

Appendix A

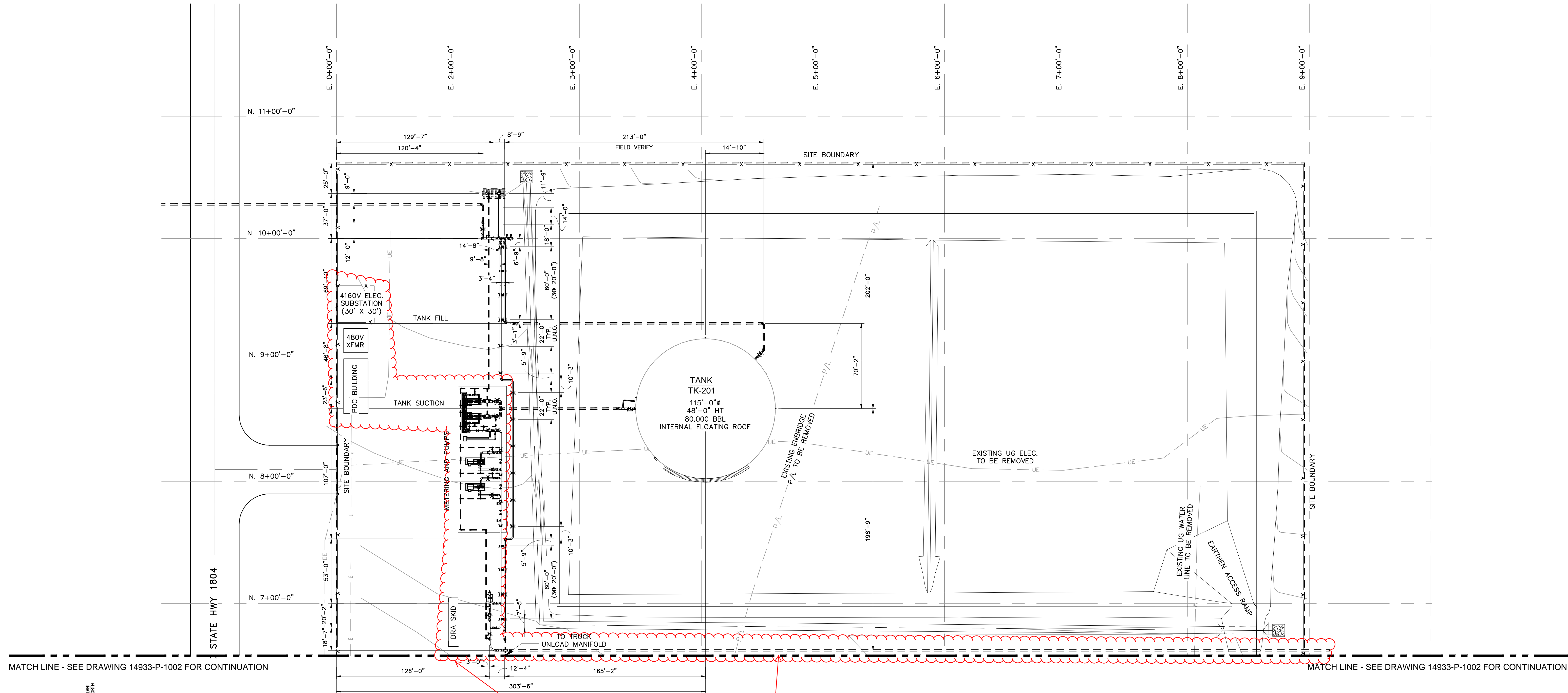
Engineering Documents

Table of Contents

Engineering Drawings for Bakken North Pipeline

Sheet or Drawing #	Description
14933-P-1001	Trenton Station Plot Plan
14933-P-2011	Block Valve Plan, Section, Details, and B.O.M
PAALP-ENG-GUI-PRW-038	Typical Undercrossing All Roads
14933-A-0007	Pipeline set on Type Saddle Bag Weight
14933-A-0008	Stream of Ditch Pipeline Undercrossing
14933-A-0010	Open Cut Crossing for Unimproved Roads
14933-A-011	Bored Crossing for Unimproved Roads

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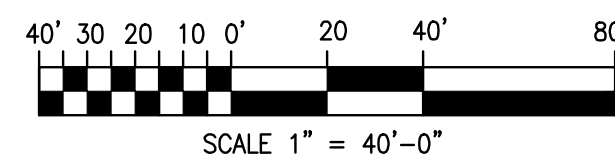


MATCH LINE - SEE DRAWING 14933-P-1002 FOR CONTINUATION

MATCH LINE - SEE DRAWING 14933-P-1002 FOR CONTINUATION

Proposed Trenton Station Facilities that are part of the ND PSC siting permit.

Bakken North PL

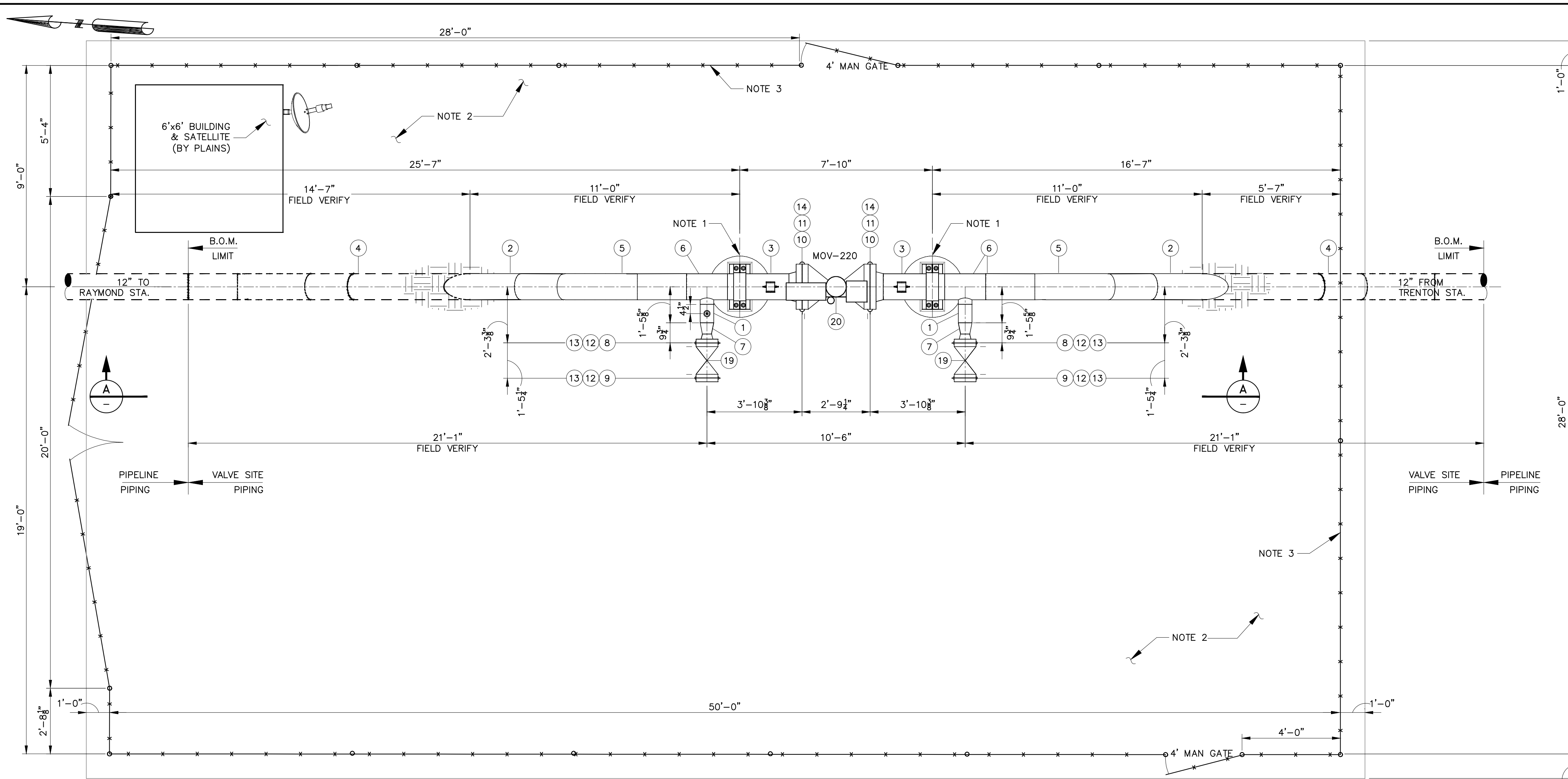


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		CJH	BLT	QLB	07/14/11	A	ISSUED FOR CLIENT REVIEW

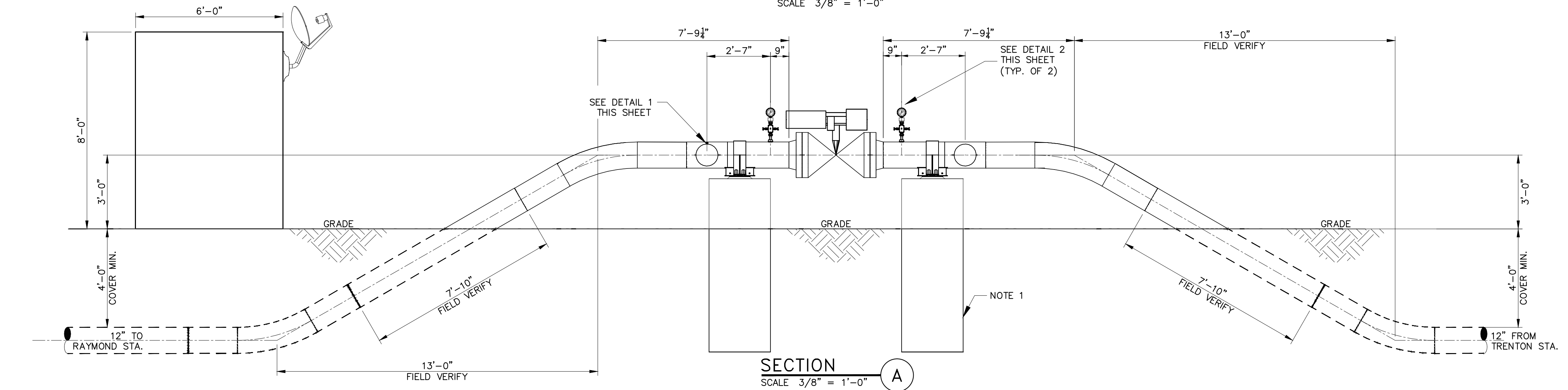
THE DRAWING PREPARED BY:
ROONEY ENGINEERING, INC
 12201 E. Arapahoe Road, Suite C-10
 Aurora, Colorado 80012
 (303) 792-5911

	BAKKEN NORTH PROJECT AFE # 14933 REI PROJ. # 02793		
	PIPING DRAWING TRENTON STATION TANK, METERING AND PUMP PIPING PLOT PLAN		
DRAWN CJH DATE 05/05/2011	CHECKED BLT SCALE AS NOTED	DRFT. APPV. ENGR. APPV.	14933-P-1001

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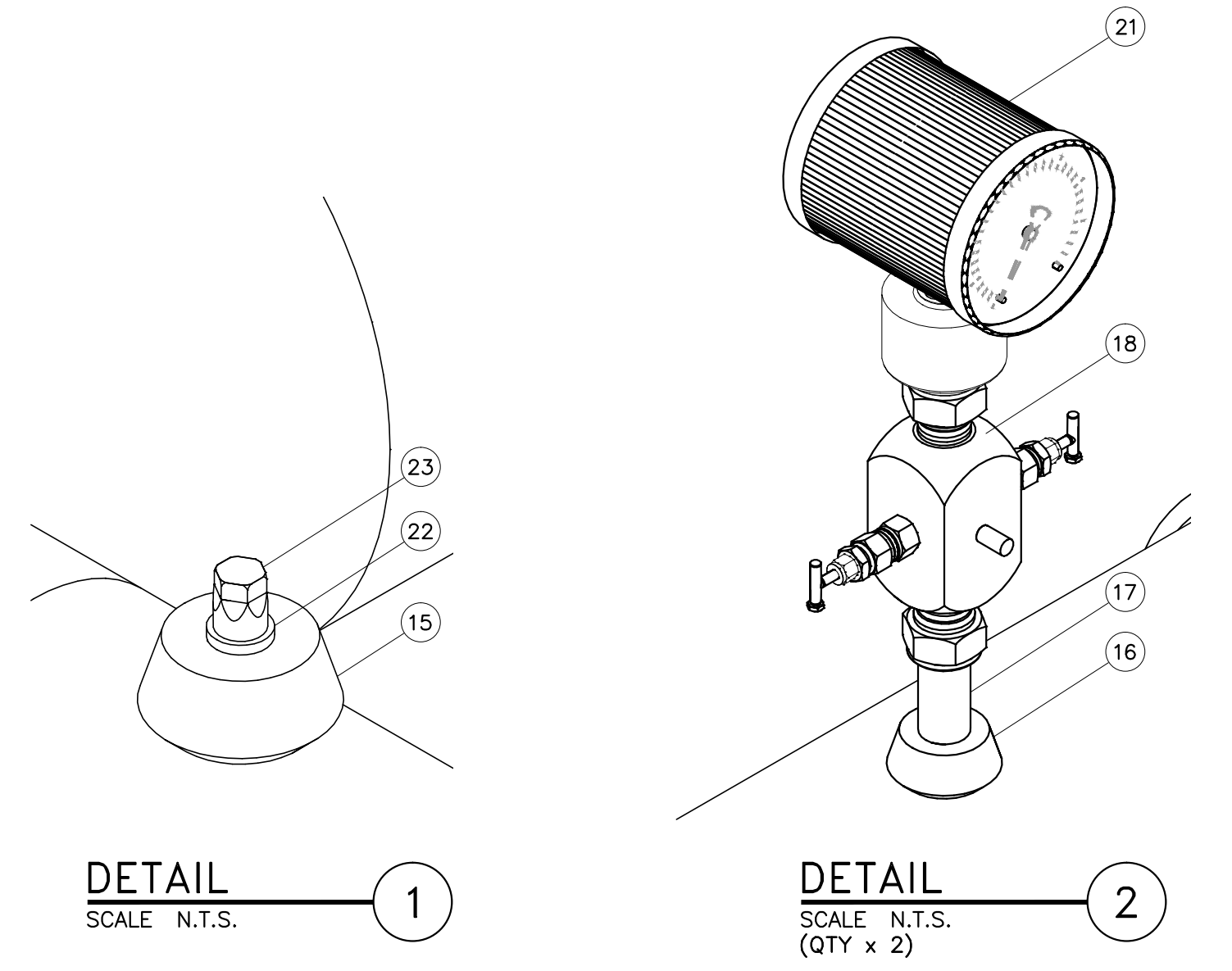


PLAN
SCALE 3/8" = 1'-0"



SECTION
SCALE 3/8" = 1'-0" A

ITEM NO.	QTY.	NOMINAL SIZE	DESCRIPTION	LENGTH
1	1	6"	PIPE, 6.625" O.D. x 0.280 W.T., API-5L, PSL2, ERW, GRADE B, DRL, PE, BFW	1'-6"
2	1	12"	PIPE, 12.750" O.D. x 0.344 W.T., API-5L, PSL2, ERW, X-52, DRL, BFW, W/ 14-16 MILS FBE COATING	15'-8"
3	1	12"	PIPE, 12.750" O.D. x 0.344 W.T., API-5L, PSL2, ERW, X-52, DRL, BFW, BARE	7'-0"
4	2	12"	INDUCTION BEND, 30 DEGREE, 6D, 2-0" TANGENTS, 12.750" O.D. x 0.344 W.T., API-5L, PSL2, ERW, X-52, DRL, BFW, W/ 14-16 MILS FBE COATING	7'-1 3/4"
5	2	12"	INDUCTION BEND, 30 DEGREE, 6D, 2-0" TANGENTS, 12.750" O.D. x 0.344 W.T., API-5L, PSL2, ERW, X-52, DRL, BFW, BARE	7'-1 3/4"
6	2	12" X 6"	TEE, STRAIGHT, BARRED, BORE TO MATCH PIPE, CS, ASTM A-234, WPB	
7	2	6" x 4"	REDUCER, CONC., BORE TO MATCH PIPE, CS, ASTM A-234, WPB	
8	2	4"	FLANGE, ANSI 600, RFWN, ASTM A-105, C.S., BORE TO MATCH PIPE	
9	2	4"	FLANGE, BLIND, ANSI 600, RFWN, ASTM A-105, C.S.	
10	2	12"	FLANGE, ANSI 600 RFWN, ASTM A-694, GRADE F-60, BORE TO MATCH PIPE	
11	40	1 1/4" x 9 1/4"	STUD BOLTS, ASTM A-193, GRADE B-7, W / TWO (2) ASTM A-194, GRADE 2H, HEAVY HEX NUTS EACH (12"-600#, 20 EA. FLANGE REQD.)	9 1/4"
12	32	7/8 x 6 1/4"	STUD BOLTS, ASTM A-193, GRADE B-7, W / TWO (2) ASTM A-194, GRADE 2H, HEAVY HEX NUTS EACH (4"-600#, 8 EA. FLANGE REQD.)	6 1/4"
13	4	4"	GASKET, 600#, 1/8" FLEXITALLIC TYPE CGI, SPIRAL WOUND, 316L SS, CS CENTERING RING	
14	2	12"	GASKET, 600#, 1/8" FLEXITALLIC TYPE CGI, SPIRAL WOUND, 316L SS, CS CENTERING RING	
15	2	6" X 1"	THREADOLET, C.S., ASTM A-105, FNPT, 3000#	
16	2	12" x 3/4"	THREADOLET, C.S., ASTM A-105, FNPT, 3000#	
17	8	3/4" x 3"	NIPPLE, 1/2" DIA. x 3" LONG, SCH 160, C.S., ASTM-106, GRADE B, TBE	
18	2	3/4"	INSTRUMENT ROOT VALVE, ROSEMOUNT MANIFOLD VALVE, MODEL NUMBER 306 RT 12AA11	
19	2	4"	GATE VALVE, BOLTED BONNET, ANSI 600 RFFE, THRU CONDUIT, CS BODY, CS GATE W/ HF, CS SEATS W/ HF, 17-4 STEM, PTFE OR VITON STEM SEAL, SELF RELIEVING SEATS, NACE MR-0174, API 6D, HANDWHEEL OPERATED	
20	1	12"	GATE VALVE, BOLTED BONNET, ANSI 600 RFFE, THRU CONDUIT, CS BODY, CS GATE W/ HF, CS SEATS W/ HF, 17-4 STEM, PTFE OR VITON STEM SEAL, SELF RELIEVING SEATS, NACE MR-0174, API 6D, ELECTRIC OPERATED	
21	2	N/A	PRESSURE INDICATING TRANSMITTER	
22	1	1"	THERMOWELL	
23	1	1"	PLUG, C.S., HEXHEAD, 3000# MNPT, ASTM A-106	



DETAIL 1
SCALE N.T.S.

DETAIL 2
SCALE N.T.S. (QTY x 2)

- NOTES:
- FOR PIPE SUPPORT AND CLAMP DESIGN, SEE DRAWING 14933-C-200X "TYPICAL PIPELINE BLOCK VALVE PIPE SUPPORT."
 - VALVE SITE SHALL BE CLEARED, GRUBBED AND STRIPPED OF TOPSOIL. ALL ORGANIC MATERIAL AND TOPSOIL SHALL BE STRIPPED FROM DESIGNATED AREA. STRIPPING OF TOPSOIL SHALL NOT BE STARTED UNTIL CLEARING AND GRUBBING HAS BEEN COMPLETED. TOPSOIL SHALL NOT BE STRIPPED WHILE IN A WET OR FROZEN CONDITION OR IN A MANNER WHICH ADVERSELY AFFECTS THE SOIL STRUCTURE. SITE SHALL BE FINAL GRADED SUCH THAT FINISHED SITE SLOPES BETWEEN A MINIMUM OF 1% TO A MAXIMUM OF 5%. SITE GRADING SHALL MATCH EXISTING SITE GRADING AS MUCH AS PRACTICABLE. GRADING AREA SHALL BE LIMITED TO THE AREA DESIGNATED ON VALVE SITE DRAWING. SITE WILL BE SURFACED WITH CRUSHED GRAVEL (1 1/2" MINUS) OR RECYCLED CRUSHED CONCRETE (1" MINUS) OR RECYCLED CRUSHED ASPHALT (1" MINUS). SURFACING MATERIAL SHALL CONSIST OF HARD, DURABLE ANGULAR PARTICLES, FREE FROM CLAY LUMPS, ORGANIC MATERIAL, FROZEN MATERIAL OR OTHER DELETERIOUS MATERIALS. SURFACING MATERIAL LAYER SHALL BE A MINIMUM OF 6" THICK.
 - PIPELINE SUBCONTRACTOR TO SUPPLY 8' HIGH FENCE AND GATE MATERIAL AND INSTALL MATERIAL PER PROJECT SPECIFICATION AND TYPICAL CONSTRUCTION DETAILS

TITLE OF REFERENCE DRAWING	DRAWING NO.	DRAWN	CHECKED	APPROVED	DATE	REV. NO.	DESCRIPTION
		PJ	JLP	QLB	07/18/11	B	REISSUED FOR CLIENT REVIEW PER DESIGN REVIEW
		CJH	BLT		06/03/11	A	ISSUED FOR CLIENT REVIEW

THIS DRAWING PREPARED BY:
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PLAINS
ALL AMERICAN
PIPELINE, L.P.

BAKKEN NORTH PROJECT
AFE # 14933
REI PROJ. # 02793

PIPING DRAWING

AUTOMATED BLOCK VALVE - 56TH STREET
PLAN, SECTION, DETAILS AND B.O.M.

DRAWN	CJH	CHECKED	BLT	DRFT. APPV.
DATE	05/25/2011	SCALE	3/8"=1'-0"	ENGR. APPV.

14933-P-2011



TYPICAL UNDERCROSSING ALL ROADS

DOC NO: PAALP-ENG-GUI-PRW-038

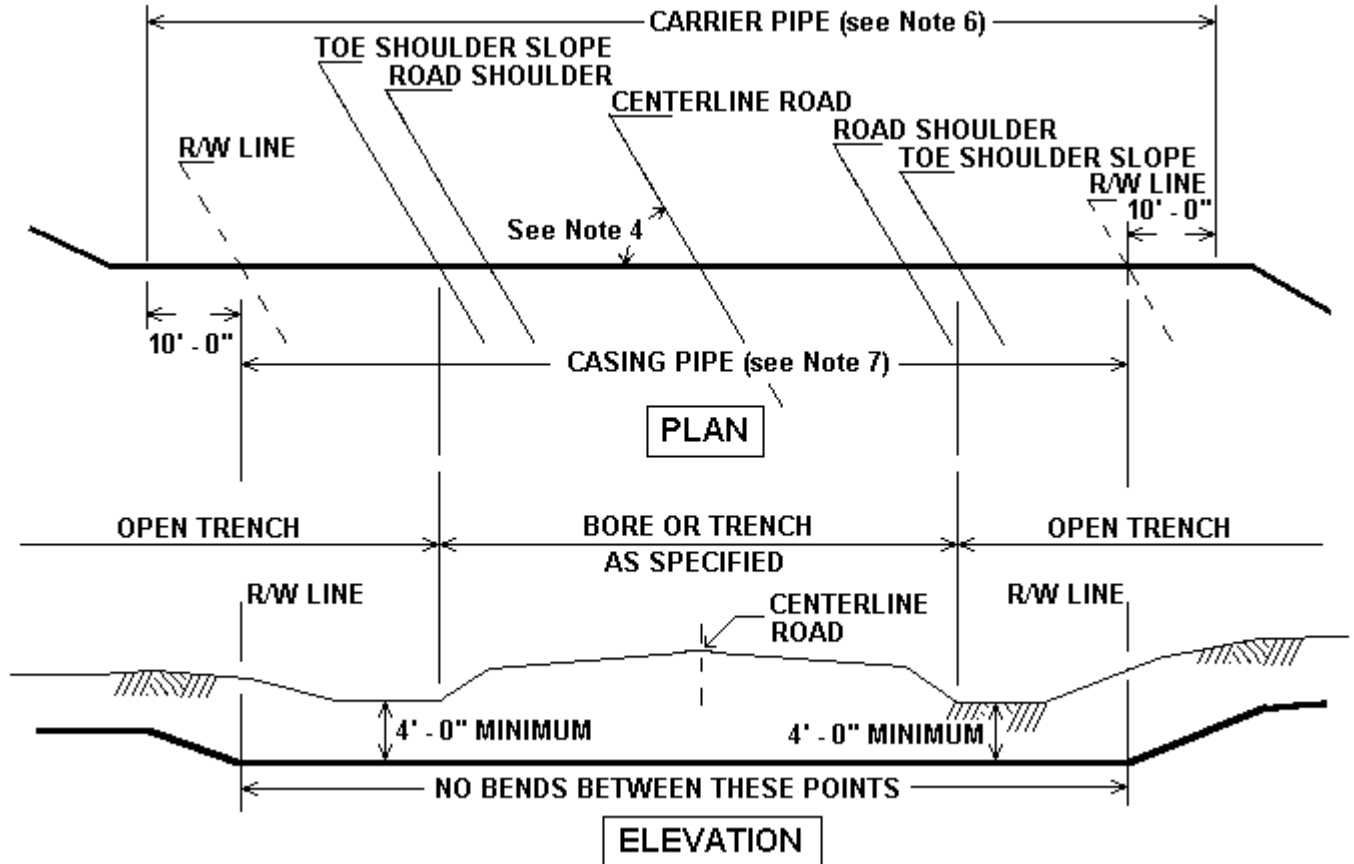
REV NO: 0

SHEET NO: 1 of 1

REVIEWED BY: Frank J. Hayes

APPROVED BY: John N. Haldiman

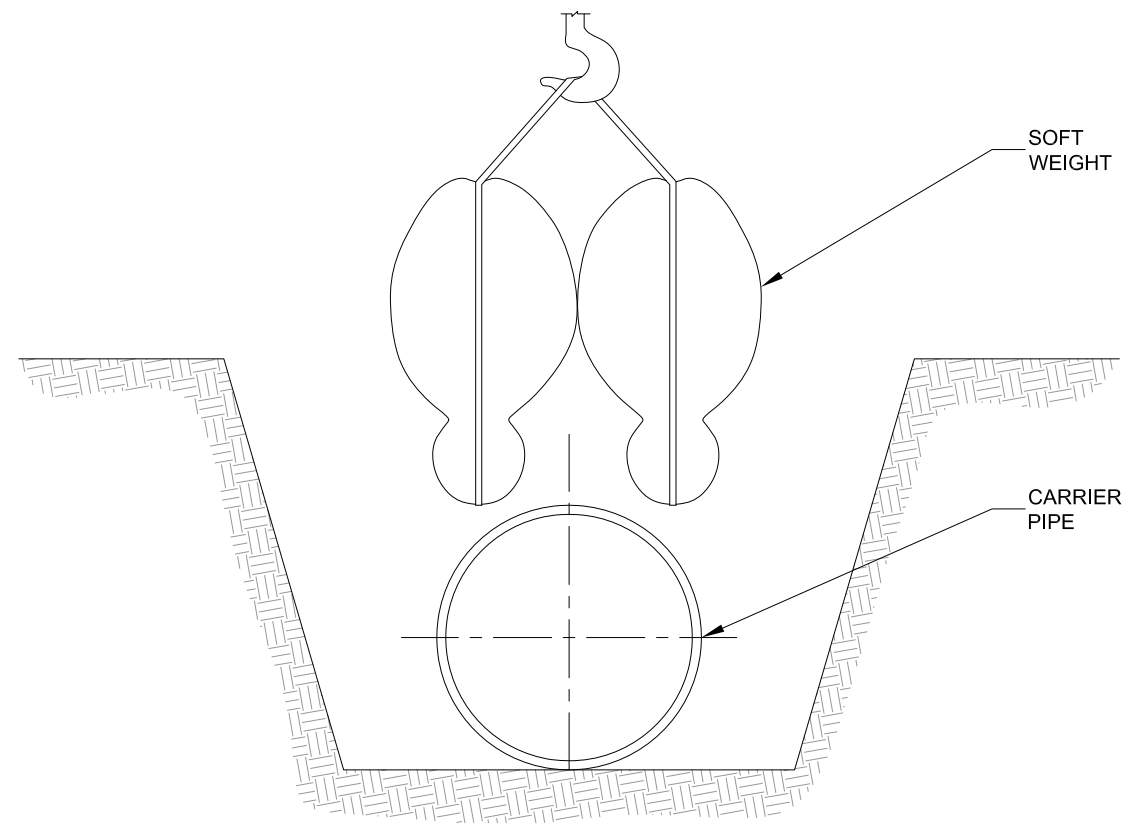
APP DATE: 10/31/2008



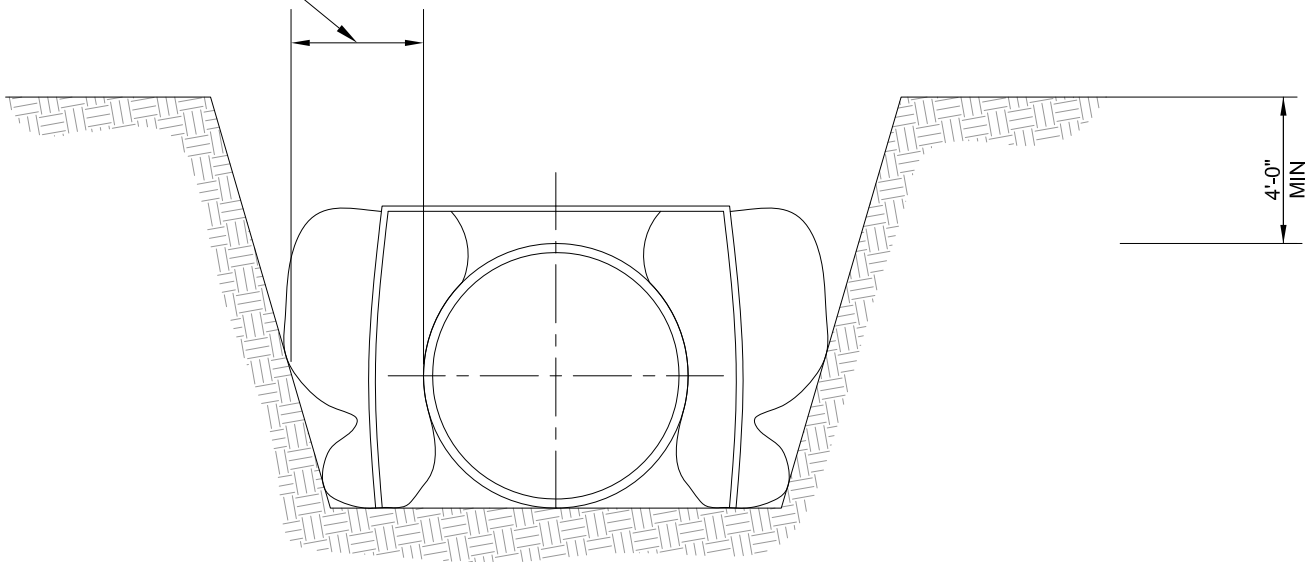
GENERAL SPECIFICATIONS:

- Contractor to install pipeline under all public roads as shown in the sketch above, or as shown on approved construction drawings.
- All voids developed by boring under surface of road bed shall be repaired.
 - Voids developed under hard surface roads (bituminous mat or concrete) shall be filled by pressure grouting. Grout shall consist of a sand-cement slurry of at least 2 sacks of cement per cubic yard.
 - Voids developed under non-hard surface roads (graded gravel or crushed rock and dirt) shall be filled by removal of road bed and backfilling with suitable material pneumatically tamped in 6" layers to density of surrounding undisturbed earth and replacing surface material to original condition.
- Pipeline undercrossings of all roads shall be installed in accordance with Engineering Standards and/or permit requirements or specifications provided by the Company.
- The pipeline should cross as near to right angles as possible and economically practical.
- For roads not having a drainage ditch, the minimum cover from the top of the road bed or the lowest elevation within the R/W shall be 4' - 0" or as specified by the permitting authorities.
- For uncased road crossings, the design factor for the carrier pipe shall extend 10' - 0" beyond each R/W line.
- When casing pipe is required, it shall be installed as required by the permit or extend from R/W to R/W. Carrier pipe for cased road crossings shall meet the DOT design requirements.
- All undercrossings shall be bored unless specified otherwise in the construction drawings or specifications.

TYPICAL INSTALLATION DRAWING



EXTRA TRENCH
TYPICALLY 1/2
PIPE DIAMETER
EACH SIDE.

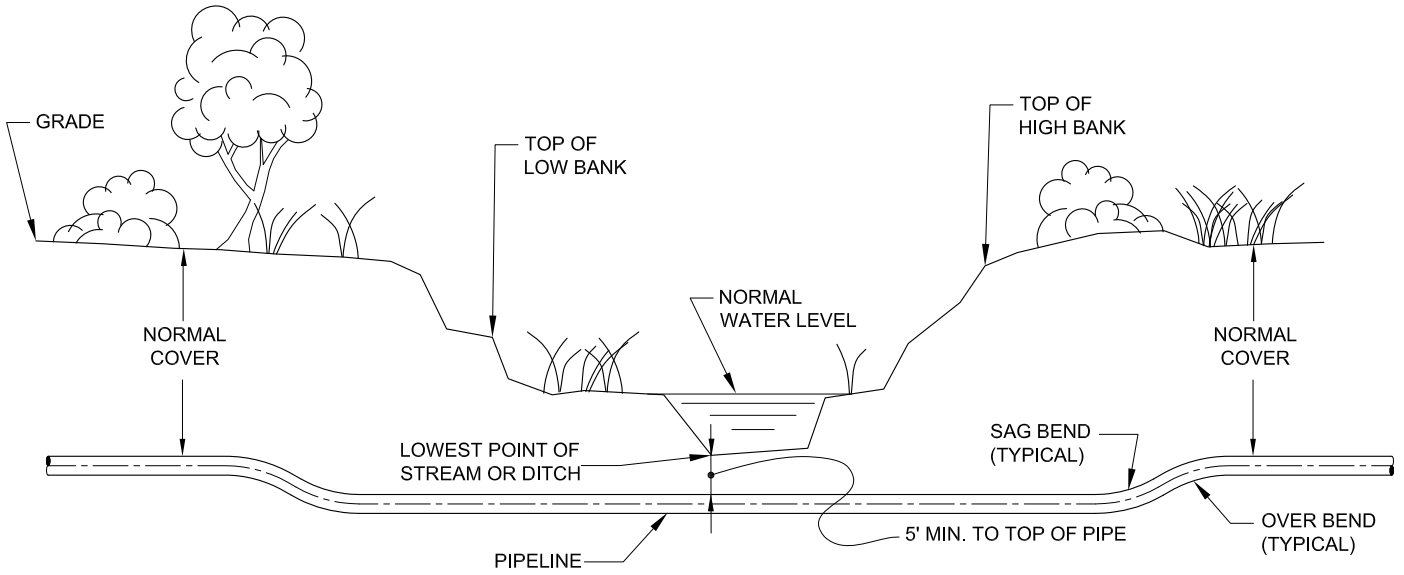


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DRAWN	CHECKED	APPROVED	DATE	REV NO.	DESCRIPTION
CJH	BLT	QLB	04/06/11	A	ISSUED FOR REVIEW

<small>THIS DRAWING PREPARED BY:</small> ROONEY ENGINEERING, INC 12201 E. Arapahoe Road, Suite C-10 Centennial, Colorado 80112 (303) 792-5911		PLAINS ALL AMERICAN PIPELINE, L.P.		BAKKEN NORTH PROJECT AFE#14933
		TYPICAL CONSTRUCTION DETAIL PIPELINE SET ON TYPE SADDLE BAG WEIGHT		
DRAWN CJH DATE 03/15/2011	CHECKED QLB SCALE NTS	DRFT. APPV. ENGR. APPV.	14933-A-0007	

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TYPICAL STREAM / DITCH UNDERCROSSING

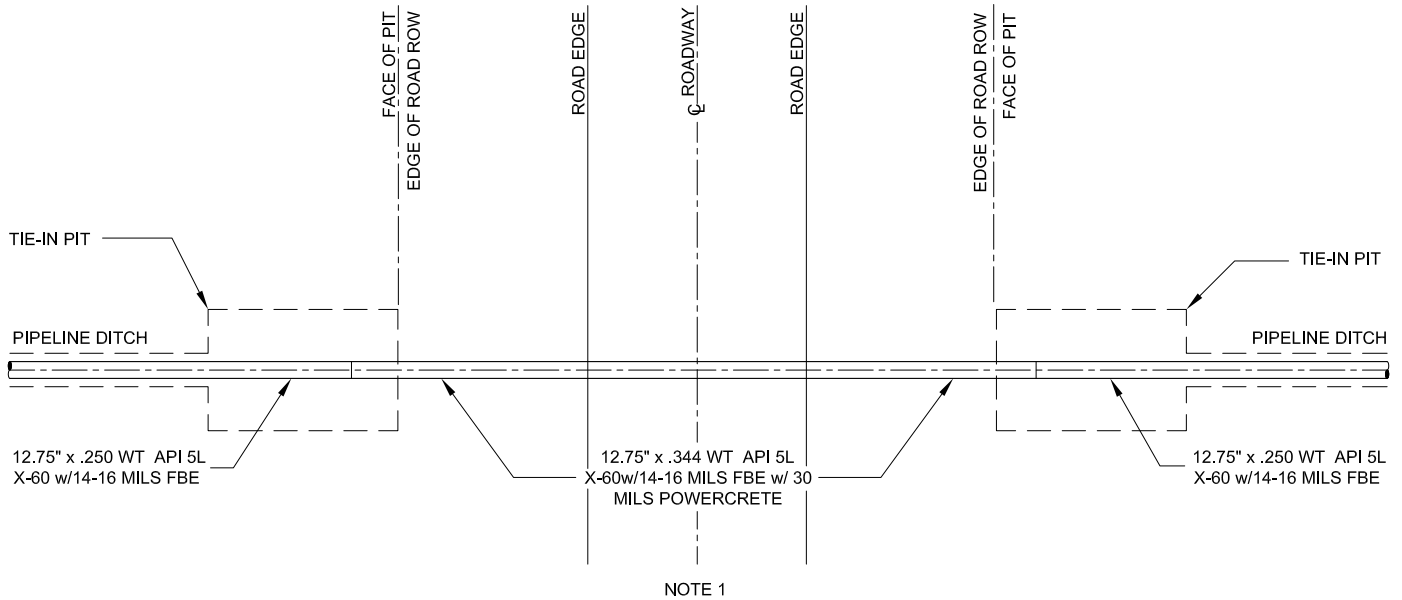
NOTES:

1. THIS DRAWING IS APPLICABLE TO ALL STREAM OR DITCH CROSSINGS NOT SHOWN INDIVIDUALLY DESIGNED ON OTHER CONSTRUCTION DRAWINGS.
2. ALL NEW CONSTRUCTION TO BE DONE BY CONTRACTOR.

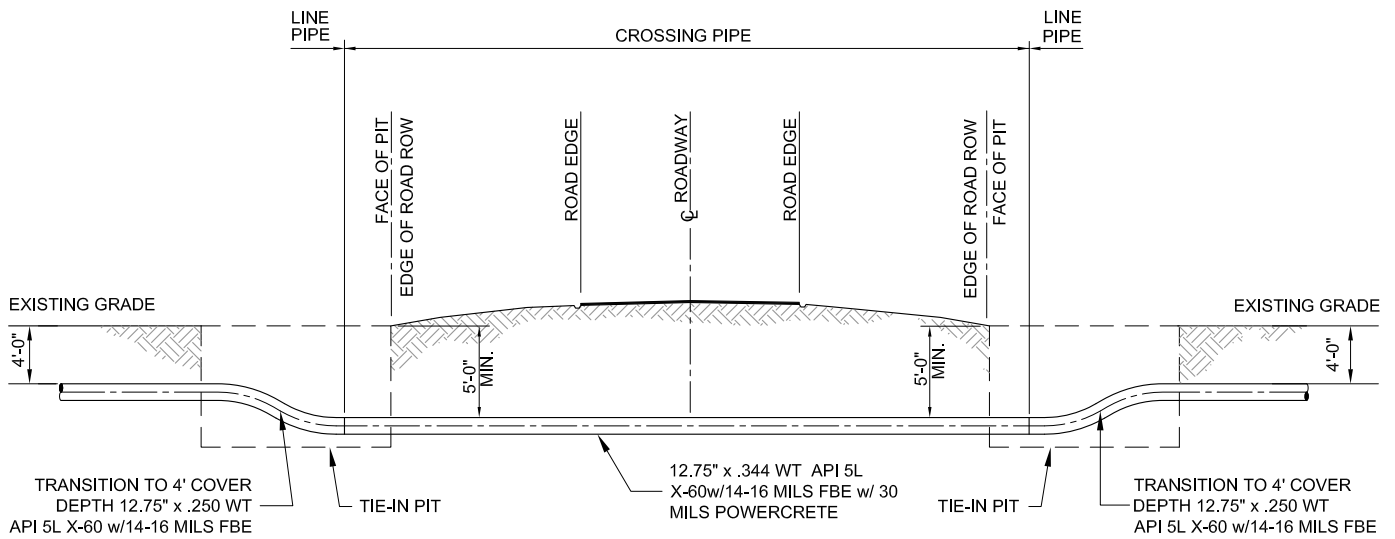
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CJH	BLT	QLB	04/06/11	A	ISSUED FOR REVIEW

		BAKKEN NORTH PROJECT AFE#14933	
TYPICAL CONSTRUCTION DETAIL STREAM OR DITCH PIPELINE UNDERCROSSING			
DRAWN	CJH	CHECKED	QLB
DATE	03/15/2011	SCALE	NTS
DRFT. APPV.		ENGR. APPV.	
14933-A-0008			

THE DRAWING PREPARED BY:
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TYPICAL BORED CROSSING
(PLAN)



TYPICAL BORED CROSSING
(ELEVATION)

- NOTES:
 1. TRAFFIC CONTROL PLAN BY CONTRACTOR AS REQUIRED BY CROSSING PERMIT
 2. ROAD SHALL BE RESTORED AS REQUIRED BY CROSSING PERMIT.

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DRAWN	CHECKED	APPROVED	DATE	REV NO.	DESCRIPTION
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<small>THIS DRAWING PREPARED BY:</small> ROONEY ENGINEERING, INC 12201 E. Arapahoe Road, Suite C-10 Centennial, Colorado 80112 (303) 792-5911		BAKKEN NORTH PROJECT AFE#14933
		TYPICAL CONSTRUCTION DETAIL BORED CROSSING FOR UNIMPROVED ROADS
DRAWN CJH DATE 03/15/2011	CHECKED QLB SCALE NTS	DRFT. APPV. ENGR. APPV.
14933-A-0011		