ATMOS energy

LINE L8-9(2ND)-1 TIE IN

ISSUED FOR BID

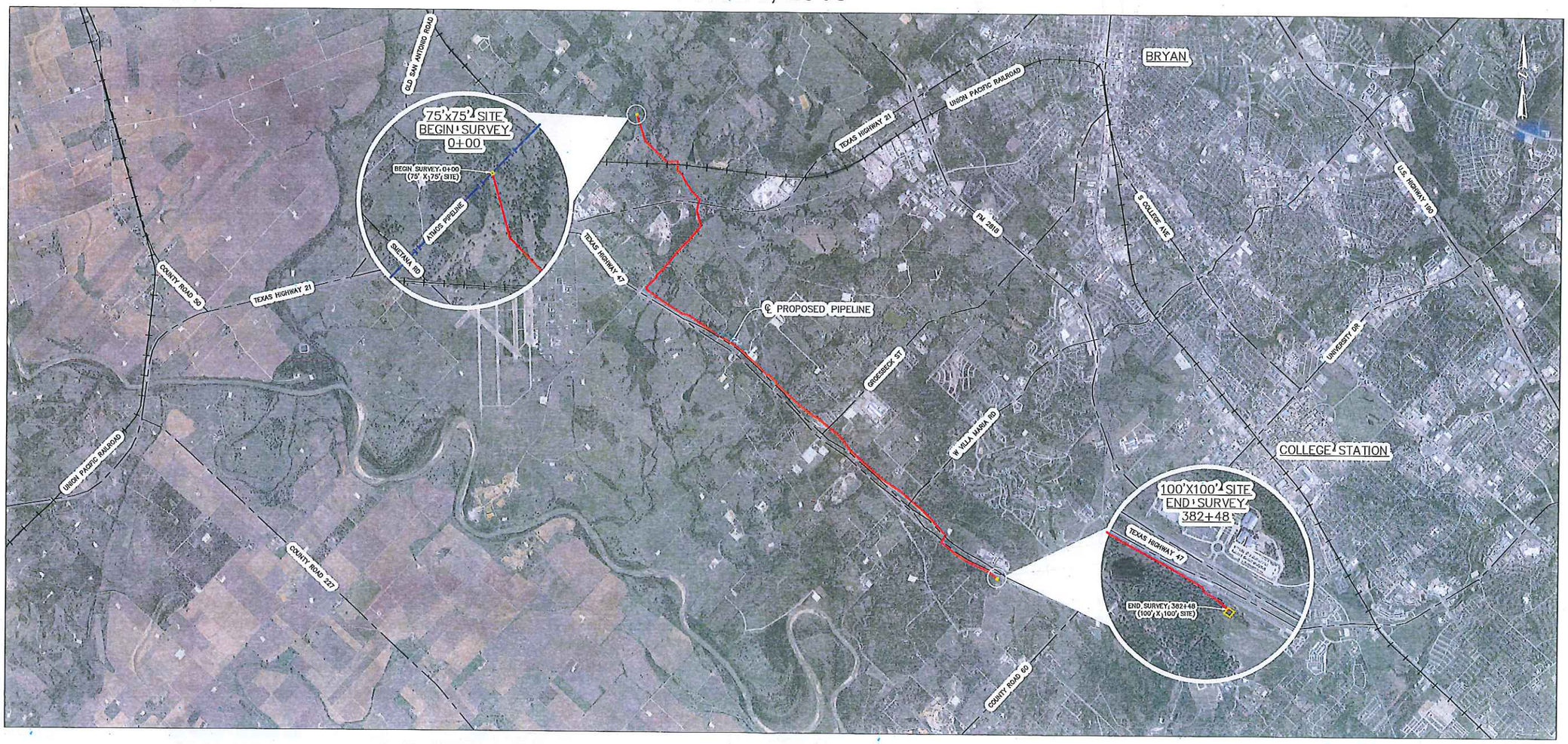
ATMOS PROJECT NUMBER 180.27259

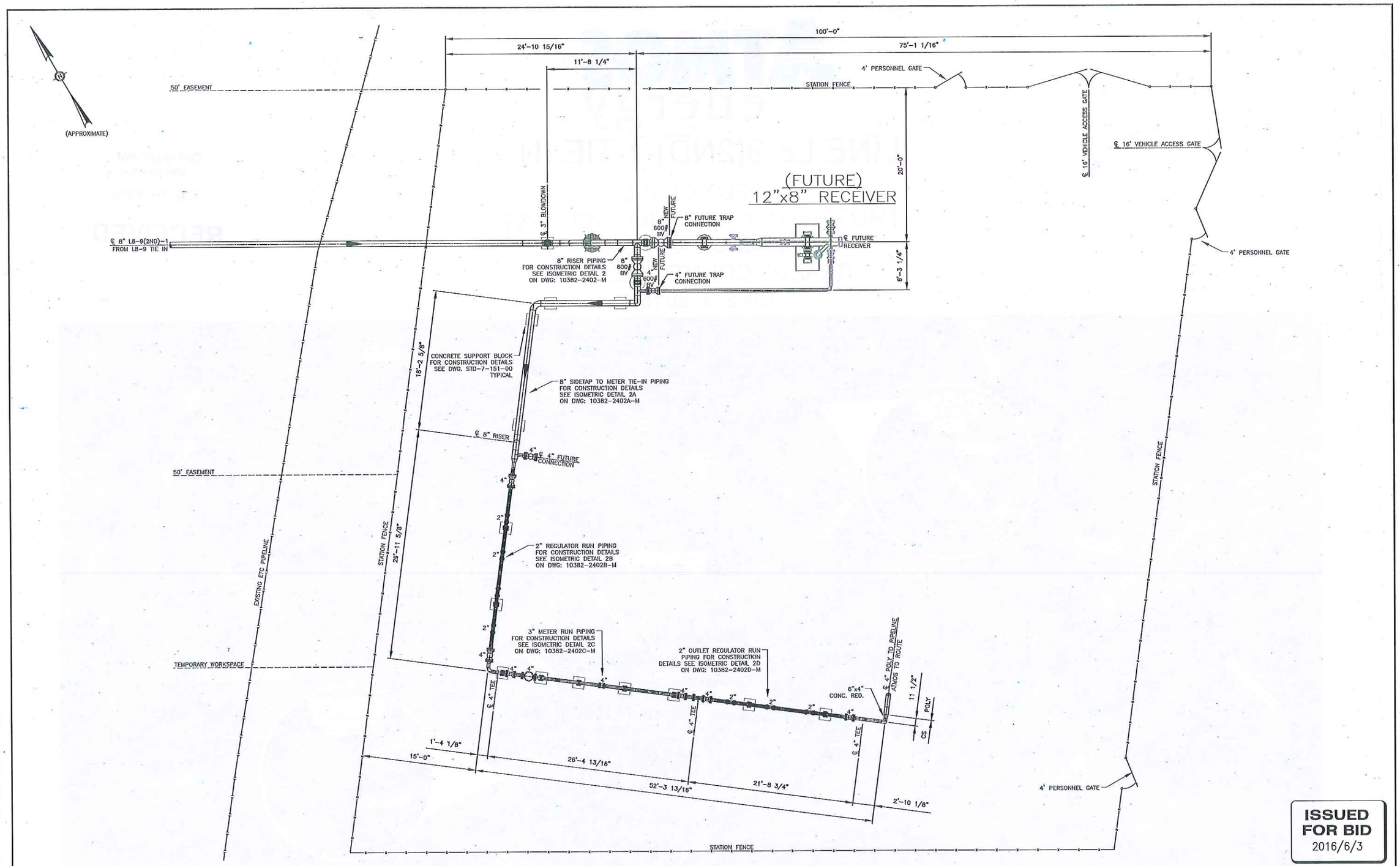
0+00 to 382+48

BRAZOS COUNTY, TEXAS

JUNE 3, 2016

Development Services
AUG 12 2016
RECEIVED





ISSUED FOR BID
2016/6/3

NOTES:

1.) CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN THE FIELD PRIOR TO CONSTRUCTION.

LEGEND:

REFERENCE DRAWINGS	
NUMBER	TITLE

REVISIONS				
NO.	DESCRIPTION	BY	CKD.	DATE
F	ISSUED FOR BID	EPG	EPG	06.03.16
E	ISSUED FOR APPROVAL	EPG	EPG	5.25.16
D	ISSUED FOR APPROVAL	EPG	EPG	5.9.16
C	ISSUED FOR APPROVAL	EPG	EPG	5.4.16
B	ISSUED FOR REVIEW	TAB	BTM	4.22.16
A	ISSUED FOR REVIEW	TAB	BTM	4.12.16

Turpin Engineering, L.L.C.
LARRY J. TURPIN, P.E.
21 Waterway Ave., Ste 300
The Woodlands, TX 77380
(281) 362-2733 Office

DRAWN BY	TBOURN	DATE	4.12.16
CHECKED BY	BMIDDLETON	DATE	.
ENGR. APPD.	.	DATE	.
PROJ. MGR. APPD.	.	DATE	.
CLIENT APPD.	.	DATE	.

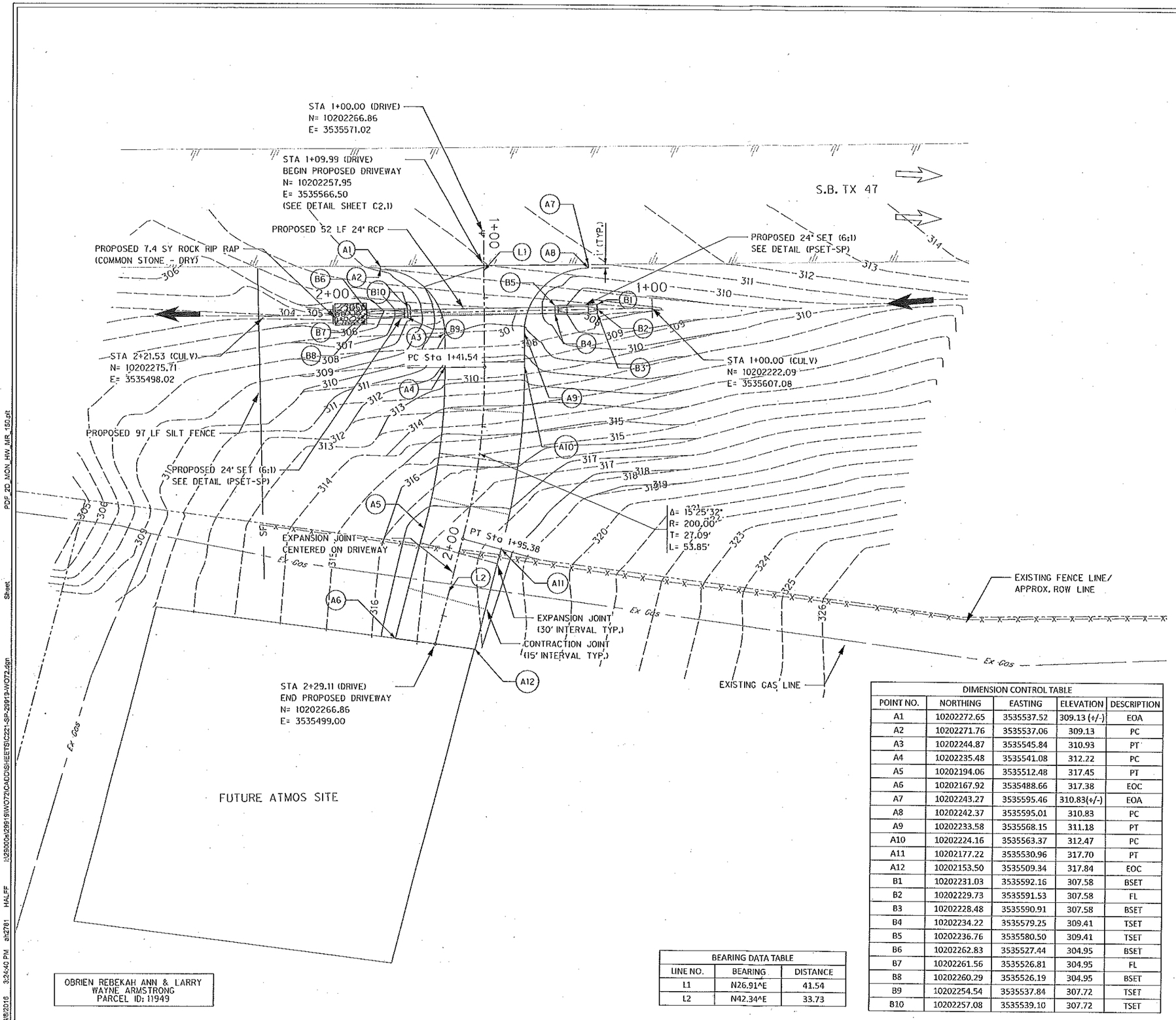
ATMOS energy

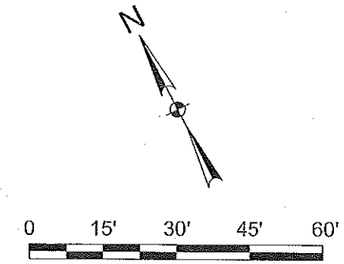
ATMOS ENERGY

PIPING PLOT PLAN
LINE L8-9(2ND)-1
8" RISER/MEASURING STATION

BRAZOS COUNTY — ATMOS PROJECT #160.27259 — TEXAS

SCALE	PROJECT NO.	DRAWING NUMBER	REV.
3/16"=1'-0"	10382	10382-2102-M	F





LEGEND

- 1+00 — PROPOSED CENTERLINE
- EXISTING CONTOURS
- PROPOSED CONTOURS
- EXISTING EDGE OF ASPHALT
- PROPOSED EDGE OF CONCRETE
- SF — SILT FENCE
- EXISTING FENCE
- EXISTING PARCEL LINE
- Ex Gas — EXISTING GAS LINE
- TRAFFIC FLOW
- EXPANSION JOINT
- CONTRACTION JOINTS
- DRAINAGE FLOW

NOTES:

1. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. IF CONFLICTS ARE ENCOUNTERED OR UTILITIES ARE DIFFERENT THAN WHAT IS SHOWN, CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY.

2. PROPOSED FILL ON SITE SHALL BE PLACED IN CONFORMANCE WITH TXDOT ITEM 132: EMBANKMENT.

3. ALL AREAS DISTURBED DURING CONSTRUCTION SHALL BE REVEGETATED IN CONFORMANCE WITH TXDOT ITEM 164: SEEDING FOR EROSION CONTROL.

4. CONCRETE PAVEMENT SHALL BE PLACED IN CONFORMANCE WITH TXDOT ITEM 360: CONCRETE PAVEMENT.

5. STONE RIPRAP SHALL BE PLACED IN CONFORMANCE WITH TXDOT ITEM 432: RIPRAP.

6. REINFORCED CONCRETE PIPE SHALL BE PLACED IN CONFORMANCE WITH TXDOT ITEM 464: REINFORCED CONCRETE PIPE.

7. TRAFFIC CONTROL SHALL BE PROVIDED IN CONFORMANCE WITH TXDOT ITEM 502: BARRICADES, SIGNS, AND TRAFFIC HANDLING, AND TXDOT TRAFFIC CONTROL PLAN STANDARD TCP (2-1)-12: CONVENTIONAL ROAD SHOULDER WORK.

8. PROPOSED DRIVEWAY SHALL BE 6" REINFORCED CONCRETE OVER 2" SAND BED, PER DETAIL (SHEET C2.1).

9. PLANS WERE PREPARED ASSUMING ATMOS WILL OBTAIN ALL NECESSARY PERMITTING AND EASEMENTS FOR THE CONSTRUCTION OF THIS FACILITY.

10. SURVEY PROVIDED BY ATMOS. CONTRACTOR TO COORDINATE SURVEY MONUMENTATION WITH ATMOS.

DIMENSION CONTROL TABLE

POINT NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
A1	10202272.65	3535537.52	309.13 (+/-)	EOA
A2	10202271.76	3535537.06	309.13	PC
A3	10202244.87	3535545.84	310.93	PT
A4	10202235.48	3535541.08	312.22	PC
A5	10202194.06	3535512.48	317.45	PT
A6	10202167.92	3535488.66	317.38	EOC
A7	10202243.27	3535595.46	310.83(+/-)	EOA
A8	10202242.37	3535595.01	310.83	PC
A9	10202233.58	3535568.15	311.18	PT
A10	10202224.16	3535563.37	312.47	PC
A11	10202177.22	3535530.96	317.70	PT
A12	10202153.50	3535509.34	317.84	EOC
B1	10202231.03	3535592.16	307.58	BSET
B2	10202229.73	3535591.53	307.58	FL
B3	10202228.48	3535590.91	307.58	BSET
B4	10202234.22	3535579.25	309.41	TSET
B5	10202236.76	3535580.50	309.41	TSET
B6	10202262.83	3535527.44	304.95	BSET
B7	10202261.56	3535526.81	304.95	FL
B8	10202260.29	3535526.19	304.95	BSET
B9	10202254.54	3535537.84	307.72	TSET
B10	10202257.08	3535539.10	307.72	TSET

BEARING DATA TABLE

LINE NO.	BEARING	DISTANCE
L1	N26.91^E	41.54
L2	N42.34^E	33.73

GAS SERVICE DRIVEWAY
CITYGATE BRYAN, TX

HALFF
TBPE #F-312
7000 SOUTH IH 35 WAY, SUITE 105
GEORGETOWN, TEXAS 78626-7574
TEL (512) 942-6232
FAX (512) 869-0069

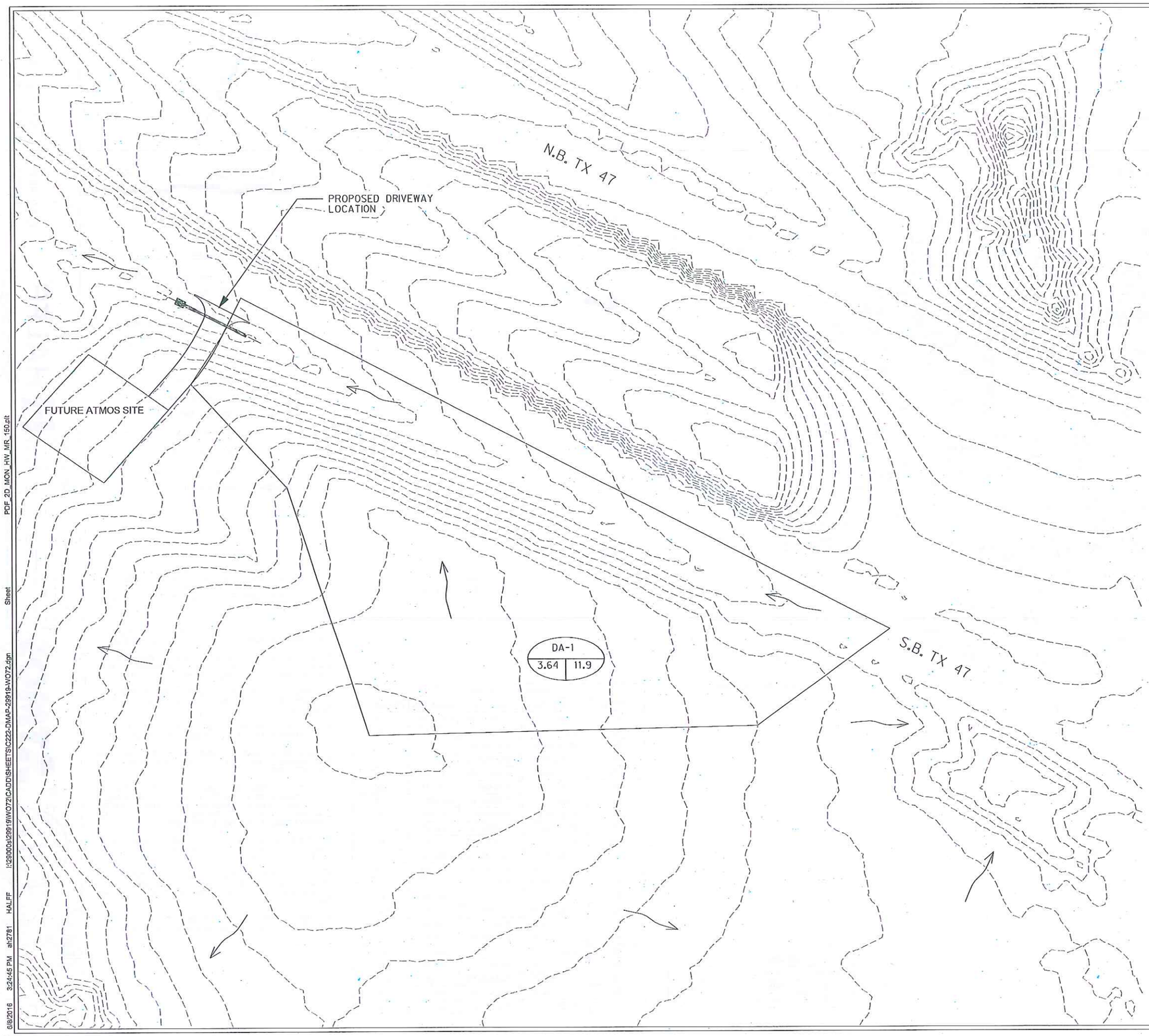
NO.	REVISION	BY	DATE

ATMOS energy

F-312 6-9-16
STATE OF TEXAS
SHAWN M. BERTRAM
98190
LICENSED
PROFESSIONAL ENGINEER

Project No.:	29919
Issued:	6/8/2016
Drawn By:	HA
Checked By:	HA
Scale:	AS NOTED
Sheet Title	SITE PLAN
Sheet Number	C1.1

PDF 2D_MON_HW_MR_150.pit
6/8/2016 3:24:40 PM sh2781 HALFF N:\29900s\29919\WO72\CADD\SHEETS\C221-SP-29919-WO72.dgn Sheet



N

0 50' 100' 150' 200'

LEGEND

- EXISTING CONTOURS
- DRAINAGE BOUNDARY
- FLOW ARROW

DRAINAGE BASIN NO.

DA-X

XX.XX | XX.XX

DRAINAGE AREA (ACRES) — Q_{10} (CFS)

NOTES:

1. CONTOURS FOR DRAINAGE AREA DELINEATIONS WERE BASED ON LIDAR PROVIDED BY CITY OF BRYAN DATED 2015.

2. THE RATIONAL METHOD WAS USED IN DETERMINING PEAK RUNOFFS FOR CONTRIBUTING DRAINAGE AREAS USING TxDOT HYDRAULIC DESIGN CRITERIA.

3. RUNOFF COEFFICIENT BASED ON TxDOT RURAL WATERSHEDS (TABLE 4-11).

4. RAINFALL INTENSITY BASED ON TxDOT IDF LOOK UP FOR BRAZOS COUNTY.

5. CULVERT CALCULATIONS WERE PERFORMED USING BENTLEY CULVERT MASTER V3.3

10 YEAR DRAINAGE CALCULATIONS

DRAINAGE AREA	AREA (AC)	C	I (in/hr)	Q (CFS)
DA-1	3.64	0.38	8.6	11.9

GAS SERVICE DRIVEWAY
CITYGATE BRYAN, TX

HALFF
TBPE #F-312
TWO SIERRA WAY, SUITE 105
GEORGETOWN, TEXAS 78626-7574
TEL (512) 863-7777
FAX (512) 869-0089

NO.	REVISION	BY	DATE

ATMOS energy

F-312 6-8-16
STATE OF TEXAS
SHAWN M. BERTRAM
98190
LICENSED
PROFESSIONAL ENGINEER

Project No.:	29919
Issued:	6/8/2016
Drawn By:	HA
Checked By:	HA
Scale:	AS NOTED

Sheet Title

DRAINAGE AREA MAP

C2.1

Sheet Number

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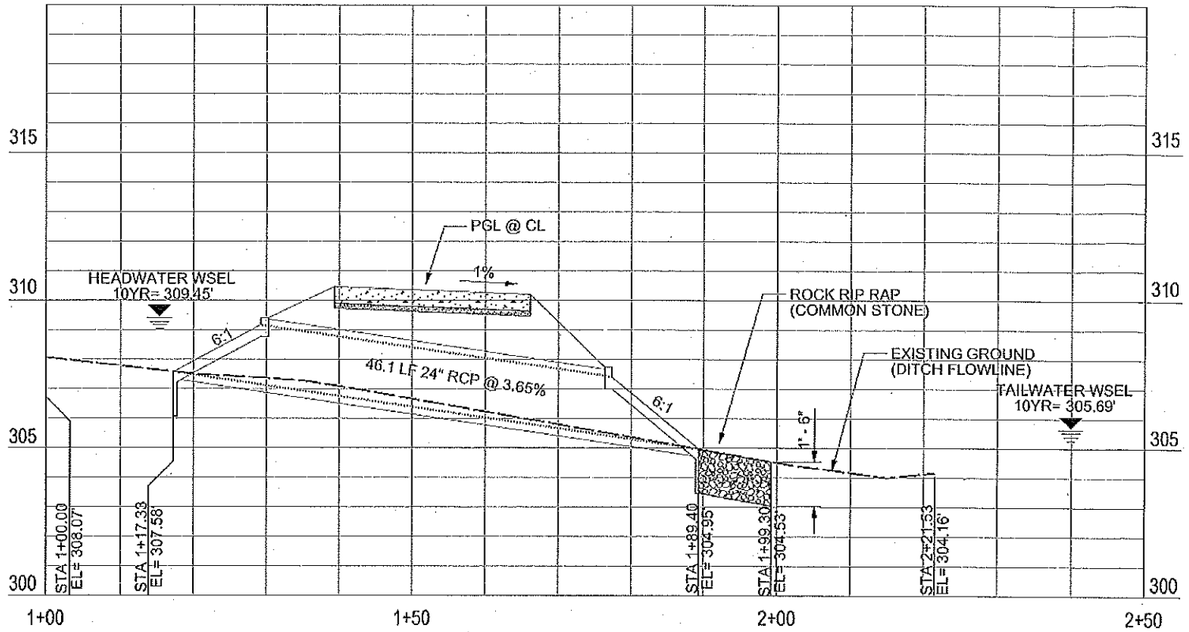
CULVERT PROFILE

H: 1"=20'
V: 1"=5'
ON 11x17 SHEET



HYDRAULIC DATA
Q_10 = 11.9 CFS
V_10 = 11.3 FPS
Q_CAP = 18.3 CFS
V_CAP = 12.4 FPS

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	309.97 ft	Headwater Depth/Height	0.94
Computed Headwater Elevi	309.45 ft	Discharge	11.90 cfs
Inlet Control HW Elev.	309.35 ft	Tailwater Elevation	0.00 ft
Outlet Control HW Elev.	309.45 ft	Control Type	Entrance Control

Grades			
Upstream Invert	307.58 ft	Downstream Invert	304.95 ft
Length	72.07 ft	Constructed Slope	0.036492 ft/ft

Hydraulic Profile			
Profile	S2	Depth, Downstream	0.74 ft
Slope Type	Steep	Normal Depth	0.72 ft
Flow Regime	Supercritical	Critical Depth	1.24 ft
Velocity Downstream	11.31 ft/s	Critical Slope	0.005560 ft/ft

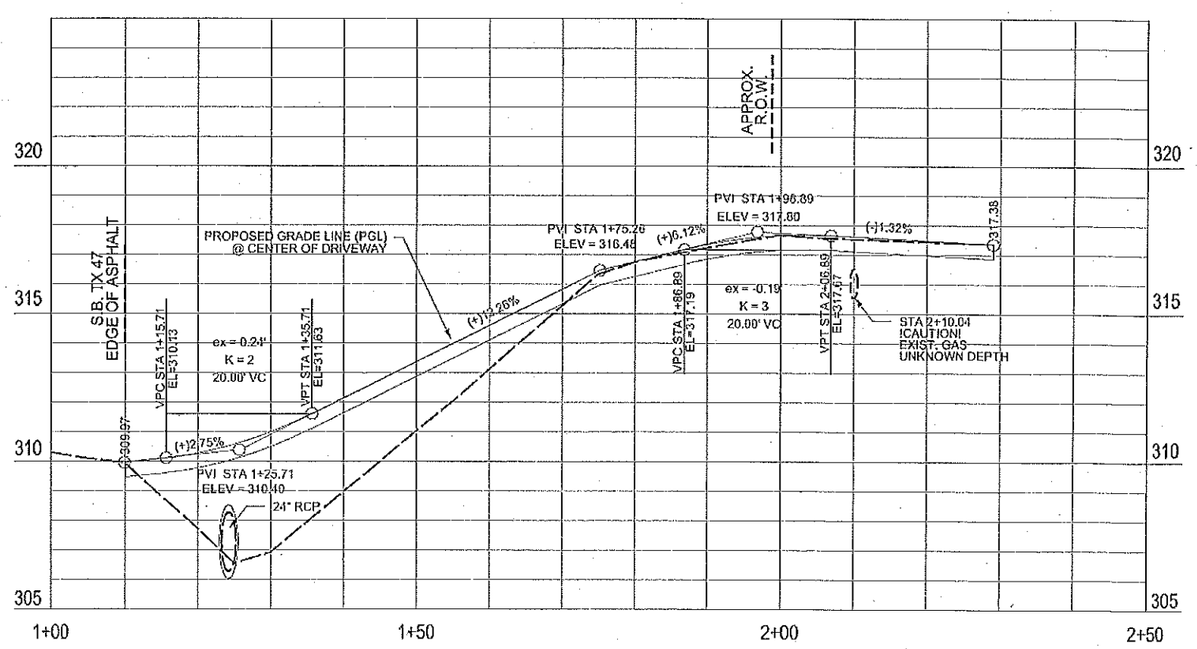
Section			
Section Shape	Circular	Mannings Coefficient	0.013
Section Material	Concrete	Span	2.00 ft
Section Size	24 inch	Rise	2.00 ft
Number Sections	1		

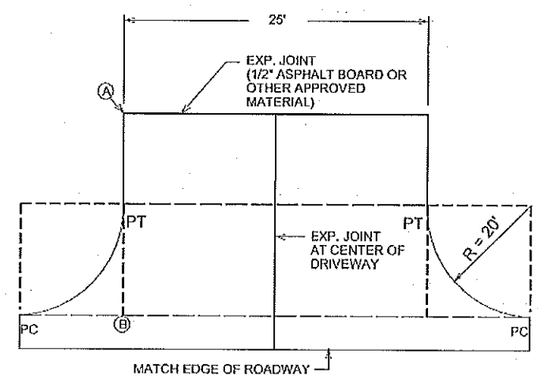
Outlet Control Properties			
Outlet Control HW Elev.	309.45 ft	Upstream Velocity Head	0.53 ft
Ke	0.20	Entrance Loss	0.11 ft

Inlet Control Properties			
Inlet Control HW Elev.	309.35 ft	Flow Control	Unsubmerged
Inlet Type	Beveled ring, 45° bevels	Area Full	3.1 ft²
K	0.00160	HDS 5 Chart	3
M	2.50000	HDS 5 Scale	A
C	0.03000	Equation Form	1
Y	0.74000		

DRIVEWAY PROFILE

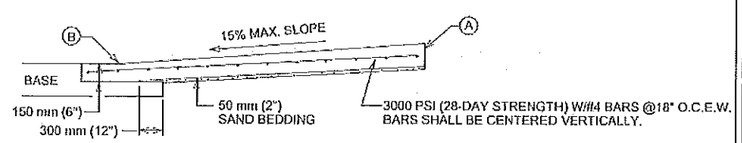
H: 1"=20'
V: 1"=5'
ON 11x17 SHEET





PLAN

NOTE: ALL DRIVEWAYS SHALL BE SLOPED TOWARDS THE STREET FROM THE R.O.W. LINE. ELEVATION OF POINT (A) ABOVE POINT (B) IS, TYPICALLY A MINIMUM OF 150 mm (6") PLUS 20 mm/m (¼" RISE/FOOT) OVER DISTANCE "X" IN METERS (FEET).



CROSS SECTION

DRIVEWAY DETAIL N.T.S.

GAS SERVICE DRIVEWAY
CITYGATE BRYAN, TX

HALFF
TBPE #F-312
1000 SOUTH PIPELINE WAY, SUITE 105
CLEBURNE, TEXAS 76033-7574
TEL (512) 942-5332
FAX (512) 869-0089

NO.	REVISION	BY	DATE

ATMOS energy

STATE OF TEXAS
SHAWN M. BERTRAM
98190
LICENSED
PROFESSIONAL ENGINEER
6-9-16

Project No.:	20919
Issued:	6/8/2016
Drawn By:	HA
Checked By:	HA
Scale:	AS NOTED
Sheet Title	PROPOSED CULVERT AND DRIVEWAY PROFILE
Sheet Number	C2.2

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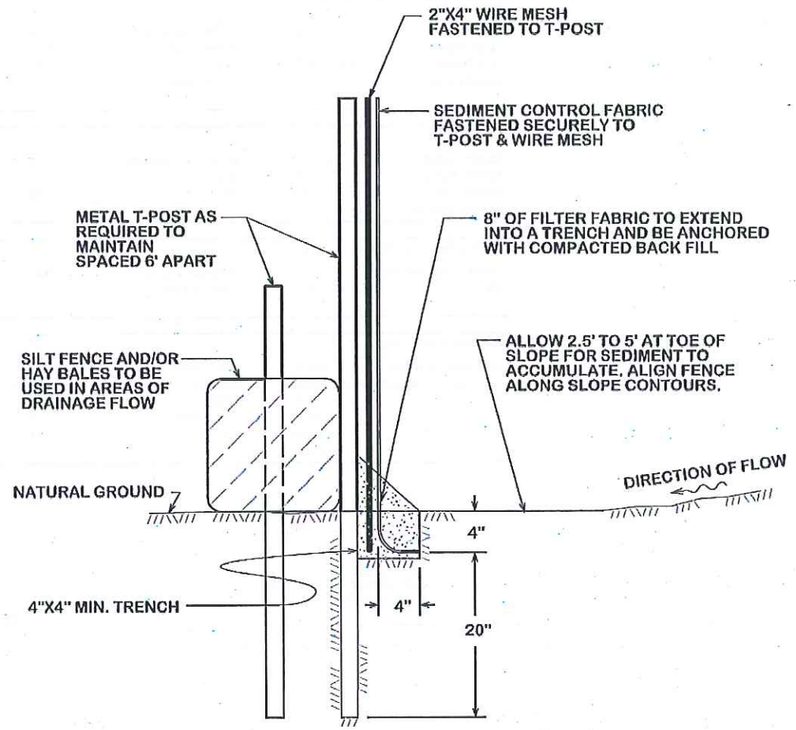
6/8/2016

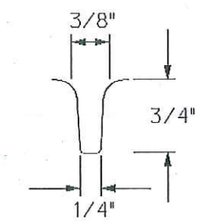


CITY OF BRYAN
The Good Life, Texas Style.

SILT FENCE ASSEMBLY

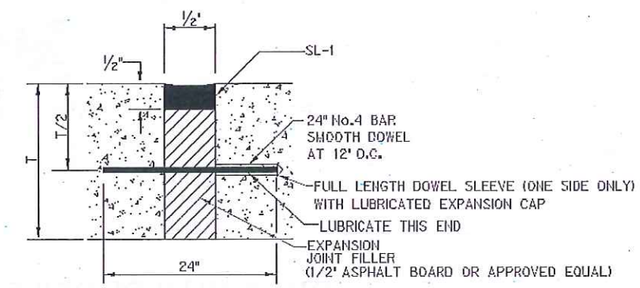
DATE		DETAIL NO.
AUG. 2012	B/CS UNIFIED STANDARD DETAIL	SWPP1-03

CITY OF COLLEGE STATION



CONTRACTION JOINT N.T.S.

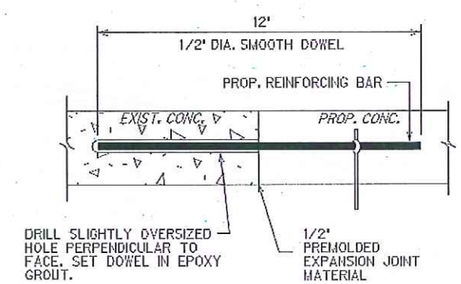
NOTE: TRANSVERSE CONTRACTION JOINTS SHALL BE SPACED AT 15' MAX



T= DRIVEWAY THICKNESS

NOTE: TRANSVERSE EXPANSION JOINTS SHALL BE SPACED AT 30' MAX.
LONGITUDINAL EXPANSION JOINT SHALL BE PLACED AT CENTER OF DRIVEWAY.

EXPANSION JOINT N.T.S.



DOWEL DETAIL N.T.S.

GAS SERVICE DRIVEWAY
CITYGATE BRYAN, TX

HALFF
TBPE #F-312
TWO SIERRA WAY, SUITE 105
GEORGETOWN, TEXAS 78626-7574
TEL (512) 942-5232
FAX (512) 869-0089

NO.	REVISION	BY	DATE

ATMOS energy

STATE OF TEXAS
SHAWN M. BERTRAM
98190
LICENSED
PROFESSIONAL ENGINEER
F-313 6-8-16

Project No.:	29919
Issued:	6/8/2016
Drawn By:	HA
Checked By:	HA
Scale:	AS NOTED
Sheet Title	STANDARD DETAILS
Sheet Number	C3.1

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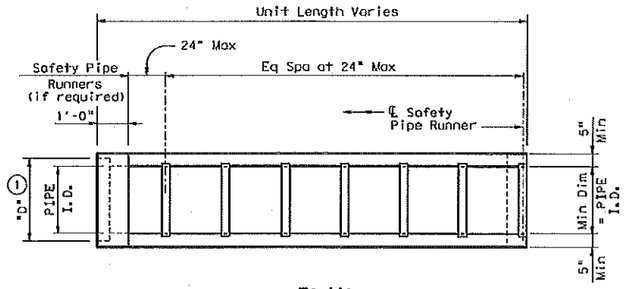
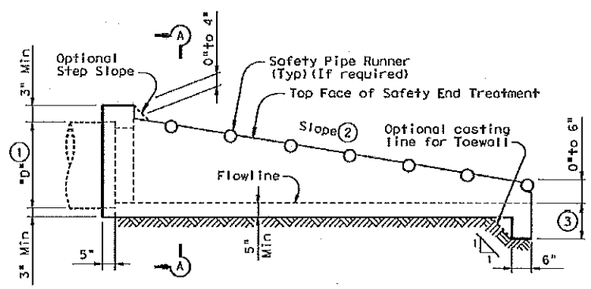
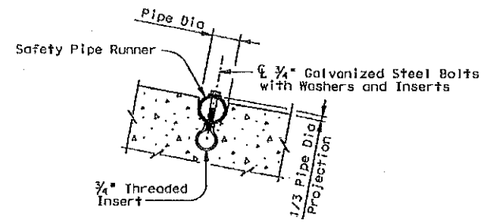


PLAN

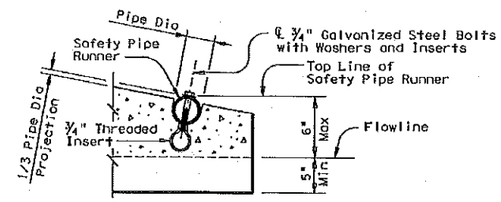


LONGITUDINAL ELEVATION

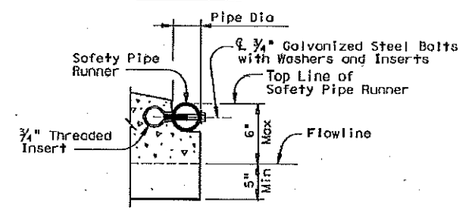


INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)



OPTION A



OPTION B

END DETAILS FOR INSTALLATION OF SAFETY PIPE RUNNERS

(If required)

PIPE I.D.	PIPE WALL "B" THICKNESS	"D" ①	MAXIMUM SLOPE	MINIMUM LENGTH OF UNIT	PIPE RUNNERS REQUIRED		REQUIRED PIPE RUNNER SIZES		
					SINGLE PIPE	MULTIPLE PIPE	NOMINAL DIA.	O.D.	I.D.
12"	2"	17"	6:1	4'-9"	No	Yes, for >2 pipes	3" STD	3.500"	3.068"
15"	2 ¼"	20 ½"	6:1	6'-5"	No	Yes, for >2 pipes	3" STD	3.500"	3.068"
18"	2 ½"	24"	6:1	8'-0"	No	Yes, for >2 pipes	3" STD	3.500"	3.068"
24"	3"	31"	6:1	11'-3"	No	Yes, for >2 pipes	3" STD	3.500"	3.068"
30"	3 ½"	38 ½"	6:1	14'-8"	No	Yes	4" STD	4.500"	4.026"
36"	4"	45 ½"	6:1	17'-11"	Yes	Yes	4" STD	4.500"	4.026"
42"	4 ½"	52 ½"	6:1	21'-2"	Yes	Yes	4" STD	4.500"	4.026"

① Dimension "D" is based on ASTM C-76, Class III, Wall "B" thickness. If any other wall thickness is used, dimension "D" must be adjusted accordingly.

② Slope as shown elsewhere in the plans. Slope of 6:1 or flatter is required for vehicle safety.

③ Toewall to be used only when dimension is shown elsewhere in the plans.

④ The top 4" of void between Precast End Treatments shall be filled with concrete Riprap and shall be considered subsidiary to Safety End Treatment.

⑤ Clear distance between pipes shall be adjusted to provide for the minimum distance between safety end treatments.

⑥ Cement stabilized bedding and backfill shall be in accordance with the Item, "Excavation and Backfill for Structures". Bedding and backfill shall be considered subsidiary to the Item "Safety End Treatment". When concrete riprap is specified around the safety end treatment, backfill shall be as directed by Engineer.

GENERAL NOTES:

Precast safety end treatment for reinforced concrete pipe may be used for TYPE II end treatment as specified in Item "Safety End Treatment".

When Precast Safety End Treatment is used as a Contractor's alternate to mitered RCP, Riprap will not be required unless noted otherwise on the plans.

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Manufacture of this product shall conform to requirements of Item "Safety End Treatment" except as noted below :

A. Minimum reinforcing shall be #4 at 6" (Grade 40) or #4 at 9" (Grade 60) each way or 6 x 6 - W12 x W12 or 5 x 5 - W10 x W10 welded wire reinforcement (WWR).

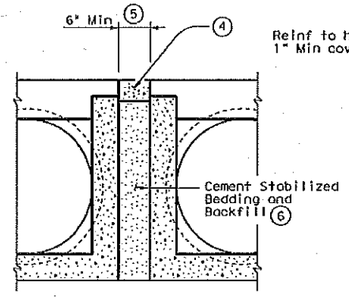
B. Concrete for precast (steel formed) sections shall be Class "C" with a minimum compressive strength of 3600 psi.

At the option and expense of the Contractor the next larger size of Safety End Treatment may be furnished; as long as the "D" dimension cost is that of the required size of pipe.

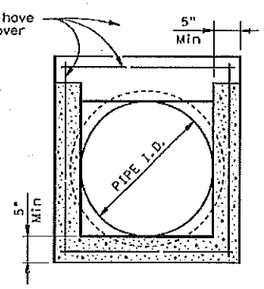
Pipe Runners are designed for a traversing load of 10,000 Lbs at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.

Pipe Runners shall conform to the requirements of ASTM A53 (Type E or S, Grade B), ASTM A500 (Grade B), or API 5LX52.

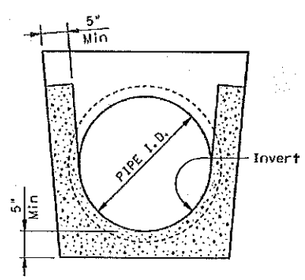
All steel components except reinforcing, shall be galvanized after fabrication. Galvanizing damaged during transport or construction shall be repaired in accordance with the specifications.



MULTIPLE PIPE INSTALLATION

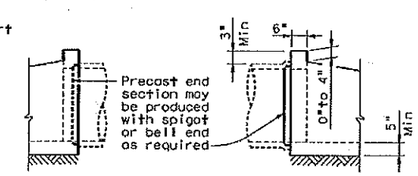


OPTION WITH SQUARE BOTTOM



OPTION WITH INVERT BOTTOM

SECTION A-A



OPTIONAL JOINT

(Showing joint between RCP and Precast Safety End Treatment)

Texas Department of Transportation — Bridge Division Standard

PRECAST SAFETY END TREATMENT

TYPE II ~ PARALLEL DRAINAGE

PSET-SP

FILE: psetsp99.dgn	DN: RLW	CK: KLR	DW: JTR	CK: GAF
©TxDOT February 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS				
11-15 Add note for synthetic fibers.	DIST	COUNTY		SHEET NO.

GAS SERVICE DRIVEWAY
CITYGATE BRYAN, TX

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STATE OF TEXAS — SHAWN M. BERTRAM 98190 — LICENSED PROFESSIONAL ENGINEER — F-312 — 6-9-16

Project No.:	99919
Issued:	6/8/2016
Drawn By:	HA
Checked By:	HA
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Sheet Number	C3.2

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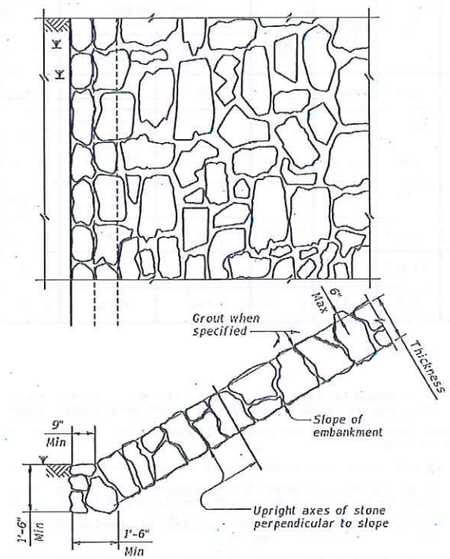

FIGURE 1 ~ TYPE R STONE RIPRAP

dry or grouted

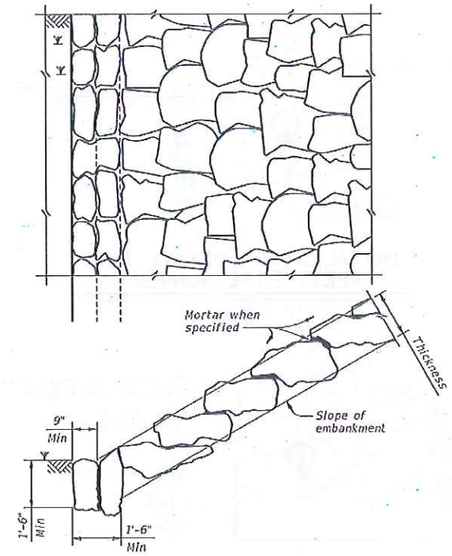

FIGURE 2 ~ TYPE F STONE RIPRAP

dry or mortared

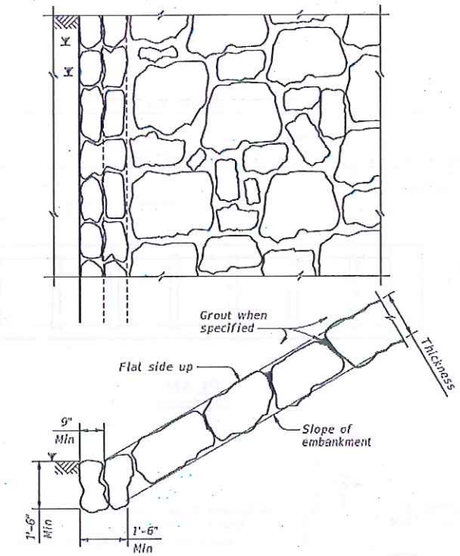

FIGURE 3 ~ TYPE F STONE RIPRAP

grouted

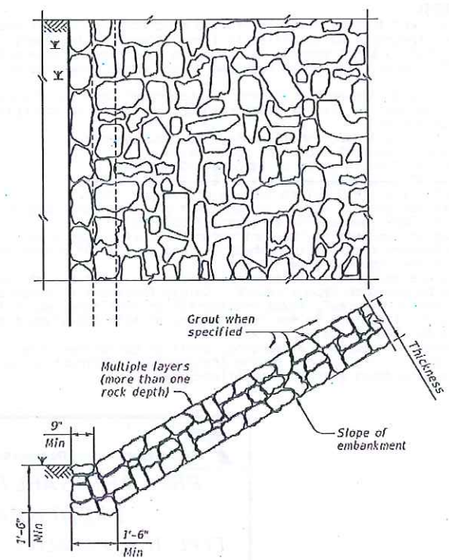

FIGURE 4 ~ COMMON STONE RIPRAP

dry or grouted

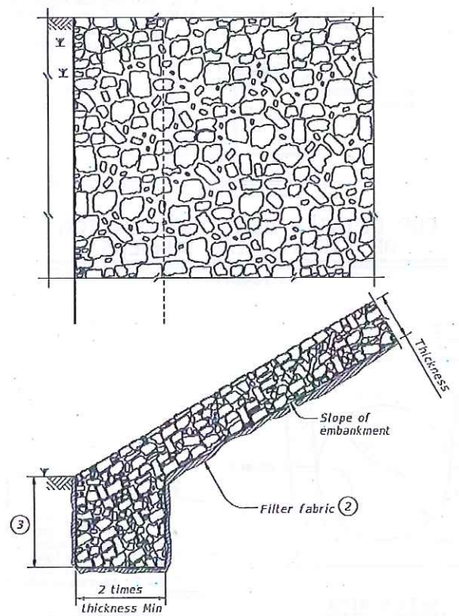

FIGURE 5 ~ PROTECTION STONE RIPRAP

(2) Provide bedding material instead of filter fabric if shown elsewhere in plans. See Layout for thickness of bedding material.

(3) Minimum toe depth is the larger of the maximum scour depth or 2 times the riprap thickness.

SHEET 2 OF 2

Texas Department of Transportation | Bridge Division Standard

STONE RIPRAP

SRR

FILE: srrstde1.dgn	DN: AES	CK: JGD	DW: BWH	CK: AES
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F-312 6-8-16
STATE OF TEXAS
SHAWN M. BERTRAM
98190
LICENSED
PROFESSIONAL ENGINEER

Project No.:	29919
Issued:	6/8/2016
Drawn By:	HA
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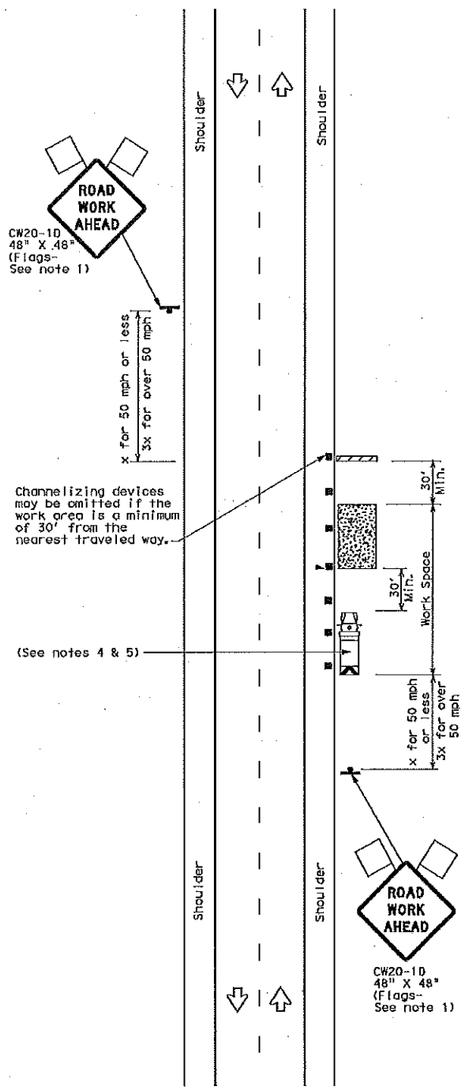
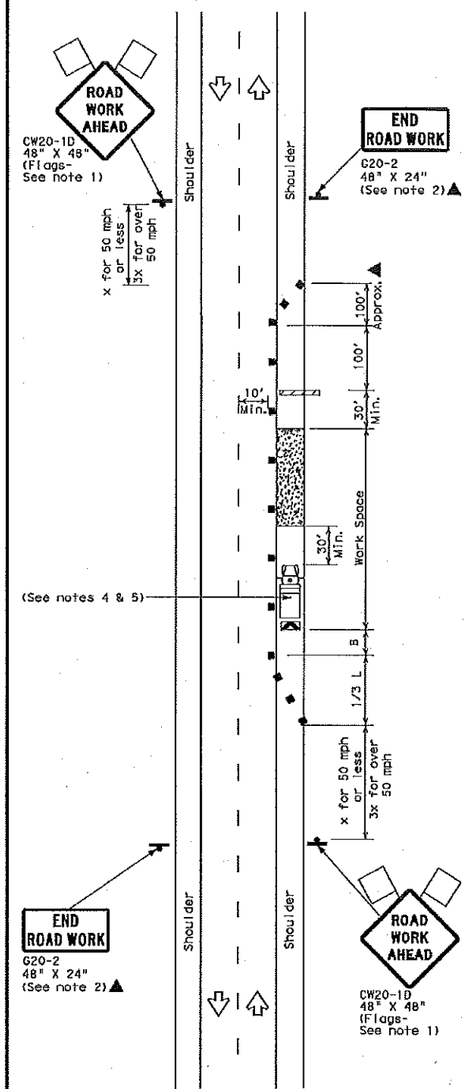
C3.3
Sheet Number



TCP (2-1a)

WORK SPACE NEAR SHOULDER

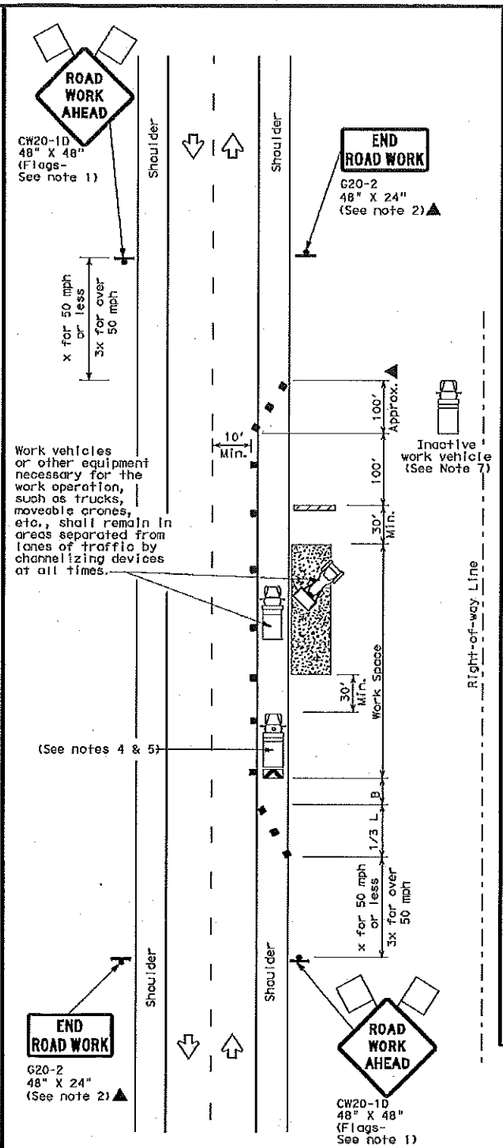
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER

Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER

Conventional Roads

LEGEND

	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed ✱	Formula	Minimum Desirable Taper Lengths ✱✱ 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

✱ Conventional Roads Only

✱✱ Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE

MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓	✓	✓

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated in the plans, or for routine maintenance work, when approved by the Engineer.
3. Stockpiled material should be placed a minimum of 30 feet from nearest traveled way.
4. Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
6. See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
7. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
8. CW21-5 "SHOULDER WORK" signs may be used in place of CW21-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

For construction or maintenance contract work, specific project requirements for shadow vehicles can be found in the project GENERAL NOTES for Item 502, Barricades, Signs and Traffic Handling.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-12

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REVISIONS
2-94 2-12
8-95
1-97
4-98

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F-312 6-9-16
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