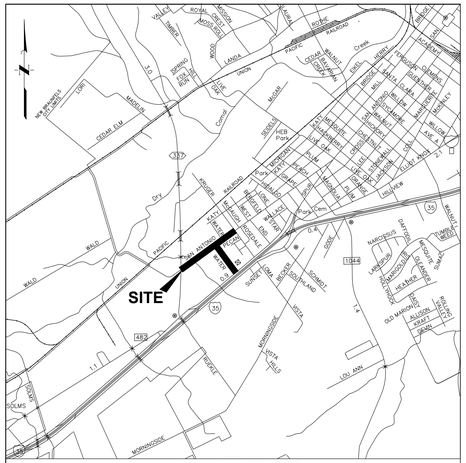
CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

NEW BRAUNFELS, TEXAS



VICINITY MAP
NTS
COMAL COUNTY

SAN ANTONIO STREET DESIGN SPEED = 30 MPH

WATER LANE DESIGN SPEED = 30 MPH

GENERAL NOTES

1. ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER OF RECORD. IN ACCEPTING THESE PLANS, THE CITY OF NEW BRAUNFELS MUST RELY UPON THE ADEQUACY OF THE WORK OF THE ENGINEER OF RECORD.
2. IF CONSTRUCTION HAS NOT COMMENCED WITHIN ONE-YEAR OF CITY APPROVAL FOR CONSTRUCTION INSPECTION, THAT APPROVAL IS NO LONGER VALID.
3. GAS UTILITY IMPROVEMENTS ARE NOT INCLUDED IN THE CIVIL CONSTRUCTION PLANS. FINAL GAS UTILITY DESIGN BY OTHERS AND SHALL BE APPROVED BY THE CITY FOR ANY WORK WITHIN PUBLIC RIGHT-OF-WAY.
4. NO PORTION OF THE PROJECT IS LOCATED WITHIN THE EXISTING SPECIAL FLOOD HAZARD ZONE A, 100-YEAR FLOOD BOUNDARY, AS DEFINED BY THE COMAL COUNTY, TEXAS COMMUNITY PANEL NUMBER 48091C0445F, REVISED SEPTEMBER 02, 2009 AS PREPARED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY.
5. NO PORTION OF THIS PROJECT IS LOCATED WITHIN THE EDWARDS AQUIFER CONTRIBUTING ZONE, RECHARGE ZONE, OR TRANSITION ZONE.
6. PRIOR TO THE START OF CONSTRUCTION, CONTRACTOR SHALL CONTACT THE CITY OF NEW BRAUNFELS (CONB) TO SET A PRE-CONSTRUCTION MEETING. A 48-HOUR ADVANCED NOTIFICATION IS REQUIRED.

NOTE TO CONTRACTOR:

BY THE ACT OF SUBMITTING A BID FOR THIS PROPOSED CONTRACT, THE BIDDER WARRANTS THAT THE BIDDER, AND ALL SUBCONTRACTORS AND MATERIAL SUPPLIERS HE INTENDS TO USE HAVE CAREFULLY AND THOROUGHLY REVIEWED THE DRAWINGS, SPECIFICATIONS AND ALL OTHER CONTRACT DOCUMENTS AND HAVE FOUND THEM COMPLETE AND FREE FROM ANY AMBIGUITIES AND SUFFICIENT FOR THE PURPOSE INTENDED, THE BIDDER FURTHER WARRANTS THAT TO THE BEST OF HIS OR HIS SUBCONTRACTORS' AND MATERIAL SUPPLIERS' KNOWLEDGE, ALL MATERIALS AND PRODUCTS SPECIFIED OR INDICATED HEREIN ARE ACCEPTABLE FOR ALL APPLICABLE CODES AND AUTHORITIES.

THE LOCATION OF ALL EXISTING UTILITIES SHOWN ON THESE PLANS HAS BEEN BASED UPON RECORD INFORMATION ONLY AND MAY NOT MATCH LOCATIONS AND/OR DEPTHS AS CONSTRUCTED. THE CONTRACTOR SHALL CONTACT EACH OF THE INDIVIDUAL UTILITIES FOR ASSISTANCE IN DETERMINING EXISTING UTILITY LOCATIONS AND DEPTHS PRIOR TO BEGINNING ANY CONSTRUCTION. CONTRACTOR SHALL FIELD VERIFY HORIZONTAL AND VERTICAL LOCATIONS OF ALL EXISTING UTILITY CROSSINGS AND CONNECTIONS PRIOR TO ORDERING MATERIALS AND BEGINNING ANY CONSTRUCTION. ALL PROPOSED IMPROVEMENT REPAIRS, REPLACEMENTS OR ADJUSTMENTS, REQUIRED DUE TO CONTRACTOR'S FAILURE TO PERFORM SAID EXISTING UTILITY FIELD VERIFICATION, SHALL BE AT CONTRACTOR'S ENTIRE EXPENSE.

C.P.E LOCATOR

CALL CENTER POINT ENERGY LOCATOR AT 1-800-545-6005, 48 HRS BEFORE BEGINNING ANY EXCAVATION. DUE TO FEDERAL REGULATIONS TITLE 49, PART 192.181, CENTER POINT ENERGY MUST MAINTAIN ACCESS TO GAS VALVES AT ALL TIMES. THE CONTRACTOR MUST PROTECT AND WORK AROUND ANY GAS VALVES THAT ARE IN THE PROJECT AREA.

TELEPHONE LOCATOR

THE EXISTENCE AND LOCATION OF UNDERGROUND CABLE INDICATED ON THE PLANS ARE TAKEN FROM THE BEST RECORDS AVAILABLE AND ARE NOT GUARANTEED TO BE ACCURATE. CONTRACTOR TO CONTACT THE TELEPHONE COMPANY LOCATOR 48HRS PRIOR TO EXCAVATION AT 1-800-545-6005. CONTRACTOR HAS THE RESPONSIBILITY TO PROTECT AND SUPPORT TELEPHONE COMPANY DURING CONSTRUCTION.

CITY OF NEW BRAUNFELS

550 LANDA STREET
NEW BRAUNFELS, TEXAS 78130
BID SET

PREPARED BY:

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED
PROFESSIONAL ENGINEER

5/12/2025

NO.	DATE	REVISIONS	APP.

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PROPOSED LEGEND

- DRAINAGE EASEMENT
- TEMPORARY CONSTRUCTION EASEMENT
- LOC — LIMITS OF CONSTRUCTION
- SF — SF — SILT FENCE
- ROCK BERM
- EDGE OF PAVEMENT/CURB
- AREA OF BASE REPAIR
- AREA OF FULL DEPTH REHABILITATION
- AREA OF STREET MILL/OVERLAY
- AREA OF PAVEMENT CROSS SLOPE TRANSITION
- AREA OF ASPHALT DRIVEWAY PENETRATION
- AREA OF CONCRETE DRIVEWAY PENETRATION
- AREA OF REMOVAL
- AREA OF ROADWAY OBLITERATION
- 1 DRIVEWAY NUMBER
- MAILBOX
- MASONRY MAILBOX
- UTILITY
- SEWER MANHOLE
- SEWER CLEANOUT
- MANHOLE VENT
- PLUG
- TEE
- CROSS
- BENDS
- REDUCER
- GATE VALVE
- METER BOX
- METER VAULT

EXISTING LEGEND

- ROW/PROPERTY LINE
- EASEMENT
- PAVEMENT
- EDGE OF GRAVEL
- CONTOUR — 100 —
- CHAIN LINK FENCE
- WOOD FENCE
- GUARD FENCE
- OVERHEAD ELECTRIC — OHE —
- ABANDONED UTILITY — X — X — X —
- SANITARY SEWER — WW —
- QL"B" – AT&T (FIBER OPTIC/DUCT) — C1 —
- QL"B" – AT&T (TELE) — C2 —
- QL"B" – FIBERLIGHT (FIBER OPTIC/DUCT) — C3 —
- QL"B" – MCI (FIBER OPTIC/DUCT) — C4 —
- QL"B" – SPECTRUM (FIBER OPTIC/DUCT) — C5 —
- QL"B" – SPECTRUM (CABLE TV) — C6 —
- QL"B" – CENTERPOINT ENERGY GAS — G1 —
- QL"B" – TXDOT TRAFFIC SIGNAL — TS1 —
- QL"B" – WATER — W1 —
- QL"C/D" – AT&T (FIBER OPTIC/DUCT) — C1 —
- QL"C/D" – AT&T (TELE) — C2 —
- QL"C/D" – FIBERLIGHT (FIBER OPTIC/DUCT) — C3 —
- QL"C/D" – MCI (FIBER OPTIC/DUCT) — C4 —
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- QL"C/D" – TXDOT TRAFFIC SIGNAL — TS1 —
- QL"C/D" – WATER — W1 —

EXISTING LEGEND

- POWER POLE
- GUY WIRE
- W WATER METER
- WATER VALVE
- S IRRIGATION
- FIRE HYDRANT
- MANHOLE
- SEWER CLEANOUT
- TSP TRAFFIC SIGNAL POLE
- TSB TRAFFIC SIGNAL BOX
- T TELEPHONE PEDESTAL
- G GAS METER
- G GAS VALVE
- NG GAS TEST STATION
- LIGHT
- M MAILBOX
- SIGN
- TREE
- CONCRETE
- GRAVEL

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

INDEX OF DRAWINGS & LEGEND

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

SCALE: AS NOTED DGN. BY: AZ
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STATE OF TEXAS
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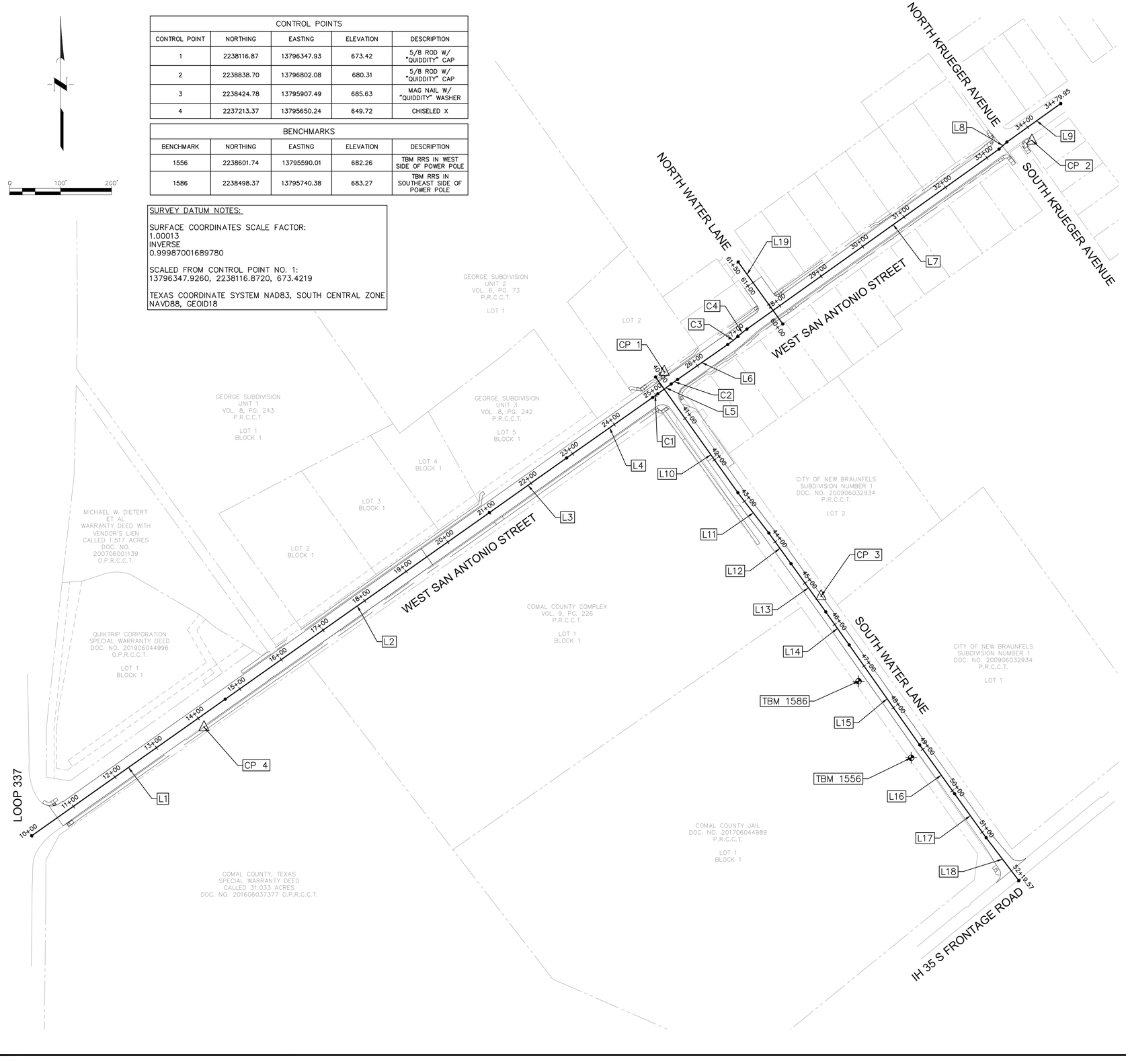

CONTROL POINTS				
CONTROL POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	2238116.87	13796347.93	673.42	5/8 ROD W/ "QUIDDITY" CAP
2	2238838.70	13796802.08	680.31	5/8 ROD W/ "QUIDDITY" CAP
3	2238424.78	13795907.49	685.63	MAG NAIL W/ "QUIDDITY" WASHER
4	2237213.37	13795650.24	649.72	CHISELED X

BENCHMARKS				
BENCHMARK	NORTHING	EASTING	ELEVATION	DESCRIPTION
1556	2238601.74	13795590.01	682.26	TBM RRS IN WEST SIDE OF POWER POLE
1586	2238498.37	13795740.38	683.27	TBM RRS IN SOUTHEAST SIDE OF POWER POLE

SURVEY DATUM NOTES:

SURFACE COORDINATES SCALE FACTOR:
1.00013
INVERSE
0.99987001689780

SCALED FROM CONTROL POINT NO. 1:
13796347.9260, 2238116.8720, 673.4219

TEXAS COORDINATE SYSTEM NAD83, SOUTH CENTRAL ZONE
NAVD88, GEOID18

SAN ANTONIO STREET ALIGNMENT LINE TABLE				
LINE #	LENGTH	DIRECTION	START POINT	END POINT
L1	465.00	N54° 46' 58.79"E	(2236875.04,13795436.93)	(2237254.94,13795705.09)
L2	635.00	N54° 46' 05.62"E	(2237254.94,13795705.09)	(2237773.62,13796071.41)
L3	185.79	N54° 42' 06.41"E	(2237773.62,13796071.41)	(2237925.25,13796178.76)
L4	206.37	N54° 53' 42.47"E	(2237925.25,13796178.76)	(2238094.08,13796297.44)
L5	32.35	N53° 51' 14.95"E	(2238104.42,13796304.85)	(2238130.54,13796323.93)
L6	120.00	N55° 06' 45.36"E	(2238143.05,13796332.86)	(2238241.49,13796401.49)
L7	608.27	N54° 27' 59.36"E	(2238279.17,13796431.64)	(2238774.16,13796785.16)
L8	20.96	N48° 07' 02.24"E	(2238774.16,13796785.16)	(2238789.77,13796799.15)
L9	129.84	N54° 27' 54.70"E	(2238789.77,13796799.15)	(2238895.43,13796874.61)

SAN ANTONIO STREET ALIGNMENT CURVE TABLE						
CURVE #	DELTA	RADIUS	LENGTH	CHORD	START POINT	END POINT
C1	1° 02' 27.53"	700.00	12.72	N54° 22' 28.71"E – 12.72	(2238094.08,13796297.44)	(2238104.42,13796304.85)
C2	1° 15' 30.41"	700.00	15.37	N54° 29' 00.15"E – 15.37	(2238130.54,13796323.93)	(2238143.05,13796332.86)
C3	7° 14' 21.64"	200.00	25.27	N51° 29' 34.54"E – 25.25	(2238241.49,13796401.49)	(2238261.25,13796417.22)
C4	6° 35' 35.64"	200.00	23.01	N51° 10' 11.54"E – 23.00	(2238261.25,13796417.22)	(2238279.17,13796431.64)

SOUTH WATER LANE ALIGNMENT LINE TABLE				
LINE #	LENGTH	DIRECTION	START POINT	END POINT
L10	279.01	S35° 24' 45.91"E	(2238099.80,13796337.86)	(2238261.48,13796110.47)
L11	99.76	S37° 29' 34.64"E	(2238261.48,13796110.47)	(2238322.20,13796031.32)
L12	74.37	S35° 57' 34.13"E	(2238322.20,13796031.32)	(2238365.87,13795971.12)
L13	116.63	S35° 47' 35.25"E	(2238365.87,13795971.12)	(2238434.08,13795876.52)
L14	79.56	S35° 18' 34.95"E	(2238434.08,13795876.52)	(2238480.06,13795811.60)
L15	240.12	S35° 10' 14.27"E	(2238480.06,13795811.60)	(2238618.38,13795615.32)
L16	117.74	S35° 32' 54.25"E	(2238618.38,13795615.32)	(2238686.83,13795519.52)
L17	106.47	S35° 42' 08.29"E	(2238686.83,13795519.52)	(2238748.96,13795433.06)
L18	105.92	S37° 15' 23.08"E	(2238748.96,13795433.06)	(2238813.08,13795348.76)

NORTH WATER LANE ALIGNMENT LINE TABLE				
LINE #	LENGTH	DIRECTION	START POINT	END POINT
L19	150.00	N35° 45' 42.74"W	(2238349.69,13796441.78)	(2238262.02,13796563.50)

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

ALIGNMENT AND BENCHMARK CONTROL DATA

QUIDDITY
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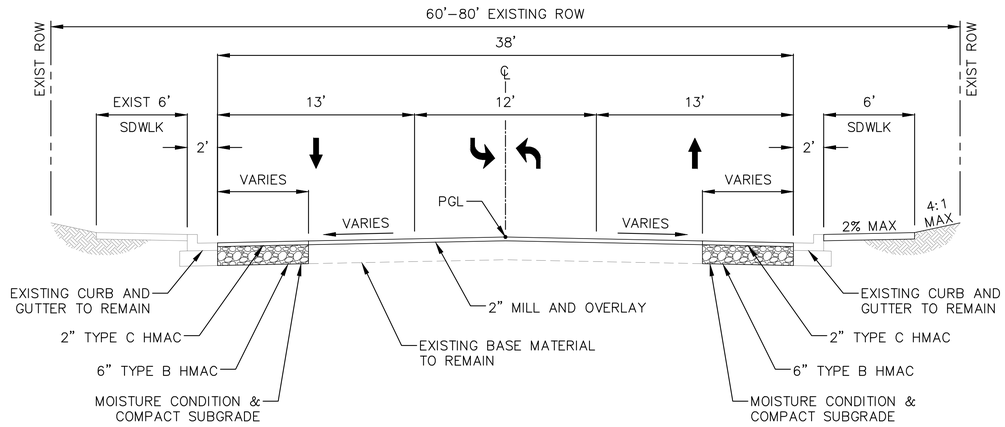
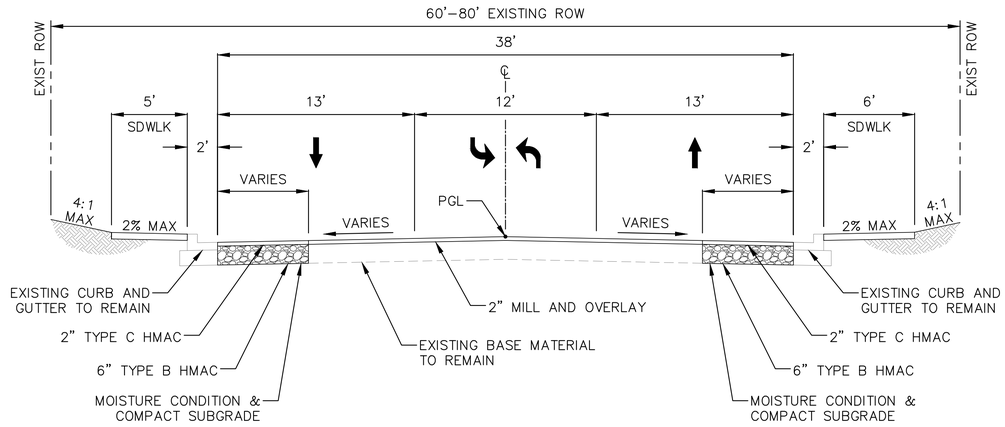
SAN ANTONIO STREET ROADWAY REHABILITATION NOTES:

1. 6" TYPE B HMAC IS TO BE PAID UNDER ITEM 351 "FLEXIBLE PAVEMENT STRUCTURE REPAIR".



SAN ANTONIO STREET ROADWAY REHABILITATION TYPICAL SECTION
BEGIN TO 15+20



SAN ANTONIO STREET ROADWAY REHABILITATION TYPICAL SECTION
STA 15+20 TO 19+50

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CITYWIDE STREETS IMPROVEMENT PROJECTS
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ROADWAY SECTIONS -
SAN ANTONIO STREET
BEGIN TO 19+50

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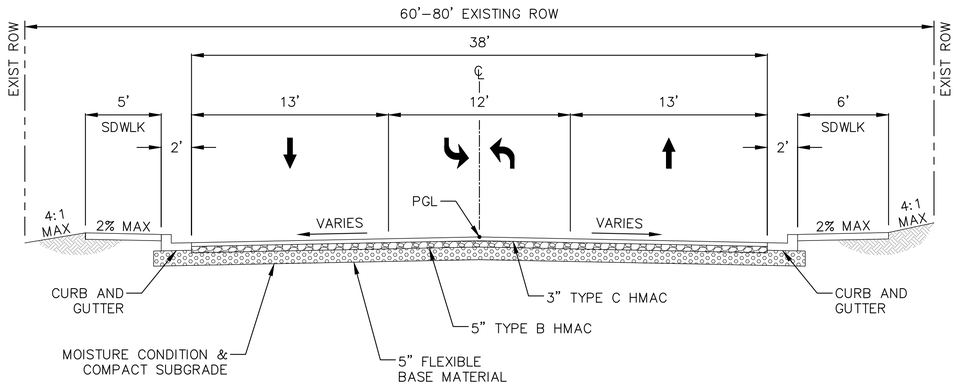
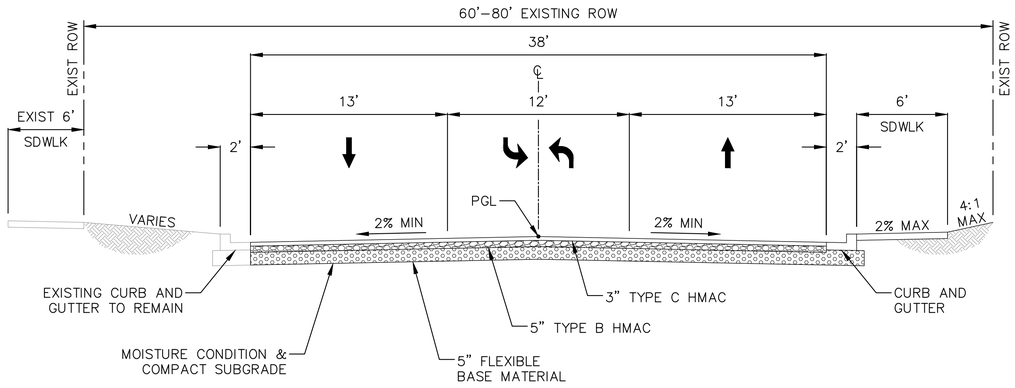


SAN ANTONIO STREET ROADWAY RECONSTRUCTION TYPICAL SECTION
STA 19+50 TO 21+00



SAN ANTONIO STREET ROADWAY RECONSTRUCTION TYPICAL SECTION
STA 21+00 TO 24+70

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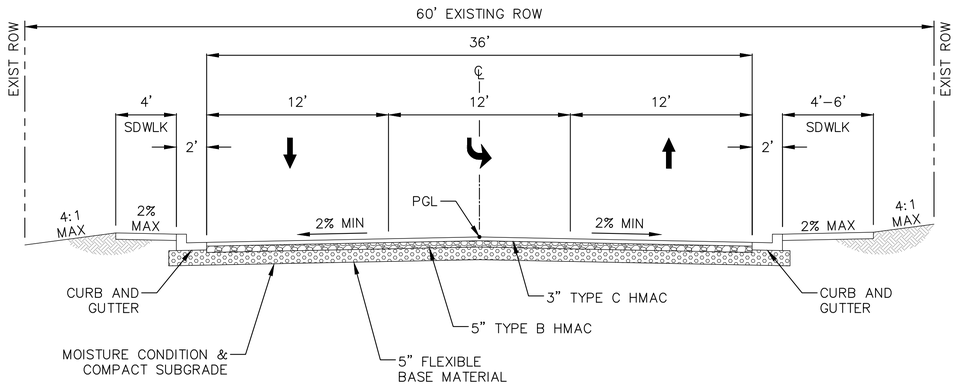
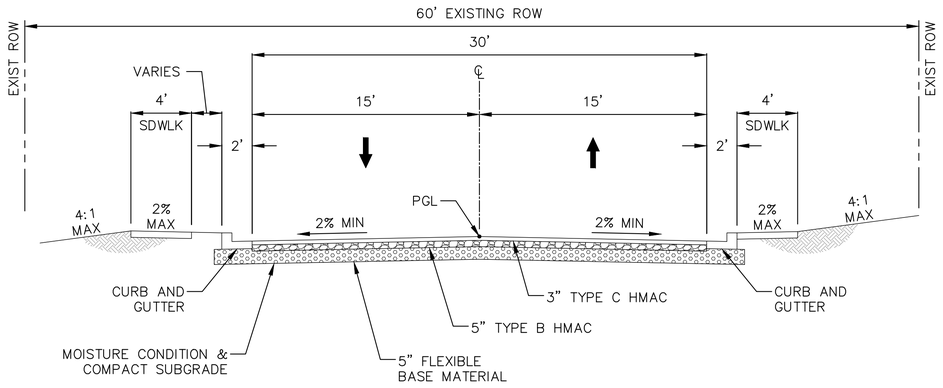


SAN ANTONIO STREET ROADWAY RECONSTRUCTION TYPICAL SECTION
STA 24+70 TO 26+80



SAN ANTONIO STREET ROADWAY RECONSTRUCTION TYPICAL SECTION
STA 26+80 TO END

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

ROADWAY SECTIONS -
SAN ANTONIO STREET
STA 24+70 TO END

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2957 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

SCALE: AS NOTED DGN. BY: AZ
DATE: AS NOTED DWN. BY: JFR
JOB NO. 05668-0026-01 DWG. NO. --
SUBMITTED: ---- SURV. BY: QUIDDITY

STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED
PROFESSIONAL ENGINEER
5/9/2025

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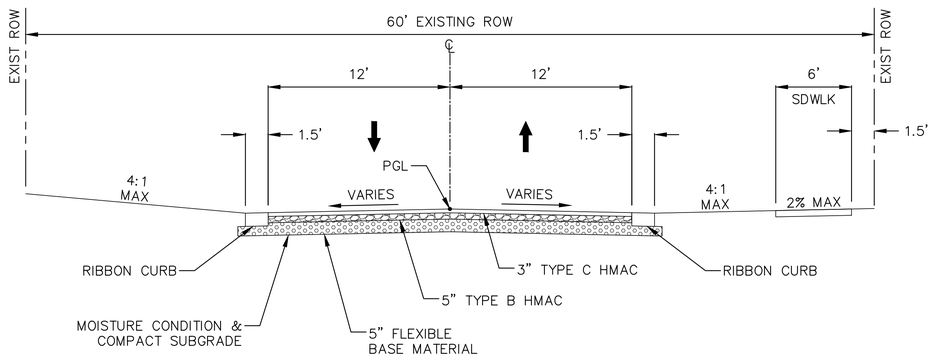
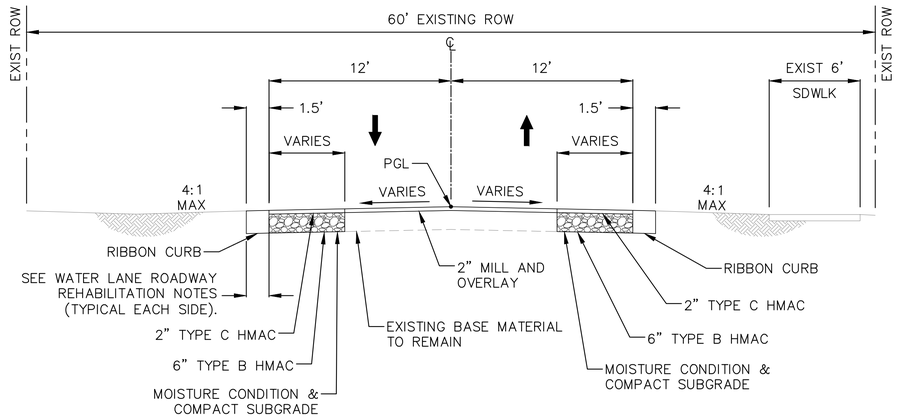
WATER LANE ROADWAY REHABILITATION NOTES:

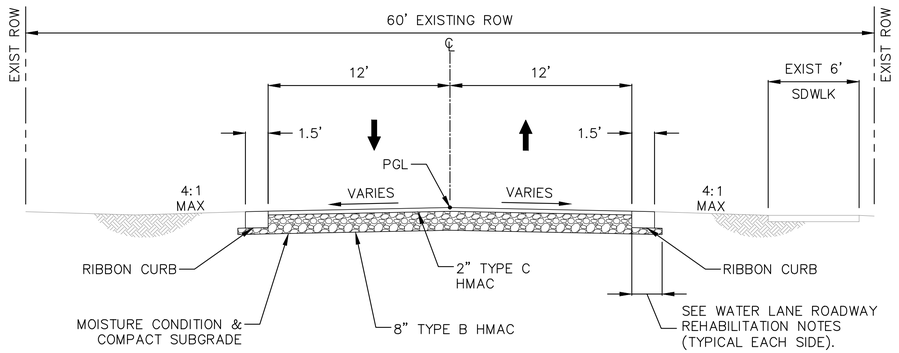
1. RIBBON CURB TO BE INSTALLED OVER TYPE B HMAC, OR COMPACTED MOISTURE CONDITIONED SUBGRADE, AS APPLICABLE.
2. WHERE TYPE B HMAC IS TO BE INSTALLED BELOW AND BEHIND RIBBON CURB, ONLY THE INITIAL LIFT OF TYPE B HMAC WILL BE PAID.
3. 6" AND 8" TYPE B HMAC IS TO BE PAID UNDER ITEM 351 "FLEXIBLE PAVEMENT STRUCTURE REPAIR".



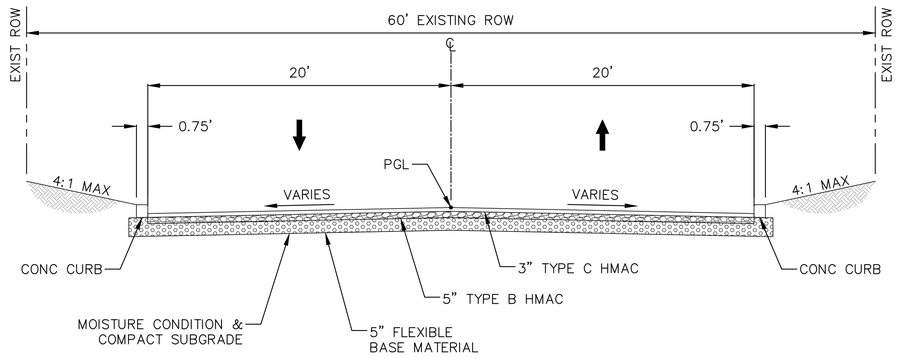
SOUTH WATER LANE ROADWAY RECONSTRUCTION TYPICAL SECTION
BEGIN TO STA 41+94



SOUTH WATER LANE ROADWAY REHABILITATION TYPICAL SECTION
STA 41+94 TO 48+40



SOUTH WATER LANE ROADWAY REHABILITATION TYPICAL SECTION
STA TO 48+40 TO END



NORTH WATER LANE ROADWAY RECONSTRUCTION TYPICAL SECTION
BEGIN TO STA 61+00

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

ROADWAY SECTIONS - WATER LANE

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2957 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

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SUBMITTED:	----	SURV. BY:	QUIDDITY

STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED
PROFESSIONAL ENGINEER
5/12/2025

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CITY OF NEW BRAUNFELS NOTES

GENERAL NOTES

1. IF CONSTRUCTION HAS NOT COMMENCED WITHIN ONE–YEAR OF CITY APPROVAL FOR CONSTRUCTION INSPECTION, THAT APPROVAL IS NO LONGER VALID.

2. THE MOST CURRENT EDITIONS OF THE CITY OF SAN ANTONIO STANDARD SPECIFICATIONS AND THE TEXAS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS AND BRIDGES SHALL BE FOLLOWED FOR ALL CONSTRUCTION EXCEPT AS AMENDED BY THE CITY OF NEW BRAUNFELS STANDARD DETAILS.

3. ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER OF RECORD. IN ACCEPTING THESE PLANS, THE CITY OF NEW BRAUNFELS MUST RELY UPON THE ADEQUACY OF THE WORK OF THE ENGINEER OF RECORD.

4. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL CONTACT THE CITY OF NEW BRAUNFELS TO SCHEDULE A PRECONSTRUCTION MEETING.

5. FOR PUBLIC INFRASTRUCTURE PERMIT OR GRADING PERMIT PROJECTS:
   a. FOR INSPECTIONS, YOU MUST CALL BEFORE 12:00 P.M., 48 HOURS PRIOR TO YOUR INSPECTION REQUEST.
   b. EACH INSPECTION WILL BE ALLOTTED 1 HOUR UNLESS YOU REQUEST FOR MORE TIME.
   c. ONCE YOUR REQUEST HAS BEEN ACCEPTED, YOU WILL RECEIVE A CALL FROM THE CITY OF NEW BRAUNFELS INSPECTOR.

6. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SEE THAT ALL TEMPORARY AND PERMANENT TRAFFIC CONTROL DEVICES ARE PROPERLY INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE PLANS AND LATEST EDITION OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES. IF, IN THE OPINION OF THE ENGINEERING REPRESENTATIVE AND THE CONSTRUCTION INSPECTOR, THE BARRICADES AND SIGNS DO NOT CONFORM TO ESTABLISHED STANDARDS OR ARE INCORRECTLY PLACED OR ARE INSUFFICIENT IN QUANTITY TO PROTECT THE GENERAL PUBLIC, THE CONSTRUCTION INSPECTOR SHALL HAVE THE OPTION TO STOP OPERATIONS UNTIL SUCH TIME AS THE CONDITIONS ARE CORRECTED. IF THE NEED ARISES, ADDITIONAL TEMPORARY TRAFFIC CONTROL DEVICES MAY BE ORDERED BY THE ENGINEERING REPRESENTATIVE AT THE CONTRACTOR'S EXPENSE.

7. A TXDOT TYPE II B–B BLUE REFLECTIVE RAISED PAVEMENT MARKER SHALL BE INSTALLED IN THE CENTER OF THE ROADWAY ADJACENT TO ALL FIRE HYDRANTS. IN LOCATIONS WHERE HYDRANTS ARE SITUATED ON CORNERS, BLUE REFLECTIVE RAISED PAVEMENT MARKERS SHALL BE INSTALLED ON BOTH APPROACHES WHICH FRONT THE HYDRANT. THE RAISED PAVEMENT MARKER SHALL MEET TXDOT MATERIAL, EPOXY AND ADHESIVE SPECIFICATIONS.

8. ALL DRIVEWAYS, CURBS, SIDEWALKS, ETC. REQUIRED TO BE REMOVED TO ACCOMMODATE NEW CONSTRUCTION SHALL BE SAW–CUT, REMOVED AND PAID FOR UNDER ITEM 100 "PREPARING RIGHT OF WAY".

GROUNDWATER

9. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, SUBCONTRACTORS, BUILDERS, GEO–TECHNICAL ENGINEER, AND PROJECT ENGINEER TO IMMEDIATELY NOTIFY THE OFFICE OF THE CITY ENGINEER AND PROJECT ENGINEER IF THE PRESENCE OF GROUNDWATER WITHIN THE SITE IS EVIDENT. UPON NOTIFICATION THE PROJECT ENGINEER SHALL RESPOND WITH PLAN REVISIONS FOR THE MITIGATION OF THE GROUNDWATER ISSUE. THE CITY ENGINEER SHALL RESPOND WITHIN TWO (2) BUSINESS DAYS UPON RECEIPT OF THE MITIGATION PLAN. ALL CONSTRUCTION ACTIVITY, IMPACTED BY THE DISCOVERY OF GROUNDWATER, SHALL BE SUSPENDED UNTIL THE CITY ENGINEER GRANTS A WRITTEN APPROVAL OF THE GROUNDWATER MITIGATION PLAN.

RECORD DRAWINGS

10. AS PER PLATTING ORDINANCE SECTION 118–38M.: WHEN ALL OF THE IMPROVEMENTS ARE FOUND TO BE CONSTRUCTED AND COMPLETED IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS AND WITH THE CITY'S STANDARDS, AND UPON RECEIPT OF ONE SET OF "RECORD DRAWING"PLANS, AND A DIGITAL COPY OF ALL PLANS (PDF COPY) THE CITY ENGINEER SHALL ACCEPT SUCH IMPROVEMENTS FOR THE CITY OF NEW BRAUNFELS, SUBJECT TO THE GUARANTY OF MATERIAL AND WORKMANSHIP PROVISIONS IN THIS SECTION.

CONSTRUCTION NOTE

11. CONTRACTOR IS RESPONSIBLE TO ENSURE THAT EROSION CONTROL MEASURES AND STORMWATER CONTROL SUFFICIENT TO MITIGATE OFF SITE IMPACTS ARE IN PLACE AT ALL STAGES OF CONSTRUCTION.

DRAINAGE NOTE

12. DRAINAGE IMPROVEMENTS SUFFICIENT TO MITIGATE THE IMPACT OF CONSTRUCTION SHALL BE INSTALLED PRIOR TO ADDING IMPERVIOUS COVER.

FINISHED FLOOR ELEVATIONS

13. THE ELEVATION OF THE LOWEST FLOOR SHALL BE AT LEAST 10 INCHES ABOVE THE FINISHED GRADE OF THE SURROUNDING GROUND, WHICH SHALL BE SLOPED IN A FASHION SO AS TO DIRECT STORMWATER AWAY FROM THE STRUCTURE. PROPERTIES ADJACENT TO STORMWATER CONVEYANCE STRUCTURES MUST HAVE FLOOR SLAB ELEVATION OR BOTTOM OF FLOOR JOISTS A MINIMUM OF ONE FOOT ABOVE THE 100–YEAR WATER FLOW ELEVATION IN THE STRUCTURE. DRIVEWAYS SERVING HOUSES ON THE DOWNHILL SIDE OF THE STREET SHALL HAVE A PROPERLY SIZED CROSS SWALE PREVENTING RUNOFF FROM ENTERING THE GARAGE.

SOILS TESTING

14. PROCTORS SHALL BE SAMPLED FROM ON–SITE MATERIAL (ON–SITE IS DEFINED AS LIMITS OF CONSTRUCTION FOR THIS PLAN SET) AND A COPY OF THE PROCTOR RESULTS SHALL BE DELIVERED TO THE CITY OF NEW BRAUNFELS STREET INSPECTOR PRIOR TO ANY DENSITY TESTS.

ROADWAY

15. ALL ROADWAY COMPACTION TESTS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR'S GEOTECHNICAL ENGINEER. FLEXIBLE BASE OR FILL/EMBANKMENT MATERIAL SHALL BE PLACED IN UNIFORM LAYERS NOT TO EXCEED EIGHT INCHES (8") LOOSE. THE REQUIRED DENSITY FOR THE FILL/EMBANKMENT MATERIAL SHALL MEET THE REQUIREMENTS OF TXDOT'S SPECIFICATION ITEM 132. THE REQUIRED DENSITY FOR THE FLEXIBLE BASE MATERIAL SHALL MEET THE REQUIREMENTS OF TXDOT'S SPECIFICATION ITEM 247. EACH LAYER OF MATERIAL, INCLUSIVE OF SUBGRADE, SHALL BE COMPACTED AS SPECIFIED AND TESTED FOR DENSITY AND MOISTURE IN ACCORDANCE WITH TEST METHODS TEX–113–E, TEX–114–E, TEX–115–E. THE NUMBER AND LOCATION OF REQUIRED TESTS SHALL BE DETERMINED BY THE GEOTECHNICAL ENGINEER AND APPROVED BY THE CITY OF NEW BRAUNFELS STREET INSPECTOR. AT A MINIMUM, TESTS SHALL BE TAKEN EVERY 200 LF FOR EACH LIFT. UPON COMPLETION OF TESTING, THE GEOTECHNICAL ENGINEER WILL PROVIDE THE CITY OF NEW BRAUNFELS STREET INSPECTOR WITH ALL TESTING DOCUMENTATION AND A CERTIFICATION STATING THAT THE PLACEMENT OF FLEXIBLE BASE, AND FILL MATERIAL, AND SUBGRADE, HAS BEEN COMPLETED IN ACCORDANCE WITH THE PLANS. ADDITIONAL DENSITY TESTS MAY BE REQUESTED BY THE CITY OF NEW BRAUNFELS INSPECTOR.

ITEM 340

16. ASPHALTIC CONCRETE PAVEMENT SHALL BE THE TYPE OF HOT MIX ASPHALT AS DEFINED IN TXDOT'S STANDARD SPECIFICATIONS FOR CURRENT TXDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREET AND BRIDGES.

17. THE CITY OF NEW BRAUNFELS WILL NOT ACCEPT THE USE OF RECYCLED ASPHALT PAVEMENT (RAP) OR RECYCLED ASPHALT SHINGLES (RAS) IN ASPHALT MIXTURES FOR NEW ROADWAYS. ANY DEBRIS INCLUSIONS WITHIN NEW ASPHALT PAVEMENTS WILL RESULT IN ASPHALT REMOVAL AND REPLACEMENT FROM CURB TO CURB FOR LIMITS TO BE DETERMINED BY THE CITY OF NEW BRAUNFELS.

18. THE ASPHALTIC CONCRETE PAVEMENT SURFACE COURSE SHALL BE PLANT MIXED, HOT LAID TYPE "C"MEETING THE SPECIFICATION REQUIREMENTS OF TXDOT ITEM 340. WHERE ASPHALTIC CONCRETE PAVEMENT SUB–SURFACE COURSES ARE SPECIFIED, THEY SHALL BE PLANT MIXED, HOT LAID TYPE "B"MEETING THE SPECIFICATION REQUIREMENTS OF TXDOT ITEM 340. THE MIXTURE SHALL BE DESIGNED PER THE DESIGN REQUIREMENTS SPECIFIED IN TXDOT ITEM 340 AND SHALL BE COMPACTED TO BETWEEN 91 AND 95 PERCENT OF THE MAXIMUM THEORETICAL DENSITY AS DETERMINED BY TXDOT TEST METHOD TEX–227–F. PLACE THE MIXTURE WHEN THE ROADWAY SURFACE TEMPERATURE IS AT OR ABOVE 60°F. COMPLETE ALL COMPACTION OPERATIONS BEFORE THE PAVEMENT TEMPERATURE DROPS BELOW 160°F. THE ASPHALT CEMENT CONTENT BY PERCENT OF TOTAL MIXTURE WEIGHT SHALL FALL WITHIN A TOLERANCE OF +0.5 PERCENT FROM A SPECIFIC MIX DESIGN.

CONSTRUCTION STABILIZED ENTRANCE

19. SAWCUT CURB FOR CONSTRUCTION ENTRANCE.

20. STABILIZED CONSTRUCTION AREA SHALL BE CONSTRUCTED OF 3"X5" ROCK TO BE PLACED A MINIMUM LENGTH OF 25–FT. AND MAINTAINED SO THAT CONSTRUCTION DEBRIS DOES NOT FALL WITHIN THE CITY RIGHT–OF–WAY. RIGHT– OF–WAY MUST BE CLEARED FROM MUD, ROCKS, ETC. AT ALL TIMES.

SIGNING AND PAVEMENT MARKING PLAN NOTES

21. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL REGULATORY AND WARNING SIGNS, STREETS NAME SIGNS AND SIGN MOUNTS IN ACCORDANCE WITH APPROVED ENGINEERING PLANS. THE CITY WILL INSPECT ALL SIGNS AT FINAL INSPECTION.

22. THE CONTRACTOR SHALL INSTALL ALL PAVEMENT MARKINGS IN ACCORDANCE WITH APPROVED ENGINEERING PLANS. THE CONTRACTOR SHALL NOTIFY THE CITY AT LEAST TWENTY–FOUR (24) HOURS PRIOR TO THE INSTALLATION OF ALL SEALER AND FINAL MARKINGS. THE CITY WILL INSPECT ALL MARKINGS AT FINAL APPLICATION.

SEEDING AND ESTABLISHMENT OF VEGETATION WITHIN EARTHEN CHANNELS, STORMWATER BASINS AND DISTURBED AREAS

23. SEEDING FOR THE PURPOSE OF ESTABLISHING VEGETATION WITHIN CONSTRUCTED EARTHEN CHANNELS, BASINS AND DISTURBED AREAS SHALL BE CONDUCTED IN ACCORDANCE WITH ITEM 164 (SEEDING FOR EROSION CONTROL OF TXDOT'S STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS AND BRIDGES MANUAL). ONLY SEED TYPES AND MIXES SPECIFIED FOR THE SAN ANTONIO DISTRICT (DISTRICT 15 IN TABLES 1 AND 2 UNDER ITEM 164) SHALL BE UTILIZED. DURING THE COOL SEASON (SEPT 1–NOV 30), CEREAL RYE AND SEED SPECIES SPECIFIED FOR THE SAN ANTONIO DISTRICT IN TABLE 3 MAY BE USED. FOR COOL SEASON SEEDING APPLICATIONS, COOL SEASON SEED MIXES SHALL BE USED IN CONJUNCTION WITH SEED MIXES FOR THE SAN ANTONIO DISTRICT AS SPECIFIED IN TABLE 1 AND 2 UNDER ITEM 164.

24. IT MAY BE DEEMED NECESSARY TO INCORPORATE TOPSOIL AND SOIL AMENDMENTS (I.E. COMPOST/ FERTILIZER) INTO EXISTING SOIL IN ORDER TO FACILITATE VEGETATION GROWTH. TOPSOIL, COMPOST AND FERTILIZER ADDITIONS SHALL BE CONDUCTED ACCORDING TO ITEMS 160, 161 AND 166 OF TXDOT'S STANDARD SPECIFICATIONS MANUAL, RESPECTIVELY.

25. AREAS REQUIRING PERMANENT VEGETATION (EARTHEN CHANNELS, PONDS, ETC.) ARE REQUIRED TO MEET TXDOT SPECIFICATIONS FOR ITEM 160 TOPSOIL. TESTING PER TEX–128–E WILL BE REQUIRED AT THE CITY'S REQUEST.

26. WATERING MAY ALSO BE NECESSARY TO FACILITATE AND EXPEDITE THE SPROUTING AND GROWTH OF VEGETATION. ITEM 168 OF TXDOT'S STANDARD SPECIFICATIONS MANUAL SHALL BE ADHERED TO FOR VEGETATIVE WATERING.

27. IF EXTENDED DROUGHT CONDITIONS EXIST THAT HINDER OR PROHIBIT THE GROWTH AND ESTABLISHMENT OF VEGETATION, THE CONTRACTOR SHALL PROVIDE A PLAN TO THE CITY OF NEW BRAUNFELS DESCRIBING THE MEASURES THAT WILL BE TAKEN TO STABILIZE EARTHEN DRAINAGE INFRASTRUCTURE UNTIL A TIME WHEN GROWING CONDITIONS BECOME MORE FAVORABLE.

AT&T TEXAS/SWBT FACILITIES:

1. THE LOCATIONS OF AT&T TEXAS/SWBT FACILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION BEFORE COMMENCING WORK. HE AGREES TO BE FULLY RESPONSIBLE FOR ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THIS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UNDERGROUND UTILITIES.

2. THE CONTRACTOR SHALL CALL 1–800–344–8377 (TEXAS 811) A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE UNDERGROUND LINES FIELD LOCATED.

3. WHEN EXCAVATING WITHIN EIGHTEEN INCHES (18") OF THE INDICATED LOCATION OF AT&T TEXAS/SWBT FACILITIES, ALL EXCAVATIONS MUST BE ACCOMPLISHED USING NON–MECHANIZED EXCAVATION PROCEDURES. WHEN BORING, THE CONTRACTOR SHALL EXPOSE THE AT&T TEXAS/SWBT FACILITIES.

4. WHEN AT&T TEXAS/SWBT FACILITIES ARE EXPOSED, THE CONTRACTOR WILL PROVIDE SUPPORT TO PREVENT DAMAGE TO THE CONDUIT DUCTS OR CABLES. WHEN EXCAVATING NEAR TELEPHONE POLES THE CONTRACTOR SHALL BRACE THE POLE FOR SUPPORT.

5. THE PRESENCE OR ABSENCE OF AT&T TEXAS/SWBT UNDERGROUND CONDUIT FACILITIES OR BURIED CABLE FACILITIES SHOWN ON THESE PLANS DOES NOT MEAN THAT THERE ARE NO DIRECT BURIED CABLES OR OTHER CABLES IN CONDUIT IN THE AREA.

SHEET SCALE NOTE:

1. ALL SCALES SHOWN ARE FOR 22"X34" SHEETS. ADJUST SCALE ACCORDINGLY FOR HALF SIZED (11"X17") SHEETS.

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

GENERAL NOTES

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2957 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

SCALE:	AS NOTED	DGN. BY:	AZ
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STATE OF TEXAS
ALEX ZERTUCHE
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K:\05668\05668–0026–01 san antonio street and water lane roadway improvements\2 design phase\CAD\Plans\05668–0026–01–SF–Notes.dwg May 09, 2025 – 1:43pm JFR

GENERAL TRAFFIC HANDLING NOTES

A. HANDLE TRAFFIC APPROPRIATELY THROUGHOUT THE PROJECT DURING CONSTRUCTION. PROVIDE FOR THE SAFETY OF THE TRAVELING PUBLIC AT ALL TIMES. PROVIDE ACCESS TO PROPERTIES AND BUSINESSES ADJACENT TO THE RIGHT-OF-WAY (ROW) AT ALL TIMES DURING THE DURATION OF THE PROJECT. THE ADEQUACY OF THE PROPERTY ACCESS WILL BE DETERMINED BY THE ENGINEER. DO NOT LEAVE EQUIPMENT IN A POSITION THAT WILL ENDANGER THE TRAVELING PUBLIC. MAINTAIN ADEQUATE SAFETY PROVISIONS THROUGHOUT THE PROJECT BY INCLUSION OF SIGNING, MARKINGS, SIGNALS, BARRIERS, AND BARRICADES. CONFORM TO THE LATEST EDITION OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD) WHEN USING THESE PROVISIONS.

B. PROCEED WITH CONSTRUCTION OPERATIONS IN CONFORMITY WITH THIS NARRATIVE OR APPROVED BY THE ENGINEER.

C. PROPOSE AND/OR RECOMMEND ANY MODIFICATIONS TO THE SEQUENCE OF WORK FOR CONSIDERATION TO THE ENGINEER IN WRITING. WRITTEN APPROVAL FROM THE ENGINEER IS REQUIRED PRIOR TO PROCEEDING WITH ANY CONSTRUCTION OPERATION BASED ON A REVISED PHASE/SEQUENCE OF WORK.

D. THE ENGINEER'S INSPECTOR WILL MONITOR THE CONTRACTOR'S TRAFFIC CONTROL DEVICES AND WILL BE RESPONSIBLE FOR APPROVAL OF ALL INFORMATION FLYERS ON ALL JOBS DURING CONSTRUCTION. THE CONTRACTOR WILL BE RESPONSIBLE FOR FURNISHING ALL RESIDENTS AND BUSINESSES WITH THE APPROVED FLIERS AS DIRECTED.

E. THE CONTRACTOR MUST CONTACT THE ENGINEER'S INSPECTOR 48 HOURS IN ADVANCE (NOT INCLUDING WEEKENDS) OF ANY MINOR STREET CLOSURE. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO ADVISE THE ENGINEER'S INSPECTOR 10 CALENDAR DAYS IN ADVANCE OF ANY ARTERIAL STREET CLOSURE. THIS MUCH TIME IS NECESSARY TO INSTALL ADVISORY SIGNS AND GIVE MOTORISTS A MINIMUM OF 7 CALENDAR DAYS NOTICE OF THE STREET CLOSURE. THE ENGINEER'S INSPECTOR, AFTER BEING NOTIFIED, WILL CONTACT THE CITY OF NEW BRAUNFELS TO MAKE THE NECESSARY ARRANGEMENTS.

F. THE CONTRACTOR WILL PROVIDE FOR ACCESS TO RESIDENCES AND BUSINESSES AT ALL TIMES WITHIN ALL PHASES OF THE WORK. DRIVEWAY/INTERSECTING STREET CONSTRUCTION WILL BE PHASED AS TO PROVIDE ACCESS TO TRAFFIC AT ALL TIMES DURING CONSTRUCTION. UTILIZE CHANNELIZING DEVICES TO CLOSE THE DRIVEWAY/MINOR STREET, ACCESS POINTS WILL BE DESIGNATED WITH SIGNS PLACED ON SEPARATE MOUNTS. SIGNING PLACEMENT ON DRUMS IS PROHIBITED.

G. OFF-DUTY PEACE OFFICERS MAY BE HIRED TO SUPPLEMENT THE WORK FORCE TO CONTROL TRAFFIC AT INTERSECTIONS DURING THE DETOURING OF TRAFFIC, CLOSURE OF ROADWAYS AND/OR INTERSECTIONS, AND ANY OTHER CRITICAL PHASES OF TRAFFIC HANDLING AS DETERMINED BY THE ENGINEER.

H. THE CONTRACTOR WILL MAINTAIN CONTINUOUS ACCESS TO ALL INTERSECTING STREETS. WHEN CONTINUOUS ACCESS IS SCHEDULED TO BE BLOCKED, THE CONTRACTOR WILL CONTACT THE DISPATCHERS FOR THE FIRE DEPARTMENT AND EMS AT (830) 221-4200 AND THE POLICE DEPARTMENT AT (830) 221-4100, TO APPRISE THEM OF PENDING STREET CLOSURE AT LEAST 48 HOURS IN ADVANCE. CONTRACTOR SHALL MAINTAIN MINIMUM ONE LANE OF TRAVEL AT ALL TIMES.

I. THE CONTRACTOR WILL INSTALL PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) TO NOTIFY THE TRAVELING PUBLIC AT LEAST TWO WEEKS PRIOR TO A LANE OR ROADWAY CLOSURE. PCMS WILL SUPPLEMENT THE ADVANCE WARNING SIGNS TO HELP MANAGE TRAFFIC FLOW. MESSAGE AND LOCATIONS WILL BE AS DIRECTED BY THE ENGINEER. THIS ITEM WILL BE PAID FOR IN ACCORDANCE WITH TXDOT SPECIAL SPECIFICATION 6001. THE CONTRACTOR WILL PROVIDE TWO (2) PORTABLE CHANGEABLE MESSAGE BOARDS ON SITE AT ALL TIMES.

J. THE CONTRACTOR WILL MAINTAIN EITHER EXISTING OR TEMPORARY STREET NAME SIGNS AT EACH INTERSECTION ONSITE THROUGHOUT CONSTRUCTION. IF THE EXISTING STREET NAME SIGNS ARE USED, THEY MUST BE MAINTAINED IN THE CONDITION ENCOUNTERED PRIOR TO THE BEGINNING OF CONSTRUCTION, AND THEN TURNED IN TO THE ENGINEER'S INSPECTOR AT THE END OF THE PROJECT. IF TEMPORARY SIGNS ARE USED DURING CONSTRUCTION, THEY WILL HAVE A MINIMUM OF 4-INCH LETTERS, AND MAY BE FABRICATED WITH CONSTRUCTION ZONE MATERIAL (BLACK LEGEND ON ORANGE BACKGROUND, USING PLYWOOD SUBSTRATE, ETC.)

K. THE ENGINEER MAY DIRECT THE CONTRACTOR TO VARY THE NUMBER AND LOCATION OF SIGNS AND BARRICADES.

L. EXCEPT AS OTHERWISE REQUIRED FOR THE SAFETY OR PROTECTION OF PERSONS OR THE WORK OR PROPERTY AT THE SITE OR ADJACENT THERETO, AND EXCEPT AS OTHERWISE STATED IN THE CONTRACT DOCUMENTS, ALL WORK AT THE SITE SHALL BE PERFORMED DURING REGULAR WORKING HOURS. CONTRACTOR WILL NOT PERMIT THE PERFORMANCE OF WORK ON A SATURDAY, SUNDAY, OR ANY LEGAL HOLIDAY WITHOUT OWNER'S WRITTEN CONSENT (WHICH WILL NOT BE UNREASONABLY WITHHELD) GIVEN AFTER PRIOR WRITTEN NOTICE TO ENGINEER.

M. WORKING HOURS ARE WEEKDAYS 7:00 AM TO 5:00 PM. ALL REQUESTS TO WORK OUTSIDE THE SPECIFIED TIME PERIODS SHALL BE SUBMITTED IN WRITING AND APPROVED BY THE OWNER NO LATER THAN THREE (3) WORKING DAYS PRIOR TO THE REQUESTED WORK DATE. EMERGENCY WORK MAY BE DONE WITHOUT PRIOR CONSENT OF THE OWNER. CONTRACTOR SHALL REFER TO THE PROJECT MANUAL FOR ADDITIONAL INFORMATION.

N. THE CONTRACTOR WILL BE RESPONSIBLE FOR MAINTAINING POSITIVE DRAINAGE DURING CONSTRUCTION, INCLUDING OFFSITE DRAINAGE FROM ADJACENT PROPERTIES AND AVOID IMPEDING FLOW FROM PRIVATE PROPERTY. DO NOT BLOCK DRAINAGE WHEN HANDLING & STOCKPILING EXCAVATED MATERIAL

O. PLACE CONSTRUCTION EXITS AS NEEDED OR AS DIRECTED BY THE ENGINEER.

P. CONSTRUCT ALL ROADWAYS UP TO THE FIRST LAYER OF 2" TY C MAT UNTIL SUCH A TIME AS THE ENTIRE PROJECT CAN RECEIVE THE FINAL SURFACE MAT OF OVERLAY, UNLESS OTHERWISE NOTED.

Q. THE CONTRACTOR WILL BE RESPONSIBLE FOR REPAIRING ALL STREETS OUTSIDE OF THE PROJECT LIMITS WHICH ARE DAMAGED DUE TO CONSTRUCTION ACTIVITIES. THE REPLACED PAVEMENT SECTION MUST BE APPROVED BY THE ENGINEER. THERE WILL BE NO DIRECT PAYMENT FOR THIS WORK.

R. THE INFORMATION SHOWN CONCERNING THE TYPE AND LOCATION OF ALL UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING DETERMINATIONS AS TO THE TYPE AND LOCATION OF ALL UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO.

S. NO TRAFFIC CONTROL DEVICES, EXCEPT THOSE DIRECTLY RELATED TO SIDEWALK CLOSURES OR DETOURS WILL BE PLACED ON ANY SIDEWALK.

T. THE CONTRACTOR WILL PROTECT ALL EXISTING ILLUMINATION POLES. THE CONTRACTOR WILL BE RESPONSIBLE FOR REPAIRING ANY ILLUMINATION POLE DAMAGED DUE TO CONSTRUCTION ACTIVITIES. THE REPLACEMENT OF ILLUMINATION POLES MUST BE APPROVED BY THE ENGINEER. THERE WILL BE NO DIRECT PAYMENT FOR THIS WORK AND WILL BE COVERED UNDER TXDOT ITEM 100-6002 – "PREPARING ROW".

U. ANY QUESTIONS REGARDING PHASING OR STAGING WILL BE STRICTLY OVERSEEN BY A CITY OF NEW BRAUNFELS INSPECTOR, WHICH HAS COMPLETE AUTHORITY TO MAKE FINAL DECISIONS ON ANY CHANGES OR MODIFICATIONS.

V. THE TEMPORARY BARRICADES AND WARNING SIGNS WILL BE LOCATED SO AS TO AFFORD THE MAXIMUM PROTECTION TO THE PUBLIC AS WELL AS CONSTRUCTION PERSONNEL AND EQUIPMENT AND TO FACILITATE AN EXPEDITIOUS FLOW OF TRAFFIC AT ALL TIMES DURING CONSTRUCTION.

W. THE PLANS ARE PHASED FOR UTILITY AND STREET CONSTRUCTION. NO CONSTRUCTION WILL TAKE PLACE OUTSIDE OF THE PHASING LIMITS, UNLESS SPECIFICALLY AUTHORIZED IN WRITING BY THE CITY OF NEW BRAUNFELS. THE CONTRACTOR'S CONSTRUCTION SCHEDULE, REQUIRED PRIOR TO CONSTRUCTION, WILL BE ADHERED TO UNLESS MODIFIED AND AUTHORIZED IN WRITING BY THE CITY OF NEW BRAUNFELS.

X. INTERSECTING STREETS WILL BE CONSTRUCTED IN STAGES SO AS TO MAINTAIN ACCESS. WITH APPROVAL FROM THE CITY OF NEW BRAUNFELS, THE CONTRACTOR MAY CLOSE AN ENTIRE INTERSECTION. THE CONTRACTOR WILL BE REQUIRED TO PROVIDE A DETOUR PLAN FOR SUCH A CLOSURE TO THE CITY OF NEW BRAUNFELS FOR APPROVAL.

Y. ONLY ONE PHASE CAN BE WORKED ON A TIME, UNLESS APPROVED BY THE ENGINEER.

SEQUENCE OF WORK

THE SEQUENCE OF WORK WILL BE AS FOLLOWS UNLESS OTHERWISE DIRECTED/APPROVED BY THE ENGINEER.

1. BEFORE THE COMMENCEMENT OF EACH PHASE, INSTALL OR MAINTAIN ADVANCE WARNING SIGNS, TEMPORARY TRAFFIC CONTROL SIGNS, BARRICADES, AND TEMPORARY EROSION CONTROL ITEMS. DO NOT PLACE DEVICES WHERE THEY INTERFERE WITH SIGHT DISTANCE AT DRIVEWAYS OR INTERSECTIONS. DAILY CLOSURES WILL BE USED IN ACCORDANCE WITH TXDOT TCP STANDARDS. ALL ACTIVE WORK AREAS AND AREAS WHERE DROP-OFF CONDITIONS ARE GREATER THAN 2 INCHES MUST HAVE AT LEAST A 3:1 SLOPE AT THE END OF EACH WORKDAY AND THROUGHOUT THE PROJECT LIMITS TO ALLOW ACCESS TO ADJACENT PROPERTIES, DRIVEWAYS, AND SIDE STREETS
2. PREPARING ROW/REMOVAL OF EXISTING ITEMS TO BE DONE ONLY IN AREAS WHERE WORK IS OCCURRING, AS PER THE PHASES NOTED BELOW.
3. ANY EXISTING PAVEMENT MARKINGS CONFLICTING WITH WORK ZONE PAVEMENT MARKINGS WILL BE REMOVED AND PAID FOR IN ACCORDANCE WITH ITEM 677. SURFACE TREATMENT METHOD AND WILL BE COVERED WITH A STRIP OF SEAL OF 24"MINIMUM WIDTH AS DIRECTED BY THE ENGINEER.
4. PERFORM PLANING, SURFACE TREATMENTS AND OVERLAYS IN THE DIRECTION OF TRAFFIC. UNLESS OTHERWISE NOTED IN THE PLANS, CONSTRUCT JOINT BID UTILITIES WITHIN THE WORK ZONE OF EACH CORRESPONDING PHASE/STAGE PRIOR TO THE ROADWAY CONSTRUCTION OR CONCURRENTLY AS APPROVED BY THE ENGINEER.

THIS PROJECT WILL BE CONSTRUCTED IN FOUR (4) PHASES. PRIOR TO BEGINNING CONSTRUCTION OF EACH PHASE, CONTRACTOR WILL SUBMIT A DETAILED TRAFFIC CONTROL PLAN, INCLUDING ANY NECESSARY STAGES OF THE WORK, TO THE ENGINEER FOR APPROVAL. A BRIEF DESCRIPTION OF EACH PHASE IS AS FOLLOWS:

PHASE 1: UTILITIES (WATER AND WASTEWATER INSTALLMENT)

1. SEE NBU WATER AND SEWER PLANS ("SAN ANTONIO STREET REHABILITATION PHASE 3 PROJECT") FOR PROPOSED WATER AND SEWER IMPROVEMENTS.
2. INSTALL PROJECT LIMITS, ADVANCE WARNING SIGNS, TRAFFIC CONTROL DEVICES, AND TEMPORARY EROSION CONTROL DEVICES AS SHOWN IN THE PLANS AND TXDOT TCP STANDARDS.
3. CONSTRUCT PROPOSED UTILITIES WITHIN THE LIMITS AND AS SHOWN IN THE PLANS. MAINTAIN TWO-LANES, TWO-WAY TRAFFIC WHERE POSSIBLE AND SHIFT TRAFFIC TO ONE-LANE, TWO-WAY OPERATION USING FLAGGERS AS NEEDED. ALL UTILITY WORK THAT CANNOT BE COMPLETED IN PHASE I WILL BE COMPLETED IN PHASE II.

PHASE 2: BASE REPAIR AND MILL

1. RELOCATE/ADJUST TEMPORARY TRAFFIC AND EROSION CONTROL DEVICES AS NEEDED.
2. REMOVE AND/OR COVER EXISTING PAVEMENT MARKINGS IN CONFLICT WITH PHASE WORK.
3. CONSTRUCT PAVEMENT REHABILITATION AS SHOWN IN PLANS (EXCEPT FOR FINAL SURFACE). MILL EXISTING ASPHALT AND PERFORM ROADWAY BASE REPAIRS AS SHOWN IN THE PLANS, OMITTING THE FINAL SURFACE COURSE.
4. UTILITY WORK AND ROAD WORK MAY BE CONCURRENT IF APPROVED BY ENGINEER.

PHASE 3: FULL RECONSTRUCTION

1. RELOCATE/ADJUST TEMPORARY TRAFFIC AND EROSION CONTROL DEVICES AS NEEDED.
2. REMOVE AND/OR COVER EXISTING PAVEMENT MARKINGS IN CONFLICT WITH PHASE WORK.
3. PERFORM FULL RECONSTRUCTION AS SHOWN IN THE PLANS, OMITTING FINAL SURFACE COURSE.

PHASE 4: FINAL SURFACE COURSE

1. RELOCATE/ADJUST TEMPORARY TRAFFIC AND EROSION CONTROL DEVICES AS NEEDED.
2. CONSTRUCT FINAL ROAD IMPROVEMENTS AS SHOWN IN THE PLANS.
3. CONSTRUCT SIDEWALK, DRIVEWAY, AND RETAINING WALL IMPROVEMENTS AS SHOWN IN THE PLANS.
4. HYDROMULCH / SOD ALL DISTURBED PERVIOUS AREAS.
5. PLACE FINAL ROADWAY ASPHALT SURFACE COURSE AS SHOWN IN THE PLANS.
6. PLACE FINAL PAVEMENT MARKINGS TO THE LIMITS SHOWN IN THE PLANS.
7. REMOVE ALL TEMPORARY SIGNAGE, TRAFFIC CONTROL DEVICES, AND EROSION CONTROL DEVICES.
8. PERFORM FINAL WALK THROUGH AND OPEN TO TRAFFIC UNRESTRICTED.

SAFETY

A. THE CONTRACTOR WILL PROVIDE, CONSTRUCT AND MAINTAIN BARRICADES AND SIGNS IN ACCORDANCE WITH THE LATEST VERSION OF THE STATE STANDARDS BC (1 – 12). ANY SIGNS REQUIRED THAT ARE NOT DETAILED IN THE STANDARD SHEETS WILL BE IN CONFORMANCE WITH THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" AND THE "STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS".

B. THE CONTRACTOR WILL PROVIDE AND MAINTAIN OTHER BARRICADES AND SIGNS DEEMED NECESSARY BY THE ENGINEER OR AS DIRECTED BY FIELD CONDITIONS, TO PROVIDE FOR THE PASSAGE OF TRAFFIC IN SAFETY AT ALL TIMES.

C. THE CONTRACTOR MUST MAINTAIN ALL STREETS WITHIN PROJECT LIMITS OPEN TO TRAFFIC BY REPAIRING TRENCHES, POTHOLES, LEVELING UP WITH ASPHALT, ETC. AT NO DIRECT PAYMENT, COST SHOULD BE INCLUDED IN OTHER ITEMS.

D. PROTECT EXPOSED PITS THAT MUST REMAIN OPEN DURING NON-WORKING HOURS AS PER OSHA REQUIREMENTS. ADDITIONALLY, UTILITY TRENCHES SHALL BE FENCED IN OR PLATED IN PAVED AREAS AT THE END OF EACH WORKDAY.

E. THE CONTRACTOR WILL PROVIDE AND MAINTAIN FLAGGERS AS DIRECTED/APPROVED BY THE ENGINEER, AT SUCH POINTS, AND FOR SUCH PERIODS OF TIME AS MAY BE REQUIRED, TO PROVIDE FOR THE SAFETY OF THE TRAVELING PUBLIC AND THE CONTRACTOR'S PERSONNEL. THE USE OF FLAGGERS, AS NECESSARY, WILL NOT BE PAID FOR SEPARATELY BUT WILL BE CONSIDERED SUBSIDIARY TO OTHER BID ITEMS.

F. THE CONTRACTOR WILL KEEP THE ROADWAY CLEAN AND FREE OF DIRT OR OTHER MATERIALS DURING HAULING OPERATIONS. IF THE CONTRACTOR DOES NOT MAINTAIN A CLEAN ROADWAY, THEY WILL CEASE ALL CONSTRUCTION OPERATIONS, WHEN DIRECTED BY THE ENGINEER, TO CLEAN THE ROADWAY TO THE SATISFACTION OF THE ENGINEER.

G. USE A POWER-BROOM WHEN CLEANING THE ROADWAY AS NEEDED.

TRAFFIC CONTROL DEVICES:

A. AT THE COMMENCEMENT OF CONSTRUCTION, ALL TRAFFIC CONTROL DEVICES SHALL BE IN ACCEPTABLE CONDITION, AND MAINTAINED THROUGHOUT THE DURATION OF CONSTRUCTION.

B. NOTIFY THE CITY INSPECTOR IN WRITING (OR EMAIL) ONCE THE TRAFFIC CONTROL DEVICES HAVE BEEN INSTALLED AND ARE READY FOR INSPECTION. COMMENCEMENT OF WORK WILL NOT BE AUTHORIZED NOR ALLOWED UNTIL THE CITY INSPECTOR NOTIFIES THE CONTRACTOR IN WRITING (OR EMAIL) TO PROCEED WITH THE WORK.

C. CONTRACTOR SHALL HAVE A SUFFICIENT AMOUNT OF TRAFFIC CONTROL DEVICES IN ACCEPTABLE CONDITION TO REPLACE ANY DAMAGED TRAFFIC CONTROL DEVICES WITHIN 24 HOURS.

D. PROVIDE ADDITIONAL SIGNS AND BARRICADES AS NECESSARY TO ADDRESS FIELD CONSTRUCTABILITY & VISIBILITY. THESE ADDITIONAL SIGNS WILL BE CONSIDERED SUBSIDIARY TO TXDOT ITEM 502.

E. REMOVE OR COMPLETELY COVER ALL EXISTING SIGNS WHICH ARE IN CONFLICT WITH THE TRAFFIC CONTROL PLANS.

F. COORDINATE THE VARIOUS PHASES OF CONSTRUCTION WITH ADJACENT CONSTRUCTION PROJECTS IF APPLICABLE, TO ENSURE THE UNINTERRUPTED AND SAFE FLOW OF TRAFFIC.

G. NOTIFY THE CITY INSPECTOR IN WRITING (OR EMAIL) WHEN MAJOR TRAFFIC CHANGES ARE TO BE MADE. NOTIFICATIONS MUST BE GIVEN A MINIMUM OF THREE WORKING DAYS PRIOR TO THE CHANGE.

HAULING EQUIPMENT

A. THE USE OF RUBBER-TIRED EQUIPMENT WILL BE REQUIRED FOR MOVING DIRT OR OTHER MATERIALS ALONG OR ACROSS PAVEMENTED SURFACES. WHERE THE CONTRACTOR DESIRES TO MOVE ANY EQUIPMENT NOT LICENSED FOR OPERATION ON PUBLIC HIGHWAYS, ON OR ACROSS PAVEMENT. THEY WILL PROTECT THE PAVEMENT FROM DAMAGE AS DIRECTED / APPROVED BY THE ENGINEER.

B. THROUGHOUT CONSTRUCTION OPERATIONS, THE CONTRACTOR WILL BE REQUIRED TO CONDUCT THEIR HAULING OPERATIONS IN A MANNER SUCH THAT VEHICLES WILL NOT HAUL OVER PREVIOUSLY RECOMPACTED SUBGRADE OR COMPACTED BASE MATERIAL, EXCEPT IN SHORT SECTIONS FOR DUMPING MANIPULATIONS.

FINAL CLEAN UP

A. UPON COMPLETION OF THE WORK AND BEFORE FINAL ACCEPTANCE AND FINAL PAYMENT IS MADE, THE CONTRACTOR WILL CLEAR AND REMOVE FROM THE SITE ALL SURPLUS AND DISCARDED MATERIALS AND DEBRIS OF EVERY KIND AND LEAVE THE ENTIRE PROJECT IN A SMOOTH, NEAT AND SIGHTLY CONDITION. DISPOSE OF EXCESS MATERIALS IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS.

PROJECT SPECIFIC NOTES

A. CONTRACTOR SHALL REFERENCE TXDOT TRAFFIC CONTROL PLAN STANDARDS (TCP) FOR TRAFFIC CONTROL DEVICES, AND SIGN AND SPACING REQUIREMENTS NOT SPECIFICALLY SHOWN IN THE PLANS.

B. THE VARIOUS PHASES OF CONSTRUCTION SERVE AS A GUIDE FOR DURING CONSTRUCTION OF THE UTILITIES, ROADWAY IMPROVEMENTS, AND OTHER RELATED ITEMS. THE PHASING PLAN SHOWN DOES NOT ATTEMPT TO ADDRESS EVERY ASPECT OF CONSTRUCTION THAT IS REQUIRED. THE PHASING PLAN DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF CONSTRUCTING THE COMPLETE UTILITIES, ROADWAY IMPROVEMENTS AND OTHER RELATED ITEMS, AS NOTED ON THE PLANS AND SPECIFICATIONS.

C. THE CONTRACTOR SHALL NOTIFY THE PROPER CITY, COUNTY, E.M.S., FIRE DEPARTMENT, POLICE DEPARTMENT, TEXAS DEPARTMENT OF PUBLIC SAFETY, TEXAS DEPARTMENT OF TRANSPORTATION OFFICIALS WHEN MAJOR TRAFFIC CHANGES ARE TO BE MADE. THE NOTIFICATION MUST BE MADE THREE DAYS PRIOR TO THE CHANGE.

D. THE CONTRACTOR SHALL KEEP TRAVELED SURFACES USED IN HAULING OPERATIONS CLEAR AND FREE OF DIRT AND OTHER MATERIAL.

E. CONTRACTOR TO SUBMIT SHOP DRAWINGS FOR DESIGN OF TEMPORARY SHORING REQUIRED FOR CULVERT CONSTRUCTION.

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

TRAFFIC CONTROL PLAN NARRATIVE

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2957 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

SCALE: AS NOTED DGN. BY: AZ
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SUBMITTED: ---- SURV. BY: QUIDDITY

STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED PROFESSIONAL ENGINEER
5/9/2025

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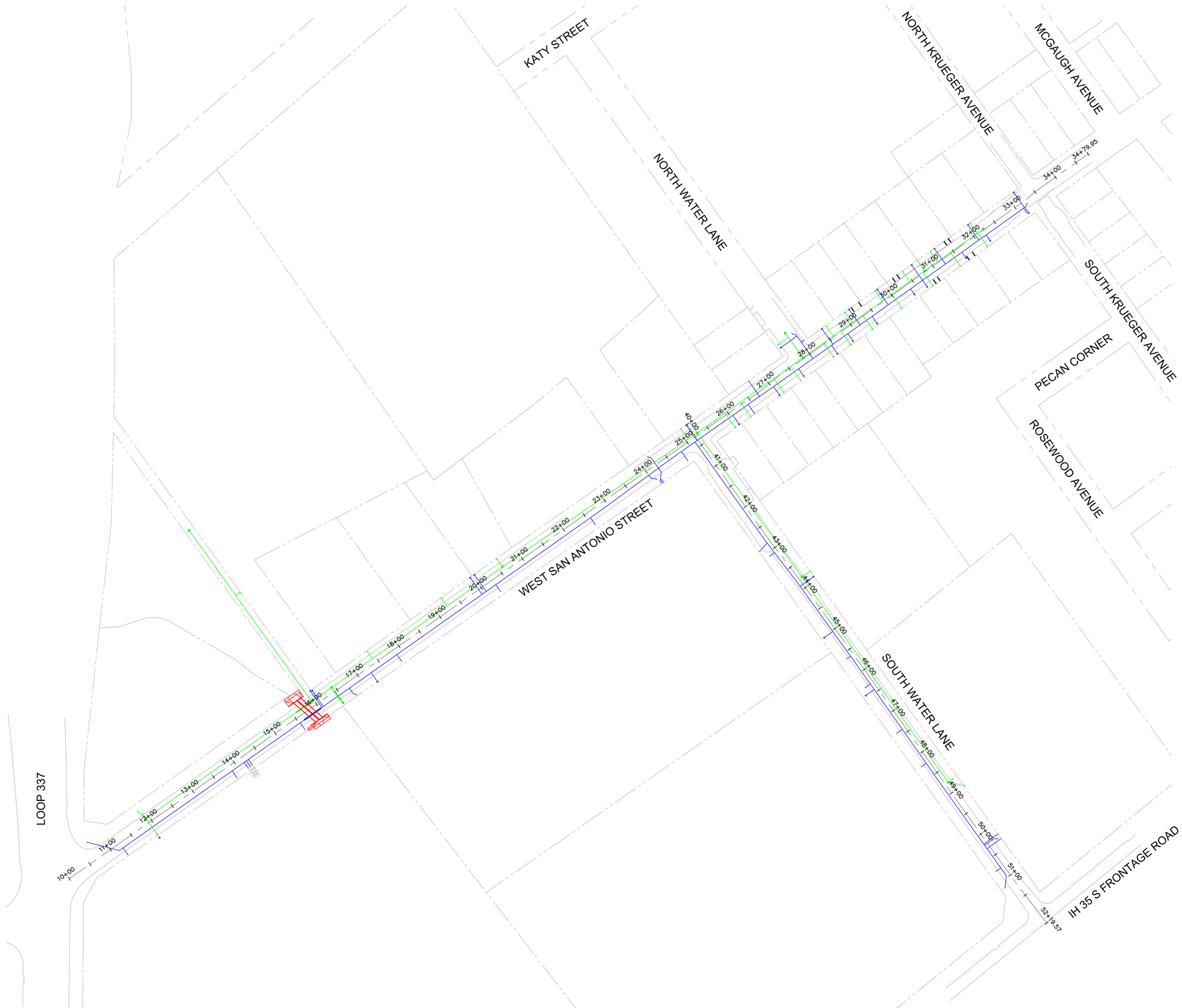

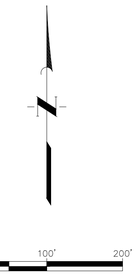

LEGEND

- TRACT BOUNDARIES
- EXISTING EDGE OF PAVEMENT
- PROPOSED STORM
- PROPOSED SANITARY SEWER MAIN
- PROPOSED WATER MAIN

SEE NBU WATER AND SEWER PLANS ("SAN ANTONIO STREET REHABILITATION PHASE 3 PROJECT") FOR PROPOSED WATER AND SEWER IMPROVEMENTS

NOTES:

1. THE VARIOUS PHASES OF CONSTRUCTION SERVE AS A GUIDE FOR THE SAFE HANDLING OF TRAFFIC DURING CONSTRUCTION OF THE UTILITIES, ROADWAY IMPROVEMENTS, AND OTHER RELATED ITEMS. THE PHASING PLAN SHOWN DOES NOT ATTEMPT TO ADDRESS EVERY ASPECT OF CONSTRUCTION THAT IS REQUIRED. THE PHASING PLAN DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF CONSTRUCTING THE COMPLETE UTILITIES, ROADWAY IMPROVEMENTS AND OTHER RELATED ITEMS, AS NOTED ON THE PLANS AND SPECIFICATIONS.
2. CONTRACTOR TO PROVIDE ACCESS TO POLICE STATION, FIRE DEPARTMENT, COUNTY FACILITIES AND PRIVATE DRIVEWAYS AT ALL TIMES.
3. CONTRACTOR SHALL REFERENCE TMUTCD FOR TRAFFIC CONTROL DEVICES, AND SIGN AND SPACING REQUIREMENTS NOT SPECIFICALLY SHOWN ON THIS SHEET.
4. THE CONTRACTOR WILL MAINTAIN CONTINUOUS ACCESS TO ALL INTERSECTING STREETS. WHEN CONTINUOUS ACCESS IS SCHEDULED TO BE BLOCKED, THE CONTRACTOR WILL CONTACT THE DISPATCHERS FOR THE FIRE DEPARTMENT AND EMS AT (830) 221-4200 AND THE POLICE DEPARTMENT AT (830) 221-4100, TO APPRISE THEM OF PENDING STREET CLOSURE AT LEAST 48 HOURS IN ADVANCE. CONTRACTOR SHALL MAINTAIN MINIMUM ONE LANE OF TRAVEL AT ALL TIMES.

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

TCP LAYOUT PHASE 1 UTILITIES

QUIDDITY
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2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

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STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED
PROFESSIONAL ENGINEER
5/9/2025

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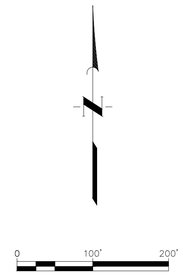

LEGEND

- TRACT BOUNDARIES
- EXISTING EDGE OF PAVEMENT
- ROADWAY BASE REPAIR
- MILL EXISTING ASPHALT

NOTES:

1. THE VARIOUS PHASES OF CONSTRUCTION SERVE AS A GUIDE FOR THE SAFE HANDLING OF TRAFFIC DURING CONSTRUCTION OF THE UTILITIES, ROADWAY IMPROVEMENTS, AND OTHER RELATED ITEMS. THE PHASING PLAN SHOWN DOES NOT ATTEMPT TO ADDRESS EVERY ASPECT OF CONSTRUCTION THAT IS REQUIRED. THE PHASING PLAN DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF CONSTRUCTING THE COMPLETE UTILITIES, ROADWAY IMPROVEMENTS AND OTHER RELATED ITEMS, AS NOTED ON THE PLANS AND SPECIFICATIONS.
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NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

TCP LAYOUT PHASE 2
BASE REPAIR & MILL

QUIDDITY
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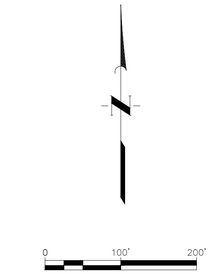

LEGEND

- TRACT BOUNDARIES
- EXISTING EDGE OF PAVEMENT
- FULL RECONSTRUCTION PHASE 3A
- FULL RECONSTRUCTION PHASE 3B

NOTES:

1. THE VARIOUS PHASES OF CONSTRUCTION SERVE AS A GUIDE FOR THE SAFE HANDLING OF TRAFFIC DURING CONSTRUCTION OF THE UTILITIES, ROADWAY IMPROVEMENTS, AND OTHER RELATED ITEMS. THE PHASING PLAN SHOWN DOES NOT ATTEMPT TO ADDRESS EVERY ASPECT OF CONSTRUCTION THAT IS REQUIRED. THE PHASING PLAN DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF CONSTRUCTING THE COMPLETE UTILITIES, ROADWAY IMPROVEMENTS AND OTHER RELATED ITEMS, AS NOTED ON THE PLANS AND SPECIFICATIONS.
2. CONTRACTOR TO PROVIDE ACCESS TO POLICE STATION, FIRE DEPARTMENT, COUNTY FACILITIES AND PRIVATE DRIVEWAYS AT ALL TIMES.
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NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

TCP LAYOUT PHASE 3
FULL RECONSTRUCTION

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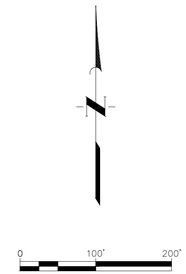

LEGEND

- TRACT BOUNDARIES
- EXISTING EDGE OF PAVEMENT
- FINAL SURFACE
- CONCRETE IMPROVEMENTS

NOTES:

1. THE VARIOUS PHASES OF CONSTRUCTION SERVE AS A GUIDE FOR THE SAFE HANDLING OF TRAFFIC DURING CONSTRUCTION OF THE UTILITIES, ROADWAY IMPROVEMENTS, AND OTHER RELATED ITEMS. THE PHASING PLAN SHOWN DOES NOT ATTEMPT TO ADDRESS EVERY ASPECT OF CONSTRUCTION THAT IS REQUIRED. THE PHASING PLAN DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF CONSTRUCTING THE COMPLETE UTILITIES, ROADWAY IMPROVEMENTS AND OTHER RELATED ITEMS, AS NOTED ON THE PLANS AND SPECIFICATIONS.
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NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

TCP LAYOUT PHASE 4
FINAL

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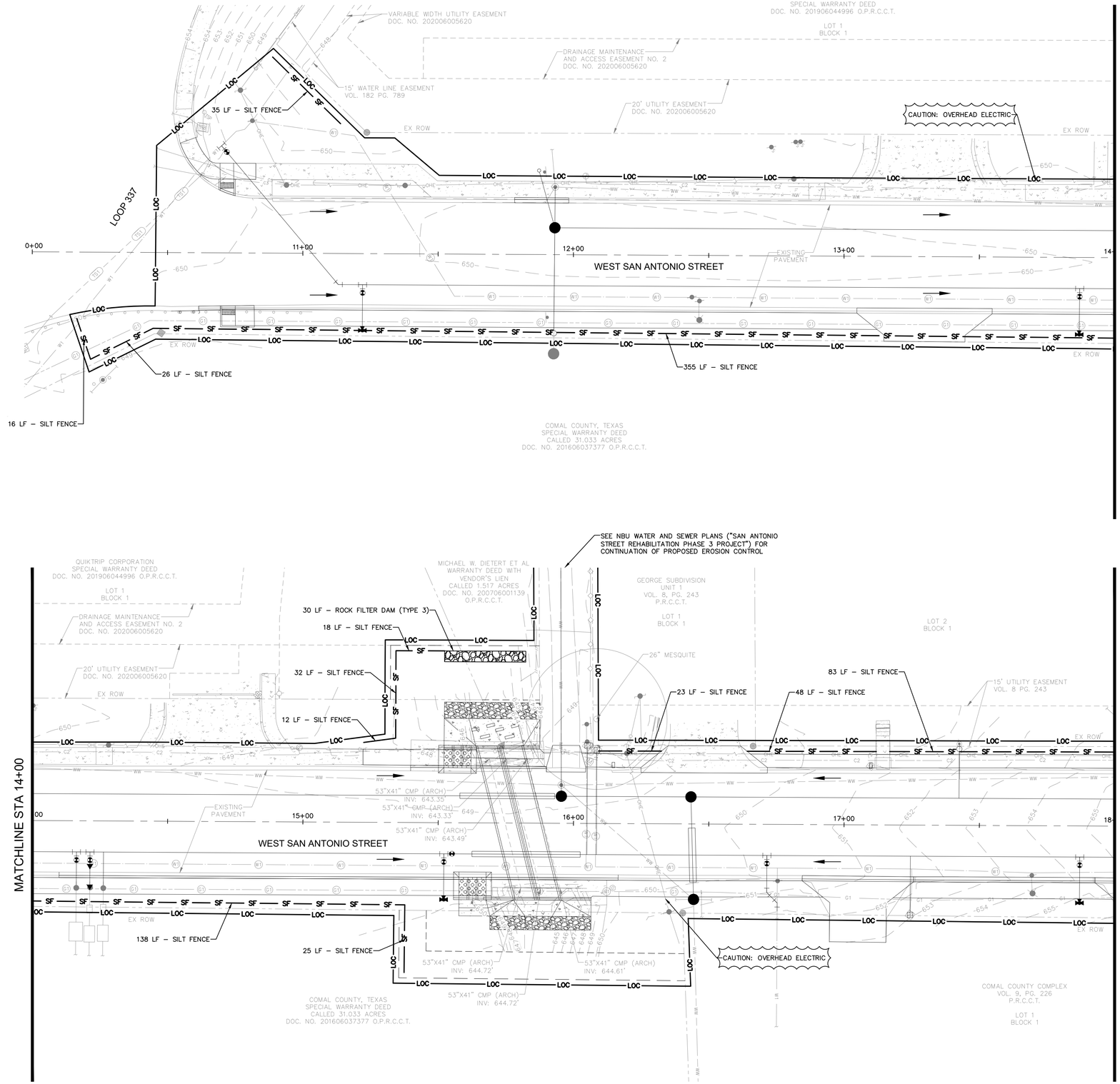

LEGEND

- SF — SILT FENCE
- LOC — LIMITS OF CONSTRUCTION
- SANDBAG
- DRAINAGE DIRECTION
- ROCK BERM

EROSION CONTROL NOTES:

1. ALL SILT FENCING AND OTHER EROSION CONTROL MEASURES SHALL BE LOCATED AT OR WITHIN PUBLIC RIGHT OF WAY OR UTILITY EASEMENTS.
2. PER TPDES REQUIREMENTS, DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITIES HAVE CEASED (TEMPORARILY OR PERMANENTLY) SHALL BE STABILIZED WITHIN 14 DAYS UNLESS ACTIVITY RESUMES WITHIN 21 DAYS. SEEDING DOES NOT CONSTITUTE AS STABILIZATION.

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

EROSION CONTROL
BEGIN TO 18+00

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

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STATE OF TEXAS
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PROFESSIONAL ENGINEER
5/9/2025

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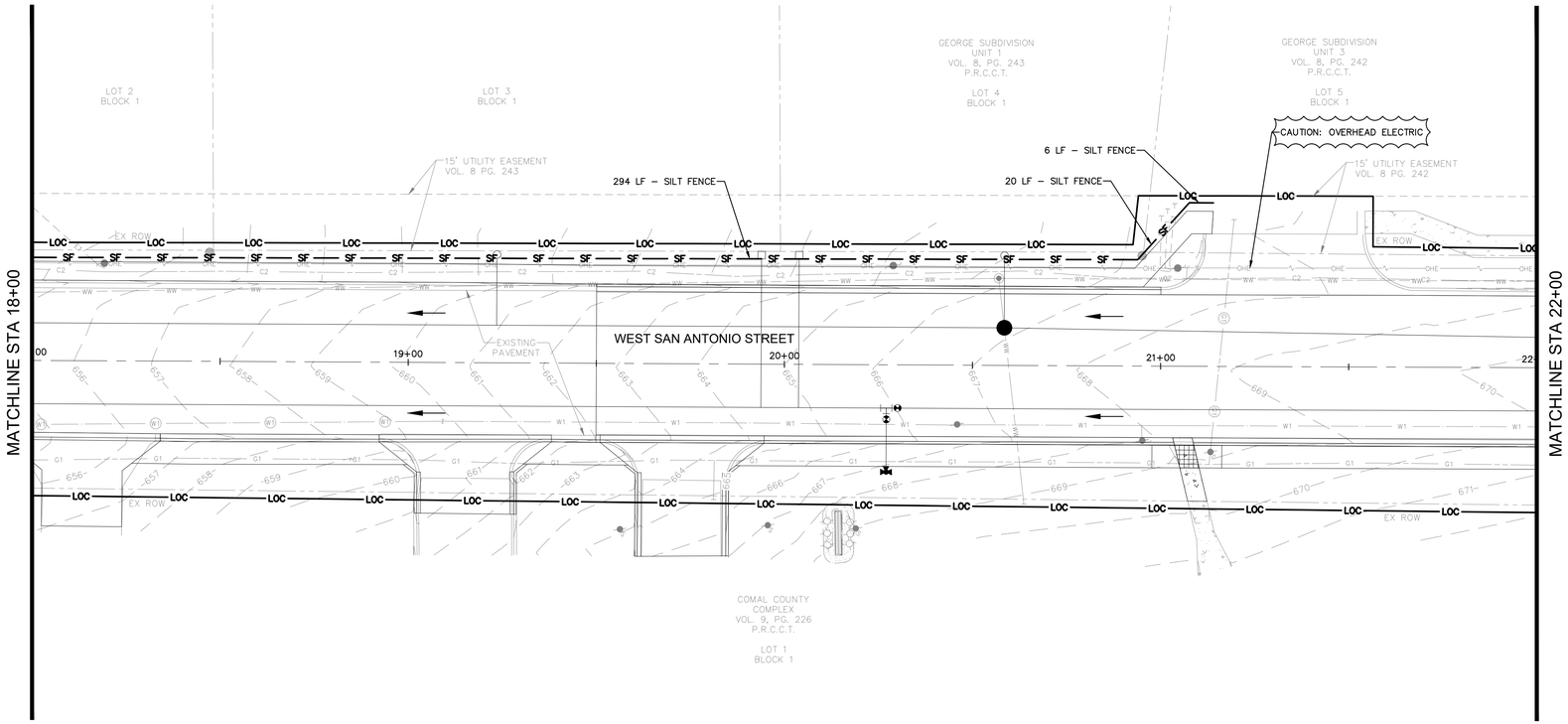

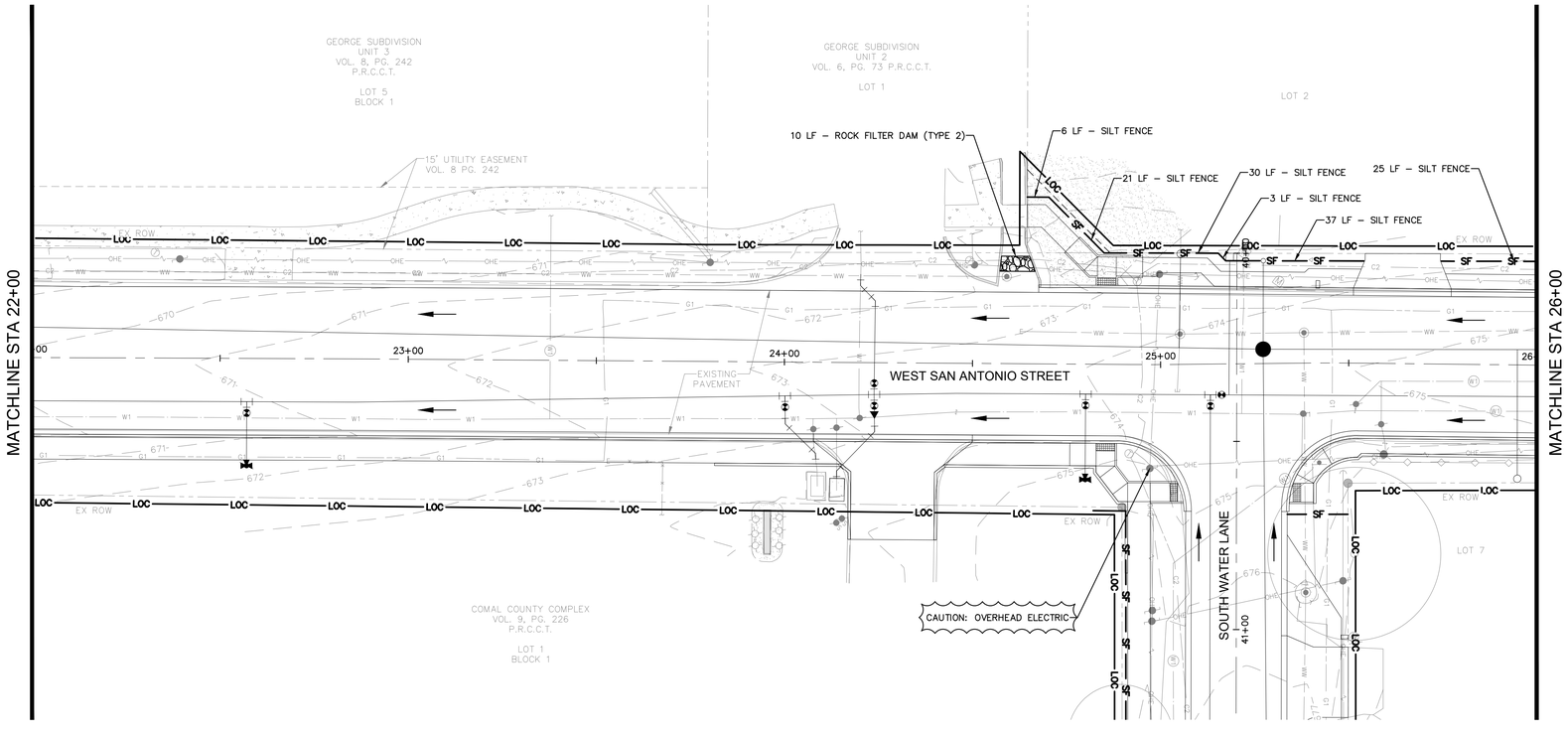

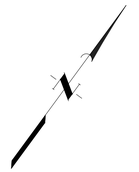

LEGEND

- SF — SILT FENCE
- LOC — LIMITS OF CONSTRUCTION
- SANDBAG
- DRAINAGE DIRECTION
- ROCK BERM

EROSION CONTROL NOTES:

1. ALL SILT FENCING AND OTHER EROSION CONTROL MEASURES SHALL BE LOCATED AT OR WITHIN PUBLIC RIGHT OF WAY OR UTILITY EASEMENTS.
2. PER TPDES REQUIREMENTS, DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITIES HAVE CEASED (TEMPORARILY OR PERMANENTLY) SHALL BE STABILIZED WITHIN 14 DAYS UNLESS ACTIVITY RESUMES WITHIN 21 DAYS. SEEDING DOES NOT CONSTITUTE AS STABILIZATION.

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

EROSION CONTROL
STA 18+00 TO 26+00

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
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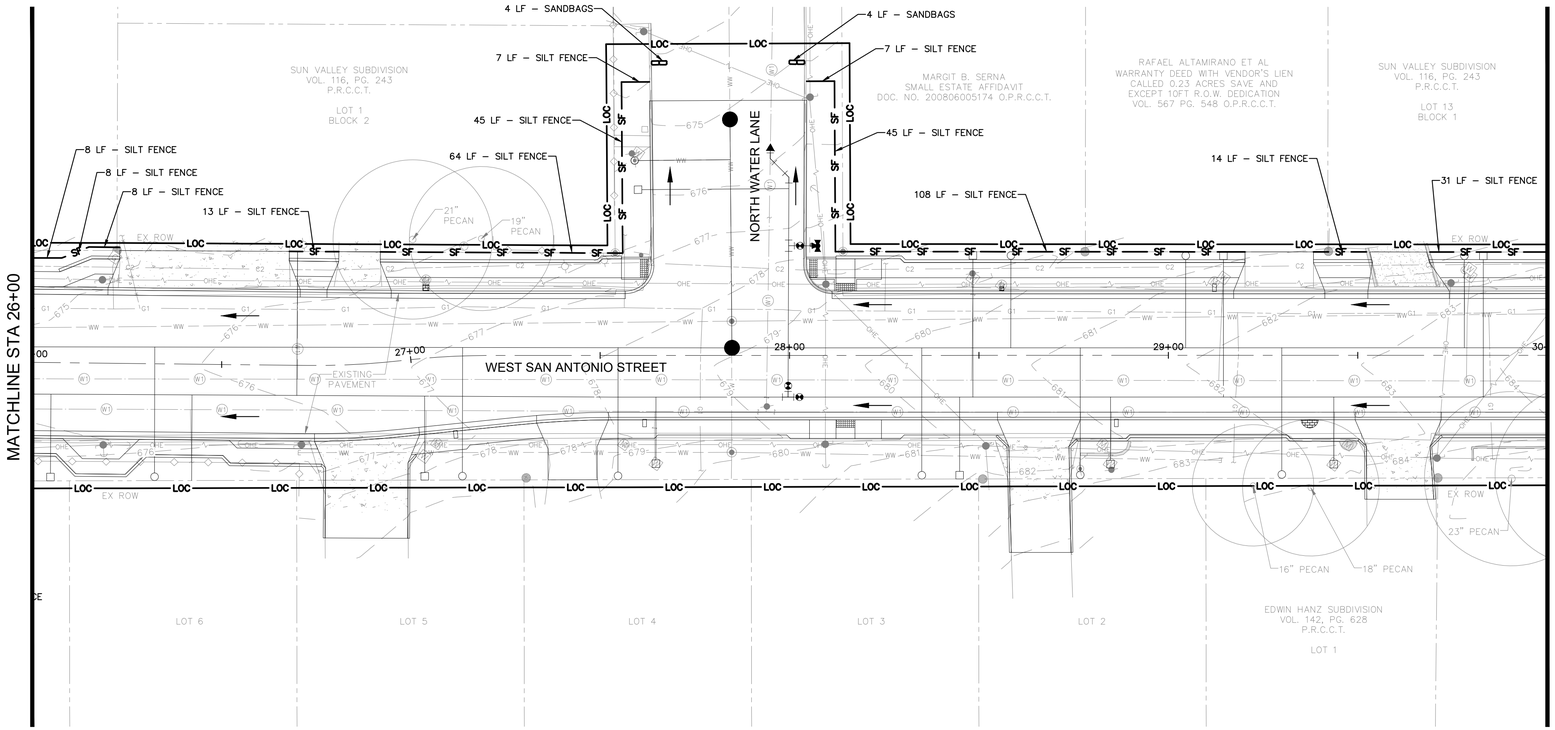

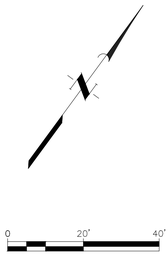

LEGEND

- SF — SILT FENCE
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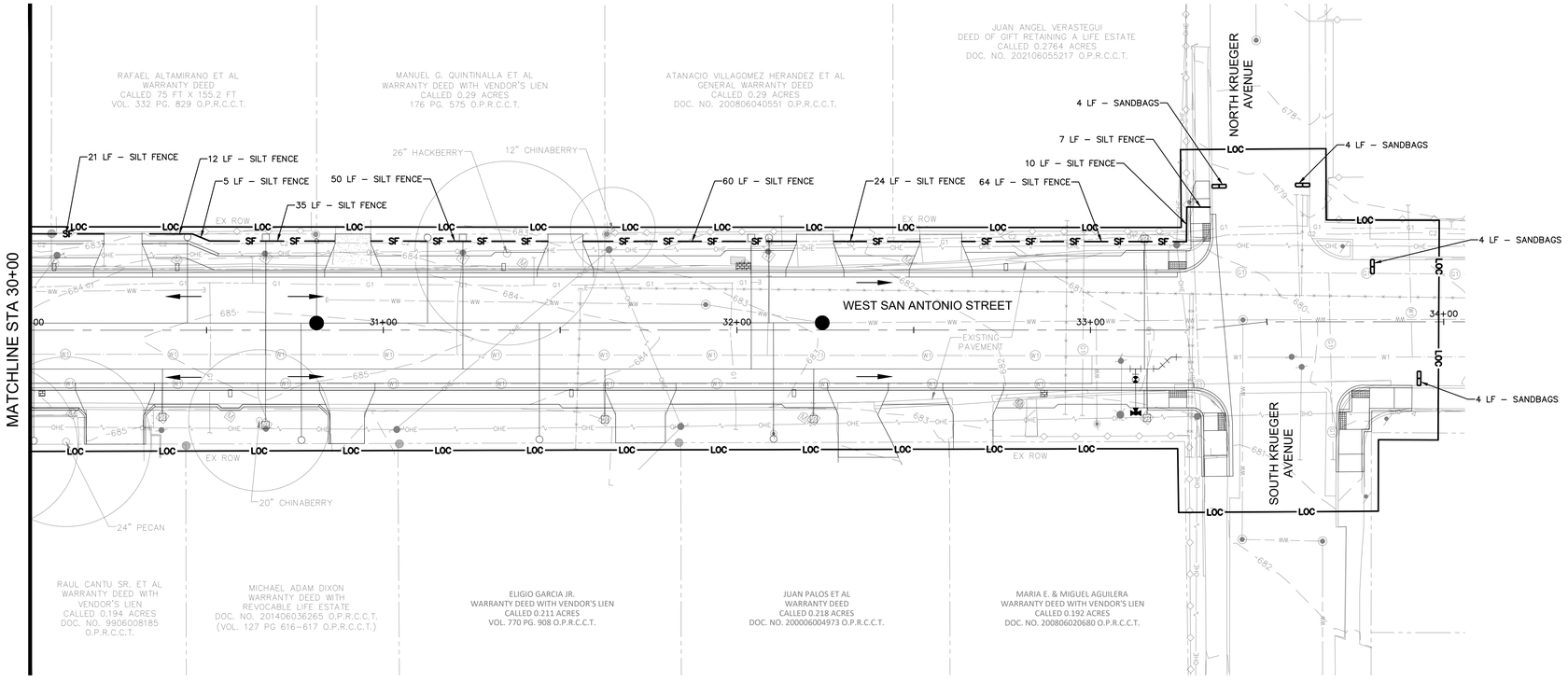

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
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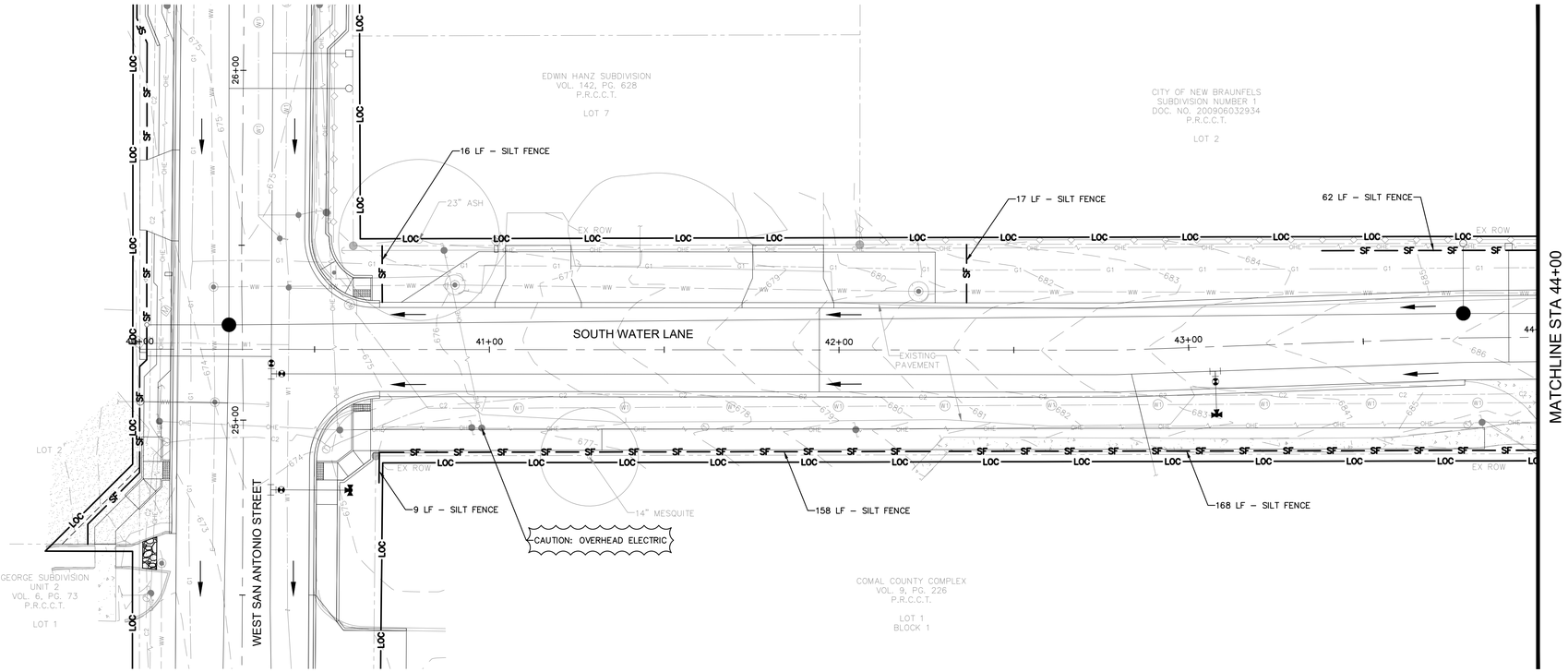

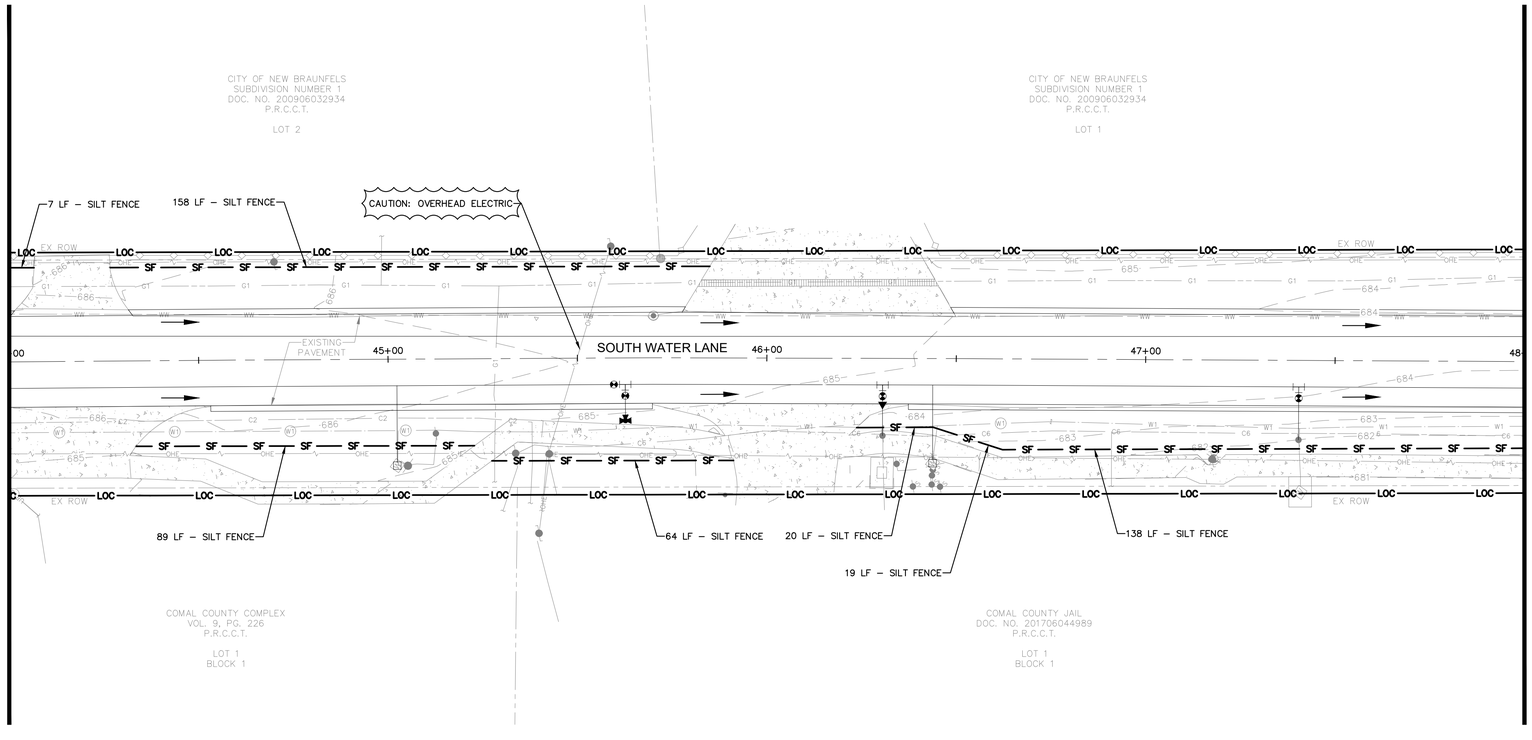

0 20' 40'

LEGEND

- SF — SILT FENCE
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CITYWIDE STREETS IMPROVEMENT PROJECTS
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EROSION CONTROL
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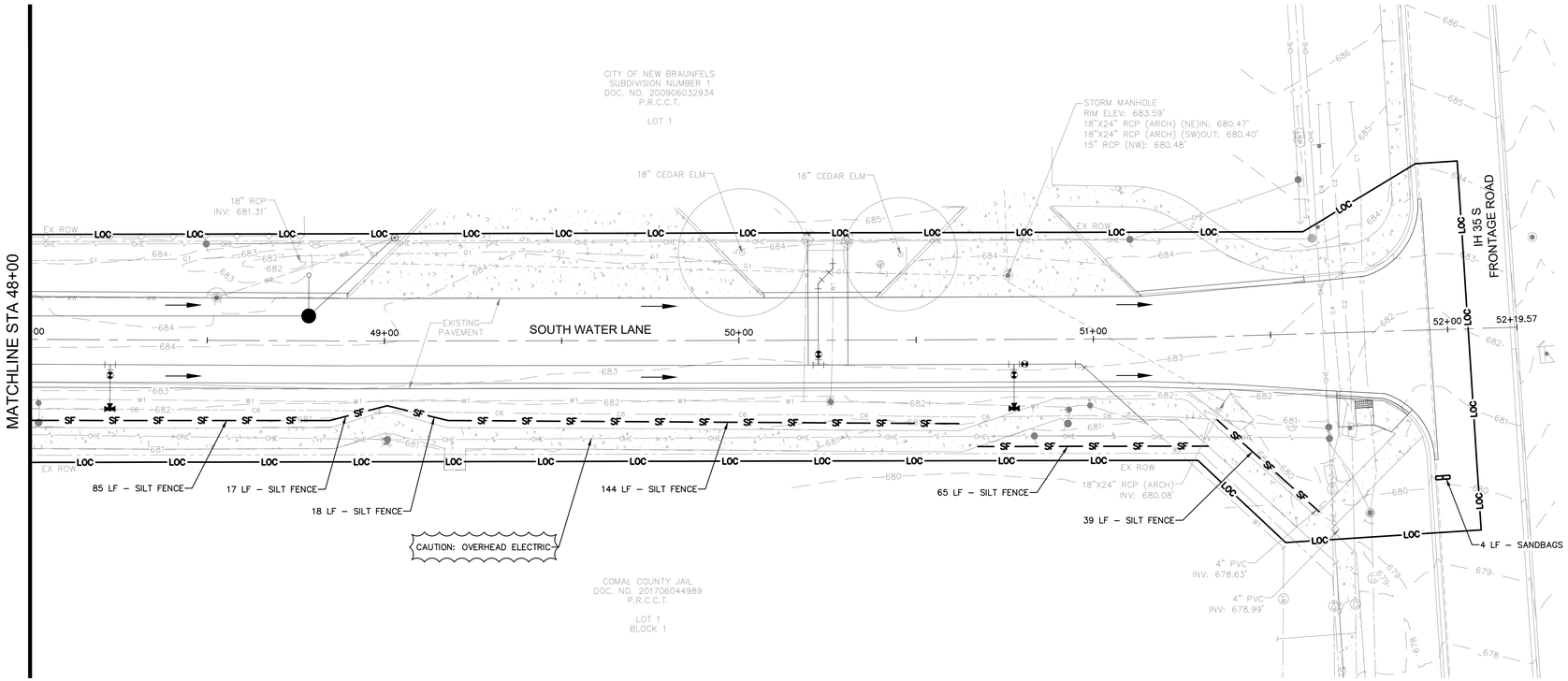

LEGEND

- SF — SILT FENCE
- LOC — LIMITS OF CONSTRUCTION
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CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

EROSION CONTROL
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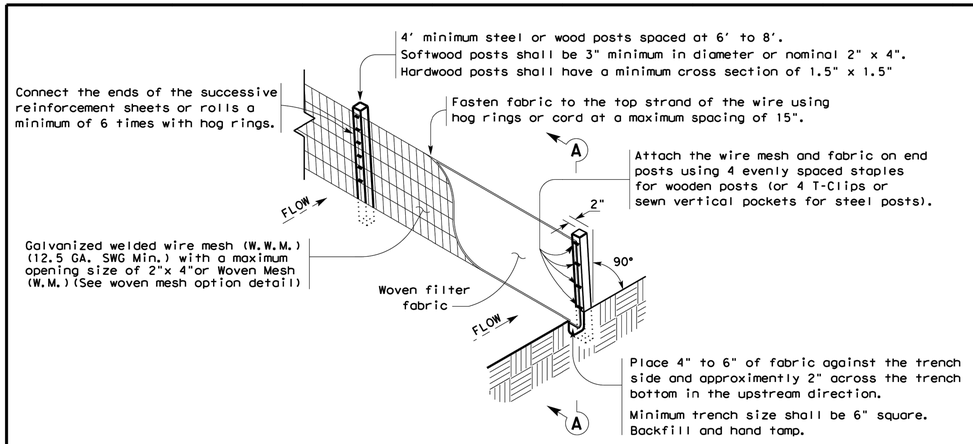
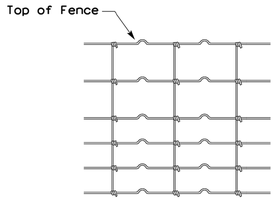
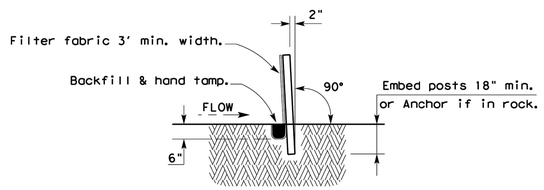


TEMPORARY SEDIMENT CONTROL FENCE

SCF





SECTION A-A

HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

Galvanized hinge joint knot woven mesh (12.5 GA.SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.

SEDIMENT CONTROL FENCE USAGE GUIDELINES

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT^2. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

LEGEND

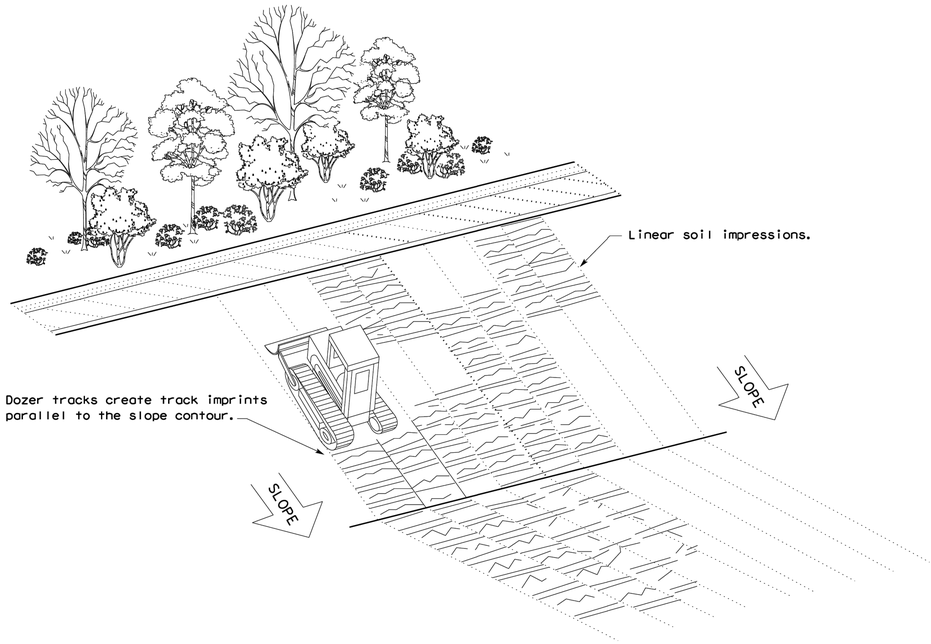
Sediment Control Fence

SCF

DATE
FILE

GENERAL NOTES

1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.



VERTICAL TRACKING

Texas Department of Transportation — Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
FENCE & VERTICAL TRACKING
EC(1)-16

FILE: ec116	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

EROSION CONTROL DETAILS I

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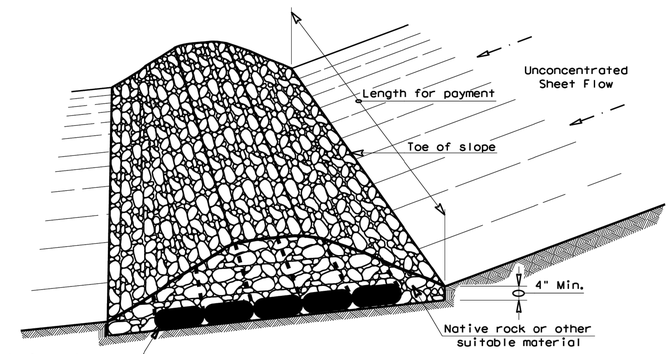
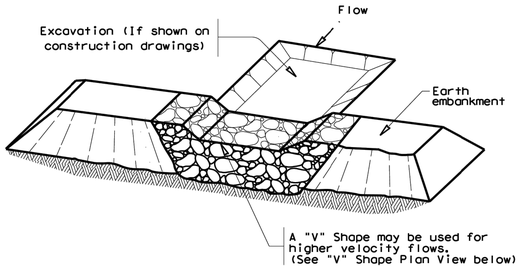


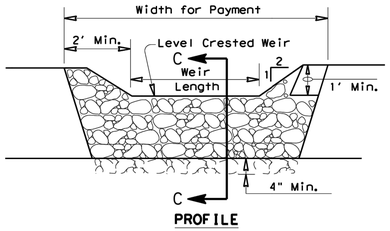
FILTER DAM AT TOE OF SLOPE

RFD1

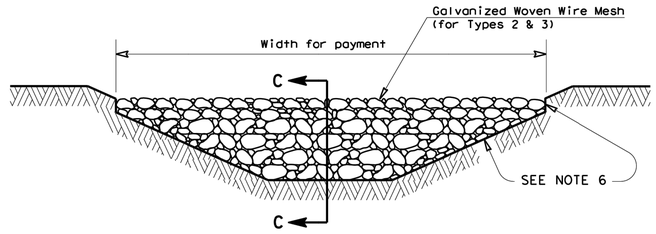


FILTER DAM AT SEDIMENT TRAP

RFD1 OR RFD2

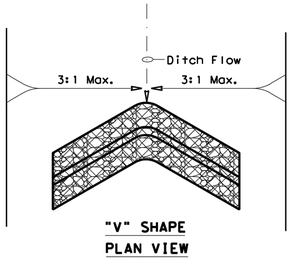


PROFILE

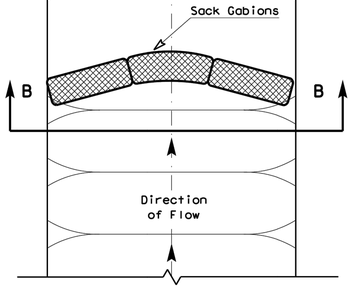


FILTER DAM AT CHANNEL SECTIONS

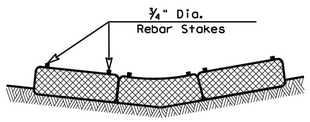
RFD1 OR RFD2 OR RFD3



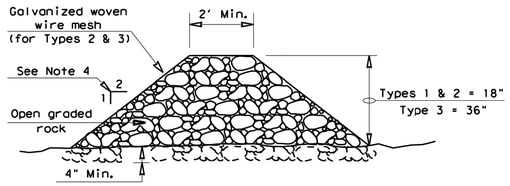
"V" SHAPE
PLAN VIEW



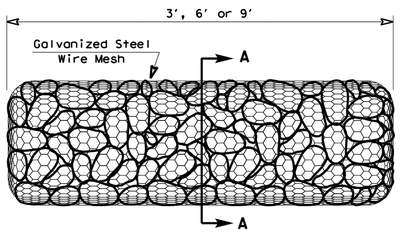
PLAN VIEW



SECTION B-B

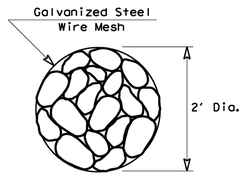


SECTION C-C



TYPE 4 (SACK GABIONS)

RFD4



SECTION A-A

ROCK FILTER DAM USAGE GUIDELINES

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT^2 of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flows (approximently 8 Ft/Sec or more) in which aggregate wash out may occur. Sandbags may be used at the embedded foundation (4" deep min.) for better filtering efficiency of low flows if called for on the plans or directed by the Engineer.

Type 2 (18" high with wire mesh) (3" to 6" aggregate): Type 2 may be used in ditches and at dike or swale outlets.

Type 3 (36" high with wire mesh) (4" to 8" aggregate): Type 3 may be used in stream flow and should be secured to the stream bed.

Type 4 (Sack gabions) (3" to 6" aggregate): Type 4 May be used in ditches and smaller channels to form an erosion control dam.

Type 5: Provide rock filter dams as shown on plans.

GENERAL NOTES

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with ¾" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 ½" x 3 ¼"
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

PLAN SHEET LEGEND

Type 1 Rock Filter Dam — RFD1
Type 2 Rock Filter Dam — RFD2
Type 3 Rock Filter Dam — RFD3
Type 4 Rock Filter Dam — RFD4

DATE:
FILE:

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

EROSION CONTROL DETAILS II

Texas Department of Transportation — Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

ROCK FILTER DAMS

EC(2)-16

FILE: ec216	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
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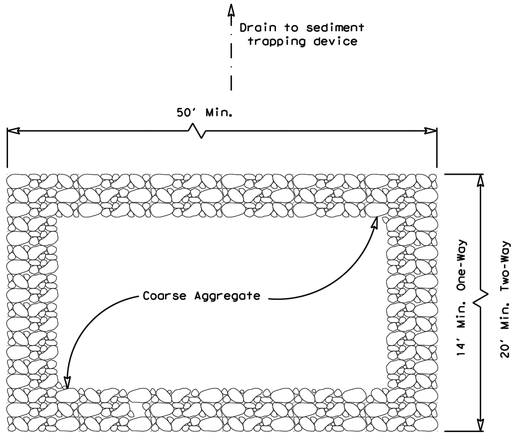
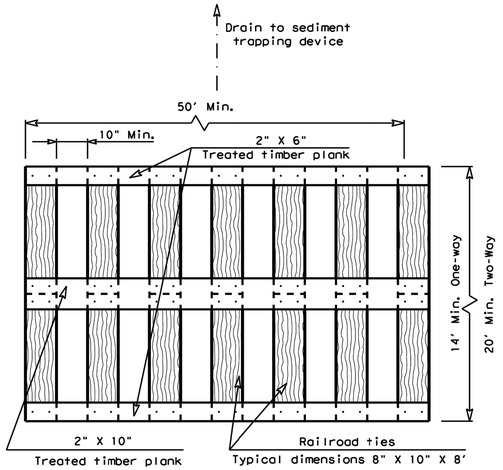


PLAN VIEW



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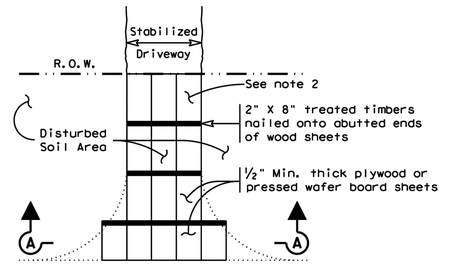

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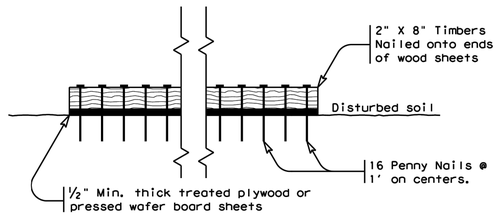


SECTION A-A

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	C	S	J	HWY
	DIST	COUNTY		SHEET NO.
	DST	CTY	$EC(3)-16$	

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

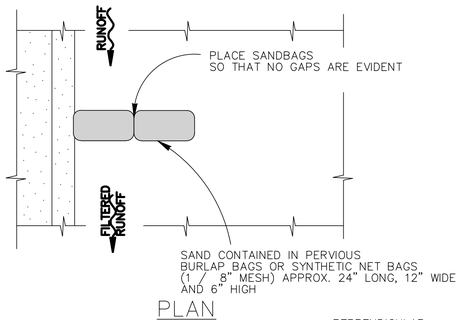
EROSION CONTROL DETAILS III

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

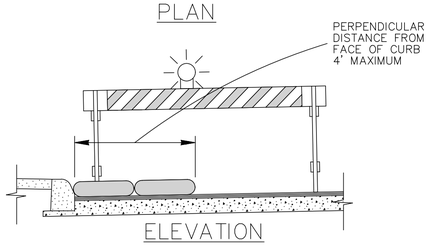
SCALE: AS NOTED	DGN. BY: AZ		
DATE: AS NOTED	DWN. BY: JFR		
JOB NO. 05668-0026-01	DWG. NO. --		
SUBMITTED: ----	SURV. BY: QUIDDITY		

STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED PROFESSIONAL ENGINEER
5/9/2025

K:\05668\05668-0026-01 san antonio street and water lane roadway improvements\2 design phase\CAD\Plans\05668-0026-01-SF-Eros Details.dwg May 09, 2025 - 11:24am JFR



PLAN



ELEVATION

NOTE:
STRADDLE SANDBAGS WITH TYPE 1 BARRICADES MOUNTED WITH TYPE "A" FLASHING WARNING LIGHT. PLACE FLASHING LIGHTS AWAY FROM GUTTER, FLUSH WITH OUTSIDE EDGE OF BAG CONFIGURATION.

SANDBAGS

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

EROSION CONTROL DETAILS IV

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2957 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

SCALE: AS NOTED DGN. BY: AZ
DATE: AS NOTED DWN. BY: JFR
JOB NO. 05668-0026-01 DWG. NO. --
SUBMITTED: ---- SURV. BY: QUIDDITY

STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED
PROFESSIONAL ENGINEER
5/9/2025

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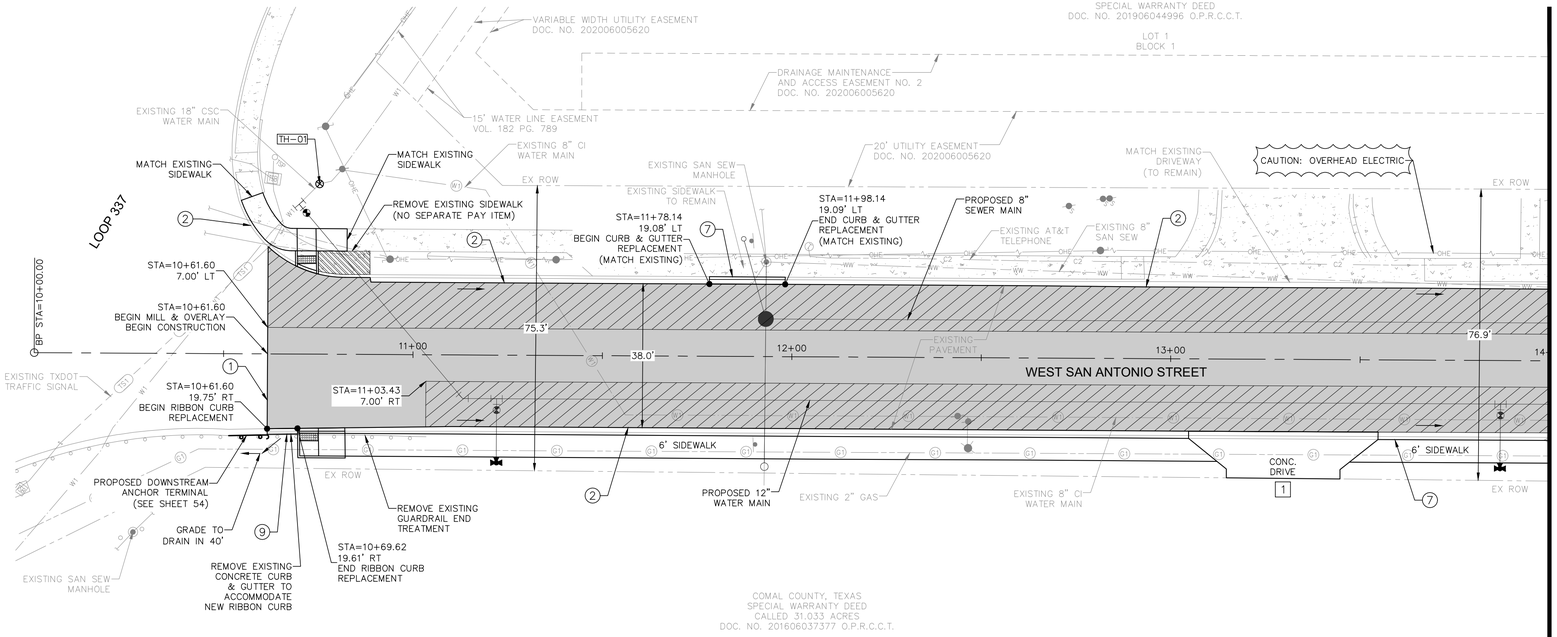


SUE TEST HOLE DATA						
TEST HOLE	UTILITY TYPE	NORTHING	EASTING	EXIST GROUND ELEV.	TOP OF UTILITY ELEV.	NOTES
TH-01	18" CSC WATER	13795516.96	2236910.49	650.58	641.49	*TRGs target utility was an 18" CSC water line. Crew exposed the west edge of the utility. Size & material per record. Owner: New Braunfels Utilities

SEE NBU WATER AND SEWER PLANS ("SAN ANTONIO STREET REHABILITATION PHASE 3 PROJECT") FOR PROPOSED WATER AND SEWER IMPROVEMENTS

NOTES:

1. IN AREAS OF PROPOSED MILL & OVERLAY, THE EXISTING GROUND PROFILE SHOWN IS FOR THE PURPOSE OF REESTABLISHING THE EXISTING GRADES ALONG THE PROPOSED CENTERLINE ALIGNMENT. CONTRACTOR SHALL MATCH THE EXISTING PAVEMENT CROSS SLOPE FROM THE EXISTING CENTERLINE TO THE EXISTING PAVEMENT EDGE, UNLESS OTHERWISE NOTED.
2. COSTS OF SAW CUTTING EXISTING PAVEMENT, DRIVEWAYS, CURBS, ETC. ARE SUBSIDIARY TO BID ITEMS TO WHICH THEY RELATE.
3. ALL DRIVEWAYS, CURBS, SIDEWALKS, ETC. REQUIRED TO BE REMOVED TO ACCOMMODATE NEW CONSTRUCTION SHALL BE SAW-CUT, REMOVED AND PAID FOR UNDER ITEM 100 "PREPARING RIGHT OF WAY".
4. ASPHALT OVERLAY SHALL EXTEND TO THE LIMITS SHOWN ON THE PLANS.
5. CONTRACTOR SHALL COORDINATE MAILBOX RELOCATIONS WITH PROPERTY OWNERS.

KEYED NOTES:

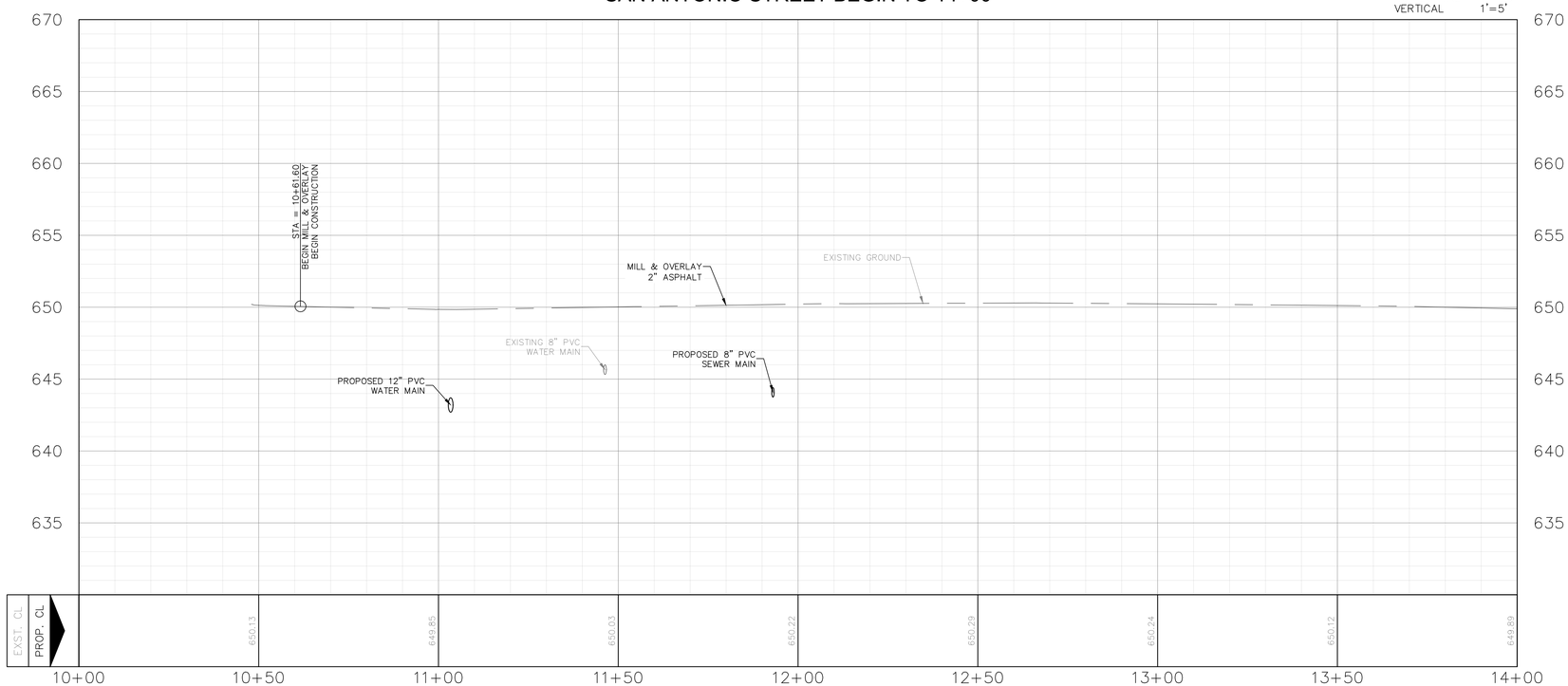
1. SAW CUT AND MATCH EXISTING
2. PROTECT EXISTING CURB OR CURB/GUTTER
3. RELOCATE EXISTING MAILBOX (SEE SHEET 34)
4. RELOCATE EXISTING MASONRY MAILBOX (SEE SHEET 34)
5. CONC CURB (TY I) (SEE SHEET 41)
6. CONC CURB & GUTTER (TY I) (SEE SHEET 42)
7. CONC CURB & GUTTER (TY II) (SEE SHEET 42)
8. CONC CURB (TY C1) (SEE SHEET 40)
9. CONC CURB (RIBBON) (SEE SHEET 35)
10. CONC CURB (DRIVEWAY WALL) (SEE SHEET 35)
11. CONC SIDEWALK WITH TOEDOWN (SEE SHEET 35)

LEGEND

- AREA OF BASE REPAIR
- AREA OF FULL DEPTH REHABILITATION
- AREA OF STREET MILL/OVERLAY
- AREA OF PAVEMENT CROSS SLOPE TRANSITION
- AREA OF ASPHALT DRIVEWAY PENETRATION
- AREA OF CONCRETE DRIVEWAY PENETRATION
- AREA OF REMOVAL
- AREA OF ROADWAY OBLITERATION
- [1] DRIVEWAY NUMBER

SAN ANTONIO STREET BEGIN TO 14+00

SCALE
HORIZONTAL 1"=20'
VERTICAL 1'=5'



NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

SAN ANTONIO STREET
BEGIN TO 14+00

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 235 • New Braunfels, TX 78132 • 830.203.6630

SCALE: AS NOTED
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JOB NO. 05668-0026-01
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STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED
PROFESSIONAL ENGINEER
5/9/2025

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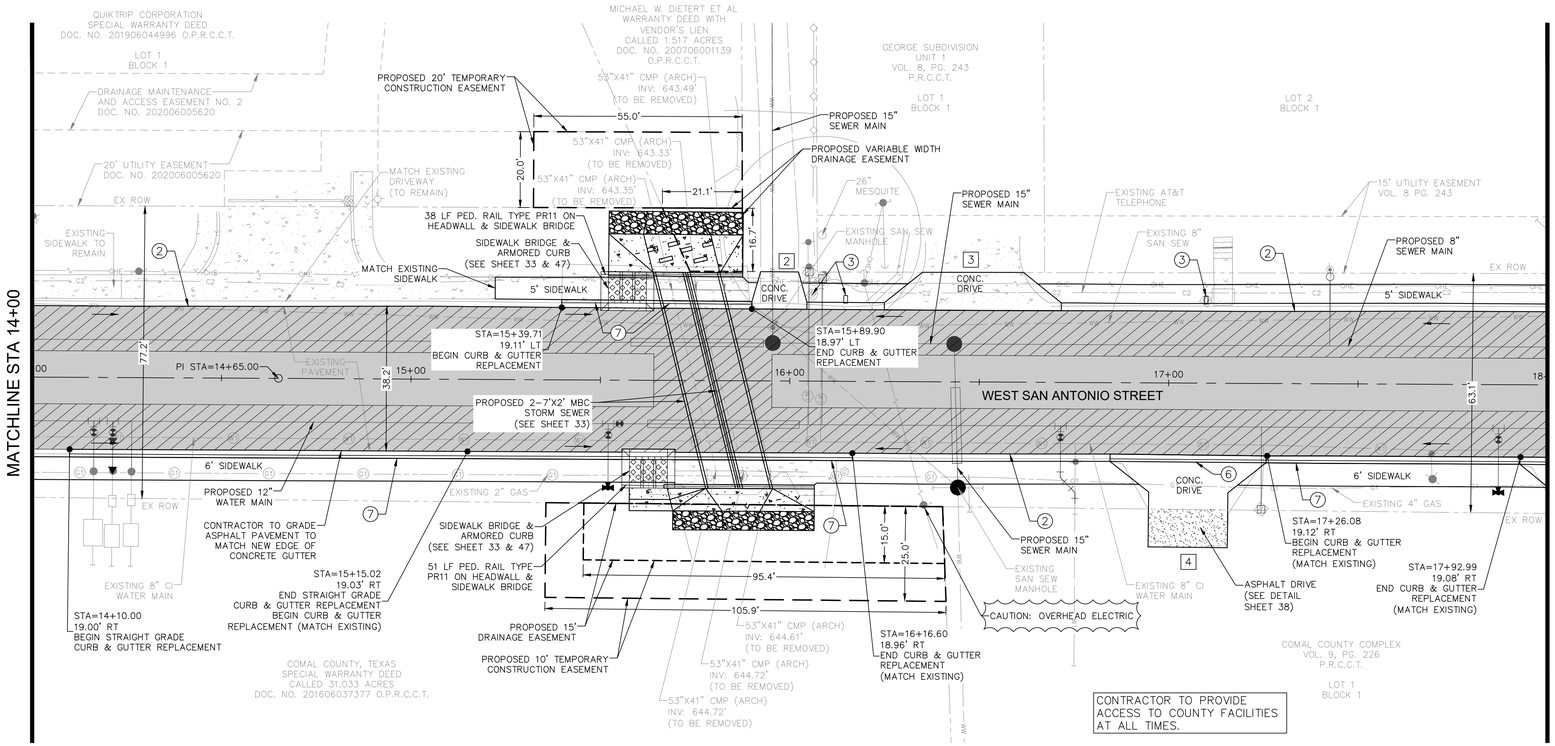

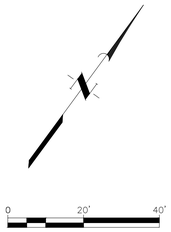

SEE NBU WATER AND SEWER PLANS ("SAN ANTONIO STREET REHABILITATION PHASE 3 PROJECT") FOR PROPOSED WATER AND SEWER IMPROVEMENTS

NOTES:

1. IN AREAS OF PROPOSED MILL & OVERLAY, THE EXISTING GROUND PROFILE SHOWN IS FOR THE PURPOSE OF REESTABLISHING THE EXISTING GRADES ALONG THE PROPOSED CENTERLINE ALIGNMENT. CONTRACTOR SHALL MATCH THE EXISTING PAVEMENT CROSS SLOPE FROM THE EXISTING CENTERLINE TO THE EXISTING PAVEMENT EDGE, UNLESS OTHERWISE NOTED.
2. COSTS OF SAW CUTTING EXISTING PAVEMENT, DRIVEWAYS, CURBS, ETC. ARE SUBSIDIARY TO BID ITEMS TO WHICH THEY RELATE.
3. ALL DRIVEWAYS, CURBS, SIDEWALKS, ETC. REQUIRED TO BE REMOVED TO ACCOMMODATE NEW CONSTRUCTION SHALL BE SAW-CUT, REMOVED AND PAID FOR UNDER ITEM 100 "PREPARING RIGHT OF WAY".
4. ASPHALT OVERLAY SHALL EXTEND TO THE LIMITS SHOWN ON THE PLANS.
5. CONTRACTOR SHALL COORDINATE MAILBOX RELOCATIONS WITH PROPERTY OWNERS.

KEYED NOTES:

1. SAW CUT AND MATCH EXISTING
2. PROTECT EXISTING CURB OR CURB/GUTTER
3. RELOCATE EXISTING MAILBOX (SEE SHEET 34)
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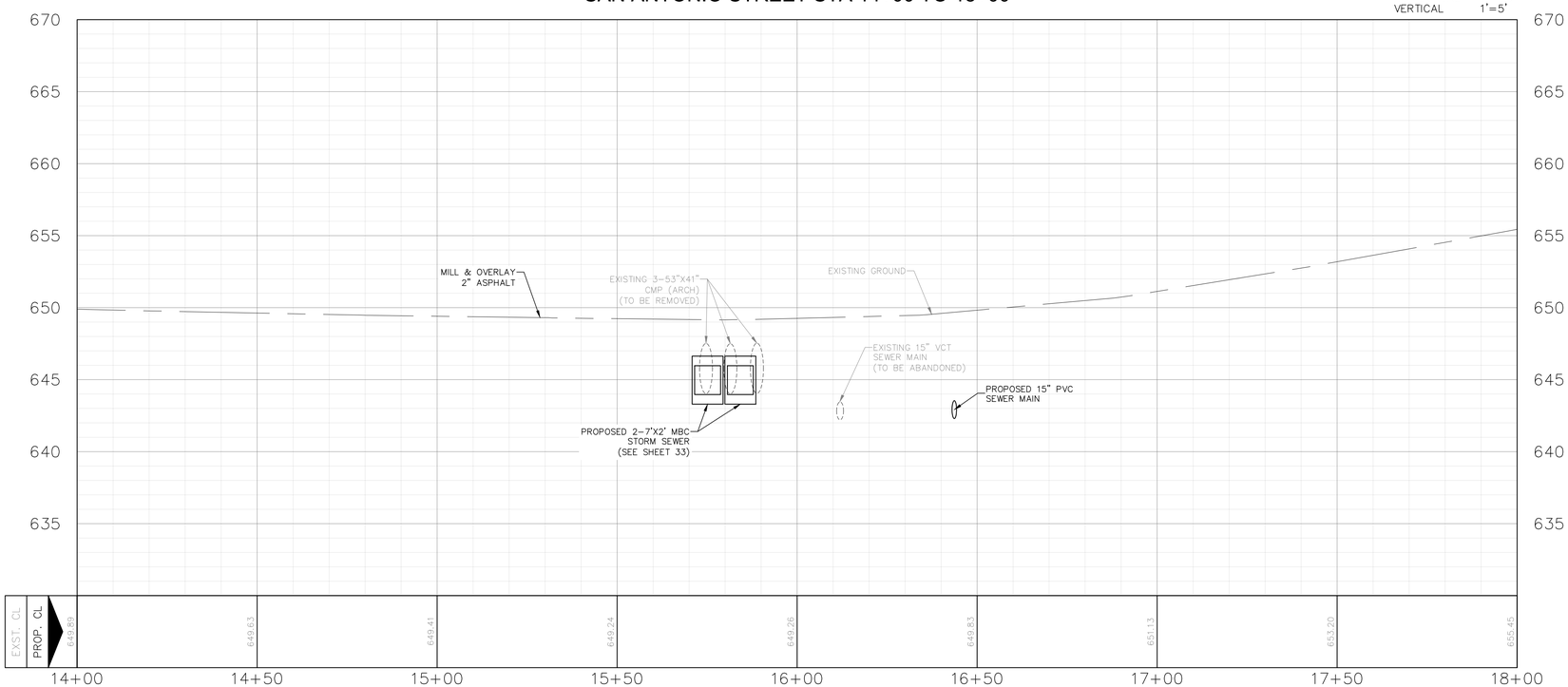
9. CONC CURB (RIBBON) (SEE SHEET 35)
10. CONC CURB (DRIVEWAY WALL) (SEE SHEET 35)
11. CONC SIDEWALK WITH TOEDOWN (SEE SHEET 35)

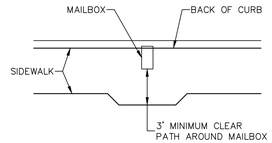
LEGEND

- AREA OF BASE REPAIR
- AREA OF FULL DEPTH REHABILITATION
- AREA OF STREET MILL/OVERLAY
- AREA OF PAVEMENT CROSS SLOPE TRANSITION
- AREA OF ASPHALT DRIVEWAY PENETRATION
- AREA OF CONCRETE DRIVEWAY PENETRATION
- AREA OF REMOVAL
- AREA OF ROADWAY OBLITERATION
- [1] DRIVEWAY NUMBER

SAN ANTONIO STREET STA 14+00 TO 18+00

SCALE
HORIZONTAL 1"=20'
VERTICAL 1'=5'





SIDEWALK CLEAR PATH DETAIL

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

SAN ANTONIO STREET
STA 14+00 TO 18+00

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 235 • New Braunfels, TX 78132 • 830.203.6630

SCALE: AS NOTED DGN. BY: AZ
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STATE OF TEXAS
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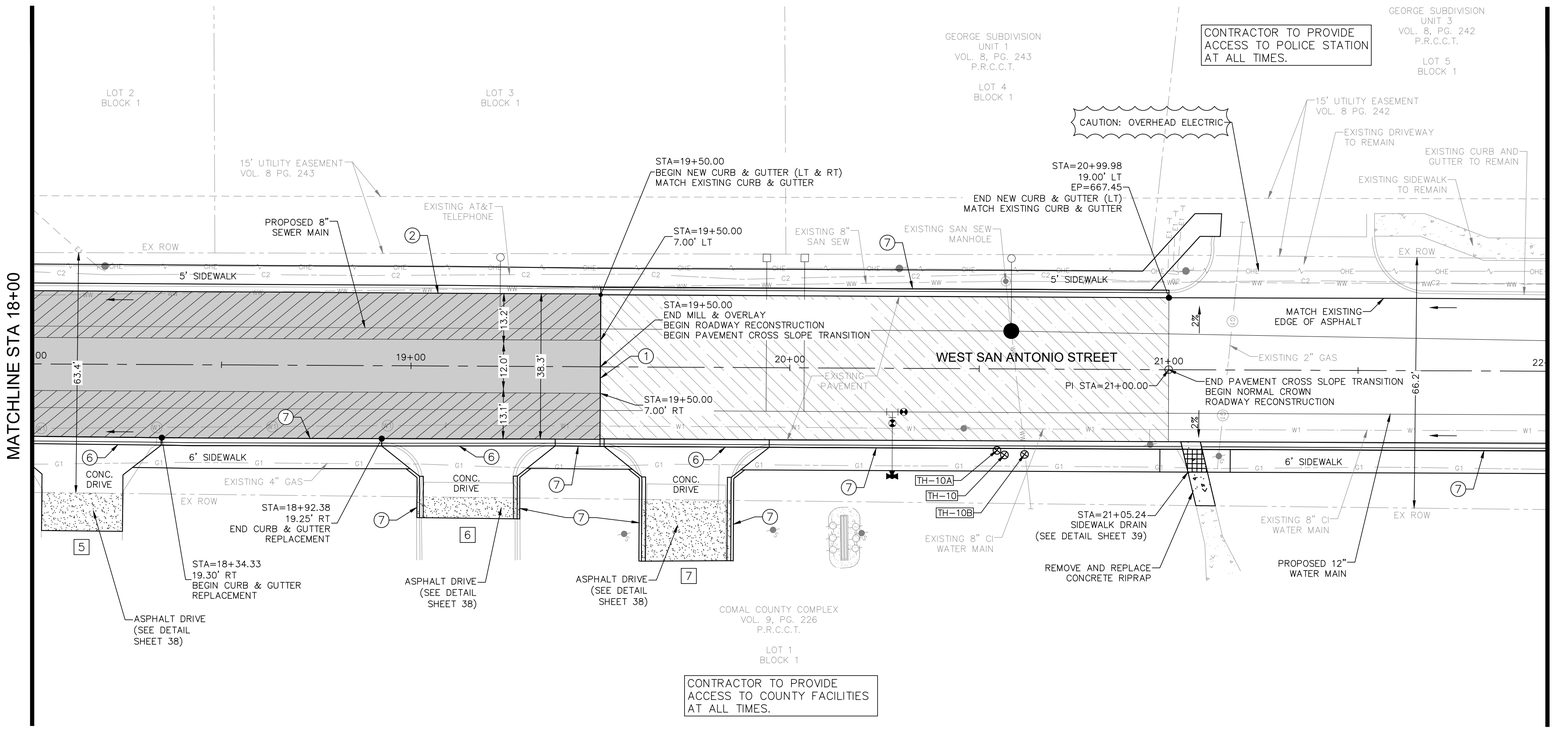
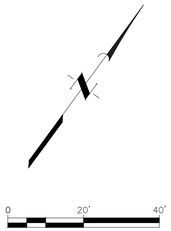


SUE TEST HOLE DATA						
TEST HOLE	UTILITY TYPE	NORTHING	EASTING	EXIST GROUND ELEV.	TOP OF UTILITY ELEV.	NOTES
TH-10	N/A	13796027.91	2237751.39	667.31	N/A	*TRG's target utility was a 6" unknown material sewer line. Crew excavated to 10.90 feet and did not expose utility. Owner: New Braunfels Utilities
TH-10A	N/A	13796027.74	2237749.09	667.07	N/A	*Second attempt. TRG's target utility was a 6" unknown material sewer line. Crew excavated to 9.71 feet and did not expose utility. Owner: New Braunfels Utilities
TH-10B	10" VCP SEWER	13796031.1	2237755.64	667.45	657.43	*Third attempt. TRG's target utility was a 6" unknown material sewer line. Crew exposed a 10" VCP sewer line at a pipe joint. Owner: New Braunfels Utilities



SAN ANTONIO STREET
ROADWAY RECONSTRUCTION LIMITS:

STA=19+50.00 TO STA=33+37.83

SEE NBU WATER AND SEWER PLANS ("SAN ANTONIO STREET REHABILITATION PHASE 3 PROJECT") FOR PROPOSED WATER AND SEWER IMPROVEMENTS

NOTES:

1. IN AREAS OF PROPOSED MILL & OVERLAY, THE EXISTING GROUND PROFILE SHOWN IS FOR THE PURPOSE OF REESTABLISHING THE EXISTING GRADES ALONG THE PROPOSED CENTERLINE ALIGNMENT. CONTRACTOR SHALL MATCH THE EXISTING PAVEMENT CROSS SLOPE FROM THE EXISTING CENTERLINE TO THE EXISTING PAVEMENT EDGE, UNLESS OTHERWISE NOTED.
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3. ALL DRIVEWAYS, CURBS, SIDEWALKS, ETC. REQUIRED TO BE REMOVED TO ACCOMMODATE NEW CONSTRUCTION SHALL BE SAW-CUT, REMOVED AND PAID FOR UNDER ITEM 100 "PREPARING RIGHT OF WAY".
4. ASPHALT OVERLAY SHALL EXTEND TO THE LIMITS SHOWN ON THE PLANS.
5. CONTRACTOR SHALL COORDINATE MAILBOX RELOCATIONS WITH PROPERTY OWNERS.

KEYED NOTES:

1. SAW CUT AND MATCH EXISTING
2. PROTECT EXISTING CURB OR CURB/GUTTER
3. RELOCATE EXISTING MAILBOX (SEE SHEET 34)
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9. CONC CURB (RIBBON) (SEE SHEET 35)
10. CONC CURB (DRIVEWAY WALL) (SEE SHEET 35)
11. CONC SIDEWALK WITH TOEDOWN (SEE SHEET 35)

LEGEND

- AREA OF BASE REPAIR
- AREA OF FULL DEPTH REHABILITATION
- AREA OF STREET MILL/OVERLAY
- AREA OF PAVEMENT CROSS SLOPE TRANSITION
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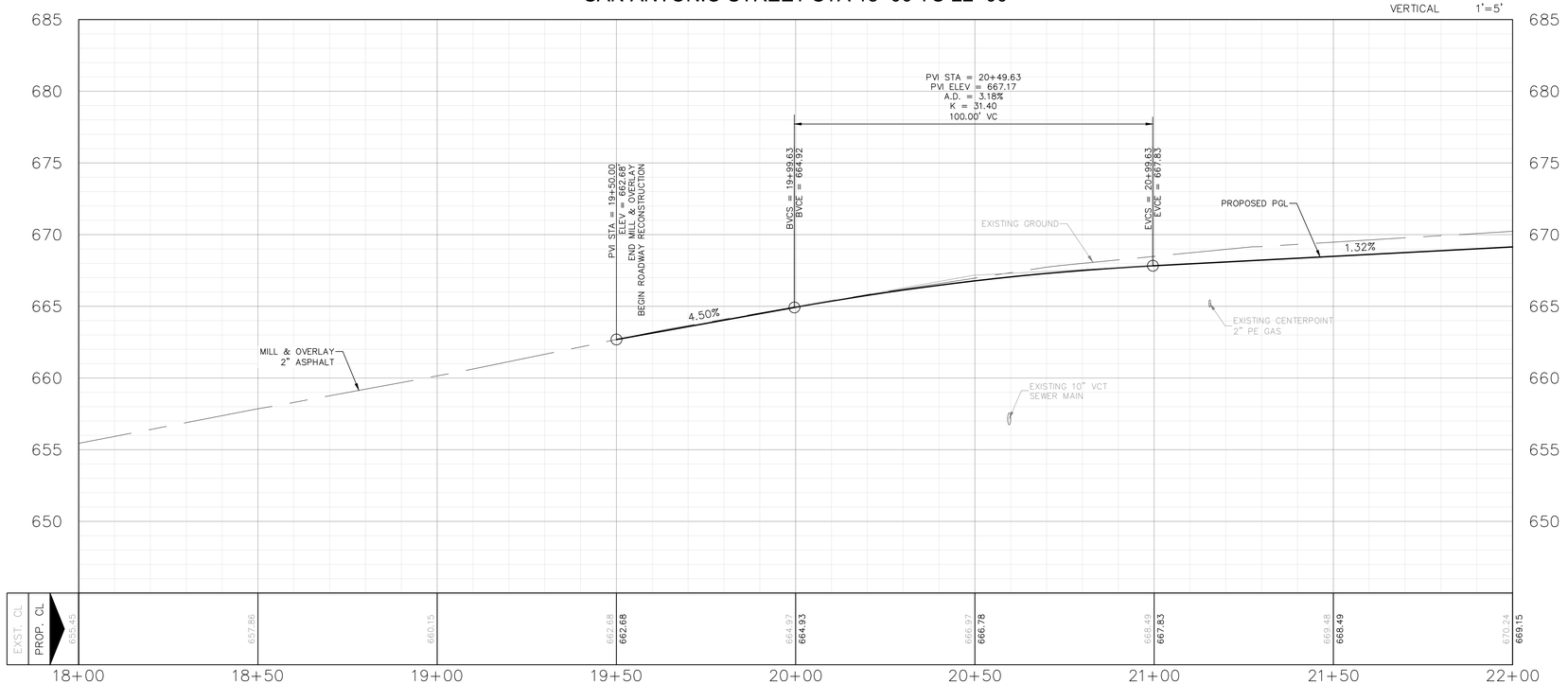
- AREA OF CONCRETE DRIVEWAY PENETRATION
- AREA OF REMOVAL
- AREA OF ROADWAY OBLITERATION
- [1] DRIVEWAY NUMBER

SAN ANTONIO STREET STA 18+00 TO 22+00

SCALE
HORIZONTAL 1"=20'
VERTICAL 1'=5'



NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

SAN ANTONIO STREET
STA 18+00 TO 22+00

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 235 • New Braunfels, TX 78132 • 830.203.6630

SCALE:	AS NOTED	DGN. BY:	AZ
DATE:	AS NOTED	DWN. BY:	JFR
JOB NO.	05668-0026-01	DWG. NO.	--
SUBMITTED:	----	SURV. BY:	QUIDDITY

STATE OF TEXAS
ALEX ZERTUCHE
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LICENSED
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5/9/2025

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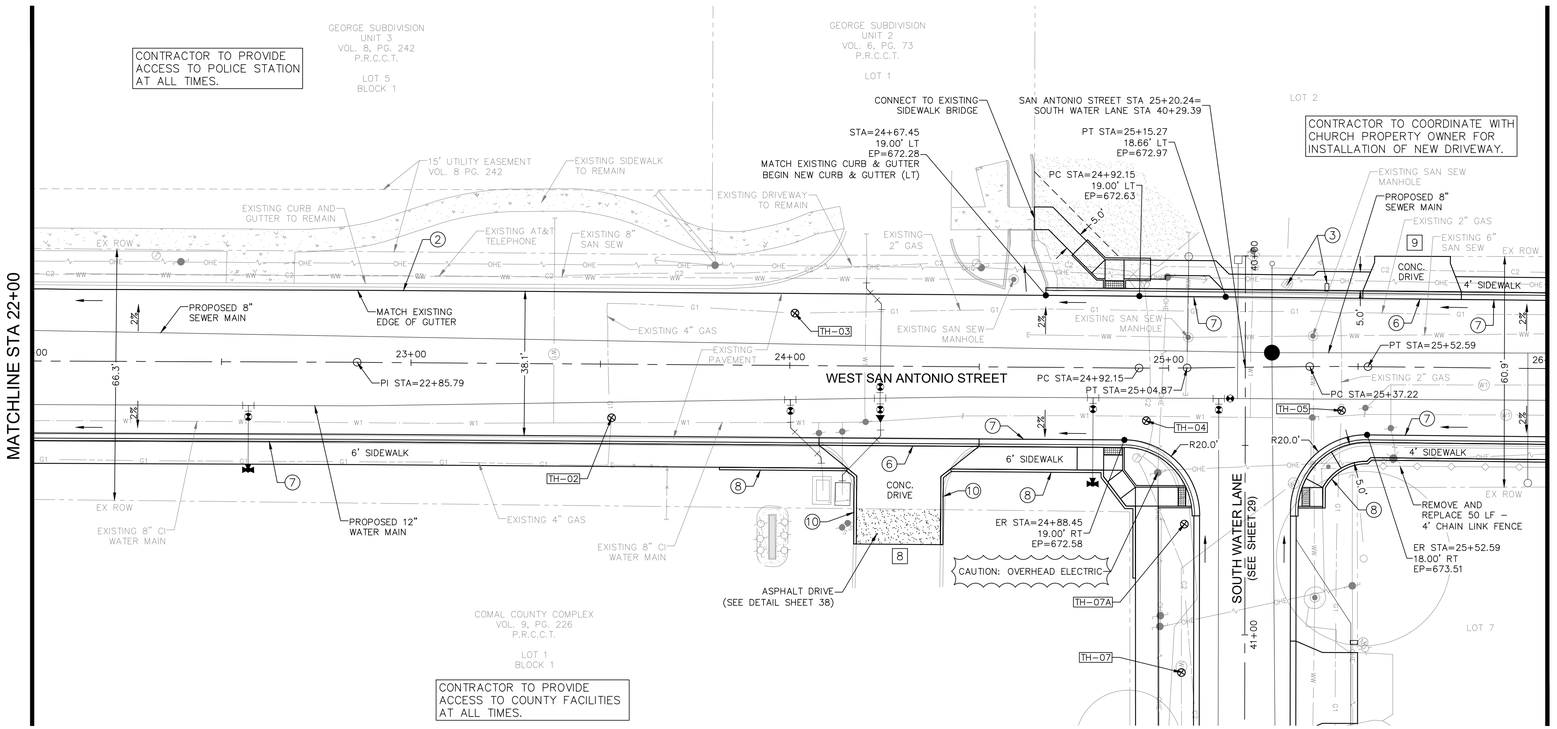

SUE TEST HOLE DATA

TEST HOLE	UTILITY TYPE	NORTHING	EASTING	EXIST GROUND ELEV.	TOP OF UTILITY ELEV.	NOTES
TH-02	4" STEEL GAS	13796205.85	2237988.41	671.89	669.49	Owner: Centerpoint Energy
TH-03	2" STEEL GAS	13796256.45	2238011.77	671.6	669.9	Owner: Centerpoint Energy
TH-04	1" DBC TELE	13796287.24	2238103.75	674.06	669.92	Owner: AT&T
TH-05	2" STEEL GAS	13796319.37	2238144.12	674.62	672.12	Owner: Centerpoint Energy
TH-07	8" PVC WATER	13796238.56	2238149.9	676.18	671.07	TRG's target utility was a 6" PVC sewer line. Crew exposed an 8" PVC water line. Owner: New Braunfels Utilities
TH-07A	N/A	13796270.87	2238127.79	675.03	N/A	*Second Attempt. TRG's target utility was a 6" PVC sewer line. Crew excavated to a depth of 8.32' but did not expose utility. Owner: New Braunfels Utilities

NOTES:

1. IN AREAS OF PROPOSED MILL & OVERLAY, THE EXISTING GROUND PROFILE SHOWN IS FOR THE PURPOSE OF REESTABLISHING THE EXISTING GRADES ALONG THE PROPOSED CENTERLINE ALIGNMENT. CONTRACTOR SHALL MATCH THE EXISTING PAVEMENT CROSS SLOPE FROM THE EXISTING CENTERLINE TO THE EXISTING PAVEMENT EDGE, UNLESS OTHERWISE NOTED.
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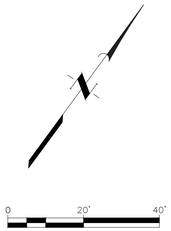

SAN ANTONIO STREET
ROADWAY RECONSTRUCTION LIMITS:

STA=19+50.00 TO STA=33+37.83

SEE NBU WATER AND SEWER PLANS ("SAN ANTONIO STREET REHABILITATION PHASE 3 PROJECT") FOR PROPOSED WATER AND SEWER IMPROVEMENTS

KEYED NOTES:

1. SAW CUT AND MATCH EXISTING
2. PROTECT EXISTING CURB OR CURB/GUTTER
3. RELOCATE EXISTING MAILBOX (SEE SHEET 34)
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LEGEND

- AREA OF BASE REPAIR
- AREA OF FULL DEPTH REHABILITATION
- AREA OF STREET MILL/OVERLAY
- AREA OF PAVEMENT CROSS SLOPE TRANSITION
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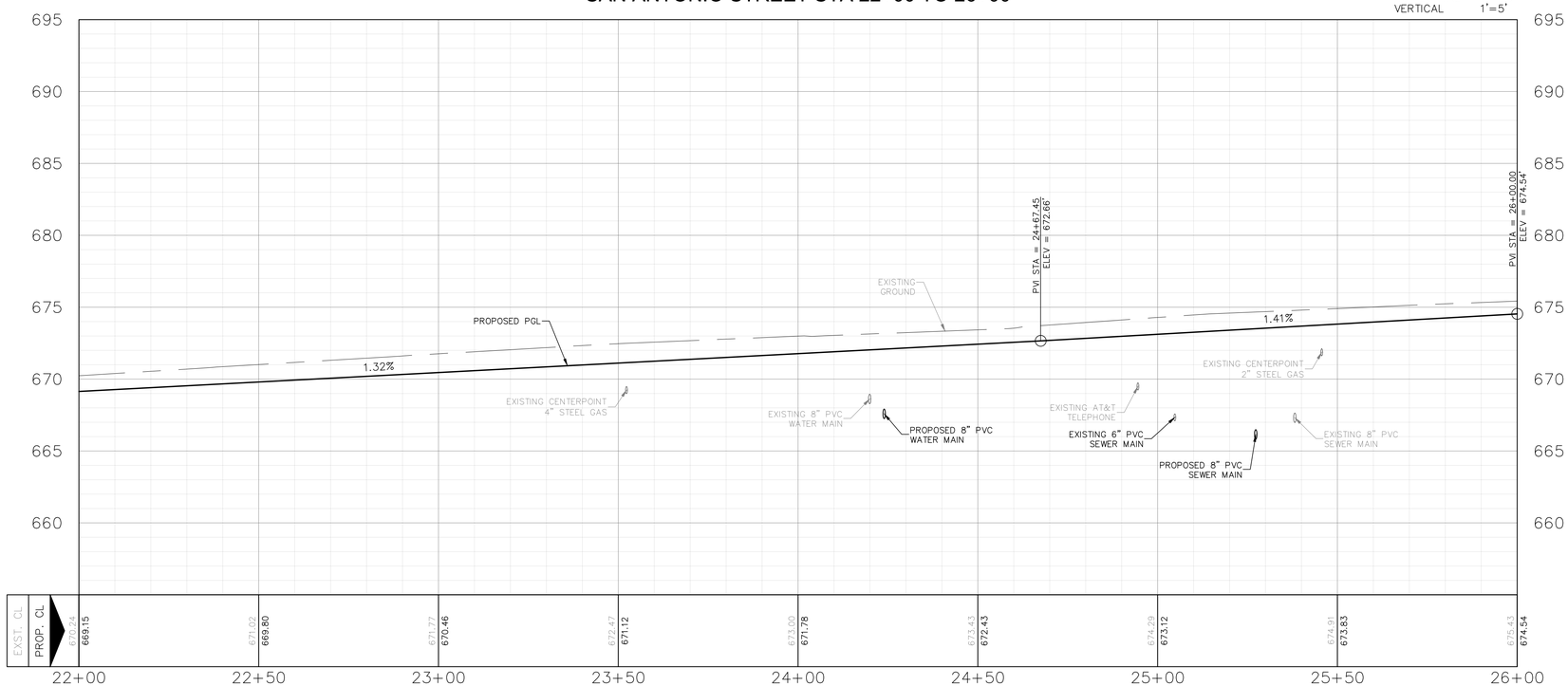
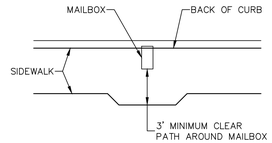
- AREA OF CONCRETE DRIVEWAY PENETRATION
- AREA OF REMOVAL
- AREA OF ROADWAY OBLITERATION
- [1] DRIVEWAY NUMBER

SAN ANTONIO STREET STA 22+00 TO 26+00

SCALE
HORIZONTAL 1"=20'
VERTICAL 1"=5'





SIDEWALK CLEAR PATH DETAIL

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

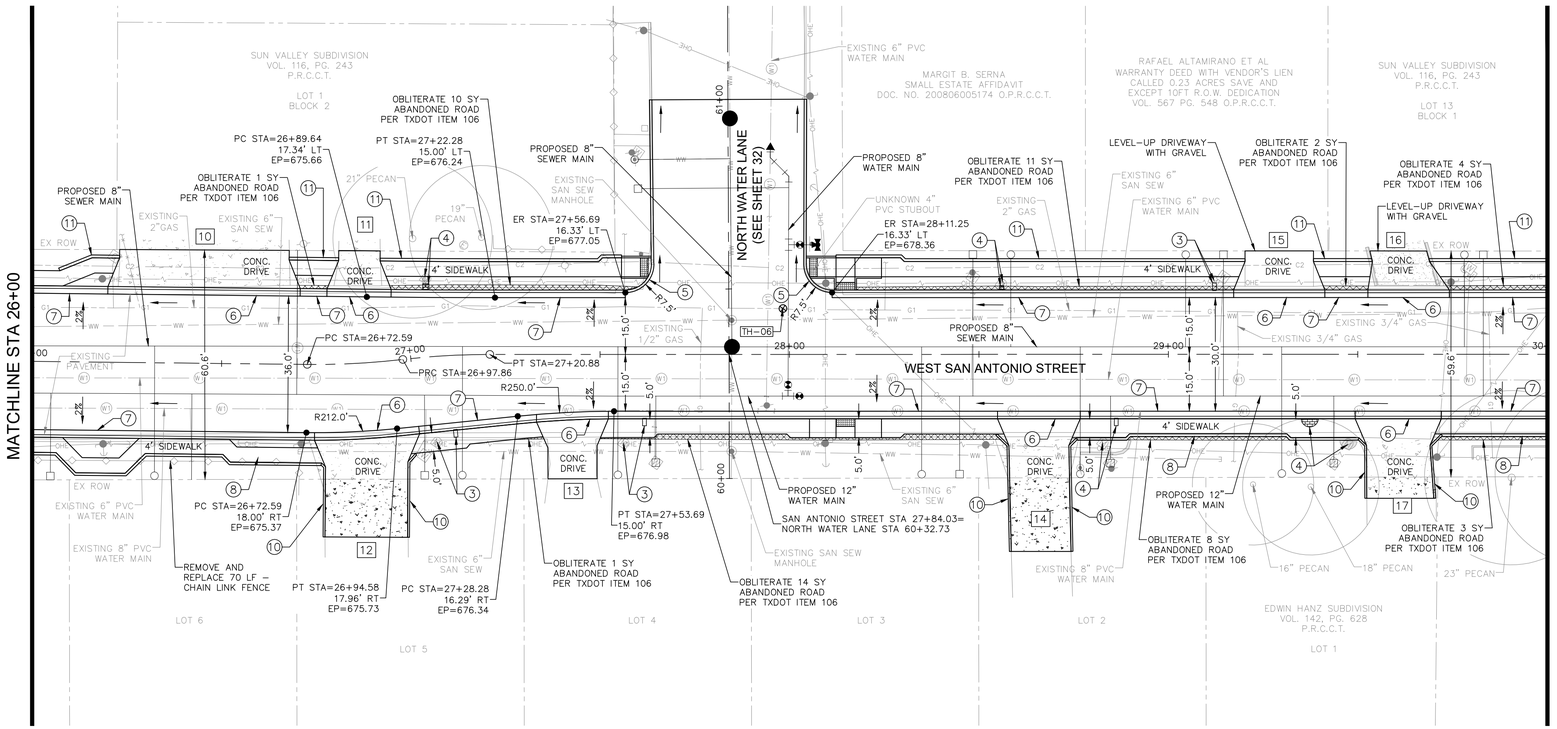
SAN ANTONIO STREET
STA 22+00 TO 26+00

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 235 • New Braunfels, TX 78132 • 830.203.6630

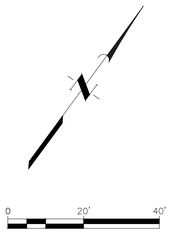
SCALE: AS NOTED DGN. BY: AZ
DATE: AS NOTED DWN. BY: JFR
JOB NO. 05668-0026-01 DWG. NO. --
SUBMITTED: ---- SURV. BY: QUIDDITY

STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED
PROFESSIONAL ENGINEER
5/9/2025

K:\05668\05668-0026-01 san antonio street and water lane roadway improvements\2 design phase\CAD\Plans\05668-0026-01-SF-PNP San Antonio.dwg May 09, 2025 - 1:14pm JFR



SUE TEST HOLE DATA						
TEST HOLE	UTILITY TYPE	NORTHING	EASTING	EXIST GROUND ELEV.	TOP OF UTILITY ELEV.	NOTES
TH-06	2" STEEL GAS	13796486.46	2238335.1	678.84	676.29	Owner: Centerpoint Energy



NOTES:

1. IN AREAS OF PROPOSED MILL & OVERLAY, THE EXISTING GROUND PROFILE SHOWN IS FOR THE PURPOSE OF REESTABLISHING THE EXISTING GRADES ALONG THE PROPOSED CENTERLINE ALIGNMENT. CONTRACTOR SHALL MATCH THE EXISTING PAVEMENT CROSS SLOPE FROM THE EXISTING CENTERLINE TO THE EXISTING PAVEMENT EDGE, UNLESS OTHERWISE NOTED.
2. COSTS OF SAW CUTTING EXISTING PAVEMENT, DRIVEWAYS, CURBS, ETC. ARE SUBSIDIARY TO BID ITEMS TO WHICH THEY RELATE.
3. ALL DRIVEWAYS, CURBS, SIDEWALKS, ETC. REQUIRED TO BE REMOVED TO ACCOMMODATE NEW CONSTRUCTION SHALL BE SAW-CUT, REMOVED AND PAID FOR UNDER ITEM 100 "PREPARING RIGHT OF WAY".
4. ASPHALT OVERLAY SHALL EXTEND TO THE LIMITS SHOWN ON THE PLANS.
5. CONTRACTOR SHALL COORDINATE MAILBOX RELOCATIONS WITH PROPERTY OWNERS.

KEYED NOTES:

1. SAW CUT AND MATCH EXISTING
2. PROTECT EXISTING CURB OR CURB/GUTTER
3. RELOCATE EXISTING MAILBOX (SEE SHEET 34)
4. RELOCATE EXISTING MASONRY MAILBOX (SEE SHEET 34)
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9. CONC CURB (RIBBON) (SEE SHEET 35)
10. CONC CURB (DRIVEWAY WALL) (SEE SHEET 35)
11. CONC SIDEWALK WITH TOEDOWN (SEE SHEET 35)

SAN ANTONIO STREET
ROADWAY RECONSTRUCTION LIMITS:

STA=19+50.00 TO STA=33+37.83

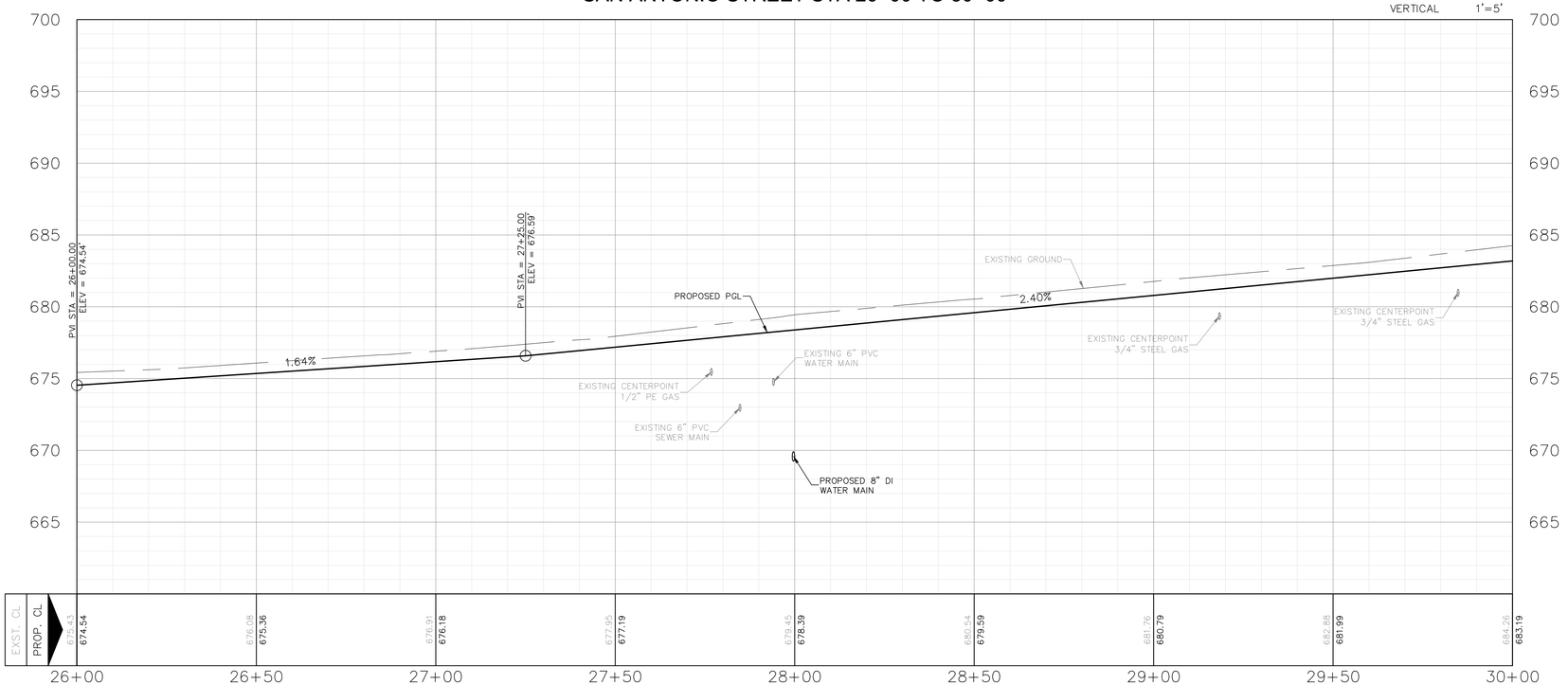
SEE NBU WATER AND SEWER PLANS ("SAN ANTONIO STREET REHABILITATION PHASE 3 PROJECT") FOR PROPOSED WATER AND SEWER IMPROVEMENTS

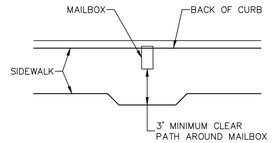
LEGEND

- AREA OF BASE REPAIR
- AREA OF FULL DEPTH REHABILITATION
- AREA OF STREET MILL/OVERLAY
- AREA OF PAVEMENT CROSS SLOPE TRANSITION
- AREA OF ASPHALT DRIVEWAY PENETRATION
- AREA OF CONCRETE DRIVEWAY PENETRATION
- AREA OF REMOVAL
- AREA OF ROADWAY OBLITERATION
- [1] DRIVEWAY NUMBER

SAN ANTONIO STREET STA 26+00 TO 30+00

SCALE
HORIZONTAL 1"=20'
VERTICAL 1'=5'





SIDEWALK CLEAR PATH DETAIL

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

SAN ANTONIO STREET
STA 26+00 TO 30+00

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 235 • New Braunfels, TX 78132 • 830.203.6630

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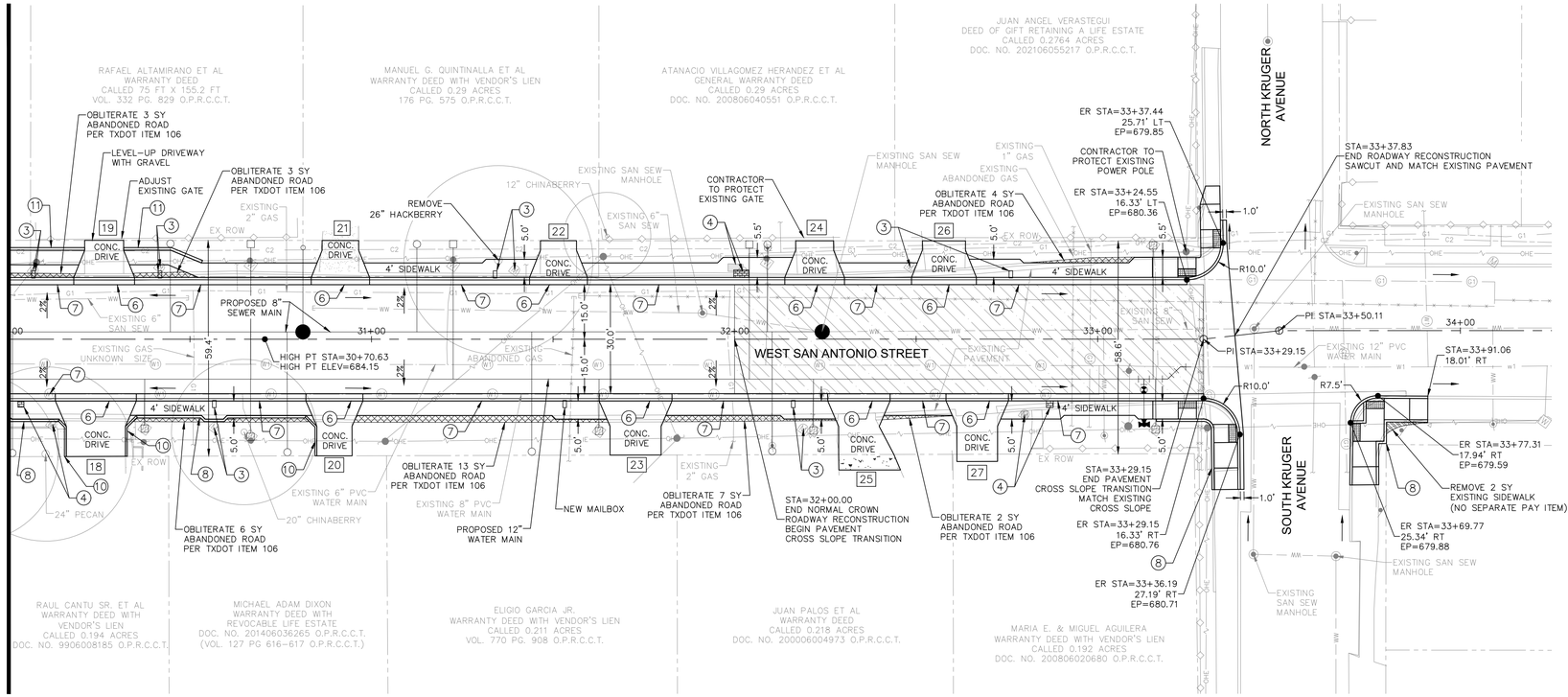
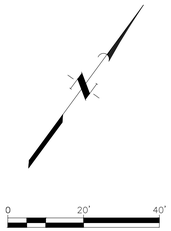
K:\05668\05668-0026-01 san antonio street and water lane roadway improvements\2 design phase\CAD\Plans\05668-0026-01-SF-PNP San Antonio.dwg May 09, 2025 - 1:15pm JFR





SAN ANTONIO STREET
ROADWAY RECONSTRUCTION LIMITS:

STA=19+50.00 TO STA=33+37.83

SEE NBU WATER AND SEWER PLANS ("SAN ANTONIO STREET REHABILITATION PHASE 3 PROJECT") FOR PROPOSED WATER AND SEWER IMPROVEMENTS

NOTES:

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LEGEND

- AREA OF BASE REPAIR
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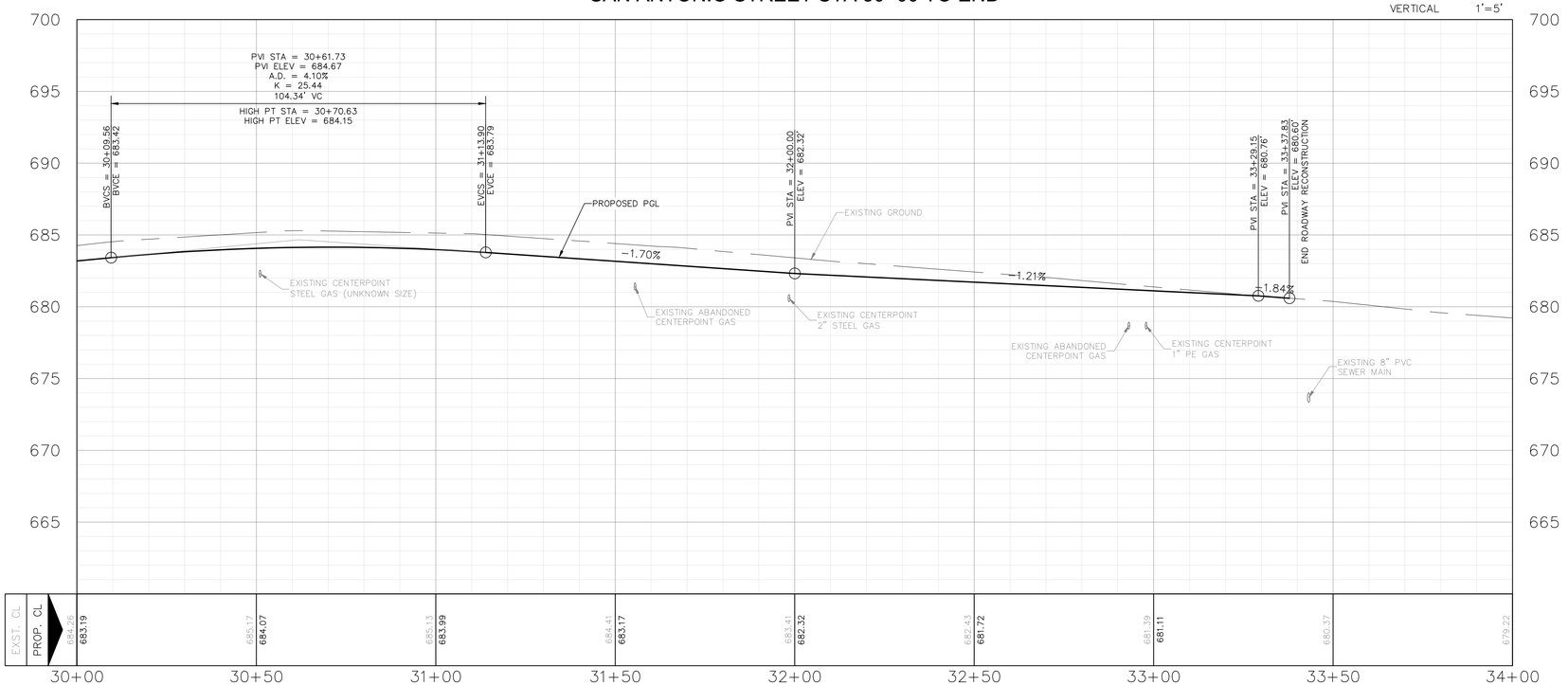
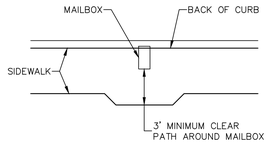
- AREA OF REMOVAL
- AREA OF ROADWAY OBLITERATION
- [1] DRIVEWAY NUMBER

SAN ANTONIO STREET STA 30+00 TO END

SCALE
HORIZONTAL 1"=20'
VERTICAL 1'=5'





SIDEWALK CLEAR PATH DETAIL

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

SAN ANTONIO STREET
STA 30+00 TO END

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 235 • New Braunfels, TX 78132 • 830.203.6630

SCALE: AS NOTED DGN. BY: AZ
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ALEX ZERTUCHE
92080
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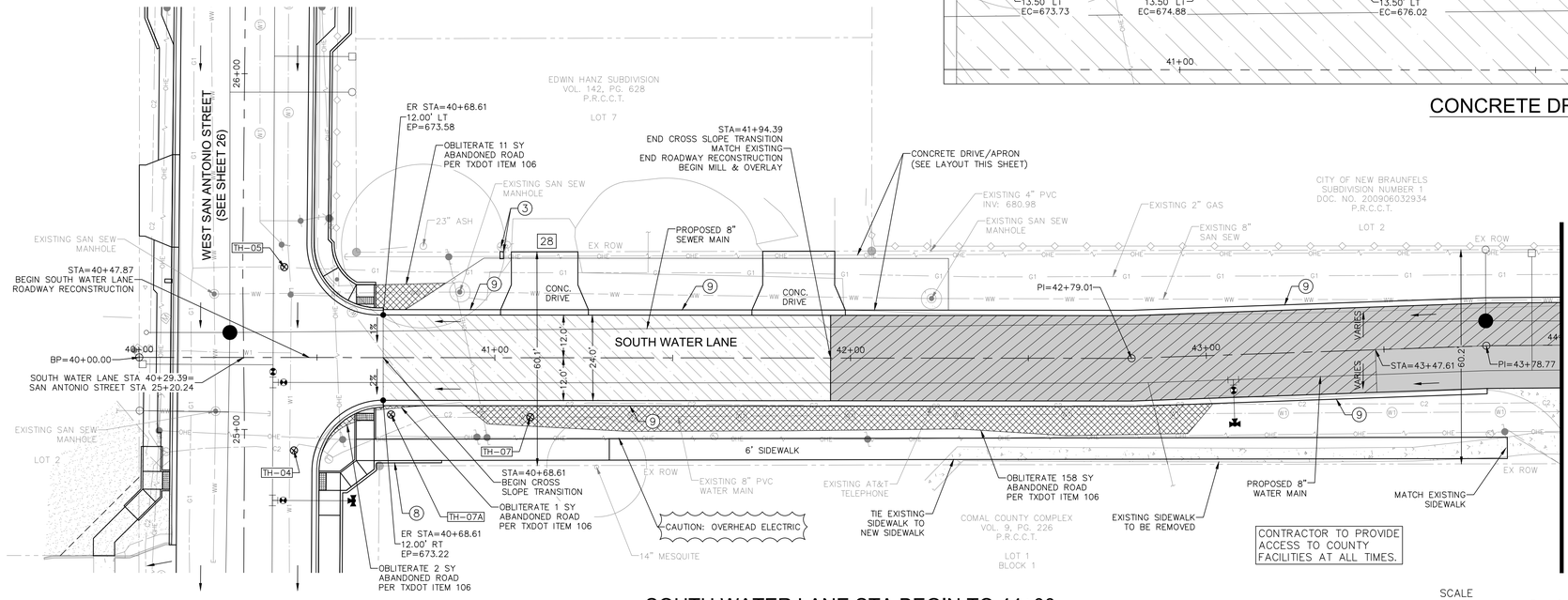
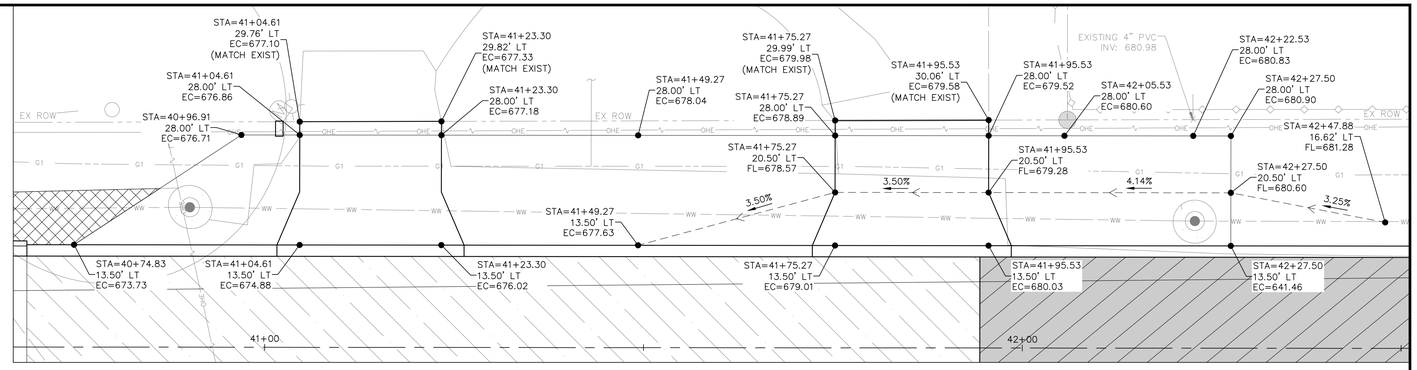
PROFESSIONAL ENGINEER
5/9/2025

K:\05668\05668-0026-01 san antonio street and water lane roadway improvements\2 design phase\CAD\Plans\05668-0026-01-SF-PNP San Antonio.dwg May 09, 2025 - 1:18pm JFR

TEST HOLE	UTILITY TYPE	NORTHING	EASTING	EXIST GROUND ELEV.	TOP OF UTILITY ELEV.	NOTES
TH-04	1" DBC TELE	13796287.24	2238103.75	674.06	669.92	Owner: AT&T
TH-05	2" STEEL GAS	13796319.37	2238144.12	674.62	672.12	Owner: Centerpoint Energy
TH-07	8" PVC WATER	13796238.56	2238149.9	676.18	671.07	TRG's target utility was a 6" PVC sewer line. Crew exposed an 8" PVC water line. Owner: New Braunfels Utilities
TH-07A	N/A	13796270.87	2238127.79	675.03	N/A	*Second Attempt. TRG's target utility was a 6" PVC sewer line. Crew excavated to a depth of 8.32' but did not expose utility. Owner: New Braunfels Utilities





CONCRETE DRIVE/APRON LAYOUT

SCALE: 1"=10'

SOUTH WATER LANE ROADWAY RECONSTRUCTION LIMITS:

STA=40+47.87 TO STA=41+94.39

SEE NBU WATER AND SEWER PLANS ("SAN ANTONIO STREET REHABILITATION PHASE 3 PROJECT") FOR PROPOSED WATER AND SEWER IMPROVEMENTS

0 20' 40'

KEYED NOTES:

1. SAW CUT AND MATCH EXISTING
2. PROTECT EXISTING CURB OR CURB/GUTTER
3. RELOCATE EXISTING MAILBOX (SEE SHEET 34)
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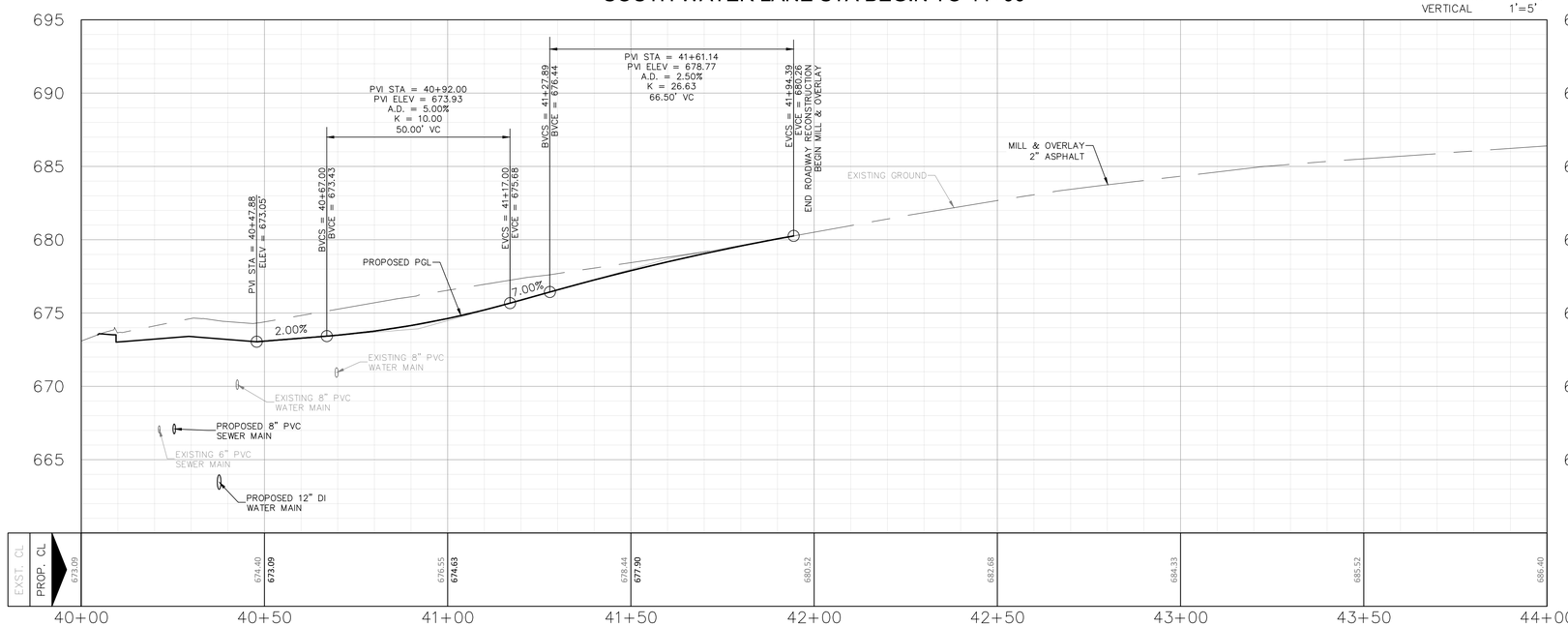
- AREA OF REMOVAL
- AREA OF ROADWAY OBLITERATION
- [1] DRIVEWAY NUMBER

SOUTH WATER LANE STA BEGIN TO 44+00

SCALE
HORIZONTAL 1"=20'
VERTICAL 1"=5'



NOTES:

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NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

SOUTH WATER LANE
BEGIN TO 44+00

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

SCALE: AS NOTED DGN. BY: AZ
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STATE OF TEXAS
ALEX ZERTUCHE
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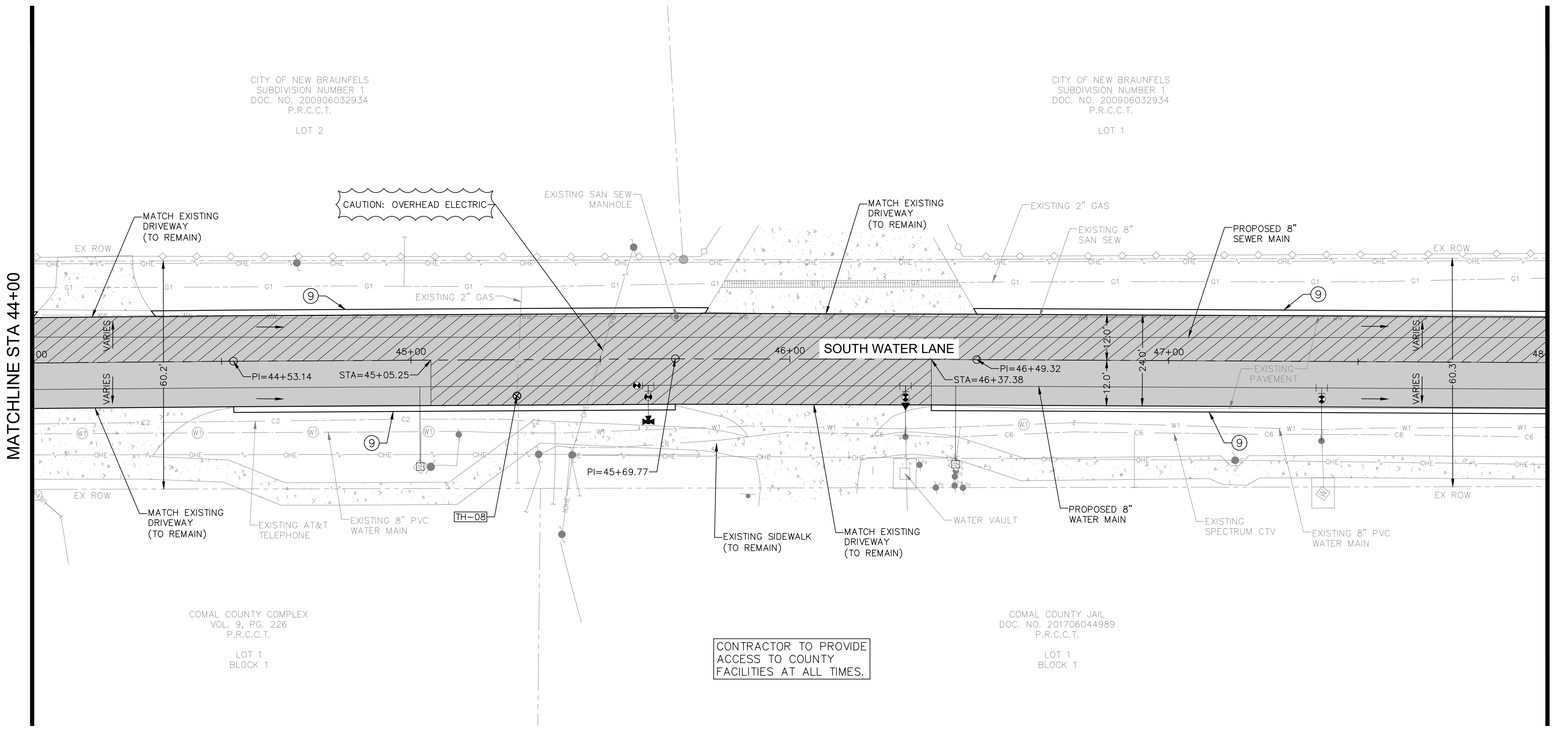
5/9/2025

K:\05668\05668-0026-01 san antonio street and water lane roadway improvements\2 design phase\Cad\Plans\05668-0026-01-SF-PNP Water Lane.dwg May 09, 2025 - 11:16am JFR



SUE TEST HOLE DATA						
TEST HOLE	UTILITY TYPE	NORTHING	EASTING	EXIST GROUND ELEV.	TOP OF UTILITY ELEV.	NOTES
TH-08	2" PE GAS	13795904.87	2238401.82	685.81	683.48	Owner: Centerpoint Energy

SEE NBU WATER AND SEWER PLANS ("SAN ANTONIO STREET REHABILITATION PHASE 3 PROJECT") FOR PROPOSED WATER AND SEWER IMPROVEMENTS

NOTES:

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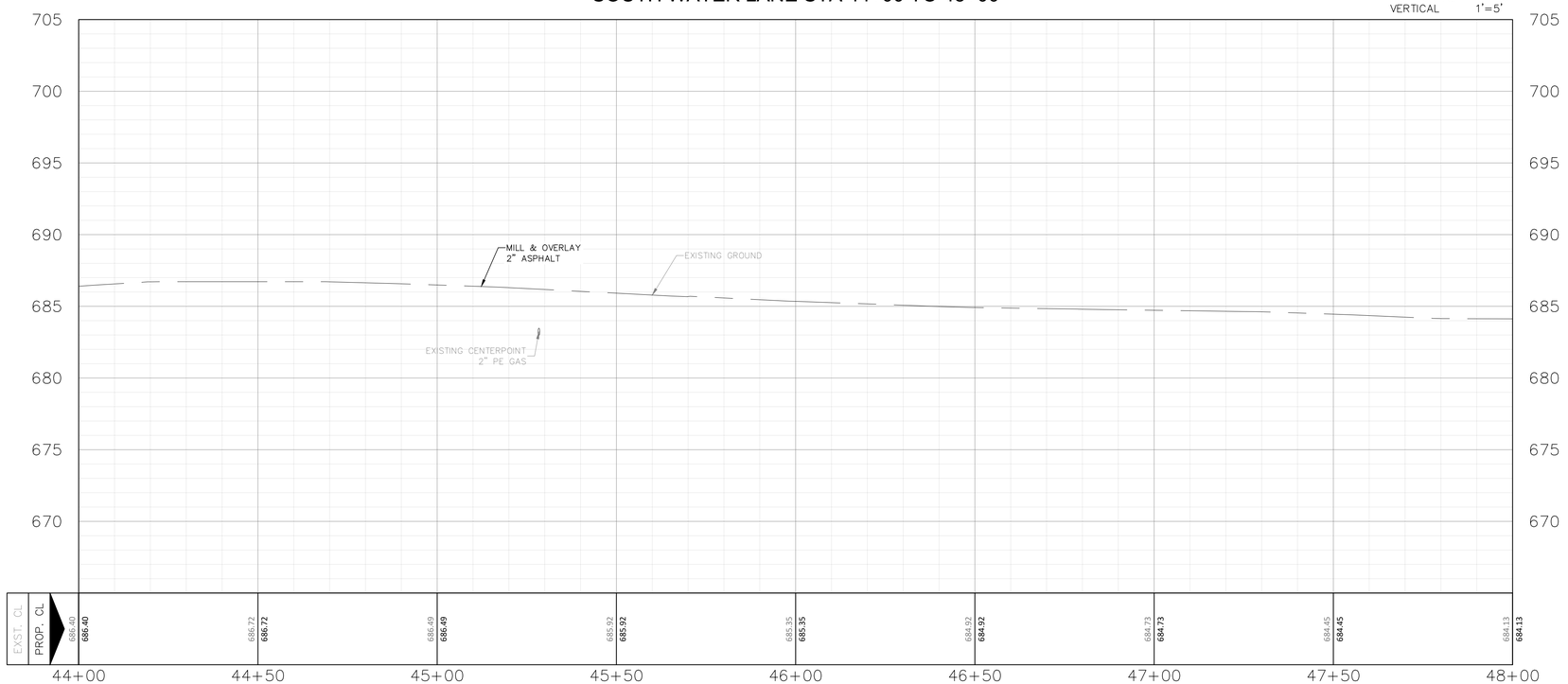
- AREA OF CONCRETE DRIVEWAY PENETRATION
- AREA OF REMOVAL
- AREA OF ROADWAY OBLITERATION
- [1] DRIVEWAY NUMBER

SOUTH WATER LANE STA 44+00 TO 48+00

SCALE
HORIZONTAL 1"=20'
VERTICAL 1'=5'



NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

SOUTH WATER LANE
STA 44+00 TO 48+00

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
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STATE OF TEXAS
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5/9/2025

K:\05668-0026-01 san antonio street and water lane roadway improvements\2 design phase\CAD\Plans\05668-0026-01-SF-PWP Water Lane.dwg May 09, 2025 - 1:16pm JFR

MATCHLINE STA 48+00

CONTRACTOR TO PROVIDE ACCESS TO FIRE STATION AT ALL TIMES.

FIRE STATION #2
CITY OF NEW BRAUNFELS
SUBDIVISION NUMBER 1
DOC. NO. 200906032934
P.R.C.C.T.
LOT 1

EXISTING AT&T TELEPHONE
EXISTING MCI FIBER OPTIC
EXISTING AT&T FIBER OPTIC
STORM MANHOLE
RIM ELEV: 683.59'
18"X24" RCP (ARCH) (NE)IN: 680.47'
18"X24" RCP (ARCH) (SW)OUT: 680.40'
15" RCP (NW): 680.48'

MATCH EXISTING DRIVEWAY (TO REMAIN)
EXISTING SAN SEW MANHOLE
18" RCP INV: 681.31'
EXISTING 2" GAS
18" CEDAR ELM
16" CEDAR ELM
MATCH EXISTING DRIVEWAY (TO REMAIN)
EX ROW
EXISTING 8" SAN SEW
PROPOSED 8" SEWER MAIN
VARIES
60.3'
49+00
SOUTH WATER LANE
12.0'
24.0'
50+00
VARIES
51+00
60.4'
PI=51+13.65
1.0'
STA=51+93.69
37.04' LT
MATCH EXISTING EDGE OF GUTTER
STA=51+94.94
END MILL & OVERLAY
END FULL DEPTH REHABILITATION
END CONSTRUCTION
SAWCUT AND MATCH EXISTING PAVEMENT
52+00
52+19.57
EP=52+19.57
PI=48+89.44
PI=50+07.19
MATCH EXISTING EDGE OF GUTTER
MATCH EXISTING SIDEWALK
STA=51+96.18
36.65' RT
1.0'
STA=48+40.00
BEGIN FULL DEPTH REHABILITATION
EXISTING SPECTRUM CTV
CAUTION: OVERHEAD ELECTRIC
EXISTING 8" PVC WATER MAIN
PROPOSED 12" WATER MAIN
TH-09
OBLITERATE 17 SY ABANDONED ROAD PER TXDOT ITEM 106
18"X24" RCP (ARCH) INV: 680.08'
EXISTING 8" PVC WATER MAIN
4" PVC INV: 678.63'
4" PVC INV: 678.99'
REMOVE EXISTING CONCRETE PAD AND SIGN POST FOUNDATION (NO SEPARATE PAY ITEM) (SEE SHEET 64 FOR SIGN RELOCATION)
IH 35 S FRONTAGE ROAD

COMAL COUNTY JAIL
DOC. NO. 201706044989
P.R.C.C.T.
LOT 1
BLOCK 1

CONTRACTOR TO PROVIDE ACCESS TO COUNTY FACILITIES AT ALL TIMES.

SEE NBU WATER AND SEWER PLANS ("SAN ANTONIO STREET REHABILITATION PHASE 3 PROJECT") FOR PROPOSED WATER AND SEWER IMPROVEMENTS

0 20' 40'

SUE TEST HOLE DATA

TEST HOLE	UTILITY TYPE	NORTHING	EASTING	EXIST GROUND ELEV.	TOP OF UTILITY ELEV.	NOTES
TH-09	3" PVC FIBER	13795456.08	2238705.52	681.06	678.46	Owner: Spectrum

NOTES:

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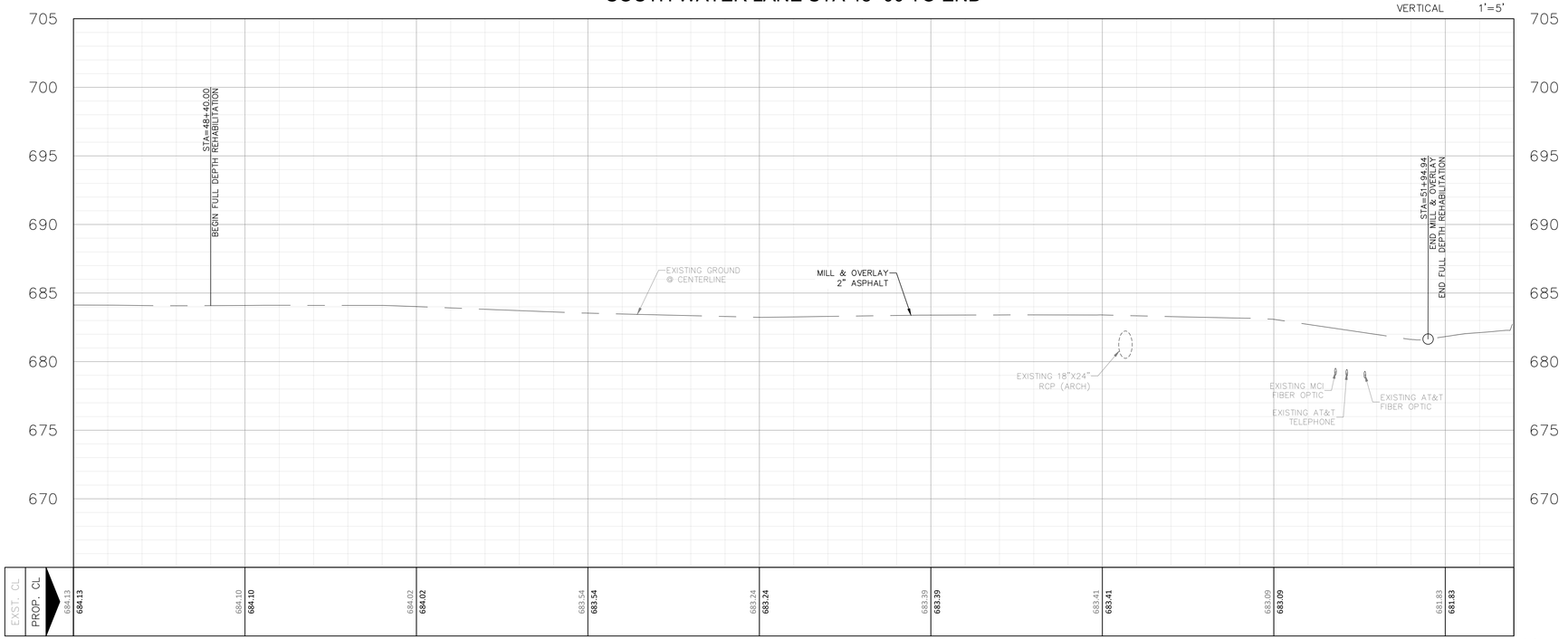
- AREA OF CONCRETE DRIVEWAY PENETRATION
- AREA OF REMOVAL
- AREA OF ROADWAY OBLITERATION
- [1] DRIVEWAY NUMBER

SOUTH WATER LANE STA 48+00 TO END

SCALE
HORIZONTAL 1"=20'
VERTICAL 1"=5'



NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

SOUTH WATER LANE
STA 48+00 TO END

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
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DATE: AS NOTED DWN. BY: JFR
JOB NO. 05668-0026-01 DWG. NO. --
SUBMITTED: ---- SURV. BY: QUIDDITY

STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED
PROFESSIONAL ENGINEER
5/9/2025

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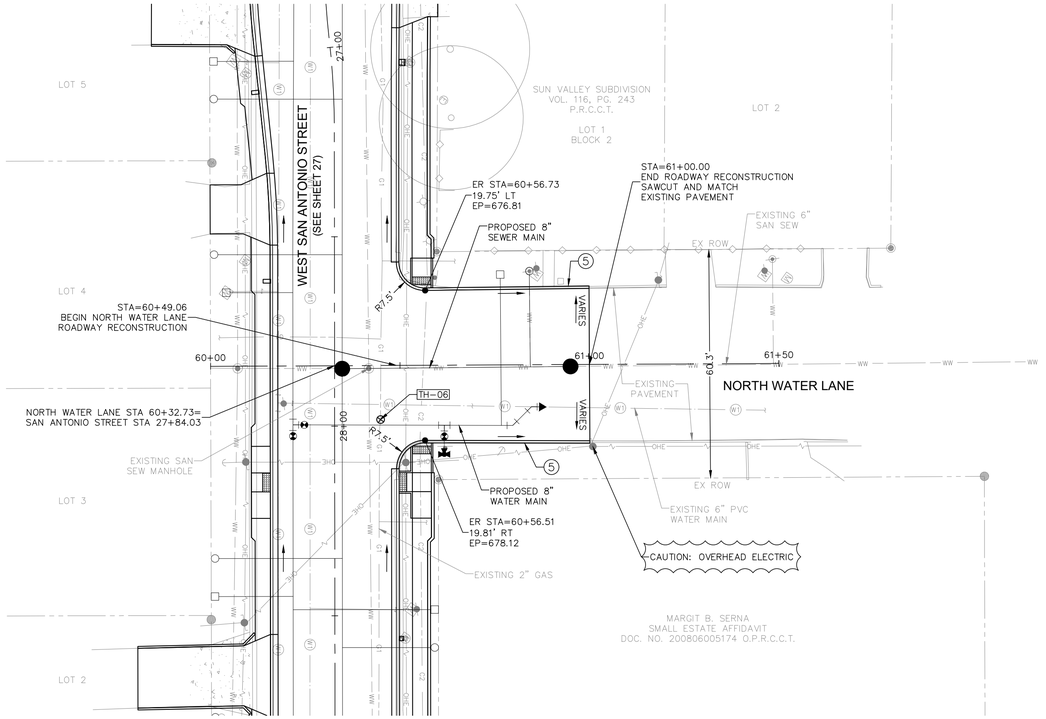

NORTH WATER LANE STA 60+00 TO END

SCALE
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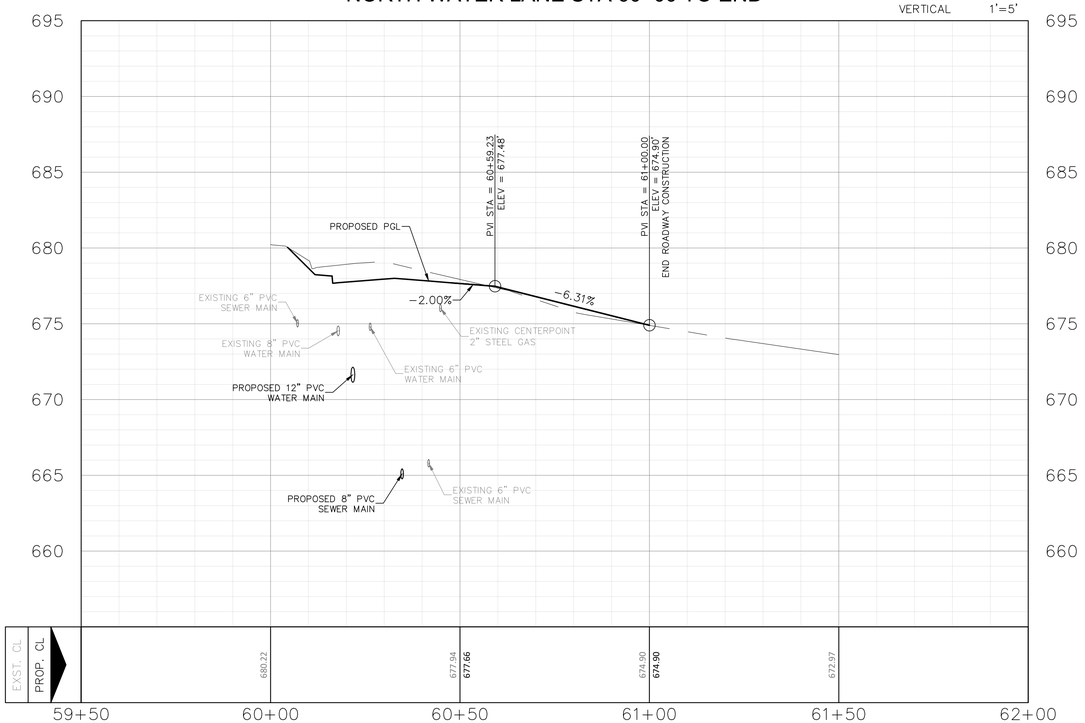
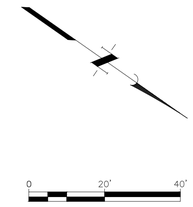
VERTICAL 1"=5'



SUE TEST HOLE DATA						
TEST HOLE	UTILITY TYPE	NORTHING	EASTING	EXIST GROUND ELEV.	TOP OF UTILITY ELEV.	NOTES
TH-06	2" STEEL GAS	13796486.46	2238335.1	678.84	676.29	Owner: Centerpoint Energy



NORTH WATER LANE
ROADWAY RECONSTRUCTION LIMITS:

STA=60+49.06 TO STA=61+00.00

SEE NBU WATER AND SEWER PLANS ("SAN ANTONIO STREET REHABILITATION PHASE 3 PROJECT") FOR PROPOSED WATER AND SEWER IMPROVEMENTS

NOTES:

1. IN AREAS OF PROPOSED MILL & OVERLAY, THE EXISTING GROUND PROFILE SHOWN IS FOR THE PURPOSE OF REESTABLISHING THE EXISTING GRADES ALONG THE PROPOSED CENTERLINE ALIGNMENT. CONTRACTOR SHALL MATCH THE EXISTING PAVEMENT CROSS SLOPE FROM THE EXISTING CENTERLINE TO THE EXISTING PAVEMENT EDGE, UNLESS OTHERWISE NOTED.
2. COSTS OF SAW CUTTING EXISTING PAVEMENT, DRIVEWAYS, CURBS, ETC. ARE SUBSIDIARY TO BID ITEMS TO WHICH THEY RELATE.
3. ALL DRIVEWAYS, CURBS, SIDEWALKS, ETC. REQUIRED TO BE REMOVED TO ACCOMMODATE NEW CONSTRUCTION SHALL BE SAW-CUT, REMOVED AND PAID FOR UNDER ITEM 100 "PREPARING RIGHT OF WAY".
4. ASPHALT OVERLAY SHALL EXTEND TO THE LIMITS SHOWN ON THE PLANS.
5. CONTRACTOR SHALL COORDINATE MAILBOX RELOCATIONS WITH PROPERTY OWNERS.

KEYED NOTES:

1. SAW CUT AND MATCH EXISTING
2. PROTECT EXISTING CURB OR CURB/GUTTER
3. RELOCATE EXISTING MAILBOX (SEE SHEET 34)
4. RELOCATE EXISTING MASONRY MAILBOX (SEE SHEET 34)
5. CONC CURB (TY I) (SEE SHEET 41)
6. CONC CURB & GUTTER (TY I) (SEE SHEET 42)
7. CONC CURB & GUTTER (TY II) (SEE SHEET 42)
8. CONC CURB (TY C1) (SEE SHEET 40)
9. CONC CURB (RIBBON) (SEE SHEET 35)
10. CONC CURB (DRIVEWAY WALL) (SEE SHEET 35)
11. CONC SIDEWALK WITH TOEDOWN (SEE SHEET 35)

LEGEND

- AREA OF BASE REPAIR
- AREA OF FULL DEPTH REHABILITATION
- AREA OF STREET MILL/OVERLAY
- AREA OF PAVEMENT CROSS SLOPE TRANSITION
- AREA OF ASPHALT DRIVEWAY PENETRATION
- AREA OF CONCRETE DRIVEWAY PENETRATION
- AREA OF REMOVAL
- AREA OF ROADWAY OBLITERATION
- [1] DRIVEWAY NUMBER

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

NORTH WATER LANE

QUIDDITY
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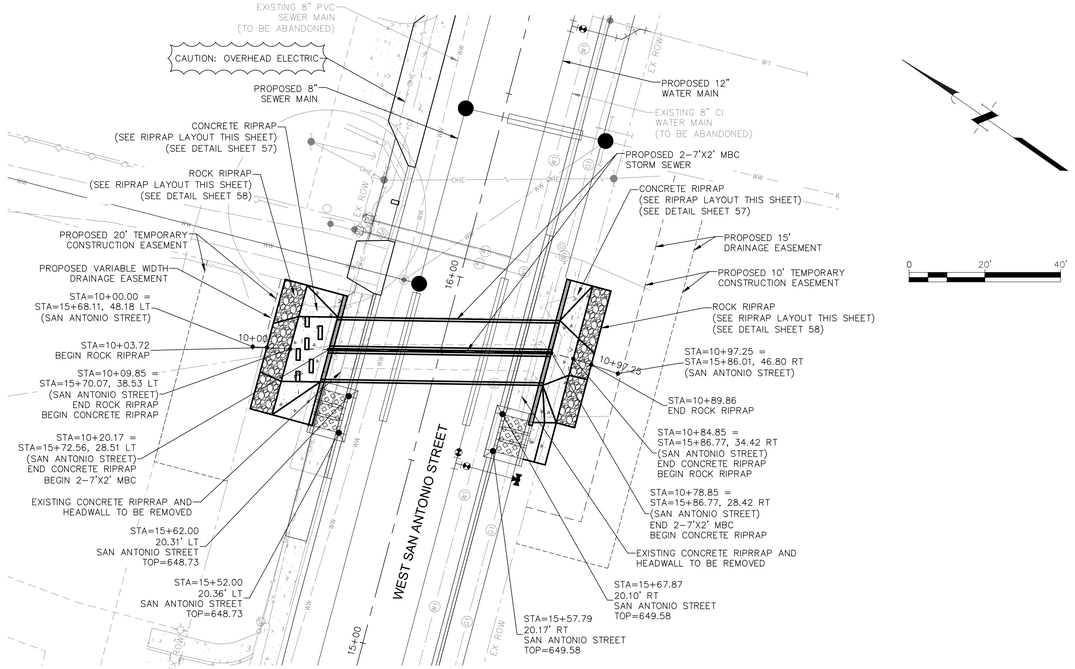
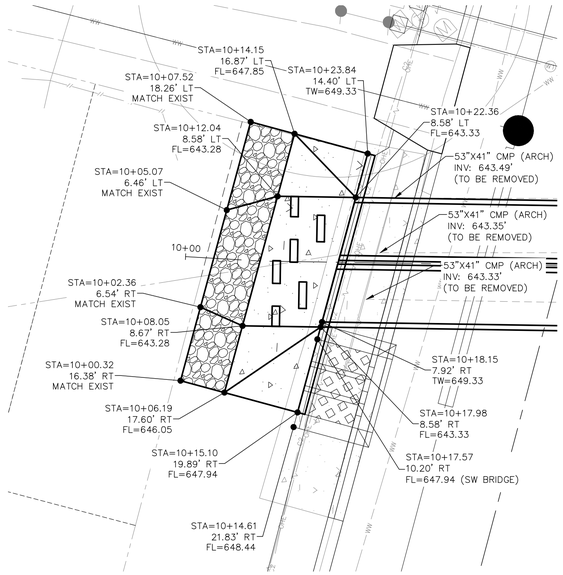
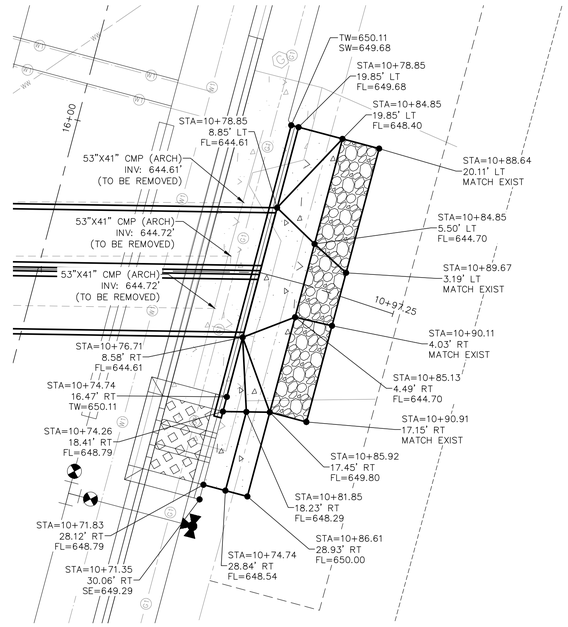




DOWNSTREAM RIPRAP LAYOUT

SCALE: 1"=10'

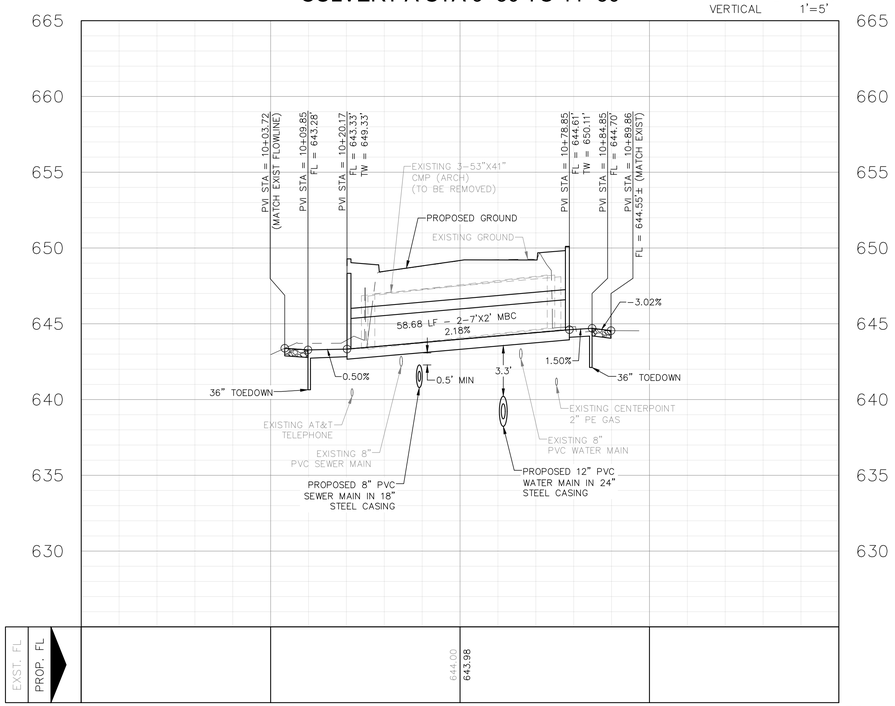


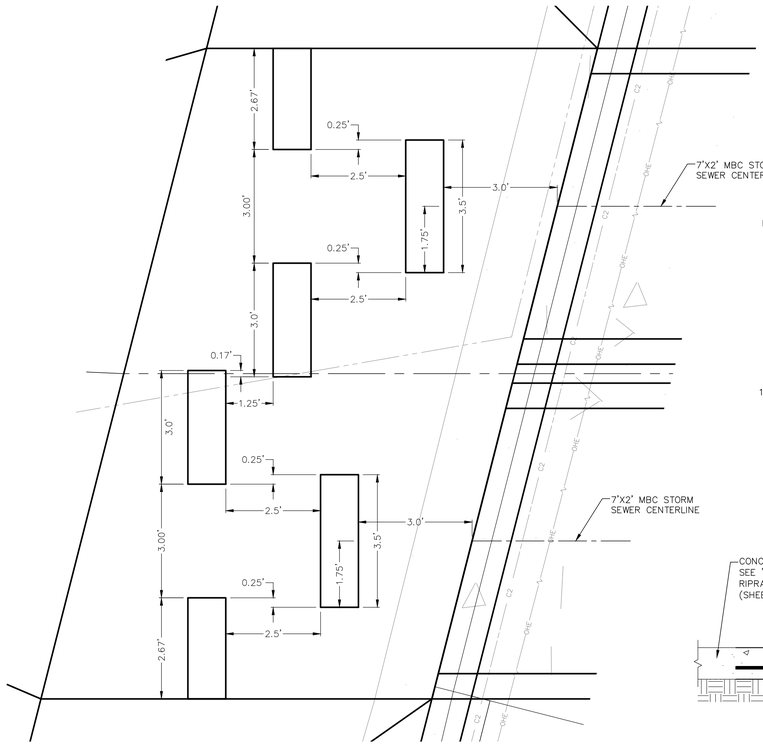
UPSTREAM RIPRAP LAYOUT

SCALE: 1"=10'

CULVERT A STA 9+50 TO 11+50

SCALE
HORIZONTAL 1"=20'
VERTICAL 1'=5'



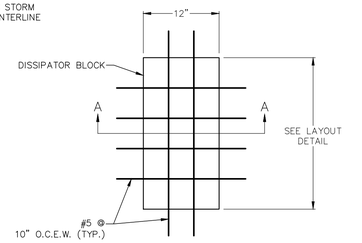


VELOCITY DISSIPATORS LAYOUT DETAIL

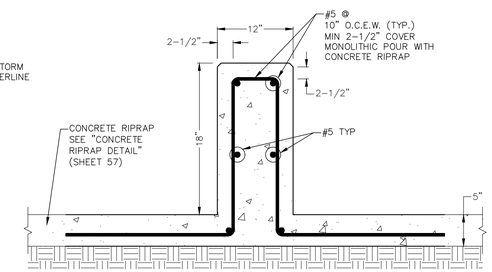
SCALE: 1"=2'

NOTES:

1. CONCRETE FOR VELOCITY DISSIPATORS SHALL BE CLASS "A" 3000 PSI.
2. ALL DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTER OF BARS UNLESS OTHERWISE SHOWN.
3. ALL REINFORCEMENT STEEL SHALL MEET ASTM DESIGNATIONS AS CALLED FOR IN THE STANDARD SPECIFICATIONS.
4. ALL EXPOSED CONCRETE CORNERS SHALL HAVE A ¾" CHAMFER.
5. ALL REINFORCING STEEL SHALL HAVE A MINIMUM 2" COVER.



PLAN VIEW



SECTION A-A

VELOCITY DISSIPATOR BLOCK DETAIL

SCALE: NTS

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

CULVERT A

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
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STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED
PROFESSIONAL ENGINEER
5/9/2025

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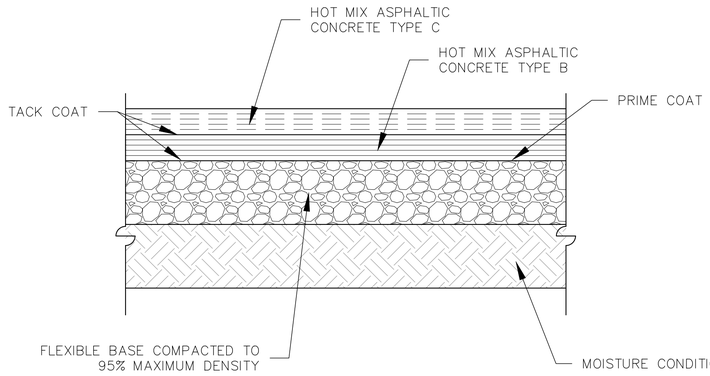
NOTE:

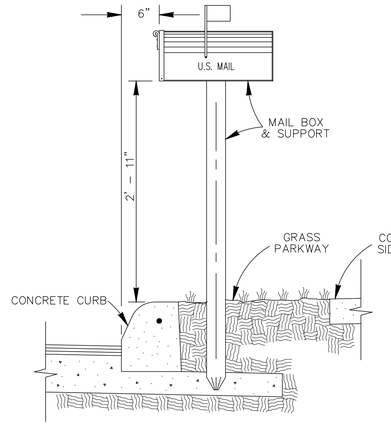
1. TYPICAL ASPHALT PAVEMENT SECTION SHALL BE USED ON ALL STREET RECONSTRUCTION, EXCEPT AS OTHERWISE NOTED ON THE PLANS. ALL PAVEMENT CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH THE GEOTECHNICAL REPORT FOR THIS PROJECT.
2. THE CONTRACTOR SHALL ENGAGE A GEOTECHNICAL ENGINEERING FIRM TO OBSERVE AND EVALUATE THE SUBGRADE MATERIAL AND DETERMINE THE LIMITS OF THE APPROPRIATE MINIMUM PAVEMENT SECTION REQUIRED.



RECOMMENDED PAVEMENT RECONSTRUCTION COMPONENTS AND THICKNESSES (INCHES)		
PAVEMENT MATERIALS	SAN ANTONIO STREET	WATER LANE
HOT MIX ASPHALTIC CONCRETE TYPE C	3	3
HOT MIX ASPHALTIC CONCRETE TYPE B	5	5
FLEXIBLE BASE COURSE	5	5

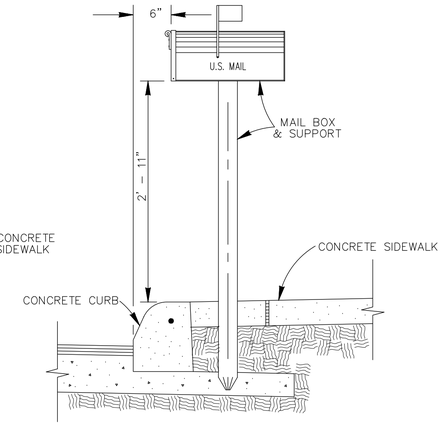
TYPICAL ASPHALT PAVEMENT RECONSTRUCTION SECTION

Scale: NTS



MAIL BOX PERPENDICULAR TO CURB

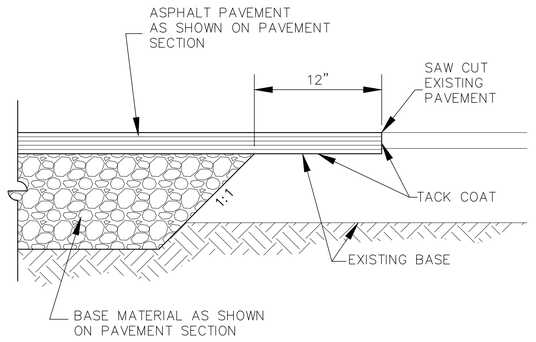
WHEN SIDEWALK IS DETACHED FROM CURB
SCALE : NTS



MAIL BOX PERPENDICULAR TO CURB

WHEN SIDEWALK IS ATTACHED TO CURB
SCALE : NTS

MAIL BOX LOCATION



NEW ASPHALT PAVEMENT TO EXISTING ASPHALT

Scale: NTS

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

ROADWAY STANDARD DETAILS I

QUIDDITY
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LICENSED PROFESSIONAL ENGINEER
5/9/2025

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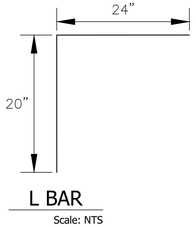
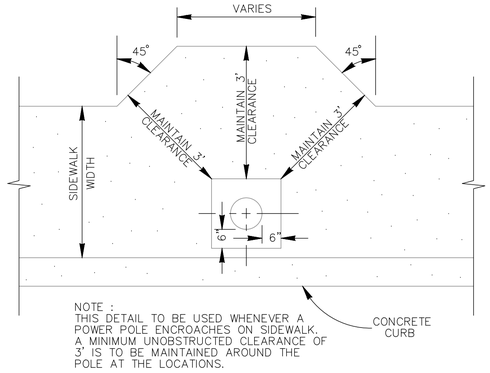


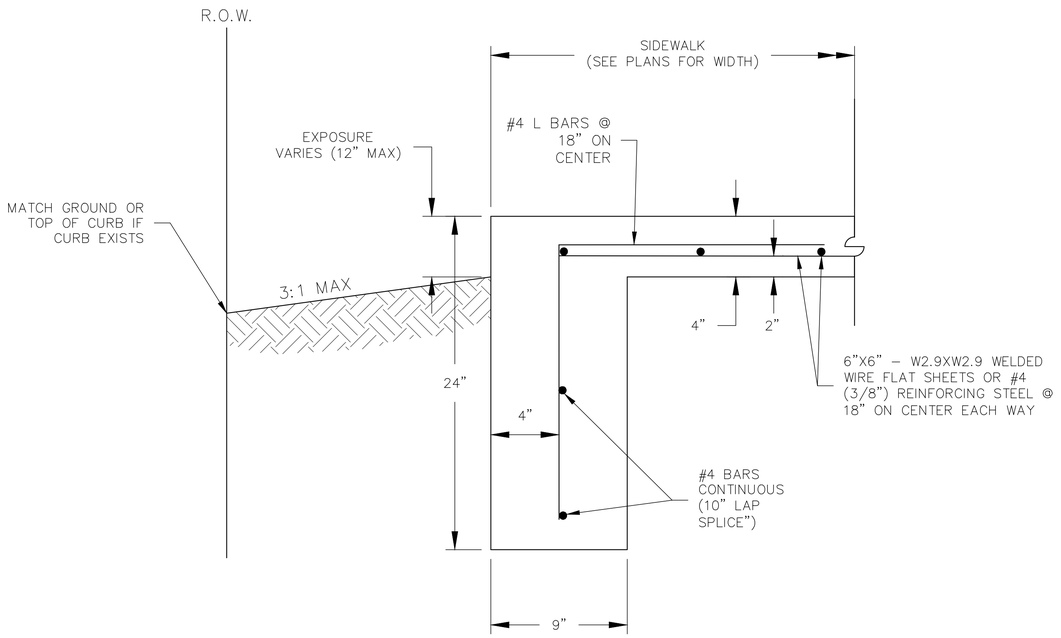
L BAR

Scale: NTS



CONCRETE SIDEWALK @ UTILITY POWER POLE DETAIL

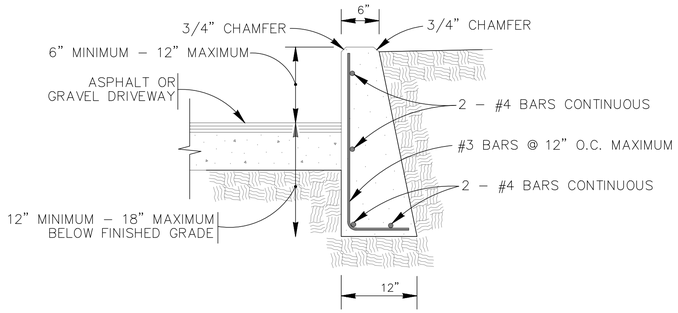
SCALE : NTS



NOTE:
SIDEWALK TOE DOWN ONLY AT LOCATIONS SHOWN ON PLANS.

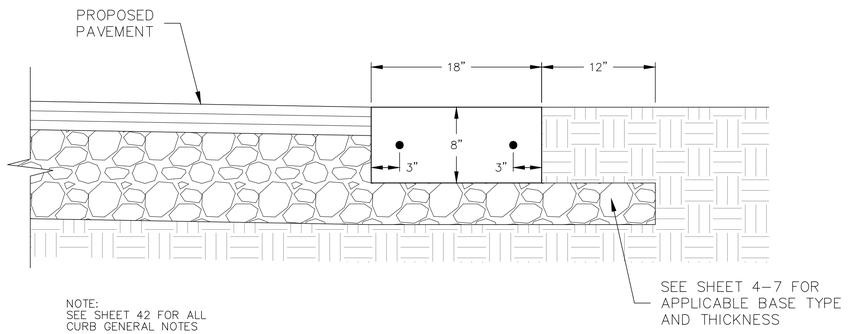
SIDEWALK WITH TOE DOWN DETAIL

Scale: NTS



CONCRETE CURB (DRIVEWAY WALL)

ON COMPACTED SUBGRADE



NOTE:
SEE SHEET 42 FOR ALL CURB GENERAL NOTES

CONCRETE RIBBON CURB

SCALE: NTS

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

ROADWAY STANDARD DETAILS II

QUIDDITY

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ALEX ZERTUCHE
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5/9/2025

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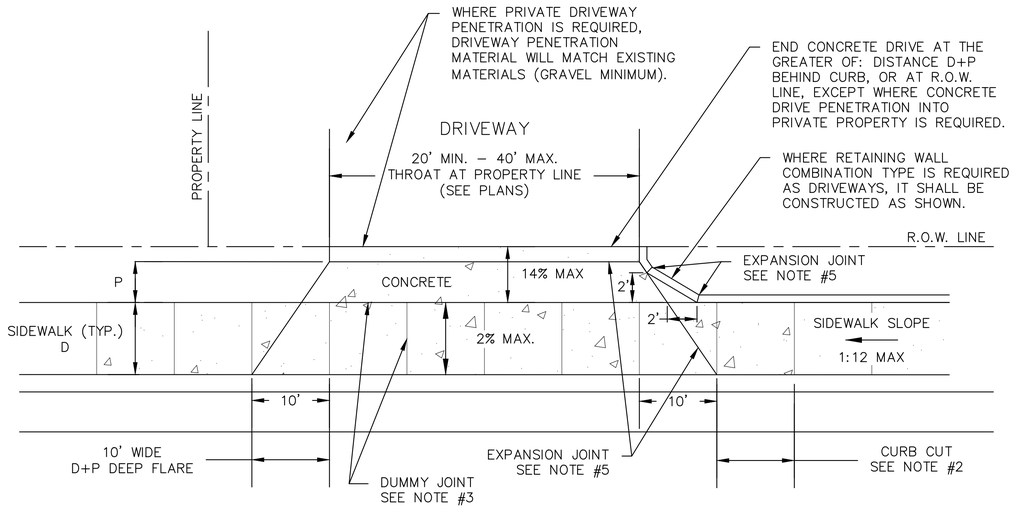
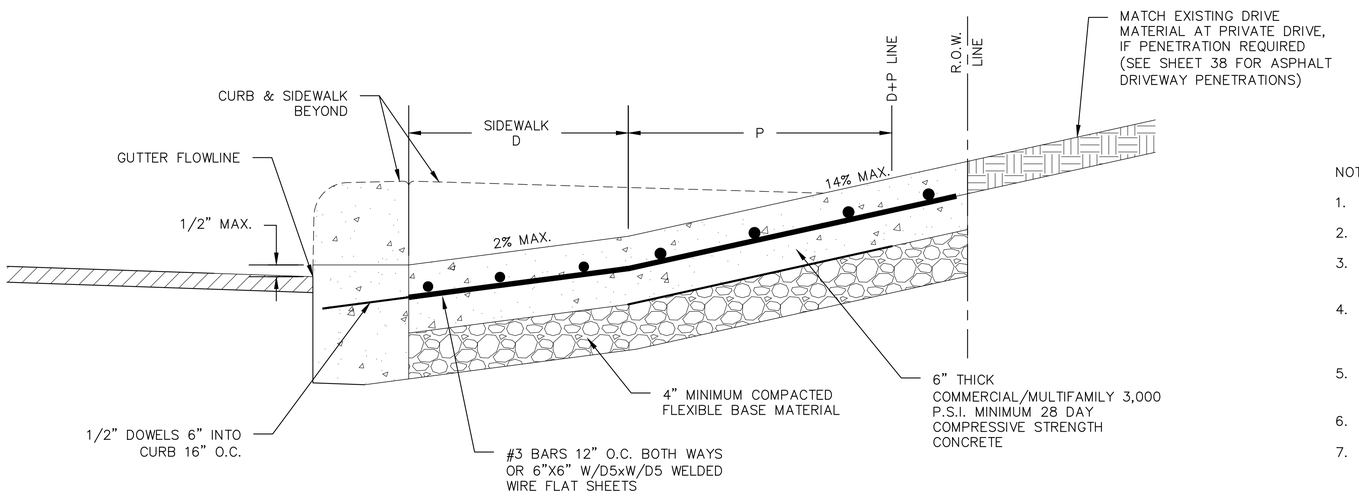


DRIVEWAY APRON (COMMERCIAL-FLARED)

P & D VALUES FOR DRIVEWAY DIMENSIONS			
	SAN ANTONIO STREET (5' SIDEWALK)	SAN ANTONIO STREET (6' SIDEWALK)	WATER LANE (6' SIDEWALK)
P (FT)	3	2	2
D (FT)	5	6	6

D = BACK OF CURB TO BACK OF SIDEWALK WIDTH

P = BACK OF SIDEWALK TO END OF FLARE WIDTH



DRIVEWAY SECTION

NOTES:

1. CROSS SLOPE OF SIDEWALK SHALL BE NO GREATER THAN 2%.
2. CURB CUT LENGTH NO GREATER THAN AS REQUIRED TO MATCH SLOPE OF ADJACENT SIDEWALK.
3. DUMMY JOINTS TO BE PROVIDED AT MINIMUM 4 FT. INTERVALS PERPENDICULAR TO THE CURB LINE WITHIN THE SIDEWALK AREA AND PARALLEL TO THE SIDEWALK AREA.
4. UNLESS OTHERWISE SHOWN ON DRIVEWAY PLAT, PROVIDE A MINIMUM 7" HIGH POINT. HIGH POINT HEIGHT SHALL BE MEASURED FROM THE GUTTER FLOW LINE TO THE DRIVEWAY APRON/PENETRATION. NOTE HIGH POINT MAY OCCUR OUTSIDE OF ROW.
5. PROVIDE EXPANSION JOINTS AT ALL SIDEWALK AND DRIVEWAY THROAT JOINTS. EXPANSION JOINTS SHALL BE PLACED USING 1/2" ASPHALTIC MATERIAL WITH DOWELS 16" O.C.
6. ALL SIDEWALK AND DRIVEWAY CONSTRUCTION SHALL MEET A.D.A. SPECIFICATIONS.
7. PROVIDE 4' VERTICAL CURVE FOR VERTICAL GRADE BREAKS WITH ALGEBRAIC DIFFERENCES GREATER THAN 14%.

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

COMMERCIAL DRIVEWAY STANDARD DETAILS

QUIDDITY
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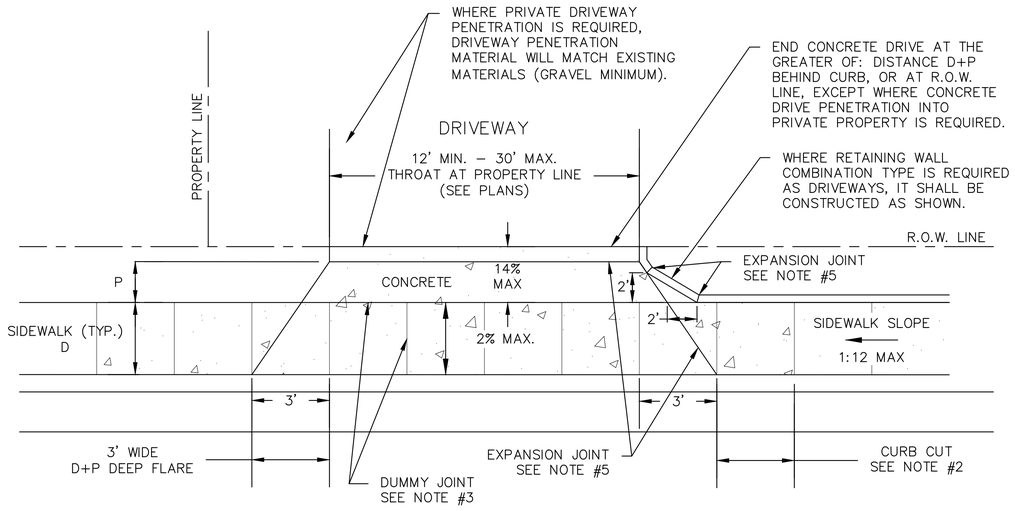
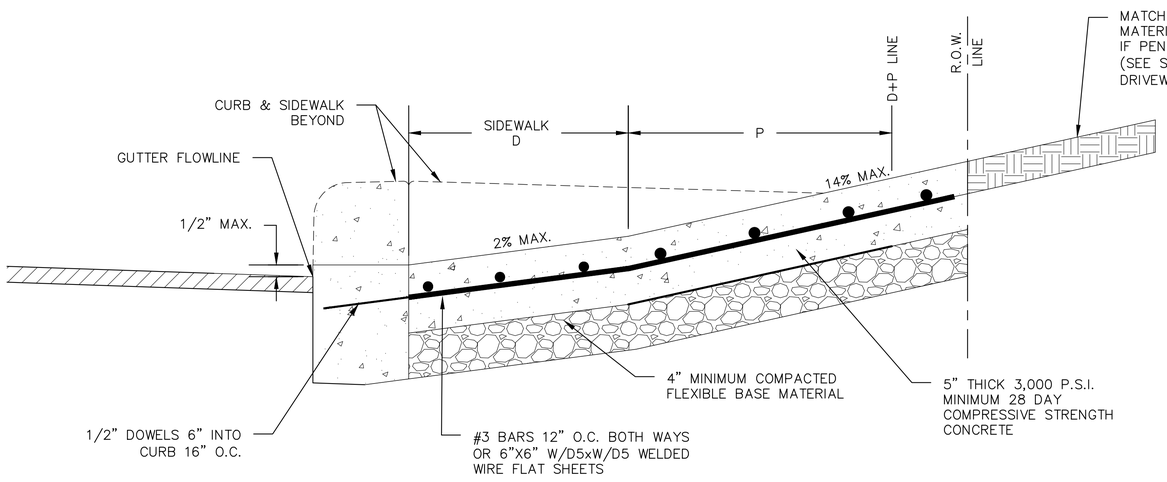


DRIVEWAY APRON (RESIDENTIAL-FLARED)

P & D VALUES FOR DRIVEWAY DIMENSIONS		
	SAN ANTONIO STREET (5' SIDEWALK)	SAN ANTONIO STREET (6' SIDEWALK)
P (FT)	3	2
D (FT)	5	6

D = BACK OF CURB TO BACK OF SIDEWALK WIDTH

P = BACK OF SIDEWALK TO END OF FLARE WIDTH



DRIVEWAY SECTION

NOTES:

1. CROSS SLOPE OF SIDEWALK SHALL BE NO GREATER THAN 2%.
2. CURB CUT LENGTH NO GREATER THAN AS REQUIRED TO MATCH SLOPE OF ADJACENT SIDEWALK.
3. DUMMY JOINTS TO BE PROVIDED AT MINIMUM 4 FT. INTERVALS PERPENDICULAR TO THE CURB LINE WITHIN THE SIDEWALK AREA AND PARALLEL TO THE SIDEWALK AREA.
4. UNLESS OTHERWISE SHOWN ON DRIVEWAY PLAT, PROVIDE A MINIMUM 7" HIGH POINT. HIGH POINT HEIGHT SHALL BE MEASURED FROM THE GUTTER FLOW LINE TO THE DRIVEWAY APRON/PENETRATION. NOTE HIGH POINT MAY OCCUR OUTSIDE OF ROW.
5. PROVIDE EXPANSION JOINTS AT ALL SIDEWALK AND DRIVEWAY THROAT JOINTS. EXPANSION JOINTS SHALL BE PLACED USING 1/2" ASPHALTIC MATERIAL WITH DOWELS 16" O.C.
6. ALL SIDEWALK AND DRIVEWAY CONSTRUCTION SHALL MEET A.D.A. SPECIFICATIONS.
7. PROVIDE 4' VERTICAL CURVE FOR VERTICAL GRADE BREAKS WITH ALGEBRAIC DIFFERENCES GREATER THAN 14%.

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

RESIDENTAIL DRIVEWAY STANDARD DETAILS

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
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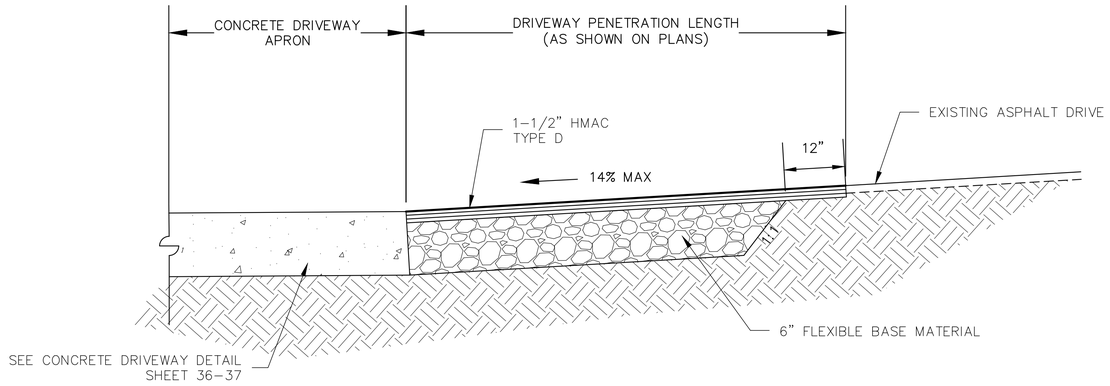

NOTE:
THIS DETAIL IS ONLY APPLICABLE TO ASPHALT DRIVEWAY PENETRATIONS SHOWN ON THE PLANS OR AS INSTRUCTED BY THE CITY INSPECTOR.

TYPICAL ASPHALT DRIVEWAY PENETRATION

*DRIVEWAY SLOPE VARIES

Scale: NTS

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

DRIVEWAY PENETRATION DETAILS

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
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DATE:	AS NOTED	DWN. BY:	JFR
JOB NO.	05668-0026-01	DWG. NO.	--
SUBMITTED:	----	SURV. BY:	QUIDDITY

STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED
PROFESSIONAL ENGINEER
5/9/2025

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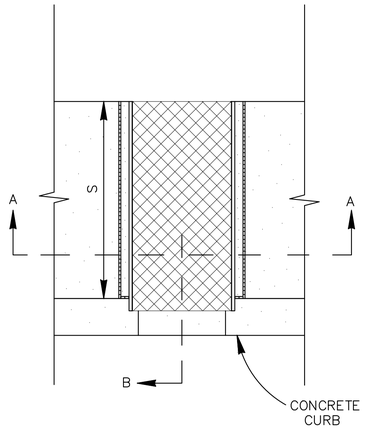
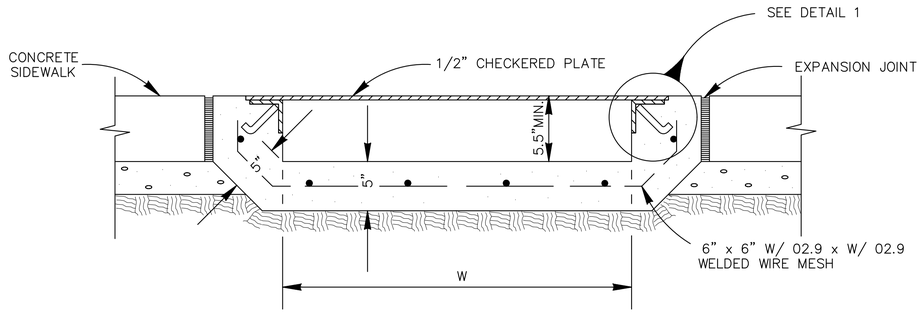
CONCRETE SIDEWALK DRAIN DIMENSIONS		
SAN ANTONIO STREET STATION	S (FT)	W (FT)
CL STA. 21+05.24	6	5

NOTES:

1. CONCRETE FOR CHANNEL RIP–RAP SHALL BE CLASS "A" 3000 P.S.I.
2. ALL DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTER OF BARS UNLESS OTHERWISE SHOWN.





SECTION A–A

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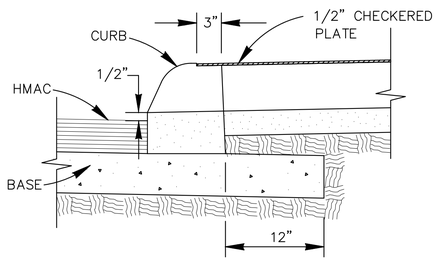

SECTION B–B

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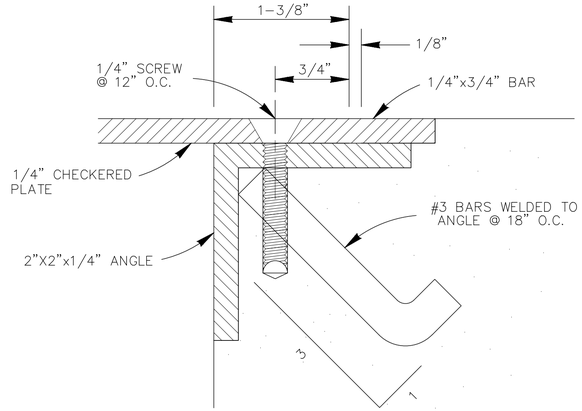

DETAIL 1

SCALE : N.T.S.

CONCRETE SIDEWALK DRAIN DETAIL

Scale: NTS

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

CONCRETE SIDEWALK DRAIN

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DATE: AS NOTED DWN. BY: JFR
JOB NO. 05668–0026–01 DWG. NO. ––
SUBMITTED: –––– SURV. BY: QUIDDITY

STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED PROFESSIONAL ENGINEER
5/9/2025

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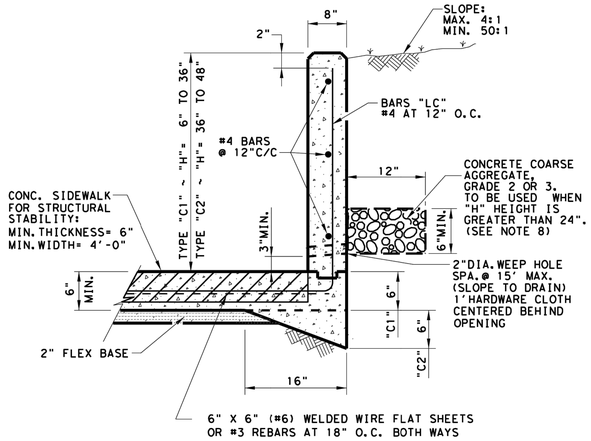
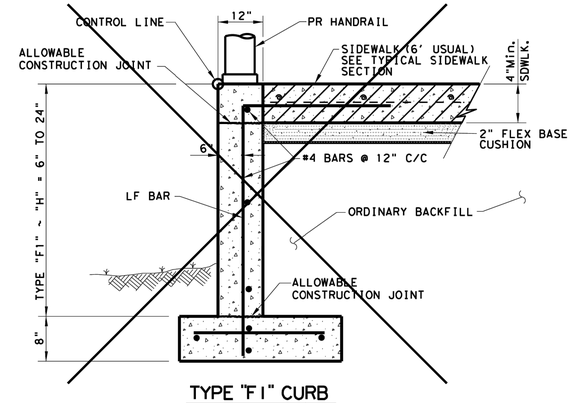


TYPE "C1" & "C2" CURB



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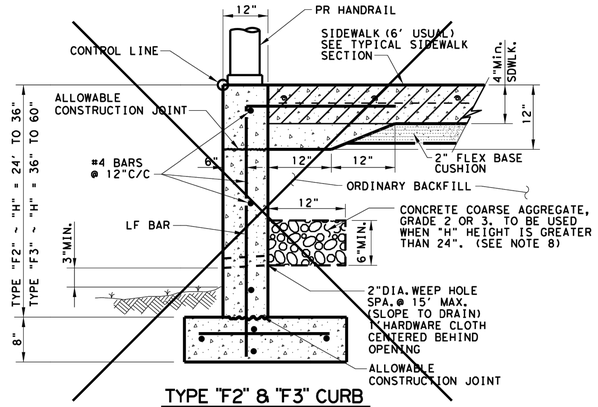

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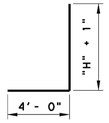
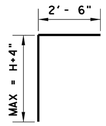
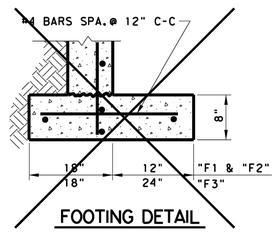


BAR "LC"



BAR "LF"



FOOTING DETAIL

CLASS C CONCRETE PAID UNDER ITEM 531, SIDEWALK. (NOTE. ADDITIONAL CONCRETE TO MEET THE THICKENED SECTIONS REQUIRED BY THESE DETAILS IS SUBSIDIARY TO ITEM 531, CURB.)

GENERAL NOTES:

1. CONCRETE FOR CURB TYPE F AND C SHOWN SHALL MEET THE MINIMUM SPECIFICATION REQUIREMENTS OF CLASS "C" CONCRETE PER ITEM 421
2. ALL REINFORCING STEEL SHALL BE GRADE 60
3. WHERE CONCRETE CURB I SPLACED ON EXISTING CONCRETE PAVEMENT, THE PAVEMENT SHALL BE DRILLED AND THE REINFORCING BARS GROUTED IN PLACE.
4. EXPANSION AND CONTRACTION JOINTS SHALL BE CONSTRUCTED TO MATCH PAVEMENT JOINITS IN ALL CURBS AND CURB AND GUTTER ADJACENT TO JOINTED CONCRETE PAVEMENT. WHERE PLACEMENT OF CURB OR CURB AND GUTTER IS NOT ADJACENT TO CONCRETE PAVEMENT, EXPANSION JOINTS SHALL BE PROVIDED AT STRUCTURES, CURB RETURNS AT STREETS, AND AT LOCATIONS DIRECTED BY THE ENGINEER.
5. VERTICAL AND HORIZONTAL DOWEL BARS AND TRANSVERSE REINFORCING BARS SHALL BE PLACED AT 4 FEET C-C, UNLESS OTHERWISE SHOWN.
6. ONE-HALF INCH EXPANSION JOINT MATERIAL SHALL BE PROVIDED WHERE CURB OR CURB AND GUTTER IS ADJACENT TO SIDEWALK OR RIPRAP. THIS IS SUBSIDIARY TO THE CURB, ITEM 529.
7. UNTIL THE SIDEWALK IS COMPLETE, LATERAL SUPPORT FOR THE "F" CURBS WILL BE REQUIRED.
8. IF AGGREGATE IS REQUIRED PER THE DETAIL, IT IS PAID AS SUBSIDIARY TO THE CURB, ITEM 529.

DESIGN SOIL PARAMETERS:
Soil Unit Wt.= 120 pcf
Phi = 30 Degrees
Cohesion = 50 psf
Min. PI = 15
Max. PI = 30
SURCHARGE:
TYPE F CURB q = 2' Adjacent to sidewalk
Max. slope behind TYPE C Curb = 4:1
Min. Factor of Safety against sliding is 1.5.
Designed in accordance with current AASHTO Standards and Interim Specifications.

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Texas Department of Transportation
San Antonio District

MISCELLANEOUS CURB AND SIDEWALK DETAILS

San Antonio District Standard
Sheet (2 of 2)

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ORIGINAL DRAWING DATE:	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT #			SHEET
REVISIONS		6				
09-01-08	COUNTY		CONTROL	SECTION	JOB	HIGHWAY
10-10-17 sidewalk width equals 6' usual						
07-22-20 9" curb + curb w/ conc pvmt det.						

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

MISC. CURB AND SIDEWALK DETAILS I

QUIDDITY
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JOB NO.	05668-0026-01	DWG. NO.	--
SUBMITTED:	----	SURV. BY:	QUIDDITY

STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED
PROFESSIONAL ENGINEER
5/9/2025

$DATE$ $TIME$ $FILE$

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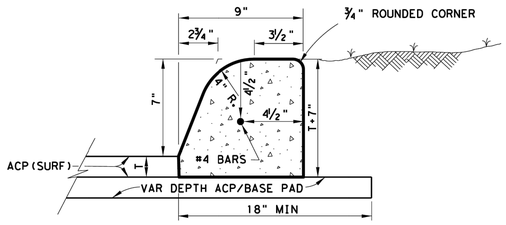
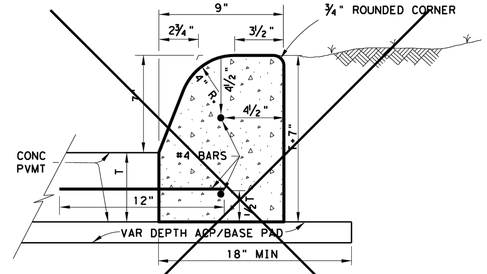
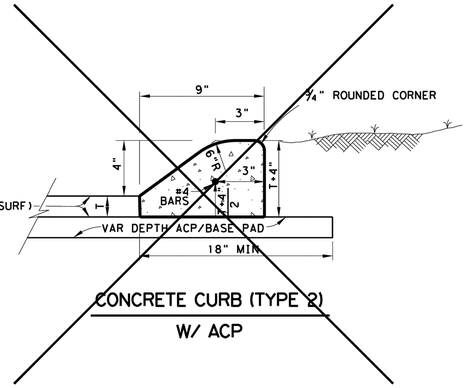


CONCRETE CURB (TYPE 1)
W/ ACP



CONCRETE CURB (TYPE 1)
W/ CONC PAVEMENT



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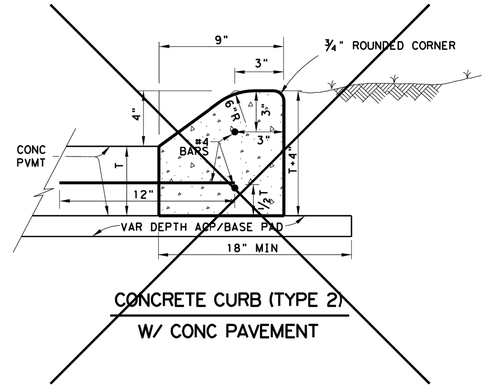

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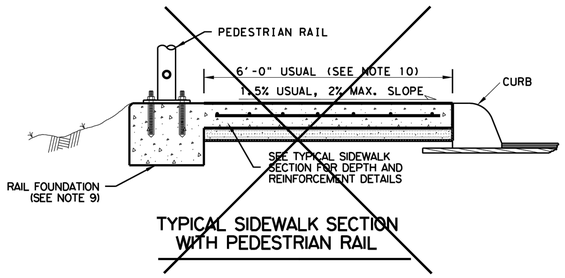
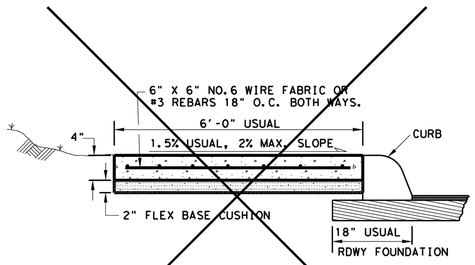
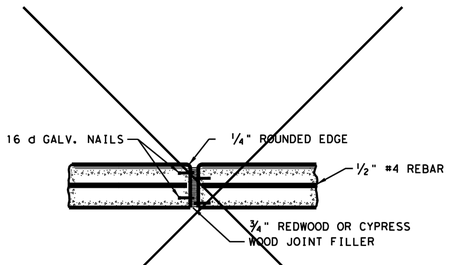


TYPICAL SIDEWALK SECTION WITH PEDESTRIAN RAIL



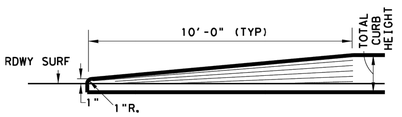
TYPICAL SIDEWALK SECTION

GROOVED JOINTS IN THE SIDE WALK SHALL BE AT A MAX. SPACING OF 10 FT. AND SHALL HAVE ¾" EXPANSION JOINTS AT A MAX. SPACING OF 60' AND TO COINSIDE WITH THE CURB EXP. JOINTS.



TYPICAL CURB EXPANSION JOINT DETAIL

EXPANSION JOINTS TO BE PLACED AT BEGINNING AND END OF CURVES, DRIVEWAYS WHEELCHAIR RAMPS, INLETS, ILLUMINATION/ SIGNAL FOUNDATIONS AND OTHER FIXED OBJECTS.



TRANSITION FOR CONCRETE CURB ENDS

SEE CURB DETAIL FOR REINFORCEMENT

GENERAL NOTES:

1. CONCRETE CURB TYPE 1 AND 2 SHOWN SHALL MEET THE MINIMUM SPECIFICATION REQUIREMENTS OF CLASS "A" CONCRETE PER ITEM 529 AND 421.
2. ALL REINFORCING STEEL SHALL BE GRADE 60
3. WHERE CONCRETE CURB IS PLACED ON EXISTING CONCRETE PAVEMENT, THE PAVEMENT SHALL BE DRILLED AND THE REINFORCING BARS GROUTED IN PLACE.
4. EXPANSION AND CONTRACTION JOINTS SHALL BE CONSTRUCTED TO MATCH PAVEMENT JOINTS IN ALL CURBS AND CURB AND GUTTER ADJACENT TO JOINTED CONCRETE PAVEMENT. WHERE PLACEMENT OF CURB OR CURB AND GUTTER IS NOT ADJACENT TO CONCRETE PAVEMENT, EXPANSION JOINTS SHALL BE PROVIDED AT STRUCTURES, CURB RETURNS AT STREETS, AND AT LOCATIONS DIRECTED BY THE ENGINEER.
5. VERTICAL AND HORIZONTAL DOWEL BARS AND TRANSVERSE REINFORCING BARS SHALL BE PLACED AT 4 FEET C-C, UNLESS OTHERWISE SHOWN.
6. ONE-HALF INCH EXPANSION JOINT MATERIAL SHALL BE PROVIDED WHERE CURB OR CURB AND GUTTER IS ADJACENT TO SIDEWALK OR RIPRAP. THIS IS SUBSIDIARY TO THE CURB, ITEM 529.
7. LAYDOWN CURB AT DRIVEWAYS WILL BE PAID AS SUBSIDIARY TO ITEM 530.
8. FOR SIDEWALK DETAILS AT DRIVEWAYS, SEE SAN ANTONIO DISTRICT STANDARD "DRIVEWAY DETAILS".
9. SEE PEDESTRIAN HANDRAIL DETAILS STANDARD "PRD" FOR MORE INFORMATION. CONCRETE RAIL FOUNDATION TO BE POURED WITH THE SIDEWALK BUT PAYMENT IS SUBSIDIARY TO ITEM 450 "RAILING".
10. CLEAR SIDEWALK WIDTH EXCLUDING THE PEDESTRIAN RAIL FOUNDATION SHALL BE 6' UNLESS OTHERWISE SPECIFIED IN THE PLANS

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Texas Department of Transportation
San Antonio District

MISCELLANEOUS CURB AND SIDEWALK DETAILS

San Antonio District Standard
Sheet (1 of 2)

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ORIGINAL DRAWING DATE:	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT #			SHEET
REVISIONS		6				
09-01-08	COUNTY		CONTROL	SECTION	JOB	HIGHWAY
10-10-17 sidewalk width equals 6' usual						
07-22-20 9" curb + curb w/ conc pvmt det.						

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

MISC. CURB AND SIDEWALK DETAILS II

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SUBMITTED: ----	SURV. BY: QUIDDITY		

STATE OF TEXAS
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92080
LICENSED PROFESSIONAL ENGINEER
5/9/2025

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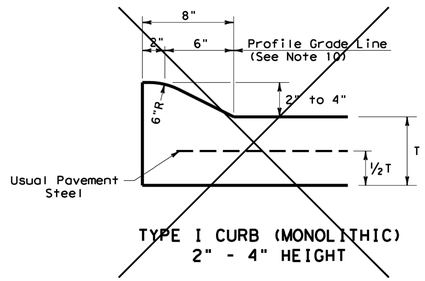
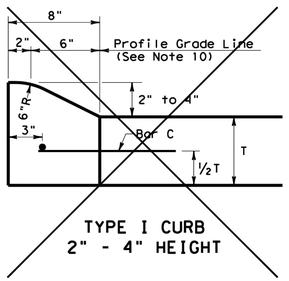


TYPE I CURB (MONOLITHIC)
2" - 4" HEIGHT



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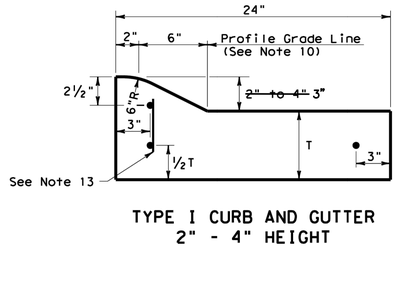

TYPE I CURB AND GUTTER
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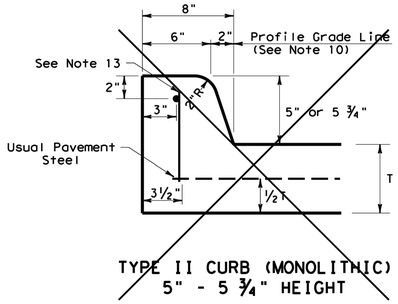
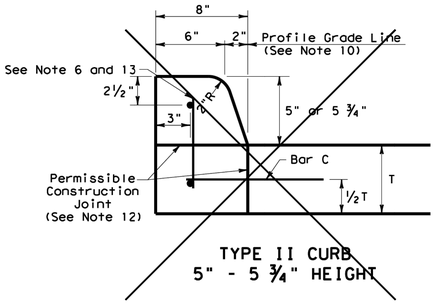
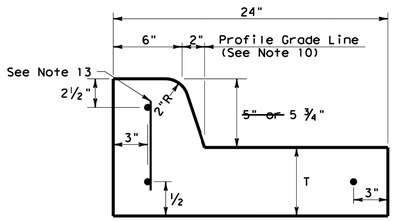


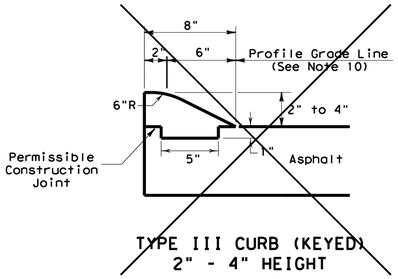
TYPE II CURB (MONOLITHIC)
5" - 5 ¾" HEIGHT



TYPE II CURB
5" - 5 ¾" HEIGHT



TYPE II CURB AND GUTTER
5" - 5 ¾" HEIGHT



TYPE III CURB (KEYED)
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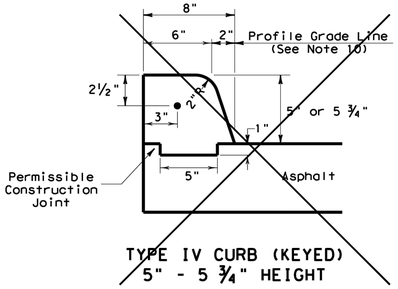

TYPE IV CURB (KEYED)
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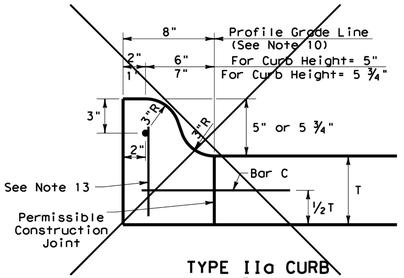
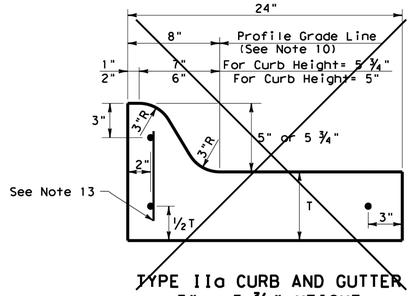
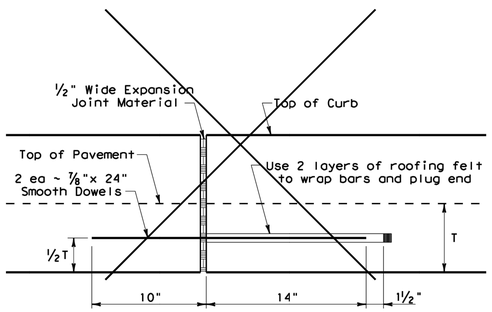


TYPE IIa CURB
5" - 5 ¾" HEIGHT

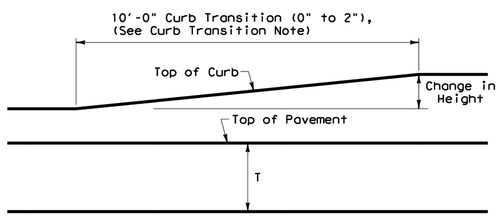


TYPE IIa CURB AND GUTTER
5" - 5 ¾" HEIGHT

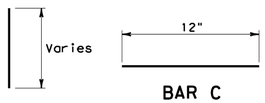


EXPANSION JOINT DETAIL

CURB TRANSITION NOTE:
Field conditions may require a longer or shorter transition, and shall be shown elsewhere in the plans, or as directed by the Engineer.



CURB TRANSITION
Note: To be paid for as Highest Curb



BAR B

BAR C

GENERAL NOTES

1. All materials and construction shall be in accordance with Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter."
2. Concrete shall be Class A.
3. When reinforcing bars are used, they shall be No.4 unless otherwise shown. The use of fiber reinforced concrete in lieu of reinforcing steel is acceptable. Use fibers meeting the requirements of DMS 4550, "Fibers for Concrete," and dose fibers in accordance with Material Producers List (MPL) "Fibers for Class A and B Concrete Applications."
4. Round exposed sharp edges with a rounding tool, to a minimum radius of ¼ inch.
5. All existing curbs and driveways to be removed shall be sawed or removed at existing joints.
6. Where concrete curb is to be placed on existing concrete pavement, Bar B may be drilled and grouted in place, or may be inserted into fresh concrete.
7. Expansion and contraction joints shall be constructed to match pavement joints in all curbs and curb and gutter adjacent to jointed concrete pavement. Where placement of curb or curb and gutter is not adjacent to concrete pavement, expansion joints shall be provided at structures, curb returns at streets, and at locations directed by The Engineer.
8. Vertical and horizontal dowel bars and transverse reinforcing bars shall be placed at four feet C~C.
9. Dimension 'T' shown is the thickness of concrete pavement. When curb is installed adjacent to flexible pavement dimension 'T' is 8" maximum.
10. Usual profile grade line. Refer to typical sections and plan-profile sheets for exact locations.
11. One-half inch expansion joint material shall be provided where curb or curb and gutter is adjacent to sidewalk or riprap.
12. When horizontal permissible construction joints are used, the longitudinal pavement steel shall be placed in accordance with pavement details shown elsewhere in the plans. Reinforcing steel for curb section shall then conform to that required for concrete curb.
13. Bar B placement as needed (typically at four ft. C-C) to support curb reinforcing steel during concrete placement.

DATE:
FILE:

Texas Department of Transportation — Design Division Standard

CONCRETE CURB AND CURB AND GUTTER

CCCG-22

FILE: cccg21.dgn	DN: TxDOT	CK: AN	DW: CS	CK: KM
©TxDOT: JUNE 2022 REVISIONS	CONT	SECT	JOB	HIGHWAY
	DIST	COUNTY		SHEET NO.

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

MISC. CURB AND SIDEWALK DETAILS III

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

SCALE: AS NOTED		DGN. BY: AZ	
DATE: AS NOTED		DWN. BY: JFR	
JOB NO. 05668-0026-01		DWG. NO. --	
SUBMITTED: ----		SURV. BY: QUIDDITY	

STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED PROFESSIONAL ENGINEER
5/9/2025

K:\05668\05668-0026-01 san antonio street and water lane roadway improvements\2 design phase\CAD\Plans\05668-0026-01-SF-Pavement Details.dwg May 09, 2025 - 11:27am JFR

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DATE:
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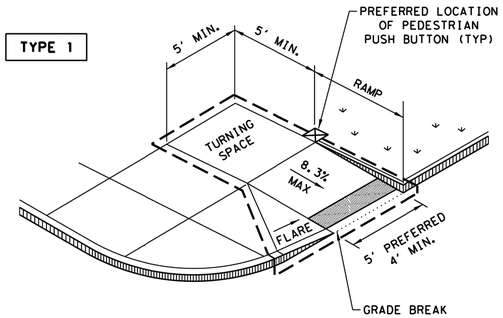
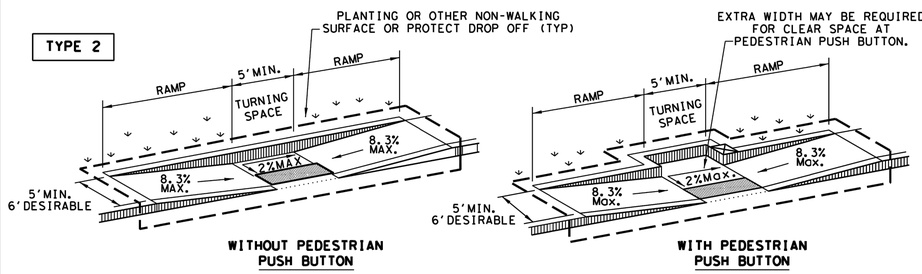
TYPE 1



PERPENDICULAR CURB RAMP

TYPE 2

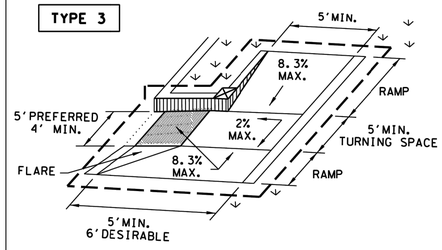


WITHOUT PEDESTRIAN PUSH BUTTON

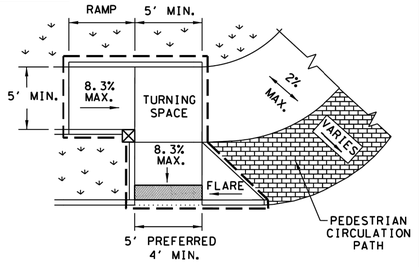
WITH PEDESTRIAN PUSH BUTTON

PARALLEL CURB RAMP

TYPE 3

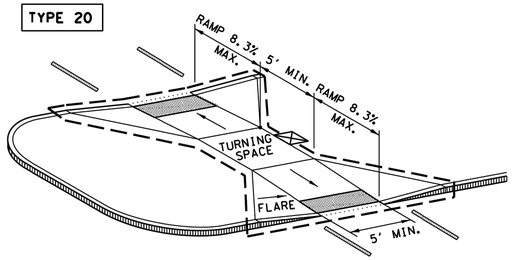


TYPE 6



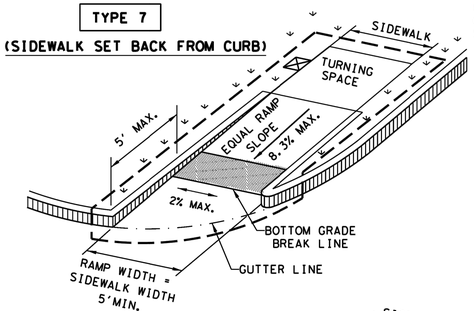
COMBINATION CURB RAMPS

TYPE 20

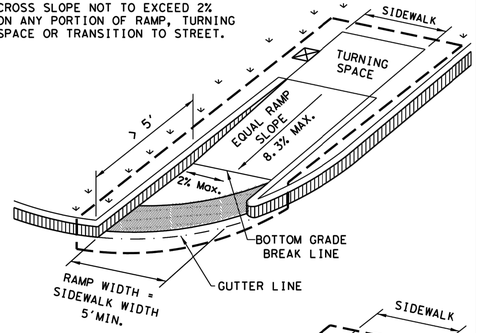


CURB RAMPS AT MEDIAN ISLANDS

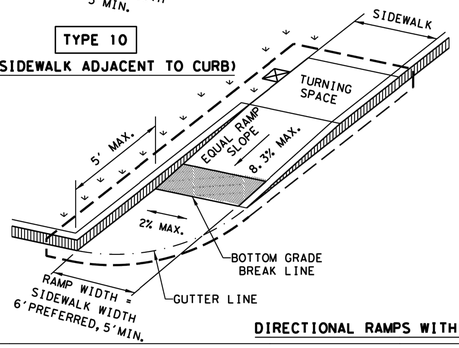
TYPE 7
(SIDEWALK SET BACK FROM CURB)



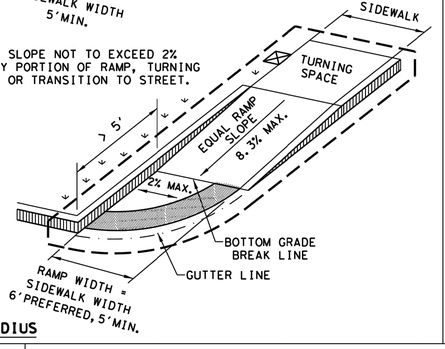
CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.



TYPE 10
(SIDEWALK ADJACENT TO CURB)

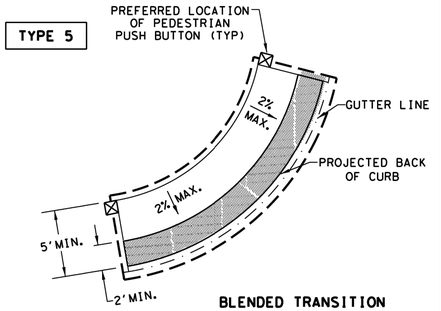


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.



DIRECTIONAL RAMPS WITHIN RADIUS

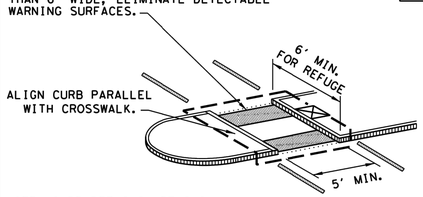
TYPE 5



BLENDED TRANSITION
(FLUSH LANDING)

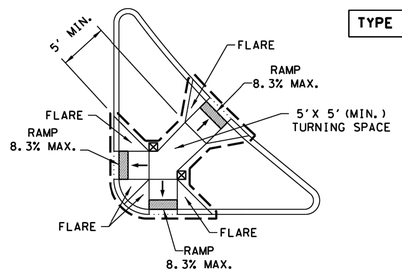
TYPE 21

INSTALL DETECTABLE WARNING SURFACE AT EACH END OF THE CUT-THROUGH RAMP WITH A MINIMUM 2' USUAL SIDEWALK SURFACE BETWEEN. IF MEDIAN IS LESS THAN 6' WIDE, ELIMINATE DETECTABLE WARNING SURFACES.

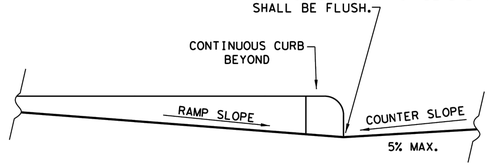


NOTE: CURB DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.

TYPE 22



COMBINATION ISLAND RAMPS



TYPICAL SECTION OF PERPENDICULAR CURB RAMP AT CONNECTION TO ROADWAY

NOTES / LEGEND:

SEE GENERAL NOTES ON SHEET 2 OF 4 FOR MORE INFORMATION.

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH.

DETECTABLE WARNING SURFACE

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON IF APPLICABLE.

GUTTER LINE

GRADE BREAK

RAMP LIMITS OF PAYMENT

SHEET 1 OF 4

Texas Department of Transportation | Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS				
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY		SHEET NO.

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

PED. CURB RAMP (PED1)
TXDOT STANDARD DETAILS

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

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DATE: AS NOTED	DWN. BY: JFR
JOB NO. 05668-0026-01	DWG. NO. --
SUBMITTED: ----	SURV. BY: QUIDDITY

STATE OF TEXAS
ALEX ZERTUCHE
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LICENSED PROFESSIONAL ENGINEER
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FILE:

GENERAL NOTES

CURB RAMPS

1. Install a curb ramp or blended transition at each pedestrian street crossing.
2. All slopes shown are maximum allowable. Cross slopes of 1.5% and lesser running should be used. Adjust curb ramp length or grade of approach sidewalks as directed.
3. Maximum allowable cross slope on sidewalk and curb ramp surfaces is 2%.
4. The minimum sidewalk width is 5'. Where the sidewalk is adjacent to the back of curb, a 6' sidewalk width is desirable. Where a 5' sidewalk cannot be provided due to site constraints, sidewalk width may be reduced to 4' for short distances. 5'x 5' passing areas at intervals not to exceed 200' are required.
5. Turning Spaces shall be 5'x 5' minimum. Cross slope shall be maximum 2%.
6. Clear space at the bottom of curb ramps shall be a minimum of 4'x 4' wholly contained within the crosswalk and wholly outside the parallel vehicular travel path.
7. Provide flared sides where the pedestrian circulation path crosses the curb ramp. Flared sides shall be sloped at 10% maximum, measured parallel to the curb. Returned curbs may be used only where pedestrians would not normally walk across the ramp, either because the adjacent surface is planted, substantially obstructed, or otherwise protected.
8. Additional information on curb ramp location, design, light reflective value and texture may be found in the latest draft of the Proposed Guidelines for Pedestrian Facilities in the Public Right of Way (PROWAG) as published by the U.S. Architectural and Transportation Barriers Compliance Board (Access Board).
9. To serve as a pedestrian refuge area, the median should be a minimum of 6' wide, measured from back of curbs. Medians should be designed to provide accessible passage over or through them.
10. Small channelization islands, which do not provide a minimum 5'x 5' landing at the top of curb ramps, shall be cut through level with the surface of the street.
11. Crosswalk dimensions, crosswalk markings and stop bar locations shall be as shown elsewhere in the plans. At intersections where crosswalk markings are not required, curb ramps shall align with theoretical crosswalks unless otherwise directed.
12. Provide curb ramps to connect the pedestrian access route at each pedestrian street crossing. Handrails are not required on curb ramps.
13. Curb ramps and landings shall be constructed and paid for in accordance with Item 531 "Sidewalks".
14. Place concrete at a minimum depth of 5" for ramps, flares and landings, unless otherwise directed.
15. Furnish and install No. 3 reinforcing steel bars at 18" o.c. both ways, unless otherwise directed.
16. Provide a smooth transition where the curb ramps connect to the street.
17. Curbs shown on sheet 1 within the limits of payment are considered part of the curb ramp for payment, whether it is concrete curb, gutter, or combined curb and gutter.
18. Existing features that comply with applicalble standards may remain in place unless otherwise shown on the plans.

DETECTABLE WARNING MATERIAL

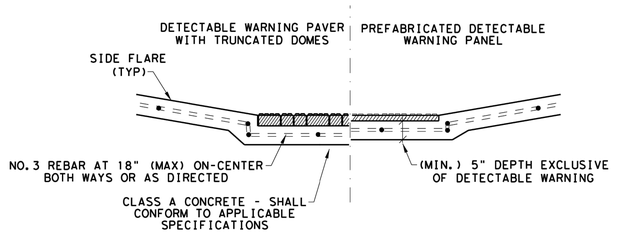
19. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with PROWAG. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material adjacent to uncolored concrete, unless specified elsewhere in the plans.
20. Detectable Warning Materials must meet TxDOT Departmental Materials Specification DMS 4350 and be listed on the Material Producer List. Install products in accordance with manufacturer's specifications.
21. Detectable warning surfaces must be firm, stable and slip resistant.
22. Detectable warning surfaces shall be a minimum of 24 inches in depth in the direction of pedestrian travel, and extend the full width of the curb ramp or landing where the pedestrian access route enters the street.
23. Detectable warning surfaces shall be located so that the edge nearest the curb line is at the back of curb and neither end of that edge is greater than 5 feet from the back of curb. Detectable warning surfaces may be curved along the corner radius.
24. Shaded areas on Sheet 1 of 4 indicate the approximate location for the detectable warning surface for each curb ramp type.

DETECTABLE WARNING PAVERS (IF USED)

25. Furnish detectable warning paver units meeting all requirements of ASTM C-936, C-33. Lay in a two by two unit basket weave pattern or as directed.
26. Lay full-size units first followed by closure units consisting of at least 25 percent (25%) of a full unit. Cut detectable warning paver units using a power saw.

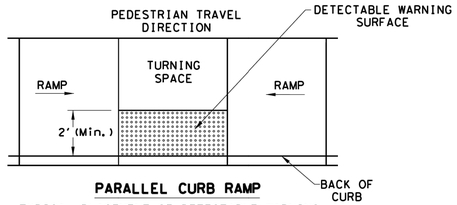
SIDEWALKS

27. Provide clear ground space at operable parts, including pedestrian push buttons. Operable parts shall be placed within unobstructed reach range specified in PROWAG section R406.
28. Place traffic signal or illumination poles, ground boxes, controller boxes, signs, drainage facilities and other items so as not to obstruct the pedestrian access route or clear ground space.
29. Street grades and cross slopes shall be as shown elsewhere in the plans.
30. Changes in level greater than 1/4 inch are not permitted.
31. The least possible grade should be used to maximize accessibility. The running slope of sidewalks and crosswalks within the public right of way may follow the grade of the parallel roadway. Where a continuous grade greater than five percent (5%) must be provided, handrails may be desirable to improve accessibility. Handrails may also be needed to protect pedestrians from potentially hazardous conditions. If provided, handrails shall comply with PROWAG R409.
32. Handrail extensions shall not protrude into the usable landing area or into intersecting pedestrian routes.
33. Driveways and turnouts shall be constructed and paid for in accordance with Item "Intersections, Driveways and Turnouts". Sidewalks shall be constructed and paid for in accordance with Item, "Sidewalks".
34. Sidewalk details are shown elsewhere in the plans.

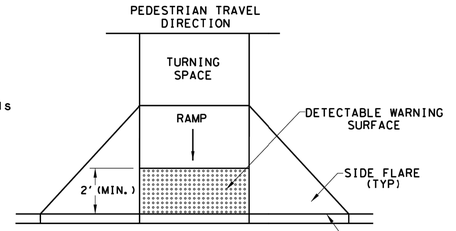


SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS

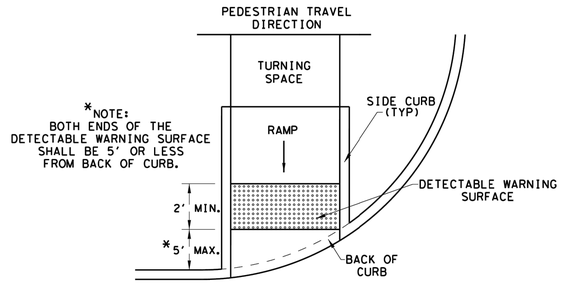
DETECTABLE WARNING SURFACE DETAILS



PARALLEL CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON LANDING AT STREET EDGE.



PERPENDICULAR CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.



DIRECTIONAL CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.

SHEET 2 OF 4

Texas Department of Transportation — Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS				
REVISED 08,2005	DIST	COUNTY		SHEET NO.
REVISED 06,2012				
REVISED 01,2018				

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

PED. CURB RAMP (PED2)
TXDOT STANDARD DETAILS

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SUBMITTED: ----	SURV. BY: QUIDDITY		

STATE OF TEXAS
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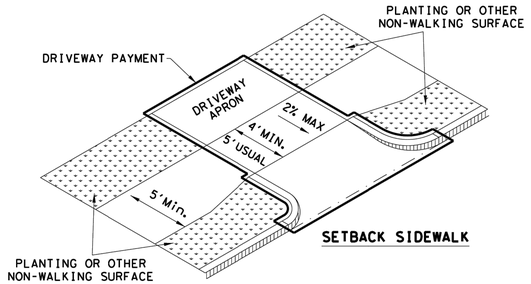
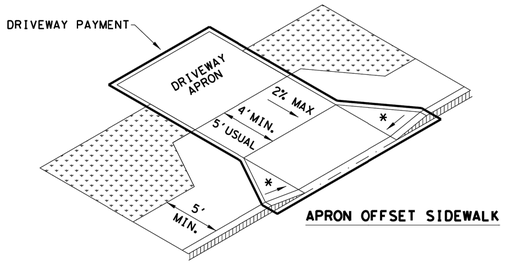
DATE:
FILE:

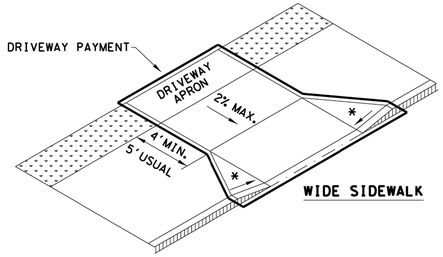
SIDEWALK TREATMENT AT DRIVEWAYS



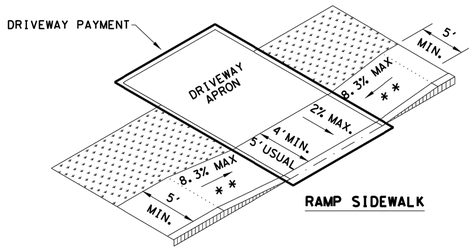
SETBACK SIDEWALK



APRON OFFSET SIDEWALK



WIDE SIDEWALK

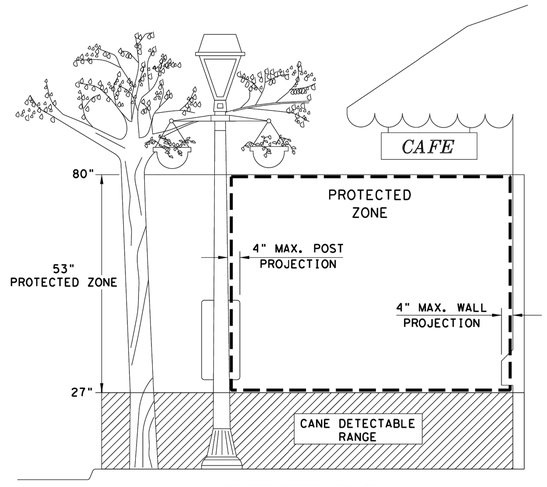


RAMP SIDEWALK

NOTES:

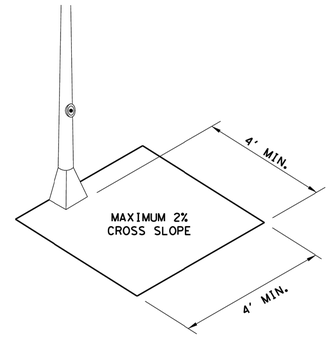
* WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.

** IF CURB HEIGHT IS GREATER THAN 6 INCHES, USE GRADE LESS THAN OR EQUAL TO 5%. HANDRAIL AND DETECTABLE WARNING ARE NOT REQUIRED.

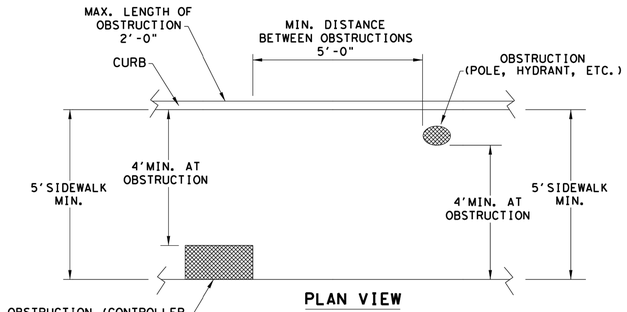


PROTECTED ZONE

NOTE: IN PEDESTRIAN CIRCULATION AREA, MAXIMUM 4" PROJECTION FOR POST OR WALL MOUNTED OBJECTS BETWEEN 27" AND 80" ABOVE THE SURFACE.



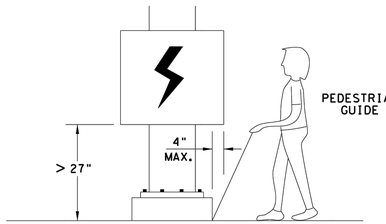
CLEAR SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



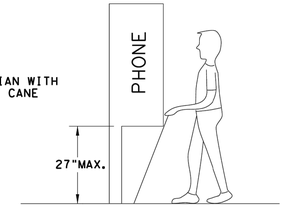
PLAN VIEW

PLACEMENT OF STREET FIXTURES

NOTE: ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' X 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.



WHEN AN OBSTRUCTION OF A HEIGHT GREATER THAN 27" FROM THE SURFACE WOULD CREATE A PROTRUSION OF MORE THAN 4" INTO THE PEDESTRIAN CIRCULATION AREA, CONSTRUCT ADDITIONAL CURB OR FOUNDATION AT THE BOTTOM TO PROVIDE A MAXIMUM 4" OVERHANG.



PROTRUDING OBJECTS OF A HEIGHT ≤27" ARE DETECTABLE BY CANE AND DO NOT REQUIRE ADDITIONAL TREATMENT.

DETECTION BARRIER FOR VERTICAL CLEARANCE < 80"

SHEET 3 OF 4

Texas Department of Transportation | Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

PED. CURB RAMP (PED3)
TXDOT STANDARD DETAILS

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

SCALE: AS NOTED	DGN. BY: AZ
DATE: AS NOTED	DWN. BY: JFR
JOB NO. 05668-0026-01	DWG. NO. --
SUBMITTED: ----	SURV. BY: QUIDDITY

STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED PROFESSIONAL ENGINEER
5/9/2025

K:\05668\05668-0026-01 san antonio street and water lane roadway improvements\2 design phase\CAD\Plans\05668-0026-01-SF-Pavement Details.dwg May 09, 2025 - 11:27am JFR

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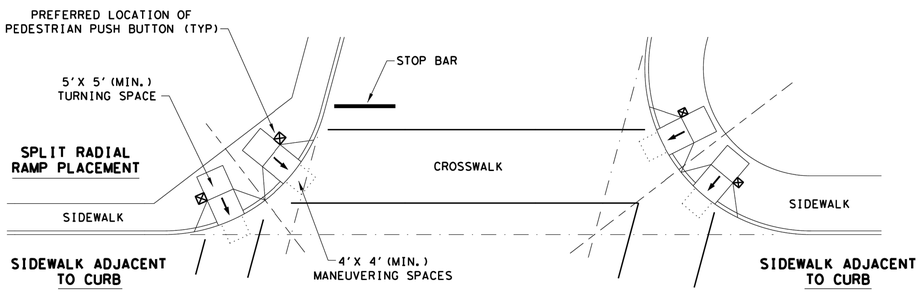
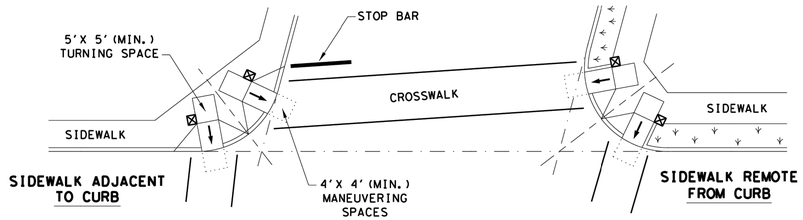
DATE:
FILE:

TYPICAL CROSSING LAYOUTS

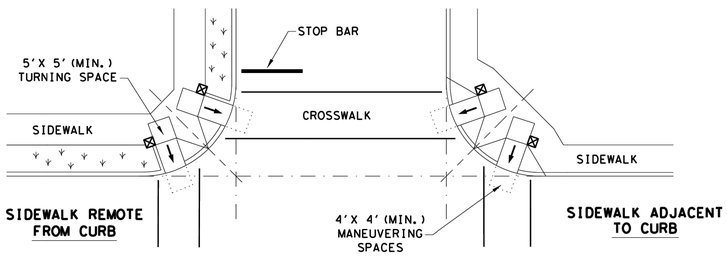
SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



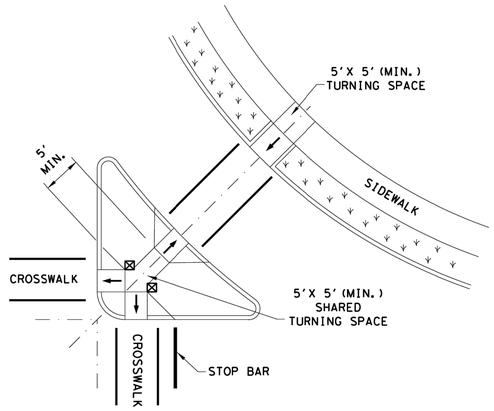
SKEWED INTERSECTION WITH "LARGE" RADIUS



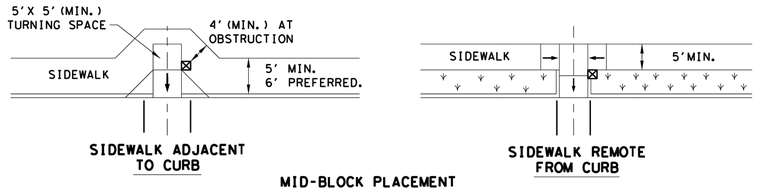
SKEWED INTERSECTION WITH "SMALL" RADIUS



NORMAL INTERSECTION WITH "SMALL" RADIUS



AT INTERSECTION
W/FREE RIGHT TURN & ISLAND



MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS

LEGEND:

SHOWS DOWNWARD SLOPE. →

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON (IF APPLICABLE). ⊠

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH.

SHEET 4 OF 4

Texas Department of Transportation | Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS				
REVISED 08,2005	DIST	COUNTY		SHEET NO.
REVISED 06,2012				
REVISED 01,2018				

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

PED. CURB RAMP (PED4)
TXDOT STANDARD DETAILS

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

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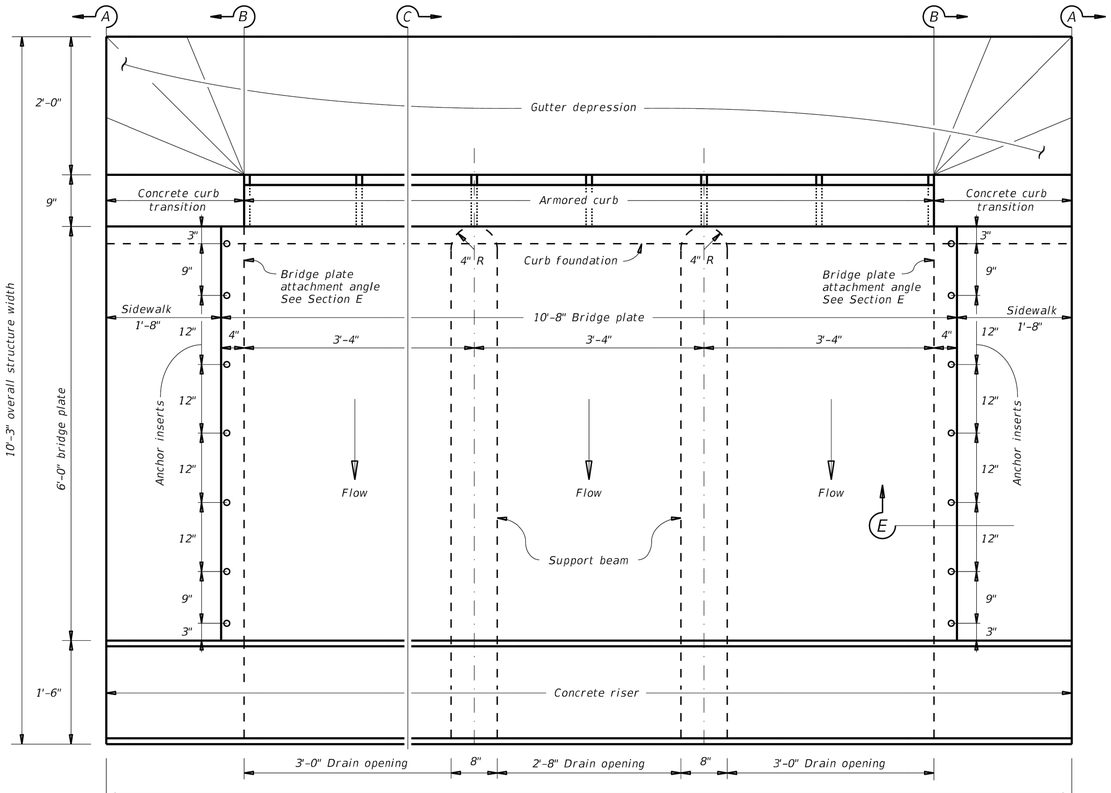
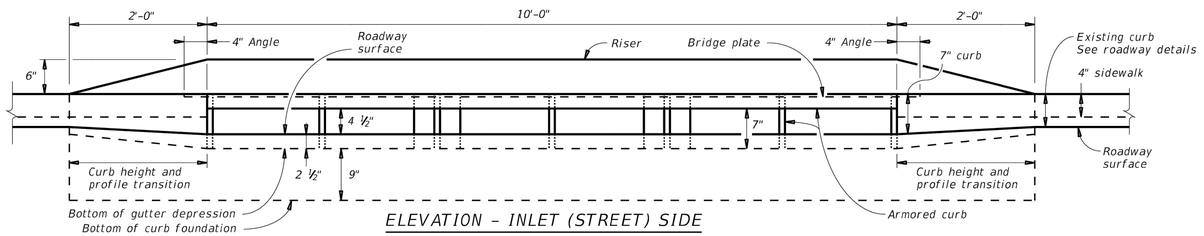
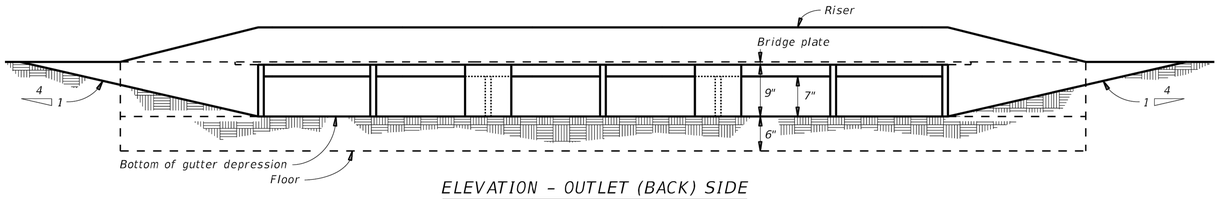


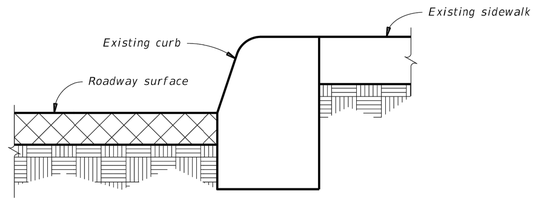
PLAN



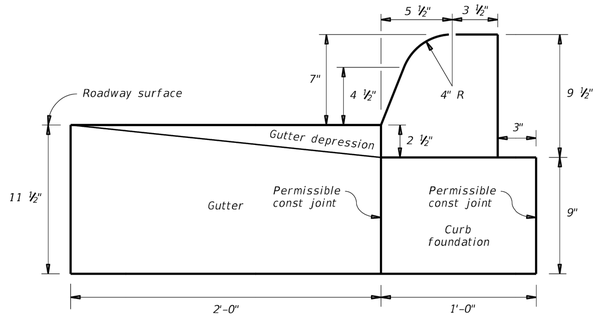
ELEVATION – INLET (STREET) SIDE



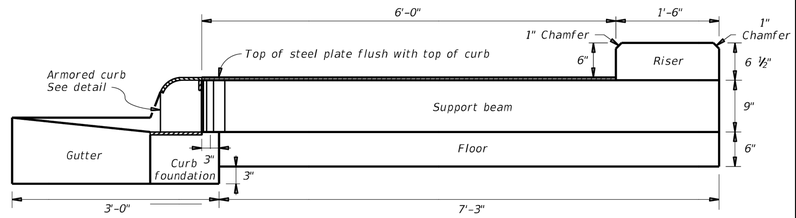
ELEVATION – OUTLET (BACK) SIDE



SECTION A



SECTION B DIMENSIONS



SECTION C DIMENSIONS

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions are out-to-out of bar.

Contractor is responsible for verifying all dimensions and quantities in the field before beginning work.

SHEET 1 OF 3

Texas Department of Transportation
San Antonio District (Structural Design)
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SIDEWALK BRIDGE
SAN ANTONIO DISTRICT STANDARD

DN: BCL	CK:	FILENAME: SA District Sidewalk Bridge.dgn		
DW: SRF	CK:	ORIGINAL DRAWING DATE: January 2020		
DIST	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		COUNTY
SAT	6			COUNTY
CONTROL	SECTION	JOB	SHEET NO.	ROUTE
0000	00	000	000	ROUTE

REVISIONS:

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

SIDEWALK BRIDGE I

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

SCALE: AS NOTED DGN. BY: AZ
DATE: AS NOTED DWN. BY: JFR
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STATE OF TEXAS
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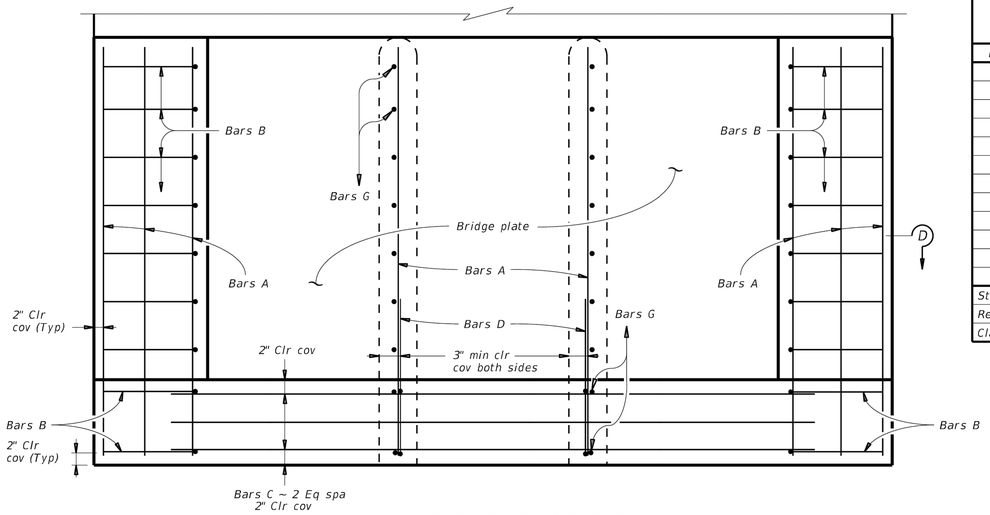
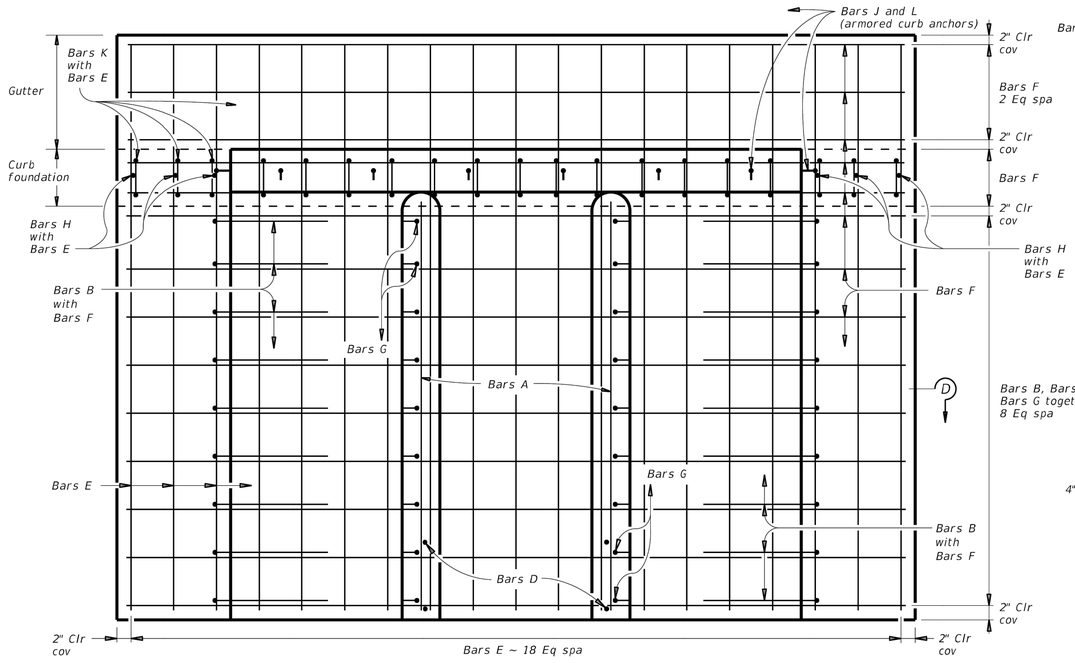


PLAN – TOP REINFORCEMENT

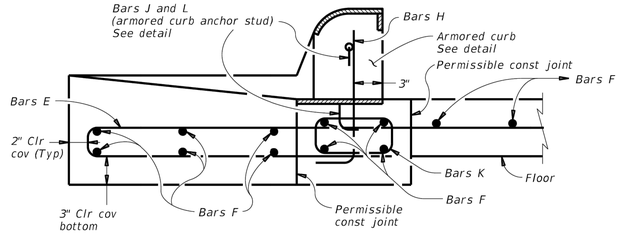


PLAN – BOTTOM REINFORCEMENT

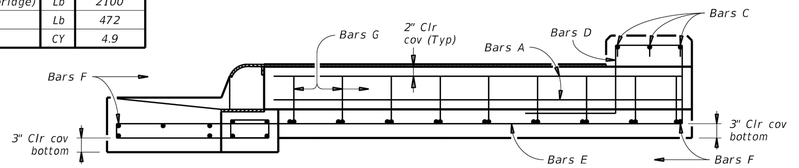
TABLE OF ESTIMATED QUANTITIES

For Contractor information only.

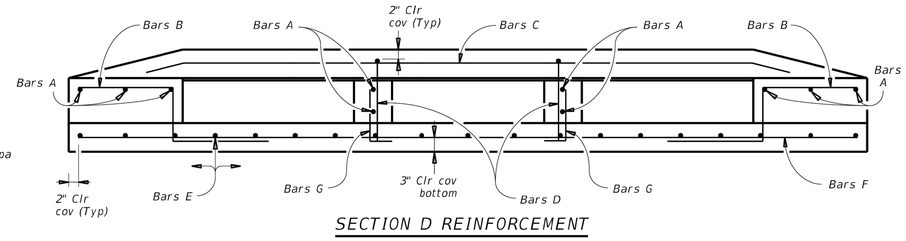
Bar	No.	Size	Length	Weight
A	10	#4	7'-2"	48
B	18	#4	4'-3"	52
C	3	#4	11'-4"	23
D	2	#4	5'-6"	8
E	19	#4	12'-10"	163
F	14	#4	13'-8"	128
G	18	#4	1'-6"	18
H	6	#4	1'-10"	8
I	6	#4	0'-8"	3
J	2	#4	0'-9"	1
K	19	#3	2'-6"	18
L	6	#4	0'-5"	2
Struct. steel (Misc. non bridge)			Lb	2100
Reinforcing Steel			Lb	472
Class "C" Concrete			CY	4.9



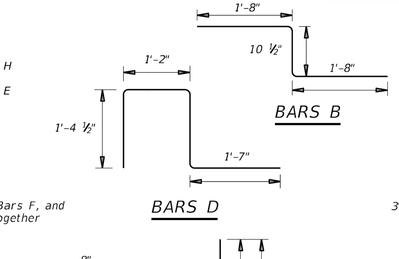
SECTION B REINFORCEMENT



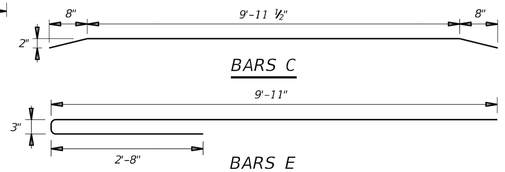
SECTION C REINFORCEMENT



SECTION D REINFORCEMENT



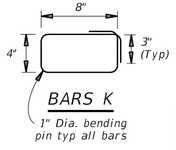
BARS B



BARS C

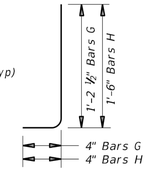
BARS E

Bars B, Bars F, and Bars G together 8 Eq spa



BARS K

1" Dia. bending pin typ all bars



BARS G AND H

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions are out-to-out of bar.

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SHEET 2 OF 3

Texas Department of Transportation
San Antonio District (Structural Design)

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SIDEWALK BRIDGE

SAN ANTONIO DISTRICT STANDARD

DN: BCL	CK:	FILENAME: SA District Sidewalk Bridge.dgn		
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DIST	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		COUNTY
SAT	6			COUNTY
CONTROL	SECTION	JOB	SHEET NO.	ROUTE
0000	00	000	000	ROUTE

REVISIONS:

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

SIDEWALK BRIDGE II

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

SCALE: AS NOTED | DGN. BY: AZ
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JOB NO. 05668-0026-01 | DWG. NO. --
SUBMITTED: ---- | SURV. BY: QUIDDITY

STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED PROFESSIONAL ENGINEER
5/9/2025

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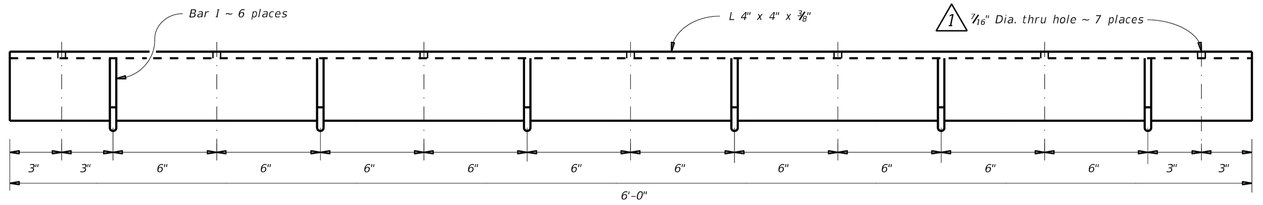
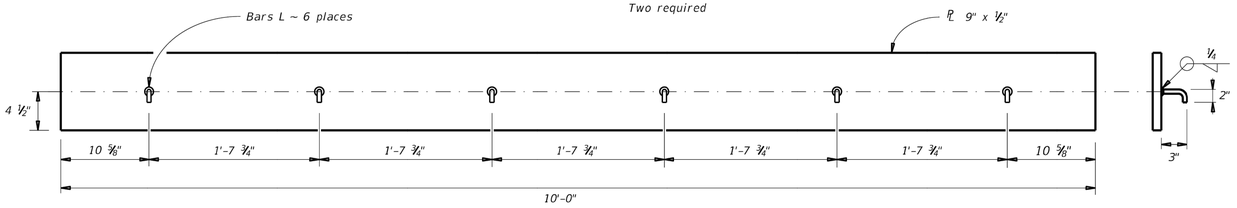
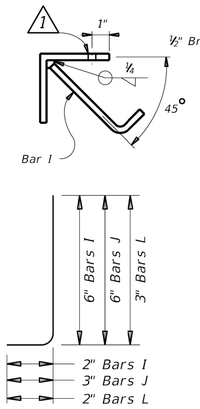


BRIDGE PLATE ATTACHMENT ANGLE

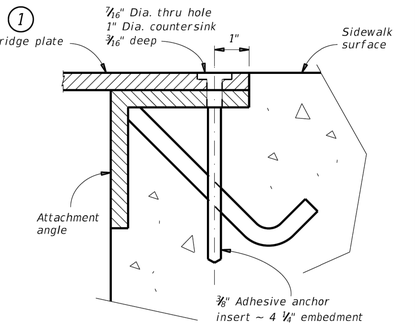
Two required



FLOOR PLATE



BARS I, J, AND L



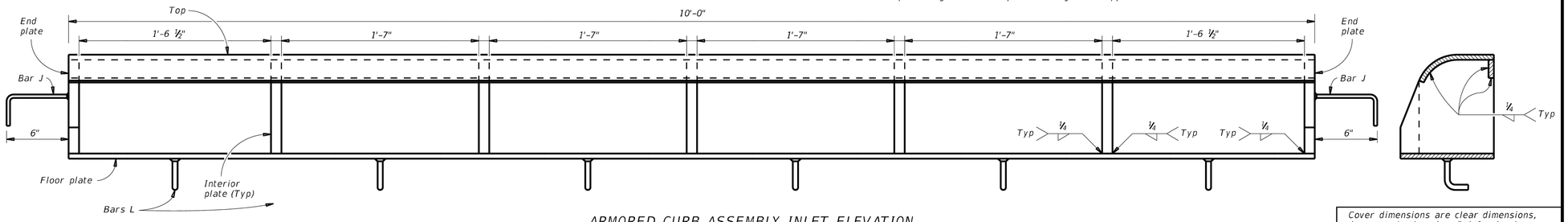
SECTION E

APPROVED SLIP RESISTANT PLATE	
Product	Manufacturer Website
Algrip™, Steel	www.algrip.com
Mebac® #3, Steel	www.harscoikg.com
SlipNOT®Grade 2, Steel	www.slipnot.com

(1) Provide cover plates fabricated with a product from this list. No exceptions are permitted.

GENERAL NOTES:

Provide Class A concrete (f'c = 3000 psi).
Provide Grade 60 reinforcing steel.
Structural steel components must be Grade A36.
All exposed edges of the armored curb must receive a 1/4" bevel.
All structural steel components must be galvanized after fabrication in accordance with Item 445, "Galvanizing".
Galvanizing damaged during transport or construction must be repaired in accordance with the Specification.
The bridge plate must be hot-dip galvanized slip resistant steel (see table). Checker or diamond plate is not allowed, nor are slip resistant tapes, films, or non-metallic coatings.
Adhesive anchor system must be HIT HY 150 H.I.S. internally threaded inserts as furnished by Hilti, Inc., Tulsa, OK, or approved equivalent.
Sidewalk bridge, including all labor, armored curb, bridge plate, and other material complete and in place must be paid for under Item 465, "Inlet (Comp) (Ty Sidewalk Bridge)" by location.
Shop drawings will not require the Engineer's approval if fabrication is in accordance with the details shown.



ARMORED CURB ASSEMBLY INLET ELEVATION

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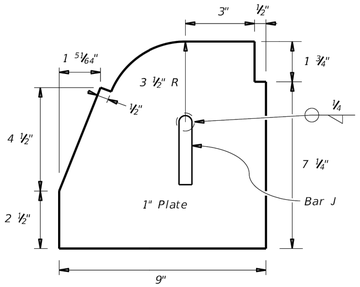
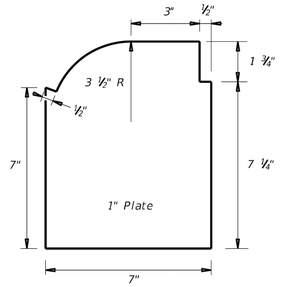


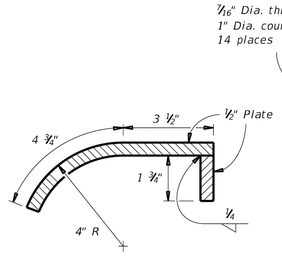
END PLATE

Two required



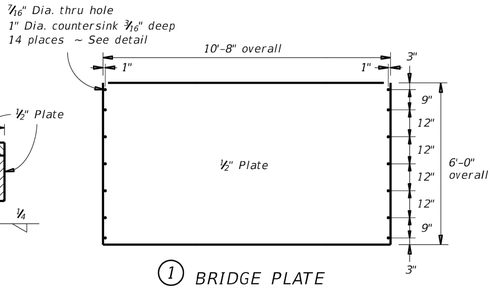
INTERIOR PLATE

Five required



TOP (SECTION)

10'-0" length



(1) BRIDGE PLATE

Hole location dimensions to center of hole

SHEET 3 OF 3

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Texas Department of Transportation
San Antonio District (Structural Design)
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SIDEWALK BRIDGE

SAN ANTONIO DISTRICT STANDARD

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SAT	6			COUNTY
CONTROL	SECTION	JOB	SHEET NO.	ROUTE
0000	00	000	000	ROUTE

REVISIONS:
1 12/7/22 Corrected hole placement error. Moved holes from side to top of angle.

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

SIDEWALK BRIDGE III

QUIDDITY
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SCALE: AS NOTED DGN. BY: AZ
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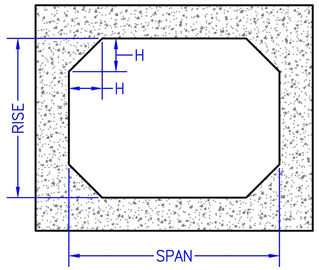
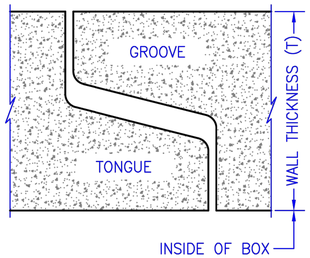
Reinforced Concrete Box Culvert
Tongue and Groove Joint

NOTES:
1. 7'X2' PRECAST BOX CULVERT SHALL BE RINKER MATERIALS OR APPROVED EQUAL. SHOP DRAWINGS SHALL BE SUBMITTED IN ACCORDANCE WITH ITEM 424 "PRECAST CONCRETE STRUCTURAL MEMBERS (FABRICATION)".
2. DESIGN SHALL MEET HL93 LOADING AND SHALL CONFORM TO ASTM C1577



Section Thru Barrel



Section Thru Joint

Standard Box Culvert Approximate Weights (lbs/ft)

Rise \ Span	3'	4'	5'	6'	7'	8'	9'	10'	11'	12'
2'	600	906	1,275	1,706	2,200	2,400	-	-	-	-
3'	700	1,031	1,425	1,881	2,400	2,600	3,206	3,875	4,606	5,400
4'	-	1,156	1,575	2,056	2,600	2,800	3,431	4,125	4,881	5,700
5'	-	-	1,725	2,231	2,800	3,000	3,656	4,375	5,156	6,000
6'	-	-	-	2,406	3,000	3,200	3,881	4,625	5,431	6,300
7'	-	-	-	-	3,200	3,400	4,106	4,875	5,706	6,600
8'	-	-	-	-	-	3,600	4,331	5,125	5,981	6,900
9'	-	-	-	-	-	-	4,556	5,375	6,256	7,200
10'	-	-	-	-	-	-	-	5,625	6,531	7,500
11'	-	-	-	-	-	-	-	-	6,806	7,800
12'	-	-	-	-	-	-	-	-	-	8,100
Wall (T)	4"	5"	6"	7"	8"	8"	9"	10"	11"	12"
Haunch (H)	4"	5"	6"	7"	8"	8"	9"	10"	11"	12"

Notes:
1. Box culvert manufactured to meet current ASTM and AASHTO specifications.

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

BOX CULVERT DETAIL

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2957 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

SCALE: AS NOTED DGN. BY: AZ
DATE: AS NOTED DWN. BY: JFR
JOB NO. 05668-0026-01 DWG. NO. --
SUBMITTED: ---- SURV. BY: QUIDDITY

STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED
PROFESSIONAL ENGINEER
5/9/2025

K:\05668\05668-0026-01 san antonio street and water lane roadway improvements\2 design phase\CAD\Plans\05668-0026-01-SF-Culvert Details.dwg May 09, 2025 - 11:27am JFR

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DATE:
FILE:

TABLE OF DIMENSIONS AND REINFORCING STEEL
(Wings for one structure end)

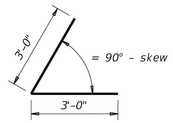
Dimensions					Variable Reinforcing				Estimated Quantities per ft of wing (2-wings) (4)		Estimated Quantities per ft of Toewall (1-toewall)	
					Bars J1		Bars J2					
Maximum Wingwall Height Hw	W	X	Y	Z	Size	Spa	Size	Spa	Reinf Lb/Ft)	Conc (CY/Ft)	Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	48.64	0.406	6.85	0.071
2'-9"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	49.31	0.424	6.85	0.071
3'-0"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	49.98	0.444	6.85	0.071
3'-3"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	53.32	0.462	6.85	0.071
3'-6"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	53.98	0.480	6.85	0.071
4'-0"	3'-2"	1'-2"	1'-0"	7"	#4	1'-0"	#4	1'-0"	55.77	0.532	6.85	0.071
4'-6"	3'-2"	1'-2"	1'-0"	7"	#4	1'-0"	#4	1'-0"	59.77	0.568	6.85	0.071
5'-0"	3'-9"	1'-7"	1'-2"	7"	#4	1'-0"	#4	1'-0"	63.45	0.632	6.96	0.075
5'-6"	3'-9"	1'-7"	1'-2"	7"	#4	1'-0"	#4	1'-0"	67.46	0.668	6.96	0.075
6'-0"	4'-4"	2'-0"	1'-4"	7"	#5	1'-0"	#5	1'-0"	80.67	0.730	7.07	0.078
6'-6"	4'-4"	2'-0"	1'-4"	7"	#5	1'-0"	#5	1'-0"	85.05	0.768	7.07	0.078
7'-0"	5'-0"	2'-3"	1'-9"	8"	#5	1'-0"	#5	1'-0"	92.15	0.864	8.07	0.093
7'-6"	5'-0"	2'-3"	1'-9"	8"	#5	1'-0"	#5	1'-0"	96.54	0.902	8.07	0.093
8'-0"	5'-6"	2'-8"	1'-10"	8"	#5	6"	#5	6"	139.04	0.962	8.13	0.095
8'-5"	5'-6"	2'-8"	1'-10"	8"	#5	6"	#5	6"	144.47	1.000	8.13	0.095
9'-6"	6'-0"	2'-10"	2'-2"	9"	#5	6"	#5	6"	156.93	1.136	8.41	0.110
10'-6"	6'-5"	3'-0"	2'-5"	9"	#6	6"	#5	6"	196.27	1.234	8.57	0.117
11'-6"	7'-2"	3'-6"	2'-8"	11"	#6	6"	#6	6"	230.13	1.438	9.52	0.140
12'-6"	7'-8"	3'-9"	2'-11"	1'-0"	#7	6"	#6	6"	283.41	1.592	9.74	0.157
13'-6"	8'-2"	4'-0"	3'-2"	1'-2"	#8	6"	#6	6"	348.72	1.804	10.02	0.186
14'-6"	8'-10"	4'-5"	3'-5"	1'-4"	#9	6"	#6	6"	432.94	2.046	10.30	0.218
15'-6"	9'-6"	4'-10"	3'-8"	1'-6"	#9	6"	#7	6"	489.52	2.302	11.24	0.253
16'-0"	9'-11"	5'-0"	3'-11"	1'-7"	#9	6"	#7	6"	505.72	2.448	11.47	0.279

TABLE OF WINGWALL REINFORCING
(2-wings)

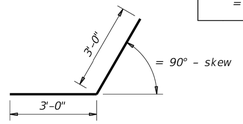
Bar	Size	No.	Spa
D1	#6	~	1'-0"
D2	#6	~	1'-0"
E1	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	~	8"
M1	#4	4	~
P	#4	~	1'-0"
V	#4	~	1'-0"

TABLE OF TOEWALL REINFORCING

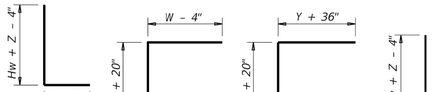
Bar	Size	No.	Spa
J3	#4	~	1'-0"
M2	#4	2	~
E2	#4	~	1'-0"



BARS D1



BARS D2



BARS J1 BARS J2 BARS J3 BARS V

WING DIMENSION FORMULAS:

(All values are in feet.)

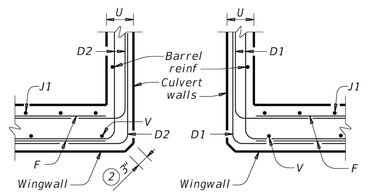
Hw = H + T + C
Lw = (Hw) (SL) ÷ cosine (θ) for Type PW-1
= (Hw - 1') (SL) ÷ cosine (θ) for Type PW-2 and Hw ≥ 4'
= (Hw - 0.5') (SL) ÷ cosine (θ) for Type PW-2 and Hw < 4'

For cast-in-place culverts:
Ltw = [(N) (S) + (N + 1) (U)] ÷ cosine (θ)

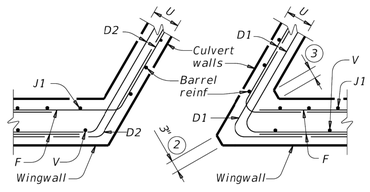
For precast culverts:
Ltw = [(N) (2 U + S) + (N - 1) (0.5')] ÷ cosine (θ)
Total Wingwall Area (two wings ~ SF)
= (2)(Hw)(Lw) for Type PW-1
= (2)(Hw)(Lw) - 6 SF for Type PW-2 and Hw ≥ 4'
= (2)(Hw)(Lw) - 1.5 SF for Type PW-2 and Hw < 4'

Hw = Height of wingwall
Lw = Length of wingwall
Ltw = Culvert toewall length
N = Number of culvert spans
SL:1 = Channel slope ratio, (horizontal: 1 vertical, usual value is 2:1)
θ = Culvert skew

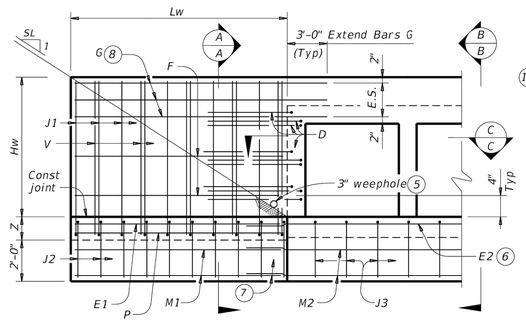
See applicable box culvert standard sheet for S, H, T, and U values.



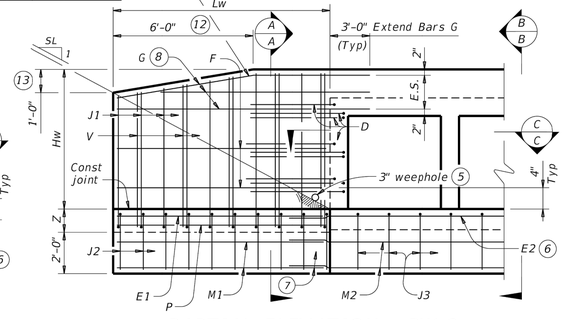
SECTION C-C - PW-1



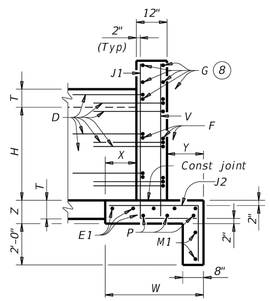
SECTION C-C - PW-2



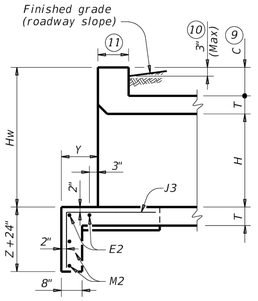
PARTIAL ELEVATION - PW-1



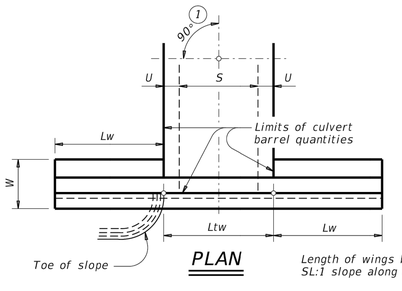
PARTIAL ELEVATION - PW-2



SECTION A-A
(Showing wing reinforcement.)

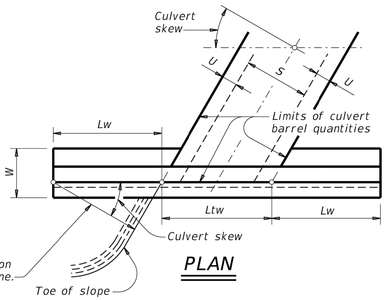


SECTION B-B
(Showing wing reinforcement.)



PLAN

DETAILS FOR NON-SKEWED BOX CULVERTS



PLAN

DETAILS FOR SKEWED BOX CULVERTS
(Showing 30° skew.)

1. Skew = 0°
2. At discharge end, chamfer may be ¾" minimum.
3. For 15° skew ~ 1"
   For 30° skew ~ 2"
   For 45° skew ~ 3"
4. Quantities shown are for two Type PW-1 wings. Adjust concrete volume for Type PW-2 wings. To determine estimated quantities for two wings, multiply the tabulated values by Lw. Quantities shown do not include weight of Bars D.
5. Provide weepholes for Hw = 5'-0" and greater. Fill around weepholes with coarse gravel.
6. Extend Bars E2 1'-6" minimum into the wingwall footing.
7. Lap Bars M1 1'-6" minimum with Bars M2.
8. Place Bars G as shown, equally spaced at 8" maximum. Provide at least two pairs of Bars G per wing.
9. 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
10. For vehicle safety, the following requirements must be met:
    - For structures without bridge rail, construct curbs no more than 3" above finished grade.
    - For structures with bridge rail, construct curbs flush with finished grade.

    Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
11. 1'-0" typical. 2'-3" when the Box Culvert Rail Mounting Details (RAC) standard sheet is referred to elsewhere in the plans.
12. 3'-0" for Hw < 4'.
13. 6" for Hw < 4'.

DESIGNER NOTES:
Type PW-1 can be used for all applications and must be used if railing is to be mounted to the wingwall.
Type PW-2 can only be used for applications without a railing mounted to the wingwall.

MATERIAL NOTES:
Provide Class C concrete (f'c=3,600 psi).
Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.

GENERAL NOTES:
Designed in accordance with AASHTO LRFD Bridge Design Specifications.
Depth of toewalls for wingwalls and culverts may be reduced or eliminated when founded on solid rock, when directed by the Engineer.
See Box Culvert Supplement (BCS) standard sheet for wingwall type and additional dimensions and information.
Quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for the Contractor's information only.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing dimensions are out-to-out of bars.

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

WINGWALL DETAILS

Texas Department of Transportation — Bridge Division Standard

CONCRETE WINGWALLS
WITH PARALLEL WINGS FOR BOX CULVERTS TYPES PW-1 AND PW-2
PW

FILE: CD-PW-20.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020 REVISIONS	CONT	SECT	JOB	HIGHWAY
	DIST	COUNTY		SHEET NO.

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

SCALE: AS NOTED	DGN. BY: AZ
DATE: AS NOTED	DWN. BY: JFR
JOB NO. 05668-0026-01	DWG. NO. --
SUBMITTED: ----	SURV. BY: QUIDDITY

STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED PROFESSIONAL ENGINEER
5/9/2025

K:\05668\05668-0026-01 san antonio street and water lane roadway improvements\2 design phase\CAD\Plans\05668-0026-01-SF-Culvert Details.dwg May 09, 2025 - 11:27am JFR

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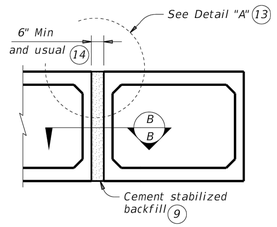
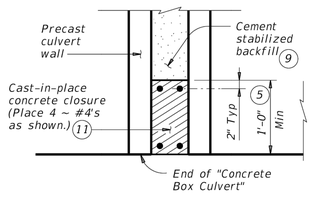
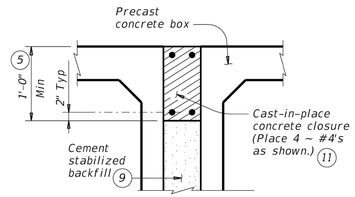
DATE:
FILE:



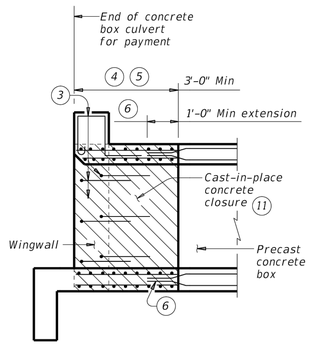
MULTIPLE UNIT PLACEMENT



SECTION B-B

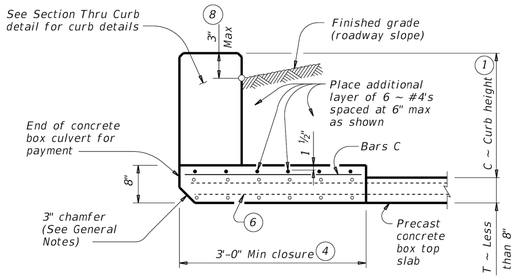


DETAIL "A" (13)

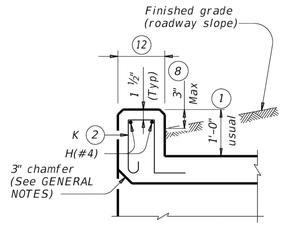


WINGWALL CONNECTION

(Also applies to safety end treatment.)

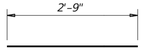


SECTION THRU TOP SLABS LESS THAN 8"

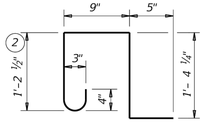


SECTION THRU CURB

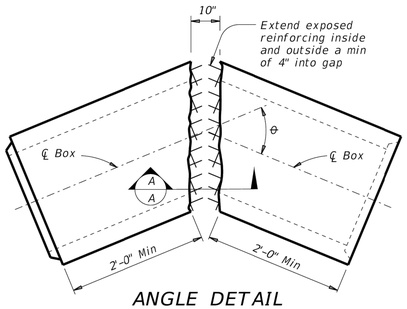
QUANTITIES PER FOOT OF CURB (10)	
Reinforcing Steel	4.12 Lb
Concrete	0.037 CY



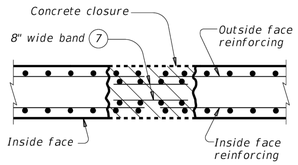
BARS C (#4)
(Spa = 1'–0" Max)



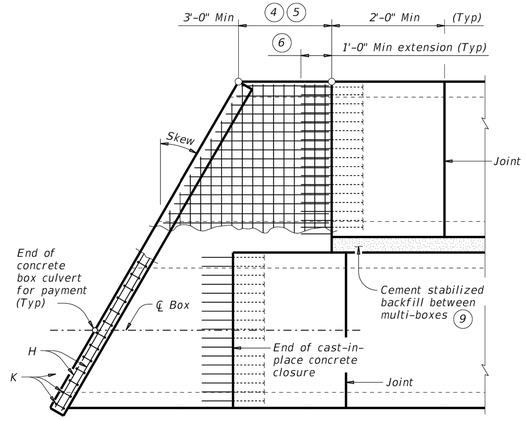
BARS K (#4)
(Spa = 1'–0" Max)
(Length = 4'–2")



ANGLE DETAIL



SECTION A-A



PLAN OF SKEWED ENDS

(Showing multi–box placement.)

1. 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail, or curbs taller than 1'-0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
2. For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.
3. Extend curb, wingwall, or safety end treatment reinforcing into concrete closure. Bend or trim, as necessary, any reinforcing that does not fit into closure area.
4. Provide a 3'–0" Min cast–in–place concrete closure. Break back boxes in the field or cast boxes short. Provide bands of reinforcing in the closure that are the same size and spacing as in the precast box section. Provide #4 longitudinal reinforcement spaced at 12 inches Max within the closure. Except where shown otherwise, construct the cast–in–place closure flush with the inside and outside faces of the precast box section.
5. For multiple unit placements, adjust the length of the closure for the interior walls as necessary. Provide a 3'–0" Min cast–in–place closure in the top slab, bottom slab, and exterior wall. See Section B–B detail when interior walls are cast full length.
6. Extend precast box reinforcing a minimum of 1'–0" into concrete closure (Typ).
7. Place bands of reinforcing matching the inside and outside face reinforcing in the gaps of the top and bottom slabs. Place a band matching the outside face reinforcing of the wall in the gaps of the walls (placed in the outside face only). Tack weld the bands to the exposed reinforcing at each point of contact.
8. For vehicle safety, the following requirements must be met:
   - For structures without bridge rail, construct curbs no more than 3" above finished grade.
   - For structures with bridge rail, construct curbs flush with finished grade.

   Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
9. Cement stabilized backfill between boxes is considered part of the box culvert for payment.
10. All curb concrete and reinforcing is considered part of the box culvert for payment.
11. Any additional concrete and reinforcing required for the closures will be considered subsidiary to the box culvert for payment.
12. 1'-0" typical. 2'–3" when the Box Culvert Rail Mounting Details (RAC) standard sheet is referred to elsewhere in the plans.
13. For multiple unit placement with overlay, with 1 to 2 course surface treatment, or with the top slab as the final riding surface, provide wall closure as shown in Detail "A".
14. This dimension may be increased with approval of the Engineer to allow the precast boxes to be tunneled or jacked in accordance with Item 476, "Jacking, Boring, or Tunneling Pipe or Box." No payment will be made for any additional material in the gap between adjacent boxes.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.
Provide ASTM A1064 welded wire reinforcement.
Provide Class C concrete (f'c = 3,600 psi) for the closures.
Provide cement stabilized backfill meeting the requirements of Item 400, "Excavation and Backfill for Structures."
Any additional concrete required for the closures will be considered subsidiary to the box culvert.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
Refer to the Single Box Culverts Precast (SCP) standard sheets for details and notes not shown.
Chamfer the bottom edge of the top slab closure 3 inches at culvert closure ends.

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bars dimensions are out–to–out of bars.

HL93 LOADING

Texas Department of Transportation | Bridge Division Standard

BOX CULVERTS PRECAST MISCELLANEOUS DETAILS

SCP-MD

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

BOX CULVERT AND
MISC. DETAILS

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ALEX ZERTUCHE
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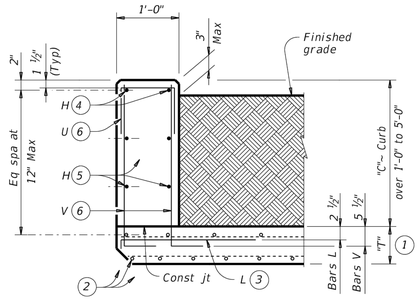
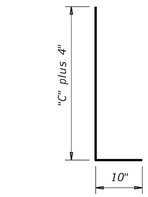
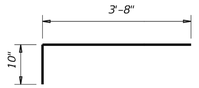


TYPICAL SECTION

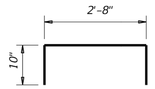
Used for curbs over 1'-0" to 5'-0"



BARS V (#5) (6)
Spaced at 12" Max



BARS L (#5) (3)
Spaced at 12" Max



OPTIONAL
BARS L (#5) (3) (7)
Spaced at 12" Max

BARS U (#4) (6)
Spaced at 12" Max

(1) "T" is equal to the culvert top slab thickness. For precast boxes with slabs less than 8" thick, see SCP-MD standard for additional details.

(2) Adjust normal culvert slab bars as necessary to clear obstructions.

(3) Place bars L as shown. Tilt hook as necessary to maintain cover.

(4) Place normal culvert curb bars H(#4) as shown. Adjust as necessary to clear obstructions.

(5) Additional bars H(#4) as required to maintain 12" Max spacing.

(6) Replace normal culvert curb bars K with one bar U and two bars V as shown spaced at 12" Max. Adjust length of bars V as necessary to maintain clear cover.

(7) Optional bars L are to be used only for precast box culverts with 3'-0" closure pour.

(8) Quantities shown are for Contractor's information only. Quantities are per linear foot of curb length. The value in table can be interpolated for intermediate values of curb height, "C". Quantity includes bars K (when applicable).

TABLE OF ESTIMATED CURB QUANTITIES (8)

Curb Height "C"	Conc (CY/LF)	Reinf Steel (Lb/LF)
1'-0"	0.037	10.4
1'-6"	0.056	14.5
2'-0"	0.074	15.6
2'-6"	0.093	18.0
3'-0"	0.111	19.0
3'-6"	0.130	21.3
4'-0"	0.148	22.4
4'-6"	0.167	24.8
5'-0"	0.185	25.9

CONSTRUCTION NOTES:

Adjust reinforcing steel as necessary to provide 1 ¼" cover.
For vehicle safety, top of the curb must not project more than 3" above the finished grade.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.
Provide Class "C" concrete (f'c = 3,600 psi) minimum for curbs.
Provide bar laps, where required, as follows:
- Uncoated or galvanized ~ #4 = 1'-8" Min

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
These extended curb details have sufficient strength to allow for future retrofit of Type T631 or T631LS railing. These details are suitable for use with PR11, PR22 and PR3 type rails. These details are not suitable for the mounting of other rail types. For new construction using T631 or T631LS railing, use the T631-CM standard.
This Curb is considered as part of the Box Culvert for payment.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.

Texas Department of Transportation | Bridge Division Standard

EXTENDED CURB DETAILS
FOR BOX CULVERTS WITH CURBS OVER 1'-0" TO 5'-0" TALL

ECD

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CITYWIDE STREETS IMPROVEMENT PROJECTS
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EXTENDED CURB DETAILS

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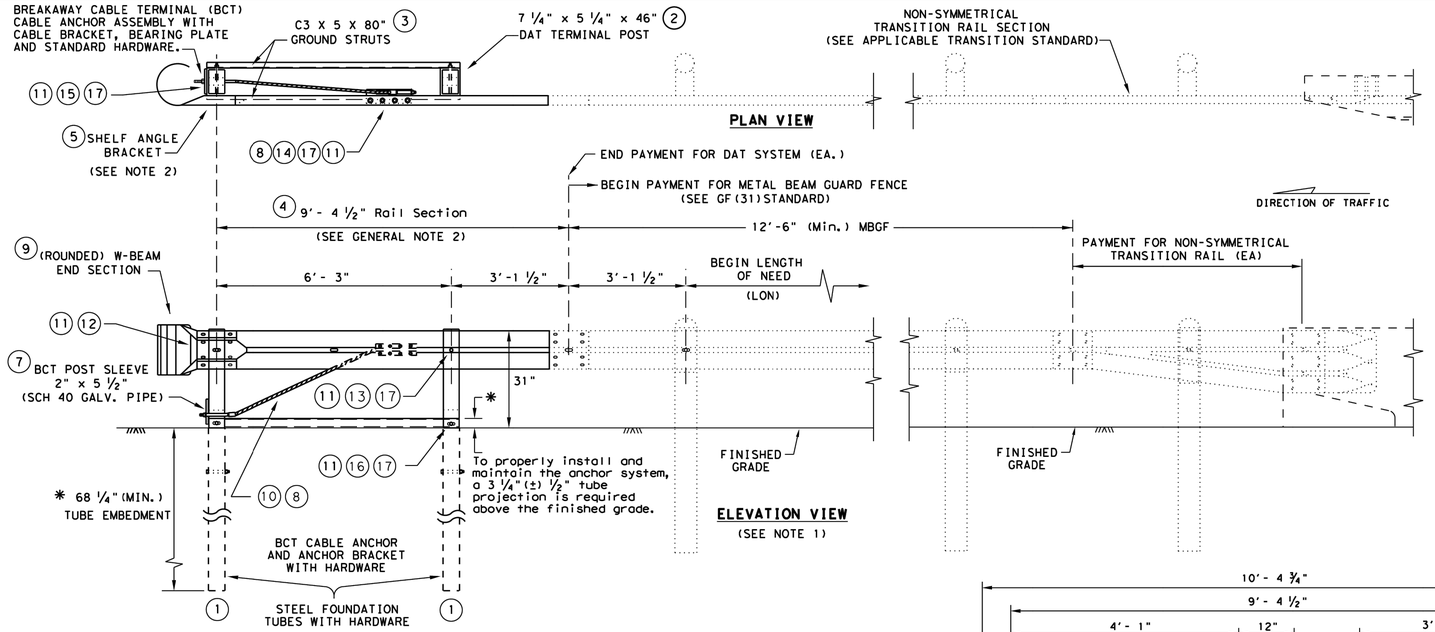
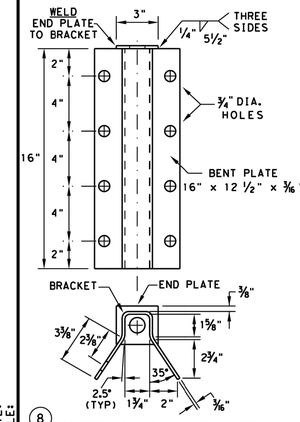
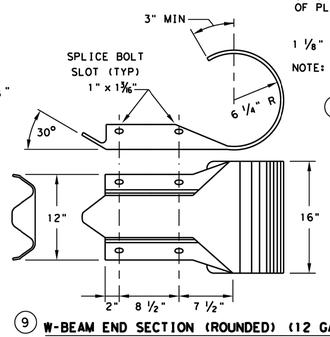


DOWNSTREAM ANCHOR TERMINAL (DAT)

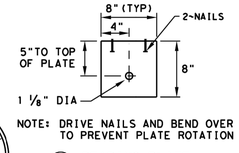
NOTE: ONLY FOR DOWNSTREAM USE, WHEN LOCATED OUTSIDE THE HORIZONTAL CLEARANCE AREA OF OPPOSING TRAFFIC.



(8) GUARDRAIL ANCHOR BRACKET

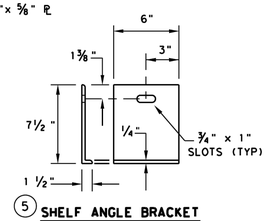


(9) W-BEAM END SECTION (ROUNDED) (12 GA.)

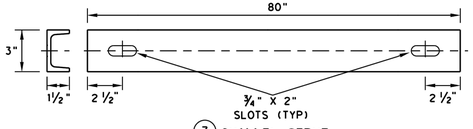


NOTE: DRIVE NAILS AND BEND OVER TO PREVENT PLATE ROTATION

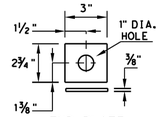
(6) BEARING PLATE
8"x 8"x 5/8" R



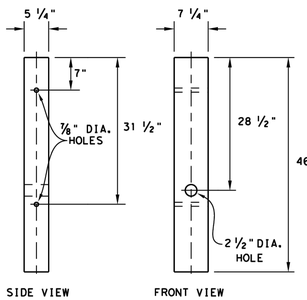
(5) SHELF ANGLE BRACKET



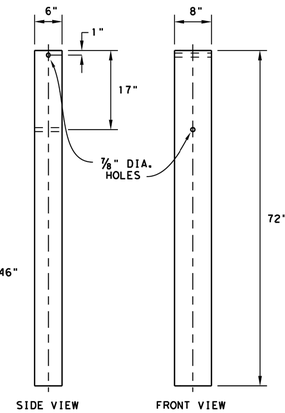
(3) CHANNEL STRUT
C3 X 5 X 80", GRADE A36



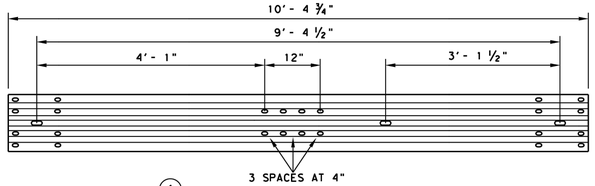
END PLATE



(2) TERMINAL POST
7 1/4"x 5 1/4"x 46" WOOD POST



(1) STEEL FOUNDATION TUBE
6"x 8"x 1/8" x 72" STEEL TUBE



(4) TERMINAL RAIL ELEMENT FOR DAT

GENERAL NOTES

1. THE DETAIL SHOWN IS THE MINIMUM LENGTH OF NEED (LON) FOR A DOWNSTREAM ANCHOR TERMINAL (DAT) CONNECTED TO A CONCRETE RAIL.
2. THE RAIL SECTION AT THE END POST IS SUPPORTED BY THE SHELF ANGLE BRACKET. THE RAIL ELEMENT IS NOT ATTACHED TO THE END POST.
3. THE FOUNDATION TUBES SHALL NOT PROJECT MORE THAN 3 3/4" ABOVE THE FINISHED GRADE.
4. ALL HARDWARE FOR DAT SHALL BE ASTM A307 UNLESS OTHERWISE SHOWN.
5. REFER TO GF(31) SHEET FOR TERMINAL CONNECTION DETAILS.

MOW STRIP INSTALLATION

IF A MOW STRIP IS REQUIRED WITH THE DAT INSTALLATION THE LEAVE-OUT AREA AROUND THE STEEL FOUNDATION TUBES AND THE TWO CHANNEL STRUTS MAY BE OMITTED. THIS WILL REQUIRE A FULL POUR AT THE FOUNDATION TUBES.

#	(DAT) PARTS LIST	QTY
(1)	STEEL FOUNDATION TUBE	2
(2)	DAT TERMINAL POST	2
(3)	CHANNEL STRUT	2
(4)	TERMINAL RAIL ELEMENT	1
(5)	SHELF ANGLE BRACKET	1
(6)	BCT BEARING PLATE	1
(7)	BCT POST SLEEVE	1
(8)	GUARDRAIL ANCHOR BRACKET	1
(9)	(ROUNDED)W-BEAM END SECTION	1
(10)	BCT CABLE ANCHOR	1
(11)	RECESSED NUT, GUARDRAIL	20
(12)	1 1/4" BUTTON HEAD BOLT	4
(13)	10" BUTTON HEAD BOLT	2
(14)	5/8" X 2" HEX HEAD BOLT	8
(15)	5/8" X 8" HEX HEAD BOLT	4
(16)	5/8" X 10" HEX HEAD BOLT	2
(17)	5/8" FLAT WASHER	18

Texas Department of Transportation — Design Division Standard

METAL BEAM GUARD FENCE
(DOWNSTREAM ANCHOR TERMINAL) TL-3 MASH COMPLIANT
GF(31)DAT-19

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CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

METAL BEAM GUARD FENCE DETAIL

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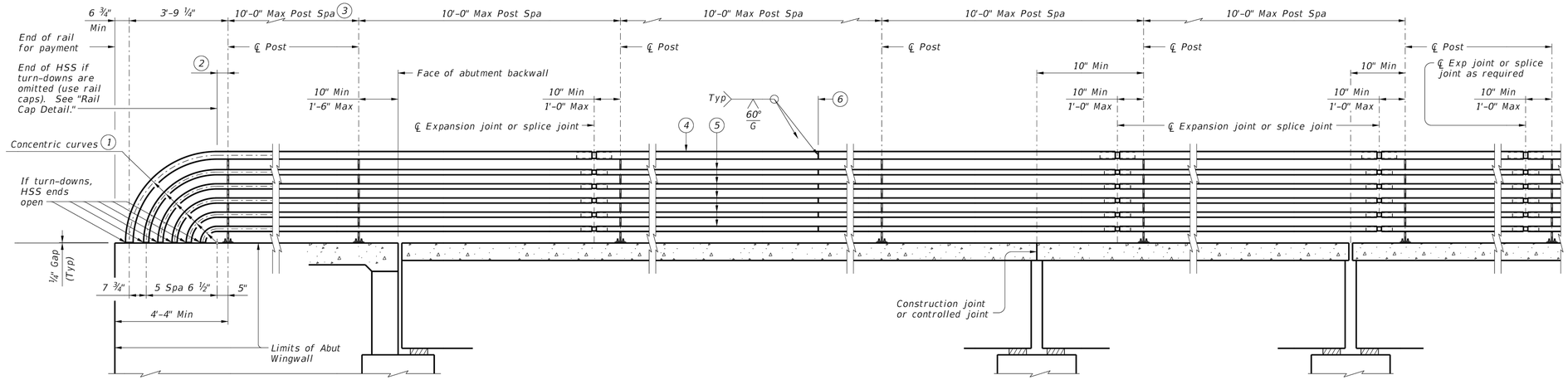
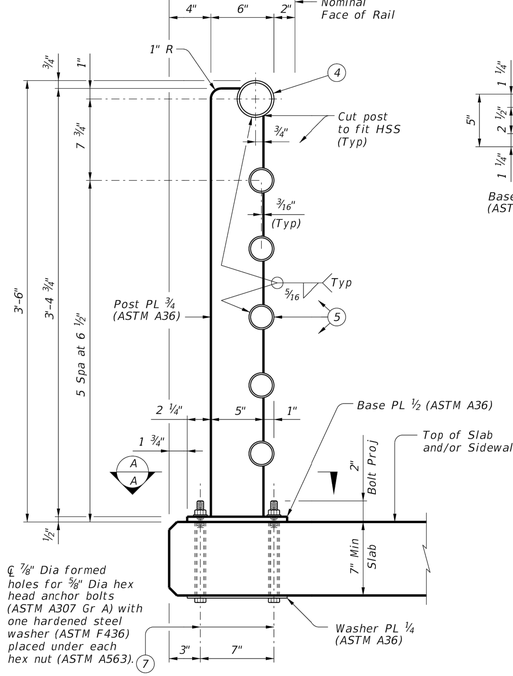


AT ABUTMENTS

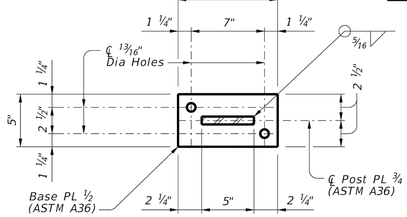
AT BENTS WITHOUT SLAB EXP JOINTS

AT BENTS WITH SLAB EXP JOINTS

ROADWAY ELEVATION OF RAIL

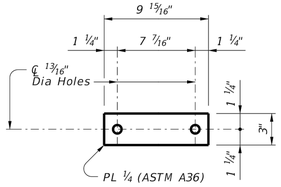


ON BRIDGE SLAB

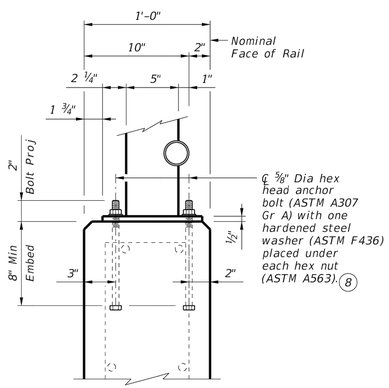


SECTION A-A

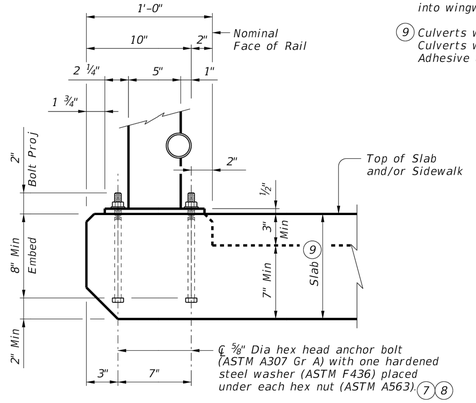
Showing base plate detail.



WASHER PLATE DETAIL



ON ABUTMENT WINGWALLS OR CIP RETAINING WALLS



ON CULVERTS WITH OR WITHOUT CURBS

Used with 1'-0" Min thick parallel wings on culverts.

SECTIONS THRU RAIL

1. Portion of railing with turn-downs to be used or omitted as indicated on Bridge Layout.
2. 10" Min ~ 1'-6" Max if turn-downs are omitted.
3. Min of 2 posts required on wingwall.
4. HSS 3.500 x 0.216 (Rail Member)
5. HSS 2.375 x 0.154 (Rail Member)
6. One shop splice per panel is permitted (with minimum 85 percent penetration). The weld may be square groove or single V groove. Grind smooth.
7. At Contractor's option, adhesive anchors may be used. Adhesive anchors must be ⅝" Dia ASTM A307 Grade A fully threaded rods. Minimum adhesive anchor embedment depth is 5" into slabs or culverts without curbs. See "Material Notes" for adhesive anchor requirements.
8. At Contractor's option, adhesive anchors may be used. Adhesive anchors must be ⅝" Dia ASTM A307 Grade A fully threaded rods. Minimum adhesive anchor embedment depth is 7" into wingwalls or culverts with curbs. See "Material Notes" for adhesive anchor requirements.
9. Culverts without curbs for cast-in-place anchor bolts require a 10" Min slab thickness. Culverts with curbs for cast-in-place anchor bolts require a curb plus slab thickness of 10" Min. Adhesive anchors may be used with a 7" Min slab thickness or culverts with curbs.

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CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

PEDESTRIAN RAIL DETAIL I

SHEET 1 OF 2

Texas Department of Transportation — Bridge Division Standard

PEDESTRIAN RAIL

TYPE PR11

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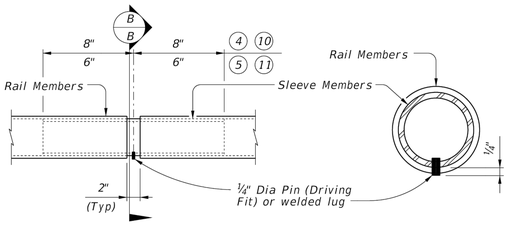
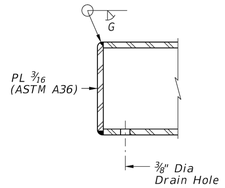


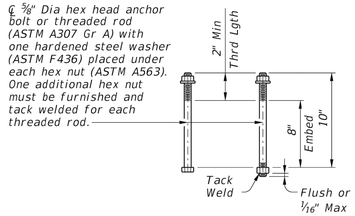
AT SPLICES OR EXP JTS

SECTION B-B

PIPE SPLICE DETAIL



RAIL CAP DETAIL



CAST-IN-PLACE & FORMED HOLE ANCHOR BOLT OPTIONS

(4) HSS 3.500 x 0.216 (Rail Member)

(5) HSS 2.375 x 0.154 (Rail Member)

(10) HSS 2.875 x 0.203 (Sleeve Member)

(11) HSS 1.900 x 0.145 (Sleeve Member)

CONSTRUCTION NOTES:

Panel lengths of railing must be attached to a minimum of three posts except at abutment wingwalls.

At the Contractor's option anchor bolts may be an adhesive anchorage system. See "Material Notes."

Test adhesive anchors in accordance with Item 450.3.3, "Tests". Test 3 anchors per 100 anchors installed. Perform corrective measures to provide adequate capacity if any of the tests do not meet the required test load. Repair damage from testing as directed.

Face of rail and posts must be vertical transversely unless otherwise approved. Posts must be perpendicular to adjacent roadway grade. Use Type VIII epoxy mortar under post base plates if gaps larger than $\frac{1}{16}$" exist.

For curved railing applications, fabricate the HSS rail to the radius when the radius is 600' or less. Submit shop drawings for approval when tubes are required to be fabricated to a radius. Shop drawings must be submitted to the Engineer for approval.

Round or chamfer all exposed edges of steel components $\frac{1}{16}$" by grinding prior to galvanizing.

MATERIAL NOTES:

Provide ASTM A500 Gr B, A1085 or A53 Gr B for all HSS.

Galvanize all metal components of steel rail system. Apply additional coatings when shown elsewhere on the plans. When plans require paint over galvanizing, Follow the requirements for painting galvanized steel in Item 445, "Galvanizing" and when field painting, Item 446, "Field Cleaning and Painting Steel." Sleeve members and anchor bolts must receive galvanization prior to installation and only field paint after installation unless directed otherwise by Engineer.

Anchor bolts must be $\frac{5}{8}$" Dia ASTM A307 Gr A with one hardened steel washer (ASTM F436) placed under each hex nut or ASTM A307 Gr A threaded rods with one tack welded hex nut each and with one hex nut with one hardened steel washer (ASTM F436) each. Nuts must conform to ASTM A563 requirements.

Optional adhesive anchorage system must be $\frac{5}{8}$" Dia ASTM A307 Gr A fully threaded rods with one hex nut and one hardened steel washer (ASTM F436). Nuts must conform to ASTM A563 requirements. Embed fully threaded rods into slab, wingwalls, or culvert curbs using a Type III, Class C, D, E, or F anchor adhesive. Anchor adhesive chosen must be able to achieve a nominal bond strength in tension, Na, of a single anchor of 10 kips (edge distance must be accounted for). Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing".

GENERAL NOTES:

Designed according to AASHTO LRFD Specifications.

Do not use this railing on bridges with expansion joints providing more than 5" movement.

Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

For all rails, submit erection drawings showing section lengths, splice locations, rail post spacing and anchor bolt setting for approval.

Average weight of railing is 30 plf.

SHEET 2 OF 2

Texas Department of Transportation | Bridge Division Standard

PEDESTRIAN RAIL

TYPE PR11

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	DIST	COUNTY		SHEET NO.

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

PEDESTRIAL RAIL DETAIL II

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

SCALE: AS NOTED	DGN. BY: AZ		
DATE: AS NOTED	DWN. BY: JFR		
JOB NO. 05668-0026-01	DWG. NO. --		
SUBMITTED: ----	SURV. BY: QUIDDITY		

STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED
PROFESSIONAL ENGINEER
5/9/2025

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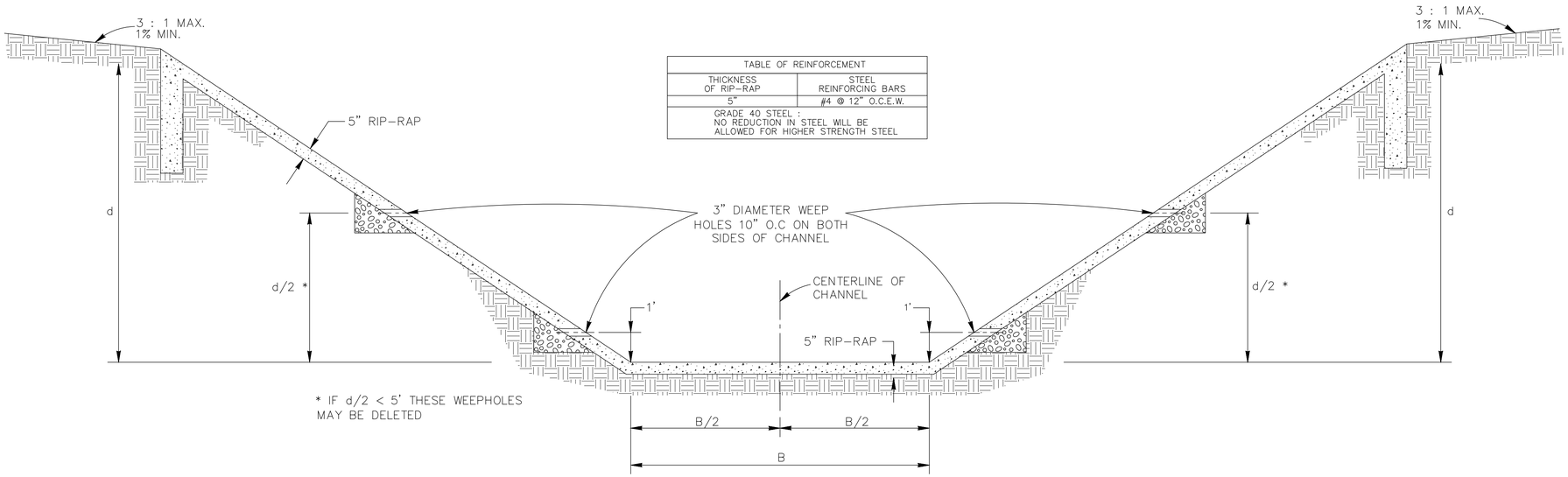
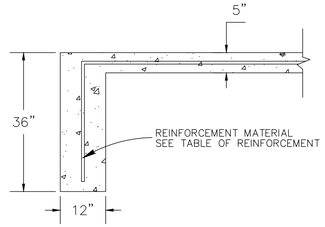


TABLE OF REINFORCEMENT	
THICKNESS OF RIP-RAP	STEEL REINFORCING BARS
5"	#4 @ 12" O.C.E.W.
GRADE 40 STEEL : NO REDUCTION IN STEEL WILL BE ALLOWED FOR HIGHER STRENGTH STEEL	

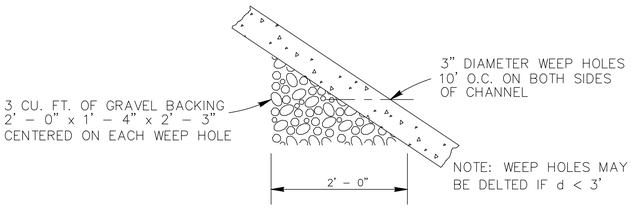
TYPICAL CHANNEL SECTION LOOKING DOWNSTREAM

SCALE : N.T.S



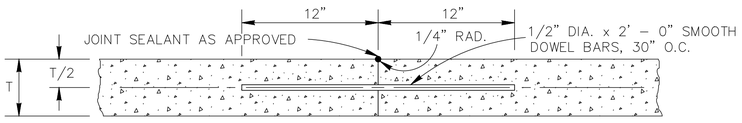
LONGITUDINAL TOEDOWN SECTION

SCALE : N.T.S



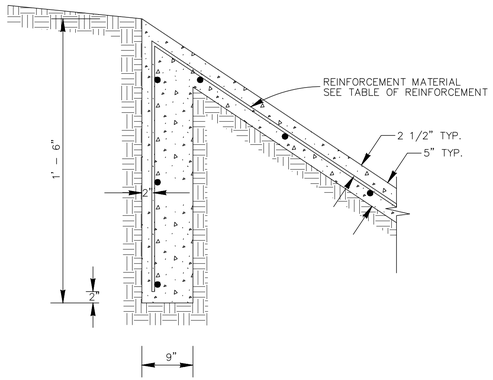
WEEP HOLES DETAILS FOR SIDE SLOPES

SCALE : 1" = 2'



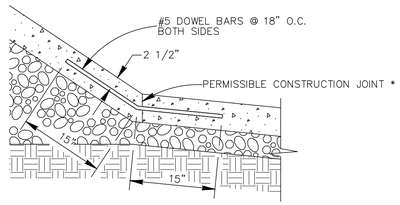
CONVERSE CONTRACTION OR CONSTRUCTION JOINT

SCALE : N.T.S.



REINFORCEMENT DETAIL SIDE TOE-DOWN

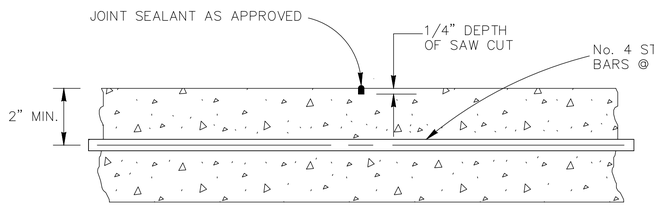
SCALE : N.T.S



* THIS JOINT MUST BE A VERTICAL JOINT AS SHOWN

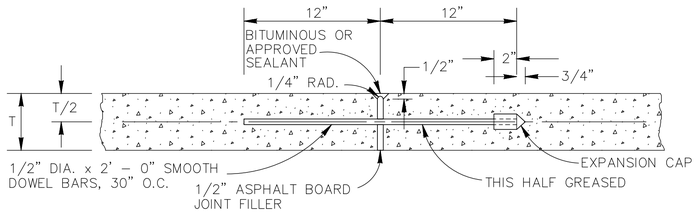
ALL SECTIONS

SCALE : N.T.S.



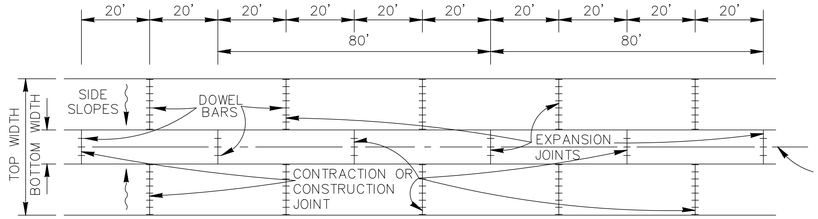
"SAW CUT" CONTRACTION JOINT

SCALE : N.T.S.



TRANSVERSE EXPANSION JOINT

SCALE : N.T.S.



EXPANSION AND CONTRACTION JOINTS FOR CONCRETE CHANNEL LINING

SCALE : N.T.S.

NOTES:

1. CONCRETE FOR CHANNEL RIP-RAP SHALL BE CLASS "A" 3000 P.S.I.
2. ALL DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTER OF BARS UNLESS OTHERWISE SHOWN.
3. ALL REINFORCEMENT STEEL SHALL MEET ASTM DESIGNATIONS AS CALLED FOR IN THE STANDARD SPECIFICATIONS.
4. ALL EXPOSED CORNERS SHALL HAVE A 3/4" CHAMFER.
5. ALL REINFORCING STEEL SHALL HAVE A MINIMUM 2" COVER.
6. NEW RIP-RAP SHOULD BE ATTACHED TO EXISTING CONCRETE BY NO. 4 BARS DOWELED 6" INTO EXISTING CONCRETE. THESE BARS ARE TO BE SPACED 18" O.C. AND HAVE A LENGTH OF 18".

TYPICAL CONCRETE RIPRAP DETAILS

N.T.S.

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

CONCRETE RIPRAP DETAIL

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STATE OF TEXAS
ALEX ZERTUCHE
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PROFESSIONAL ENGINEER
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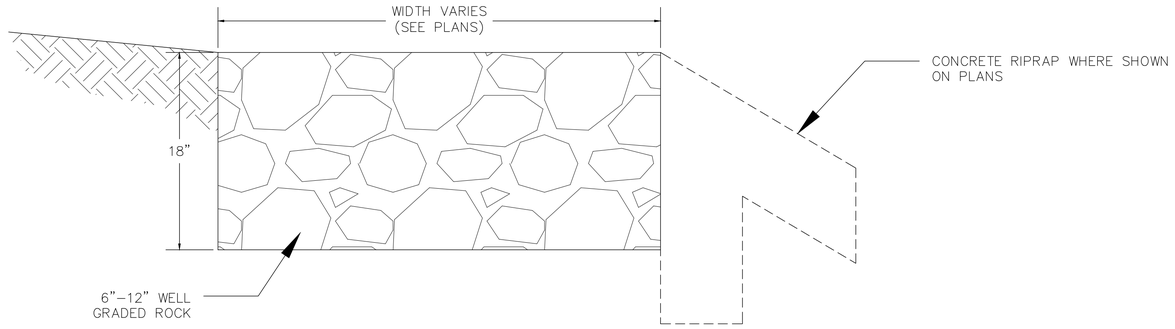

DRY ROCK (STONE) RIPRAP DETAIL

N.T.S.

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

STONE RIPRAP DETAIL

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DATE: $TIME$
FILE: $DOCUMENT NAME$

SUMMARY OF SMALL SIGNS

SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
60	1	R2-1	SPEED LIMIT (30)	30X36	X		10BWG	1	SA	P		
	2		ADVANCE INTERSECTION LANE CONTROL (REUSE EXISTING)	(EXISTING SIZE)	X		10BWG	1	SA	P		
61	3	W11-2	2 - PEDESTRIAN	36X36	X		10BWG	1	SA	T		
		W16-7PL	DOWNWARD DIAGONAL ARROW (PLAQUE)	24X12	X							
		W16-7PR	DOWNWARD DIAGONAL ARROW (PLAQUE)	24X12	X							
	4	W11-2	2 - PEDESTRIAN	36X36	X		10BWG	1	SA			
		W16-7PL	DOWNWARD DIAGONAL ARROW (PLAQUE)	24X12	X					T		
		W16-7PR	DOWNWARD DIAGONAL ARROW (PLAQUE)	24X12	X							
61	5	R1-1	STOP	30X30	X		10BWG	1	SA	P		
			STREET NAME (REUSE EXISTING)	(EXISTING SIZE)	X							
			STREET NAME (REUSE EXISTING)	(EXISTING SIZE)	X							
62	6	R1-1	STOP	30X30	X		10BWG	1	SA	P		
			STREET NAME (REUSE EXISTING)	(EXISTING SIZE)	X							
			STREET NAME (REUSE EXISTING)	(EXISTING SIZE)	X							
62	7	R1-1	STOP (REUSE EXISTING)	(EXISTING SIZE)	X		10BWG	1	SA	P		
			STREET NAME (REUSE EXISTING)	(EXISTING SIZE)	X							
			STREET NAME (REUSE EXISTING)	(EXISTING SIZE)	X							
63	8	R1-1	STOP	30X30	X		10BWG	1	SA	P		
			STREET NAME (REUSE EXISTING)	(EXISTING SIZE)	X							
			STREET NAME (REUSE EXISTING)	(EXISTING SIZE)	X							
64	9	R1-1	STOP	30X30	X		10BWG	1	SA	P		
			STREET NAME (REUSE EXISTING)	(EXISTING SIZE)	X							
			STREET NAME (REUSE EXISTING)	(EXISTING SIZE)	X							

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

NOTE:

1. Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.
2. For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS)Standard Sheet.
3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS					
4-16		DIST	COUNTY		SHEET NO.
8-16			COMAL		
18					

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

SUMMARY OF SMALL SIGNS

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

SCALE:	AS NOTED	DGN. BY:	AZ
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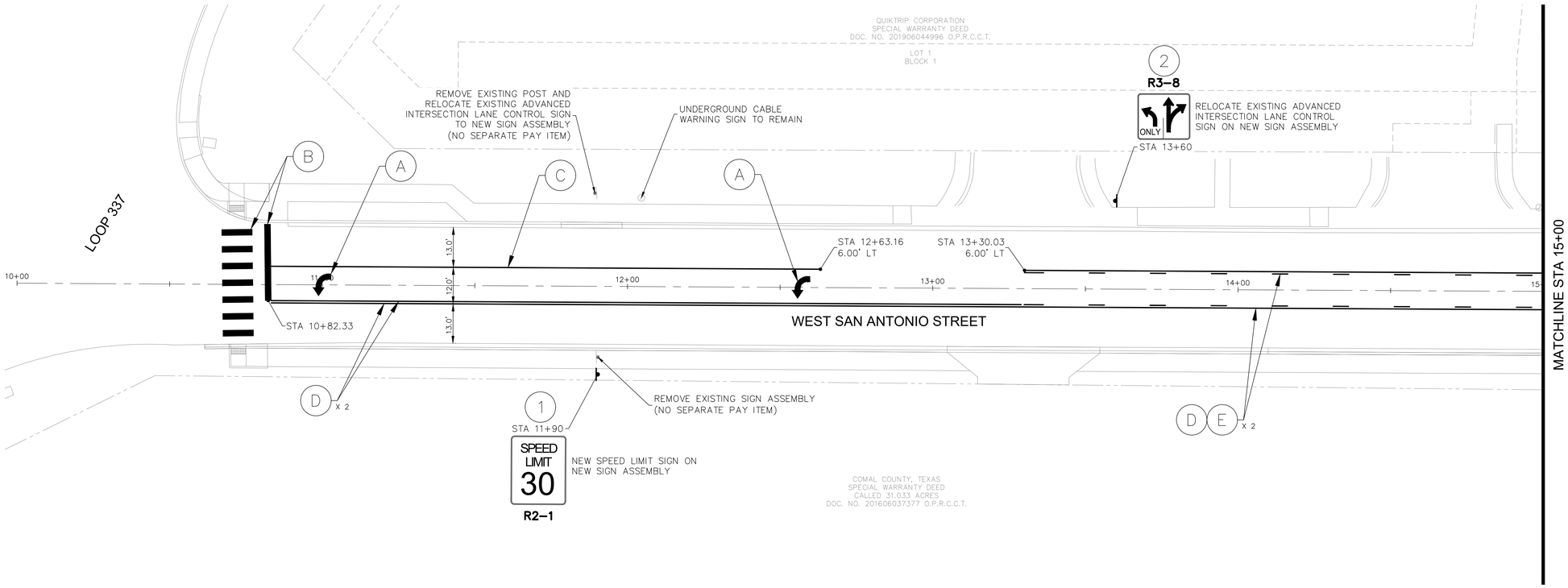
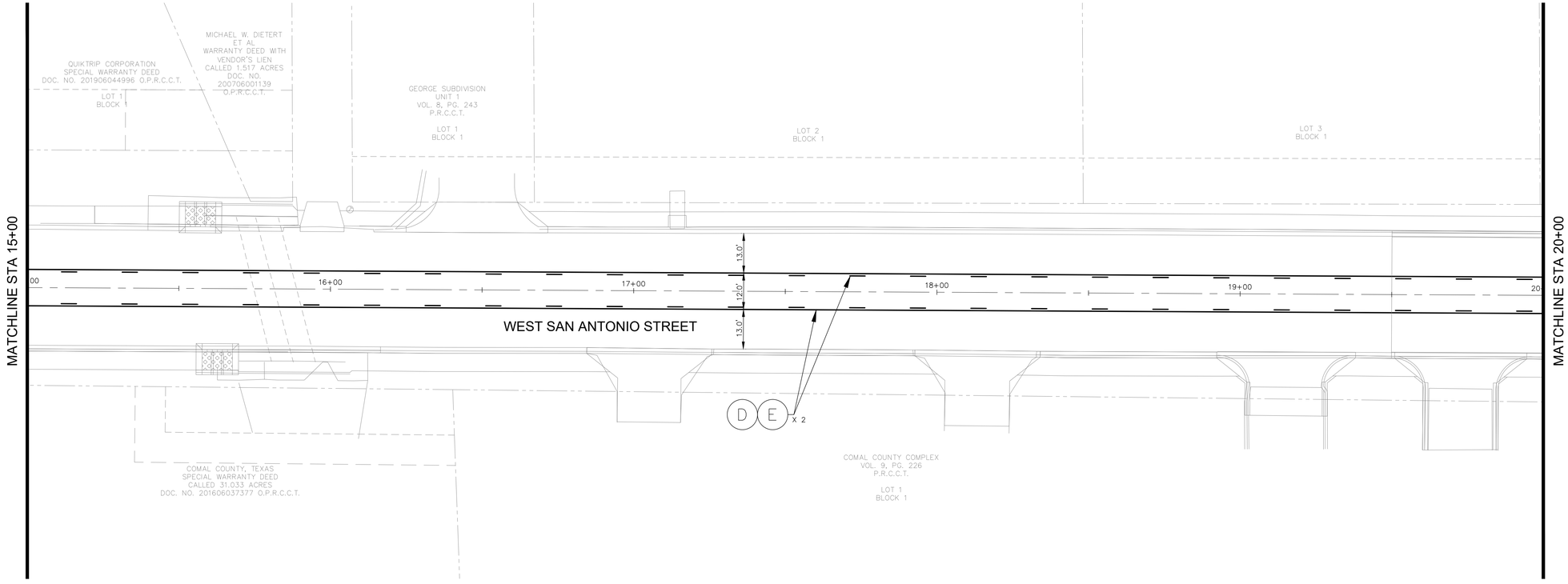


SYM	DESCRIPTION
A	REFL PAV MRK TY 1 (W) (ARROW)
B	REFL PAV MRK TY 1 (W) 24" (SLD)
C	REFL PAV MRK TY 1 (W) 8" (SLD)
D	REFL PAV MRK TY 1 (Y) 6" (SLD)
E	REFL PAV MRK TY 1 (Y) 6" (BRK)
F	REFL PAV MRK TY 1 (Y) (MED NOSE)
G	REFL PAV MRK TY 1 (Y) 24" (SLD)
⊸	ALUMINUM SIGNS (TYPE A)



NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

SIGN & PAVEMENT MARKINGS BEGIN TO 20+00

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

SCALE: AS NOTED DGN. BY: AZ
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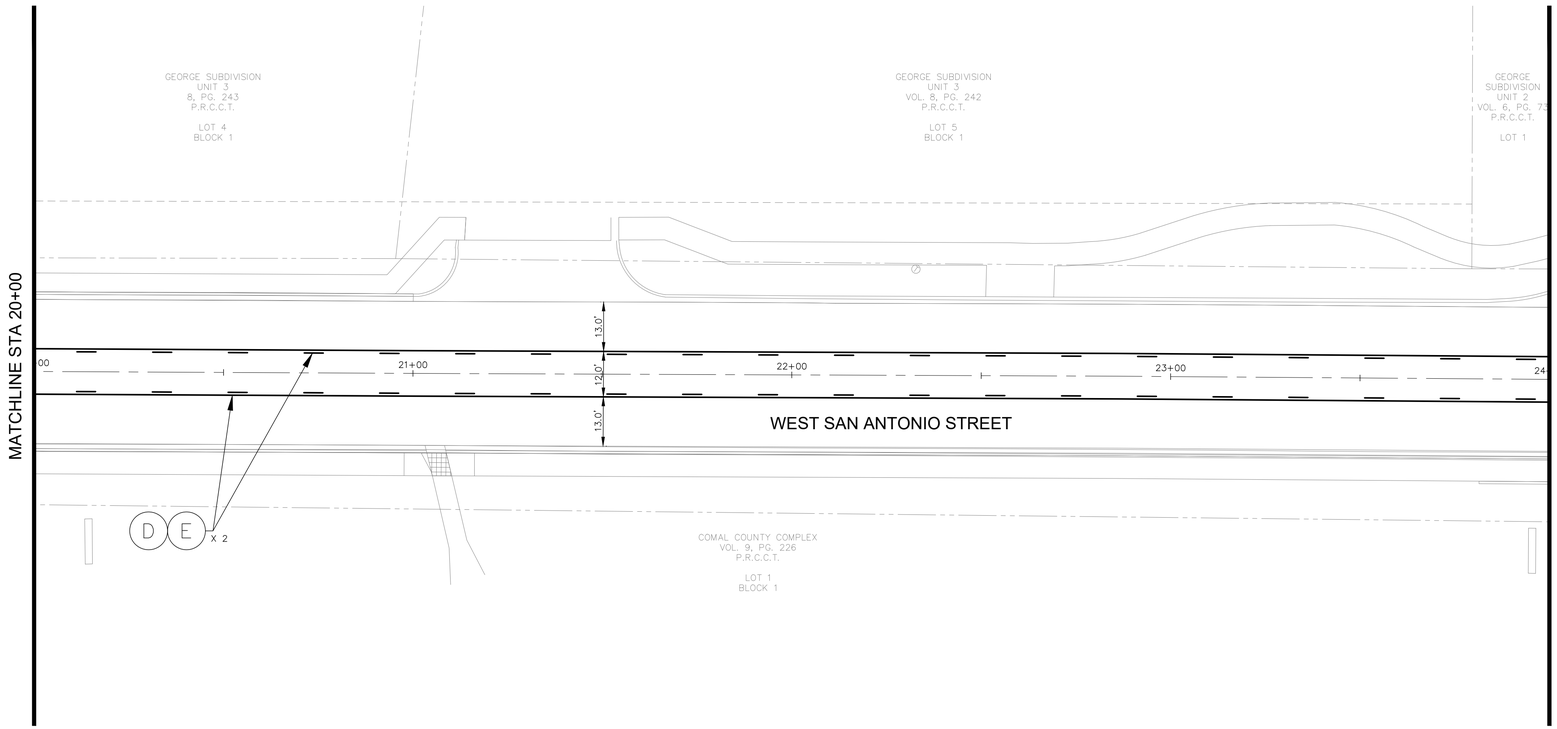

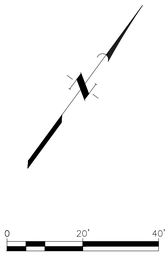

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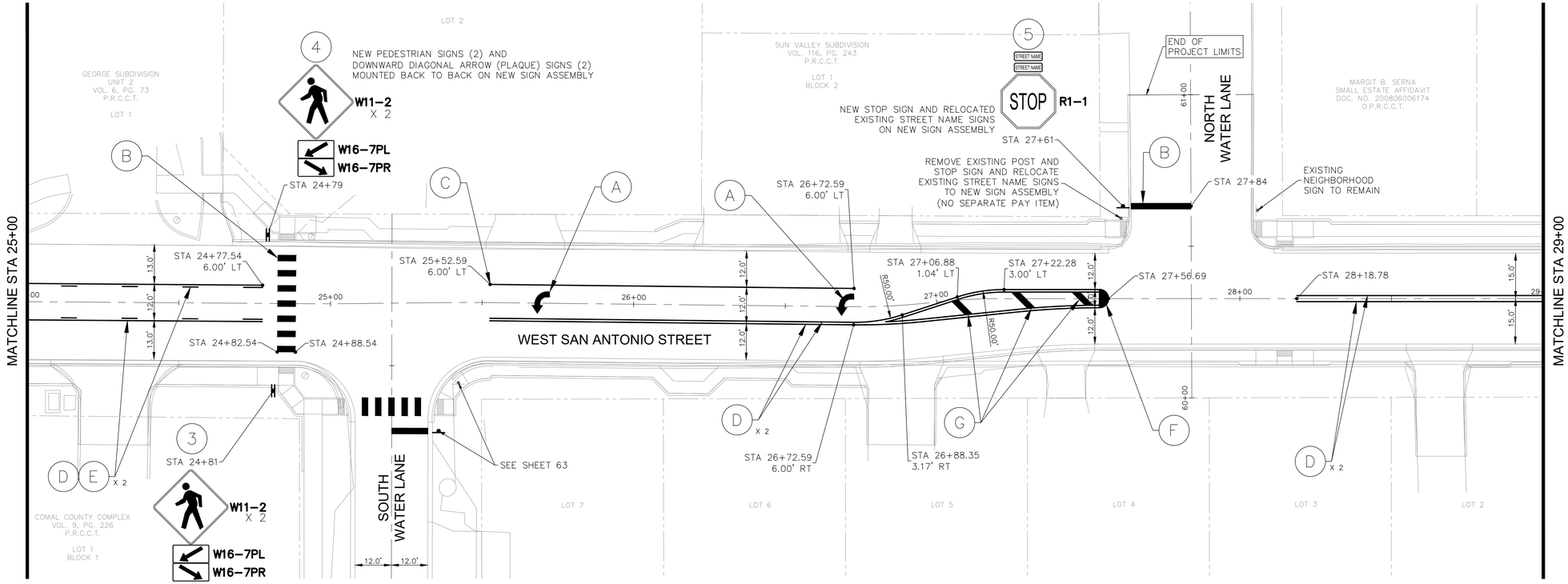
F	REFL PAV MRK TY 1 (Y) (MED NOSE)
G	REFL PAV MRK TY 1 (Y) 24" (SLD)
⊸	ALUMINUM SIGNS (TYPE A)



NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

SIGN & PAVEMENT MARKINGS
STA 20+00 TO 29+00

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

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STATE OF TEXAS
ALEX ZERTUCHE
92080
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PROFESSIONAL ENGINEER
5/9/2025

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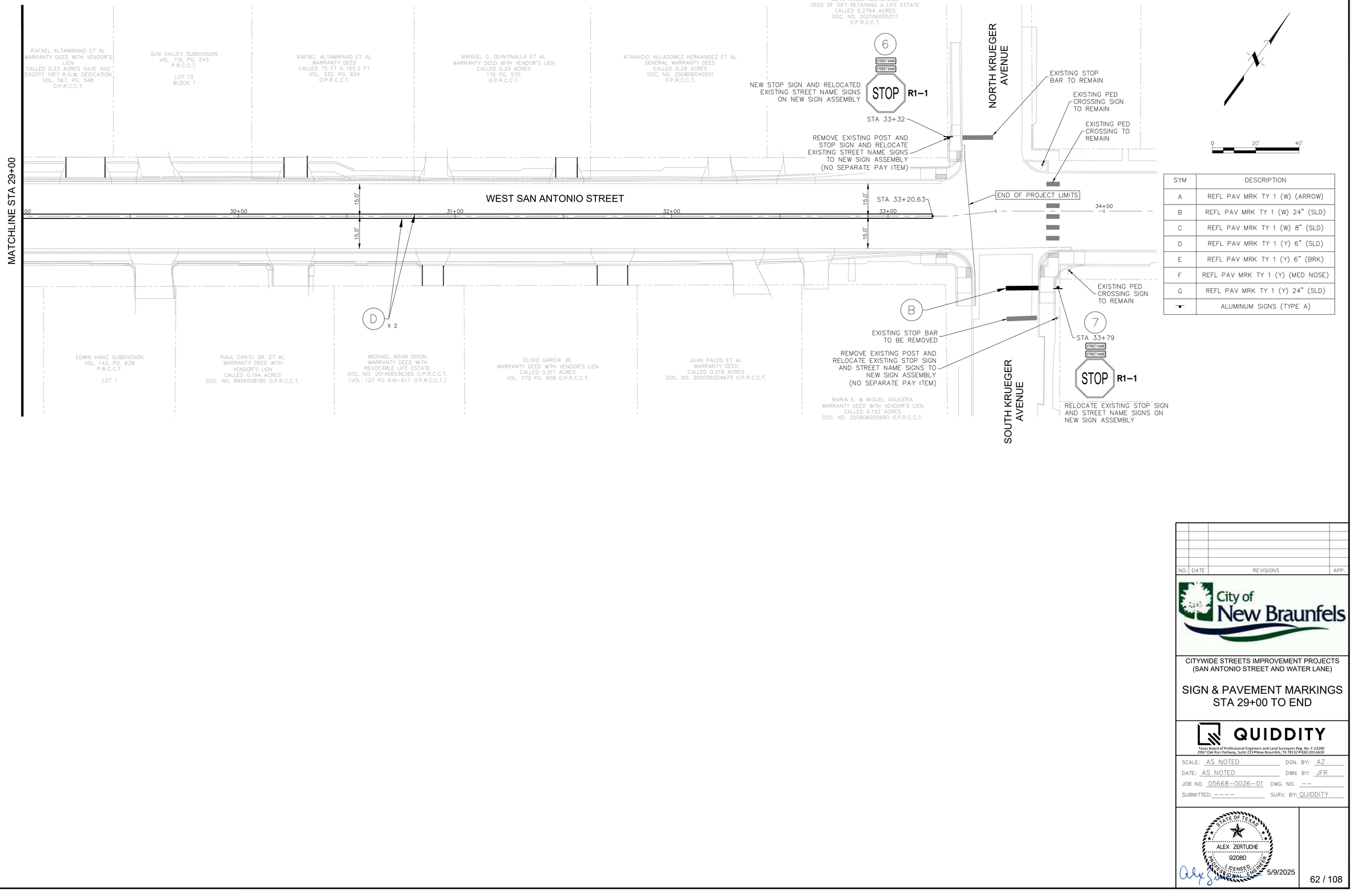

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F	REFL PAV MRK TY 1 (Y) (MED NOSE)
G	REFL PAV MRK TY 1 (Y) 24" (SLD)
⊸	ALUMINUM SIGNS (TYPE A)

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

SIGN & PAVEMENT MARKINGS STA 29+00 TO END

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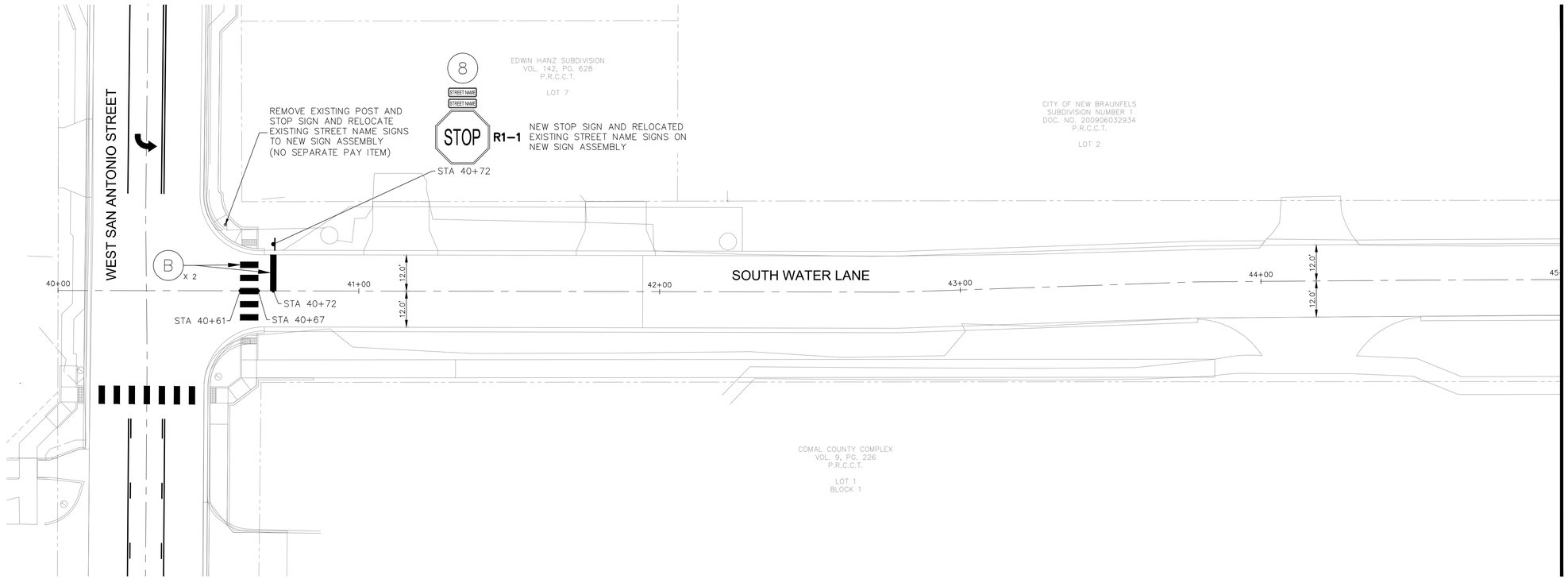

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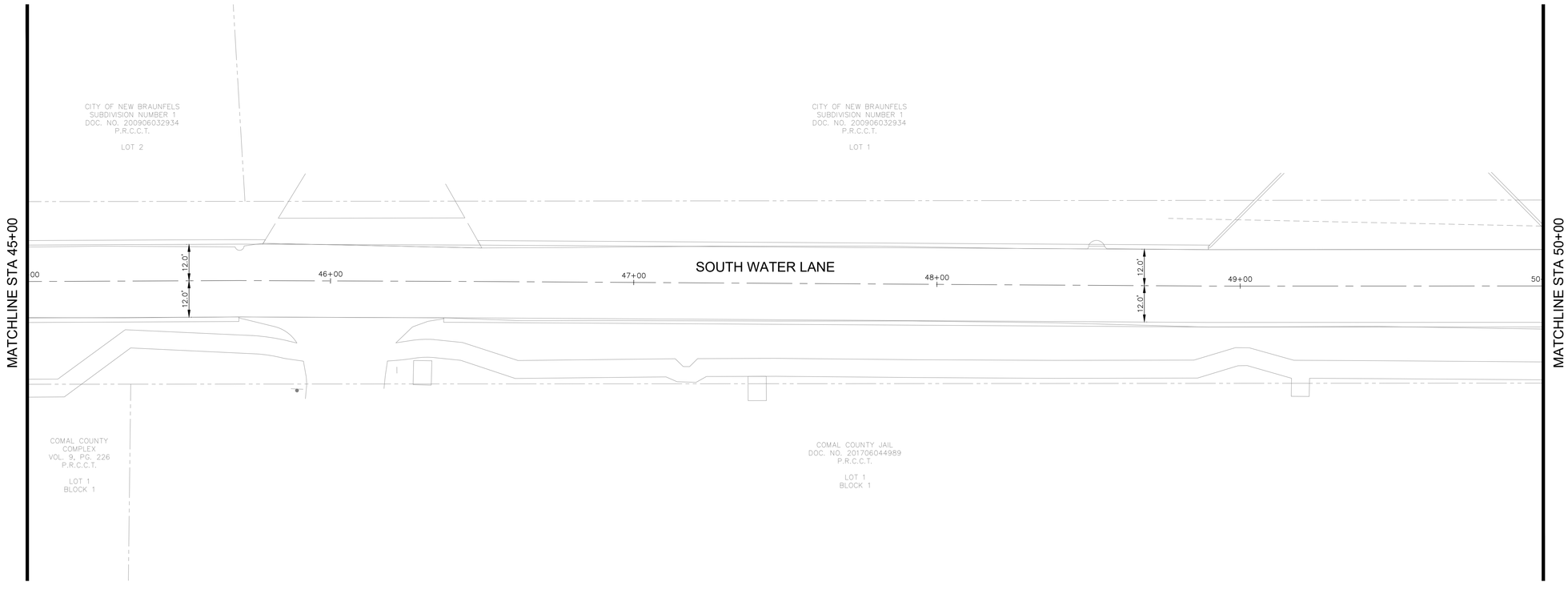

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

SIGN & PAVEMENT MARKINGS BEGIN TO 50+00

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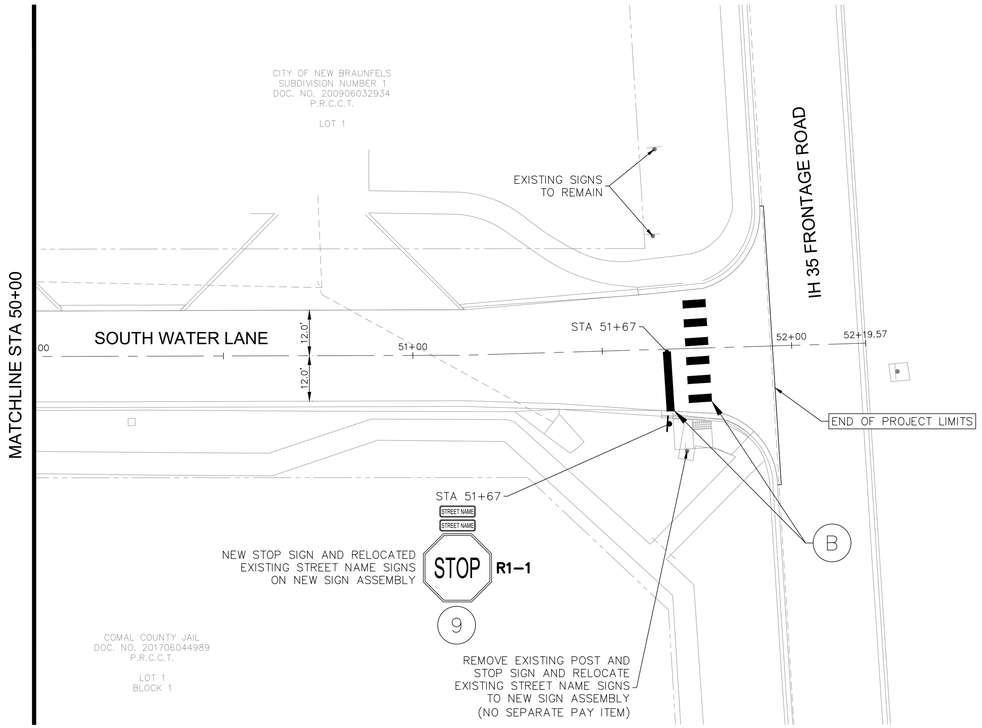

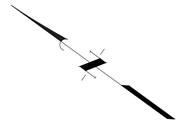

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G	REFL PAV MRK TY 1 (Y) 24" (SLD)
⊸	ALUMINUM SIGNS (TYPE A)

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

SIGN & PAVEMENT MARKINGS
STA 50+00 TO END

QUIDDITY
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2957 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

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PROFESSIONAL ENGINEER
5/9/2025

K:\05668\05668-0026-01 san antonio street and water lane roadway improvements\2 design phase\CAD\Plans\05668-0026-01-SF-Sign & Pavement.dwg May 09, 2025 - 11:29am JFR

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DATE:
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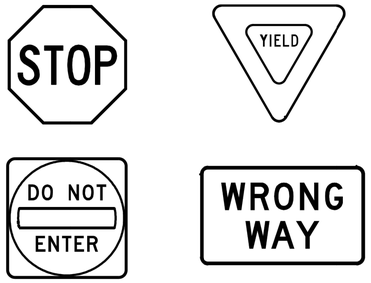
REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS
(STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

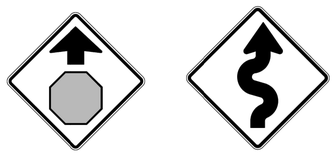
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	WHITE	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE B OR C SHEETING
LEGEND	RED	TYPE B OR C SHEETING

REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS
(EXCLUDING STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)

TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND, BORDERS AND SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR WARNING SIGNS



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	FLOURESCENT YELLOW	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR SCHOOL SIGNS

TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	FLOURESCENT YELLOW GREEN	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
SYMBOLS	RED	TYPE B OR C SHEETING

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. Sign legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod or F).
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
5. White legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof.
6. Colored legend shall be applied by screening process with transparent colored ink, transparent colored overlay film or colored sheeting to background sheeting, or combination thereof.
7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.
8. Mounting details for roadside mounted signs are shown in the "SMD series" Standard Plan Sheets.

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080
7.5 to 15	0.100
Greater than 15	0.125

DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.
http://www.txdot.gov/

Texas Department of Transportation — Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(4)-13

FILE: tsr4-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS				
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08				

4

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

SIGN & PAVEMENT MARKINGS STANDARD DETAILS I

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

SCALE: AS NOTED		DGN. BY: AZ	
DATE: AS NOTED		DWN. BY: JFR	
JOB NO. 05668-0026-01	DWG. NO. --		
SUBMITTED: ----	SURV. BY: QUIDDITY		

STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED PROFESSIONAL ENGINEER
5/9/2025

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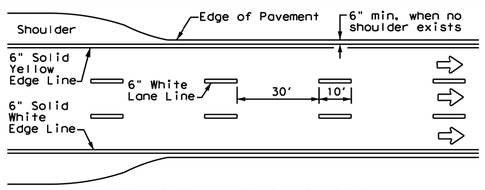
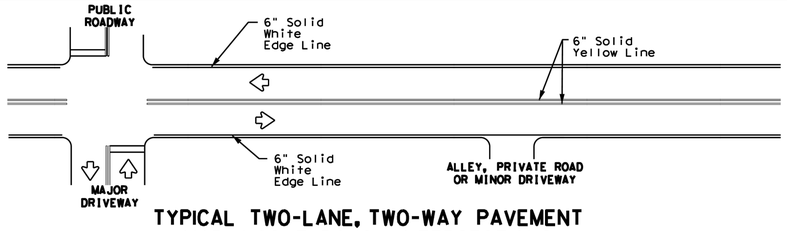
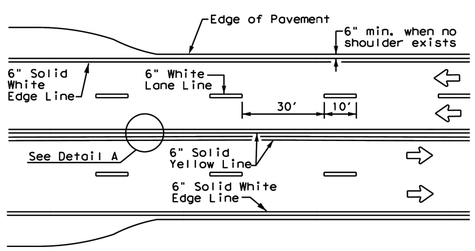
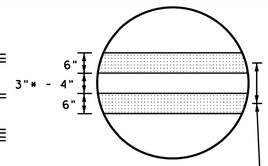


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS





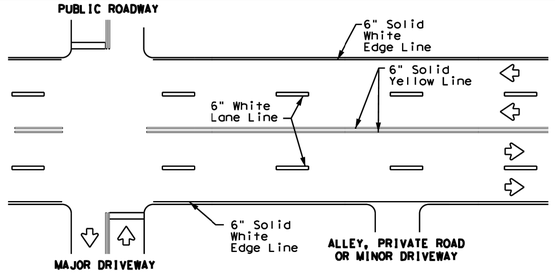
DETAIL "A"

9"** min. - 10" typ.
(18" max. for traveled way greater than 48' only)

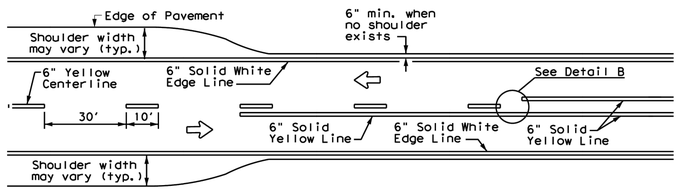
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

* 2" minimum for restripe projects when approved by the Engineer.

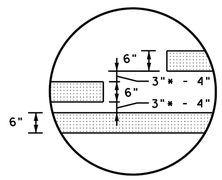
** 8" minimum for restripe projects when approved by the Engineer.



TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS

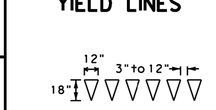


TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

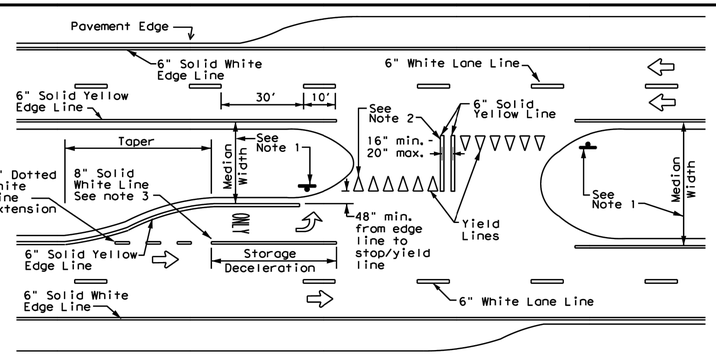


DETAIL "B"

* 2" minimum for restripe projects when approved by the Engineer.



YIELD LINES



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

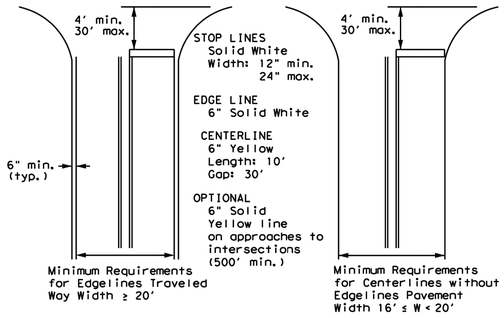
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs and stop bars are optional as determined by the Engineer.
2. Install median striping (double yellow centerlines and stop lines/yield lines) when a 50' or greater median centerline can be placed. Stop lines shall only be used with stop signs. Yield lines shall only be used with yield signs.
3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

GENERAL NOTES

1. Edge line striping shall be as shown in the plans or as directed by the Engineer. The edge line should not be placed less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edge lines are not required in curb and gutter sections of roadways.
2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the center of edge line to the center of edge line of a two lane roadway.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



NOTE: Traveled way is exclusive of shoulder widths. Refer to General Note 2 for additional details.

GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Roadways

Texas Department of Transportation — *Traffic Safety Division Standard*

TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-22

FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 11-78 8-00 6-20 / 8-95 3-03 12-22 / 5-00 2-12	DIST	COUNTY		SHEET NO.
22A				

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

SIGN & PAVEMENT MARKINGS STANDARD DETAILS II

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

SCALE: AS NOTED — DGN. BY: AZ
DATE: AS NOTED — DWN. BY: JFR
JOB NO. 05668-0026-01 — DWG. NO. --
SUBMITTED: ---- — SURV. BY: QUIDDITY

STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED PROFESSIONAL ENGINEER
5/9/2025

DATE:
FILE:

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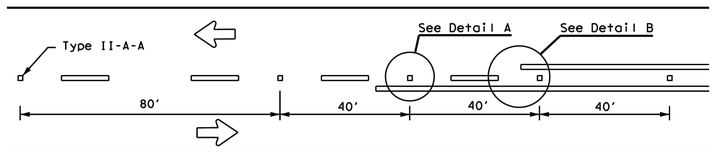
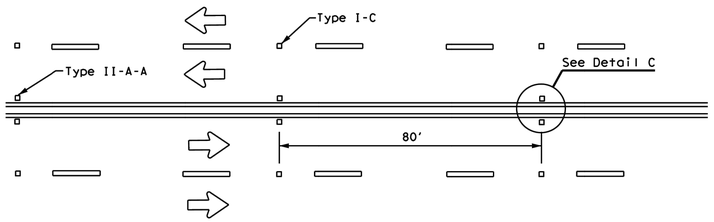
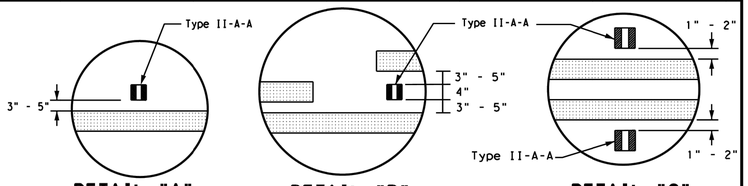
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

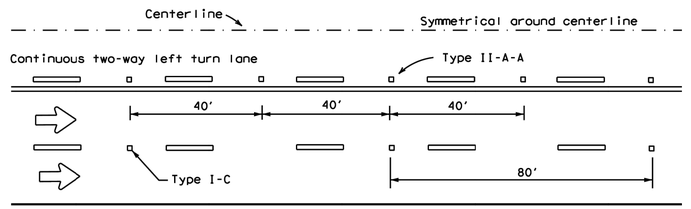


CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS

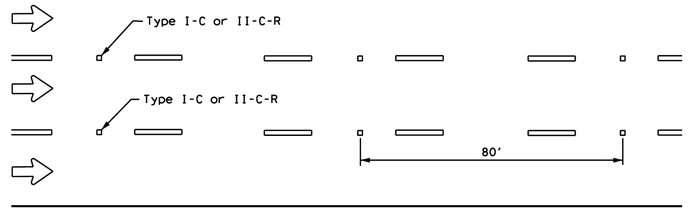


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY ROADWAYS





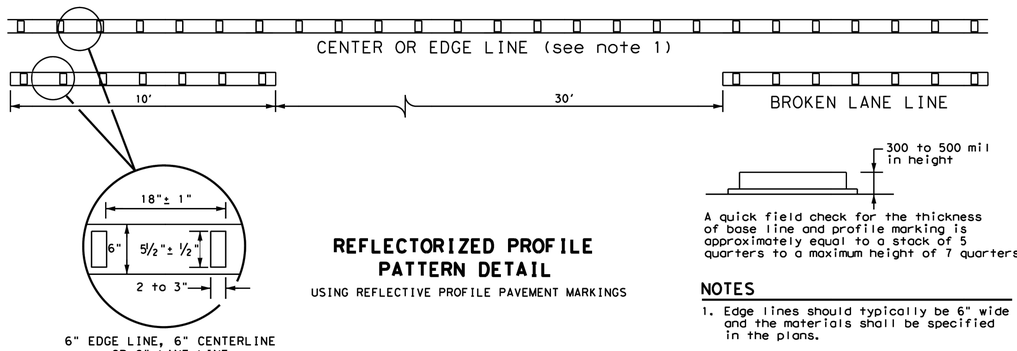
CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

See Note 3.



REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

A quick field check for the thickness of base line and profile marking is approximately equal to a stack of 5 quarters to a maximum height of 7 quarters.

NOTES

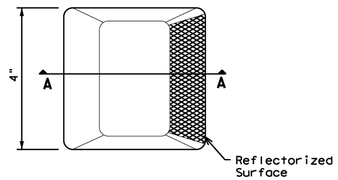
1. Edge lines should typically be 6" wide and the materials shall be specified in the plans.
2. Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

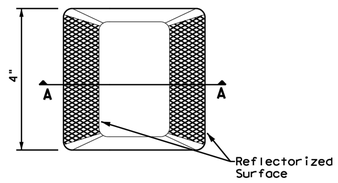
1. All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements, the raised pavement markers should be placed to one side of the longitudinal joints.
3. Use raised pavement marker Type I-C with undivided roadways, flush medians, and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

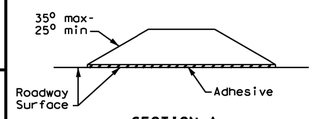
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS

Texas Department of Transportation — *Traffic Safety Division Standard*

POSITION GUIDANCE USING RAISED MARKERS REFLECTORIZED PROFILE MARKINGS PM(2)-22

FILE: pm2-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-77 8-00 6-20 4-92 2-10 12-22 5-00 2-12	DIST	COUNTY		SHEET NO.

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NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

SIGN & PAVEMENT MARKINGS STANDARD DETAILS III

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

SCALE: AS NOTED	DGN. BY: AZ		
DATE: AS NOTED	DWN. BY: JFR		
JOB NO. 05668-0026-01	DWG. NO. --		
SUBMITTED: ----	SURV. BY: QUIDDITY		

STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED
PROFESSIONAL ENGINEER
5/9/2025

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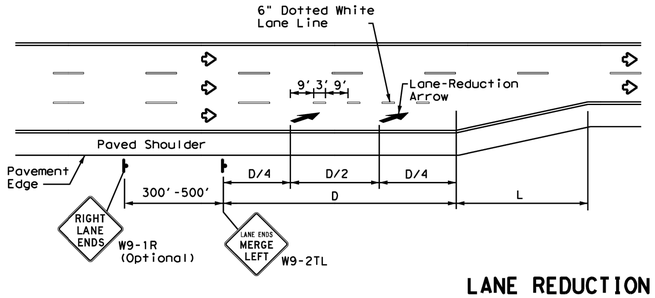
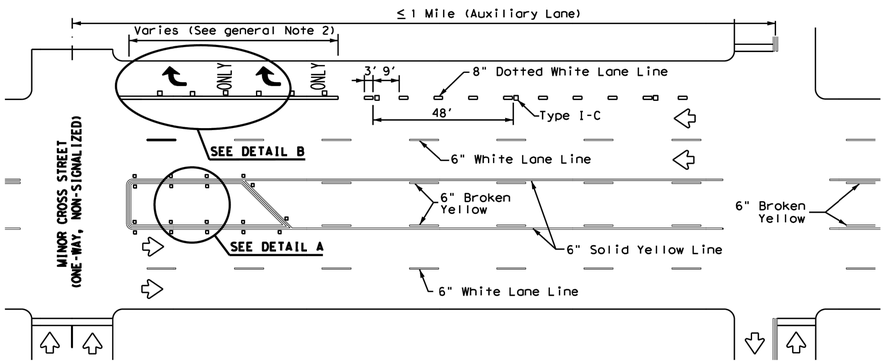


LANE REDUCTION

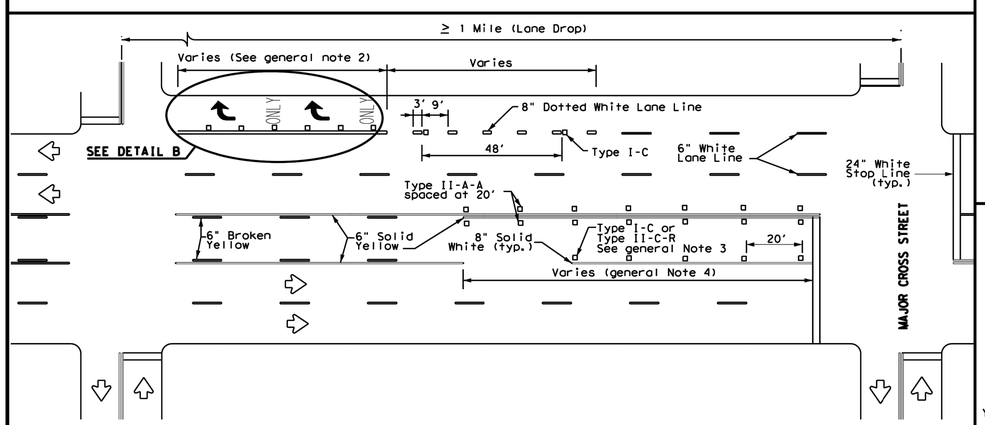
NOTES

1. Lane reduction pavement markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. For Texas Super 2 Passing Lanes, see TS2(PL) standard sheets.
2. On divided highways, an additional RIGHT LANE ENDS (W9-1R) sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.
3. Lane reduction arrows are required for speeds of 45 mph or greater. An optional third lane reduction arrow may be added based on engineering judgement. If used, the optional third lane reduction arrow should be centered between the first and last lane reduction arrows.
4. For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.

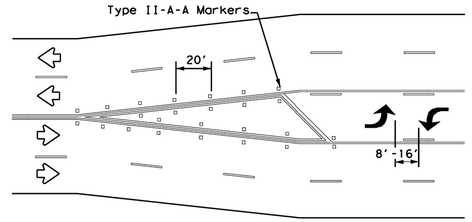
ADVANCED WARNING SIGN DISTANCE (D)		
Posted Speed	D (ft)	L (ft)
30 MPH	460	$L=\frac{WS^2}{60}$
35 MPH	565	
40 MPH	670	
45 MPH	775	L=WS
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	



TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE

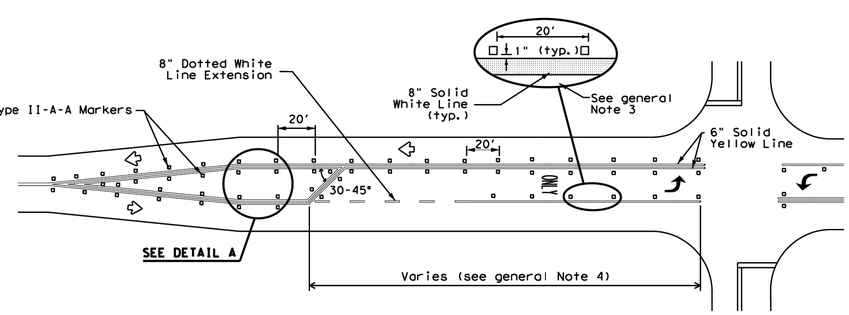


TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP

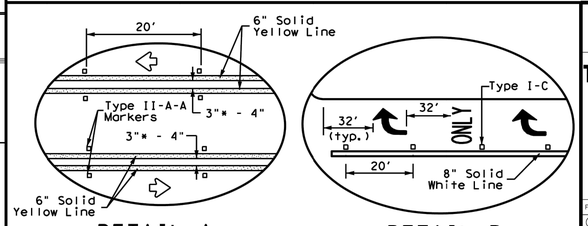


A two-way left-turn (TWLT) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY



TYPICAL TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS



* 2" minimum allowed for restripe projects when approved by the Engineer.

GENERAL NOTES

1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
2. When lane-use words and arrow markings are used, two sets of arrows should be used if the length of the bay is greater than 180 feet. When a single lane use arrow or word and arrow marking is used for a short turn lane, it should be located at or near the upstream end of the full-width turn lane.
3. Use raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.
4. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer. See Chapter 3 of the Roadway Design Manual for additional information on turning lanes or storage lengths.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.

Texas Department of Transportation — Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS PM(3)-22

FILE: pm3-22.dgn	DN:	CK:	DW:	CK:
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226

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

SIGN & PAVEMENT MARKINGS STANDARD DETAILS IV

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

SCALE: AS NOTED	DGN. BY: AZ		
DATE: AS NOTED	DWN. BY: JFR		
JOB NO. 05668-0026-01	DWG. NO. --		
SUBMITTED: ----	SURV. BY: QUIDDITY		

STATE OF TEXAS · ALEX ZERTUCHE · 92080 · LICENSED PROFESSIONAL ENGINEER
5/9/2025

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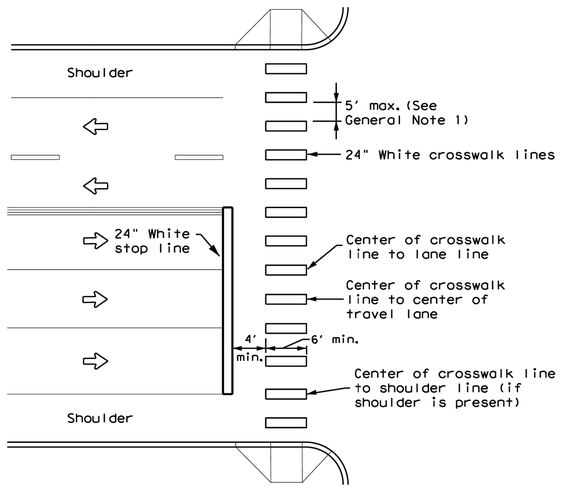


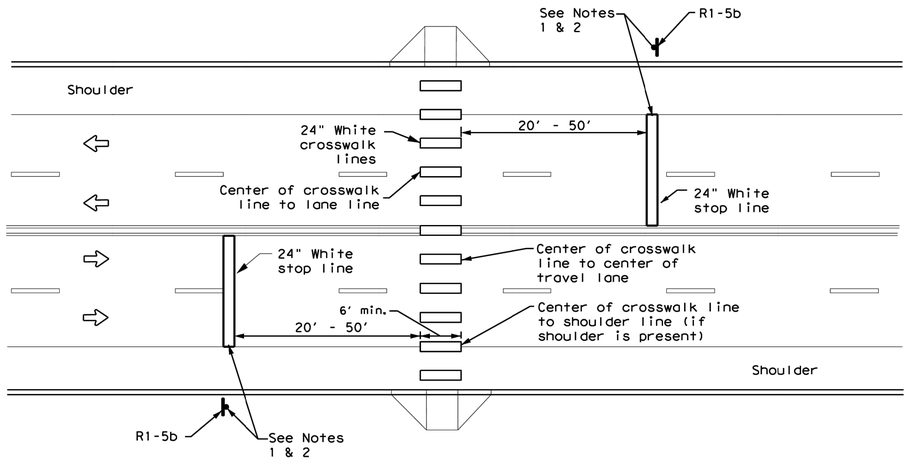
HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH

GENERAL NOTES

1. Longitudinal crosswalk lines should not be placed in the wheel path of vehicles. Center the crosswalk lines on travel lanes, lane lines, and shoulder lines (if present).
2. A minimum 6" clear distance shall be provided to the curb face. If the last crosswalk line falls into this distance it must be omitted.
3. For divided roadways, adjustments in spacing of the crosswalk lines should be made in the median so that the crosswalk lines are maintained in their proper location across the travel portion of the roadway.
4. At skewed crosswalks, the crosswalk lines are to remain parallel to the lane lines.
5. Each crosswalk shall be a minimum of 6′ wide.
6. The High-Visibility Longitudinal Crosswalk is the preferred crosswalk pattern on State Highways. Other crosswalk patterns as shown in the "Texas Manual on Uniform Traffic Control Devices" may be used. All crosswalk designs and dimension shall comply with the "Texas Manual on Uniform Traffic Control Devices."
7. Final placement of Stop Bar and Crosswalk shall be approved by the Engineer in the field.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



UNSIGNALIZED MIDBLOCK HIGH-VISIBILITY LONGITUDINAL CROSSWALK

NOTES:

1. Use stop bars with Stop Here For Pedestrians (R1-5b) signs at unsignalized midblock cross walks.
2. Use stop bars with STOP HERE ON RED (R10-6 or R10-6a) signs at mid block crosswalks controlled by traffic signals or pedestrian hybrid beacons.

Texas Department of Transportation — Traffic Safety Division Standard

CROSSWALK PAVEMENT MARKINGS

PM(4)-22A

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

SIGN & PAVEMENT MARKINGS STANDARD DETAILS V

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

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STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED PROFESSIONAL ENGINEER
5/9/2025

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SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

SM RD SGN ASSM TY XXXXX(X)XX(X-XXXX)

Post Type

FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
TWT = Thin-Walled Tubing (see SMD(TWT))
10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2)

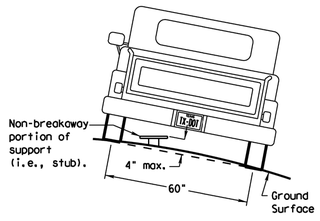
Anchor Type

UA = Universal Anchor - Concreted (see SMD(FRP) and (TWT))
UB = Universal Anchor - Bolted down (see SMD(FRP) and (TWT))
WS = Wedge Anchor Steel - (see SMD(TWT))
WP = Wedge Anchor Plastic (see SMD(TWT))
SA = Slipbase - Concreted (see SMD(SLIP-1) to (SLIP-3))
SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation

P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
IF REQUIRED
1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
WC = 1.12 #/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))
EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-3))

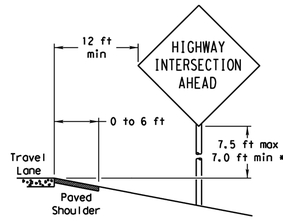
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

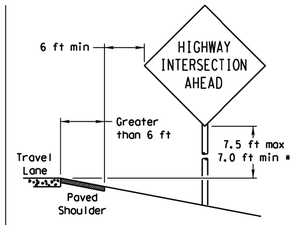
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

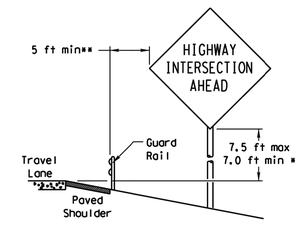
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



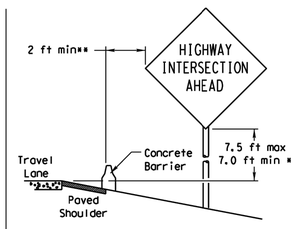
GREATER THAN 6 FT. WIDE

When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

BEHIND BARRIER



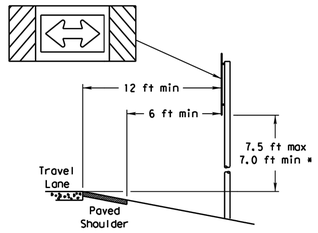
BEHIND GUARDRAIL



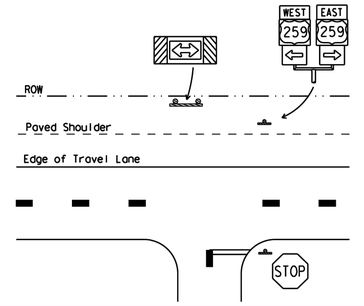
BEHIND CONCRETE BARRIER

**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

T-INTERSECTION



When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



* Signs shall be mounted using the following condition that results in the greatest sign elevation:

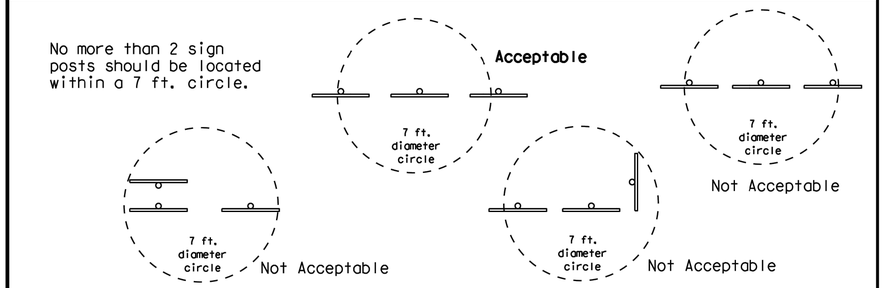
(1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or

(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

The maximum values may be increased when directed by the Engineer.

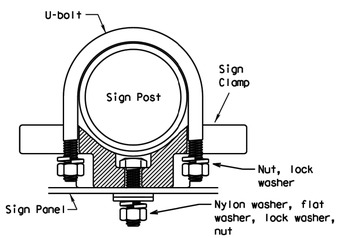
See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

The website address is:
http://www.txdot.gov/publications/traffic.htm



TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

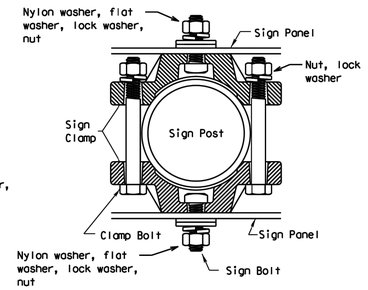


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

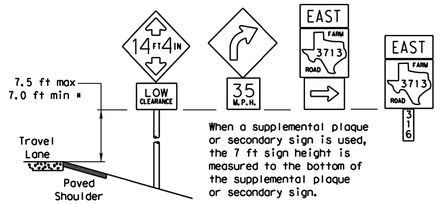
Sign clamps may be either the specific size clamp or the universal clamp.

Back-to-Back Signs



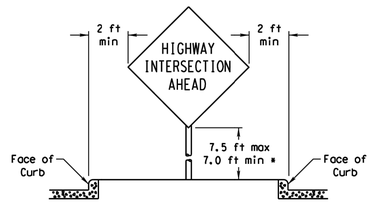
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



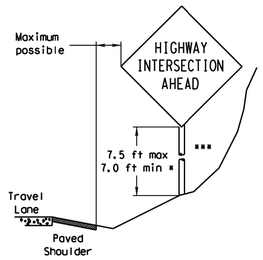
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

*** Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

SIGN & PAVEMENT MARKINGS
STANDARD DETAILS VI

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
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STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED PROFESSIONAL ENGINEER
5/9/2025

DATE:
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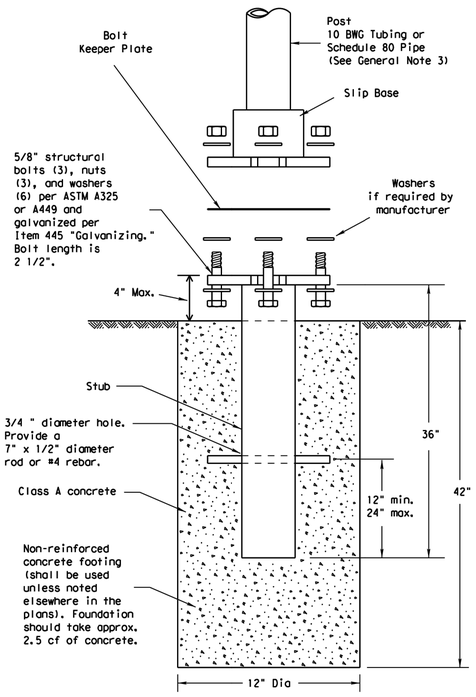
TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



SM RD SGN ASSM TY XXXXX(X)SA(X-XXXX)

NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer_list.htm The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

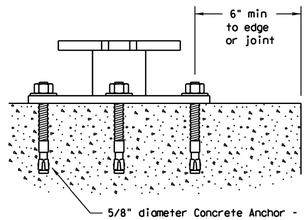
1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   0.134" nominal wall thickness
   Seamless or electric-resistance welded steel tubing or pipe
   Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   Other steels may be used if they meet the following:
   55,000 PSI minimum yield strength
   70,000 PSI minimum tensile strength
   20% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
   Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
   Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
   Schedule 80 Pipe (2.875" outside diameter)
   0.276" nominal wall thickness
   Steel tubing per ASTM A500 Gr C
   Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
   46,000 PSI minimum yield strength
   62,000 PSI minimum tensile strength
   21% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
   Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

Foundation
1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support
1. Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

CONCRETE ANCHOR



Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

SM RD SGN ASSM TY XXXXX(X)SB(X-XXXX)

DATE:
FILE:

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

SIGN & PAVEMENT MARKINGS
STANDARD DETAILS VII

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

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STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED
PROFESSIONAL ENGINEER
5/9/2025

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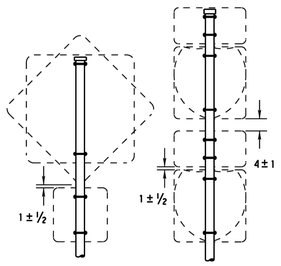

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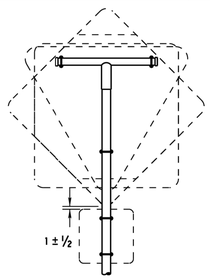
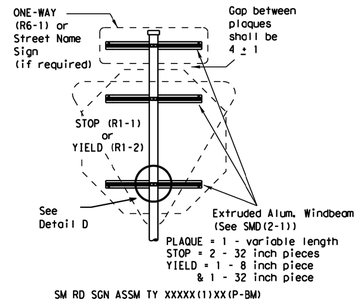


SM RD SGN ASSM TY XXXXX(1)XX(T)



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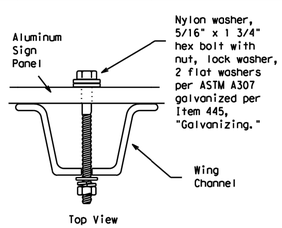
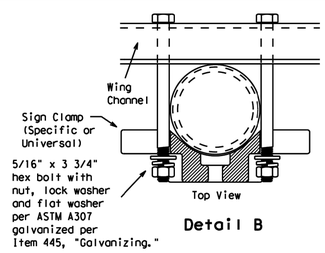
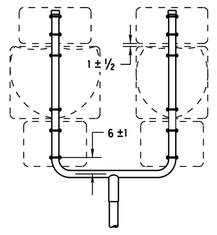


Detail A



Detail B



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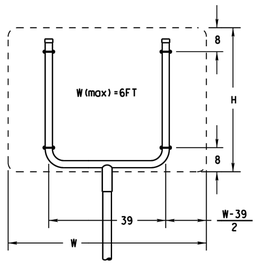

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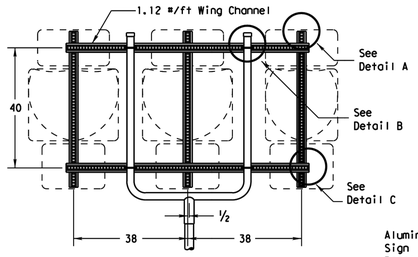

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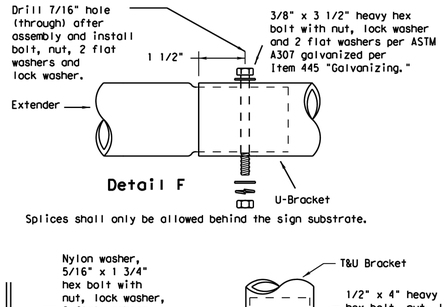
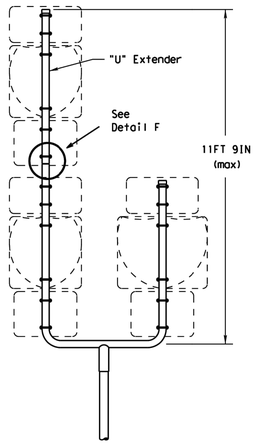
(See Note 11)



Detail F

Splices shall only be allowed behind the sign substrate.



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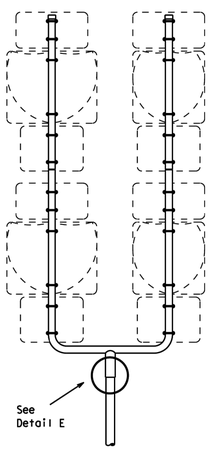

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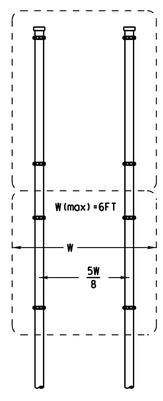
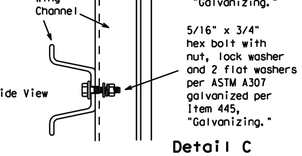
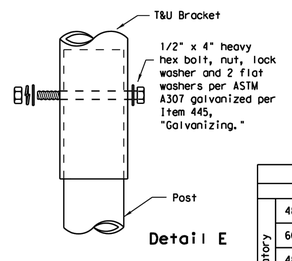


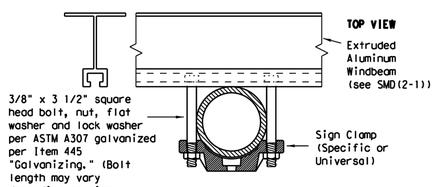
SM RD SGN ASSYM TY XXXXX(2)XX(P)



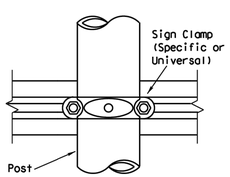
SIDE VIEW **Detail C**

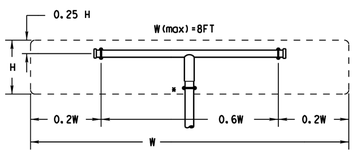


Detail E



Detail D

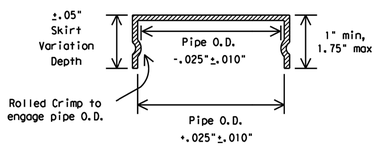




SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

All dimensions are in english unless detailed otherwise.

FRICTION CAP DETAIL



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

GENERAL NOTES:

1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.

REQUIRED SUPPORT

	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

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REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	DIST	COUNTY		SHEET NO.

26C

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

SIGN & PAVEMENT MARKINGS
STANDARD DETAILS VIII

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

SCALE: AS NOTED	DGN. BY: AZ		
DATE: AS NOTED	DWN. BY: JFR		
JOB NO. 05668-0026-01	DWG. NO. --		
SUBMITTED: ----	SURV. BY: QUIDDITY		

STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED PROFESSIONAL ENGINEER
5/9/2025

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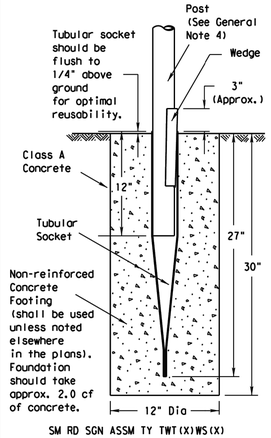
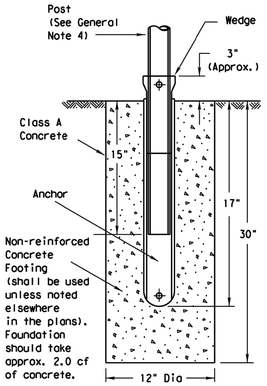
DATE:
FILE:

Wedge Anchor Steel System



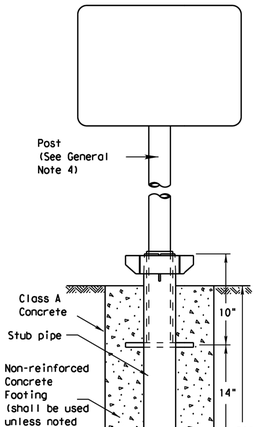
SM RD SGN ASSM TY TWT(X)WS(X)

Wedge Anchor High Density Polyethylene (HDPE) System

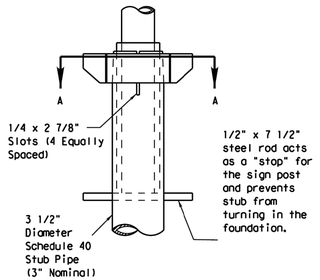


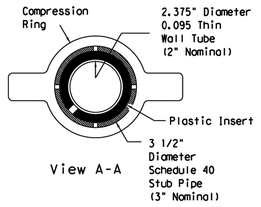
SMD RD SGN ASSM TY TWT(X)WP(X)

Universal Anchor System with Thin-Walled Tubing Post

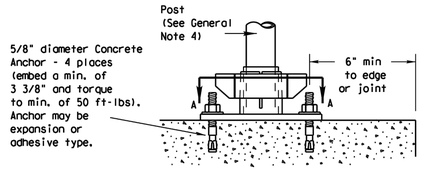


SM RD SGN ASSM TY TWT(X)UA(P)

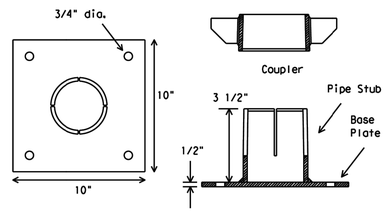




Plastic insert must be used when using the TWT with either the Universal Anchor System or the Bolt Down Universal Anchor System. The insert should be approx. 10" long and cover the tubing from just above the top of the stub pipe to the bottom of the sign post when using the Universal Anchor System. The insert should be cut to approx. 4 1/2" when used with the Bolt Down Universal Anchor System.

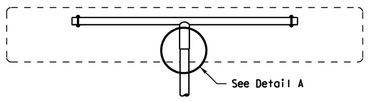


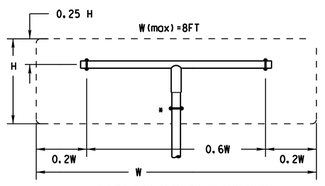
Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. A heavy hex nut per ASTM A563 and hardened washer per ASTM F436. The stud bolt shall have minimum yield and ultimate tensile strengths of 50 and 75 ksi, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Top of bolt shall extend at least flush with top of nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 3 3/8" minimum embedment, shall have a minimum allowable tension and shear of 2450 and 1525 psi, respectively. Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations.



SM RD SGN ASSM TY TWT(X)UB(P)

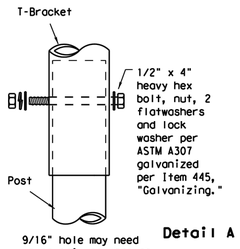
Sign Installation Using a Prefabricated T-Bracket for Thin-Wall Tubing Post





SM RD SGN ASSM TY TWT(X)XX(T)

(* - See General Note 6)



9/16" hole may need to be drilled through post to accommodate bolt.

Detail A

NOTE

The devices shall be installed per manufacturer's recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

1. The Wedge Anchor System and the Universal Anchor System with thin wall tubing post may be used to support up to 10 square feet of sign area.
2. The tubular socket, wedge and prefabricated T-bracket shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to the approval of the TxDOT Traffic Standards Engineer.
3. Except for posts (13 BWG Tubing), clamps, nuts and bolts, all components shall be prequalified. A list of prequalified vendors may be obtained from the Material Producer List web page. The website address is: http://www.txdot.gov/business/producer list.htm
4. Material used as post with this system shall conform to the following specifications:
   13 BWG Tubing (2.375" outside diameter) (TWT)
   0.095" nominal wall thickness
   Seamless or electric-resistance welded steel tubing
   Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   Other steels may be used if they meet the following:
   55,000 PSI minimum yield strength
   70,000 PSI minimum tensile strength
   18% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of .083" to .099"
   Outside diameter (uncoated) shall be within the range of 2.369" to 2.381"
   Galvanization per ASTM 123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
5. Sign blanks shall be the sizes and shapes shown on the plans.
6. Additional sign clamp required on the "T-bracket" post for 24" high signs. Place clamp at least 3" above bottom of sign when possible.
7. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
8. See the Traffic Operations Division website for detailed drawings of sign clamps and Wedge Anchor System components. The website address is: http://www.txdot.gov/publications/traffic.htm

WEDGE ANCHOR SYSTEM INSTALLATION PROCEDURE

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Place concrete into hole until it is approximately flush with the ground. Concrete shall be Class A.
3. Insert tubular socket into concrete until top of socket is approximaely 1/4 " above the concrete footing.
4. Plumb the socket. Allow a minimum 4 days for concrete to set, unless otherwise directed by Engineer..
5. Attach the sign to the sign post.
6. Insert the sign post into socket and align sign face with roadway.
7. Drive the wedge into the socket to secure post. This will leave approximately 3 inches of the wedge exposed.

UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURE

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. Insert base post in hole to depths shown and backfill hole with concrete.
3. Level and plumb the base post using a torpedo level and allow concrete adequate time to set. The bottom of the slots provided in the stub pipe shall remain above the top of the concrete foundation.
4. Attach the sign to the sign post.
5. Install plastic insert around bottom of post.
6. Insert sign post into base post. Lower until the post comes to rest on steel rod.
7. Seat compression ring using a hammer. Typically, the top of compression ring will be approximately level with top of stub post when optimally installed.
8. Check sign post by hand to ensure it is unable to turn. If loose, increase the tightening of the compression ring.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS WEDGE & UNIVERSAL ANCHOR WITH THIN WALL TUBING POST

SMD(TWT)-08

©TxDOT July 2002	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08 REVISIONS	CONT	SECT	JOB	HIGHWAY
	DIST	COUNTY		SHEET NO.

26E

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

SIGN & PAVEMENT MARKINGS STANDARD DETAILS IX

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

SCALE:	AS NOTED	DGN. BY:	AZ
DATE:	AS NOTED	DWN. BY:	JFR
JOB NO.	05668-0026-01	DWG. NO.	--
SUBMITTED:	----	SURV. BY:	QUIDDITY

STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED
PROFESSIONAL ENGINEER
5/9/2025

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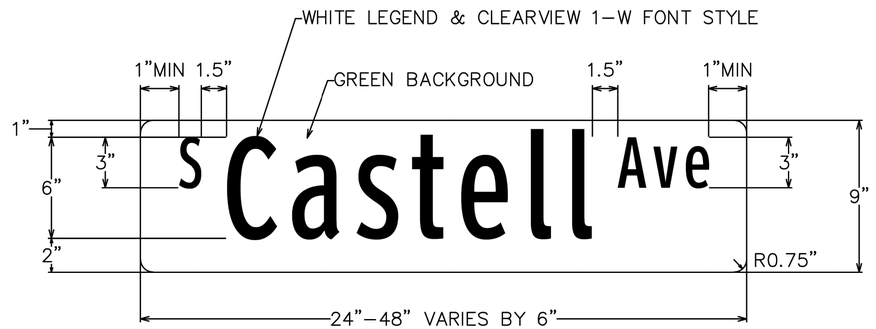
STREET SIGN DETAIL - GROUND MOUNT



Height	9"
Length	24" min 48" max 6" increments in length
Thickness	0.080"
Substrate	Flat aluminum sheeting with ¾" radius circular fillets at corners conforming to the requirements of ASTM B 209, Alloys 6061–T–6, or 5052–H38.
Sign Face Materials	Green film over High Intensity Prismatic sheeting
Legend	Legends shall be Clearview 1–W font style. Reduced spacing between the letters or words should not be used as a means of reducing the overall size of a street name sign unless approved by the City Traffic Engineer.
Color	White legend on green background

Notes:

1. Street name signs shall be double sided when center mounted on top of sign post. Only one street name sign should be installed on top of sign post with STOP or YIELD sign.
2. When two sets of street name signs are required (e.g. at "T" intersections), one double-sided street name sign shall be mounted on sign post. The sign assembly shall meet minimum height requirements as required in the Texas Manual on Uniform Traffic Control Devices (TMUTCD). When required, DEAD END (W14-1a) or NO OUTLET (W14-2a) signs shall also be mounted on the sign post.
3. Street name signs greater than 36" long and center mounted on top of sign post shall be mounted on post top bracket with 12" slot. All other street name signs center mounted on top of sign post shall be mounted on post top bracket with 5 ¼" slot.
4. Street name signs mounted on sign post shall be mounted with double-sided round pole brackets. Two holes should be punched in the center of the 9" street name sign blank 1" from edge of the blank with 7"spacing between holes.
5. The lettering for names of streets shall be composed of a combination of lower-case letters with initial upper-case letters. Acceptable abbreviations per TMUTCD may be used except for the street name itself.
6. Red background (red film over High Intensity Prismatic) should be used for private street name signs.

Street Sign Detail - Ground Mount		
ISSUE DATE: February 2013	DWG. NO: ST-024	SCALE: N.T.S.
DRAWN BY: RAS	CONTACT: GF	SHEET: 1 OF 1

City of New Braunfels
ENGINEERING DIVISION
424 S. CASTELL AVE.
NEW BRAUNFELS, TEXAS 78130
PHONE: 830 221 4020
FAX: 830 626 3600

P:\2010 ENGINEERING-AUTOCAD\DETAILS\NB-PUBLIC WORKS DETAILS\NB-UNAPPROVED DETAILS-2013\ST-2013.024 STREET SIGN DETAIL - GROUND MOUNT.DWG

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

SIGN & PAVEMENT MARKINGS
STANDARD DETAILS X

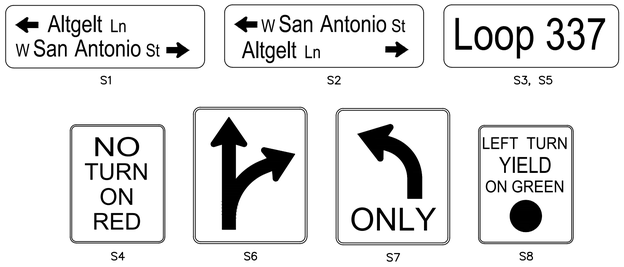
QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215•New Braunfels, TX 78132 • 830.203.6630

SCALE: AS NOTED DGN. BY: AZ
DATE: AS NOTED DWN. BY: JFR
JOB NO. 05668–0026–01 DWG. NO. ––
SUBMITTED: ––––– SURV. BY: QUIDDITY

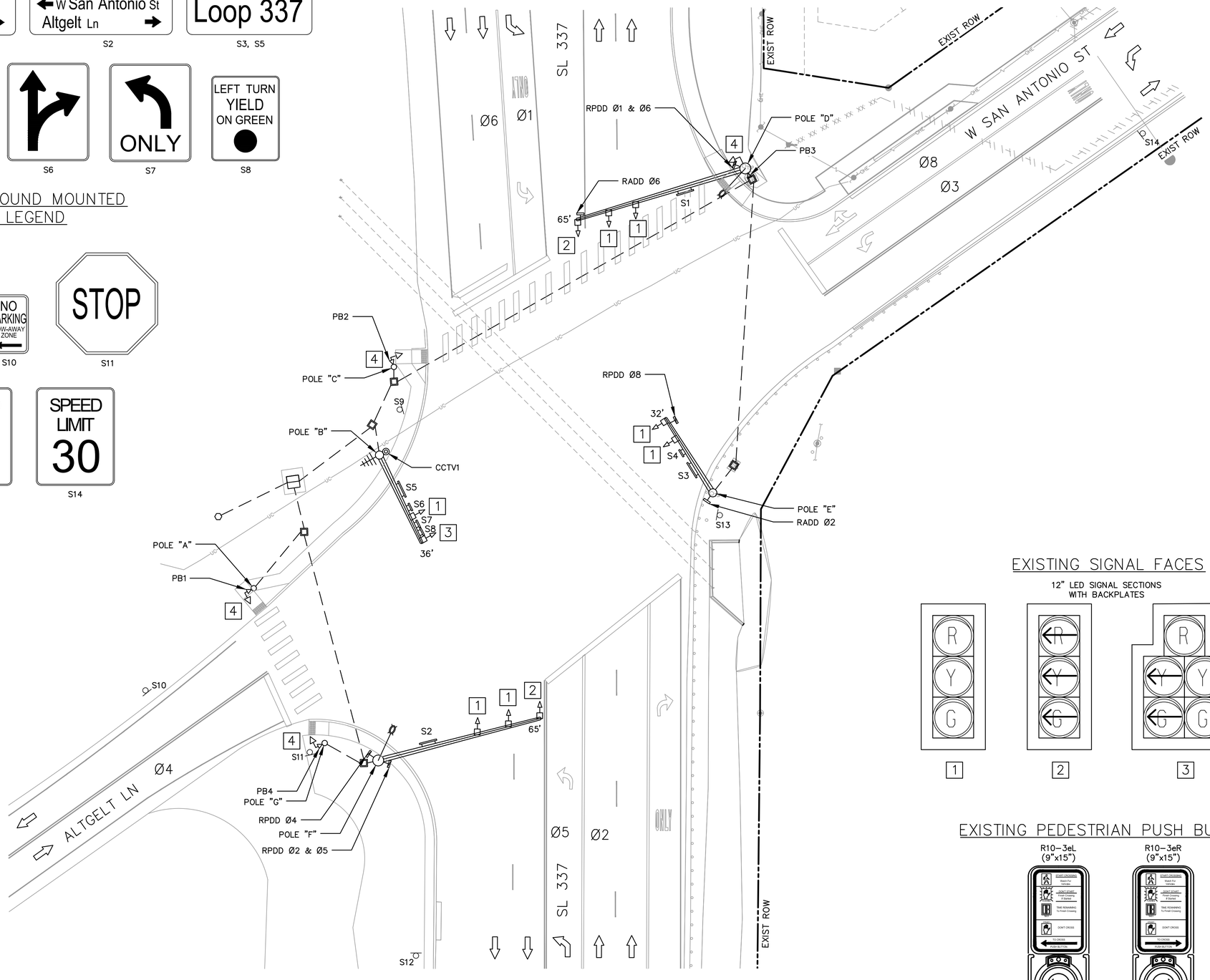
STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED PROFESSIONAL ENGINEER
5/9/2025

K:\05668\05668–0026–01 san antonio street and water lane roadway improvements\2 design phase\CAD\Plans\05668–0026–01–SP–Sign & Pavement Details.dwg May 09, 2025 – 11:30am JFR

EXISTING MAST ARM SIGN LEGEND



EXISTING GROUND MOUNTED SIGN LEGEND

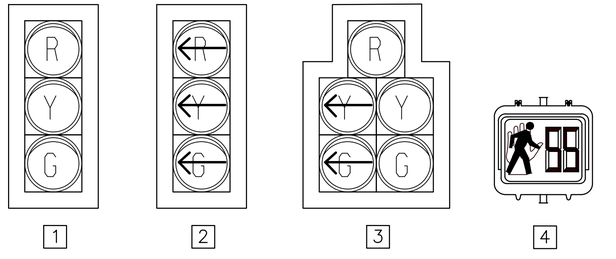


LEGEND

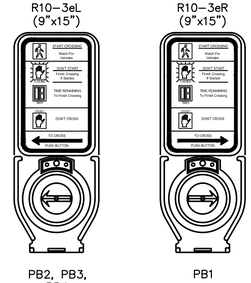
- EXISTING MAST ARM AND POLE
- EXISTING PEDESTRIAN POLE
- EXISTING LED SIGNAL HEAD
- EXISTING PEDESTRIAN SIGNAL HEAD
- EXISTING PEDESTRIAN PUSH BUTTON
- EXISTING CONDUIT
- EXISTING GROUND BOX
- EXISTING OVERHEAD SIGN
- EXISTING RADAR PRESENCE DETECTOR
- EXISTING RADAR ADVANCE DETECTOR
- EXISTING CCTV
- EXISTING SPREAD SPECTRUM RADIO ANTENNA (YAGI)
- EXISTING LUMINAIRE ARM
- EXISTING ELECTRICAL SERVICE
- EXISTING CONTROLLER CABINET
- EXISTING GROUND MOUNTED SIGN
- DIRECTION OF TRAFFIC FLOW
- EXISTING ROW
- EXISTING GUARD RAIL
- EXISTING OVERHEAD ELECTRIC
- EXISTING GAS LINE
- EXISTING WATER LINE
- EXISTING WASTEWATER LINE
- EXISTING WASTEWATER MANHOLE
- EXISTING FIBER OPTIC CABLE
- EXISTING STORM SEWER
- EXISTING POWER POLE

EXISTING SIGNAL FACES

12" LED SIGNAL SECTIONS WITH BACKPLATES



EXISTING PEDESTRIAN PUSH BUTTONS



0 5 10 20 40 60
SCALE: 1" = 20'

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO TO WATER LANE)

EXISTING TRAFFIC SIGNAL LAYOUT LOOP 337 & SAN ANTONIO

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

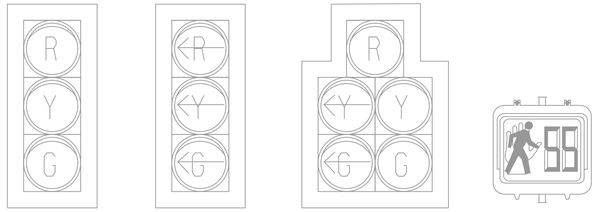
SCALE:	AS NOTED	DGN. BY:	THC
DATE:	AS NOTED	DWN. BY:	TGT
JOB NO.	05668-0026-01	DWG. NO.	--
SUBMITTED:	----	SURV. BY:	QUIDDITY

STATE OF TEXAS
TYLER H. COWSER
147988
LICENSED PROFESSIONAL ENGINEER
Tyler Cowser P.E., PTOE
5/2/2025

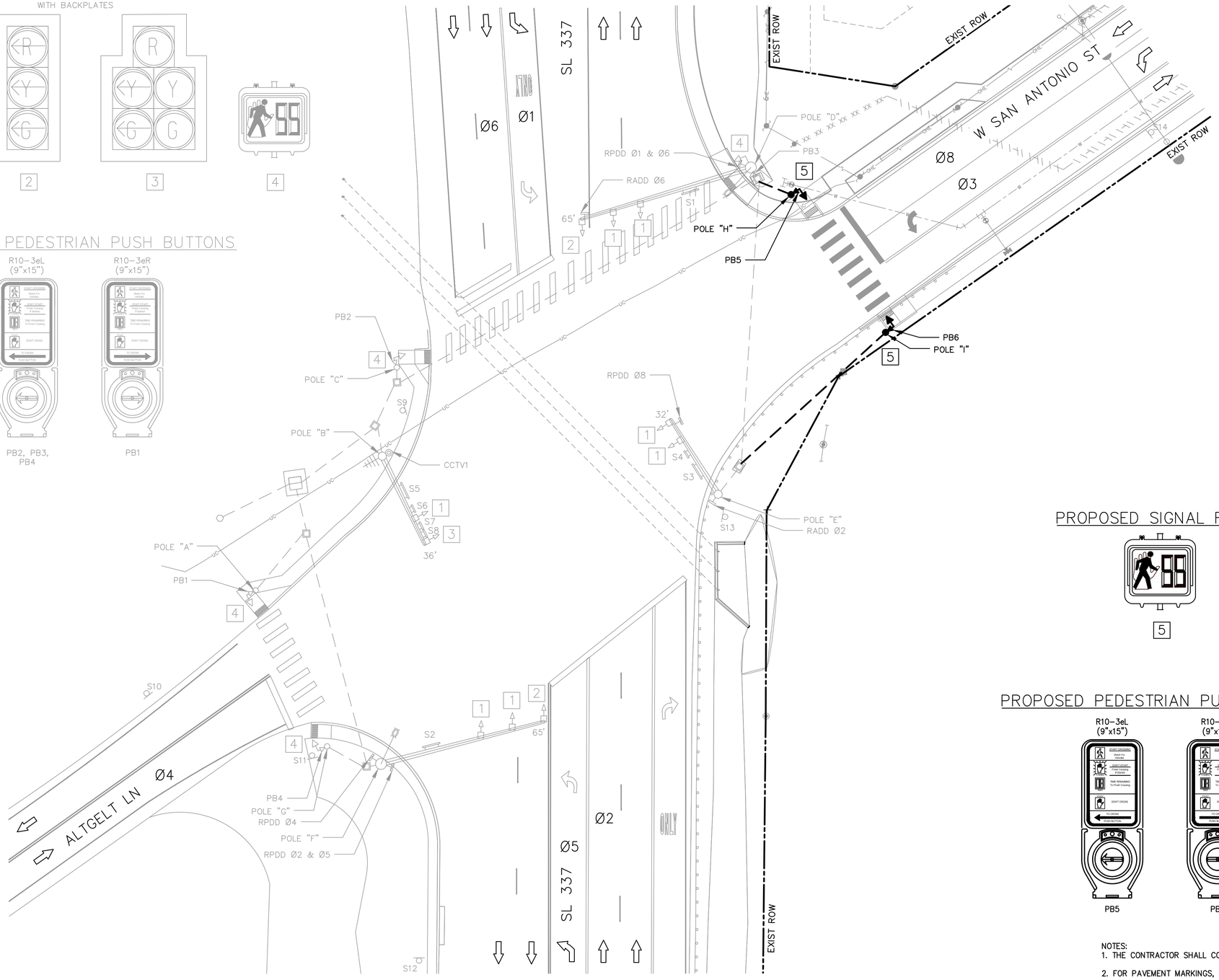
K:\05668\05668-0026-01 San Antonio Street and Water Lane Roadway Improvements\2 Design Phase\CAD\traffic\0 SL 337 & San Antonio Signal Mod.dwg May 01, 2025 - 6:15pm thc

EXISTING SIGNAL FACES

12" LED SIGNAL SECTIONS
WITH BACKPLATES



EXISTING PEDESTRIAN PUSH BUTTONS

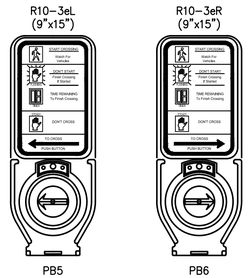


LEGEND

- PROPOSED PEDESTRIAN POLE
- PROPOSED PEDESTRIAN SIGNAL HEAD
- PROPOSED PEDESTRIAN PUSH BUTTON
- PROPOSED CONDUIT (TRENCH)
- EXISTING MAST ARM
- EXISTING PED POLE
- EXISTING LED SIGNAL HEAD
- EXISTING PEDESTRIAN SIGNAL HEAD
- EXISTING PEDESTRIAN PUSH BUTTON
- EXISTING CONDUIT
- EXISTING GROUND BOX
- EXISTING OVERHEAD SIGN
- EXISTING RADAR PRESENCE DETECTOR
- EXISTING RADAR ADVANCE DETECTOR
- EXISTING CCTV
- EXISTING SPREAD SPECTRUM RADIO ANTENNA (YAGI)
- EXISTING LUMINAIRE ARM
- EXISTING ELECTRICAL SERVICE
- EXISTING CONTROLLER CABINET
- EXISTING GROUND MOUNTED SIGN
- DIRECTION OF TRAFFIC FLOW
- EXISTING ROW

PROPOSED SIGNAL FACES

PROPOSED PEDESTRIAN PUSH BUTTONS



NOTES:
1. THE CONTRACTOR SHALL CONNECT FIELD WIRING TO CONTROLLER.
2. FOR PAVEMENT MARKINGS, SEE PAVEMENT MARKING LAYOUT.
3. CONTRACTOR SHALL LOCATE UTILITIES PRIOR TO THE INSTALLATION OF ANY TRAFFIC SIGNAL ELEMENTS.
4. PROPOSED PEDESTRIAN SIGNALS AND PEDESTRIAN PUSH BUTTONS MUST BE THE SAME BRAND AND COLOR AS THE EXISTING PEDESTRIAN SIGNALS AND PEDESTRIAN PUSH BUTTONS.

0 5 10 20 40 60
SCALE: 1" = 20'

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO TO WATER LANE)

PROPOSED TRAFFIC SIGNAL LAYOUT LOOP 337 & SAN ANTONIO

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2957 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

SCALE: AS NOTED
DATE: AS NOTED
JOB NO. 05668-0026-01
SUBMITTED: ----
DGN. BY: THC
DWN. BY: TGT
DWG. NO. --
SURV. BY: QUIDDITY

STATE OF TEXAS
TYLER H. COWSER
147989
LICENSED
PROFESSIONAL ENGINEER
Tyler Cowser P.E., PTOE
5/2/2025

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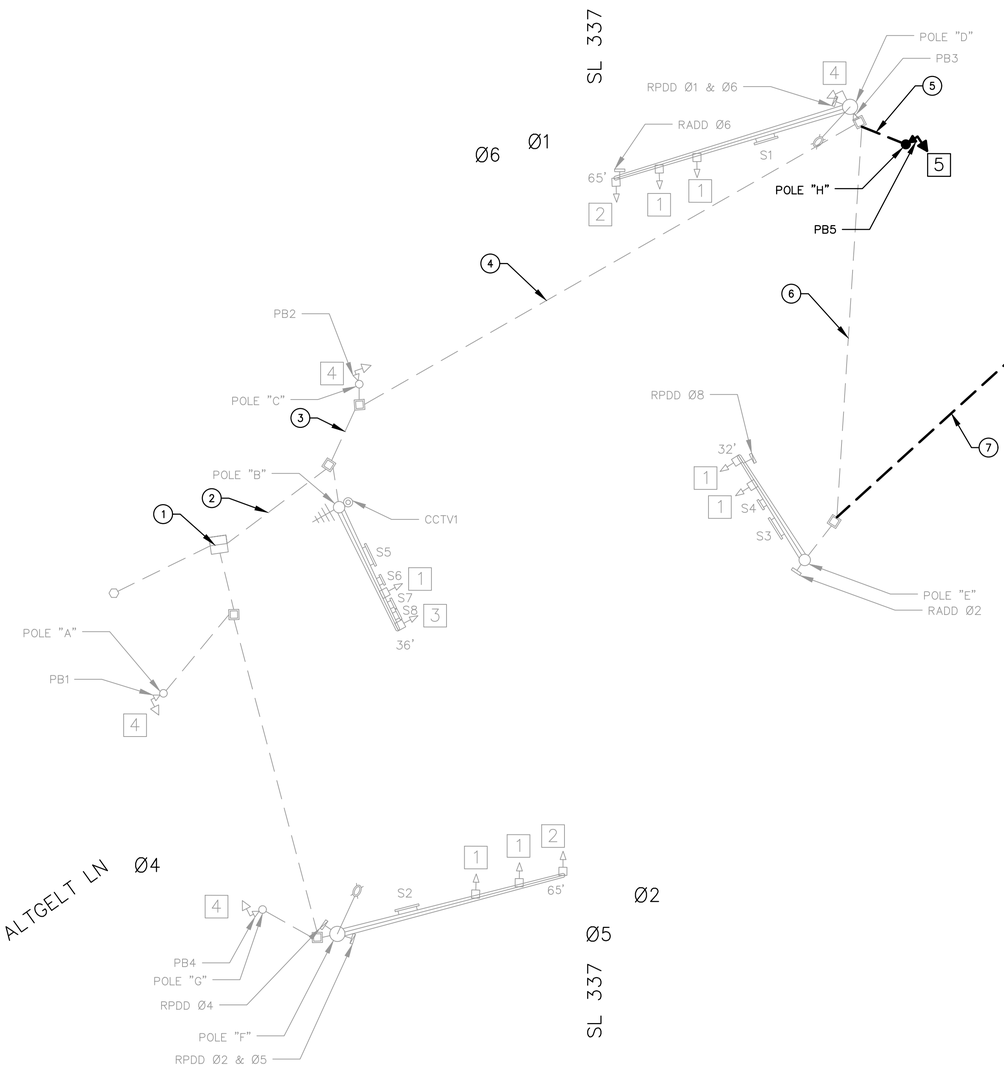
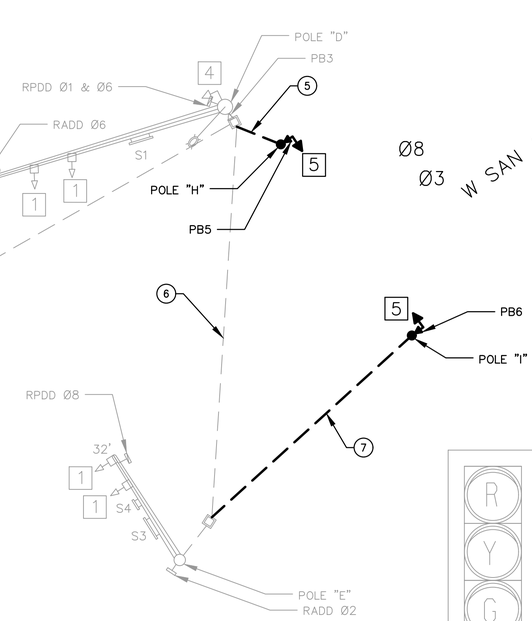
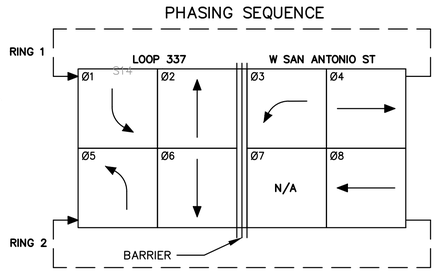
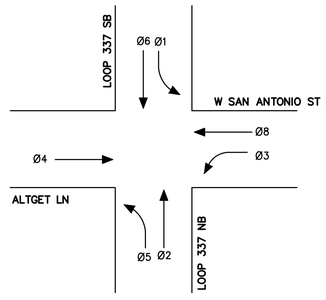
PROPOSED CONDUIT AND CONDUCTOR TABLE										
	RUN NUMBER		1	2	3	4	5	6	7	TOTAL (LF)
	CONDUIT SIZE IN INCHES						3.00		3.00	95
	EXISTING CONDUIT			X	X	X		X		
	NUMBER OF CONDUITS						1		1	
	RUN LENGTH (FT)		10	40	20	155	20	110	75	
	TRENCH (T)/BORE (B)/CONTROLLER (C)		C				T		T	
CABLE	CIRCUIT			NUMBER OF CONDUCTORS						
#6 BARE	BARE BOND GROUND						1		1	95
4/C - #12 TYPE A	PED SIGNALS	PHASE 2	2	2	2	2	1	1	1	655
2/C - #14 TYPE C	PED PUSH BUTTONS	PHASE 2	2	2	2	2	1	1	1	655



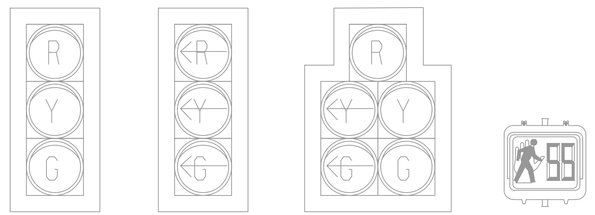






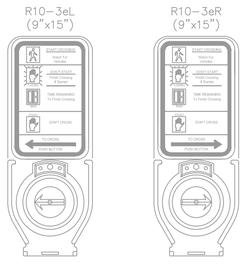
EXISTING SIGNAL FACES

12" LED SIGNAL SECTIONS WITH BACKPLATES

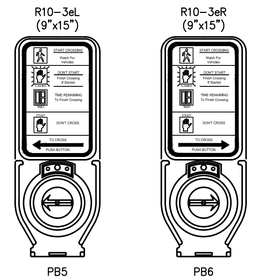


PROPOSED SIGNAL FACES

EXISTING PEDESTRIAN PUSH BUTTONS



PROPOSED PEDESTRIAN PUSH BUTTONS



0 5 10 20 40 60

SCALE: 1" = 20'

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO TO WATER LANE)

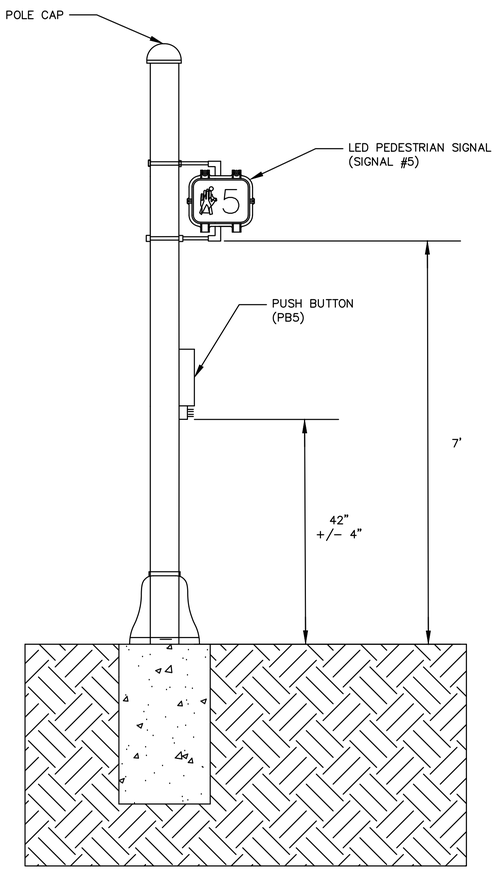
TRAFFIC SIGNAL DETAILS
LOOP 337 & SAN ANTONIO

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

SCALE: AS NOTED DGN. BY: THC
DATE: AS NOTED DWN. BY: TGT
JOB NO. 05668-0026-01 DWG. NO. --
SUBMITTED: ---- SURV. BY: QUIDDITY

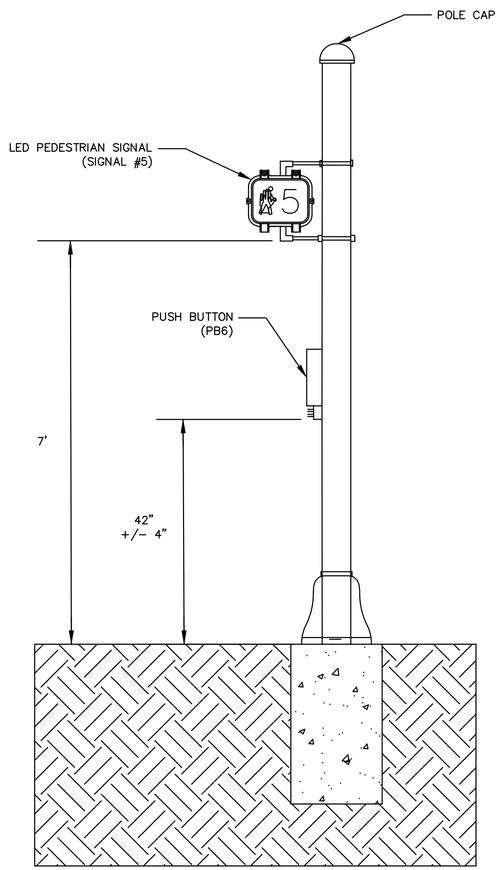
STATE OF TEXAS
TYLER H. COWSER
147989
LICENSED PROFESSIONAL ENGINEER
Tyler Cowser P.E., PTOE
5/2/2025

K:\05668\05668-0026-01 San Antonio Street and Water Lane Roadway Improvements\2 Design Phase\CAD\traffic\0 SL 337 & San Antonio Signal Mod.dwg May 01, 2025 - 6:16pm thc



POLE H
N.T.S.

PED POLE
ELEVATION DETAILS



POLE I
N.T.S.

0 5 10 20 40 60
SCALE: 1" = 20'

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO TO WATER LANE)

PROPOSED TRAFFIC SIGNAL ELEVATION DETAILS LOOP 337 & SAN ANTONIO

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

SCALE: AS NOTED DGN. BY: THC
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STATE OF TEXAS
TYLER H. COWSER
147989
LICENSED
PROFESSIONAL ENGINEER
Tyler Cowser P.E., PTOE
5/2/2025

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QUANTITY SUMMARY				
ITEM NO.	DESC. CODE	DESCRIPTION	UNIT	QTY
416	7042	DRILL SHAFT (TRF SIG POLE) (24 IN) *	LF	11.4
618	7060	CONDT (PVC) (SCH 80) (3")	LF	95
620	7009	ELEC CONDR (NO.6) BARE	LF	95
680	7011	INSTALL HWY TRF SIG (UPGRADE)	EA	1
682	7018	PED SIG SEC (LED) (COUNTDOWN)	EA	2
684	7009	TRF SIG CBL (TY A)(12 AWG)(4 CONDR)	LF	655
684	7080	TRF SIG CBL (TY C)(14 AWG)(2 CONDR)	LF	655
687	7001	PED POLE ASSEMBLY	EA	2
688	7001	PED DETECT PUSH BUTTON (APS)	EA	2

* SUBSIDIARY TO ITEM 687-7001

POLE & EQUIPMENT INFORMATION	
ITEM NO.	DESCRIPTION
EXISTING	
A	10' PEDESTAL POLE WITH A 24-A FOUNDATION WITH ONE LED COUNTDOWN PEDESTRIAN HEAD AND ONE ACCESSIBLE PEDESTRIAN SIGNAL UNIT.
B	36' MAST ARM ON A 19' POLE ON A 36-A FOUNDATION WITH ONE SPREAD SPECTRUM RADIO ANTENNA (YAGI) AND ONE CLOSED-CIRCUIT TELEVISION (CCTV1).
C	10' PEDESTAL POLE WITH A 24-A FOUNDATION WITH ONE LED COUNTDOWN PEDESTRIAN HEAD AND ONE ACCESSIBLE PEDESTRIAN SIGNAL UNIT.
D	65' MAST ARM ON A 30' POLE WITH LUMINAIRE ON A 48-A FOUNDATION WITH ONE RADAR PRESENCE DETECTION DEVICES (RPDD Ø1 & Ø6), ONE RADAR ADVANCE DETECTION DEVICE (RADD Ø6), ONE LED COUNTDOWN PEDESTRIAN HEAD AND ONE ACCESSIBLE PEDESTRIAN SIGNAL UNIT.
E	32' MAST ARM ON A 19' POLE ON A 30-A FOUNDATION WITH ONE ADVANCE DETECTION DEVICE (RADD Ø2) AND ONE RADAR PRESENCE DETECTION DEVICE (RPDD Ø8)
F	65' MAST ARM ON A 30' POLE WITH LUMINAIRRE ON A 48-A FOUNDATION WITH TWO RADAR PRESENCE DETECTION DEVICES (RPDD Ø2 & Ø5)(RPDD Ø4).
G	10' PEDESTAL POLE WITH A 24-A FOUNDATION WITH ONE LED COUNTDOWN PEDESTRIAN HEAD AND ONE ACCESSIBLE PEDESTRIAN SIGNAL UNIT.
CONTROLLER CABINET	TYPE 2 CONTROLLER
PROPOSED	
H	10' PEDESTAL POLE WITH A 24-A FOUNDATION AT 5.7' WITH ONE LED COUNTDOWN PEDESTRIAN HEAD AND ONE ACCESSIBLE PEDESTRIAN SIGNAL UNIT.
I	10' PEDESTAL POLE WITH A 24-A FOUNDATION AT 5.7' WITH ONE LED COUNTDOWN PEDESTRIAN HEAD AND ONE ACCESSIBLE PEDESTRIAN SIGNAL UNIT.

0 5 10 20 40 60

SCALE: 1" = 20'

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO TO WATER LANE)

PROPOSED TRAFFIC SIGNAL QUANTITIES LOOP 337 & SAN ANTONIO

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

SCALE: AS NOTED DGN. BY: THC
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STATE OF TEXAS
TYLER H. COWSER
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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.

DATE:
FILE:

GENERAL NOTES FOR ALL ELECTRICAL WORK

1. The location of all conduits, junction boxes, ground boxes, and electrical services is diagrammatic and may be shifted to accommodate field conditions.

2. Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC), TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA), and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association (CSA), Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Where reference is made to NEMA listed devices, International Electrotechnical Commission (IEC) listed devices will not be considered an acceptable equal to a NEMA listed device. Acceptable devices may have both a NEMA and IEC listing. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection. Replace or reinstall rejected material or equipment at no additional cost to the Department.

3. Miscellaneous nuts, bolts and hardware, except for high strength bolts, may be stainless steel when plans specify galvanized, provided the bolt size is ½ in. or less in diameter.

4. Provide the following test equipment as required by the Engineer to confirm compliance with the contract and the NEC: voltmeter, ammeter, megohm meter (1000 volt DC), ground resistance tester, torque wrenches, and torque screwdrivers. Ensure all equipment has been properly calibrated within the last year. Provide calibration certification to the Engineer upon request. Operate test equipment during inspection as requested by the Engineer.

5. Install grounding as shown on the plans and in accordance with the NEC. Ensure all metallic conduits; metal poles; luminaires; and metal enclosures are bonded to the equipment grounding conductor. Provide stranded bare copper or green insulated grounding conductors. Ground rods, connectors, and bonding jumpers are subsidiary to the various bid items.

6. When required by the Engineer, notify the Department in writing of materials from the Material Producers List (MPL) intended for use on each project. Prequalified materials are listed on the MPL on TxDOT's website under "Roadway Illumination and Electrical Supplies." No substitutions will be allowed for materials on this list.

CONDUIT

A. MATERIALS

1. Provide conduit, junction boxes, fittings, and hardware as per TxDOT Departmental Material Specification (DMS) 11030 "Conduit" and Item 618 "Conduit" of TxDOT's "Standard Specifications For Construction And Maintenance Of Highways, Streets, And Bridges," latest edition. Provide conduits listed under Item 618 on the MPL under "Roadway Illumination and Electrical Supplies." Provide conduit types according to the descriptive code or as shown on the plans. Do not substitute other types of conduits for those shown. Provide liquidtight flexible metal conduit (LFMC) when flexible conduit is called for on galvanized steel rigid metallic conduit (RMC) systems. Provide liquidtight flexible nonmetallic conduit (LFNC) when flexible conduit is called for on polyvinyl chloride (PVC) systems.

2. Provide galvanized steel RMC for all exposed conduits, unless otherwise shown on the plans. Properly bond all metal conduits.

3. Unless otherwise shown on the plans, provide junction boxes with a minimum size as shown in the following table, which applies to the greatest number of conductors entering the box through one conduit with no more than four conduits per box. When a mixture of conductor sizes is present, count the conductors as if all are of the larger size. For situations not applicable to the table, size junction boxes in accordance with NEC.

AWG	3 CONDUCTORS	5 CONDUCTORS	7 CONDUCTORS
#1	10" x 10" x 4"	12" x 12" x 4"	16" x 16" x 4"
#2	8" x 8" x 4"	10" x 10" x 4"	12" x 12" x 4"
#4	8" x 8" x 4"	10" x 10" x 4"	10" x 10" x 4"
#6	8" x 8" x 4"	8" x 8" x 4"	10" x 10" x 4"
#8	8" x 8" x 4"	8" x 8" x 4"	8" x 8" x 4"

4. Junction boxes with an internal volume of less than 100 cu. in. and supported by entering raceways must have threaded entries or hubs identified for the intended purpose and supported by connection of two or more rigid metal conduits. Secure conduit within 3 ft. of the enclosure or within 18 in. of the enclosure if all conduit entries are on the same side. Mechanically secure all junction boxes with an internal volume greater than 100 cu. inches.

5. Provide hot dipped galvanized cast iron or sand cast aluminum outlet boxes for junction boxes containing only 10 AWG or 12 AWG conductors. Do not use die cast aluminum boxes. Size outlet boxes according to the NEC.

6. Do not use intermediate metal conduit (IMC) or electrical metallic tubing (EMT) unless specifically required by the plan sheets. When EMT is called for, provide junction boxes made from galvanized steel sheeting, listed and approved for outdoor use, unless otherwise noted on the plans. Size all galvanized steel junction boxes in accordance with the NEC. Provide junction boxes for IMC conduit systems that meet the same requirements for junction boxes used with RMC systems.

7. Provide PVC junction boxes intended for outdoor use on PVC conduit systems, unless otherwise noted on the plans.

8. Provide PVC elbows in PVC conduit systems, unless otherwise shown on the plans. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the PVC conduit system. When galvanized steel RMC elbows are specifically called for in the plans and any portion of the RMC elbow is buried less than 18 in., ground the RMC elbow by means of a grounding bushing on a rigid metal extension. Grounding of the rigid metal elbow is not required if the entire RMC elbow is encased in a minimum of 2 in. of concrete. PVC extensions are allowed on these concrete encased rigid metal elbows. RMC or PVC elbows are subsidiary to various bid items.

9. When required, provide High-Density Polyethylene (HDPE) conduit with factory installed internal conductors according to Item 622 "Duct Cable." At the Contractor's request and with approval by the Engineer, substitute HDPE conduit with no conductors for bored schedule 40 or schedule 80 PVC conduit bid under Item 618. Ensure bored HDPE substituted for PVC is schedule 40 and of the same size PVC called for in the plans. Ensure the substituted HDPE meets the requirements of Item 622, except that the conduit is supplied without factory-installed conductors. Make the transition of the HDPE conduit to PVC (or RMC elbow when required) at the bore pit. Provide conduit of the size and schedule as shown on the plans. Do not extend substituted conduit into ground boxes or foundations. Provide PVC or galvanized steel RMC elbows as called for at all ground boxes and foundations.

10. Use two-hole straps when supporting 2 in. and larger conduits. On electrical service poles, properly sized stainless steel or hot dipped galvanized one-hole standoff straps are allowed on the service riser conduit.

B. CONSTRUCTION METHODS

1. Provide and install expansion joint conduit fittings on all structure-mounted conduits at the structure's expansion joints to allow for movement of the conduit. In addition, provide and install expansion joint fittings on all continuous runs of galvanized steel RMC conduit externally exposed on structures such as bridges at maximum intervals of 150 ft. When requested by the project Engineer, supply manufacturer's specification sheet for expansion joint conduit fittings. Repair or replace expansion joint fittings that do not allow for movement at no additional cost to the Department. Provide the method of determining the amount of expansion to the Engineer upon request. Do not use LFMC or LFNC as a substitute for the required expansion conduit fittings.

2. Space all conduit supports at maximum intervals of 5 ft. Install conduit spacers when attaching metal conduit to surface of concrete structures. See "Conduit Mounting Options" on ED(2). Install conduit support within 3 ft. of all enclosures and conduit terminations.

3. Do not attach conduit supports directly to pre-stressed concrete beams except as shown specifically in the plans or as approved by the Engineer.

4. Unless otherwise shown on the plans, jack or bore conduit placed beneath existing roadways, driveways, sidewalks, or after the base or surfacing operation has begun. Backfill and compact the bore pits below the conduit per Item 476 "Jacking, Boring, or Tunneling Pipe or Box" prior to installing conduit or duct cable to prevent bending of the connections.

5. When placing conduit in the sub-grade of new roadways, backfill all trenches with excavated material unless otherwise noted on the plans. When placing conduit in the sub-base of new roadways, backfill all trenches with cement-stabilized base as per requirements of Items 110 "Excavation", 400 "Excavation and Backfill for Structures", 401 "Flowable Backfill", 402 "Trench Excavation Protection", and 403 "Temporary Special Shoring."

6. Provide and place warning tape approximately 10 in. above all trenched conduit as per Item 618.

7. During construction, temporarily cap or plug open ends of all conduit and raceways immediately after installation to prevent entry of dirt, debris and animals. Temporary caps constructed of durable duct tape are allowed. Tightly fix the tape to the conduit opening. Clean out the conduit and prove it clear in accordance with Item 618 prior to installing any conductors.

8. Ensure conduit entry into the top of any enclosure is waterproof by installing conduit sealing hubs or using boxes with threaded bosses. This includes surface mounted safety switches, meter cans, service enclosures, auxiliary enclosures and junction boxes. Grounding bushings on water tight sealing hubs are not required.

9. Fit the ends of all PVC conduit terminations with bushings or bell end fittings. Provide and install a grounding type bushing on all metal conduit terminations.

10. Install a bonding jumper from each grounding bushing to the nearest ground rod, grounding lug, or equipment grounding conductor. Ensure all bonding jumpers are the same size as the equipment grounding conductor. Bonding of conduit used as a casing under roadways for duct cable is not required, if the duct extends the full length through the casing.

11. At all electrical services, install a 6 AWG solid copper grounding electrode conductor.

12. Place conduits entering ground boxes so that the conduit openings are between 3 in. and 6 in. from the bottom of the box. See the ground box detail on sheet ED(4).

*13. Seal ends of all conduits with duct seal, expandable foam, or by other methods approved by the Engineer. Seal conduit immediately after completion of conductor installation and pull tests. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a conduit sealant.

14. File smooth the cut ends of all mounting strut and conduit. Before installing, paint the field cut ends of all mounting strut and RMC (threaded or non-threaded) with zinc rich paint (94% or more zinc content) to alleviate overspray. Use zinc rich paint to touch up galvanized material as allowed under Item 445 "Galvanizing." Do not paint non-galvanized material with a zinc rich paint as an alternative for materials required to be galvanized.

* NOTE: UNDER SECTION B "CONSTRUCTION METHODS" ITEM 13, SEALS HAVE A MAXIMUM SPRAY FOAM DEPTH OF 2" – 2.5".

Texas Department of Transportation | Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUITS & NOTES

ED(1)-14

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO TO WATER LANE)

TRAFFIC SIGNAL STANDARDS ED(1)-14

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STATE OF TEXAS
TYLER H. COWSER
147989
LICENSED PROFESSIONAL ENGINEER
Tyler Cowser P.E., PTOE
5/2/2025

K:\05668\05668-0026-01 San Antonio Street and Water Lane Roadway Improvements\2 Design Phase\CAD\traffic\SL_137 & San Antonio Signal Standards.dwg May 01, 2025 - 6:16pm thc

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ELECTRICAL CONDUCTORS

A. MATERIAL INFORMATION

1. Provide Type XHHW insulated conductors in accordance with Departmental Material Specification (DMS)11040 "Conductors" and Item 620 "Electrical Conductors." Provide conductors as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies" Item 620. Color code insulated conductors in conformance with the NEC. Identify grounded (neutral) conductors with white insulation. Identify grounding conductors (ground wires) with green insulation or bare conductors. Identify ungrounded (hot) conductors with any color insulation except green, white, or gray. Keep color scheme consistent throughout the wiring system. Identify conductors 6 American Wire Gauge (AWG) and smaller by continuous color jacket. Identify electrical conductors 4 AWG and larger by continuous color jacket or by colored tape. When identifying conductors with colored tape, mark at least 6 in. of the conductor's insulation with half laps of tape.
2. Provide a solid copper 6 AWG grounding electrode conductor to bond the electrical service equipment to the concrete encased grounding electrode or the ground rod at the service location. Connect the grounding electrode conductor to the ground rod with a UL listed connector in accordance with DMS 11040. Connect the grounding electrode conductor to the concrete encased grounding electrode as shown in the plans.
3. Where two or more circuits are present in one conduit or enclosure, permanently identify the conductors of each branch circuit by attaching a non-metallic tag around both circuit conductors at each accessible location. Provide tags with two straps, large enough to indicate circuit number, letter, or other identification as shown in the plans. Print circuit identification on the tag with a permanent marker.
4. Use listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors for splicing as specified in DMS 11040. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Provide UL listed gel-filled insulating splice covers. Splicing materials, insulating materials, breakaway disconnects, splice covers, and fuse holders are subsidiary to various bid items.

B. CONSTRUCTION METHODS

1. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the conduit system. After installing conductors in conduit, perform conductor pull test. If a conductor cannot be freely pulled, make any needed alterations or repairs at no additional cost to the department. Perform insulation resistance tests in accordance with Item 620. Coordinate with the Engineer to witness the tests.
2. Leave 2 ft. minimum, 3 ft. maximum length for each conductor up to the splice in ground boxes. Leave 3 ft. minimum, 4 ft. maximum length of conductor in ground boxes when pulled through with no splice. Leave 1 ft. minimum, 1.5 ft. maximum length of conductor at enclosures, weatherheads and pole bases.
3. Make splices only in junction boxes, ground boxes, pole bases, or electrical enclosures and use only listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors. Insulate splices with heavy wall heat shrink tubing or gel-filled insulating splice covers to provide a watertight splice. Overlap conductor insulation with heat shrink tubing a minimum of 2 in. past both sides of the splice. Where heat shrink tubing may not shrink sufficiently to provide a watertight seal around the individual conductors, prior to heating the tubing, increase the diameter of the conductor insulation using hot melt adhesive tape to provide a watertight seal between the individual conductors and the heat shrink tubing. Ensure the tape extends past the heat shrink tubing. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Heat shrink tubing that appears to have been burned, or overheated, is considered defective and must be replaced.
4. Size and install gel-filled insulating splice covers according to manufacturer's specifications when used in place of heat shrink tubing.
5. Wire nuts with factory applied waterproof sealant may be used for 8 AWG or smaller conductors in above ground junction boxes, but not in pole bases or ground boxes. Install wire nuts in an upright position to prevent the accumulation of water.
6. Support conductors in illumination poles with a J-hook at the top of the pole.
7. When terminating conductors, remove the insulation and jacketing material without nicking the individual strands of the conductor. Conductors with nicked individual conductor strands or removed strands will be considered damaged.
8. Replace conductors and cables that are damaged beyond repair or that fail an insulation resistance test at no additional cost to the department.
9. Do not repair damaged conductors with duct tape, electrical tape, or wire nuts. Use only approved splicing methods.
10. Do not terminate more than one conductor under a single connector, unless the connector is rated for multiple conductors. Do not exceed the pressure connector's listing for maximum number and size of conductors allowed.
11. Install breakaway connectors on conductors bid under Item 620 whenever those conductors pass through a breakaway support device. Follow manufacturer's instructions when terminating conductors to breakaway connectors. Properly torque threaded connections. Proper terminations are critical to the safe operation of breakaway devices. Trim waterproofing boots on breakaway connectors to fit snugly around the conductor to ensure waterproof connection. Only one conductor may enter a single opening in a boot. Provide waterproof boots with the correct number of openings. Leave unused openings factory sealed. Use prequalified breakaway connectors as shown on the MPL.
12. Provide and install a separate stranded equipment grounding conductor (EGC) in all conduits that contain circuit wiring of 50 volts or more. Unless shown elsewhere, size the EGC to be the same size as the largest current carrying conductor contained in the conduit. Ensure all EGCs are bonded together at every accessible location. For traffic signal installations, provide a minimum size 8 AWG EGC. The EGC is paid for under Item 620.

C. TEMPORARY WIRING

1. Install temporary conductors and electrical equipment in accordance with the NEC article "Temporary Installations" and Department standard sheets.
2. Provide a ground fault circuit interrupter (GFCI) for power outlets for portable electrical equipment, power tools, ice machines, ice storage bins and refrigerators located outdoors at grade. GFCI may be any one of the following: molded cord and plug set, receptacle, or circuit breaker type.
3. Use listed wire nuts with factory applied sealant for temporary wiring where approved.
4. Enclose conductor splices within a listed enclosure or ground box, or ensure the splices are more than 10 ft. above grade vertically and more than 5 ft. horizontally from any metal structure. Where installing temporary conductors in areas subject to vehicle traffic or mobile construction equipment, ensure the vertical clearance to ground is at least 18 ft. when measured at the lowest point. Ground messenger wires that support power conductors in conformance with the NEC.
5. Protect and when necessary repair any existing electrical conduits uncovered during the construction process in a timely manner and in conformance with the NEC.

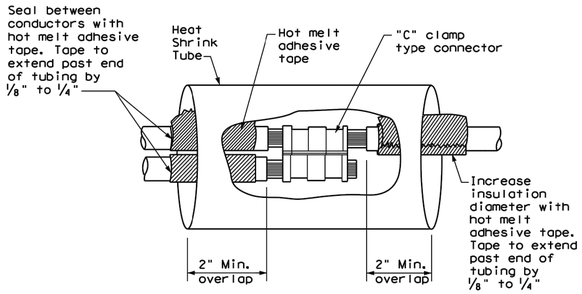
GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

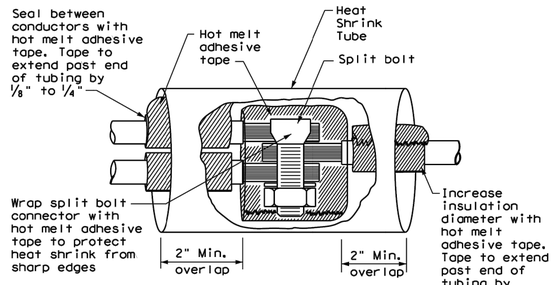
1. Provide and install a grounding electrode at electrical services. Provide ground rods according to DMS 11040 and the plans. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets. Concrete encased grounding electrodes may be called for in specific locations including electrical service, see individual plan sheets.

B. CONSTRUCTION METHODS

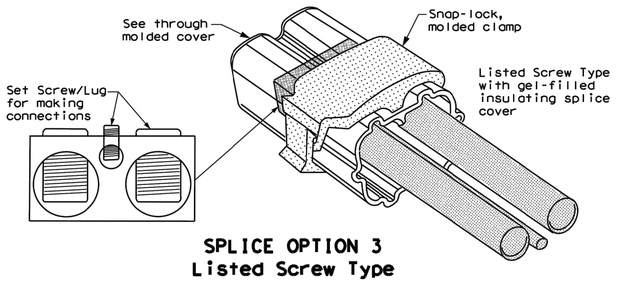
1. Furnish auxiliary ground rods for lightning protection and install in soil, concrete, or both, as called for in the plans. For ground rods installed in concrete, ensure the connection of the conductor to the ground rod is readily accessible for inspection or repairs. For ground rods installed in soil, ensure that the upper end is between 2 to 4 in. below finished grade.
2. Do not place ground rods in the same drilled hole as a timber pole.
3. Install ground rods so the imprinted part number is at the upper end of the rod.
4. Remove all non-conductive coatings such as concrete splatter from the rod at the clamp location.
5. Route all conductors as short and straight as possible for connection to lightning protection ground rods. When a bend is required, ensure a minimum radius bend of four inches for these conductors.
6. Unless otherwise called for in the plans, protect grounding electrode conductors with non-metallic conduit. When protecting grounding electrode conductors with metal conduit, provide and install a grounding type bushing and properly sized bonding jumper on each end of the metal conduit.
7. Written authorization is required before installing a ground rod in a horizontal trench for rocky soil or a solid rock bottom.



SPLICE OPTION 1
Compression Type



SPLICE OPTION 2
Split Bolt Type



SPLICE OPTION 3
Listed Screw Type

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO TO WATER LANE)

TRAFFIC SIGNAL
STANDARDS ED(3)-14

Texas Department of Transportation | *Traffic Operations Division Standard*

ELECTRICAL DETAILS CONDUCTORS

ED(3)-14

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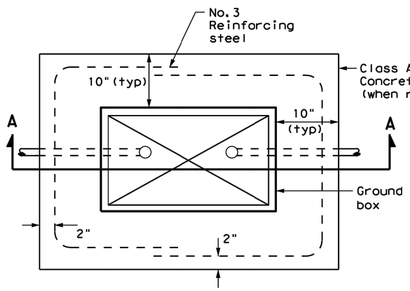
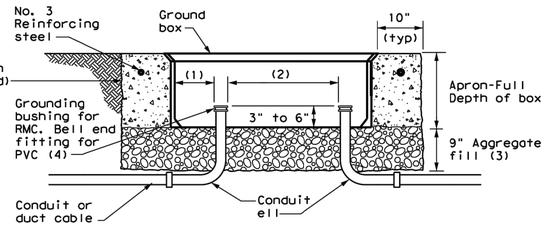


PLAN VIEW



SECTION A - A

APRON FOR GROUND BOX

(1) Uniformly space ends of conduits within the ground box. Position ends of conduits so that ground box walls do not interfere with the installation of grounding bushings or bell end fittings.

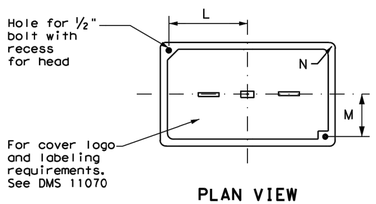
(2) Maintain sufficient space between conduits to allow for proper installation of bushing.

(3) Place aggregate under the box, not in the box. Aggregate should not encroach on the interior volume of the box.

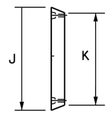
(4) Install a grounding bushing on the upper end of all RMC terminating in a ground box. Ground RMC elbows when any part of the elbow is less than 18 in. below the bottom of the ground box. Install a PVC bushing or bell end fitting on the upper end of all PVC conduits terminating in a ground box.

GROUND BOX DIMENSIONS	
TYPE	OUTSIDE DIMENSIONS (INCHES) (Width x Length X Depth)
A	12 X 23 X 11
B	12 X 23 X 22
C	16 X 29 X 11
D	16 X 29 X 22
E	12 X 23 X 17

GROUND BOX COVER DIMENSIONS								
TYPE	DIMENSIONS (INCHES)							
	H	I	J	K	L	M	N	P
A, B & E	23 1/4	23	13 3/4	13 1/2	9 7/8	5 1/8	1 3/8	2
C & D	30 1/2	30 1/4	17 1/2	17 1/4	13 1/4	6 3/4	1 3/8	2



PLAN VIEW



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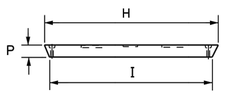

SIDE

GROUND BOX COVER

GROUND BOXES

A. MATERIALS

1. Provide polymer concrete ground boxes measuring 16x30x24 in. (WxLxD) or smaller in accordance with Departmental Material Specification (DMS) 11070 "Ground Boxes" and Item 624 "Ground Boxes."

2. Provide Type A, B, C, D, and E ground boxes as shown in the plans, and as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 624.

3. Ensure ground box cover is correctly labeled in accordance with DMS 11070.

4. Provide larger ground boxes in accordance with Item 624 and as shown in the plans.

B. CONSTRUCTION METHODS

1. Remove all gravel and dirt from conduit. Cap all conduits prior to placing aggregate and setting ground box. Provide Grade 3 or 4 coarse aggregate as shown on Table 2 of Item 302 "Aggregates for Surface Treatments." Ensure aggregate bed is in place and at least 9 inches deep, prior to setting the ground box. Install ground box on top of aggregate.

2. Cast ground box aprons in place. Reinforcing steel may be field bent. Ensure the depth of concrete for the apron extends from finished grade to the top of the aggregate bed under the box. Ground box aprons, including concrete and reinforcing steel, are subsidiary to ground boxes when called for by descriptive code.

3. Keep bolt holes in the box clear of dirt. Bolt covers down when not working in ground boxes.

4. Install all conduits and ells in a neat and workmanlike manner. Uniformly space conduits so grounding bushings and bell end fittings can easily be installed.

5. Temporarily seal all conduits in the ground box until conductors are installed.

6. Permanently seal conduits immediately after the completion of conductor installation and pull tests. Permanently seal the ends of all conduits with duct seal, expandable foam, or other method as approved. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a sealant.

7. When a ground rod is present in a ground box, bond all equipment grounding conductors together and to the ground rod with listed connectors.

8. When a type B or D ground box is stacked to meet volume requirements, it is allowable to cut an appropriately sized hole for conduit entry in the side wall at least 18 inches below grade.

9. If an existing ground box in the contract has a metal cover, bond the cover to the equipment grounding conductor with a 3 ft. long stranded bonding jumper the same size as the grounding conductor. The bonding jumper is subsidiary to various bid items. Verify existing ground boxes with metal covers are shown on the plans, with notes fully describing the work required.

10. If other ground boxes with metal covers are within the project limits but are not part of the contract, the Engineer may direct the Contractor to bond the metal covers, identifying the specific boxes in writing. This work will be paid for separately.

11. Bond metal ground box covers to the grounding conductor with a tank ground type lug.

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO TO WATER LANE)

TRAFFIC SIGNAL
STANDARDS ED(4)-14

Texas Department of Transportation — Traffic Operations Division Standard

ELECTRICAL DETAILS
GROUND BOXES

ED(4)-14

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STATE OF TEXAS
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5/2/2025

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TRAFFIC SIGNAL NOTES

1. Do not pass luminaire conductors through the signal controller cabinet.
2. Include an equipment grounding conductor in all conduits throughout the electrical system. Bond all exposed metal parts to the grounding conductor.
3. Provide roadway luminaires, when required, in accordance with the material and construction sections of Item 610, "Roadway Illumination Assemblies," except for performance testing of luminaires. Test installed roadway luminaires for proper operation as a part of the associated traffic signal system test.
4. If internally illuminated street name signs are approved for use, ground the fixture to the pole with a 12 AWG green XHHW conductor.
5. Bond anchor bolts to rebar cage in two locations using #3 bars or 6 AWG stranded copper conductors. Use listed mechanical connectors rated for embedment in concrete. See TXDOT standard TS-FD for further details.
6. Drill and tap signal poles for ½ in. X 13 UNC tank ground fitting. Provide and install tank ground fitting 4 in. to 6 in. directly below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Connect the electrical service grounding electrode conductor to the tank ground fitting. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. See Inset A detail for further information. Size service entrance conduit and branch circuit conduit as shown in the plans.
7. Mount electrical service enclosure and meter to signal pole with stainless steel bands. Ensure bands are a minimum width of ¾ in. Secure enclosures to bands using two-bolt brackets. Install brackets near top and bottom of each enclosure. Install properly sized stainless steel washers on each bolt in the enclosure. Band or drill and tap properly sized stand-off straps to signal pole for attaching conduit.
8. Conduct pull tests and insulation resistance tests on all illumination and power conductors as required in Item 620 "Electrical Conductors" and ED(3). To prevent electronics damage, do not conduct insulation resistance tests on traffic signal cables after termination.
9. Lock all enclosures and bolt down all ground box covers before applying power to the signal installation.
10. Terminate conduits entering the top of enclosures with a conduit-sealing hub or threaded boss such as meter hub. Install a grounding bushing on all metal conduits not connected to conduit-sealing hub or threaded boss. Bond the grounding bushing to the ground bus with a bonding jumper. Seal all conduits entering enclosures with duct seal or expanding foam. Do not use silicone to seal conduit ends.
11. For all conduits, ensure the burial depth is a minimum of 18". Ensure the minimum burial depth for conduit placed under a roadway is 24".

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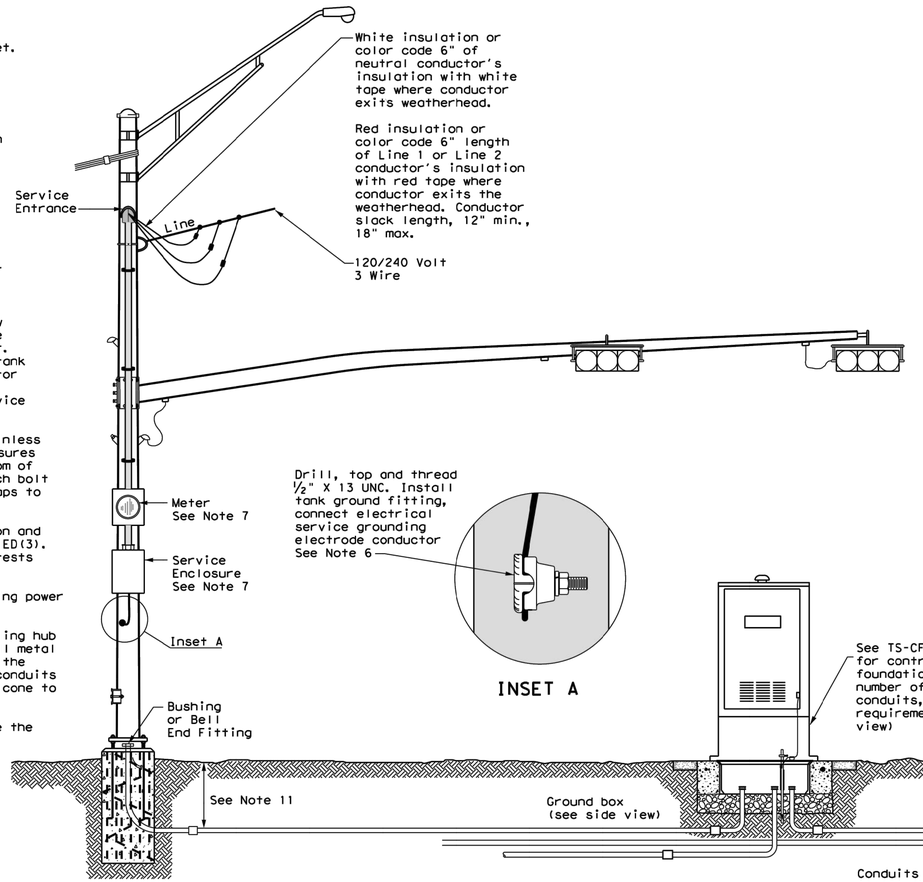
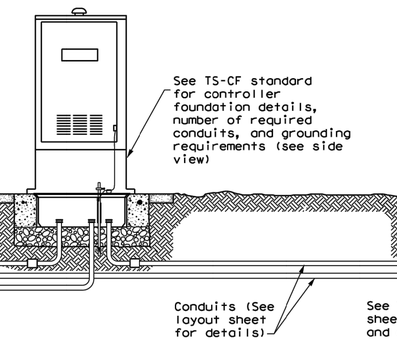


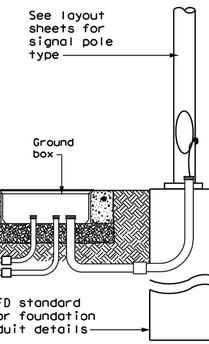
SIGNAL POLE WITH SERVICE

Type T electrical service mounted on signal pole shown as an example. See electrical details, layout sheets, and electrical service data chart for additional details.

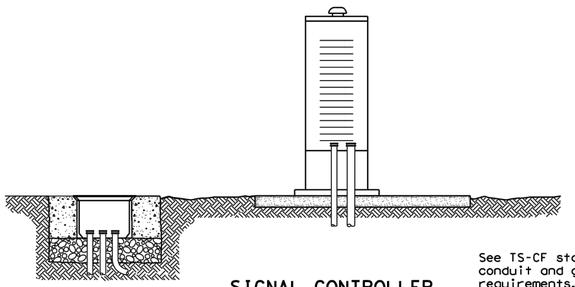
INSET A



SIGNAL CONTROLLER FRONT VIEW



SIGNAL POLE



SIGNAL CONTROLLER SIDE VIEW

See TS-CF standard for conduit and grounding requirements. See layout sheets for ground box locations and any additional conduits that are required.

Texas Department of Transportation | Traffic Operations Division Standard

ELECTRICAL DETAILS TYPICAL TRAFFIC SIGNAL SYSTEM DETAILS

ED(8)-14

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS (SAN ANTONIO TO WATER LANE)

TRAFFIC SIGNAL STANDARDS ED(8)-14

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STATE OF TEXAS
TYLER H. COWSER
147989
LICENSED PROFESSIONAL ENGINEER
Tyler Cowser P.E., PTOE
5/2/2025

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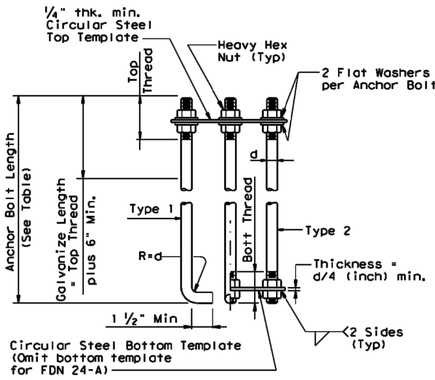
FOUNDATION DESIGN TABLE

FDN TYPE	DRILLED SHAFT DIA	REINFORCING STEEL		EMBEDDED DRILLED SHAFT LENGTH-ft ④, ⑤, ⑥			ANCHOR BOLT DESIGN ①				FOUNDATION DESIGN LOAD ②		TYPICAL APPLICATION
		VERT BARS	SPIRAL & PITCH	TEXAS CONE PENETROMETER N blows/ft			ANCHOR BOLT DIA	Fy (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft	SHEAR Kips	
				10	15	40							
24-A	24"	4- #5	#2 at 12"	5.7	5.3	4.5	¾"	36	12 ¾"	1	10	1	Pedestal pole, pedestal mounted controller.
30-A	30"	8- #9	#3 at 6"	11.3	10.3	8.0	1 ½"	55	17"	2	87	3	Mast arm assembly. (see Selection Table)
36-A	36"	10- #9	#3 at 6"	13.2	12.0	9.4	1 ¾"	55	19"	2	131	5	Mast arm assembly. (see Selection Table) 30' strain pole with or without luminaire.
36-B	36"	12- #9	#3 at 6"	15.2	13.6	10.4	2"	55	21"	2	190	7	Mast arm assembly. (see Selection Table) Strain pole taller than 30' & strain pole with mast arm
42-A	42"	14- #9	#3 at 6"	17.4	15.6	11.9	2 ¼"	55	23"	2	271	9	Mast arm assembly. (see Selection Table)

FOUNDATION SELECTION TABLE FOR STANDARD MAST ARM PLUS ILSN SUPPORT ASSEMBLIES (ft)

		FDN 30-A	FDN 36-A	FDN 36-B	FDN 42-A
80 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH	32'	48'		
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS	24' X 24'			
		28' X 28'			
		32' X 28'	32' X 32'		
			36' X 36'		
			40' X 36'		
			44' X 28'	44' X 36'	
100 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH		36'	44'	
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS		24' X 24'		
			28' X 28'		
			32' X 24'	32' X 32'	
				36' X 36'	
				40' x24'	40' X 36'
					44' x 36'

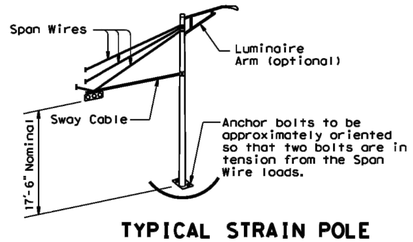
EXAMPLE:
1. For 80mph design wind speed, foundation 30-A can support up to a 32' arm with another arm up to 28'
2. For 100mph design wind speed, foundation 36-A can support a single 36' mast arm.



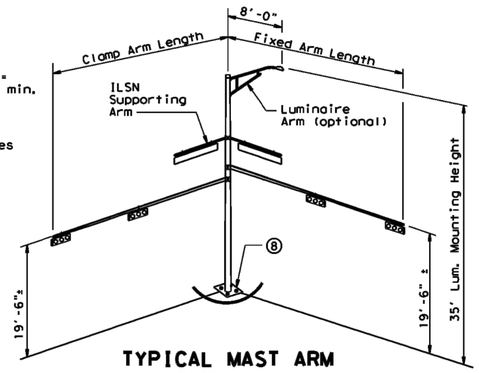
HOOKED ANCHOR (TYPE 1) NUT ANCHOR (TYPE 2)

ANCHOR BOLT ASSEMBLY

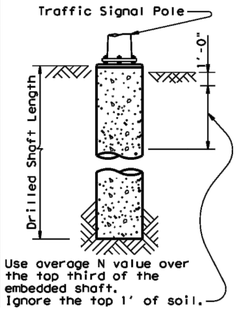
⑧Orient anchor bolts orthogonal with the fixed arm direction to ensure that two bolts are in tension under dead load.



TYPICAL STRAIN POLE ASSEMBLY



TYPICAL MAST ARM ASSEMBLY



NOTES:

① Anchor bolt design develops the foundation capacity given under Foundation Design Loads.

② Foundation Design Loads are the allowable moments and shears at the base of the structure.

③ Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.

④ Field Penetrometer readings at a depth of approximately 3 to 5 feet may be used to adjust shaft lengths.

⑤ If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.

⑥ Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

ANCHOR BOLT & TEMPLATE SIZES

BOLT DIA IN.	⑦ BOLT LENGTH	TOP THREAD	BOTTOM THREAD	BOLT CIRCLE	R2	R1
¾"	1'-6"	3"	—	12 ¾"	7 ⅛"	5 ⅝"
1 ½"	3'-4"	6"	4"	17"	10"	7"
1 ¾"	3'-10"	7"	4 ½"	19"	11 ¼"	7 ¾"
2"	4'-3"	8"	5"	21"	12 ½"	8 ½"
2 ¼"	4'-9"	9"	5 ½"	23"	13 ¾"	9 ¼"

⑦ Min dimensions given, longer bolts are acceptable.

FOUNDATION DETAILS

FOUNDATION SUMMARY TABLE ③

LOCATION IDENTIFICATION	AVG. N BLOW /ft.	FDN TYPE	NO. EA	DRILLED SHAFT LENGTH ⑥ (FEET)				
				24-A	30-A	36-A	36-B	42-A
POLE H	10	24-A	1	5.7				
POLE I	10	24-A	1	5.7				
TOTAL DRILLED SHAFT LENGTHS				11.4				

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals and interim revisions thereto.

Reinforcing steel shall conform to Item 440, "Reinforcing Steel".

Concrete shall be Class "C".

Threads for anchor bolts and nuts shall be rolled or cut threads of 8UN series up to 2" in diameter or UNC series for all sizes. Bolts and nuts shall have Class 2A and 2B fit tolerances. Galvanized nuts shall be tapped after galvanizing.

Anchor bolts that are larger than 1" in diameter shall conform to "alloy steel" or "medium-strength mild steel" per Item 449, "Anchor Bolts". Anchor bolts that are 1" in diameter or less shall conform to ASTM A36. Galvanize a minimum of the top end thread length plus 6" for all anchor bolts unless otherwise noted. Exposed washers and exposed nuts shall be galvanized. All galvanizing shall be in accordance with Item 445, "Galvanizing".

Templates and embedded nuts need not be galvanized. Lubricate and tighten anchor bolts when erecting the structure in accordance with Item 449, "Anchor Bolts".

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS (SAN ANTONIO TO WATER LANE)

TRAFFIC SIGNAL STANDARDS TS-FD-12

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL POLE FOUNDATION

TS-FD-12

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REVISIONS
5-96
11-98
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STATE OF TEXAS
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LICENSED PROFESSIONAL ENGINEER
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5/2/2025

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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

SHEET 1 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

TRAFFIC CONTROL STANDARDS BC(1)-21

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STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED PROFESSIONAL ENGINEER
5/9/2025

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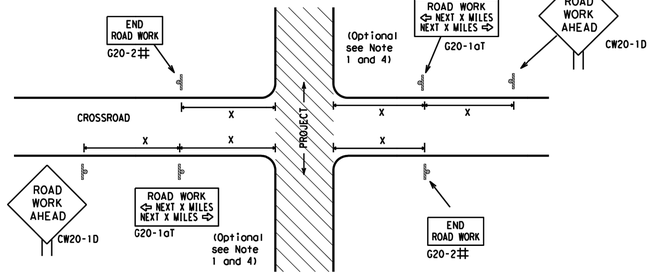
TYPICAL LOCATION OF CROSSROAD SIGNS



ROAD WORK AHEAD

CW20-1D

ROAD WORK ⇦ NEXT X MILES NEXT X MILES ⇨

G20-1aT

(Optional see Note 1 and 4)

END ROAD WORK

G20-2##

ROAD WORK ⇦ NEXT X MILES ⇨

G20-1aT

(Optional see Note 1 and 4)

END ROAD WORK

G20-2##

ROAD WORK AHEAD

CW20-1D

ROAD WORK AHEAD

CW20-1D

ROAD WORK ⇦ NEXT X MILES ⇨

G20-1aT

(Optional see Note 1 and 4)

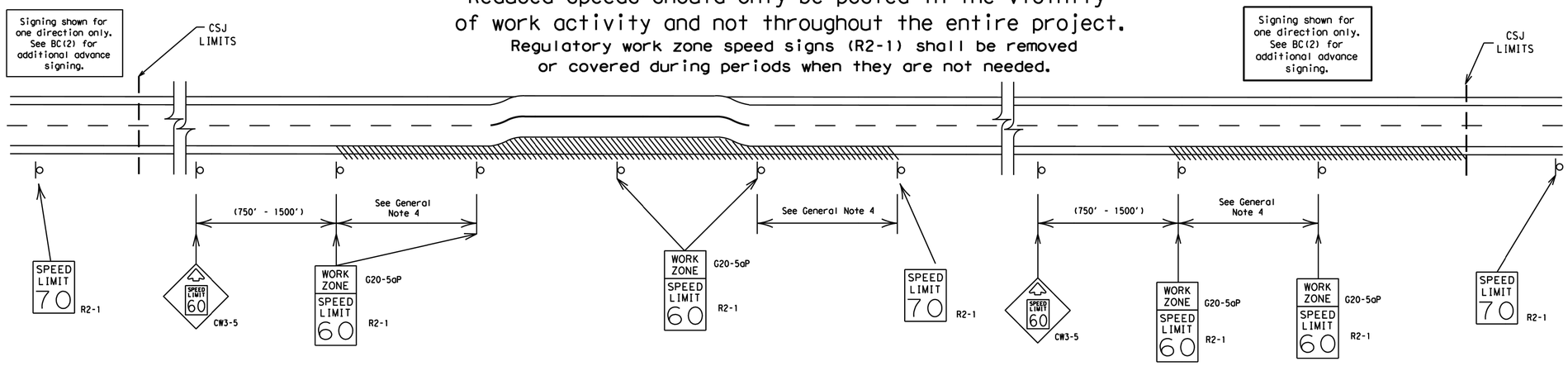
END ROAD WORK

G20-2##

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

Reduced speeds should only be posted in the vicinity of work activity and not throughout the entire project.
Regulatory work zone speed signs (R2-1) shall be removed or covered during periods when they are not needed.



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit should be included on the design of the traffic control plans when restricted geometrics with a lower design speed are present in the work zone and modification of the geometrics to a higher design speed is not feasible.

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

1. Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
2. Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
3. Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
4. Frequency of work zone speed limit signs should be:
   40 mph and greater 0.2 to 2 miles
   35 mph and less 0.2 to 1 mile
5. Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
6. Fabrication, erection and maintenance of the"ADVANCE SPEED LIMIT"(CW3-5)sign, "WORK ZONE"(G20-5aP) plaque and the "SPEED LIMIT"(R2-1)signs shall not be paid for directly, but shall be considered subsidiary to Item 502.
7. Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
8. Techniques that may help reduce traffic speeds include but are not limited to:
   A. Law enforcement.
   B. Flagger stationed next to sign.
   C. Portable changeable message sign (PCMS).
   D. Low-power (drone) radar transmitter.
   E. Speed monitor trailers or signs.
9. Speeds shown on details above are for illustration only. Work Zone Speed Limits should only be posted as approved for each project.
10. For more specific guidance concerning the type of work, work zone conditions and factors impacting allowable regulatory construction speed zone reduction see TxDOT form #1204 in the TxDOT e-form system.

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Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

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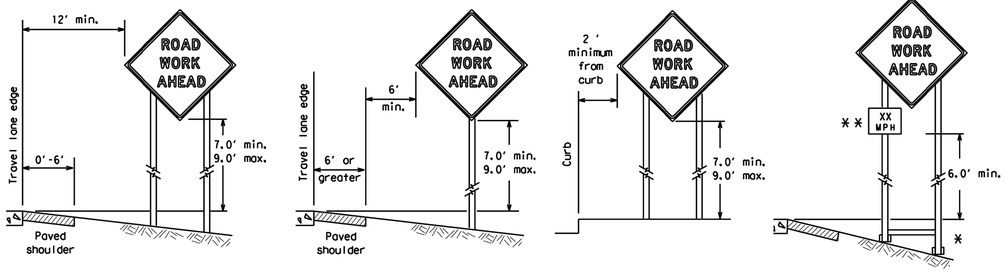
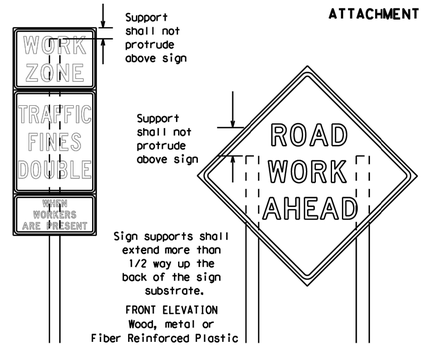
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



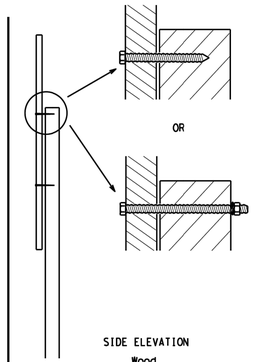
* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS



Splicing embedded perforated square metal tubing in order to extend post height will only be allowed when the splice is made using four bolts, two above and two below the 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.

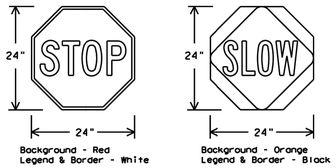


Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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.

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

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

TRAFFIC CONTROL STANDARDS BC(4)-21

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DATE: AS NOTED — DWN. BY: JFR
JOB NO. 05668-0026-01 — DWG. NO. --
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STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED PROFESSIONAL ENGINEER
5/9/2025

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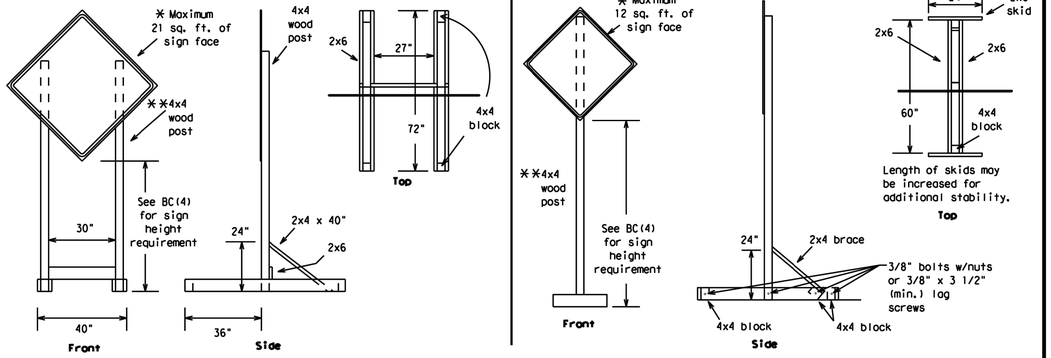
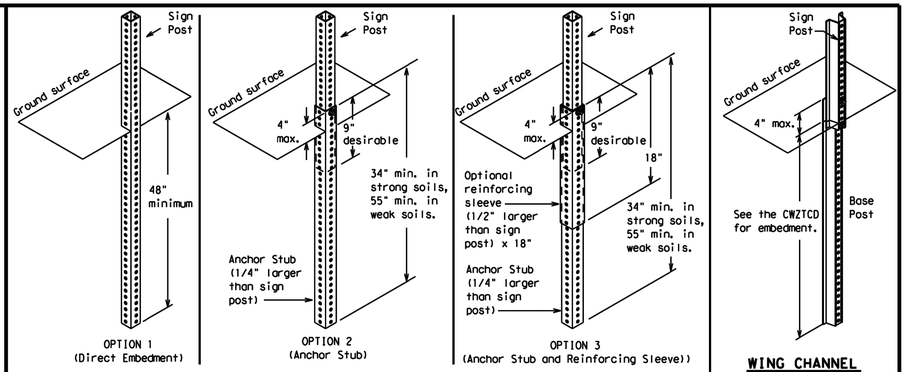


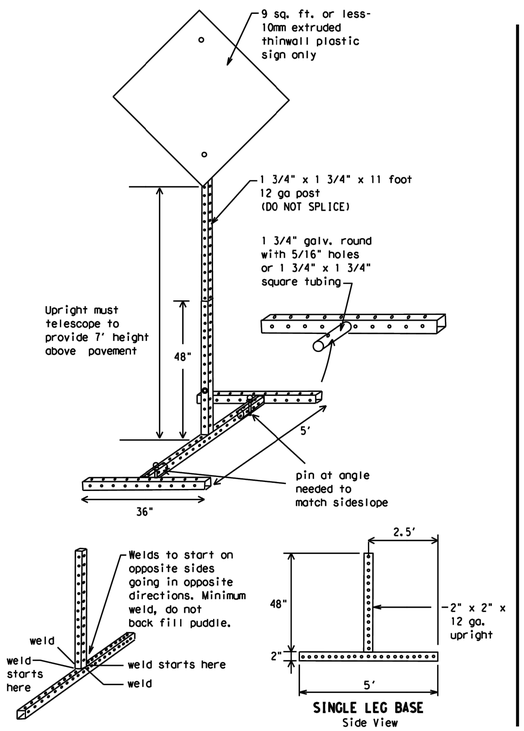
SKID MOUNTED WOOD SIGN SUPPORTS

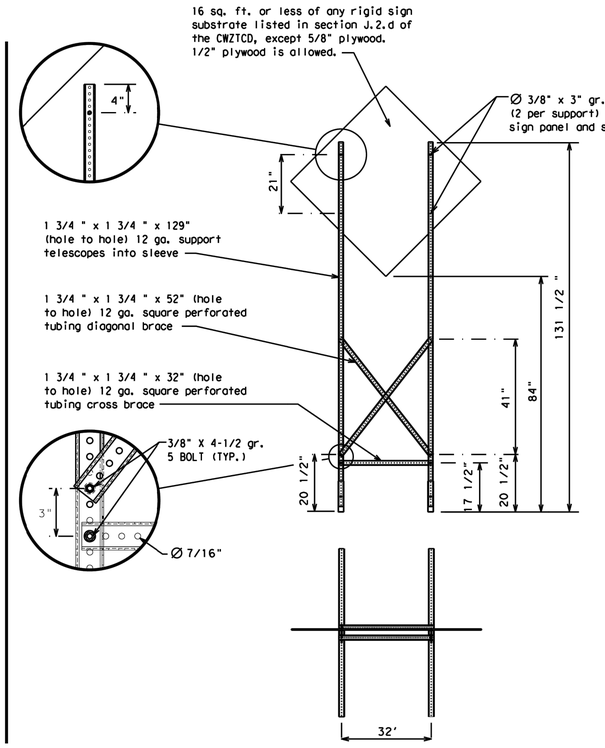
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

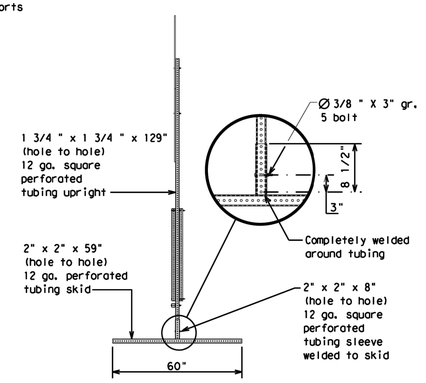


GROUND MOUNTED SIGN SUPPORTS

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

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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.

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Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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City of New Braunfels

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TRAFFIC CONTROL STANDARDS BC(5)-21

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WHEN NOT IN USE, REMOVE THE PCMS FROM THE RIGHT-OF-WAY OR PLACE THE PCMS BEHIND BARRIER OR GUARDRAIL WITH SIGN PANEL TURNED PARALLEL TO TRAFFIC

PORTABLE CHANGEABLE MESSAGE SIGNS

1. The Engineer/Inspector shall approve all messages used on portable changeable message signs (PCMS).
2. Messages on PCMS should contain no more than 8 words (about four to eight characters per word), not including simple words such as "TO," "FOR," "AT," etc.
3. Messages should consist of a single phase, or two phases that alternate. Three-phase messages are not allowed. Each phase of the message should convey a single thought, and must be understood by itself.
4. Use the word "EXIT" to refer to an exit ramp on a freeway; i.e., "EXIT CLOSED." Do not use the term "RAMP."
5. Always use the route or interstate designation (IH, US, SH, FM) along with the number when referring to a roadway.
6. When in use, the bottom of a stationary PCMS message panel should be a minimum 7 feet above the roadway, where possible.
7. The message term "WEEKEND" should be used only if the work is to start on Saturday morning and end by Sunday evening at midnight. Actual days and hours of work should be displayed on the PCMS if work is to begin on Friday evening and/or continue into Monday morning.
8. The Engineer/Inspector may select one of two options which are available for displaying a two-phase message on a PCMS. Each phase may be displayed for either four seconds each or for three seconds each.
9. Do not "flash" messages or words included in a message. The message should be steady burn or continuous while displayed.
10. Do not present redundant information on a two-phase message; i.e., keeping two lines of the message the same and changing the third line.
11. Do not use the word "Danger" in message.
12. Do not display the message "LANES SHIFT LEFT" or "LANES SHIFT RIGHT" on a PCMS. Drivers do not understand the message.
13. Do not display messages that scroll horizontally or vertically across the face of the sign.
14. The following table lists abbreviated words and two-word phrases that are acceptable for use on a PCMS. Both words in a phrase must be displayed together. Words or phrases not on this list should not be abbreviated, unless shown in the TMUTCD.
15. PCMS character height should be at least 18 inches for trailer mounted units. They should be visible from at least 1/2 (.5) mile and the text should be legible from at least 600 feet at night and 800 feet in daylight. Truck mounted units must have a character height of 10 inches and must be legible from at least 400 feet.
16. Each line of text should be centered on the message board rather than left or right justified.
17. If disabled, the PCMS should default to an illegible display that will not alarm motorists and will only be used to alert workers that the PCMS has malfunctioned. A pattern such as a series of horizontal solid bars is appropriate.

WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD
Alternate	ALT
Avenue	AVE
Best Route	BEST RTE
Boulevard	BLVD
Bridge	BRDG
Cannot	CANT
Center	CTR
Construction Ahead	CONST AHD
CROSSING	XING
Detour Route	DETOUR RTE
Do Not	DONT
East	E
Eastbound	(route) E
Emergency	EMER
Emergency Vehicle	EMER VEH
Entrance, Enter	ENT
Express Lane	EXP LN
Expressway	EXPWY
XXXX Feet	XXXX FT
Fog Ahead	FOG AHD
Freeway	FRWY, FWY
Freeway Blocked	FWY BLKD
Friday	FRI
Hazardous Driving	HAZ DRIVING
Hazardous Material	HAZMAT
High-Occupancy	HOV
Vehicle Highway	HWY
Hour(s)	HR, HRS
Information	INFO
It Is	ITS
Junction	JCT
Left	LFT
Left Lane	LFT LN
Lane Closed	LN CLOSED
Lower Level	LWR LEVEL
Maintenance	MAINT
Major	MAJ
Miles	MI
Miles Per Hour	MPH
Minor	MNR
Monday	MON
Normal	NORM
North	N
Northbound	(route) N
Parking	PKING
Road	RD
Right Lane	RT LN
Saturday	SAT
Service Road	SERV RD
Shoulder	SHLDR
Slippery	SLIP
South	S
Southbound	(route) S
Speed	SPD
Street	ST
Sunday	SUN
Telephone	PHONE
Temporary	TEMP
Thursday	THURS
To Downtown	TO DWNTN
Traffic	TRAF
Travelers	TRVLRS
Tuesday	TUES
Time Minutes	TIME MIN
Upper Level	UPR LEVEL
Vehicles (s)	VEH, VEHS
Warning	WARN
Wednesday	WED
Weight Limit	WT LIMIT
West	W
Westbound	(route) W
Wet Pavement	WET PVMT
Will Not	WONT

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

- FREEWAY CLOSED X MILE
- ROAD CLOSED AT SH XXX
- ROAD CLSD AT FM XXXX
- RIGHT X LANES CLOSED
- CENTER LANE CLOSED
- NIGHT LANE CLOSURES
- VARIOUS LANES CLOSED
- EXIT CLOSED
- MALL DRIVEWAY CLOSED
- XXXXXXXX BLVD CLOSED
- FRONTAGE ROAD CLOSED
- SHOULDER CLOSED XXX FT
- RIGHT LN CLOSED XXX FT
- RIGHT X LANES OPEN
- DAYTIME LANE CLOSURES
- I-XX SOUTH EXIT CLOSED
- EXIT XXX CLOSED X MILE
- RIGHT LN TO BE CLOSED
- X LANES CLOSED TUE - FRI

Other Condition List

- ROADWORK XXX FT
- FLAGGER XXXX FT
- RIGHT LN NARROWS XXXX FT
- MERGING TRAFFIC XXXX FT
- LOOSE GRAVEL XXXX FT
- DETOUR X MILE
- ROADWORK PAST SH XXXX
- BUMP XXXX FT
- TRAFFIC SIGNAL XXXX FT
- ROAD REPAIRS XXXX FT
- LANE NARROWS XXXX FT
- TWO-WAY TRAFFIC XX MILE
- CONST TRAFFIC XXX FT
- UNEVEN LANES XXXX FT
- ROUGH ROAD XXXX FT
- ROADWORK NEXT FRI-SUN
- US XXX EXIT X MILES
- LANES SHIFT *

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

- MERGE RIGHT
- DETOUR NEXT X EXITS
- USE EXIT XXX
- STAY ON US XXX SOUTH
- TRUCKS USE US XXX N
- WATCH FOR TRUCKS
- EXPECT DELAYS
- REDUCE SPEED XXX FT
- USE OTHER ROUTES
- STAY IN LANE *
- FORM X LINES RIGHT
- USE XXXXX RD EXIT
- USE EXIT I-XX NORTH
- USE I-XX E TO I-XX N
- WATCH FOR TRUCKS
- EXPECT DELAYS
- PREPARE TO STOP
- END SHOULDER USE
- WATCH FOR WORKERS

Location List

- AT FM XXXX
- BEFORE RAILROAD CROSSING
- NEXT X MILES
- PAST US XXX EXIT
- XXXXXXX TO XXXXXXX
- US XXX TO FM XXXX

Warning List

- SPEED LIMIT XX MPH
- MAXIMUM SPEED XX MPH
- MINIMUM SPEED XX MPH
- ADVISORY SPEED XX MPH
- RIGHT LANE EXIT
- USE CAUTION
- DRIVE SAFELY
- DRIVE WITH CARE

** Advance Notice List

- TUE-FRI XX AM- X PM
- APR XX-XX X PM-X AM
- BEGINS MONDAY
- BEGINS MAY XX
- MAY X-X XX PM - XX AM
- NEXT FRI-SUN
- XX AM TO XX PM
- NEXT TUE AUG XX
- TONIGHT XX PM- XX AM

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

1. Only 1 or 2 phases are to be used on a PCMS.
2. The 1st phase (or both) should be selected from the "Road/Lane/Ramp Closure List" and the "Other Condition List".
3. A 2nd phase can be selected from the "Action to Take/Effect on Travel, Location, General Warning, or Advance Notice Phase Lists".
4. A Location Phase is necessary only if a distance or location is not included in the first phase selected.
5. If two PCMS are used in sequence, they must be separated by a minimum of 1000 ft. Each PCMS shall be limited to two phases, and should be understandable by themselves.
6. For advance notice, when the current date is within seven days of the actual work date, calendar days should be replaced with days of the week. Advance notification should typically be for no more than one week prior to the work.

WORDING ALTERNATIVES

1. The words RIGHT, LEFT and ALL can be interchanged as appropriate.
2. Roadway designations IH, US, SH, FM and LP can be interchanged as appropriate.
3. EAST, WEST, NORTH and SOUTH (or abbreviations E, W, N and S) can be interchanged as appropriate.
4. Highway names and numbers replaced as appropriate.
5. ROAD, HIGHWAY and FREEWAY can be interchanged as needed.
6. AHEAD may be used instead of distances if necessary.
7. FT and MI, MILE and MILES interchanged as appropriate.
8. AT, BEFORE and PAST interchanged as needed.
9. Distances or AHEAD can be eliminated from the message if a location phase is used.

PCMS SIGNS WITHIN THE R.O.W. SHALL BE BEHIND GUARDRAIL OR CONCRETE BARRIER OR SHALL HAVE A MINIMUM OF FOUR (4) PLASTIC DRUMS PLACED PERPENDICULAR TO TRAFFIC ON THE UPSTREAM SIDE OF THE PCMS, WHEN EXPOSED TO ONE DIRECTION OF TRAFFIC. WHEN EXPOSED TO TWO WAY TRAFFIC, THE FOUR DRUMS SHOULD BE PLACED WITH ONE DRUM AT EACH OF THE FOUR CORNERS OF THE UNIT.

FULL MATRIX PCMS SIGNS

1. When Full Matrix PCMS signs are used, the character height and legibility/visibility requirements shall be maintained as listed in Note 15 under "PORTABLE CHANGEABLE MESSAGE SIGNS" above.
2. When symbol signs, such as the "Flagger Symbol"(CW20-7) are represented graphically on the Full Matrix PCMS sign and, with the approval of the Engineer, it shall maintain the legibility/visibility requirement listed above.
3. When symbol signs are represented graphically on the Full Matrix PCMS, they shall only supplement the use of the static sign represented, and shall not substitute for, or replace that sign.
4. A full matrix PCMS may be used to simulate a flashing arrow board provided it meets the visibility, flash rate and dimming requirements on BC(7), for the same size arrow.

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Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

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TRAFFIC CONTROL STANDARDS BC(6)-21

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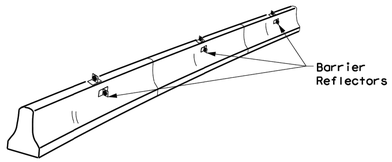
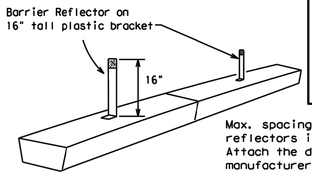
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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

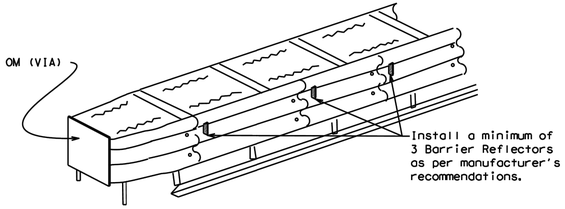


Max. spacing of barrier reflectors is 20 feet.
Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB)

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.

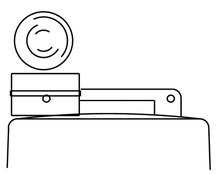


DELINEATION OF END TREATMENTS

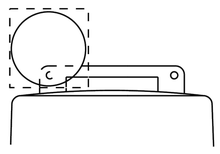
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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_{FL} 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

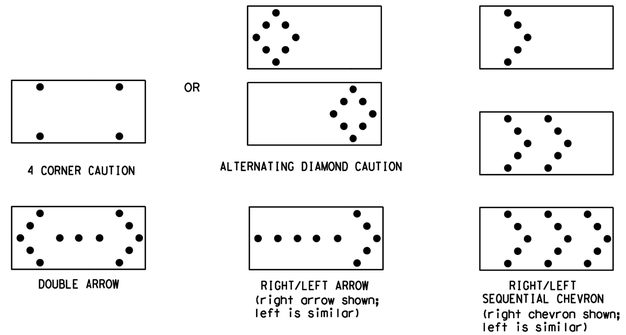
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing 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

SHEET 7 OF 12

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	DIST	COUNTY		SHEET NO.
7-13 5-21				

101

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

TRAFFIC CONTROL STANDARDS BC(7)-21

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

SCALE: AS NOTED — DGN. BY: AZ
DATE: AS NOTED — DWN. BY: JFR
JOB NO. 05668-0026-01 — DWG. NO. --
SUBMITTED: ---- — SURV. BY: QUIDDITY

STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED PROFESSIONAL ENGINEER
5/9/2025

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DATE:
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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:

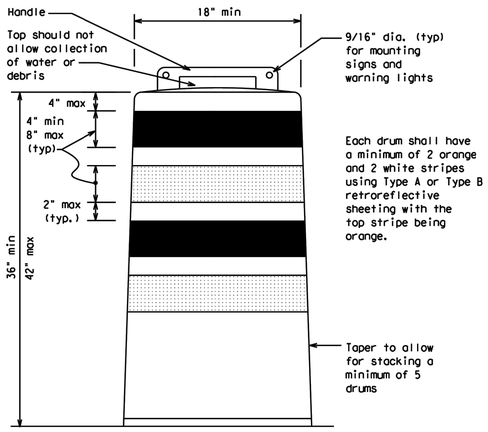
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents 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.

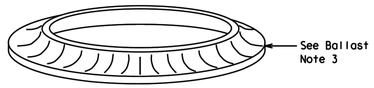
RETROREFLECTIVE SHEETING

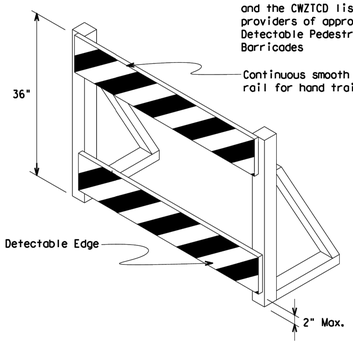
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall 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.



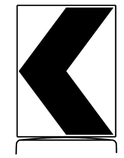




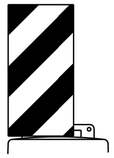
This detail is not intended for fabrication. See note 3 and the CWZTCD list for providers of approved Detectable Pedestrian Barricades

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_{FL} or Type C_{FL} Orange 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.

SHEET 8 OF 12

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.
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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

TRAFFIC CONTROL STANDARDS BC(8)-21

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

SCALE: AS NOTED	DGN. BY: AZ		
DATE: AS NOTED	DWN. BY: JFR		
JOB NO. 05668-0026-01	DWG. NO. --		
SUBMITTED: ----	SURV. BY: QUIDDITY		

STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED
PROFESSIONAL ENGINEER
5/9/2025

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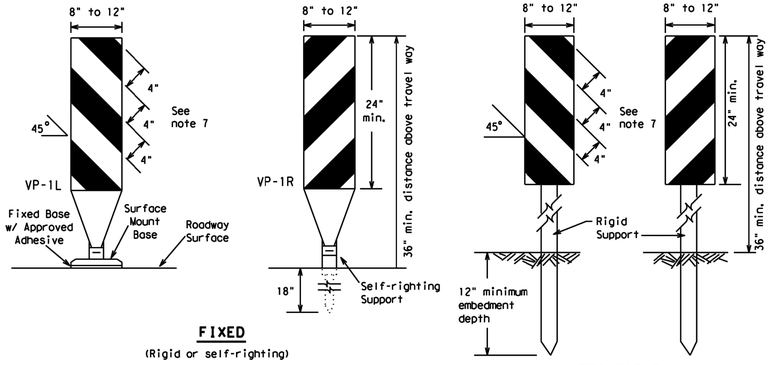
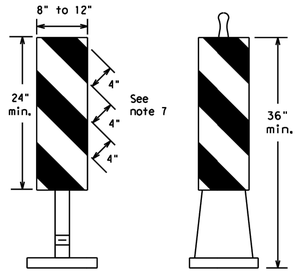


FIXED
(Rigid or self-righting)

DRIVEABLE

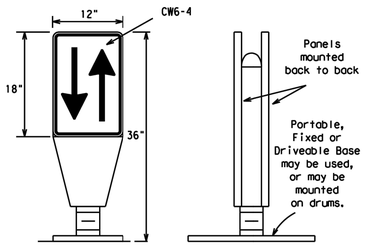


(Rigid or self-righting)

PORTABLE

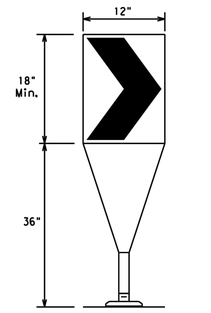
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is 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_{FL} or Type C_{FL} conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



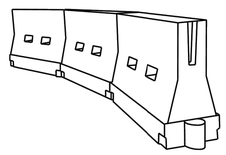
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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_{FL} or Type C_{FL} 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

SHEET 9 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

TRAFFIC CONTROL STANDARDS BC(9)-21

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

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JOB NO. 05668-0026-01	DWG. NO. --		
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STATE OF TEXAS — ALEX ZERTUCHE — 92080 — LICENSED PROFESSIONAL ENGINEER — 5/9/2025

DATE:
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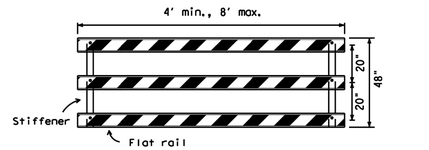
TYPE 3 BARRICADES

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.

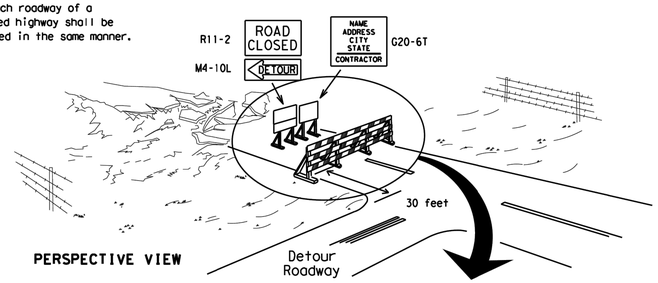
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

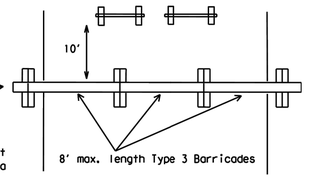
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

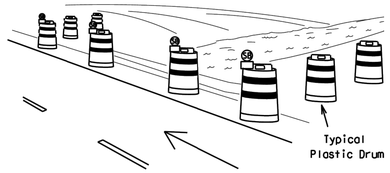
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

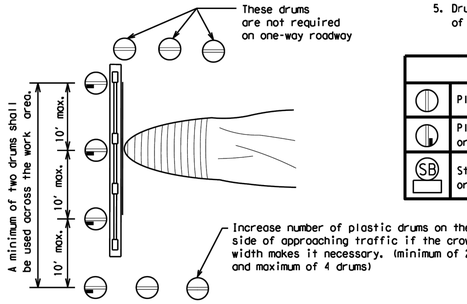
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

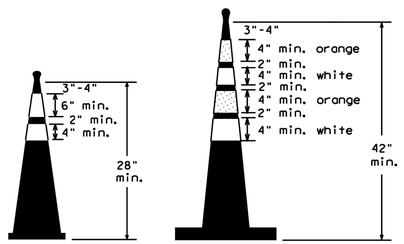
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder 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

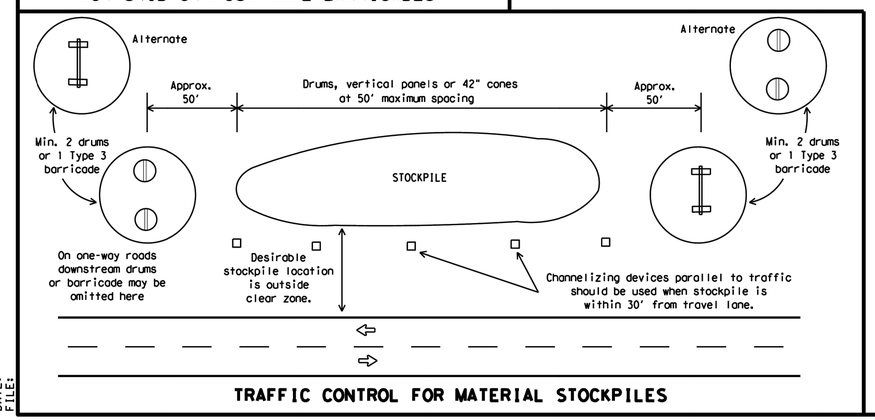


Two-Piece cones | One-Piece cones | Tubular Marker

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

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SHEET 10 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

TRAFFIC CONTROL STANDARDS BC(10)-21

QUIDDITY
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STATE OF TEXAS
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92080
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PROFESSIONAL ENGINEER
5/9/2025

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WORK ZONE PAVEMENT MARKINGS

GENERAL

1. The Contractor shall be responsible for maintaining work zone and existing pavement markings, in accordance with the standard specifications and special provisions, on all roadways open to traffic within the CSJ limits unless otherwise stated in the plans.
2. Color, patterns and dimensions shall be in conformance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
3. Additional supplemental pavement marking details may be found in the plans or specifications.
4. Pavement markings shall be installed in accordance with the TMUTCD and as shown on the plans.
5. When short term markings are required on the plans, short term markings shall conform with the TMUTCD, the plans and details as shown on the Standard Plan Sheet WZ(STPM).
6. When standard pavement markings are not in place and the roadway is opened to traffic, DO NOT PASS signs shall be erected to mark the beginning of the sections where passing is prohibited and PASS WITH CARE signs at the beginning of sections where passing is permitted.
7. All work zone pavement markings shall be installed in accordance with Item 662, "Work Zone Pavement Markings."

RAISED PAVEMENT MARKERS

1. Raised pavement markers are to be placed according to the patterns on BC(12).
2. All raised pavement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAVEMENT MARKERS" and Departmental Material Specification DMS-4200 or DMS-4300.

PREFABRICATED PAVEMENT MARKINGS

1. Removable prefabricated pavement markings shall meet the requirements of DMS-8241.
2. Non-removable prefabricated pavement markings (foil back) shall meet the requirements of DMS-8240.

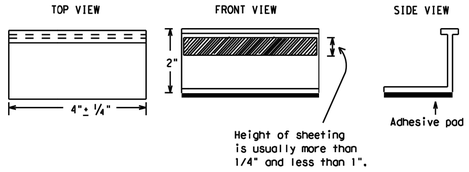
MAINTAINING WORK ZONE PAVEMENT MARKINGS

1. The Contractor will be responsible for maintaining work zone pavement markings within the work limits.
2. Work zone pavement markings shall be inspected in accordance with the frequency and reporting requirements of work zone traffic control device inspections as required by Form 599.
3. The markings should provide a visible reference for a minimum distance of 300 feet during normal daylight hours and 160 feet when illuminated by automobile low-beam headlights at night, unless sight distance is restricted by roadway geometrics.
4. Markings failing to meet this criteria within the first 30 days after placement shall be replaced at the expense of the Contractor as per Specification Item 662.

REMOVAL OF PAVEMENT MARKINGS

1. Pavement markings that are no longer applicable, could create confusion or direct a motorist toward or into the closed portion of the roadway shall be removed or obliterated before the roadway is opened to traffic.
2. The above shall not apply to detours in place for less than three days, where flaggers and/or sufficient channelizing devices are used in lieu of markings to outline the detour route.
3. Pavement markings shall be removed to the fullest extent possible, so as not to leave a discernable marking. This shall be by any method approved by TxDOT Specification Item 677 for "Eliminating Existing Pavement Markings and Markers".
4. The removal of pavement markings may require resurfacing or seal coating portions of the roadway as described in Item 677.
5. Subject to the approval of the Engineer, any method that proves to be successful on a particular type pavement may be used.
6. Blast cleaning may be used but will not be required unless specifically shown in the plans.
7. Over-painting of the markings SHALL NOT BE permitted.
8. Removal of raised pavement markers shall be as directed by the Engineer.
9. Removal of existing pavement markings and markers will be paid for directly in accordance with Item 677, "ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS," unless otherwise stated in the plans.
10. Black-out marking tape may be used to cover conflicting existing markings for periods less than two weeks when approved by the Engineer.

Temporary Flexible-Reflective Roadway Marker Tabs



STAPLES OR NAILS SHALL NOT BE USED TO SECURE TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TABS TO THE PAVEMENT SURFACE

1. Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
2. Tabs detailed on this sheet are to be inspected and accepted by the Engineer or designated representative. Sampling and testing is not normally required, however at the option of the Engineer, either "A" or "B" below may be imposed to assure quality before placement on the roadway.
   A. Select five (5) or more tabs at random from each lot or shipment and submit to the Construction Division, Materials and Pavement Section to determine specification compliance.
   B. Select five (5) tabs and perform the following test. Affix five (5) tabs at 24 inch intervals on an asphaltic pavement in a straight line. Using a medium size passenger vehicle or pickup, run over the markers with the front and rear tires at a speed of 35 to 40 miles per hour, four (4) times in each direction. No more than one (1) out of the five (5) reflective surfaces shall be lost or displaced as a result of this test.
3. Small design variances may be noted between tab manufacturers.
4. See Standard Sheet WZ(STPM) for tab placement on new pavements. See Standard Sheet TCP(7-1) for tab placement on seal coat work.

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

1. Raised pavement markers used as guidemarks shall be from the approved product list, and meet the requirements of DMS-4200.
2. All temporary construction raised pavement markers provided on a project shall be of the same manufacturer.
3. Adhesive for guidemarks shall be bituminous material hot applied or butyl rubber pad for all surfaces, or thermoplastic for concrete surfaces.

Guidemarks shall be designated as:
YELLOW - (two amber reflective surfaces with yellow body).
WHITE - (one silver reflective surface with white body).

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
TRAFFIC BUTTONS	DMS-4300
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY REMOVABLE, PREFABRICATED PAVEMENT MARKINGS	DMS-8241
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS	DMS-8242

A list of prequalified reflective raised pavement markers, non-reflective traffic buttons, roadway marker tabs and other pavement markings can be found at the Material Producer List web address shown on BC(1).

SHEET 11 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
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TRAFFIC CONTROL STANDARDS BC(11)-21

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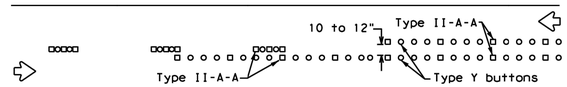
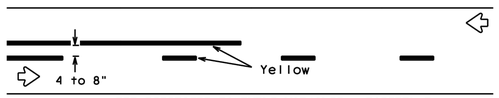
PAVEMENT MARKING PATTERNS

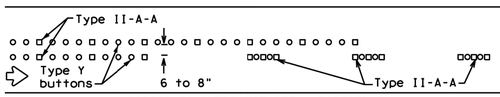
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



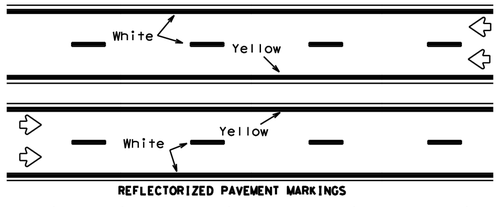
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



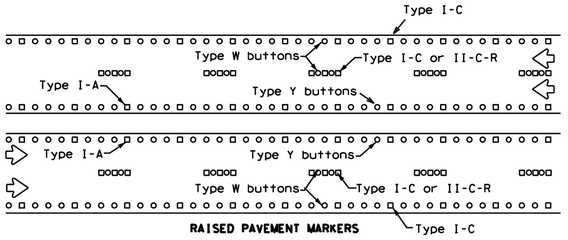
RAISED PAVEMENT MARKERS - PATTERN B

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

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



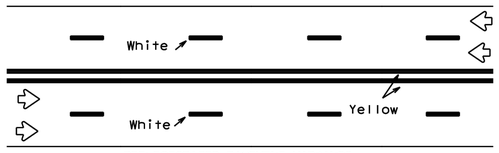
REFLECTORIZED PAVEMENT MARKINGS



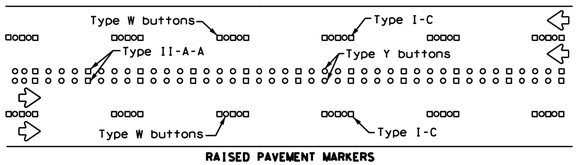
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



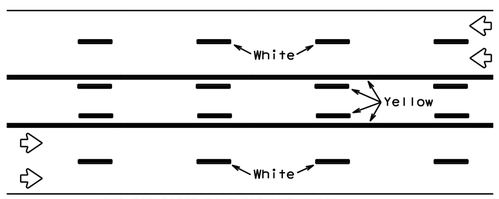
REFLECTORIZED PAVEMENT MARKINGS



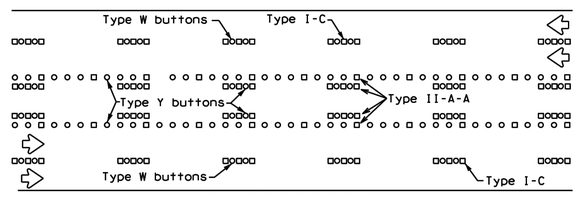
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

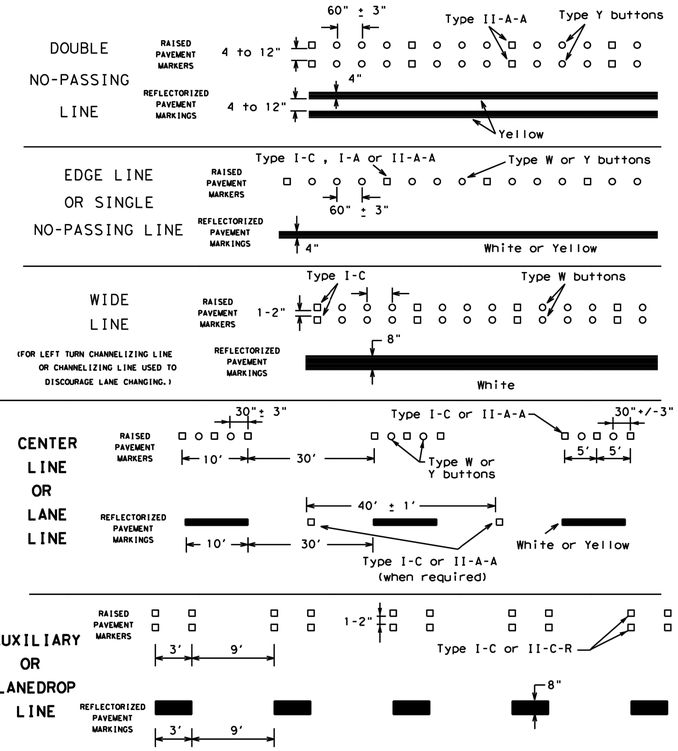


RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

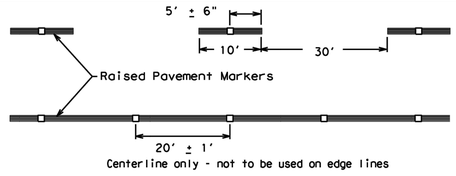
TWO-WAY LEFT TURN LANE

STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

If raised pavement markers are used to supplement REMOVABLE markings, the markers shall be applied to the top of the tape at the approximate mid length of tape used for broken lines or at 20 foot spacing for solid lines. This allows an easier removal of raised pavement markers and tape.



Centerline only - not to be used on edge lines

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

SHEET 12 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	DIST	COUNTY		SHEET NO.
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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

TRAFFIC CONTROL STANDARDS BC(12)-21

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JOB NO. 05668-0026-01	DWG. NO. --
SUBMITTED: ----	SURV. BY: QUIDDITY

STATE OF TEXAS
ALEX ZERTUCHE
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5/9/2025

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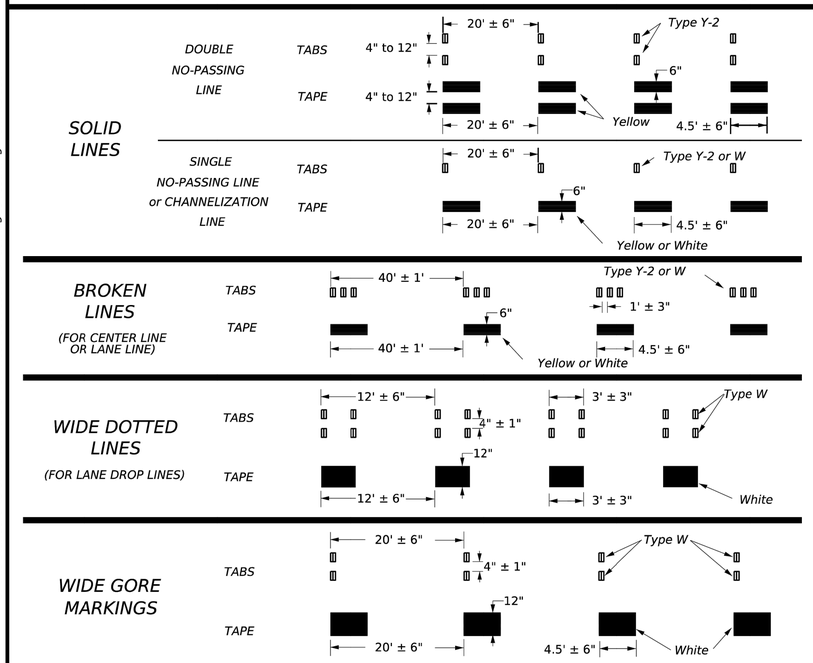
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



NOTES:

1. *Short term pavement markings may be prefabricated markings (stick down tape) or temporary flexible reflective roadway marker tabs unless otherwise specified elsewhere in plans.*
2. *Short term pavement markings shall NOT be used to simulate edge lines.*
3. *Dimensions indicated on this sheet are typical and approximate. Variations in size and height may occur between markers or devices made by manufacturers, by as much as 1/4 inch, unless otherwise noted.*
4. *Temporary flexible-reflective roadway marker tabs will require normal maintenance replacement when used on roadways with an ADT per lane of up to 7500 vehicles with no more than 10% truck mix. When roadways exceed these values, additional maintenance replacement of devices should be planned.*
5. *No segment of roadway open to traffic shall remain without permanent pavement markings for a period greater than 14 calendar days. The Contractor will be responsible for maintaining short term pavement markings until permanent pavement markings are in place. When the Contractor is responsible for placement of permanent pavement markings, no segment of roadway shall remain without permanent pavement markings for a period greater than 14 calendar days unless weather conditions prohibit placement. Permanent pavement markings shall be placed as soon as weather permits.*
6. *For two lane, two-way roadways, DO NOT PASS signs shall be erected to mark the beginning of sections where passing is prohibited and PASS WITH CARE signs shall be erected to mark the beginning of sections where passing is permitted. Signs shall be in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and may be used to indicate the limits of no-passing zones for up to 14 calendar days. Permanent pavement markings should then be placed.*
7. *For low volume two lane, two-way roadways of 4000 ADT or less, no-passing lines may be omitted when approved by the Engineer. DO NOT PASS and PASS WITH CARE signs shall be erected (see note 6).*
8. *For exit gores where a lane is being dropped place wide gore markings or retroreflective channelizing devices to guide motorist through the exit. If channelizing devices are to be used it should be noted elsewhere in the plans. One piece cones are not allowed for this purpose.*

TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

1. *Temporary flexible-reflective roadway marker tabs detailed on this sheet will be designated Type Y-2 (two amber reflective surfaces with yellow body); Type Y (one amber reflective surface with yellow body); and Type W (one white or silver reflective surface with white body). Additional details may be found on BC(11).*
2. *Tabs shall meet requirements of Departmental Material Specification DMS-8242.*
3. *When dry, tabs shall be visible for a minimum distance of 200 feet during normal daylight hours and when illuminated by automobile low-beam head light at night, unless sight distance is restricted by roadway geometrics.*
4. *No two consecutive tabs nor four tabs per 1000 feet of line shall be missing or fail to meet the visual performance requirements of Note 3.*

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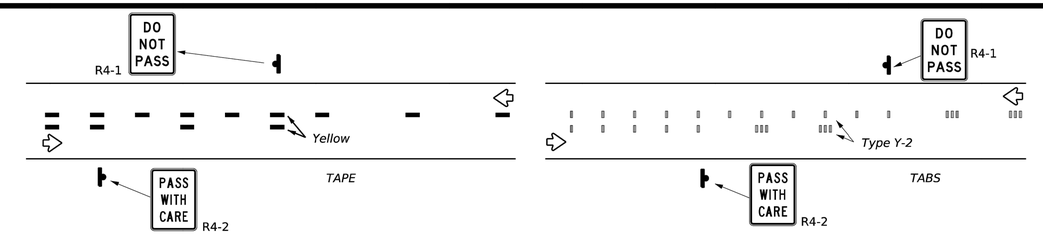
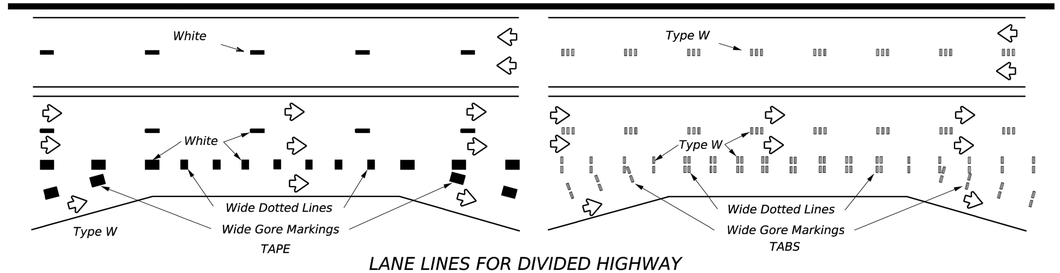
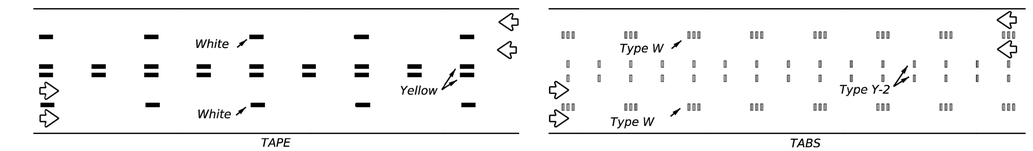
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



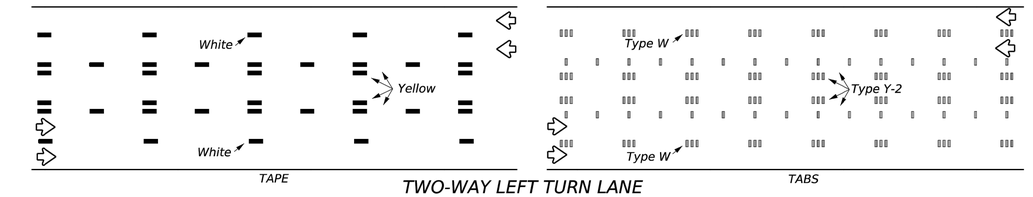
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



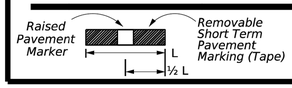
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



If raised pavement markers are used to supplement REMOVABLE short term markings, the markers shall be applied to the top of the tape at the approximate mid length of the tape. This allows an easier removal of raised markers and tape.

PREFABRICATED PAVEMENT MARKINGS

1. *Temporary Removable Prefabricated Pavement Markings shall meet the requirements of DMS-8241.*
2. *Non-removable Prefabricated Pavement Markings shall meet the requirements of either DMS-8240 "Permanent Prefabricated Pavement Markings" or DMS-8243 "Temporary Costruction-Grade Prefabricated Pavement Markings."*

RAISED PAVEMENT MARKERS

1. *All raised pavement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAVEMENT MARKERS" and DMS-4200.*

DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS) & MATERIAL PRODUCER LISTS (MPL)

1. *DMSs referenced above can be found along with embedded links to their respective MPLs at the following website:*

http://www.txdot.gov/business/contractors_consultants/material_specifications/default.htm

Texas Department of Transportation — Traffic Safety Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-23

FILE: wzstpm-23.dgn	DN:	CK:	DW:	CK:
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REVISIONS				
4-92 7-13 1-97 2-23 3-03	DIST	COUNTY		SHEET NO.
111				

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

TRAFFIC CONTROL STANDARDS WZ(STPM)-23

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STATE OF TEXAS
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92080
LICENSED PROFESSIONAL ENGINEER
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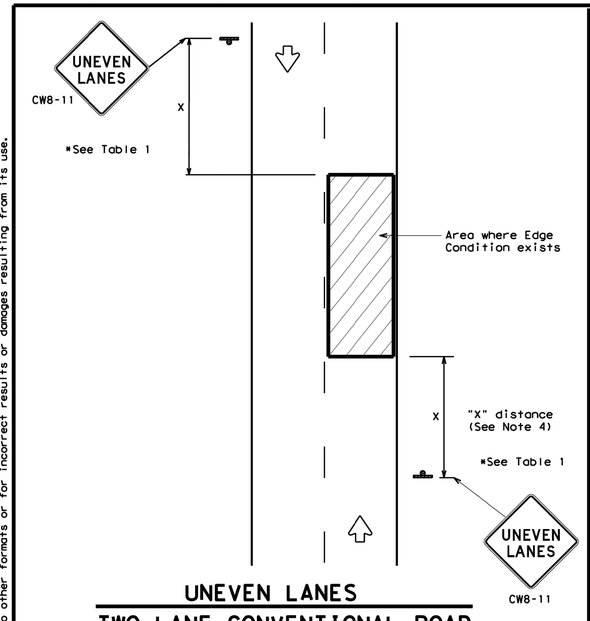
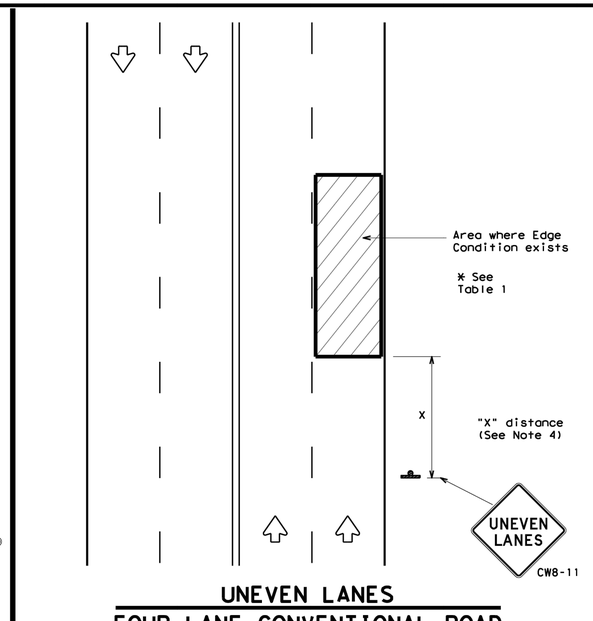
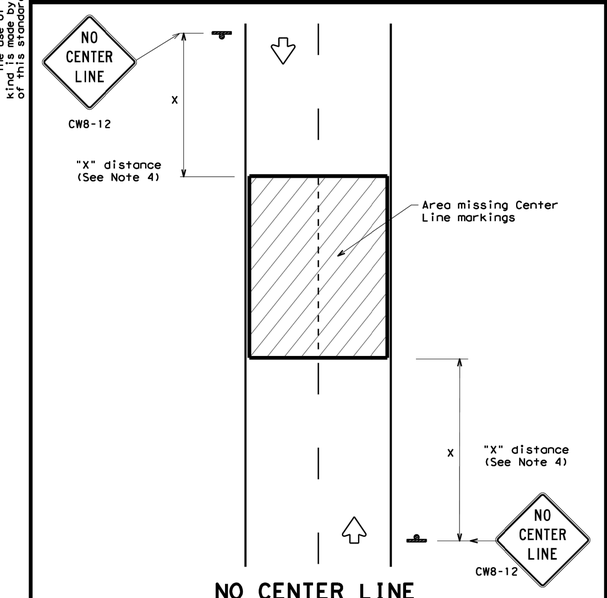


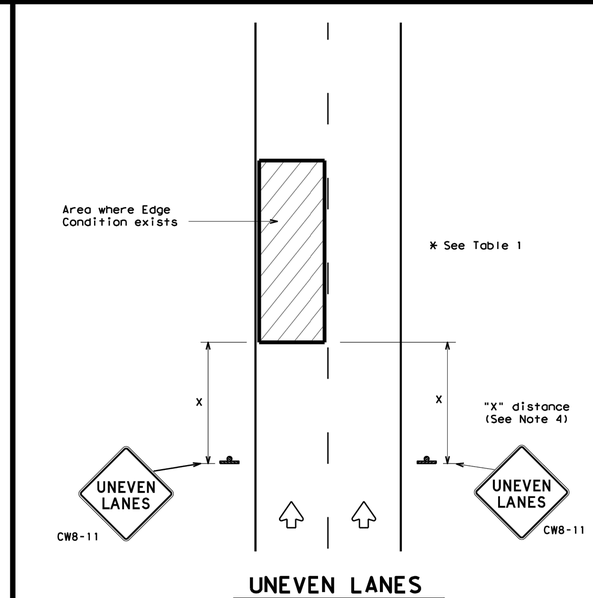
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

DATE:
FILE:

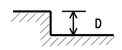
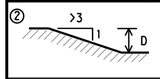
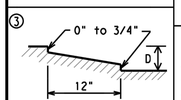
DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

COLOR	USAGE	SHEETING MATERIAL
ORANGE	BACKGROUND	TYPE B_{FL} OR TYPE C_{FL} SHEETING
BLACK	LEGEND & BORDERS	ACRYLIC NON-REFLECTIVE SHEETING

GENERAL NOTES

1. If spalling or holes occur, ROUGH ROAD (CW8-8) signs should be placed in advance of the condition and be repeated every two miles where the condition persists.
2. UNEVEN LANES (CW8-11) signs shall be installed in advance of the condition and repeated every mile. Signs installed along the uneven lane condition may be supplemented with the NEXT XX MILES (CW7-3aP) plaque or Advisory Speed (CW13-1P) plaque.
3. NO CENTER LINE (CW8-12) signs and temporary pavement markings as per the WZ(STPM) standard shall be installed if yellow centerlines separating two way traffic are obscured or obliterated. Repeat NO CENTER LINE signs every two miles where the center line markings are not in place. The signs and markings shall remain in place until permanent pavement markings are installed.
4. Signs shall be spaced at the distances recommended as per BC standards.
5. Additional signs may be required as directed by the Engineer. Signs shall remain in place until final surface is applied. Signs shall be considered subsidiary to Item 502 "BARRICADES, SIGNS AND TRAFFIC HANDLING."
6. Signs shall be fabricated and mounted on supports as shown on the BC standards and/or listed on the "Compliant Work Zone Traffic Control Devices" list.
7. Short term markings shall not be used to simulate edge lines.
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition.

TABLE 1

Edge Condition	Edge Height (D)	* Warning Devices
① 	Less than or equal to: 1¼" (maximum-planing) 1½" (typical-overlay)	Sign: CW8-11
	Distance "D" may be a maximum of 1 1/4 " for planing operations and 2" for overlay operations if uneven lanes with edge condition 1 are open to traffic after work operations cease.	
② 	Less than or equal to 3"	Sign: CW8-11
③  Notched Wedge Joint	Distance "D" may be a maximum of 3" if uneven lanes with edge condition 2 or 3 are open to traffic after work operations cease. Uneven lanes should not be open to traffic when "D" is greater than 3".	

TRAFFIC CONTROL DURING PLANING, OVERLAY AND LEVELING OPERATIONS ARE SHOWN ELSEWHERE IN THE PLANS.

MINIMUM WARNING SIGN SIZE	
Conventional roads	36" x 36"
Freeways/expressways, divided roadways	48" x 48"

Texas Department of Transportation — *Traffic Operations Division Standard*

SIGNING FOR UNEVEN LANES

WZ(UL)-13

FILE: wzul-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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8-95 2-98 7-13	DIST	COUNTY		SHEET NO.
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112				

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

TRAFFIC CONTROL STANDARDS WZ(UL)-13

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92080
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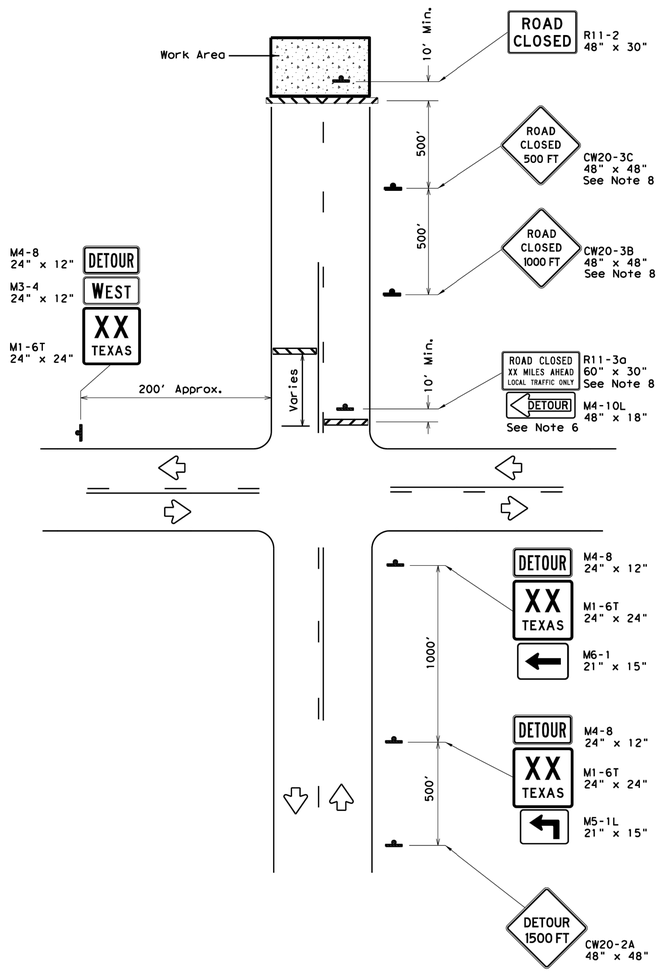
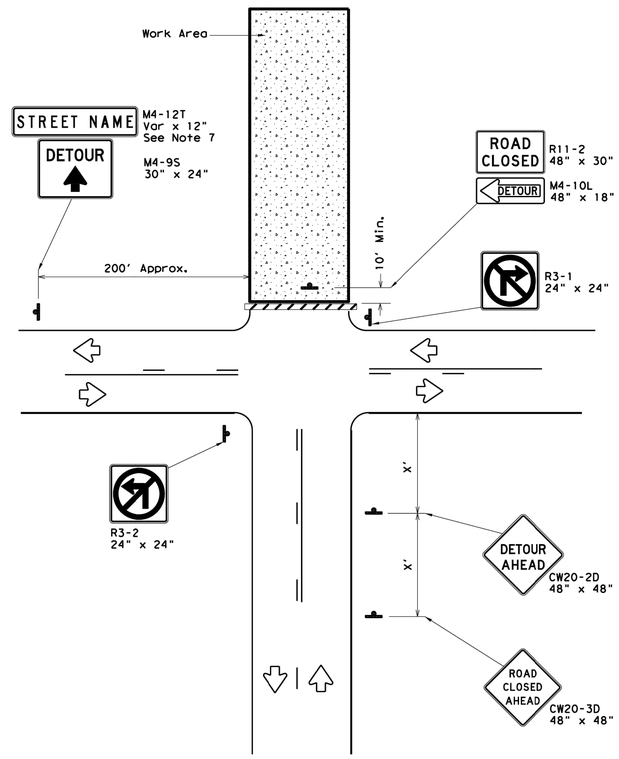


ROAD CLOSURE BEYOND THE INTERSECTION

Signing for a Numbered Route with an Off-Site Detour



ROAD CLOSURE AT THE INTERSECTION

Signing for an Un-numbered Route with an Off-Site Detour

LEGEND	
	Type 3 Barricade
	Sign

Posted Speed *	Minimum Sign Spacing "X" Distance
30	120'
35	160'
40	240'
45	320'
50	400'
55	500'
60	600'
65	700'
70	800'
75	900'

* Conventional Roads Only

GENERAL NOTES

1. This sheet is intended to provide details for temporary work zone road closures. For permanent road closure details see the D&OM standards.
2. Barricades used shall meet the requirements shown on Barricade and Construction Standard BC(10) and listed on the Compliant Work Zone Traffic Control Devices list (CWZTCD).
3. Stockpiled materials shall not be placed on the traffic side of barricades.
4. Barricades at the road closure should extend from pavement edge to pavement edge.
5. Detour signing shown is intended to illustrate the type of signing that is appropriate for numbered routes or un-numbered routes as labeled. It does not indicate the full extent of detour signing required. Detour routes should be signed as shown elsewhere in the plans.
6. If the road is open for a significant distance beyond the intersection or there are significant origin/destination points beyond the intersection, the signs and barricades at this location should be located at the edge of the traveled way.
7. The Street Name (M4-12T) sign is to be placed above the DETOUR (M4-9S) sign.
8. For urban areas where there is a shorter distance between the intersection and the actual closure location, the ROAD CLOSED XX MILES AHEAD (R11-3a) sign may be replaced with a ROAD CLOSED TO THRU TRAFFIC (R11-4) sign. If adequate space does not exist between the intersection and the closure a single ROAD CLOSED AHEAD (CW20-3D) sign spaced as per the table above may replace the ROAD CLOSED 1000 FT (CW20-3B) and ROAD CLOSED 500 FT (CW20-3C) signs.
9. Signs and barricades shown shall be subsidiary to Item 502. Locations where these details will be required shall be as shown elsewhere in the plans.

Texas Department of Transportation — Traffic Operations Division Standard

WORK ZONE ROAD CLOSURE DETAILS

WZ(RCD)-13

FILE: wzrcd-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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1-97 4-98 7-13	DIST	COUNTY		SHEET NO.
2-98 3-03				

113

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

TRAFFIC CONTROL STANDARDS WZ(RCD)-13

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SUBMITTED: ----		SURV. BY: QUIDDITY	

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92080
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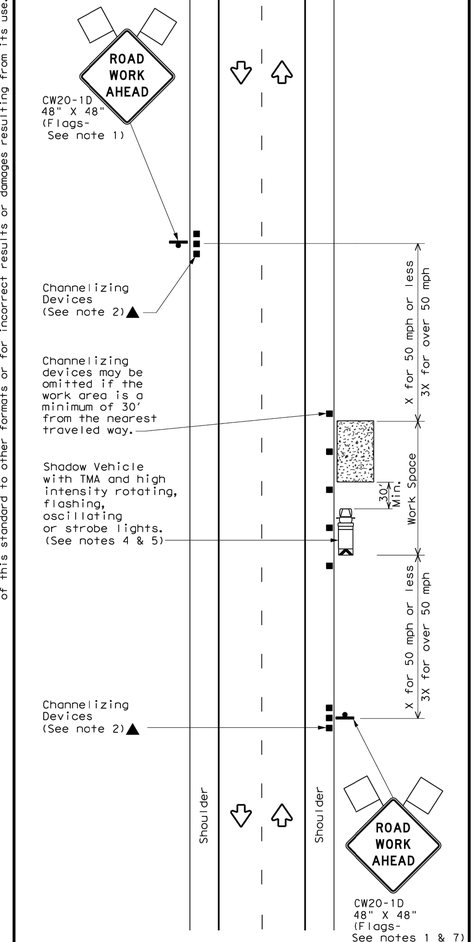
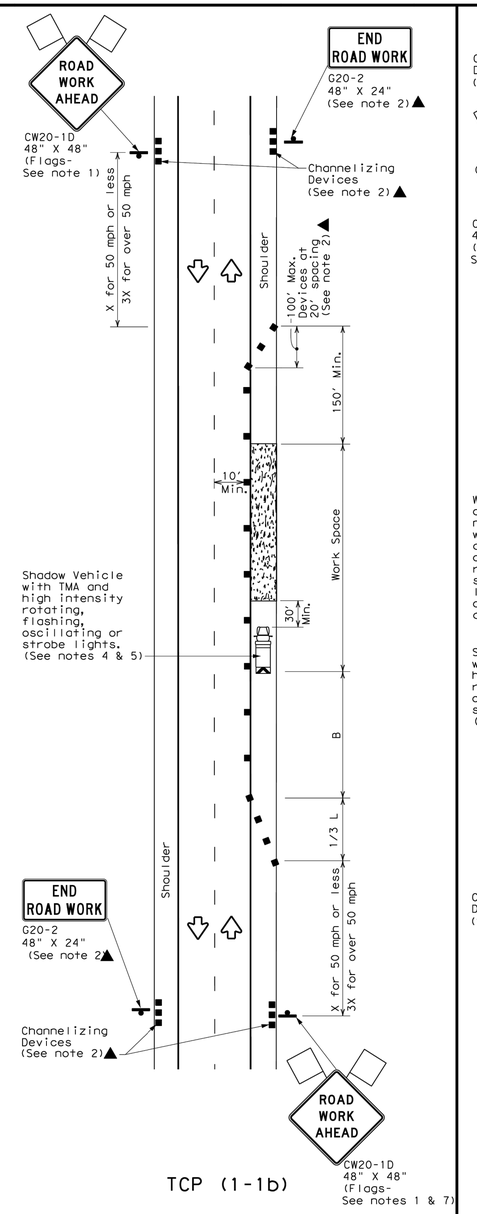


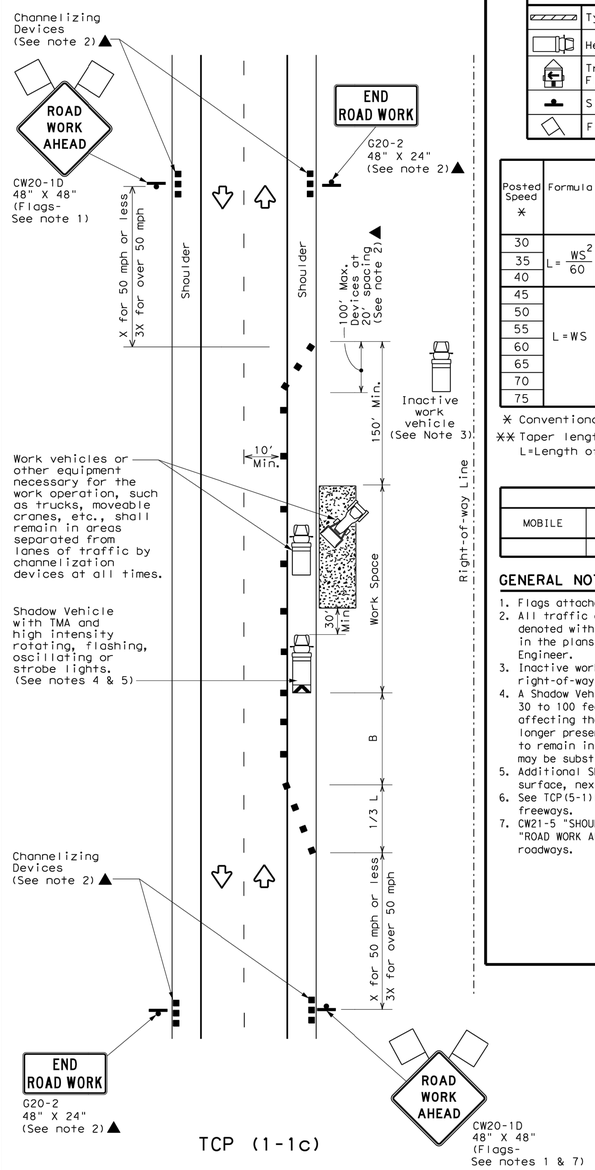
TCP (1-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (1-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (1-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

DATE:
FILE:

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 elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
4. 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 wider work spaces.
6. See TCP(5-1)for shoulder work on divided highways, expressways and freeways.
7. 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(1-1)-18

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

TRAFFIC CONTROL STANDARDS TCP(1-1)-18

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

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JOB NO. 05668-0026-01		DWG. NO. --	
SUBMITTED: ----		SURV. BY: QUIDDITY	

STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED PROFESSIONAL ENGINEER
5/9/2025

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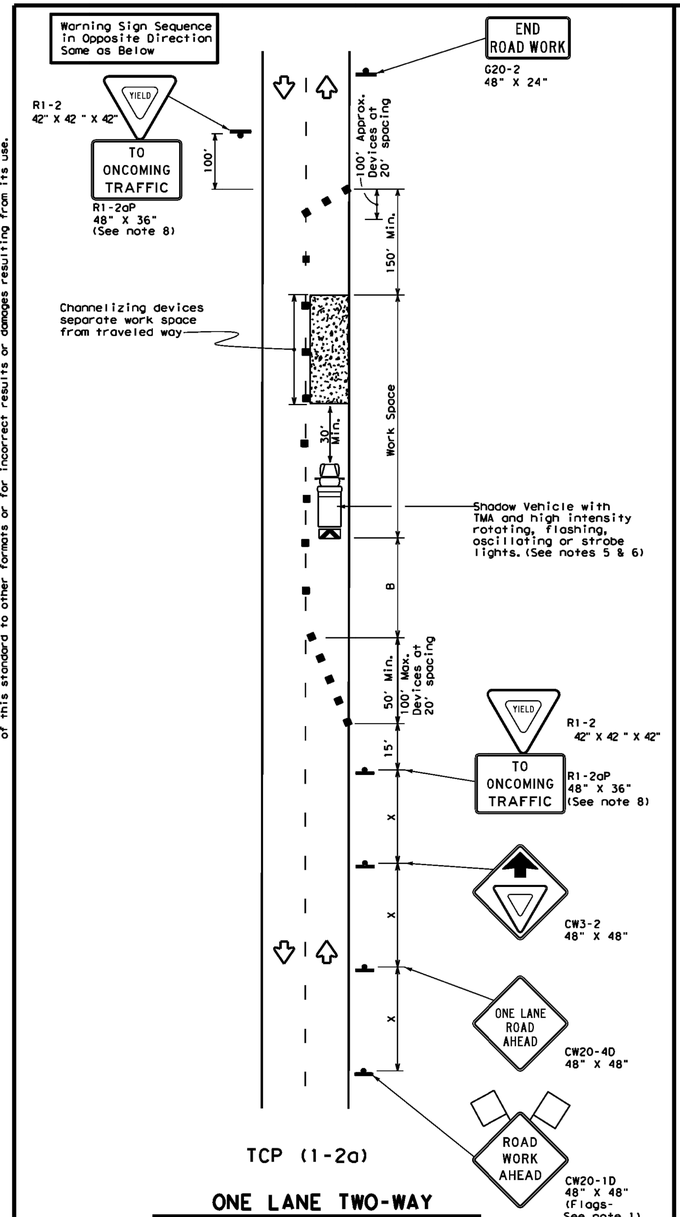
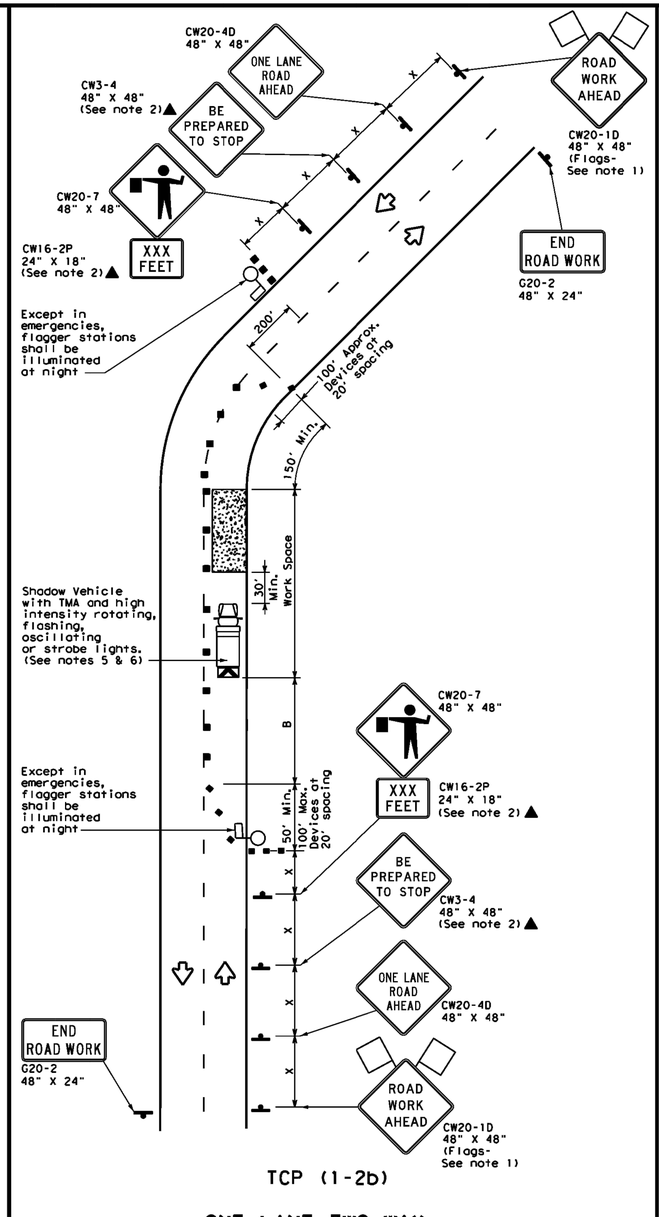


TCP (1-2a)

ONE LANE TWO-WAY CONTROL WITH YIELD SIGNS

(Less than 2000 ADT - See note 7)



TCP (1-2b)

ONE LANE TWO-WAY CONTROL WITH FLAGGERS

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"	Stopping Sight Distance
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L=WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

* 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 elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign, but proper sign spacing shall be maintained.
4. Sign spacing may be increased or an additional CW20-1D "ROAD WORK AHEAD" sign may be used if advance warning ahead of the flagger or R1-2 "YIELD" sign is less than 1500 feet.
5. 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.
6. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

TCP (1-2a)

7. R1-2 "YIELD" sign traffic control may be used on projects with approaches that have adequate sight distance. For projects in urban areas, work spaces should be no longer than one half city block. In rural areas on roadways with less than 2000 ADT, work spaces should be no longer than 400 feet.
8. R1-2 "YIELD" sign with R1-2aP "TO ONCOMING TRAFFIC" plaque shall be placed on a support at a 7 foot minimum mounting height.

TCP (1-2b)

9. Flaggers should use two-way radios or other methods of communication to control traffic.
10. Length of work space should be based on the ability of flaggers to communicate.
11. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain adequate stopping sight distance to the flagger and a queue of stopped vehicles (see table above).
12. Channelizing devices on the center-line may be omitted when a pilot car is leading traffic and approved by the Engineer.
13. Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(1-2)-18

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

TRAFFIC CONTROL STANDARDS TCP(1-2)-18

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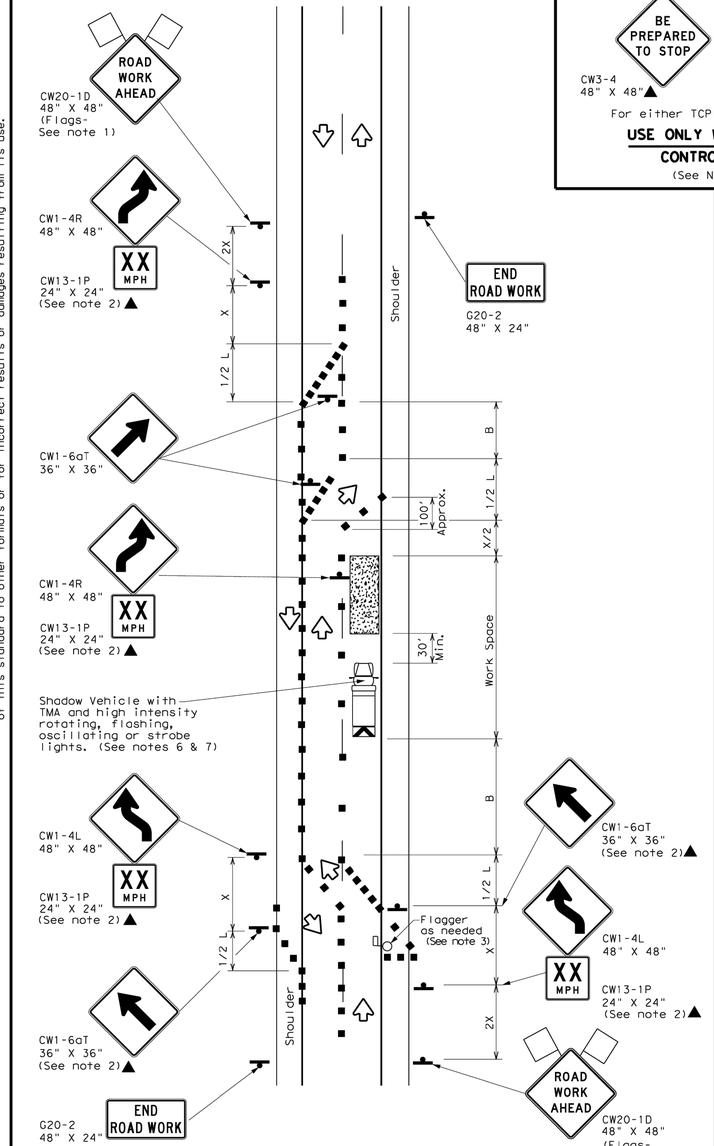
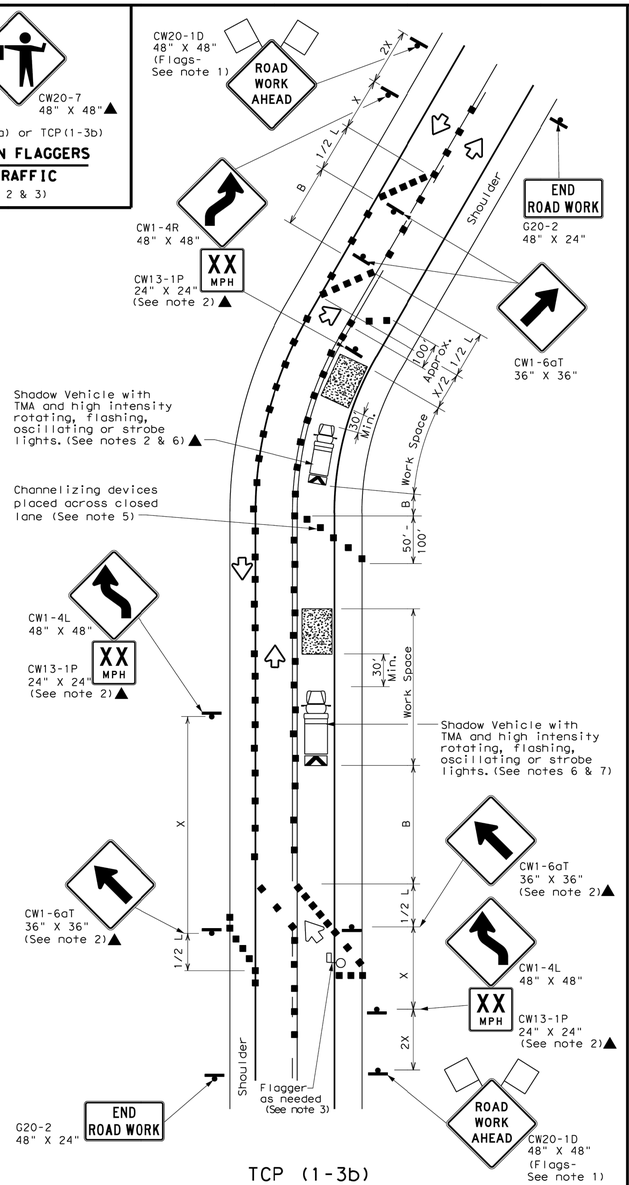


TCP (1-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



TCP (1-3b)
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	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 elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Additional flaggers may be positioned in advance of traffic queues to alert traffic to reduce speed.
4. DO NOT PASS, PASS WITH CARE and construction regulatory speed zone signs may be installed downstream of the ROAD WORK AHEAD signs.
5. When the work zone is made up of several work spaces, channelizing devices should be placed laterally across the closed lane to re-emphasize closure. Laterally placed channelizing devices should be repeated every 500 to 1000 feet in urban areas and every 1/4 to 1/2 mile in rural areas.
6. 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.
7. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
8. 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 speed are 35 mph or slower, and for tangent sections, at 1/2S where S is the speed in mph. This tighter device spacing is intended for the area of conflicting markings not the entire work zone.

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO LANE ROADS

TCP(1-3)-18

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

TRAFFIC CONTROL STANDARDS TCP(1-3)-18

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Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
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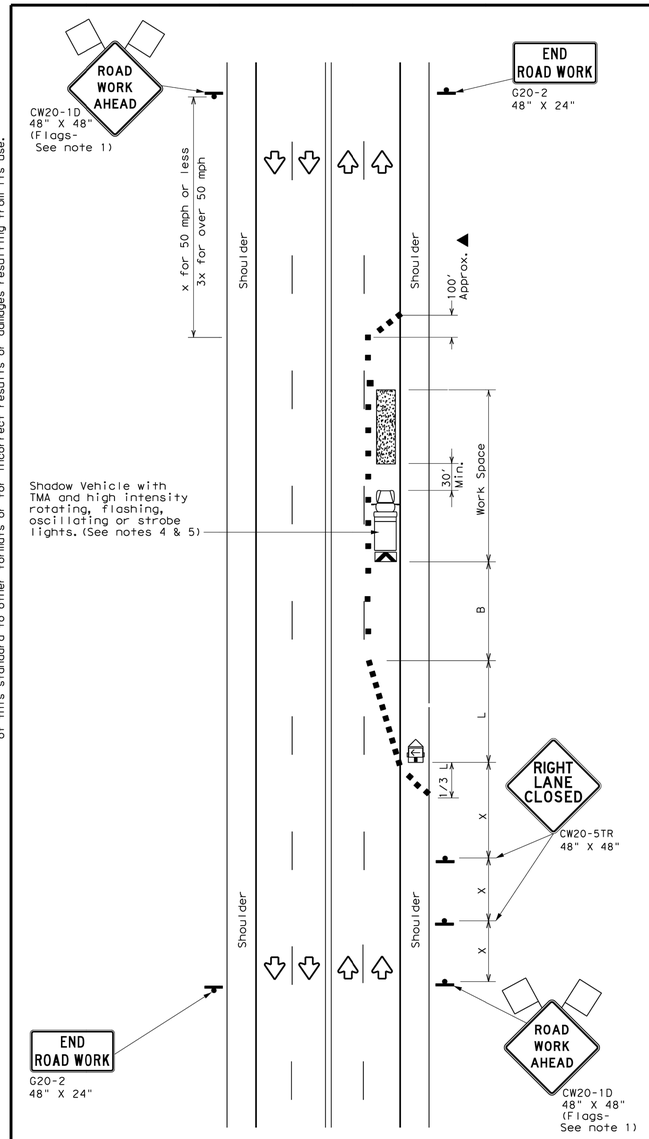
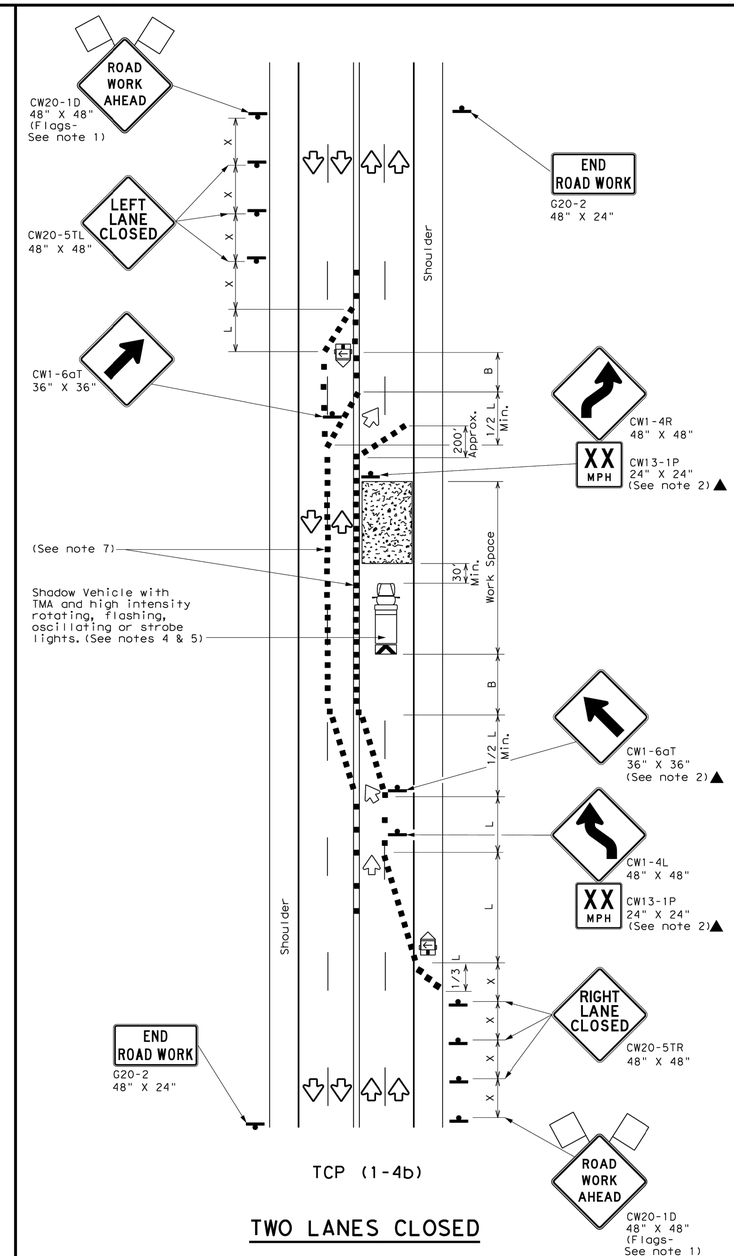


TCP (1-4a)

ONE LANE CLOSED



TCP (1-4b)

TWO LANES CLOSED

DATE:
FILE:

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 elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW20-1D "ROAD WORK AHEAD" sign may be repeated if the visibility of the work zone is less than 1500 feet.
4. 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 wider work spaces.

TCP (1-4a)

6. If this TCP is used for a left lane closure , CW20-5TL "LEFT LANE CLOSED" signs shall be used and channelizing devices shall be placed on the centerline where needed to protect the work space from opposing traffic with the arrow panel placed in the closed lane near the end of the merging taper.

TCP (1-4b)

7. 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 1/2S where S is the speed in mph. This tighter device spacing is intended for the areas of conflicting markings, not the entire work zone.

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(1-4)-18

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

TRAFFIC CONTROL STANDARDS TCP(1-4)-18

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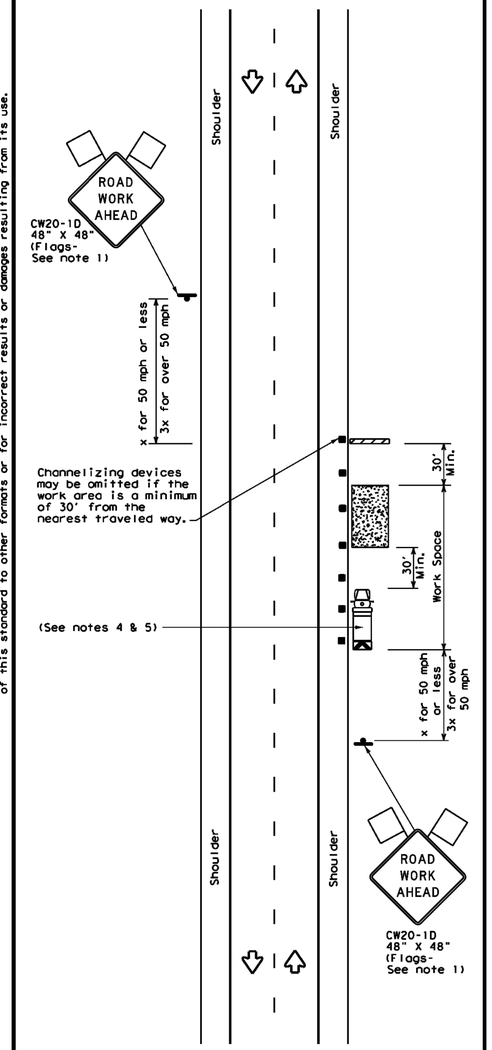
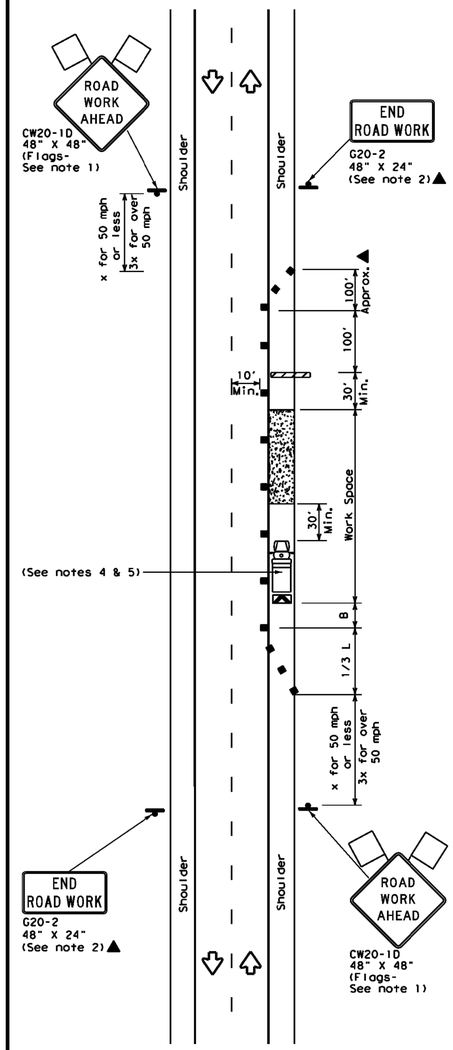


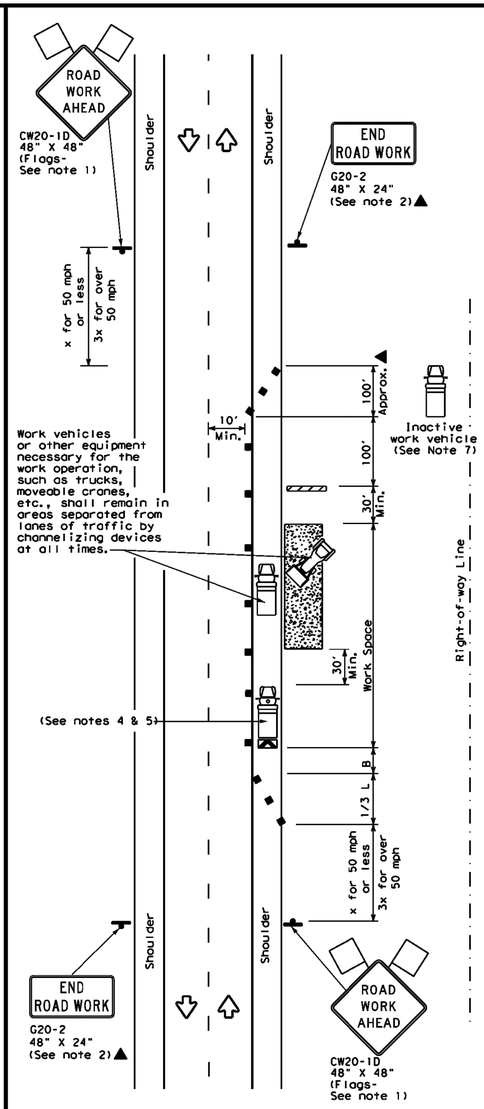
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

DATE:
FILE:

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

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NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

TRAFFIC CONTROL STANDARDS TCP(2-1)-18

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

SCALE: AS NOTED — DGN. BY: AZ
DATE: AS NOTED — DWN. BY: JFR
JOB NO. 05668-0026-01 — DWG. NO. --
SUBMITTED: ---- — SURV. BY: QUIDDITY

STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED PROFESSIONAL ENGINEER
5/9/2025

K:\05668\05668-0026-01 san antonio street and water lane roadway improvements\2 design phase\C40\Plans\05668-0026-01-SF-Traffic Control Details 2.dwg May 09, 2025 - 11:41am JFR

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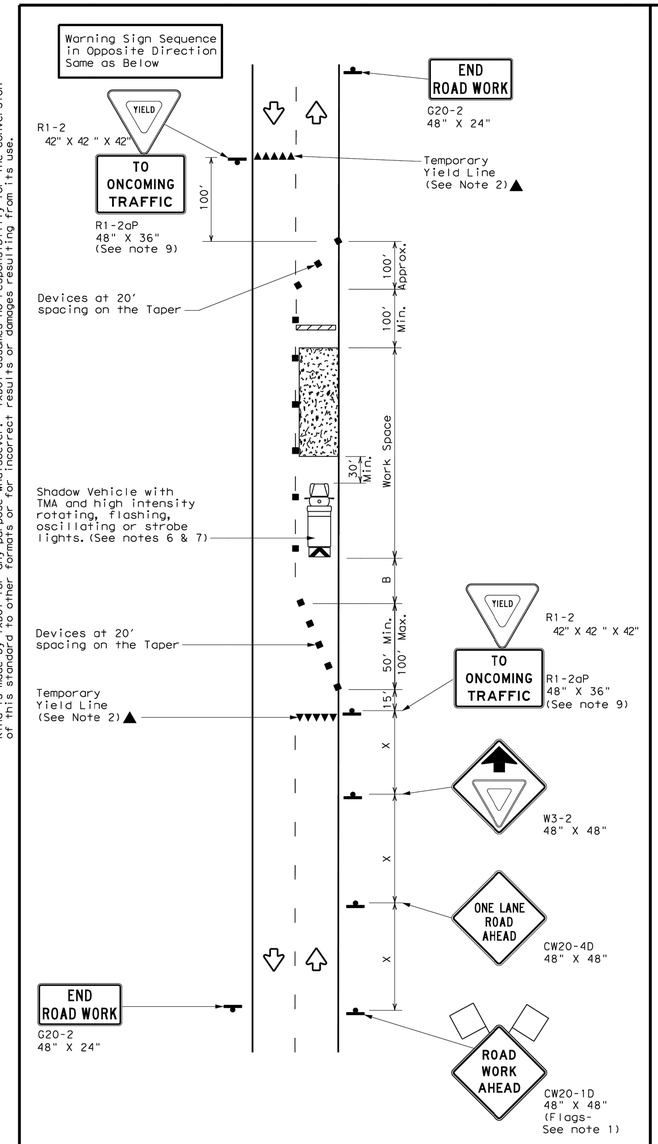
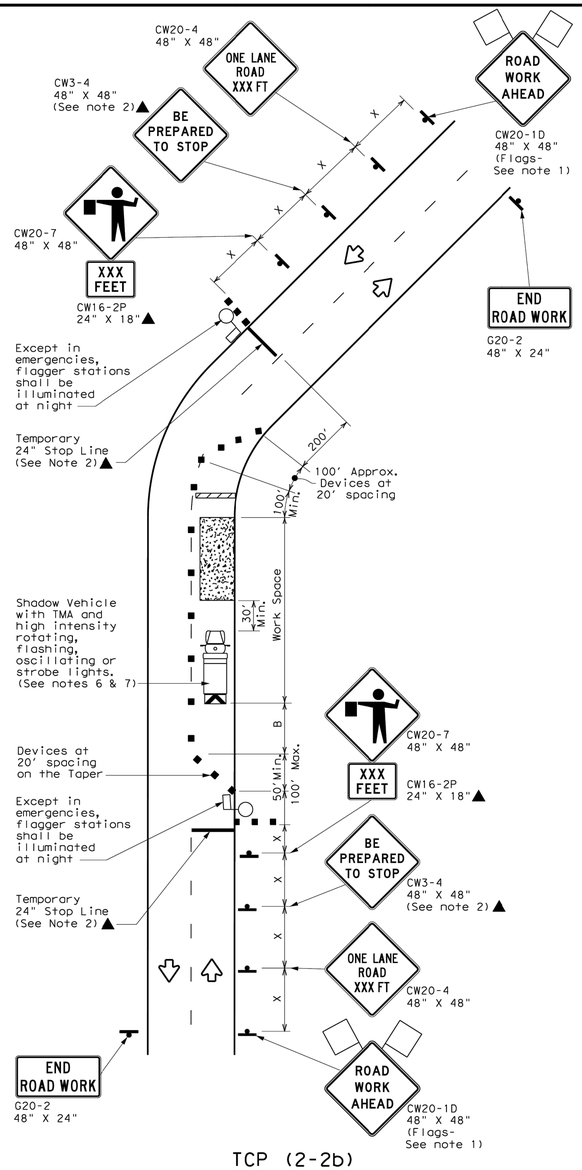


TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See Note 9)



TCP (2-2b)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH FLAGGERS

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"	Stopping Sight Distance
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L=WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

* 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 elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4 "ONE LANE ROAD XXX FT" sign, but proper sign spacing shall be maintained.
4. Flaggers should use two-way radios or other methods of communication to control traffic.
5. Length of work space should be based on the ability of flaggers to communicate.
6. 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.
7. 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 (2-2a)

8. The R1-2 "YIELD" sign traffic control may be used on projects with approaches that have adequate sight distance. For projects in urban areas, work space should be no longer than one half city block. In rural areas, roadways with less than 2000 ADT, work space should be no longer than 400 feet.
9. The R1-2aP "YIELD TO ONCOMING TRAFFIC" sign shall be placed on a support at a 7 foot minimum mounting height.

TCP (2-2b)

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

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(2-2)-18

FILE: tcp2-2-18.dgn	DN:	CK:	DW:	CK:
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REVISIONS 8-95 3-03 / 1-97 2-12 / 4-98 2-18	DIST	COUNTY		SHEET NO.
162				

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

TRAFFIC CONTROL
STANDARDS TCP(2-2)-18

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
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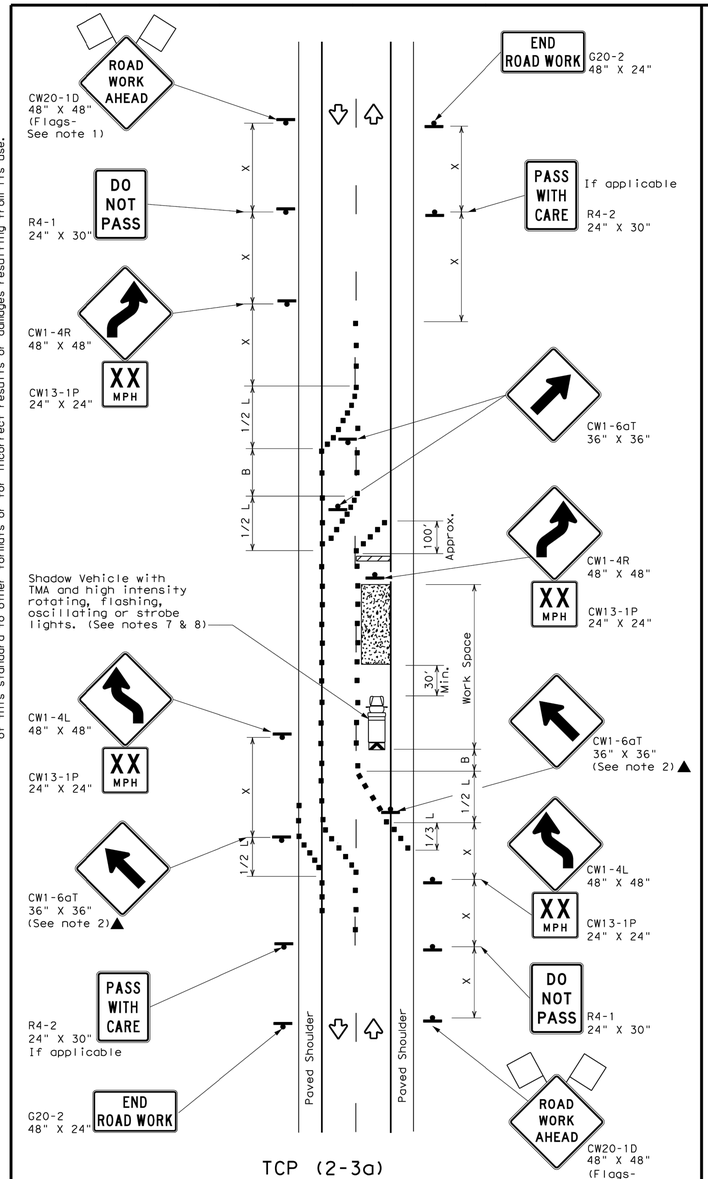
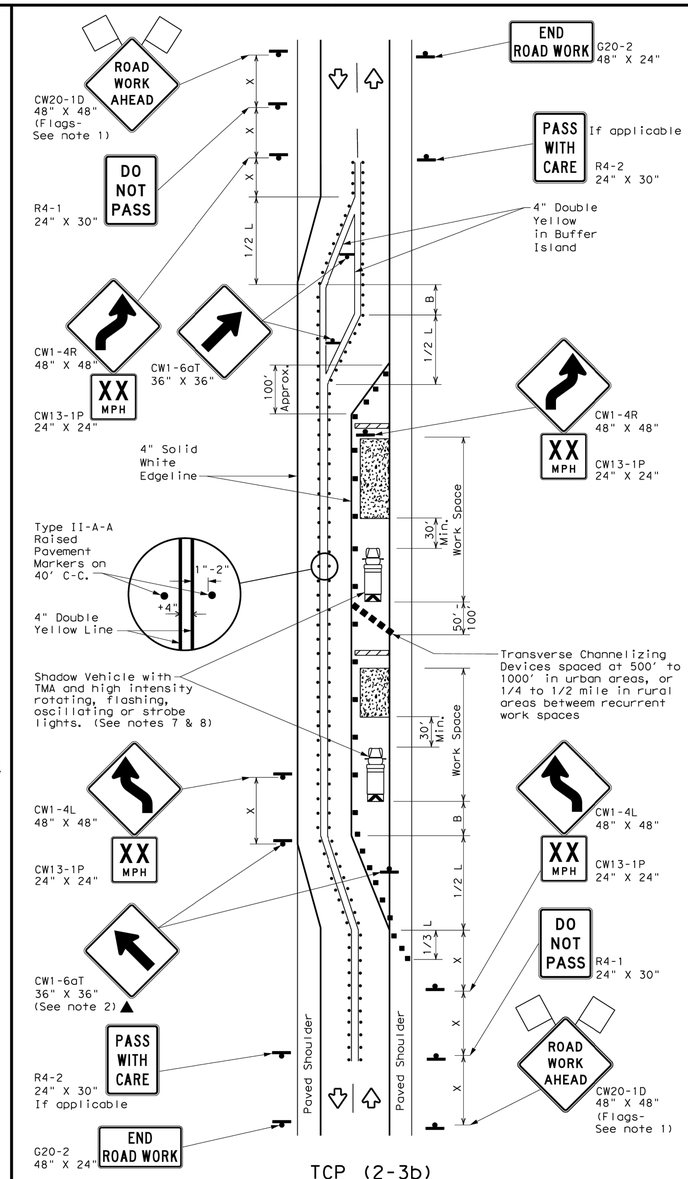


TCP (2-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



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

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

DATE:
FILE:

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 Operations Division Standard

TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO-LANE ROADS

TCP(2-3)-18

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REVISIONS 8-95 3-03 1-97 2-12 4-98 2-18	DIST	COUNTY		SHEET NO.
163				

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

TRAFFIC CONTROL STANDARDS TCP(2-3)-18

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
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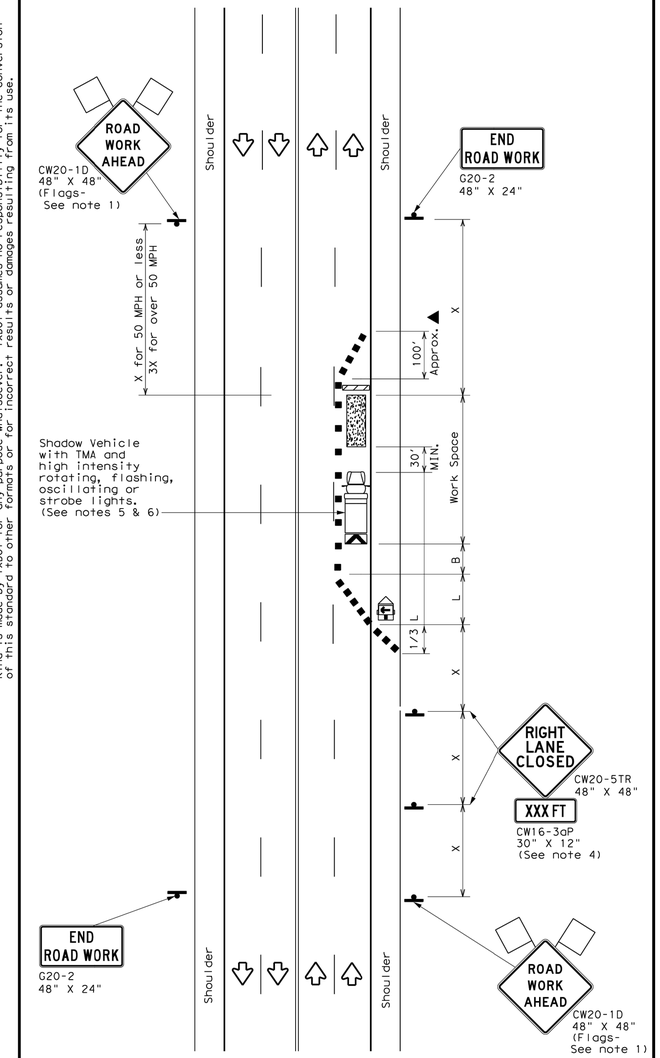
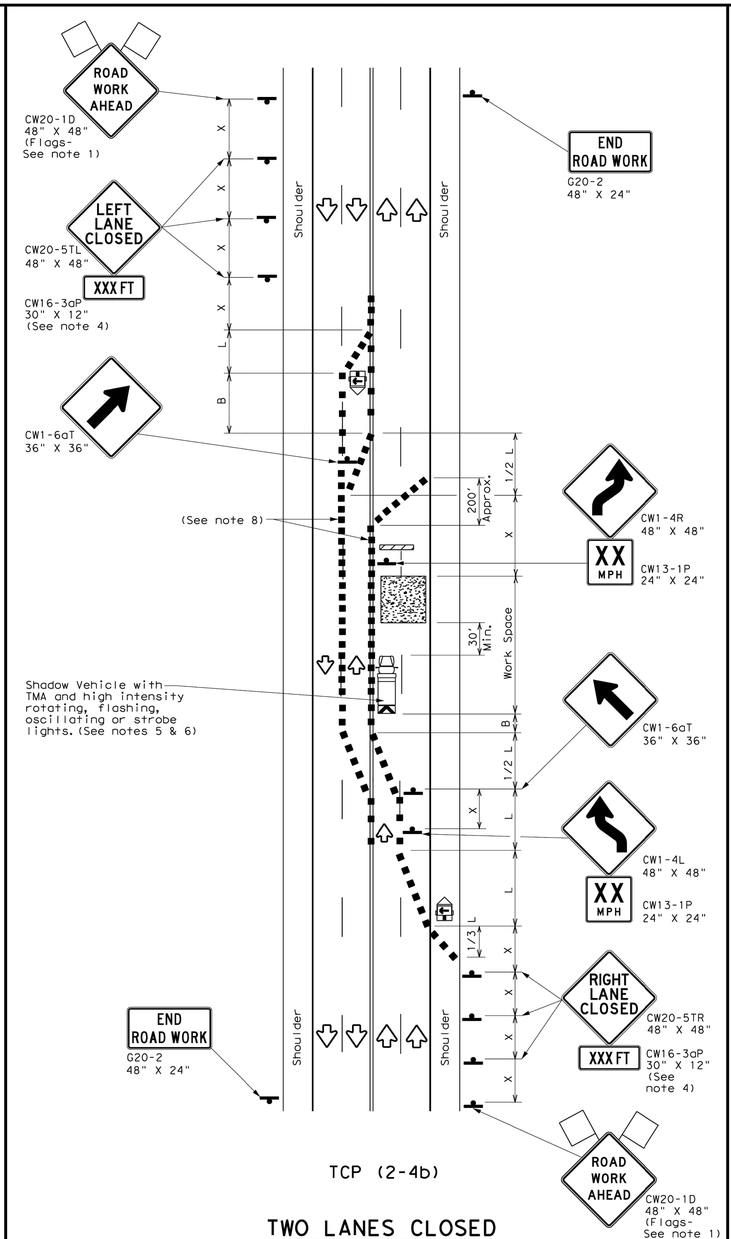


TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

DATE:
FILE:

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 elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The downstream taper is optional. When used, it should be 100 feet minimum length per lane.
4. For short term applications, when post mounted signs are not used, the distance legend may be shown on the sign face rather than on a CW16-3aP supplemental plaque.
5. 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.
6. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-4a)

7. If this TCP is used for a left lane closure, CW20-5TL "LEFT LANE CLOSED"signs shall be used and channelizing devices shall be placed on the centerline to protect the work space from opposing traffic with the arrow board placed in the closed lane near the end of the merging taper.

TCP (2-4b)

8. 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 devices spacing is intended for the area of conflicting markings, not the entire work zone.

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

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City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

TRAFFIC CONTROL STANDARDS TCP(2-4)-18

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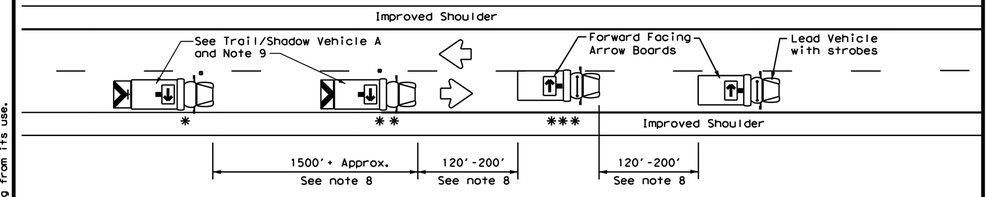
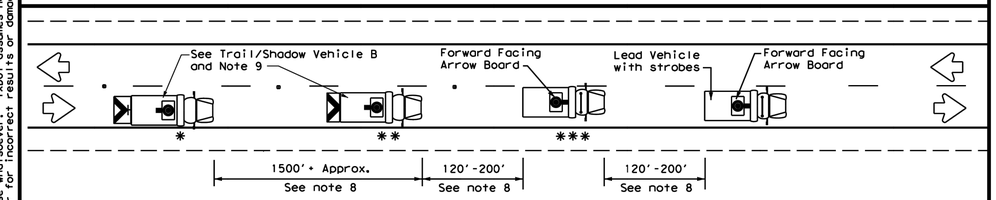


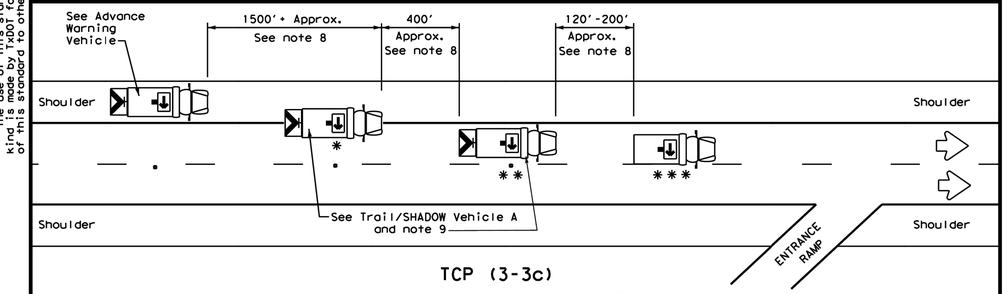
TCP (3-3a)

TWO LANE HIGHWAY WITH PAVED SHOULDERS (WORK ON TRAVEL LANE)



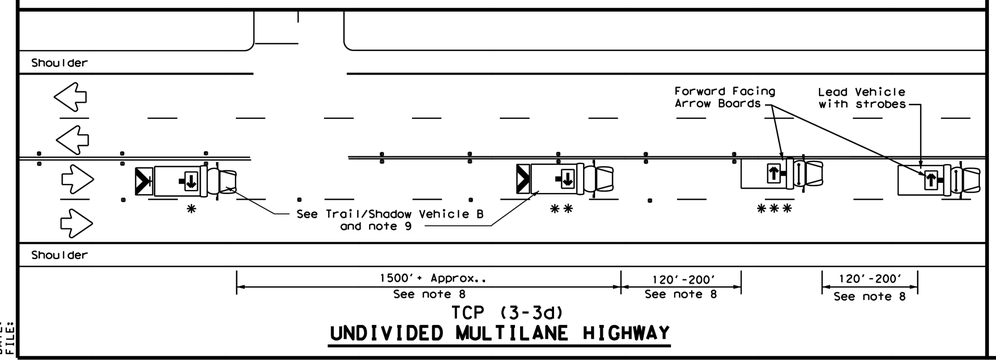
TCP (3-3b)

TWO LANE HIGHWAY WITHOUT PAVED SHOULDERS (WORK ON TRAVEL LANE)



TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY

DATE:
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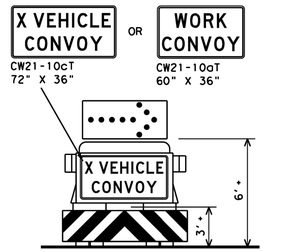
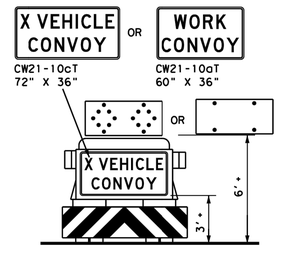


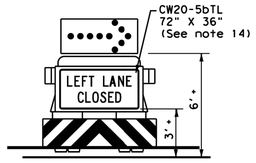
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

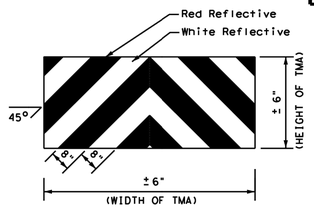


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

LEGEND			
*	Trail Vehicle	ARROW BOARD DISPLAY	
**	Shadow Vehicle		
***	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)

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

GENERAL NOTES

1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used on two way roads the WORK vehicle must have an arrow board. For divided roadways, the arrow board on the WORK vehicle is optional based on the type of work being performed. The Engineer will determine if the LEAD vehicle and/or TRAIL vehicle are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.
2. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating, or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
3. The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE, ADVANCE WARNING and TRAIL VEHICLE are required.
4. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION DMS 8300, Type A.
5. Flashing arrow boards shall be Type B or Type C as per the Barricade and Construction (BC) standards. The board shall be controlled from inside the vehicle.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.
9. X VEHICLE CONVOY (CW21-10cT) or WORK CONVOY (CW21-10aT) signs shall be used on TRAIL VEHICLES and SHADOW VEHICLES as shown. As an option 48" x 48" diamond shaped WORK CONVOY (CW21-10T) or X VEHICLE CONVOY (CW21-10bT) signs may be used where adequate mounting space exists. When used, the X VEHICLE CONVOY sign shall have the number of the convoy vehicles displayed on the sign in the number designation "X" location. The X VEHICLE CONVOY sign shall not be used on the SHADOW VEHICLE if a TRAIL VEHICLE is used.
10. For divided highways with two or three lanes in one direction, the appropriate LEFT LANE CLOSED (CW20-5bTL), RIGHT LANE CLOSED (CW20-5bTR), or CENTER LANE CLOSED (CW20-5dT) sign should be used on the Advance Warning Vehicle. As an option, a portable changeable message sign (PCMS) or truck mounted changeable message sign (TMCMS) with a minimum character height of 12", and displaying the same legend may be substituted for these signs. An appropriate directional arrow display, simulating the size and legibility of the flashing arrow board may be used in the second phase of the PCMS/TMCMS message. When this is done, the arrow board will not be required on the Advance Warning Vehicle.
11. A double arrow shall not be displayed on the arrow board on the Advance Warning Vehicle.
12. For divided highways with three or four lanes in each direction, use TCP(3-2).
13. Standard diamond shape versions of the CW20-5 series signs may be used as an option if the rectangular signs shown are not available.
14. The Advance Warning Vehicle may straddle the edgeline when Shoulder width makes it necessary.
15. On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a DO NOT PASS (R4-1) sign should be placed on the back of the rearmost protection vehicle.

Texas Department of Transportation — *Traffic Operations Division Standard*

TRAFFIC CONTROL PLAN MOBILE OPERATIONS RAISED PAVEMENT MARKER INSTALLATION/ REMOVAL TCP(3-3)-14

FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS				
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13				
1-97 7-14				

177

NO.	DATE	REVISIONS	APP.

City of New Braunfels

CITYWIDE STREETS IMPROVEMENT PROJECTS
(SAN ANTONIO STREET AND WATER LANE)

TRAFFIC CONTROL
STANDARDS TCP(3-3)-14

QUIDDITY
Texas Board of Professional Engineers and Land Surveyors Reg. No. F-23290
2967 Oak Run Parkway, Suite 215 • New Braunfels, TX 78132 • 830.203.6630

SCALE: AS NOTED	DGN. BY: AZ		
DATE: AS NOTED	DWN. BY: JFR		
JOB NO. 05668-0026-01	DWG. NO. --		
SUBMITTED: ----	SURV. BY: QUIDDITY		

STATE OF TEXAS
ALEX ZERTUCHE
92080
LICENSED
PROFESSIONAL ENGINEER
5/9/2025

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