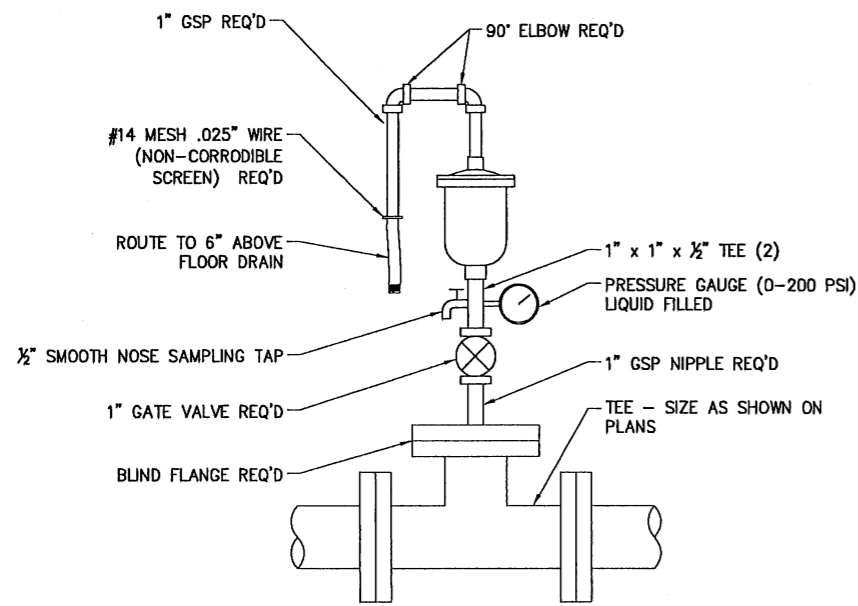
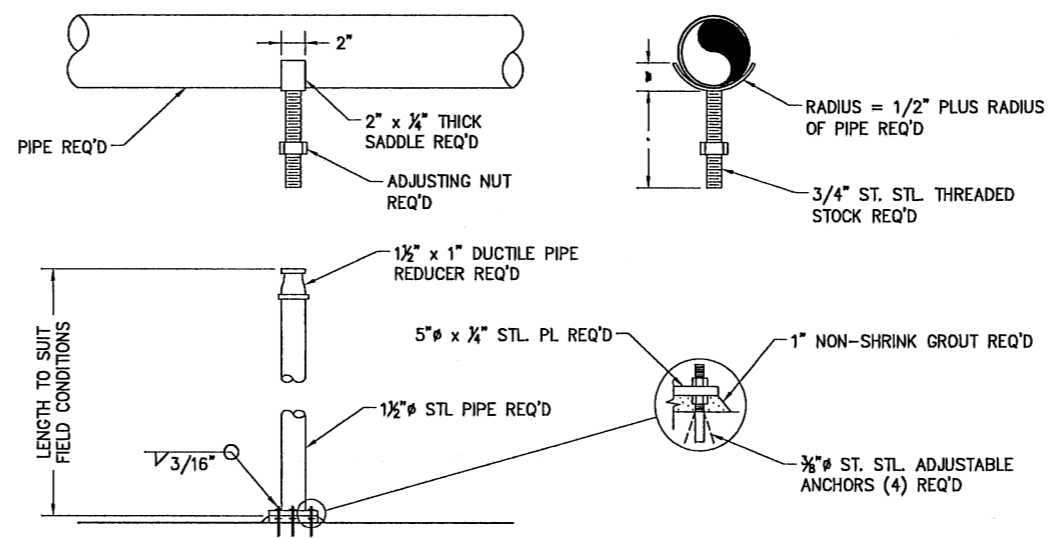


A **DETAIL - PRESSURE GAUGE ASSEMBLY**
MP NTS

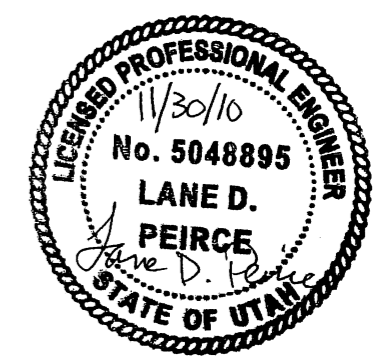
B **NOT USED**



D **DETAIL - COMBINATION AIR/VACUUM RELIEF VALVE**
MP NTS

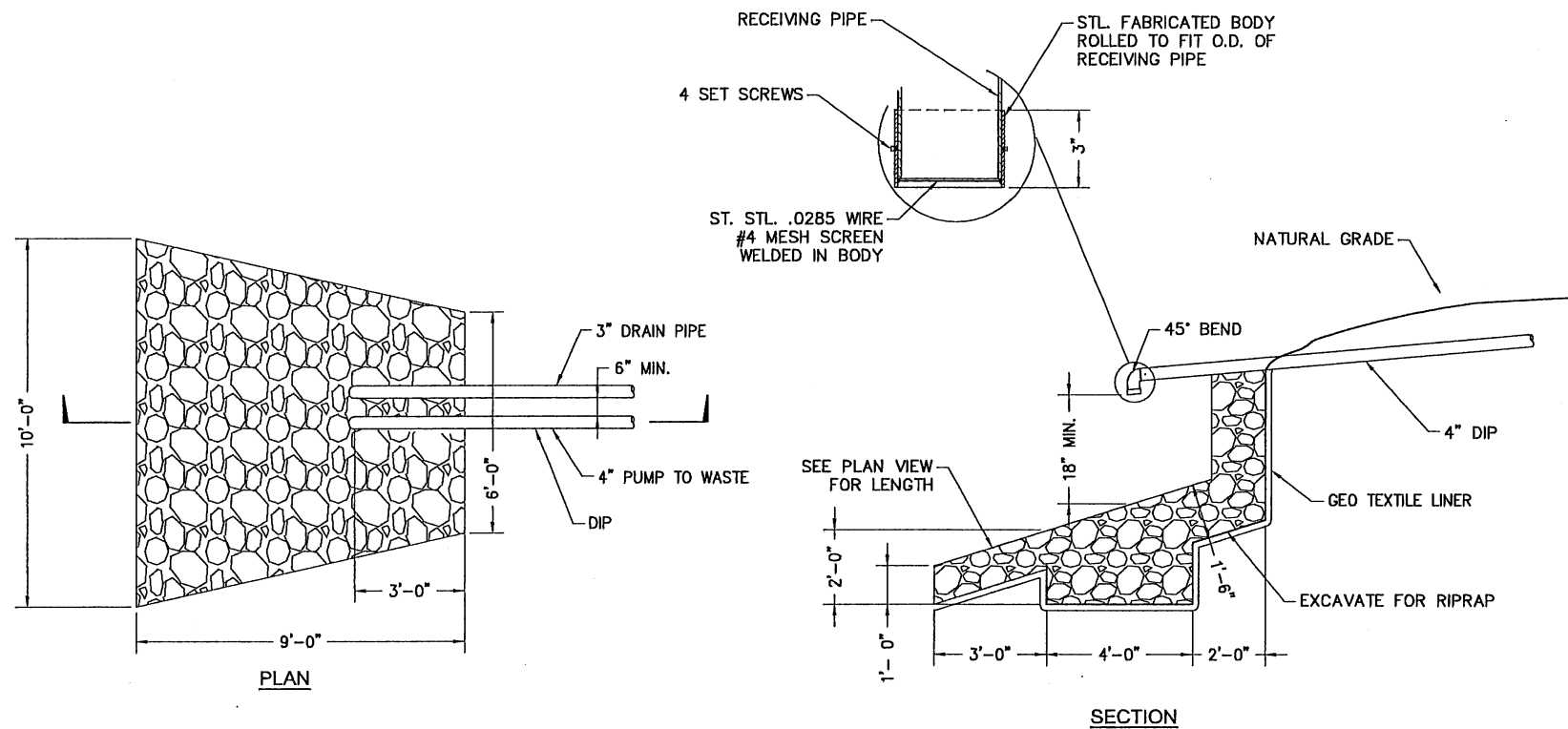


E **DETAIL - PIPE SUPPORT**
MP NTS



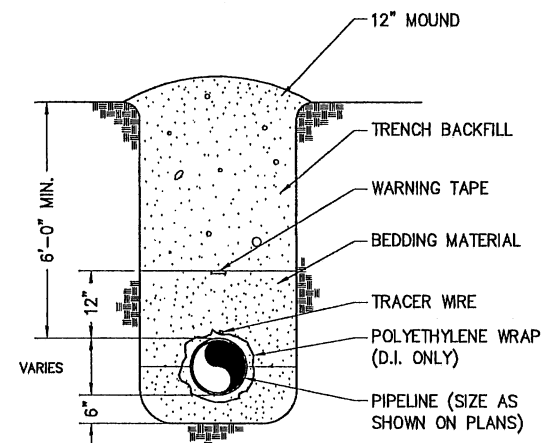
REV. NO.	COMMENT	DATE
 SUNRISE ENGINEERING 12227 SOUTH BUSINESS PARK DRIVE, SUITE 220 DRAPER, UTAH 84020 TEL 801.523.0100 • FAX 801.523.0990 www.sunrise-eng.com		
CROYDON PIPELINE COMPANY HILL TOP WELL #1		
DETAILS		
SEI NO. 03562	DESIGNED LDP	DRAWN AAD
CHECKED LDP	SHEET NO. 17 of 30	D1

P:\Croydon\03562_Croydon Well\Design3D\Sheets\CROY-D.dwg Nov 24, 2010 11:36am lpeirce

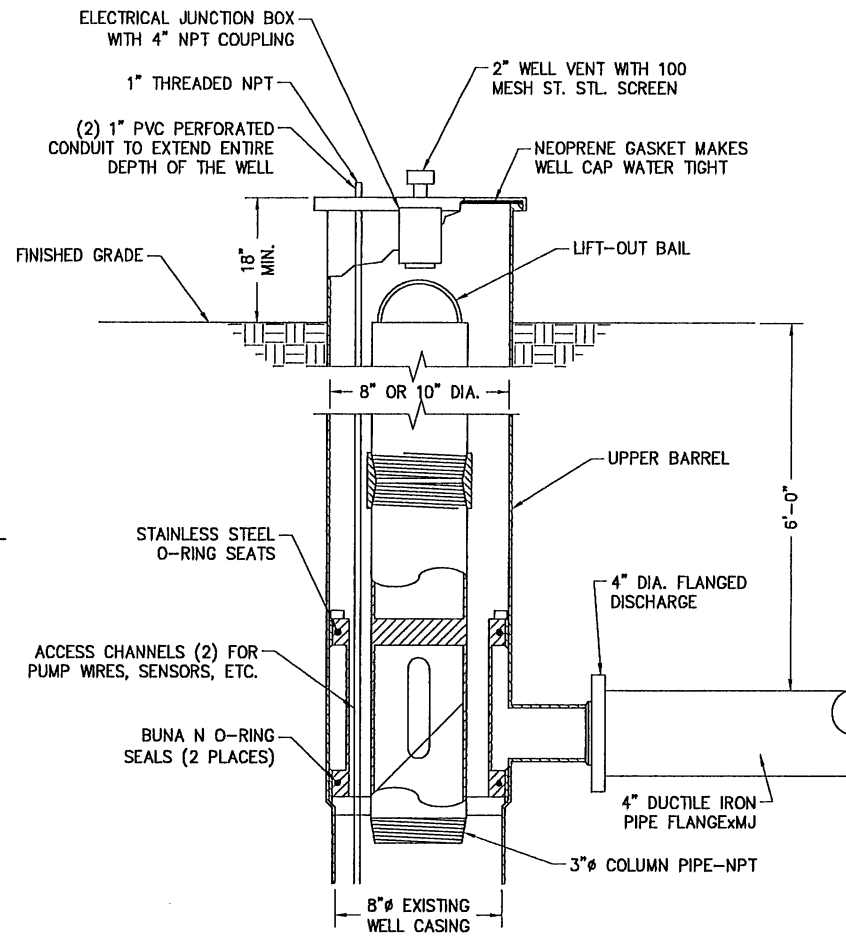


A **SP** **DETAIL - PUMP TO WASTE OUTLET**
NTS

NOTE:
MAINTAIN CONTINUOUS DOWNHILL
SLOPE ON OUTLET PIPE



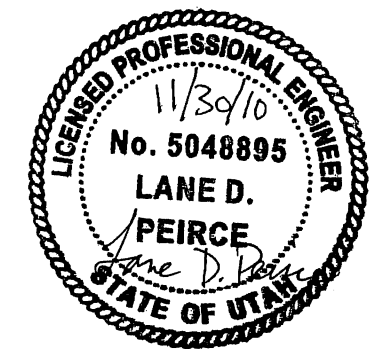
C **SP** **DETAIL - TRENCH**
NTS



B **SP** **DETAIL - PITLESS UNIT**
NTS

PITLESS ADAPTER NOTES

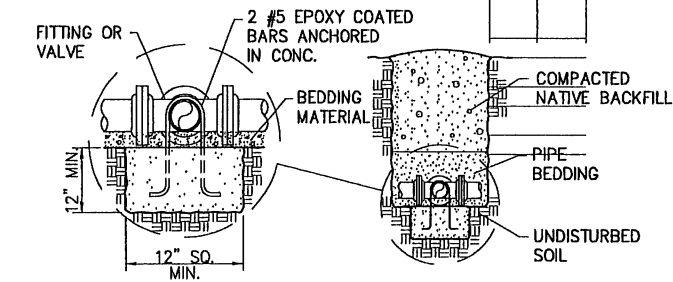
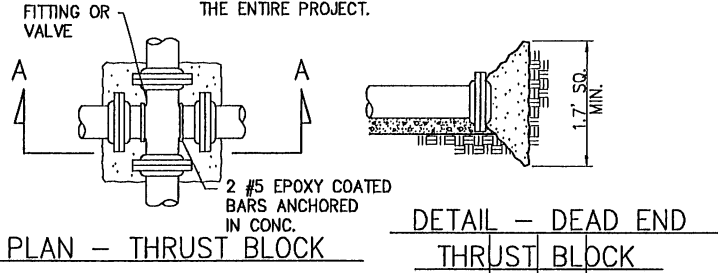
1. PITLESS UNIT SHALL BE APPROVED BY NSF INTERNATIONAL OR THE PITLESS ADAPTER ASSOCIATION OR OTHER APPROPRIATE REVIEW AUTHORITY,
2. PITLESS UNIT SHALL HAVE SUITABLE ACCESS TO THE INTERIOR OF THE CASING IN ORDER TO DISINFECT THE WELL, AND SHALL HAVE A SUITABLE SANITARY SEAL OR COVER AT THE UPPER TERMINAL OF THE CASING THAT WILL PREVENT THE ENTRANCE OF ANY FLUIDS OR CONTAMINATION, ESPECIALLY AT THE CONNECTION POINT OF THE ELECTRICAL CABLES.
3. PITLESS UNIT SHALL HAVE SUITABLE ACCESS SO THAT MEASUREMENTS OF STATIC AND PUMPED WATER LEVELS IN THE WELL CAN BE OBTAINED AS REQUIRED IN THE SPECIFICATIONS.
4. PITLESS UNIT SHALL HAVE CHECK VALVES IN THE COLUMN PIPE WITHIN WELL CASING PER THE SPECIFICATIONS
5. PITLESS UNIT SHALL BE FURNISHED WITH A COVER THAT IS LOCKABLE OR OTHERWISE PROTECTED AGAINST VANDALISM OR SABOTAGE, AND SHALL BE SHOP-FABRICATED FROM THE POINT OF CONNECTION WITH THE WELL CASING TO THE UNIT CAP OR COVER,
6. PITLESS UNIT SHALL BE OF WATERTIGHT CONSTRUCTION THROUGHOUT, AND BE CONSTRUCTED OF MATERIALS AT LEAST EQUIVALENT TO AND HAVING WALL THICKNESS COMPATIBLE TO THE CASING AS PER THE SPECIFICATIONS.
7. PITLESS UNIT SHALL BE THREADED OR WELDED TO THE WELL CASING. IF THE CONNECTION TO THE CASING IS BY FIELD WELD, THE SHOP ASSEMBLED UNIT MUST BE DESIGNED SPECIFICALLY FOR FIELD WELDING TO THE CASING. THE ONLY FIELD WELDING PERMITTED ON THE PITLESS UNIT WILL BE THAT NEEDED TO CONNECT A PITLESS UNIT TO THE CASING.



REV NO.	COMMENT	DATE
 SUNRISE ENGINEERING 12227 SOUTH BUSINESS PARK DRIVE, SUITE 220 DRAPER, UTAH 84020 TEL 801.523.0100 • FAX 801.523.0990 www.sunrise-eng.com		
CROYDON PIPELINE COMPANY HILL TOP WELL #1		
DETAILS		
SEI NO. 03562	DESIGNED LDP	DRAWN AAD
CHECKED LDP	SHEET NO. 18 of 30	D2

**CONCRETE THRUST BLOCK
RESTRAINING SYSTEM DETAILS**

NOTE:
CONTRACTOR SHALL USE EITHER MEGALUG OR
CONCRETE THRUST RESTRAINING SYSTEM FOR
THE ENTIRE PROJECT.



SECTION A-A

THRUST BLOCK BEARING AREA IN SQ. FT.									
PIPE SIZE	CROSS	TEE	WYE	DEAD END	VALVE	90° BEND	45° BEND	22.5° BEND	11.25° BEND
4	2.4	1.7	1.7	1.7	-	2.4	1.3	1.0	1.0
6	5.4	3.8	3.8	3.8	-	5.4	2.9	1.5	1.0
8	9.6	6.8	6.8	6.8	-	9.6	5.2	2.7	1.4
10	15.0	10.6	10.6	10.6	-	15.0	8.1	4.2	2.1
12	21.5	15.2	15.2	15.2	15.2	21.5	11.7	6.0	3.0
14	29.3	20.7	20.7	20.7	20.7	29.3	15.9	8.1	4.1
16	38.2	27.0	27.0	27.0	27.0	38.2	20.7	10.6	5.3
18	48.4	34.2	34.2	34.2	34.2	48.4	26.2	13.4	6.7
20	59.7	42.2	42.2	42.2	42.2	59.7	32.3	16.5	8.3
24	85.9	60.8	60.8	60.8	60.8	85.9	46.5	23.7	11.9

REDUCER									
D1/D2	6	8	10	12	14	16	18	20	24
4	2.1	5.1	8.8	13.4	-	-	-	-	-
6	-	3.0	6.7	11.3	16.8	23.1	-	-	-
8	-	-	3.8	8.4	13.8	20.1	27.2	-	-
10	-	-	-	4.6	10.1	16.3	23.5	31.4	-
12	-	-	-	-	5.5	11.7	18.8	26.8	45.2
14	-	-	-	-	-	6.3	13.4	21.3	39.8
16	-	-	-	-	-	-	7.1	15.1	33.5
18	-	-	-	-	-	-	-	8.0	26.3
20	-	-	-	-	-	-	-	-	18.4

- NOTE:
- ALL THRUST BLOCK BEARING FACES SHALL BE PLACED AGAINST UNDISTURBED SOIL OR APPROVED COMPACTED BACKFILL.
 - SQUARE ALL EDGES TO RECEIVE CONCRETE.
 - CONCRETE SHALL BE CLASS C.
 - CALCULATED ON 200 PSI TEST PRESSURE AND ALLOWABLE BEARING PRESSURE OF 1500 LBS. PER SQ. FT.
 - IN POORER SOILS, SPECIAL DESIGN IS REQUIRED.
 - ALL FITTINGS AND VALVES SHALL BE ANCHORED WITH TWO EPOXY COATED #5 REBAR. ONLY ONE REQ'D FOR REDUCER.
 - CENTER ALL FITTINGS OVER THRUST BLOCKS.

**MEGALUG
THRUST RESTRAINING SYSTEM DETAILS**

NOTE:
CONTRACTOR SHALL USE
EITHER MEGALUG OR
CONCRETE THRUST
RESTRAINING SYSTEM FOR
THE ENTIRE PROJECT.

* CALCULATIONS DERIVED FROM EBAA IRON SALES

BASED ON:
TEST PRESSURE 200 PSI
SOIL TYPE: GM-SILTY GRAVEL, GRAVEL-SAND-SILT MIXTURE
BURIAL DEPTH: 4 FT.
TRENCH TYPE: 5-PIPE BEDDED IN COMPACTED GRANULAR MATERIAL TO THE CENTER LINE OF PIPE, 4" MIN. UNDER PIPE.
COMPACTED GRANULAR OR SELECT MATERIAL TO TOP OF PIPE. (APPROX. 90% STANDARD PROCTOR, AASHTO T-99)
SAFETY FACTOR: 1.5

**PVC VERTICAL BEND RESTRAINED LENGTHS IN FT.
(L₁ - BEFORE CONNECTION / L₂ - AFTER CONNECTION)**

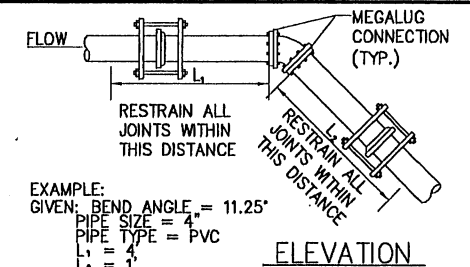
BEND ANGLE	PIPE SIZE									
	4	6	8	10	12	14	16	18	20	24
11.25	4/1	5/2	7/2	9/3	10/3	12/4	13/4	15/5	16/5	19/6
22.5	8/3	11/4	15/5	17/6	21/7	24/8	27/9	30/9	33/10	38/12
45	16/5	23/8	30/10	36/12	43/14	49/16	56/18	62/20	68/21	79/25

CALCULATIONS BASED ON THE ELEVATION OF THE PIPE REMAINING CONSTANT WITH THE CONTOUR OF THE GROUND.
FOR TWO WAY FLOW, SUCH AS FOUND IN DISTRIBUTION SYSTEMS, USE L₁ ON BOTH SIDES OF FITTING.

**DIP VERTICAL BEND RESTRAINED LENGTHS IN FT.
(L₁ BEFORE CONNECTION / L₂ - AFTER CONNECTION)**

BEND ANGLE	PIPE SIZE									
	4	6	8	10	12	14	16	18	20	24
11.25	2/1	4/2	5/2	6/2	7/3	8/3	8/4	9/4	10/4	12/5
22.5	5/2	7/3	9/4	11/5	13/6	15/6	17/7	19/8	21/9	24/10
45	11/5	15/6	20/8	23/10	28/12	32/13	36/15	40/17	43/18	51/21

CALCULATIONS BASED ON THE ELEVATION OF THE PIPE REMAINING CONSTANT WITH THE CONTOUR OF THE GROUND.



EXAMPLE:
GIVEN: BEND ANGLE = 11.25°
PIPE SIZE = 4"
PIPE TYPE = PVC
L₁ = 4'
L₂ = 1'

PVC HORIZONTAL BEND RESTRAINED LENGTHS L, IN FT.

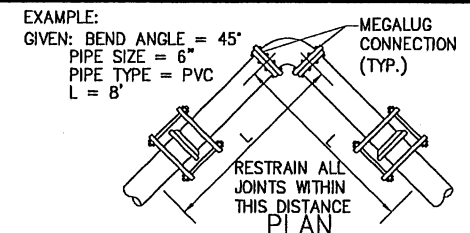
BEND ANGLE	PIPE SIZE									
	4	6	8	10	12	14	16	18	20	24
11.25	1	2	2	3	3	4	4	5	5	6
22.5	3	4	5	6	7	8	9	9	10	12
45	5	8	10	12	14	16	18	20	21	25
90	13	18	24	29	34	38	43	47	52	60

1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED

DIP HORIZONTAL BEND RESTRAINED LENGTHS L, IN FT.

BEND ANGLE	PIPE SIZE									
	4	6	8	10	12	14	16	18	20	24
11.25	1	2	2	3	3	4	4	5	5	6
22.5	2	3	4	5	6	6	7	8	9	10
45	5	6	8	10	12	13	15	17	18	21
90	11	15	20	24	28	32	36	40	44	51

1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED



EXAMPLE:
GIVEN: BEND ANGLE = 45°
PIPE SIZE = 6"
PIPE TYPE = PVC
L = 8'

PVC TEE RESTRAINED LENGTHS L, IN FT.

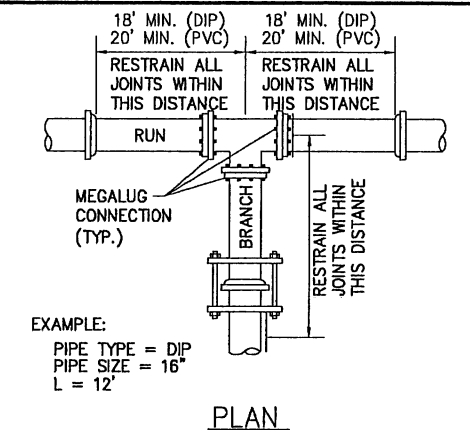
BRANCH SIZE DIA.	RUN SIZE DIAMETER									
	4	6	8	10	12	14	16	18	20	24
4	*	*	*	*	*	*	*	*	*	*
6	-	*	*	*	*	*	*	*	*	*
8	-	-	*	*	*	*	*	*	*	*
10	-	-	-	*	*	*	*	*	*	*
12	-	-	-	-	*	*	*	*	*	*
14	-	-	-	-	-	*	*	*	*	*
16	-	-	-	-	-	-	7	*	*	*
18	-	-	-	-	-	-	-	20	4	*
20	-	-	-	-	-	-	-	-	34	3
24	-	-	-	-	-	-	-	-	-	60

* = FOR THIS CONDITION NEED ONLY RESTRAIN THE OUTLETS OF TEE.
NOTES:
1. RESTRAIN THE THREE MECHANICAL JOINTS ON THE TEE.
2. ALL JOINTS WITHIN THE "L" DISTANCE ON THE BRANCH SIDE OF TEE SHALL BE RESTRAINED AND ALL JOINTS WITHIN 18' ON THE RUN SIDE OF THE TEE SHALL BE RESTRAINED.

DIP TEE RESTRAINED LENGTHS L, IN FT.

BRANCH SIZE DIA.	RUN SIZE DIAMETER									
	4	6	8	10	12	14	16	18	20	24
4	*	*	*	*	*	*	*	*	*	*
6	-	*	*	*	*	*	*	*	*	*
8	-	-	*	*	*	*	*	*	*	*
10	-	-	-	*	*	*	*	*	*	*
12	-	-	-	-	*	*	*	*	*	*
14	-	-	-	-	-	*	*	*	*	*
16	-	-	-	-	-	-	12	2	*	*
18	-	-	-	-	-	-	-	21	12	*
20	-	-	-	-	-	-	-	-	30	12
24	-	-	-	-	-	-	-	-	-	47

* = FOR THIS CONDITION NEED ONLY RESTRAIN THE OUTLETS OF TEE.
NOTES:
1. RESTRAIN THE THREE MECHANICAL JOINTS ON THE TEE.
2. ALL JOINTS WITHIN THE "L" DISTANCE ON THE BRANCH SIDE OF TEE SHALL BE RESTRAINED AND ALL JOINTS WITHIN 18' ON THE RUN SIDE OF THE TEE SHALL BE RESTRAINED.



EXAMPLE:
PIPE TYPE = DIP
PIPE SIZE = 16"
L = 12'

**PVC REDUCER RESTRAINED LENGTHS L, IN FT.
(SMALL SIDE/LARGE SIDE)**

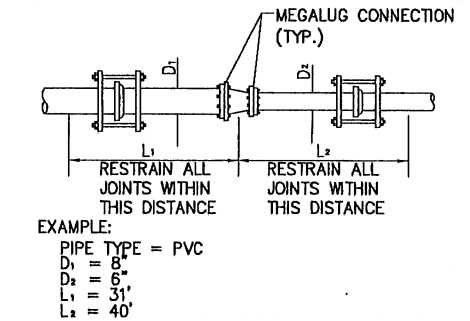
D1/D2	6	8	10	12	14	16	18	20	24
4	42/29	100/52	171/71	258/90	-	-	-	-	-
6	-	40/31	88/54	147/75	217/95	297/113	-	-	-
8	-	-	37/29	82/55	135/77	197/98	266/117	-	-
10	-	-	-	36/30	79/56	128/80	183/100	244/120	-
12	-	-	-	-	36/30	77/57	123/80	174/102	293/142
14	-	-	-	-	-	35/30	74/57	118/81	219/124
16	-	-	-	-	-	-	34/30	73/57	161/104
18	-	-	-	-	-	-	-	34/30	111/82
20	-	-	-	-	-	-	-	-	70/57

1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED

**DIP REDUCER RESTRAINED LENGTHS L, IN FT.
(SMALL SIDE/LARGE SIDE)**

D1/D2	6	8	10	12	14	16	18	20	24
4	27/18	65/34	110/46	166/58	-	-	-	-	-
6	-	26/20	57/35	95/48	140/61	192/73	-	-	-
8	-	-	24/19	53/35	87/50	127/63	171/75	-	-
10	-	-	-	23/20	51/36	82/51	118/64	158/77	-
12	-	-	-	-	23/20	49/37	79/52	112/66	188/91
14	-	-	-	-	-	22/20	48/37	76/52	141/80
16	-	-	-	-	-	-	22/19	47/37	103/67
18	-	-	-	-	-	-	-	22/19	72/53
20	-	-	-	-	-	-	-	-	45/37

1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED



EXAMPLE:
PIPE TYPE = PVC
D₁ = 8"
D₂ = 6"
L₁ = 31'
L₂ = 40'

PVC DEAD END RESTRAINED LENGTHS L, IN FT.

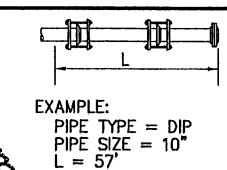
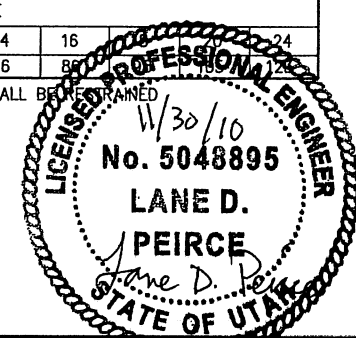
PIPE SIZE									
4	6	8	10	12	14	16	18	20	24
39	55	73	88	104	119	134	149	163	192

1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED

DIP DEAD END RESTRAINED LENGTHS L, IN FT.

PIPE SIZE									
4	6	8	10	12	14	16	18	20	24
25	36	47	57	67	76	85	94	103	112

1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED



EXAMPLE:
PIPE TYPE = DIP
PIPE SIZE = 10"
L = 57'

REV. NO.	COMMENT	DATE

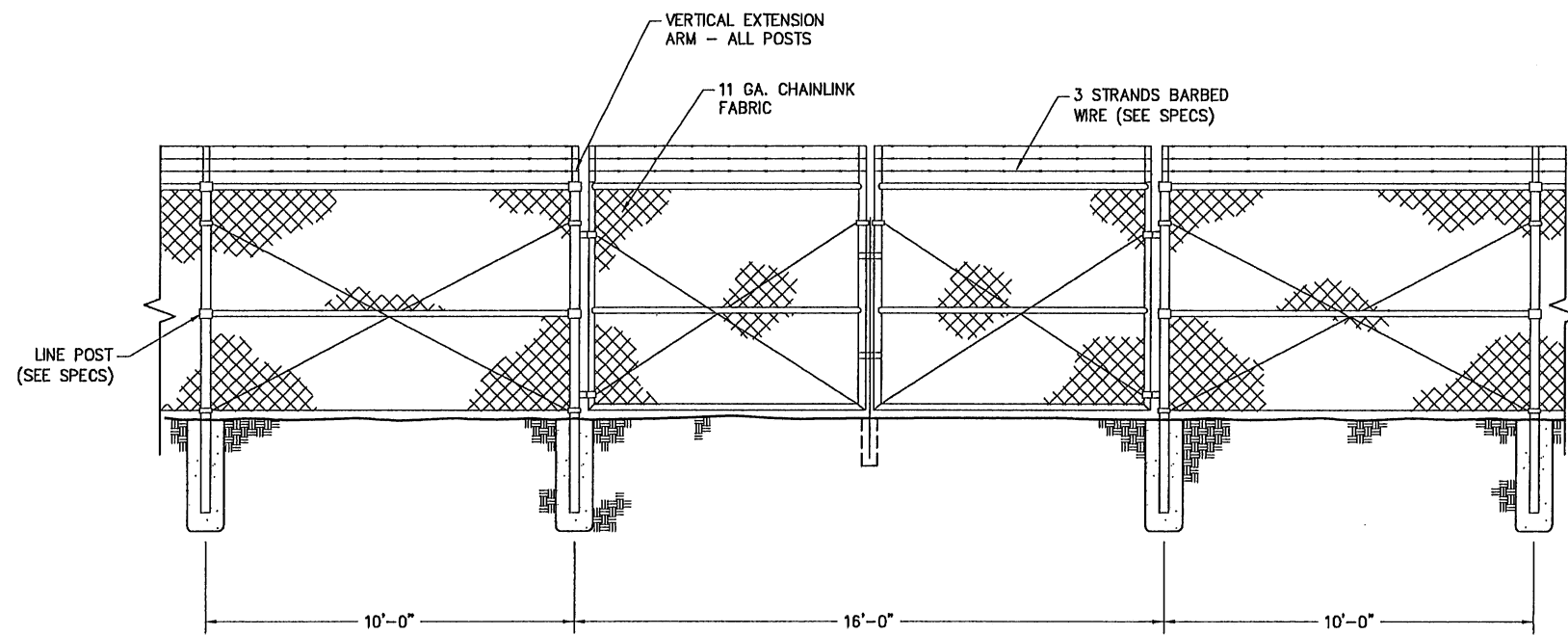
SUNRISE ENGINEERING
12227 SOUTH BUSINESS PARK DRIVE, SUITE 220
DRAPER, UTAH 84020
TEL 801.523.0100 • FAX 801.523.0990
www.sunrise-eng.com

CROYDON PIPELINE COMPANY
HILL TOP WELL #1

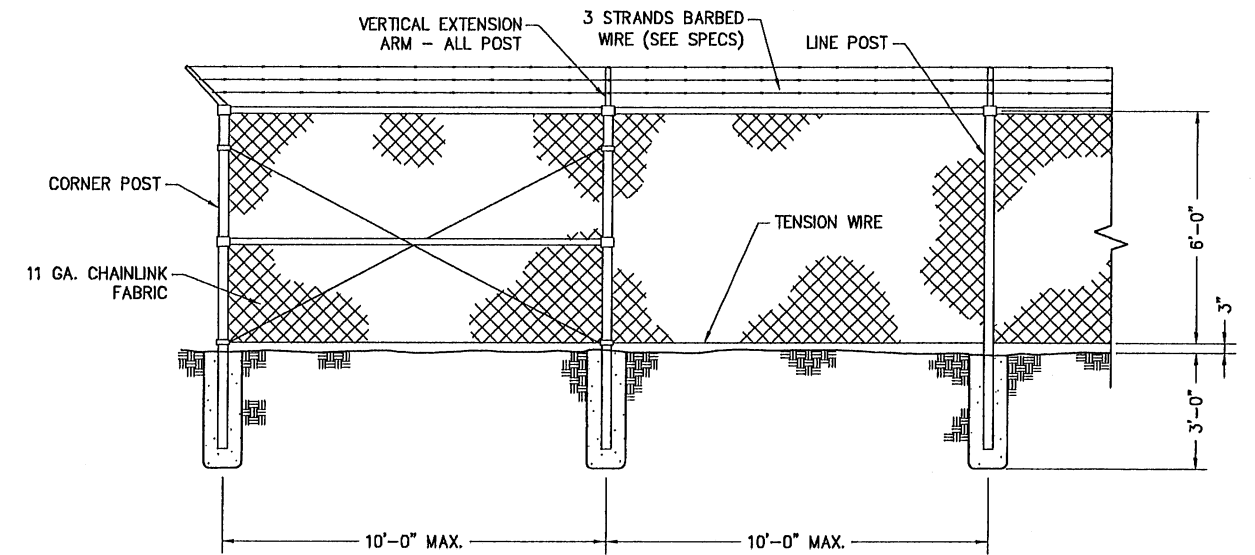
DETAILS

SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.
03562	LDP	AAD	LDP	19 of 30

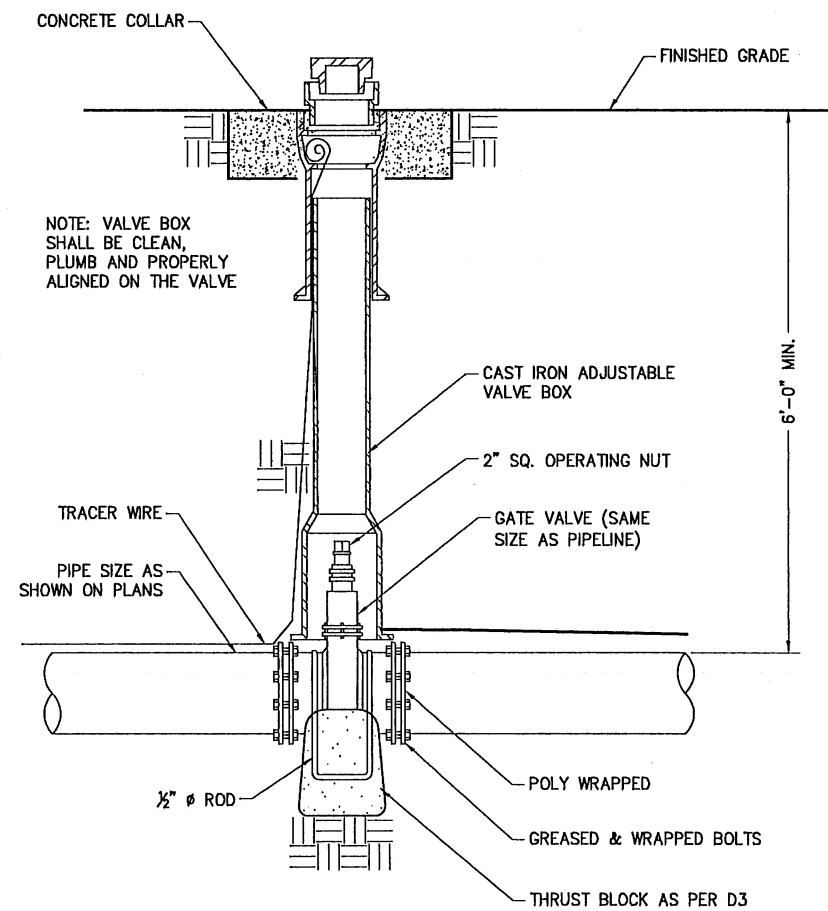
D3



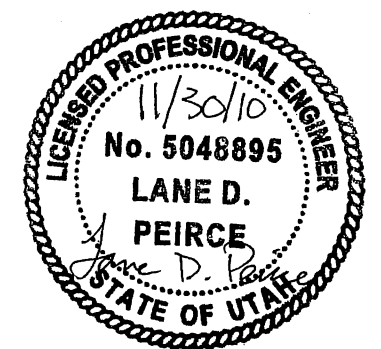
A DETAIL - GATE CHAINLINK FENCE
D4 NTS




B DETAIL - CHAINLINK FENCE
D4 NTS



C DETAIL - TYPICAL GATE VALVE
SP NTS



REV NO.	ADDENDUM #1 REVISIONS	DATE
1		4/28/09
	COMMENT	

 SUNRISE ENGINEERING					
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CROYDON PIPELINE COMPANY					
HILL TOP WELL #1					
DETAILS					
SEI NO. 03562	DESIGNED LDP	DRAWN AAD	CHECKED LDP	SHEET NO. 20 of 30	D4