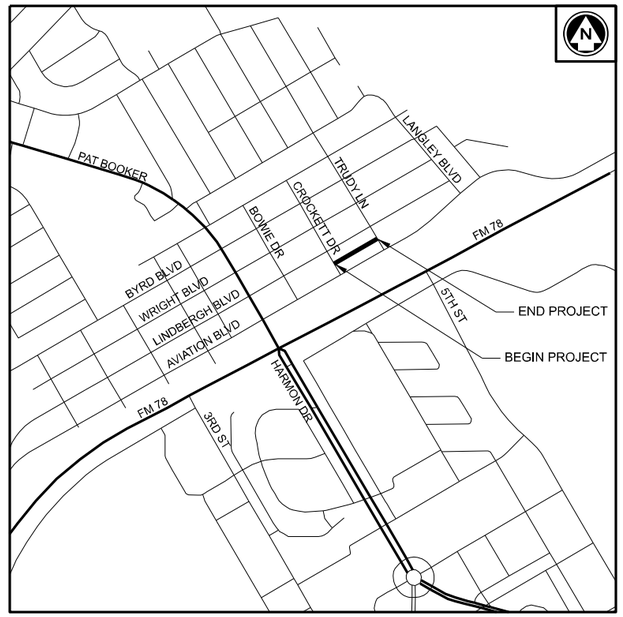
UNIVERSAL CITY

PUBLIC WORKS DEPARTMENT

ALLEY REHAB

BASE BID
ALLEY C-5 : FROM CROCKETT DR TO TRUDY LN

INDEX OF SHEETS



LOCATION MAP
NOT TO SCALE

UNIVERSAL CITY
Est.1960
Gateway to Randolph AFB

JULY 2025

PROJECT SHALL BE GOVERNED BY THE LATEST ADOPTED SPECIFICATIONS OF THE CITY OF UNIVERSAL CITY (DECEMBER 2015 OR MOST RECENT REVISION) AND THE TEXAS DEPARTMENT OF TRANSPORTATION (TXDOT) STANDARD SPECIFICATIONS (NOVEMBER 2014).

MAYOR

TOM MAXWELL

MAYOR PRO-TERM

CHRISTINA FITZPATRICK

COUNCIL

ASHTON BULMAN
BEAR GOOLSBY
BERNARD RUBAL
LORI PUTT
PHIL VAUGHAN

CITY MANAGER

KIM TURNER

DIRECTOR OF PUBLIC WORKS

RANDY LUENSMANN

STATE OF TEXAS
ROBERTO ERAZO, JR.
123437
LICENSED
PROFESSIONAL ENGINEER

7/18/25

PLANS PREPARED BY:

AJL ENGINEERING
9862 LORENE LN, SUITE 108
SAN ANTONIO, TX 78216
T.B.P.E FIRM NO. 14387
210-663-1255

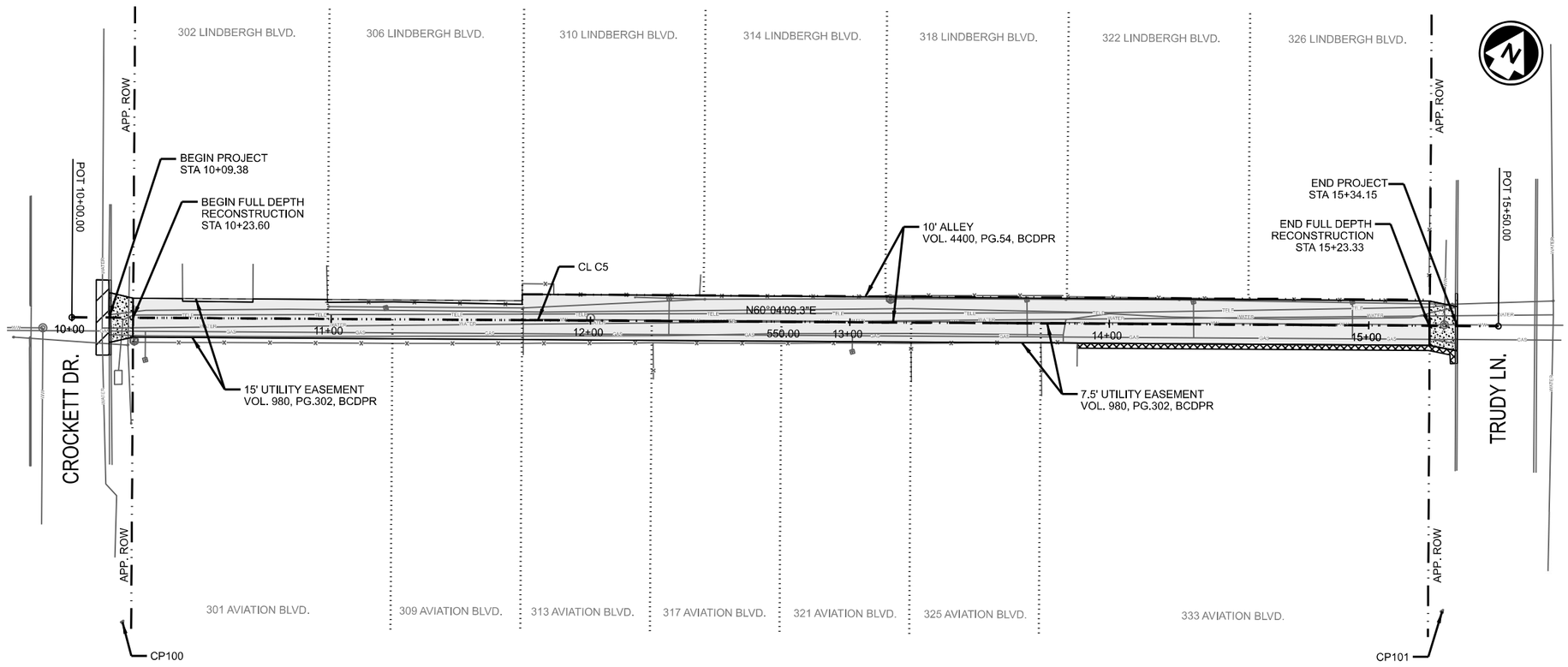
HORIZONTAL ALIGNMENT REPORT

Alignment name: C5
Alignment description:
Report Created: Tuesday, March 11, 2025
Time: 3:19:10 PM

	STATION	X	Y
POT	1000.000 R1	2195491.314	13746955.549
POT	1550.000 R1	2195967.960	13747229.973
Tangential Direction:	N60.069°E		
Tangential Length:	550.000		

PLAN VIEW LEGEND

- EXIST. APPARENT ROW
- EXIST. LOT LINE
- EXIST. FEATURES
- PROP. SIDEWALK
- PROP. CURB
- PROP. DRIVEWAY
- XX DRIVEWAY NUMBER
- PED. RAMP/DETECT. WARNING
- SAWCUT LINE
- FULL DEPTH RECONSTRUCTION
- PAVEMENT TRANSITION (ACP)



CONTROL POINTS				
NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
100	13746863.91	2195567.47	755.87'	MAG NAIL W/ JC WASHER
101	13747124.05	2196004.73	752.19'	MAG NAIL W/ JC WASHER

STATE OF TEXAS
ROBERTO ERAZO, JR.
123437
LICENSED
PROFESSIONAL ENGINEER

7/18/25

0 25 50
SCALE IN FEET

AJL ENGINEERING
9862 LORENE LN, SUITE 108
SAN ANTONIO, TX, 78216
(210) 663 -1255
TBPE FIRM NO. 14387

CITY OF UNIVERSAL CITY
PUBLIC WORKS

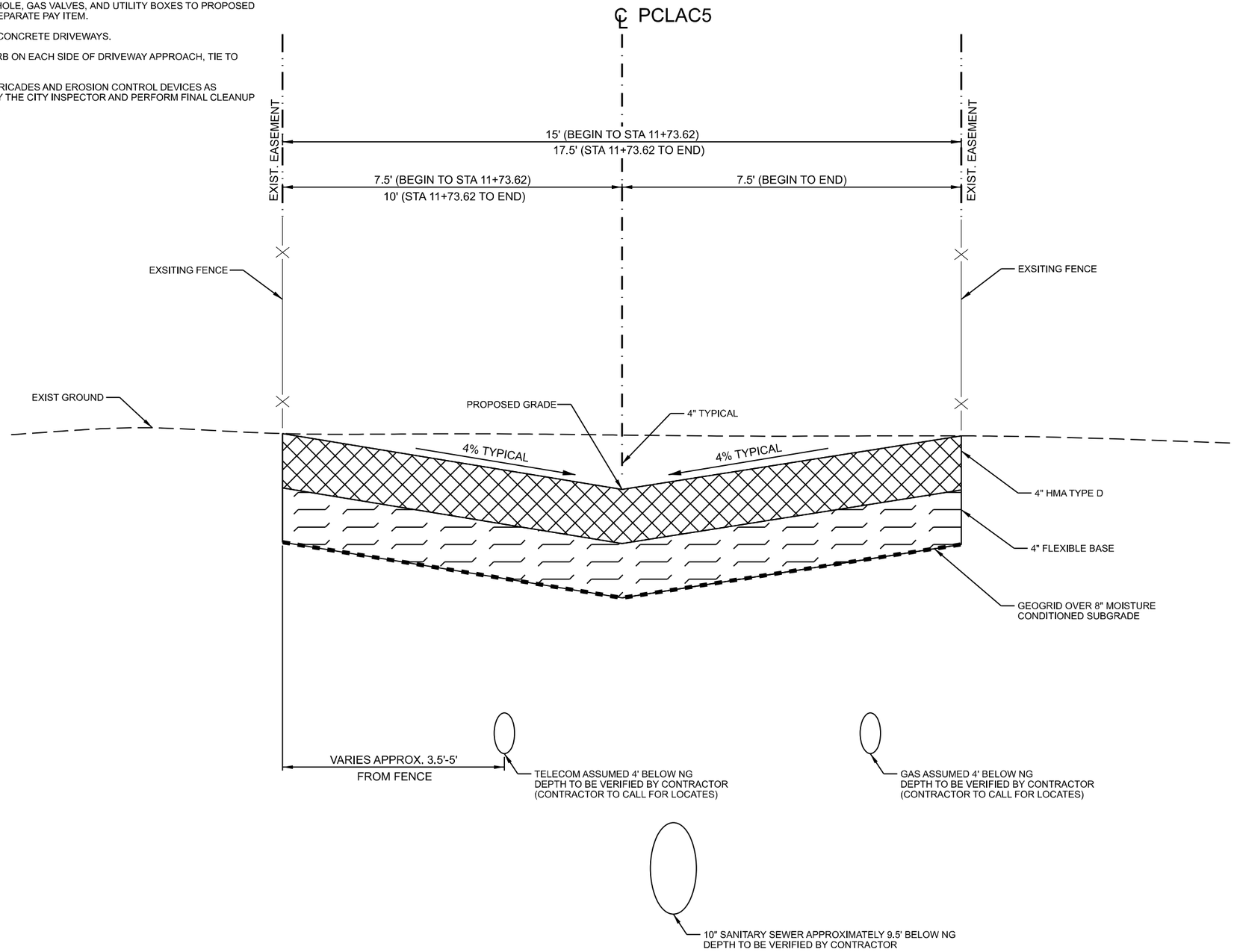
ALLEY REHAB - BASE BID - C5

PROJECT LAYOUT & HALN DATA

100% SUBMITTAL	PROJECT NO.:24-022	DATE: 07/18/2025	SHEET 01 OF 01
DRWN. BY: NL	DSGN. BY: RE	CHKD. BY: AL	SHEET NO.: 002

CONSTRUCTION SEQUENCE OF WORK

1. INSTALL CONSTRUCTION BARRICADES PER TXDOT BC-21 STANDARDS.
2. PLACE PROJECT SIGNS IN ALLEY. ONE NEAR CROCKETT DRIVE AND ON NEAR TRUDY LANE. COORDINATE WITH CITY INSPECTOR FOR FINAL LOCATION.
3. 14'X50' STAGING AREA FOR PROJECT TO BE LOCATED AT 151 E. AVIATION BLVD. LOT OWNED BY THE CITY OF UNIVERSAL CITY. COORDINATE WITH CITY INSPECTOR AS NEEDED. PLACE CONSTRUCTION EXIT ON LINDBERGH BLVD., FOLLOWING TXDOT STANDARD.
4. PLACE TEMPORARY EROSION CONTROL DEVICES.
5. BEGIN ROAD WORK (STA 10+09.38 TO STA 15+34.24).
6. REMOVE EXISTING WATER METER BOXES. NO SEPARATE PAY ITEM.
7. ADJUST MANHOLE, GAS VALVES, AND UTILITY BOXES TO PROPOSED GRADE. NO SEPARATE PAY ITEM.
8. CONSTRUCT CONCRETE DRIVEWAYS.
9. REPLACE CURB ON EACH SIDE OF DRIVEWAY APPROACH, TIE TO EXISTING.
10. REMOVE BARRICADES AND EROSION CONTROL DEVICES AS APPROVED BY THE CITY INSPECTOR AND PERFORM FINAL CLEANUP OPERATIONS.



NOTES:

1. DEPTHS AND LOCATIONS OF EXISTING UTILITIES SHOWN ARE APPROXIMATE.
2. CONTRACTOR SHALL VERIFY LOCATIONS AND DEPTHS OF ALL EXISTING UTILITIES PRIOR TO STARTING ANY WORK.
3. CONTRACTOR IS RESPONSIBLE FOR PROTECTING EXSITING UTILITIES AS REQUIRED FOR INSTALLATION OF PROPOSED IMPROVEMENTS. NO SEPARATE PAY ITEM FOR WORK REQUIRED TO PROTECT EXISTING UTILITIES.
4. ABANDONED WATER MAINS ARE TO REMAIN AS IS.
5. MOISTURE CONDITION 8IN OF EXISTING SUBGRADE PRIOR TO GEOGRID INSTALLATION. NO SEPARATE PAY ITEM FOR THIS WORK.
6. FLOWABLE MAY BE ENCOUNTERED DURING EXCAVATION. NO SEPARATE PAY ITEM FOR REMOVAL REQUIRED TO COMPLETE ALLEY WORK.

STATE OF TEXAS
ROBERTO ERAZO, JR.
123437
LICENSED
PROFESSIONAL ENGINEER

7/18/25

AJL ENGINEERING
9862 LORENE LN, SUITE 108
SAN ANTONIO, TX, 78216
(210) 663 -1255
TBPE FIRM NO. 14387

CITY OF UNIVERSAL CITY
PUBLIC WORKS

ALLEY REHAB - BASE BID - C5

TYPICAL SECTION

100% SUBMITTAL	PROJECT NO.:24-022	DATE: 07/18/2025	SHEET 01 OF 01
DRWN. BY: NL	DSGN. BY: RE	CHKD. BY: AL	SHEET NO.: 003

SUMMARY OF ROADWAY ITEMS

UNIVERSAL CITY	200	201	203	300	400	--	--	--	--	--	--
ITEM NUMBER	RDWY-1	RDWY-2	RDWY-3	RDWY-4	RDWY-5	RDWY-6	RDWY-7	RDWY-8	RDWY-9	RDWY-10	RDWY-11
TXDOT	247	310	3076	530	110	340	354	502	529	502	5001
ITEM NUMBER	6366	6001	6050	6004	6001	6272	6045	6001	6014	6001	6002
LOCATION	4IN FL BS (CMP IN PLC)(TY A GR 5)(FNAL POS)	PRIME COAT (MULTI OPTION)	4IN D-GR HMA TY-D SAC-B PG76-22 (VIRGN MIX)	DRIVEWAYS (CONC)	EXCAVATION (ROADWAY)(8" MOIST. COND. SUBGRADE)	TACK COAT	PLANE ASPH CONC PAV (2")	BARRICADES, SIGNS AND TRAFFIC HANDLING	CONC CURB (MOD)(TYPE I)	DRIVEWAYS (ACP)	GEOGRID BASE REINFORCE. (TY II)
	SY	GAL	SY	SY	CY	GAL	SY	MO	LF	SY	SY
BEGIN TO END	932	187	932	37	270	94	34	2	20	34	932
PROJECT TOTALS	932	187	932	37	270	94	34	2	20	34	932

STATE OF TEXAS
ROBERTO ERAZO, JR.
123437
LICENSED
PROFESSIONAL ENGINEER

7/18/25

AJL ENGINEERING
9862 LORENE LN, SUITE 108
SAN ANTONIO, TX, 78216
(210) 663-1255
TBPE FIRM NO. 14387

CITY OF UNIVERSAL CITY
PUBLIC WORKS

ALLEY REHAB - BASE BID - C5

SUMMARY OF QUANTITIES

100% SUBMITTAL	PROJECT NO.:24-022	DATE: 07/18/2025	SHEET 01 OF 01
DRWN. BY: NL	DSGN. BY: RE	CHKD. BY: AL	SHEET NO.: 004

STREET GENERAL NOTES

1. ALL WORK IS TO BE INSTALLED IN ACCORDANCE WITH STANDARDS OF THE CITY OF UNIVERSAL CITY. MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT WILL CONFORM TO APPLICABLE CITY OF UNIVERSAL CITY SUBDIVIONS REGULATIONS AND, STANDARD SPECIFICATIONS AND DETAILS.

2. FOR ALL REFERENCES TO THE TEXAS DEPARTMENT OF TRANSPORTATION (TXDOT), THE CONTRACTOR SHALL SEE THEIR CURRENT STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS, AND BRIDGES, WHICH IS ALSO LOCATED AT WWW.TXDOT.GOV.

3. ALL CONCRETE SHALL BE AS DETAILED ON THE PLAN SHEETS AND MEET MATERIAL REQUIREMENTS OF TXDOT ITEM 421, "HYDRAULIC CEMENT CONCRETE".

4. ALL REINFORCING STEEL SHALL BE GRADE 60, MEET THE MATERIAL AND CONSTRUCTION REQUIREMENTS OF TXDOT ITEM 440, "REINFORCING STEEL", AND BE LISTED ON THE TXDOT APPROVED LIST OF SUPPLIERS WHICH IS LOCATED AT WWW.TXDOT.GOV.

5. CONCRETE CURING SHALL BE WITH AN IMPERVIOUS MEMBRANE APPLICATION AND SHALL MEET THE MATERIAL AND APPLICATION REQUIREMENTS OF THE CITY OF SAN ANOTNIO "MEMBRANE CURING" AND BE LISTED ON THE TXDOT APPROVED LIST OF SUPPLIERS WHICH IS LOCATED AT WWW.TXDOT.GOV. IN ADDITION TO THE CONTRACTOR APPLYING THE CURING COMPOUND THEY ARE TO INSTALL CONTRACTION/EXPANSION JOINTS ON CONCRETE WORK.

6. ALL CONCRETE CONSTRUCTION AND FINISHING SHALL MEET THE REQUIREMENTS OF TXDOT ITEM 420 "CONCRETE STRUCTURES" FOR PUBLIC WORKS CONSTRUCTION.

7. THE CONTRACTOR IS REQUIRED TO ATTEND A PRE-CONSTRUCTION CONFERENCE AND SHALL SCHEDULE IT WITH THE CITY PUBLIC WORKS DEPARTMENT (RANDY LUENSMANN AT (210) 658-5364) A MINIMUM OF ONE (1) WEEK PRIOR TO BEGINNING CONSTRUCTION.

8. MANHOLES SHALL BE BROKEN BELOW THE FINISH GRADE LEVEL UNTIL THE BASE IS COMPLETED AND THEN RESTORED.

9. THE ENGINEER WILL STAKE THE STREET ONE TIME ONLY AND FURNISH CUT SHEETS TO THE STREET CONTRACTOR; ANY CONSTRUCTION STAKES REMOVED OR DESTROYED BY THE CONTRACTOR OR HIS EMPLOYEES WILL BE REPLACED AT THE CONTRACTOR'S EXPENSE.

10. AN INDEPENDENT TESTING LABORATORY APPROVED BY THE CITY OF UNIVERSAL CITY SHALL PERFORM ALL "FIELD AND LABORATORY TESTING". THE CITY REQUIRES ALL INSPECTION AND/OR TESTING FIRMS TO BE ACCREDITED, QUALIFIED, AND IN COMPLIANCE WITH THE REQUIREMENTS OF ASTM E329, "STANDARD SPECIFICATION FOR AGENCIES ENGAGED IN CONSTRUCTION INSPECTION AND/OR TESTING". FIRMS MUST PRESENT A COPY OF THEIR CURRENT, OFFICIAL ACCREDITATION BY THE AMERICAN ASSOCIATION FOR LABORATORY ACCREDITATION (A2LA) OR THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) AND CURRENT AMRL AND CCRL PROFICIENCY RESULTS. THE FIRMS SHALL BE ACCREDITED IN ALL MATERIAL TEST PROCEDURES REQUIRED TO BE PERFORMED FOR EACH PROJECT.

11. THE CITY SHALL PAY ALL TESTING FOR PUBLIC WORKS PROJECTS UNLESS OTHERWISE AGREED UPON AND APPROVED BY THE CITY. FOR NON- PUBLIC WORKS PROJECTS OR PRIVATE DEVELOPMENTS, THE CONTRACTOR SHALL PAY ALL COSTS OF TESTING. THE FOLLOWING TEST SCHEDULE SHALL BE ADHERED TO:

    A. ALL IMPORT FILL PLACED IN THE STREET'S SUBGRADE SHALL BE SELECT MATERIAL, WITH A PLASTICITY INDEX LESS THAN FIFTEEN (15), AND COMPACTED IN MAXIMUM EIGHT (8) INCH LIFTS TO 98% DENSITY OF TXDOT'S TEST METHOD TEX 113-E. PROVIDE TESTING ON EACH EIGHT (8) INCH COMPACTED LIFT. SUBGRADE MOISTURE DENSITY TESTING SHALL BE AT THE MINIMUM FREQUENCY OF THREE (3) PER BLOCK AND SHALL NOT TO EXCEED FIVE HUNDRED (500) FOOT SPACING.

    B. THE RATE OF LIME TREATED/STABILIZED OF THE SUBGRADE SHALL REDUCE THE PLASTICITY INDEX TO 20 OR LESS OR IN ACCORDANCE WITH THE GEOTECHNICAL RECOMMENDATIONS AND SHALL BE CONSTRUCTED IN ACCORDANCE WITH TXDOT ITEM 260, LIME TREATMENT (ROAD-MIXED).

    C. FLEXIBLE BASE TESTING SHALL INCLUDE – P.I., L.L., GRADATION, AND WET BALL MILL OF MATERIAL SHALL BE TESTED UPON DELIVERY TO THE PROJECT AND AS DIRECTED BY THE CITY. MOISTURE DENSITY TESTING SHALL BE AT THE MINIMUM RATE OF THREE (3) PER BLOCK AND SHALL NOT TO EXCEED FIVE HUNDRED (500) FOOT SPACING. THE QUALITY CONTROL TEST ON THE MATERIALS SHALL BE PERFORMED BY THE CONTRACTOR'S CITY APPROVED TESTING FIRM. IN-PLACE DENSITY SHALL MEET THE REQUIREMENTS DETAILED IN THE CITY'S SUBDIVISION REGULATIONS.

    D. HOT AND WARM MIX ASPHALTIC CONCRETE (HMAC/WMAC) DENSITY – IN PLACE DENSITY TESTING SHALL RESULT BETWEEN 92% AND 97% OF THE MAXIMUM THEORETICAL GRAVITY PER TEX 207-F. A SET OF TWO (2) CORES SHALL BE RANDOMLY SAMPLED AT A DISTANCE NOT TO EXCEED FIVE HUNDRED (500) FOOT SPACING PER BLOCK. ALL QUALITY CONTROL NUCLEAR TESTING OF THE IN-PLACE HMAC/WMAC IS FOR QUALITY CONTROL INFORMATION ONLY. THE HMAC/WMAC THICKNESS IS REQUIRED TO BE MEASUREMENT BY CORE. FIELD QUALITY CONTROL PERSONNEL SHALL BE TXDOT LEVEL IB CERTIFIED AND BE PRESENT AT START AND THROUGH THE DURATION OF THE PLACEMENT OPERATONS OF THE HMAC/WMAC TO DOCUMENT DENSITY, THICKNESS, AND COMPACTION AND PLACEMENT OPERATIONS. THE CITY WILL DETERMINE THE REMOVAL AND REPLACEMENT OF ALL FAILED PRODUCTION AND PLACEMENT HMAC/WMAC TEST RESULTS.

    E. RECYCLED ASPHALT SHINGLES (RAS) SHALL NOT BE USED IN ANY HMAC OR WMAC MIXES.

    F. CONCRETE STRUCTURES – A MINIMUM OF ONE (1) SET OF COMPRESSIVE CONCRETE STRENGTH TEST OF 4, SIX (6) INCH DIAMETER CYLINDERS EACH WILL BE TESTED PER EACH STRUCTURE AND THE FREQUNCY SHALL BE NO LESS THAN ONE (1) SET PER SIXTY (60) CUBIC YARDS OF CONCRETE PLACED AND AT LEAST ONE (1) SET PER DAY.

    G. CONCRETE CURB AND SIDEWALK – PROVIDE ONE (1) SET OF FOUR (4), SIX (6) INCH DIAMETER CYLINDERS PER EACH 500 LINEAR FEET OF CURB AND/OR SIDEWALK AND AT LEAST ONE (1) SET PER DAY.

    H. THE CONTRACTOR SHALL SUBMIT CONCRETE, WMAC, AND HMAC DESIGNS A MINIMUM OF 2 WEEKS PRIOR TO THE PLACEMENT OF THE MATERIAL.

12. ALL SUBGRADE AND FLEXIBLE BASE MATERIALS SHALL BE PROOF ROLLED WITH A HEAVY PNEUMATIC ROLLER (MINIMUM 25 TONS) IN CONFORMANCE WITH TXDOT ITEM 216, "PROOF ROLLING" AND COMPACTED TO THE DENSITY REQUIREMENT SHOWN IN THE CITY OF UC ITEM 200, "FLEXIBLE BASE". TESTS FOR DENSITY WILL BE PERFORMED WITHIN TWENTY-FOUR (24) HOURS AFTER COMPACTION OPERATIONS ARE COMPLETED. IF THE MATERIAL FAILS TO MEET THE DENSITY SPECIFIED, IT SHALL BE REWORKED AS NECESSARY TO OBTAIN THE DENSITY REQUIRED. THE CONTRACTOR SHALL MAINTAIN A MOIST BASE SURFACE AFTER IT HAS BEEN TESTED UNTIL THE NEXT PAVEMENT LAYER IS CONTRUCTED. SOFT AND YIELDING AREAS DISCOVERED SHALL BE CORRECTED BY THE CONTRACTOR AT THEIR EXPENSE.

13. SURFACE STRUCTURES SUCH AS MAILBOXES, STREET SIGNS, FENCES, DRIVEWAYS, SIDEWALKS, LANDSCAPING, CONCRETE ISLANDS, CURBS OR CONCRETE DRIVEWAYS, ETC., VISIBLE AT THE TIME OF THE SURVEY ARE SHOWN ON THE PLANS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SAFEGUARD AND MAINTAIN ANY AND ALL SURFACE STRUCTURES DURING THE COURSE OF WORK AND TO REPLACE OR REPAIR THOSE ITEMS WHICH ARE DAMAGED BY THE CONTRACTOR WITH LIKE OR BETTER QUALITY AND SHALL BE RESPONSIBLE FOR RESTORING TO ITS ORIGINAL OR BETTER CONDITION (NO SEPARATE PAY ITEM).

14. LOCATIONS AND DEPTHS OF EXISTING UTILITIES SHOWN ON THE PLANS ARE UNDERSTOOD TO BE APPROXIMATE. ACTUAL LOCATIONS MUST BE FIELD VERIFIED BY THE CONTRACTOR AT LEAST 48 HOURS PRIOR TO CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, PROTECT THEM DURING CONSTRUCTION AND REPAIR ANY DAMAGE TO OTHER UTILITIES AT NO COST TO THE CITY OF UNIVERSAL CITY.

15. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SEE THAT ALL SIGNS AND BARRICADES ARE PROPERLY INSTALLED AND MAINTAINED. ALL LOCATIONS AND DISTANCES WILL BE DECIDED UPON IN THE FIELD BY THE CONTRACTOR, USING THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES. THE CITY'S CONSTRUCTION INSPECTOR/TRAFFIC ENGINEERING REPRESENTATIVE WILL ONLY BE RESPONSIBLE TO INSPECT BARRICADES AND SIGNS. IF IN THE OPINION OF THE TRAFFIC ENGINEERING REPRESENTATIVE/ CONSTRUCTION INSPECTOR, THE TRAFIC CONTROL DEVICES DO NOT CONFORM TO ESTABLISHED STANDARDS, ARE INCORRECTLY PLACED OR INSUFFICIENT IN QUANTITY TO PROTECT THE TRAVELING GENERAL PUBLIC, THE CONSTRUCTION INSPECTOR WILL HAVE THE OPTION OF STOPPING THE OPERATIONS UNTIL SUCH TIME AS THE CONDITIONS ARE CORRECTED AT NO EXPENSE TO THE CITY OF UNIVERSAL CITY.

16. CITY TO FURNISH AND INSTALL STREET NAME SIGNS, STOP SIGNS, SPEED LIMIT, YIELD SIGNS, ETC. DEVELOPER SHALL REIMBURSE CITY FOR MATERIAL AND LABOR COSTS.

17. THE STREET CONTRACTOR IS REQUIRED TO ADJUST ALL EXISTING MANHOLES (SEE "ADJUSTING EXISTING MANHOLES" OF THE SPECIFICATION) AND WATER VALVES TO MATCH THE GRADE OF THE STREET SECTION OR THE ELEVATION SPECIFIED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

18. DUE TO FEDERAL REGULATIONS TITLE 49, PART 192.181 ACCESS TO GAS VALVES MUST BE MAINTAINED AT ALL TIMES. THE CONTRACTOR MUST PROTECT AND WORK AROUND ANY GAS VALVES THAT ARE IN THE PROJECT AREA.

19. CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF UNDERGROUND UTILITIES AND OTHER UNDERGROUND STRUCTURES WHETHER SHOWN ON THE PLANS OR NOT. CONTRACTOR WILL NOTIFY ALL UTILITY COMPANIES AT LEAST 72 HOURS PRIOR TO EXCAVATION.

CITY OF UNIVERSAL CITY	(210) 658-5364
WATER AND SANITARY SEWER	(210) 658-5365
STORM DRAIN	(210) 658-5364
DIG TESS	1-800-344-8377
TEXAS STATEWIDE ONE CALL LOCATORS	1-800-545-6005 OR 811
COSA TRAFFIC SIGNAL OPERATIONS	(210) 207-7720
CITY PUBLIC SERVICE (ELECTRIC AND GAS)	
TIME WARNER CABLE	
AT&T	
MCI	
VERIZON	

20. CONCRETE CURB SHALL BE CONSTRUCTED WITH A MAXIMUM OF EIGHTY (80) FEET BETWEEN EXPANSION JOINTS AND MARKED AT TEN (10) FOOT INTERVALS WITH APPROVED STEEL MARKING TOOLS. EXPANSION JOINTS SHALL BE PLACED AT THE BEGINNING OF ALL RADII AND AT A MAXIMUM OF EIGHTY (80) FOOT INTERVALS AS DIRECTED BY THE ENGINEER.

21. THE CONTRACTOR SHALL NOTIFY THE CITY PUBLIC WORKS DEPARTMENT (PUBLIC WORKS DIRECTOR OR HIS AUTHORIZED REPRESENTATIVE AT 658-5364) PRIOR TO PLACING BACKFILL OR CONCRETE AND PRIOR TO ANY TESTING. CONTRACTOR SHALL REQUEST INPECTIONS A MINIMUM OF 24 HOURS IN ADVANCE. NO INSPECTIONS ARE AVAILABLE BETWEEN 12:00 P.M. AND 1:00 P.M. OR AFTER 4:00 P.M. DAILY, ON WEEKENDS, OR ON CITY HOLIDAYS.

22. CONCRETE SIDEWALKS SHALL HAVE TOOLED WEAKENED PLANE JOINTS EVERY FOUR (4) FEET AND DOWELED EXPANSION JOINT WITH ONE QUARTER INCH (¼) BITUMASTIC MATERIAL SEVENTY FIVE FEET (75) ON CENTER AND ABUTTING EXISTING STRUCTURES.

23. ALL WORKMANSHIP AND MATERIAL SHALL CONFORM TO THE CITY OF UNIVERSAL CITY ORDINANCES FOR PUBLIC WORKS CONSTRUCTION AND TXDOT ITEMS 5 AND 6.

24. CONTRACTOR SHALL INSTALL CURB FOR HANDICAP RAMPS AS SHOWN ON THE PLANS AND ADA STANDARD PLAN SHEETS.

25. CONTRACTOR SHALL PROVIDE BRASS KEYS TO BE USED TO OPEN LOCKING MANHOLE COVERS ON DRAINAGE STRUCTURES DURING PRELIMINARY INSPECTION FOR ACCEPTANCE OF PROJECT.

26. ALL TRENCHES PART OF A ROADWAY RECONSTRUCTION OR PROPOSED ROADWAY PROJECT ARE TO BE BACKFILLED AND COMPACTED AS NOTED IN UNIVERSAL CITY STANDARD SPECIFICATIONS AND STANDARD DRAWINGS.

27. WHEN UNDER PAVEMENT, ALL UTILITY TRENCHES NOT PART OF A ROADWAY RECONSTRUCTION OR PROPOSED ROADWAY PROJECT ARE TO BE BACKFILLED WITH FLOWABLE FILL FOR THE SECONDARY BACKFILL UP TO THE BOTTOM OF THE BASE MATERIAL GRADE, UNLESS OTHERWISE DIRECTED BY THE CITY. MATCH EXISTING PAVEMENT TYPE, REINFORCEMENT (FOR CONCRETE PAVEMENTS), AND THICKNESS.

28. REMOVE EXISTING CURB ON ALL NEW DRIVEWAYS AND PLACE THE COMPLETE PAVEMENT THICKNESS WITH A MINIMUM OF FIVE (5) INCHES THICKNESS ON RESIDENTIAL AND SIX (6) INCHES MINIMUM ON COMMERCIAL; DEPENDING ON TRAFFIC WEIGHT.

29. CONCRETE PLACED IN NEW DRIVEWAYS INCLUDING ALLEY'S SHALL MEET A MINIMUM 3,000 PSI COMPRESSIVE STRENGTH AT 28 DAYS.

30. EXCESS MATERIAL IS TO BE DISPOSED OF AS DIRECTED BY THE ENGINEER. NO EXCESS MATERIAL SHALL BE DUMPED OR ALLOWED TO ENTER ANY WATERWAY, CULVERT OR OTHER DRAINAGE STRUCTURE. THE CONTRACTOR SHALL NOT PLACE ANY MATERIAL IN THE 100-YEAR FLOODPLAIN WITHOUT OBTAINING AN APPROVED FLOOD PLAIN PERMIT.

31. ANY WORK COMPLETED WITHOUT PRIOR AUTHORIZATION WHETHER INCLUDED IN THE PLANS AND SPECIFICATIONS OR NOT, SHALL NOT BE COMPENSATED BY THE CITY OF UNIVERSAL CITY.

32. IF THE STREET HAS BEEN CONSTRUCTED AND ACCEPTED, ANY NEW OPEN CUT UTILITY TRENCHES SHALL USE FLOWABLE FILL CONSTRUCTED TO THE BOTTOM OF THE SURFACE LAYER. NO OPEN CUT TRENCHES WILL BE ALLOWED ON ANY STREET LESS THAN TWO (2) YEARS OF AGE. IF THE OPEN CUT TRENCH IS REQUIRED AND APPROVED, THE UTILITY ENTITY WILL MILL AND OVERLAY THE ENTIRE STREET BLOCK AS DIRECTED BY THE ENGINEER.

33. ALL UTILITY INSTALLATIONS PLANNED FOR A DEVELOPMENT WILL REQUIRE PROGRESS MEETINGS WITH THE CITY OF UC STAFF THROUGHOUT THE DESIGN OF THE UTILITY PLANS. UPON SUBMITTAL OF THE FINAL ROADWAY DESIGN PLANS, THE UTILITY COMPANY MUST SUBMIT THEIR SET OF PLANS AND THE PRIME CONSULTING FIRM WILL CREATE A MASTER UTILITY SHEET(S) COORDINATING THE HORIZONTAL AND VERTICAL ALIGNMENTS AND ANY JOINT VENTURES.

34. ALL UTILITY COMPANIES ARE RQUIRED TO SUBMIT A LETTER STATING THEY HAVE COMPLETED ONE HUNDRED (100) PERCENT INSTALLATION OF THEIR SYSTEM PRIOR TO THE PRIME CONTRACTOR'S PLACEMENT OF THE FINAL PAVEMENT'S SURFACE COURSE.

STATE OF TEXAS
ROBERTO ERAZO, JR.
123437
LICENSED
PROFESSIONAL ENGINEER

7/18/25

AJL ENGINEERING
9862 LORENE LN, SUITE 108
SAN ANTONIO, TX, 78216
(210) 663 -1255
TBPE FIRM NO. 14387

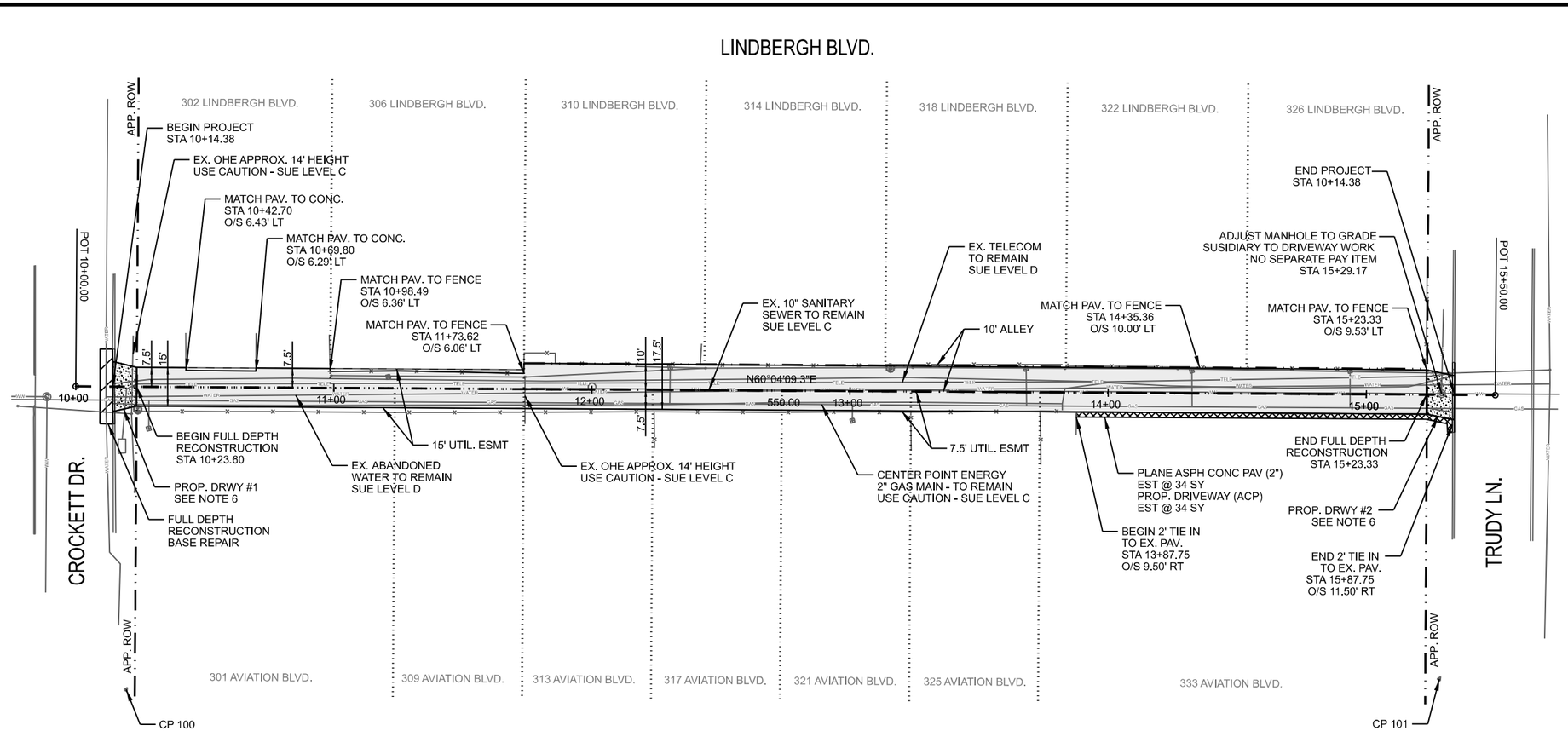
UNIVERSAL CITY

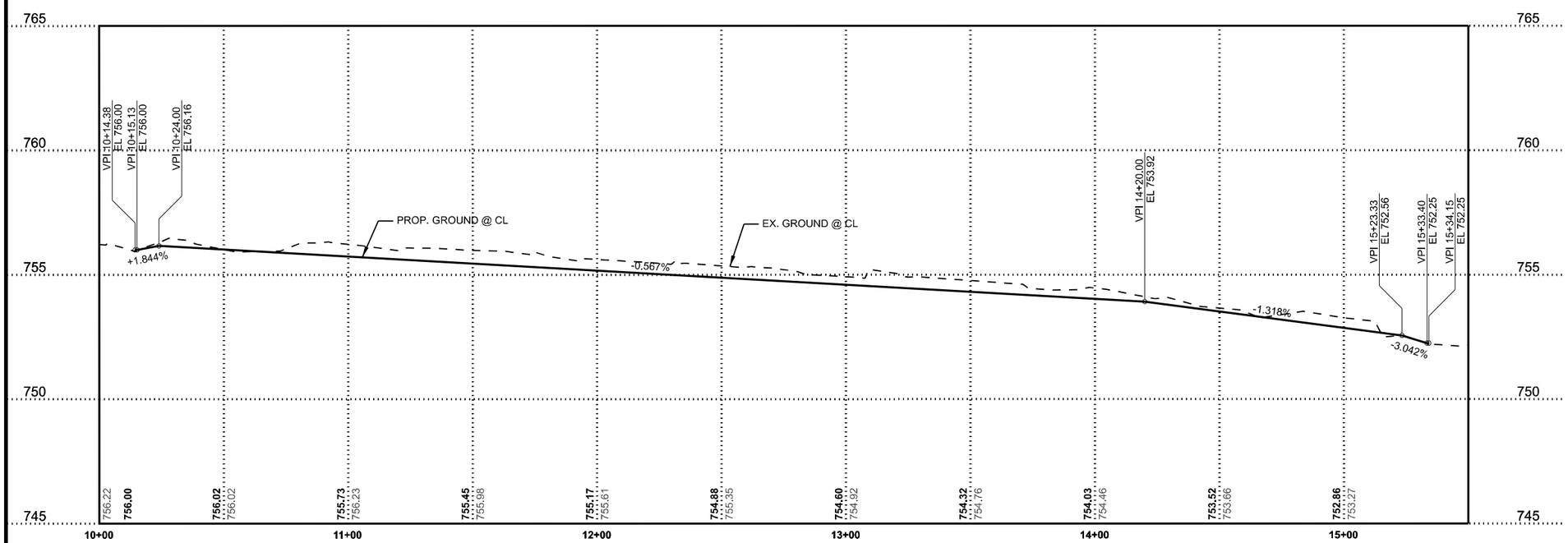
CITY OF UNIVERSAL CITY
PUBLIC WORKS

ALLEY REHAB - BASE BID - C5

GENERAL NOTES

100% SUBMITTAL	PROJECT NO.:24-022	DATE: 07/18/2025	SHEET 01 OF 01
DRWN. BY: NL	DSGN. BY: RE	CHKD. BY: AL	SHEET NO.: 005





PLAN VIEW LEGEND

- EXIST. APPARENT ROW
- EXIST. LOT LINE
- EXIST. FEATURES
- PROP. SIDEWALK
- PROP. CURB
- PROP. DRIVEWAY
- DRIVEWAY NUMBER (XX)
- PED. RAMP/DETECT. WARNING
- SAWCUT LINE
- FULL DEPTH RECONSTRUCTION
- PAVEMENT TRANSITION (ACP)

NOTES:

1. CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES PRIOR TO EXCAVATION. IT IS THE CONTRACTORS RESPONSIBILITY TO PROTECT ALL UTILITIES DURING CONSTRUCTION. NO SEPERATE PAY ITEM FOR THIS WORK.
2. DAMAGES TO EXISTING UTILITIES, SIDEWALKS, DRIVEWAYS OR ANY OTHER FACILITY SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND THEREFORE THE CONTRACTOR SHALL REPLACE/FURNISH/INSTALL AT CONTRACTORS OWN EXPENSE.
3. CONTRACTOR TO BRACE POWER POLES AS NEEDED TO COMPLETE WORK. NO SEPARATE PAY ITEM PROVIDED FOR POWER POLE BRACING.
4. REFER TO THE CITY OF UNIVERSAL CITY STANDARD SPECIFICATIONS AND STANDARD DETAILS, OR LATEST REVISION THEREOF, FOR THE ALLEY REHABILITATION PROJECT.
5. MAINTAIN DRIVEWAY AND INTERSECTION ACCESS AT ALL TIMES. COORDINATE WITH CITY REPRESENTATIVE TO SCHEDULE ANY CLOSURES NEEDED.
6. SEE ALLEY MISCELLANEOUS DETAILS FOR DRIVEWAY APPROACH AND CURB DETAILS.

STATE OF TEXAS
ROBERTO ERAZO, JR.
123437
LICENSED
PROFESSIONAL ENGINEER

7/18/25

SCALE IN FEET: 0 25 50

AJL ENGINEERING
9862 LORENE LN, SUITE 108
SAN ANTONIO, TX, 78216
(210) 663 -1255
TBPE FIRM NO. 14387

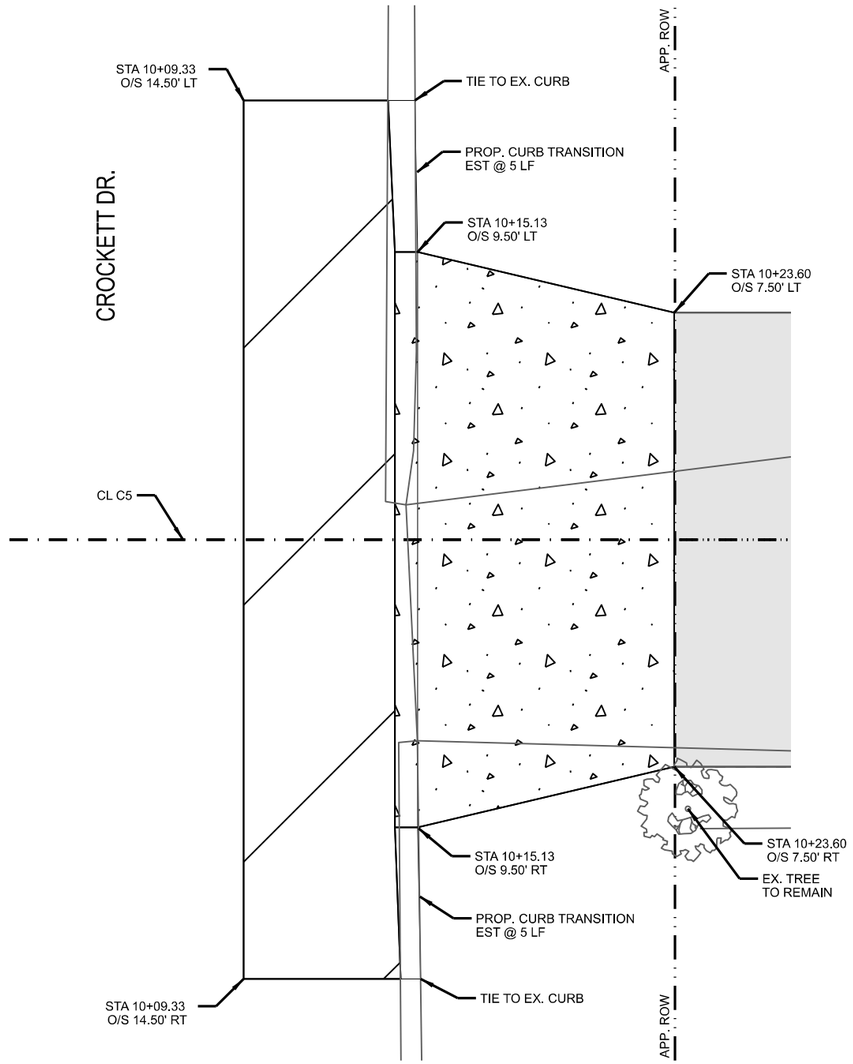
CITY OF UNIVERSAL CITY
PUBLIC WORKS

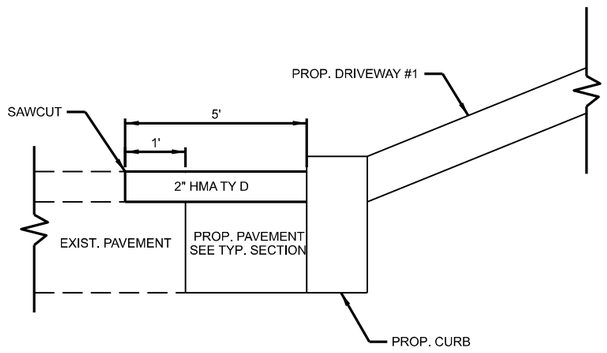
ALLEY REHAB - BASE BID - C5

ALLEY C5 : PLAN & PROFILE

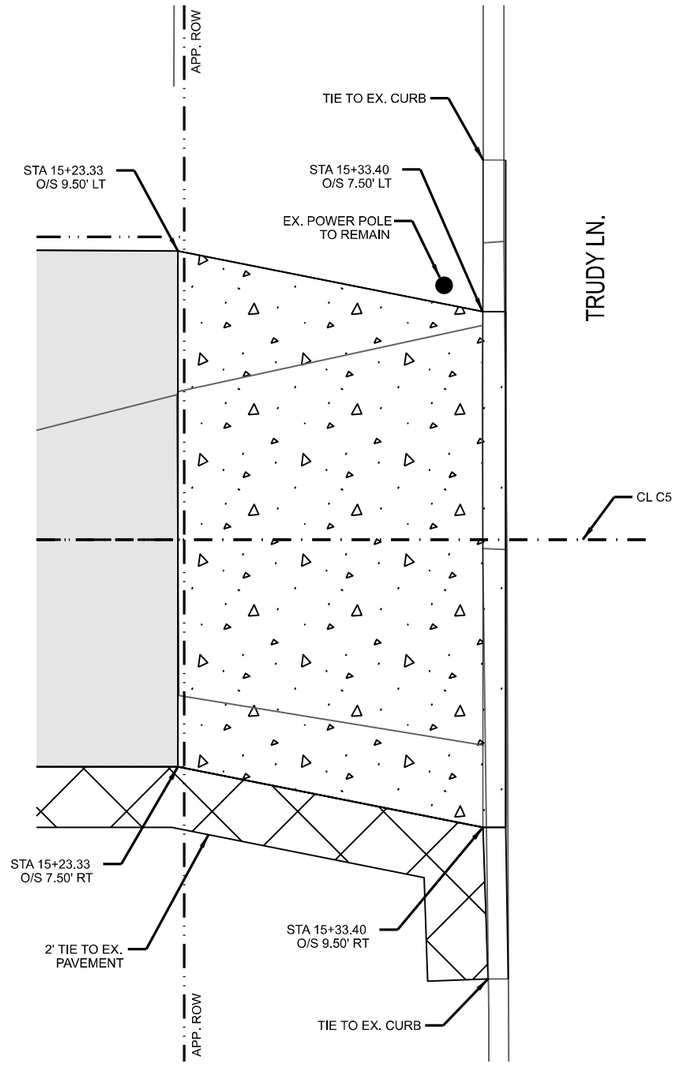
CROCKETT DR TO TRUDY LN

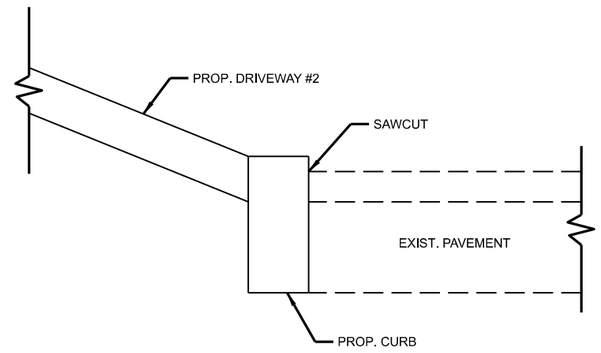
100% SUBMITTAL	PROJECT NO.:24-022	DATE: 07/18/2025	SHEET 01 OF 01
DRWN. BY: NL	DSGN. BY: RE	CHKD. BY: AL	SHEET NO.: 006





DRIVEWAY #1 APPROACH





DRIVEWAY #2 APPROACH

PLAN VIEW LEGEND

- EXIST. APPARENT ROW
- EXIST. LOT LINE
- EXIST. FEATURES
- PROP. SIDEWALK
- PROP. CURB
- PROP. DRIVEWAY
- XX DRIVEWAY NUMBER
- PED. RAMP/DETECT. WARNING
- SAWCUT LINE
- FULL DEPTH RECONSTRUCTION
- PAVEMENT TRANSITION (ACP)

STATE OF TEXAS
ROBERTO ERAZO, JR.
123437
LICENSED
PROFESSIONAL ENGINEER

7/18/25

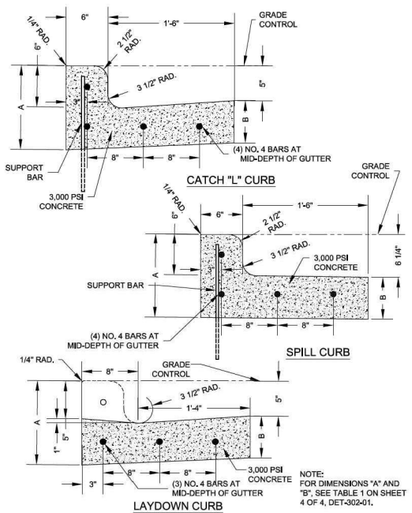
AJL ENGINEERING
9862 LORENE LN, SUITE 108
SAN ANTONIO, TX, 78216
(210) 663 -1255
TBPE FIRM NO. 14387

CITY OF UNIVERSAL CITY
PUBLIC WORKS

ALLEY REHAB - BASE BID - C5

ALLEY MISC. DETAILS

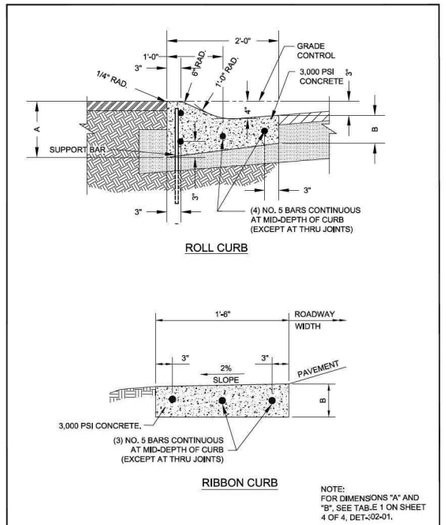
100% SUBMITTAL	PROJECT NO.:24-022	DATE: 07/18/2025	SHEET 01 OF 01
DRWN. BY: NL	DSGN. BY: RE	CHKD. BY: AL	SHEET NO.: 007



NOTE:
FOR DIMENSIONS "A" AND "B", SEE TABLE 1 ON SHEET 4 OF 4, DET-302-01.

CITY OF UNIVERSAL CITY DEPARTMENT OF PUBLIC WORKS	ADOPTED 9/19/11 REVISED 10/1/18
CATCH "L" CURB, SPILL CURB, AND LAYDOWN CURB	STANDARD NO. DET-302-01
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD. RECORD COPY SIGNED BY RANDY LIEBERMANN, PUBLIC WORKS DIRECTOR.	1 OF 4

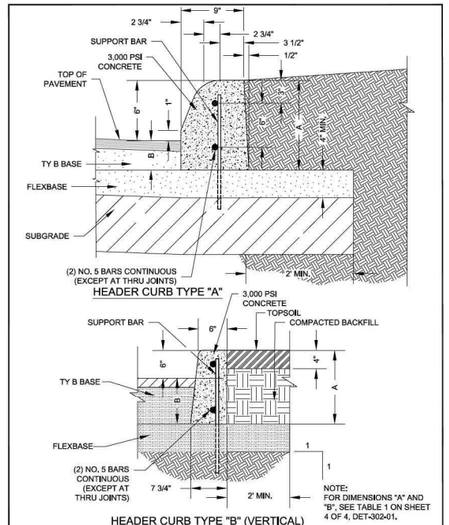
16



NOTE:
FOR DIMENSIONS "A" AND "B", SEE TABLE 1 ON SHEET 4 OF 4, DET-302-01.

CITY OF UNIVERSAL CITY DEPARTMENT OF PUBLIC WORKS	ADOPTED 9/19/11 REVISED 10/1/18
ROLL CURB AND RIBBON CURB	STANDARD NO. DET-302-01
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD. RECORD COPY SIGNED BY RANDY LIEBERMANN, PUBLIC WORKS DIRECTOR.	2 OF 4

17



NOTE:
FOR DIMENSIONS "A" AND "B", SEE TABLE 1 ON SHEET 4 OF 4, DET-302-01.

CITY OF UNIVERSAL CITY DEPARTMENT OF PUBLIC WORKS	ADOPTED 9/19/11 REVISED 10/1/18
HEADER CURB TYPE "A" AND TYPE "B"	STANDARD NO. DET-302-01
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD. RECORD COPY SIGNED BY RANDY LIEBERMANN, PUBLIC WORKS DIRECTOR.	3 OF 4

18

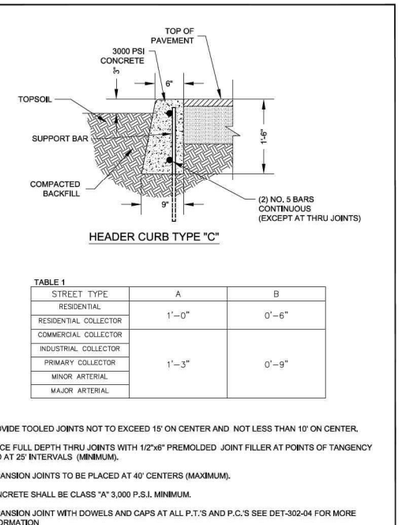


TABLE 1

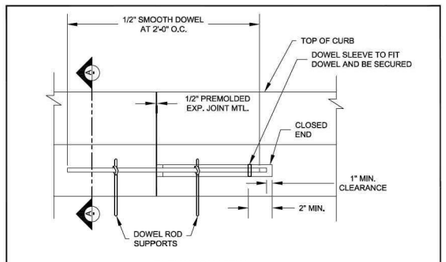
STREET TYPE	A	B
RESIDENTIAL	1'-0"	0'-6"
RESIDENTIAL COLLECTOR		
COMMERCIAL COLLECTOR	1'-3"	0'-9"
INDUSTRIAL COLLECTOR		
PRIMARY COLLECTOR		
MINOR ARTERIAL		
MAJOR ARTERIAL		

NOTES:

1. PROVIDE TOOLED JOINTS NOT TO EXCEED 15' ON CENTER AND NOT LESS THAN 10' ON CENTER.
2. PLACE FULL DEPTH THRU JOINTS WITH 1/2"x6" PREMOLDED JOINT FILLER AT POINTS OF TANGENCY AND AT 25' INTERVALS (MINIMUM).
3. EXPANSION JOINTS TO BE PLACED AT 40' CENTERS (MAXIMUM).
4. CONCRETE SHALL BE CLASS "A" 3,000 P.S.I. MINIMUM.
5. EXPANSION JOINT WITH DOWELS AND CAPS AT ALL P.T.'S AND P.C.'S SEE DET-302-04 FOR MORE INFORMATION

CITY OF UNIVERSAL CITY DEPARTMENT OF PUBLIC WORKS	ADOPTED 9/19/11 REVISED 5/2/18
HEADER CURB TYPE "C"	STANDARD NO. DET-302-01
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD. RECORD COPY SIGNED BY RANDY LIEBERMANN, PUBLIC WORKS DIRECTOR.	4 OF 4

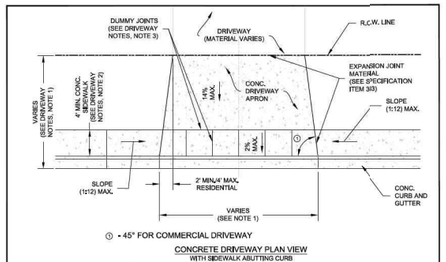
19



NOTE:
FOR DIMENSIONS "A" AND "B", SEE TABLE 1 ON SHEET 4 OF 4, DET-302-01.

CITY OF UNIVERSAL CITY DEPARTMENT OF PUBLIC WORKS	ADOPTED 9/19/11 REVISED 9/19/18
CURB EXPANSION JOINT AND DOWEL	STANDARD NO. DET-302-02
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD. RECORD COPY SIGNED BY RANDY LIEBERMANN, PUBLIC WORKS DIRECTOR.	1 OF 1

20



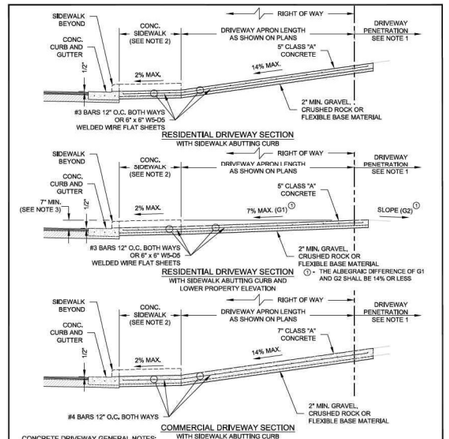
CONCRETE DRIVEWAY GENERAL NOTES:

1. THE PROPOSED DRIVEWAY SHOULD MATCH THE EXISTING WIDTH AT THE PROPERTY LINE. THE ACCESS WIDTH SHALL BE WITHIN THE FOLLOWING VALUES:

USE CLASSIFICATION	STANDARD	MAX. ACCESS WIDTH	FLARE DIMENSION MIN.	FLARE DIMENSION MAX.
SINGLE FAMILY RESIDENTIAL	ONE-CAR GARAGE TWO-CAR GARAGE THREE-CAR GARAGE	16 FEET 25 FEET 32 FEET	2'-0"	4'-0"
TWO-FAMILY RESIDENTIAL, R2-R4	2, ONE-CAR GARAGE 2, TWO-CAR GARAGES	25 FEET 40 FEET	2'-0"	4'-0"
TOWNHOUSE (3 STORIES HIGH OR LESS)	TWO-CAR GARAGE	25 FEET	2'-0"	4'-0"
GROUP HOMES		25 FEET	2'-0"	4'-0"
4-PLEX		25 FEET 40 FEET	2'-0"	4'-0"
COMMERCIAL (TWO-WAY DRIVE) APARTMENT COMPLEX (TWO-WAY DRIVE)	RECOMMENDED MINIMUM MAXIMUM (UP TO 175' FRONTAGE) MAXIMUM (GREATER THAN 175' FRONTAGE)	30 FEET 25 FEET 35 FEET 52 FEET	45°	45°
COMMERCIAL (ONE-WAY DRIVE) APARTMENT COMPLEX (ONE-WAY DRIVE)	RECOMMENDED (INGRESS) RECOMMENDED (EGRESS) MINIMUM MAXIMUM	18 FEET 18 FEET 16 FEET 25 FEET	45°	45°

CITY OF UNIVERSAL CITY DEPARTMENT OF PUBLIC WORKS	ADOPTED 9/19/11 REVISED 9/19/18
DRIVEWAY TYPE 1 (SIDEWALK ABUTTING CURB)	STANDARD NO. DET-302-08
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD. RECORD COPY SIGNED BY RANDY LIEBERMANN, PUBLIC WORKS DIRECTOR.	1 OF 3

30



CONCRETE DRIVEWAY GENERAL NOTES:

1. DRIVEWAY PENETRATION REFERS TO A PORTION OF THE DRIVEWAY WITHIN PRIVATE PROPERTY THAT MAY BE NECESSARY FOR RECONSTRUCTION TO COMPLY WITH A MAXIMUM DRIVEWAY SLOPE.
2. FOR TYPICAL RESIDENTIAL TYPE STREETS, SIDEWALKS SHALL HAVE A MINIMUM WIDTH OF FOUR (4) FEET. FOR COMMERCIAL OR STREETS OTHER THAN TYPICAL RESIDENTIAL STREETS, THE SIDEWALK SHALL BE A MINIMUM WIDTH OF SIX (6) FEET. WHERE THE CITY HAS DESIGNATED A BIKE ROUTE, THE CITY MAY REQUIRE AN EIGHT (8') CONCRETE SIDEWALK FOR DUAL PURPOSES.
3. THE MINIMUM SEVEN (7') INCHES HEIGHT WILL NOT NECESSARILY OCCUR AT THE PROPERTY LINE. IT MAY OCCUR WITHIN THE RIGHT OF WAY OR WITHIN THE DRIVEWAY PENETRATION ON PRIVATE PROPERTY.

CITY OF UNIVERSAL CITY DEPARTMENT OF PUBLIC WORKS	ADOPTED 9/19/11 REVISED 9/19/18
DRIVEWAY TYPE 1 (SIDEWALK ABUTTING CURB)	STANDARD NO. DET-302-08
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD. RECORD COPY SIGNED BY RANDY LIEBERMANN, PUBLIC WORKS DIRECTOR.	2 OF 3

31

ADDITIONAL NOTES:

1. RESIDENTIAL SIDE ENTRY GARAGES SHALL HAVE A MINIMUM OF TWENTY (20') FEET SETBACK FROM THE ADJACENT SIDE PROPERTY LINE.
2. FOR TYPICAL RESIDENTIAL TYPE STREETS, SIDEWALKS SHALL HAVE A MINIMUM WIDTH OF FOUR (4) FEET. FOR COMMERCIAL OR STREETS OTHER THAN TYPICAL RESIDENTIAL STREETS, THE SIDEWALK SHALL BE A MINIMUM WIDTH OF SIX (6') FEET. WHERE THE CITY HAS DESIGNATED A BIKE ROUTE, THE CITY MAY REQUIRE AN EIGHT (8') CONCRETE SIDEWALK FOR DUAL PURPOSES.
3. DUMMY JOINTS PARALLEL TO THE CURB SHALL BE PLACED WHERE THE SIDEWALK MEETS THE DRIVEWAY. DUMMY JOINTS PERPENDICULAR TO THE CURB, AND WITHIN THE BOUNDARIES OF THE PARALLEL DUMMY JOINTS, SHALL BE PLACED AT INTERVALS EQUAL TO THE WIDTH OF THE SIDEWALK.
4. A MINIMUM OF TWO ROUND AND SMOOTH DOWEL BARS, 1/2" IN DIAMETER AND TWENTY-FOUR (24") INCHES IN LENGTH, SHALL BE SPACED EIGHTEEN (18") INCHES APART AT EACH EXPANSION JOINT. DOWEL SLEEVES SHALL BE PLACED ON DOWEL BARS ON ONE SIDE OF THE EXPANSION JOINT UNIFORMLY.
5. CIRCULAR DRIVES SHALL BE A MAXIMUM OF TWO (2) SIXTEEN (16') FEET CURB CUTS WITH A MINIMUM OF TWENTY-EIGHT (28') FEET BETWEEN EACH CUT.
6. ALL DRIVEWAYS SHALL BE SLOPED TOWARDS THE STREET FROM THE RIGHT-OF-WAY LINE.
7. REINFORCEMENT SHALL BE ACCURATELY PLACED AT SLAB MID-DEPTH AND HELD FIRMLY IN PLACE BY MEANS OF "BAR SUPPORTS" OF ADEQUATE STRENGTH AND NUMBER THAT WILL PREVENT DISPLACEMENT AND KEEP THE STEEL AT ITS PROPER POSITION DURING THE PLACEMENT OF THE PORTLAND CEMENT CONCRETE. IN NO INSTANCE SHALL THE STEEL BE PLACED DIRECTLY ON THE SUBGRADE OR SAND CUSHION LAYER. MAINTAIN A MINIMUM 2" CLEAR COVER FOR REINFORCEMENT FROM FORMS AND ADJACENT SURFACES.
8. IF DIMENSION B IS LESS THAN 5 FEET, REMOVE CURB AND GUTTER TO EXISTING EXPANSION JOINT AND POUR MONOLITHICALLY WITH THE DRIVEWAY.
9. IF THE BASE IS OVER EXCAVATED WHERE THE CURB AND GUTTER WAS REMOVED, BACKFILL WITH CONCRETE MONOLITHICALLY WITH THE DRIVEWAY.
10. ALL DRIVEWAYS MUST BE CONSTRUCTED WITHIN THE STREET FRONTAGE OF THE SUBJECT PROPERTY AS DETERMINED BY EXTENDING THE SIDE PROPERTY LINES TO THE CURB.
11. DRIVEWAYS ARE TO BE LOCATED NO CLOSER TO THE CORNER OF AN INTERSECTING RIGHTS-OF-WAY THAN 60% OF PARCEL FRONTAGE OR 50 FEET, WHICHEVER IS LESS.
12. DRIVEWAYS SHALL NOT BE CONSTRUCTED WITHIN THE CURB RETURN OF A STREET INTERSECTION.
13. SINGLE FAMILY LOTS LIMITED TO ONE DRIVEWAY EXCEPT FOR APPROVED SEMICIRCULAR DRIVES.
14. WHEN TWO (2) DRIVEWAYS ARE USED (ONE PER UNIT; TWO MAXIMUM) FOR DUPLEXES AND TOWN HOMES, SINGLE FAMILY STANDARDS SHALL APPLY.
15. WHILE THE PROPERTY OWNER REMAINS RESPONSIBLE FOR GRADE BREAKS WITHIN PRIVATE PROPERTY, THE FIRE DEPARTMENT SHALL BE CONSULTED WHERE THE DRIVEWAY IS ESSENTIAL TO EMERGENCY VEHICLE ACCESS AND "G1" PLUS "G2" IS GREATER THAN 14%.
16. SEE SPECIFICATION ITEM 303 FOR APPROVED MATERIAL FOR EXPANSION JOINTS.
17. THE SIDEWALK, REGARDLESS OF ITS LOCATION WITH RESPECT TO THE CURB OR PROPERTY LINE, SHALL BE CONNECTED TO THE DRIVEWAY AT THESE LOCATIONS.
18. PLACE A DUMMY JOINT DOWN THE CENTER OF ALL DRIVEWAYS.
19. WATER METER BOXES AND WASTEWATER CLEANOUTS ARE PROHIBITED FROM BEING LOCATED IN DRIVEWAY, SIDEWALK, AND CURB AREAS.
20. WHEN INSTALLING NEW DRIVEWAY, REMOVE EXISTING CURB IF SIGNS OF STRESS EXIST AND POUR MONOLITHICALLY WITH THE DRIVEWAY (2 PAST EACH SIDE).
21. WHEN TIE IN TO EXISTING CONCRETE USE #4 BARS 18" IN LENGTH DOWELED 9" SPACED AT 2' O.C. EPOXY GROUT ALL TIE BARS. COMPLETELY FILL THE TIE BAR HOLE WITH TYPE III, CLASS A OR CLASS C EPOXY BEFORE INSERTING TIE BAR INTO THE HOLE.
22. SUBGRADE PREPARATION, SHAPE AND COMPACT SUBGRADE TO THE LINE, GRADE, AND CROSS-SECTION SHOWN ON THE PLANS, BEFORE AND DURING COMPACTION, BRING THE SCARIFIED LAYER TO THE MOISTURE CONTENT DIRECTED, AND COMPACT UNTIL THERE IS NO EVIDENCE OF FURTHER CONSOLIDATION.
23. PLACING BASE MATERIAL: WHEN SHOWN ON THE PLANS, PLACE, SPREAD, AND COMPACT MATERIAL IN ACCORDANCE WITH THE APPLICABLE ITEM TO THE REQUIRED OR DIRECTED DEPTH.

CITY OF UNIVERSAL CITY DEPARTMENT OF PUBLIC WORKS	ADOPTED 9/19/11 REVISED 9/19/18
DRIVEWAY NOTES	STANDARD NO. DET-302-08
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD. RECORD COPY SIGNED BY RANDY LIEBERMANN, PUBLIC WORKS DIRECTOR.	3 OF 3

32

STATE OF TEXAS
ROBERTO ERAZO, JR.
123437
LICENSED
PROFESSIONAL ENGINEER

7/18/25

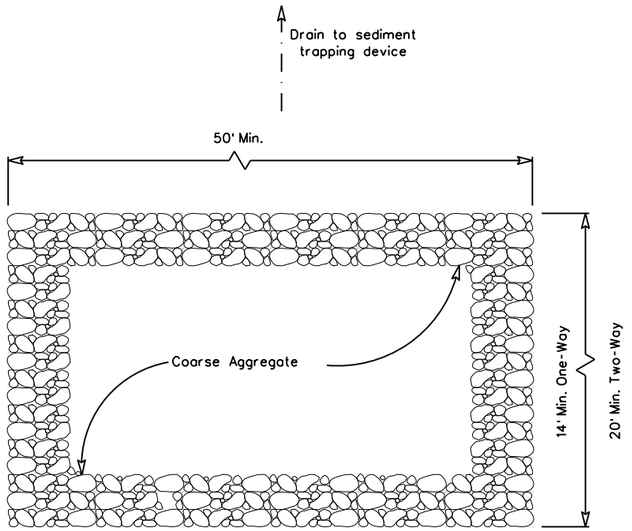
AJL ENGINEERING
9862 LORENE LN, SUITE 108
SAN ANTONIO, TX, 78216
(210) 663 -1255
TBPE FIRM NO. 14387

CITY OF UNIVERSAL CITY
PUBLIC WORKS

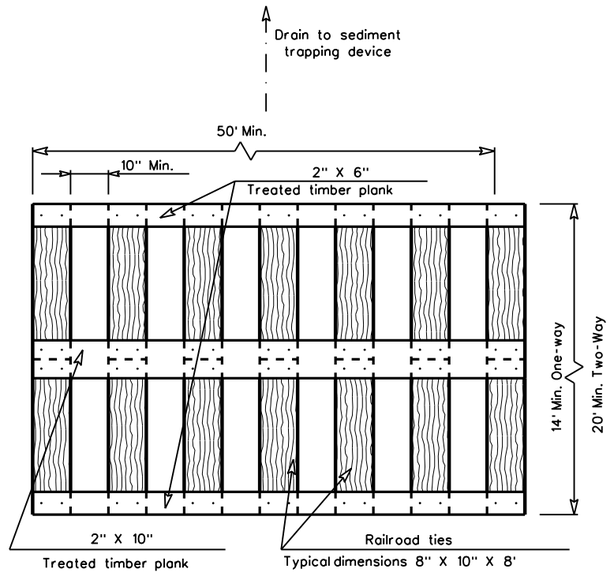
ALLEY REHAB - BASE BID - C5

UC STANDARD DETAILS

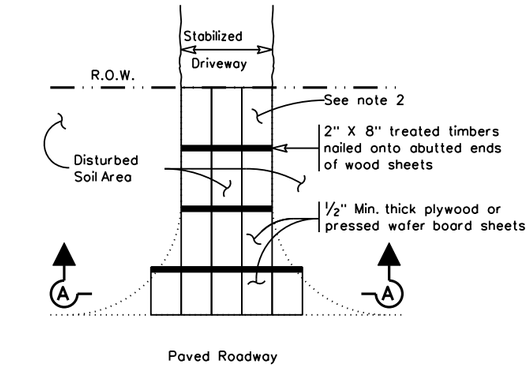
100% SUBMITTAL	PROJECT NO.:24-022	DATE: 07/18/2025	SHEET 01 OF 01
DRWN. BY: NL	DSGN. BY: RE	CHKD. BY: AL	SHEET NO.: 008



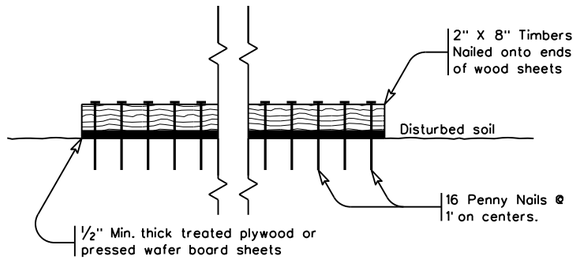
PLAN VIEW



PLAN VIEW



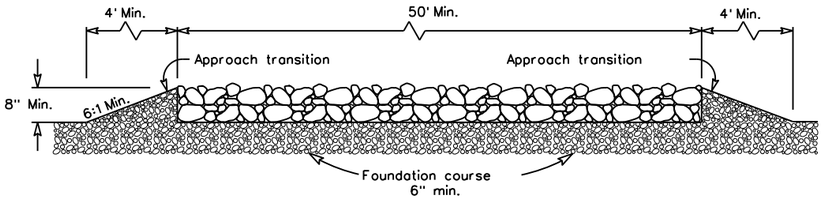
PLAN VIEW



SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

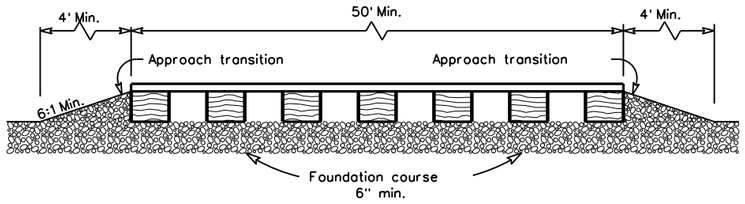
SHORT TERM



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 1)

ROCK CONSTRUCTION (LONG TERM)



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 2)

TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 1)

1. The length of the type 1 construction exit shall be as indicated on the plans, but not less than 50'.
2. The coarse aggregate should be open graded with a size of 4" to 8".
3. The approach transitions should be no steeper than 6:1 and constructed as directed by the Engineer.
4. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other materialas approved by the Engineer.
5. The construction exit shall be graded to allow drainage to a sediment trapping device.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
7. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 2)

1. The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50'.
2. The treated timber planks shall be attached to the railroad ties with ½"x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
5. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
6. The construction exit should be graded to allow drainage to a sediment trapping device.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
8. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 3)

1. The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
2. The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

CONSTRUCTION EXITS

EC(3)-16

FILE: ec316	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS				
	DIST	COUNTY		SHEET NO.
				09

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(2). 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.

WORKER SAFETY NOTES:

1. 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 ISEA "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.

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

1. Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources.

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

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 (ONLINE MANUALS)"
STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)
TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD)
TRAFFIC ENGINEERING STANDARD SHEETS

Texas Department of Transportation

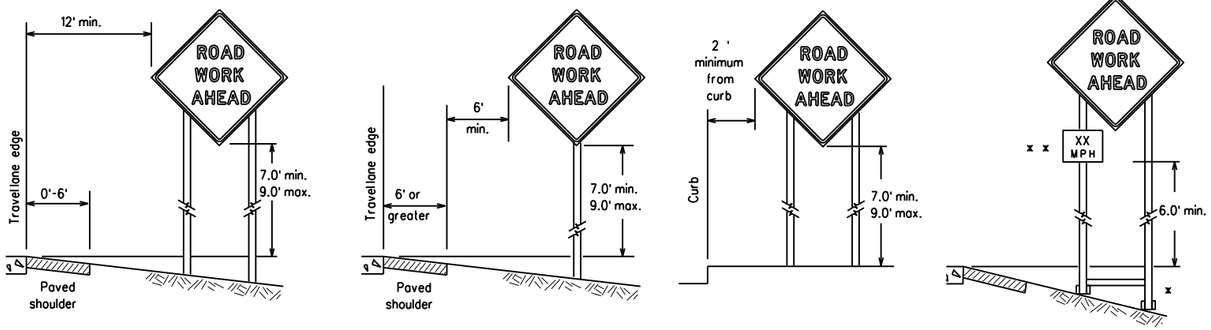
Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS				
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14				10
5-10 5-21				

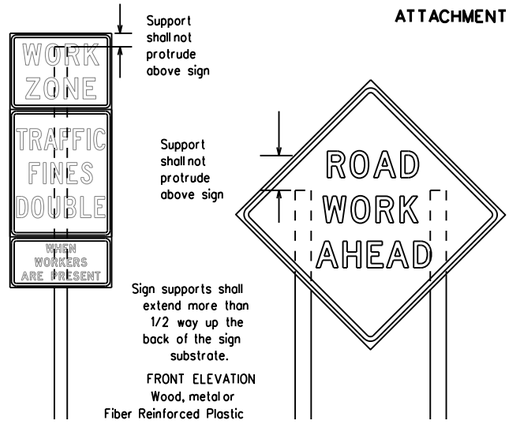
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

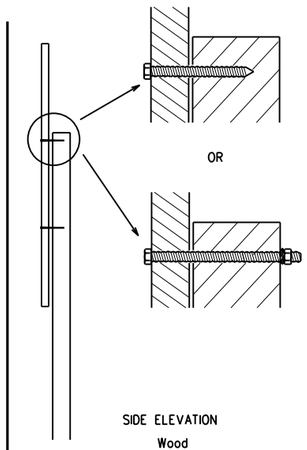


x When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

x x 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





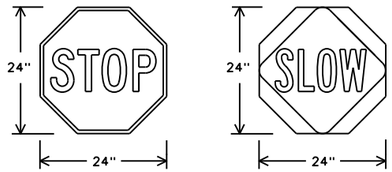
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

Nails shall NOT be allowed. Each sign shall be attached directly to the sign support. Multiple signs shall not be joined or spliced by any means. Wood supports shall not be extended or repaired by splicing or other means.

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 spice point. Splice must be located entirely behind the sign substrate, not near the base of the support. Splice insert lengths should be at least 5 times nominal post size, centered on the splice and of at least the same gauge material.

STOP/SLOW PADDLES

1. STOP/SLOW paddles are the primary method to control traffic by flaggers. The STOP/SLOW paddle size should be 24" x 24".
2. STOP/SLOW paddles shall be retroreflectorized when used at night.
3. STOP/SLOW paddles may be attached to a staff with a minimum length of 6' to the bottom of the sign.
4. Any lights incorporated into the STOP or SLOW paddle faces shall only be as specifically described in Section 6E.03 Hand Signaling Devices in the TMUTCD.



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

1. Permanent signs are used 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 geographical, recreational, specific service (LOGO), or cultural information. Drivers proceeding through a work zone need the same, if not better route guidance as normally installed on a roadway without construction.
2. 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 TS-CD standard.
3. When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
4. If existing signs are to be relocated on their original supports, they shall be installed on crashworthy bases as shown on the SMD Standard sheets. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards. This work should be paid for under the appropriate pay item for relocating existing signs.
5. 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, TLRS standard sheets or the CWZTCD list. The signs shall meet the required mounting heights shown on the BC, or the SMD standard sheets during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
6. 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.

GENERAL NOTES FOR WORK ZONE SIGNS

1. Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. 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.
5. The Contractor may furnish either the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD). The Engineer/Inspector may require the Contractor to furnish other work zone signs that are shown in the TMUTCD but may have been omitted from the plans. Any variation in the plans shall be documented by written agreement between the Engineer and the Contractor's Responsible Person. All changes must be documented in writing before being implemented. This can include documenting the changes in the Inspector's TxDOT diary and having both the Inspector and Contractor initial and date the agreed upon changes.
6. The Contractor shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD) 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 regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so the Engineer can verify the correct procedures are being followed.
7. 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.
8. Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1 inch.
9. The Contractor shall replace damaged wood posts. New or damaged wood sign posts shall not be spliced.

DURATION OF WORK (as defined by the "Texas Manual on Uniform Traffic Control Devices" Part 6)

1. The types of sign supports, sign mounting height, the size of signs, and the type of sign substrates can vary based on the type of work being performed. The Engineer is responsible for selecting the appropriate size sign for the type of work being performed. The Contractor is responsible for ensuring the sign support, sign mounting height and substrate meets manufacturer's recommendations in regard to crashworthiness and duration of work requirements.
   a. Long-term stationary - work that occupies a location more than 3 days.
   b. Intermediate-term stationary - work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than one hour.
   c. Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
   d. Short, duration - work that occupies a location up to 1 hour.
   e. Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN MOUNTING HEIGHT

1. 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.
2. The bottom of 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.
3. Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
4. Short-term/Short Duration signs shall be used only during daylight and shall be removed at the end of the workday or raised to appropriate Long-term/Intermediate sign height.
5. 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

1. 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

1. 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 CWZTCD lists each substrate that can be used on the different types and models of sign supports.
2. "Mesh" type materials are NOT an approved sign substrate, regardless of the tightness of the weave.
3. All wooden individual sign panels fabricated from 2 or more pieces shall have one or more plywood cleat, 1/2" thick by 6" wide, fastened to the back of the sign and extending fully across the sign. The cleat shall be attached to the back of the sign using wood screws that do not penetrate the face of the sign panel. The screws shall be placed on both sides of the splice and spaced at 6" centers. The Engineer may approve other methods of splicing the sign face.

REFLECTIVE SHEETING

1. 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).
2. White sheeting, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.
3. Orange sheeting, meeting the requirements of DMS-8300 Type B_{FL} or Type C_{FL}, shall be used for rigid signs with orange backgrounds.

SIGN LETTERS

1. All sign letters and numbers shall be clear, and open rounded type uppercase alphabet letters as approved by the Federal Highway Administration (FHWA) and as published in the "Standard Highway Sign Design for Texas" manual. Signs, letters and numbers shall be of first class workmanship in accordance with Department Standards and Specifications.

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
2. Long-term stationary or intermediate stationary signs installed on square metal tubing may be turned away from traffic 90 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.
3. Signs installed on wooden skids shall not be turned at 90 degree angles to the roadway. These signs should be removed or completely covered when not required.
4. When signs are covered, the material used shall be opaque, such as heavy mil black plastic, or other materials which will cover the entire sign face and maintain their opaque properties under automobile headlights at night, without damaging the sign sheeting.
5. Burlap shall NOT be used to cover signs.
6. Duct tape or other adhesive material shall NOT be affixed to a sign face.
7. Signs and anchor stubs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT WEIGHTS

1. Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign support weights.
4. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs.
5. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall NOT be used.
6. Rubber ballasts designed for channelizing devices should not be used for ballast on portable sign supports. Sign supports designed and manufactured with rubber bases may be used when shown on the CWZTCD list.
7. Sandbags shall only be placed along or laid over the base supports of the traffic control device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners. Sandbags shall be placed along the length of the skids to weigh down the sign support.
8. Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

FLAGS ON SIGNS

1. 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.

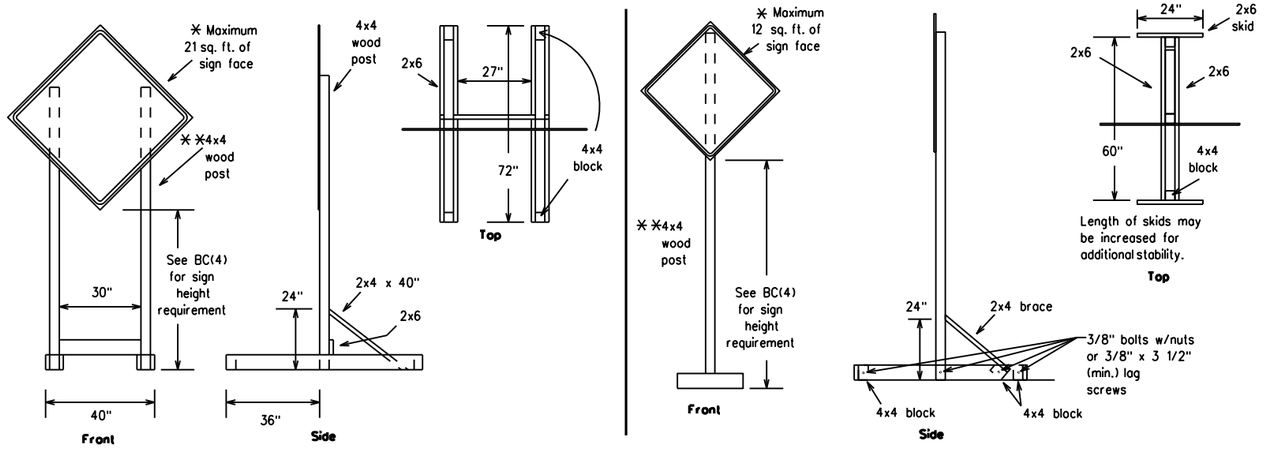
Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

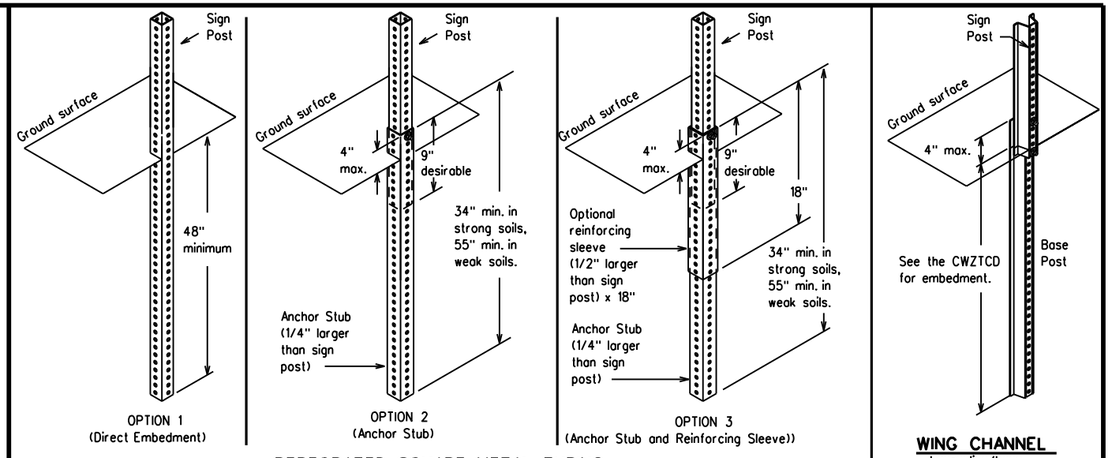
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS				
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21				11

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. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



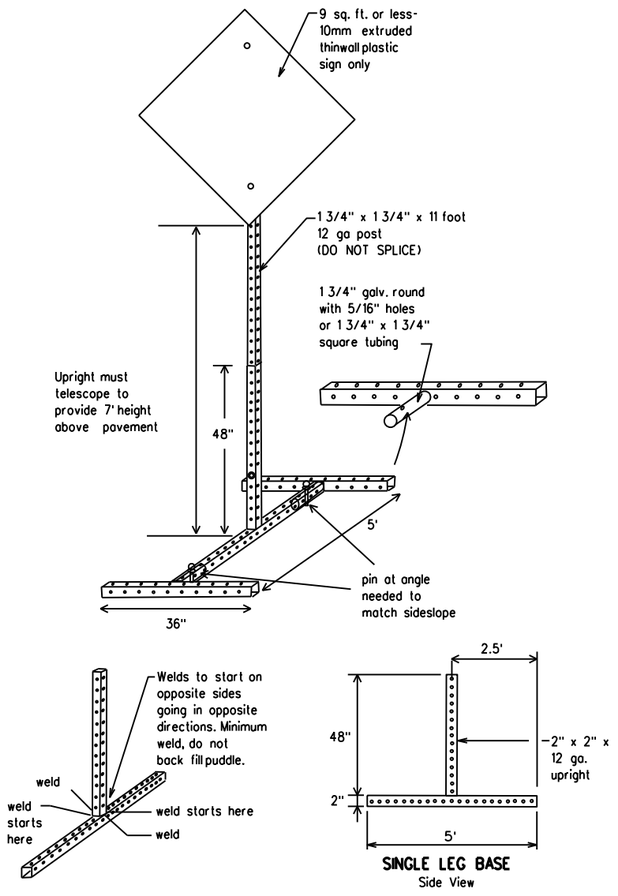
SKID MOUNTED WOOD SIGN SUPPORTS

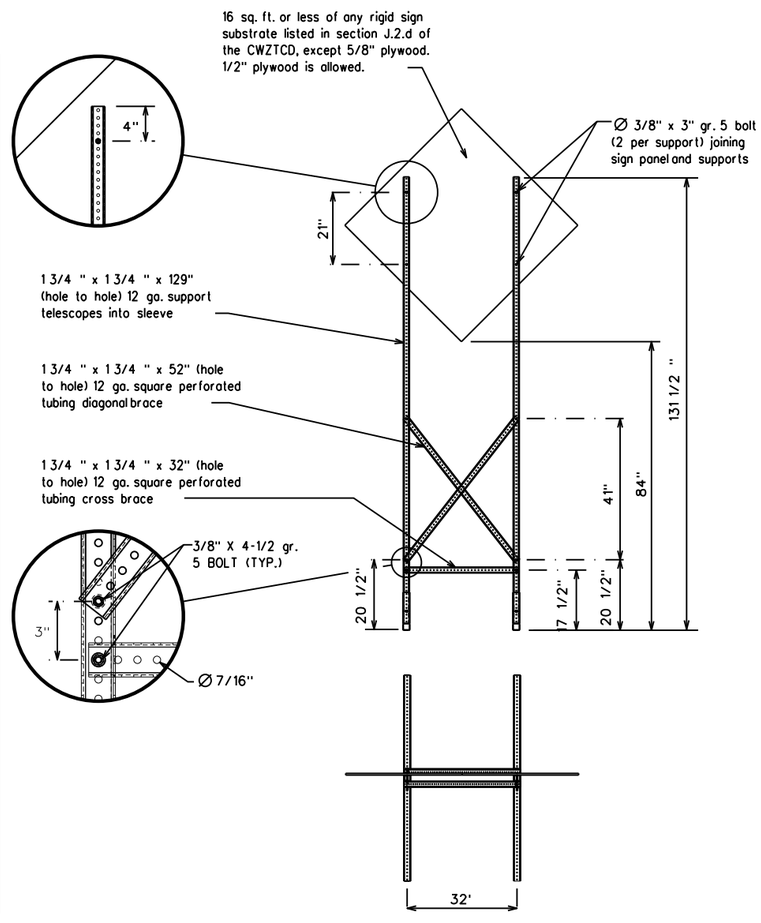
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

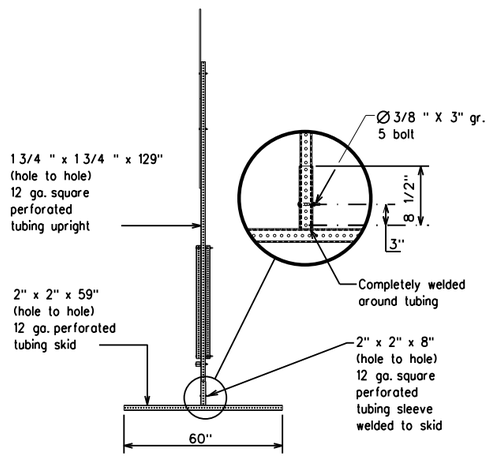


GROUND MOUNTED SIGN SUPPORTS

Refer to the CWZTCD and the manufacturer's installation procedure for each type sign support.
The maximum sign square footage shall adhere to the manufacturer's recommendation.
Two post installations can be used for larger signs.







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

Both steel and plastic Wedge Anchor Systems as shown on the SMD Standard Sheets may be used as temporary sign supports for signs up to 10 square feet of sign face. They may be set in concrete or in sturdy soils if approved by the Engineer. (See web address for "Traffic Engineering Standard Sheets" on BC(1)).

OTHER DESIGNS

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

GENERAL NOTES

1. Nails may be used in the assembly of wooden sign supports, but 3/8" bolts with nuts or 3/8" x 3 1/2" lag screws must be used on every joint for final connection.
2. No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
3. When project is completed, all sign supports and foundations shall be removed from the project site. This will be considered subsidiary to Item 502.

* See BC(4) for definition of "Work Duration."

** Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.

☐ See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

SHEET 5 OF 12

Texas Department of Transportation

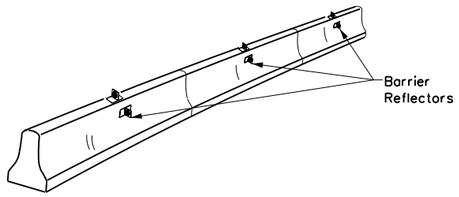
Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

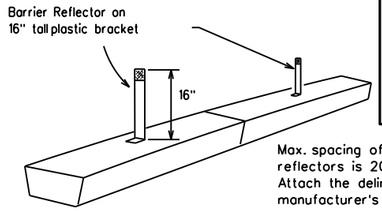
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS				
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21				12

1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 512.



CONCRETE TRAFFIC BARRIER (CTB)

3. Where traffic is on one side of the CTB, two (2) Barrier Reflectors shall be mounted in approximately the midsection of each section of CTB. An alternate mounting location is uniformly spaced at one end of each CTB. This will allow for attachment of a barrier grapple without damaging the reflector. The Barrier Reflector mounted on the side of the CTB shall be located directly below the reflector mounted on top of the barrier, as shown in the detail above.
4. Where CTB separates two-way traffic, three barrier reflectors shall be mounted on each section of CTB. The reflector unit on top shall have two yellow reflective faces (Bi-Directional)while the reflectors on each side of the barrier shall have one yellow reflective face, as shown in the detail above.
5. When CTB separates traffic traveling in the same direction, no barrier reflectors will be required on top of the CTB.
6. Barrier Reflector units shall be yellow or white in color to match the edgeline being supplemented.
7. Maximum spacing of Barrier Reflectors is forty (40) feet.
8. Pavement markers or temporary flexible-reflective roadway marker tabs shall NOT be used as CTB delineation.
9. Attachment of Barrier Reflectors to CTB shall be per manufacturer's recommendations.
10. Missing or damaged Barrier Reflectors shall be replaced as directed by the Engineer.
11. Single slope barriers shall be delineated as shown on the above detail.

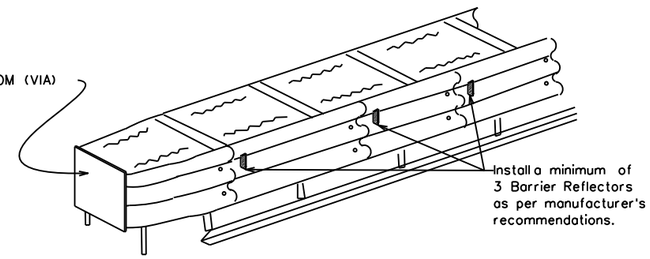


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

LPCB is approved for use in work zone locations, where the posted speed is 45mph, or less. See Roadway Standard Sheet LPCB.

LOW PROFILE CONCRETE BARRIER (LPCB)

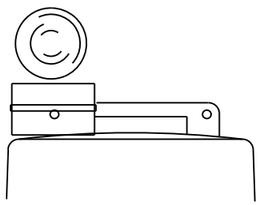


DELINEATION OF END TREATMENTS

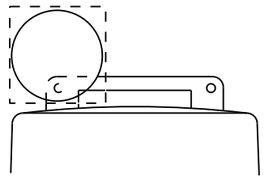
END TREATMENTS FOR CTB'S USED IN WORK ZONES

End treatments used on CTB's in work zones shall meet the apppropriate crashworthy standards as defined in the Manual for Assessing Safety Hardware (MASH). Refer to the CWZTCD List for approved end treatments and manufacturers.

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



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

WARNING LIGHTS

1. Warning lights shall meet the requirements of the TMUTCD.
2. Warning lights shall NOT be installed on barricades.
3. Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "FL". The Type A Warning Lights shall not be used with signs manufactured with Type B or C $_{FL}$ Sheeting meeting the requirements of Departmental Material Specification DMS-8300.
4. Type-C and Type D 360 degree Steady Burn Lights are intended to be used in a series for delineation to supplement other traffic control devices. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "SB".
5. The Engineer/Inspector or the plans shall specify the location and type of warning lights to be installed on the traffic control devices.
6. When required by the Engineer, the Contractor shall furnish a copy of the warning lights certification. The warning light manufacturer will certify the warning lights meet the requirements of the latest ITE Purchase Specifications for Flashing and Steady-Burn Warning Lights.
7. When used to delineate curves, Type-C and Type D Steady Burn Lights should only be placed on the outside of the curve, not the inside.
8. The location of warning lights and warning reflectors on drums shall be as shown elsewhere in the plans.

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

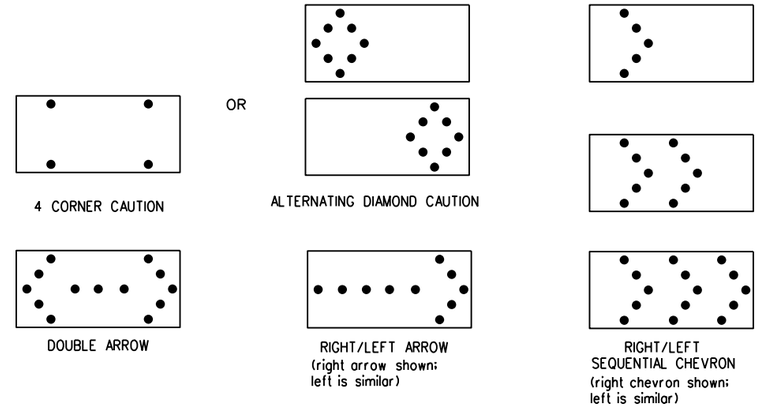
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing devices to form a merging taper may be used for delineation. If used, the successive flashing of the sequential warning lights should occur from the beginning of the taper to the end of the merging taper in order to identify the desired vehicle path. The rate of flashing for each light shall be 65 flashes per minute, plus or minus 10 flashes.
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. Warning lights shall not be installed on a drum that has a sign, chevron or vertical panel.
7. The maximum spacing for 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 at the discretion of the Contractor unless otherwise noted in the plans.
2. The warning reflector shall be yellow in color and shall be manufactured using a sign substrate approved for use with plastic drums listed on the CWZTCD.
3. The warning reflector shall have a minimum retroreflective surface area (one-side) of 30 square inches.
4. Round reflectors shall be fully reflectorized, including the area where 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 attaches to the drum.
6. The side of the warning reflector facing approaching traffic shall have sheeting meeting the color and retroreflectivity requirements for DMS 8300-Type B or Type C.
7. When used near two-way traffic, both sides of the warning reflector shall be reflectorized.
8. The warning reflector should be mounted on the side of the handle nearest approaching traffic.
9. The maximum spacing for warning reflectors should be identical to the channelizing device spacing requirements.

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 lane closures on multi-lane roadways, 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 shall choose all appropriate signs, barricades and/or other traffic control devices that should be used in conjunction with the Flashing Arrow Board.
4. The Flashing Arrow Board should be able to display the following symbols:



5. The "CAUTION" display consists of four corner lamps flashing simultaneously, or the Alternating Diamond Caution mode as shown.
6. The straight line caution display is NOT ALLOWED.
7. The Flashing Arrow Board shall be capable of minimum 50 percent dimming from rated lamp voltage. The flashing rate of the lamps shall not be less than 25 nor more than 40 flashes per minute.
8. 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.
9. The sequential arrow display is NOT ALLOWED.
10. The flashing arrow display is the TxDOT standard; however, the sequential chevron display may be used during daylight operations.
11. The Flashing Arrow Board shall be mounted on a vehicle, trailer or other suitable support.
12. A Flashing Arrow Board SHALL NOT BE USED to laterally shift traffic.
13. A full matrix PCMS 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. Minimum mounting height of trailer mounted Arrow Boards should be 7 feet from roadway to bottom of panel.

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.

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

TRUCK-MOUNTED ATTENUATORS

1. Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the Manual for Assessing Safety Hardware (MASH).
2. Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
3. Refer to the CWZTCD for a list of approved TMAs.
4. TMAs are required on freeways unless otherwise noted in the plans.
5. A TMA should be used anytime that it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the work performance.
6. The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is an extended distance from the TMA.

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13 5-21	DIST	COUNTY		SHEET NO. 13

101

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. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

GENERAL NOTES

1. For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
2. For intermediate term stationary work zones on freeways, drums should be used as the primary channelizing device but may be replaced in tangent sections by vertical panels, or 42" two-piece cones. In tangent sections, one-piece 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 stationary work zones on freeways, drums are the preferred channelizing device but may be replaced in tapers, transitions and tangent sections by vertical panels, two-piece cones or one-piece 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" (TMUTCD) and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
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. The Contractor shall have a maximum of 24 hours to replace any plastic drums identified for replacement by the Engineer/Inspector. The replacement device must be an approved device.

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

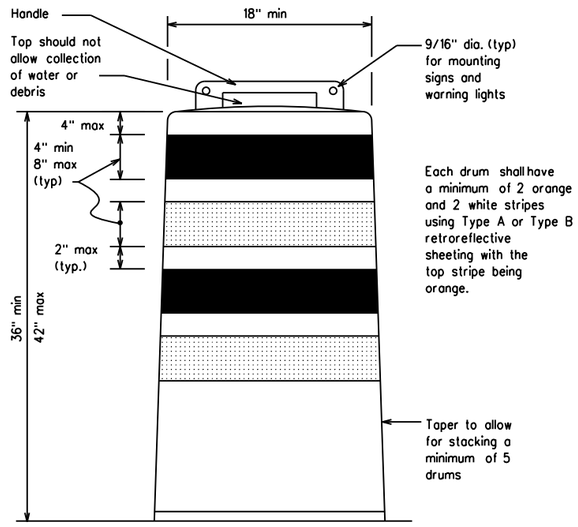
1. Plastic drums shall be a two-piece design: the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents accidental separation due to normal handling and/or air turbulence created by passing vehicles.
3. Plastic drums shall be constructed of lightweight flexible, and 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. The top of the drum shall have a built-in handle for easy pickup 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 light, 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 4 inches nor greater than 8 inches in width. Any non-reflectorized 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 footholds 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 ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
9. Drum body shall have a maximum unballasted weight of 11 lbs.
10. Drum and base shall be marked with manufacturer's name and model number.

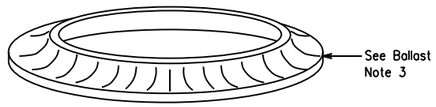
RETROREFLECTIVE SHEETING

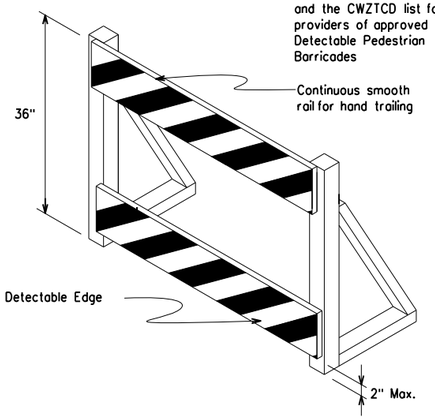
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall be suitable for use on and shall adhere to the drum surface such that, upon vehicular impact, the sheeting shall remain adhered in-place and exhibit no delaminating, cracking, or loss of retroreflectivity other than that loss due to abrasion of the sheeting surface.

BALLAST

1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. 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 surface may not exceed 12 inches.
2. Bases with built-in ballast shall weigh between 40 lbs. and 50 lbs. Built-in ballast can be constructed of an integral crumb rubber base or a solid rubber base.
3. Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWZTCD list.
4. The ballast shall not be heavy objects, water, or any material that would become 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 when struck by a vehicle.
6. Ballast shall not be placed on top of drums.
7. Adhesives may be used to secure base of drums to pavement.

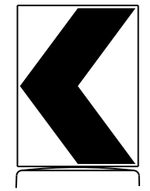




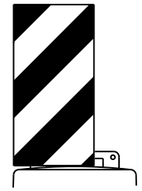


DETECTABLE PEDESTRIAN BARRICADES

1. When existing pedestrian facilities are disrupted, closed, or relocated in a TTC zone, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility. Refer to WZ(BTS-2) for Pedestrian Control requirements for Sidewalk Diversions, Sidewalk Detours and Crosswalk Closures.
2. Where pedestrians with visual disabilities normally use the closed sidewalk, a Detectable Pedestrian Barricade shall be placed across the full width of the closed sidewalk instead of a Type 3 Barricade.
3. Detectable pedestrian barricades similar to the one pictured above, longitudinal channelizing devices, some concrete barriers, and wood or chain link fencing with a continuous detectable edging can satisfactorily delineate a pedestrian path.
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 movements.
5. Warning lights shall not be attached to detectable pedestrian barricades.
6. Detectable pedestrian barricades should use 8" nominal barricade rails as shown on BC(10) provided that the top rail provides a smooth continuous rail suitable for hand trailing with no splinters, burrs, or sharp edges.



18" x 24" Sign
(Maximum Sign Dimension)
Chevron CW1-8, Opposing Traffic Lane Divider, Driveway sign D70a, Keep Right R4 series or other signs as approved by Engineer



12" x 24"
Vertical Panel
mount with diagonals sloping down towards travel way

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

1. Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
2. Chevrons and other work zone signs with an orange background shall be manufactured with Type B or Type C Orange$_{FL}$ sheeting meeting the color and retroreflectivity requirements of DMS-8300, "Sign Face Material," unless otherwise specified in the plans.
3. Vertical Panels shall be manufactured with orange and white sheeting meeting the requirements of DMS-8300 Type A or Type B. Diagonal stripes on Vertical Panels shall slope down toward the intended traveled lane.
4. Other sign messages (text or symbolic) may be used as approved by the Engineer. Sign dimensions shall not exceed 18 inches in width or 24 inches in height, except for the R9 series signs discussed in note 8 below.
5. Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one locking washer for each connection.
6. Mounting bolts and nuts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2 inch beyond nuts.
7. Chevrons may be placed on drums on the outside of curves, on merging tapers or on shifting tapers. When used in these locations, they may be placed on every drum or spaced not more than on every third drum. A minimum of three (3) should be used at each location called for in the plans.
8. R9-9, R9-10, R9-11 and R9-11a Sidewalk Closed signs which are 24 inches wide may be mounted on plastic drums, with approval of the Engineer.

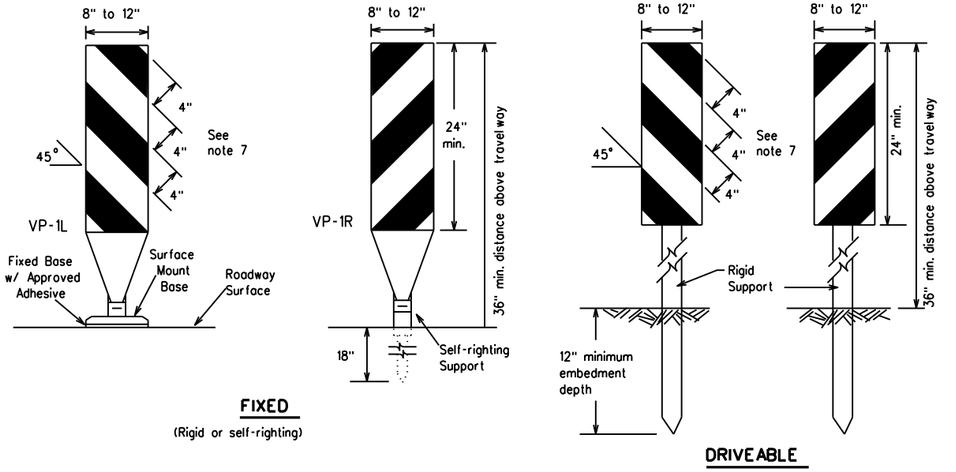
Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS				
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21				14
7-13				



FIXED
(Rigid or self-righting)

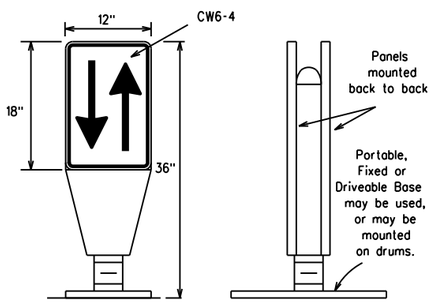
DRIVEABLE

(Rigid or self-righting)

PORTABLE

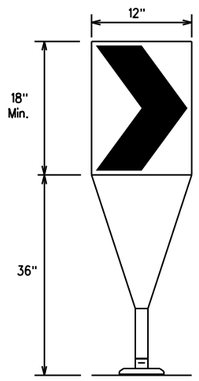
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is required. The Engineer/Inspector shall refer to the Roadway Design Manual for additional requirements on the use VP's for drop-offs.
3. VP's should be mounted back to back if used at the edge of cuts adjacent to two-way two lane roadways. Stripes are to be reflective orange and reflective white and should always slope downward toward the travel lane.
4. VP's used on expressways and freeways or other high speed roadways, may have more than 270 square inches of retroreflective area facing traffic.
5. Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
6. Sheeting for the VP's shall be retroreflective Type A or Type B conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
7. Where the height of reflective material on the vertical panel is 36 inches or greater, a panel stripe of 6 inches shall be used.

VERTICAL PANELS (VPs)



1. Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base is secured to the pavement with an adhesive or rubber weight to minimize movement caused by a vehicle impact or wind gust.
2. The OTLD may be used in combination with 42" cones or VPs.
3. Spacing between the OTLD shall not exceed 500 feet. 42" cones or VPs placed between the OTLD's should not exceed 100 foot spacing.
4. The OTLD shall be orange with a black non-reflective legend. Sheeting for the OTLD shall be retroreflective Type B or Type C conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



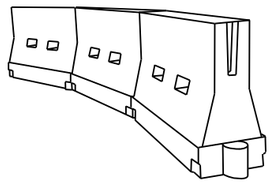
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

1. The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
2. Chevrons are intended to give notice of a sharp change of alignment with the direction of travel and provide additional emphasis and guidance for vehicle operators with regard to changes in horizontal alignment of the roadway.
3. Chevrons, when used, shall be erected on the outside of a sharp curve or turn, or on the far side of an intersection. They shall be in line with and at right angles to approaching traffic. Spacing should be such that the motorist always has three in view, until the change in alignment eliminates its need.
4. To be effective, the chevron should be visible for at least 500 feet.
5. Chevrons shall be orange with a black nonreflective legend. Sheeting for the chevron shall be retroreflective Type B or Type C conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.
6. For Long Term Stationary use on tapers or transitions on freeways and divided highways, self-righting chevrons may be used to supplement plastic drums but not to replace plastic drums.

CHEVRONS

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 driveable, fixed or portable base. The requirement for self-righting 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 "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
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.
6. Pavement surfaces shall be prepared in a manner 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.
7. The installation and removal of channelizing devices shall not cause detrimental effects to the final pavement surfaces, including pavement surface discoloration or surface integrity. Driveable bases shall not be permitted on final pavement surfaces. The Engineer/Inspector shall approve all application and removal procedures of fixed bases.



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 may be used instead of a line of cones or drums.
3. LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
5. LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the travel lanes.
6. LCDs used as barricades placed perpendicular to traffic should have at least one row of reflective sheeting meeting the requirements for barricade rails 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 to channelize vehicular traffic shall be supplemented with retroreflective delineation or channelizing devices to improve daytime/nighttime visibility. They may also be supplemented with pavement markings.
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 CWZTCD 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 should be designed to optimize road user operations considering the available geometric conditions.
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 canes 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

Posted Speed	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'
35		205'	225'	245'	35'	70'
40		265'	295'	320'	40'	80'
45	$L = WS$	450'	495'	540'	45'	90'
50		500'	550'	600'	50'	100'
55		550'	605'	660'	55'	110'
60		600'	660'	720'	60'	120'
65		650'	715'	780'	65'	130'
70		700'	770'	840'	70'	140'
75		750'	825'	900'	75'	150'
80		800'	880'	960'	80'	160'

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

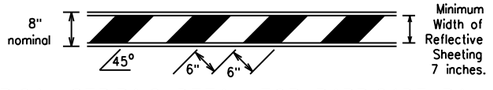
BC(9)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS				
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21				15

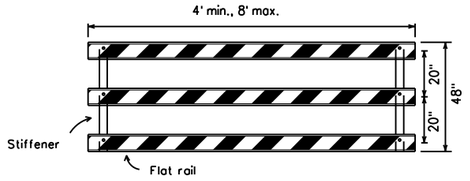
TYPE 3 BARRICADES

1. Refer to the Compliant Work Zone Traffic Control Devices List (CWZTCD) for details of the Type 3 Barricades and a list of all materials used in the construction of Type 3 Barricades.
2. Type 3 Barricades shall be used at each end of construction projects closed to all traffic.
3. Barricades 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 barricade. Where no turns are provided at a closed road, striping should slope downward in both directions toward the center of roadway.
4. Striping of rails, 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.
5. Identification markings may be shown only on the back of the barricade rails. The maximum height of letters and/or company logos used for identification shall be 1".
6. Barricades shall not be placed parallel to traffic unless an adequate clear zone is provided.
7. Warning lights shall NOT be installed on barricades.
8. Where barricades 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 stacked in a manner that covers any portion of a barricade rails reflective sheeting. Rock, concrete, iron, steel or other solid objects 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 vehicular impact. Rubber (such as tire inner tubes) shall not be used for sandbags. Sandbags shall only be placed along or upon the base supports of the device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners.
9. Sheeting for barricades shall be retroreflective Type A or Type B conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.



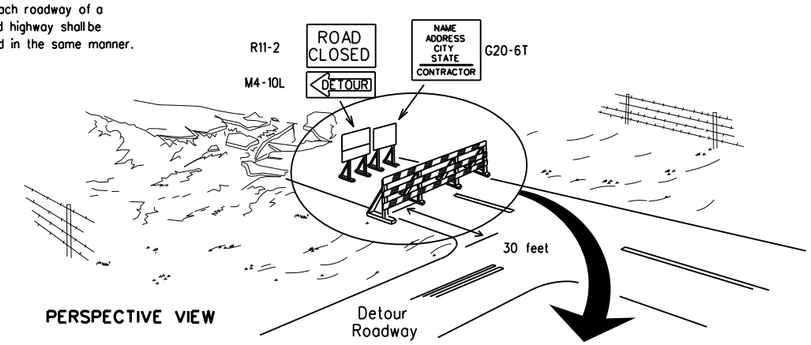
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

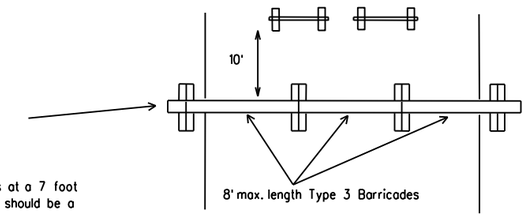
Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.

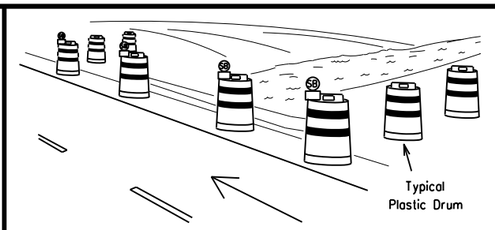
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

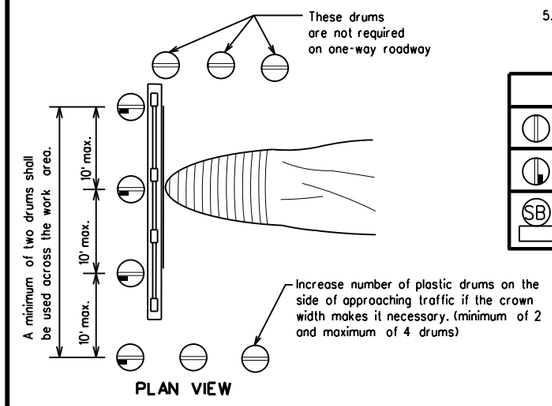
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

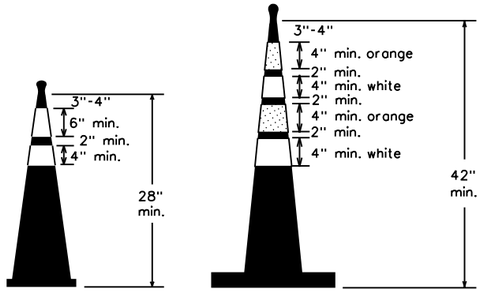
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder width is greater than 12 feet, steady-burn lights may be omitted if drums are used.
5. Drums must extend the length of the culvert widening.



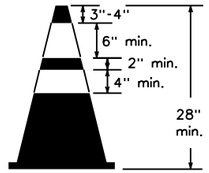
PLAN VIEW

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

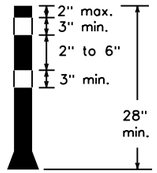
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

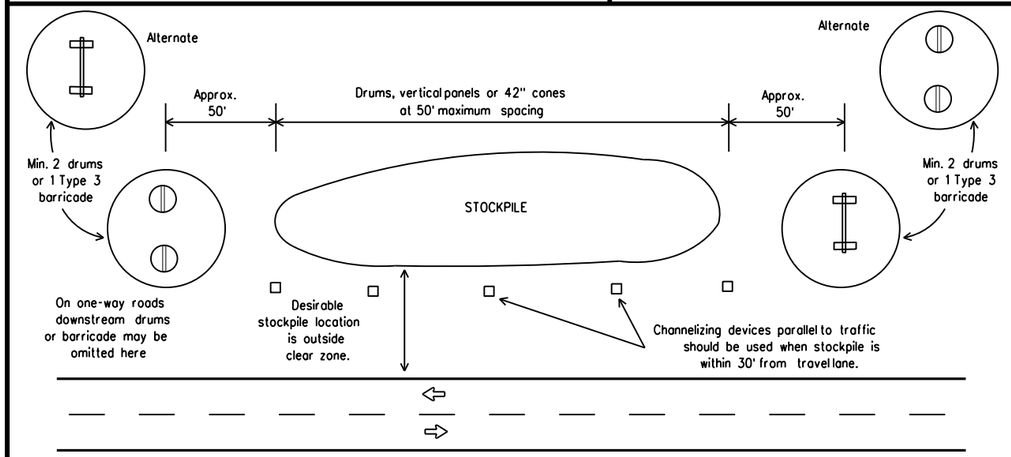


Tubular Marker

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.

1. Traffic cones and tubular markers shall be predominantly orange, and meet the height and weight requirements shown above.
2. One-piece cones have the body and base of the cone molded in one consolidated unit. Two-piece cones have a cone shaped body and a separate rubber base, or ballast, that is added to keep the device upright and in place.
3. Two-piece cones may have a handle or loop extending up to 8" above the minimum height shown, in order to aid in retrieving the device.
4. Cones or tubular markers shall have white or white and orange reflective bands as shown above. The reflective bands shall have a smooth, sealed outer surface and meet the requirements of Departmental Material Specification DMS-8300 Type A or Type B.
5. 28" cones and tubular markers are generally suitable for short duration and short-term stationary work as defined on BC(4). These should not be used for intermediate-term or long-term stationary work unless personnel is on-site to maintain them in their proper upright position.
6. 42" two-piece cones, vertical panels or drums are suitable for all work zone durations.
7. Cones or tubular markers used on each project should be of the same size and shape.



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

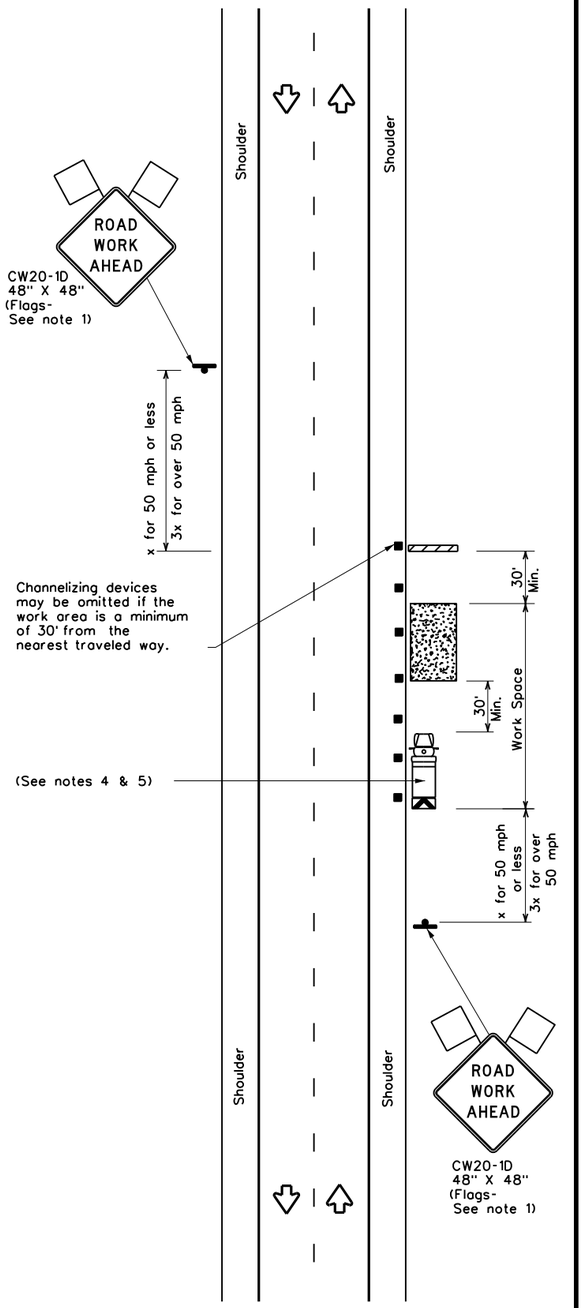
Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

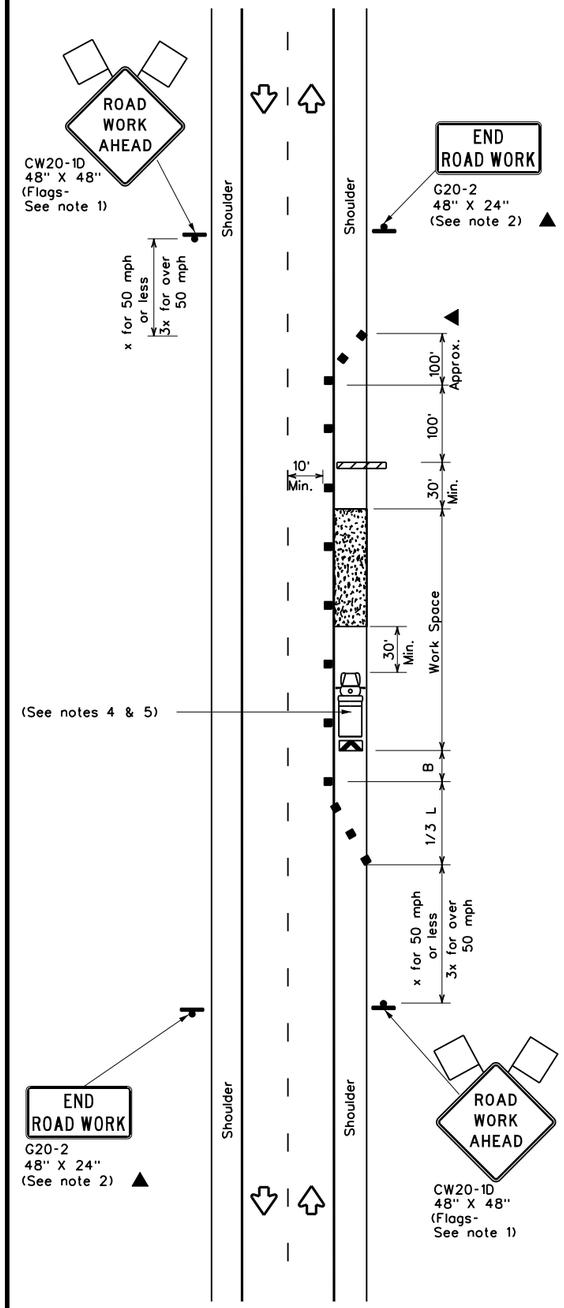
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS				
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21				16



TCP (2-1a)

WORK SPACE NEAR SHOULDER

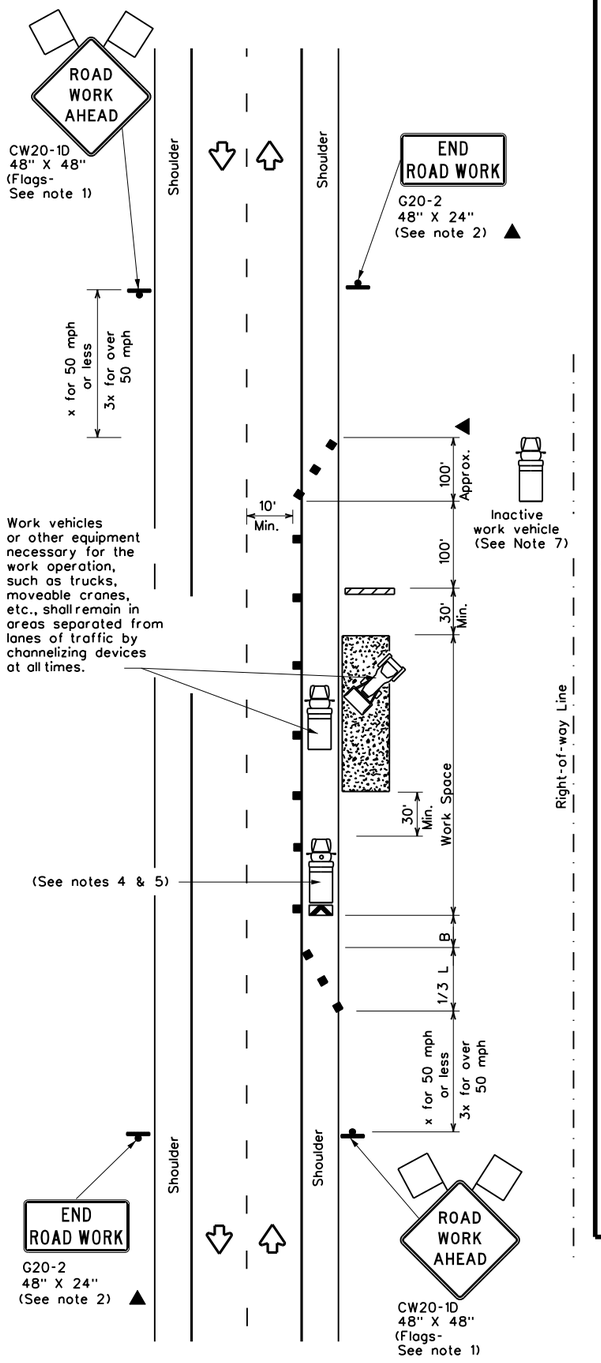
Conventional Roads



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	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated in the plans, or for routine maintenance work, when approved by the Engineer.
3. Stockpiled material should be placed a minimum of 30 feet from nearest traveled way.
4. Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
6. See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
7. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
8. CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

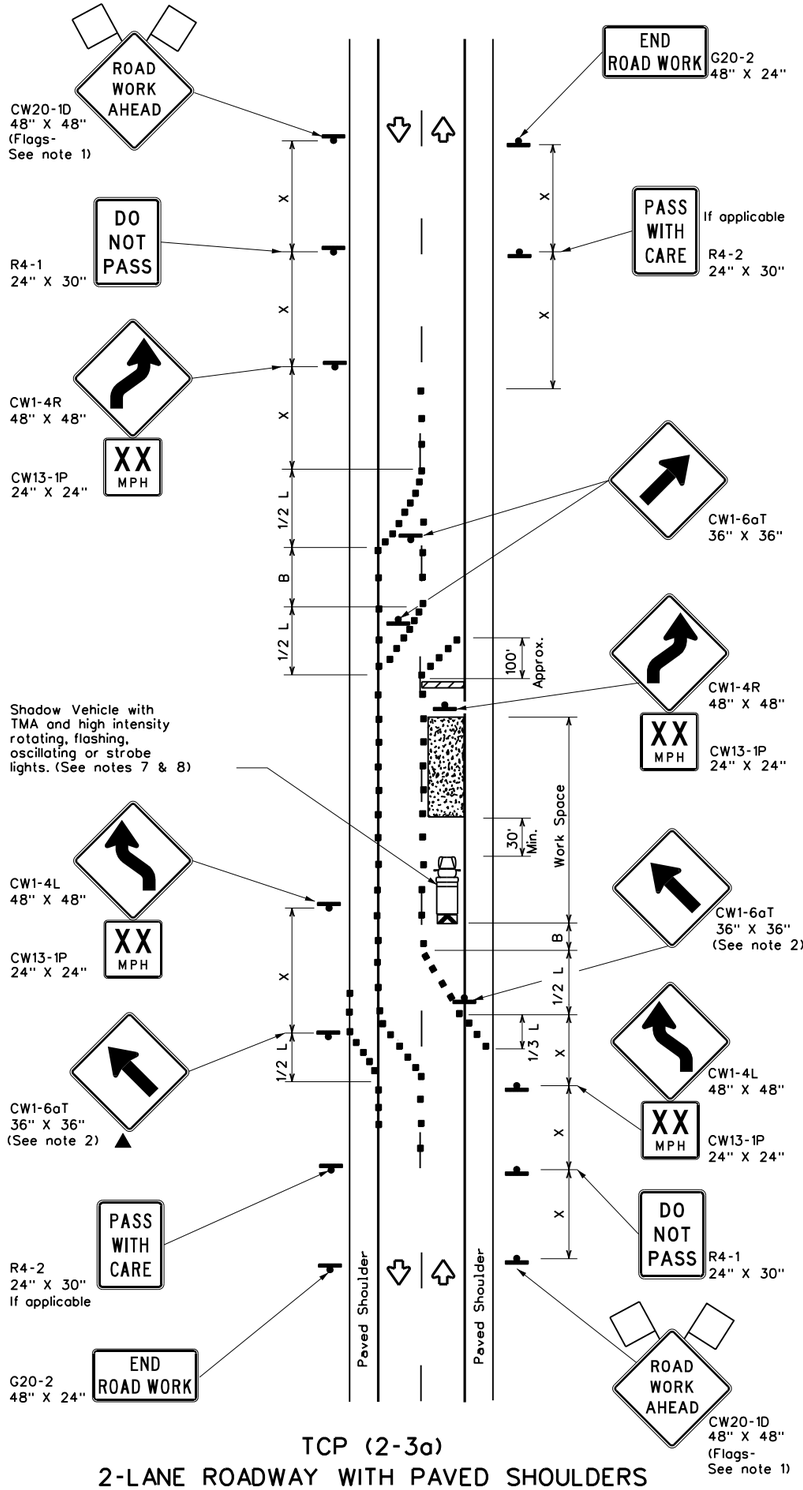
Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

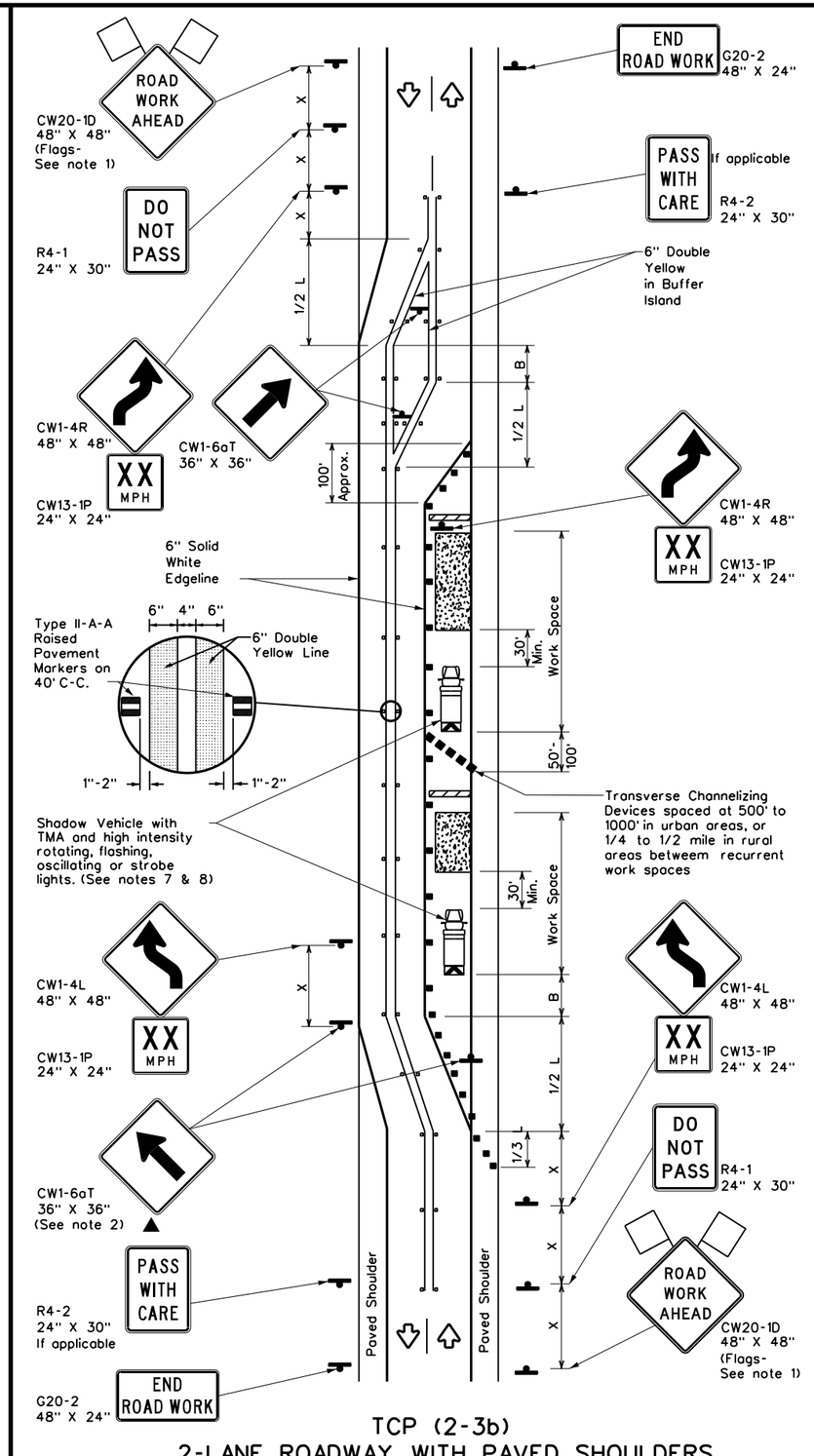
TCP(2-1)-18

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS				
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12				17
1-97 2-18				



TCP (2-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



TCP (2-3b)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
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 Ty II-AA
	Sign		Traffic Flow
	Flag		Flagger

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

* Conventional Roads Only

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

TYPICAL USAGE

MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
				TCP(2-3b)ONLY
			✓	✓

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. When work space will be in place less than three days existing pavement markings may remain in place. Channelizing devices shall be used to separate traffic.
4. Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Flagger should be positioned at end of traffic queue.
5. The R4-1 "DO NOT PASS," R4-2 " PASS WITH CARE" and construction regulatory speed zone signs may be installed within CW20-1D "ROAD WORK AHEAD" signs. Proper spacing of signs shall be maintained.
6. Conflicting pavement marking shall be removed for long term projects.
7. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted.
8. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-3a)

9. Conflicting pavement markings shall be removed for long-term projects. For shorter durations where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2(S) where S is the speed in mph. This tighter device spacing is intended for the area of the conflicting markings, not the entire work zone.

Texas Department of Transportation

Traffic Safety Division Standard

TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO-LANE ROADS

TCP(2-3)-23

FILE: tcp(2-3)-23.dgn	DN:	CK:	DW:	CK:
© TxDOT April 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-85 4-98 2-18 / 8-95 3-03 4-23 / 1-97 2-12	DIST	COUNTY		SHEET NO. 18

163