

WILLIAMSON COUNTY, TEXAS

CHANGE ORDER NUMBER: 1

1. CONTRACTOR: Austin Underground, Inc.

2. Change Order Work Limits: Sta. 10+00 to Sta. 136+51

3. Type of Change (on federal-aid non-exempt projects): Minor (Major/Minor)

4. Reasons: 3F, 3L (3 Max. - In order of importance - Primary first)

Project: T5045

Roadway: CR 404

CSJ
Number: _____

5. Describe the work being revised:

3F. County Convenience. Additional work desired by the County. This Change Order revises the original water line pipe design from 18 inch ductile iron to 24 inch HDPE pipe. Due to the Contract value of this requested change, the 24 inch HDPE pipe material and the fusion of that pipe is also being removed from this Contract and will be bid under a separate Contract. Portable concrete traffic barrier (CTB) is also being added to the Contract, to improve the work zone safety.

6. Work to be performed in accordance with Items: See attached.

7. New or revised plan sheet(s) are attached and numbered: C-002, 003, 100, 301 to 338, 401 and 501 to 503

8. New Special Provisions/Specifications to the contract are attached: ☐ Yes ☒ No

9. New Special Provisions to Item N/A No. N/A, Special Specification Item N/A are attached.

Each signatory hereby warrants that each has the authority to execute this Change Order (CO).

The contractor must sign the Change Order and, by doing so, agrees to waive any and all claims for additional compensation due to any and all other expenses; additional changes for time, overhead and profit; or loss of compensation as a result of this change.

The following information must be provided

Time Ext. #: N/A Days added on this CO: 0

Amount added by this change order: (\$232,550.27)

THE CONTRACTOR

Date 5-18-22

By

Typed/Printed Name

Typed/Printed Title

Valentin J Gomez, Jr
Sr. PM

RECOMMENDED FOR EXECUTION:

[Signature]
Project Manager Date 5/31/2022

N/A
Design Engineer Date

[Signature]
Program Manager Date 5/31/2022

Design Engineer's Seal:

County Commissioner Precinct 1 Date
☐ APPROVED ☐ REQUEST APPROVAL

County Commissioner Precinct 2 Date
☐ APPROVED ☐ REQUEST APPROVAL

County Commissioner Precinct 3 Date
☐ APPROVED ☐ REQUEST APPROVAL

County Commissioner Precinct 4 Date
☐ APPROVED ☐ REQUEST APPROVAL

[Signature] Jun 9, 2022
Bill Gravell (Jun 9, 2022 08:56 CDT)

County Judge Date
☐ APPROVED

TABLE A: Force Account Work and Materials Placed into Stock

TABLE B: Contract Items:

ORIGINAL + PREVIOUSLY REVISED				NEW					
ITEM	DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	ITEM COST	ADD or (DEDUCT)	QUANTITY	ITEM COST	OVERRUN/ UNDERRUN
502-6001	BARRICADES, SIGNS, AND TRAFFIC HANDLING	MO	\$1,900.00	2.00	\$3,800.00		1.00	\$5,700.00	\$1,900.00
512-6001	PORT CTB (FURN & INSTL)(SGL SLOPE)(TY 1	LF	\$27.50	0.00	\$0.00		120.00	\$3,300.00	\$3,300.00
512-6009	PORT CTB (FURN & INSTL)(LOW PROF)(TY 1)	LF	\$54.00	200.00	\$10,800.00		160.00	\$19,440.00	\$8,640.00
512-6010	PORT CTB (FURN & INSTL)(LOW PROF)(TY 2)	LF	\$54.00	120.00	\$6,480.00		40.00	\$8,640.00	\$2,160.00
512-6049	PORT CTB (REMOVE)(SGL SLOPE)(TY 1)	LF	\$17.25	0.00	\$0.00		120.00	\$2,070.00	\$2,070.00
512-6057	PORT CTB (REMOVE)(LOW PROF)(TY 1)	LF	\$12.00	200.00	\$2,400.00		160.00	\$4,320.00	\$1,920.00
512-6058	PORT CTB (REMOVE)(LOW PROF)(TY 2)	LF	\$12.00	120.00	\$1,440.00		40.00	\$1,920.00	\$480.00
545-6005	CRASH CUSHION ATTEN. (REMOVE)	EA	\$1,225.00	0.00	\$0.00		4.00	\$4,900.00	\$4,900.00
545-6019	CRASH CUSHION ATTEN. (INSTL)(S(N)(TL3)	EA	\$8,800.00	0.00	\$0.00		4.00	\$35,200.00	\$35,200.00
501S-30	Jacking or Boring, 30" Steel Pipe, ASTM A134	LF	\$770.00	579.00	\$445,830.00		(579.00)	\$0.00	(\$445,830.00)
CIP11.06:B	Trench Excavation Safety Protection Systems (All Depths)	LF	\$1.00	12,072.00	\$12,072.00		2,246.00	\$14,318.00	\$2,246.00
G2.07	SITE PREPARATION	STA	\$500.00	136.50	\$68,250.00		13.50	\$75,000.00	\$6,750.00
G6.09.A-RB	ROCK BERM	LF	\$42.00	253.00	\$10,626.00		189.00	\$18,564.00	\$7,938.00
G6.09.A-SF	SILT FENCE	LF	\$3.00	12,581.00	\$37,743.00		3,211.00	\$47,376.00	\$9,633.00
G7.09	BROADCAST SEEDING	SY	\$1.00	35,938.00	\$35,938.00		25,893.00	\$61,831.00	\$25,893.00
W1.17.A	Ductile Iron Fittings (C-153 Weight Schedule)	TON	\$5,000.00	5.00	\$25,000.00		(4.00)	\$5,000.00	(\$20,000.00)
W1.17.A.18/ W2.10.A.18	Pipe, 18" Dia. DI CL-250 or PVC C-900, pressure-rated for 250 psi, Complete in Place, Including Excaation and Backfill	LF	\$115.00	7,342.00	\$844,330.00		(7,342.00)	\$0.00	(\$844,330.00)
W1.17.AR.18/ W2.10.AR.18	Restrained Pipe, 18" Dia. DI CL-250 or PVC C-900, pressure-rated for 250 psi, Complete in Place, Including Excavation andn Backfill	LF	\$150.00	5,309.00	\$796,350.00		(5,309.00)	\$0.00	(\$796,350.00)
W3.21.A18	VALVES, GATE 18" DIA.	EA	\$17,000.00	9.00	\$153,000.00		(9.00)	\$0.00	(\$153,000.00)
W3.21.ARV2	AIR RELEASE VALVES, 2"	EA	\$8,500.00	8.00	\$52,000.00		1.00	\$58,500.00	\$6,500.00
W4.04.24	Encasement Pipe, 30" Dia., Steel (7/16" Thickness)	LF	\$280.00	91.00	\$25,480.00		(91.00)	\$0.00	(\$25,480.00)
TOTALS					\$2,531,539.00			\$366,079.00	(\$2,165,460.00)

Project # T5045

CHANGE ORDER NUMBER: 1

TABLE B: Contract Items (Continued)

[illegible]

CHANGE ORDER REASON(S) CODE CHART

1. Design Error or Omission	1A. Incorrect PS&E 1B. Other
2. Differing Site Conditions (unforeseeable)	2A. Dispute resolution (expense caused by conditions and/or resulting delay) 2B. Unavailable material 2C. New development (conditions changing after PS&E completed) 2D. Environmental remediation 2E. Miscellaneous difference in site conditions (unforeseeable)(Item 9) 2F. Site conditions altered by an act of nature 2G. Unadjusted utility (unforeseeable) 2H. Unacquired Right-of-Way (unforeseeable) 2I. Additional safety needs (unforeseeable) 2J. Other
3. County Convenience	3A. Dispute resolution (not resulting from error in plans or differing site conditions) 3B. Public relations improvement 3C. Implementation of a Value Engineering finding 3D. Achievement of an early project completion 3E. Reduction of future maintenance 3F. Additional work desired by the County 3G. Compliance requirements of new laws and/or policies 3H. Cost savings opportunity discovered during construction 3I. Implementation of improved technology or better process 3J. Price adjustment on finished work (price reduced in exchange for acceptance) 3K. Addition of stock account or material supplied by state provision 3L. Revising safety work/measures desired by the County 3M. Other
4. Third Party Accommodation	4A. Failure of a third party to meet commitment 4B. Third party requested work 4C. Compliance requirements of new laws and/or policies (impacting third party) 4D. Other
5. Contractor Convenience	5A. Contractor exercises option to change the traffic control plan 5B. Contractor requested change in the sequence and/or method of work 5C. Payment for Partnering workshop 5D. Additional safety work/measures desired by the contractor 5E. Other
6. Untimely ROW/Utilities	6A. Right-of-Way not clear (third party responsibility for ROW) 6B. Right-of-Way not clear (County responsibility for ROW) 6C. Utilities not clear 6D. Other

Williamson County Road Bond Program

CR 404 Hutto Water Line Williamson County Project No. T5045

Change Order No. 1 Reason for Change

This Change Order revises the original water line pipe design from 18 inch ductile iron to 24 inch HDPE pipe. The change in pipe size and material was necessary to meet the increased demand in water and to alleviate the availability issues of ductile iron pipe. Due to the Contract value of this requested change, the 24 inch HDPE pipe material and the fusion of that pipe is also being removed from this Contract (T5045) and will be bid under a separate Contract (22IFB96). Portable concrete traffic barrier (CTB) is also being added to the Contract, to improve the work zone safety.

The following new item will be added by this Change Order.

ITEM	DESCRIPTION	QTY	UNIT
512-6001	PORT CTB (FURN & INSTL)(SGL SLOPE)(TY 1)	120.00	LF
512-6049	PORT CTB (REMOV)(SGL SLOPE)(TY 1)	120.00	LF
545-6005	CRASH CUSHION ATTEN. (REMOV)	4.00	EA
545-6019	CRASH CUSHION ATTEN. (INSTL)(S)(N)(TL3)	4.00	EA
501S-36	Jacking or Boring, 36" Steel Pipe, ASTM A134	789.00	LF
G4.05	Concrete Trench Cap (6" Thick, 2000 PSI)	5.00	CY
SP.W3.21.G	Valves, Butterfly 24" Dia.	11.00	EA
SP.W3.21.F	Drain Valve Assembly, including valve and pipe	10.00	EA
SS.W5.9.B24	24" HDPE Fittings	10.00	EA
SS.W5.9.C24	24" HDPE MJ Adapter	24.00	EA
SS.W5.9.C6	6" HDPE MJ Adapter	10.00	EA
SS.W5.9.A24- IO	Pipe, 24" Dia. HDPE (DIPS Size), DR11 (200psi), Complete in Place, excavation and backfill (Materials and Fusion not included)	14,967.00	LF

This Change Order results in a net decrease of \$232,550.27 to the Contract amount, for an adjusted Contract total of \$2,665,088.73. The original Contract amount was \$2,897,639.00. As a result of this and all Change Orders to-date, \$232,550.27 has been deducted from the Contract, resulting in an 8.03% net decrease in the overall Contract cost. As a result of this Change Order, (0) days will be added to the contract.

HNTB Corporation
Oscar Salazar-Bueno, P.E.

WILLIAMSON COUNTY

CR 404 HUTTO 24 INCH WATER LINE REALIGNMENT PRECINCT NUMBER 4 WILLIAMSON COUNTY PROJECT NO. IFB T5045

INDEX OF SHEETS

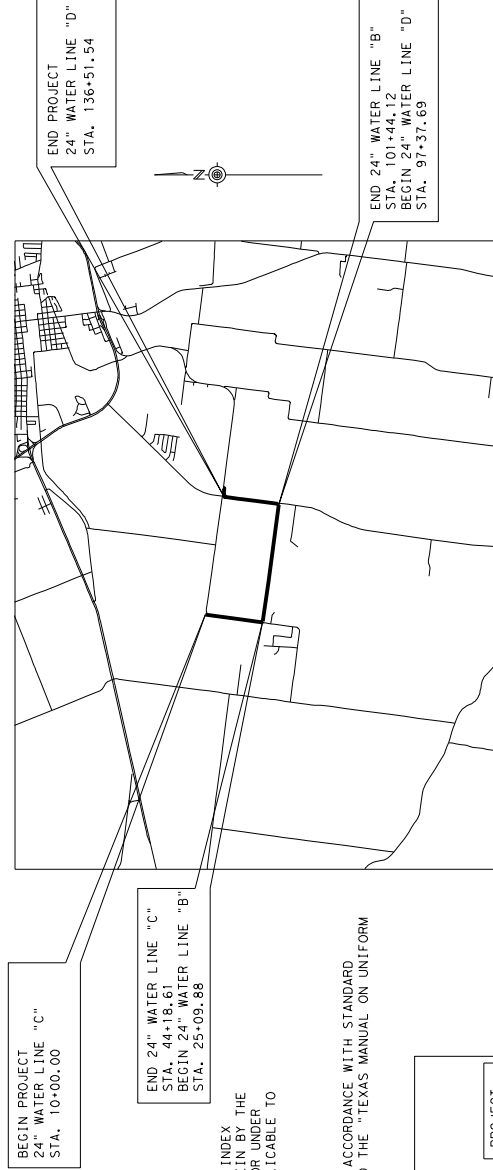
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1	TITLE SHEET
2	GENERAL NOTES
3	SURVEY NOTES
4	KEY MAP
5 - 42	WATER LINE P&P SHEETS
43	EROSION CONTROL STANDARD DETAILS
44 - 45	STANDARD WATER DETAILS
46	HOPE WATER DETAILS
47 - 63	TXDOT TRAFFIC CONTROL STANDARDS

CLASSIFICATION & POSTED SPEED:
CR 404 RURAL MAJOR COLLECTOR 40 MPH
FM 973 RURAL MINOR ARTERIAL 65 MPH

AVERAGE DAILY TRAFFIC (ADT):
CR 404 452 (2021) 496 (2041)
FM 973 5758 (2021) 7975 (2041)

PROJECT LIMITS: ALONG FUTURE COUNTY ROAD FROM CR 404 TO CR 404 AT FM 973

FOR THE RELOCATION OF AN EXISTING CITY OF HUTTO TRANSMISSION MAIN WITH VALVES, APPURTENANCES, ENCASEMENT PIPE, JACK AND BORE, AND PRESSURE TAPS ONTO THE EXISTING MAIN



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APPROVED BY:
WILLIAMSON COUNTY

HONORABLE BILL GRAVELL, JR., DATE
WILLIAMSON COUNTY JUDGE

APPROVED BY:
WILLIAMSON COUNTY

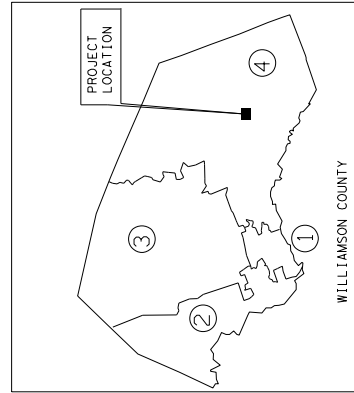
COMMISSIONER RUSS BOLES DATE
WILLIAMSON COUNTY PRECINCT 4

APPROVED BY:
HNTB CORPORATION

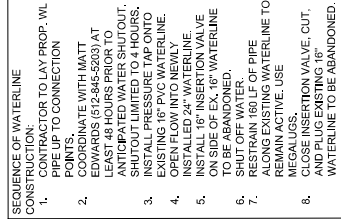
RICHARD L. RIDINGS, PE DATE
ROAD BOND MANAGEMENT TEAM

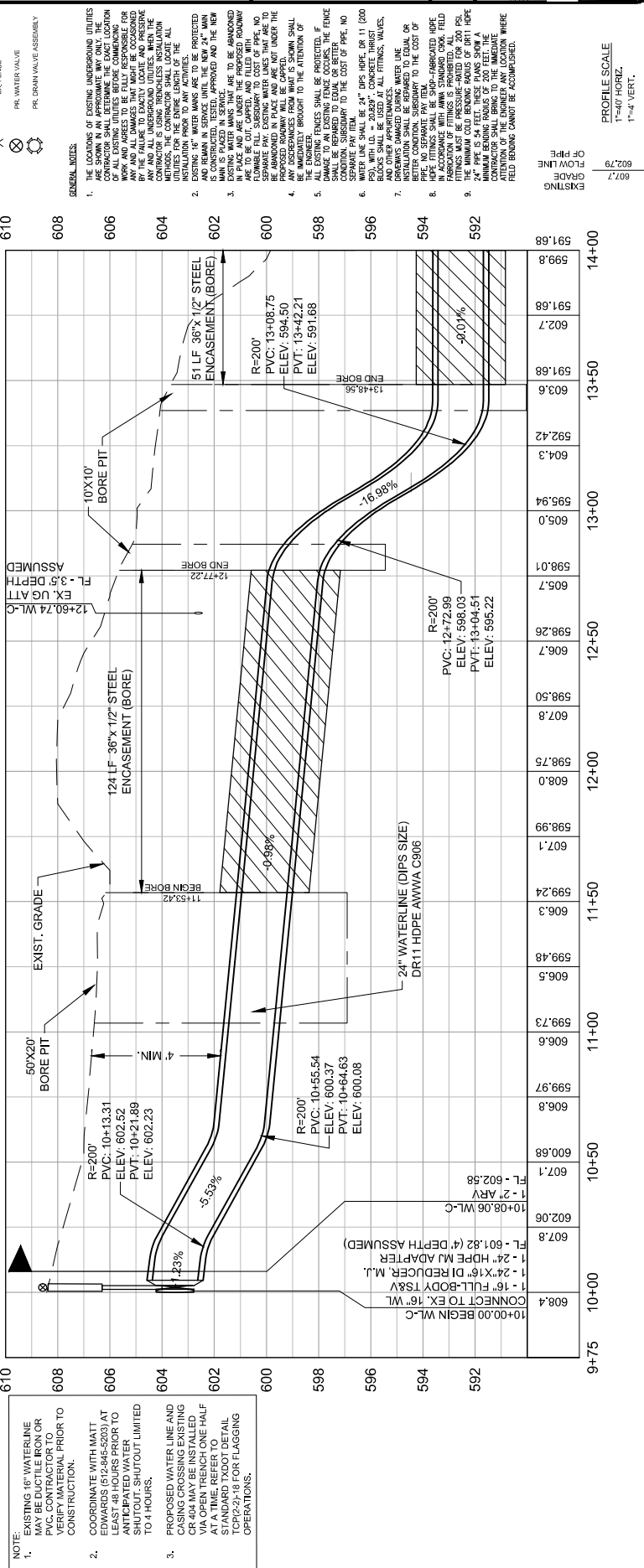
PREPARED BY:
COBBFENDLEY (DESIGN CONSULTANT)

CobbFendley
100 EAST FORT AND DRIVE, SUITE 100
512.844.8708 | FAX 512.844.7727
WWW.COBBFENDLEY.COM
JULIA M. FORT, P.E., TITLE NO. 000000070
KRISTEN VAN HOOSIER, P.E.
PROJECT MANAGER
3/30/2022 DATE



TXDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS AND BRIDGES ADOPTED ON NOVEMBER 1, 2014 AND ALL APPLICABLE SPECIAL PROVISIONS AND SPECIAL SPECIFICATIONS AS INDICATED IN THE BID DOCUMENTS SHALL GOVERN ON THIS PROJECT.





NOTE:

1. EXISTING 16" WATER LINE UNDER THE ROAD FOR PVC CONTRACTOR TO VERIFY MATERIAL PRIOR TO CONSTRUCTION.
2. COORDINATE WITH MATT EDWARDS (512) 446-5203 AT 12:00 PM TO ADVISE OF ANY UNEXPECTED WATER SHUTOFF, SHUTOFF LIMITED TO 4 HOURS.
3. PROPOSED WATER LINE AND CASING CROSSING EXISTING R 404 MAY BE INSTALLED AT A LINE REFER TO AT A LINE REFER TO STANDARD XDOT DETAIL TOP(2)-2-18 FOR FLAGGING OPERATIONS.

[illegible]

PROFILE SCALE
1"=40' HORIZ.
1"=4' VERT.

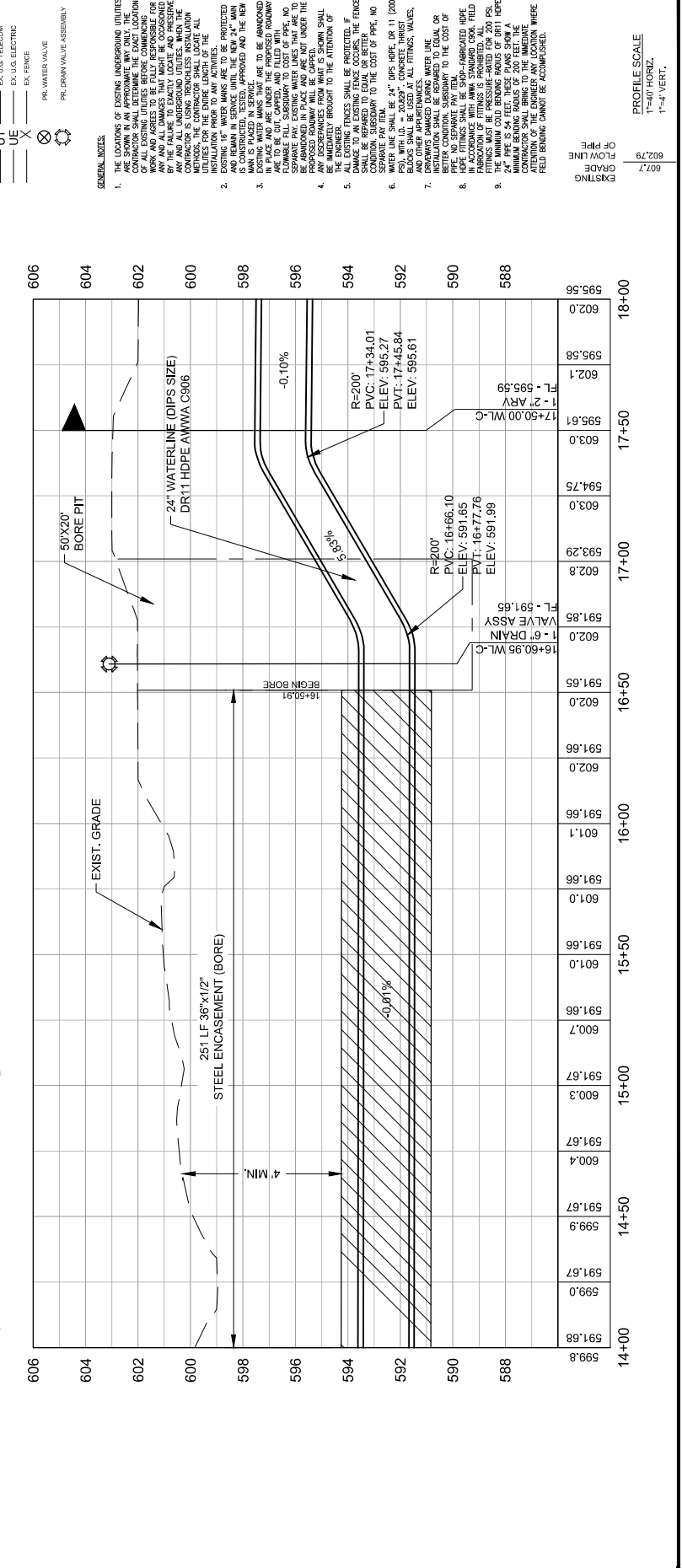
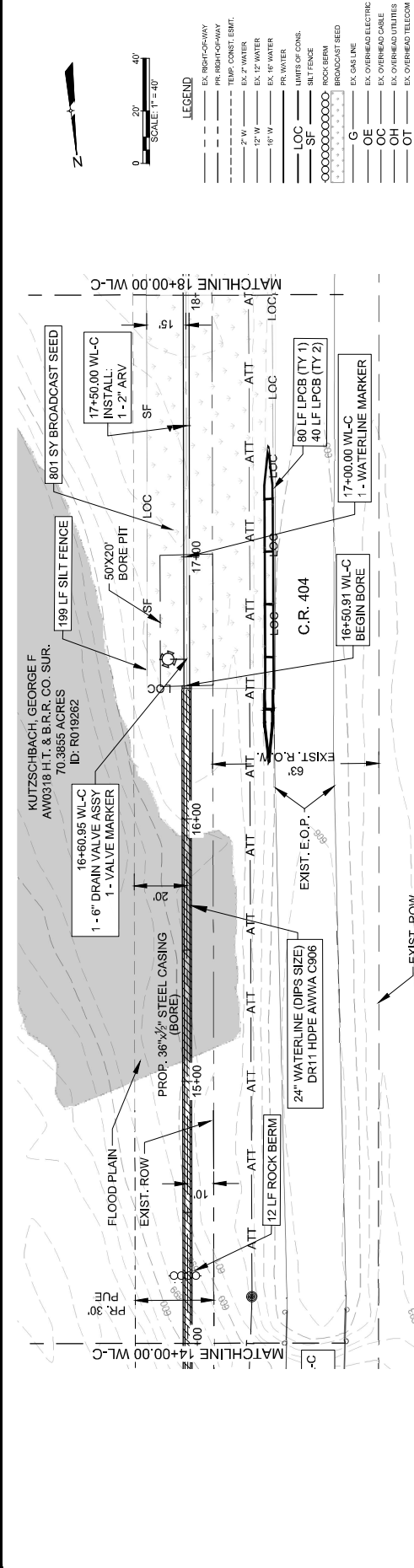
REV	NO.	REVISION DESCRIPTION	APPROVED	DATE



CR 404 Hutto 24" WATER LINE
TAYLOR, TEXAS
14+00 TO 18+00
WATER LINE C PLAN AND PROFILE



SHEET
C-302
6 of 66



GENERAL NOTES:

- THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE MANNER ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION. ANY WORK SHALL BE DONE IN ACCORDANCE WITH THE UTILITY LOCATOR'S REPORT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO EXISTING UTILITIES. WHEN THE CONTRACTOR SHALL LOCATE ALL UTILITIES FOR THE ENTIRE LENGTH OF THE PROJECT, THE CONTRACTOR SHALL LOCATE ALL UTILITIES FOR THE ENTIRE LENGTH OF THE PROJECT.
- EXISTING 12" WATER MAINS ARE TO BE PROTECTED AND REMAIN IN SERVICE UNTIL THE NEW 24" MAIN HAS BEEN INSTALLED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES.
- EXISTING WATER MAINS THAT ARE TO BE ABANDONED SHALL BE CUT, CAPPED, AND FILLED WITH FLAMABLE FILL. SUBSIDIARY TO COST OF PIPE, NO FILL SHALL BE USED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES.
- PROPOSED ROADWAY WILL BE CAPPED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES.
- THE ENGINEER'S DESIGN SHALL BE PROTECTED. IF DAMAGE TO AN EXISTING FENCE OCCURS, THE FENCE SHALL BE REPAIRED TO EQUAL OR BETTER CONDITION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES.
- WATER LINE SHALL BE 24" DIPPS HDPE, OR 1" 1200 DIPPS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES.
- AND OTHER APPROPRIATE WATER LINE INSTALLATION SHALL BE REPAIRED TO EQUAL OR BETTER CONDITION. SUBSIDIARY TO THE COST OF FITTINGS SHALL BE SHIP-FABRICATED HDPE. FITTINGS SHALL BE PRESSURE-TESTED FOR 200 PSI. FITTINGS MUST BE PRESSURE-TESTED FOR 200 PSI. FITTINGS MUST BE PRESSURE-TESTED FOR 200 PSI.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES.
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LEGEND

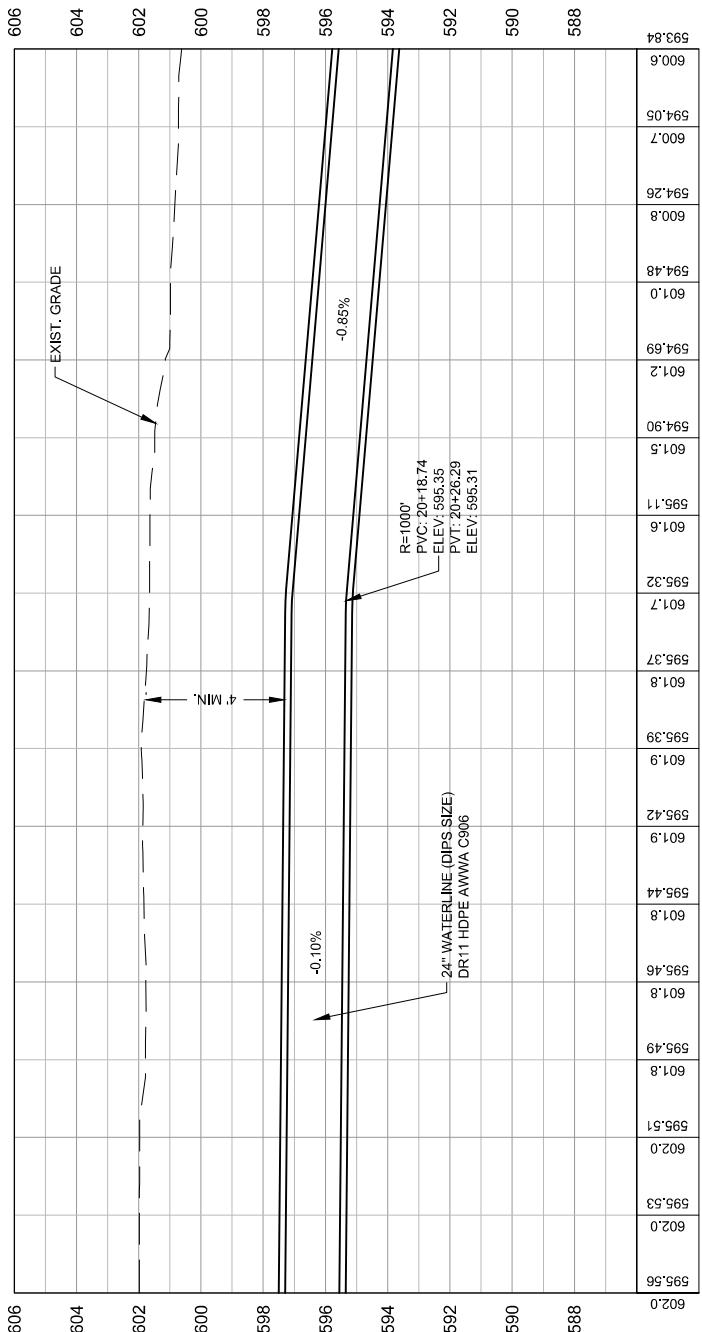
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- PR. RIGHT-OF-WAY
- TEMP. CONST. EMT.
- EX. 2" WATER
- EX. 12" WATER
- EX. 16" WATER
- PR. WATER
- LIMITS OF CONG.
- SILT FENCE
- ROCK BERM
- BROADCAST SEED
- EX. GAS LINE
- EX. OVERHEAD ELECTRIC
- EX. OVERHEAD CABLE
- EX. OVERHEAD UTILITIES
- EX. OVERHEAD TELECOM
- EX. U.S. TELECOM
- EX. U.S. ELECTRIC
- EX. FENCE
- PR. WATER VALVE
- PR. DRAIN VALVE ASSEMBLY

PROFILE SCALE

1"=40' HORIZ.
1"=4' VERT.

602.79
602.7

EXISTING
GRADE
FLOW LINE
OF PIPE

[illegible]

PROFILE SCALE
=40' HORIZ.
=4' VERT.

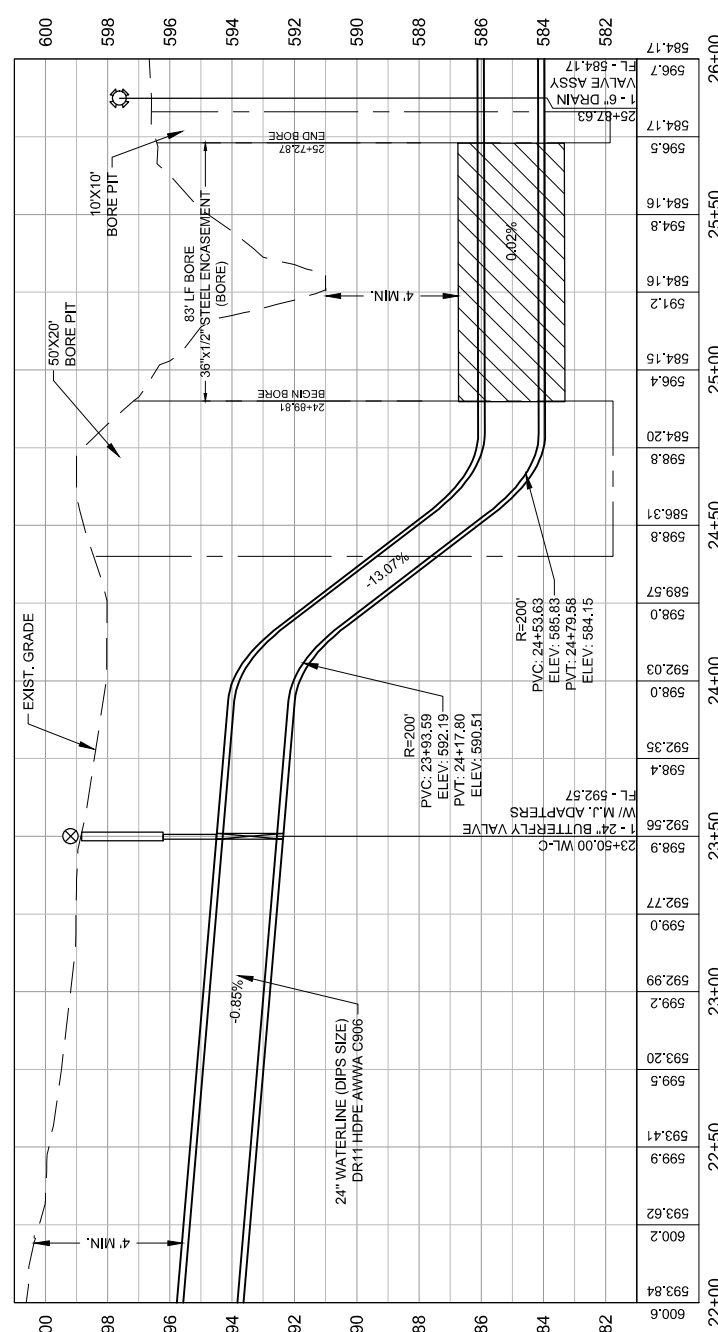
$$\begin{array}{r} 607.7 \\ \hline 602.79 \end{array}$$


BROADCAST SEED	EX. GAS LINE
— G —	EX. OVERHEAD ELECTRIC
— OE —	EX. OVERHEAD CABLE
— OC —	EX. OVERHEAD UTILITIES
— OH —	EX. OVERHEAD TELECOM
— OT —	EX. U.G. TELECOM
— UT —	EX. U.G. ELECTRIC
— UE —	EX. FENCE
— X —	
	PR. WATER VALVE

WATER LINE C PLAN AND PROFILE
18+00 TO 22+00
CR 404 HUITO 24" WATER LINE
TAYLOR, TEXAS

ROJ. NO. 1903-099-05-57
DESIGN: R. RODRIGUEZ
DRAWN: G. LITTLEFIELD
CHECK: J. HASTINGS
OPR: K. VAN HOOSIER

SHEET
C-303
7 of 66



- [illegible]

PROFILE SCALE
1"=40' HORIZ.
1"=4' VERT.

REV	NO.	REVISION DESCRIPTION	APPROVED	DATE



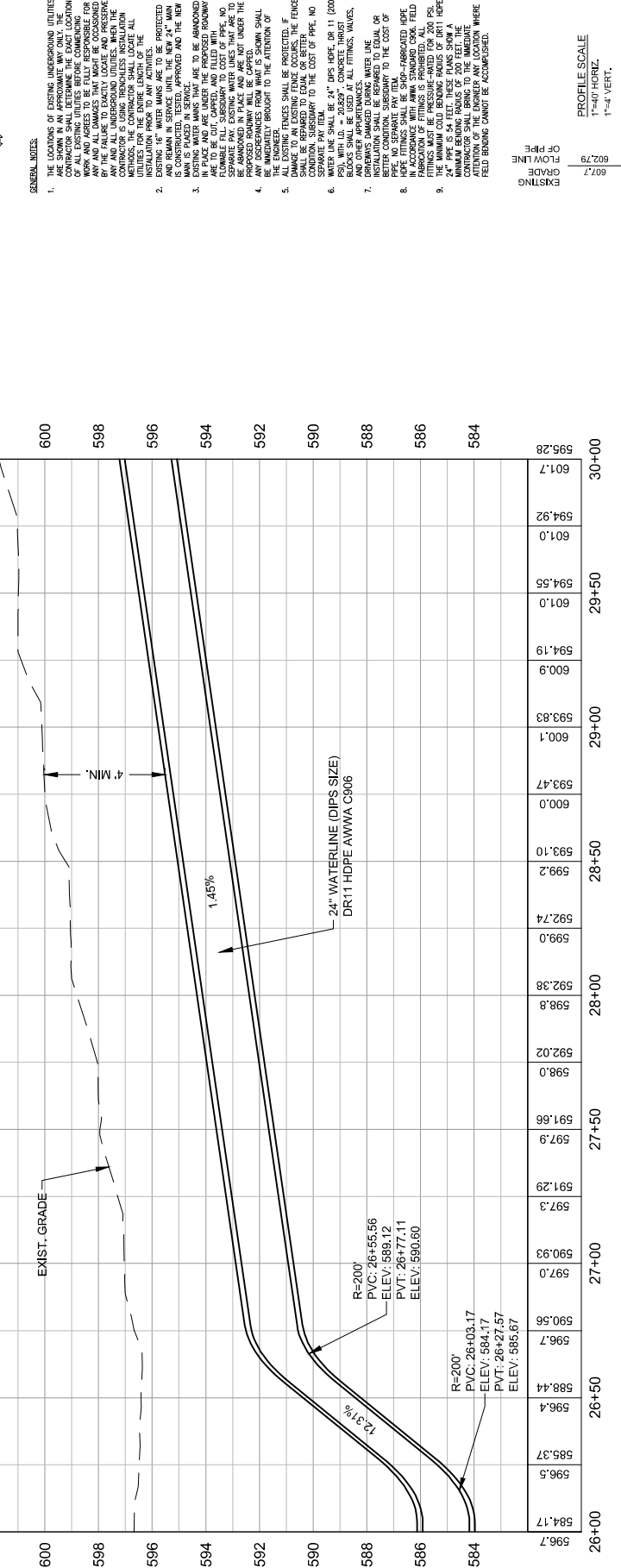
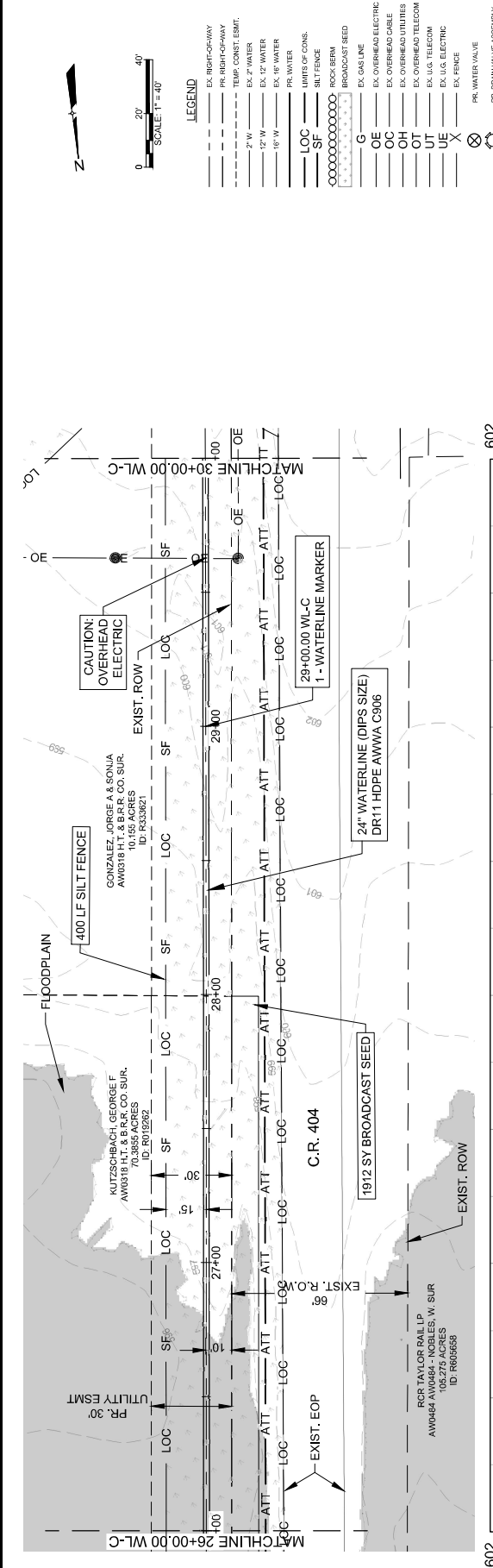
CR 404 HUTTO 24" WATER LINE
26+00 TO 30+00
WATER LINE C PLAN AND PROFILE
TAYLOR, TEXAS



PROJECT NO. 18060000000000000000
DESIGNER: E. LITTLEFIELD
CHECKER: A. WATKINS
DATE: 5/20/2022



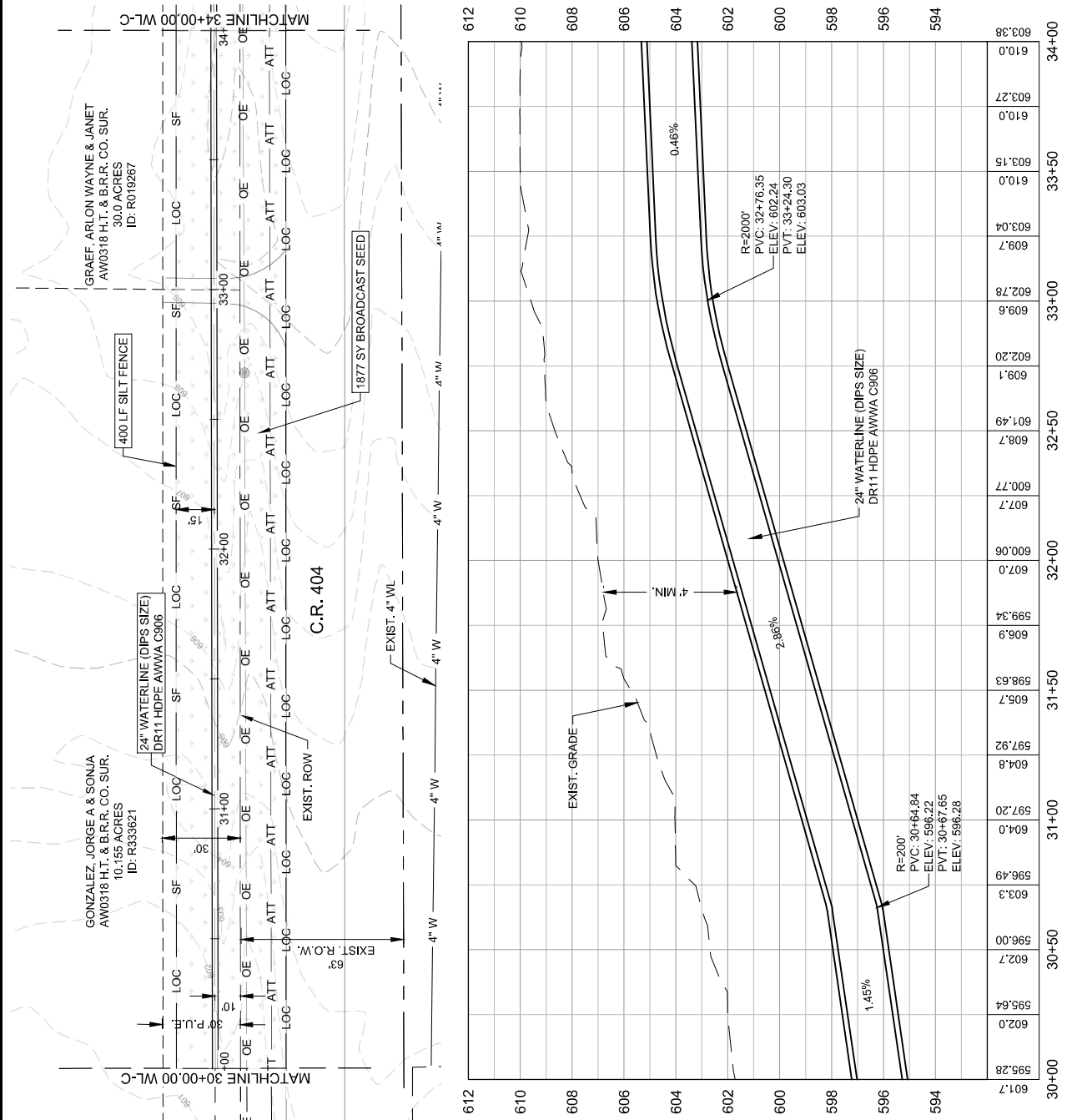
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C-305
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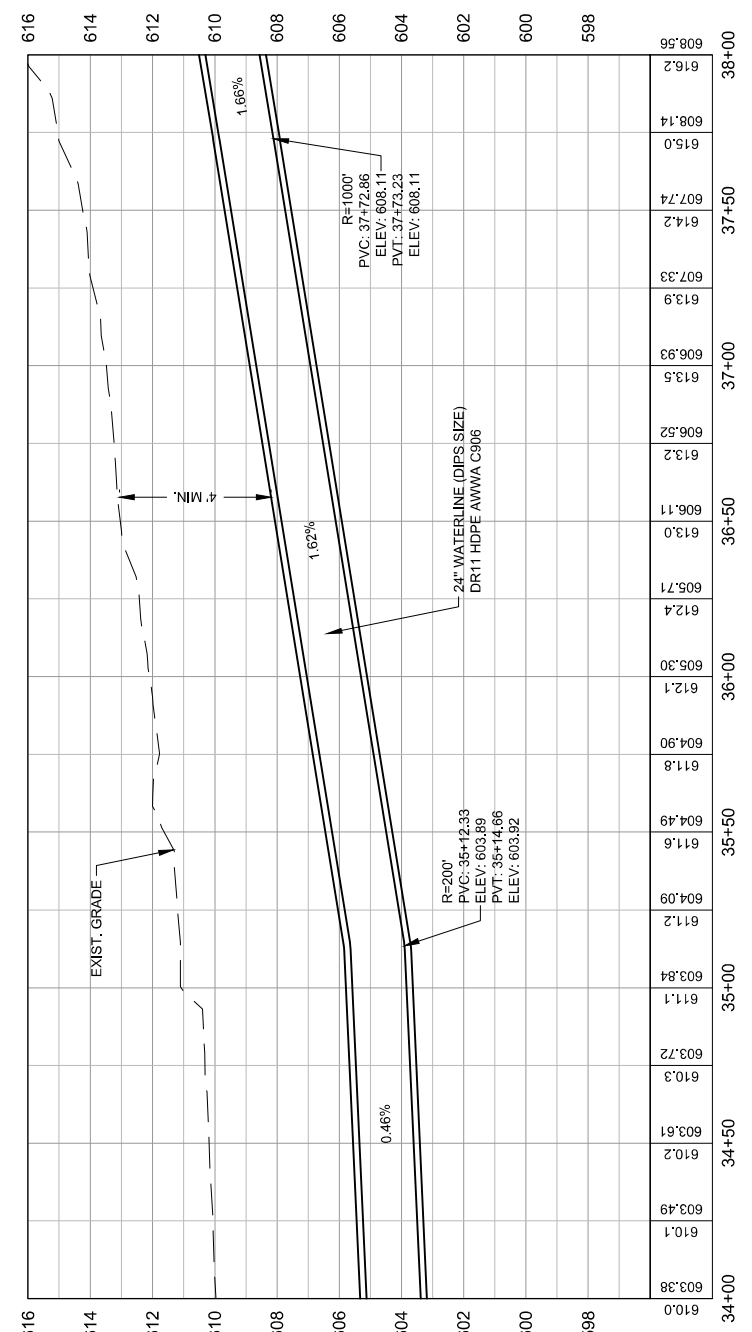


- GENERAL NOTES:
- THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE MANNER ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY DAMAGE TO EXISTING UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY EASEMENTS. WHEN THE CONTRACTOR SHALL LOCATE ALL UTILITIES FOR THE ENTIRE LENGTH OF THE PROJECT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY EASEMENTS.
 - EXISTING 12" WATER MAINS ARE TO BE PROTECTED AND REMAIN IN SERVICE UNTIL THE NEW 24" MAIN IS INSTALLED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY EASEMENTS.
 - EXISTING WATER MAINS THAT ARE TO BE ABANDONED SHALL BE DELETED FROM THE RECORD DRAWING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY EASEMENTS.
 - PROPOSED ROADWAY WILL BE CAPPED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY EASEMENTS.
 - THE ENGINEER'S OFFICE SHALL BE NOTIFIED IMMEDIATELY OF ANY DAMAGE TO EXISTING UTILITIES. THE FENCE SHALL BE REPAIRED TO EQUAL OR BETTER CONDITION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY EASEMENTS.
 - WATER LINE SHALL BE 24" HDPE HOPE, OR 1" (200) BLOCKS SHALL BE USED AT ALL FITTINGS, VALVES, AND OTHER APPROPRIATE PLACES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY EASEMENTS.
 - INSTALLATION SHALL BE REPAIRED TO EQUAL OR BETTER CONDITION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY EASEMENTS.
 - HOPE FITTINGS SHALL BE SHOP-FABRICATED HOPE FITTINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY EASEMENTS.
 - HOPE FITTINGS MUST BE PRESSURE-TESTED FOR 200 PSI. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY EASEMENTS.
 - 12" PIPE SHALL BE 12" HDPE HOPE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY EASEMENTS.

EXISTING	GRADE	FLOW LINE	OF PIPE
602.79	602.79	602.79	602.79

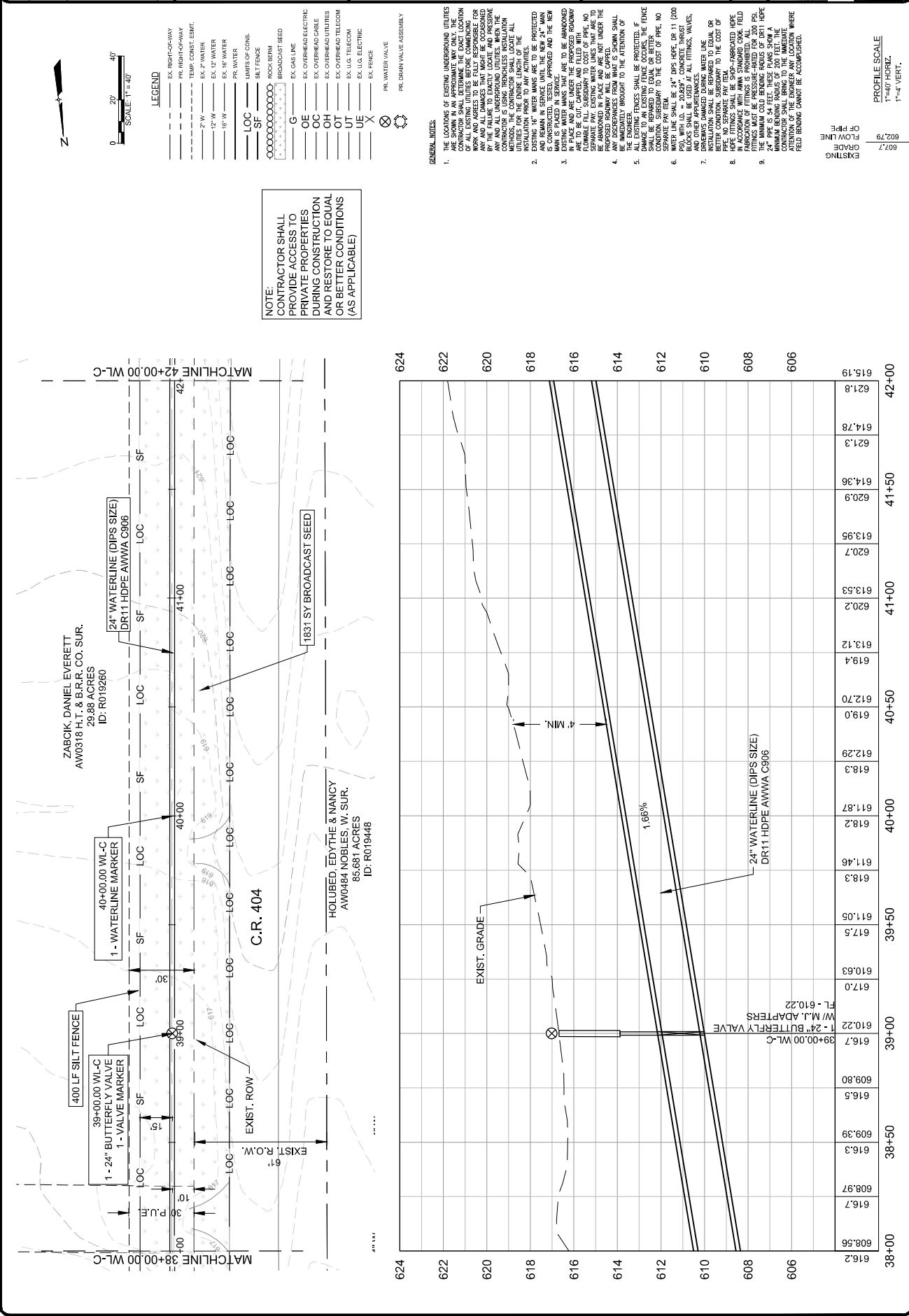
PROFILE SCALE
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1"=4' VERT.

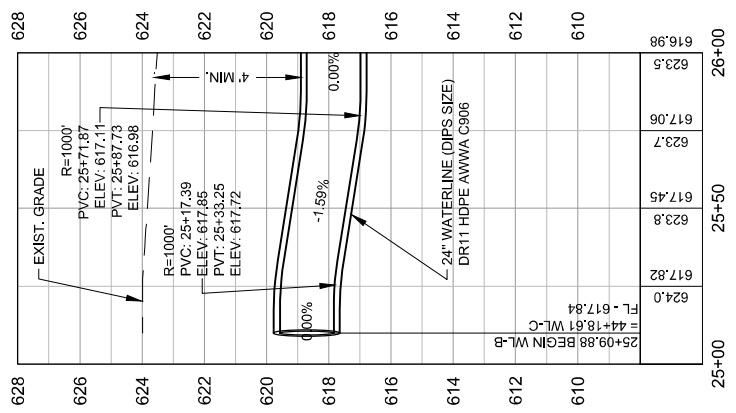
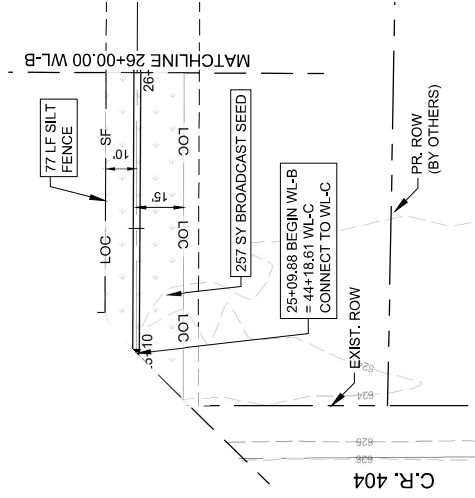
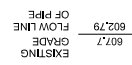




EXISTING GRADE FLOW LINE OF PIPE

- [illegible]



[illegible]

PROFILE SCALE
1"=40' HORIZ.
1"=4' VERT.

REV	NO.	REVISION DESCRIPTION	APPROVED	DATE

CobbFendley
 1700 N. COAST HIGHWAY, SUITE 100
 AUSTIN, TEXAS 78752
 512.334.9998 | FAX 512.334.7723
 WWW.COBBFENDLEY.COM

CR 404 HUTTO 24" WATER LINE
 26+00 TO 30+00
 WATER LINE B PLAN AND PROFILE



PROJECT NO.: 2013-08801
 DESIGNER: J. B. BONE
 CHECKER: A. VAN HOOSIER
 DATE: 3/28/2022

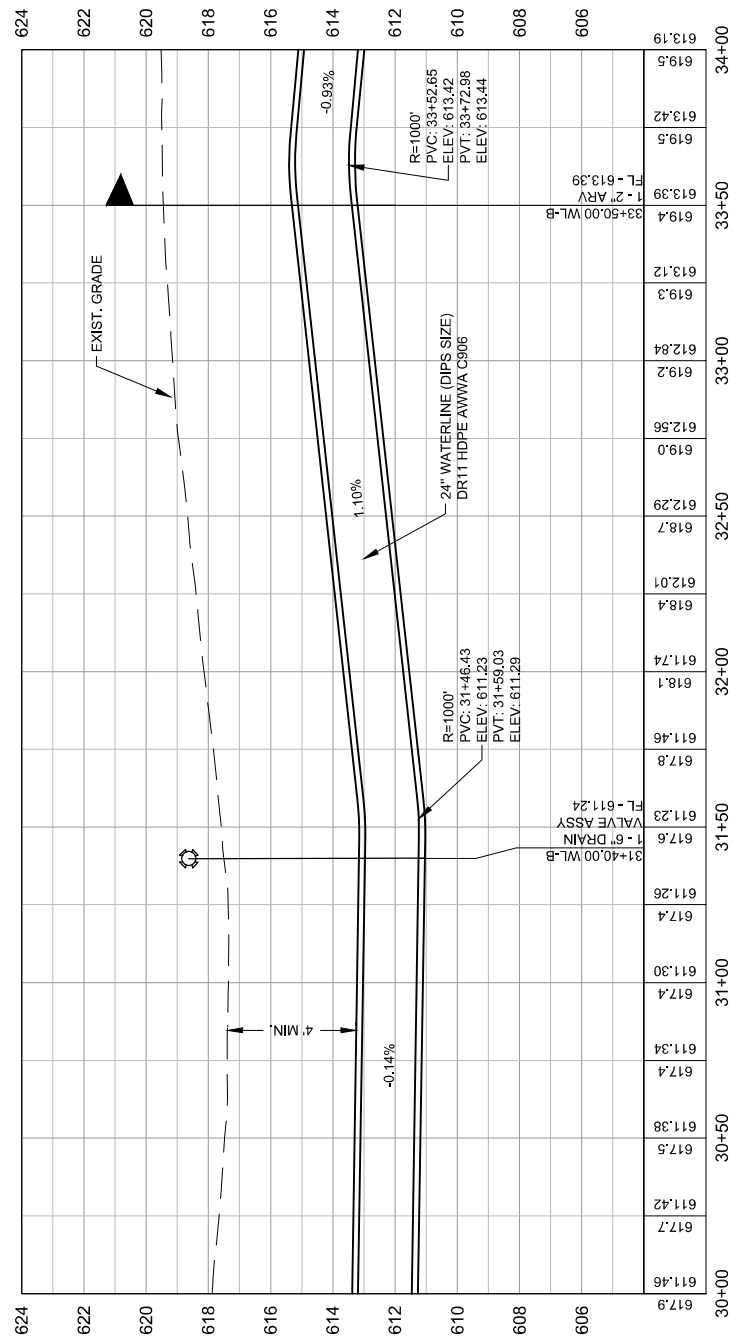
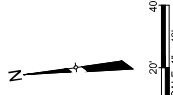


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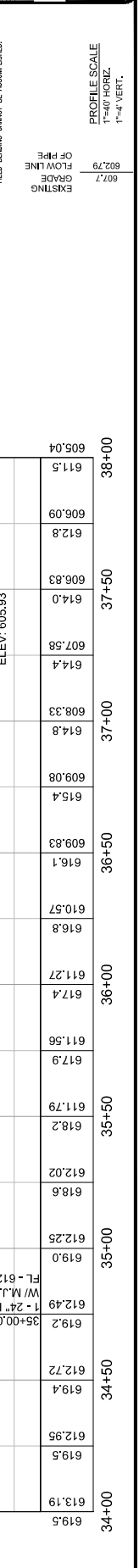
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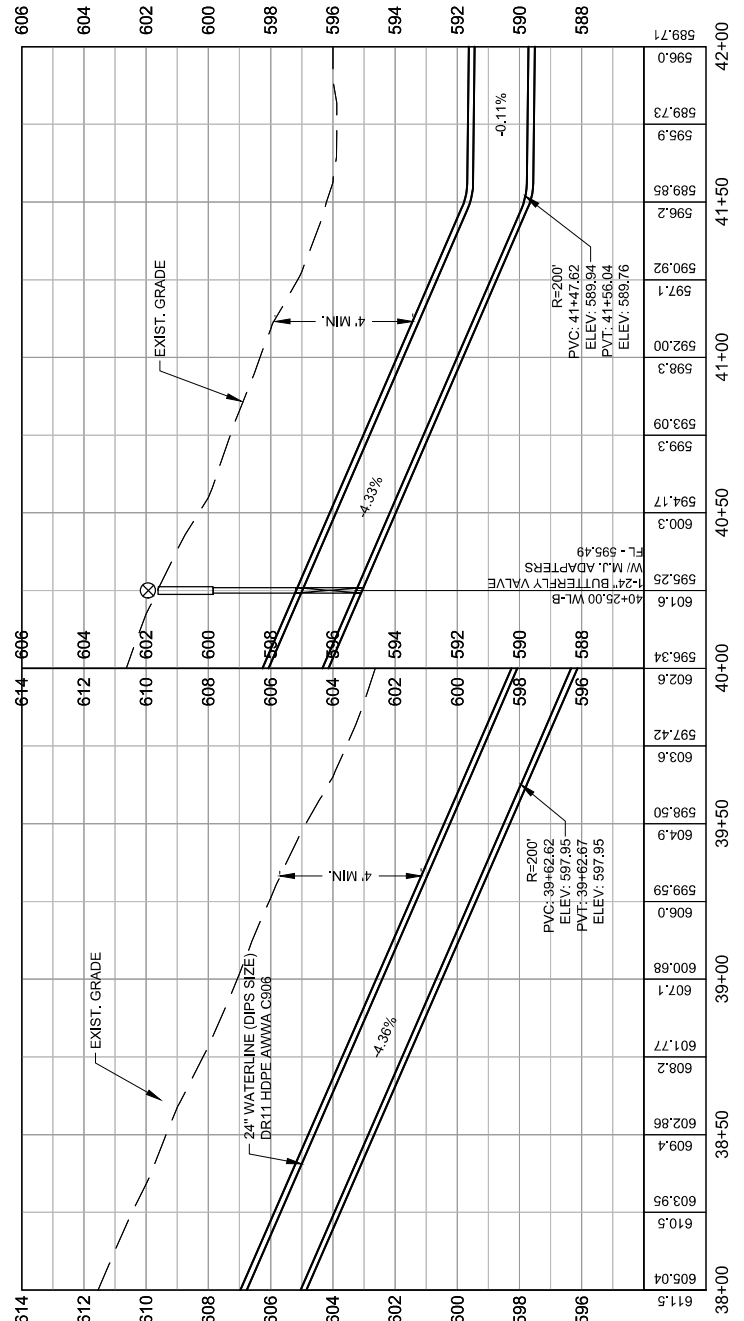
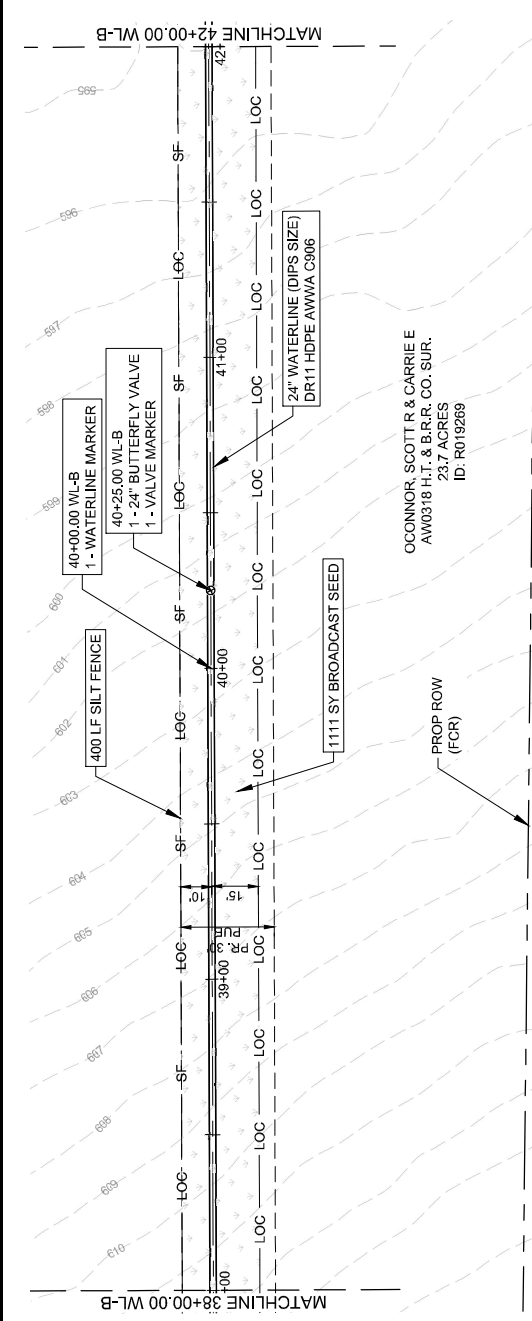
- EX. RIGHT-OF-WAY
- PR. RIGHT-OF-WAY
- TEMP. CONST. EMT.
- EX. 2" WATER
- EX. 12" WATER
- EX. 16" WATER
- PR. WATER
- LIMITS OF CONG.
- LOC
- SF
- SILT FENCE
- ROCK BERM
- BROADCAST SEED
- EX. GAS LINE
- EX. OVERHEAD ELECTRIC
- OC
- EX. OVERHEAD CABLE
- OH
- EX. OVERHEAD UTILITIES
- OT
- EX. OVERHEAD TELECOM
- UE
- EX. U.S. TELECOM
- X
- EX. U.S. ELECTRIC
- EX. FENCE
- PR. WATER VALVE
- PR. DRAIN VALVE ASSEMBLY

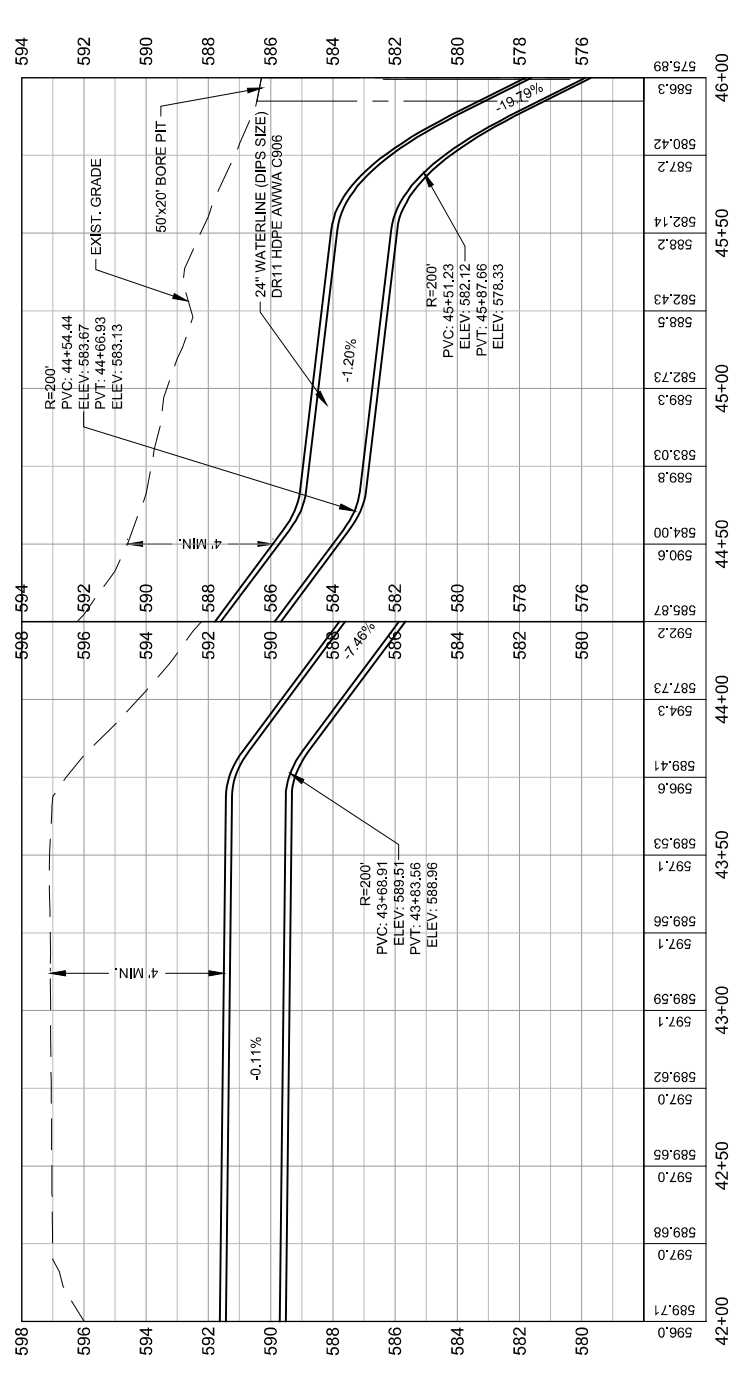
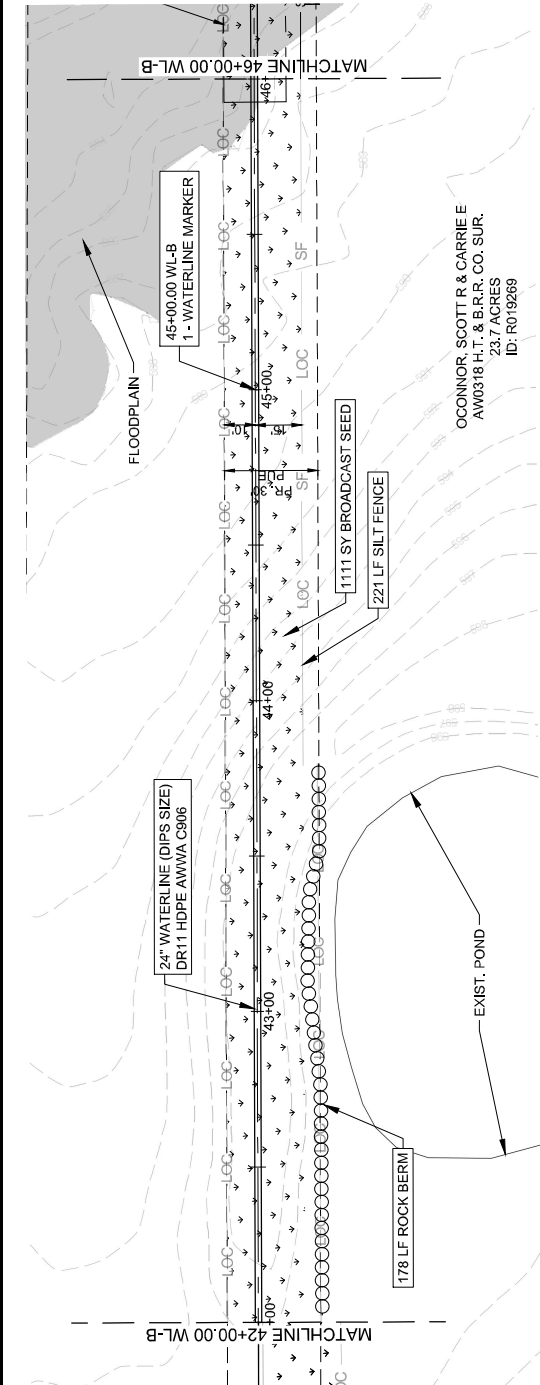
- GENERAL NOTES:**
- THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE MANNER ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY DAMAGE TO EXISTING UTILITIES. ANY DAMAGE TO ANY AND ALL EXISTING UTILITIES SHALL BE REPAIRED TO ORIGINAL CONDITION OR BETTER. WHEN THE CONTRACTOR IS UNABLE TO LOCATE EXISTING UTILITIES, THE CONTRACTOR SHALL LOCATE ALL UTILITIES FOR THE ENTIRE LENGTH OF THE PROPOSED WATER LINE. EXISTING UTILITIES SHALL BE PROTECTED. EXISTING 16" WATER MAINS ARE TO BE PROTECTED AND REMAIN IN SERVICE UNTIL THE NEW 24" MAIN IS INSTALLED. EXISTING 12" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 8" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 4" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 2" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/2" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/4" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/8" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/16" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/32" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/64" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/128" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/256" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/512" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/1024" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/2048" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/4096" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/8192" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/16384" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/32768" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/65536" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/131072" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/262144" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/524288" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/1048576" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/2097152" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/4194304" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/8388608" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/16777216" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/33554432" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/67108864" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/134217728" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/268435456" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/536870912" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/1073741824" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/2147483648" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/4294967296" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. EXISTING 1/8589934592" WATER MAINS ARE TO BE REMOVED AND REPAIRED TO ORIGINAL CONDITION. 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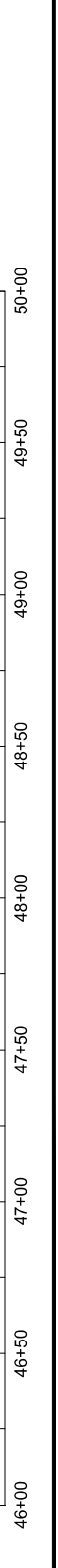
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PROFILE SCALE
1"=40' HORIZ.
1"=4' VERT.

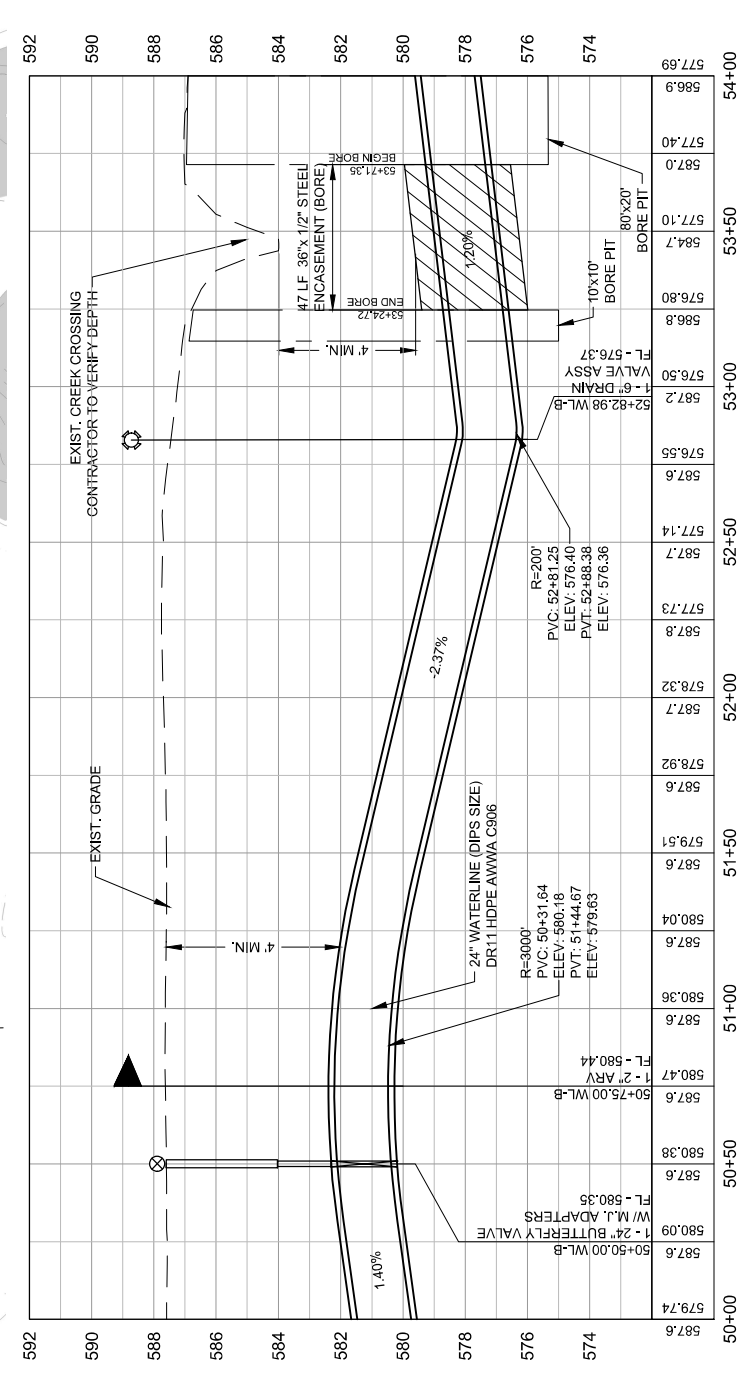
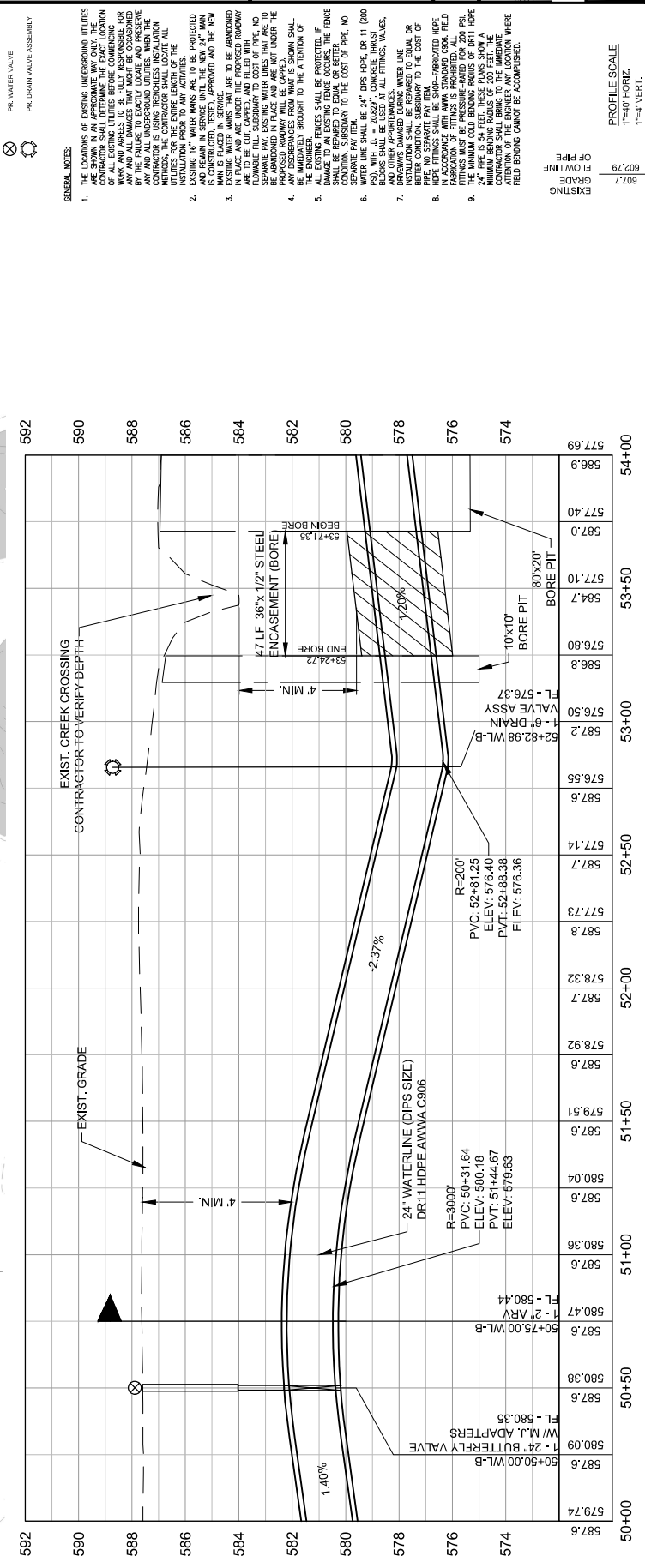


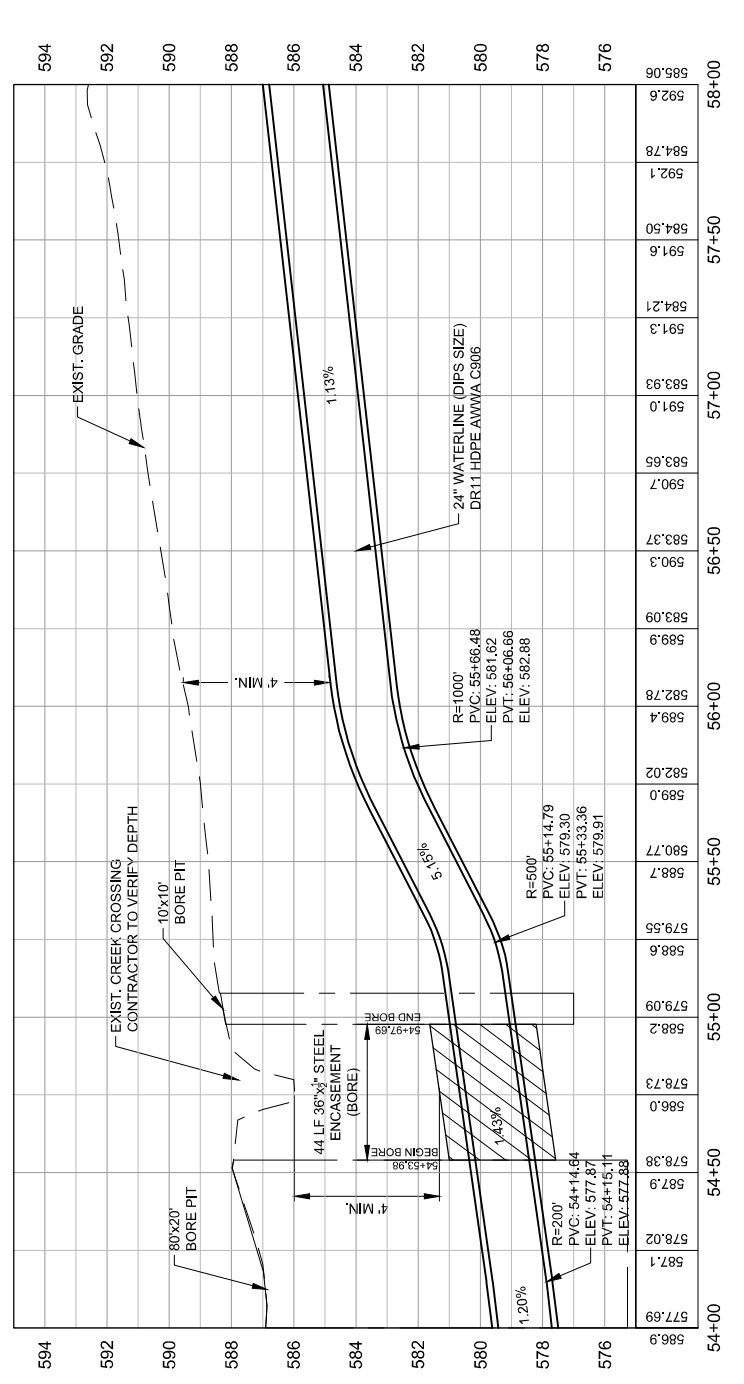






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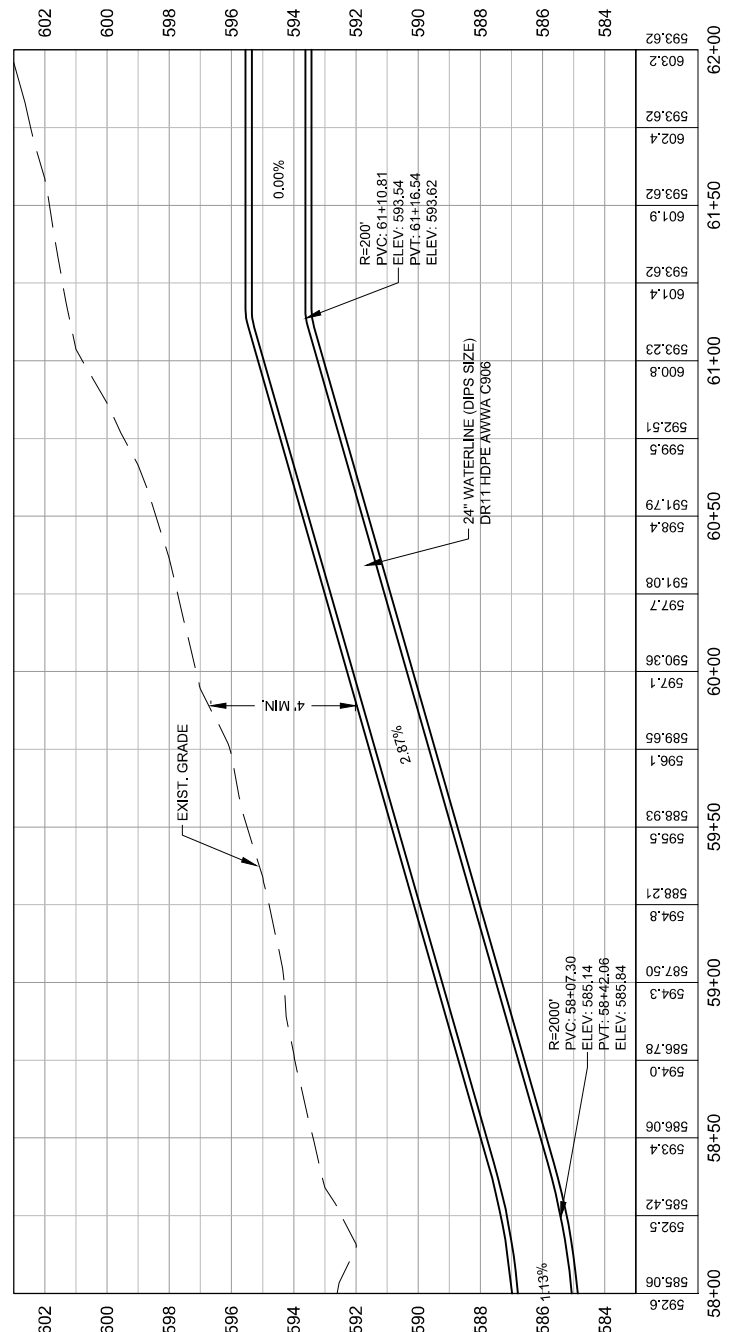


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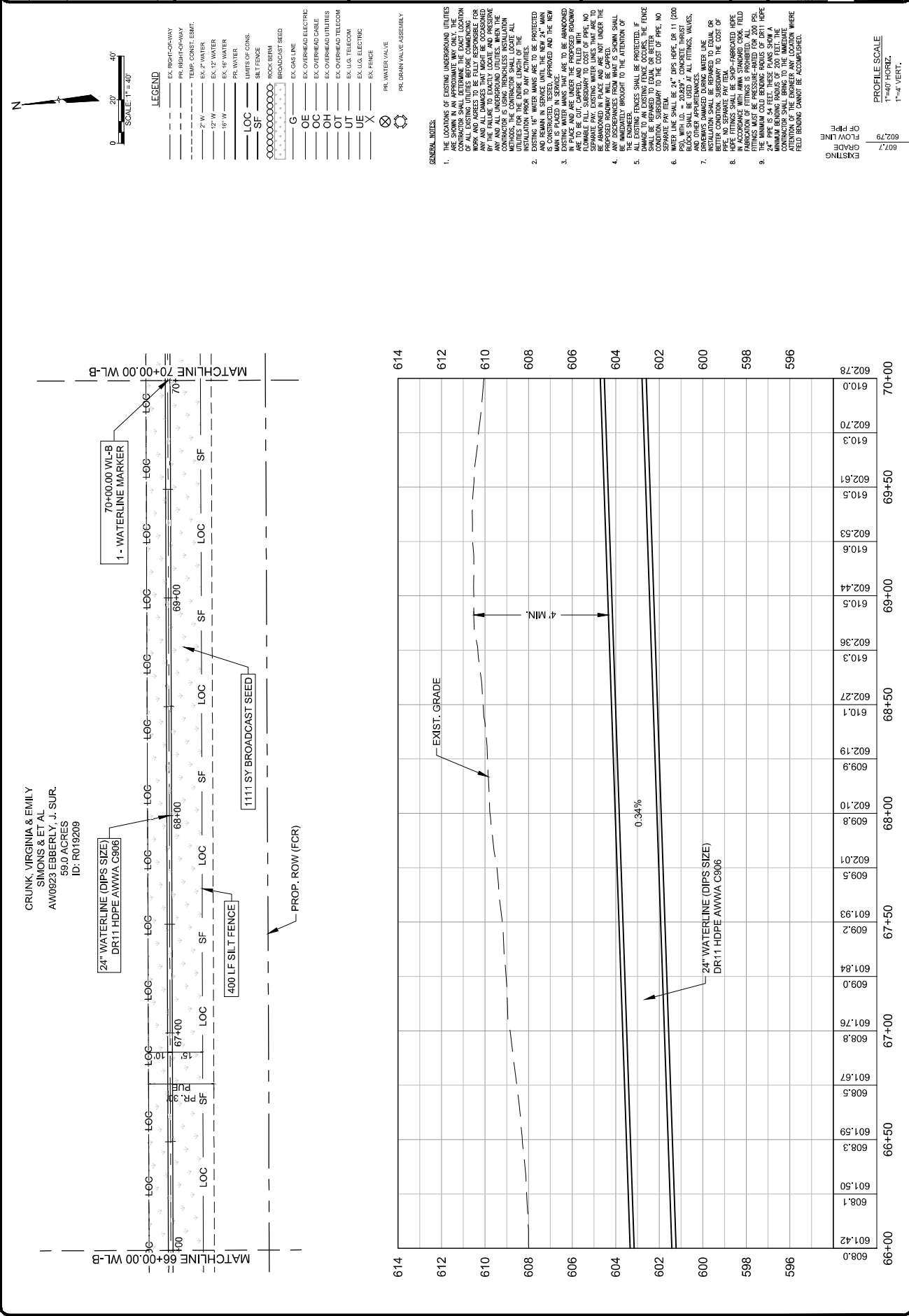
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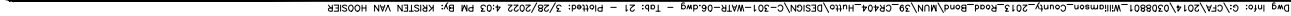
- GENERAL NOTES:

- | | |
|-----------|--------|
| EXISTING | 607.7 |
| GRADE | |
| FLOW LINE | 602.79 |
| OF PIPE | |



EXISTING GRADE	607.7
FLOW LINE OF PIPE	602.79





REV.	NO.	REVISION DESCRIPTION	APPROVED	DATE

Cobbendley
 1000 N. 45th St., Suite 100
 Austin, Texas 78752
 512.334.9991 | FAX 512.334.7772
 WWW.COBBERNDLEY.COM

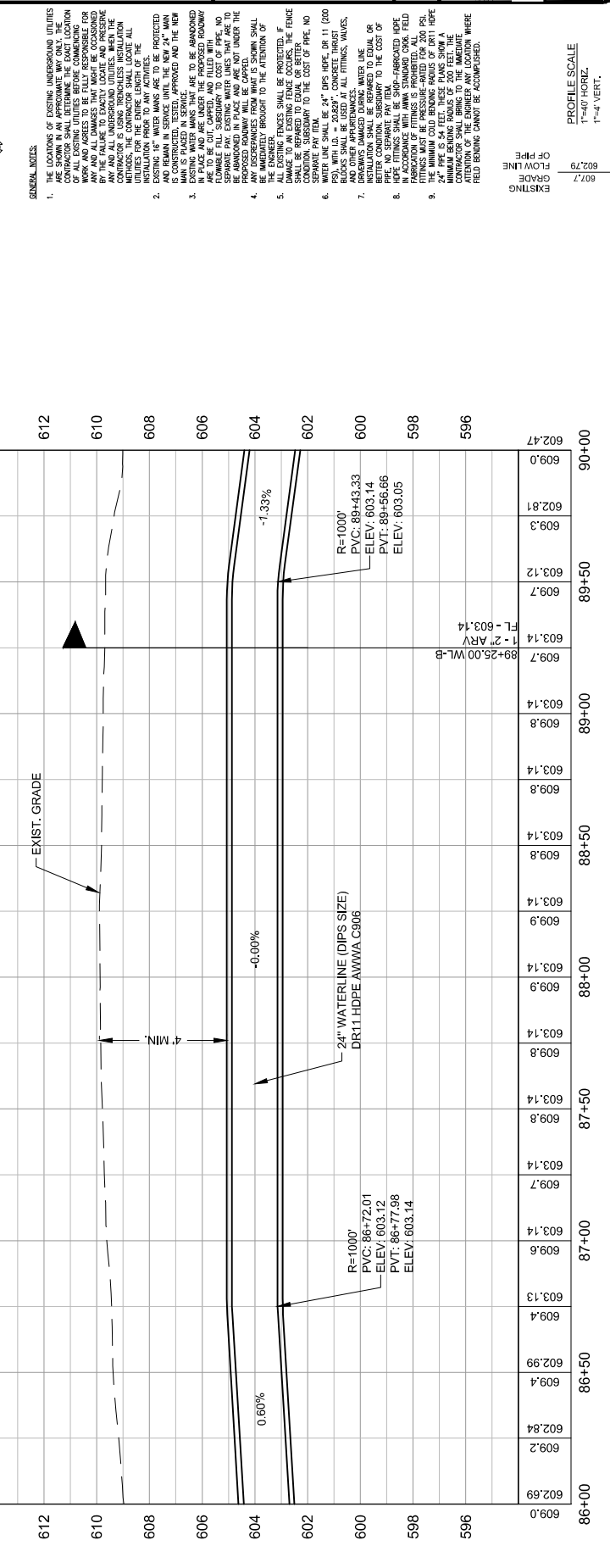
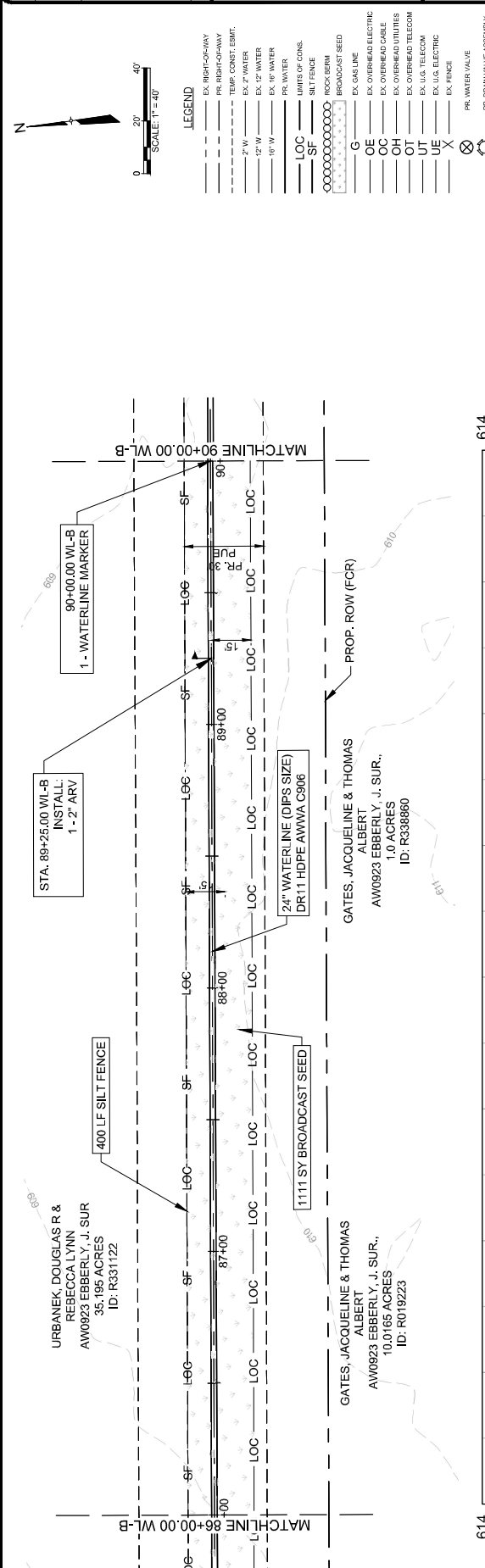
CR 404 HUTTO 24" WATER LINE
 TAYLOR, TEXAS
 86+00 TO 90+00
 WATER LINE B PLAN AND PROFILE



PROJECT NO. 2013-08801
 DESIGNER: H. NEWTON
 CHECKER: A. VANHOESER
 DATE: 5/28/2022

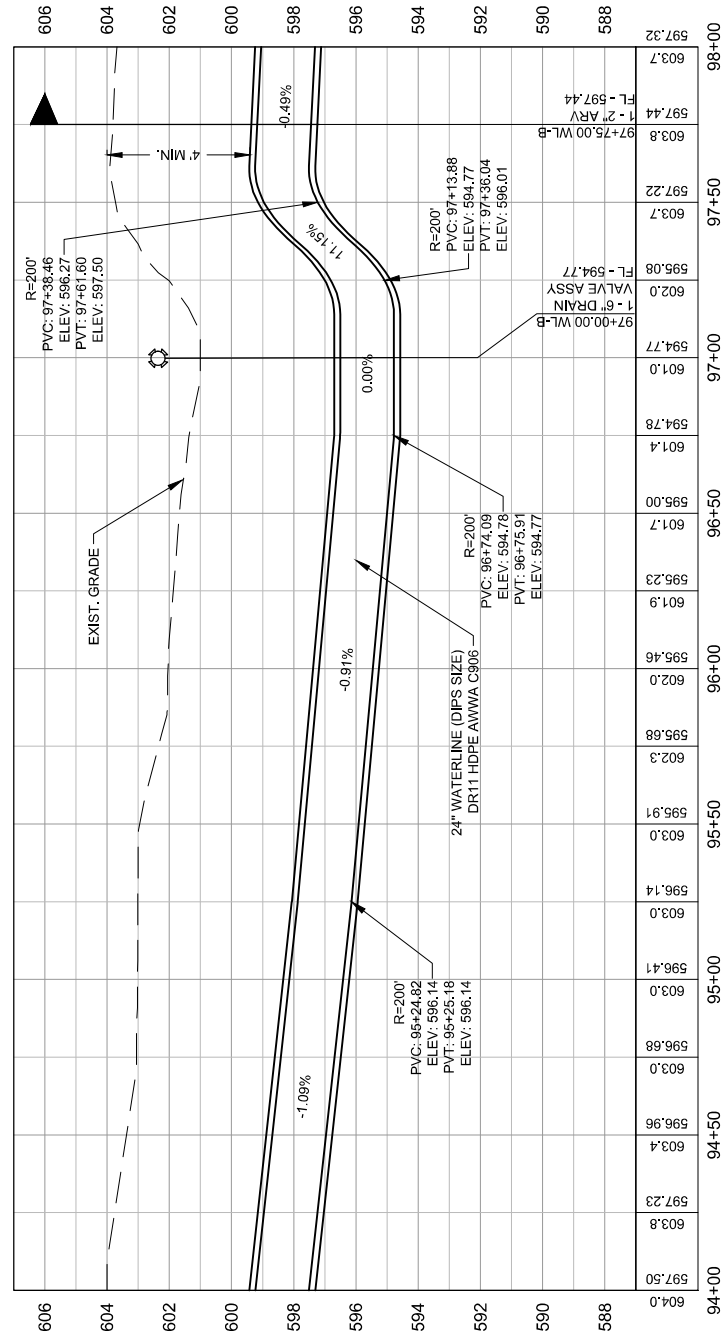
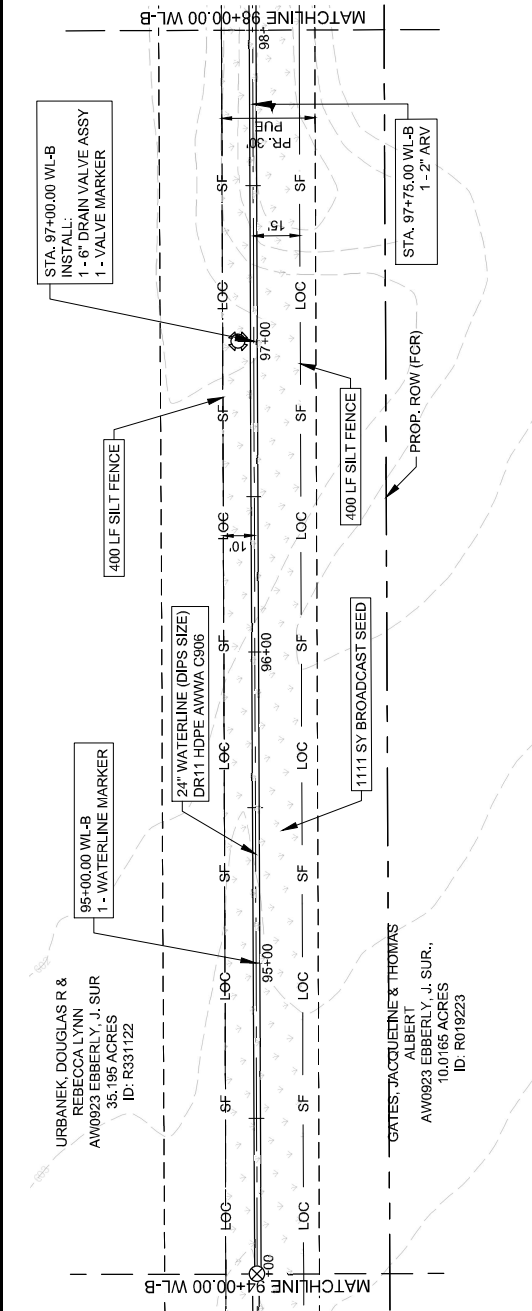


SHEET
 C-325
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EXISTING	GRADE	FLOW LINE	PROFILE SCALE
602.79	602.79	602.79	1"=40' HORIZ. 1"=4' VERT.
602.47	609.0	90+00	
602.81	609.3	89+50	
603.12	609.7	89+00	
603.14	609.8	88+50	
603.14	609.8	88+00	
603.14	609.9	87+50	
603.14	609.8	87+00	
603.14	609.7	86+50	
603.13	609.4	86+00	
602.99	609.4		
602.84	609.2		
602.69	609.0		





GENERAL NOTES:

- [illegible]

EXISTING	607.7
GRADE	
FLOW LINE	602.79
OF PIPE	

PROFILE SCALE
1"=40' HORIZ.
1"=4' VERT.

136882
PROFESSIONAL ENGINEER
LICENSED
3/30/2022

THESE DESIGN REQUIREMENTS ARE NOT TO BE
USED FOR CONSTRUCTION ENFORCEMENT TO
REGULATORY JURISDICTION AND POINT.

SHEET
C-327
31 of 66

CobbFendley
 1106 N. F-24 / 1106 N. F-24 / 1106 N. F-24
 505 EAST HUNTLAND DRIVE, SUITE 100
 AUSTIN, TEXAS 78752
 512.834.9788 | FAX 512.834.7727
 WWW.COBBFENDLEY.COM

WATER LINE B PLAN AND PROFILE
94+00 TO 98+00
CR 404 HULL TO 24" WATER LINE
TAYLOR, TEXAS

DATE: 3/26/2022

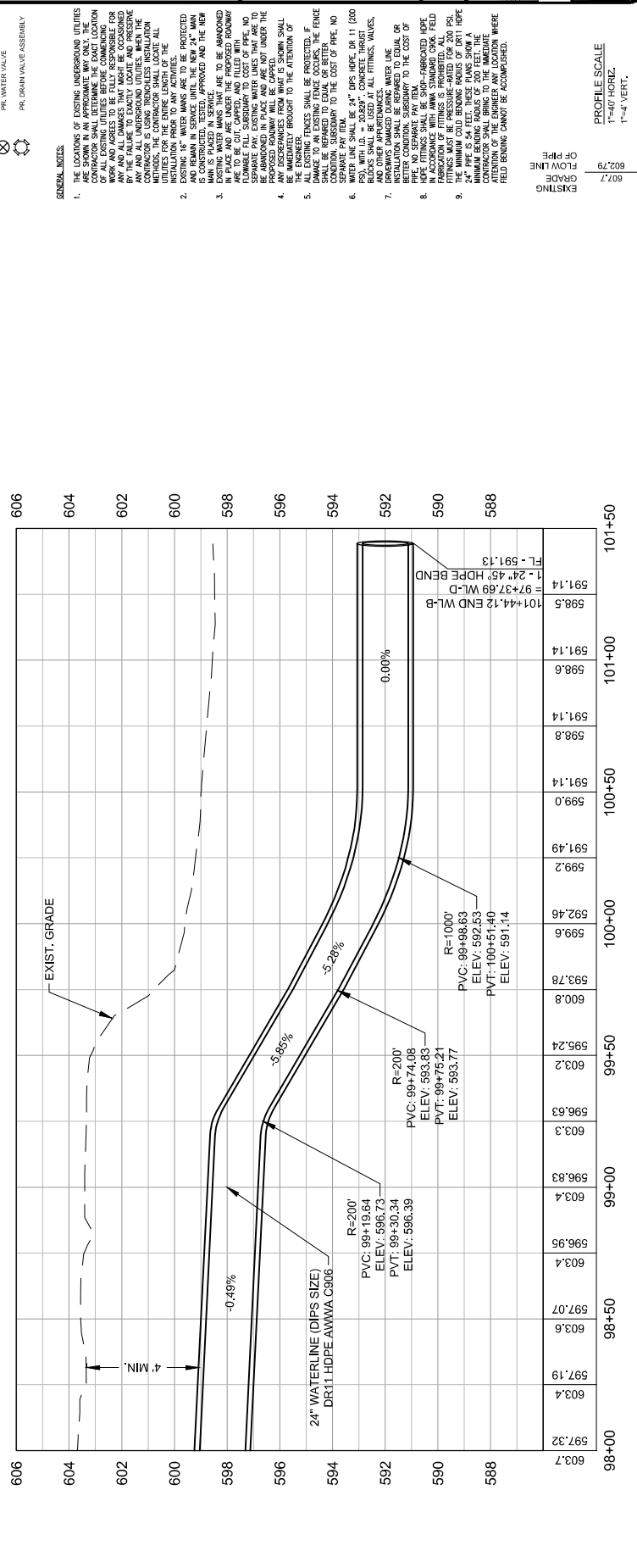
 KRISTEN VAN HOOSIER
136882
RECEIVED
LEGISLATIVE COUNCIL

3/30/2022

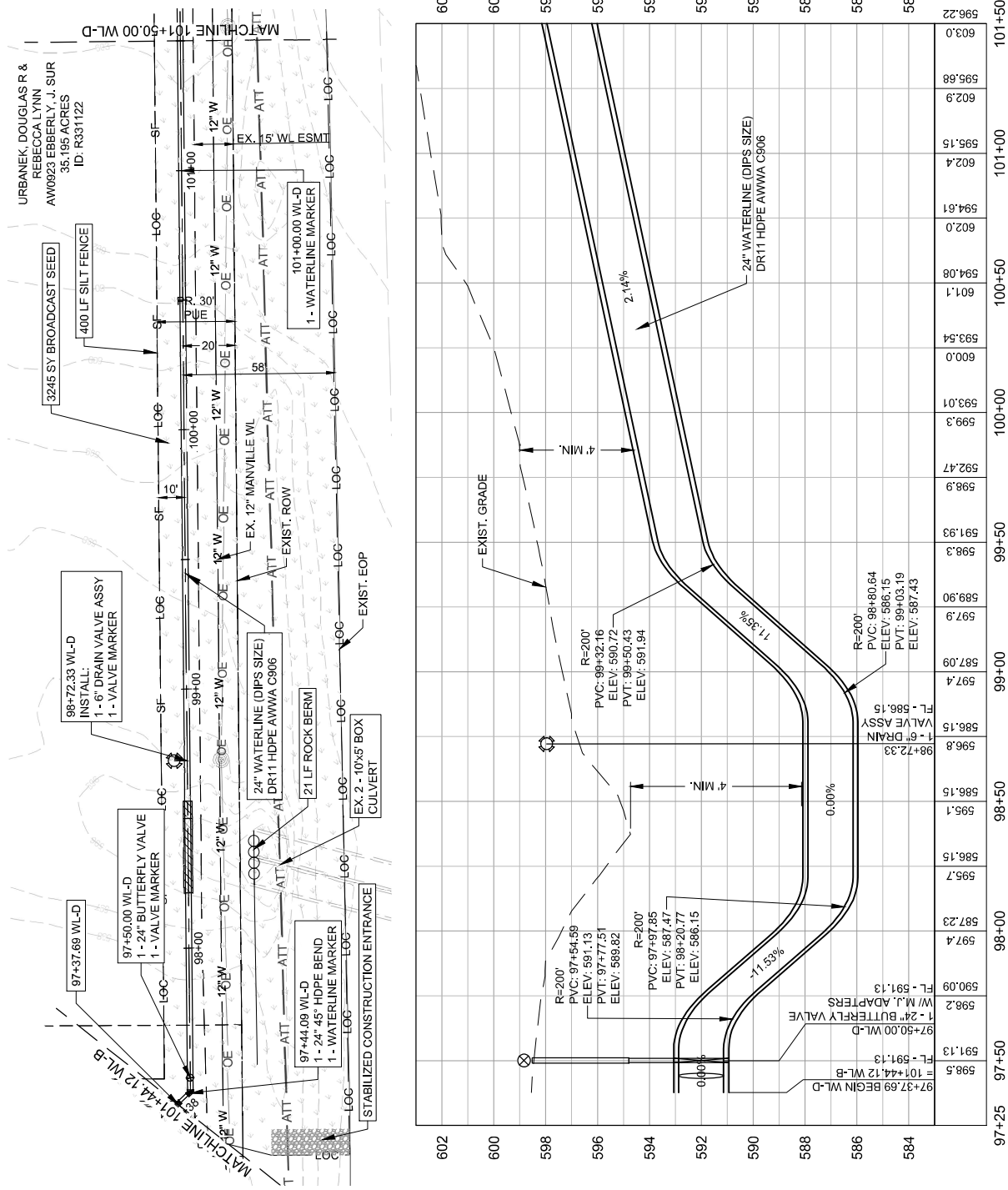
THESE DESIGN DOCUMENTS ARE NOT TO BE

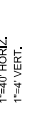
SHEET
C-327
31 of 66

Dwg Info: C:\CFA\2014\0308801-Williamson-County-2013-Road-Bond\MUN\39-CR404-Hutto\DESIGN\C-301-WATR-08.dwg - Tab: 27 - Plotted: 3/28/2022 4:09 PM By: KRISTEN VAN HOOISIER

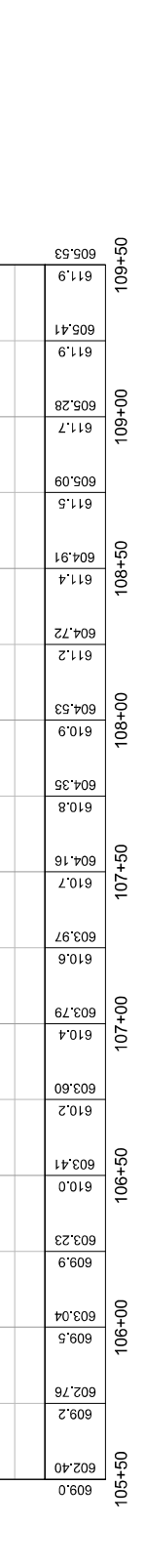


PROFILE SCALE
1"=40' HORIZ.
1"=4' VERT.

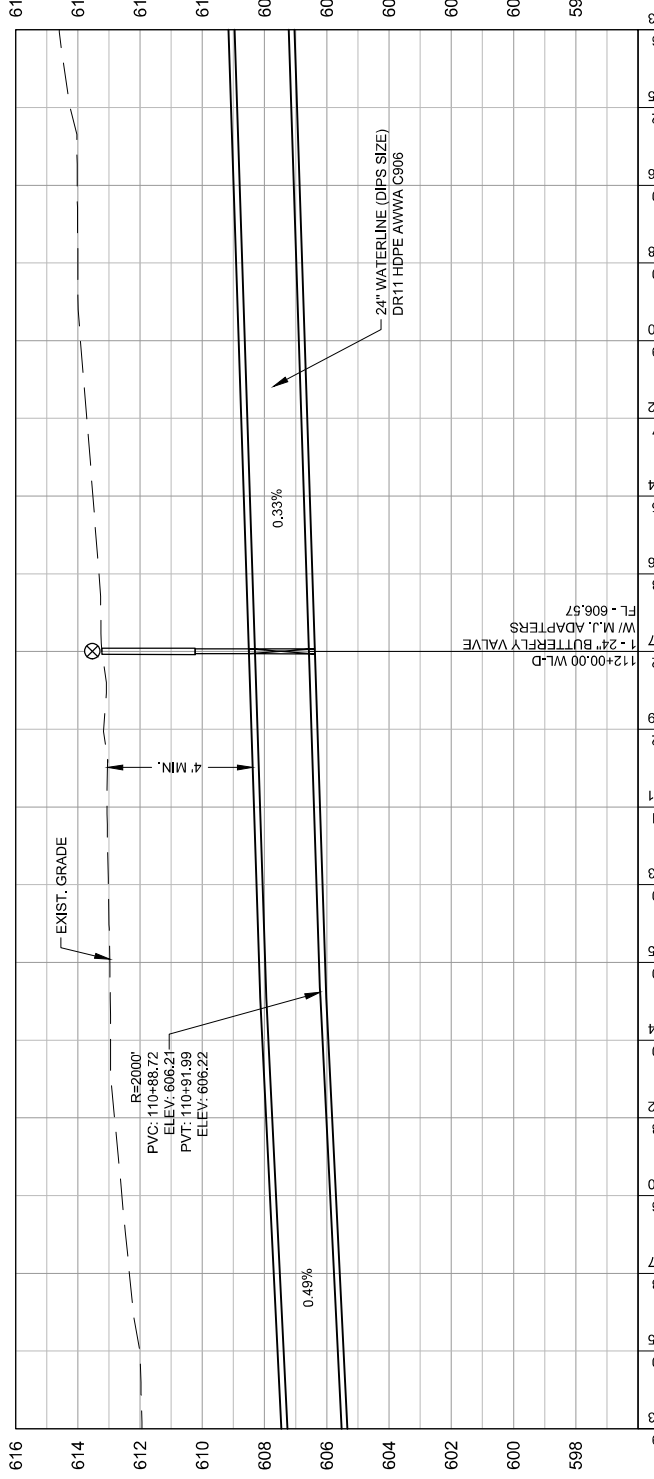




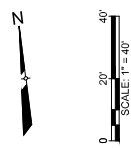
GENERAL NOTES	
1.	THE LOCATION OF ALL EXISTING CONTRACTOR UTILITIES ARE SHOWN ON THE DRAWING. ANY AND ALL UTILITIES BY THE FALL OF ANY AND ALL CONTRACTOR UTILITIES TO METHODS OF INSTALLATION.
2.	EXISTING 16" CONDUIT IS TO BE REMOVED AND REINSTALLED IN CONSTRUCTION MAIN IS PLANNED TO BE EXISTING WATER MAIN ARE TO BE REMOVED AND REINSTALLED IN CONSTRUCTION.
3.	EXISTING 16" CONDUIT IS TO BE REMOVED AND REINSTALLED IN CONSTRUCTION.
4.	EXISTING 16" CONDUIT IS TO BE REMOVED AND REINSTALLED IN CONSTRUCTION.
5.	EXISTING 16" CONDUIT IS TO BE REMOVED AND REINSTALLED IN CONSTRUCTION.
6.	EXISTING 16" CONDUIT IS TO BE REMOVED AND REINSTALLED IN CONSTRUCTION.
7.	EXISTING 16" CONDUIT IS TO BE REMOVED AND REINSTALLED IN CONSTRUCTION.
8.	EXISTING 16" CONDUIT IS TO BE REMOVED AND REINSTALLED IN CONSTRUCTION.
9.	EXISTING 16" CONDUIT IS TO BE REMOVED AND REINSTALLED IN CONSTRUCTION.



EXISTING	607.7
GRADE	
FLOW LINE	602.79
OF PIPE	



109+50	619.9	605.5	612.0	605.6	612.3	605.7	612.6	605.9	612.8	606.0	613.0	606.1	613.3	606.2	613.6	606.3	613.9	606.4	614.2	606.5	614.5	606.6	614.8	606.7	615.1	606.8	615.4	606.9	615.7	607.0	616.0	607.1	616.3	607.2	616.6	607.3	616.9	607.4	617.2	607.5	617.5	607.6	617.8	607.7	618.1	607.8	618.4	607.9	618.7	608.0	619.0
110+00	612.0	605.6	612.3	605.7	612.6	605.9	612.8	606.0	613.0	606.1	613.3	606.2	613.6	606.3	613.9	606.4	614.2	606.5	614.5	606.6	614.8	606.7	615.1	606.8	615.4	606.9	615.7	607.0	616.0	607.1	616.3	607.2	616.6	607.3	616.9	607.4	617.2	607.5	617.5	607.6	617.8	607.7	618.1	607.8	618.4	607.9	618.7	608.0	619.0		
110+50	612.0	605.6	612.3	605.7	612.6	605.9	612.8	606.0	613.0	606.1	613.3	606.2	613.6	606.3	613.9	606.4	614.2	606.5	614.5	606.6	614.8	606.7	615.1	606.8	615.4	606.9	615.7	607.0	616.0	607.1	616.3	607.2	616.6	607.3	616.9	607.4	617.2	607.5	617.5	607.6	617.8	607.7	618.1	607.8	618.4	607.9	618.7	608.0	619.0		
111+00	613.0	606.2	613.3	606.3	613.6	606.4	613.9	606.5	614.2	606.6	614.5	606.7	614.8	606.8	615.1	606.9	615.4	607.0	616.0	607.1	616.3	607.2	616.6	607.3	616.9	607.4	617.2	607.5	617.5	607.6	617.8	607.7	618.1	607.8	618.4	607.9	618.7	608.0	619.0	608.1	619.3	608.2	619.6	608.3	619.9	608.4	620.2	608.5	620.5		
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112+00	613.2	606.4	613.5	606.5	613.8	606.6	614.1	606.7	614.4	606.8	614.7	606.9	615.0	607.0	615.3	607.1	615.6	607.2	615.9	607.3	616.2	607.4	616.5	607.5	616.8	607.6	617.1	607.7	617.4	607.8	617.7	607.9	618.0	608.0	618.3	608.1	618.6	608.2	618.9	608.3	619.2	608.4	619.5	608.5	619.8	608.6	620.1				
112+50	613.2	606.4	613.5	606.5	613.8	606.6	614.1	606.7	614.4	606.8	614.7	606.9	615.0	607.0	615.3	607.1	615.6	607.2	615.9	607.3	616.2	607.4	616.5	607.5	616.8	607.6	617.1	607.7	617.4	607.8	617.7	607.9	618.0	608.0	618.3	608.1	618.6	608.2	618.9	608.3	619.2	608.4	619.5	608.5	619.8	608.6	620.1				
113+00	613.3	606.5	613.6	606.6	613.9	606.7	614.2	606.8	614.5	606.9	614.8	607.0	615.1	607.1	615.4	607.2	615.7	607.3	616.0	607.4	616.3	607.5	616.6	607.6	616.9	607.7	617.2	607.8	617.5	607.9	617.8	608.0	618.1	608.2	618.4	608.3	618.7	608.4	619.0	608.5	619.3	608.6	619.6	608.7	619.9	608.8	620.2	608.9	620.5		
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114+00	614.2	607.0	614.5	607.1	614.8	607.2	615.1	607.3	615.4	607.4	615.7	607.5	616.0	607.6	616.3	607.7	616.6	607.8	616.9	607.9	617.2	608.0	617.5	608.1	617.8	608.2	618.1	608.3	618.4	608.4	618.7	608.5	619.0	608.6	619.3	608.7	619.6	608.8	619.9	608.9	620.2	609.0	620.5	609.1	620.8	609.2	621.1				

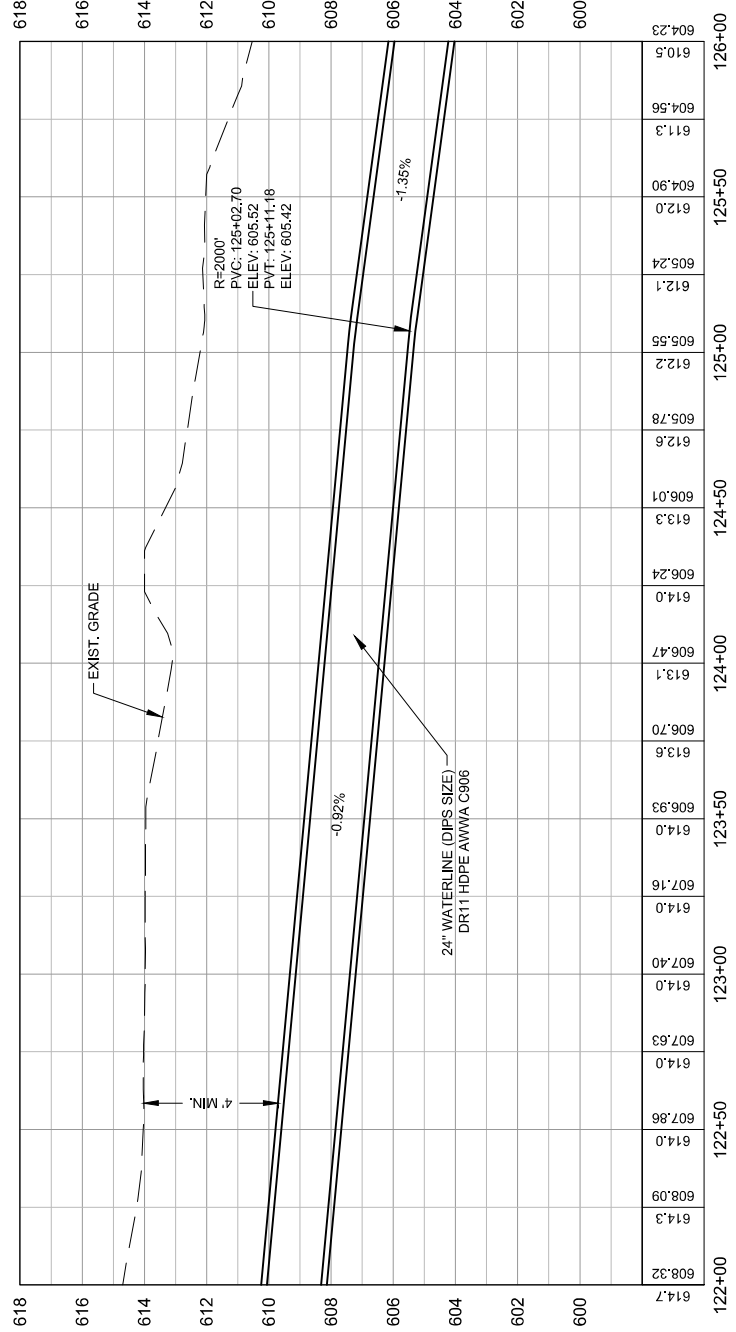
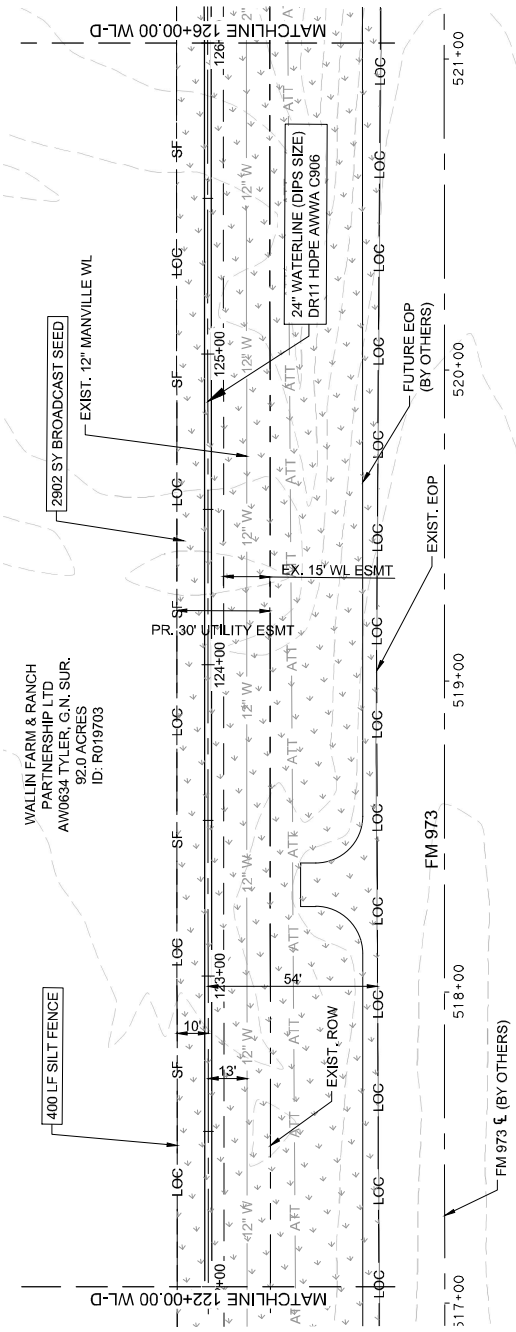
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WATER LINE D PLAN AND PROFILE
109+50 TO 114+00
CR 404 HUITTO 24" WATER LINE



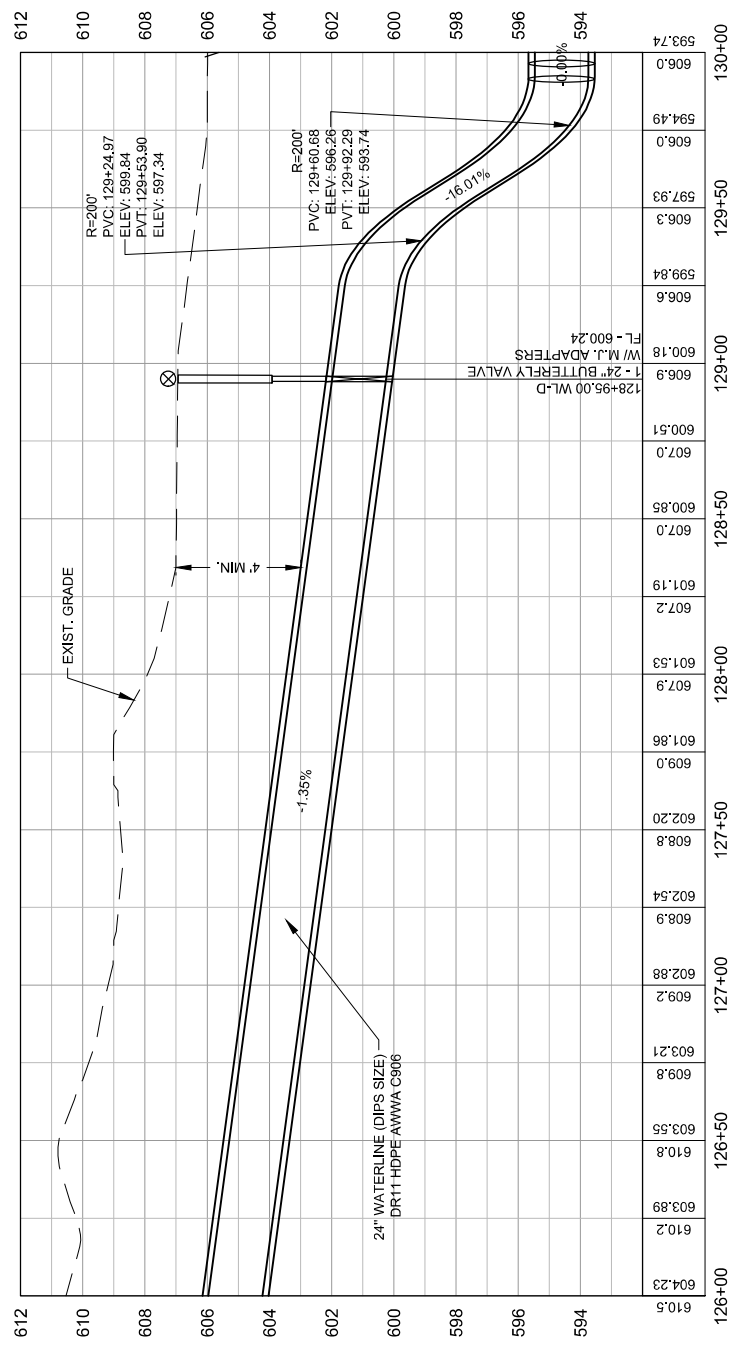
SHEET
C-332
36 of 66

EXISTING GRADE	607.7
FLOW LINE OF PIPE	602.79

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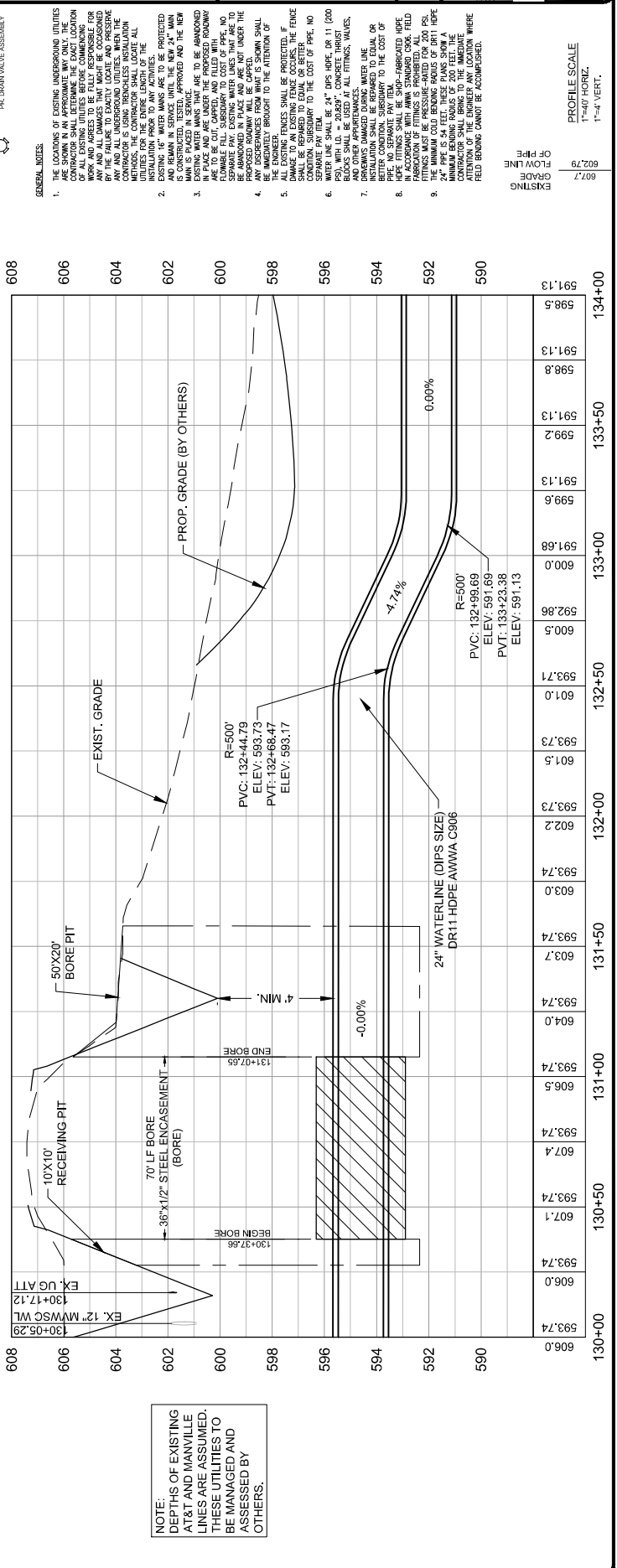
EXISTING	607.7
GRADE	
FLOW LINE	602.79
OF PIPE	

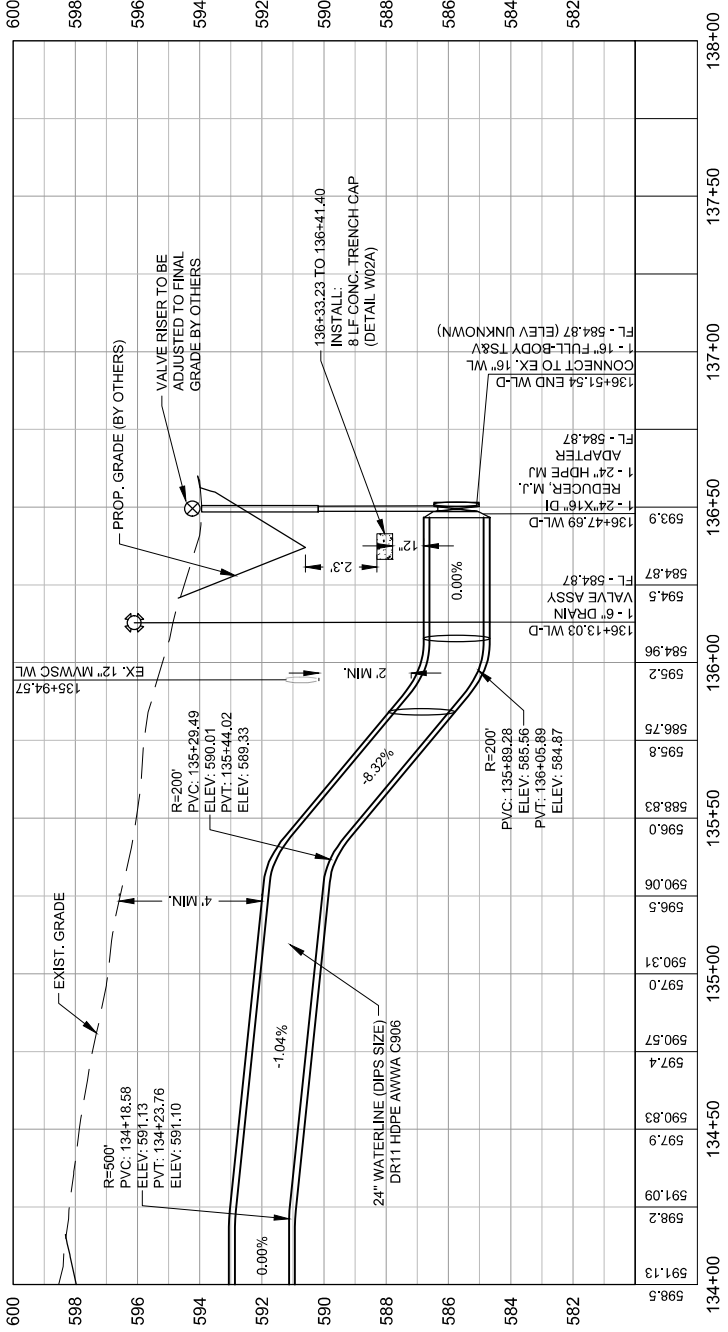
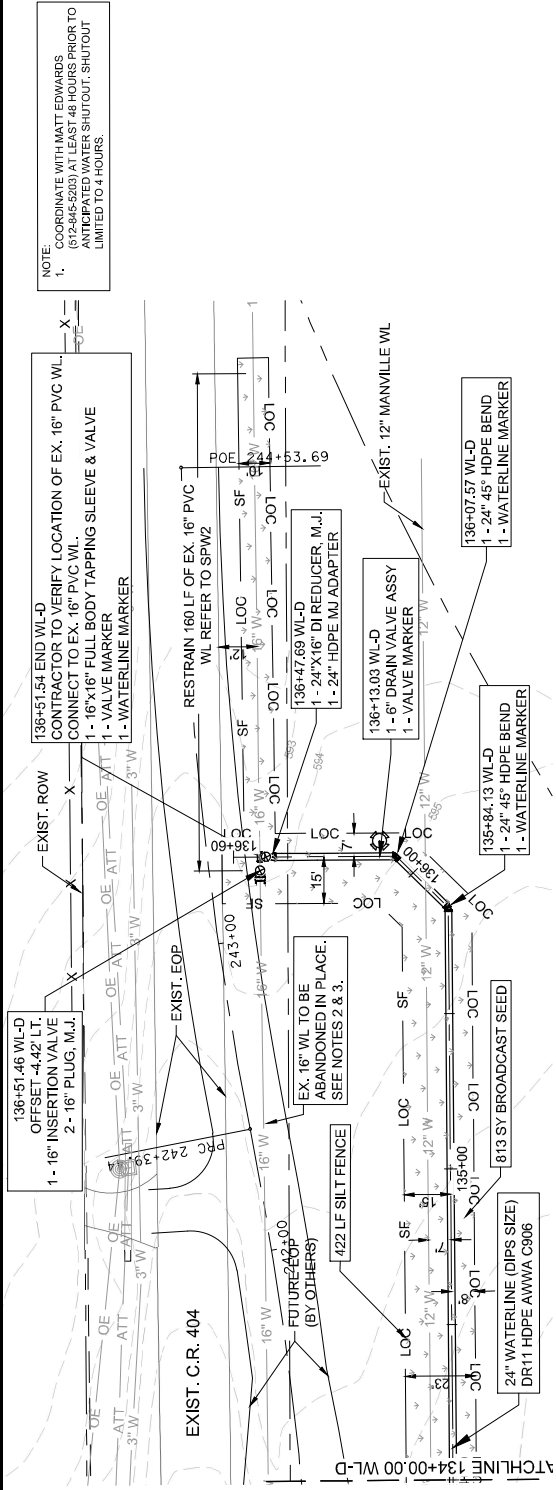
NOTE:
CONTRACTOR SHALL
PROVIDE ACCESS TO
PRIVATE PROPERTIES
DURING CONSTRUCTION
AND RESTORE TO EQUAL
OR BETTER CONDITIONS
(AS APPLICABLE)

[illegible]

EXISTING	607.7
GRADE	
FLOW LINE	602.79
OF PIPE	

PROFILE SCALE
1"=40' HORIZ.
1"=4' VERT.





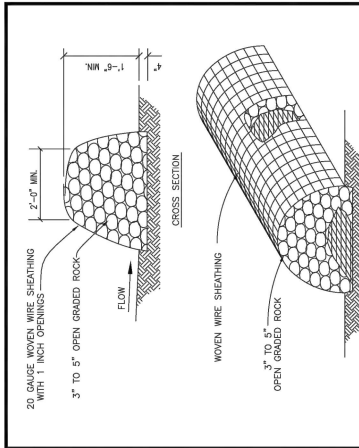
TEMPORARY EROSION AND SEDIMENTATION CONTROLS

TYPE OF STRUCTURE	TYPE OF STRUCTURE	TYPE OF STRUCTURE	TYPE OF STRUCTURE
SILT FENCE	N/A 200 FEET 200 FEET 100 FEET	2 ACRES 2 ACRES 1/2 ACRE 1/2 ACRE	0 - 10% 10% 20% - 30% > 30%
TRIANGLE FILTER DIKE	100 FEET 50 FEET	1/2 ACRE 1/4 ACRE	< 30% > 30%
ROCK BERM **	500 FEET	< 5 ACRES	0 - 10%

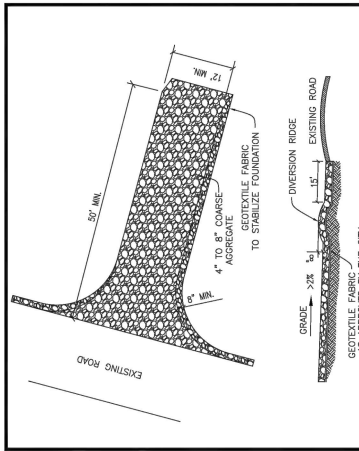
** FOR ROCK BERM, SPECIFIC PARAMETERS ARE OTHER THAN STONE DRAINAGE

HIGH SERVICE ROCK BERMS MAY BE REQUIRED IN AREAS OF ENVIRONMENTAL SIGNIFICANCE AS DETERMINED BY THE CITY OF HUTTO.

	CITY OF HUTTO CONSTRUCTION STANDARDS AND DETAILS TEMPORARY EROSION AND SEDIMENTATION CONTROL ENGINEERING & PUBLIC WORKS		DRAWING NO. EROSI
			UPDATED: 06/01/2018
			DRAWN BY: HBI
			SCALE: NTS
		DESIGNED BY: EROSI	
		CHECKED BY: EROSI	
		DATE: 06/01/2018	
		PROJECT NAME: EROSI.DWG	

[illegible]

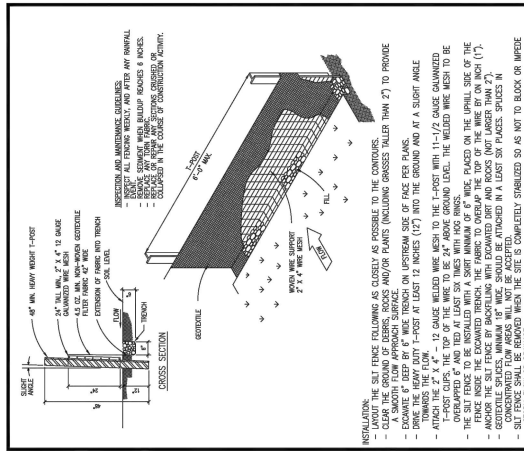
	CITY OF HUTTO CONSTRUCTION STANDARDS AND DETAILS		DRAWING NO. ESO001
	ROCK		UPDATED: 02/01/2019
	BERM		DRAWN BY: BB
	ENGINEERING & PAVING WORKS		SCALE: N.T.S.
	PROJECT NAME: ESO001.DWG		DATE: 02/01/2019



INSTALLATION:

- AREA OF STUDY: ROADS OR PLANTS THAT WILL INTERFERE WITH INSTALLATION
- GRADE THE AREA FOR THE ENTRANCE TO ALLOW RAIN TO THE CONSTRUCTION SITE, RUNOFF FROM THE STABILIZED
- PLACE SODICORABLE FABRIC AS APPROVED BY THE CITY.
- PLACE ROCK AS APPROVED BY THE CITY.
- THE ENTRANCE SHOULD BE MARKED IN A LOCATION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO
- REPAIR AND/OR CLEANUP OF ANY MEASURES USED TO STOP SEDIMENT
- ALL OTHERS (GRAVEL, SPILLED, MOVED OR TRACKED ON) MUST BE REMOVED IMMEDIATELY
- WHEN NECESSARY, WHEELS SHOULD BE CLEANED TO REMOVE SEDIMENT FROM ENTRANCE AND ROAD RIGHT-OF-WAY.
- WHEN NECESSARY, WHEELS SHOULD BE CLEANED TO REMOVE SEDIMENT FROM ENTRANCE AND ROAD RIGHT-OF-WAY.
- APPROVED SEDIMENT FROM THE SEDIMENT

	CITY OF HUTTO CONSTRUCTION STANDARDS AND DETAILS		DRAWING NO. E5006
	STABILIZED		UPDATED: 02/01/2019
	CONSTRUCTION ENTRANCE ENGINEERING & PUBLIC WORKS		DRAWN BY: BB
	SCALE: N.T.S.		DATE: 02/01/2019
	FILE NAME: E5006.DWG		DATE: 02/01/2019



	CITY OF HUTTO CONSTRUCTION STANDARDS AND DETAILS				DRAWING NO. K2000
	SILT FENCE ENGINEERING & PUBLIC WORKS				UPDATED: 06/01/2019 DRAWN BY: HB SCALE: N.T.S. FILE NAME: 180202.DWG

	CITY OF HUTTO CONSTRUCTION STANDARDS AND DETAILS SILT FENCE ENGINEERING & PUBLIC WORKS		DRAWING NO. K2002
	UPDATED: 06/01/2018	DRAWN BY: HBI	SCALE: N.T.S. FILE NAME: IS2002.DWG

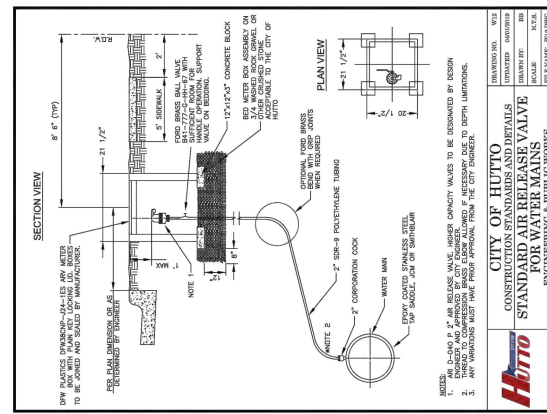
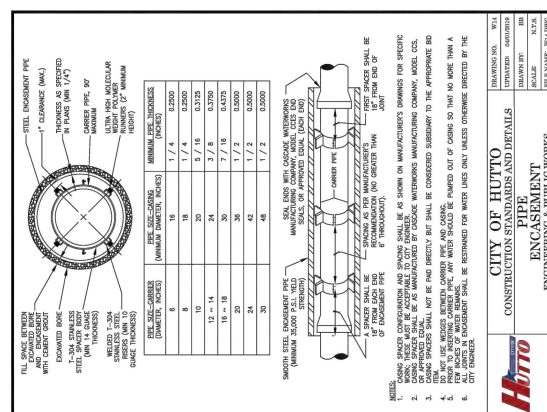
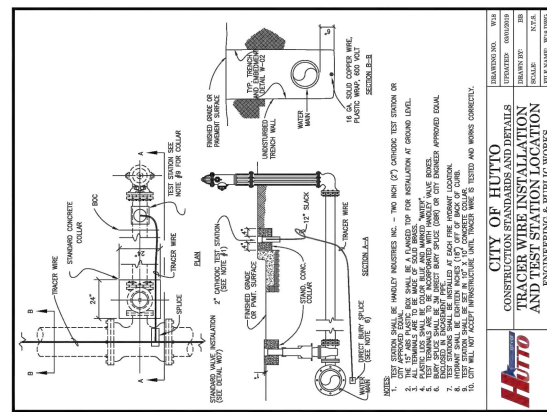
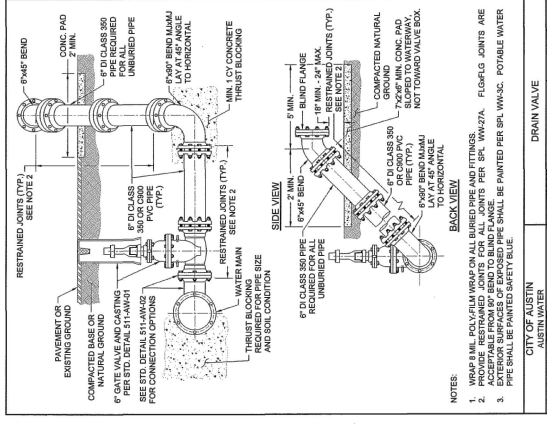
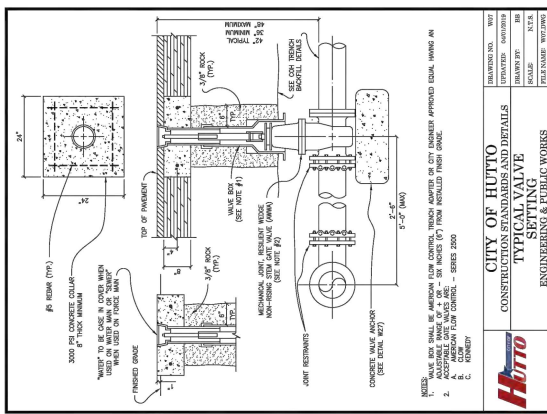
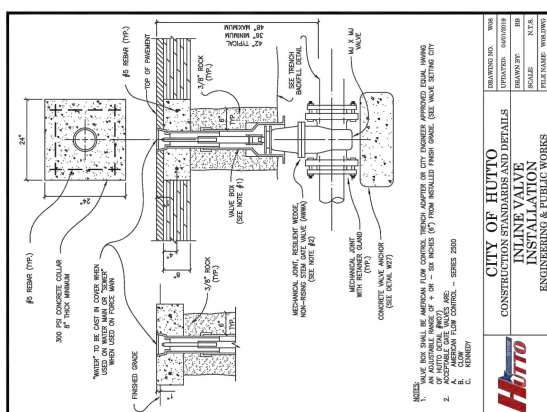
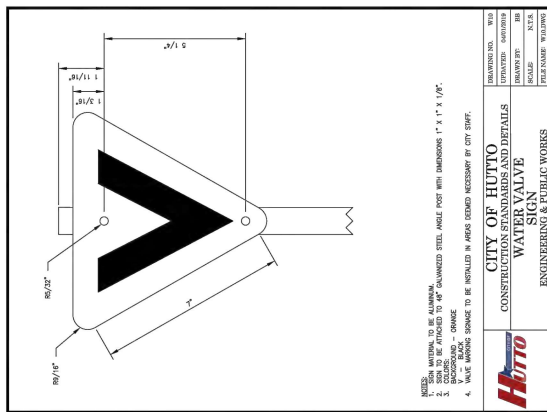
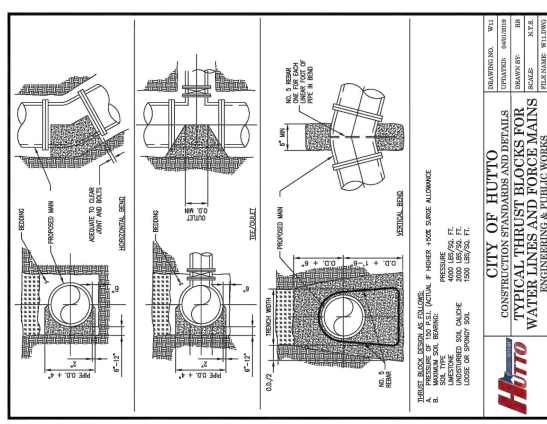
REV	NO.	REVISION DESCRIPTION	APPROVED	DATE

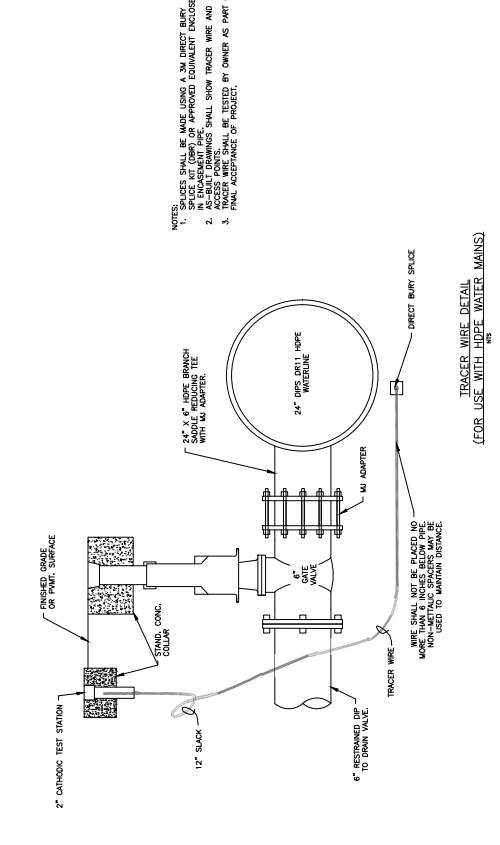
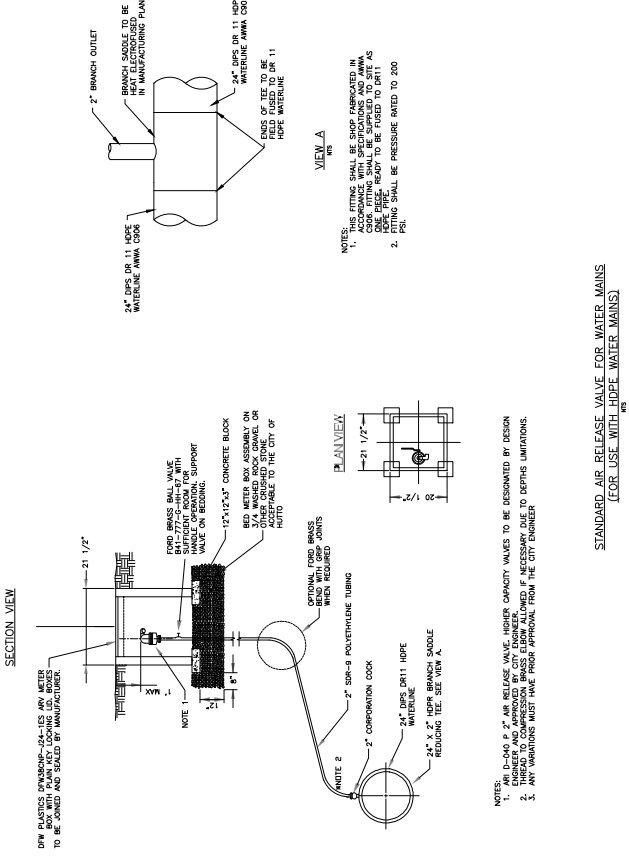
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 AUSTIN, TEXAS 78702
 512.358.9998 | FAX 512.358.7722
 WWW.COBBERNDLEY.COM

CR 404 HUTTO 24" WATER LINE
 TAYLOR, TEXAS
 SHEET 1 OF 2
 STANDARD WATER DETAILS -



SHEET
 C-501
 44 of 66





BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

1. The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction, pavement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.
3. The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.
4. The Contractor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move or change the approximate location of any device without the approval of the Engineer.
5. Geometric design of lane shifts and detours should, when possible, meet the applicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials' (AASHTO), "A Policy on Geometric Design of Highways and Streets," the TxDOT "Roadway Design Manual" or engineering judgment.
6. When projects abut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the adjacent project is completed first, the Contractor shall erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.
7. The Engineer may require duplicate warning signs on the median side of divided highways where median width will permit and traffic volumes justify the signing.
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.
9. The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.
10. Where highway construction or maintenance work is being undertaken, other than mobile operations as defined by the Texas Manual on Uniform Traffic Control Devices, CSJ limit signs are required. CSJ limit signs are shown on BC(12). The OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits. For mobile operations, CSJ limit signs are not required.
11. Traffic control devices should be in place only while work is actually in progress or a definite need exists.
12. The Engineer has the final decision on the location of all traffic control devices.
13. Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

2. The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.

3. The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.

4. The Contractor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move or change the approximate location of any device without the approval of the Engineer.

5. Geometric design of lane shifts and detours should, when possible, meet the applicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials (AASHTO), "A Policy on Geometric Design of Highways and Streets," the "iXDOT "Roadway Design Manual" or engineering judgment.

6. When projects abut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the adjacent project is completed first, the Contractor shall erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.

7. The Engineer may require duplicate warning signs on the median side of divided highways where median width will permit and traffic volumes justify the signing.

8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.

9. The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.

10. Where highway construction or maintenance work is being undertaken, other than mobile operations defined by the Texas Manual on Uniform Traffic Control Devices (TMUTCD), the following CSJ limit signs shall be used:

- a. The BEGIN ROAD WORK NEXT X MILES sign shall be erected in advance of the CSJ limits.
- b. The BEGIN ROAD WORK NEXT X MILLS sign shall be erected at or near the CSJ limits.
- c. The CONTRACTOR AND END ROAD WORK signs shall be erected at or near the CSJ limits.

For mobile operations, CSJ limit signs are not required.

11. Traffic control devices should be in place only while work is actually in progress or a definite need exists.

12. The Engineer has the final decision on the location of all traffic control devices.

13. Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

WORKER SAFETY NOTES:

- Workers on foot who are exposed to traffic or to construction equipment within the right-of-way shall wear high-visibility safety apparel meeting the requirements of ISFA "American National Standard for High-Visibility Apparel," or equivalent revisions, and labeled as ANSI 107-2004 standard performance for Class 2 or 3 risk exposure. Class 3 garments should be considered for high traffic volume work areas or night time work.
 - Except in emergency situations, flagger stations shall be illuminated when flagging is used at night.
-
- COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES**
- Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources.
 - Work zone traffic control devices shall be compliant with the Manual for Assessing safety hardware (MASH).

2. Except in emergency situations, flagger stations shall be illuminated when flagging is used at night.

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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2. Work zone traffic control devices shall be compliant with the Manual for Assessing safety Hardware (MASH).

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THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT http://www.txdot.gov
COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
MATERIAL PRODUCER LIST (MPL)
ROADWAY DESIGN MANUAL - SEE "MANUALS (ON-LINE MANUALS) "
STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)
TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TWMUCD)
TRAFFIC ENGINEERING STANDARD SHEETS

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TRAFFIC ENGINEERING STANDARD SHEETS



BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

[illegible]

[illegible]

1. The typical minimum signing on a crossroad approach should be a "ROAD WORK AHEAD" (W20-1) sign and a "W20-2" End Road sign, unless the approach is a "T" intersection. The "W20-2" sign mounted back to back with the "W20-1" sign should be placed 100 feet from the intersection. The "W20-1" sign should be placed with the reduced size, 3' x 18", "END ROAD WORK (W20-2)" sign on low volume crossroads (see table 4 under "Typical Construction Warning Sign Size and Spacing"). Use the "Standard Highway Sign Designs for Texas" manual for sign details. The Engineer may omit the advance roadway sign on low volume crossroads. The Engineer will determine whether a road is low volume as per MUTCD Part 5. This information shall be shown in the plans.
2. Based on existing field conditions, the Engineer/Inspector may require additional signs such as FLAGGERS AHEAD, LOOSE DEBRIS, or other appropriate signs. When additional signs are required, these signs will be considered part of the minimum requirements. The Engineer/Inspector will determine the proper location and spacing of any sign not shown on the BC sheets, Traffic Control Plan sheets or the Work Zone Standard sheets.
3. The minimum sight distance for the intersection shall be determined from the intersection. The Engineer will determine whether a roadway is considered high volume.
4. The minimum sight distance for the intersection shall be determined from the intersection. The Engineer will determine whether a roadway is considered high volume.
5. Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
6. When work occurs in the intersection area, appropriate traffic control devices, as shown elsewhere in the plans or as determined by the Engineer/Inspector, shall be in place.

[illegible]

1. The Engineer will determine the types and location of any additional traffic control devices, such as a flagger and accompanying signs, or other signs, that should be used when work is being performed at or near an intersection.

2. If construction closes the road at a T-Intersection, the Contractor shall place the "CONTRACTOR NAME" (G20-61) sign behind the Type 3 Barricades for the road closure (see BC(10) also). The "ROAD WORK NEXT X MILES" left arrow (G20-1bTL) and "ROAD WORK NEXT X MILES" right arrow (G20-1bTR) signs shall be replaced by the better signing called for in the plans.

NOTES

When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional ROAD WORK AHEAD (CR20-10) signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TSP sheets for exact location and spacing of signs and

The diagram illustrates a proposed traffic control system for a road construction zone. It shows a sequence of signs and markers along a road, divided into a 'BEFORE' section and an 'AFTER' section. The 'BEFORE' section includes a 'ROAD CLOSED' sign (R11-2) with a red arrow pointing right, a 'Type 3 or Barrier or Barricade or Traffic Controlling Devices' label, a 'CH-4L' sign, a 'ROAD AHEAD' diamond sign, a 'ROAD WORK 1/2 MILE' diamond sign, a 'CH-1P' sign, a 'CH-16' sign, a 'SPEED LIMIT' sign (R2-1) with a red 'X', a 'TAFIC FINES DOUBLE' sign, a 'STAY ALERT' sign, and a 'G20-10T' sign. The 'AFTER' section includes a 'SPEED LIMIT' sign (R2-1) with a red 'X', a 'TAFIC FINES DOUBLE' sign, a 'STAY ALERT' sign, and a 'G20-10T' sign. The road ends with a 'WORK SPACE' area and a 'Channelizing Devices' section. The diagram is labeled 'Figure 1. Proposed Traffic Control System'.

When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD" (W20-1D) signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing of signs and

The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and "BEGIN ROAD WORK NEXT X MILES" (G20-5T) sign for each specific project. This distance shall replace the "x" and shall be rounded to the nearest whole mile with the approval of the Engineer. No decimals shall be used.

- The "BEGIN WORK ZONE" (CW20-9TP) and "END WORK ZONE" (CW20-20T) shall be used as shown on the sample layout when advance warning signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a part of the work zone lying outside the CSJ Limits where traffic fines may double if workers are present.
- *** CSJ limit stoning is required for highway construction and maintenance work, with the exception of mobile operations.
- ◇ Area for placement of "ROAD AHEAD" (CW20-1DI) sign and other signs or devices as called for on the Traffic Control Plan.
- ◇◇ Contractor will install a regulatory speed limit sign at the end of the work zone.

SPACING	Posted Speed	Sign Δ Spacing X
	MPH	Feet (Approx.)
	30	120
	35	160
	40	240
	45	320
	50	400
	55	500
	60	600
	65	700
	70	800
	75	900
	80	1000
	*	*

1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.

—	Type 3 Barricade
o o o	Channelizing Devices
+	Sign
x	See Typical Construction Warning Sign Size and Spacing chart or the MUTCD for sign spacing requirements.

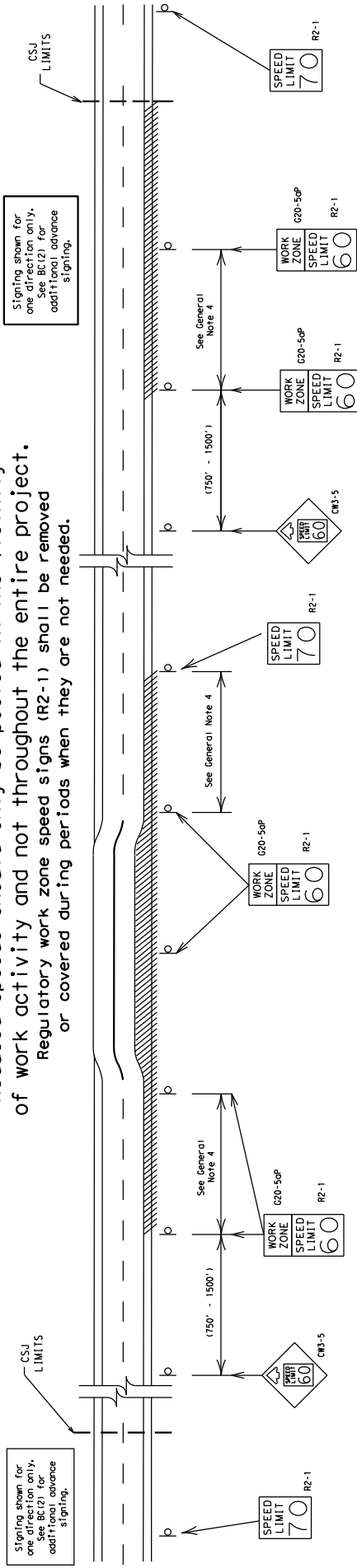

Texas Department of Transportation
 Traffic Safety Division Standard

BC(2) - 21

FILE#	bc-21.dgm	DWG	TxDOT	C&T TxDOT	C&T TxDOT
© TxDOT	November 2002	CONF	SECT	JOB	HIGHWAY
REVISIONS					
9-07	8-14				SHEET NO.
7-13	5-21	DIST		COUNTY	

Work zone speed limits shall be regulatory, established in accordance with the "Procedures for Establishing Speed Zones," and approved by the Texas Transportation Commission, or by City Ordinance when within Incorporated City Limits.

signing shown for
direction only.
See BC(2) for
additional advance
signing.



LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

Long/intermediate Term Work Zone Speed Limit signs, when approved as described above, should be posted and visible to the motorist when work activity is present. Work activity may also be defined as a change in the roadway that requires a reduced speed for motorists to safely negotiate the work area, including:

- a) rough road or damaged pavement surface
- b) substantial alteration of roadway geometrics (diversions)
- c) construction detours
- d) grade
- e) width
- f) other conditions readily apparent to the driver

As long as any of these conditions exist, the work zone speed limit signs should remain in place.

This type of work zone speed limit may be included on the design of the traffic control plans when workers or equipment are not behind concrete barrier, when work activity is within 10 feet of the traveled way or actually in the traveled way.

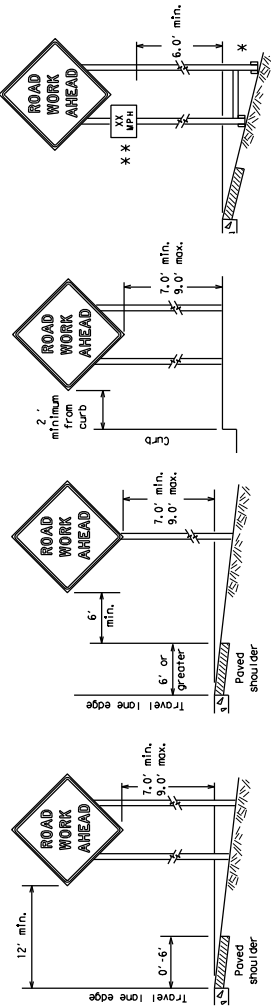
Short Term Work Zone Speed Limit signs should be posted and visible to the motorists only when work activity is present. When work activity is not present, signs shall be removed or covered.
(See Removing or Covering on BC(4)).

1. Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
2. Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
3. Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
4. Frequency of work zone speed limit signs should be:

40 mph and greater	0.2 to 2 miles
35 mph and less	0.2 to 1 mile
5. Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(41)).
6. Fabrication, erection and maintenance of the "ADVANCE SPEED LIMIT" (W3-5) sign, "WORK ZONE" (W20-30P) plaque and the "SPEED LIMIT" (R2-1) signs shall not be paid for directly, but shall be considered subsidiary to Item 502.
7. Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
8. Techniques that may help reduce traffic speeds include but are not limited to:
 - A. Low enforcement.
 - B. Flagger stationed next to sign.
 - C. Portable changeable message sign (PCMS).
 - D. Low power (dome) radar transmitter.
 - E. Speed monitor trailers or signs.
9. Speeds shown on details above are for illustration only.
10. Work Zone Speed Limits should only be posted as approved for each project.

For more specific guidance concerning the type of work, work zone conditions and factors impacting allowable regulatory construction speed zone reduction see 'X00T' form #1204 in the 'X00T e-form system.

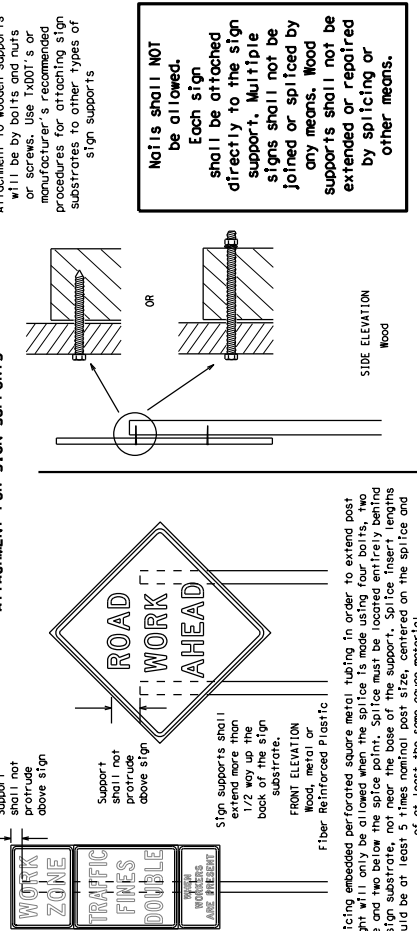
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



* When placing sign supports on uneven ground, the sign post lengths must be adjusted so the sign appears straight and plumb. Objects shall not be placed under signs as a means of leveling.

** When plaques are placed on dual-leg supports, they should be attached to the upright nearest the travel lane. Supplemental plaques (advisory or distance) should not cover the surface of the parent sign.

ATTACHMENT FOR SIGN SUPPORTS



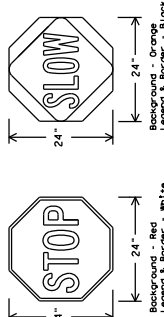
Splicing embedded perforated square metal tubing in order to extend post height will only be allowed when the splice is made using four bolts, two above and two below the splice post. The splice must be made using a splice post that is at least 5 times nominal post size, centered on the splice and made of at least the same gauge material.

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

- Permanent signs are to give notice of traffic laws or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, services, points of interest, and other information. Permanent signs shall be installed in accordance with the Texas Department of Transportation's (TxDOT) Standard Specifications for Highway Construction, Section 603, or other applicable standards. If no better route guidance is normally installed on a roadway without construction.
- When permanent regulatory or warning signs conflict with work zone conditions, remove or cover the permanent signs until the permanent sign message matches the roadway condition. For details for covering large guide signs see the TSD standard.
- When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
- If existing signs are to be relocated on their original supports, they shall be relocated in the same location and orientation. If existing signs are to be relocated on new supports, they shall meet the required mounting heights shown on the BC Sheets or the SM Standards. This work should be paid for under the appropriate pay item for relocating existing signs.
- If permanent signs are to be removed and relocated using temporary supports, the Contractor shall use crashworthy supports as shown on the BC standard sheets, LR standard sheets or the CAZTCD list. The signs shall meet the required mounting heights shown on the BC, or the SM standard sheets during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
- Any sign or traffic control device that is struck or damaged by the Contractor or his/her construction equipment shall be replaced as soon as possible by the Contractor to ensure proper guidance for the motorists. This will be subsidiary to item 502.

STOP/SLOW PADDLES

- STOP/SLOW paddles are the primary method to control traffic during construction.
- STOP/SLOW paddles shall be retroreflective when used at night.
- STOP/SLOW paddles may be attached to a staff with a minimum length of 6' to the bottom of the sign.
- Any lights incorporated into the STOP or SLOW paddle faces shall only be as specifically described in Section 6E.03.



SHEETING REQUIREMENTS (WHEN USED AT NIGHT)			
USAGE	COLOR	SIGN FACE MATERIAL	
BACKGROUND	RED	TYPE B OR C SHEETING	
BACKGROUND	ORANGE	TYPE B ₁ OR C ₁ SHEETING	
LEGEND & BORDER	WHITE	TYPE B OR C SHEETING	
LEGEND & BORDER	BLACK	ACRYLIC NON-REFLECTIVE FILM	

GENERAL NOTES FOR WORK ZONE SIGNS

- Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
- Wooden sign posts shall be painted white.
- Sign supports shall be attached to the sign post using bolts and nuts or screws.
- All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to regulate, warn, and guide the traveling public safely through the work zone.
- The Contractor may require the Contractor to furnish other work zone signs that are shown in the MUTCD but may have been omitted from the plans. Any such signs shall be installed in accordance with the plans and shall be maintained in accordance with the plans. The Contractor shall include documenting the changes in the Engineer's TxDOT diary and having both the Inspector and Contractor Initial and date the agreed upon changes.
- The Contractor shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (CAZTCD) for small roadside signs. Supports for temporary large roadside signs shall meet the requirements detailed on the Temporary Large Roadside Signs (TLRS) standard sheets. The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question as to the proper installation of the sign support, the Contractor shall consult with the Engineer. A copy of the manufacturer's installation recommendations shall be provided to the Engineer.
- The Contractor is responsible for installing signs on approved supports and replacing signs with damaged or cracked substrates and/or damaged or marred reflective sheeting as directed by the Engineer/Inspector.
- Identification markings may be shown only on the back of the sign substrate.
- The Contractor shall replace damaged wood posts. New or damaged wood sign posts shall not be spliced.

DURATION OF WORK TO BE DEFINED BY THE "Texas Manual on Uniform Traffic Control Devices" Part 6J

- The types of signs that shall be used to regulate traffic shall be based on the type of work and the duration of the work. The duration of the work shall be defined by the "Texas Manual on Uniform Traffic Control Devices" Part 6J. The Contractor is responsible for ensuring the appropriate size sign for the type of work being performed. The Contractor is responsible for ensuring the appropriate size sign for the type of work being performed. The Contractor is responsible for ensuring the appropriate size sign for the type of work being performed.
- Long-term stationary - work that occupies a location more than one day/night period up to 3 days.
- Intermediate-term stationary - work that occupies a location more than one day/night period up to 3 days, or nighttime work lasting more than 1 hour.
- Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
- Mobile - work that moves continuously or intermittently stopping for up to approximately 15 minutes.

SIGN MOUNTING HEIGHT

- The bottom of long-term/intermediate-term signs shall be at least 7 feet, but not more than 9 feet, above the paved surface, except as shown for supplemental plaques mounted below other signs.
- Signs for Short-term/Short duration signs shall be a minimum of 1 foot above the pavement surface but no more than 2 feet above the ground.
- Long-term/intermediate-term signs may be used in lieu of Short-term/Short duration signing.
- Long-term/intermediate-term signs shall be installed in accordance with the plans and shall be removed at the end of the workday or rolled to the appropriate long-term/intermediate sign height.
- Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

SIZE OF SIGNS

- The Contractor shall furnish the sign sizes shown on BC (2) unless otherwise shown in the plans or as directed by the Engineer.

SIGN SUBSTRATES

- The Contractor shall ensure the sign substrate is installed in accordance with the manufacturer's recommendations for the type of sign support that is being used. The CAZTCD lists each substrate that can be used on the different types and models of sign supports.
- "Mesh" type materials are NOT an approved sign substrate, regardless of the tightness of the weave.
- All wooden materials are NOT approved sign substrates, regardless of the tightness of the weave.

REFLECTIVE SHEETING

- All signs shall be retroreflective and constructed of sheeting meeting the color and retro-reflectivity requirements of DMS-8300 for rigid signs or DMS-8310 for roll-up signs. The web address for DMS specifications is shown on BC(1).
- White sheeting, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.
- Orange sheeting, meeting the requirements of DMS-8300 Type B₁ or Type C₁, shall be used for rigid signs with orange backgrounds.

SIGN LETTERS

- All sign letters and numbers shall be clear, and open rounded type uppercase alphabet letters as approved by the Federal Highway Administration. Letters shall be at least 1/2 inch high and shall be spaced at least 1/4 inch apart.
- Signs and anchor studs shall be removed and holes backfilled upon completion of work.

REMOVING OR COVERING

- When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
- Long-term stationary or intermediate stationary signs installed on square metal tubing may be turned away from traffic 30 degrees when the sign message is not applicable. This technique may not be used for signs installed in the median of divided highways or near any intersections where the sign may be seen from approaching traffic.

SIGN SUPPORT WEIGHTS

- Where sign supports require the use of weights to keep from turning over, the use of sandbags or other weights shall be used. The sandbags or other weights shall be used to keep the sign from spilling and to maintain a constant weight.
- Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as fire inner tubes) shall NOT be used.
- Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as fire inner tubes) shall NOT be used.
- Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as fire inner tubes) shall NOT be used.
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PLACEMENT OF SIGNS

- Flags may be used to draw attention to warning signs. When used, the flag shall be 16 inches square or larger and shall be orange or fluorescent red-orange in color. Flags shall not be allowed to cover any portion of the sign face.

Texas Department of Transportation

TRAFFIC SAFETY DIVISION

STANDARD

BARRICADE AND CONSTRUCTION

TEMPORARY SIGN NOTES

BC (4) - 21

FILE: BC-21.dgn DW: TxDOT CM: TxDOT JOB: HIGHWAY

REVISIONS: 9-07 8-14 7-13 5-21

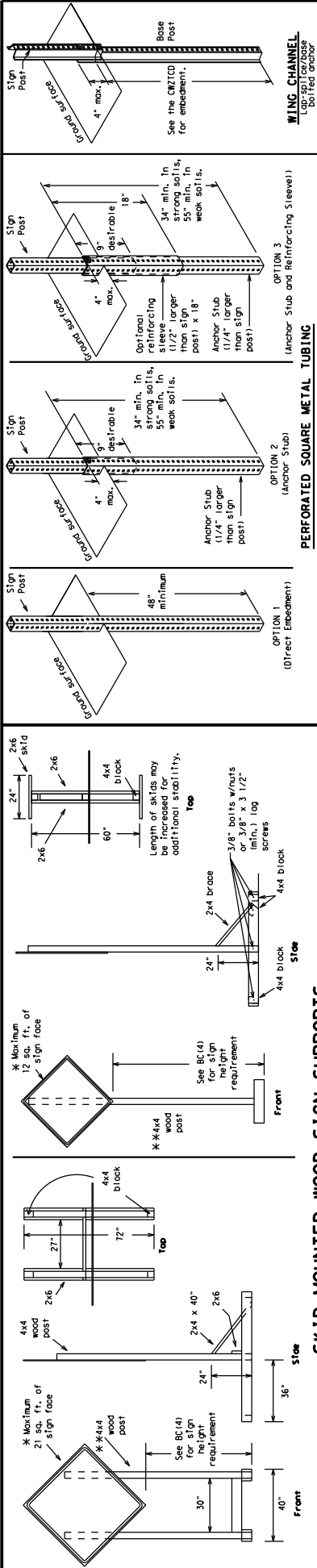
SHEET NO. 50 OF 66

DISCLAIMER: This standard is governed by the Texas Engineering Practice Act. No warranty or any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:

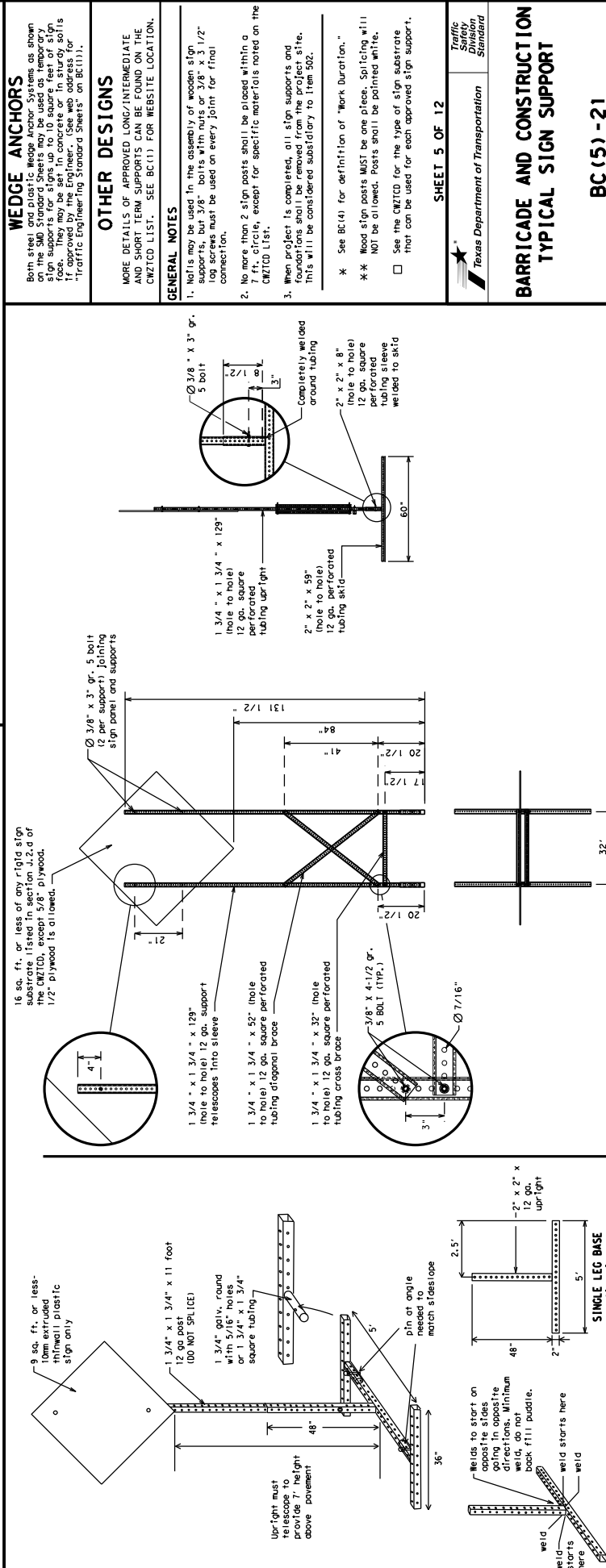
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever, including liability for conversion.

DATE: FILE: 9/27/2007 8:14 7-13 5-21



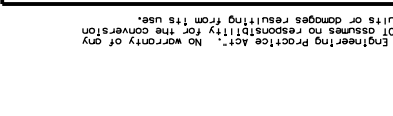
SKID MOUNTED WOOD SIGN SUPPORTS

* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS



SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS



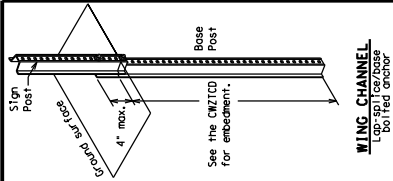
SKID MOUNTED WOOD SIGN SUPPORTS

* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS



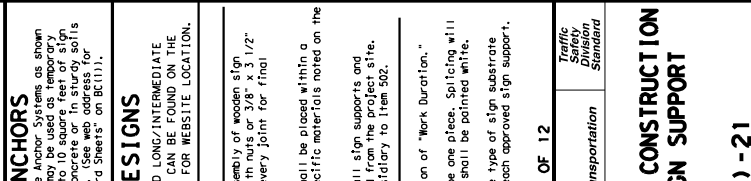
SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS



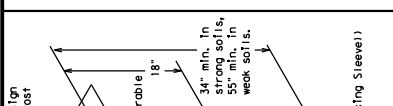
WING CHANNEL

Long-span/long-base bolted anchor



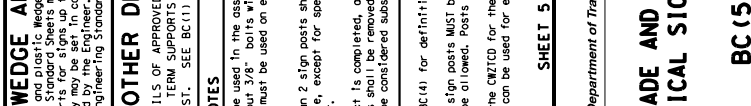
PERFORATED SQUARE METAL TUBING

(Anchor Stub and Reinforcing Sleeve)



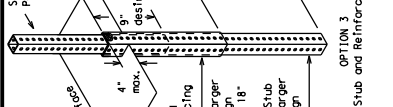
WEDGE ANCHORS

Both steel and concrete wedge anchors are shown on the SMO Standard. Wedge anchors may be used for sign supports for signs up to 10 square feet of sign face. They may be set in concrete or in sturdy soils approved by the Engineer. See web address for Traffic Engineering Standard Sheets on BC(11).

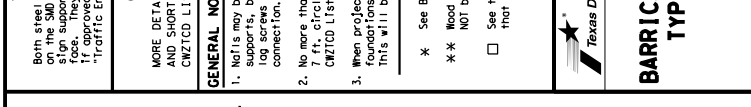


OTHER DESIGNS

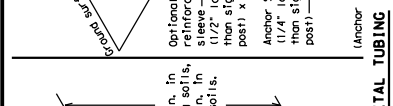
MORE DETAILS OF APPROVED LONG/INTERMEDIATE AND SHORT TERM SUPPORTS CAN BE FOUND ON THE CWZTCO LIST. SEE BC(1) FOR WEBSITE LOCATION.



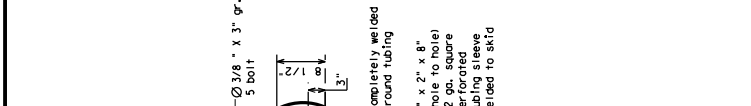
GENERAL NOTES



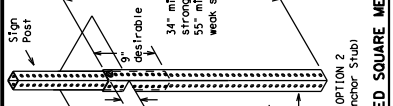
SHEET 5 OF 12



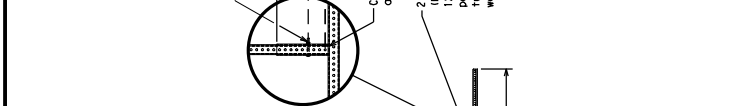
BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT



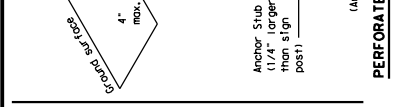
BC(5) - 21



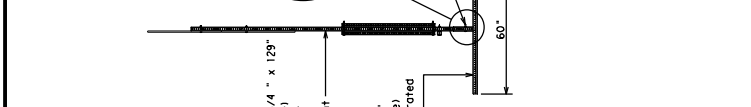
FILE



REVISIONS



COUNTY



SHEET NO. 51 OF 66

(The Engineer may approve other messages not specifically covered here.)

- [illegible]

Roadway designation = IH-number, US-number, SH-number, FM-number

Road/Lane/Ramp Closure List

FREWAY CLOSED X MILE	FRONTAGE ROAD CLOSED	ROADWORK XXX FT	ROAD REPAIRS XXXX FT
ROAD CLOSED AT SH XXX	SHOULDER CLOSED XXX FT	FLAGGER XXXX FT	LANE NARROWS XXXX FT
ROAD CLSD AT FM XXXX	RIGHT LN CLOSED XXX FT	RIGHT LN NARROWS XXXX FT	TWO-WAY TRAFFIC XX MILE
RIGHT X LANES CLOSED	RIGHT X LANES OPEN	MERGING TRAFFIC XXXX FT	CONST TRAFFIC XXX FT
CENTER LANE CLOSED	DAYTIME LANE CLOSURES	LOOSE GRAVEL XXXX FT	UNEVEN LANES XXXX FT
NIGHT LANE CLOSURES	1-XX SOUTH EXIT CLOSED	DETOUR X MILE	ROUGH ROAD XXXX FT
VARIOUS LANES CLOSED	EXIT XXX CLOSED X MILE	ROADWORK PAST SH XXXX	ROADWORK NEXT FRI-SUN
EXIT CLOSED	RIGHT LN TO BE CLOSED	BUMP XXXX FT	US XXX EXIT X MILES
MALL DRIVEWAY CLOSED	X LANES CLOSED TUE - FRI	TRAFFIC SIGNAL XXXX FT	LANES SHIFT
XXXXXXX BLVD CLOSED			

★ LANES SHIFT In Phase 1 must be used with STAY IN LANE In Phase 2

* LANES SHIFT IN Phase 1 must be used with STAY IN LANE in Phase 2.

Action to Take/Effect on Travel List

[illegible]

*** See Application Guidelines Note 6.

1. Only 1 or 2 phases are to be used on a PCMS.
2. The 1st phase (or both) should be selected from the "Road/Lane/Ramp Closure List" and the "Other Condition List".
3. A 2nd phase can be selected from the "Action to Take/Effect on Travel, Location, General Warning, or Advance Notice Phase Lists".

- Only 1 or 2 phases may be used on a job.
- The 1st phase for birth should be selected from the "Road/Lane/Ramp Closure List" and the "Other Condition List".
- A 2nd phase can be selected from the "Action to Take/Effect Phase List", "Location, General Warning, or Advance Notice Phase List".
- A Location Phase is necessary only if a distance or location phase is not included in the first phase selected.
- If two PADS are used in sequence, they must be separated by a blank space.
- Phases should be understandable by themselves.
- For advance notice, when the current date is within seven days of the actual work date, calendar days should be replaced with the number of actual work days. For example, "10 days" should be replaced with "10 more than last week" prior to the work.

The words RIGHT, LEFT and ALL can be interchanged as appropriate.

2. Replacements in the following list may be made as appropriate.

3. EAST, WEST, NORTH and SOUTH for Interchanges E, M, N and S1 can be interchanged as appropriate.

4. (1) Names and numbers replaced as appropriate.

5. (2) Words and numbers replaced as appropriate.

6. AHEAD may be used instead of distances if necessary.

7. FT and MI, MILE and MILES interchanged as appropriate.

8. AT, BEFORE and PAST interchanged as needed.

9. A DISCREPANCY or AHEAD can be eliminated from the message if a

REMOVE STONES WITHIN THE ROAD SHALL BE BEHIND CUMBERBATTI OR

CONCRETE BARRIER OR SHALL HAVE A MINIMUM OF FOUR (4) STMS STIONS WITHIN THE R.O.W. SHALL BE BEHIND GUARDRAIL

PLASTIC DRUMS PLACED PERPENDICULAR TO TRAFFIC ON THE UPSTREAM SIDE OF THE PCMS, WHEN EXPOSED TO ONE DIRECTION

OF TRAFFIC. WHEN EXPOSED TO TWO WAY TRAFFIC, THE FOUR DRUMS SHOULD BE PLACED WITH ONE DRUM AT EACH OF THE FOUR CORNERS OF THE UNIT.

1. When Full Matrix PCMS signs are used, the character height and legibility/visibility requirements shall be maintained as listed in Note 15 under "PORTABLE CHANGEABLE MESSAGE SIGNS" above.

1. When Full Matrix PDS signs are used, the character height and legibility/visibility requirements shall be maintained as listed in Note 15 under "PORTABLE CHANGEABLE MESSAGE SIGNS" above.
2. The "Signal" (Traffic Signal) (CDD-7) are represented graphically on the Full Matrix PDS sign and, with the approval of the Engineer, it shall conform to the legibility/visibility requirement listed above.
3. When symbol signs are represented graphically on the Full Matrix PDS, they shall only supplement the use of the static sign represented, and shall not substitute for, or replace that sign.
4. A full matrix PDS may be used to simulate a flashing arrow board provided it meets the visibility, flash rate and dimming requirements on BC(7), for the same size arrow.

DATE:
FILE:

-
- A schematic diagram of a tapered optical waveguide. It consists of two parallel lines representing the waveguide walls, which are tapered from left to right. Inside the waveguide, there are four small black circles representing barrier reflectors. Lines connect these reflectors to a label 'Barrier Reflector s' at the top right. The waveguide is shown in perspective, with the top and bottom surfaces indicated by dashed lines.

3. Where traffic is on one side of the CIB, two (2) Barrier Reflectors shall be mounted in approximately the midsection of each section of CIB. Where there are multiple lanes of traffic, the reflectors shall be spaced at intervals of approximately 100 feet. Where traffic is on both sides of the CIB, Barrier Reflectors shall be mounted on each side of the CIB. Where traffic is on one side of the CIB, the Barrier Reflector mounted on the side of the CIB shall be located directly below the reflector mounted on top of the barrier, as shown in the detail above.
4. Where traffic is on both sides of the CIB, Barrier Reflectors shall be mounted on each section of CIB. The reflector unit on top shall have two yellow reflective faces (B-Directional) while the reflectors on each side of the barrier shall have one yellow reflective face, as shown in the detail above.
5. Where traffic is traveling in the same direction, no barrier reflectors will be required on top of the CIB.
6. Barrier Reflector units shall be yellow or white in color to match the delineation being supplemented.
7. Maximum spacing of Barrier Reflectors is forty (40) feet.
8. Barrier Reflectors shall be reflective roadway marker type and shall NOT be used as CIB delineation.
9. Attachment of Barrier Reflectors to CIB shall be per manufacturer's recommendations.
10. Missing or damaged Barrier Reflectors shall be replaced as directed.
11. Single slope barriers shall be delineated as shown on the above detail.

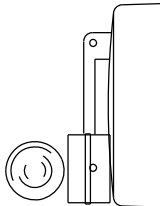
Max. spacing of barrier reflectors is 20 feet. Attach the delineators at manufacturer's recommendation.

Install a minimum of 3 barrier fireectors along the perimeter of the roof edge. (WIA)

**END TREATMENTS FOR
CTB'S USED
IN WORK ZONES**

WARNING LIGHTS

- [illegible]



WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

1. Type A flashing warning lights are not intended for use in a potentially hazardous area.
2. Type A flashing warning lights are not intended for use in a series of sequential flashing warning lights placed on channelizing devices to form a perimeter.
3. A series of sequential flashing warning lights placed on channelizing devices to form a perimeter shall be used in a series of sequential flashing warning lights to form a perimeter.
4. Type C and D steady burn warning lights are intended to be used in a series to delineate the edge of the travel lane on detours, on lane changes, on lane closures, and on other similar conditions.
5. Type A, type C and type D warning lights shall be installed at locations as detailed on other sheets in the plans.
6. Type A, type C and type D warning lights shall be identical to the channelizing device spacing.
7. The maximum spacing for type A, type C and type D warning lights on drums should be identical to the channelizing device spacing.

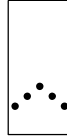
WARNING REFLECTORS MOUNTED ON PLASTIC DRUMS AS A SUBSTITUTE FOR TYPE C (STEADY BURN) WARNING LIGHTS

1. A warning reflector or approved substitute may be mounted on a plastic drum as a substitute for a Type C, steady burn warning light or a discrete light source.
2. The warning reflector shall be yellow in color and shall be manufactured using a sign substrate approved for use with plastic drums listed in the catalog of the Contractor unless otherwise noted in the plans.
3. The warning reflector shall have a minimum reflective surface area (one-side) of 30 square inches.
4. Round reflectors shall be fully reflectorized, including the area where they are attached to the drum.
5. Square substrates must have a minimum of 30 square inches of reflectorized sheeting. They do not have to be reflectorized where it is attached to the drum.
6. The side of the warning reflector facing approaching traffic shall have sheeting meeting the color and reflectivity requirements for DMS 3800-Type B or Type C.
7. When used near two-way traffic, both sides of the warning reflector shall be reflectorized.
8. The maximum spacing for the reflectors shall be the same as the spacing for the reflective sheeting.
9. The maximum spacing for the reflectors shall be identical to the channelizing device spacing requirements.

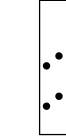
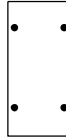
Warning reflector may be round or square. Must have a yellow reflective surface area of at least 30 square inches.

Arrow Boards may be located behind channelizing devices in place for a shoulder taper or merging taper, otherwise they shall be delineated with four (4) channelizing devices placed perpendicular to traffic on the upstream side of traffic.

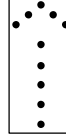
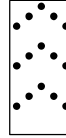
1. The Flashing Arrow Board should be used for all one-lane closures, or slow moving maintenance or construction activities on the travel lanes.
2. Flashing Arrow Boards should not be used on two-lane, two-way roadways, detours, diversions or work on shoulders unless the "CAUTION" display (see detail below) is used.
3. The Engineer/Inspector should choose all appropriate signs, barricades and/or other traffic control devices to be used in conjunction with the Flashing Arrow Board.
4. The Flashing Arrow Board should be able to display the following symbols:



OR



ALTERNATING DIAMOND CAUTION



DOUBLE ARROW



RIGHT/LEFT ARROW

RIGHT/LEFT ARROW
(right arrow shown;
left is similar)

BIO

SEQUENCE:
(right
left is

5. The "CAUTION" display consists of four corner lamps flashing simultaneously, or the Alternating Diamond Caution mode as shown.
6. The flashing rate caution display is NOT ALLOWED.
7. The flashing rate of the lamps shall be between 50 percent dimming (low rated lamp voltage) and 100 percent (full rated lamp voltage).
8. The flashing rate of the lamps shall not be less than 40 flashes per minute.
9. Minimum "lamp on time" shall be approximately 50 percent for the flashing arrow and equal intervals of 25 percent for each sequential phase of the flashing chevron.
10. The flashing arrow display is the ICAOT standard; however, the sequential chevron display may be used during daylight operations.
11. The flashing arrow board and the sequential chevron board shall be used as a warning, trailer or other suitable support.
12. A full pointing arrow board SHALL NOT BE USED as a warning of imminent traffic.
13. A full pointing PADS may be used to simulate a flashing arrow board provided it meets visibility, flash rate and dimming requirements on this sheet for the same size arrow.
14. The height of trailer mounted arrow boards should be 7 feet from roadway to bottom of sign.

REQUIREMENTS			
TYPE	MINIMUM SIZE	MINIMUM NUMBER OF PANEL LAMPS	MINIMUM VISIBILITY DISTANCE
B	30 x 60	13	3/4 mile
C	48 x 96	15	1 mile

ATTENTION	Flashing Arrow Boards shall be equipped with automatic dimming devices.
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WHEN NOT IN USE, REMOVE THE ARROW BOARD FROM THE RIGHT-OF-WAY OR PLACE THE ARROW BOARD BEHIND CONCRETE TRAFFIC BARRIER OR GUARDRAIL.

FLASHING ARROW BOARDS

SHEET 7 OF 12



**BARRICADE AND CONSTRUCTION
ARROW PANEL, REFLECTORS,
WARNING LIGHTS & ATTENUATOR**

BC(7)-21

FILE#	bc-21-dgn	DWG	TXDOT	CD	TXDOT	DWG	TXDOT	CD	TXDOT
② TXDOT	November 2002	CONV	SECT			JOB			HIGHWAY
REVISONS									
9-07	8-14					COUNTY			SHEET NO.
7-13	5-21								FOOTING

101

1. For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.

1. For long term stationery work zones on freeways, drums shall be used as the primary stationery device.
2. For intermediate term stationery work zones on freeways, drums should be used as the primary stationery device but may be replaced in tangent sections by vertical panels, or 42" two-face cones. In tangent sections, one-face cones may be used with the approval of the Engineer but only if personnel are present on the project at all times to maintain the cones in proper position and location.
3. For short term stationery work zones on freeways, drums are the preferred stationery device. Drums may be replaced in tangent sections by vertical panels, two-face cones or one-face cones as approved by the Engineer.
4. Drums and all related items shall comply with the requirements of the current version of the "Texas Manual on Uniform Traffic Control Devices" (TMUDCD) and the "Compliant Work Zone Traffic Control Devices List" (CAZK12D).
5. Drums, bases, and related materials shall exhibit good workmanship and shall be free from objectionable marks or defects that would adversely affect their appearance or serviceability.
6. Drums, bases, and related materials shall be replaced by plastic drums identified for replacement by the Engineer/Inspector. The replacement device must be an approved device.

Pre-qualified plastic drums shall meet the following requirements:

Pre-qualified plastic drums shall meet the following requirements:

1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 mph or greater but prevents accidental separation due to normal handling and/or air turbulence created by passing vehicles.
3. The drums shall be constructed of rigid plastic, metal, and/or deformable materials. The Contractor shall not use metal drums or single piece plastic drums as channelization devices or sign supports.
4. Drums shall present a profile that is a minimum of 18 inches in width at the 36 inch height when viewed from any direction. The height of drum unit (body installed on base) shall be a minimum of 36 inches and a maximum of 42 inches.
5. Drums shall have a built-in handle for easy placement and shall be designed to drain water and not collect debris. The handle shall have a minimum of two widely spaced 9/16 inch diameter holes to allow attachment of a warning flag, warning reflector unit or approved compliant sign.
6. The exterior of the drum body shall have a minimum of four alternating orange and white retroreflective circumferential stripes not less than 2 inches wide and not more than 4 inches wide. The stripes shall have a space between any two adjacent stripes shall not exceed 2 inches in width.
7. Bases shall have a maximum width of 36 inches, a maximum height of 4 inches, and a minimum of two footings of sufficient size to allow base to be held down while separating the drum body from the base.
8. Plastic drums shall be constructed of ultraviolet stabilized, orange, yellow, red, white, and/or reflective materials.
9. Drum body shall have a maximum unlabeled weight of 11 lbs.
10. Drum and base shall be marked with manufacturer's name and model number.

[illegible]

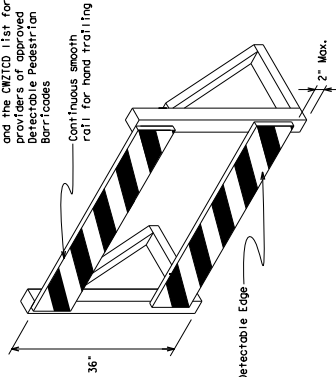
1. The strips used on drums shall be constructed of sheeting meeting the following specifications:
a. Type of Material: Type A or Type B.
b. Specification: DMS-8300, "Sign Face Materials."
c. Reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall be suitable for use on and shall adhere to the drum surface such that, upon venturi impact, the sheeting shall remain adhered in-place and exhibit no delamination, cracking, or loss of reflectivity other than that loss due to abrasion of the sheeting surface.

[illegible]

1. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other ballasting devices as approved by the Engineer. Stacking of sandbags will be allowed, however height of sandbags above pavement shall not exceed 12 inches.
2. Bases with ball-in-ballast shall weigh between 40 lbs. and 50 lbs. Bases with ball-in-ballast can be constructed of an integral curbs rubber base or a solid rubber base.
3. Recycled truck tire sidewalls may be used for ballast on drums approved by the Engineer.
4. The ballast shall not be heavy objects, water, or any material that would be hazardous to motorists, pedestrians, or workers when the drum is struck by a vehicle.
5. When used in regions susceptible to freezing, drums shall have drainage holes in the bottoms so that water will not collect and freeze becoming a hazard.
6. Ballast shall not be placed on top of drums.
7. Adhesives may be used to secure base of drums to pavement.

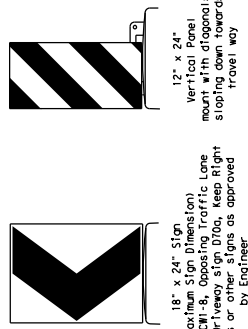


This detail is not intended for fabrication. See note 3 and the CWTCD list for providers of approved Detectable Pedestrian Barricades



1. When existing pedestrian facilities are disrupted, closed, or

1. relocated in a TIC zone, the temporary facilities should be detectable and include accessibility features consistent with the Americans with Disabilities Act Accessibility Guidelines (ADAAG) (1991), the Federal Communications Commission's (FCC) 91.015-2, and the Federal Highway Administration's (FHWA) 23 CFR 659.015-2. Stairways, Diversional, Stairwell Entrances and Crosswalk Closures.
2. Where pedestrian with visual disabilities normally use the closed sidewalk, a detectable pedestrian barricade should be placed across the full width of the closed sidewalk instead of a detectable pedestrian barricade.
3. Detectable pedestrian barricades similar to the one pictured above, longitudinal channel linking fences, some concrete barriers, and wood or chain link fencing with a continuous detectable edging can satisfactorily delineate a pedestrian crossing.
4. Tape, rope, or plastic chain strung between devices are not detectable, do not comply with the design standards in the "Americans with Disabilities Act Accessibility Guidelines" (ADAAG) and should not be used as a control for pedestrian crossing.
5. Warning lights should not be attached to detectable pedestrian barricades.
6. Detectable pedestrian barricades should use 8" nominal baricade rails as shown on BC101 provided that the rail top provides a detectable edge for the hand railing. No rails with no spalliners, burrs, or sharp edges.



Plywood, Aluminum or Metal sign
substrates shall NOT be used on
plastic drums

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

- [illegible]



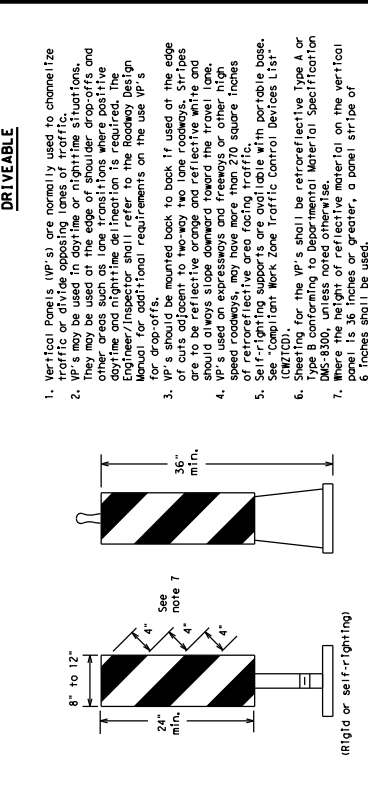
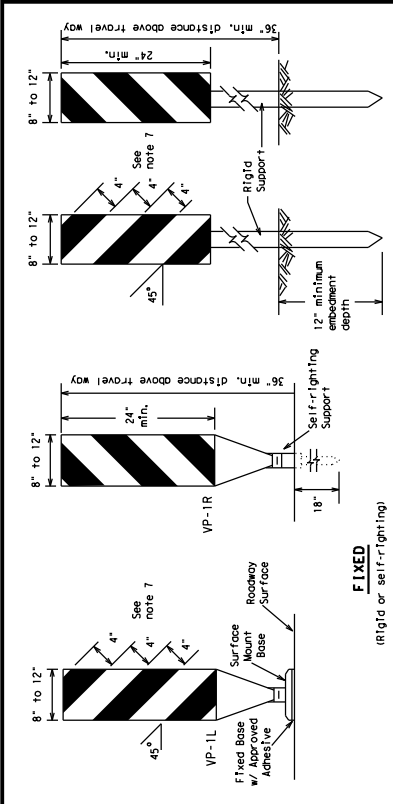
Texas Department of Transportation

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE:	bc-21.dgn						
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DWG	TxDWT	CONT	SECT	JOB	DW	TxDWT	CELL TxDWT
REVISED							
	4-03	8-14					
	9-07	5-21					
	7-13						
			DIST	COUNTY	SHEET NO.		
					54 of 66		

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FIXED (Rigid or self-righting)

PORTABLE (Rigid or self-righting)

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

VERTICAL PANELS (VPs)

WATER BALLASTED SYSTEMS USED AS BARRIERS

LONGITUDINAL CHANNELIZING DEVICES (LCD)

CHEVRONS

CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (9) - 21

FILE: BC-21.dgn DW: TxDOT Cn: TxDOT Dn: TxDOT Cn: TxDOT

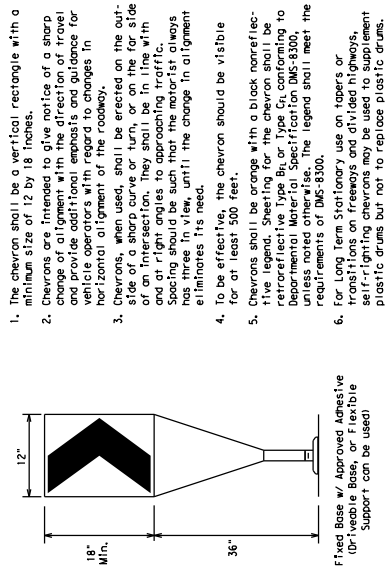
REVISIONS: November 2002 CONF: SECT: JOB: HIGHWAY: SHEET NO. 55 OF 66

9-07 8-14 7-13 3-21

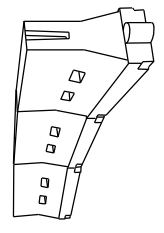
103

GENERAL NOTES

1. Work zone channelizing devices illustrated on this sheet may be installed in close proximity to traffic and are suitable for use on high or low speed roadways. The Engineer/Inspector shall ensure that spacing and placement is uniform and in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. Channelizing devices shown on this sheet may have a drivable, fixed or portable base. The Engineer/Inspector shall ensure that channelizing devices must be specified in the General Notes or other plan sheets.
3. Channelizing devices on self-righting supports should be used in work zone areas where channelizing devices are frequently impacted by errant vehicles or vehicle related wind gusts making alignment of the channelizing devices difficult to maintain. Locations of these devices shall be detailed elsewhere in the plans. These devices shall conform to the TMUTCD and the requirements of DMS-8300.
4. The Contractor shall maintain devices in a clean condition and replace damaged, nonreflective, faded, or broken devices and bases as required by the Engineer/Inspector. The Contractor shall be required to maintain proper device spacing and alignment.
5. Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh a minimum of 30 lbs. that ensures proper bonding between the adhesives, the fixed mount bases and the pavement surface. Adhesives shall be prepared and applied according to the manufacturer's recommendations.
6. The installation and removal of channelizing devices shall not cause detrimental effects to the final pavement surfaces, including pavement surface deterioration or surface integrity. Drivable bases shall not be used in work zones where the Engineer/Inspector shall approve all application and removal procedures of fixed bases.
7. The installation and removal of channelizing devices shall not cause detrimental effects to the final pavement surfaces, including pavement surface deterioration or surface integrity. Drivable bases shall not be used in work zones where the Engineer/Inspector shall approve all application and removal procedures of fixed bases.



CHEVRONS



LONGITUDINAL CHANNELIZING DEVICES (LCD)

1. LCDs are crashworthy, lightweight, deformable devices that are highly visible, have good target value and can be connected together. They are not designed to contain or redirect a vehicle on impact.
2. LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CDOT list.
3. LCDs shall be supplemented with retroreflective delineation as required for temporary barriers.
4. LCDs shall be supplemented with retroreflective delineation as required for temporary barriers.
5. LCDs shall be supplemented with retroreflective delineation as required for temporary barriers.
6. LCDs used as barriers placed perpendicular to traffic should have at least one row of reflective sheeting meeting the requirements for barricade rolls as shown on BC(10). Place reflective sheeting near the top of the LCD along the full length of the device.

WATER BALLASTED SYSTEMS USED AS BARRIERS

1. Water ballasted systems used as barriers shall not be used solely to channelize road users, but also to protect the work space per the appropriate Manual for Assessing Safety Hardware (MASH) crashworthiness requirements based on roadway speed and barrier application.
2. Water ballasted systems used as barriers shall be supplemented with retroreflective delineation.
3. Water ballasted systems used as barriers shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CDOT list.
4. Water ballasted systems used as barriers should not be used for a merging taper except in low speed (less than 45 MPH) urban areas. When used on a taper in a low speed urban area, the taper shall be delineated and the taper length shall be determined by the Engineer/Inspector.
5. When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to a point outside the clear zone.

If used to channelize pedestrians, longitudinal channelizing devices or water ballasted systems must have a continuous detectable bottom for users of long cones and the top of the unit shall not be less than 32 inches in height.

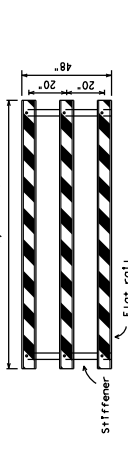
HOLLOW OR WATER BALLASTED SYSTEMS USED AS LONGITUDINAL CHANNELIZING DEVICES OR BARRIERS

1. Refer to the Compliant Work Zone Traffic Control Devices List (CWZTCD) for details of the Type 3 Barricodes and a list of all materials used in the construction of Type 3 Barricodes.
2. Type 3 Barricodes shall be used at each end of construction

3. Baricodes extending across a roadway should have stripes that slope downward in the direction toward which traffic must turn in detouring. When both right and left turns are provided, the chevron striping may slope downward in both directions from the center of the baricode.
4. Baricodes that are placed on the shoulder of a roadway should slope downward in both directions toward the center of roadway.
5. Striping of railroads, for the right side of the roadway, should slope downward to the left, for the left side of the roadway, striping should slope downward to the right.
6. Baricodes should be placed only on the back of the baricode rail. The maximum height of letters and/or company logos placed on the back of the baricode shall be 1".
7. Baricodes shall not be placed parallel to traffic unless an adequate clear zone is provided.
8. Baricodes shall be installed on paracodes.
9. Where baricodes require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand is recommended. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight. Sand bags shall not be strapping in a manner that would restrict the movement of the baricodes. Weights shall not be rock, concrete, iron, steel or other solid objects which will NOT be permitted. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs. Sandbags shall be made of a durable material that tears upon impact with a vehicle. Rubber such as tire inner tubes shall not be used as weights. Baricodes shall be supported by a device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners.
10. Sheeting for baricodes shall be nonreflective Type A or Type B conforming to Departmental Material Specification DMS-8300 unless

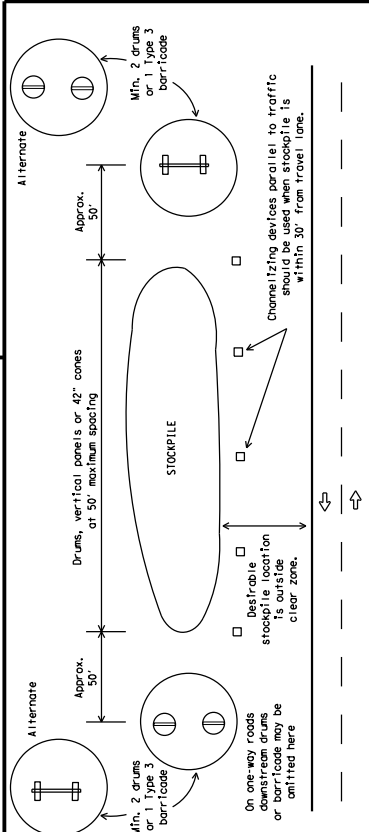
Diagram illustrating the cross-section of the reflective sheeting. The sheeting is shown with a nominal width of 8 inches and a minimum width of 7 inches. The reflective surface is composed of alternating black and white stripes, with a 45-degree angle indicated for the reflective surface.

4' min., 8' max.



Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

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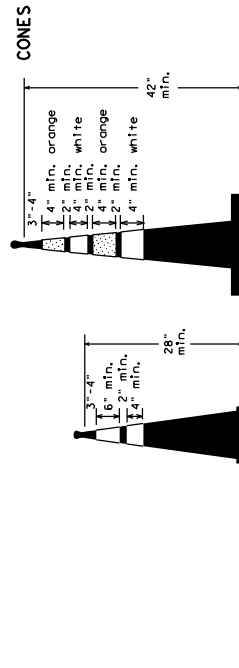
PERSPECTIVE VIEW

This diagram shows a perspective view of the bridge deck and approach ramp. A large curved arrow indicates the direction of traffic flow. Labels include "M4-10L", "CONTRACTOR", "DETOUR", and "Detour Roadway". A dimension line indicates a "30 feet" distance.

The three rails on Type 3 barricades shall be reflective striped orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.

1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

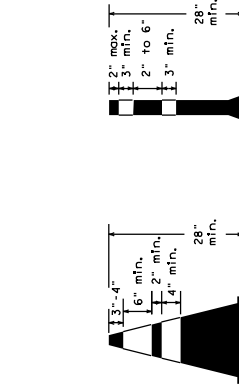
PI AN VIEW



One-Piece cones

28" Cones shall have a minimum weight of 9 1/2 lbs.
42" 2-piece cones shall have a minimum weight of 30 lbs, including base.

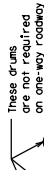
PIAN VIEW



Tubular Marker

1. Where positive redirection capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder width is greater than 4 feet, steady-burn lights may be omitted if drums are used.
5. Drums must extend the length of the culvert when the

PERSPECTIVE VIEW



Increase number of plastic drums on the side of approaching traffic. If the crown width makes it necessary, (minimum of 2 and maximum of 4 drums)

LEGEND

	Plastic drum
	Plastic drum with steady burn light or yellow warning reflector
	Steady burn warning light or yellow warning reflector

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS

SHEET 10 OF 12



Texas Department of Transportation

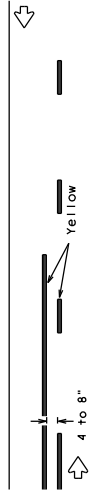
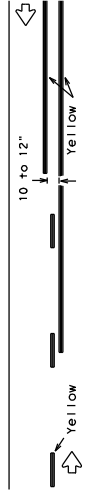
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10) - 21

FILE:	DC-21.dgn										
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REVISONS											
9-07	8-14	COUNTY		SHEET NO.							
7-13	5-21	DIST		EG. NO. EG.							
DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME	DATE	TIME

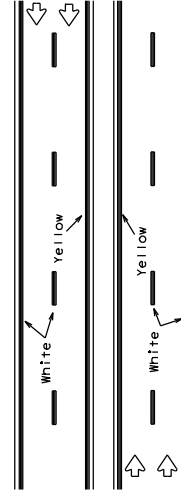
Profile

PAVEMENT MARKING PATTERNS



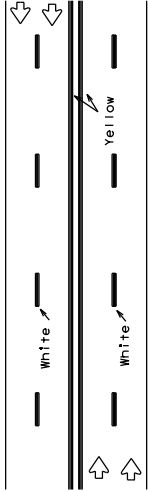
Pattern A is the TxDOT Standard, however Pattern B may be used if approved by the Engineer. Prefabricated markings may be substituted for reflectORIZED pavement markings.

CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO-LANE, TWO-WAY HIGHWAYS



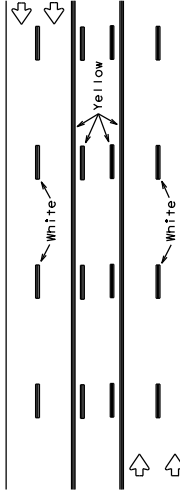
Prefabricated markings may be substituted for reflectORIZED pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



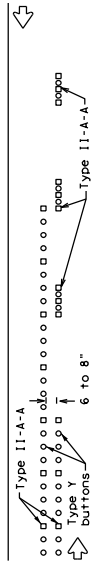
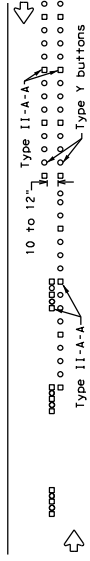
Prefabricated markings may be substituted for reflectORIZED pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



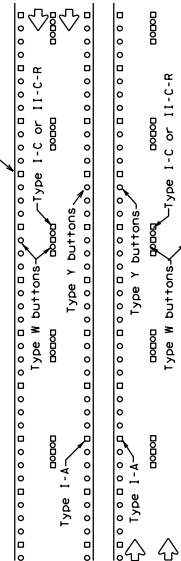
Prefabricated markings may be substituted for reflectORIZED pavement markings.

TWO-WAY LEFT TURN LANE



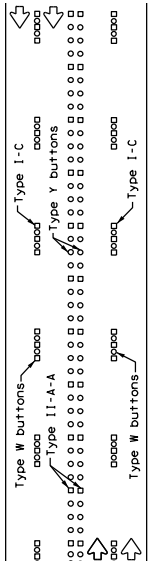
Pattern A is the TxDOT Standard, however Pattern B may be used if approved by the Engineer. Prefabricated markings may be substituted for reflectORIZED pavement markings.

CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO-LANE, TWO-WAY HIGHWAYS



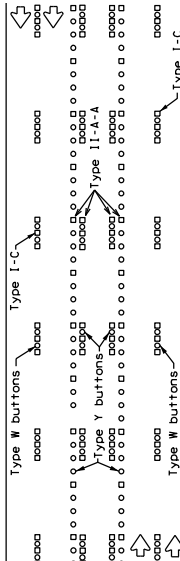
Prefabricated markings may be substituted for reflectORIZED pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



Prefabricated markings may be substituted for reflectORIZED pavement markings.

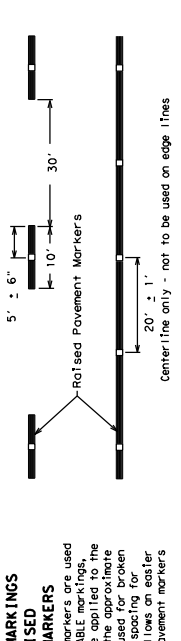
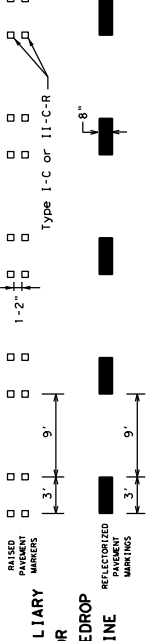
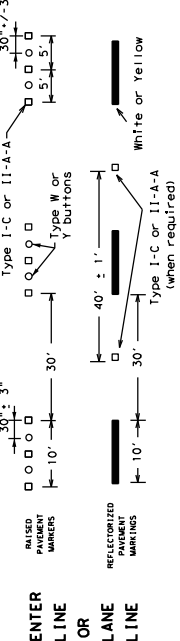
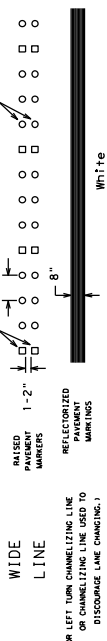
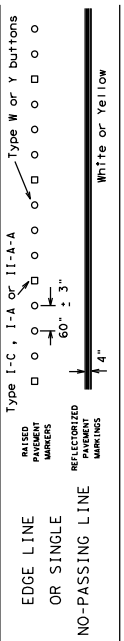
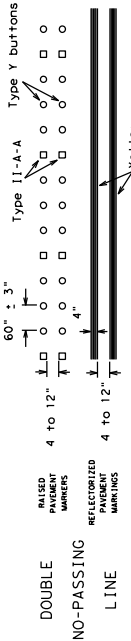
LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



Prefabricated markings may be substituted for reflectORIZED pavement markings.

TWO-WAY LEFT TURN LANE

STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



Center line only - not to be used on edge lines

SHEET 12 OF 12

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC (12) - 21

FILE	DC-21.dgn	DATE	1/2007	BY	TxDOT	REV	1/2007	CHK	TxDOT
REVISIONS	1-97	9-07	3-21	2-98	7-13	11-02	8-14		
SHEET NO.									
SHEET OF	58								

Raised pavement markers used as standard pavement markings shall be from the approved products list and meet the requirements of Item 672 - RAISED PAVEMENT MARKERS."

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

Formula	Minimum Desirable Spacing of Channelizing Devices, ft	Minimum Spacing of Channelizing Devices, ft	Suggested Maximum Spacing of Channelizing Devices, ft	Suggested Minimum Spacing of Channelizing Devices, ft
$L = WS^2$	10' 11'	12'	On a Taper	On a Taper
30	150'	165'	180'	30'
35	205'	225'	245'	35'
40	265'	295'	320'	40'
45	330'	365'	395'	45'
50	400'	440'	480'	50'
55	475'	520'	565'	55'
60	560'	610'	660'	60'
65	650'	710'	770'	65'
70	750'	825'	900'	70'
75	860'	940'	1020'	75'

* 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 TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
✓	✓	✓	✓

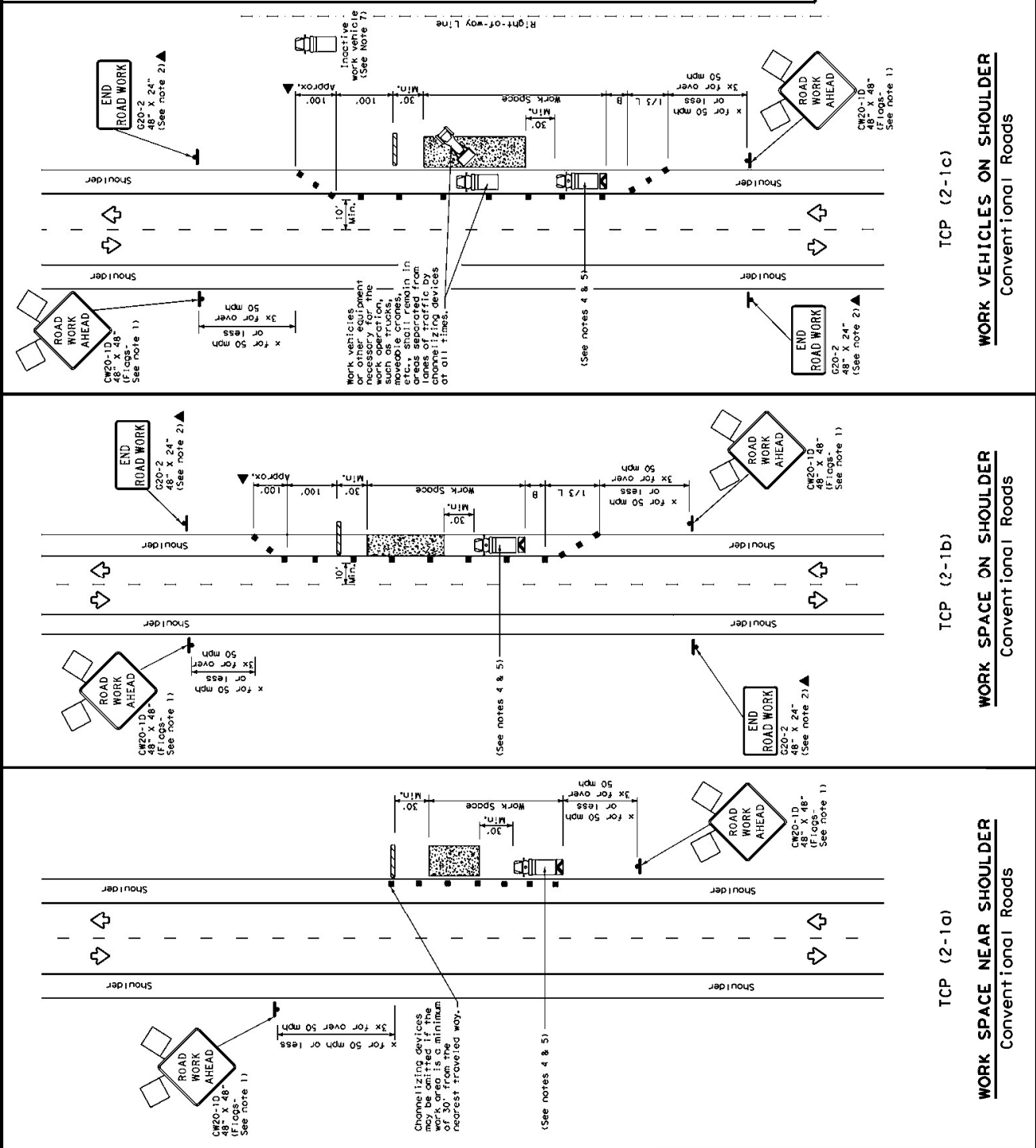
- GENERAL NOTES**
- Flags attached to signs where shown, are REQUIRED.
 - When used in conjunction with other signs, except those denoted with the triangle symbol, may be omitted when stored in the plans, or for routine maintenance work, when approved by the Engineer.
 - Shoaled material should be placed a minimum of 30 feet from nearest traveled way.
 - Shadow vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A shadow vehicle with a TMA should be placed in the work area to protect workers from the rear 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.
 - When used in conjunction with other channelizing devices off the paved surface, the shadow vehicle and TMA should be positioned to protect the surface from those shown in order to protect a wider work space.
 - See (CP15-1) for shoulder work on divided highways, expressways and freeways.
 - Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
 - CP21-5 "SHOULDER WORK" signs may be used in place of CP20-10 "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

Texas Department of Transportation

TRAFFIC CONTROL PLAN
CONVENTIONAL ROAD
SHOULDER WORK

TCP (2-1) - 18

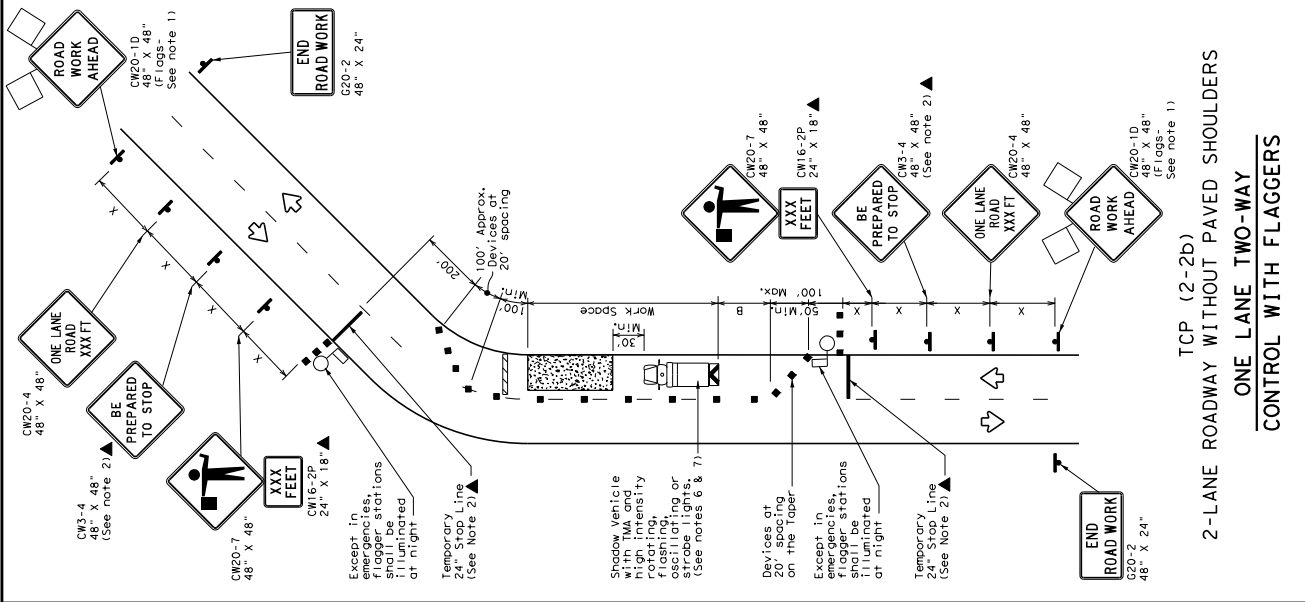
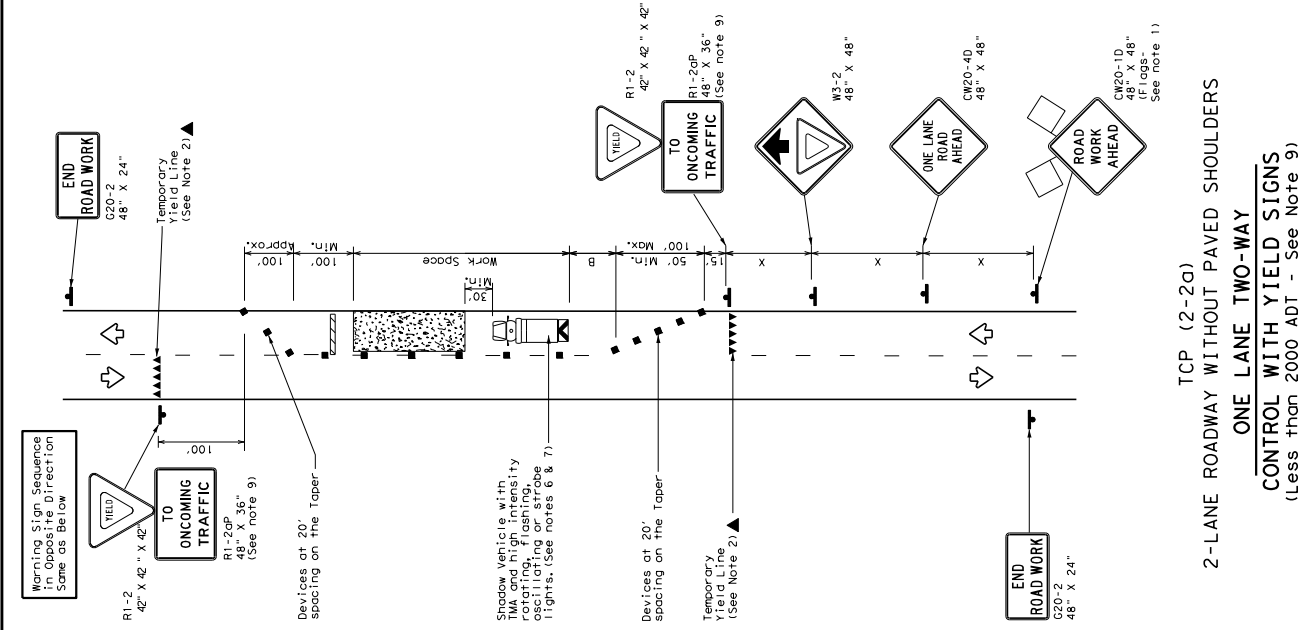
FILED	12/1/2011 1:18:00 PM	DATE	12/1/2011
PROJECT	12/1/2011	DATE	12/1/2011
REVISIONS	2-94 4-99 2-12 8-95 2-12 1-97 2-18	DATE	12/1/2011
SHEET NO.	59 OF 66	DATE	12/1/2011



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

Preset Speed * %	Formula	Minimum Desirable Pulse Lengths			Suggested Maximum Spacing of Devices			Minimum Spacing "x"	Suggested Pulse Spacing "x"	Shipping Light Distance
		10' Offset	12' T ₁	12' T ₂	30' T ₁	30' T ₂	30' T ₂			
30	L = W ² 40	150'	165'	180'	30'	60'	120'	90'	200'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'	305'
45		450'	495'	540'	45'	90'	320'	195'	360'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'	425'
55	L = W ² 60	550'	605'	660'	55'	110'	500'	295'	495'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'	820'

**Taper lengths have been rounded off.

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 signs illustrated are REQUIRED, except those denoted with the triangle symbol by the Engineer when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Signs prepared to STOP sign may be installed after the CE20-4 "ONE LANE ROAD AHEAD" sign, but proper sign spacing shall be maintained.
4. Flaggers should use two-way radios or other methods of communication to control traffic.
5. Length of work space should be based on the ability of flaggers to communicate.
6. Signs should be placed in advance of the work zone, with the first advance sign at least 100 feet in advance of the point of construction that 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.
7. All vehicles with TMA may be positioned off the paved surface, next to those shown in order to protect a worker work space.

TCP (2-2a)

8. The R-12 "YIELD" sign traffic control may be used on projects that have adequate sight distance. For projects in urban areas, work space should be no longer than one half city block. In rural areas, roadways with less than 2000 ADT, work space should be no longer than 400 feet.
9. The R-12a "YIELD TO ONCOMING TRAFFIC" sign shall be placed on a support at a 7 foot minimum mounting height.

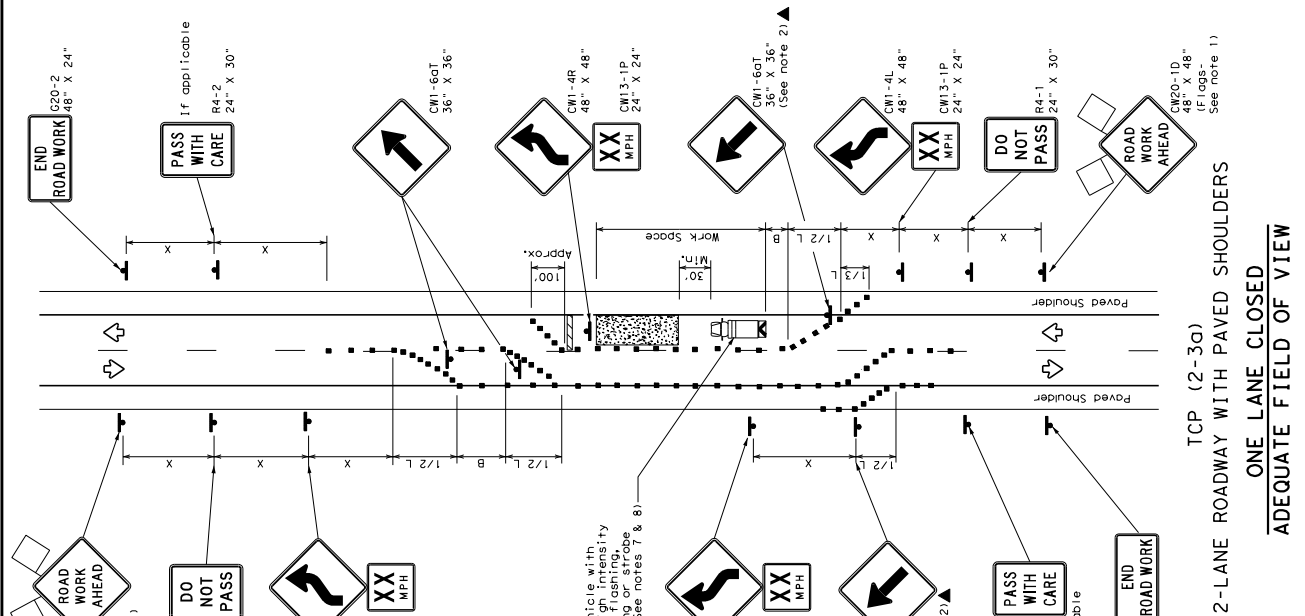
TCP (2-2b)

10. Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
11. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain stopping sight distance to the flogger and a queue of stopped vehicles. (See table above).
12. Floggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.

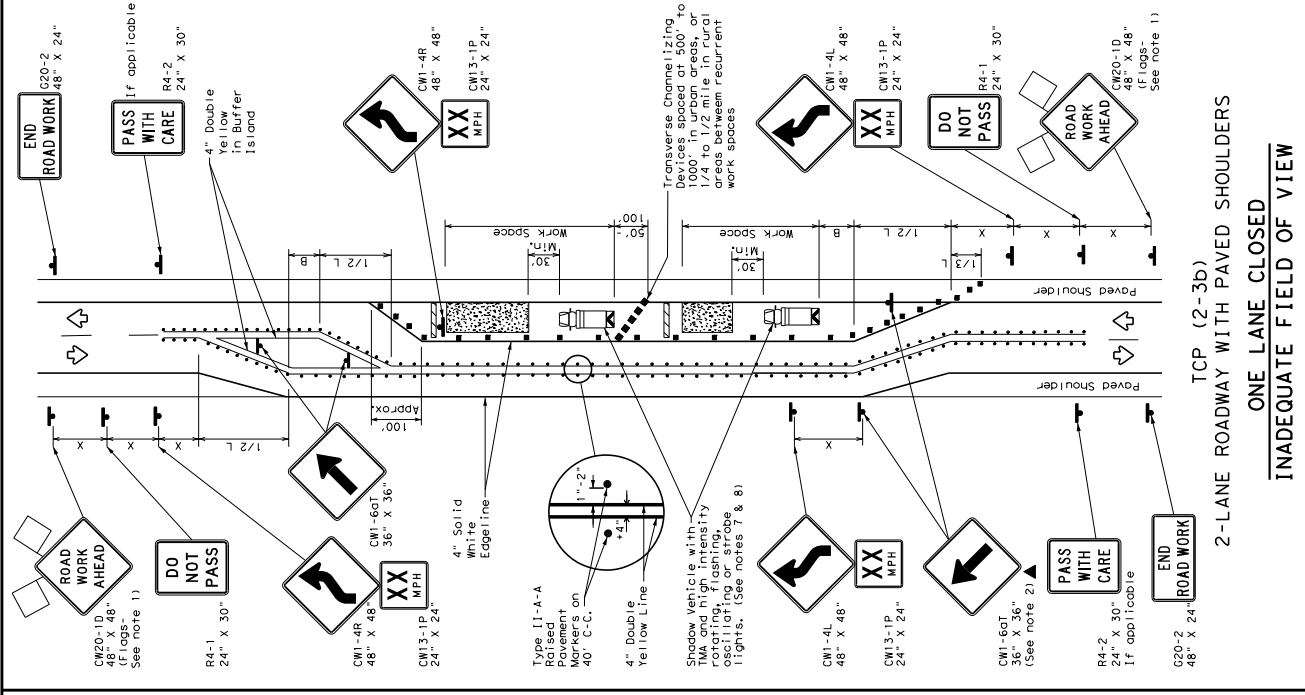
TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY
TRAFFIC CONTROL

TCP(2-2)-18

FILE#:	top2-2-18.dgn	DWG:		CAT:		JOB:		DWG:		SHEET NO.	60 OF 66
© Xroot December 1985											
REVISONS											
8-95		3-03									
1-97		2-12									
4-98		2-18									



TCP (2-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS
ADEQUATE FIELD OF VIEW



TCP (2-3b)
2-LANE ROADWAY WITH PAVED SHOULDERS
INADEQUATE FIELD OF VIEW

LEGEND									
Type 3 Barricade	■ ■	Channelizing Devices							
Heavy Work Vehicle		Truck Mounted Attenuator (TMA)							
Trailer Mounted Flashing Arrow Board		Raised Pavement Markers 1x11-AA							
Sign		Traffic Flow							
Flag		Flagger							

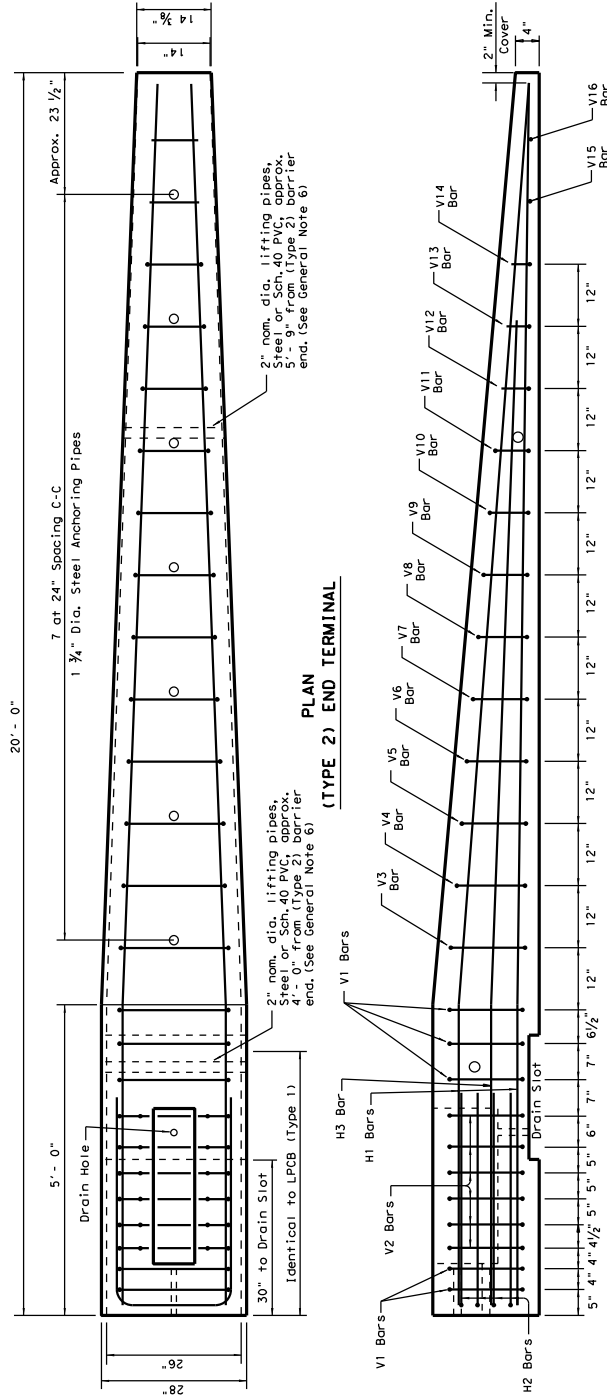
Posted Speed * MPH	Formula	Minimum Desirable Taper Lengths **		Suggested Maximum Channelizing Devices		Minimum Sign Spacing 'X'	Minimum Sign Spacing 'X'	Suggested Longitudinal Buffer Space 'B'	Suggested Longitudinal Buffer Space 'B'
		10'- Offset	11'- Offset	On a Taper	On a Tangent				
30	MS ²	150'	165'	180'	30'	60'	120'	90'	
35	L = 60	205'	225'	245'	35'	70'	160'	120'	
40		265'	295'	320'	40'	80'	210'	150'	
45		450'	495'	540'	45'	90'	320'	195'	
50		500'	500'	600'	50'	100'	400'	240'	
55	L = 85	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
* Posted Speed (MPH)
* Taper Lengths have been rounded off.
L=Length of Taper (FT) W=Width of Offset (FT) S=Posted Speed (MPH)

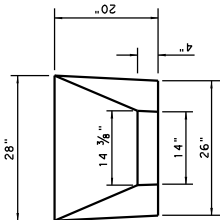
MOBILE	TYPICAL USAGE			LONG TERM STATIONARY
	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	

DISCLAIMER: TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use. The use of this standard is governed by the Texas Engineering Practice Act. No warranty of any kind is made by TxDOT for any purpose whatsoever.

DATE: FILE:



PLAN
(TYPE 2) END TERMINAL



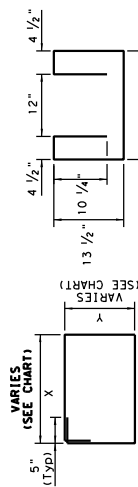
APPROACH VIEW

TYPE 2 - NOTES

1. Welded wire reinforcement (WWR) is "not" an option for Type 2 Barrier.
2. Type 2 Barrier shall be used as an end treatment for the Type 1 barrier segments, when applicable.
3. The end treatment can be used without the anchor pins in lateral displacement of the end treatment. The use of non-pinned end treatment does not affect the performance or the deflection of the Low-Profile Barrier System.
4. The anchor pins are all the same length and are to be driven flush with the top of the (Type 2) barrier surface.
5. The bands in the H3 and H1 bars are slight, no formal bend is necessary.
6. The Type 2 barrier segment must be lifted from the rear first, to prevent cracking of sloped section.
7. See LPCB sheet 1 for additional information.

Note: Anchoring pipes not shown in Elevation view

ELEVATION
(TYPE 2) END TERMINAL



V3-V14 Bars

(6)~V2 Bars

(5)~V1 Bars

BAR (#4)	X (IN.)	Y (IN.)
V3 BAR	20 1/4	14 1/2
V4 BAR	19 1/2	13 1/2
V5 BAR	18 1/2	12 1/2
V6 BAR	17 1/2	11 1/2
V7 BAR	17	10 1/4
V8 BAR	16 1/4	9
V9 BAR	15 1/2	8
V10 BAR	14 1/2	7
V11 BAR	13 3/4	6

REINFORCING STEEL DETAILS
TYPE 2 - END TERMINAL

Note: Use 2" Dia. Bending Pin, unless otherwise shown

Approx. bending point

Approx. bending point

Approx. bending point

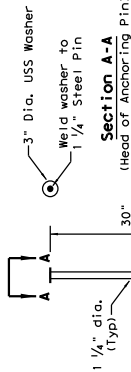
Note: Bands on H1 and H3 bars are slight and do not require formal bends.

(4)~H1 Bars
(#5) Bar

(2)~H3 Bars
(#5) Bar

19' - 8"

Note: All V Bars are (#4)



Section A-A
(Head of Anchoring Pin)

(7) Anchor Pins
ASTM A36 Steel

(See Note 3)

(2) CONNECTION BOLTS
ASTM A36

Note: Rods, Hex nuts and Washers shall be Galvanized.

PLATE WASHER
5" x 10" x 3/8"

(2) Plate Washer
5" x 10" x 3/8"

(4) 1 1/4" Hex Nut Grade 5

(4) 1 1/4" Flat Hardened Washer

1 1/4" dia. x 26" rods Min. 4" threads

5"

26"

4"

4"

2 1/4"

5 1/2"

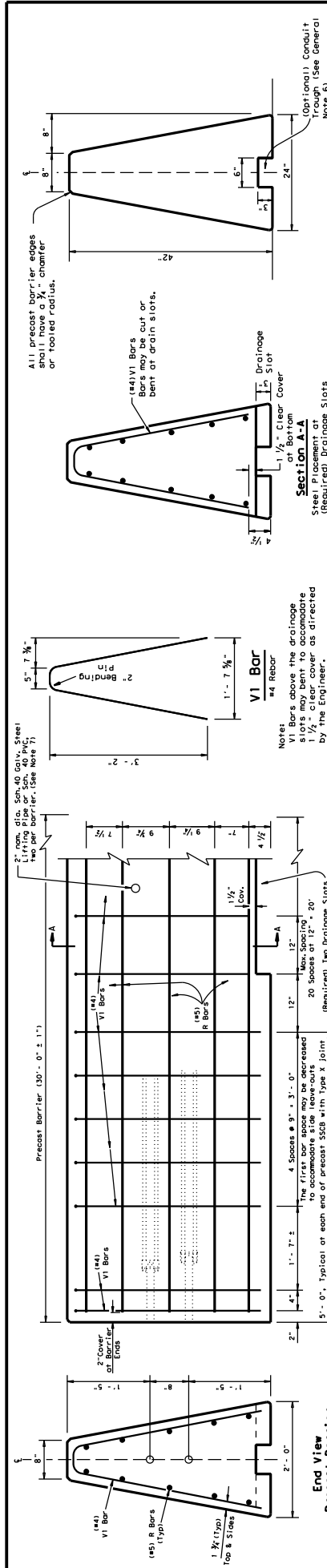
2 1/4"

FOR CONTRACTORS INFORMATION ONLY
(TYPE 2)

APPROX. QUANTITIES	20 FT. SECTION
CONCRETE	CY 1.65
REINFORCING STEEL	LBS 240
TOTAL BARRIER WT.	LBS 7000

LOW PROFILE
CONCRETE BARRIER
PRECAST BARRIER
(TYPE 2)
LPCB-13

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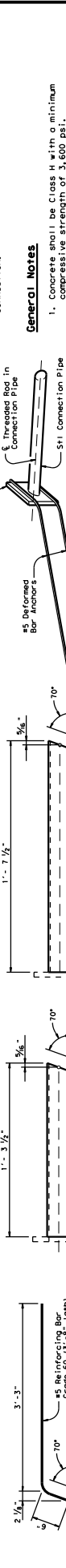


End View
Precast Barrier
Pipe locations for joint
Type X connection

Reinforcement for Precast (SSCB)
Showing reinforcement for joint connection (Type X)

General Notes

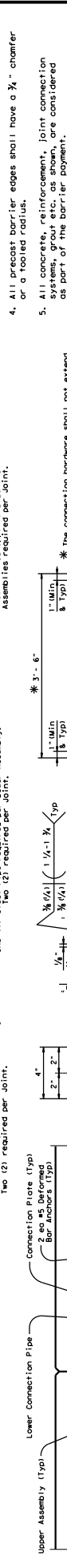
- Concrete shall be Class H with a minimum compressive strength of 3,600 psi.
- Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
- Precast barrier length shall be 30 ft. unless otherwise specified on the plans.
- All precast barrier edges shall have a $\frac{1}{4}$ " chamfer or a rounded radius.
- All concrete, reinforcement, joint connection systems, grout etc., as shown, are considered as part of the barrier payment.
- Conduit trough when required shall be shown elsewhere on the plans, or as directed by the Engineer.
- Regardless of the method of handling, barrier lifting points shall be approximately 15 feet from the ends of the barrier and the lifting points shall be attached to barrier sections shall be approved by the Engineer.
- Surface finishing and grouting where required shall be two parts sand one part cement with enough water to make the mixture plastic. Grouting shall be done in a manner that will ensure full contact between the precast barrier and the grout. The grout shall be considered subsidiary to the various bid items.
- All steel assemblies shall be galvanized after fabrication in accordance with Item 445, Galvanizing.



ISOMETRIC OF TYPICAL WELDED ASSEMBLY
Showing reinforcement for joint connection (Type X)

General Notes

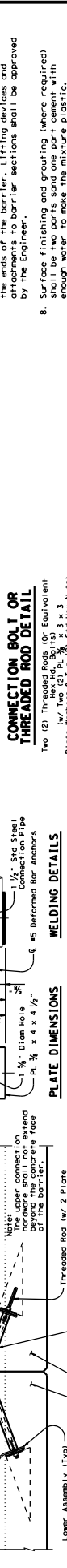
- Concrete shall be Class H with a minimum compressive strength of 3,600 psi.
- Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
- Precast barrier length shall be 30 ft. unless otherwise specified on the plans.
- All precast barrier edges shall have a $\frac{1}{4}$ " chamfer or a rounded radius.
- All concrete, reinforcement, joint connection systems, grout etc., as shown, are considered as part of the barrier payment.
- Conduit trough when required shall be shown elsewhere on the plans, or as directed by the Engineer.
- Regardless of the method of handling, barrier lifting points shall be approximately 15 feet from the ends of the barrier and the lifting points shall be attached to barrier sections shall be approved by the Engineer.
- Surface finishing and grouting where required shall be two parts sand one part cement with enough water to make the mixture plastic. Grouting shall be done in a manner that will ensure full contact between the precast barrier and the grout. The grout shall be considered subsidiary to the various bid items.
- All steel assemblies shall be galvanized after fabrication in accordance with Item 445, Galvanizing.



LOWER CONNECTION PIPE DETAILS
One (1) Steel Pipe required per Lower Assembly.
Two (2) required per joint.

General Notes

- Concrete shall be Class H with a minimum compressive strength of 3,600 psi.
- Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
- Precast barrier length shall be 30 ft. unless otherwise specified on the plans.
- All precast barrier edges shall have a $\frac{1}{4}$ " chamfer or a rounded radius.
- All concrete, reinforcement, joint connection systems, grout etc., as shown, are considered as part of the barrier payment.
- Conduit trough when required shall be shown elsewhere on the plans, or as directed by the Engineer.
- Regardless of the method of handling, barrier lifting points shall be approximately 15 feet from the ends of the barrier and the lifting points shall be attached to barrier sections shall be approved by the Engineer.
- Surface finishing and grouting where required shall be two parts sand one part cement with enough water to make the mixture plastic. Grouting shall be done in a manner that will ensure full contact between the precast barrier and the grout. The grout shall be considered subsidiary to the various bid items.
- All steel assemblies shall be galvanized after fabrication in accordance with Item 445, Galvanizing.



UPPER CONNECTION PIPE DETAILS
One (1) Steel Pipe required per Upper Assembly.
Two (2) required per joint.

General Notes

- Concrete shall be Class H with a minimum compressive strength of 3,600 psi.
- Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
- Precast barrier length shall be 30 ft. unless otherwise specified on the plans.
- All precast barrier edges shall have a $\frac{1}{4}$ " chamfer or a rounded radius.
- All concrete, reinforcement, joint connection systems, grout etc., as shown, are considered as part of the barrier payment.
- Conduit trough when required shall be shown elsewhere on the plans, or as directed by the Engineer.
- Regardless of the method of handling, barrier lifting points shall be approximately 15 feet from the ends of the barrier and the lifting points shall be attached to barrier sections shall be approved by the Engineer.
- Surface finishing and grouting where required shall be two parts sand one part cement with enough water to make the mixture plastic. Grouting shall be done in a manner that will ensure full contact between the precast barrier and the grout. The grout shall be considered subsidiary to the various bid items.
- All steel assemblies shall be galvanized after fabrication in accordance with Item 445, Galvanizing.



CONNECTION PLATE DETAILS
One (1) Steel Plate required per Assembly.
Two (2) required per joint.

General Notes

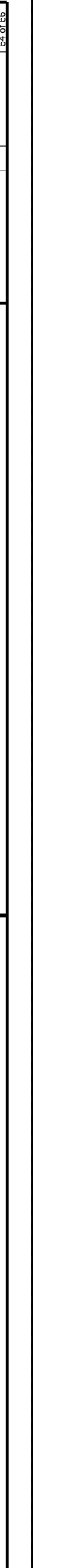
- Concrete shall be Class H with a minimum compressive strength of 3,600 psi.
- Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
- Precast barrier length shall be 30 ft. unless otherwise specified on the plans.
- All precast barrier edges shall have a $\frac{1}{4}$ " chamfer or a rounded radius.
- All concrete, reinforcement, joint connection systems, grout etc., as shown, are considered as part of the barrier payment.
- Conduit trough when required shall be shown elsewhere on the plans, or as directed by the Engineer.
- Regardless of the method of handling, barrier lifting points shall be approximately 15 feet from the ends of the barrier and the lifting points shall be attached to barrier sections shall be approved by the Engineer.
- Surface finishing and grouting where required shall be two parts sand one part cement with enough water to make the mixture plastic. Grouting shall be done in a manner that will ensure full contact between the precast barrier and the grout. The grout shall be considered subsidiary to the various bid items.
- All steel assemblies shall be galvanized after fabrication in accordance with Item 445, Galvanizing.



PLATE DIMENSIONS
One (1) Steel Plate required per Assembly.
Two (2) required per joint.

General Notes

- Concrete shall be Class H with a minimum compressive strength of 3,600 psi.
- Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
- Precast barrier length shall be 30 ft. unless otherwise specified on the plans.
- All precast barrier edges shall have a $\frac{1}{4}$ " chamfer or a rounded radius.
- All concrete, reinforcement, joint connection systems, grout etc., as shown, are considered as part of the barrier payment.
- Conduit trough when required shall be shown elsewhere on the plans, or as directed by the Engineer.
- Regardless of the method of handling, barrier lifting points shall be approximately 15 feet from the ends of the barrier and the lifting points shall be attached to barrier sections shall be approved by the Engineer.
- Surface finishing and grouting where required shall be two parts sand one part cement with enough water to make the mixture plastic. Grouting shall be done in a manner that will ensure full contact between the precast barrier and the grout. The grout shall be considered subsidiary to the various bid items.
- All steel assemblies shall be galvanized after fabrication in accordance with Item 445, Galvanizing.



TYPE X JOINT INSTALLATION DETAIL
Barrier reinforcing and Type X Joint Leave-Out dimensions not shown for clarity.

General Notes

- Concrete shall be Class H with a minimum compressive strength of 3,600 psi.
- Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
- Precast barrier length shall be 30 ft. unless otherwise specified on the plans.
- All precast barrier edges shall have a $\frac{1}{4}$ " chamfer or a rounded radius.
- All concrete, reinforcement, joint connection systems, grout etc., as shown, are considered as part of the barrier payment.
- Conduit trough when required shall be shown elsewhere on the plans, or as directed by the Engineer.
- Regardless of the method of handling, barrier lifting points shall be approximately 15 feet from the ends of the barrier and the lifting points shall be attached to barrier sections shall be approved by the Engineer.
- Surface finishing and grouting where required shall be two parts sand one part cement with enough water to make the mixture plastic. Grouting shall be done in a manner that will ensure full contact between the precast barrier and the grout. The grout shall be considered subsidiary to the various bid items.
- All steel assemblies shall be galvanized after fabrication in accordance with Item 445, Galvanizing.

SINGLE SLOPE CONCRETE BARRIER
PRECAST BARRIER
(TYPE 1)

SSCB(2) - 10

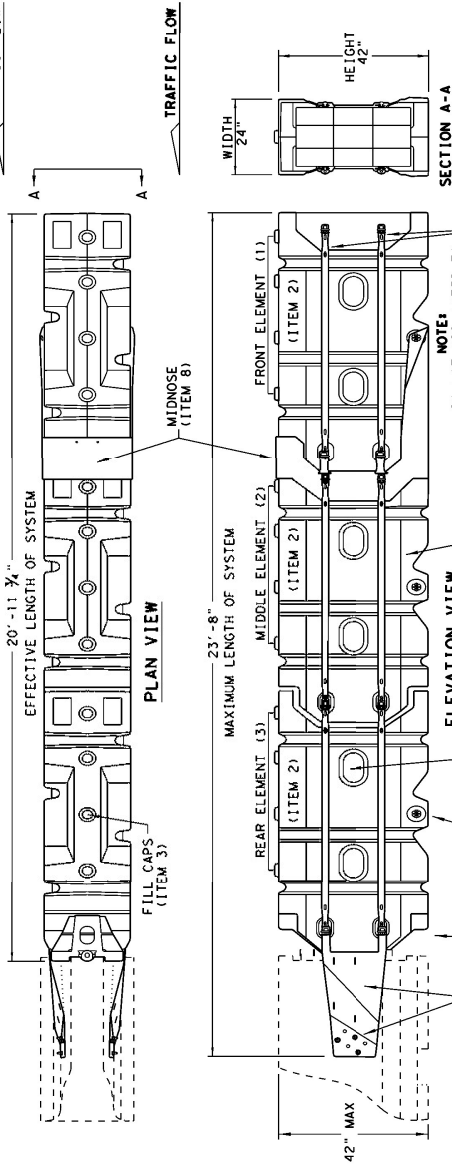
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SINGLE SLOPE CONCRETE BARRIER
PRECAST BARRIER
(TYPE 1)

SSCB(2) - 10

FILED	SSCB(2)-10	DATE	10/10/10	BY	10/10/10
REVISIONS					
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SYSTEM SHOWN - ABSORB-M TL-3

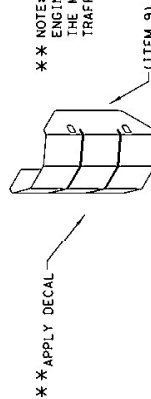


NOTE: TENSION STRAPS (ITEM 5) SECURED WITH BOLTS AND THREAD LOCKING COMPOUND. SEE: * PRE-ASSEMBLED NOTE.

THE ABSORB-M IS A NON-REDIRECTIVE, GATING, CRASH CUSHION DESIGNED TO MEET THE LATEST TL-3 & TL-2 MASH REQUIREMENTS. THE SYSTEM IS DESIGNED TO ACCOMMODATE A VARIETY OF F-SHAPE AND SINGLE SLOPE CONCRETE BARRIERS. CONTACT THE MANUFACTURER FOR GUIDANCE REGARDING OTHER ALLOWABLE SHAPES.

TEST LEVEL	NUMBER OF ELEMENTS	EFFECTIVE LENGTH	MAXIMUM LENGTH
TL-2	2	14' - 7 3/4"	17' - 4"
TL-3	3	20' - 11 3/4"	23' - 8"

NOTE: CROSS SLOPES OF UP TO 8% (OR 1:12 SLOPE) CAN BE ACCOMMODATED WITH STANDARD HARDWARE SHOWN WITHIN THE INSTRUCTIONS MANUAL. FOR SLOPES WITH EXCESS OF 8% (OR 1:12) CONTACT, LINDSAY TRANSPORTATION SOLUTIONS.



** NOTE: (PROVIDED BY OTHERS) ENGINEER OR CONTRACTOR SHALL COORDINATE WITH THE MANUFACTURER FOR THE CORRECT DECAL PER TRAFFIC FLOW, LEFT, RIGHT OR BOTH-SIDES.

DELINEATION DECAL PLACEMENT GUIDE	
	TRAFFIC FLOW LEFT-SIDE BARRIER
	TRAFFIC FLOW BOTH-SIDE BARRIER
	TRAFFIC FLOW RIGHT-SIDE BARRIER

NOTE: APPLY A HIGH REFLECTIVE DECAL TO THE NOSE PLATE. DELINERATION DECAL ORIENTATION IS SHOWN ON THE CONSTRUCTION PLAN SET AND SHALL BE IN ACCORDANCE WITH THE TEXAS MUTCD FOR (TRAFFIC CONTROL DEVICES). DECALS ARE AVAILABLE FOR TRAFFIC FLOW ON THE LEFT-SIDE, BOTH -SIDES AND RIGHT-SIDE.

TRAFFIC FLOW

TRAFFIC FLOW

GENERAL NOTES

- FOR SPECIFIC INFORMATION REGARDING THE INSTALLATION AND TECHNICAL GUIDANCE, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800. 180 RIVER ROAD, RIO VISTA, CA 94571
- THE ABSORB-M SYSTEM IS ONLY APPROVED FOR USE IN (TEMPORARY WORK ZONE) LOCATIONS.
- THE ABSORB-M IS A WATER FILLED NON-REDIRECTIVE, GATING CRASH CUSHION THAT DOES NOT NEED TO BE ATTACHED TO A FOUNDATION AND CAN BE INSTALLED ON TOP OF CONCRETE, ASPHALT, OR ANY SURFACE CAPABLE OF BEARING THE WEIGHT OF THE SYSTEM.
- MAXIMUM PERMISSIBLE CROSS-SLOPE IS 8%.
- THE INSTALLATION AREA SHOULD BE FREE FROM CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
- THE ABSORB-M SHOULD BE LOCATED APPROXIMATELY PARALLEL WITH THE BARRIER.
- THE USE OF THE ABSORB-M IS RESTRICTED TO A BARRIER HEIGHT OF UP TO 42 INCHES.
- DO NOT ADD WATER TO FRONT ELEMENT (TL-2 OR TL-3 UNIT).

BILL OF MATERIALS (BOM) ABSORB-M TL-3 & TL-2 SYSTEMS		QTY	QTY
ITEM #	PART NUMBER	PART DESCRIPTION	TL-2 SYSTEM
1	BSI-1809036-00	TRANSITION-(GALV)	1
2	BSI-1808002-00	PRE-ASSEMBLED ABSORBING (ELEMENTS)	2
3	BSI-4004598	FILL CAPS	8
4	BSI-4004599	DRAIN PLUGS	2
5	BSI-1809053-00	TENSION STRAP-(GALV)	8
6	BSI-2001998	C-SCR FH 3/8-16 X 1 1/2 GR5 PLT	8
7	BSI-2001999	C-SCR FH 3/8-16 X 1 GR5 PLT	8
8	BSI-1809035-00	MIDNOSE-(GALV)	1
9	BSI-1808014-00	NOSE PLATE	1
10	BSI-1809037-00	TRANSITION STRAP (LEFT-HAND)-(GALV)	1
11	BSI-1809038-00	TRANSITION STRAP (RIGHT-HAND)-(GALV)	1
12	BSI-1808005-00	PIN ASSEMBLY	8
13	BSI-2002001	ANC MECH 5/8-11X5 (GALV)	6
14	ABSORB-M	INSTALLATION AND INSTRUCTIONS MANUAL	1

*COMPONENTS PRE-ASSEMBLED WITH ELEMENT ASSEMBLY

NOTE: THIS STANDARD IS A BASIC REPRESENTATION OF THE ABSORB-M. IT IS NOT INTENDED TO REPLACE THE INSTALLATION INSTRUCTIONS MANUAL.

SACRIFICIAL

Design Standard

LINDSAY TRANSPORTATION SOLUTIONS

CRASH CUSHION

(MASH TL-3 & TL-2)

TEMPORARY - WORK ZONE

ABSORB (M) - 19

FILE: absorb19	DATE: JULY 2019	REV: 1
TXDOT: JULY 2019	COM: BCT	JOB: HIGHWAY
REVISIONS	DIST	COUNTY
SHEET NO.	66 OF 66	