

Witness my hand and official seal.
My Commission expires: 05/20/2020

SEPTEMBER SACK
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID #20164019460
My Commission Expires May 20, 2020

Notary Public

STATE OF COLORADO)
) ss.
COUNTY OF Gunnison)

The foregoing instrument was acknowledged before me this 23rd day of October, 2018, by Paul A. Pike.

Witness my hand and official seal.
My Commission expires: 05/20/2020

SEPTEMBER SACK
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID #20164019460
My Commission Expires May 20, 2020

Notary Public

STATE OF COLORADO)
) ss.
COUNTY OF Gunnison)

The foregoing instrument was acknowledged before me this 14th day of ~~October~~ November, 2018, by Shawn Rossman, as a Member of 28357US50 LLC, a Colorado Limited Liability Company.

Witness my hand and official seal.
My Commission expires: 2-2-21

BEVERLY A. RICHARDS
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID #19994026009
My Commission Expires February 2, 2021

Notary Public