

VICINITY MAP  
N.T.S.

**EDWARD TEAL SURVEY  
A-207**

12 ACRES  
CRAIG R. & DONNA L. DUHON  
VOLUME 683, PAGE 228  
D.R.R.C.T.

**LEGEND**

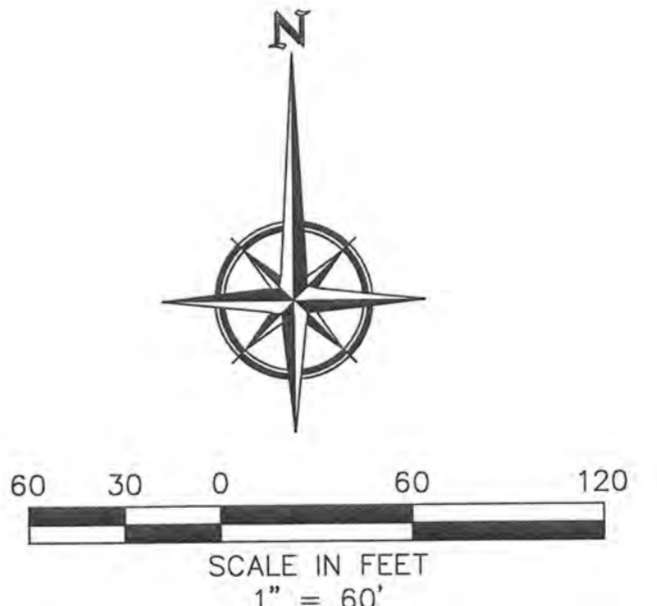
- 5/8" I.R.S. W/CAP 5/8" IRON ROD SET WITH YELLOW CAP STAMPED "RPLS 3963"
- I.R.F. IRON ROD FOUND
- CM CONTROL MONUMENT
- SPC STATE PLANE COORDINATES
- C.A. COMMON AREA TRACT
- B.L. BUILDING SETBACK LINE
- R.E. RETAINING WALL EASEMENT
- U.E. UTILITY EASEMENT
- F.U.E. FRANCHISE UTILITY EASEMENT
- L.S.E. LANDSCAPE EASEMENT
- D.E. DRAINAGE EASEMENT
- S.V.E. SIDEWALK & VISIBILITY EASEMENT
- P.R.R.C.T. PLAT RECORDS ROCKWALL COUNTY, TEXAS
- D.R.R.C.T. DEED RECORDS ROCKWALL COUNTY, TEXAS
- ◊ INDICATES CHANGE IN STREET NAME

**LINE TABLE**

NO.	DIRECTION	DISTANCE
L1	N 6°03'52" E	14.12'
L2	N 46°11'20" E	19.51'
L3	S 42°43'50" E	19.90'
L4	S 5°31'18" W	34.36'
L5	N 85°47'45" W	34.42'
L6	N 0°07'12" E	65.15'
L7	N 21°46'40" W	52.49'
L8	S 53°11'39" E	35.52'
L9	S 44°30'54" E	14.23'
L10	N 45°31'09" E	14.06'
L11	N 42°48'13" W	14.63'
L12	S 49°53'50" W	14.31'
L13	S 40°06'10" E	13.97'
L14	S 63°25'20" W	36.12'
L15	S 84°28'42" E	21.33'

**CURVE TABLE**

CURVE	DELTA	RADIUS	TANGENT	LENGTH	CHORD BEARING	CHORD
C1	094°40'18"	32.50'	35.26'	53.70'	S 41°48'51" E	47.80'
C2	088°40'57"	32.50'	31.76'	50.30'	S 49°51'47" W	45.43'
C3	085°54'57"	32.50'	30.26'	48.73'	N 42°50'16" W	44.29'



FINAL PLAT  
**WHISPER ROCK**  
LOTS 1-28, BLOCK A  
BEING  
28 SINGLE FAMILY LOTS  
2 COMMON AREA TRACTS  
ZONED: PD-47  
9.477 ACRES  
SITUATED IN THE  
EDWARD TEAL SURVEY, A-207  
CITY OF ROCKWALL, ROCKWALL COUNTY, TEXAS  
**ENGINEERING CONCEPTS & DESIGN, L.P.**  
ENGINEERING/PROJECT MANAGEMENT/CONSTRUCTION SERVICES  
TEXAS FIRM REG. NO. 001145  
201 WINDCO CIRCLE, SUITE 200, WYLIE, TX 75098  
(972) 941-8400 FAX (972) 941-8401

OWNER  
**RRDC, LTD.**  
900 HEATHLAND CROSSING  
HEATH, TX 75032  
LAND SURVEYOR  
**R.C. MYERS SURVEYING, LLC**  
488 ARROYO COURT  
SUNNYVALE, TX 75182  
(214) 532-0636  
FAX (972) 412-4875  
EMAIL: rcmsurveying@gmail.com  
FIRM NO. 10192300 JOB NO. 426

STATE OF TEXAS  
COUNTY OF ROCKWALL

**OWNER'S CERTIFICATE & DEDICATION**

WHEREAS RRDC, LTD., BEING THE OWNER OF A TRACT OF land in the County of Rockwall, State of Texas, said tract being described as follows:

BEING a 9.477 acre tract of land situated in the Edward Teal Survey, Abstract No. 207, City of Rockwall, Rockwall County, Texas and being all of a called 9.4769 acre tract of land described in a deed to RRDC, LTD., recorded as instrument No. 2017000023557, Deed Records of Rockwall County, Texas (DRRCT), and being more particularly described as follows:

BEGINNING at a 5/8" iron rod with a yellow plastic cap stamped "RPLS 3963" set for corner in the east right-of-way line of Ridge Road (FM 740) at the northwest corner of said 9.4769 acre tract;

THENCE South 85 degrees 43 minutes 42 seconds East along the north line thereof and partly with the south lines of the original Benton Court Addition, an Addition to the City of Rockwall recorded in Cabinet D, Slide 69, and Benton Woods, an Addition to the City of Rockwall recorded in Cabinet C, Slide 254, all recorded in the Plat Records of Rockwall County, Texas (PRRCT), for a total distance of 559.60 feet to a point for corner near the base of a steel fence post at the northeast corner of said 9.4769 acre tract, common to the northwest corner of a called 12.000 acre tract described in a deed to Craig Duhon et ux, recorded in Volume 693, Page 228, (DRRCT), from which a 5/8" iron rod with a yellow plastic cap stamped "RPLS 3963" set for reference bears South 65 degrees 08 minutes 39 seconds West, a distance of 39.54 feet;

THENCE South 00 degrees 10 minutes 53 seconds West, along the common line of last mentioned tracts, a distance of 679.81 feet to a point for corner near the base of a plastic fence post at the southeast corner of said 9.4769 acre tract, common to the northeast corner of Lot 1, Block A, First Christian Church, Disciples of Christ, an Addition to the City of Rockwall recorded in Cabinet E, Slide 361 (PRRCT), from which a 5/8" iron rod with a yellow plastic cap stamped "RPLS 3963" set for reference bears South 61 degrees 46 minutes 53 seconds West, a distance of 37.56 feet;

THENCE North 89 degrees 09 minutes 00 seconds West with the common line of said 9.4769 acre tract and said Lot 1, a distance of 625.79 feet to a point for corner at the common west corner thereof, and also being in the east line of said Ridge Road, from which a 3-1/4" TXDOT Aluminum Disk found for reference bears South 58 degrees 52 minutes 38 seconds West, a distance of 0.41 feet;

THENCE North 05 degrees 42 minutes 52 seconds East with the East Right-of-Way line of said Ridge Road, a distance of 14.11 feet to a 3-1/4" TXDOT Aluminum Disk found at an angle point thereof;

THENCE North 05 degrees 35 minutes 24 seconds East continuing with the East Right -of-way line of said Ridge Road, a distance of 701.50 feet to the POINT OF BEGINNING and containing 412,629 square feet or 9.477 acres of land.

NOW, THEREFORE, KNOW ALL MEN BY THESE PRESENTS:

RRDC, LTD., the undersigned owner of the land shown on this plat, and designated herein as WHISPER ROCK, a subdivision to the City of Rockwall, Texas, and whose name is subscribed hereto, hereby dedicate to the use of the public forever all streets, alleys, parks, water courses, drains, easements and public places thereon shown on the purpose and consideration therein expressed. I further certify that all other parties who have a mortgage or lien interest in the WHISPER ROCK subdivision have been notified and signed this plat. I understand and do hereby reserve the easement strips shown on this plat for the purposes stated and for the mutual use and accommodation of all utilities desiring to use or using same. I also understand the following:

- No buildings shall be constructed or placed upon, over, or across the utility easements as described herein.
- Any public utility shall have the right to remove and keep removed all or part of any buildings, fences, trees, shrubs, or other growths or improvements which in any way endanger or interfere with construction, maintenance or efficiency of their respective system on any of these easement strips; and any public utility shall at all times have the right of ingress or egress to, from and upon the said easement strips for purpose of construction, reconstruction, inspecting, patrolling, maintaining, and either adding to or removing all or part of their respective system without the necessity of, at any time, procuring the permission of anyone.
- The City of Rockwall will not be responsible for any claims of any nature resulting from or occasioned by the establishment of grade of streets in the subdivision.
- The developer and subdivision engineer shall bear total responsibility for storm drain improvements.
- The developer shall be responsible for the necessary facilities to provide drainage patterns and drainage controls such that properties within the drainage area are not adversely affected by storm drainage from the development.
- No house dwelling unit, or other structure shall be constructed on any lot in this addition by the owner or any other person until the developer and/or owner has complied with all requirements of the Subdivision Regulations of the City of Rockwall regarding improvements with respect to the entire block on the street or streets on which property abuts, including the actual installation of streets with the required base and paving, curb and gutter, water and sewer, drainage structures, storm structures, storm sewers, and alleys, all according to the specifications of the City of Rockwall; or

Until an escrow deposit, sufficient to pay for the cost of such improvements, as determined by the city's engineer and/or city administrator, computed on a private commercial rate basis, has been made with the city secretary, accompanied by an agreement signed by the developer and/or owner, authorizing the city to make such improvements at prevailing private commercial rates, or have the same made by a contractor and pay for the same out of the escrow deposit, should the developer and/or owner fail or refuse to install the required improvements within the time stated in such written agreement, but in no case shall the City be obligated to make such improvements itself. Such deposit may be used by the owner and/or developer as progress payments as the work progresses in making such improvements by making certified requisitions to the city secretary, supported by evidence of work done; or

Until the developer and/or owner files a corporate surety bond with the city secretary in a sum equal to the cost of such improvements for the designated area, guaranteeing the installation thereof within the time stated in the bond, which time shall be fixed by the city council of the City of Rockwall.

7. Property owners are responsible for maintenance, repair and replacement of all retaining walls and drainage and detention systems in easements.

I further acknowledge that the dedications and/or exaction's made herein are proportional to the impact of the Subdivision upon the public services required in order that the development will comport with the present and future growth needs of the City. I, my successors and assigns hereby waive any claim, damage, or cause of action that I may have as a result of the dedication of exactions made herein.

FOR: RRDC, LTD.  
BY: RRDC-GP, LLC, its general partner

BY: Scott Lewis, Manager

FOR: \_\_\_\_\_ (LIEN HOLDER)

BY: NAME:  
TITLE:

STATE OF TEXAS  
COUNTY OF ROCKWALL

Before me, the undersigned authority, on this day personally appeared Scott Lewis, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same for the purpose and consideration therein stated.

Given upon my hand and seal of office this \_\_\_\_ day of \_\_\_\_\_, 2019.

Notary Public in and for the State of Texas  
My Commission Expires:

STATE OF TEXAS  
COUNTY OF ROCKWALL

Before me, the undersigned authority, on this day personally appeared \_\_\_\_\_ known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same for the purpose and consideration therein stated.

Given upon my hand and seal of office this \_\_\_\_ day of \_\_\_\_\_, 2019.

Notary Public in and for the State of Texas  
My Commission Expires:

**Notes:**

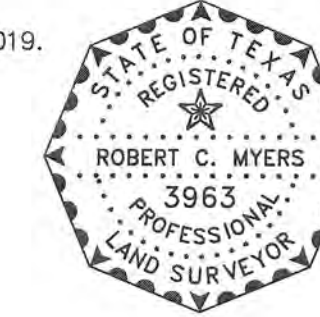
- Bearings and grid coordinates are based on Texas State Plane Coordinates. Projection: State Plane NAD83 Texas North Central Zone 4202, Lambert Conformal Conic, Feet (TX83-NCF).
- Unless otherwise noted, a 5/8" iron rod with a yellow cap stamped "RPLS 3963" will be set at all lot corners, whenever possible, after all construction for this subdivision is completed.
- According to my interpretations of the Rockwall County, Texas and Incorporated Areas, Flood Insurance Rate Map Number 48397C0040L, dated September 26, 2008, the subject property lies within flood Zone "X" and is not shown to be within a Special Flood Hazard Area. This statement does not imply that the property and/or structures thereon will be free from flooding or flood damage. On rare occasions, greater floods can and will occur and flood heights may be increased by man-made or natural causes. This statement shall not create liability on the part of the surveyor.
- The retaining walls located within the Retaining Wall Easements will be owned and maintained by the property owner of the lot in which the retaining wall is located. Retaining walls may not be located on the property lines between lots. The Retaining Wall Easements are private easements to provide access for construction and maintenance of the retaining walls by the affected lot owners.
- The Homeowners Association or Property Owner will be responsible for all maintenance of the Common Area tracts and Landscape Easements.

**SURVEYOR'S CERTIFICATE**

NOW, THEREFORE KNOW ALL MEN BY THESE PRESENTS:

That I, Robert C. Myers, do hereby certify that this plat was prepared from an actual and accurate survey of the land, and that the corner monuments shown thereon were properly placed under my personal supervision.

GIVEN UNDER MY HAND AND SEAL THIS 22ND DAY OF MAY, 2019.



ROBERT C. MYERS  
REGISTERED PROFESSIONAL LAND SURVEYOR  
STATE OF TEXAS NO. 3963

STATE OF TEXAS  
COUNTY OF COLLIN

BEFORE ME, the undersigned authority, on this date personally appeared Robert C. Myers, known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that he executed the same for the purposes and consideration therein stated.

GIVEN MY HAND AND SEAL OF OFFICE THIS 22ND DAY OF MAY, 2019.

NOTARY PUBLIC FOR THE STATE OF TEXAS  
MY COMMISSION EXPIRES:

**APPROVAL CERTIFICATE**

Planning & Zoning Commission, Chairman

Date

APPROVED:  
I hereby certify that the above and foregoing plat of an addition to the City of Rockwall, Texas, was approved by the City Council of the City of Rockwall on the \_\_\_\_ day of \_\_\_\_\_, 2019.

This approval shall be invalid unless the approved plat for such addition is recorded in the office of the County Clerk of Rockwall, County, Texas, within one hundred eighty (180) days from said date of final approval.

WITNESS OUR HANDS, this \_\_\_\_ day of \_\_\_\_\_, 2019.

\_\_\_\_\_  
Mayor, City of Rockwall

\_\_\_\_\_  
City Secretary

\_\_\_\_\_  
City Engineer

**FINAL PLAT**

**WHISPER ROCK  
LOTS 1-28, BLOCK A**

BEING

**28 SINGLE FAMILY LOTS  
2 COMMON AREA TRACTS  
ZONED: PD-47  
9.477 ACRES**

SITUATED IN THE

**EDWARD TEAL SURVEY, A-207  
CITY OF ROCKWALL, ROCKWALL COUNTY, TEXAS**

OWNER  
**RRDC, LTD.**  
900 HEATHLAND CROSSING  
HEATH, TX 75032

LAND SURVEYOR  
**R.C. MYERS SURVEYING, LLC**  
488 ARROYO COURT  
SUNNYVALE, TX 75182  
(214) 532-0636  
FAX (972) 412-4875  
EMAIL: ramsurveying@gmail.com  
FIRM NO. 10192300 JOB NO. 426

**ENGINEERING CONCEPTS & DESIGN, L.P.**  
ENGINEERING/PROJECT MANAGEMENT/CONSTRUCTION SERVICES  
TEXAS FIRM REG. NO. 001145  
201 WINDCO CIRCLE, SUITE 200, WYLIE, TX 75098  
(972) 941-8400 FAX (972) 941-8401

REV. 05/20/2019  
DATE: 12/22/2017 CASE: P2018-043 SHEET 2 OF 2

**GENERAL NOTES:**

- All work, methods, materials, and equipment shall conform to City of Rockwall Subdivision Regulations, the North Central Texas Council of Government construction standards 4th edition, any special provisions to the NCTCOG approved by the city of Rockwall. Standard details can be obtained from NCTCOG and the City of Rockwall.
- Prior to construction, the contractor shall familiarize himself with the contract documents and specifications, the plans including all notes and any other applicable standards or specifications relevant to the proper completion of the work specified. Failure on the part of the contractor to familiarize himself with all standards or specifications pertaining to this work shall in no way relieve the contractor of responsibility for performing the work in accordance with all such applicable standards and specifications.
- Contractor shall have in his possession, prior to construction, all-necessary permits, licenses, etc. Contractor shall have at least one set of approved engineering plans and specifications on site at all time.
- Any item of work called for by the plans and/or specification and not included, as a bid item shall be subsidiary to the construction of the various bid items.
- Construction inspection will be performed by representatives of the owner, engineer, City, geotechnical engineer, and reviewing authorities and agencies. Unrestricted access shall be provided to them at all times. Contractor is responsible for scheduling required inspections as required by contract documents.
- The contractor and all subcontractors must confine their activities to the work area. Any damage resulting from work outside the work area, shall be the contractor's responsibility.
- It will be the responsibility of each contractor to protect all existing public and private utilities throughout the construction of this project. Contractor shall contact the appropriate utility companies for line locations prior to commencement of construction and shall assume full liability to those companies for any damages caused to their facilities. Location of utilities are taken from the City and Utility Company records. Contractor shall field verify to determine exact location of utilities. Contractor to adjust all existing and proposed utilities to final grade.
- Trench safety design will be the responsibility of the contractor. The contractor shall abide by all applicable federal, state, and local laws governing excavation. Trench side slopes shall meet OSHA standards. Shutting, shoring, and bracing shall be required when side slope standards are not met. A pull box, meeting OSHA standards will be acceptable. The contractor shall submit detailed plans to the City Engineer for review showing how OSHA Standards for excavation shall be met prior to the start of any utility construction. The plans shall be sealed by an Engineer registered by the State of Texas.
- Contractor shall stockpile salvage materials for inspection. All items not salvaged by the owner shall be removed from the site at the contractor's expense. The owner will transport salvaged materials away from the site at the owner's expense. Salvage, stockpile, and removal of materials shall be considered subsidiary to the various bid items and shall not be paid for directly unless such items are specifically included in the bid items.
- The contractor shall be responsible for providing and maintaining all necessary warning and safety work, material, and operations needed to provide for the health and safety of the public until all work has been completed, including maintenance bond periods, and to be accepted by City of Rockwall in writing.
- All fill to be compacted to 95% with sheeps foot roller in 8" lifts.

**WATER NOTES:**

- All new water line shall be fully purged. Do not test against existing valves when connecting to existing lines.
- Where water mains either cross or otherwise come within 9 feet of a sanitary sewer main, the contractor will conform to Texas Administrative Code Title 30, Part 1, Chapter 290, Subchapter D, Rule
- Utility contractor shall use MEGALUG when installing the water line and double strap services when installing the services.
- Water services shall be installed w/double strap saddle and tap installed with a corporation stop at the distribution pipeline and an angle stop.
- All water lines shall be pressure tested and disinfected in accordance with AWWA C 601. A passing Bacteriological test (negative for coliform) shall be achieved prior to acceptance.
- Water pipelines shall be PVC pipe conforming to the Standard Specifications for Construction. In general, the water pipelines shall be Class 200 PVC C900 DR14 pipe, and installed with a minimum of four feet (4') of cover, unless approved by the City. All pipes shall be installed in embedment material as shown on the Standard Drawings and in conformance with the Standard Specifications of Construction. Blue EMS locator pads to be installed on waterline every 250' and at every bend, service, valve and firehydrant.
- All gate valves shall be manufactured by Mueller, or an approved equal with resilient seat only and shall conform to and shall be installed according to the Standard Specifications of Construction.
- Fire hydrants shall be either Mueller, or an approved equal conforming to the requirements set forth in the Standard Specifications for Construction. All fire hydrants shall be installed with a six-inch (6") gate valve on the hydrant lead. The installation shall be as set forth in the Standard Specifications for Construction. Fire hydrants shall be painted to meet the City's requirements for color code as set forth in the Standard Specifications. In general, the fire hydrant will be reflective silver with differing cap color, which corresponds to the size of hydrant feeder line, as detailed in Table 5.2 Fire hydrants shall be installed at the end of each dead end line. Minimum main size for a fire hydrant shall be eight inches (8") if main is over fifty feet (50') long. In all developments an eight inch (8") lead will be required on all fire hydrants that are located more than fifty feet (50') from a looped water line.
- Service pipelines shall be in accordance with the designs shown on the Standard Drawings. The materials shall be Mueller or approved equal and shall be installed in accordance with the Standard Specifications for Construction. All connections shall be flare type or approved equal.
- Mega-lugs or approved equal shall be installed at all horizontal change in directions at all vertical changes in directions that require a bend. The restraints shall be placed at the bend and at the next pipe joint in each direction from the bend.
- Commercial irrigation meters shall have a testable double check backflow preventer.
- Install blue EMS disks on the water line at every change in direction, valve, fire hydrant, and every 250' and service connection.

**WASTEWATER NOTES:**

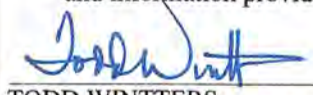
- All wastewater lines shall be tested for infiltration in accordance with the procedures set forth in the Standard Specifications for Construction. In general, all wastewater pipe shall be installed so that the completed wastewater will have a maximum exfiltration of one hundred fifty (150) gallons per inch of internal diameter, per mile of pipe, per 24 hours, where the maximum hydrostatic head at the centerline of the pipe does not exceed twenty-five (25) feet. A television survey will be performed as part of the final testing in the tenth (10th) month of the maintenance period. The City's representative shall be present at all testing. All expenses for this work shall be the developer's responsibility.
- Install green EMS disks on sanitary sewer line at every change in direction, manhole, service, & clean out.
- All manholes to be Raven lined or approved equal and sealed.

**STORM WATER NOTES:**

- Contractor shall construct and maintain all stormwater facilities detention which includes either seeded curlex or sod on the sides and bottom of the detention pond before paving can be placed..

**TxDOT**

- ALL WORK WITHIN THE TEXAS DEPARTMENT OF TRANSPORTATION (TxDOT) RIGHT OF WAY MUST COMPLY WITH SPECIFICATIONS ADOPTED BY TxDOT NOVEMBER 1, 2014, AND THE TxDOT STANDARDS INCLUDED IN THE PLANS.

**RECORD DRAWINGS**  
 To the best of our knowledge Engineering Concepts & Design, L.P., hereby states that this plan is As-Built. This information provided is based on surveying at the site and information provided by the contractor.  
 11-1-19  
 TODD WINTERS DATE

ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN REMAINS WITH THE DESIGN ENGINEER. THE CITY OF ROCKWALL, IN REVIEWING AND RELEASING PLANS FOR CONSTRUCTION, ASSUMES NO RESPONSIBILITY FOR ADEQUACY OR ACCURACY OF DESIGN.

CITY \_\_\_\_\_ DATE \_\_\_\_\_


**CAUTION! EXISTING UTILITIES**  
 CONTRACTOR SHOULD CALL 1-800-DIG-TESS PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES FOR EXISTING UTILITY LOCATIONS. EXISTING UTILITIES AND UNDERGROUND FACILITIES INDICATED ON THESE PLANS HAVE BEEN LOCATED FROM REFERENCE INFORMATION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY BOTH HORIZONTALLY AND VERTICALLY THE LOCATION OF ALL EXISTING UTILITIES AND UNDERGROUND FACILITIES PRIOR TO CONSTRUCTION AND TO TAKE NECESSARY PRECAUTIONS IN ORDER TO PROTECT ALL FACILITIES ENCOUNTERED. THE CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION.

**BENCHMARKS**  
 BM = MONUMENT RESET #1  
 32± LF WEST OF FM 740 & SUMMER LEE DRIVE INTERSECTION, SOUTH SIDE OF SUMMER LEE DRIVE.  
 ELEV=567.704  
 BM = MONUMENT R014  
 375± LF WEST OF RIDGE ROAD & HENRY M CHANDLER DRIVE INTERSECTION, ON NORTH SIDE OF HENRY M. CHANDLER DRIVE  
 ELEV=561.017

**ENGINEERING CONCEPTS & DESIGN, L.P.**  
 ENGINEERING / PROJECT MANAGEMENT / CONSTRUCTION SERVICES - FIRM REG. #F-001145  
 201 WINDCO CIR, STE 200, WYLIE, TX 75098  
 972-941-8400 FAX: 972-941-8401 WWW.ECDLP.COM

REVISIONS:	
DRAWN: JD	DATE:
CHECKED: M.A.	DATE: NOVEMBER 2018
PROJECT NO: 02114	
DWG FILE NAME: GENERAL NOTES.DWG	

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF CONSTRUCTION. THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY MATT ATKINS, P.E. 93968

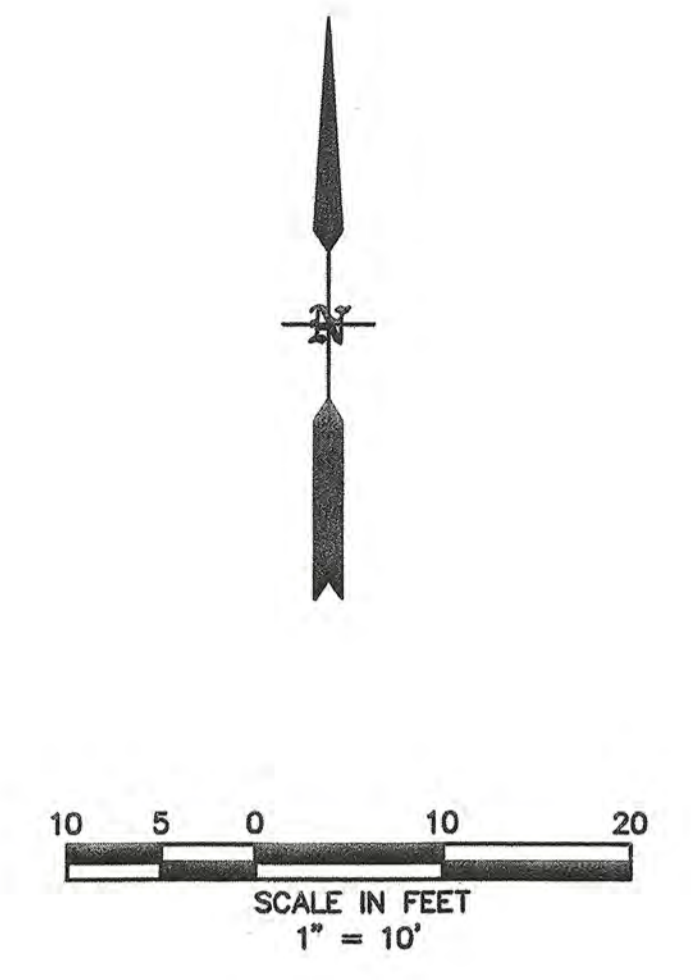
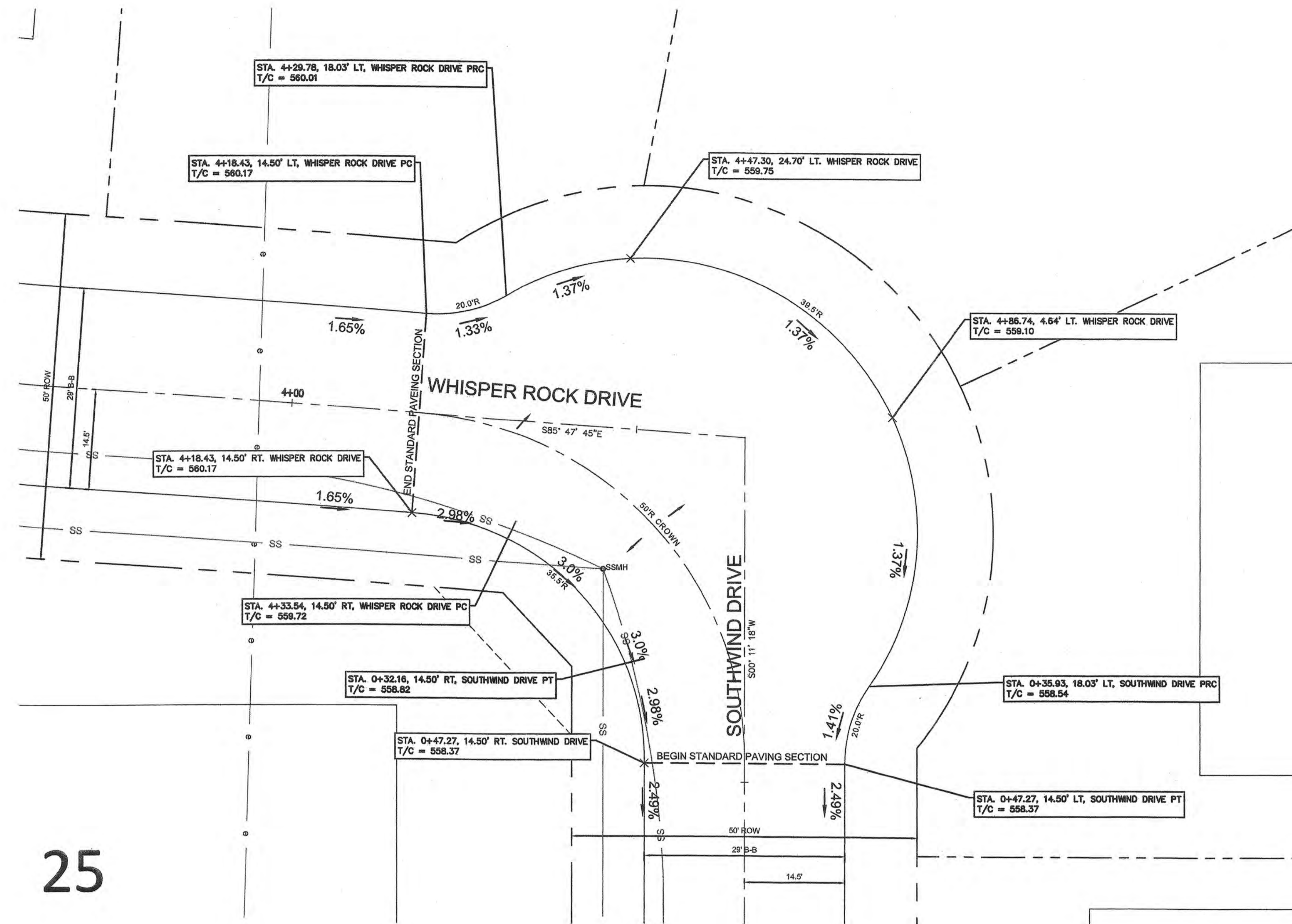


11/01/2018

**GENERAL NOTES**  
 WHISPER ROCK  
 CITY OF ROCKWALL  
 ROCKWALL COUNTY

SHEET  
 03  
 OF  
 58





25

**RECORD DRAWINGS**

To the best of our knowledge Engineering Concepts & Design, L.P., hereby states that this plan is As-Built. This information provided is based on surveying at the site and information provided by the contractor.

*Todd Winters* 11-1-17  
 TODD WINTERS DATE

ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN REMAINS WITH THE DESIGN ENGINEER. THE CITY OF ROCKWALL, IN REVIEWING AND RELEASING PLANS FOR CONSTRUCTION, ASSUMES NO RESPONSIBILITY FOR ADEQUACY OR ACCURACY OF DESIGN.

CITY \_\_\_\_\_ DATE \_\_\_\_\_

**CAUTION! EXISTING UTILITIES**

CONTRACTOR SHOULD CALL 1-800-DIG-TESS PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES FOR EXISTING UTILITY LOCATIONS. EXISTING UTILITIES AND UNDERGROUND FACILITIES INDICATED ON THESE PLANS HAVE BEEN LOCATED FROM REFERENCE INFORMATION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY BOTH HORIZONTALLY AND VERTICALLY THE LOCATION OF ALL EXISTING UTILITIES AND UNDERGROUND FACILITIES PRIOR TO CONSTRUCTION AND TO TAKE NECESSARY PRECAUTIONS IN ORDER TO PROTECT ALL FACILITIES ENCOUNTERED. THE CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION.

**BENCHMARKS**

BM = MONUMENT RESET #1  
 322.1' WEST OF FM 740 & SUMMER LEE DRIVE INTERSECTION. SOUTH SIDE OF SUMMER LEE DRIVE.  
 ELEV=567.704

BM = MONUMENT R014  
 375± LF WEST OF RIDGE ROAD & HENRY M CHANDLER DRIVE INTERSECTION, ON NORTH SIDE OF HENRY M. CHANDLER DRIVE  
 ELEV=561.017

**ENGINEERING CONCEPTS & DESIGN, L.P.**

ENGINEERING / PROJECT MANAGEMENT / CONSTRUCTION SERVICES - FIRM REG. #F-001145  
 201 WINDCO CIR, STE 200, WYLIE, TX 75098  
 972-941-8400 FAX: 972-941-8401 WWW.ECDLP.COM

REVISIONS:

DRAWN: JD	DATE:
CHECKED: M.A.	DATE: NOVEMBER 2018
PROJECT NO.: 02114	
DWG FILE NAME: 2114 EYEBROW DETAILS.DWG	

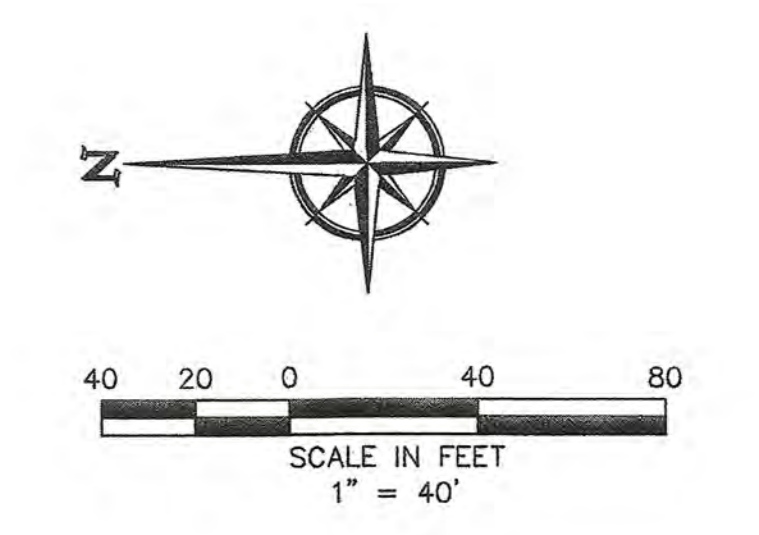
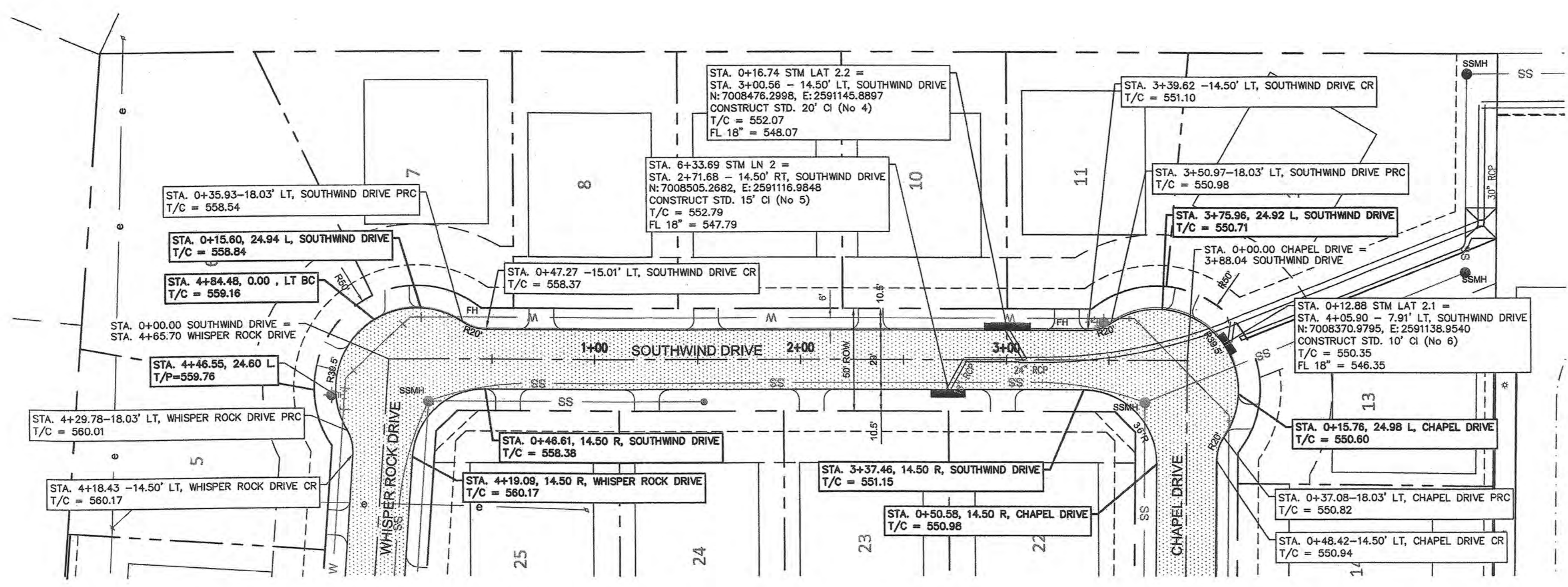
THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF CONSTRUCTION. THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY MATT ATKINS, P.E. 93968



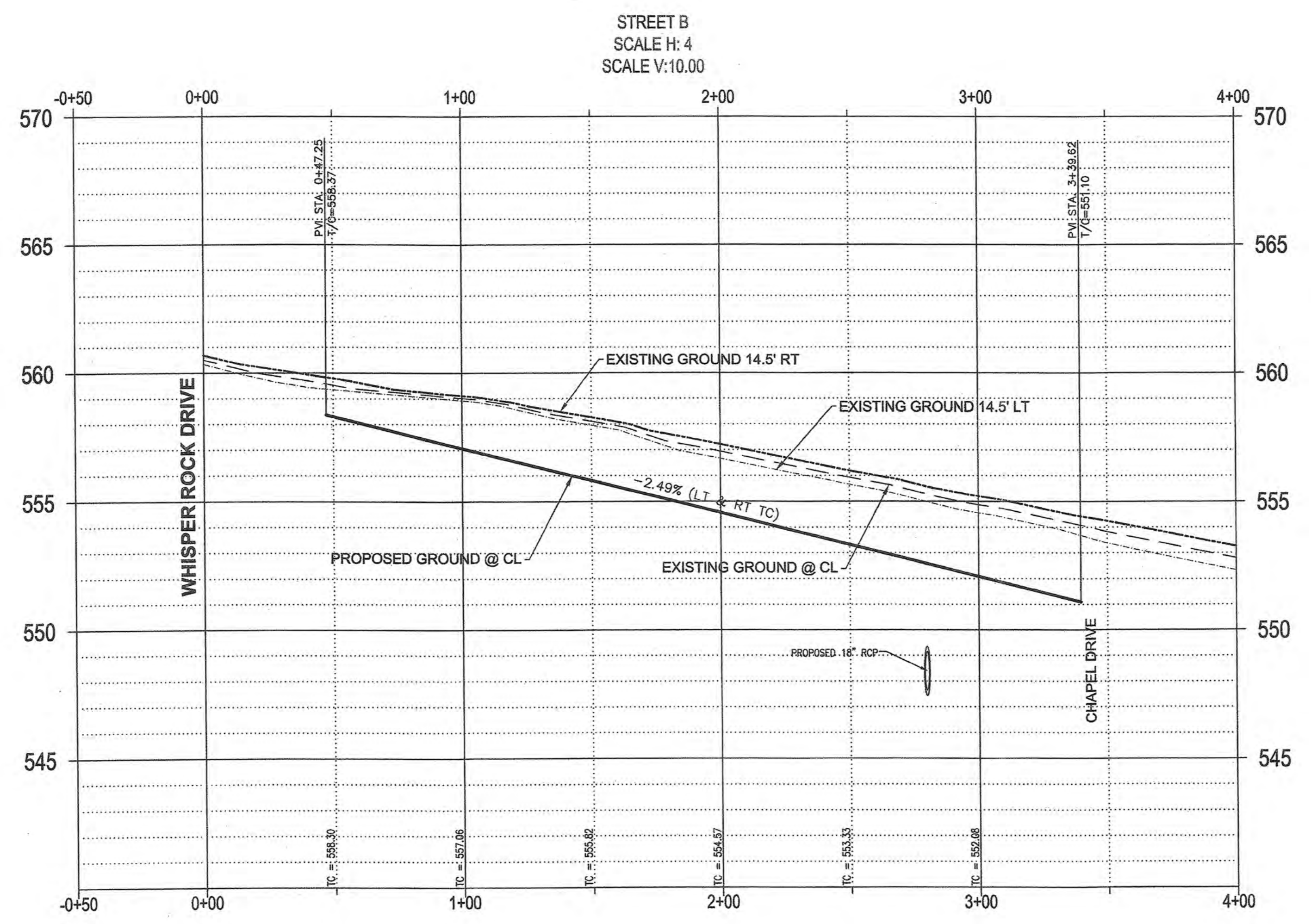
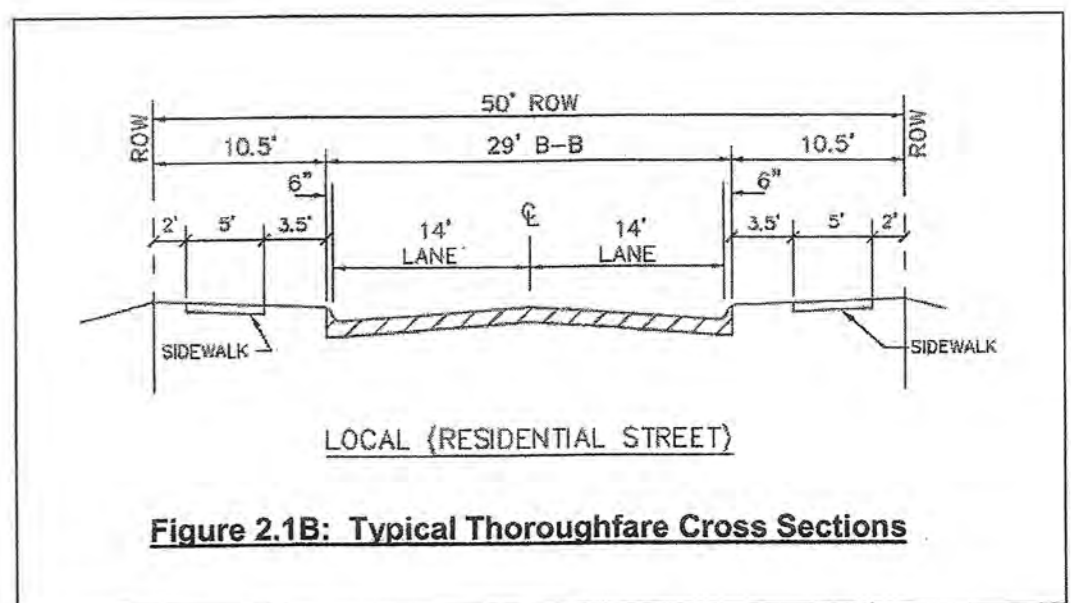
**INTERSECTION 1 DETAIL-WHISPER ROCK DR & SOUTHWIND DRIVE**

WHISPER ROCK  
 CITY OF ROCKWALL  
 ROCKWALL COUNTY

SHEET  
 05  
 OF  
 58



**LEGEND:**  
 PROPOSED CONCRETE PVMT.  
 (SEE GEOTECH REPORT FOR DETAILS.)



**RECORD DRAWINGS**  
 To the best of our knowledge Engineering Concepts & Design, L.P., hereby states that this plan is As-Built. This information provided is based on surveying at the site and information provided by the contractor.  
 Todd Winters 11-1-19  
 TODD WINTERS DATE

ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN REMAINS WITH THE DESIGN ENGINEER. THE CITY OF ROCKWALL, IN REVIEWING AND RELEASING PLANS FOR CONSTRUCTION, ASSUMES NO RESPONSIBILITY FOR ADEQUACY OR ACCURACY OF DESIGN.  
 CITY DATE

**CAUTION! EXISTING UTILITIES**  
 CONTRACTOR SHOULD CALL 1-800-966-TESS PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES FOR EXISTING UTILITY LOCATIONS. EXISTING UTILITIES AND UNDERGROUND FACILITIES INDICATED ON THESE PLANS HAVE BEEN LOCATED FROM REFERENCE INFORMATION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY BOTH HORIZONTALLY AND VERTICALLY THE LOCATION OF ALL EXISTING UTILITIES AND UNDERGROUND FACILITIES PRIOR TO CONSTRUCTION AND TO TAKE NECESSARY PRECAUTIONS IN ORDER TO PROTECT ALL FACILITIES ENCOUNTERED. THE CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION.

**BENCHMARKS**  
 BM = MONUMENT RESET #1  
 32± LF WEST OF FM 740 & SUMMER LEE DRIVE INTERSECTION, SOUTH SIDE OF SUMMER LEE DRIVE.  
 ELEV=567.704  
 BM = MONUMENT R014  
 375± LF WEST OF RIDGE ROAD & HENRY M CHANDLER DRIVE INTERSECTION, ON NORTH SIDE OF HENRY M. CHANDLER DRIVE.  
 ELEV=561.017

**ENGINEERINGCONCEPTS & DESIGN, L.P.**  
 ENGINEERING / PROJECT MANAGEMENT / CONSTRUCTION SERVICES - FIRM REG. #F-001145  
 201 WINDCO CIR, STE 200, WYLIE, TX 75098  
 972-941-8400 FAX: 972-941-8401 WWW.ECDLP.COM

REVISIONS:	
DRAWN: JD	DATE:
CHECKED: M.A.	DATE: NOVEMBER 2018
PROJECT NO.: 02114	
DWG FILE NAME: PAVING PLAN & PROFILE-1.DWG	

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF CONSTRUCTION. THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY MATT ATKINS, P.E. 93968

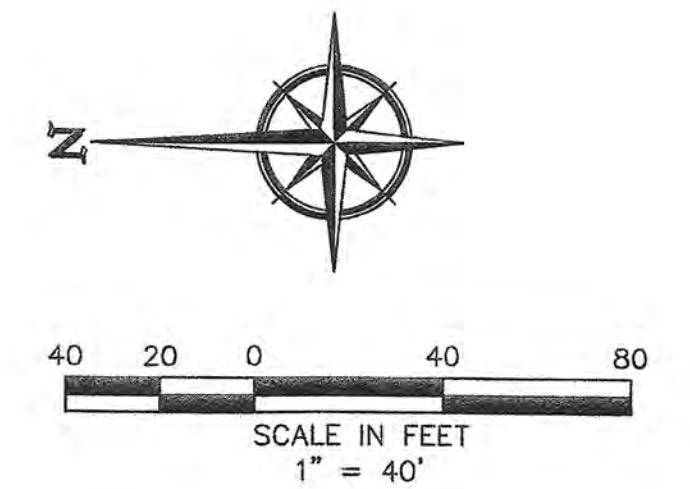
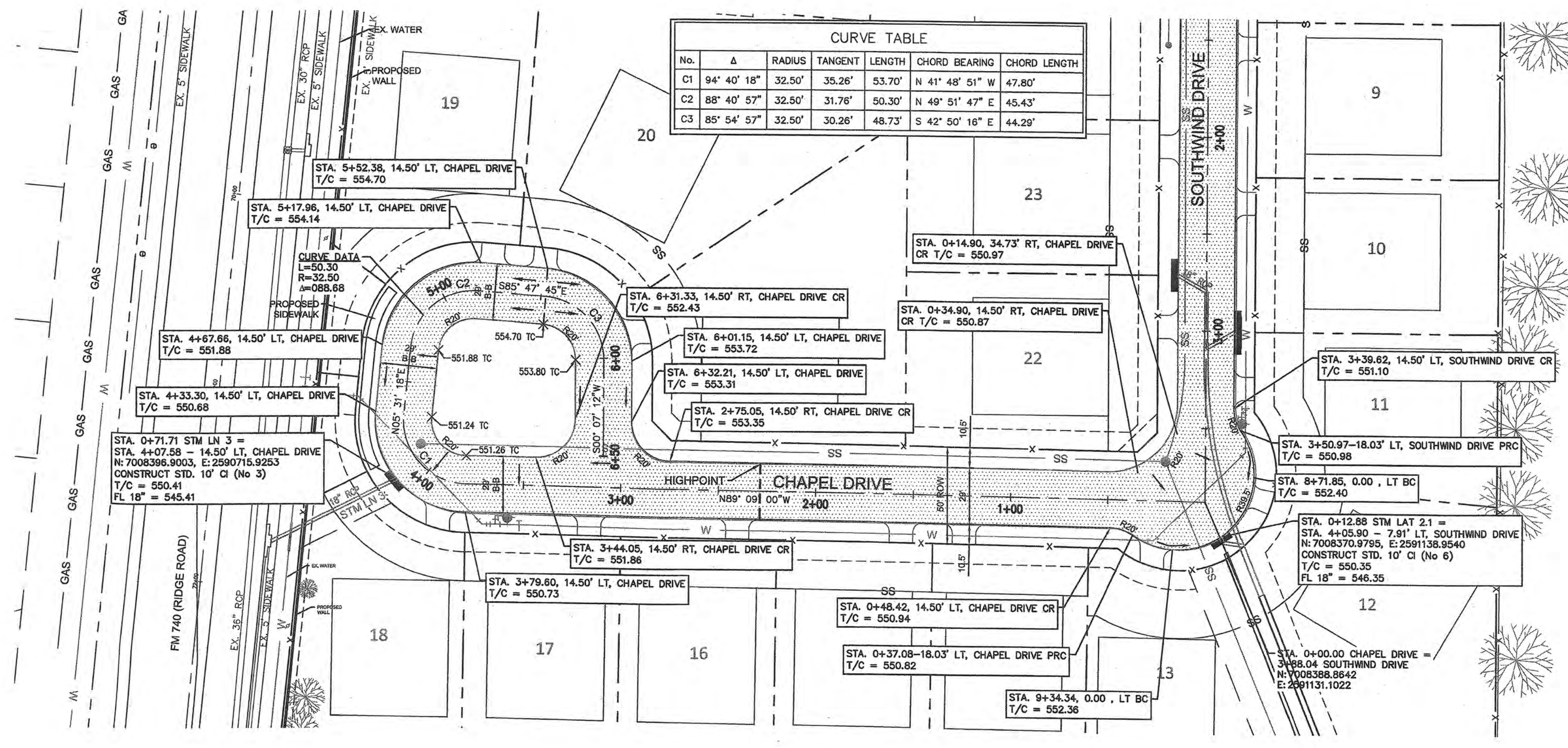


**PAVING PLAN & PROFILE SOUTHWIND DRIVE**  
 WHISPER ROCK  
 CITY OF ROCKWALL  
 ROCKWALL COUNTY

SHEET  
 06  
 OF  
 58

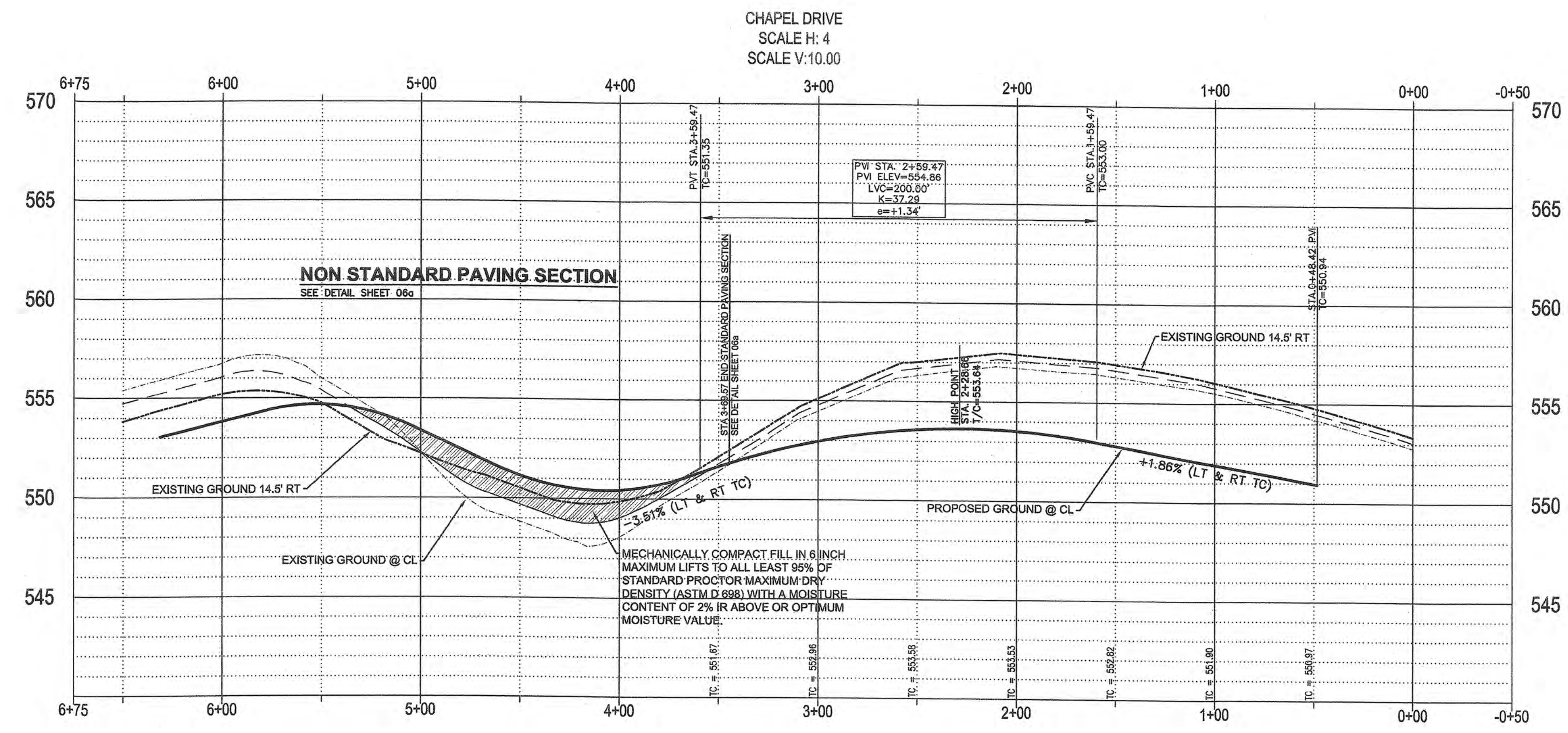
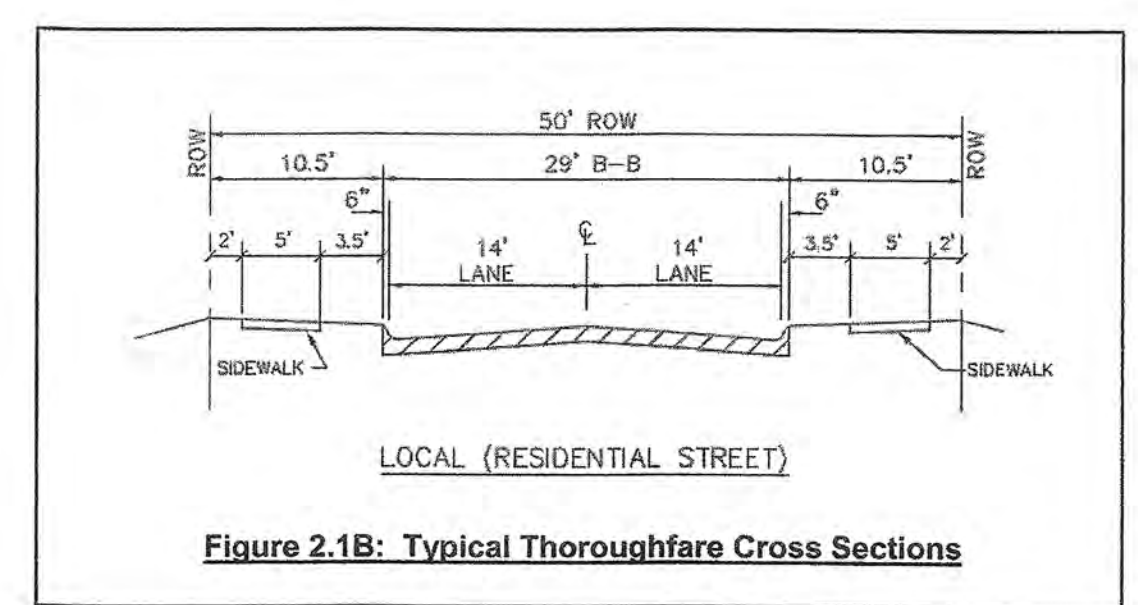






**LEGEND:**  
 [Symbol] PROPOSED CONCRETE PAVT.  
 (SEE GEOTECH REPORT FOR DETAILS.)

**NOTE**  
 SECTION PER DETAIL R-2033



**RECORD DRAWINGS**

To the best of our knowledge Engineering Concepts & Design, L.P., hereby states that this plan is As-Built. This information provided is based on surveying at the site and information provided by the contractor.

TODD WINTERS 11-1-19 DATE

ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN REMAINS WITH THE DESIGN ENGINEER. THE CITY OF ROCKWALL, IN REVIEWING AND RELEASING PLANS FOR CONSTRUCTION, ASSUMES NO RESPONSIBILITY FOR ADEQUACY OR ACCURACY OF DESIGN.

CITY \_\_\_\_\_ DATE \_\_\_\_\_

**CAUTION! EXISTING UTILITIES**

CONTRACTOR SHOULD CALL 1-800-DIG-TESS PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES FOR EXISTING UTILITY LOCATIONS. EXISTING UTILITIES AND UNDERGROUND FACILITIES INDICATED ON THESE PLANS HAVE BEEN LOCATED FROM REFERENCE INFORMATION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY BOTH HORIZONTALLY AND VERTICALLY THE LOCATION OF ALL EXISTING UTILITIES AND UNDERGROUND FACILITIES PRIOR TO CONSTRUCTION AND TO TAKE NECESSARY PRECAUTIONS IN ORDER TO PROTECT ALL FACILITIES ENCOUNTERED. THE CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION.

**BENCHMARKS**

BM = MONUMENT RESET #1  
 32± LF WEST OF FM 740 & SUMMER LEE DRIVE INTERSECTION. SOUTH SIDE OF SUMMER LEE DRIVE.  
 ELEV=567.704

BM = MONUMENT R014  
 37± LF WEST OF RIDGE ROAD & HENRY M CHANDLER DRIVE INTERSECTION. ON NORTH SIDE OF HENRY M. CHANDLER DRIVE  
 ELEV=561.017

**ENGINEERINGCONCEPTS & DESIGN, L.P.**

ENGINEERING / PROJECT MANAGEMENT / CONSTRUCTION SERVICES - FIRM REG. #F-001145  
 201 WINDCO CIR, STE 200, WYLIE, TX 75098  
 972-941-8400 FAX: 972-941-8401 WWW.ECDLP.COM

REVISIONS:

DRAWN: JD DATE: \_\_\_\_\_  
 CHECKED: M.A. DATE: NOVEMBER 2018  
 PROJECT NO.: 02114  
 DWG FILE NAME: PAVING PLAN & PROFILE-2.DWG

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF CONSTRUCTION. THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY MATT ATKINS, P.E. 93968

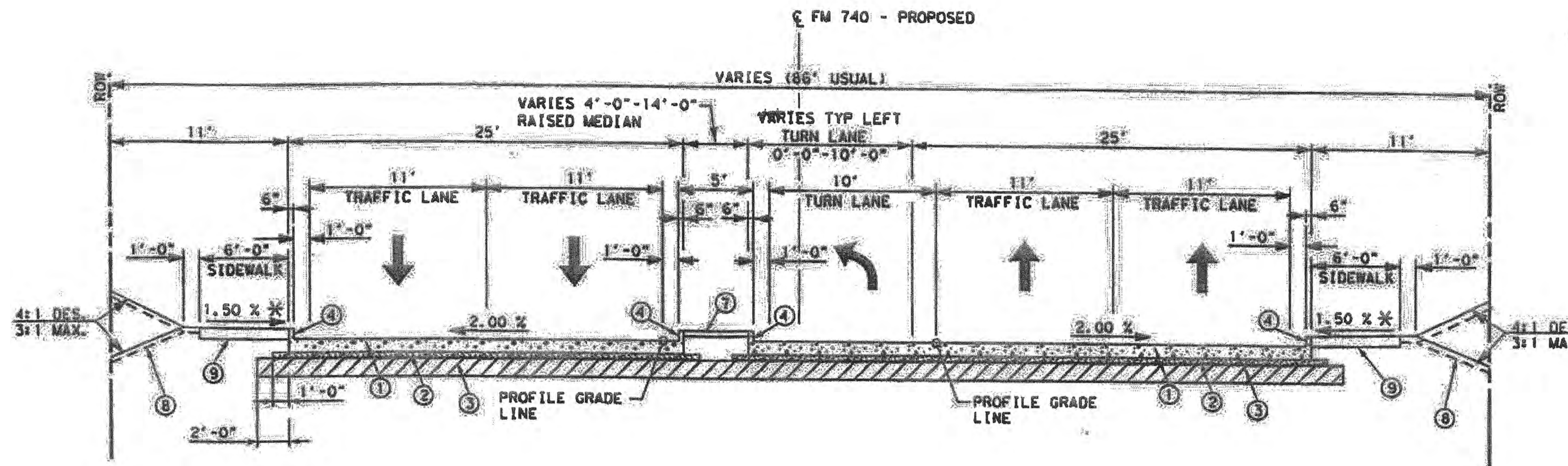
MATT ATKINS  
 REGISTERED PROFESSIONAL ENGINEER  
 STATE OF TEXAS  
 93968

PAVING PLAN & PROFILE CHAPEL DRIVE  
 WHISPER ROCK  
 CITY OF ROCKWALL  
 ROCKWALL COUNTY

SHEET  
 08  
 OF  
 58







**PROPOSED SB LEFT TURN LANE  
TYPICAL SECTION**

NTS

SEE MEDIAN DETAILS SHEETS FOR ADDITIONAL INFORMATION

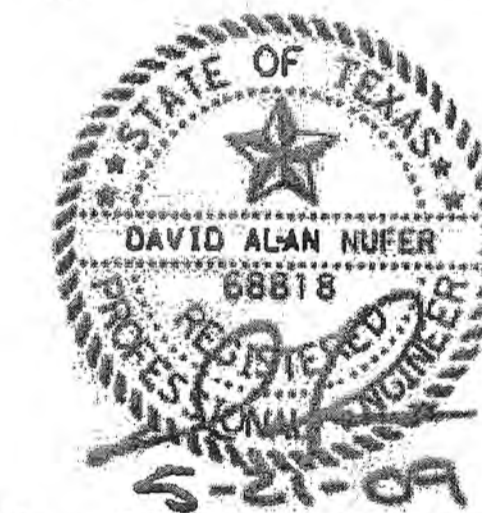
\* NOTE: ADA RAMP SHALL BE PLACED AT ALL INTERSECTIONS. MAXIMUM CROSS SLOPE FOR SIDEWALKS WILL BE 1.5%.

**LEGEND**

- ① 10" CONCRETE PAVEMENT (CRCP)
- ② 4" HMA (TY B) (D-GR HMA (METH) PG 64-22)
- ③ 14" LIME TREATED SUBGRADE (6% LIME)
- ④ MONO CURB TY II
- ⑤ 10" HMA (TY B) (D-GR HMA (METH) PG 64-22)
- ⑥ 4" HMA (TY C) (D-GR HMA (METH) SAC-B PG 70-22)
- ⑦ 4" COLORED TEXTURE CONCRETE
- ⑧ BLOCK SOD WITH 4" COMPOST MANUF TOPSOIL
- ⑨ 4" CONCRETE SIDEWALK

DESIGNER'S RESPONSIBILITY FOR CONSTRUCTION OF THIS DRAWING IS LIMITED TO THE DESIGN OF THE ROADWAY. ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN, THE CITY REMAINS WITH THE DESIGN ENGINEER. THE CITY PLANS FOR CONSTRUCTION. ASSUMES NO RESPONSIBILITY FOR ADEQUACY OR ACCURACY OF DESIGN.

CITY \_\_\_\_\_ DATE \_\_\_\_\_



Huitt-Zollars, Inc. - Firm Registration No. F-761

**HUITT-ZOLLARS**  
Huitt-Zollars, Inc. Dallas  
3131 McKinney Avenue, Suite 600  
Dallas, Texas 75204-2489



**FM 740**

**TYPICAL SECTIONS**

SCALE: NTS SHEET 3 OF 5

DESIGN	FED. PROJ. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
DAN	014-03	SEE TITLE SHEET	FM 740
GRAPHICS	STATE	DISTRICT	COUNTY
MTU	TEXAS	DALLAS	ROCKWALL
CHECK	CONTROL	SECTION	JOB
CVL	1014	03	039
CHECK	DAN		

PLAN SHEET FROM TxDOT  
AS-BUILT DRAWINGS FOR FM 740  
CONSTRUCTION

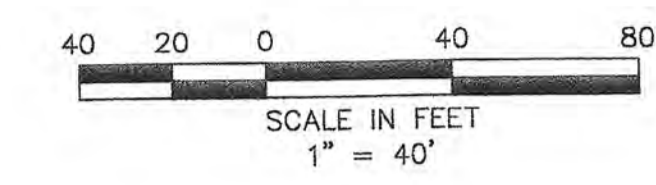
**PROPOSED TWLT  
TYPICAL SECTION**

NTS

STA 26+00 TO STA 30+00

Jparos SCALE: 1"=10' FILE NO: X01196321.dgn

f11es\196321\tdy04.dgn

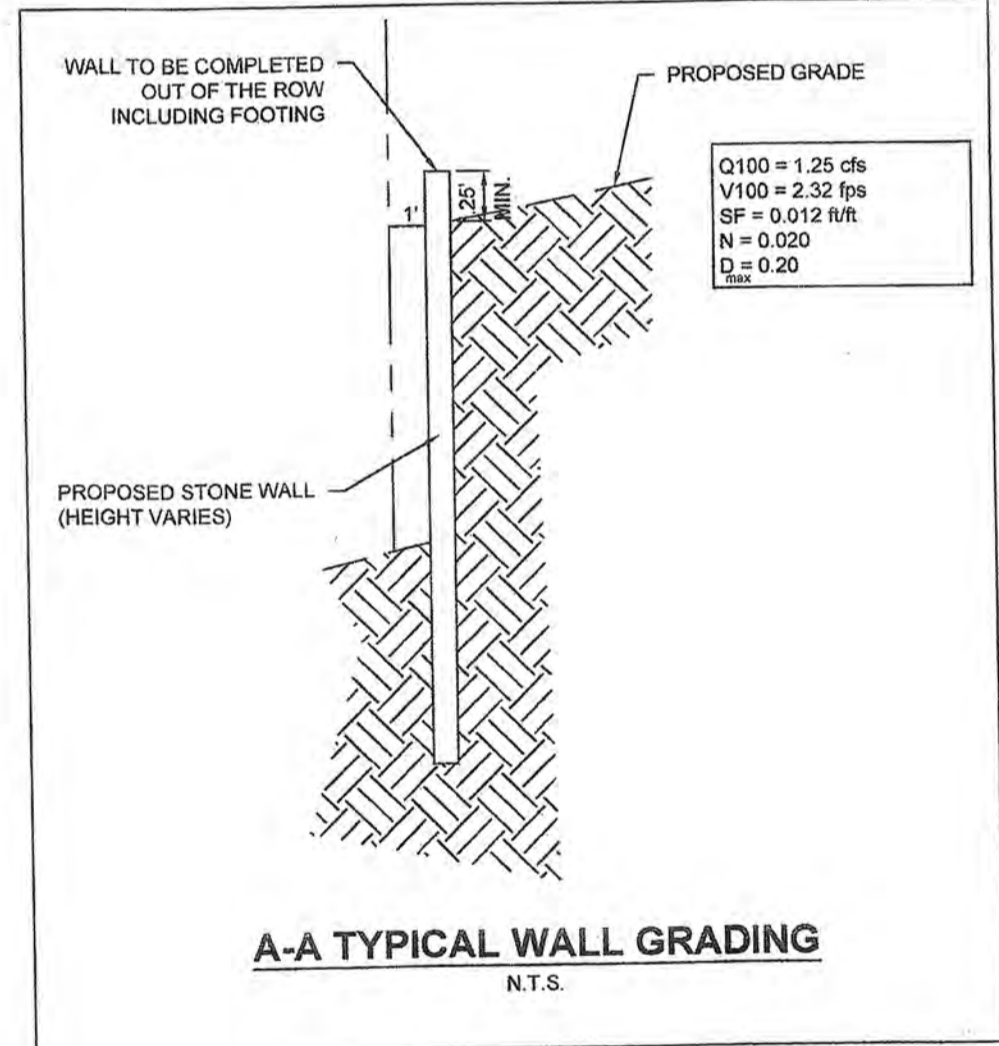


**NOTE**

1. LOTS 5 & 6 SHALL BE INDIVIDUALLY GRADED AT THE TIME OF BUILDING PERMIT TO SAVE TREES. LOT GRADING SHALL CONFORM TO THESE PLANS.
2. ALL WALLS OVER 3.0' TO BE DESIGNED BY STRUCTURAL ENGINEER.

**LEGEND**

- FLOW ARROWS
- FP FINISH PAD ELEVATION
- SSMH SANITARY SEWER MANHOLE
- FH FIRE HYDRANT
- TW TOP OF WALL
- BW BOTTOM OF WALL
- PROPOSED DRIVEWAY (GRADE NOT TO EXCEED 14%)



**RECORD DRAWINGS**

To the best of our knowledge Engineering Concepts & Design, L.P., hereby states that this plan is As-Built. This information provided is based on surveying at the site and information provided by the contractor.

*Todd Winters* 11-14-19  
TODD WINTERS DATE

ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN REMAINS WITH THE DESIGN ENGINEER. THE CITY OF ROCKWALL, IN REVIEWING AND RELEASING PLANS FOR CONSTRUCTION, ASSUMES NO RESPONSIBILITY FOR ADEQUACY OR ACCURACY OF DESIGN.

CITY \_\_\_\_\_ DATE \_\_\_\_\_



LANDING 10

YACHT CLUB ROAD

**CAUTION! EXISTING UTILITIES**

CONTRACTOR SHOULD CALL 1-800-DIG-TESS PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES FOR EXISTING UTILITY LOCATIONS. EXISTING UTILITIES AND UNDERGROUND FACILITIES INDICATED ON THESE PLANS HAVE BEEN LOCATED FROM REFERENCE INFORMATION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY BOTH HORIZONTALLY AND VERTICALLY THE LOCATION OF ALL EXISTING UTILITIES AND UNDERGROUND FACILITIES PRIOR TO CONSTRUCTION AND TO TAKE NECESSARY PRECAUTIONS IN ORDER TO PROTECT ALL FACILITIES ENCOUNTERED. THE CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION.

**BENCHMARKS**

BM = MONUMENT RESET #1  
32± LF WEST OF FM 740 & SUMMER LEE DRIVE INTERSECTION, SOUTH SIDE OF SUMMER LEE DRIVE.  
ELEV = 567.704

BM = MONUMENT R014  
375± LF WEST OF RIDGE ROAD & HENRY M CHANDLER DRIVE INTERSECTION, ON NORTH SIDE OF HENRY M. CHANDLER DRIVE.  
ELEV = 561.017

**ENGINEERINGCONCEPTS & DESIGN, L.P.**

ENGINEERING / PROJECT MANAGEMENT / CONSTRUCTION SERVICES - FIRM REG. #F-001145  
201 WINDCO CIR, STE 200, WYLIE, TX 75098  
972-941-8400 FAX: 972-941-8401 WWW.ECDLP.COM

REVISIONS:

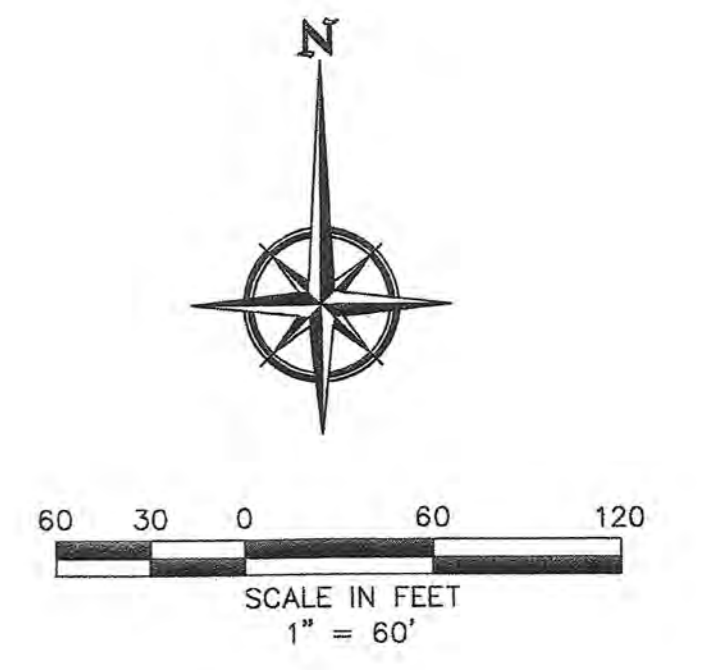
DRAWN: JD	DATE:
CHECKED: M.A.	DATE: NOVEMBER 2018
PROJECT NO.: 02114	
DWG FILE NAME: GRADING PLAN.DWG	

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF CONSTRUCTION. THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY MATT ATKINS, P.E. 93968



**GRADING PLAN**  
WHISPER ROCK  
CITY OF ROCKWALL  
ROCKWALL COUNTY

SHEET 12 OF 58



\* SHEET 215 PLANS BY CHIANG, PATEL & YERBY, INC. (DATED 5/21/09)

TXDOT DRAINAGE AREA CALCULATIONS						
DA	ACRES	C	TC	IS	QS	DESCRIPTION
D16	0.65	0.55	10	6.93	2.48	C1-D16
D17	0.48	0.35	10	6.93	2.41	C1-D17
D18	0.55	0.532	10	6.93	2.41	C1-D18
D19	1.09	0.614	10	6.93	4.64	C1-D19
D20	1.57	0.592	10	6.93	6.44	C1-D20

\* DETENTION PROVIDED BY PLANS FOR FIRST CHRISTIAN CHURCH  
SEE SHEET 8 BY HAROLD L. EVANS (DATED 2/25/08)

FIRST CHRISTIAN CHURCH DRAINAGE AREA CALCULATIONS					
DA	ACRES	C	TC	I100	Q100
1-A	6.44	0.35	20	9.8	22.09
2-A	0.24	0.35	20	9.8	0.82

TXDOT INLET COMPARISON			
Inlet Number	Pre Development TXDOT Area (Acres)	Post Development (Acres)	Post Development Areas
D16*	1.06	0.79	9, 10, & 11
D17	0.48	0.86	1 & 2-Inlet Removed
D18	0.55	0.14	12
D19	1.09	2.74	3, 8, & 13
D20	1.57	0.22	14

Note: Area D16 includes 0.65 Acres in inlet calcs plus 0.41 acres accounted in next upstream inlet.

AREA  $\frac{1-A}{6.44}$  FIRST CHRISTIAN CHURCH PLANS BY HAROLD L. EVANS (DATED 2/25/08)

AREA  $\frac{1-A}{6.44}$  FM 740 PLANS BY CHIANG, PATEL & YERBY, INC (DATED 5/21/09)

**RECORD DRAWINGS**

To the best of our knowledge Engineering Concepts & Design, L.P., hereby states that this plan is As-Built. This information provided is based on surveying at the site and information provided by the contractor.

*Todd Winters* 11-19 DATE

ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN REMAINS WITH THE DESIGN ENGINEER. THE CITY OF ROCKWALL, IN REVIEWING AND RELEASING PLANS FOR CONSTRUCTION, ASSUMES NO RESPONSIBILITY FOR ADEQUACY OR ACCURACY OF DESIGN.

CITY \_\_\_\_\_ DATE \_\_\_\_\_

**CAUTION! EXISTING UTILITIES**

CONTRACTOR SHOULD CALL 1-800-DIG-TESS PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES FOR EXISTING UTILITY LOCATIONS. EXISTING UTILITIES AND UNDERGROUND FACILITIES INDICATED ON THESE PLANS HAVE BEEN LOCATED FROM REFERENCE INFORMATION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY BOTH HORIZONTALLY AND VERTICALLY THE LOCATION OF ALL EXISTING UTILITIES AND UNDERGROUND FACILITIES PRIOR TO CONSTRUCTION AND TO TAKE NECESSARY PRECAUTIONS IN ORDER TO PROTECT ALL FACILITIES ENCOUNTERED. THE CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION.

**BENCHMARKS**

BM = MONUMENT RESET #1  
32± LF WEST OF FM 740 & SUMMER LEE DRIVE INTERSECTION. SOUTH SIDE OF SUMMER LEE DRIVE.  
ELEV=567.704

BM = MONUMENT R014  
375± LF WEST OF RIDGE ROAD & HENRY M CHANDLER DRIVE INTERSECTION, ON NORTH SIDE OF HENRY M. CHANDLER DRIVE  
ELEV=561.017

**ENGINEERING CONCEPTS & DESIGN, L.P.**

ENGINEERING / PROJECT MANAGEMENT / CONSTRUCTION SERVICES - FIRM REG. #F-001145  
201 WINDCO CIR, STE 200, WYLIE, TX 75098  
972-941-8400 FAX: 972-941-8401 WWW.ECDLP.COM

REVISIONS:

DRAWN: JD	DATE:
CHECKED: M.A.	DATE: NOVEMBER 2018
PROJECT NO: 02114	
DWG FILE NAME: DRAINAGE AREA MAP EXISTING CONDITIONS.DWG	

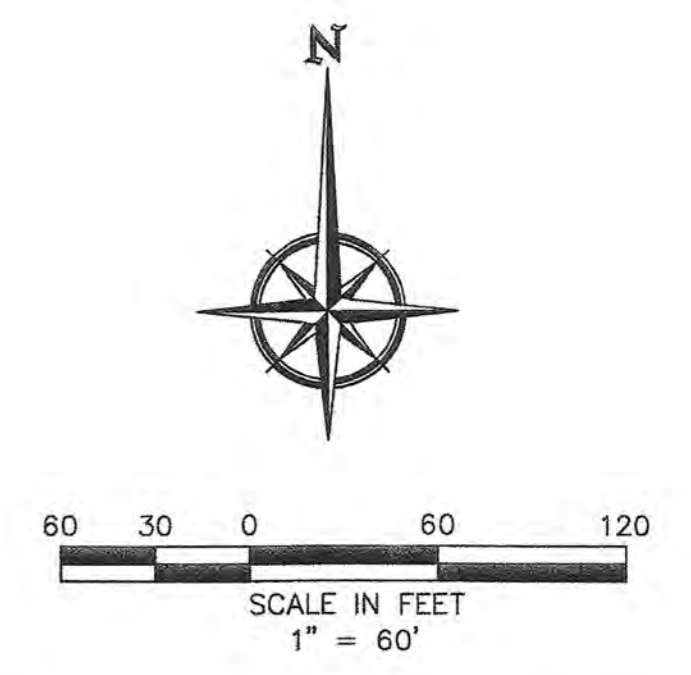
THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF CONSTRUCTION. THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY MATT ATKINS, P.E. 93968



**DRAINAGE AREA MAP EXISTING CONDITIONS**

WHISPER ROCK  
CITY OF ROCKWALL  
ROCKWALL COUNTY

SHEET 13 OF 58



DEVELOPED DRAINAGE AREA CALCULATIONS						
DA	ACRES	C	TC	I100	Q100	DESCRIPTION
1	0.42	0.50	10	9.8	2.06	PROP. 10' CURB INLET
2	0.44	0.50	10	9.8	2.16	PROP. 10' CURB INLET
3	1.74	0.50	10	9.8	8.63	PROP. 10' CURB INLET
4	2.92	0.50	10	9.8	14.31	PROP. 15' CURB INLET
5	1.36	0.50	10	9.8	6.88	PROP. 10' CURB INLET
6	1.80	0.50	10	9.8	7.84	PROP. 10' CURB INLET
7	0.61	0.50	10	9.8	2.99	PROP. WYE INLET
8	0.45	0.50	10	9.8	2.21	PROP. WYE INLET
9	0.30	0.90	10	9.8	2.65	TO TXDOT INLET D16
10	0.35	0.50	10	9.8	1.72	TO TXDOT INLET D17
11	0.14	0.50	10	9.8	0.69	WYE INLET
12	0.14	0.90	10	9.8	1.23	TO TXDOT INLET D18
13	0.55	0.90	10	9.8	4.85	TO TXDOT INLET D19
14	0.22	0.90	10	9.8	1.94	TO TXDOT INLET D20

TXDOT INLET COMPARISON			
Inlet Number	Pre Development TXDOT Area (Acres)	Post Development (Acres)	Post Development Areas
D16*	1.06	0.79	9, 10, & 11
D17	0.48	0.86	1 & 2 Inlet Removed
D18	0.55	0.14	12
D19	1.09	2.74	3, 8, & 13
D20	1.57	0.22	14

Note: Area D16 includes 0.65 Acres in inlet calcs plus 0.41 acres accounted in next upstream inlet.

**RECORD DRAWINGS**

To the best of our knowledge Engineering Concepts & Design, L.P., hereby states that this plan is As-Built. This information provided is based on surveying at the site and information provided by the contractor.

*Todd Winters* 11-19  
TODD WINTERS DATE

LEGEND	
	AREA ACRES

ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN REMAINS WITH THE DESIGN ENGINEER. THE CITY OF ROCKWALL, IN REVIEWING AND RELEASING PLANS FOR CONSTRUCTION, ASSUMES NO RESPONSIBILITY FOR ADEQUACY OR ACCURACY OF DESIGN.

CITY \_\_\_\_\_ DATE \_\_\_\_\_

**CAUTION! EXISTING UTILITIES**  
CONTRACTOR SHOULD CALL 1-800-DIG-TESS PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES FOR EXISTING UTILITY LOCATIONS. EXISTING UTILITIES AND UNDERGROUND FACILITIES INDICATED ON THESE PLANS HAVE BEEN LOCATED FROM REFERENCE INFORMATION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY BOTH HORIZONTALLY AND VERTICALLY THE LOCATION OF ALL EXISTING UTILITIES AND UNDERGROUND FACILITIES PRIOR TO CONSTRUCTION AND TO TAKE NECESSARY PRECAUTIONS IN ORDER TO PROTECT ALL UTILITIES ENCOUNTERED. THE CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION.

**BENCHMARKS**  
BM = MONUMENT RESET #1  
322+ LF WEST OF FM 740 & SUMMER LEE DRIVE INTERSECTION, SOUTH SIDE OF SUMMER LEE DRIVE.  
ELEV=567.704  
BM = MONUMENT R014  
3752+ LF WEST OF RIDGE ROAD & HENRY M CHANDLER DRIVE INTERSECTION, ON NORTH SIDE OF HENRY M. CHANDLER DRIVE  
ELEV=561.017

**ENGINEERING CONCEPTS & DESIGN, L.P.**  
ENGINEERING / PROJECT MANAGEMENT / CONSTRUCTION SERVICES - FIRM REG. #F-001145  
201 WINDCO CIR, STE 200, WYLLIE, TX 75098  
972-941-8400 FAX: 972-941-8401 WWW.ECDLP.COM

REVISIONS:  
DRAWN: JD DATE:  
CHECKED: M.A. DATE: NOVEMBER 2018  
PROJECT NO.: 02114  
DWG FILE NAME: DRAINAGE AREA MAP EXISTING CONDITIONS.DWG

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF CONSTRUCTION. THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY MATT ATKINS, P.E. 93968



**PROPOSED DRAINAGE AREA MAP**  
WHISPER ROCK  
CITY OF ROCKWALL  
ROCKWALL COUNTY

SHEET  
14  
OF  
58





Cumulative Junction Discharge Computations

Node I.D.	Node Type	Weighted C-Value	Cumulat. Dr. Area (acres)	Cumulat. Tc (min)	Intens. (in/hr)	User Supply 0 (cfs)	Additional 0 in Node (cfs)	Total Disch. (cfs)
MH-B3	BoxMh	0.000	0.00	0.00	0.00	0.000	0.01	0.010
MH-D1	BoxMh	0.691	0.52	10.00	6.93	0.000	0.01	2.514
C1-D1	Curb	0.691	0.52	10.00	6.93	0.000	0.00	2.504
MH-D2	BoxMh	0.831	1.14	11.63	6.49	0.000	0.01	6.148
C1-D2	Curb	0.950	0.62	10.00	6.93	0.000	0.00	4.047
MH-D3	BoxMh	0.838	2.98	12.12	6.37	0.000	0.01	15.917
C1-D4	Curb	0.960	0.42	10.00	6.93	0.000	0.00	2.793
C1-D3	Curb	0.807	1.42	10.00	6.93	0.000	0.00	7.951
JCT-D5	Junct	0.805	3.68	12.39	6.31	0.000	0.01	18.667
C1-D5	Curb	0.664	0.70	10.00	6.93	0.000	0.00	3.200
MH-D4	BoxMh	0.790	4.27	13.04	6.16	0.000	0.01	20.772
C1-D8	Curb	0.960	0.14	10.00	6.93	0.000	0.00	0.898
C1-D7	Curb	0.618	0.46	10.00	6.93	0.000	0.00	1.957
JCT-D9	Junct	0.812	4.92	13.36	6.09	0.000	0.01	24.357
C1-D9	Curb	0.960	0.62	10.00	6.93	0.000	0.00	4.342
JCT-D10	Junct	0.815	5.01	13.43	6.07	0.000	0.01	24.838
C1-D10	Curb	0.960	0.09	10.00	6.93	0.000	0.00	0.618
JCT-D11	Junct	0.819	5.14	13.53	6.05	0.000	0.01	25.483
C1-D11	Curb	0.960	0.13	10.00	6.93	0.000	0.00	0.844
MH-D5	BoxMh	0.801	5.93	13.60	6.04	0.000	0.01	28.698
MH-D6	BoxMh	0.806	6.88	14.18	5.92	0.000	0.01	32.853
C1-D15	Curb	0.960	0.43	10.00	6.93	0.000	0.00	2.859
C1-D14	Curb	0.739	0.52	10.00	6.93	0.000	0.00	2.663
JCT-D16	Junct	0.784	7.53	14.30	5.89	0.000	0.01	34.821
C1-D16	Curb	0.550	0.65	10.00	6.93	0.000	0.00	2.476
MH-D7	BoxMh	0.770	8.01	14.59	5.84	0.000	0.01	36.032
C1-D17	Curb	0.550	0.48	10.00	6.93	0.000	0.00	1.829
MH-D8	BoxMh	0.761	8.56	15.09	5.74	0.000	0.01	37.429
C1-D18	Curb	0.632	0.55	10.00	6.93	0.000	0.00	2.408
C1-D19	Curb	0.614	1.09	10.00	6.93	0.000	0.00	4.635
C1-D20	Curb	0.601	2.66	10.24	6.86	0.000	0.00	10.959
MH-D9	BoxMh	0.723	11.22	15.61	5.65	0.000	0.01	45.835
C1-D21	Curb	0.733	11.72	15.74	5.62	0.000	0.01	48.300
C1-D13	Curb	0.960	0.26	10.00	6.93	0.000	0.00	1.729
C1-D12	Curb	0.550	0.53	10.00	6.93	0.000	0.00	2.031
OUT	Outlet	0.733	11.72	15.74	5.62	0.000	0.01	48.300

Conveyance Configuration Data

Run#	Node US	Node DS	Flowline US Elev (ft)	Flowline DS Elev (ft)	Shape #	Span (ft)	Rise (ft)	Length (ft)	Slope (%)	n_value
2	MH-B3	MH-D1	550.21	549.16	Circ 1	0.00	1.50	225.60	0.47	0.013
3	C1-D1	MH-D1	554.00	553.80	Circ 1	0.00	1.50	6.50	3.08	0.013
4	MH-D1	MH-D2	549.16	547.84	Circ 1	0.00	1.50	335.08	0.39	0.013
5	C1-D2	MH-D2	554.00	553.80	Circ 1	0.00	1.50	6.50	3.08	0.013
6	MH-D2	MH-D3	547.84	547.36	Circ 1	0.00	2.00	126.66	0.38	0.013
7	C1-D4	MH-D3	552.50	551.90	Circ 1	0.00	1.50	57.50	1.04	0.013
8	C1-D3	MH-D3	552.50	552.30	Circ 1	0.00	1.50	6.50	3.08	0.013
9	MH-D3	JCT-D5	547.36	546.99	Circ 1	0.00	2.50	92.60	0.40	0.013
10	C1-D5	JCT-D5	548.99	547.49	Circ 1	0.00	1.50	6.50	23.72	0.013
13	JCT-D5	MH-D4	546.99	546.13	Circ 1	0.00	2.50	220.90	0.39	0.013
14	C1-D7	MH-D4	551.00	549.90	Circ 1	0.00	1.50	6.50	17.17	0.013
15	C1-D8	MH-D4	551.64	550.50	Circ 1	0.00	1.50	73.93	1.54	0.013
16	MH-D4	JCT-D9	546.13	544.80	Circ 1	0.00	2.50	151.74	0.88	0.013
17	C1-D9	JCT-D9	545.96	545.30	Circ 1	0.00	1.50	6.50	10.21	0.013
18	JCT-D9	JCT-D10	544.80	544.47	Circ 1	0.00	2.50	35.98	0.90	0.013
19	C1-D10	JCT-D10	549.24	544.97	Circ 1	0.00	1.50	37.00	11.62	0.013
20	JCT-D10	JCT-D11	544.47	544.00	Circ 1	0.00	2.50	53.29	0.90	0.013
21	C1-D11	JCT-D11	549.20	544.50	Circ 1	0.00	1.50	38.00	12.46	0.013
22	JCT-D11	MH-D5	544.00	543.68	Circ 1	0.00	2.50	35.59	0.90	0.013
23	C1-D13	MH-D5	545.94	544.78	Circ 1	0.00	1.50	78.78	1.47	0.013
24	C1-D12	MH-D5	545.71	544.78	Circ 1	0.00	1.50	6.50	14.46	0.013
25	MH-D5	MH-D6	543.68	542.52	Circ 1	0.00	3.00	237.41	0.49	0.013
26	C1-D15	MH-D6	543.31	542.62	Circ 1	0.00	2.00	57.50	1.20	0.013
27	C1-D14	MH-D6	543.31	542.62	Circ 1	0.00	1.50	6.50	10.68	0.013
28	MH-D6	JCT-D16	542.52	542.20	Circ 1	0.00	3.00	56.75	0.57	0.013
29	C1-D16	JCT-D16	543.55	542.70	Circ 1	0.00	1.50	6.50	13.19	0.013
30	JCT-D16	MH-D7	542.20	541.44	Circ 1	0.00	3.00	130.96	0.58	0.013
31	C1-D17	MH-D7	544.45	543.80	Circ 1	0.00	1.50	6.50	10.05	0.013
32	MH-D7	MH-D8	541.44	539.72	Circ 1	0.00	3.00	251.87	0.68	0.013
33	C1-D18	MH-D8	542.00	541.90	Circ 1	0.00	2.00	6.50	1.54	0.013
34	MH-D8	MH-D9	539.72	536.02	Circ 1	0.00	3.00	316.71	1.17	0.013
35	C1-D19	C1-D20	540.50	538.83	Circ 1	0.00	1.50	101.52	1.65	0.013
36	C1-D20	MH-D9	537.33	537.00	Circ 1	0.00	1.50	6.50	5.08	0.013
37	MH-D9	C1-D21	536.02	535.72	Circ 1	0.00	3.00	59.20	0.51	0.013
38	C1-D21	OUT	534.17	534.08	Circ 1	0.00	3.00	14.08	0.60	0.013

\* Super critical flow.

NORMAL TERMINATION OF WINSTORM.

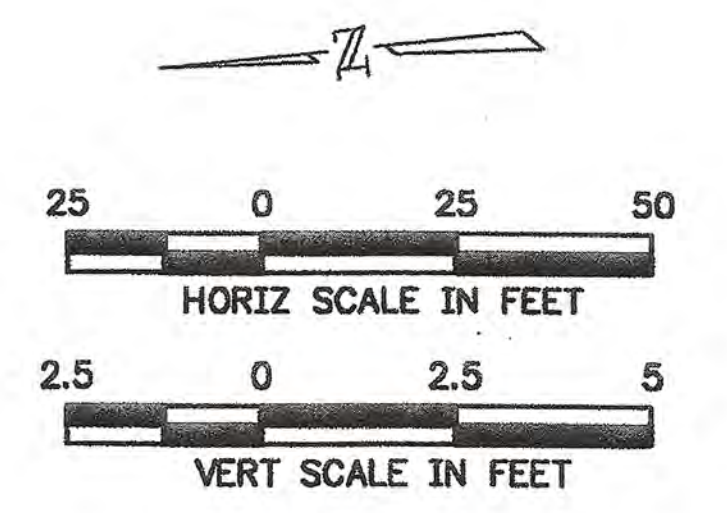
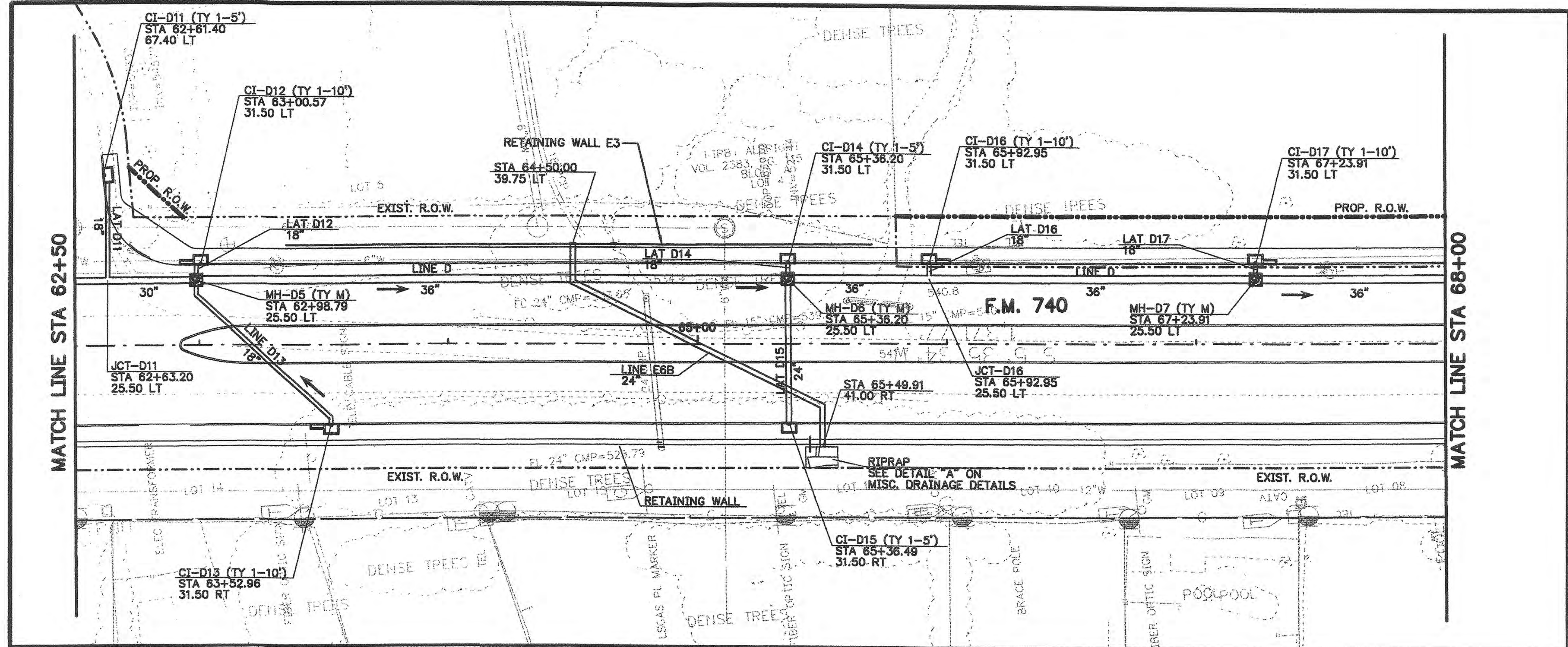
Warning Messages for current project:

Runoff Frequency of: 5 Years  
 Discharge decreased downstream node id= MH-D1 Previous intensity used.  
 Tailwater set to uniform depth elevation = 536.38(ft)

TxDOT Design (Pre-Development)										Post Development									
Run #	Junction	Cum. Area (acres)	C	Tc (min)	IS (in/hr)	QS (cfs)	TxDOT ID AREA (acres)	Subtract Area (acres)	Area ID	Add Area (acres)	Total Area (acres)	C	Tc (min)	IS (in/hr)	QS (cfs)	Additional Q (cfs)			
28	MH-D6	5.93	0.801	13.6	6.04	28.7		0		0	0								
30	JCT-D16	7.53	0.784	14.3	5.89	34.821	D-16	1.05	9.10,8.11	0.79	7.26	0.784	14.3	5.89	33.52494	-1.30			
32	MH-D7	8.01	0.77	14.59	5.84	36.032	D-17	0.48	182	0.86	8.12	0.77	14.59	5.84	36.51402	0.48			
34	MH-D8	8.56	0.761	15.09	5.74	37.429	D-18	0.55	12	0.14	8.26	0.761	15.09	5.74	36.08084	-1.35			
37	MH-D9	11.22	0.723	15.61	5.65	45.835	D-19&D20	2.66	3,8.12&14	2.96	11.22	0.723	15.61	5.65	45.83314	0.00			
							SUM OF AREAS	4.75		4.75									

Conveyance Hydraulic Computations. Tailwater = 0.000 (ft)

Run#	Hydraulic Grade Line			Depth		Velocity		Q (cfs)	Cap (cfs)	Junc Loss (ft)
	US Elev (ft)	DS Elev (ft)	Fr. Slope (%)	Unif. (ft)	Actual (ft)	Unif. (ft/s)	Actual (ft/s)			
2*	550.25	549.80	0.000	0.04	0.64	0.72	0.01	0.01	7.17	0.000
3*	554.37	554.17	0.057	0.37	0.37	7.29	7.29	2.50	18.43	0.000
4	549.80	548.88	0.057	0.64	1.04	3.46	1.92	2.51	6.59	0.000
5*	554.48	554.28	0.148	0.48	0.48	8.36	8.36	4.05	18.43	0.000
6	548.88	548.79	0.074	0.93	1.43	4.30	2.56	6.15	13.93	0.000
7*	553.02	552.42	0.071	0.52	0.52	5.11	5.11	2.79	10.73	0.000
8*	553.19	552.99	0.573	0.69	0.69	10.05	10.05	7.95	18.43	0.000
9	548.79	548.57	0.151	1.41	1.58	5.60	4.86	15.92	25.93	0.000
10*	549.33	548.57	0.093	0.25	1.08	16.14	2.34	3.20	51.16	0.000
13	548.57	547.59	0.207	1.58	1.58	5.70	5.70	18.67	25.60	0.000
14*	551.22	550.12	0.035	0.22	0.22	12.49	12.49	1.96	43.53	0.000
15*	551.91	550.77	0.007	0.27	0.27	4.23	4.23	0.90	13.05	0.000
16*	547.44	546.24	0.256	1.31	1.45	7.99	7.06	20.77	38.48	0.000
17*	546.46	546.24	0.171	0.36	0.94	13.11	3.71	4.34	33.56	0.000
18*	546.24	545.94	0.353	1.44	1.47	8.35	8.13	24.36	38.93	0.000
19*	549.38	545.94	0.003	0.14	0.97	7.69	0.51	0.62	35.81	0.000
20*	545.94	545.52	0.367	1.46	1.52	8.38	7.93	24.84	38.89	0.000
21*	549.36	545.52	0.006	0.16	1.02	8.67	0.66	0.84	37.09	0.000
22*	545.52	545.39	0.386	1.47	1.71	8.46	7.12	25.48	38.90	0.000
23*	546.31	545.39	0.027	0.37	0.61	5.03	2.59	1.73	12.75	0.000
24*	546.00	545.39	0.037	0.23	0.61	11.83	3.04	2.03	39.94	0.000
25*	545.39	544.29	0.185	1.71	1.77	6.89	6.61	28.70	46.49	0.000
26*	544.30	544.29	0.016	0.46	1.67	5.25	1.02	2.86	24.79	0.000
27*	544.30	544.29	0.064	0.28	1.50	11.56	1.51	2.66	34.33	0.000
28*	544.29	544.03	0.243	1.77	1.83	7.57	7.28	32.85	50.25	0.000
29*	544.03	544.03	0.056	0.26	1.33	12.19	1.50	2.48	38.16	0.000
30*	544.03	543.26	0.272	1.83	1.83	7.72	7.72	34.82	50.95	0.000
31*	544.69	544.04	0.030	0.24	0.24	10.14	10.14	1.83	33.31	0.000
32*	543.21	541.49	0.292	1.77	1.77	8.31	8.31	36.03	55.05	0.000
33*	542.40	542.30	0.011	0.40	0.40	5.45	5.45	2.41	28.07	0.000
34*	541.26	538.41	0.315	1.54	2.39	10.28	6.20	37.43	72.12	0.000
35*	541.11	539.44	0.195	0.61	0.61	6.92	6.92	4.64	13.48	0.000
36*	538.48									



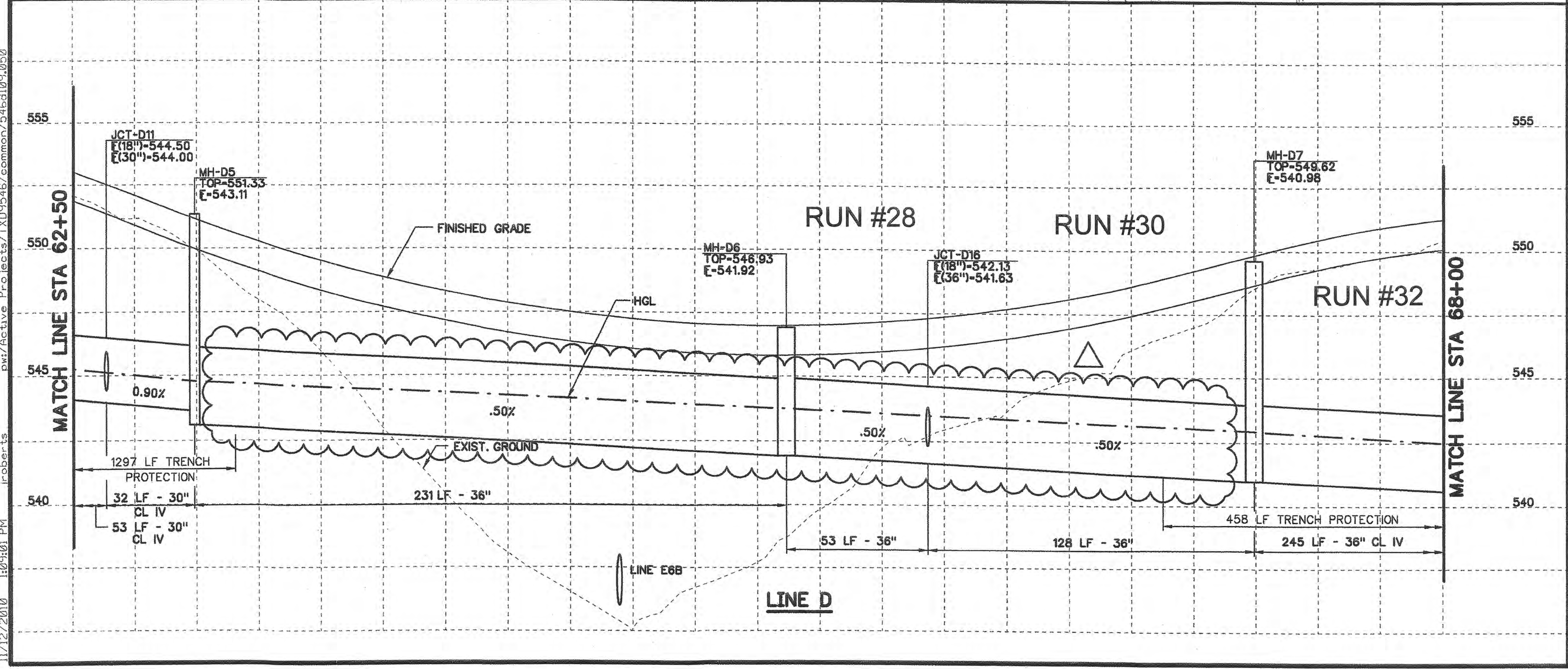
DESIGNER'S RESPONSIBILITY FOR ADEQUACY OF DESIGN REMAINS WITH THE DESIGN ENGINEER. THE CITY OF ROCKWALL, IN REVIEWING AND RELEASING PLANS FOR CONSTRUCTION, ASSUMES NO RESPONSIBILITY FOR ADEQUACY OR ACCURACY OF DESIGN.

CITY \_\_\_\_\_ DATE \_\_\_\_\_

PLAN SHEET FROM TxDOT AS-BUILT DRAWINGS FOR FM 740 CONSTRUCTION

*Andrew J. Adams*  
11/15/2010

cpub&w\_ansiB.tbl  
 pwr/Active Projects/TX09546/common/546d105.050  
 roberts  
 cpurinter\_ansiB.plt  
 11/12/2010 1:09:01 PM



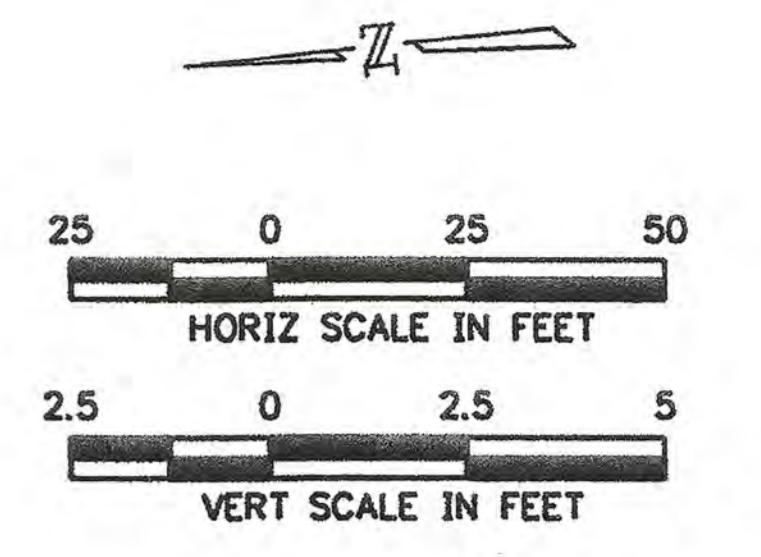
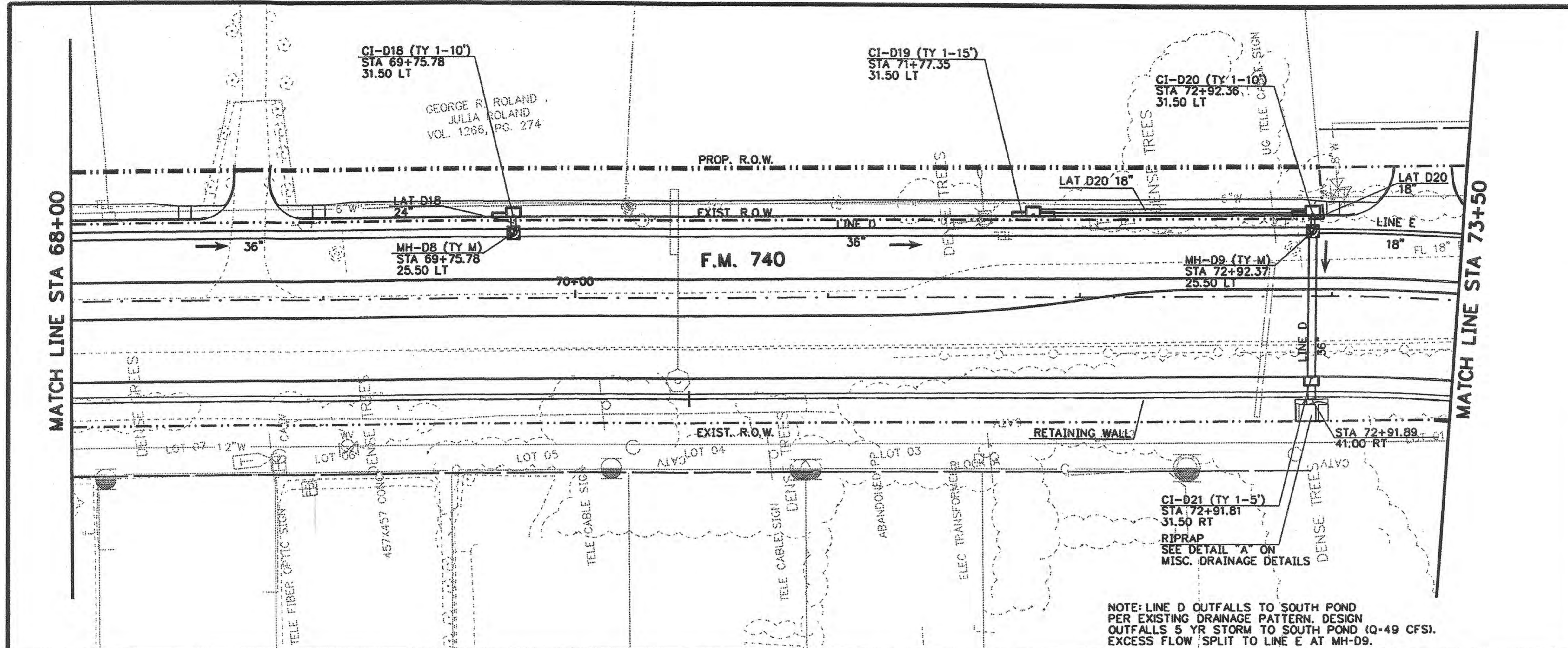
NO.	LOWER 36" RCP	BY	AJA	DATE	11/8/10
	REVISION				

©2009 Texas Department of Transportation

DALLAS DIST.-FM740  
DRAINAGE LAYOUT SHEET

SHEET 8 OF 26

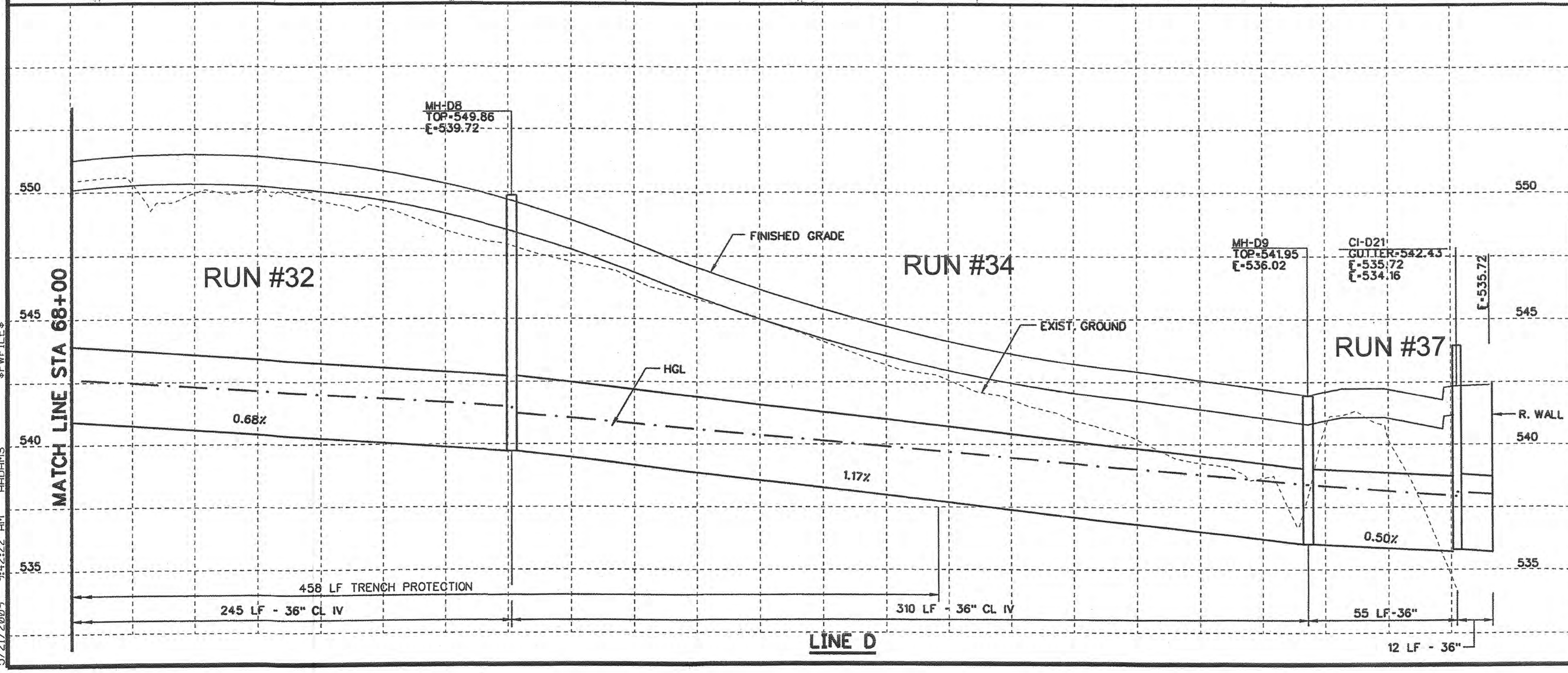
Designed:	JCM	FED. RD. DIV. NO.	6	STATE	TEXAS	FEDERAL AID PROJECT NO.		SHEET NO.	2364
Checked:	RRH	DIST.	DALLAS	COUNTY	ROCKWALL	CONTROL NO.	1014	SECTION NO.	03
Drawn:	GBC	JOB NO.	039	HIGHWAY NO.	FM 740				



NOTE: LINE D OUTFALLS TO SOUTH POND PER EXISTING DRAINAGE PATTERN. DESIGN OUTFALLS 5 YR STORM TO SOUTH POND (Q=49 CFS). EXCESS FLOW SPLIT TO LINE E AT MH-D9.

ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN REMAINS WITH THE DESIGN ENGINEER. THE CITY OF ROCKWALL, IN REVIEWING AND RELEASING PLANS FOR CONSTRUCTION, ASSUMES NO RESPONSIBILITY FOR ADEQUACY OR ACCURACY OF DESIGN.

PLAN SHEET FROM TxDOT AS-BUILT DRAWINGS FOR FM 740 CONSTRUCTION



STATE OF TEXAS  
ROBIN R. HANDEL  
66931  
5/21/09  
*Robin R. Handel*

NO.	REVISION	BY	DATE

**CP&Y** Chiang, Patel & Yerby, Inc.  
Firm Registration Number: 1741

©2009 Texas Department of Transportation

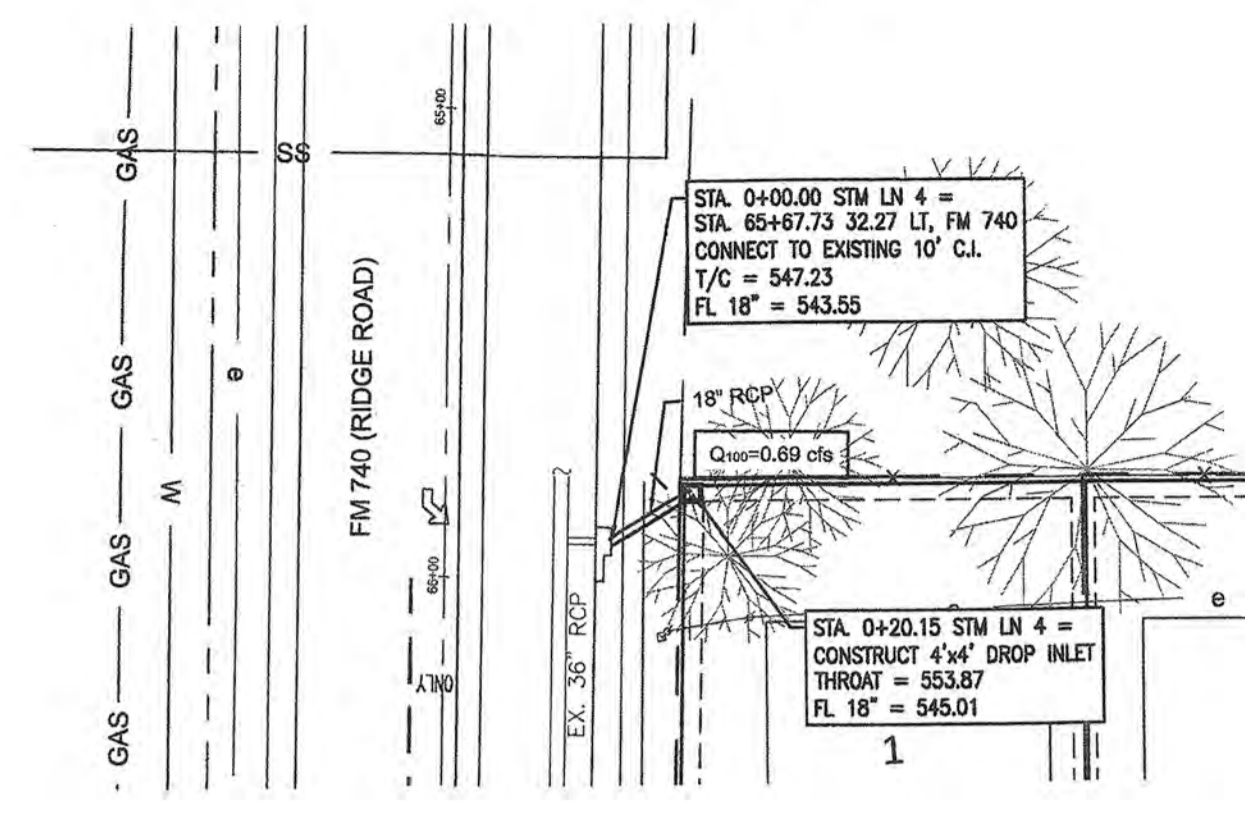
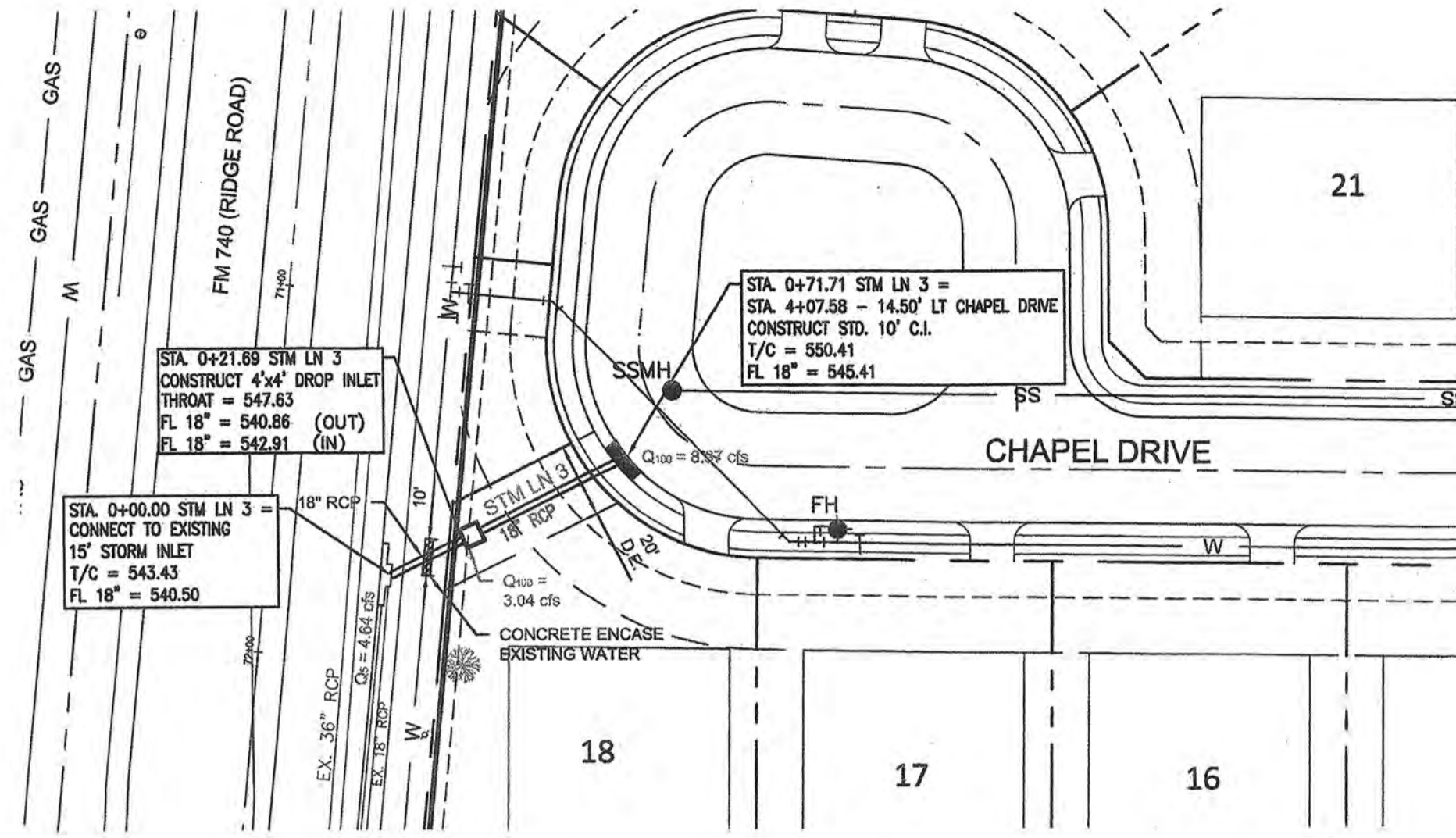
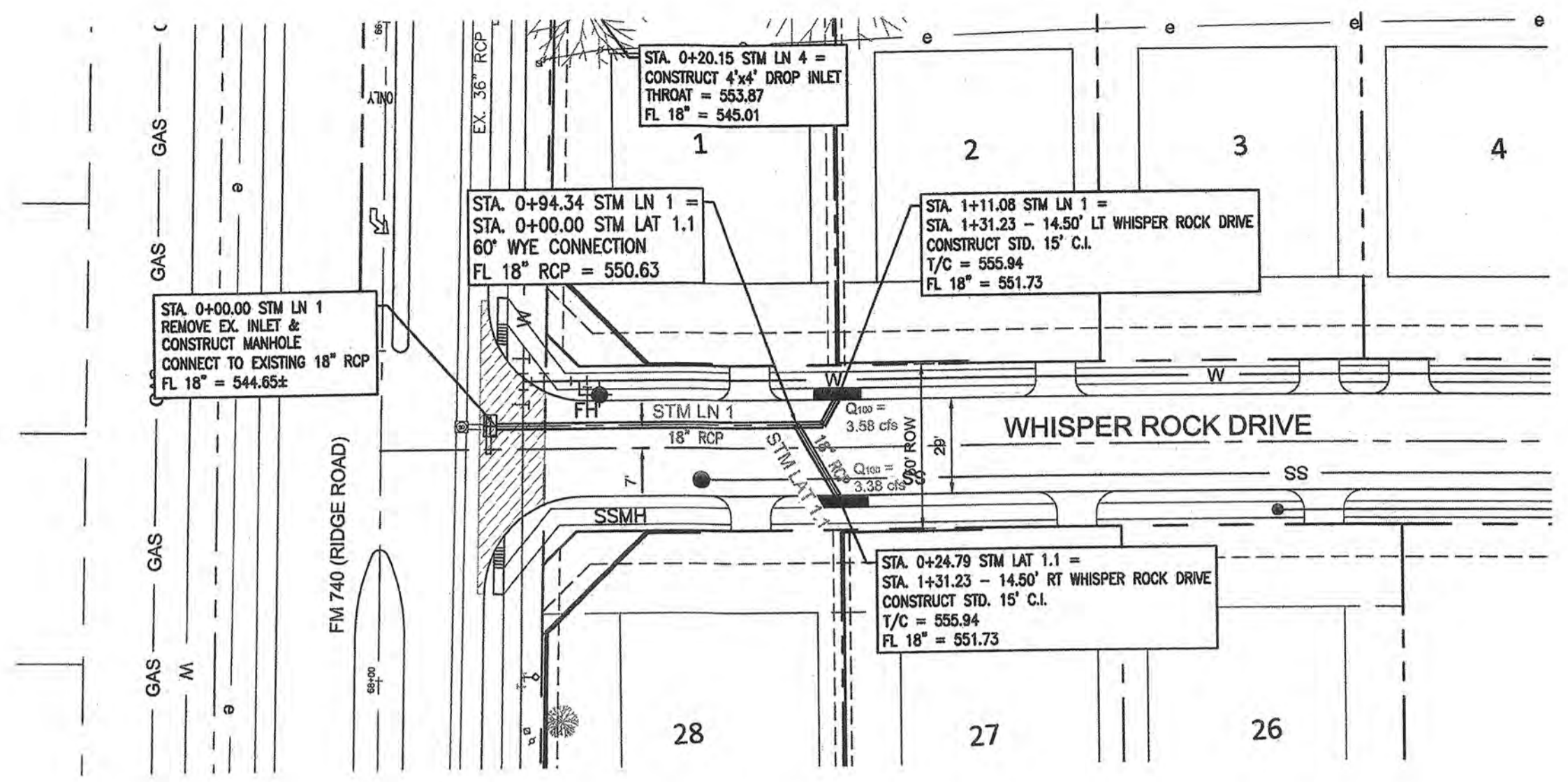
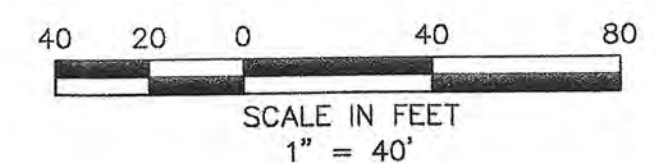
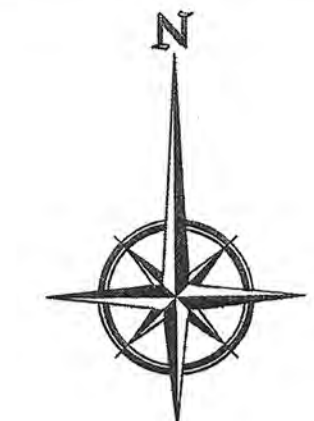
DALLAS DIST.-FM740

**DRAINAGE LAYOUT SHEET**

Design	JCM	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
Checked	RRH	6	TEXAS		237
Drawn	GBG	DIST.	COUNTY	CONTROL SECTION NO.	JOB NO.
Checked	RRH	DALLAS	ROCKWALL	1014 03	039 FM 740

\$PENTBL\$ \$PWFIL\$  
 cpjprinter-ANSI.B.plt 5/21/2009 9:42:22 AM ADAMS

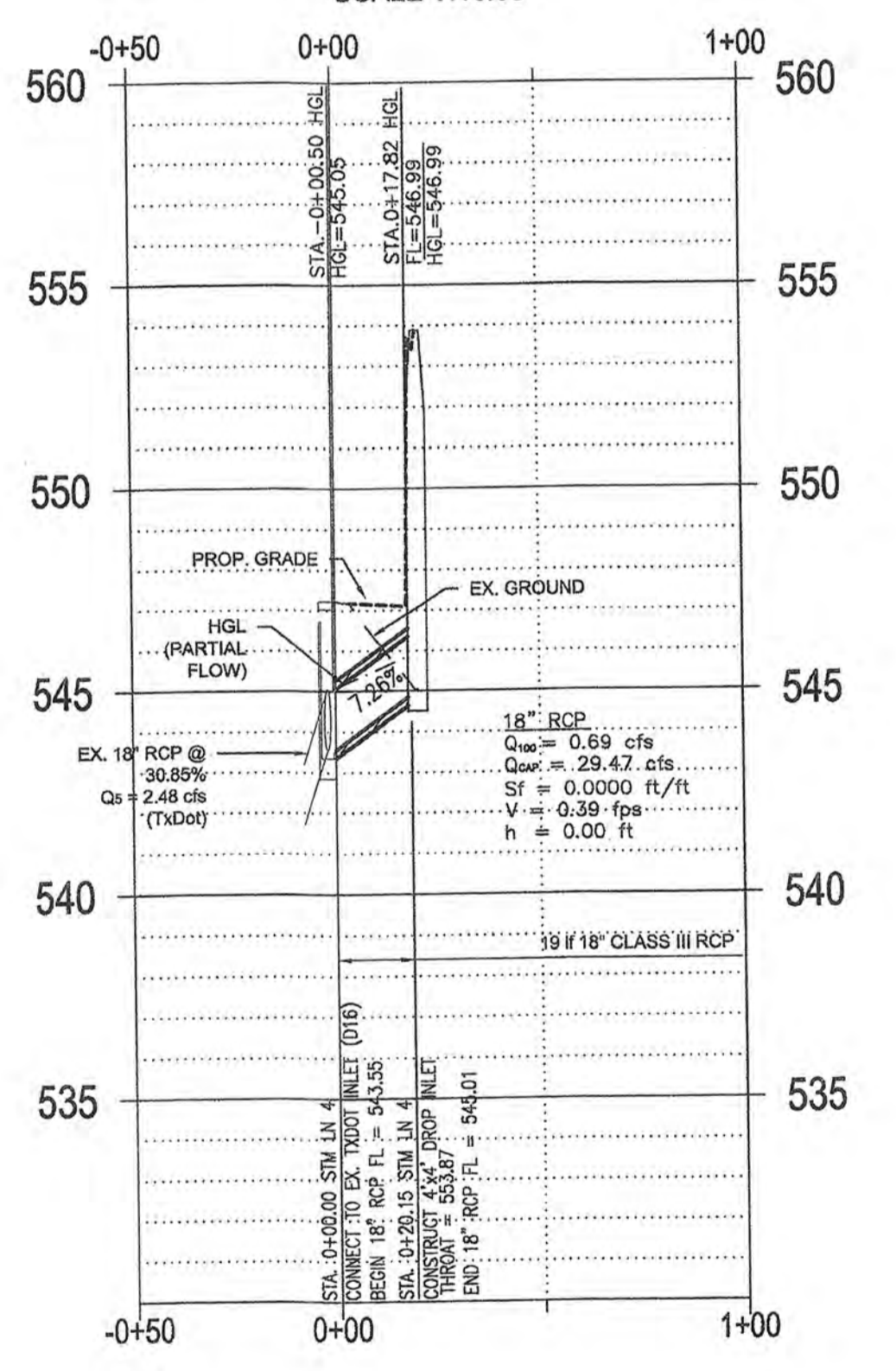
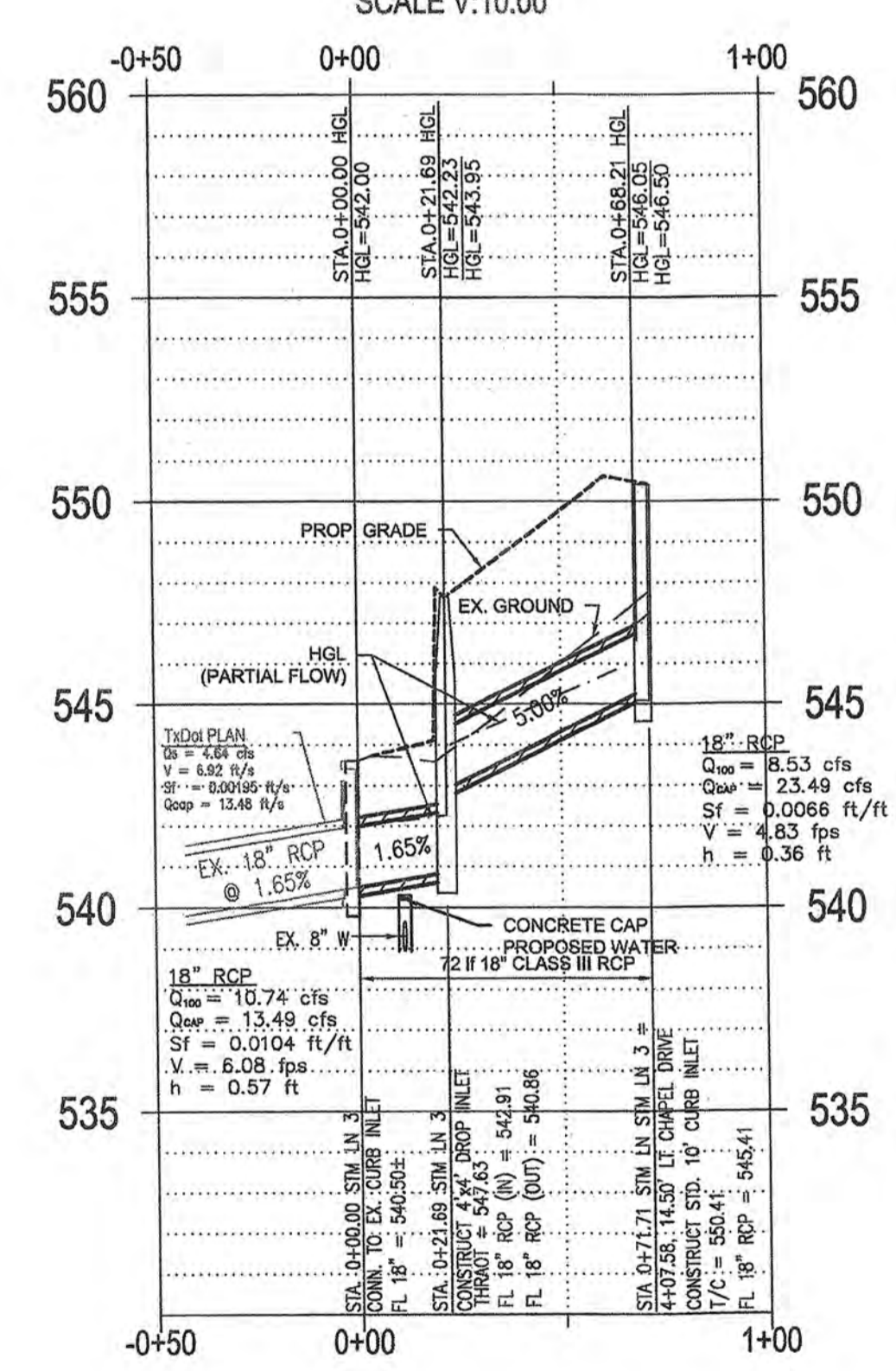
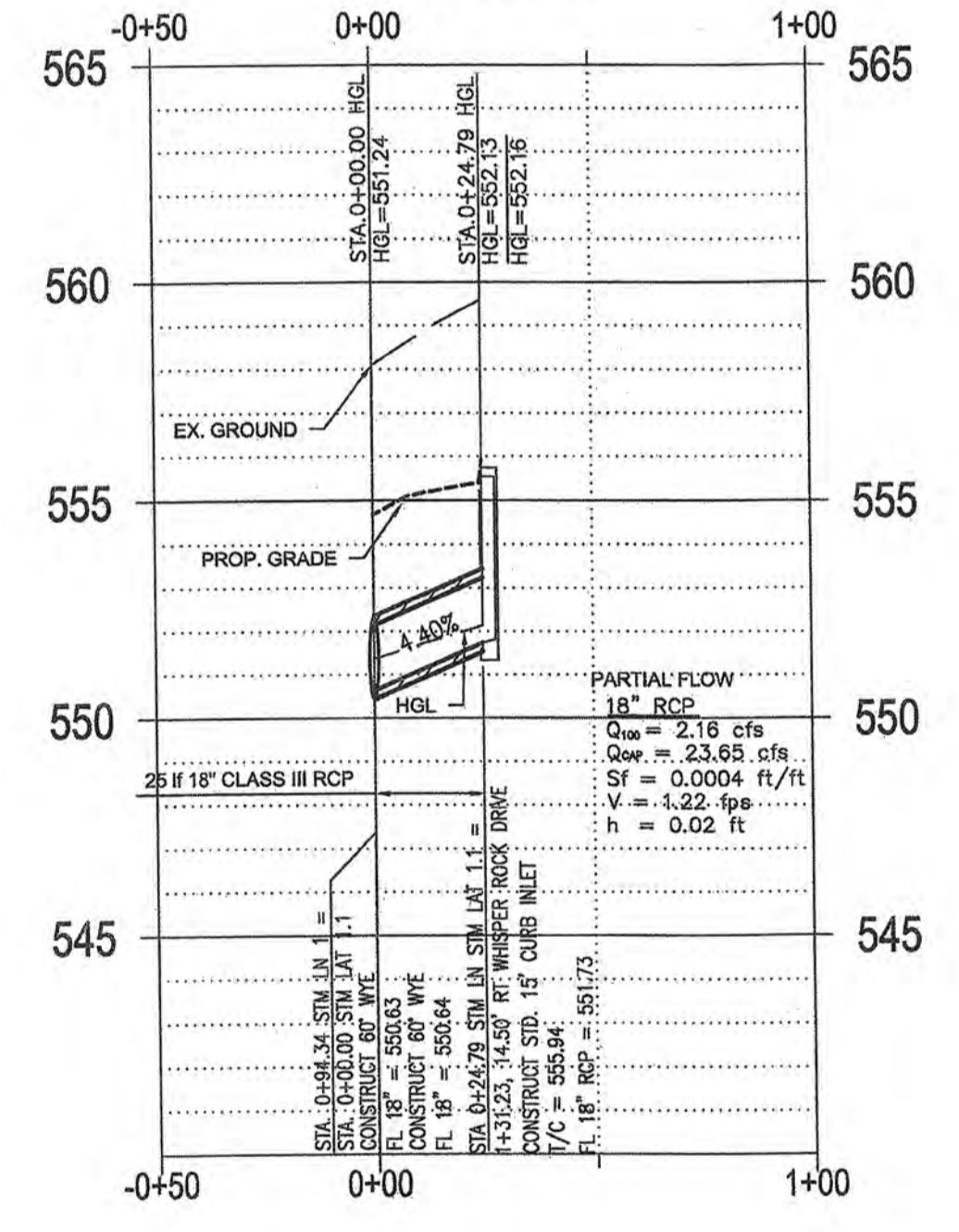
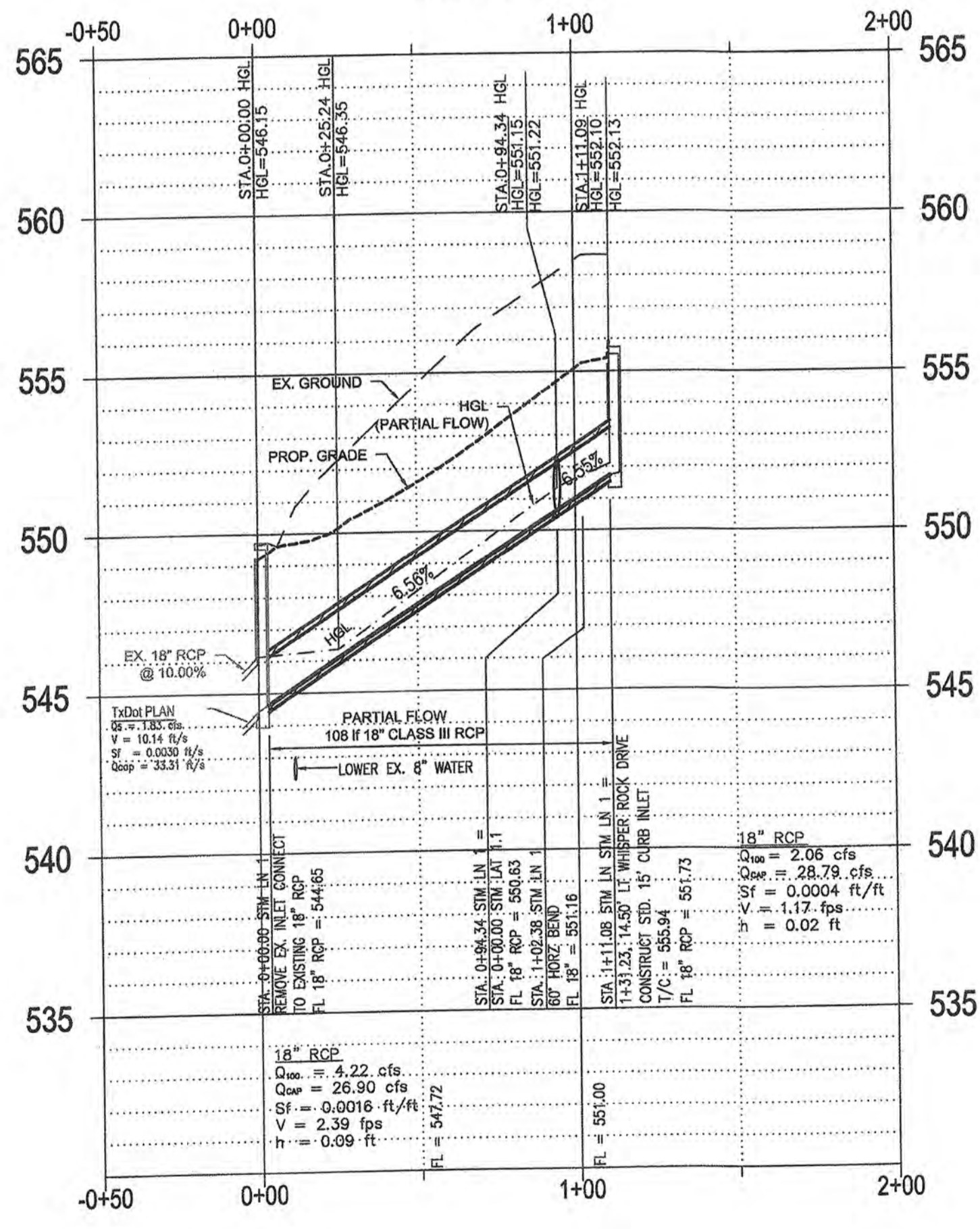




STM LN 1  
SCALE H: 4  
SCALE V: 10.00

STM LN 3  
SCALE H: 4  
SCALE V: 10.00

STM LN 4  
SCALE H: 4  
SCALE V: 10.00



RECORD DRAWINGS  
To the best of our knowledge Engineering Concepts & Design, L.P., hereby states that this plan is As-Built. This information provided is based on surveying at the site and information provided by the contractor.  
*Todd Winters*  
TODD WINTERS  
11-1-19  
DATE

ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN REMAINS WITH THE DESIGN ENGINEER. THE CITY OF ROCKWALL, IN REVIEWING AND RELEASING PLANS FOR CONSTRUCTION, ASSUMES NO RESPONSIBILITY FOR ADEQUACY OR ACCURACY OF DESIGN.  
CITY \_\_\_\_\_ DATE \_\_\_\_\_

**CAUTION! EXISTING UTILITIES**  
CONTRACTOR SHOULD CALL 1-800-DIG-TESS PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES FOR EXISTING UTILITY LOCATIONS. THESE PLANS HAVE BEEN LOCATED FROM REFERENCE INFORMATION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY BOTH HORIZONTALLY AND VERTICALLY THE LOCATION OF ALL EXISTING UTILITIES AND UNDERGROUND FACILITIES PRIOR TO CONSTRUCTION AND TO TAKE NECESSARY PRECAUTIONS IN ORDER TO PROTECT ALL FACILITIES ENCOUNTERED. THE CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION.

**BENCHMARKS**  
BM = MONUMENT RESET #1  
32± LF WEST OF FM 740 & SUMMER LEE DRIVE INTERSECTION, SOUTH SIDE OF SUMMER LEE DRIVE.  
ELEV=567.704  
BM = MONUMENT R014  
375± LF WEST OF RIDGE ROAD & HENRY M CHANDLER DRIVE INTERSECTION, ON NORTH SIDE OF HENRY M. CHANDLER DRIVE.  
ELEV=561.017

**ENGINEERING CONCEPTS & DESIGN, L.P.**  
ENGINEERING / PROJECT MANAGEMENT / CONSTRUCTION SERVICES - FIRM REG. #F-001145  
201 WINDCO CIR, STE 200, WYLLIE, TX 75098  
972-941-8400 FAX: 972-941-8401 WWW.ECDPL.COM

REVISIONS:

DRAWN: JD	DATE:
CHECKED: M.A.	DATE: NOVEMBER 2018
PROJECT NO.: 02114	
DWG FILE NAME: STORM PLAN & PROFILE.DWG	

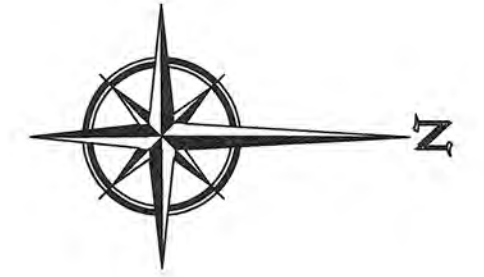
THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF CONSTRUCTION. THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY MATT ATKINS, P.E. 93968



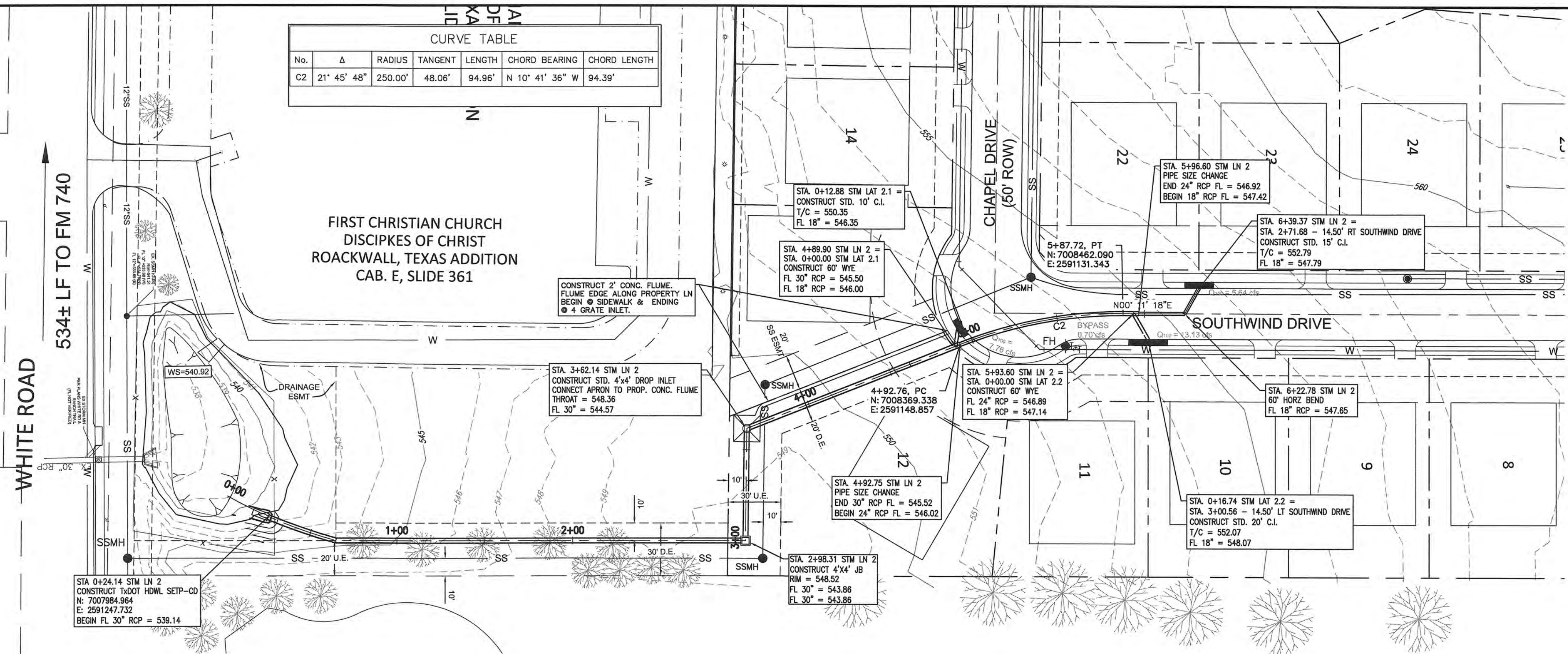
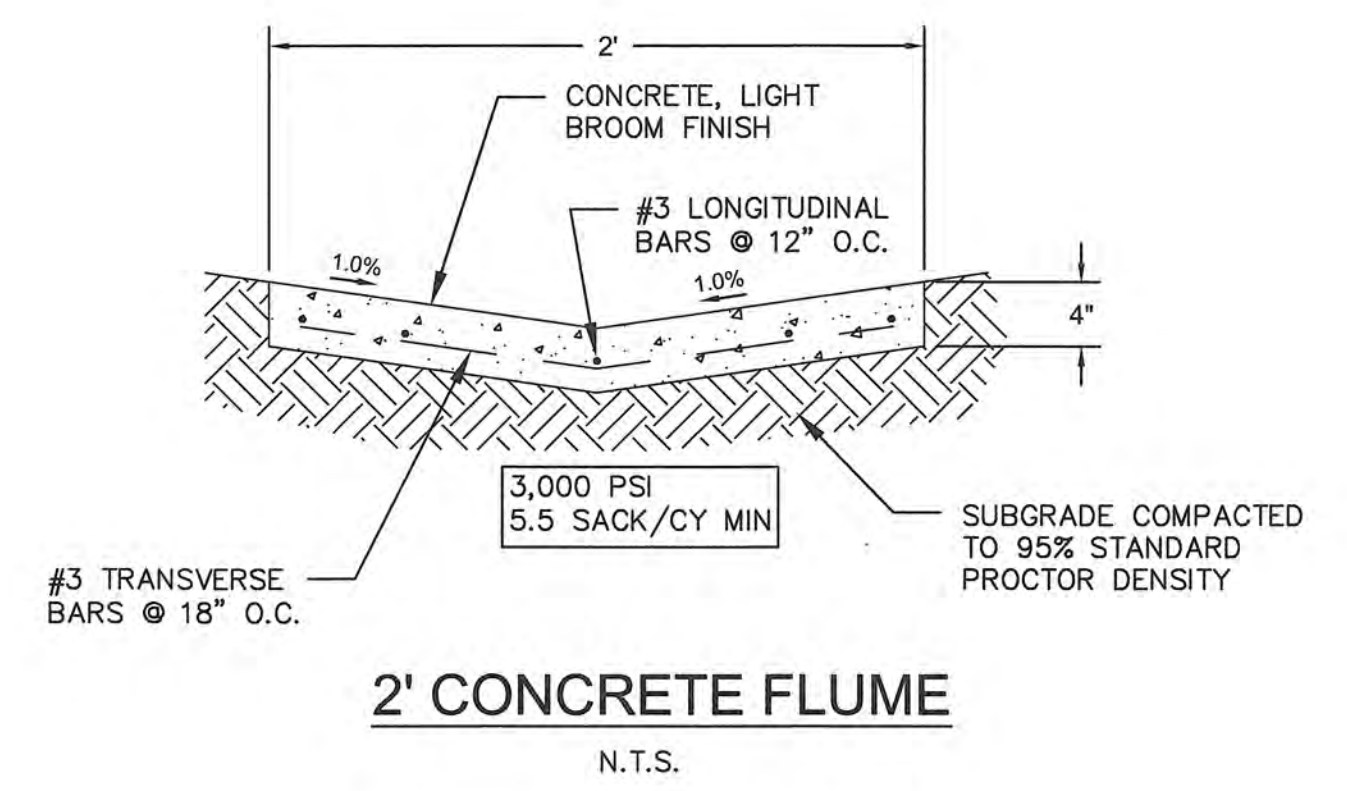
STORM PLAN & PROFILE - STORM LN 1, 3 & 4  
WHISPER ROCK  
CITY OF ROCKWALL  
ROCKWALL COUNTY

SHEET  
20  
OF  
58

No.	Δ	RADIUS	TANGENT	LENGTH	CHORD BEARING	CHORD LENGTH
C2	21° 45' 48"	250.00'	48.06'	94.96'	N 10° 41' 36" W	94.39'



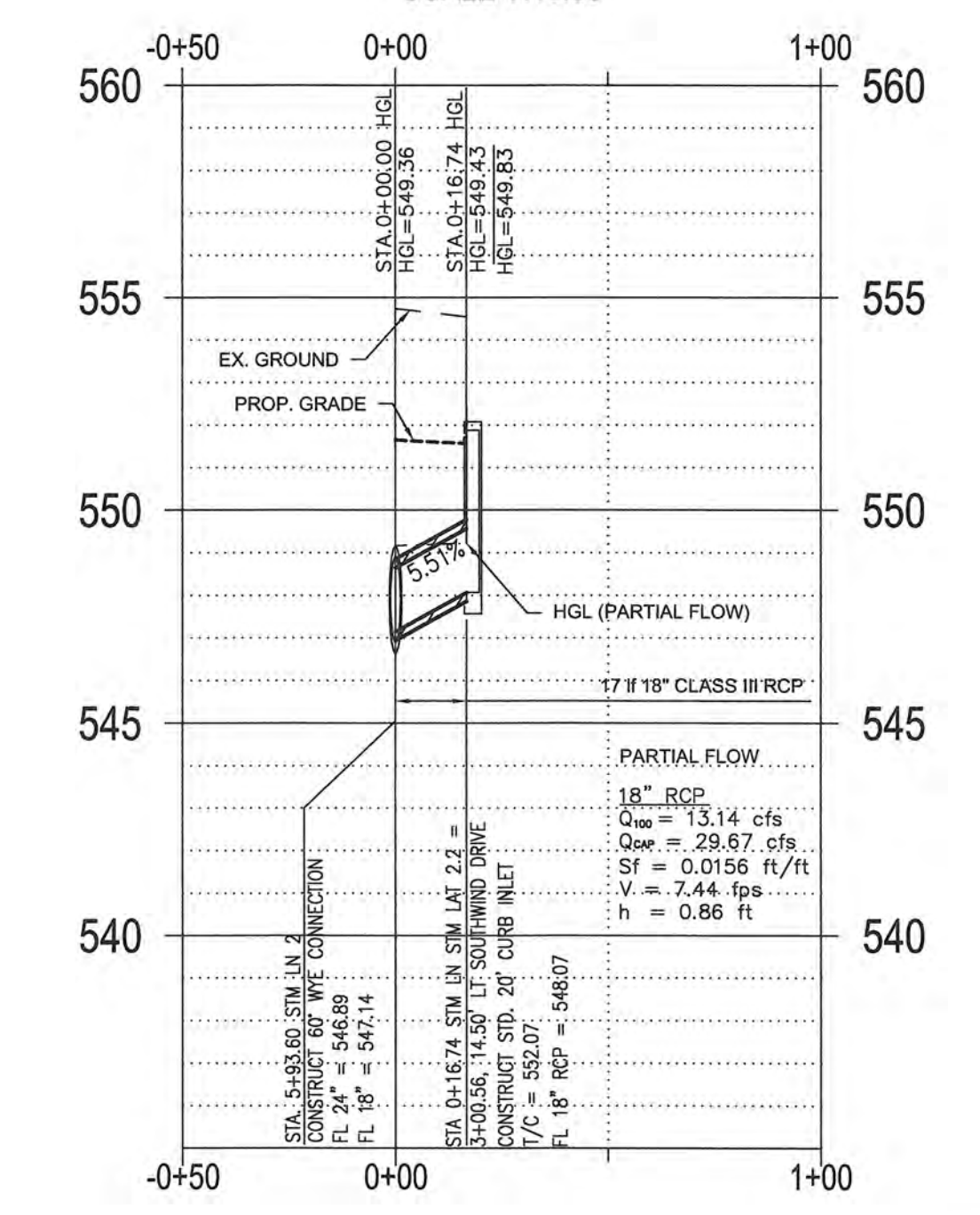
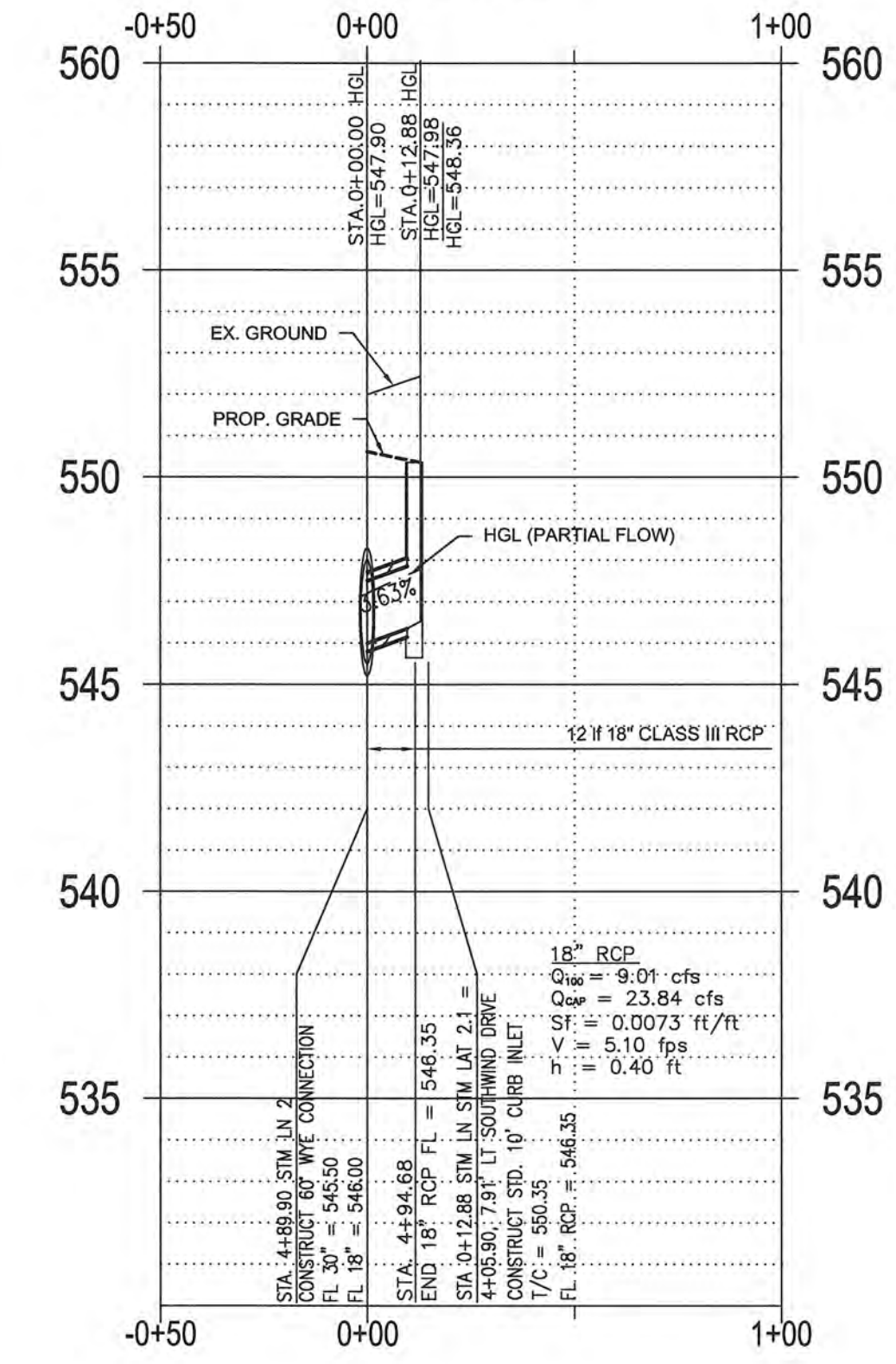
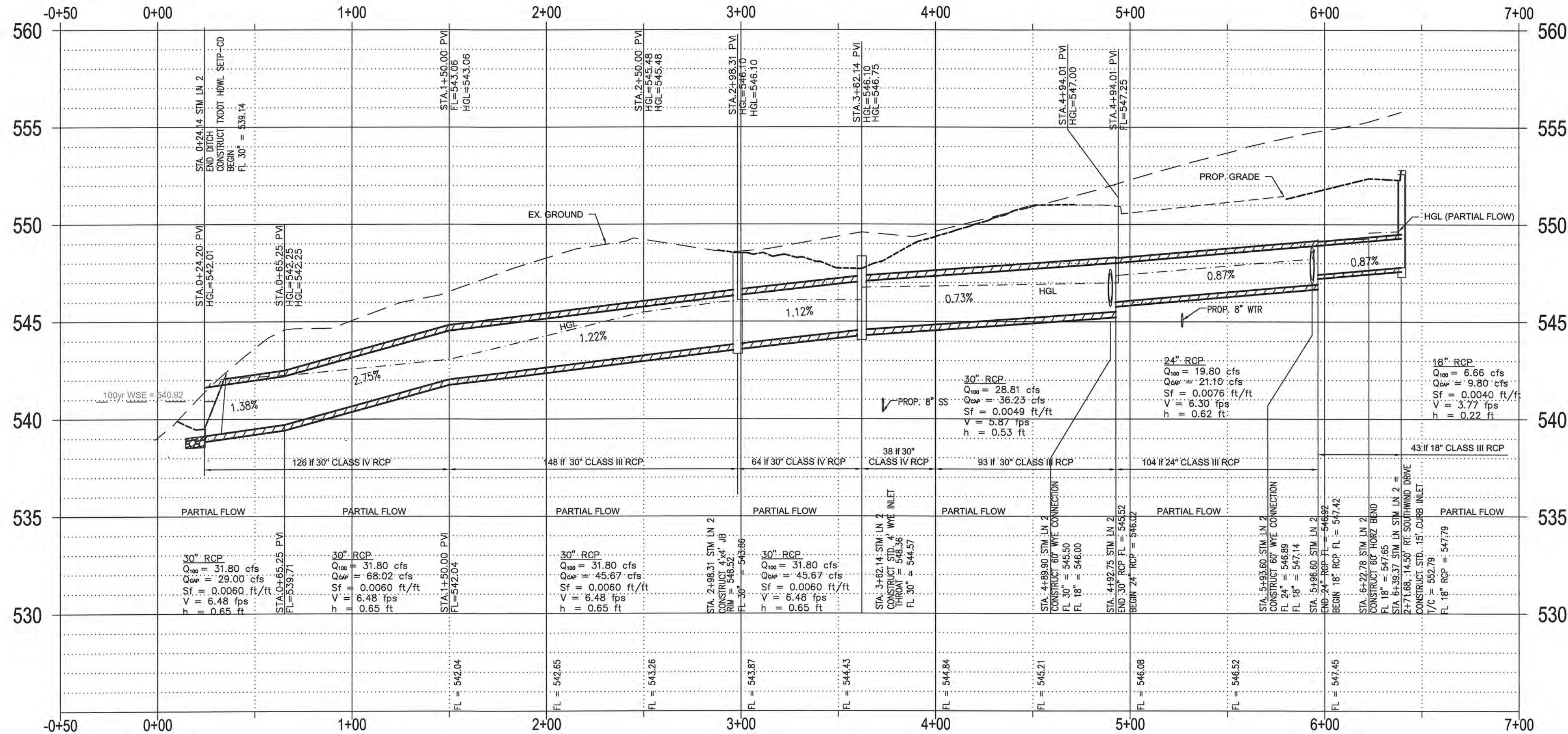
40 20 0 40 80  
SCALE IN FEET  
1" = 40'



STM LN 2  
SCALE H: 4  
SCALE V: 10:00

STM LAT 2.1  
SCALE H: 4  
SCALE V: 10:00

STM LAT 2.2  
SCALE H: 4  
SCALE V: 10:00



**RECORD DRAWINGS**  
To the best of our knowledge Engineering Concepts & Design, L.P., hereby states that this plan is As-Built. This information provided is based on surveying at the site and information provided by the contractor.  
*Todd Winters* 11-19  
TODD WINTERS DATE

**CAUTION! EXISTING UTILITIES**  
CONTRACTOR SHOULD CALL 1-800-DIG-TESS PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES FOR EXISTING UTILITY LOCATIONS. EXISTING UTILITIES AND UNDERGROUND FACILITIES INDICATED ON THESE PLANS HAVE BEEN LOCATED FROM REFERENCE INFORMATION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY BOTH HORIZONTALLY AND VERTICALLY THE LOCATION OF ALL EXISTING UTILITIES AND UNDERGROUND FACILITIES PRIOR TO CONSTRUCTION AND TO TAKE NECESSARY PRECAUTIONS IN ORDER TO PROTECT ALL FACILITIES ENCOUNTERED. THE CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION.

**BENCHMARKS**  
BM = MONUMENT RESET #1  
32± LF WEST OF FM 740 & SUMMER LEE DRIVE INTERSECTION, SOUTH SIDE OF SUMMER LEE, DRIVE.  
ELEV = 567.704  
BM = MONUMENT R014  
375± LF WEST OF RIDGE ROAD & HENRY M CHANDLER DRIVE INTERSECTION, ON NORTH SIDE OF HENRY M. CHANDLER DRIVE  
ELEV = 561.017

**ENGINEERING CONCEPTS & DESIGN, L.P.**  
ENGINEERING / PROJECT MANAGEMENT / CONSTRUCTION SERVICES - FIRM REG. #F-001145  
201 WINDCO CIR, STE 200, WYLIE, TX 75098  
972-941-8400 FAX: 972-941-8401 WWW.ECDLP.COM

REVISIONS:

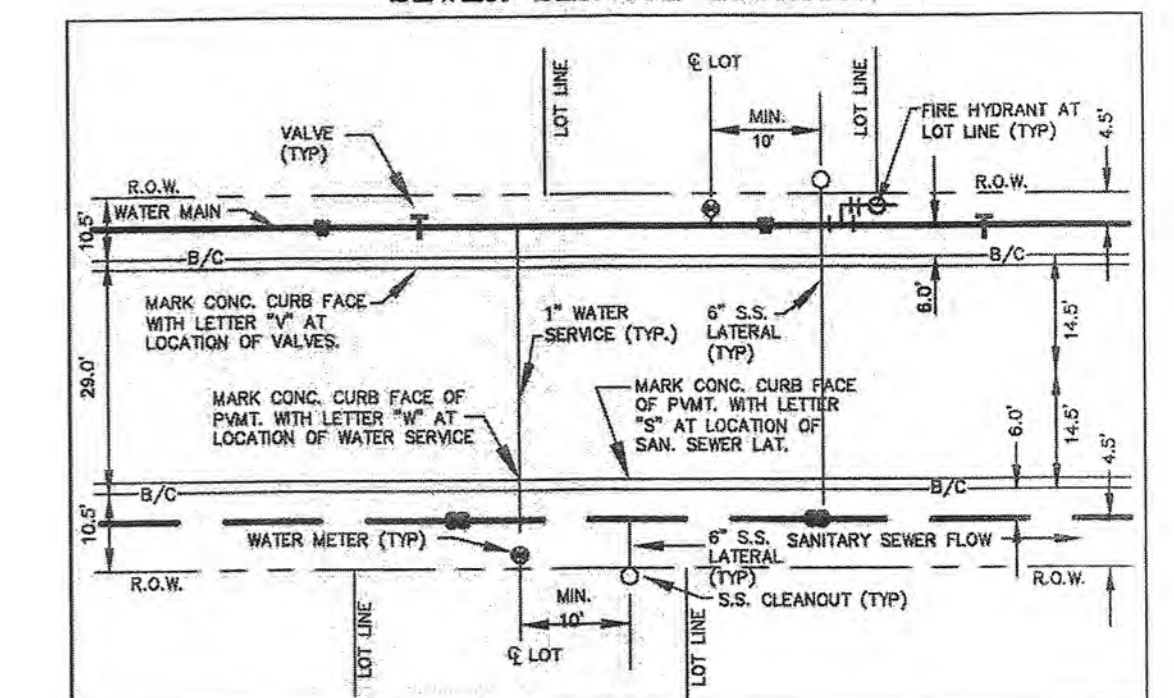
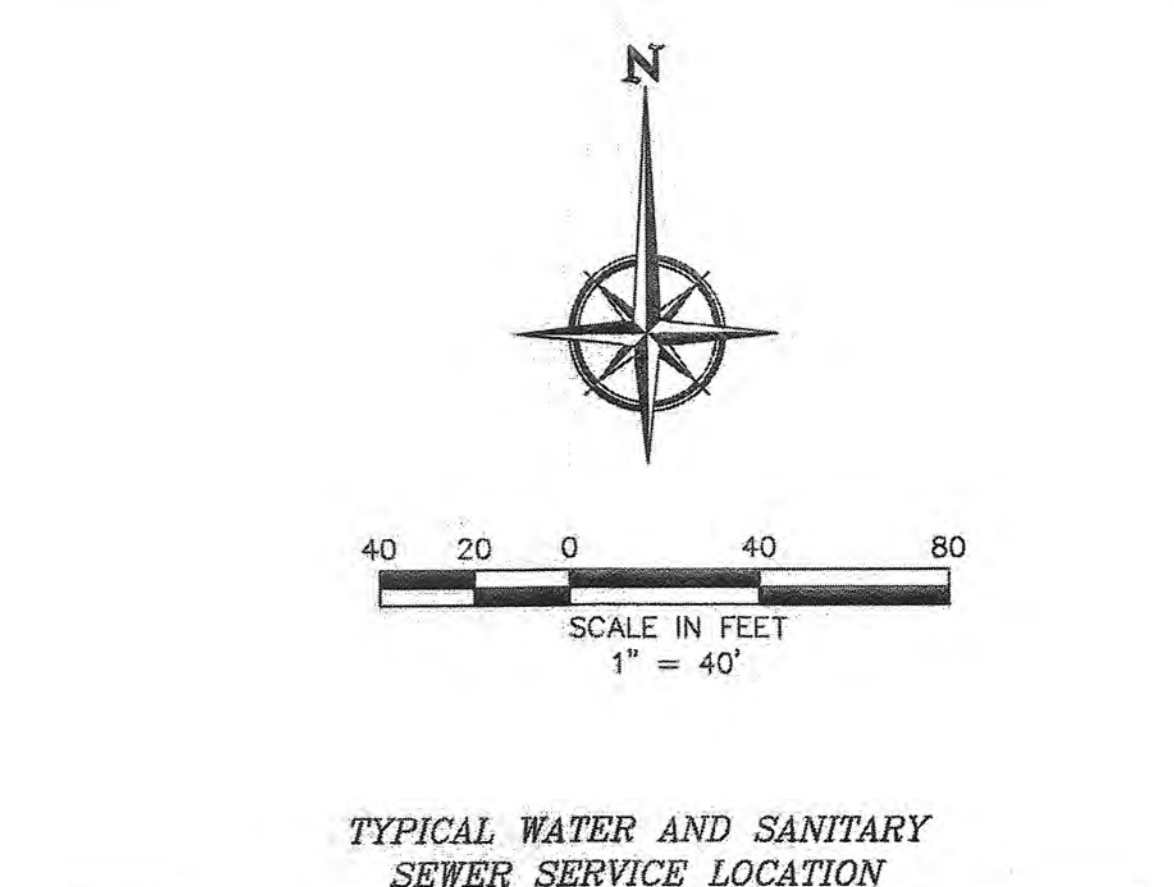
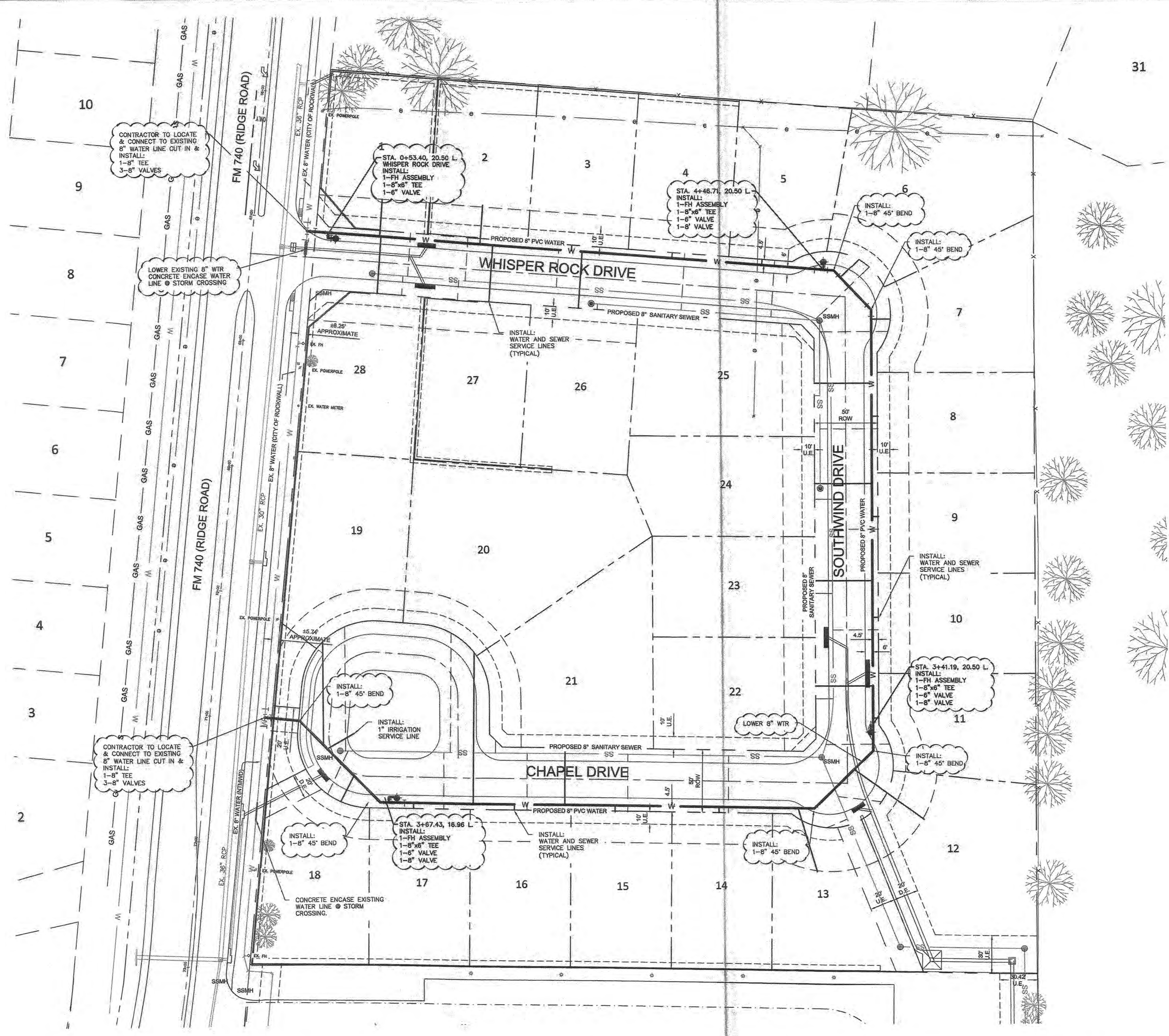
DRAWN: JD	DATE:
CHECKED: T.W.	DATE: NOVEMBER 2018
PROJECT NO.: 02114	
DWG FILE NAME: STORM PLAN & PROFILE.DWG	

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF CONSTRUCTION. THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY TODD WINTERS, P.E. 87085



**STORM PLAN & PROFILE - STORM LN 2, 2.1 & 2.2**  
WHISPER ROCK  
CITY OF ROCKWALL  
ROCKWALL COUNTY

SHEET  
**21**  
OF  
**58**



- LEGEND**
- SMH SAN. SEWER MANHOLE
  - FH FIRE HYDRANT
  - ROW RIGHT OF WAY
  - UE UTILITY EASEMENT
  - DE DRAINAGE EASEMENT

**NOTE:**  
CONTRACTOR TO FIELD VERIFY EXACT LOCATIONS AND DEPTH OF UTILITIES.

**NOTE:**  
REFER TO CITY OF ROCKWALL STANDARD DETAILS FOR WATER AND WASTEWATER SERVICE

**RECORD DRAWINGS**

To the best of our knowledge Engineering Concepts & Design, L.P., hereby states that this plan is As-Built. This information provided is based on surveying at the site and information provided by the contractor.

*Todd Winters* 11-1-19  
TODD WINTERS DATE

ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN REMAINS WITH THE DESIGN ENGINEER. THE CITY OF ROCKWALL, IN REVIEWING AND RELEASING PLANS FOR CONSTRUCTION, ASSUMES NO RESPONSIBILITY FOR ADEQUACY OR ACCURACY OF DESIGN.

CITY \_\_\_\_\_ DATE \_\_\_\_\_

**CAUTION! EXISTING UTILITIES**  
CONTRACTOR SHOULD CALL 1-800-DIG-TESS PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES FOR EXISTING UTILITY LOCATIONS. EXISTING UTILITIES AND UNDERGROUND FACILITIES INDICATED ON THESE PLANS HAVE BEEN LOCATED FROM REFERENCE INFORMATION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY BOTH HORIZONTALLY AND VERTICALLY THE LOCATION OF ALL EXISTING UTILITIES AND UNDERGROUND FACILITIES PRIOR TO CONSTRUCTION AND TO TAKE NECESSARY PRECAUTIONS IN ORDER TO PROTECT ALL FACILITIES ENCOUNTERED. THE CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION.

**BENCHMARKS**  
BM = MONUMENT RESET #1  
32± LF WEST OF FM 740 & SUMMER LEE DRIVE INTERSECTION. SOUTH SIDE OF SUMMER LEE DRIVE.  
ELEV=567.704  
BM = MONUMENT R014  
375± LF WEST OF RIDGE ROAD & HENRY M CHANDLER DRIVE INTERSECTION. ON NORTH SIDE OF HENRY M. CHANDLER DRIVE  
ELEV=561.017

**ENGINEERINGCONCEPTS & DESIGN, L.P.**  
ENGINEERING / PROJECT MANAGEMENT / CONSTRUCTION SERVICES - FIRM REG. #F-00145  
201 WINDCO CIR, STE 200, WYLLIE, TX 75098  
972-941-8400 FAX: 972-941-8401 WWW.ECDLP.COM

REVISIONS:	
DRAWN: JD	DATE:
CHECKED: M.A.	DATE: NOVEMBER 2018
PROJECT NO.: 02114	
DWG FILE NAME: WATER.PLAN.DWG	

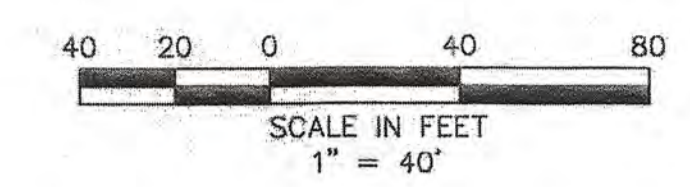
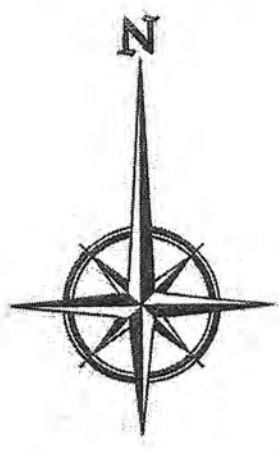
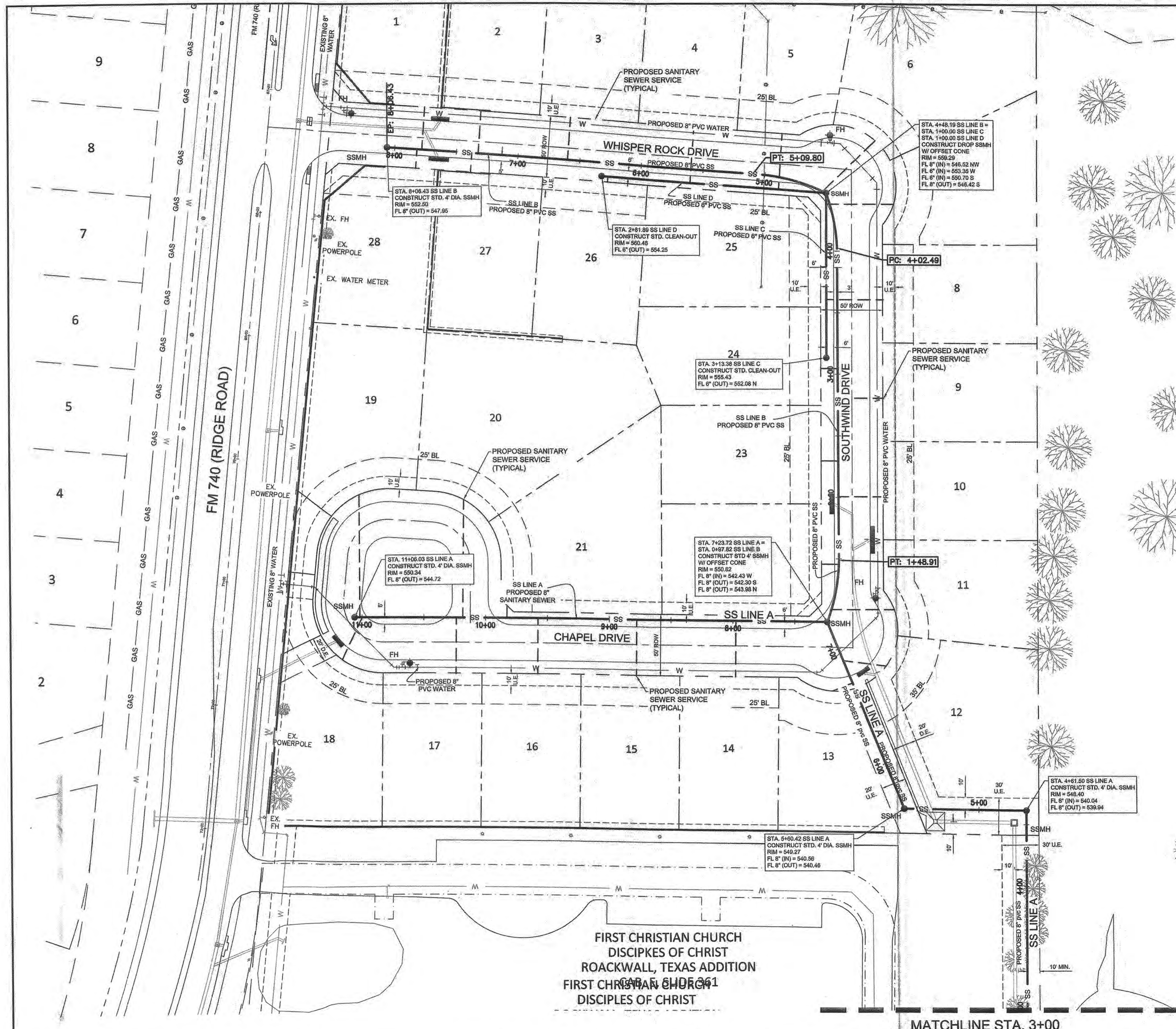
THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF CONSTRUCTION. THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY MATT ATKINS, P.E. 93968



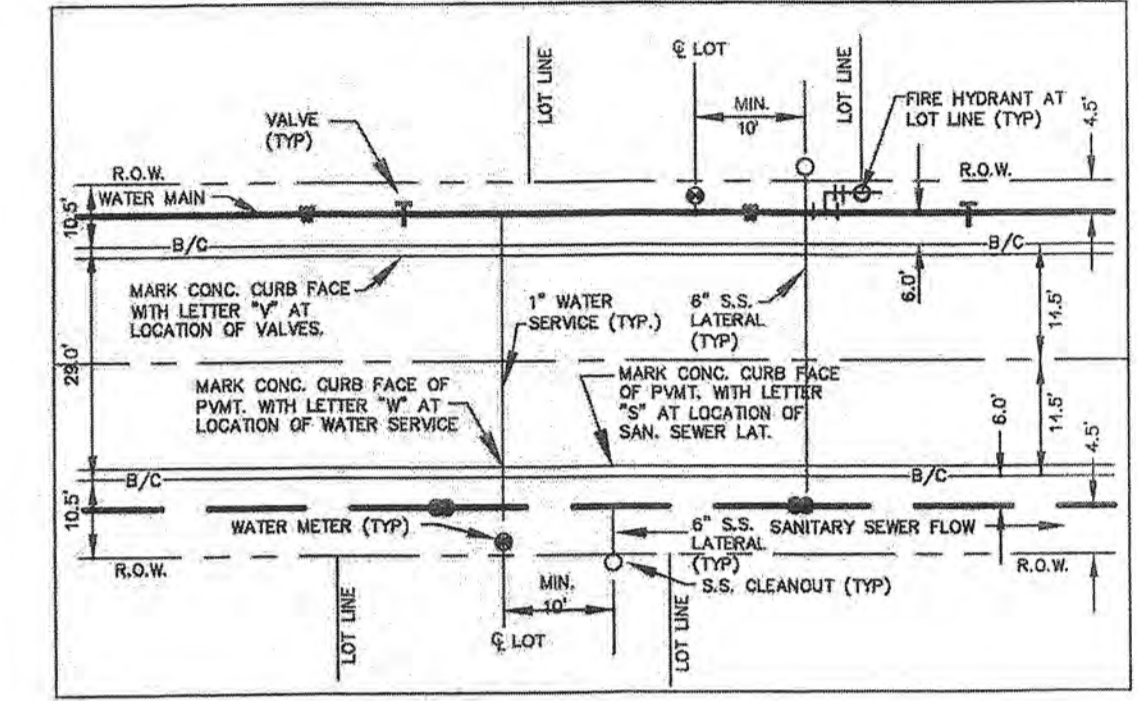
11/26/2018

**WATER PLAN  
WHISPER ROCK  
CITY OF ROCKWALL  
ROCKWALL COUNTY**

SHEET  
**22**  
OF  
**58**



TYPICAL WATER AND SANITARY SEWER SERVICE LOCATION



**LEGEND**

SMH	SAN. SEWER MANHOLE
FH	FIRE HYDRANT
ROW	RIGHT OF WAY
UE	UTILITY EASEMENT
SS	ESMT SANITARY SEWER EASEMENT
LE	LANDSCAPE EASEMENT
DE	DRAINAGE EASEMENT

NOTE: CONTRACTOR TO FIELD VERIFY EXACT LOCATIONS AND DEPTH OF ALL UTILITIES.

NOTE: REFER TO CITY OF ROCKWALL STANDARD DETAILS FOR WATER AND WASTEWATER SERVICE.

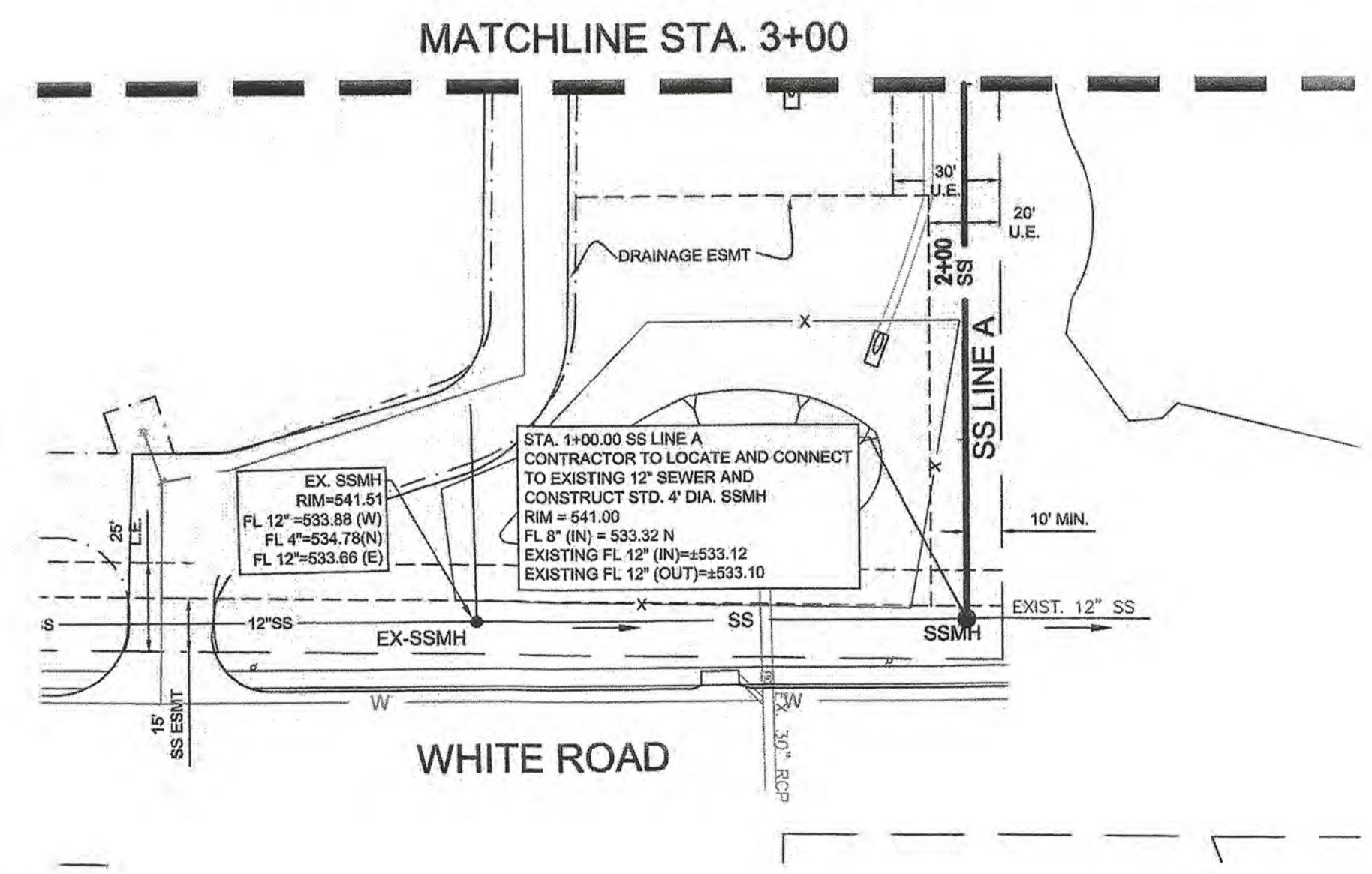
**RECORD DRAWINGS**

To the best of our knowledge Engineering Concepts & Design, L.P., hereby states that this plan is As-Built. This information provided is based on surveying at the site and information provided by the contractor.

*Todd Winters* 11-19 DATE  
TODD WINTERS

ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN REMAINS WITH THE DESIGN ENGINEER. THE CITY OF ROCKWALL, IN REVIEWING AND RELEASING PLANS FOR CONSTRUCTION, ASSUMES NO RESPONSIBILITY FOR ADEQUACY OR ACCURACY OF DESIGN.

CITY \_\_\_\_\_ DATE \_\_\_\_\_



**CAUTION! EXISTING UTILITIES**

CONTRACTOR SHOULD CALL 1-800-DIG-TESS PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES FOR EXISTING UTILITY LOCATIONS. EXISTING UTILITIES AND UNDERGROUND FACILITIES INDICATED ON THESE PLANS HAVE BEEN LOCATED FROM REFERENCE INFORMATION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY BOTH HORIZONTALLY AND VERTICALLY THE LOCATION OF ALL EXISTING UTILITIES AND UNDERGROUND FACILITIES PRIOR TO CONSTRUCTION AND TO TAKE NECESSARY PRECAUTIONS IN ORDER TO PROTECT ALL FACILITIES ENCOUNTERED. THE CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION.

**BENCHMARKS**

BM = MONUMENT RESET #1  
32± LF WEST OF FM 740 & SUMMER LEE DRIVE INTERSECTION, SOUTH SIDE OF SUMMER LEE DRIVE.  
ELEV.=567.704

BM = MONUMENT R014  
375± LF WEST OF RIDGE ROAD & HENRY M CHANDLER DRIVE INTERSECTION, ON NORTH SIDE OF HENRY M. CHANDLER DRIVE.  
ELEV.=561.017

**ENGINEERINGCONCEPTS & DESIGN, L.P.**

ENGINEERING / PROJECT MANAGEMENT / CONSTRUCTION SERVICES - FIRM REG. #F-001145  
201 WINDCO CIR, STE 200, WYLIE, TX 75098  
972-941-8400 FAX: 972-941-8401 WWW.ECDLP.COM

REVISIONS:

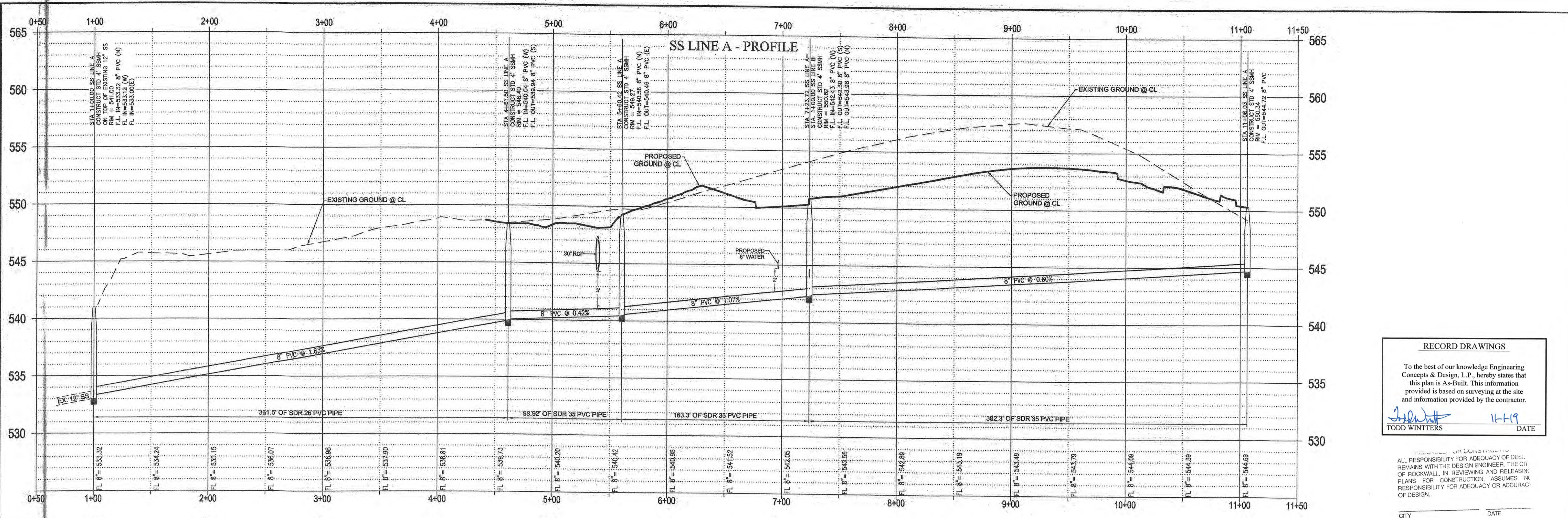
DRAWN: JD	DATE:
CHECKED: M.A.	DATE: NOVEMBER 2018
PROJECT NO: 02114	
DWG FILE NAME: SANITARY SEWER PLAN.DWG	

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF CONSTRUCTION. THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY MATT ATKINS, P.E. 83968



**SANITARY SEWER PLAN**  
WHISPER ROCK  
CITY OF ROCKWALL  
ROCKWALL COUNTY





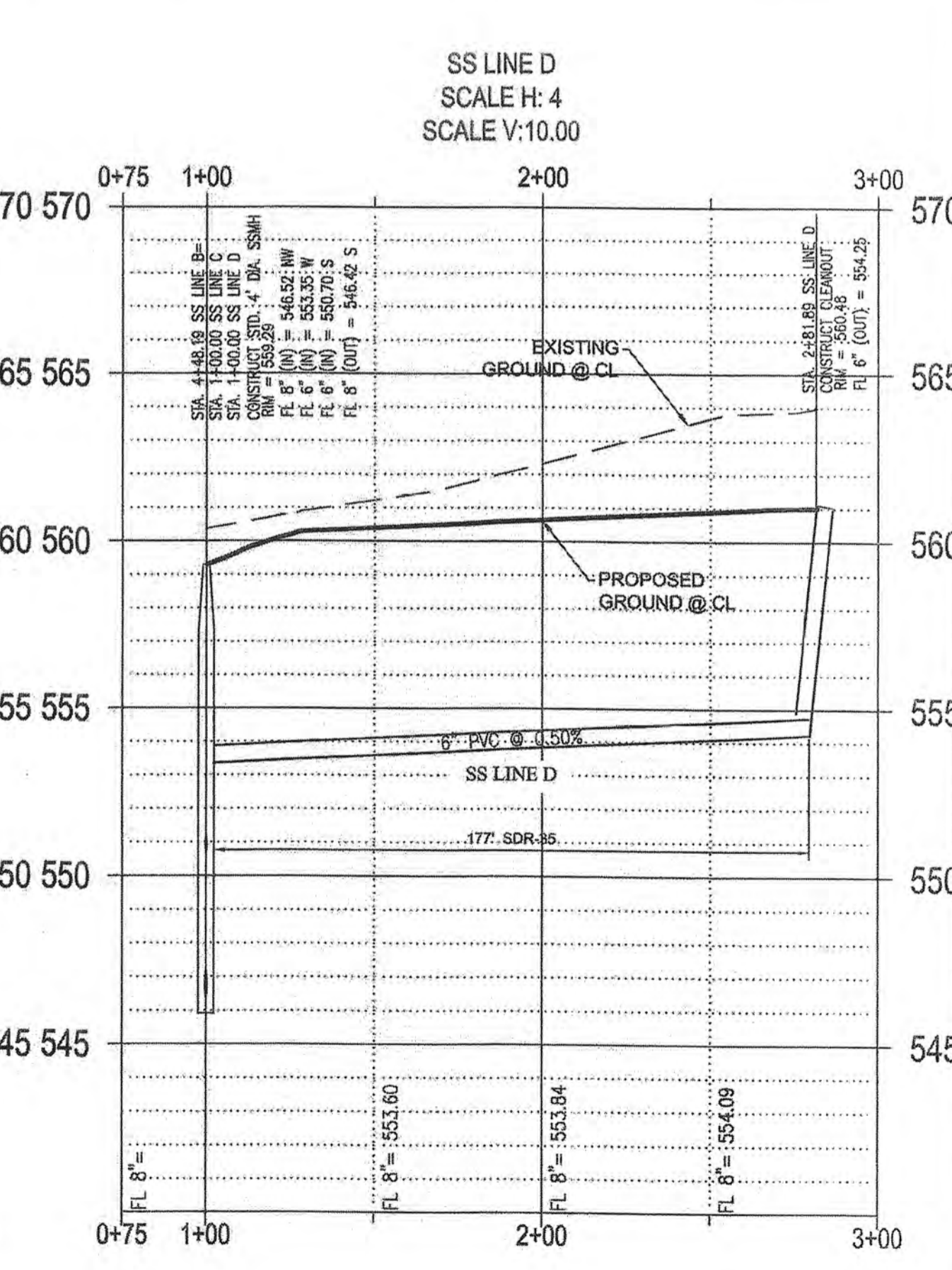
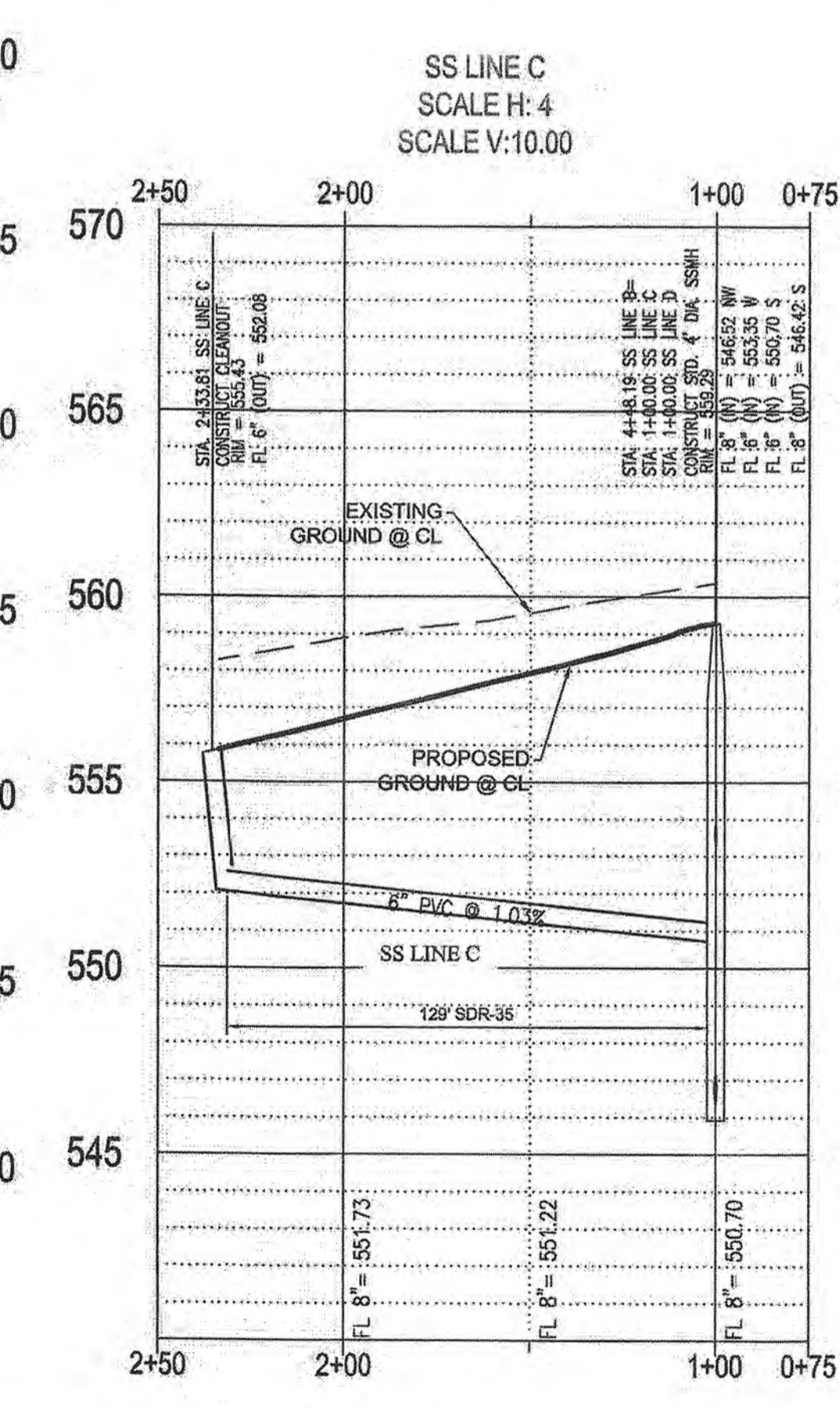
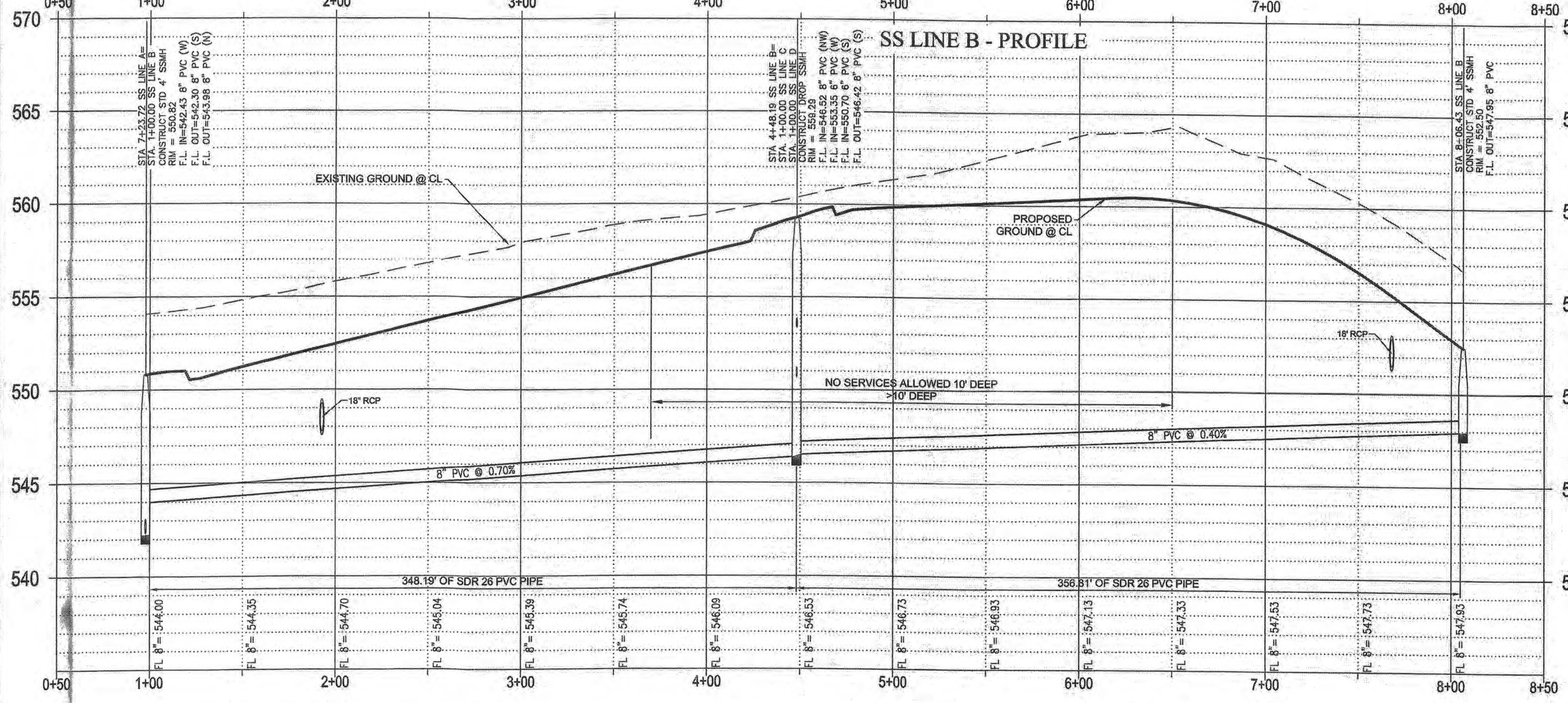
**RECORD DRAWINGS**

To the best of our knowledge Engineering Concepts & Design, L.P., hereby states that this plan is As-Built. This information provided is based on surveying at the site and information provided by the contractor.

*Todd Winters* 11-1-19  
 TODD WINTERS DATE

ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN REMAINS WITH THE DESIGN ENGINEER. THE CITY OF ROCKWALL, IN REVIEWING AND RELEASING PLANS FOR CONSTRUCTION, ASSUMES NO RESPONSIBILITY FOR ADEQUACY OR ACCURACY OF DESIGN.

CITY \_\_\_\_\_ DATE \_\_\_\_\_



**CAUTION! EXISTING UTILITIES**

CONTRACTOR SHOULD CALL 1-800-DIG-TESS PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES FOR EXISTING UTILITY LOCATIONS. EXISTING UTILITIES AND UNDERGROUND FACILITIES INDICATED ON THESE PLANS HAVE BEEN LOCATED FROM REFERENCE INFORMATION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY BOTH HORIZONTALLY AND VERTICALLY THE LOCATION OF ALL EXISTING UTILITIES AND UNDERGROUND FACILITIES PRIOR TO CONSTRUCTION AND TO TAKE NECESSARY PRECAUTIONS IN ORDER TO PROTECT ALL FACILITIES ENCOUNTERED. THE CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION.

**BENCHMARKS**

BM = MONUMENT RESET #1  
 322' LF WEST OF FM 740 & SUMMER LEE DRIVE INTERSECTION, SOUTH SIDE OF SUMMER LEE DRIVE.  
 ELEV=567.704

BM = MONUMENT R014  
 375' LF WEST OF RIDGE ROAD & HENRY M CHANDLER DRIVE INTERSECTION, ON NORTH SIDE OF HENRY M. CHANDLER DRIVE  
 ELEV=561.017

**ENGINEERING CONCEPTS & DESIGN, L.P.**

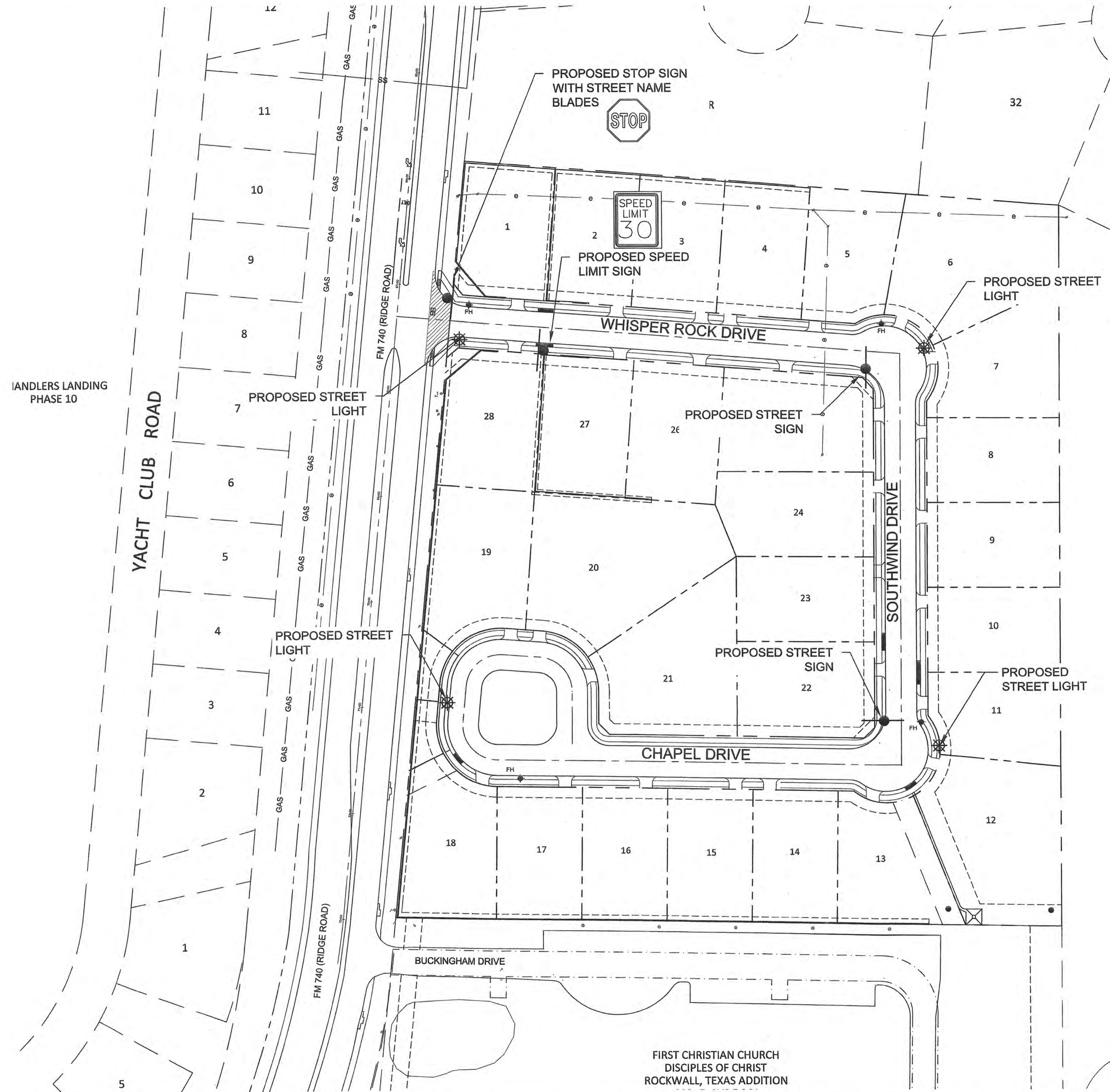
ENGINEERING / PROJECT MANAGEMENT / CONSTRUCTION SERVICES - FIRM REG. #F-001145  
 201 WINDCO CIR, STE 200, WYLIE, TX 75098  
 972-941-8400 FAX: 972-941-8401 WWW.ECDLP.COM

REVISIONS:

DRAWN: JD	DATE:
CHECKED: M.A.	DATE: NOVEMBER 2018
PROJECT NO.: 02114	
DWG FILE NAME: SANITARY SEWER PROFILES.DWG	

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF CONSTRUCTION. THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY MATT ATKINS, P.E. 93968

*Matt Atkins*  
 MATT ATKINS  
 PROFESSIONAL ENGINEER  
 STATE OF TEXAS  
 93968  
 11/26/2018



**LEGEND**

- PROPOSED STREET LIGHT
- PROPOSED STOP SIGN
- PROPOSED STREET SIGN
- PROPOSED FIRE HYDRANT

Street Department City of Rockwall Public Works

**Street and Regulatory Signage**

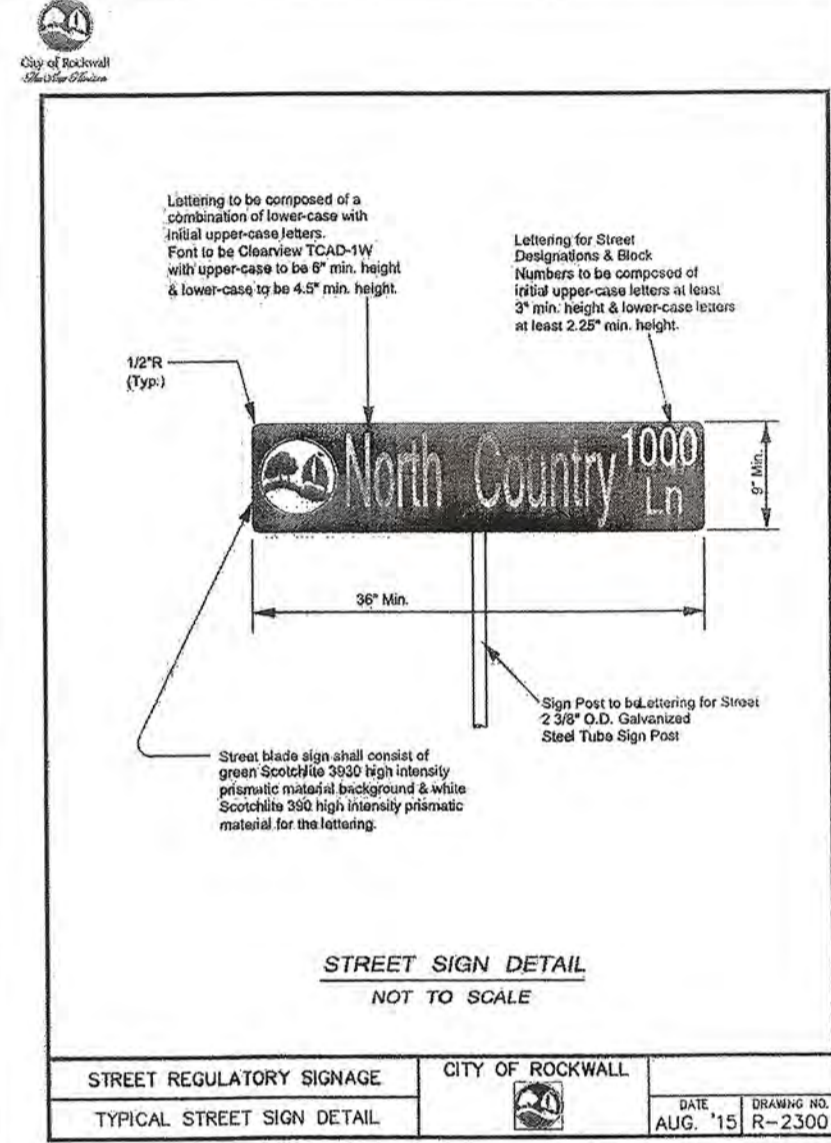
The developer shall arrange for the installation of all pavement safety, regulatory, warning and guide signs, including those shown on the plans as directed by the City of Rockwall. Street name signs shall be installed at each intersection. Examples of regulatory, warning, information and guide signs are as follows:

- Regulatory signs shall include, but are not limited to: STOP, ALL-WAY, YIELD, KEEP RIGHT and AHEAD AHEAD.
- Warning signs shall include, but are not limited to: DEAD END, NO OUTLET, DIVIDED ROAD, DPF, and PAVEMENT ENDS.
- Guide signs shall include, but are not limited to: STREET NAME SIGNS, DETOUR, direction arrows and advance arrows.

Regulatory signs should be used only when justified by engineering judgment or study. All signage plans shall be reviewed and approved by the City of Rockwall Engineering Department and be designed in accordance with the principles described in the current TMUTCD.

All signage installed shall comply with the current Texas Manual on Uniform Traffic Control Devices and the Standard Highway Signs and Markings. The sign legend covers what shows the color and construction of all sign face legend components including background color, legend color, border, symbols, letter size and sign.

- For a street with a one-way end, a standard W 14-2a shall be mounted over the street name blade, if the one-way is not clearly visible from the adjoining roadway, or is located in excess of 400 feet from the adjoining roadway.
- Sign posts shall be 2 1/2" O.D. galvanized steel tube sign post with a galvanized finish.
- Sign clamps and brackets shall be high strength aluminum.
- Street name blade signs shall be double-sided with rounded corners.
- Street name blades shall be nine inch (9") flat aluminum. The blades shall be 0.002 inches thick and be a minimum of 24" long.



- The lettering for the street signs shall be 3/4" Scotchless Series 3032 with Semiflex reflective material and shall be mounted on a 2 1/2" O.D. galvanized steel tube sign post with a galvanized finish. The sign background shall be green and the lettering shall be white.
- The street name blade must incorporate the current City of Rockwall logo. The logo shall consist of white 3/4" Scotchless Series 3032 high intensity reflective material (product code 3032).
- Block numbers are required on all street name blades and shall be located on the top right corner of the street blade.
- The lettering for the street blade shall be composed of a combination of letter-case letters with initial upper-case letters. The Chaseview TCS-1V font shall be used. The lettering shall be composed of initial upper-case letters of at least 6 inches in height and lower case letters of at least 4.5 inches in height. For supplementary lettering to indicate the type of street (such as Drive, Avenue or Road) shall be composed of initial upper-case letters of at least 3 inches in height and lower-case letters of at least 2.5 inches in height. All lettering may be used for example Dr., Ave., or Rd. except for the street name blade. The supplementary lettering shall be located at the lower right corner of the street blade, under the block number.
- The street blade sign shall consist of green 3/4" Scotchless Series 3032 high intensity reflective material (product code 3032). The lettering shall consist of white 3/4" Scotchless Series 3032 high intensity reflective material (product code 3032). The background lettering shall be white 3/4" Scotchless Series 3032 high intensity reflective material. The background material shall be the one coordinated piece of material. Painting of background material is not allowed and any sign with patching material of any type will not be accepted by the City.

**Alternative Option:**  
As an alternative, the background color may be green transparent Scotchless Series 3032 film (PVC). Lettering shall be cut and removed producing a single continuous piece of green transparent film material.

The developer shall be responsible for furnishing and installing all regulatory signage, including signs and street name signage along with all the necessary sign mounting hardware and sign posts. The City of Rockwall will provide the sign posts. The sign posts shall be provided by the City of Rockwall, located at 1600 Airport Road, Rockwall, Texas 75087. The nearest sign stock is available at 1500 Airport Road, Rockwall, Texas 75087. The nearest sign stock is available at 1500 Airport Road, Rockwall, Texas 75087.

All street and regulatory signage shall be installed, inspected and approved prior to final acceptance of the project. This inspection typically takes place as part of the engineering department's final review. Any sign related inspections will be noted on the project final submittal.

**RECORD DRAWINGS**

To the best of our knowledge Engineering Concepts & Design, L.P., hereby states that this plan is As-Built. This information provided is based on surveying at the site and information provided by the contractor.

*Todd Winters* 11/19/19  
TODD WINTERS DATE

ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN REMAINS WITH THE DESIGN ENGINEER, THE CITY OF ROCKWALL, IN REVIEWING AND RELEASING PLANS FOR CONSTRUCTION, ASSUMES NO RESPONSIBILITY FOR ADEQUACY OR ACCURACY OF DESIGN.

CITY \_\_\_\_\_ DATE \_\_\_\_\_

**CAUTION! EXISTING UTILITIES**  
CONTRACTOR SHOULD CALL 1-800-892-8888 PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES FOR EXISTING UTILITY LOCATIONS. EXISTING UTILITIES AND UNDERGROUND FACILITIES INDICATED ON THESE PLANS HAVE BEEN LOCATED FROM REFERENCE INFORMATION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY BOTH HORIZONTALLY AND VERTICALLY THE LOCATION OF ALL EXISTING UTILITIES AND UNDERGROUND FACILITIES PRIOR TO CONSTRUCTION AND TO TAKE NECESSARY PRECAUTIONS IN ORDER TO PROTECT ALL FACILITIES ENCOUNTERED. THE CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION.

**BENCHMARKS**  
BM = MONUMENT RESET #1  
32± LF WEST OF FM 740 & SUMMER LEE DRIVE INTERSECTION, SOUTH SIDE OF SUMMER LEE DRIVE.  
ELEV=567.704  
BM = MONUMENT R014  
375± LF WEST OF RIDGE ROAD & HENRY M CHANDLER DRIVE INTERSECTION, ON NORTH SIDE OF HENRY M. CHANDLER DRIVE  
ELEV=561.017

**ENGINEERINGCONCEPTS & DESIGN, L.P.**

ENGINEERING / PROJECT MANAGEMENT / CONSTRUCTION SERVICES - FIRM REG. #F-001145  
201 WINDCO CIR, STE 200, WYLIE, TX 75098  
972-941-8400 FAX: 972-941-8401 WWW.ECDLP.COM

REVISIONS:

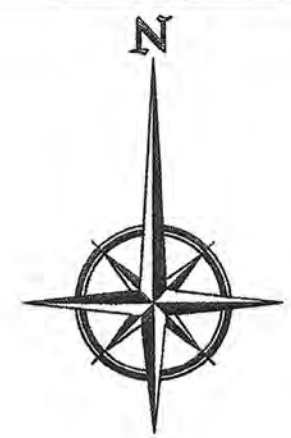
DRAWN: JD	DATE:
CHECKED: M.A.	DATE: NOVEMBER 2018
PROJECT NO: 02114	
DWG FILE NAME: LIGHTING & SIGNAGE PLAN.DWG	

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF CONSTRUCTION. THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY MATT ATKINS, P.E. 93968



**LIGHTING & SIGNAGE PLAN**  
WHISPER ROCK  
CITY OF ROCKWALL  
ROCKWALL COUNTY

SHEET 25 OF 58



50 25 0 50 100  
SCALE IN FEET  
1" = 50'

LEGEND	
	SILT FENCE
	CONSTRUCTION ENTRANCE
	INLET PROTECTION
	CHECK DAM

- NOTES:
1. A STORM WATER POLLUTION PREVENTION PLAN (S.W.P.P.P.) INCLUDING NOTICE OF INTENT (N.O.I.) WILL BE PREPARED BY THE GENERAL CONTRACTOR FOR THIS PROJECT IN ACCORDANCE WITH THE REQUIREMENTS OF THE N.P.D.E.S. GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION.
  2. ALL CONTRACTORS WILL COMPLY WITH THE REQUIREMENTS AND INTENT OF THE N.P.D.E.S. GENERAL PERMIT FOR STORM WATER DISCHARGES.
  3. EACH CONTRACTOR SHALL SUBMIT A NOTICE OF INTENT (N.O.I.) FOR STORM WATER DISCHARGE PERMIT COVERAGE. THIS SUBMITTAL SHALL BE COORDINATED WITH THE OWNER AND SHALL OCCUR NO LESS THAN 48 HOURS PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION ACTIVITY.
  4. EACH CONTRACTOR SHALL OBTAIN AND SUBMIT TO THE OWNER A POLLUTION PREVENTION CERTIFICATION FROM EACH SUBCONTRACTOR WHOSE WORK IMPACTS THE STORM WATER POLLUTION PREVENTION PLAN (S.W.P.P.P.) PRIOR TO THE PERFORMANCE OF ANY WORK BY SAID SUBCONTRACTOR. THESE CERTIFICATIONS SHALL BECOME A PART OF THE STORM WATER POLLUTION PREVENTION PLAN.
  5. CONTRACTOR SHALL INSTALL EROSION CONTROL MEASURES, AS INDICATED ON THE PLANS AND AS FIELD CONDITIONS WARRANT, PRIOR TO COMMENCING ANY CONSTRUCTION ACTIVITY. REPAIRS OR MODIFICATIONS TO THE MEASURES WILL BE MADE BY THE CONTRACTOR IF THE CONTROL MEASURES PROVE INEFFECTIVE OR IF ADDITIONAL CONTROL MEASURES ARE NECESSARY. EROSION CONTROL SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION.
  6. CONTRACTOR SHALL TAKE APPROPRIATE MEASURES TO PREVENT TRACKING OF MUD AND/OR SOILS ONTO EXISTING AND/OR NEW PAVEMENT. ANY TRACKING THAT OCCURS SHALL BE REMOVED IMMEDIATELY BY THE CONTRACTOR.
  7. CONTRACTOR SHALL CONSTRUCT INLET PROTECTION FOR ALL INCOMPLETE CURB INLETS AND SHALL TAKE EVERY MEASURE TO KEEP SOILS AND SEDIMENTS FROM ENTERING THE STORM SEWER SYSTEM.
  8. CONTRACTOR SHALL INSTALL APPROPRIATE INLET PROTECTION AT ALL AREA DRAINS AS SHOWN.
  9. AT A MINIMUM, PERIMETER CONTROLS SUCH AS SILT FENCE SHALL BE INSTALLED AT ALL DOWN SLOPE BOUNDARIES AND AS WARRANTED WHERE PAVEMENT REMOVAL, UTILITY CONSTRUCTION, GRADING, OR OTHER CONSTRUCTION ACTIVITIES ARE TO BE PERFORMED. THE CONTRACTOR SHALL AT ALL TIMES TAKE SUCH MEASURES AS NECESSARY TO MINIMIZE OFFSITE TRACKING OR TRANSPORT OF SEDIMENT AND DEBRIS.
  10. DAMAGE TO ADJACENT PROPERTY AND/OR TO RECEIVING WATERS CAUSED BY IMPROPERLY INSTALLED OR POORLY MAINTAINED EROSION CONTROL MEASURES WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
  11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND DISPOSAL OF ANY SILTATION CAUSED BY HIS OPERATIONS AND/OR FAILURE OF THE EROSION CONTROL MEASURES.
  12. CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ACCUMULATED SILT AND SEDIMENT FROM EROSION CONTROL MEASURES WHEN IT REACHES A DEPTH OF SIX (6) INCHES OR IMPAIRS THE EFFECTIVENESS OF THE MEASURES.
  13. THE CONTRACTORS REPRESENTATIVE WILL INSPECT THE PROJECT EVERY SEVEN DAYS, AT A MINIMUM, AND AFTER EVERY RAINFALL OF ONE-HALF INCHES OR GREATER TO DETERMINE THE INTEGRITY AND EFFECTIVENESS OF THE EROSION CONTROL MEASURES. A WRITTEN INSPECTION REPORT WILL BE FILED WITH THE POLLUTION PREVENTION PLAN. THIS INSPECTION DOES NOT RELIEVE THE CONTRACTOR'S RESPONSIBILITY FOR INSPECTION AND MAINTENANCE OF THE EROSION CONTROL MEASURES OR HIS DUTY TO COMPLY WITH THE INTENT AND CONDITIONS OF THE N.P.D.E.S. GENERAL PERMIT.
  14. ALL STOCKPILED SOILS WILL BE SURROUNDED BY SILT FENCE, SEDIMENT CONTROL SWALE, OR EQUIVALENT MEASURE TO PROPERLY CONTROL SEDIMENT RUNOFF, AS APPROVED BY THE CITY.
  15. CONTRACTOR SHALL STABILIZE ANY AREA WHERE CONSTRUCTION ACTIVITY IS TO BE TEMPORARILY OR PERMANENTLY CEASED FOR MORE THAN 14 DAYS.
  16. 75% -80% OF ALL DISTURBED AREA TO HAVE A MINIMUM 1" STAND OF GRASS (NOT WEEDS OR RYE) PRIOR TO CITY ACCEPTANCE OF THE PROJECT.

**RECORD DRAWINGS**

To the best of our knowledge Engineering Concepts & Design, L.P., hereby states that this plan is As-Built. This information provided is based on surveying at the site and information provided by the contractor.

*Todd Winters* 11-1-19  
TODD WINTERS DATE

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF CONSTRUCTION. THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY MATT ATKINS, P.E. 93968

11/01/2018

CITY \_\_\_\_\_ DATE \_\_\_\_\_



**CAUTION! EXISTING UTILITIES**  
CONTRACTOR SHOULD CALL 1-800-DIG-TESS PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES FOR EXISTING UTILITY LOCATIONS. EXISTING UTILITIES AND UNDERGROUND FACILITIES INDICATED ON THESE PLANS HAVE BEEN LOCATED FROM REFERENCE INFORMATION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY BOTH HORIZONTALLY AND VERTICALLY THE LOCATION OF ALL EXISTING UTILITIES AND UNDERGROUND FACILITIES PRIOR TO CONSTRUCTION AND TO TAKE NECESSARY PRECAUTIONS IN ORDER TO PROTECT ALL FACILITIES ENCOUNTERED. THE CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION.

**BENCHMARKS**

BM = MONUMENT RESET #1 32± LF WEST OF FM 740 & SUMMER LEE DRIVE INTERSECTION, SOUTH SIDE OF SUMMER LEE DRIVE. ELEV=567.704
BM = MONUMENT R014 375± LF WEST OF RIDGE ROAD & HENRY M CHANDLER DRIVE INTERSECTION, ON NORTH SIDE OF HENRY M. CHANDLER DRIVE ELEV=561.017

**ENGINEERING CONCEPTS & DESIGN, L.P.**

ENGINEERING / PROJECT MANAGEMENT / CONSTRUCTION SERVICES - FIRM REG. #F-001145  
201 WINDCO CIR, STE 200, WYLIE, TX 75098  
972-941-8400 FAX: 972-941-8401 WWW.ECDLP.COM

REVISIONS:

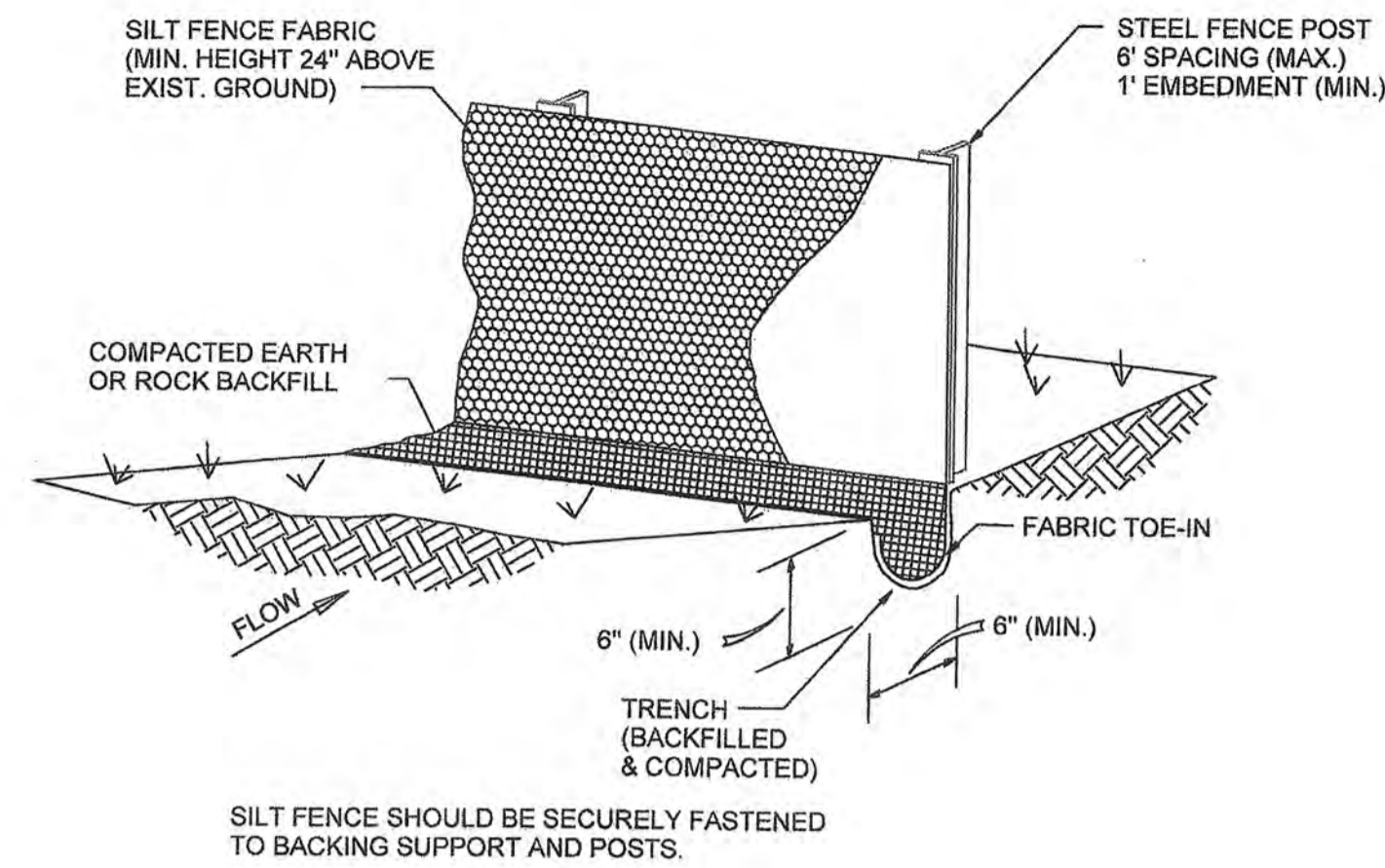
DRAWN: JD	DATE:
CHECKED: M.A.	DATE: NOVEMBER 2018
PROJECT NO.: 02114	
DWG FILE NAME: EROSION CONTROL PLAN.DWG	

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF CONSTRUCTION. THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY MATT ATKINS, P.E. 93968



**EROSION CONTROL PLAN**  
WHISPER ROCK  
CITY OF ROCKWALL  
ROCKWALL COUNTY

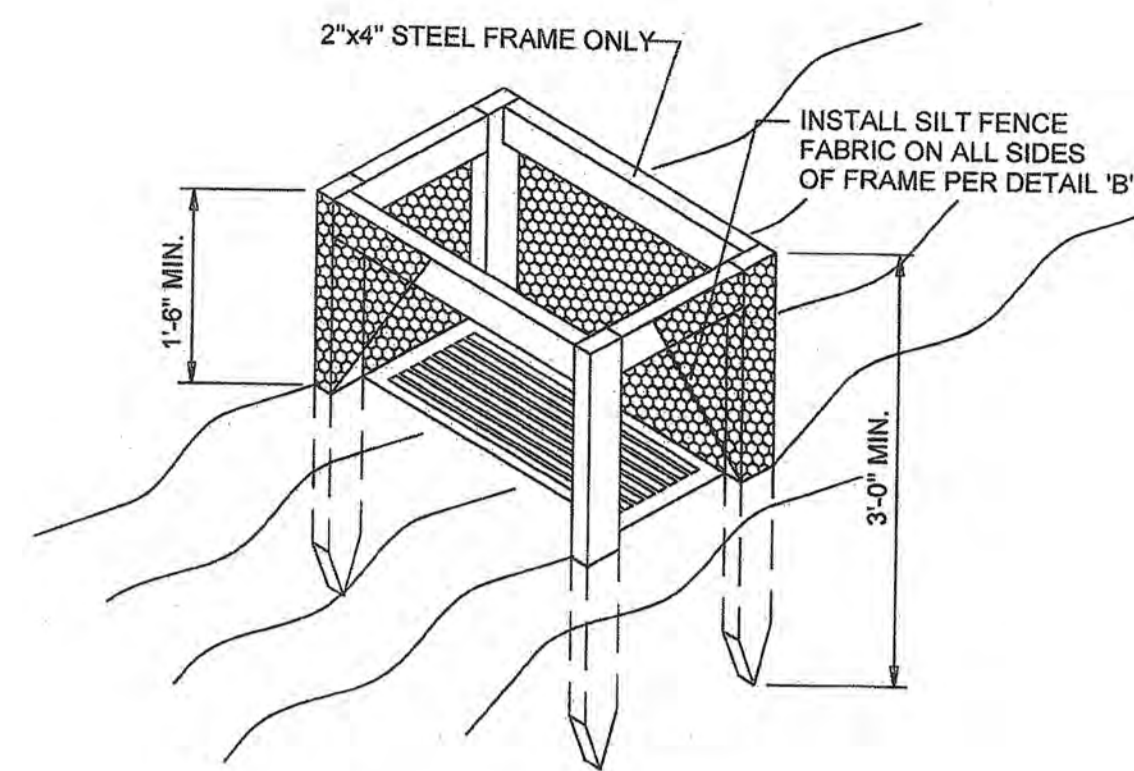
SHEET  
26  
OF  
58



SILT FENCE SHOULD BE SECURELY FASTENED TO BACKING SUPPORT AND POSTS.

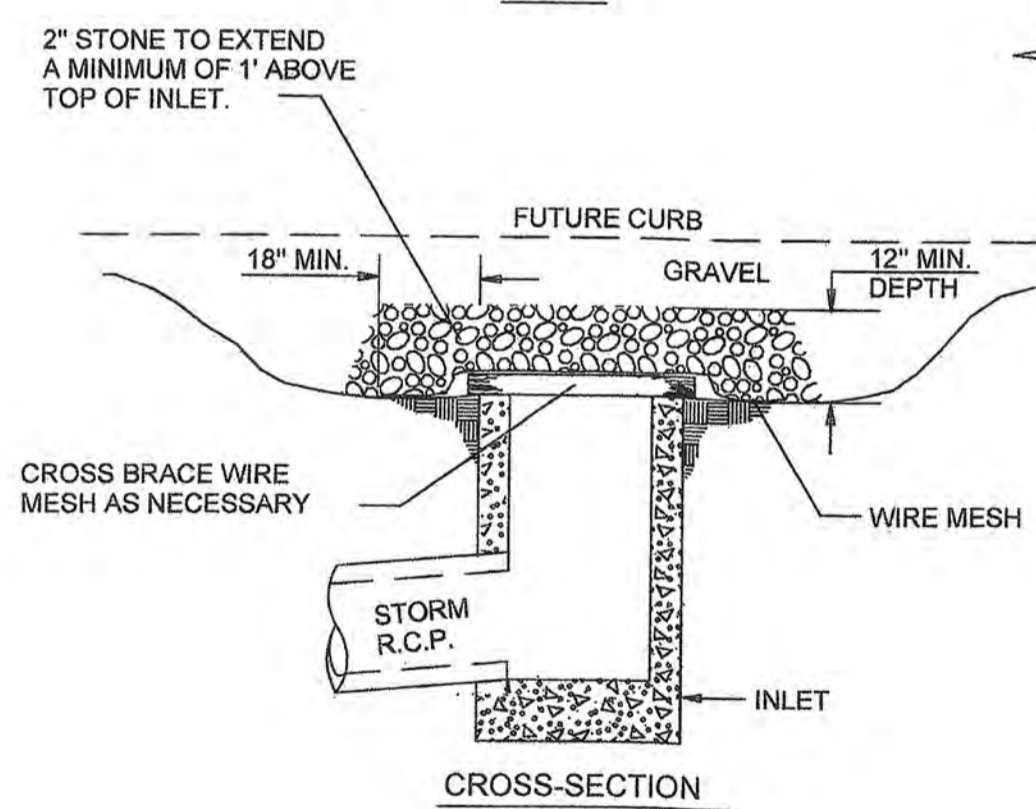
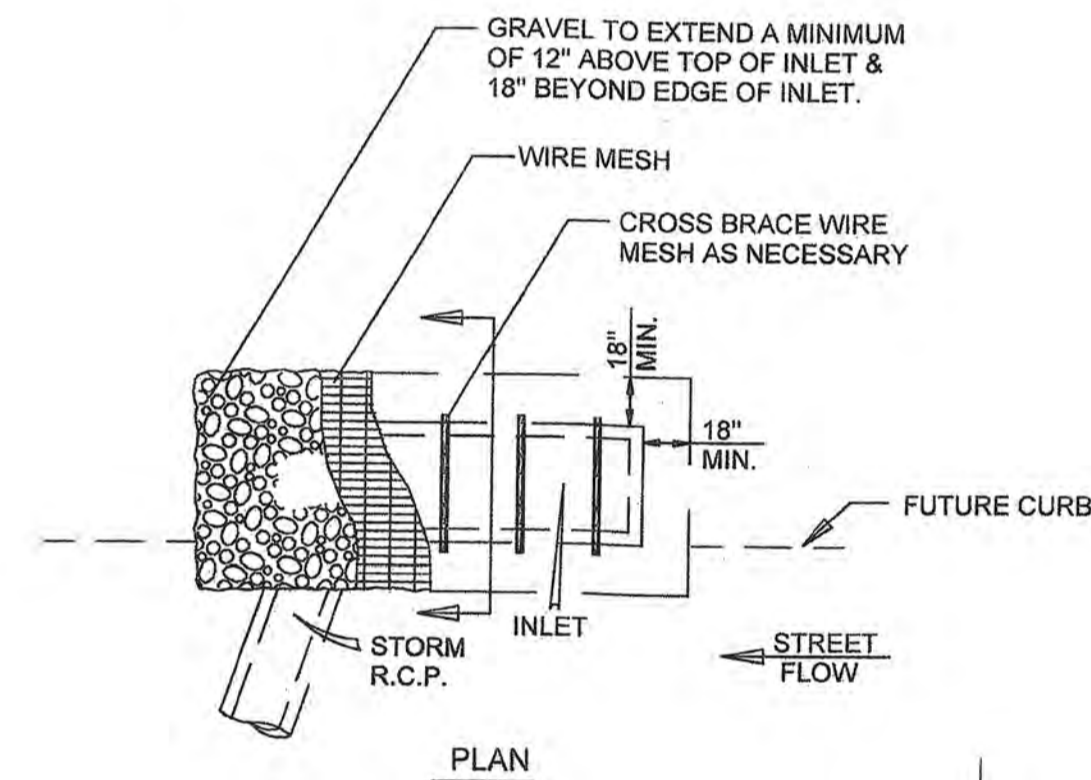
**SILT FENCE**  
N.T.S.

NCTCOG 02270.B  
STORM WATER QUALITY  
BEST MANAGEMENT PRACTICES  
FOR CONSTRUCTION ACTIVITIES



**AREA DRAIN PROTECTION**  
N.T.S.

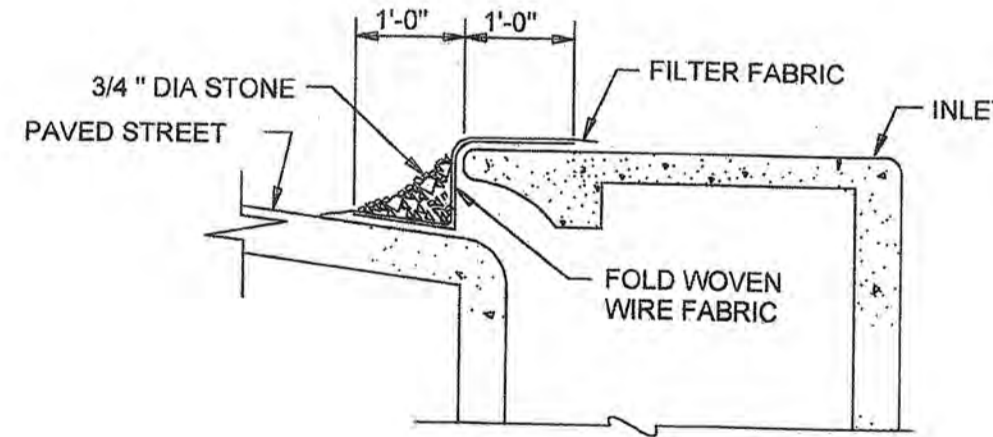
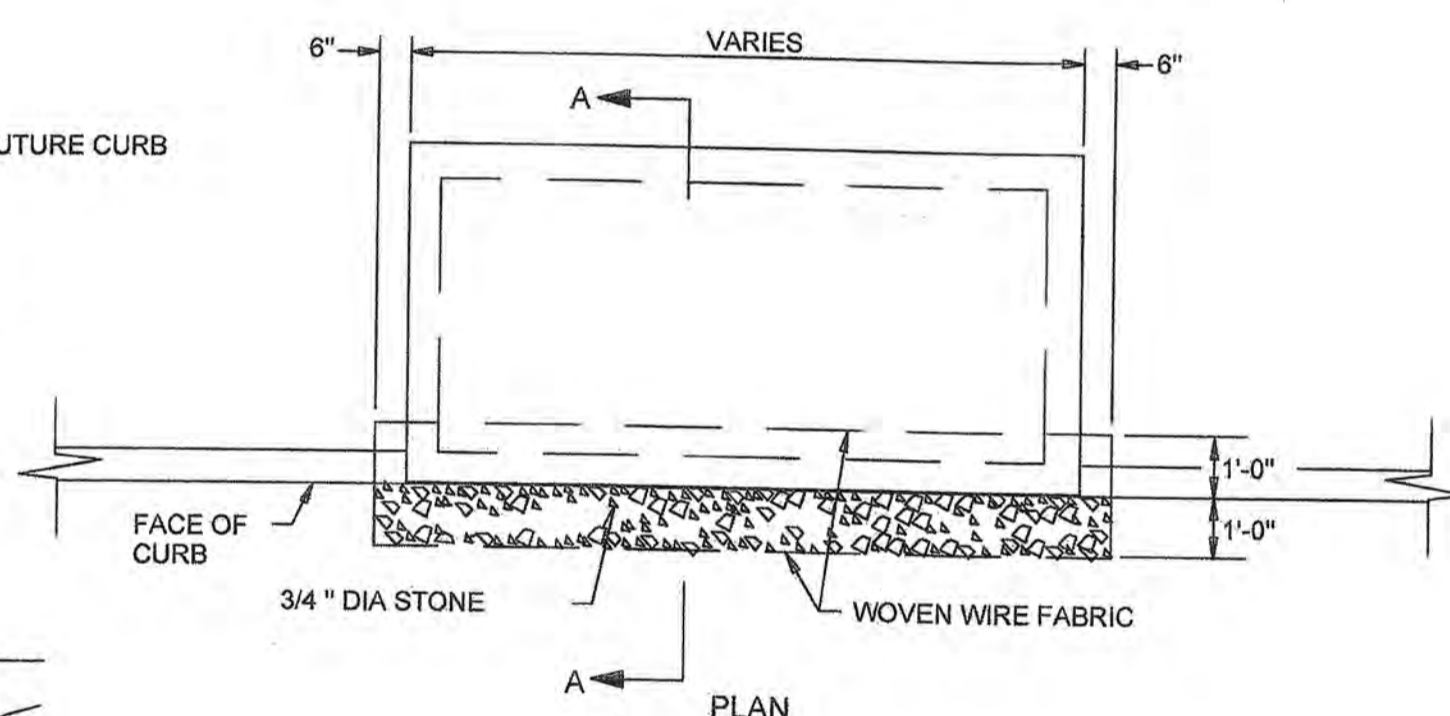
NCTCOG 02270.M  
STORM WATER QUALITY  
BEST MANAGEMENT PRACTICES  
FOR CONSTRUCTION ACTIVITIES



**INLET PROTECTION WIRE MESH & GRAVEL**  
N.T.S.

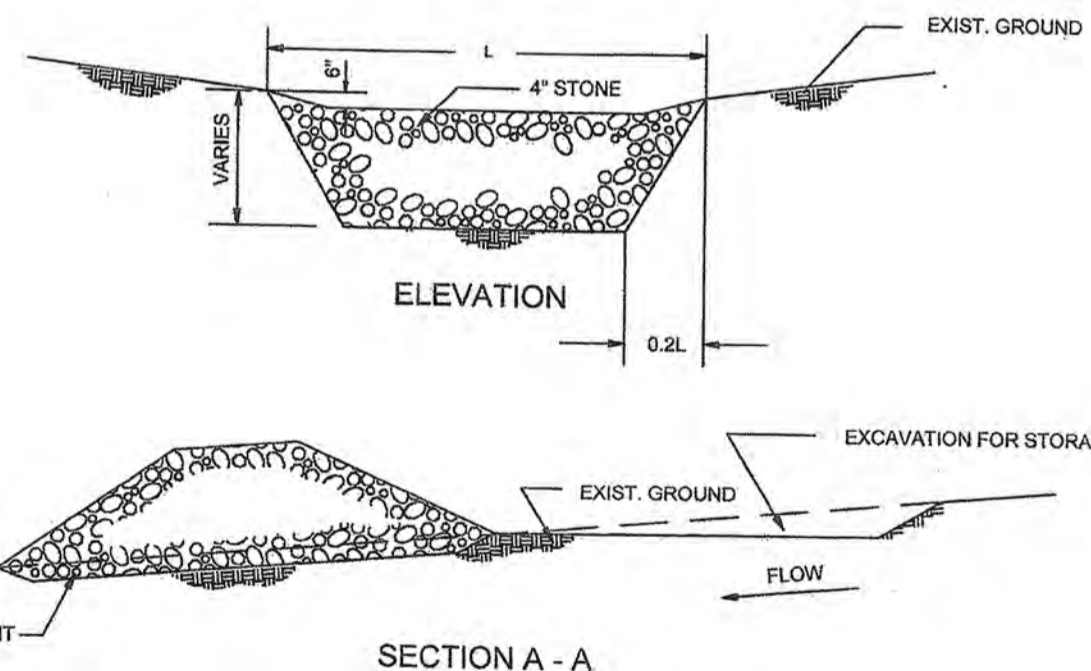
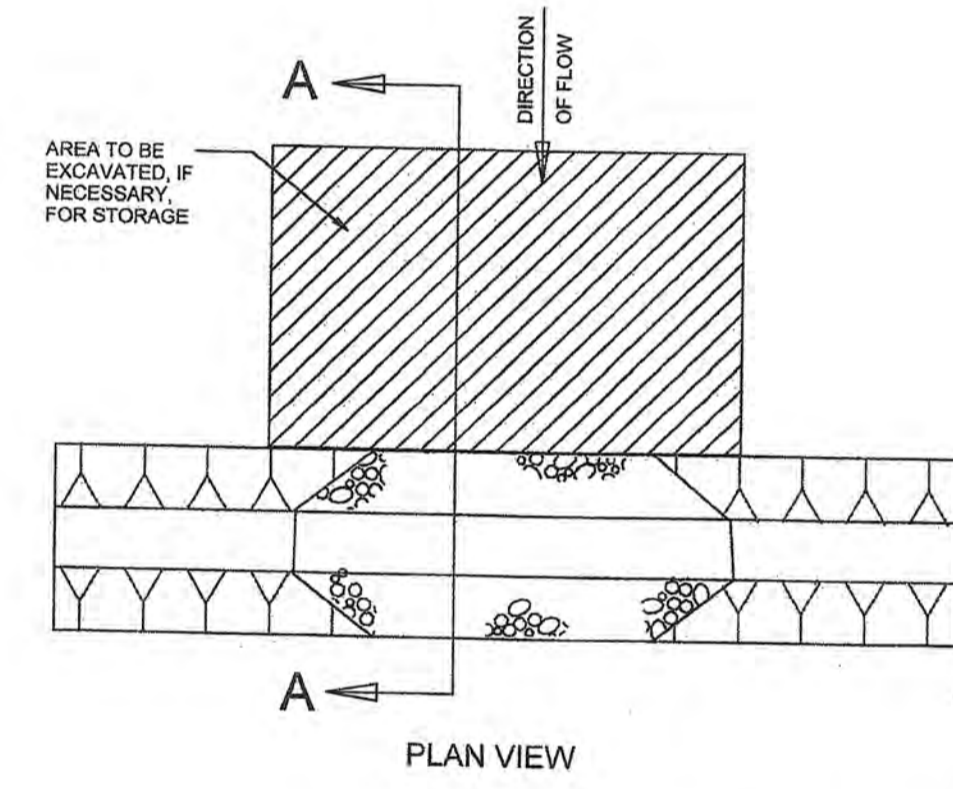
NCTCOG 02270.G  
STORM WATER QUALITY  
BEST MANAGEMENT PRACTICES  
FOR CONSTRUCTION ACTIVITIES

CONTRACTOR SHALL INTERCEPT FLOW AND INSTALL INLET PROTECTION MEASURES AS SOON AS PRACTICABLE.



**CURB INLET SEDIMENT FILTER**  
N.T.S.

NCTCOG 02270.G  
STORM WATER QUALITY  
BEST MANAGEMENT PRACTICES  
FOR CONSTRUCTION ACTIVITIES



**STONE SILTATION STRUCTURE**  
N.T.S.

Stone Siltation Structure To Be Installed Prior To Beginning Work On Site.

- NOTES:
1. A STORM WATER POLLUTION PREVENTION PLAN (S.W.P.P.) INCLUDING NOTICE OF INTENT (N.O.I.) WILL BE PREPARED BY THE GENERAL CONTRACTOR FOR THIS PROJECT IN ACCORDANCE WITH THE REQUIREMENTS OF THE N.P.D.E.S. GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION.
  2. ALL CONTRACTORS WILL COMPLY WITH THE REQUIREMENTS AND INTENT OF THE N.P.D.E.S. GENERAL PERMIT FOR STORM WATER DISCHARGES.
  3. EACH CONTRACTOR SHALL SUBMIT A NOTICE OF INTENT (N.O.I.) FOR STORM WATER DISCHARGE PERMIT COVERAGE. THIS SUBMITTAL SHALL BE COORDINATED WITH THE OWNER AND SHALL OCCUR NO LESS THAN 48 HOURS PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION ACTIVITY.
  4. EACH CONTRACTOR SHALL OBTAIN AND SUBMIT TO THE OWNER A POLLUTION PREVENTION CERTIFICATION FROM EACH SUBCONTRACTOR WHOSE WORK IMPACTS THE STORM WATER POLLUTION PREVENTION PLAN (S.W.P.P.) PRIOR TO THE PERFORMANCE OF ANY WORK BY SAID SUBCONTRACTOR. THESE CERTIFICATIONS SHALL BECOME A PART OF THE STORM WATER POLLUTION PREVENTION PLAN.
  5. CONTRACTOR SHALL INSTALL EROSION CONTROL MEASURES, AS INDICATED IN THE PLANS AND AS FIELD CONDITIONS WARRANT, PRIOR TO COMMENCING ANY CONSTRUCTION ACTIVITY. REPAIRS OR MODIFICATIONS TO THE MEASURES WILL BE MADE BY THE CONTRACTOR IF THE CONTROL MEASURES PROVE INEFFECTIVE OR IF ADDITIONAL CONTROL MEASURES ARE NECESSARY.
  6. CONTRACTOR SHALL TAKE APPROPRIATE MEASURES TO PREVENT TRACKING OF MUD AND/OR SOILS ONTO EXISTING AND/OR NEW PAVEMENT. ANY TRACKING THAT OCCURS SHALL BE REMOVED IMMEDIATELY BY THE CONTRACTOR.
  7. CONTRACTOR SHALL CONSTRUCT INLET PROTECTION FOR ALL INCOMPLETE CURB INLETS AND SHALL TAKE EVERY MEASURE TO KEEP SOILS AND SEDIMENTS FROM ENTERING THE STORM SEWER SYSTEM.
  8. CONTRACTOR SHALL CONSTRUCT INLET PROTECTION FOR ALL COMPLETED CURB INLETS AND SHALL TAKE EVERY MEASURE TO KEEP SOILS AND SEDIMENTS FROM ENTERING THE STORM SEWER SYSTEM.
  9. CONTRACTOR SHALL INSTALL APPROPRIATE INLET PROTECTION AT ALL AREA DRAINS.
  10. AT A MINIMUM, PERIMETER CONTROLS SUCH AS SILT FENCE OR STRAW BALES SHALL BE INSTALLED AT ALL DOWN SLOPE BOUNDARIES AND AS WARRANTED WHERE PAVEMENT REMOVAL, UTILITY CONSTRUCTION, GRADING, OR OTHER CONSTRUCTION ACTIVITIES ARE TO BE PERFORMED. THE CONTRACTOR SHALL AT ALL TIMES TAKE SUCH MEASURES AS NECESSARY TO MINIMIZE OFFSITE TRACKING OR TRANSPORT OF SEDIMENT AND DEBRIS.
  11. DAMAGE TO ADJACENT PROPERTY AND/OR TO RECEIVING WATERS CAUSED BY IMPROPERLY INSTALLED OR POORLY MAINTAINED EROSION CONTROL MEASURES WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
  12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND DISPOSAL OF ANY SILTATION CAUSED BY HIS OPERATIONS AND/OR FAILURE OF THE EROSION CONTROL MEASURES.
  13. CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ACCUMULATED SILT AND SEDIMENT FROM EROSION CONTROL MEASURES WHEN IT REACHES A DEPTH OF SIX (6) INCHES OR IMPAIRS THE EFFECTIVENESS OF THE MEASURES.
  14. THE CONTRACTORS REPRESENTATIVE WILL INSPECT THE PROJECT EVERY SEVEN DAYS, AT A MINIMUM, AND AFTER EVERY RAINFALL OF ONE-HALF INCHES OR GREATER TO DETERMINE THE INTEGRITY AND EFFECTIVENESS OF THE EROSION CONTROL MEASURES. A WRITTEN INSPECTION REPORT WILL BE FILED WITH THE POLLUTION PREVENTION PLAN. THIS INSPECTION DOES NOT RELIEVE THE CONTRACTOR'S RESPONSIBILITY FOR INSPECTION AND MAINTENANCE OF THE EROSION CONTROL MEASURES OR HIS DUTY TO COMPLY WITH THE INTENT AND CONDITIONS OF THE N.P.D.E.S. GENERAL PERMIT.
  15. ALL STOCKPILED SOILS WILL BE SURROUNDED BY A STRAW BALE DIKE, SILT FENCE, SEDIMENT CONTROL SWALE, OR EQUIVALENT MEASURE TO PROPERLY CONTROL SEDIMENT RUNOFF, AS APPROVED BY THE OWNER.
  16. CONTRACTOR SHALL STABILIZE ANY AREA WHERE CONSTRUCTION ACTIVITY IS TO BE TEMPORARILY OR PERMANENTLY CEASED FOR MORE THAN 14 DAYS.

RECORD DRAWINGS

To the best of our knowledge Engineering Concepts & Design, L.P., hereby states that this plan is As-Built. This information provided is based on surveying at the site and information provided by the contractor.

TODD WINTERS 11-19 DATE

ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN REMAINS WITH THE DESIGN ENGINEER. THE CITY OF ROCKWALL, IN REVIEWING AND RELEASING PLANS FOR CONSTRUCTION, ASSUMES NO RESPONSIBILITY FOR ADEQUACY OR ACCURACY OF DESIGN.

CITY DATE

**CAUTION! EXISTING UTILITIES**

CONTRACTOR SHOULD CALL 1-800-DIG-TESS PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES FOR EXISTING UTILITY LOCATIONS. EXISTING UTILITIES AND UNDERGROUND FACILITIES INDICATED ON THESE PLANS HAVE BEEN LOCATED FROM REFERENCE INFORMATION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY BOTH HORIZONTALLY AND VERTICALLY THE LOCATION OF ALL EXISTING UTILITIES AND UNDERGROUND FACILITIES PRIOR TO CONSTRUCTION AND TO TAKE NECESSARY PRECAUTIONS IN ORDER TO PROTECT ALL FACILITIES ENCOUNTERED. THE CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION.

**BENCHMARKS**

BM = MONUMENT RESET #1  
32± LF WEST OF FM 740 & SUMMER LEE DRIVE INTERSECTION, SOUTH SIDE OF SUMMER LEE DRIVE.  
ELEV=567.704

BM = MONUMENT R014  
375± LF WEST OF RIDGE ROAD & HENRY M CHANDLER DRIVE INTERSECTION, ON NORTH SIDE OF HENRY M. CHANDLER DRIVE  
ELEV=561.017

**ENGINEERING CONCEPTS & DESIGN, L.P.**

ENGINEERING / PROJECT MANAGEMENT / CONSTRUCTION SERVICES - FIRM REG. #F-001145  
201 WINDCO CIR, STE 200, WYLIE, TX 75098  
972-941-8400 FAX: 972-941-8401 WWW.ECDLP.COM

REVISIONS:	
DRAWN: JD	DATE:
CHECKED: M.A.	DATE: NOVEMBER 2018
PROJECT NO.: 02114	
DWG FILE NAME: EROSION CONTROL PLAN.DWG	

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF CONSTRUCTION. THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY MATT ATKINS, P.E. 93968



**EROSION CONTROL DETAILS**  
WHISPER ROCK  
CITY OF ROCKWALL  
ROCKWALL COUNTY

SHEET  
27  
OF  
58

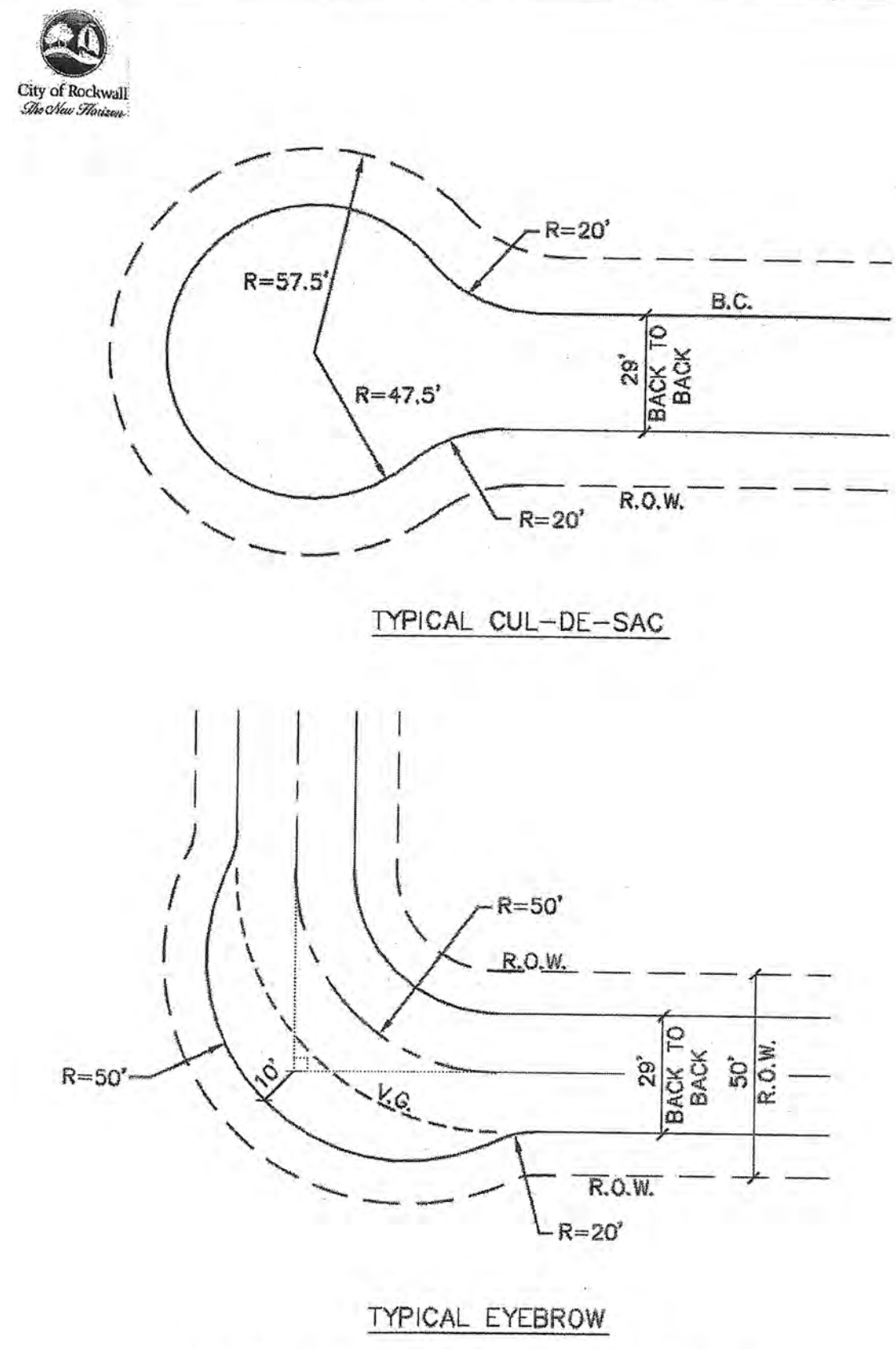
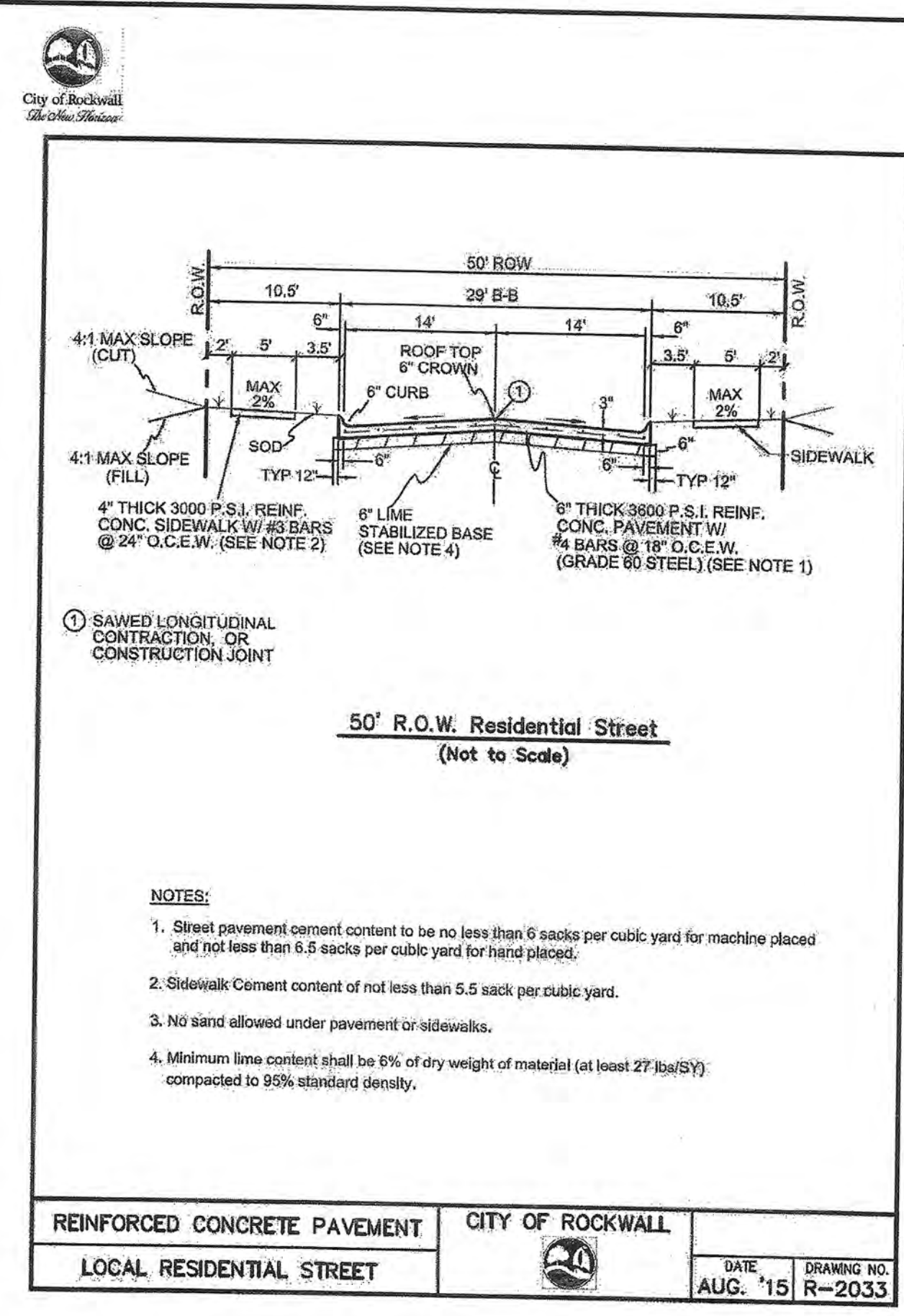
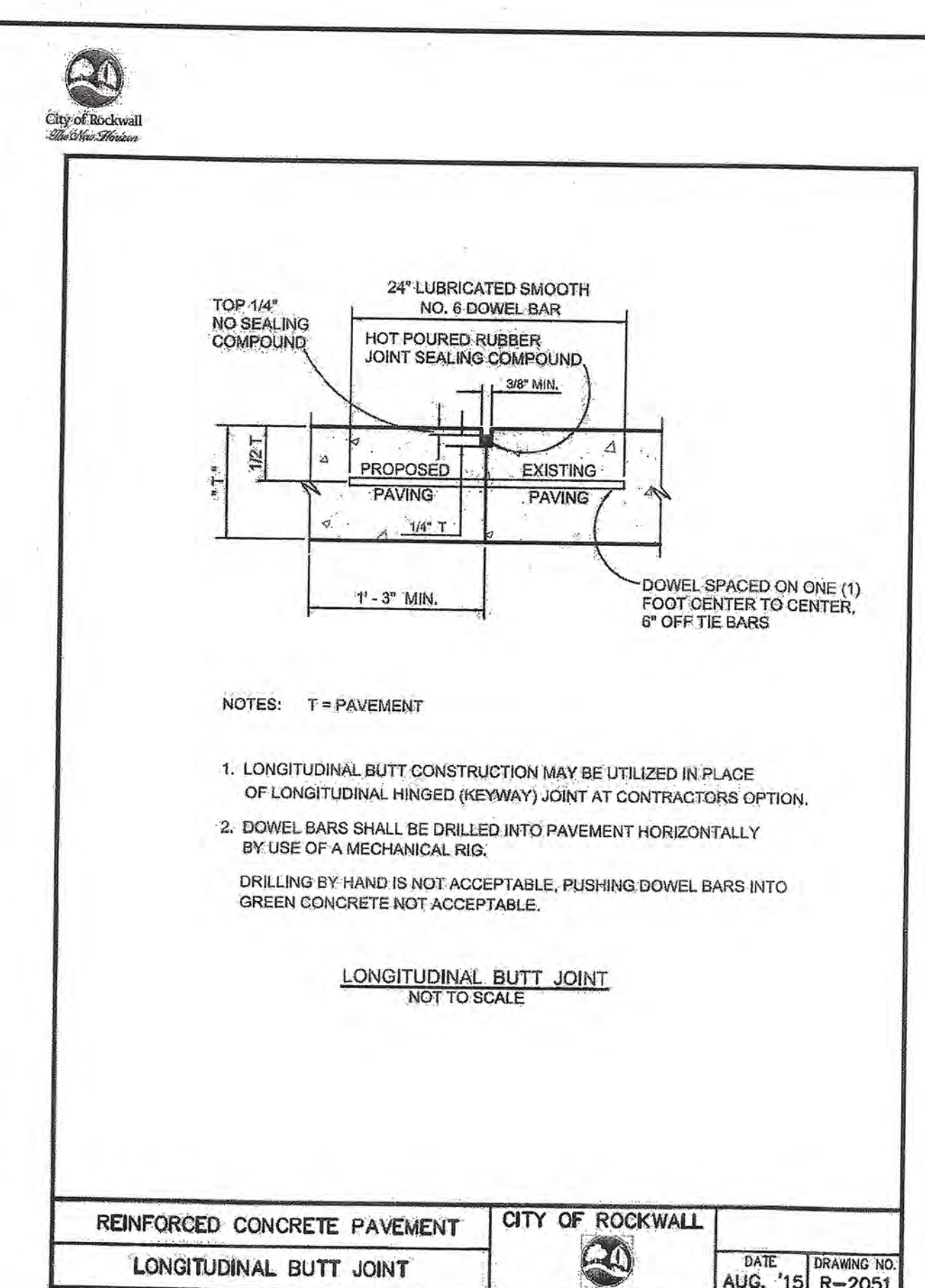


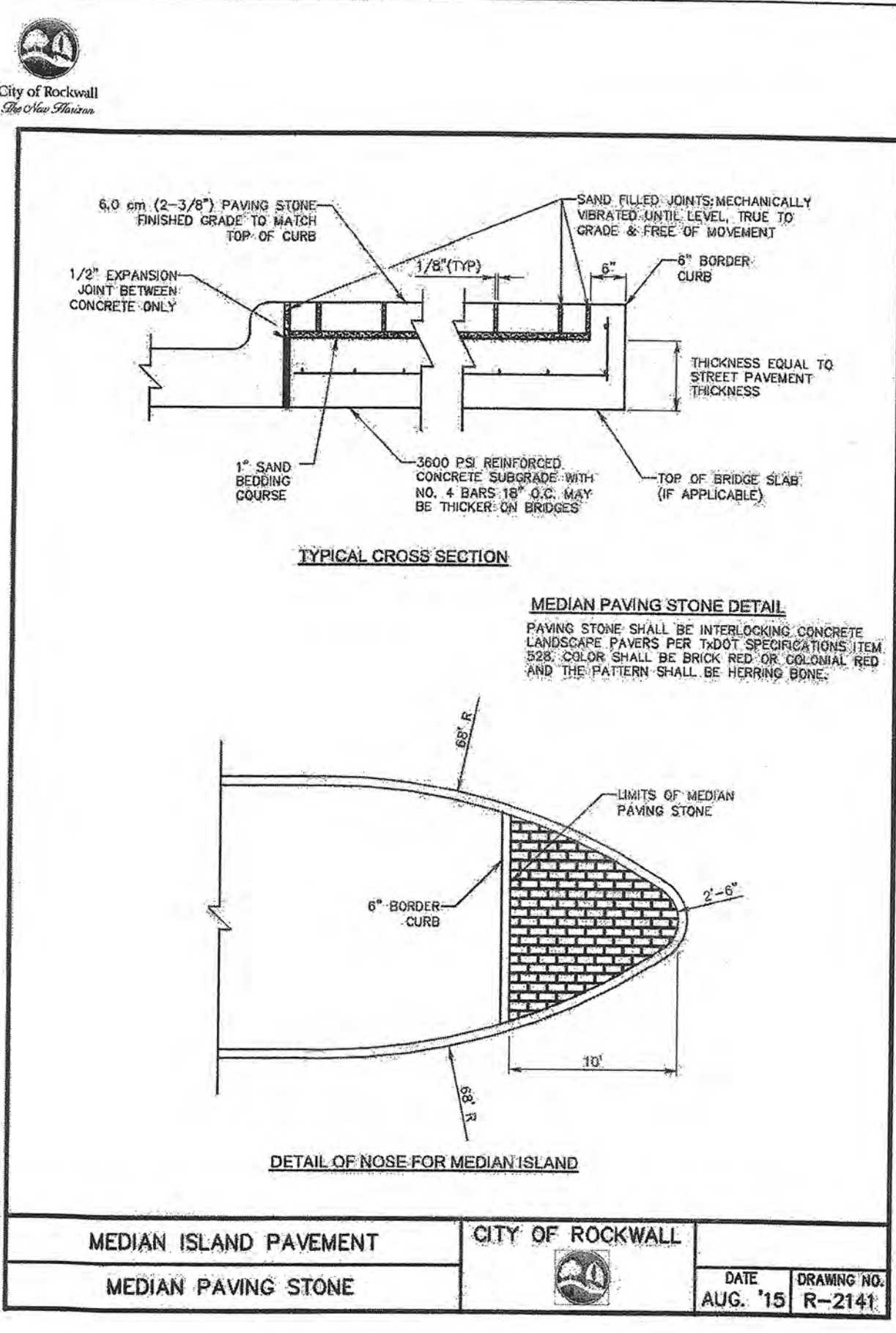
Figure 2.1C: Typical Thoroughfare Cross Sections



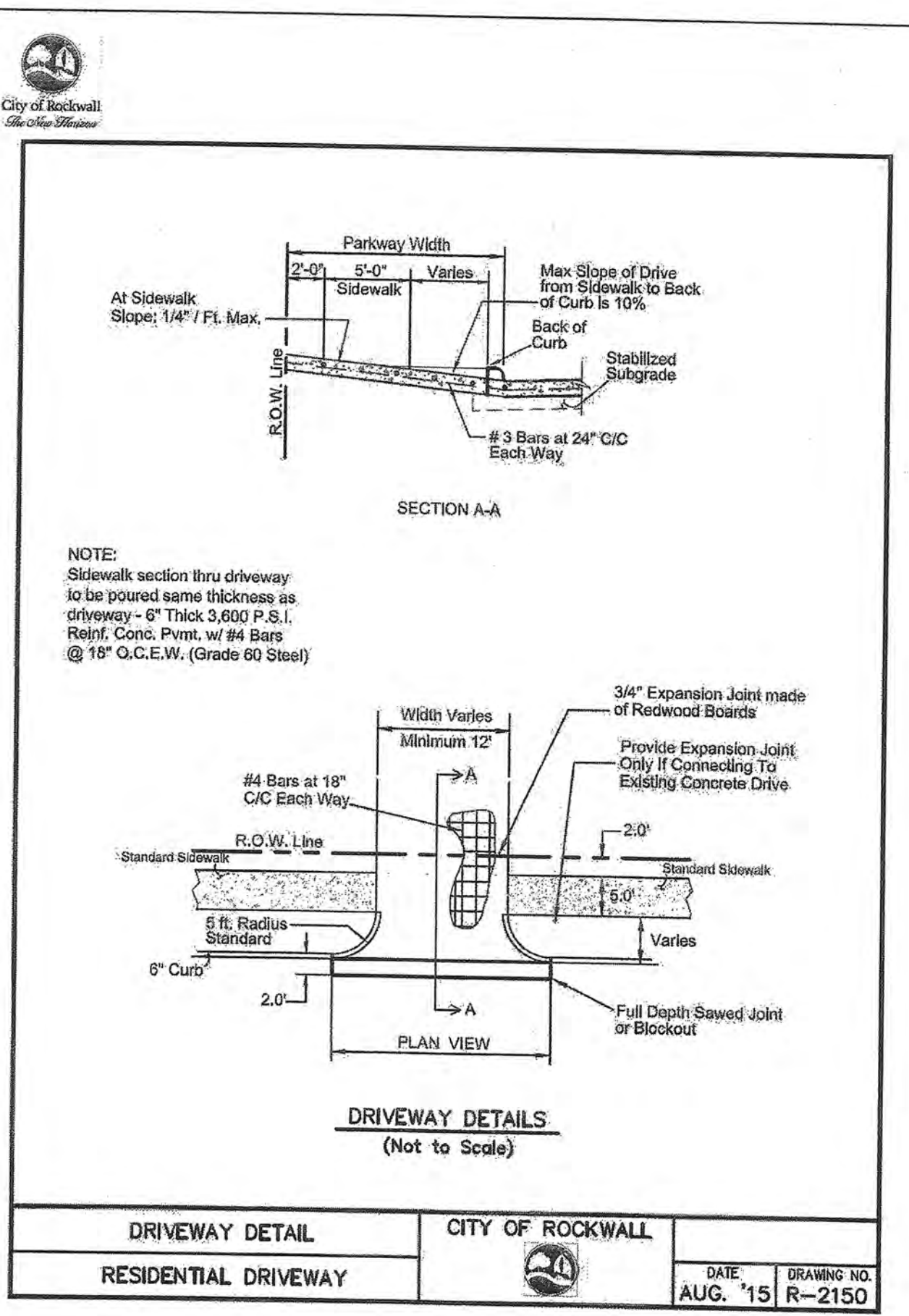
REINFORCED CONCRETE PAVEMENT	CITY OF ROCKWALL	DATE: AUG. '15	DRAWING NO. R-2033
LOCAL RESIDENTIAL STREET			



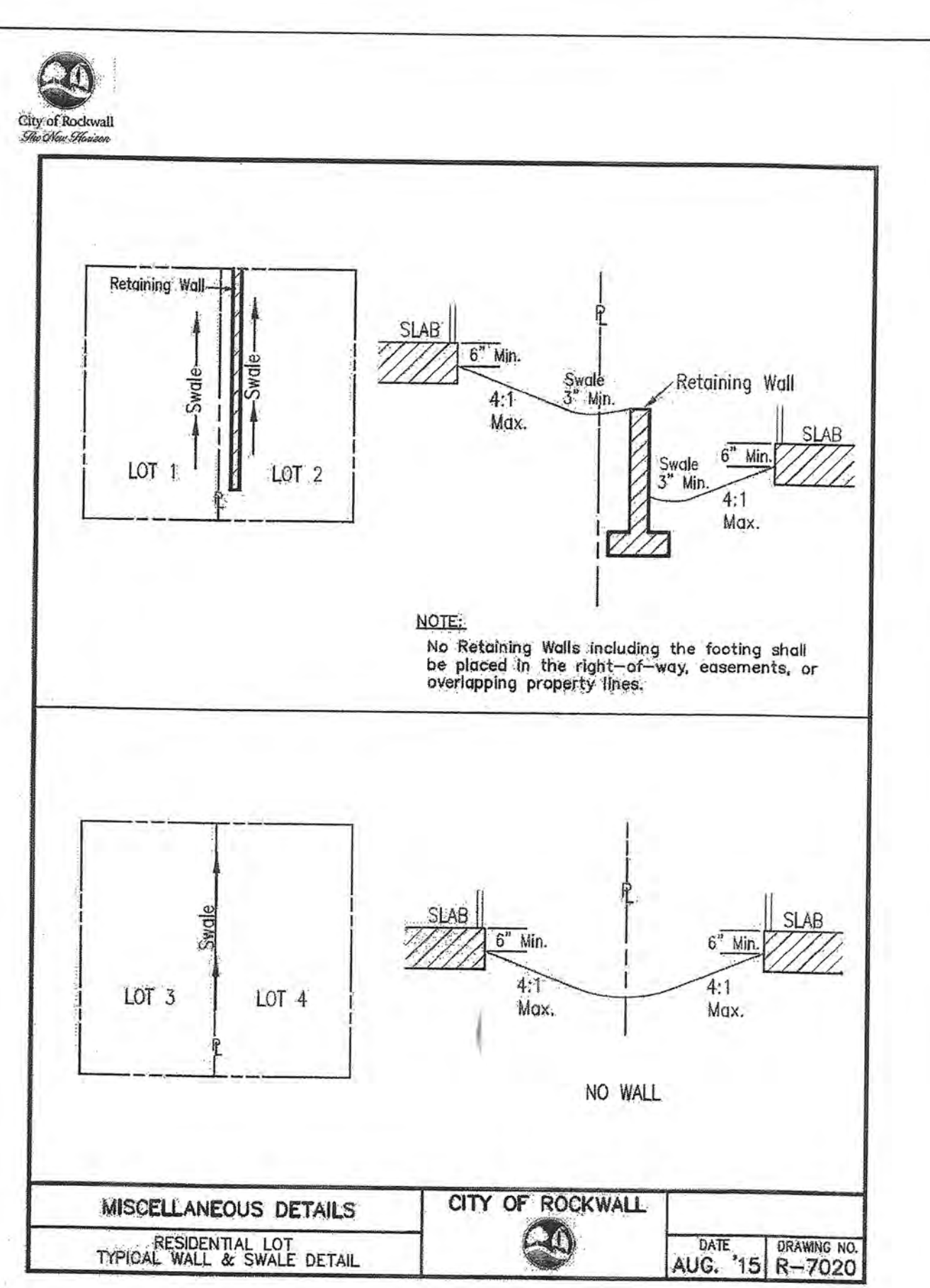
REINFORCED CONCRETE PAVEMENT	CITY OF ROCKWALL	DATE: AUG. '15	DRAWING NO. R-2051
LONGITUDINAL BUTT JOINT			



MEDIAN ISLAND PAVEMENT	CITY OF ROCKWALL	DATE: AUG. '15	DRAWING NO. R-2141
MEDIAN PAVING STONE			



DRIVEWAY DETAIL	CITY OF ROCKWALL	DATE: AUG. '15	DRAWING NO. R-2150
RESIDENTIAL DRIVEWAY			



MISCELLANEOUS DETAILS	CITY OF ROCKWALL	DATE: AUG. '15	DRAWING NO. R-7020
RESIDENTIAL LOT TYPICAL WALL & SWALE DETAIL			

**RECORD DRAWINGS**  
 To the best of our knowledge Engineering Concepts & Design, L.P., hereby states that this plan is As-Built. This information provided is based on surveying at the site and information provided by the contractor.  
 Todd Winters 11-19  
 TODD WINTERS DATE

ALL RESPONSIBILITY FOR ADEQUACY OF DESIGN REMAINS WITH THE DESIGN ENGINEER. THE CITY OF ROCKWALL, IN REVIEWING AND RELEASING PLANS FOR CONSTRUCTION, ASSUMES NO RESPONSIBILITY FOR ADEQUACY OR ACCURACY OF DESIGN.  
 CITY DATE

**CAUTION! EXISTING UTILITIES**  
 CONTRACTOR SHOULD CALL 1-800-DIG-TESS PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES FOR EXISTING UTILITY LOCATIONS. EXISTING UTILITIES AND UNDERGROUND FACILITIES INDICATED ON THESE PLANS HAVE BEEN LOCATED FROM REFERENCE INFORMATION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY BOTH HORIZONTALLY AND VERTICALLY THE LOCATION OF ALL EXISTING UTILITIES AND UNDERGROUND FACILITIES PRIOR TO CONSTRUCTION AND TO TAKE NECESSARY PRECAUTIONS IN ORDER TO PROTECT ALL FACILITIES ENCOUNTERED. THE CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION.

**BENCHMARKS**  
 BM = MONUMENT RESET #1  
 32± LF WEST OF FM 740 & SUMMER LEE DRIVE INTERSECTION, SOUTH SIDE OF SUMMER LEE DRIVE.  
 ELEV=567.704  
 BM = MONUMENT R014  
 37± LF WEST OF RIDGE ROAD & HENRY M CHANDLER DRIVE INTERSECTION, ON NORTH SIDE OF HENRY M. CHANDLER DRIVE  
 ELEV=561.017

**ENGINEERINGCONCEPTS & DESIGN, L.P.**  
 ENGINEERING / PROJECT MANAGEMENT / CONSTRUCTION SERVICES - FIRM REG. #F-001145  
 201 WINDCO CIR, STE 200, WYLIE, TX 75098  
 972-941-8400 FAX: 972-941-8401 WWW.ECDLP.COM

REVISIONS:

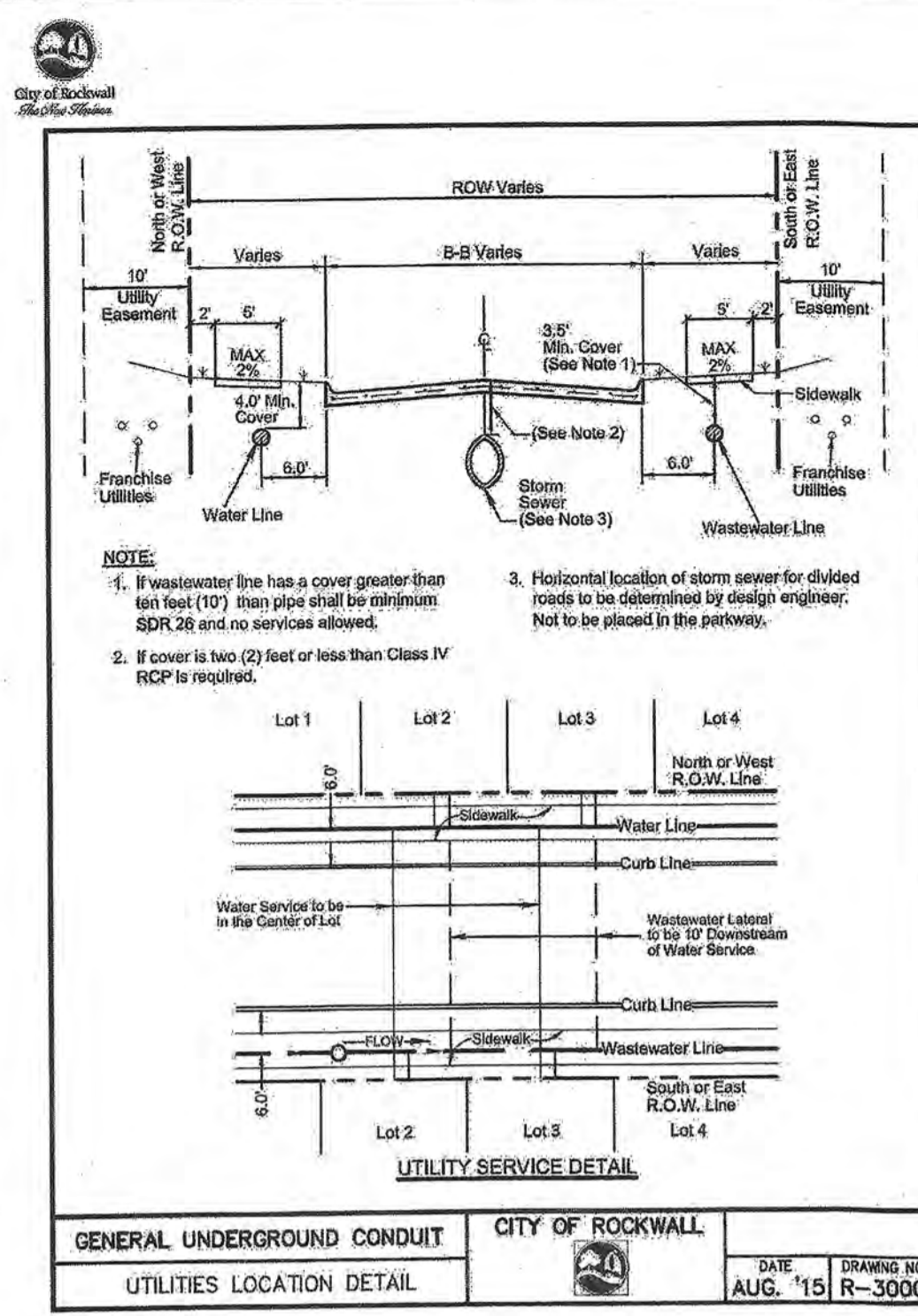
DRAWN: JD	DATE:
CHECKED: M.A.	DATE: NOVEMBER 2018
PROJECT NO.: 02114	
DWG FILE NAME: CITY PAVING DETAILS.DWG	

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF CONSTRUCTION. THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY MATT ATKINS, P.E. 93968

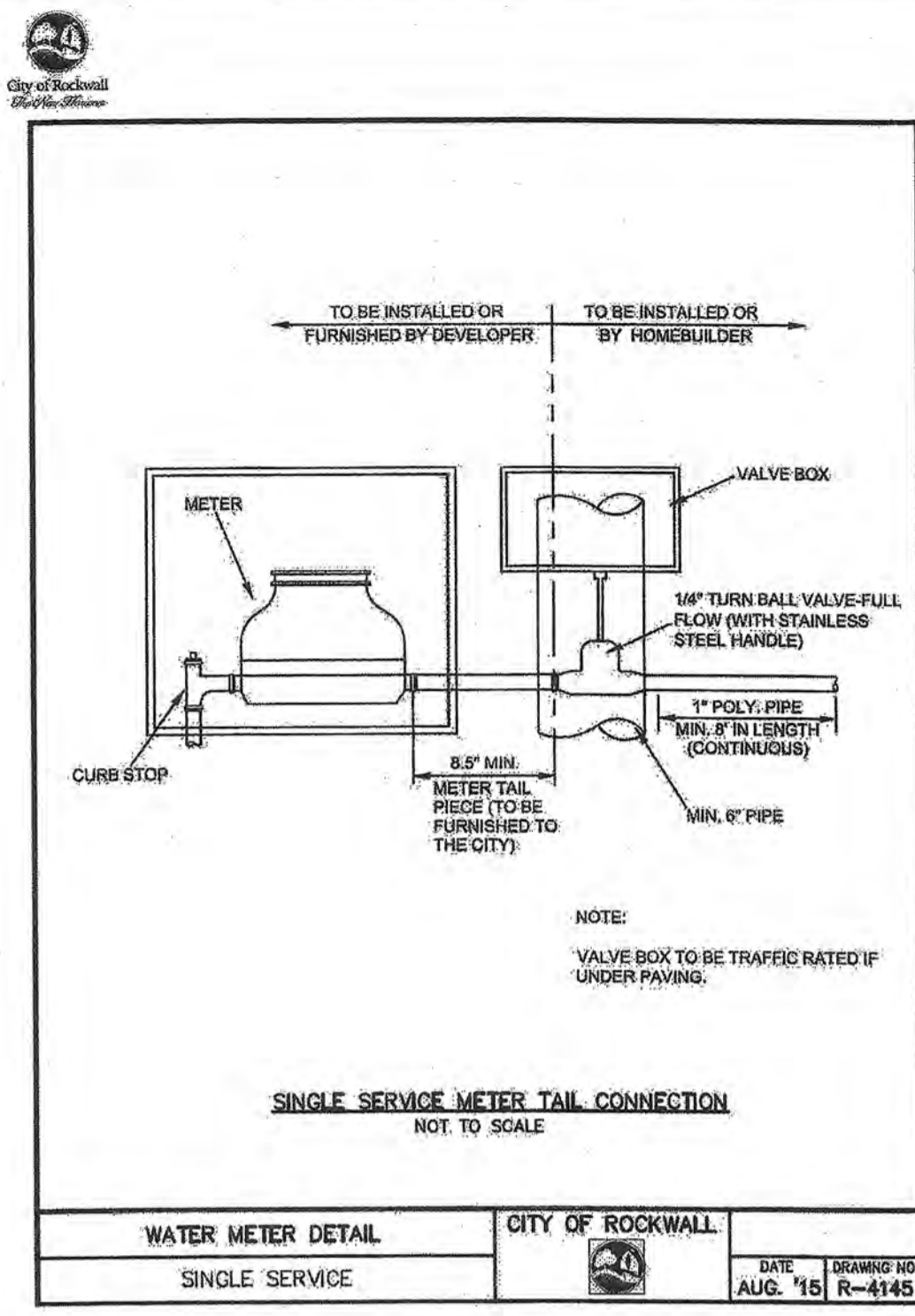


**CITY PAVING DETAILS**  
 WHISPER ROCK  
 CITY OF ROCKWALL  
 ROCKWALL COUNTY

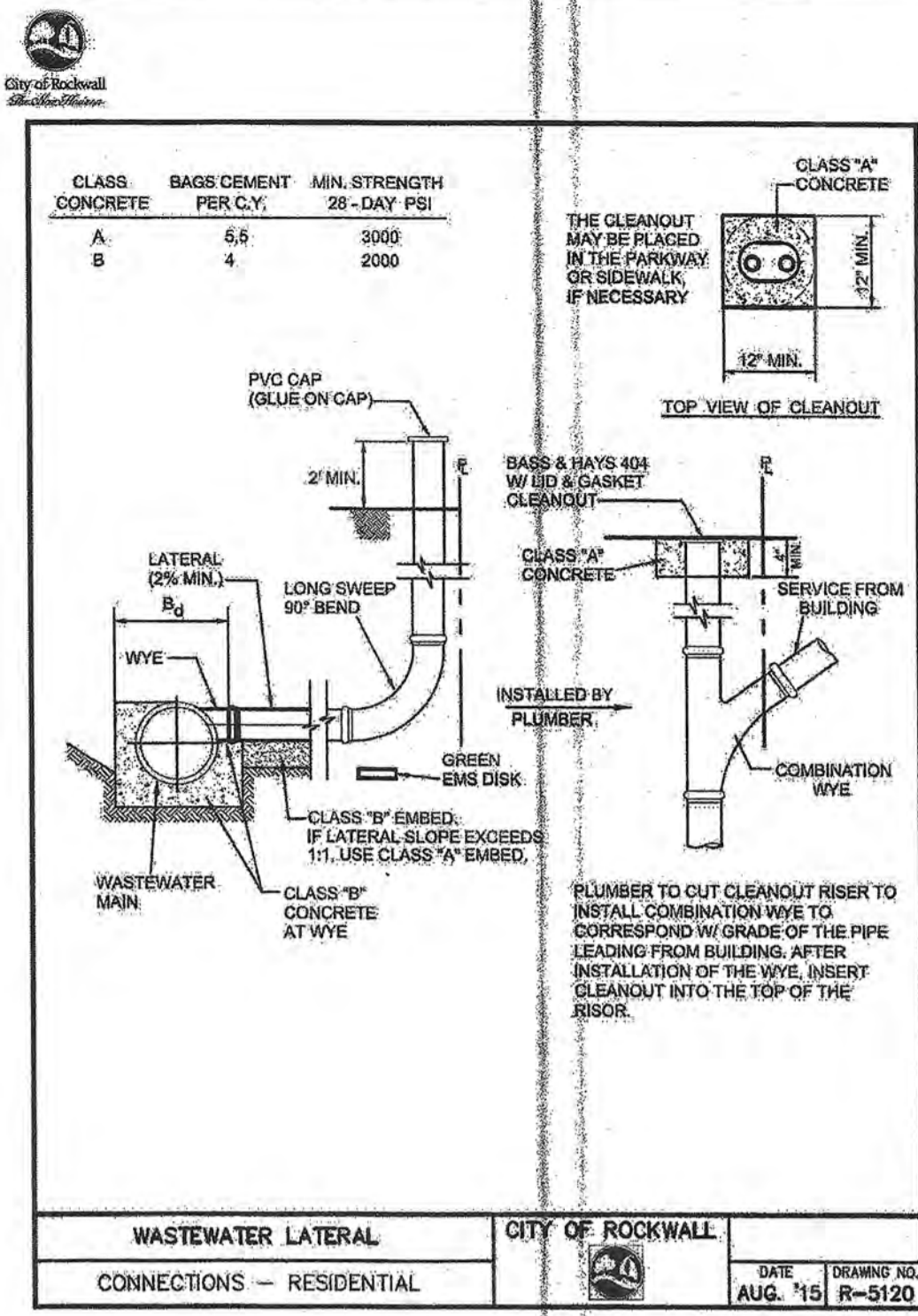
SHEET 28 OF 58



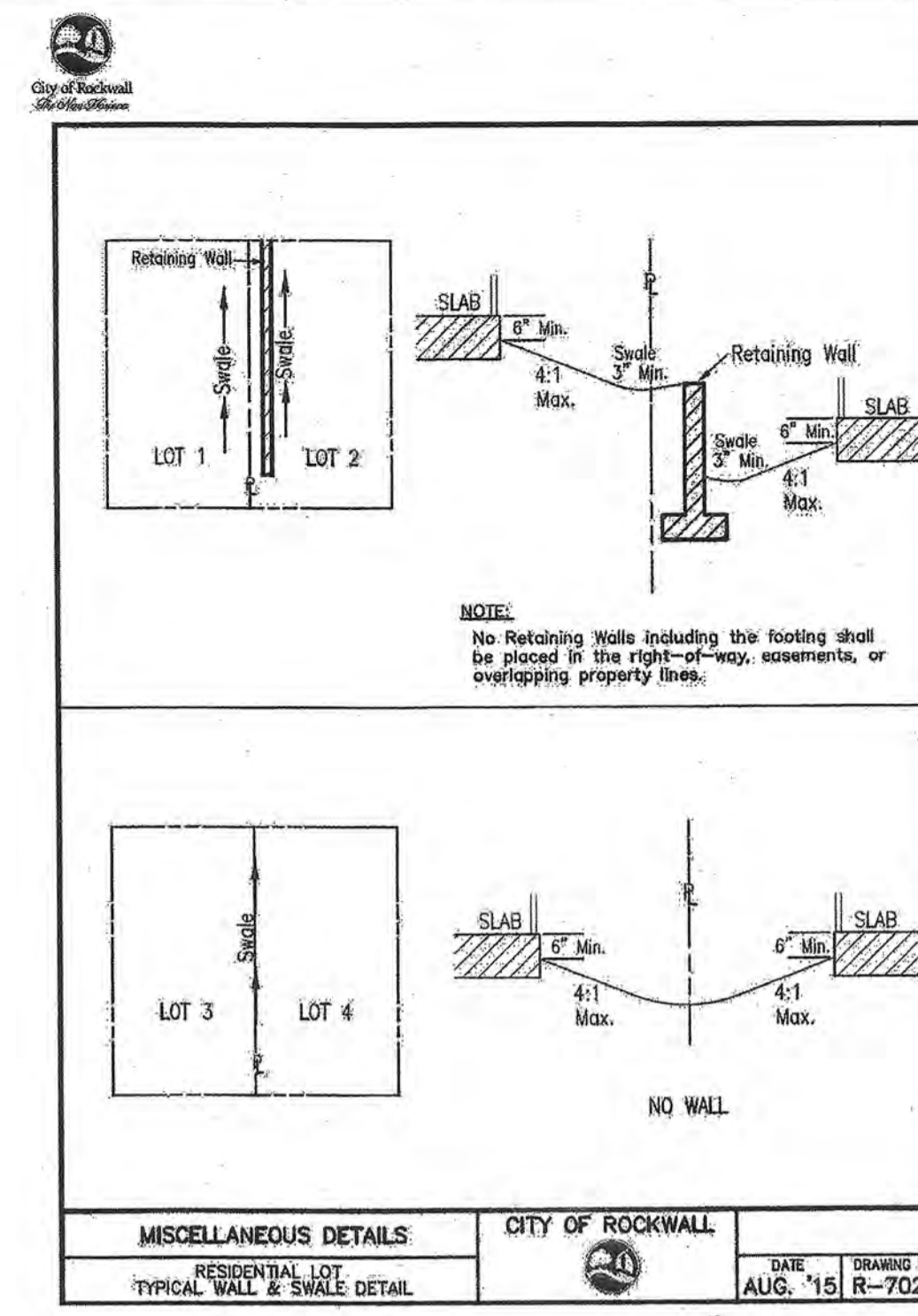
Page 221



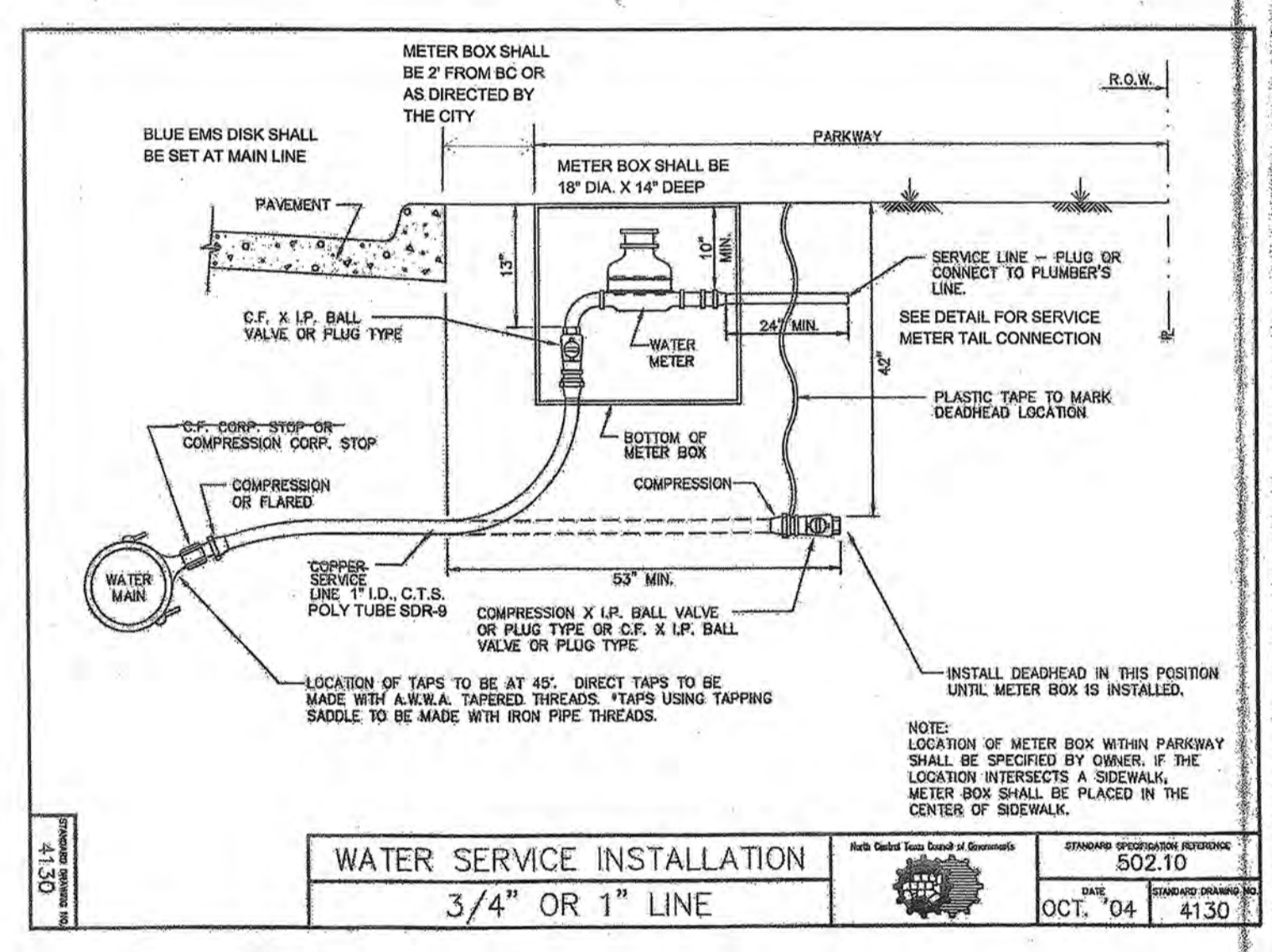
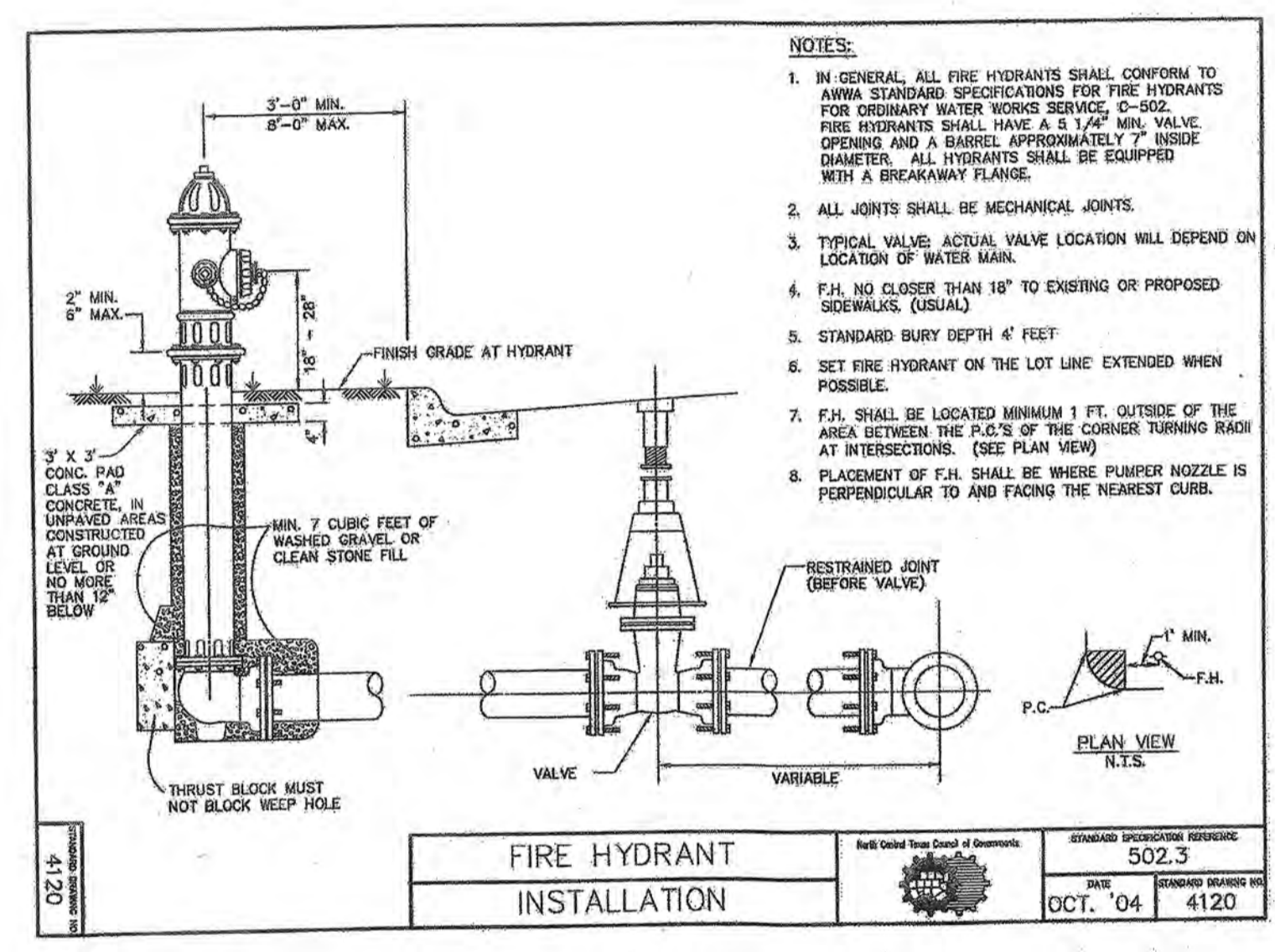
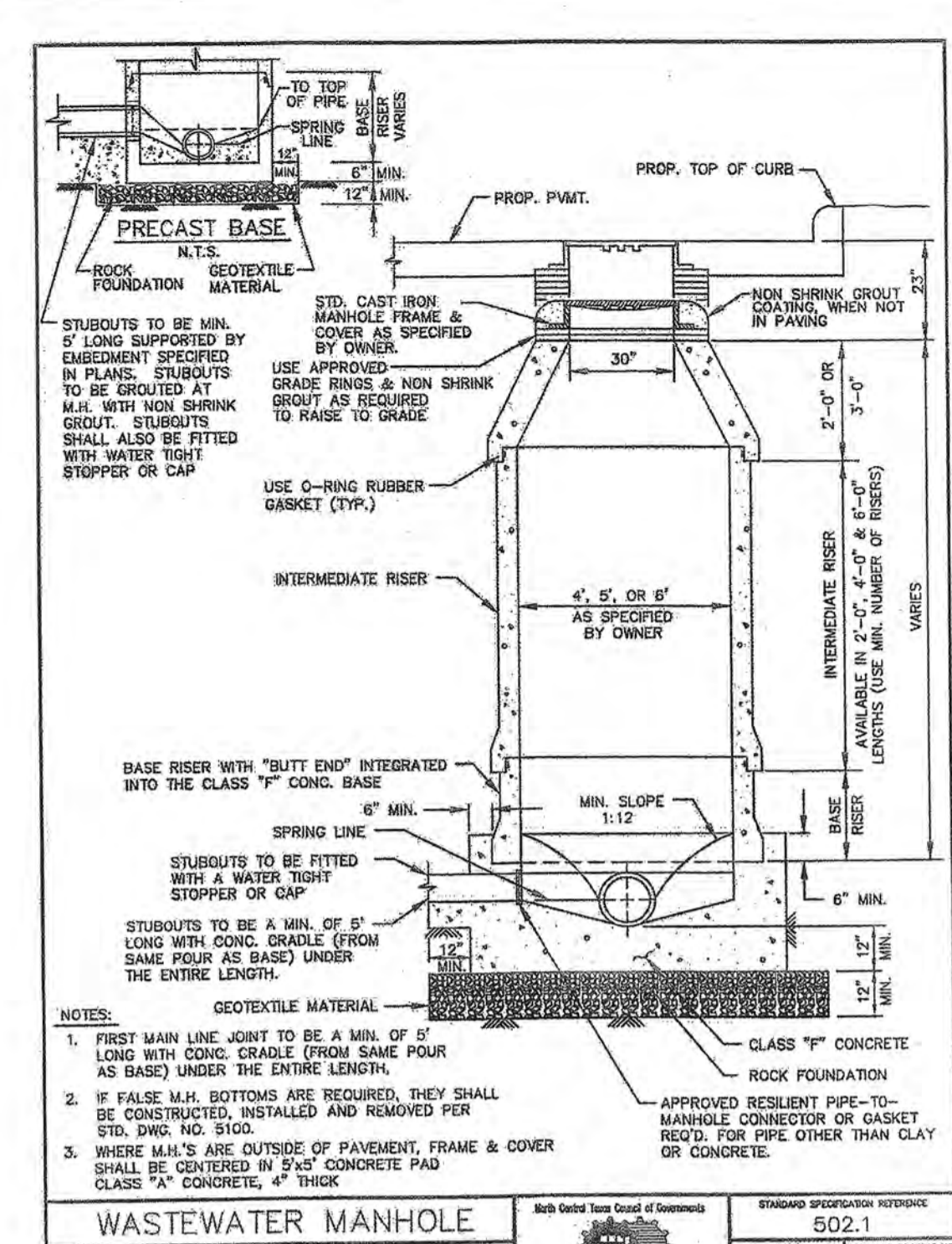
Page 225



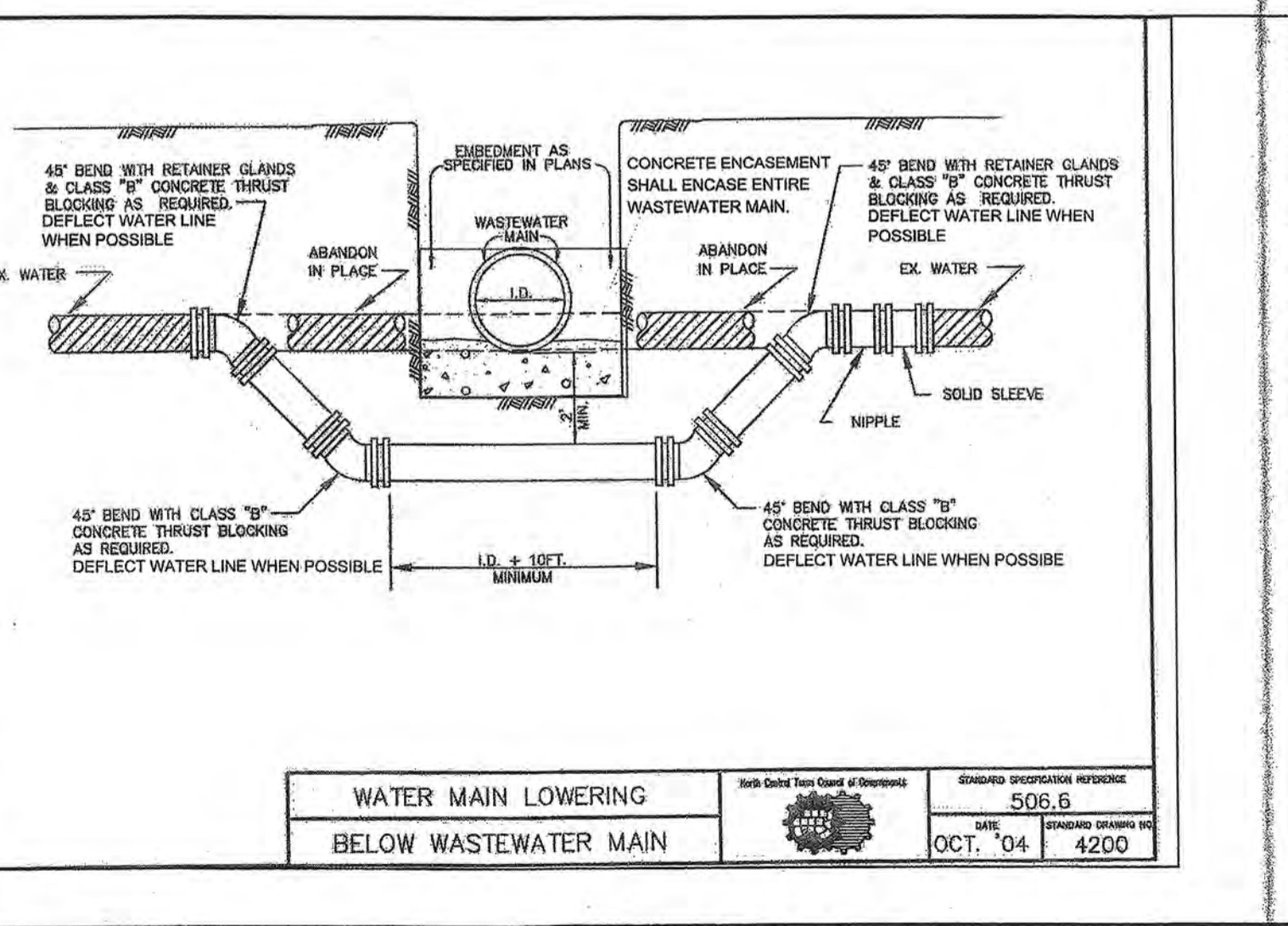
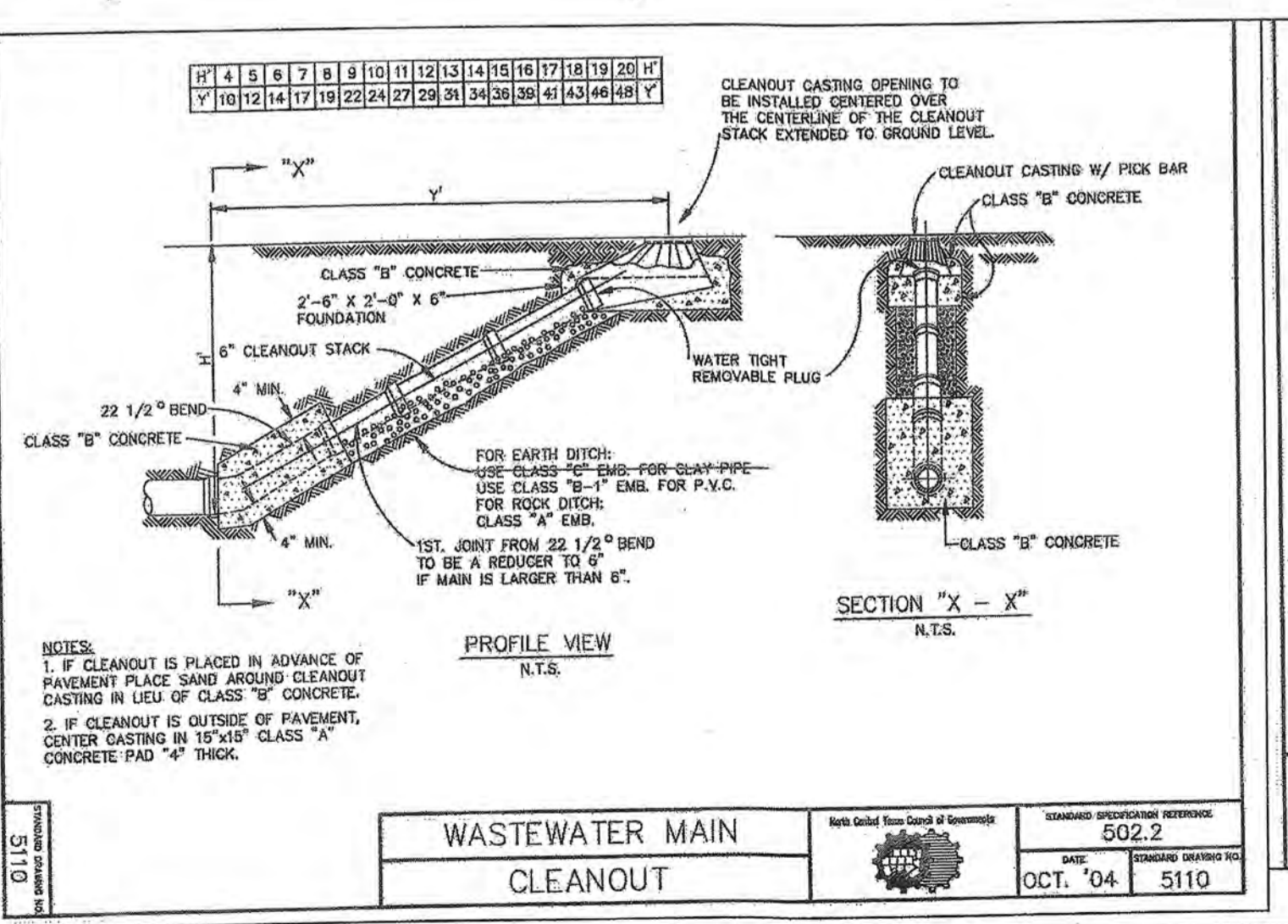
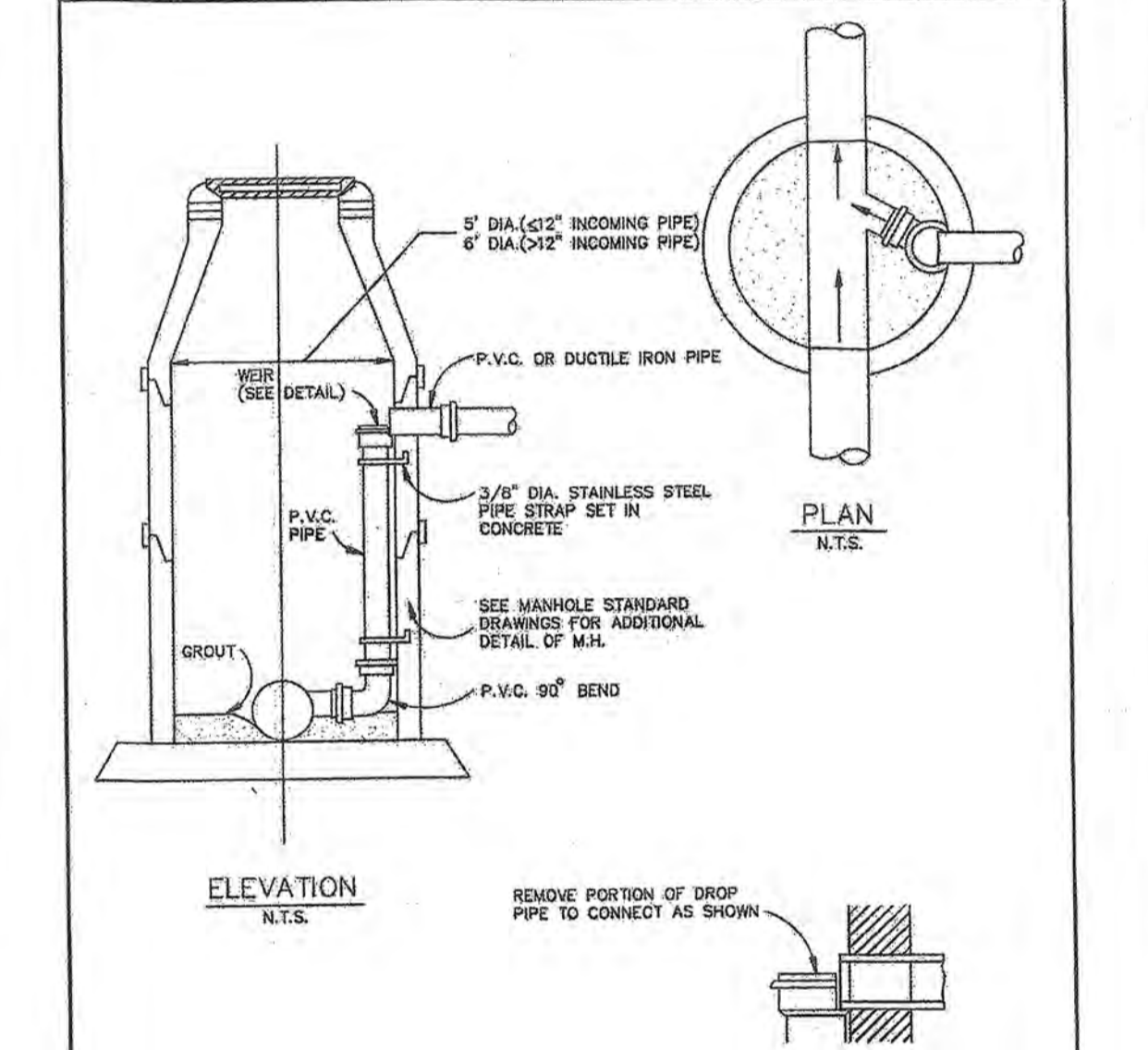
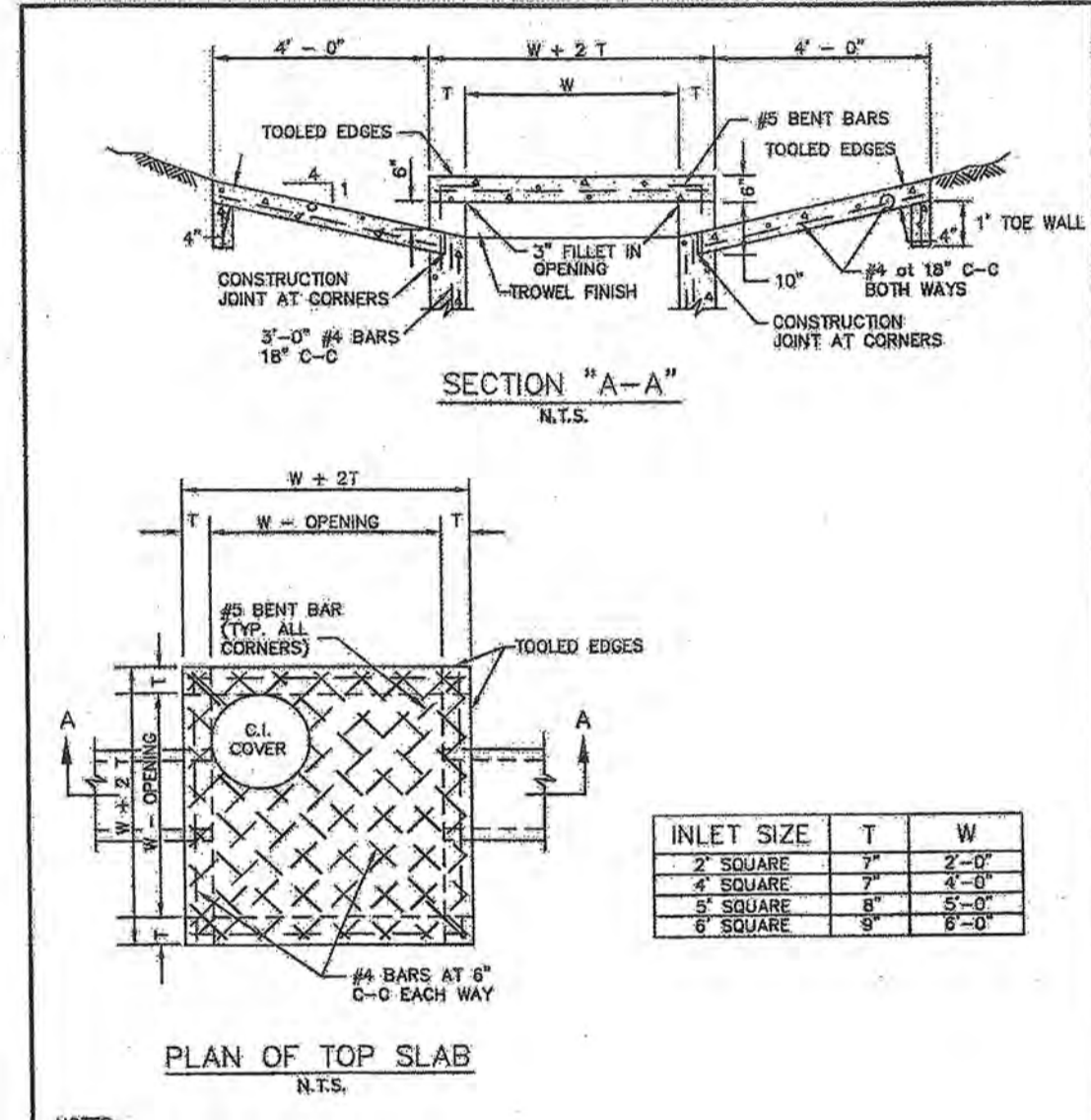
Page 228



Page 233



Page 4130



**CAUTION! EXISTING UTILITIES**  
CONTRACTOR SHOULD CALL 1-800-DIG-TESS PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES FOR EXISTING UTILITY LOCATIONS. EXISTING UTILITIES AND UNDERGROUND FACILITIES INDICATED ON THESE PLANS HAVE BEEN LOCATED FROM REFERENCE INFORMATION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY BOTH HORIZONTALLY AND VERTICALLY THE LOCATION OF ALL EXISTING UTILITIES AND UNDERGROUND FACILITIES PRIOR TO CONSTRUCTION AND TO TAKE NECESSARY PRECAUTIONS IN ORDER TO PROTECT ALL FACILITIES ENCOUNTERED. THE CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION.

**BENCHMARKS**  
BM = MONUMENT RESET #1  
32+ LF WEST OF FM 740 & SUMMER LEE DRIVE INTERSECTION, SOUTH SIDE OF SUMMER LEE DRIVE, ELEV=567.704  
BM = MONUMENT R014  
37+5 LF WEST OF RIDGE ROAD & HENRY M CHANDLER DRIVE INTERSECTION, ON NORTH SIDE OF HENRY M. CHANDLER DRIVE, ELEV=561.017

**ENGINEERINGCONCEPTS & DESIGN, L.P.**  
ENGINEERING / PROJECT MANAGEMENT / CONSTRUCTION SERVICES - FIRM REG. #F-001145  
201 WINDCO CIR, STE 200, WYLIE, TX 75098  
972-941-8400 FAX: 972-941-8401 WWW.ECDLP.COM

**REVISIONS:**  
DRAWN: JD DATE:  
CHECKED: M.A. DATE: NOVEMBER 2018  
PROJECT NO: 02114  
DWG FILE NAME: UTILITY DETAILS.DWG

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF CONSTRUCTION. THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY MATT ATKINS, P.E. 93968



**RECORD DRAWINGS**  
To the best of our knowledge Engineering Concepts & Design, L.P., hereby states that this plan is As-Built. This information provided is based on surveying at the site and information provided by the contractor.  
TODD WINTERS 11-19 DATE

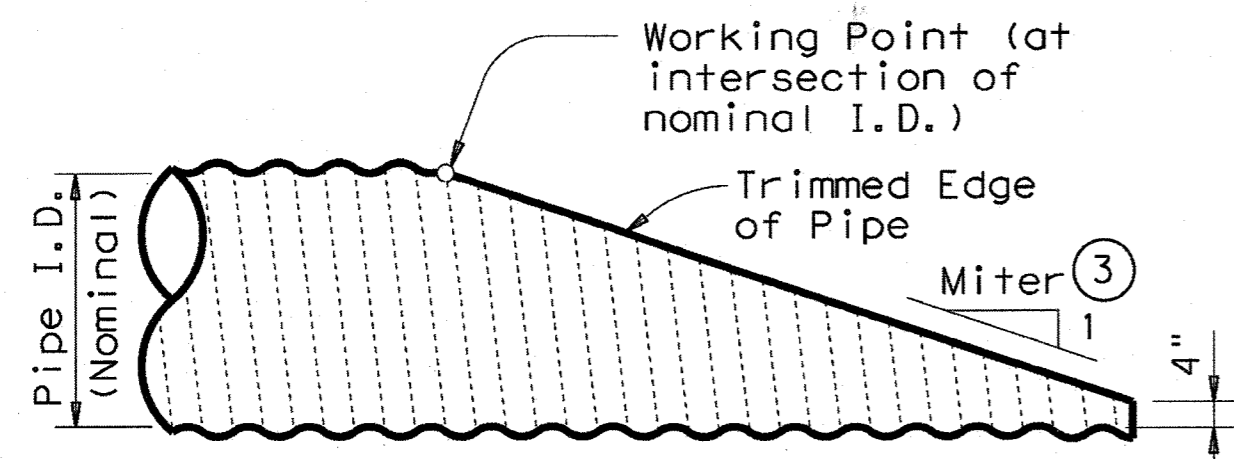
ALL RESPONSIBILITY FOR ADEQUACY OF REMAINS WITH THE DESIGN ENGINEER OF ROCKWALL, IN REVIEWING AND RELEASING FOR CONSTRUCTION, ASSUMES RESPONSIBILITY FOR ADEQUACY OR ACCURACY OF DESIGN.  
CITY DATE

**UTILITY DETAILS WHISPER ROCK CITY OF ROCKWALL ROCKWALL COUNTY**

SHEET 29 OF 58



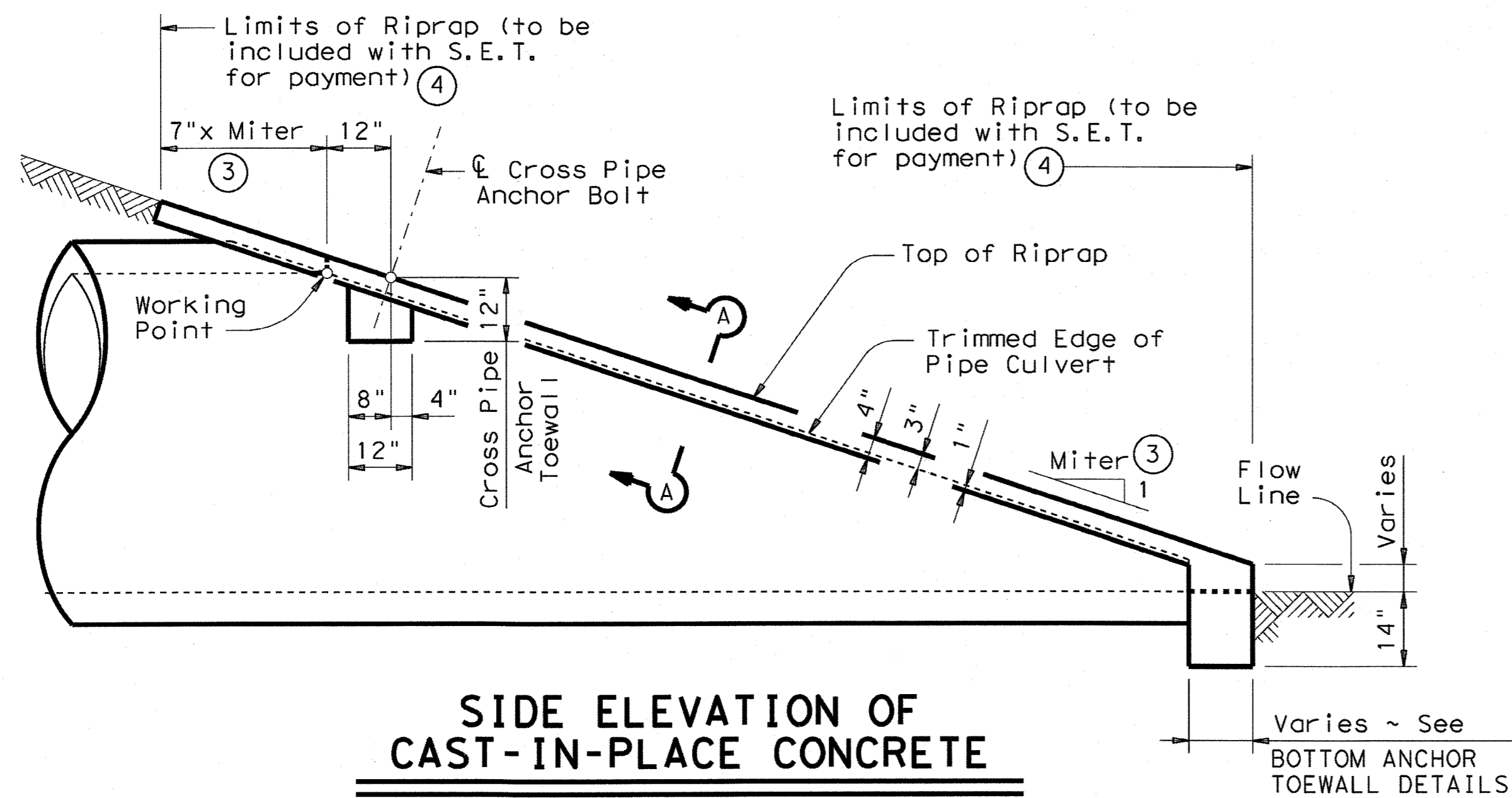
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



NOTE: All Pipe Runners, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

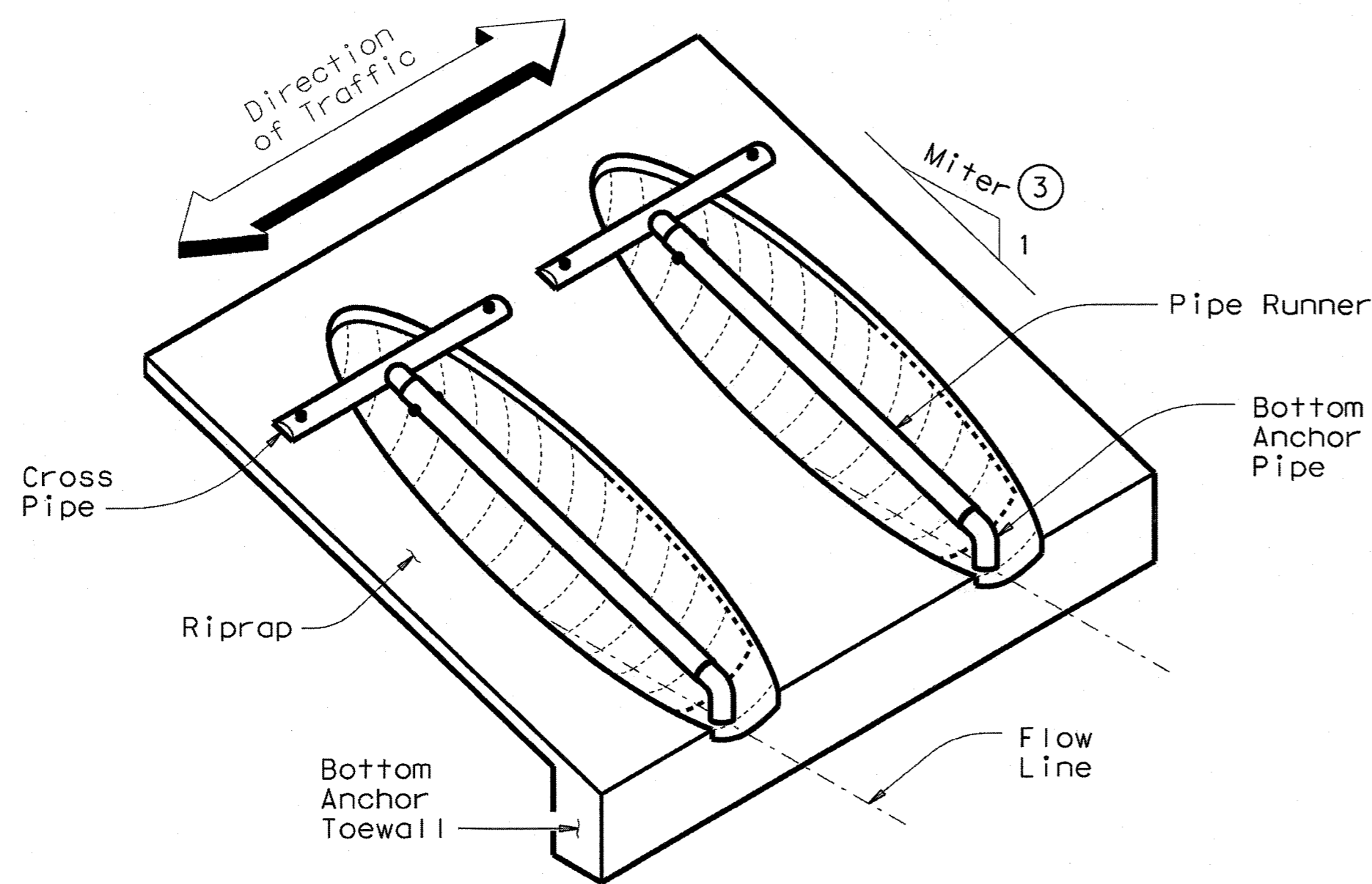
### SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

(Showing Corrugated Metal Pipe Culvert. Details of Concrete Pipe Culvert are similar.)



### SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

(Showing Concrete Pipe Culvert. Details of Corrugated Metal Pipe Culvert are similar. Pipe Runners not shown for clarity)



### ISOMETRIC VIEW OF TYPICAL INSTALLATION

(Showing installation with no skew.)

### CROSS PIPE LENGTHS & PIPE RUNNER LENGTHS (1)(2)

Nominal Culvert I.D.	Pipe Culvert Spa ~ G	Cross Pipe Length	Pipe Runner Length											
			3:1 Side Slope				4:1 Side Slope				6:1 Side Slope			
			0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew
24"	1'-7"	3'-5"	N/A	N/A	N/A	5'-10"	N/A	N/A	N/A	8'-1"	N/A	N/A	N/A	12'-9"
27"	1'-8"	3'-8"	N/A	N/A	5'-5"	6'-11"	N/A	N/A	7'-7"	9'-7"	N/A	N/A	11'-11"	14'-11"
30"	1'-10"	3'-11"	N/A	N/A	6'-4"	8'-0"	N/A	N/A	8'-9"	11'-0"	N/A	N/A	13'-8"	17'-0"
33"	1'-11"	4'-2"	6'-2"	6'-5"	7'-3"	9'-1"	8'-6"	8'-10"	10'-0"	12'-5"	13'-3"	13'-9"	15'-5"	19'-2"
36"	2'-1"	4'-5"	6'-11"	7'-3"	8'-2"	10'-2"	9'-6"	9'-11"	11'-2"	13'-10"	14'-9"	15'-3"	17'-2"	21'-3"
42"	2'-4"	4'-11"	8'-6"	8'-10"	9'-11"	12'-4"	11'-7"	12'-0"	13'-6"	16'-8"	17'-9"	18'-5"	20'-8"	25'-7"
48"	2'-7"	5'-5"	10'-1"	10'-5"	11'-9"	N/A	13'-7"	14'-2"	15'-10"	N/A	20'-9"	21'-6"	24'-2"	N/A
54"	3'-0"	5'-11"	11'-8"	12'-1"	N/A	N/A	15'-8"	16'-3"	N/A	N/A	23'-10"	24'-8"	N/A	N/A
60"	3'-3"	6'-5"	13'-3"	N/A	N/A	N/A	17'-9"	N/A	N/A	N/A	26'-10"	N/A	N/A	N/A

### TYPICAL PIPE CULVERT MITERS (3)

Side Slope	0° Skew	15° Skew	30° Skew	45° Skew
3:1	3:1	3,106:1	3,464:1	4,243:1
4:1	4:1	4,141:1	4,619:1	5,657:1
6:1	6:1	6,212:1	6,928:1	8,485:1

### CONDITIONS WHERE PIPE RUNNERS ARE NOT REQUIRED (2)

Nominal Culvert I.D.	Single Pipe Culvert	Multiple Pipe Culverts
12" thru 21"	Skews thru 45°	Skews thru 45°
24"	Skews thru 45°	Skews thru 30°
27"	Skews thru 30°	Skews thru 15°
30"	Skews thru 15°	Skews thru 15°
33"	Skews thru 15°	Always required
36"	Normal (No Skew)	Always required
42" to 60"	Always required	Always required

### STANDARD PIPE SIZES & MAX PIPE RUNNER LENGTHS (1)

Pipe Size	Pipe O.D.	Pipe I.D.	Max Pipe Runner Length
2" STD	2.375"	2.067"	N/A
3" STD	3.500"	3.068"	10'-0"
4" STD	4.500"	4.026"	19'-8"
5" STD	5.563"	5.047"	34'-2"

### ESTIMATED CONCRETE RIPRAP QUANTITIES (CY) (5)

Nominal Culvert I.D.	3:1 Side Slope				4:1 Side Slope				6:1 Side Slope			
	0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew
12"	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.7	0.7	0.7	0.8
15"	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.9
18"	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.9	1.0
21"	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.9	0.9	0.9	1.0	1.2
24"	0.6	0.7	0.7	0.8	0.8	0.8	0.8	1.0	1.0	1.0	1.1	1.3
27"	0.7	0.7	0.8	0.9	0.8	0.9	0.9	1.1	1.1	1.1	1.2	1.4
30"	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.2	1.2	1.2	1.3	1.6
33"	0.8	0.8	0.9	1.0	1.0	1.0	1.1	1.3	1.3	1.4	1.5	1.7
36"	0.9	0.9	0.9	1.1	1.1	1.1	1.2	1.4	1.4	1.5	1.6	1.8
42"	1.0	1.0	1.1	1.3	1.2	1.3	1.3	1.6	1.6	1.7	1.8	2.1
48"	1.1	1.1	1.2	N/A	1.4	1.4	1.5	N/A	1.9	1.9	2.1	N/A
54"	1.3	1.3	N/A	N/A	1.6	1.6	N/A	N/A	2.1	2.1	N/A	N/A
60"	1.4	N/A	N/A	N/A	1.7	N/A	N/A	N/A	2.3	N/A	N/A	N/A

(1) Size of Pipe Runner shall be as shown in the tables. Cross Pipe shall be the same size as the Pipe Runner. Cross Pipe Stub Out and Bottom Anchor Pipe shall be the next smaller size pipe as shown in the STANDARD PIPE SIZES table.

(2) This standard allows for the placement of only one pipe runner across each culvert pipe opening. In order to limit the clear opening to be traversed by an errant vehicle, the following conditions must be met:

- For 60" culvert pipes, the skew must not exceed 0°.
- For 54" culvert pipes, the skew must not exceed 15°.
- For 48" culvert pipes, the skew must not exceed 30°.
- For all culvert pipe sizes 42" and less, the skew must not exceed 45°.

If the above conditions cannot be met, the designer should consider using a safety end treatment with flared wings. For further information, refer to the TxDOT "Roadway Design Manual".

(3) Miter = Slope of Mitered Pipe Culvert End

(4) Riprap placed beyond the limits shown will be paid as Concrete Riprap in accordance with Item 432, "Riprap".

(5) Quantities shown are for one end of one reinforced Concrete Pipe Culvert. For multiple Pipe Culverts or for Corrugated Metal Pipe Culverts, quantities will need to be adjusted. Riprap quantities are for Contractor's information only.

SHEET 1 OF 2



## SAFETY END TREATMENT FOR 12" DIA TO 60" DIA PIPE CULVERTS TYPE II ~ CROSS DRAINAGE

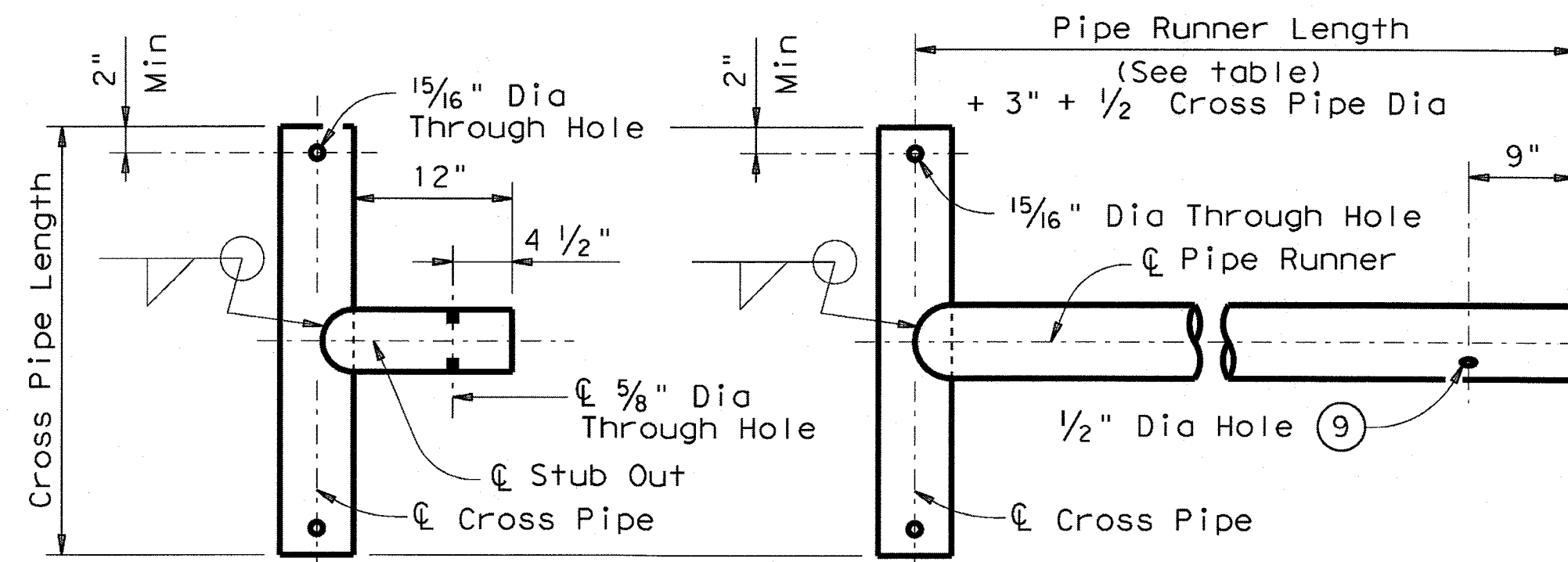
### SETP-CD

FILE: setpcdse.dgn	DW: GAF	CK: CAT	DW: JRP	CK: GAF
©TxDOT February 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS				
11-10: Add note for synthetic fibers.	DIST	COUNTY	SHEET NO.	

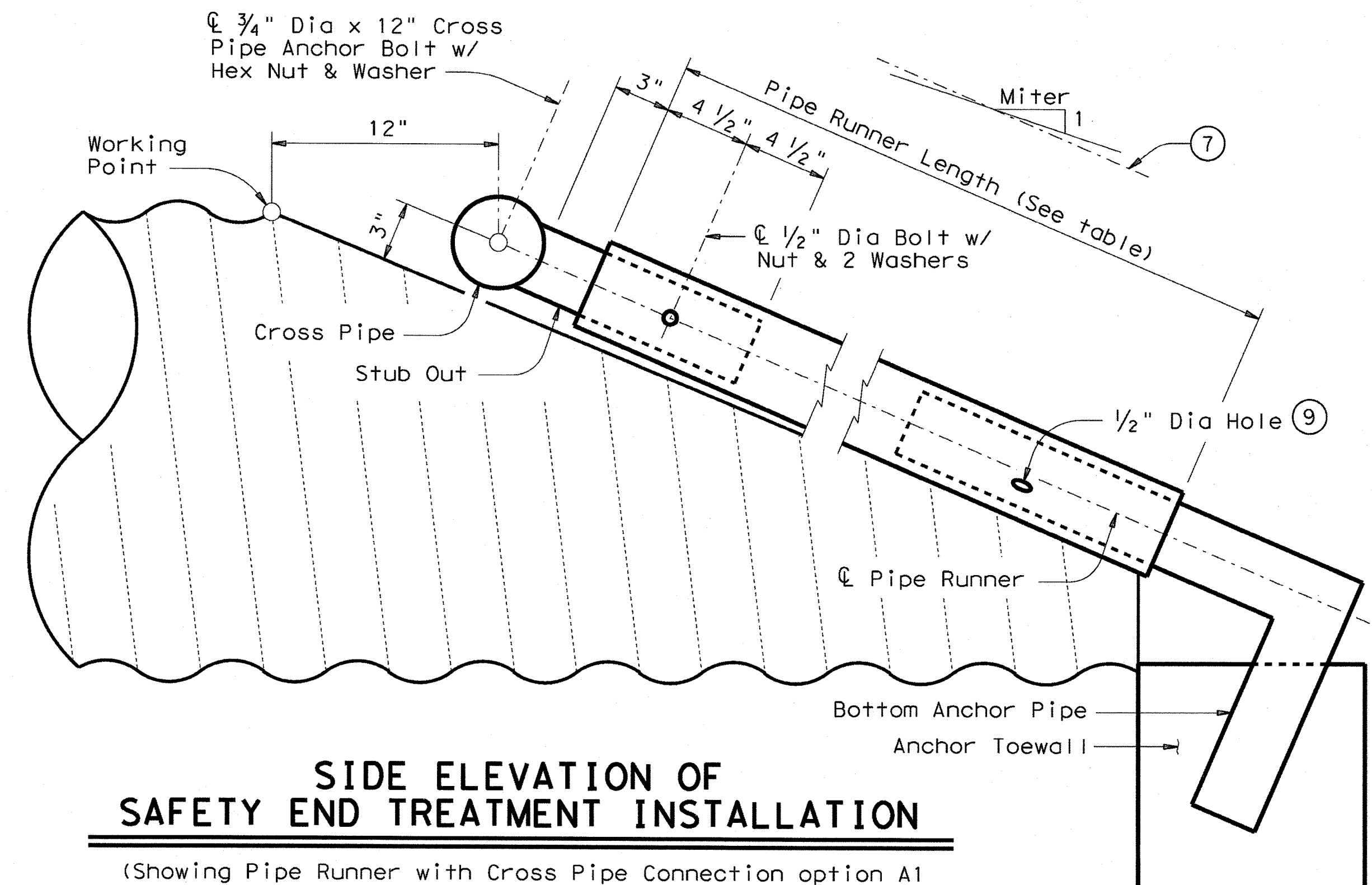
DATE: FILE:



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.

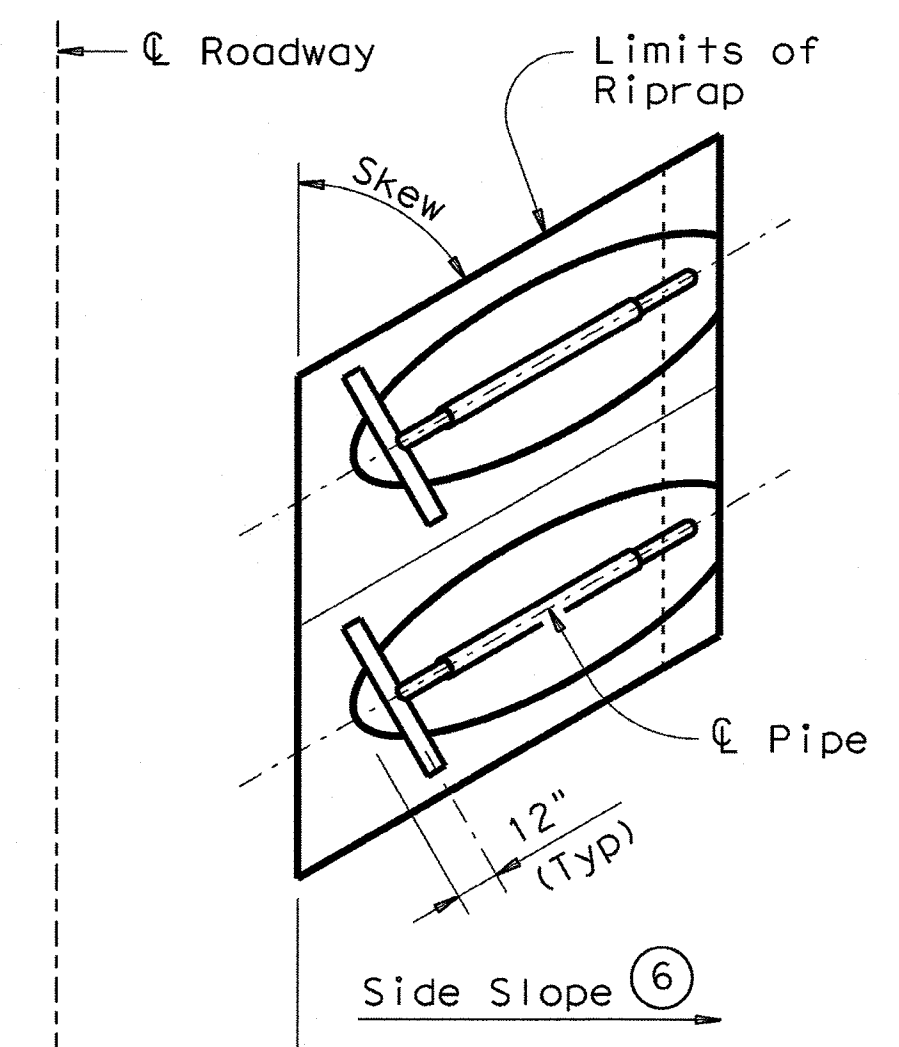


**CROSS PIPE AND CONNECTIONS DETAILS**

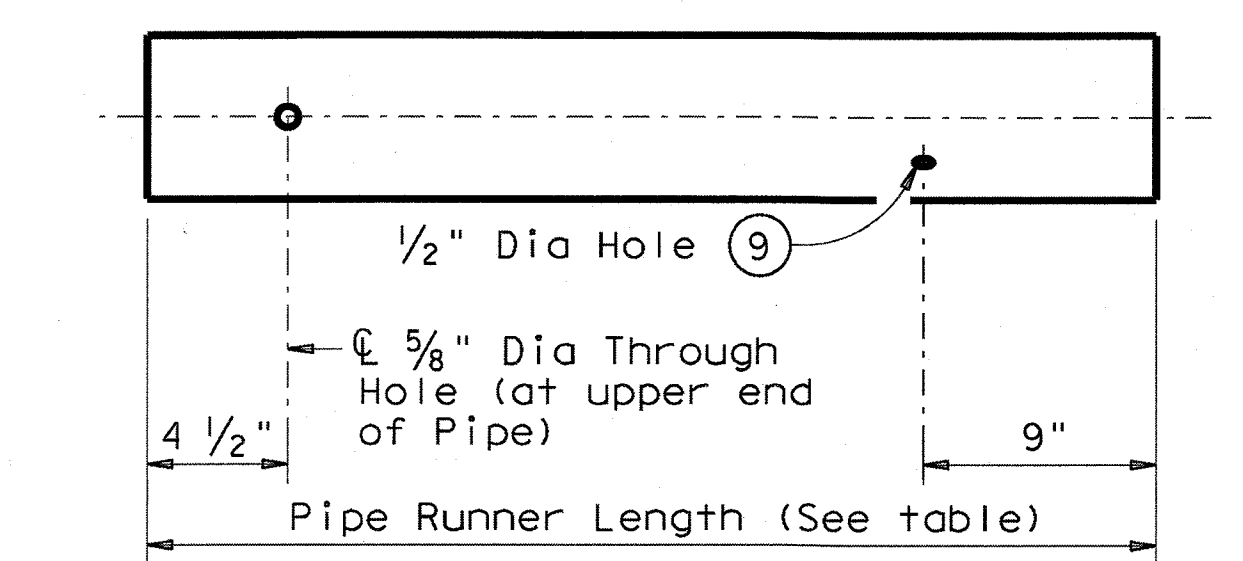


**SIDE ELEVATION OF SAFETY END TREATMENT INSTALLATION**

(Showing Pipe Runner with Cross Pipe Connection option A1 and Anchor Pipe option B2 on Corrugated Metal Pipe Culvert. Concrete Pipe Culvert details are similar. Riprap not shown for clarity)

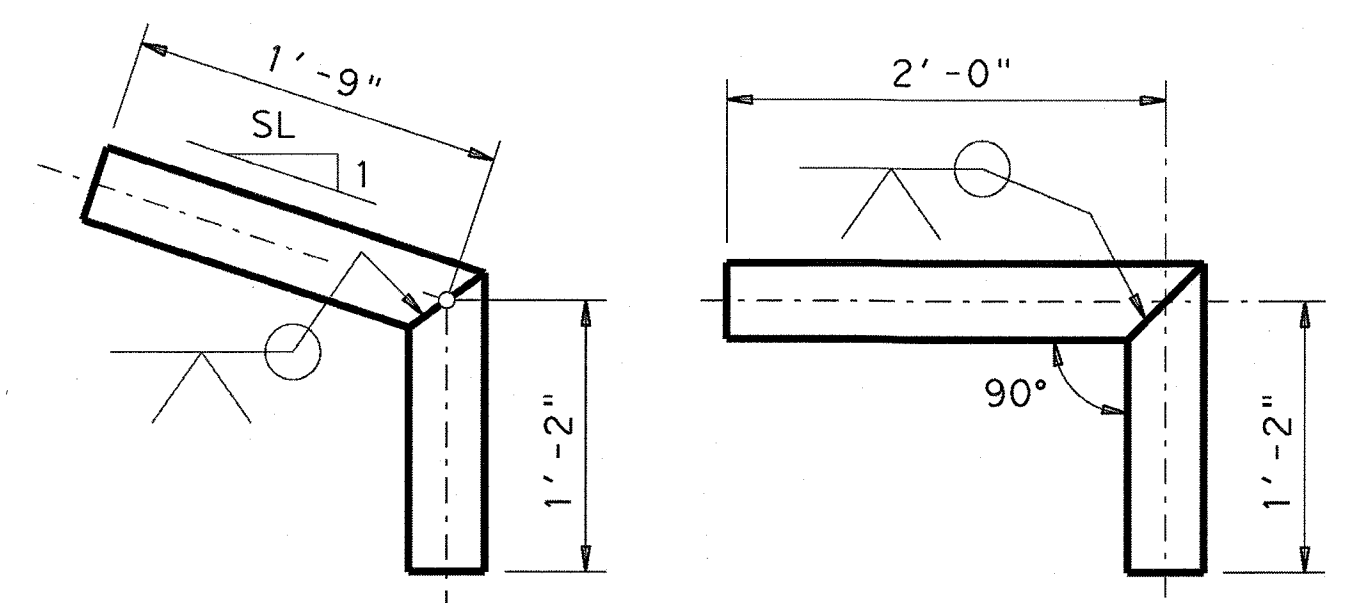


**PLAN OF SKEWED INSTALLATION**

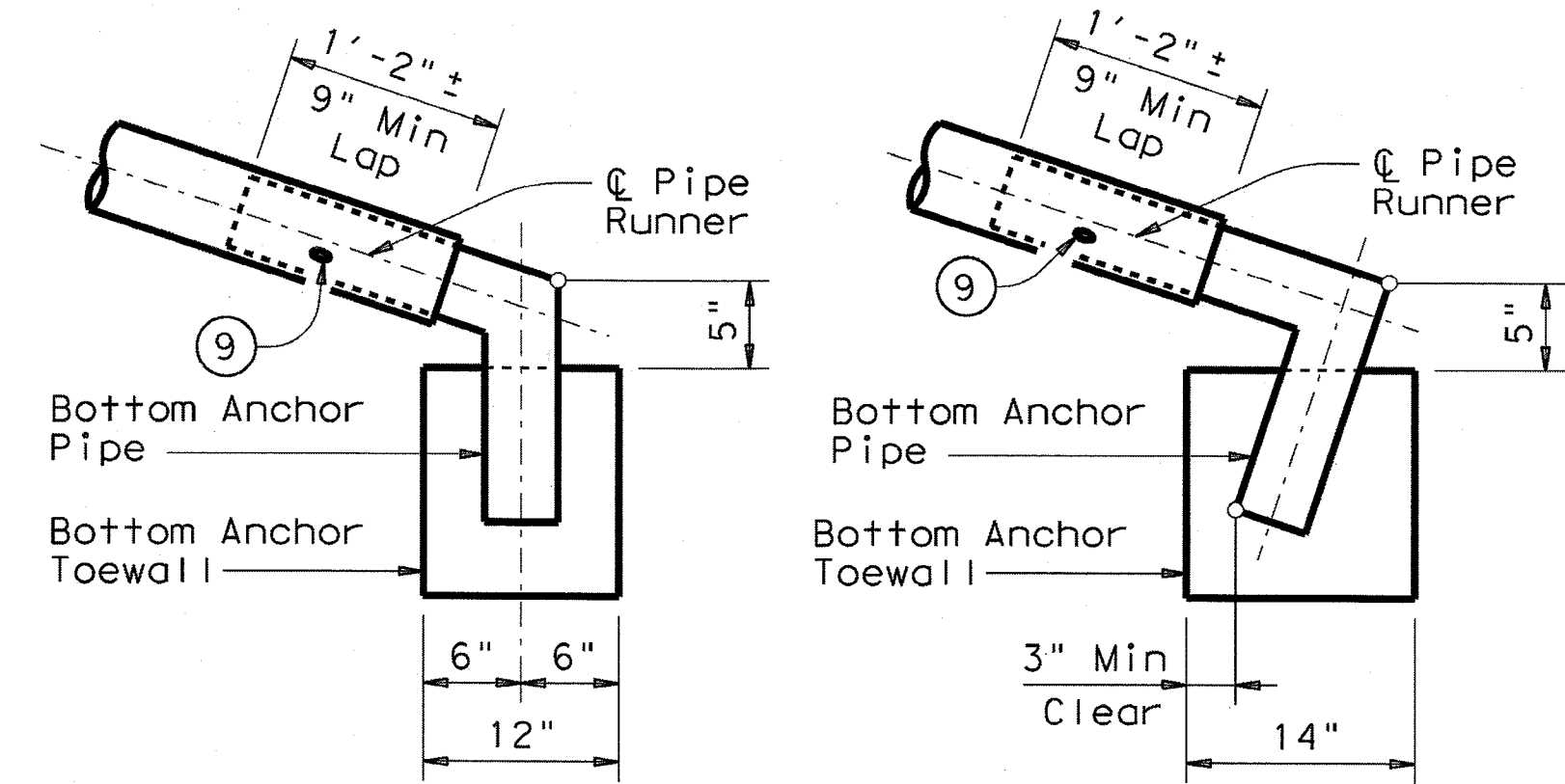


**PIPE RUNNER DETAILS**

NOTE: The separate Pipe Runner shown is required when Cross Pipe Connection Option A1 is used.

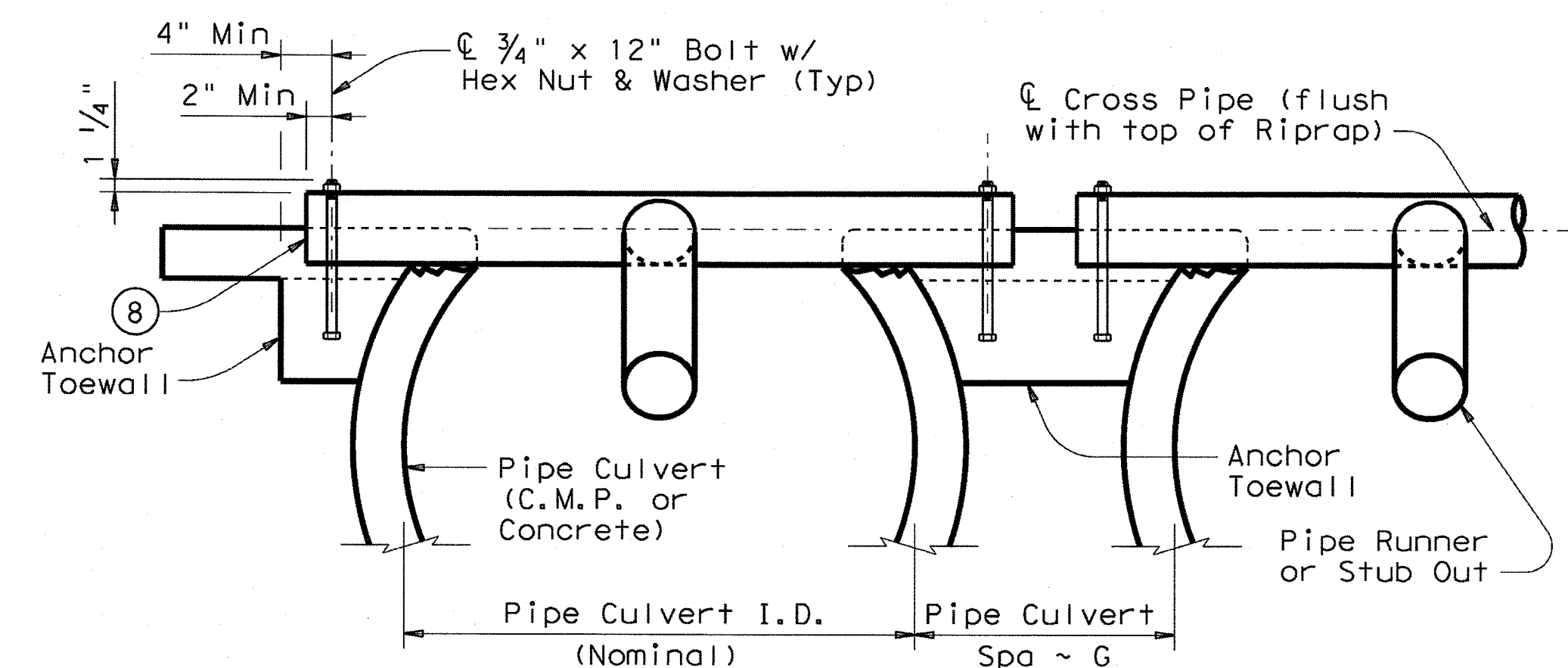


**BOTTOM ANCHOR PIPE DETAILS**

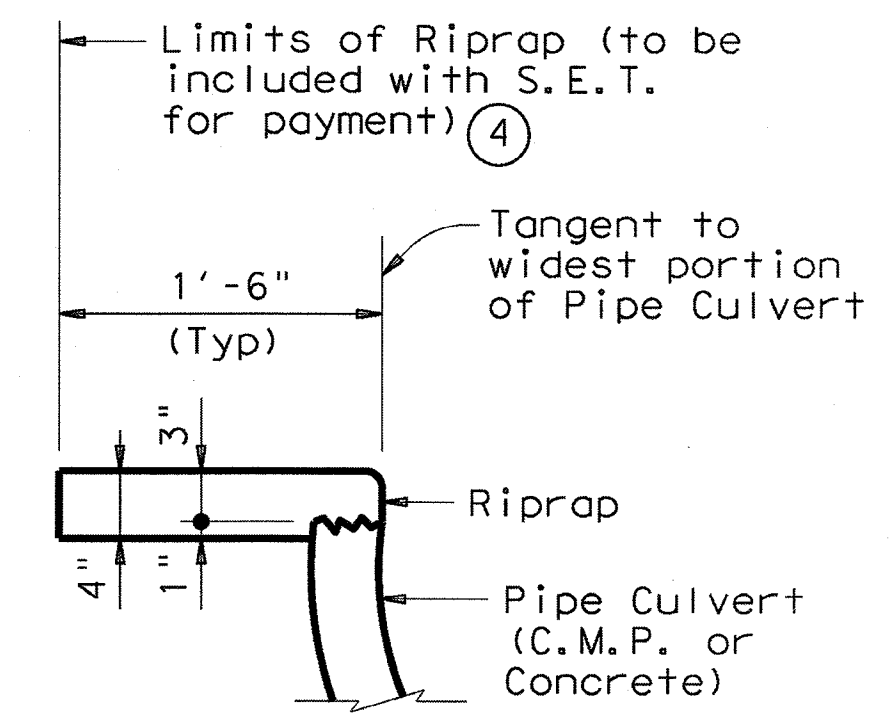


**BOTTOM ANCHOR TOEWALL DETAILS**

(Culvert & Riprap not shown for clarity)



**SHOWING CROSS PIPE & ANCHOR TOEWALL**



**SHOWING TYPICAL PIPE CULVERT & RIPRAP**

**SECTION A-A**

- ④ Riprap placed beyond the limits shown will be paid as Concrete Riprap in accordance with Item 432, "Riprap".
- ⑥ Recommended values of side slope are 3:1, 4:1, & 6:1. All quantities, calculations, and dimensions shown herein are based on these recommended values. Slope of 3:1 or flatter is required for vehicle safety.
- ⑦ Note that actual slope of Pipe Runner may vary slightly from Side Slope of Riprap and trimmed Culvert Pipe edge.
- ⑧ Care shall be taken to ensure that Riprap concrete does not flow into the Cross Pipe so as to permit disassembly of the bolted connection to allow cleanout access.
- ⑨ After installation, the 1/2" hole shall be inspected to ensure that the lap of the Pipe Runner with the Bottom Anchor Pipe is adequate.
- ⑩ At fabricator's option, a heat bend to a smooth 5" radius or a manufactured elbow (of the same material as the Runner) may be substituted for the mitered and welded joint in the Bottom Anchor Pipe.

**GENERAL NOTES:**

Pipe Runners are designed for a traversing load of 1,800 pounds at yield as recommended by Research Report 280-1, "Safety Treatment of Roadside Cross-Drainage Structures", Texas Transportation Institute, March 1981. The Safety End Treatments shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the Pipe Runners. Riprap and all necessary inverts shall be Concrete Riprap conforming to the requirements of Item 432, "Riprap". Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise. Payment for riprap and toewall is included in the Price Bid for each Safety End Treatment. Pipe Runners, Cross Pipes, and Anchor Pipes shall conform to the requirements of ASTM A53 (Type E or S, Grade B), ASTM A500 (Grade B), or API 5LX52. Bolts and nuts shall conform to ASTM A307. All steel components, except concrete reinforcing, shall be galvanized after fabrication. Galvanizing damaged during transport or construction shall be repaired in accordance with the specifications.

<b>SAFETY END TREATMENT</b> FOR 12" DIA TO 60" DIA PIPE CULVERTS TYPE II ~ CROSS DRAINAGE			
<b>SETP-CD</b>			
FILE: setpcdse.dgn	DN: GAF	CK: CAT	DW: JRP
©TxDOT February 2010	CONT	SECT	JOB
REVISIONS		HIGHWAY	
11-10: Add note for synthetic fibers.	DIST	COUNTY	SHEET NO.

DATE: FILE:

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.

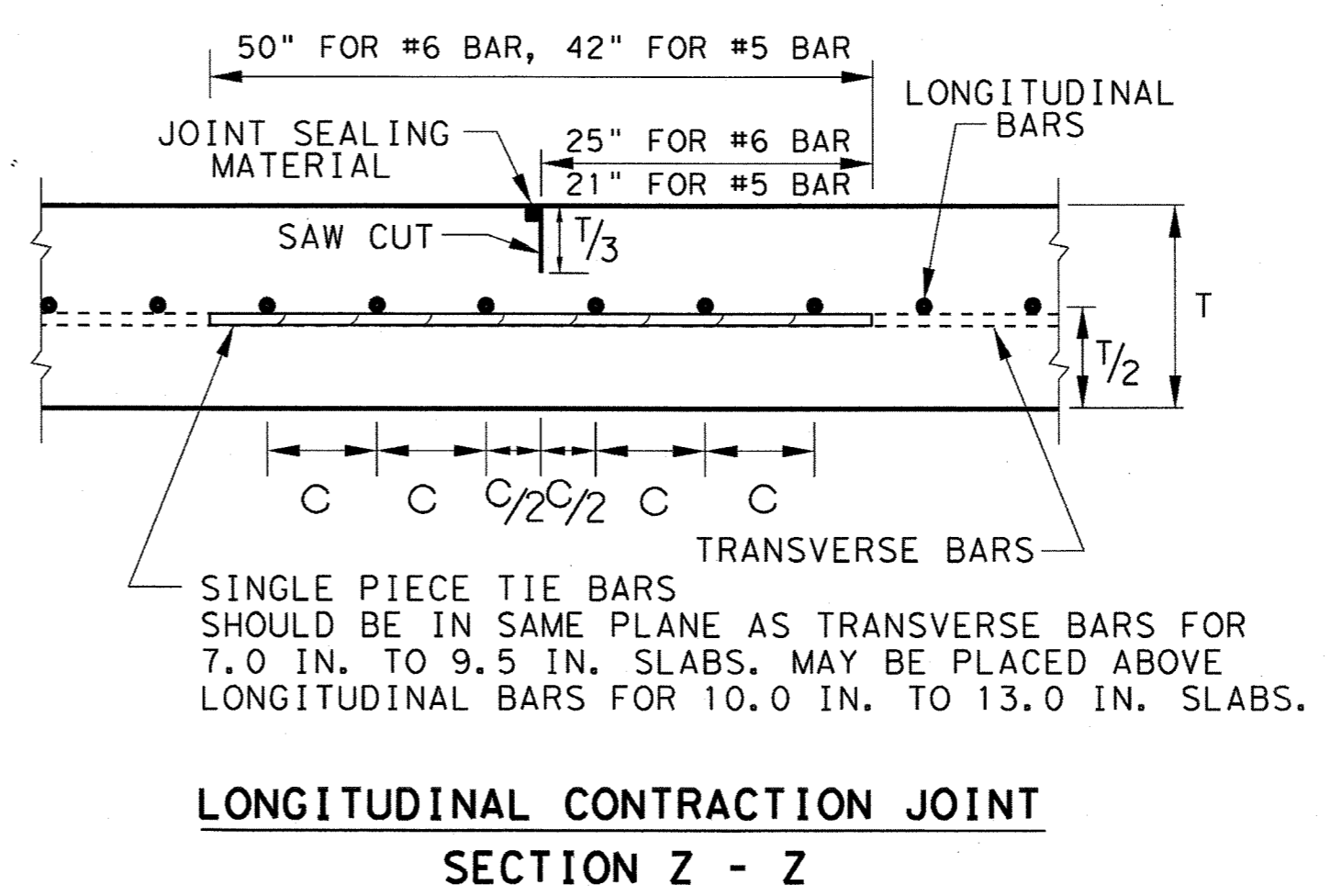
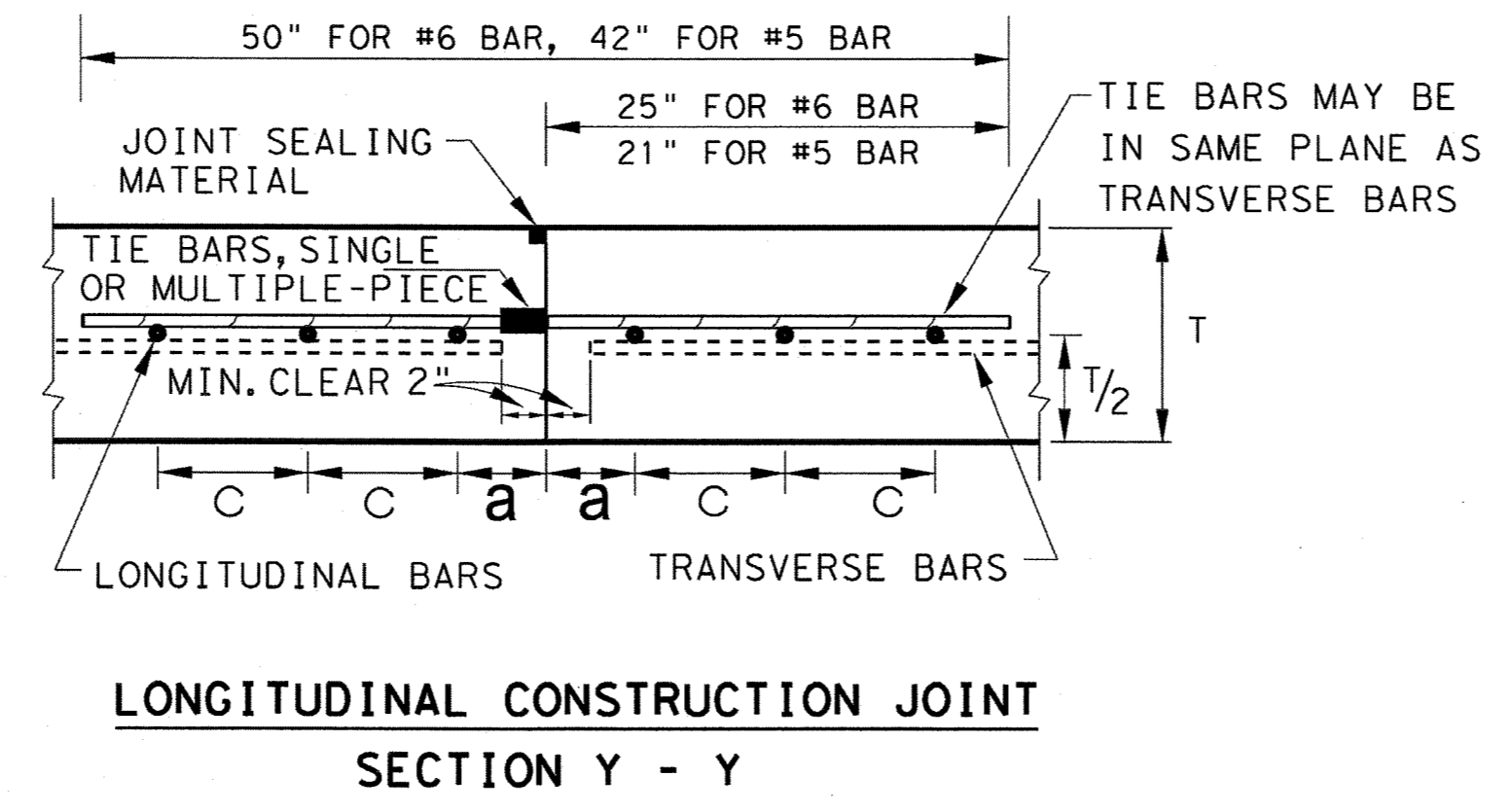
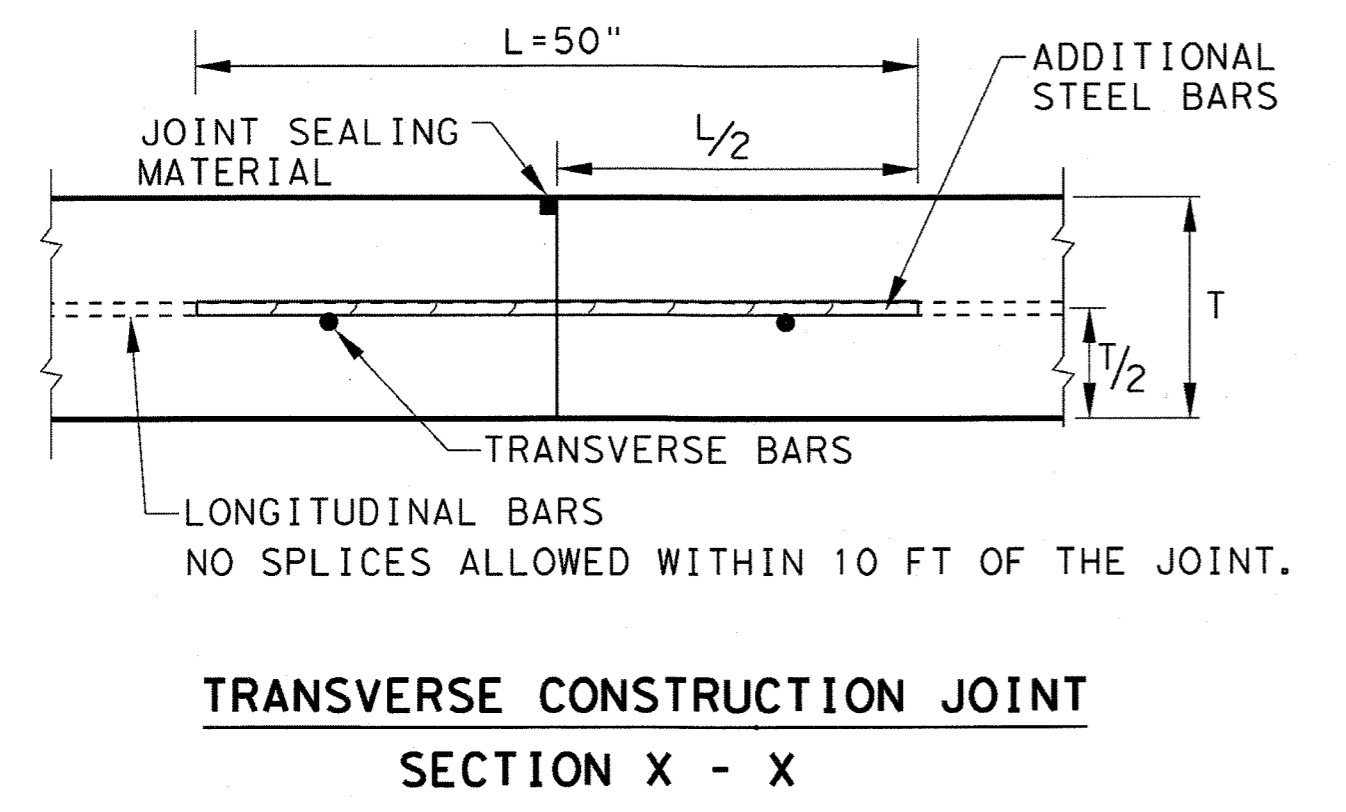
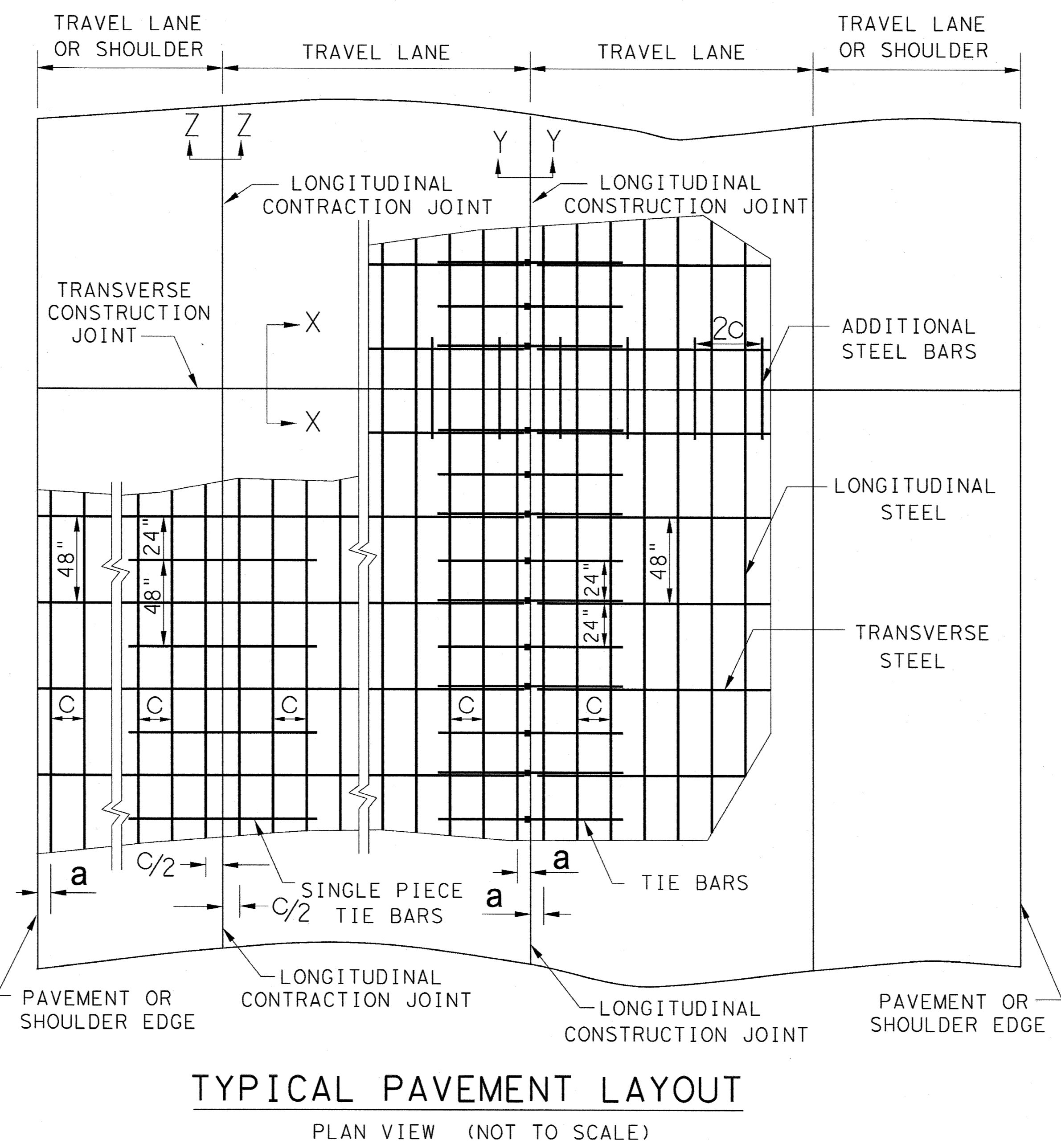
DATE: FILE:

**GENERAL NOTES**

1. DETAILS FOR PAVEMENT WIDTH, PAVEMENT THICKNESS AND THE CROWN CROSS-SLOPE SHALL BE SHOWN ELSEWHERE IN THE PLANS. PAVEMENTS WIDER THAN 100 FT. WITHOUT A FREE LONGITUDINAL JOINT ARE NOT COVERED BY THIS STANDARD.
2. USE COARSE AGGREGATES TO PRODUCE CONCRETE WITH A COEFFICIENT OF THERMAL EXPANSION (CTE) NOT MORE THAN  $5.5 \times 10^{-6}$  IN/IN/°F.
3. ALL THE REINFORCING STEEL AND TIE BARS SHALL BE DEFORMED STEEL BARS CONFORMING TO ASTM A 615 (GRADE 60) OR ASTM A 996 (GRADE 60) OR ABOVE. STEEL BAR SIZES AND SPACINGS SHALL CONFORM TO TABLE NO.1 AND TABLE NO.2.
4. WHEN LOW CTE CONCRETE (NOT MORE THAN  $4.0 \times 10^{-6}$  IN/IN/°F) IS PRODUCED, TABLE NO.1A MAY BE USED FOR LONGITUDINAL STEEL AS APPROVED BY THE ENGINEER.
5. STEEL BAR PLACEMENT TOLERANCE SHALL BE +/- 1 IN. HORIZONTALLY AND +/- 0.5 IN. VERTICALLY. CALCULATED AVERAGE BAR SPACING (CONCRETE PLACEMENT WIDTH / NUMBER OF LONGITUDINAL BARS) SHALL CONFORM TO TABLE NO.1 OR TABLE NO.1A.
6. PAVEMENT WIDTHS OF MORE THAN 15 FT. SHALL HAVE A LONGITUDINAL JOINT (SECTION Z-Z OR SECTION Y-Y). THESE JOINTS SHALL BE LOCATED WITHIN 6 IN. OF THE LANE LINE UNLESS THE JOINT LOCATION IS SHOWN ELSEWHERE ON THE PLANS.
7. THE SAW CUT DEPTH FOR THE LONGITUDINAL CONTRACTION JOINT (SECTION Z-Z) SHALL BE ONE THIRD OF THE SLAB THICKNESS (T/3).
8. WHEN TYING CONCRETE GUTTER AT A LONGITUDINAL JOINT, THE TIE BAR LENGTH OR POSITION MAY BE ADJUSTED. PROVIDE 3 IN. OF CONCRETE COVER FROM THE BACK OF GUTTER TO THE END OF TIE BAR.
9. REPLACE MISSING OR DAMAGED TIE BARS WITHOUT ADDITIONAL COMPENSATION BY DRILLING MIN. 10 IN. DEEP AND GROUTING TIE BARS WITH TYPE III, CLASS C EPOXY. MEET THE PULL-OUT TEST REQUIREMENTS IN ITEM 361.
10. OMIT TIE BARS LOCATED WITHIN 18 IN. OF THE TRANSVERSE CONSTRUCTION JOINTS (SECTION X-X). USE HAND-OPERATED IMMERSION VIBRATORS TO CONSOLIDATE THE CONCRETE ADJACENT TO ALL FORMED JOINTS.
11. LONGITUDINAL REINFORCING STEEL SPLICES SHALL BE A MINIMUM OF 25 IN. STAGGER THE LAP LOCATIONS SO THAT NO MORE THAN 1/3 OF THE LONGITUDINAL STEEL IS SPLICED IN ANY GIVEN 12-FT. WIDTH AND 2-FT. LENGTH OF THE PAVEMENT.
12. THE DETAIL FOR THE JOINT SEALANT AND RESERVOIR IS SHOWN ON STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."

SLAB THICKNESS AND BAR SIZE		REGULAR STEEL BARS	FIRST SPACING AT EDGE OR JOINT	ADDITIONAL STEEL BARS AT TRANSVERSE CONSTRUCTION JOINT (SECTION X-X)	
T (IN.)	BAR SIZE	SPACING C (IN.)	SPACING a (IN.)	SPACING 2 x c (IN.)	LENGTH L (IN.)
7.0	#5	6.5	3 TO 4	13	50
7.5	#5	6.0	3 TO 4	12	50
8.0	#6	9.0	3 TO 4	18	50
8.5	#6	8.5	3 TO 4	17	50
9.0	#6	8.0	3 TO 4	16	50
9.5	#6	7.5	3 TO 4	15	50
10.0	#6	7.0	3 TO 4	14	50
10.5	#6	6.75	3 TO 4	13.5	50
11.0	#6	6.5	3 TO 4	13	50
11.5	#6	6.25	3 TO 4	12.5	50
12.0	#6	6.0	3 TO 4	12	50
12.5	#6	5.75	3 TO 4	11.5	50
13.0	#6	5.5	3 TO 4	11	50

SLAB THICKNESS (IN.)	TRANSVERSE STEEL		TIE BARS AT LONGITUDINAL CONTRACTION JOINT (SECTION Z-Z)		TIE BARS AT LONGITUDINAL CONTRACTION JOINT (SECTION Y-Y)	
	BAR SIZE	SPACING (IN.)	BAR SIZE	SPACING (IN.)	BAR SIZE	SPACING (IN.)
7.0 - 7.5	#5	48	#5	48	#5	24
8.0 - 13.0	#5	48	#6	48	#6	24



SHEET 1 OF 2

**Design Division Standard**

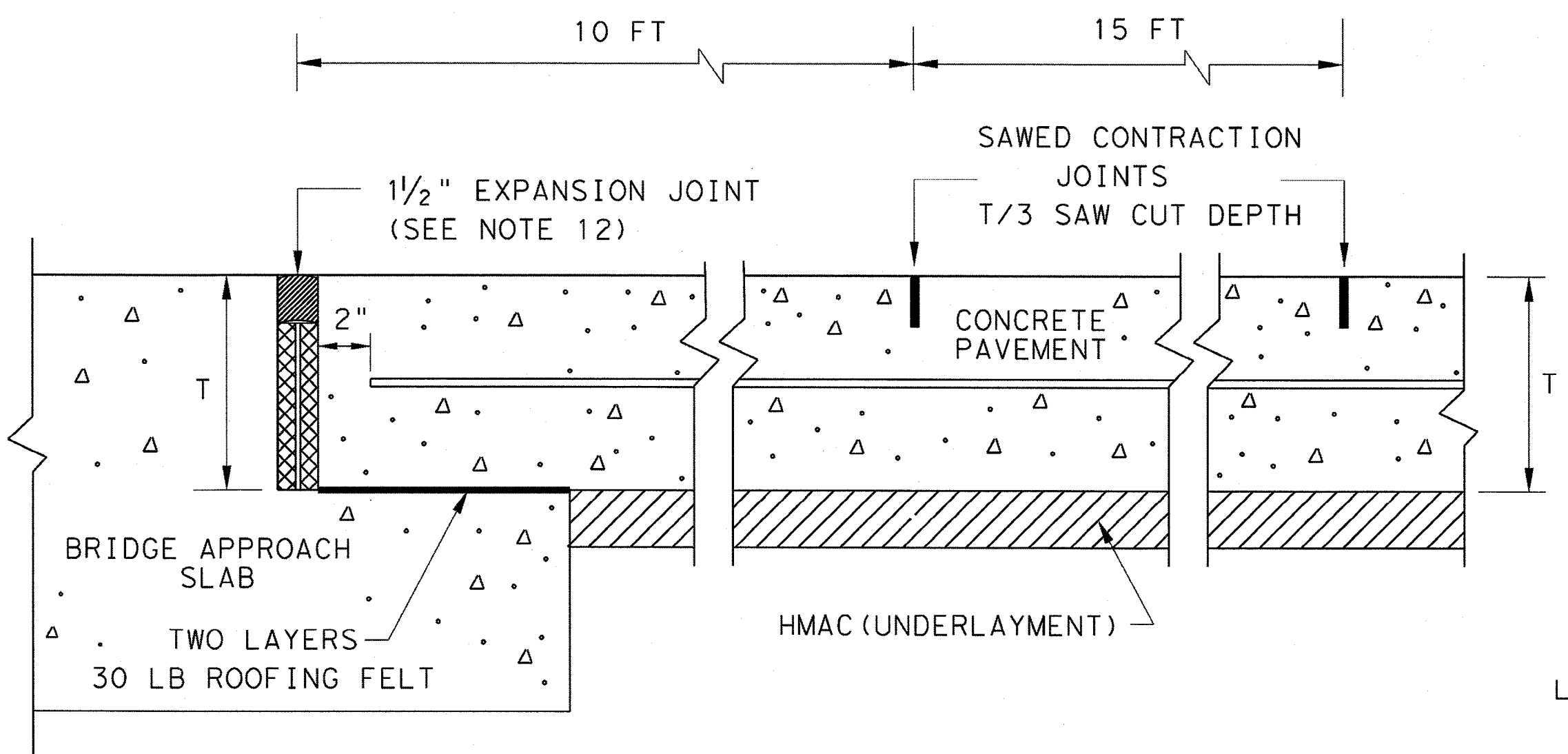
**CONTINUOUSLY REINFORCED CONCRETE PAVEMENT**  
**ONE LAYER STEEL BAR PLACEMENT**  
**T - 7 to 13 INCHES**  
**CRCP (1) - 13**

FILE: crcp113.dgn	DN: TxDOT	CK: AN	DW: HC	CK: RM
© TxDOT October 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS				
10/10/2011 ADD GN #12				
04/09/2013 REMOVE 6" AND 6.5" ADD CTE REQUIREMENTS				
DIST	COUNTY			SHEET NO.

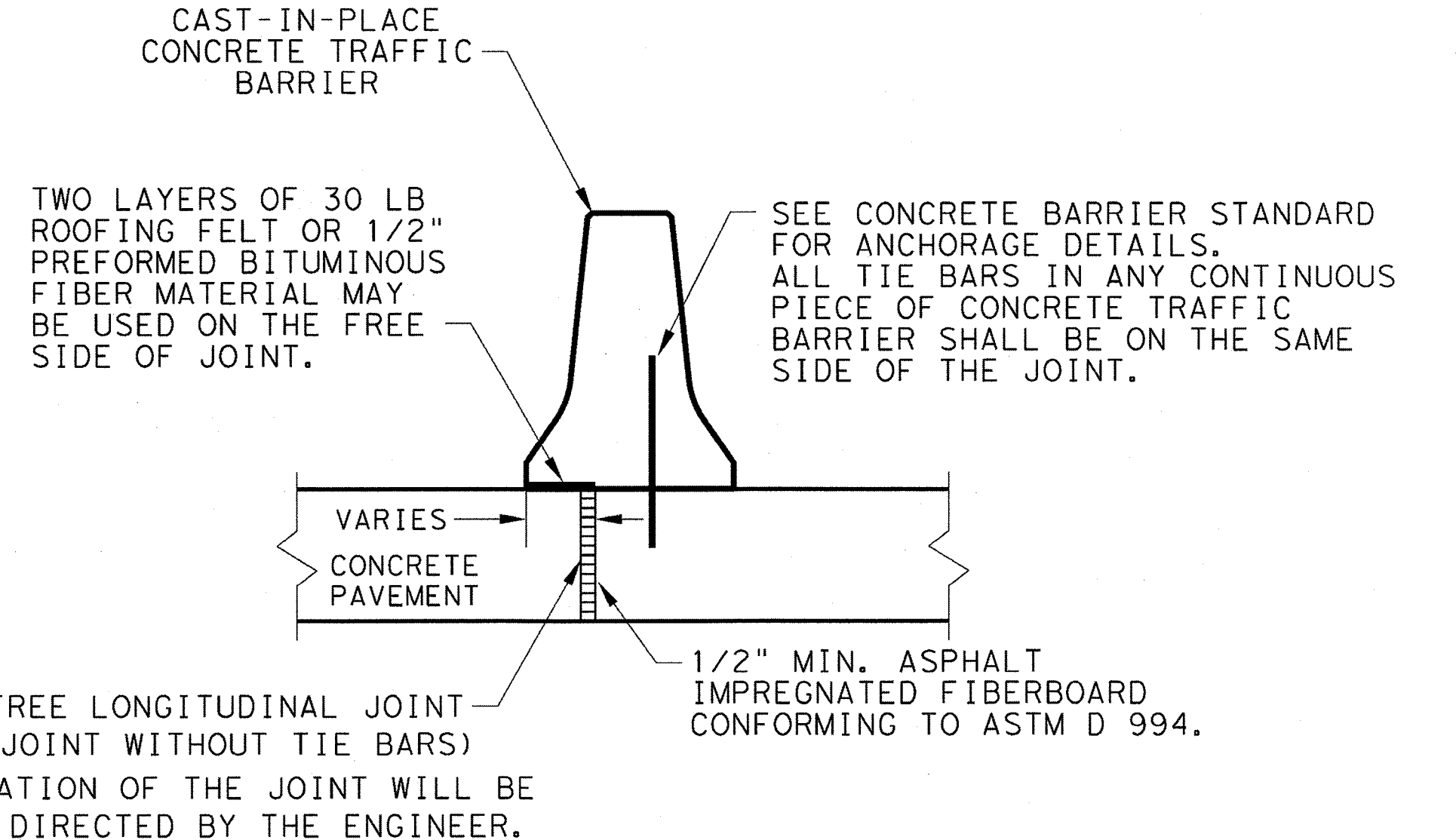
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

**TABLE NO. 1A LONGITUDINAL STEEL FOR LOW CTE CONCRETE AS APPROVED BY THE ENGINEER**

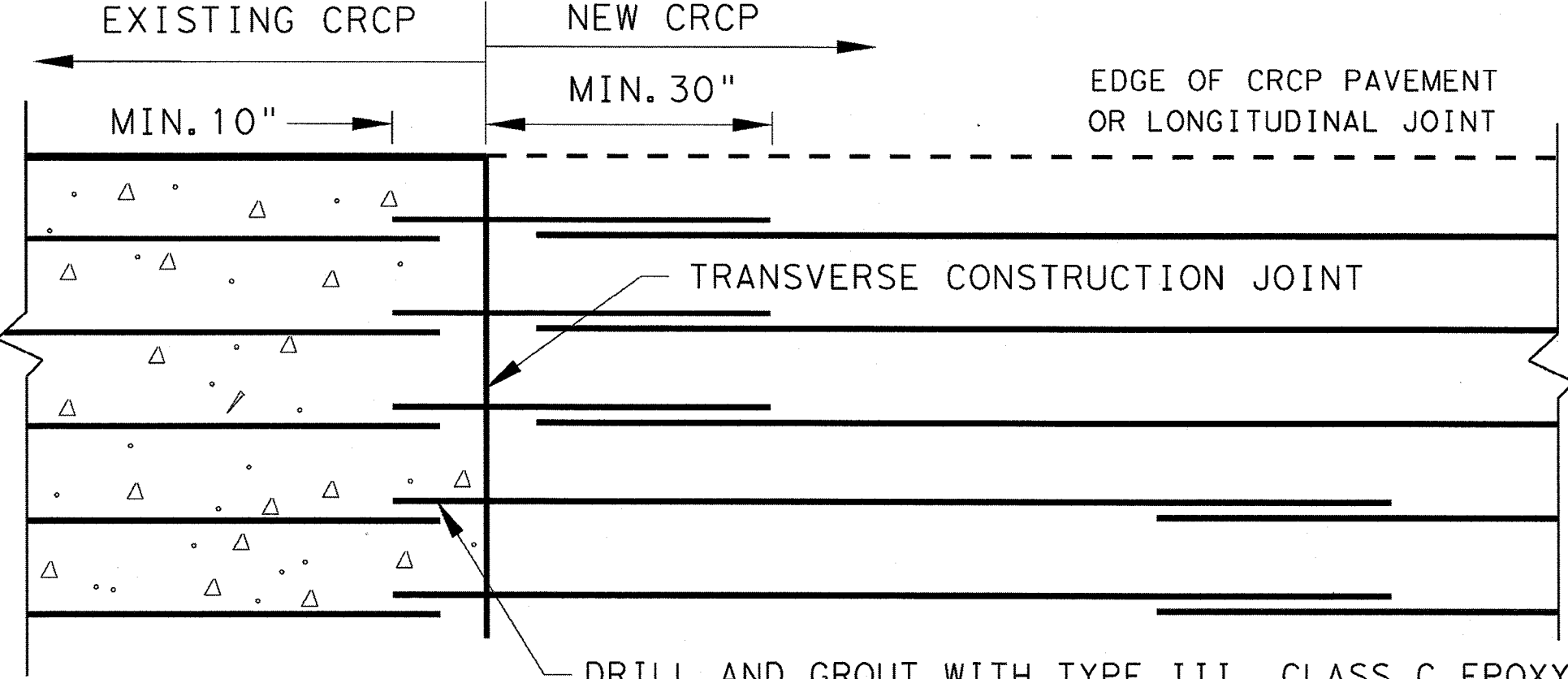
SLAB THICKNESS AND BAR SIZE		REGULAR STEEL BARS	FIRST SPACING AT EDGE OR JOINT	ADDITIONAL STEEL BARS AT TRANSVERSE CONSTRUCTION JOINT (SECTION X-X)	
T (IN.)	BAR SIZE	SPACING C (IN.)	SPACING a (IN.)	SPACING 2 x c (IN.)	LENGTH L (IN.)
7.0	#5	7.5	3 TO 4	15	50
7.5	#5	7.0	3 TO 4	14	50
8.0	#6	10.0	3 TO 4	20	50
8.5	#6	9.5	3 TO 4	19	50
9.0	#6	9.0	3 TO 4	18	50
9.5	#6	8.5	3 TO 4	17	50
10.0	#6	8.0	3 TO 4	16	50
10.5	#6	7.5	3 TO 4	15	50
11.0	#6	7.0	3 TO 4	14	50
11.5	#6	6.75	3 TO 4	13.5	50
12.0	#6	6.50	3 TO 4	13	50
12.5	#6	6.25	3 TO 4	12.5	50
13.0	#6	6.0	3 TO 4	12	50



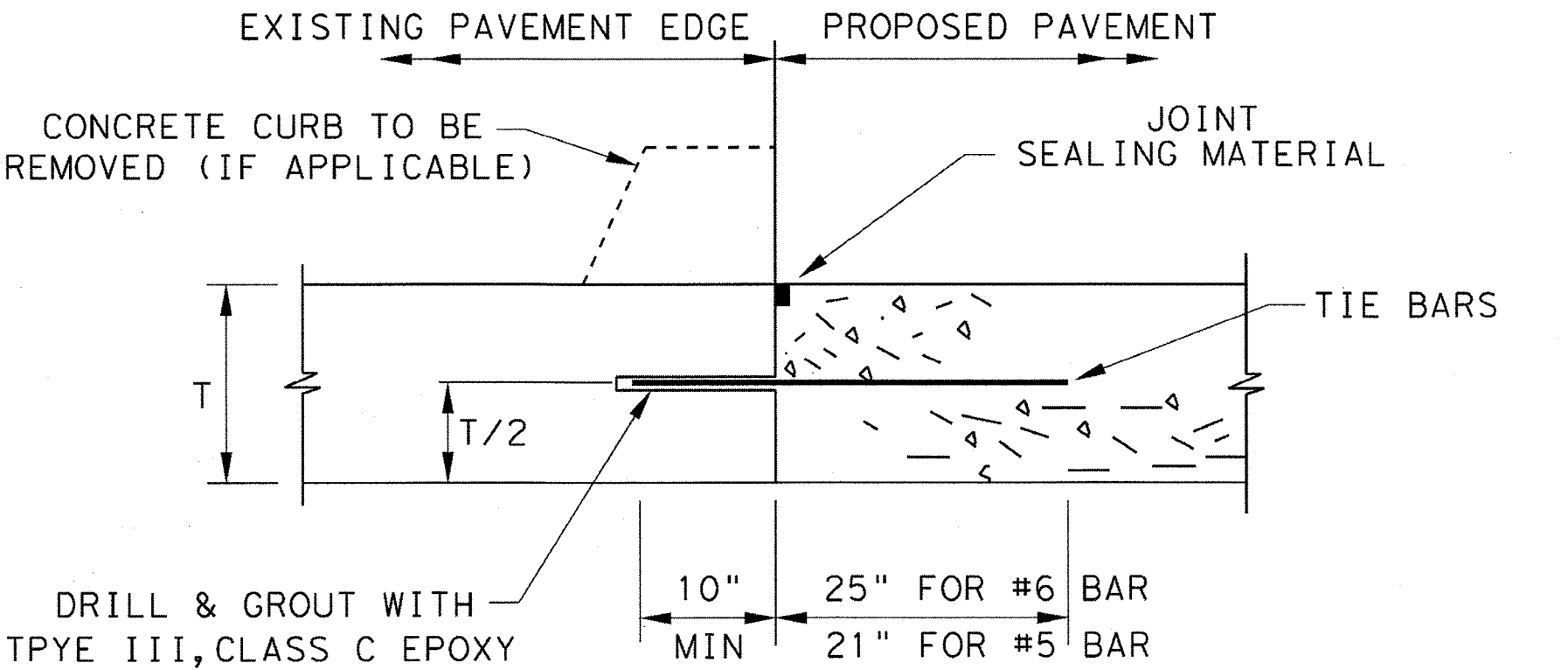
**TRANSVERSE EXPANSION JOINT DETAIL AT BRIDGE APPROACH**



**FREE LONGITUDINAL JOINT DETAIL**

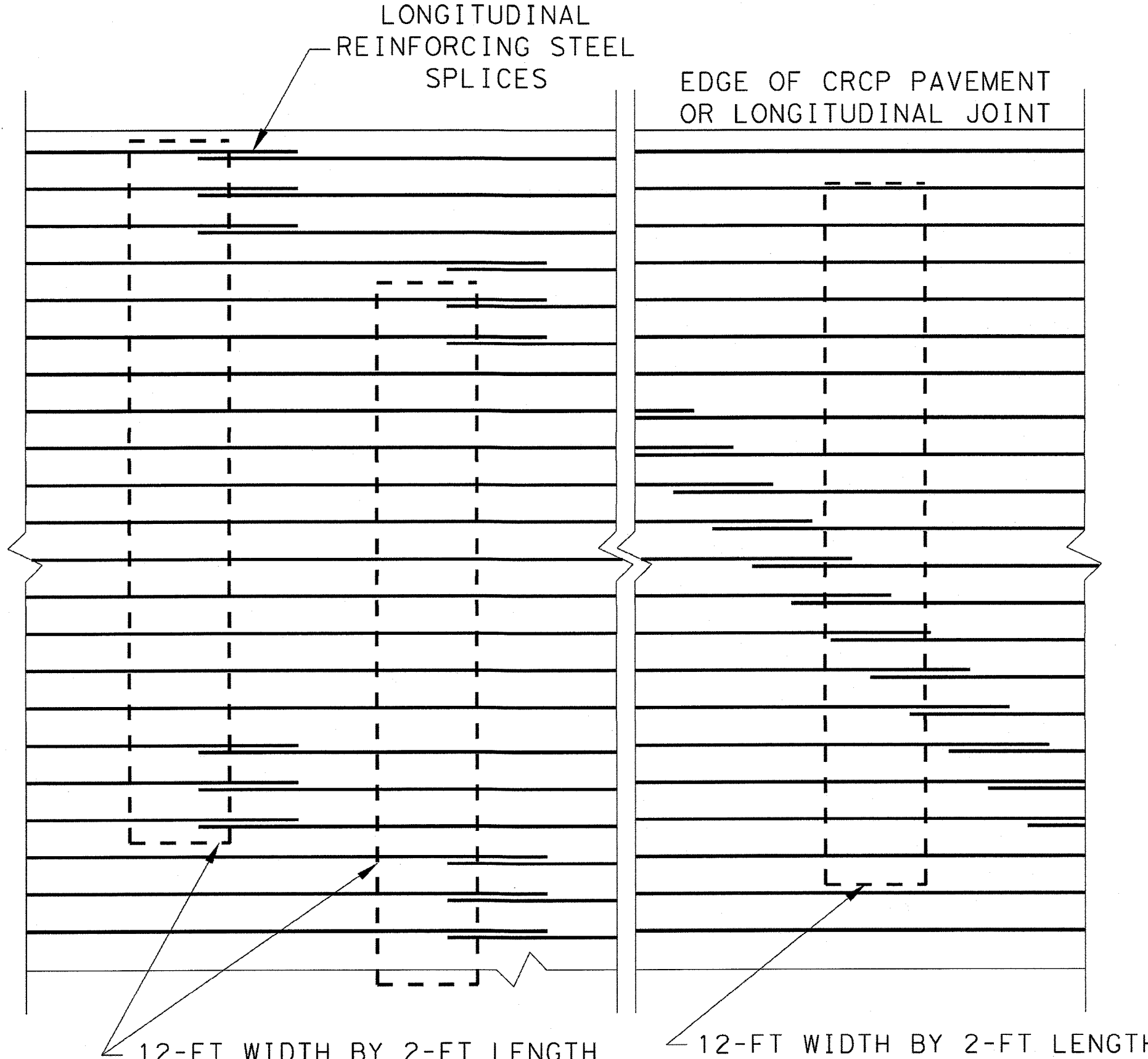


**OPTION A: DRILL AND EPOXY PLAN VIEW ( NOT TO SCALE)**



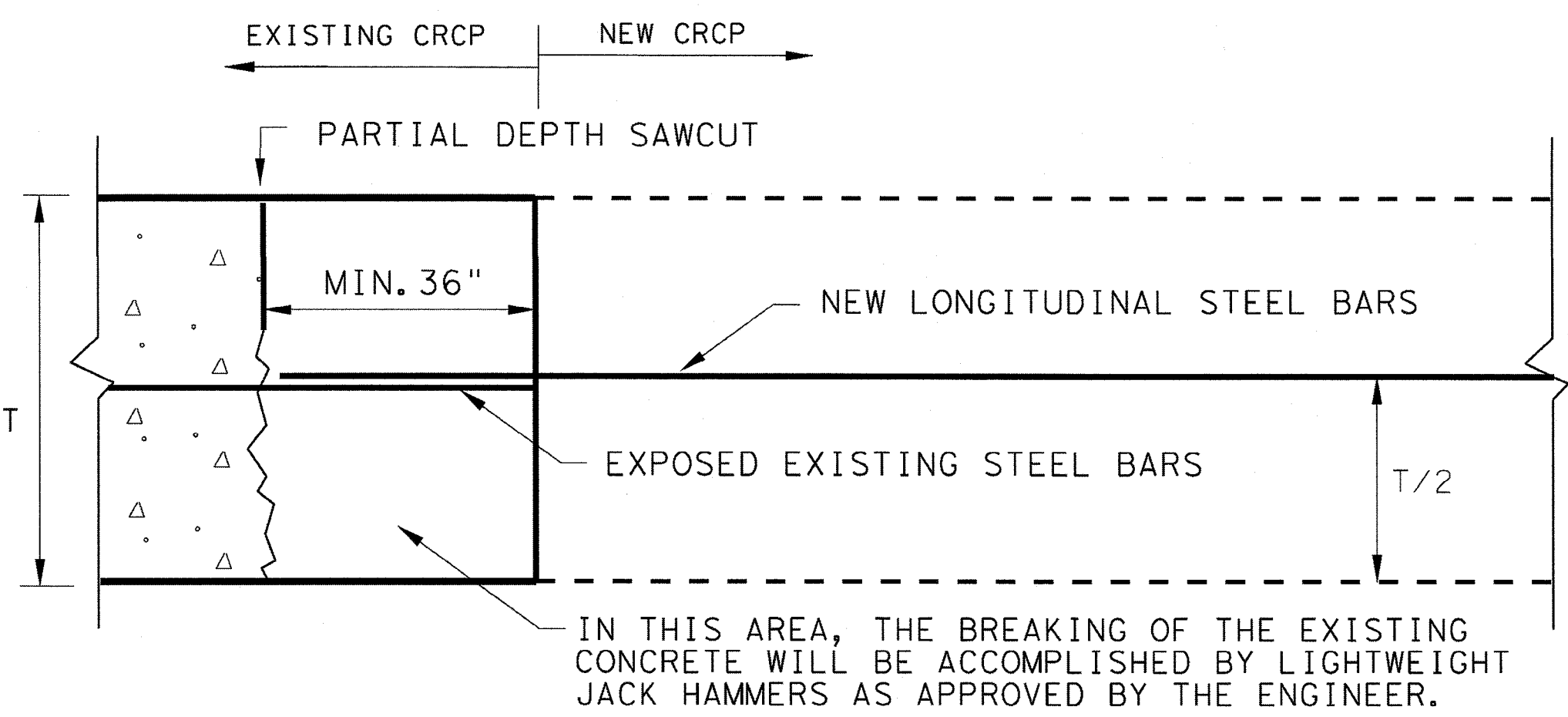
1. BEFORE WIDENING WORK, DEMONSTRATE THAT THE BOND STRENGTH OF THE EPOXY-GROUTED TIE BARS MEETS THE REQUIREMENTS OF PULL-OUT TEST SPECIFIED IN ITEM 361.
2. SPACE TIE BARS AT 24" SPACING. USE #6 TIE BARS FOR 8" AND THICKER SLABS, USE #5 TIE BARS FOR LESS THAN 8" THICK SLABS.

**LONGITUDINAL WIDENING JOINT DETAIL**



STAGGER THE LAP LOCATIONS SO THAT NO MORE THAN 1/3 OF THE LONGITUDINAL STEEL IS SPICED IN ANY GIVEN 12-FT. WIDTH AND 2-FT. LENGTH OF THE PAVEMENT. ANY OTHER LAP CONFIGURATION MEETING THIS REQUIREMENT WILL BE ALLOWED.

**EXAMPLES OF LAP CONFIGURATION PLAN VIEW ( NOT TO SCALE)**



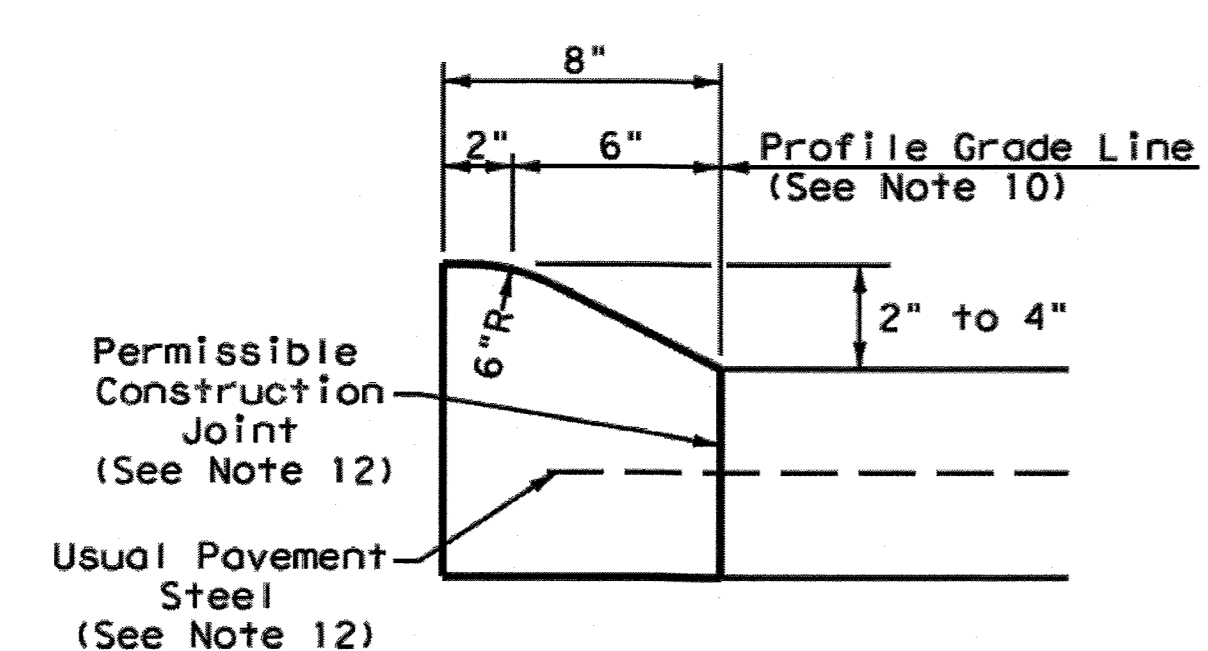
**OPTION B: BREAKBACK AND LAP TRANSVERSE TIE JOINT DETAIL EXISTING CRCP TO NEW CRCP**

		<b>Design Division Standard</b>	
<b>CONTINUOUSLY REINFORCED CONCRETE PAVEMENT</b> <b>ONE LAYER STEEL BAR PLACEMENT</b> <b>T - 7 TO 13 INCHES</b> <b>CRCP (1) - 13</b>			
FILE: crcp113.dgn	DN: TxDOT	CK: AN	DW: HC/VP
© TxDOT October 2013	CONT SECT	JOB	HIGHWAY
REVISIONS		DIST	COUNTY
		SHEET NO.	

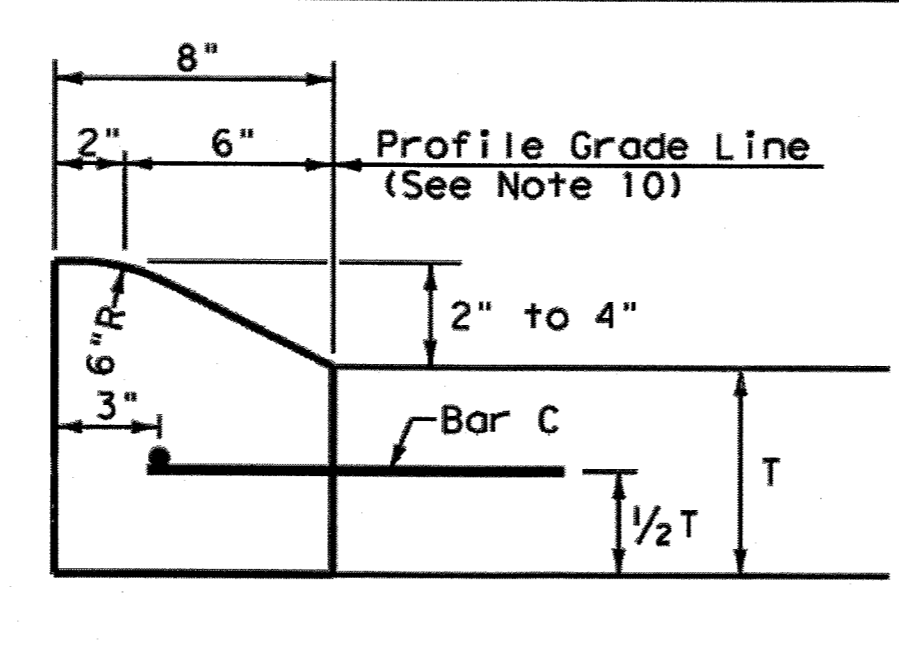
DATE: FILE:

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.

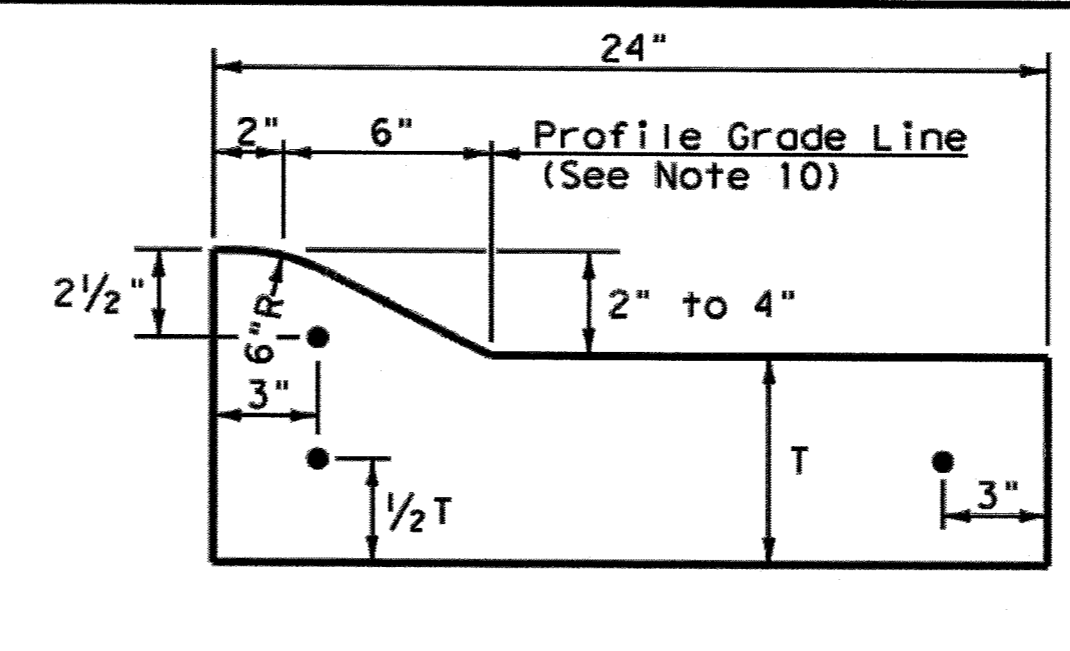
DATE: FILE:



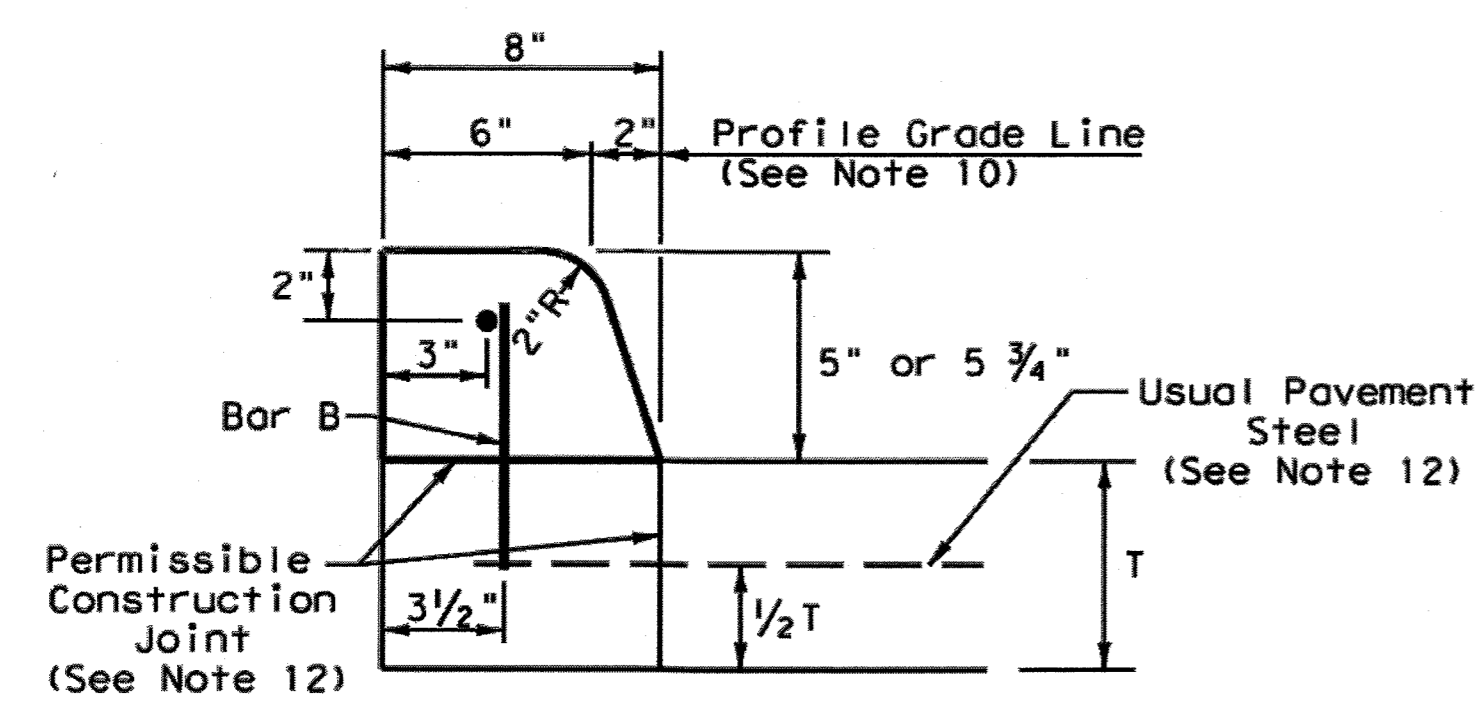
**TYPE I CURB (MONOLITHIC)**  
2" - 4" HEIGHT



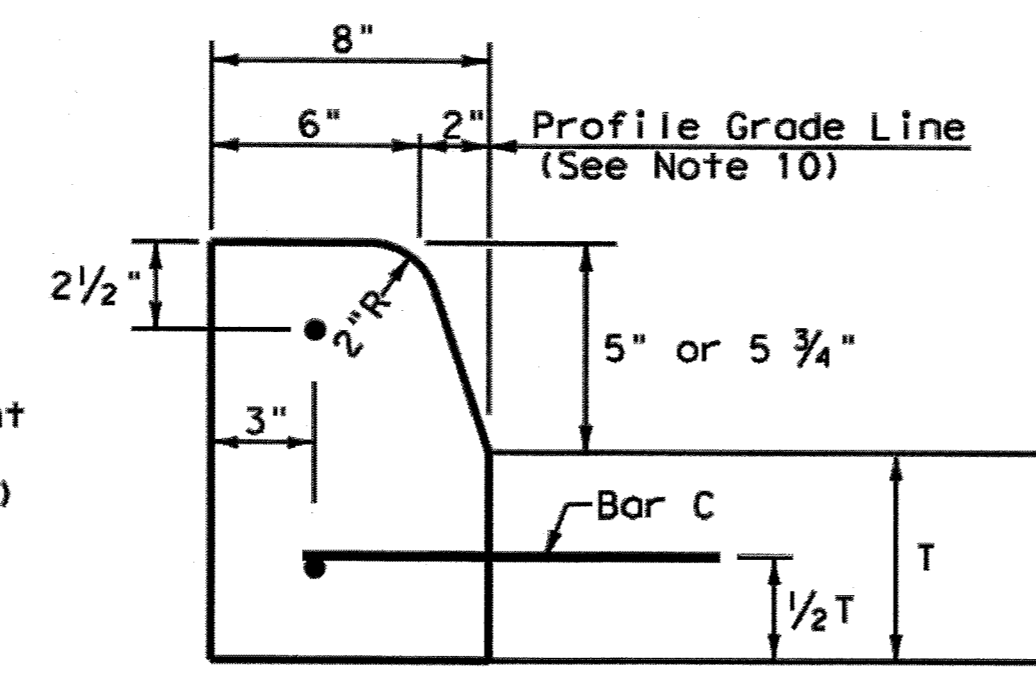
**TYPE I CURB**  
2" - 4" HEIGHT



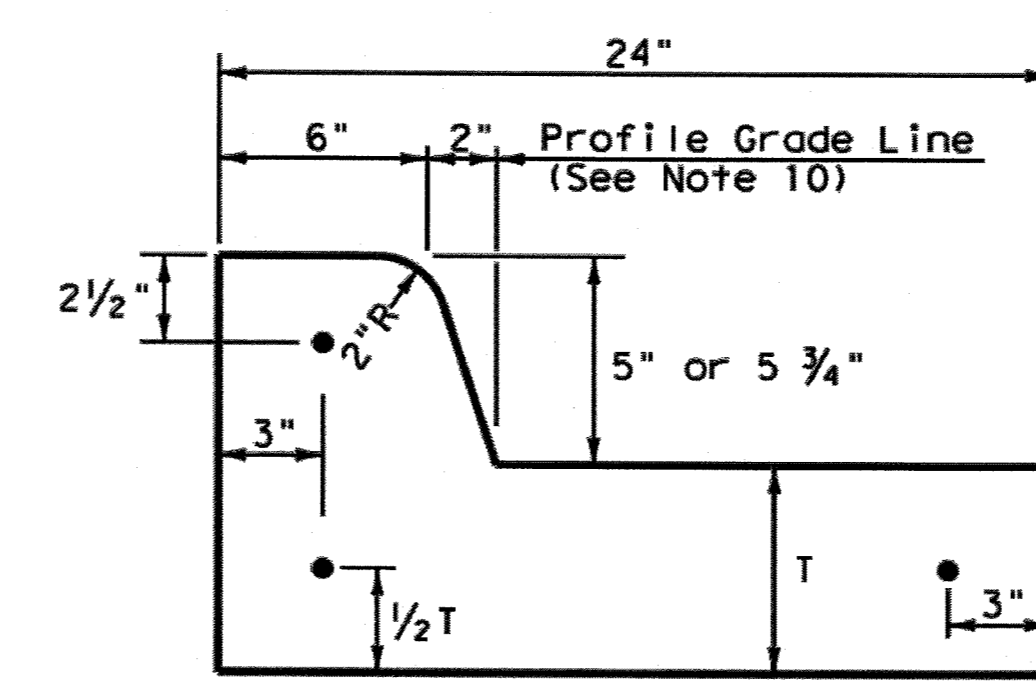
**TYPE I CURB AND GUTTER**  
2" - 4" HEIGHT



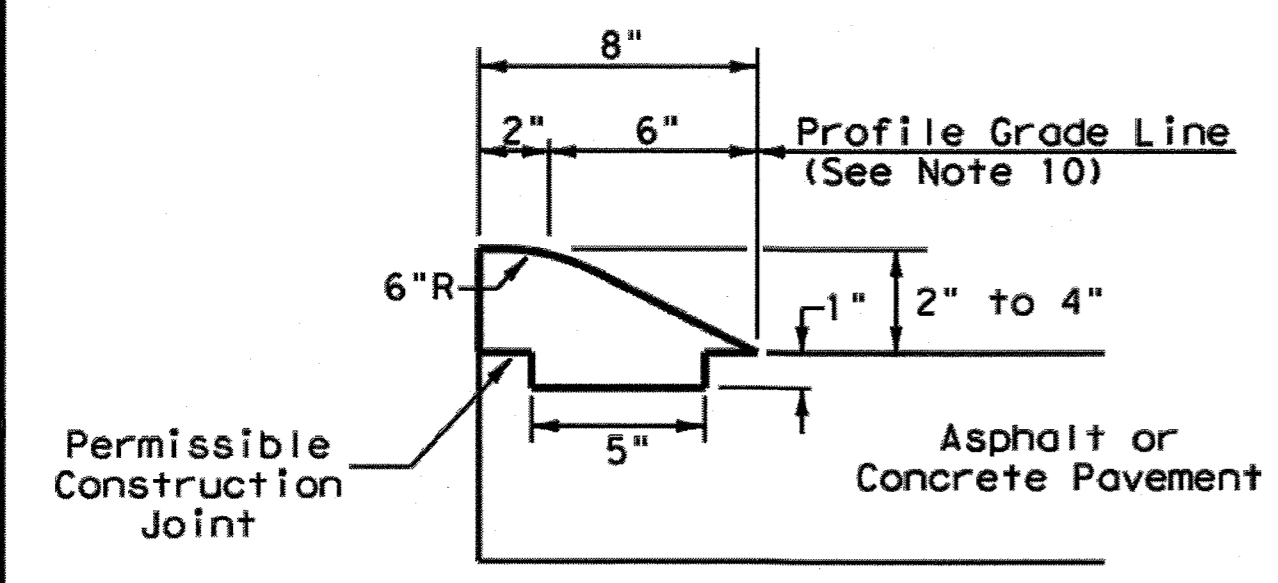
**TYPE II CURB (MONOLITHIC)**  
5" - 5 3/4" HEIGHT



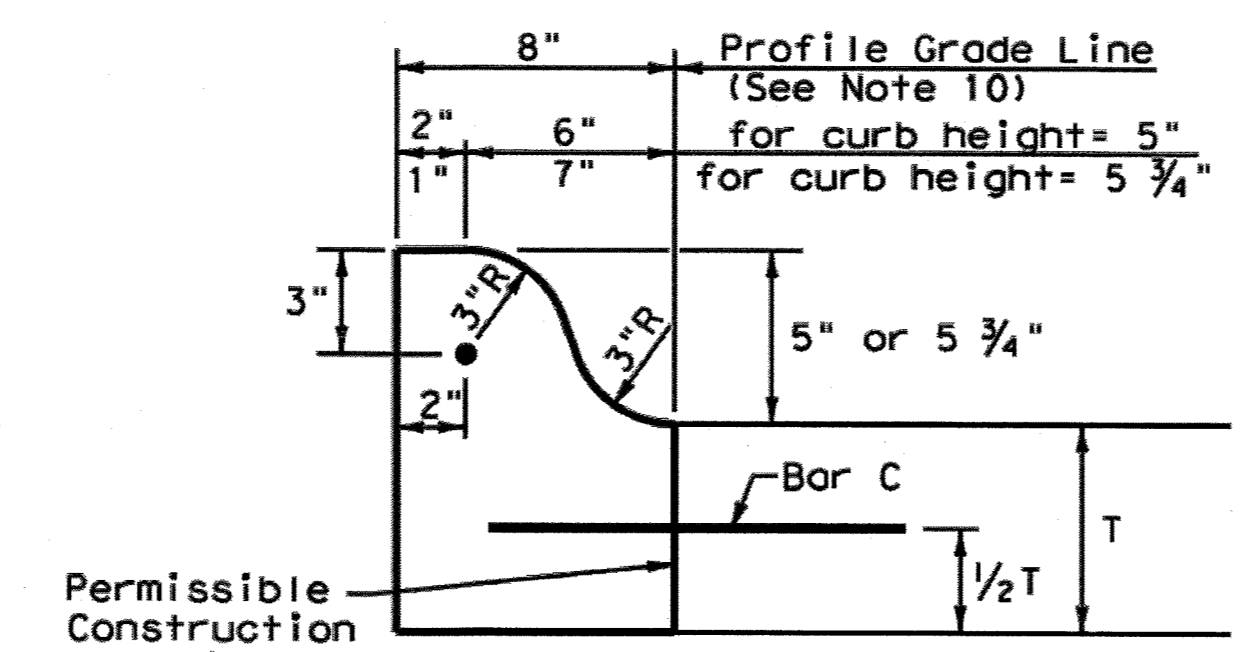
**TYPE II CURB**  
5" - 5 3/4" HEIGHT



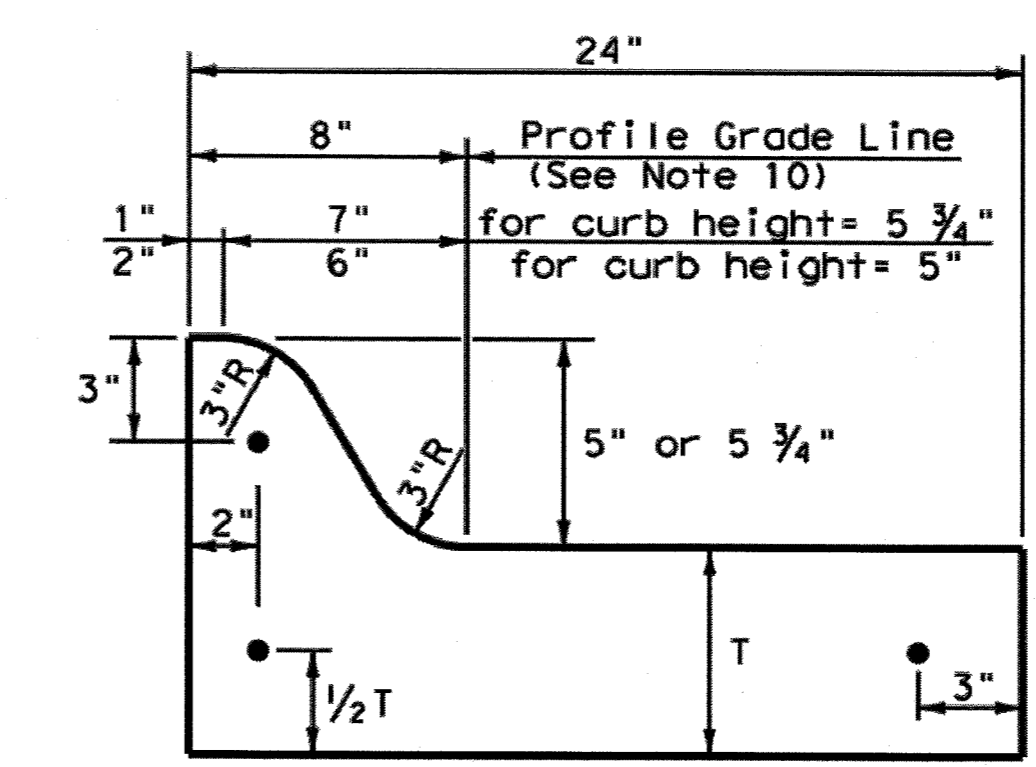
**TYPE II CURB AND GUTTER**  
5" - 5 3/4" HEIGHT



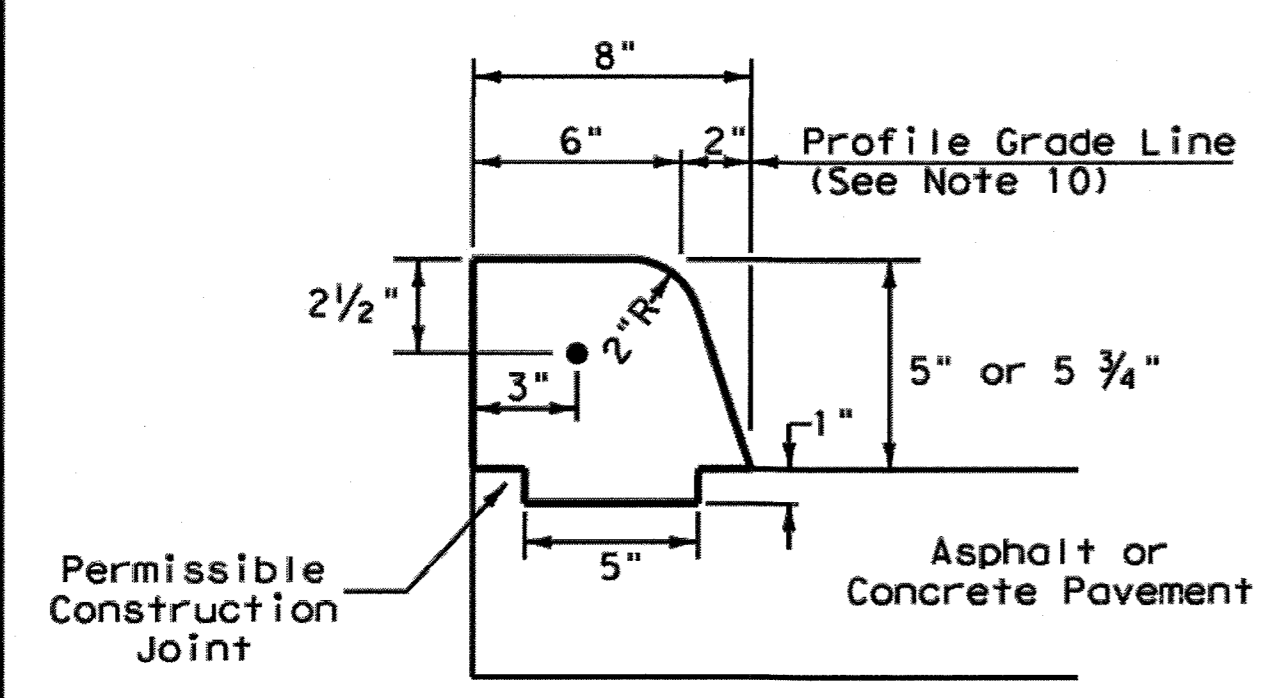
**TYPE III CURB (KEYED)**  
2" - 4" HEIGHT



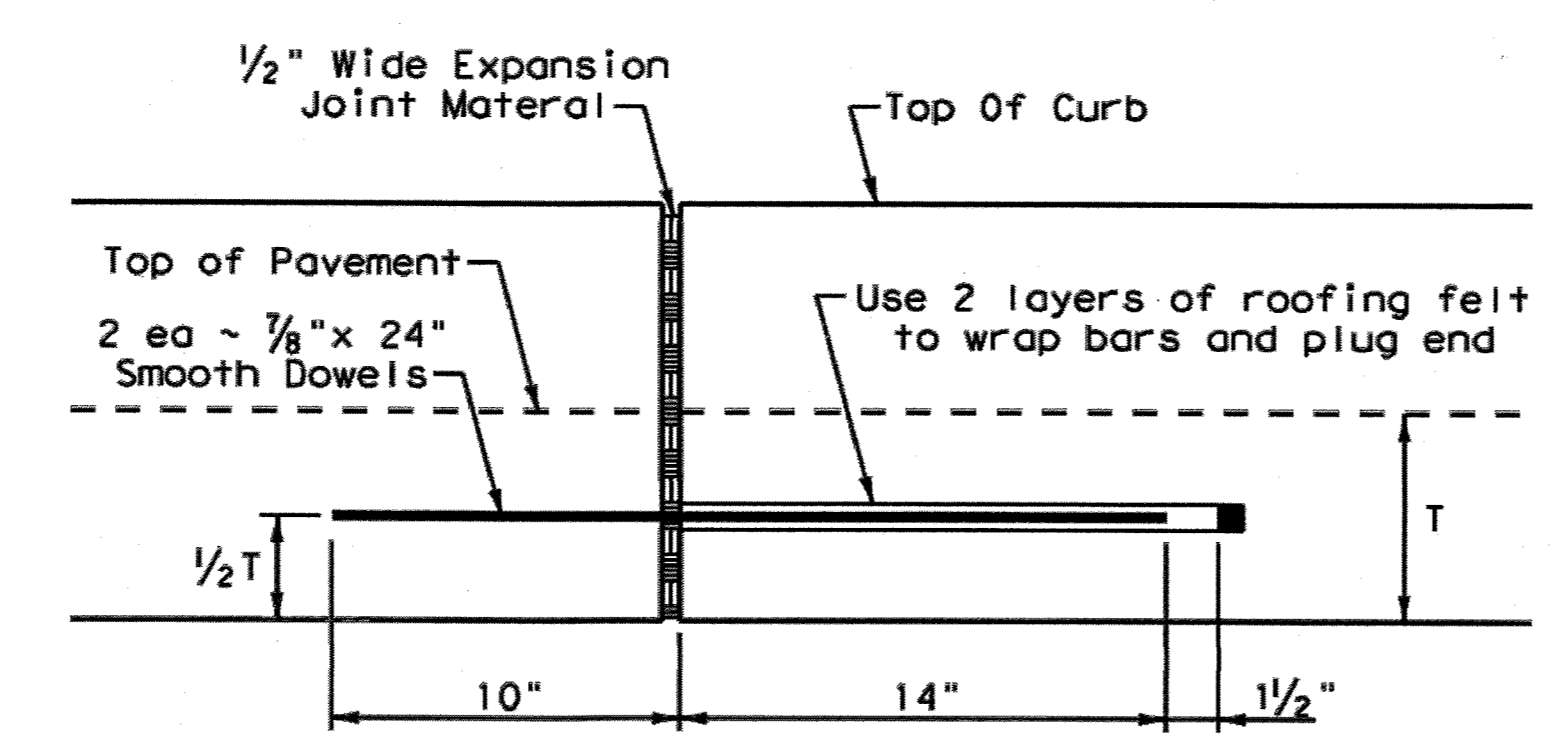
**TYPE IIIa CURB**  
5" - 5 3/4" HEIGHT



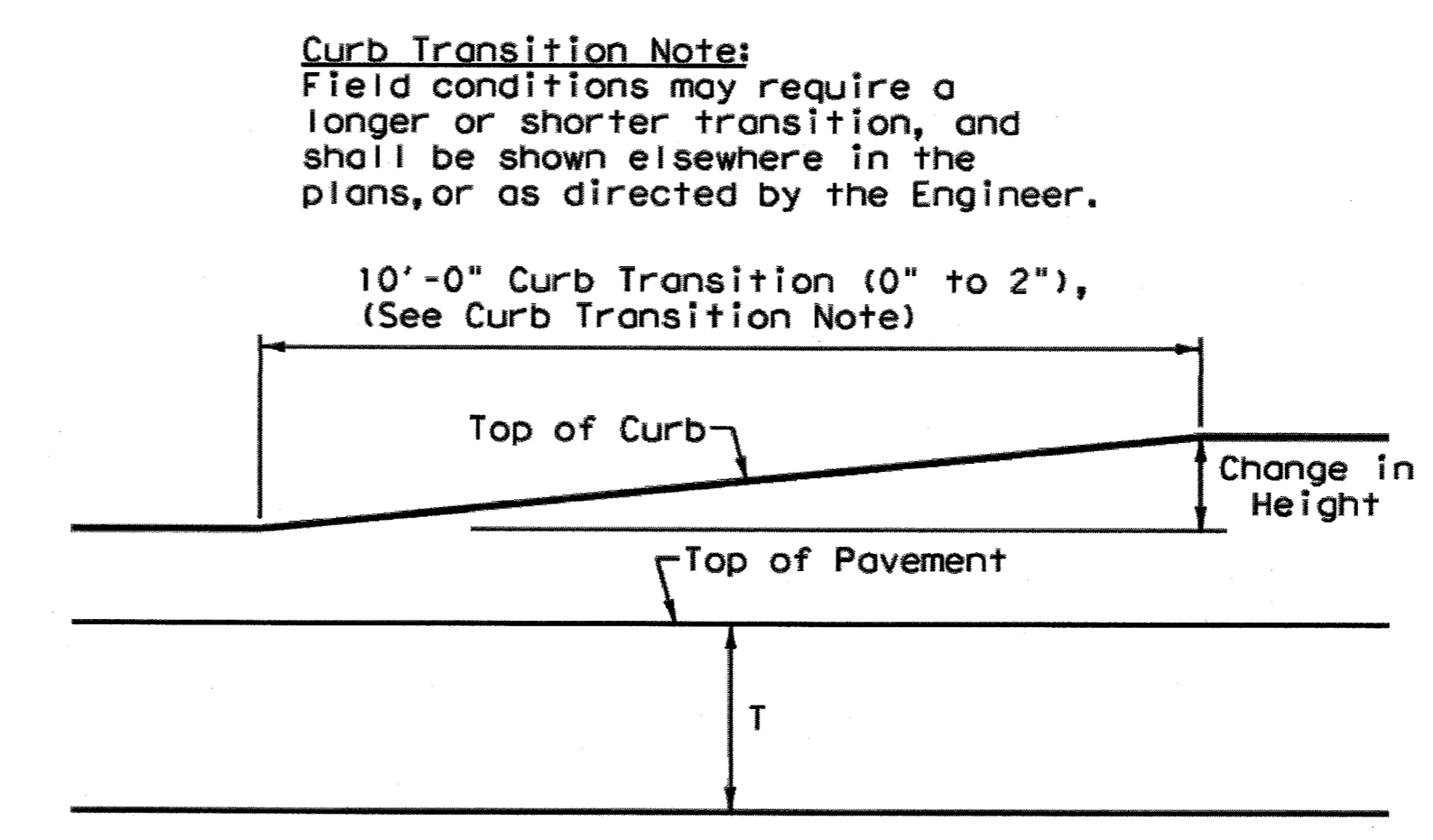
**TYPE IIIa CURB AND GUTTER**  
5" - 5 3/4" HEIGHT



**TYPE IV CURB (KEYED)**  
5" - 5 3/4" HEIGHT



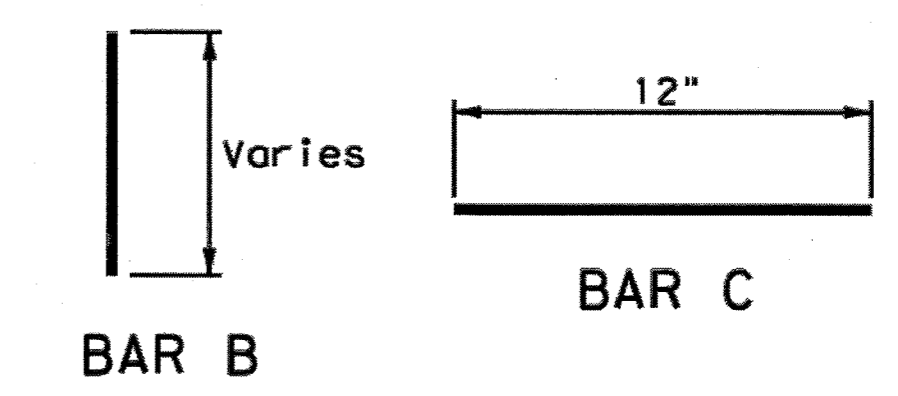
**EXPANSION JOINT DETAIL**



**CURB TRANSITION**  
Note: To be paid for as Highest Curb

**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 synthetic fiber in lieu of steel reinforcing is acceptable, provided the fiber producer is on the Department Producer List (MPL), maintained by TxDOT, Construction Division.
4. Round exposed sharp edges with a rounding tool, to a minimum radius of 1/4 inch.
5. All existing curbs and driveways to be removed shall be sawed or removed at existing joints.
6. Where concrete curb is placed on existing concrete pavement, the pavement shall be drilled and the reinforcing bars grouted in place.
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 vertical permissible construction joints are used, resulting in a longitudinal construction joint in the pavement, the longitudinal pavement steel shall be placed in accordance with pavement details shown elsewhere in the plans for longitudinal construction joints. Reinforcing steel for curb section shall then conform to that required for concrete curb.



Texas Department of Transportation  
Design Division Standard

**CONCRETE CURB AND GUTTER**

**CCCG-12**

FILE: cccg12	DW: TxDOT	CK: AM	DW: VP	CK:
© TxDOT 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS				
DIST			COUNTY	SHEET NO.

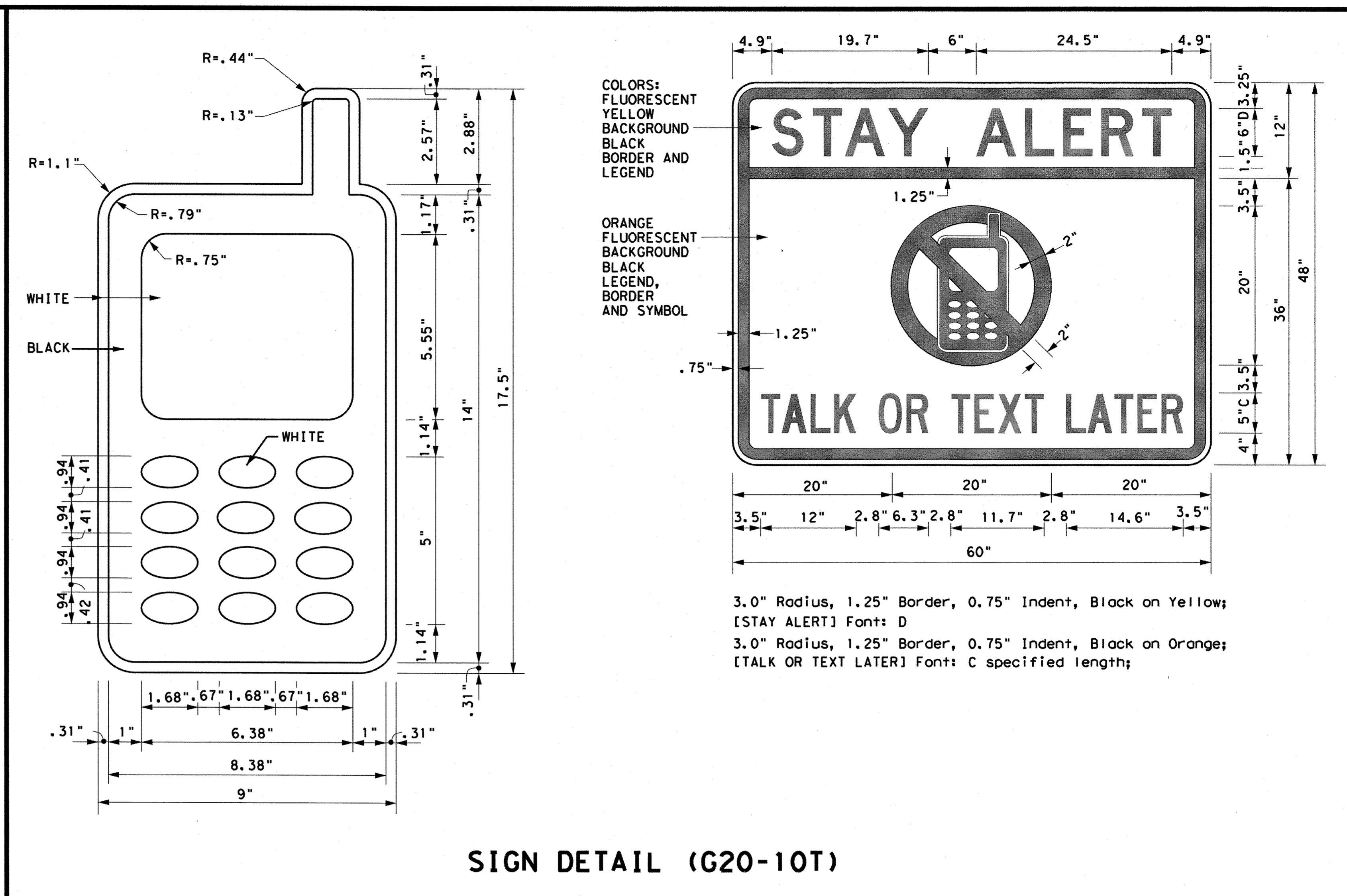
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

**BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:**

- 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).
- The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- As shown on BC(2), the OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER (see Sign Detail G20-10T) and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. However, the TRAFFIC FINES DOUBLE sign will not be required on projects consisting solely of mobile operation work, such as striping or milling edgeline rumble strips. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits.
- Except for devices required by Note 10, traffic control devices should be in place only while work is actually in progress or a definite need exists.
- The Engineer has the final decision on the location of all traffic control devices.
- 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 APPAREL NOTES:**

- Workers on foot who are exposed to traffic or to construction equipment within the right-of-way shall wear high-visibility safety apparel meeting the requirements of 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.



**SIGN DETAIL (G20-10T)**

Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found on-line at the web address given below or by contacting:

Texas Department of Transportation  
 Traffic Operations Division - TE  
 Phone (512) 416-3118

<b>THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT</b> <a href="http://www.txdot.gov">http://www.txdot.gov</a>
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

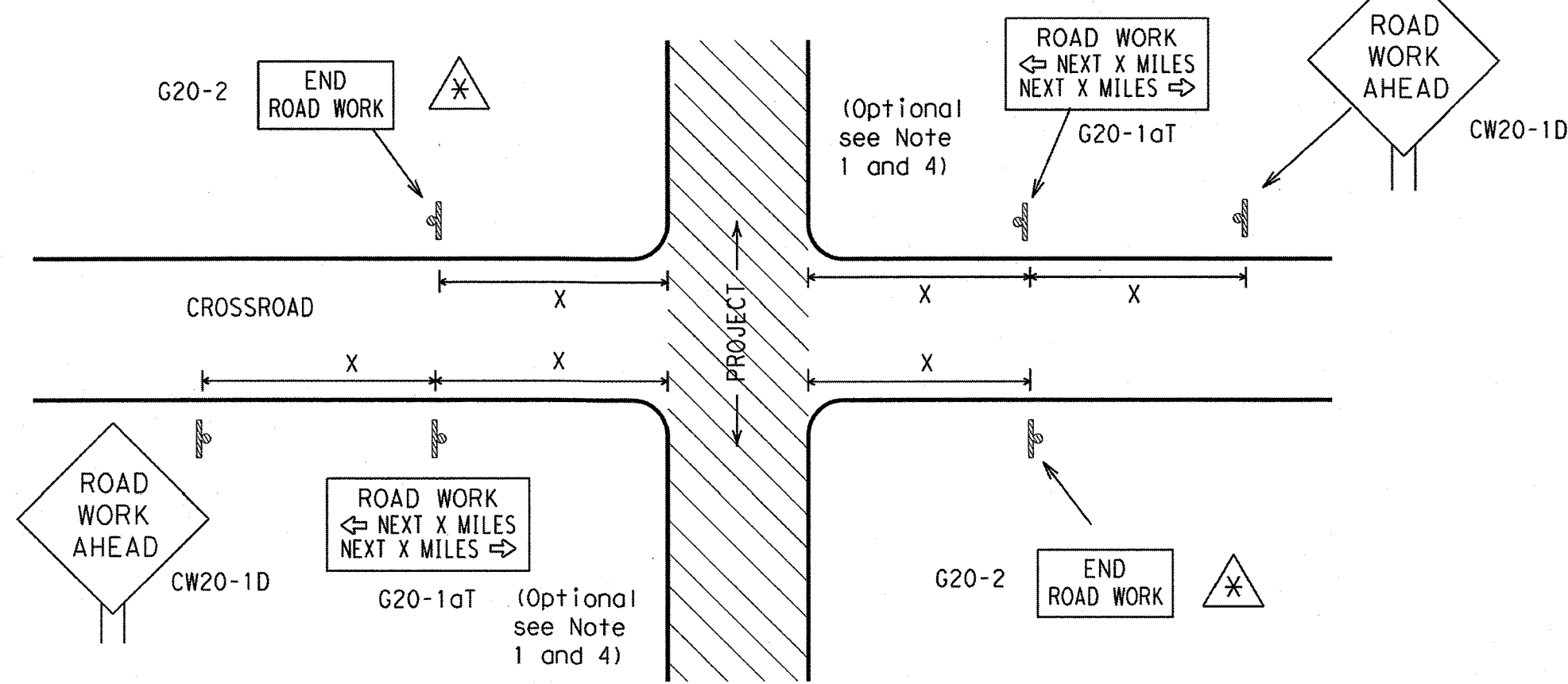
Texas Department of Transportation  
 Traffic Operations Division Standard

**BARRICADE AND CONSTRUCTION  
 GENERAL NOTES  
 AND REQUIREMENTS**  
**BC(1)-14**

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS				
4-03	5-10	8-14		
9-07	7-13			
DIST			COUNTY	SHEET NO.
				36

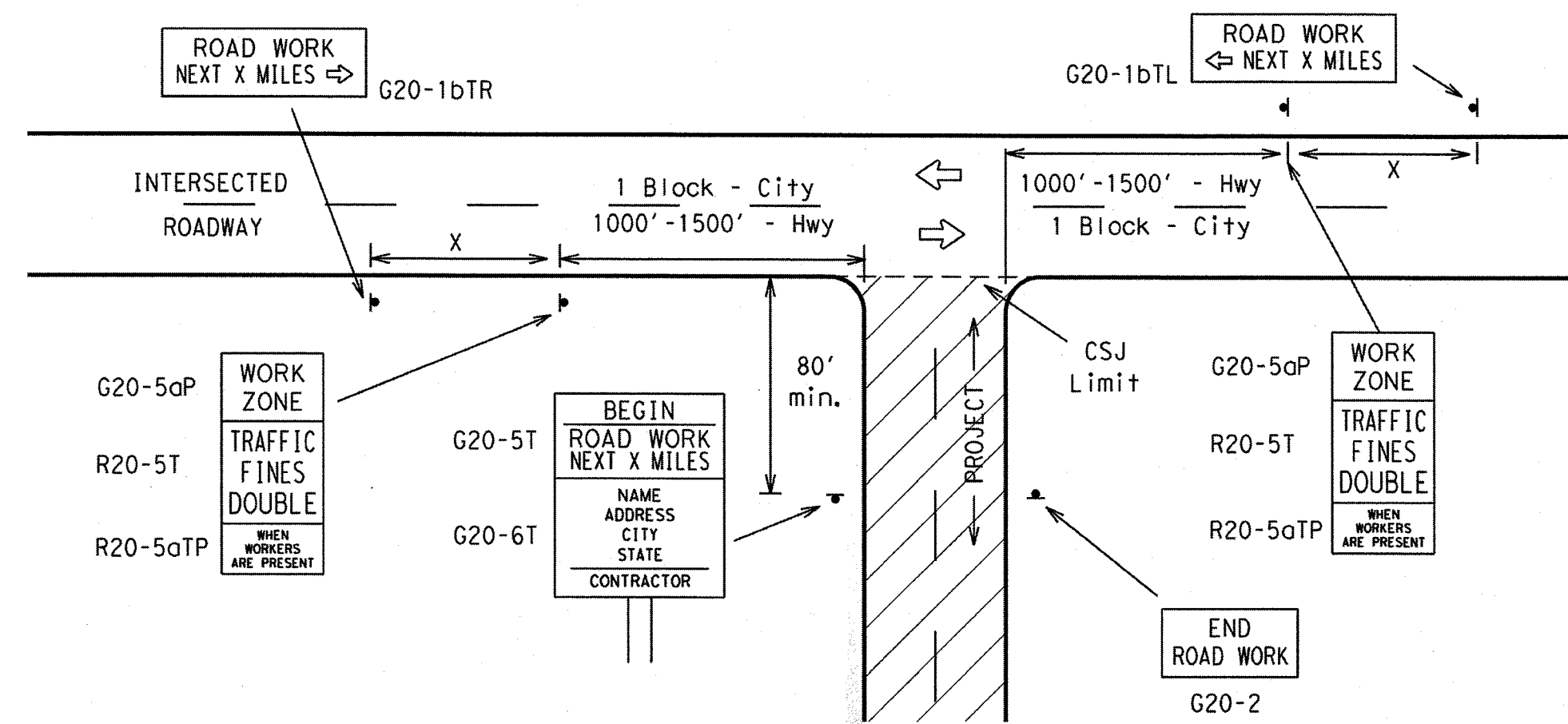
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

**TYPICAL LOCATION OF CROSSROAD SIGNS**



- △ May be mounted on back of "ROAD WORK AHEAD" (CW20-1D) sign with approval of Engineer. (See note 2 below)
- The typical minimum signing on a crossroad approach should be a "ROAD WORK AHEAD" (CW20-1D) sign and a (G20-2) "END ROAD WORK" sign, unless noted otherwise in plans.
  - The Engineer may use the reduced size 36" x 36" ROAD WORK AHEAD (CW20-1D) sign mounted back to back with the reduced size 36" x 18" "END ROAD WORK" (G20-2) sign on low volume crossroads (see Note 4 under "Typical Construction Warning Sign Size and Spacing"). See the "Standard Highway Sign Designs for Texas" manual for sign details. The Engineer may omit the advance warning signs on low volume crossroads. The Engineer will determine whether a road is low volume. This information shall be shown in the plans.
  - Based on existing field conditions, the Engineer/Inspector may require additional signs such as FLAGGER AHEAD, LOOSE GRAVEL, or other appropriate signs. When additional signs are required, these signs will be considered part of the minimum requirements. The Engineer/Inspector will determine the proper location and spacing of any sign not shown on the BC sheets, Traffic Control Plan sheets or the Work Zone Standard Sheets.
  - The "ROAD WORK NEXT X MILES" (G20-1aT) sign shall be required at high volume crossroads to advise motorists of the length of construction in either direction from the intersection. The Engineer will determine whether a roadway is considered high volume.
  - Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
  - When work occurs in the intersection area, appropriate traffic control devices, as shown elsewhere in the plans or as determined by the Engineer/Inspector, shall be in place.

**T-INTERSECTION**



**CSJ LIMITS AT T-INTERSECTION**

- The Engineer will determine the types and location of any additional traffic control devices, such as a flagger and accompanying signs, or other signs, that should be used when work is being performed at or near an intersection.
- If construction closes the road at a T-intersection the Contractor shall place the "CONTRACTOR NAME" (G20-6T) sign behind the Type 3 Barricades for the road closure (see BC(10) also). The "ROAD WORK NEXT X MILES" left arrow (G20-1bTL) and "ROAD WORK NEXT X MILES" right arrow (G20-1bTR) signs shall be replaced by the detour signing called for in the plans.

**TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING<sup>1,5,6</sup>**

Sign Number or Series	SIZE		SPACING	
	Conventional Road	Expressway/ Freeway	Posted Speed MPH	Sign Δ Spacing "x" (Feet (Apprx.))
CW20 <sup>4</sup>	48" x 48"	48" x 48"	30	120
CW21			35	160
CW22			40	240
CW23			45	320
CW25	36" x 36"	48" x 48"	50	400
CW1, CW2, CW7, CW8, CW9, CW11, CW14			55	500 <sup>2</sup>
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12			60	600 <sup>2</sup>
			65	700 <sup>2</sup>
	48" x 48"	48" x 48"	70	800 <sup>2</sup>
			75	900 <sup>2</sup>
			80	1000 <sup>2</sup>
			*	* <sup>3</sup>

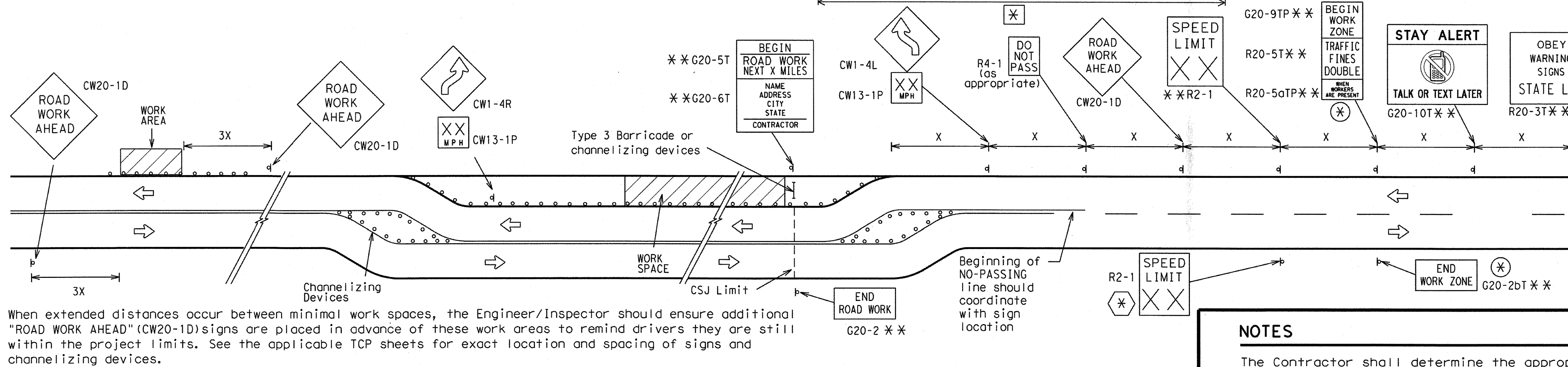
\* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

Δ Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

**GENERAL NOTES**

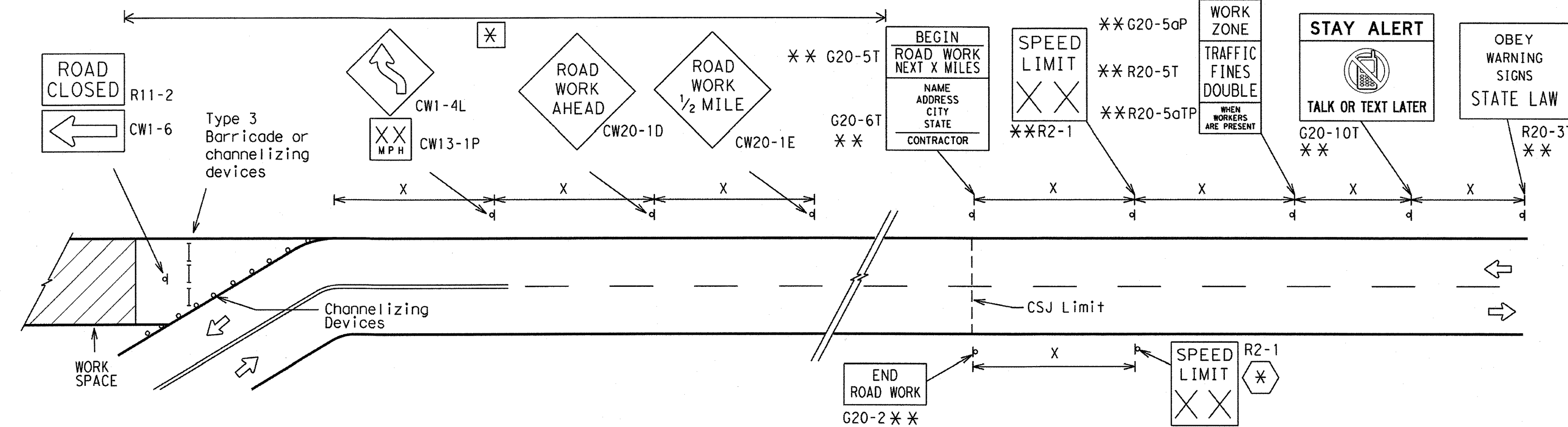
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be used on low volume crossroads at the discretion of the Engineer. See Note 2 under "Typical Location of Crossroad Signs".
- Only diamond shaped warning sign sizes are indicated.
- See sign size listing in "TMUTCD", Sign Appendix or the "Standard Highway Sign Designs for Texas" manual for complete list of available sign design sizes.

**WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS**



When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD" (CW20-1D) signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing of signs and channelizing devices.

**SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING DOWNSTREAM OF THE CSJ LIMITS**



**NOTES**

- The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and "BEGIN ROAD WORK NEXT X MILES" (G20-5T) sign for each specific project. This distance shall replace the "X" and shall be rounded to the nearest whole mile with the approval of the Engineer. No decimals shall be used.
- ⊗ The "BEGIN WORK ZONE" (G20-9TP) and "END WORK ZONE" (G20-2bT) shall be used as shown on the sample layout when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a part of the work zone lying outside the CSJ Limits where traffic fines may double if workers are present.
- \*\* Required CSJ Limit signing. See Note 10 on BC(1). TRAFFIC FINES DOUBLE signs will not be required on projects consisting solely of mobile operations work.
- ⊗ Area for placement of "ROAD WORK AHEAD" (CW20-1D) sign and other signs or devices as called for on the Traffic Control Plan.
- ⊗ Contractor will install a regulatory speed limit sign at the end of the work zone.

**LEGEND**

—	Type 3 Barricade
○ ○ ○	Channelizing Devices
⊗	Sign
X	See Typical Construction Warning Sign Size and Spacing chart or the TMUTCD for sign spacing requirements.

**BARRICADE AND CONSTRUCTION PROJECT LIMIT**

**BC(2)-14**

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS				
9-07 8-14				
7-13				
	DIST	COUNTY		SHEET NO.
				37

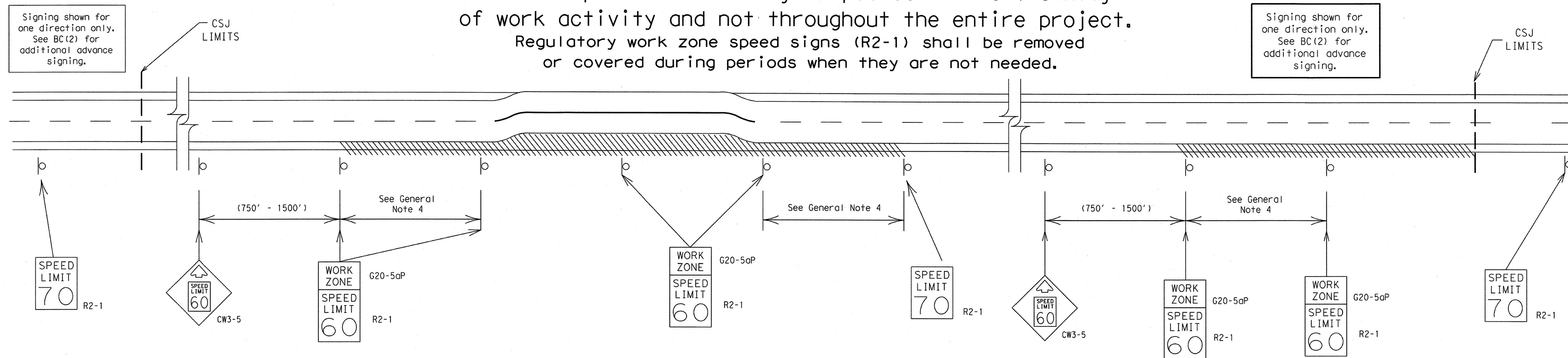
DATE: FILE:

# 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:

- rough road or damaged pavement surface
- substantial alteration of roadway geometrics (diversions)
- construction detours
- grade
- width
- 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 travelled 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

- Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
- Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
- Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
- 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
- Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
- 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.
- Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
- Techniques that may help reduce traffic speeds include but are not limited to:
  - Law enforcement.
  - Flagger stationed next to sign.
  - Portable changeable message sign (PCMS).
  - Low-power (drone) radar transmitter.
  - Speed monitor trailers or signs.
- Speeds shown on details above are for illustration only. Work Zone Speed Limits should only be posted as approved for each project.
- For more specific guidance concerning the type of work, work zone conditions and factors impacting allowable regulatory construction speed zone reduction see TxDOT form #1204 in the TxDOT e-form system.

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.

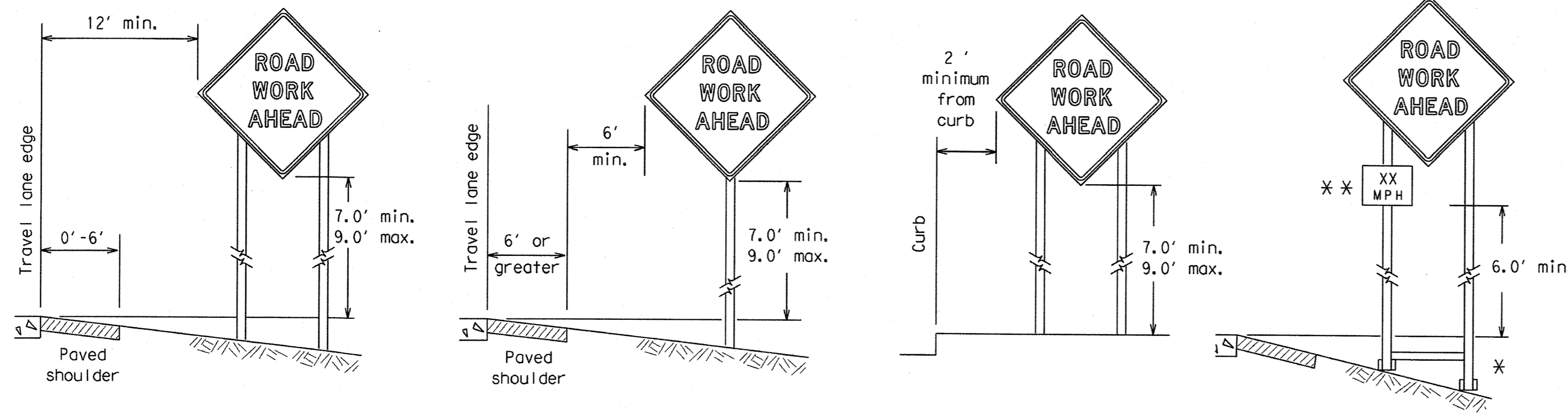
DATE:  
FILE:

SHEET 3 OF 12

		Traffic Operations Division Standard	
<h2>BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT</h2>			
<h3>BC (3) - 14</h3>			
FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
© TxDOT November 2002	CONT	SECT	JOB
REVISIONS			
9-07 8-14	DIST	COUNTY	SHEET NO.
7-13			38

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.

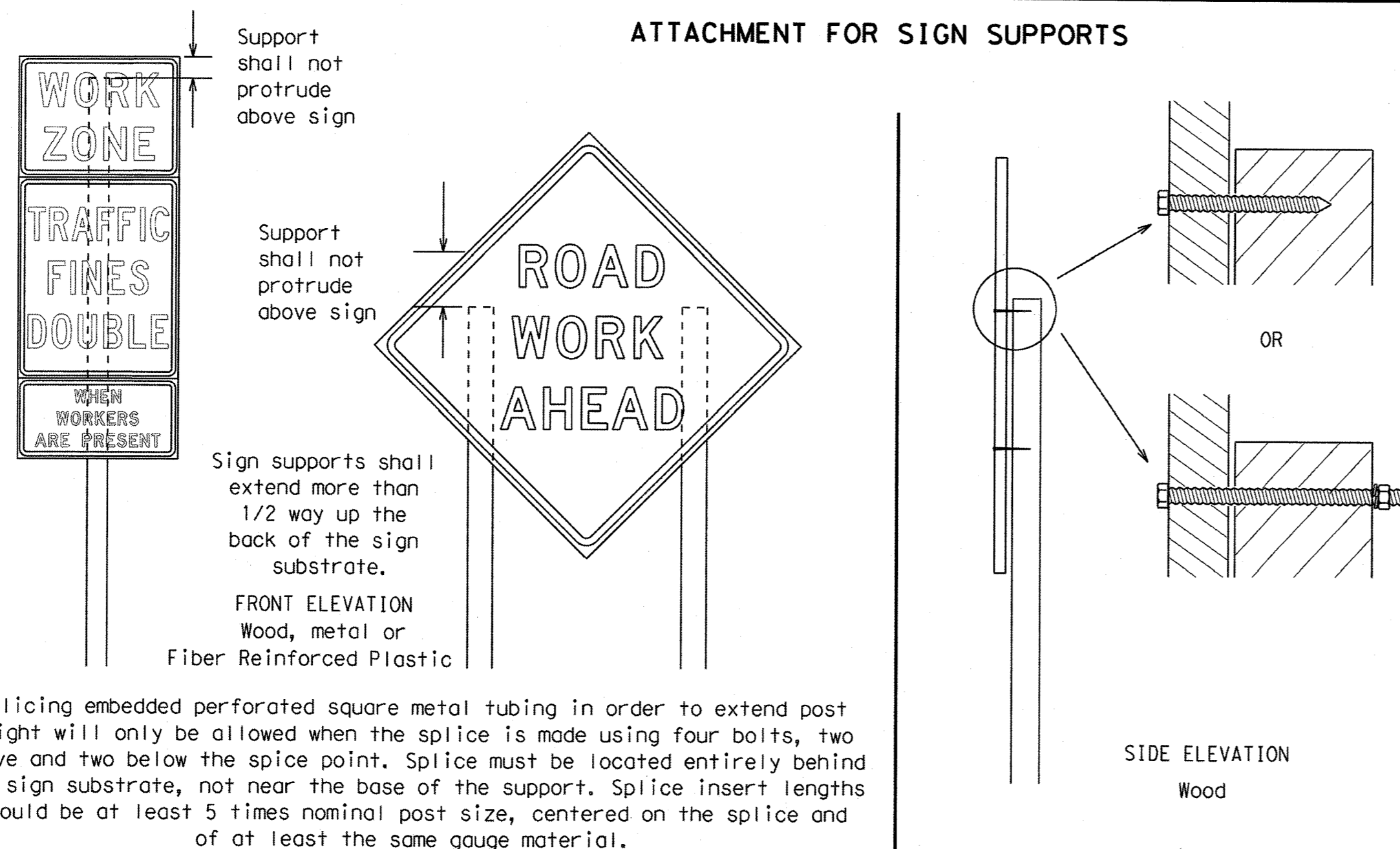
**TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS**



\* 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**

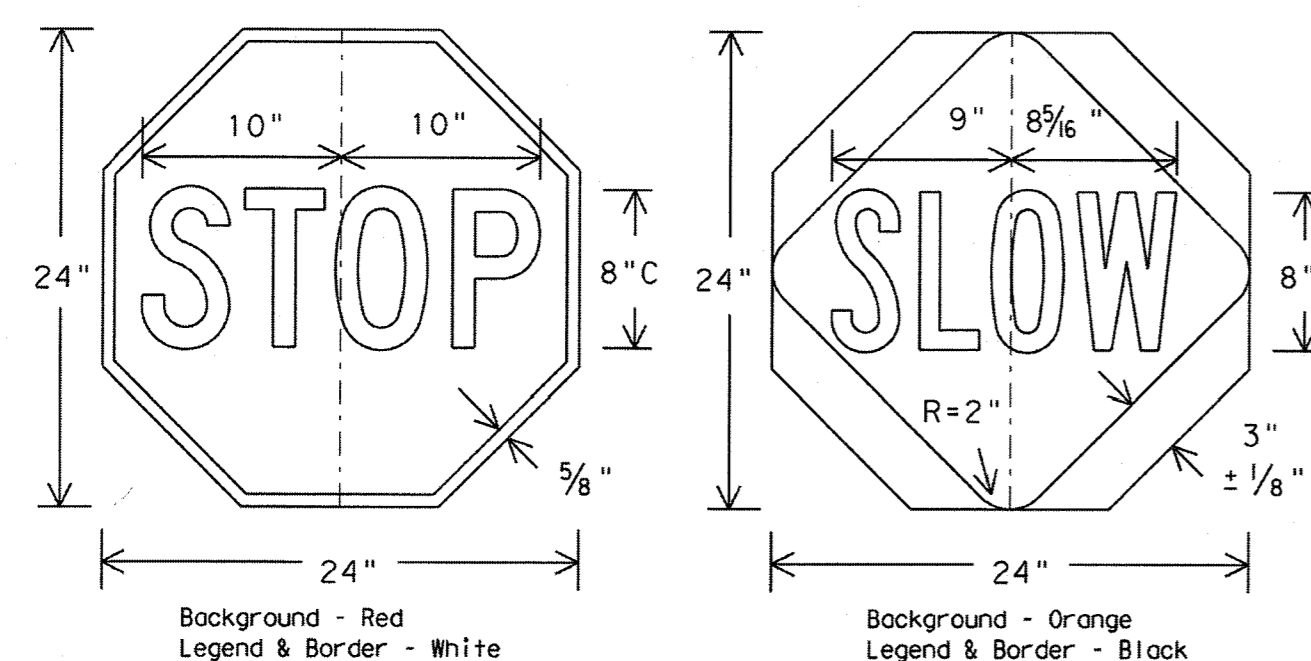


**Nails shall NOT be allowed.**  
Each sign shall be attached directly to the sign support. Multiple signs shall not be joined or spliced by any means. Wood supports shall not be extended or repaired by splicing or other means.

Splicing embedded perforated square metal tubing in order to extend post height will only be allowed when the splice is made using four bolts, two above and two below the splice point. Splice must be located entirely behind the sign substrate, not near the base of the support. Splice insert lengths should be at least 5 times nominal post size, centered on the splice and of at least the same gauge material.

**STOP/SLOW PADDLES**

1. STOP/SLOW paddles are the primary method to control traffic by flaggers. The STOP/SLOW paddle size should be 24" x 24" as detailed below.
2. When used at night, the STOP/SLOW paddle shall be retroreflectORIZED.
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.



**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, 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.
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 sheets or the CWZTCD. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards 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). 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<sub>FL</sub> or Type C<sub>FL</sub>, 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**

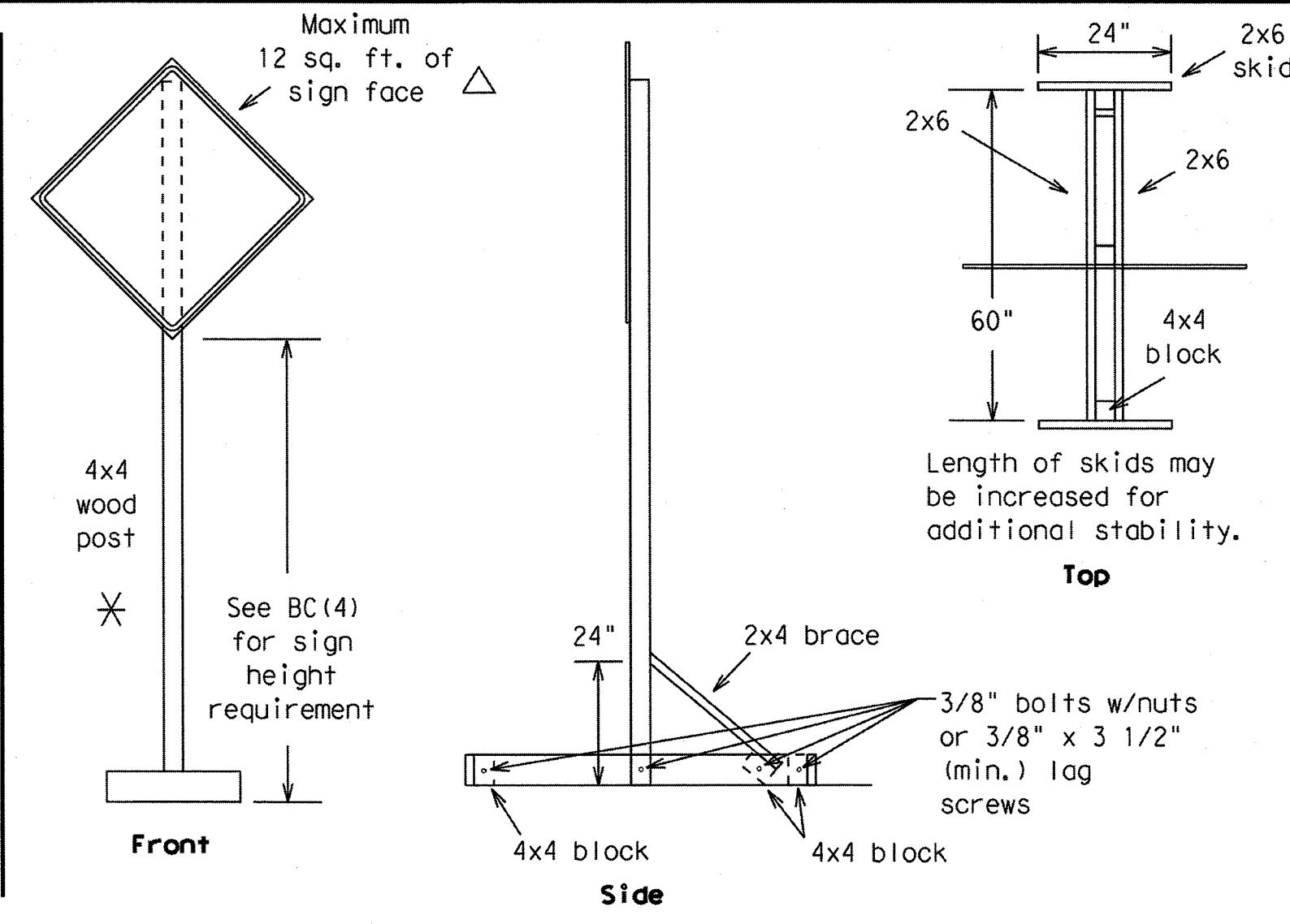
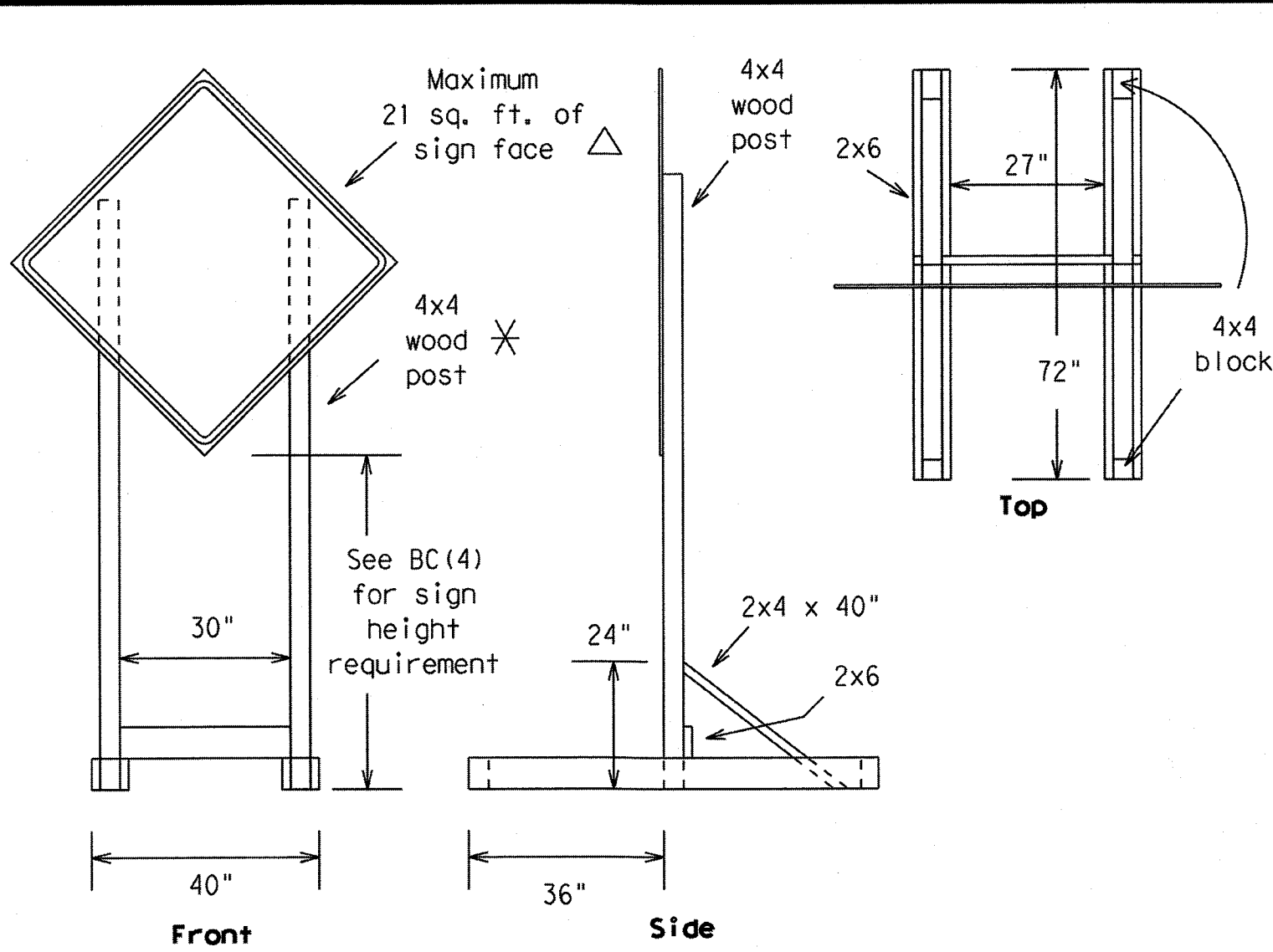
1. Flags may be used to draw attention to warning signs. When used the flag shall be 16 inches square or larger and shall be orange or fluorescent red-orange in color. Flags shall not be allowed to cover any portion of the sign face.

SHEET 4 OF 12

		<b>Texas Department of Transportation</b>		<b>Traffic Operations Division Standard</b>	
<b>BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES</b>					
<b>BC (4) - 14</b>					
FILE: bc-14.dgn	DW: TxDOT	CHK: TxDOT	DR: TxDOT	CR: TxDOT	
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY	
REVISIONS					
9-07	8-14				
7-13					
	DIST	COUNTY		SHEET NO.	39

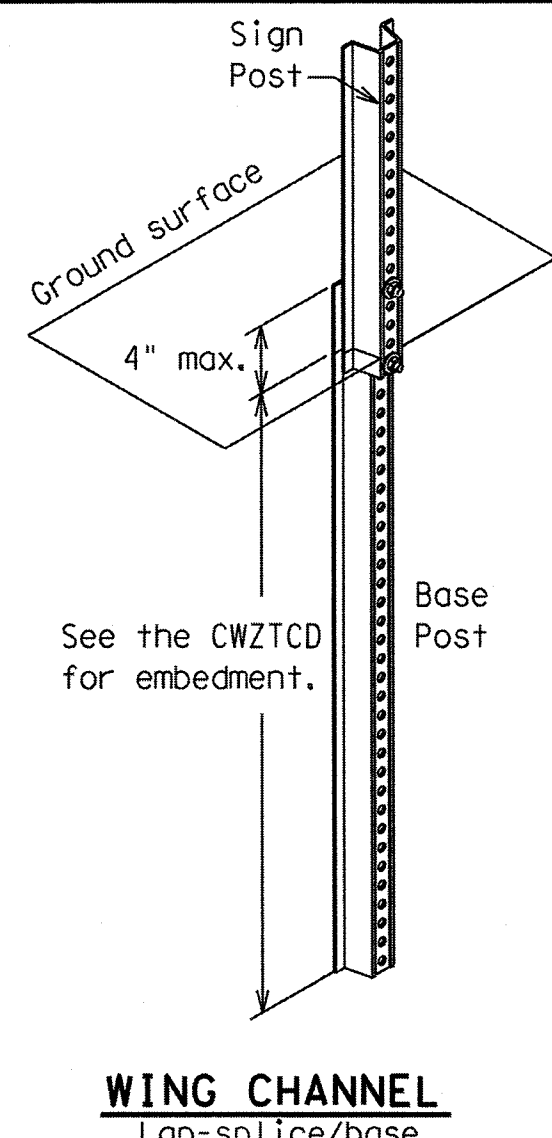
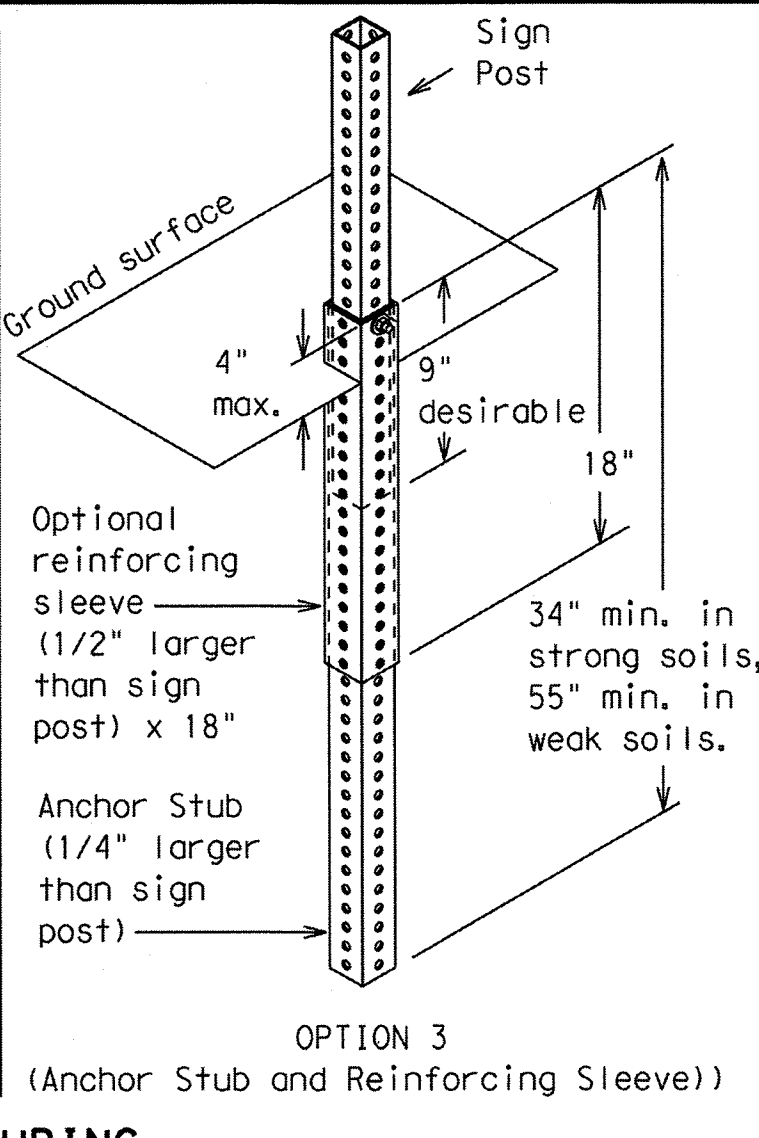
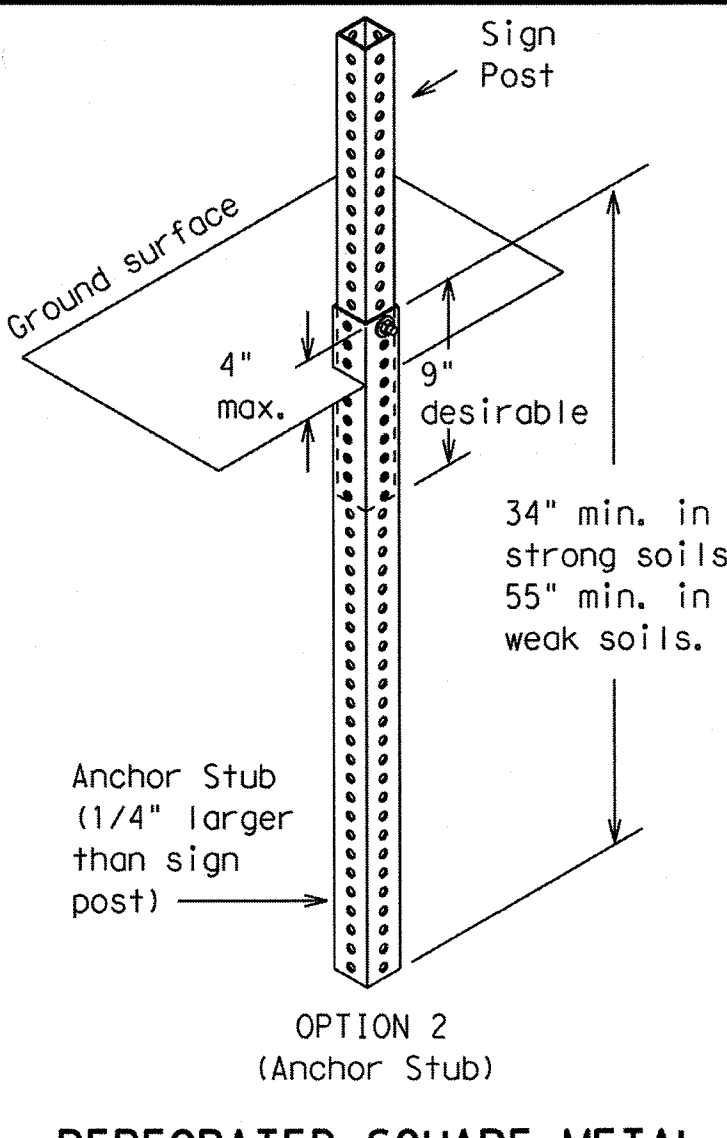
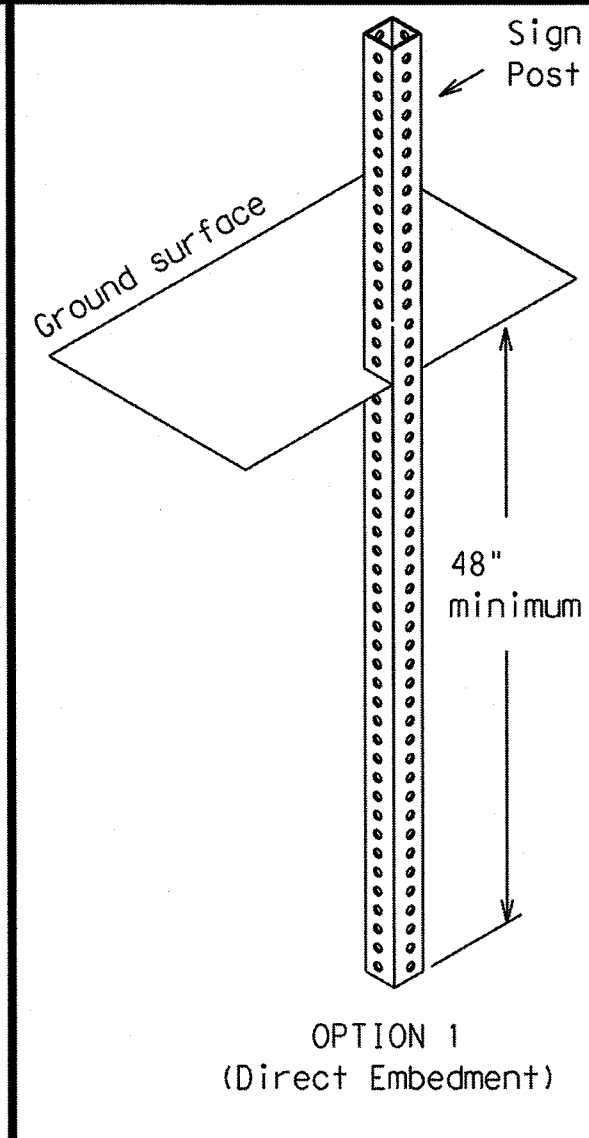


DISCLAIMER: This standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



**SKID MOUNTED WOOD SIGN SUPPORTS**

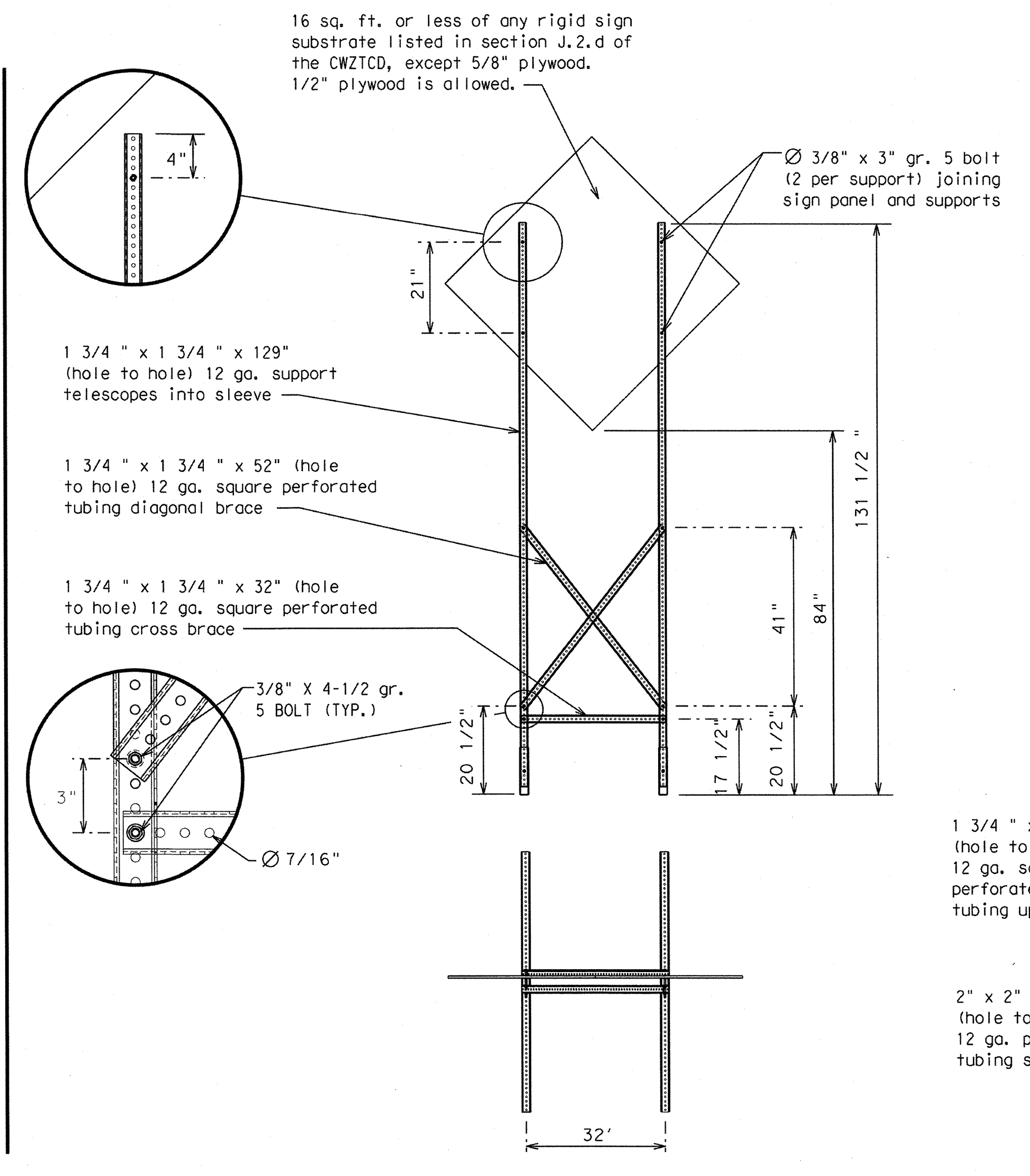
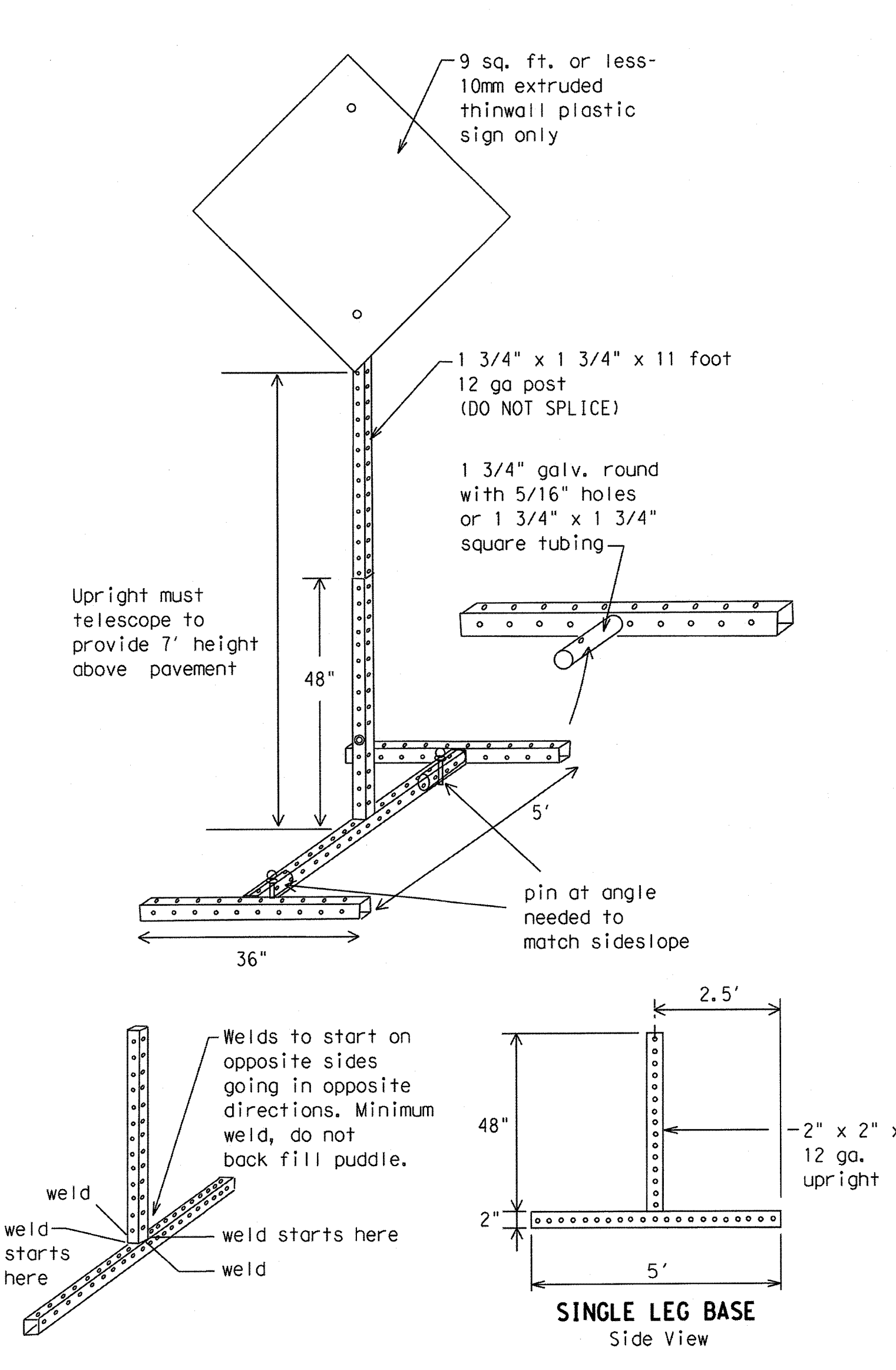
LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS □



**PERFORATED SQUARE METAL TUBING**

**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**

Nominal Post Size	Number of Posts	Maximum Sq. feet of Sign Face	Minimum Soil Embedment	Drilled Hole(s) Required
4 x 4	1	12	36"	NO
4 x 4	2	21	36"	NO
4 x 6	1	21	36"	YES
4 x 6	2	36	36"	YES

**WOOD POST SYSTEM FOR GROUND MOUNTED SIGN SUPPORTS**

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

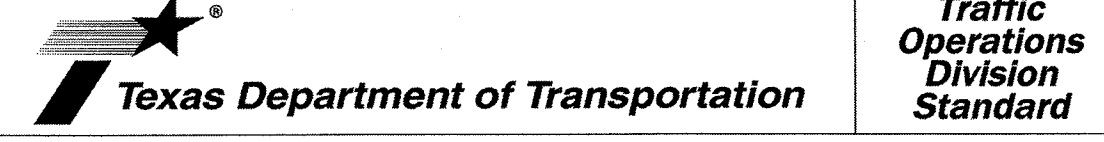
**OTHER DESIGNS**  
MORE DETAILS OF APPROVED LONG/INTERMEDIATE AND SHORT TERM SUPPORTS CAN BE FOUND ON THE CWZTCD LIST. SEE BC(1) FOR WEBSITE LOCATION.

**GENERAL NOTES**

- 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.
- No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
- When project is completed, all sign supports and foundations shall be removed from the project site. This will be considered subsidiary to Item 502.

- See BC(4) for definition of "Work Duration."
- \* Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.
- △ See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

SHEET 5 OF 12



**BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT**

BC(5)-14

FILE: bc-14.dgn	DW: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS				
9-07	8-14			
7-13				
	DIST	COUNTY	SHEET NO.	
			40	

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**

- The Engineer/Inspector shall approve all messages used on portable changeable message signs (PCMS).
- 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.
- 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.
- Use the word "EXIT" to refer to an exit ramp on a freeway; i.e., "EXIT CLOSED." Do not use the term "RAMP."
- Always use the route or interstate designation (IH, US, SH, FM) along with the number when referring to a roadway.
- When in use the bottom of a stationary PCMS message panel should be a minimum 7 feet above the roadway, where possible.
- 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.
- 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.
- Do not "flash" messages or words included in a message. The message should be steady burn or continuous while displayed.
- 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.
- Do not use the word "Danger" in message.
- Do not display the message "LANES SHIFT LEFT" or "LANES SHIFT RIGHT" on a PCMS. Drivers do not understand the message.
- Do not display messages that scroll horizontally or vertically across the face of the sign.
- 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.
- 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.
- Each line of text should be centered on the message board rather than left or right justified.
- 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	WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD	Major	MAJ
Alternate	ALT	Miles	MI
Avenue	AVE	Miles Per Hour	MPH
Best Route	BEST RTE	Minor	MNR
Boulevard	BLVD	Monday	MON
Bridge	BRDG	Normal	NORM
Cannot	CANT	North	N
Center	CTR	Northbound	(route) N
Construction Ahead	CONST AHD	Parking	PKING
CROSSING	XING	Road	RD
Detour Route	DETOUR RTE	Right Lane	RT LN
Do Not	DONT	Saturday	SAT
East	E	Service Road	SERV RD
Eastbound	(route) E	Shoulder	SHLDR
Emergency	EMER	Slippery	SLIP
Emergency Vehicle	EMER VEH	South	S
Entrance, Enter	ENT	Southbound	(route) S
Express Lane	EXP LN	Speed	SPD
Expressway	EXPWY	Street	ST
XXXX Feet	XXXX FT	Sunday	SUN
Fog Ahead	FOG AHD	Telephone	PHONE
Freeway	FRWY, FWY	Temporary	TEMP
Freeway Blocked	FWY BLKD	Thursday	THURS
Friday	FRI	To Downtown	TO DWN TN
Hazardous Driving	HAZ DRIVING	Traffic	TRAF
Hazardous Material	HAZMAT	Travelers	TRVLRS
High-Occupancy	HOV	Tuesday	TUES
Vehicle		Time Minutes	TIME MIN
Highway	HWY	Upper Level	UPR LEVEL
Hour(s)	HR, HRS	Vehicles (s)	VEH, VEHS
Information	INFO	Warning	WARN
It Is	ITS	Wednesday	WED
Junction	JCT	Weight Limit	WT LIMIT
Left	LFT	West	W
Left Lane	LFT LN	Westbound	(route) W
Lane Closed	LN CLOSED	Wet Pavement	WET PVMT
Lower Level	LWR LEVEL	Will Not	WONT
Maintenance	MAINT		

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
XXXXXXXXX BLVD CLOSED

**Other Condition List**

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

\* 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

**Location List**

AT FM XXXX
BEFORE RAILROAD CROSSING
NEXT X MILES
PAST US XXX EXIT
XXXXXXXXX TO XXXXXXXX
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

\* \* See Application Guidelines Note 6.

**APPLICATION GUIDELINES**

- Only 1 or 2 phases are to be used on a PCMS.
- The 1st phase (or both) should be selected from the "Road/Lane/Ramp Closure List" and the "Other Condition List".
- A 2nd phase can be selected from the "Action to Take/Effect on Travel, Location, General Warning, or Advance Notice Phase Lists".
- A Location Phase is necessary only if a distance or location is not included in the first phase selected.
- 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.
- 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**

- The words RIGHT, LEFT and ALL can be interchanged as appropriate.
- Roadway designations IH, US, SH, FM and LP can be interchanged as appropriate.
- EAST, WEST, NORTH and SOUTH (or abbreviations E, W, N and S) can be interchanged as appropriate.
- Highway names and numbers replaced as appropriate.
- ROAD, HIGHWAY and FREEWAY can be interchanged as needed.
- AHEAD may be used instead of distances if necessary.
- FT and MI, MILE and MILES interchanged as appropriate.
- AT, BEFORE and PAST interchanged as needed.
- 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**

- 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.
- 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.
- 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.
- 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.

SHEET 6 OF 12

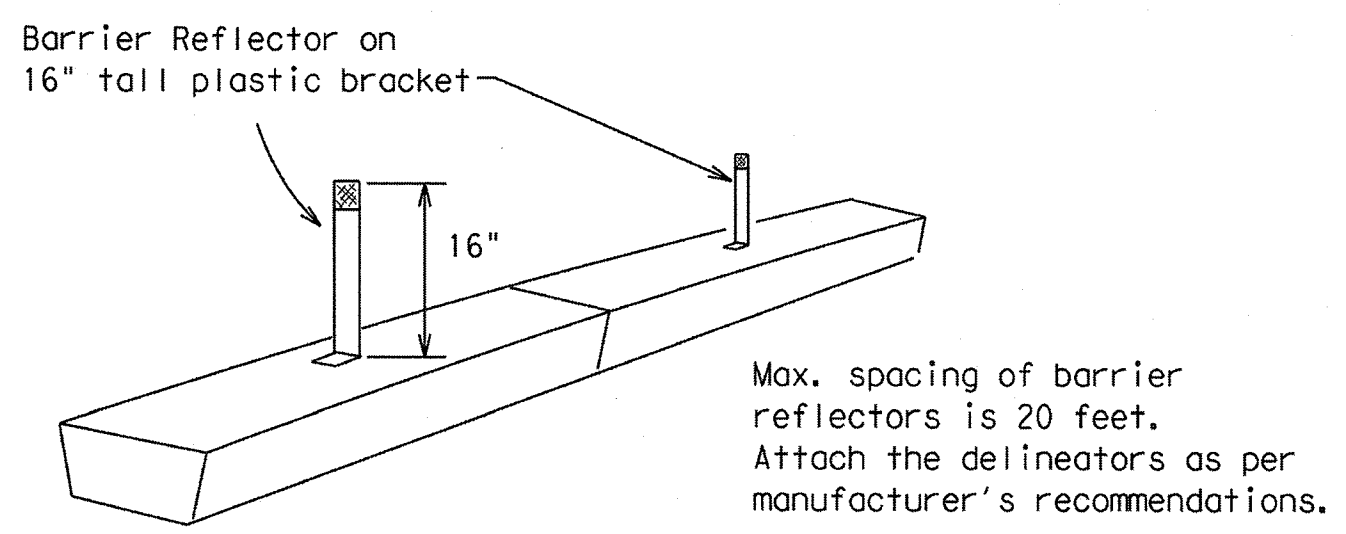
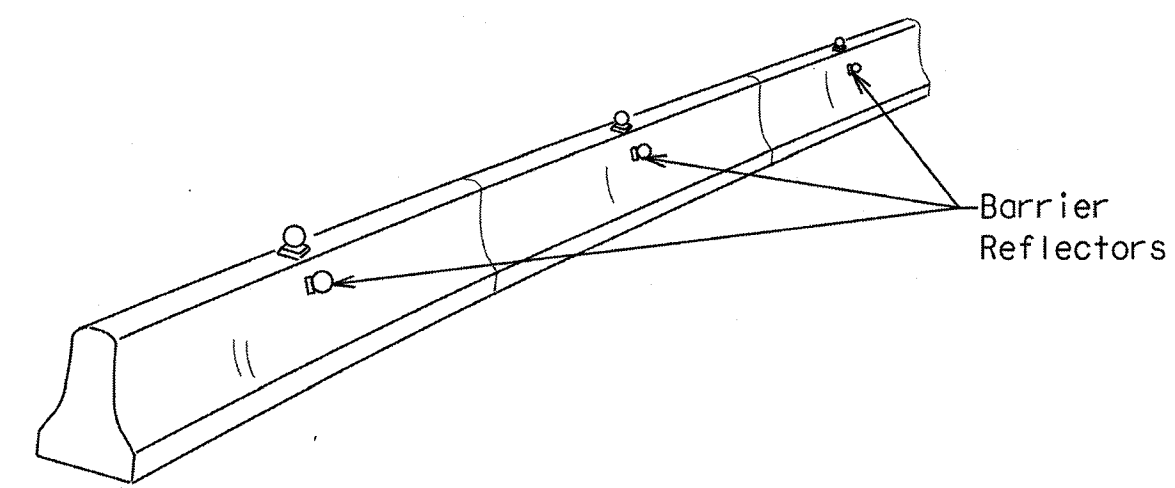
		<b>Traffic Operations Division Standard</b>	
<b>BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)</b>			
<b>BC (6) - 14</b>			
FILE: bc-14.dgn	DN: TxDOT	CR: TxDOT	DR: TxDOT
©TxDOT November 2002	CONT	SECT	JOB
REVISIONS			
9-07 8-14	DIST		COUNTY
7-13	SHEET NO.		---
100			

DISCLAIMER: 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.

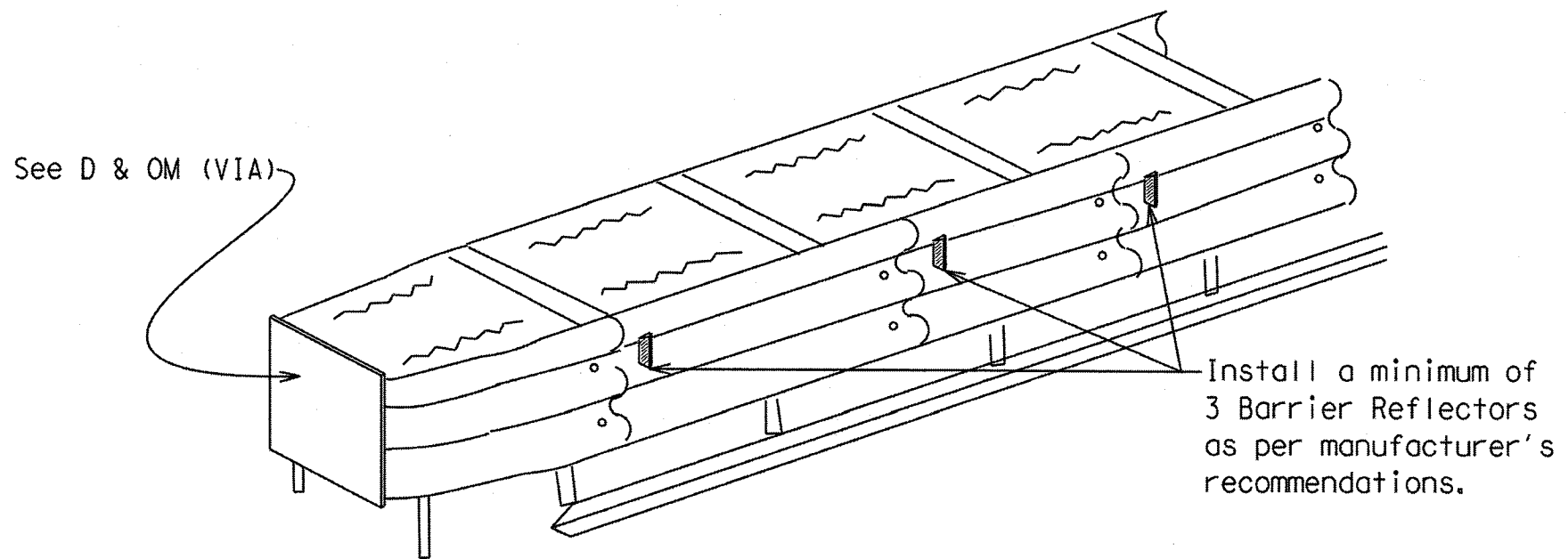
DATE: FILE:

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.

- 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).
- Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 512.



- 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.
- 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.
- When CTB separates traffic traveling in the same direction, no barrier reflectors will be required on top of the CTB.
- Barrier Reflector units shall be yellow or white in color to match the edgeline being supplemented.
- Maximum spacing of Barrier Reflectors is forty (40) feet.
- Pavement markers or temporary flexible-reflective roadway marker tabs shall NOT be used as CTB delineation.
- Attachment of Barrier Reflectors to CTB shall be per manufacturer's recommendations.
- Missing or damaged Barrier Reflectors shall be replaced as directed by the Engineer.
- Single slope barriers shall be delineated as shown on the above detail.



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

End treatments used on CTB's in work zones shall meet crashworthy standards as defined in the National Cooperative Highway Research Report 350. Refer to the CWZTCD List for approved end treatments and manufacturers.

## BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

### WARNING LIGHTS

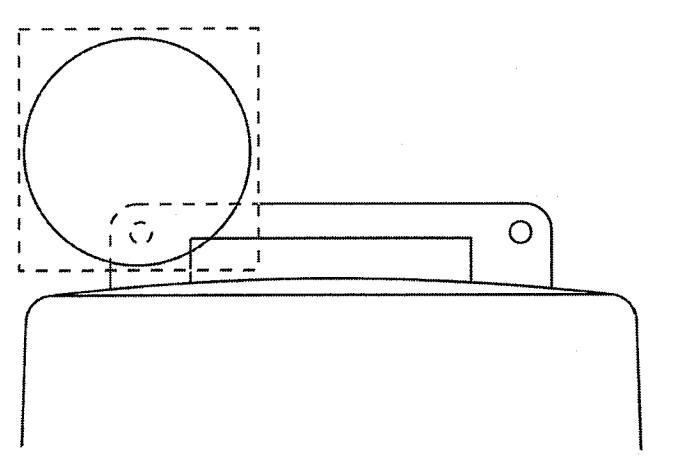
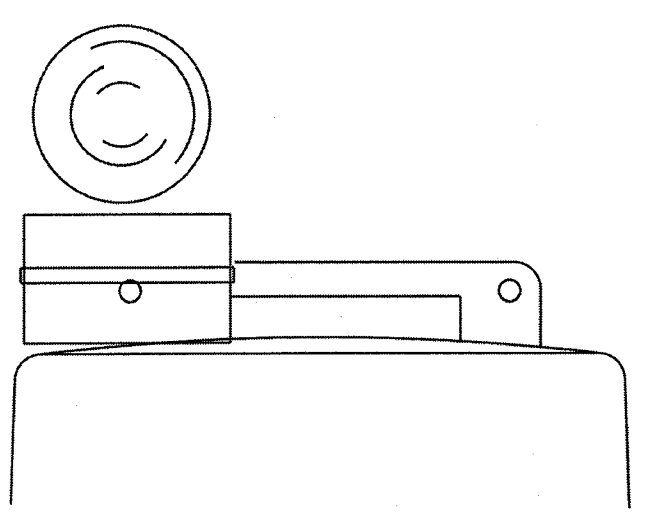
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet 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<sub>FL</sub> or C<sub>FL</sub> Sheeting meeting the requirements of Departmental Material Specification DMS-8300.
- 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".
- The Engineer/Inspector or the plans shall specify the location and type of warning lights to be installed on the traffic control devices.
- 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.
- 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.
- The location of warning lights and warning reflectors on drums shall be as shown elsewhere in the plans.

### WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- 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.
- 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.
- Type A, Type C and Type D warning lights shall be installed at locations as detailed on other sheets in the plans.
- Warning lights shall not be installed on a drum that has a sign, chevron or vertical panel.
- The maximum spacing for warning lights on drums should be identical to the channelizing device spacing.

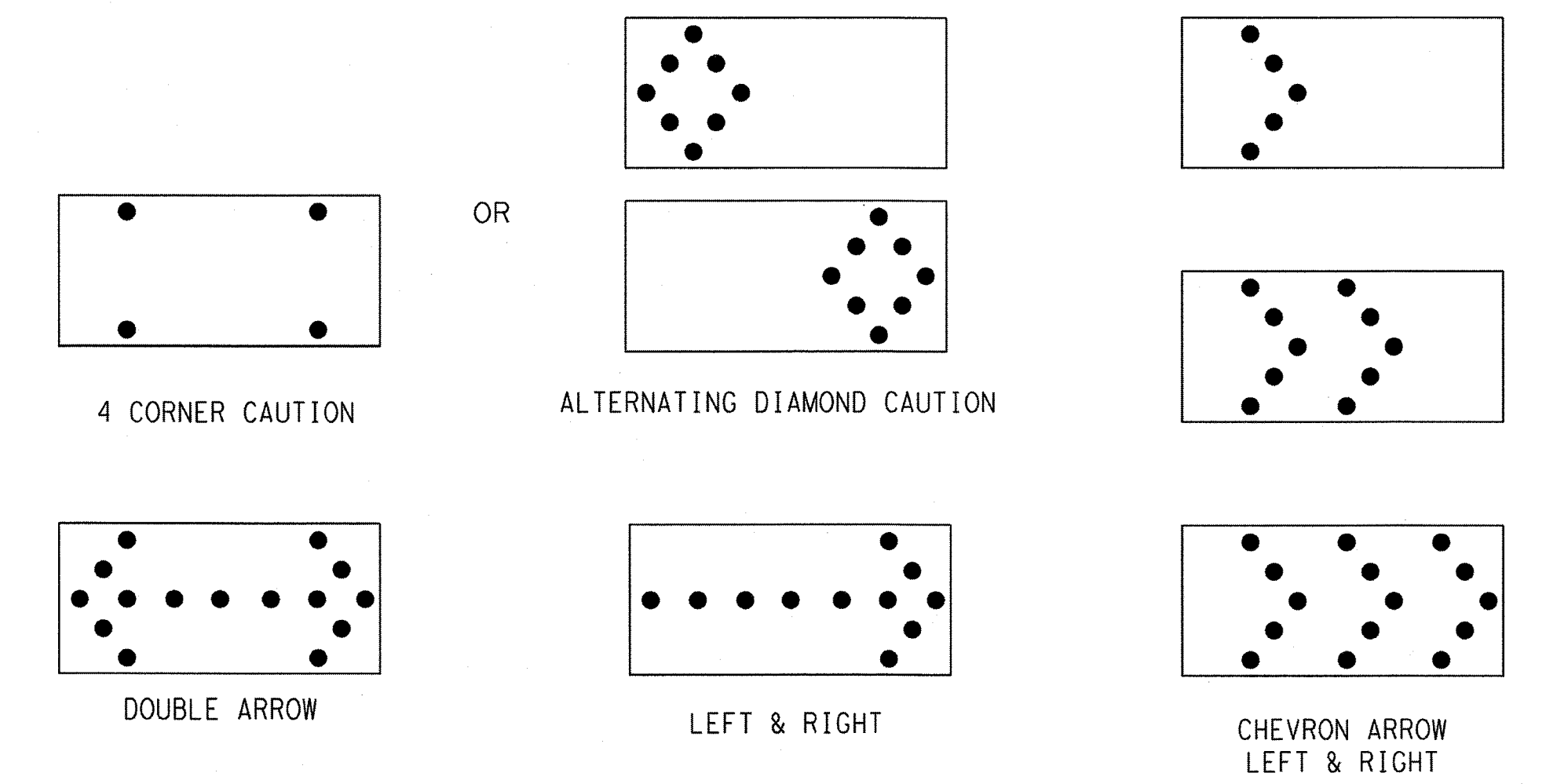
### WARNING REFLECTORS MOUNTED ON PLASTIC DRUMS AS A SUBSTITUTE FOR TYPE C (STEADY BURN) WARNING LIGHTS

- 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.
- 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.
- The warning reflector shall have a minimum retroreflective surface area (one-side) of 30 square inches.
- Round reflectors shall be fully reflectorized, including the area where attached to the drum.
- 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.
- 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.
- When used near two-way traffic, both sides of the warning reflector shall be reflectorized.
- The warning reflector should be mounted on the side of the handle nearest approaching traffic.
- 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.

- 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.
- 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.
- 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.
- The Flashing Arrow Board should be able to display the following symbols:



- The "CAUTION" display consists of four corner lamps flashing simultaneously, or the Alternating Diamond Caution mode as shown.
- The straight line caution display is NOT ALLOWED.
- 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.
- 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.
- The sequential arrow display is NOT ALLOWED.
- The flashing arrow display is the TxDOT standard; however, the sequential Chevron display may be used during daylight operations.
- The Flashing Arrow Board shall be mounted on a vehicle, trailer or other suitable support.
- A Flashing Arrow Board SHALL NOT BE USED to laterally shift traffic.
- 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.
- Minimum mounting height of trailer mounted Arrow Boards should be 7 feet from roadway to bottom of panel.

**ATTENTION**

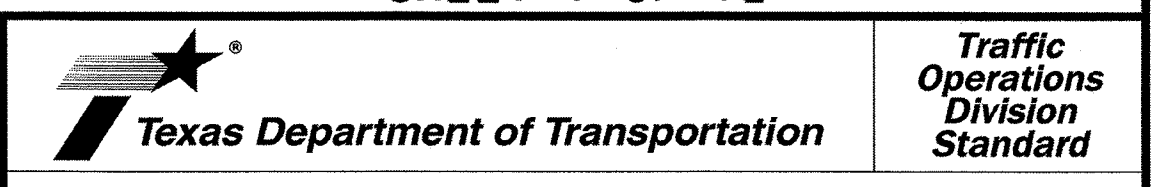
Flashing Arrow Boards shall be equipped with automatic dimming devices.

WHEN NOT IN USE, REMOVE THE ARROW BOARD FROM THE RIGHT-OF-WAY OR PLACE THE ARROW BOARD BEHIND CONCRETE TRAFFIC BARRIER OR GUARDRAIL.

## FLASHING ARROW BOARDS

### TRUCK-MOUNTED ATTENUATORS

- Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the National Cooperative Highway Research Report No. 350 (NCHRP 350) or the Manual for Assessing Safety Hardware (MASH).
- Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
- Refer to the CWZTCD for a list of approved TMAs.
- TMAs are required on freeways unless otherwise noted in the plans.
- 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.
- 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.



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

**BC (7) - 14**

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS				
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13			42	

DATE: FILE:

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 long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
- 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.
- 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.
- 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).
- 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.
- 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:

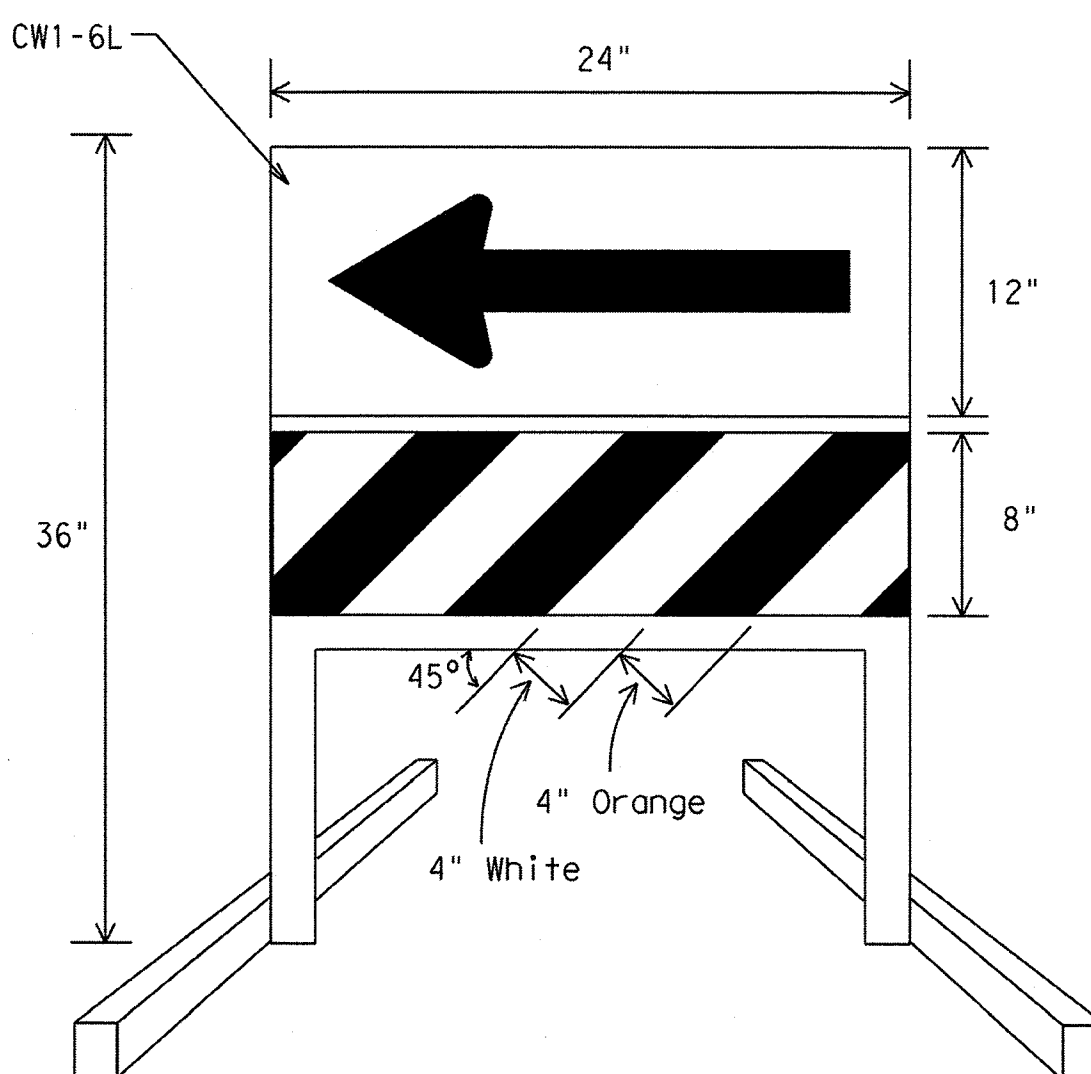
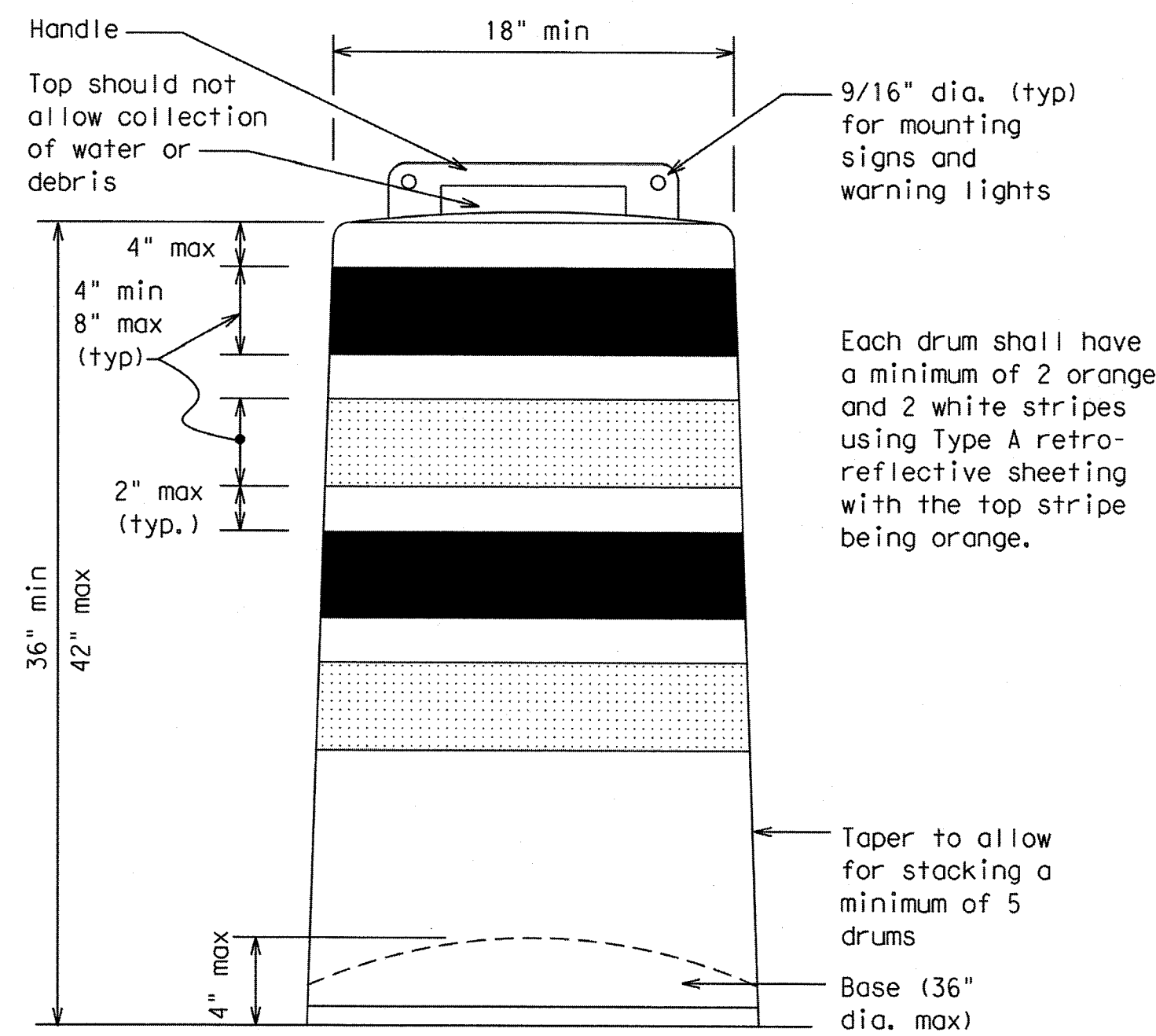
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
- The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents accidental separation due to normal handling and/or air turbulence created by passing vehicles.
- 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.
- 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.
- 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.
- 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.
- 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.
- Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
- Drum body shall have a maximum unballasted weight of 11 lbs.
- Drum and base shall be marked with manufacturer's name and model number.

**RETROREFLECTIVE SHEETING**

- 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 reflective sheeting shall be supplied unless otherwise specified in the plans.
- 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**

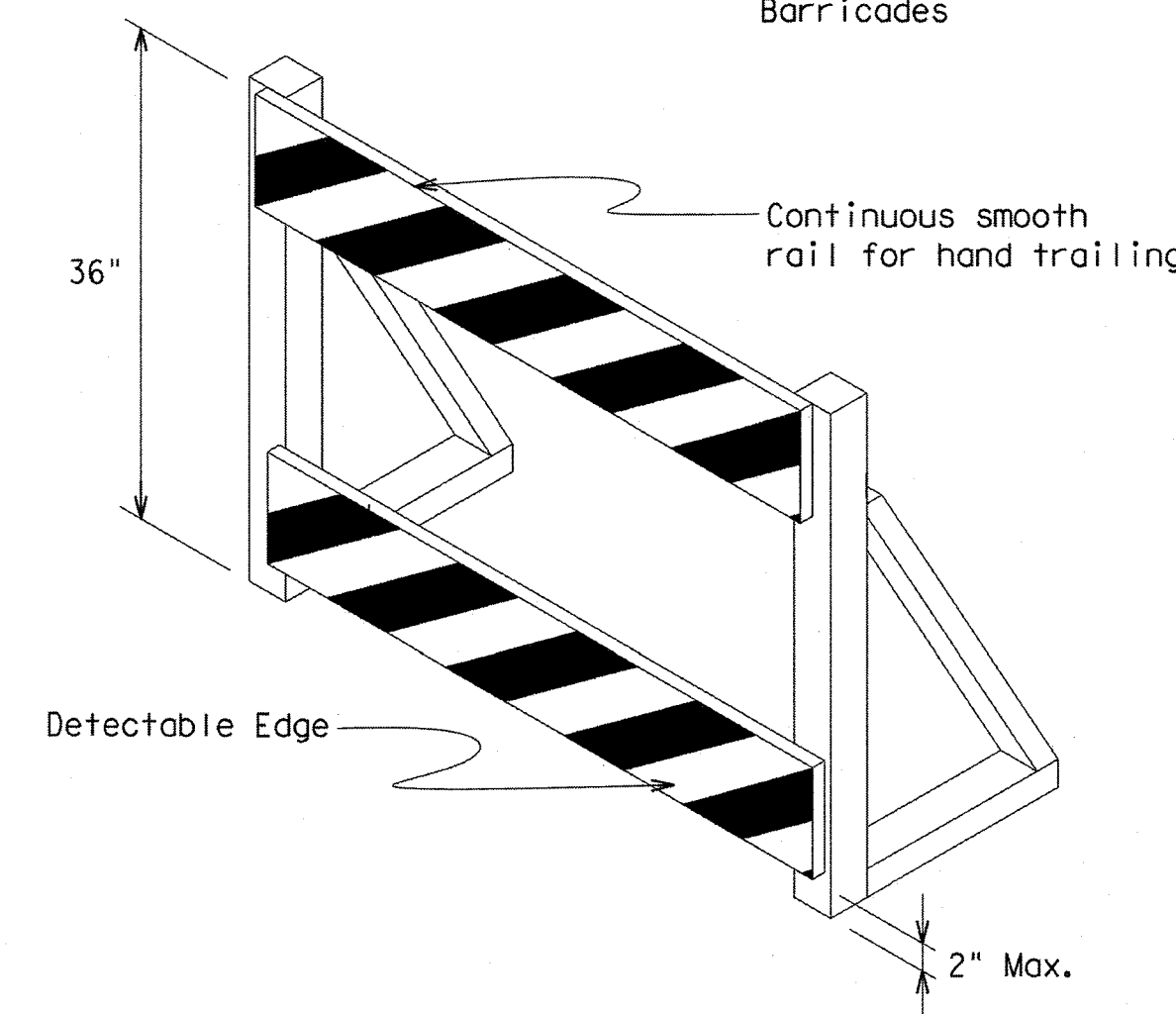
- Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other 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.
- 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.
- Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWZTCD list.
- 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.
- 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.
- Ballast shall not be placed on top of drums.
- Adhesives may be used to secure base of drums to pavement.



**DIRECTION INDICATOR BARRICADE**

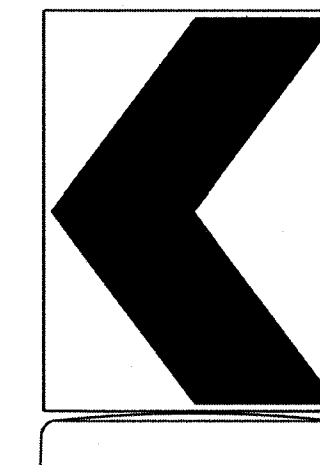
- The Direction Indicator Barricade may be used in tapers, transitions, and other areas where specific directional guidance to drivers is necessary.
- If used, the Direction Indicator Barricade should be used in series to direct the driver through the transition and into the intended travel lane.
- The Direction Indicator Barricade shall consist of One-Direction Large Arrow (CW1-6) sign in the size shown with a black arrow on a background of Type B<sub>FL</sub> or Type C<sub>FL</sub> Orange retroreflective sheeting above a rail with Type A retroreflective sheeting in alternating 4" white and orange stripes sloping downward at an angle of 45 degrees in the direction road users are to pass. Sheeting types shall be as per DMS 8300.
- Double arrows on the Direction Indicator Barricade will not be allowed.
- Approved manufacturers are shown on the CWZTCD List. Ballast shall be as approved by the manufacturers instructions.

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

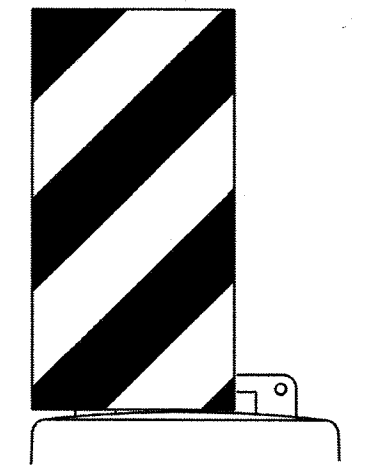


**DETECTABLE PEDESTRIAN BARRICADES**

- 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.
- Where pedestrians with visual disabilities normally use the closed sidewalk, a device that is detectable by a person with a visual disability traveling with the aid of a long cane shall be placed across the full width of the closed sidewalk.
- 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.
- 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 for Buildings and Facilities (ADAAG)" and should not be used as a control for pedestrian movements.
- Warning lights shall not be attached to detectable pedestrian barricades.
- Detectable pedestrian barricades may 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**

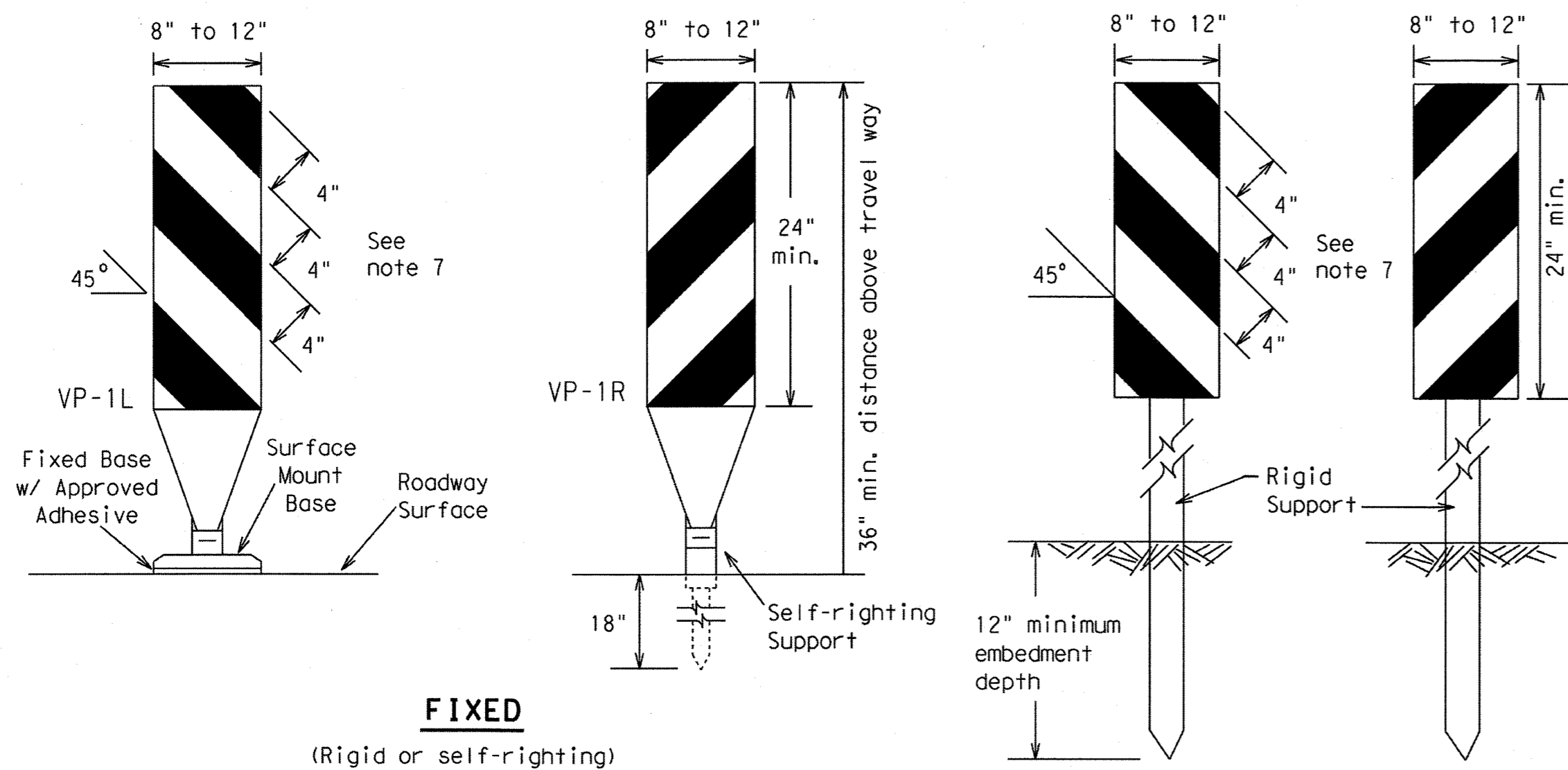
- Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
- Chevrons and other work zone signs with an orange background shall be manufactured with Type B<sub>FL</sub> or Type C<sub>FL</sub> Orange sheeting meeting the color and retroreflectivity requirements of DMS-8300, "Sign Face Material," unless otherwise specified in the plans.
- Vertical Panels shall be manufactured with orange and white sheeting meeting the requirements of DMS-8300 Type A Diagonal stripes on Vertical Panels shall slope down toward the intended traveled lane.
- 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.
- Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one locking washer for each connection.
- Mounting bolts and nuts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2 inch beyond nuts.
- 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 an every third drum. A minimum of three (3) should be used at each location called for in the plans.
- 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

		<b>Traffic Operations Division Standard</b>	
<b>BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES</b>			
<b>BC (8) - 14</b>			
FILE: bc-14.dgn	DN: TxDOT	CR: TxDOT	DR: TxDOT
© TxDOT November 2002	CONT	SECT	JOB
REVISIONS			
4-03 7-13	DIST	COUNTY	SHEET NO.
9-07 8-14			43

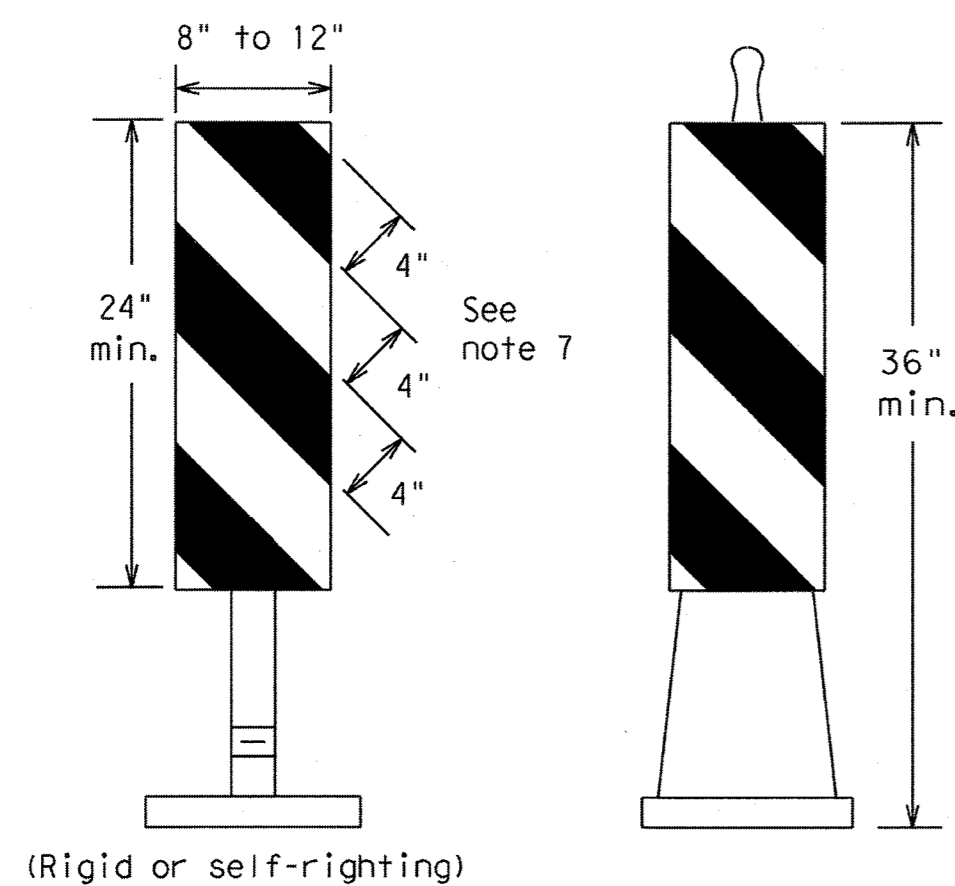
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:  
FILE:



**FIXED**  
(Rigid or self-righting)

**DRIVEABLE**

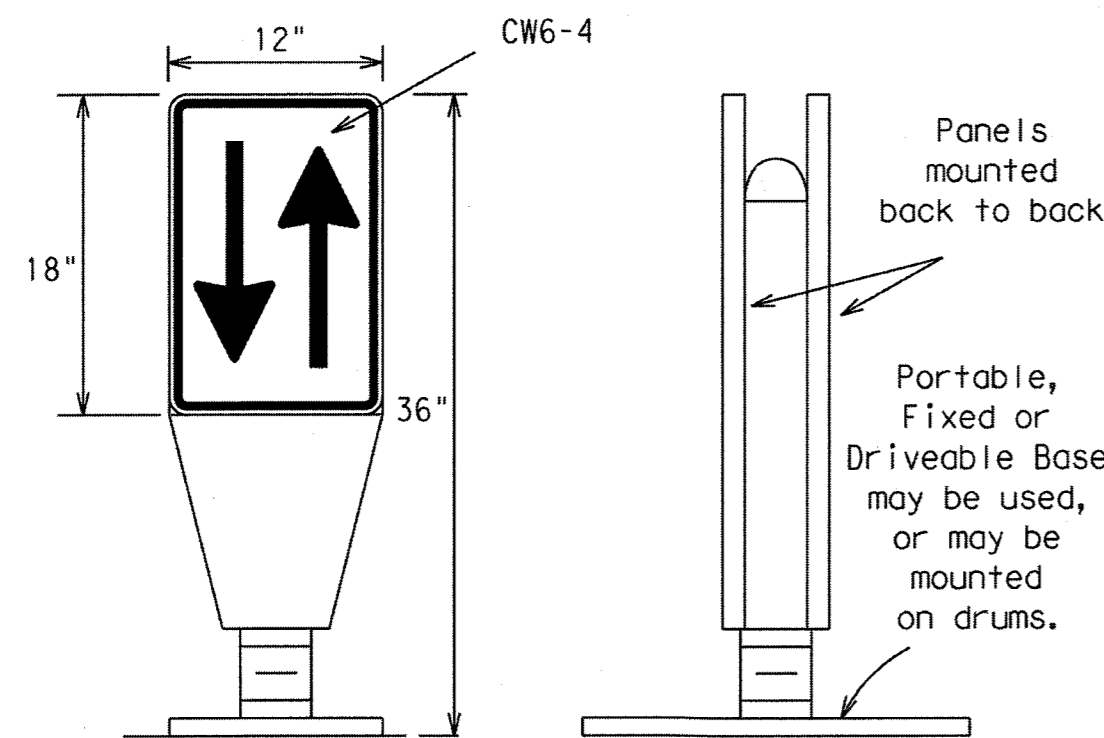


(Rigid or self-righting)

**PORTABLE**

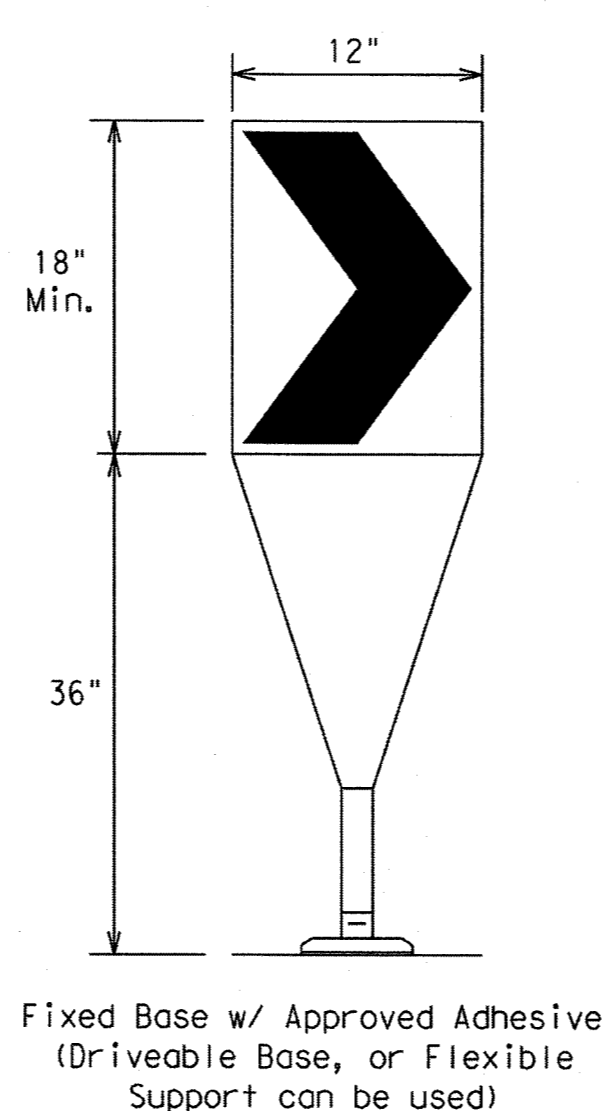
**VERTICAL PANELS (VPs)**

- Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
- 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 Appendix B "Treatment of Pavement Drop-offs in Work Zones" for additional guidelines on the use of VP's for drop-offs.
- 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.
- VP's used on expressways and freeways or other high speed roadways, may have more than 270 square inches of retroreflective area facing traffic.
- Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
- Sheeting for the VP's shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
- Where the height of reflective material on the vertical panel is 36 inches or greater, a panel stripe of 6 inches shall be used.



**OPPOSING TRAFFIC LANE DIVIDERS (OTLD)**

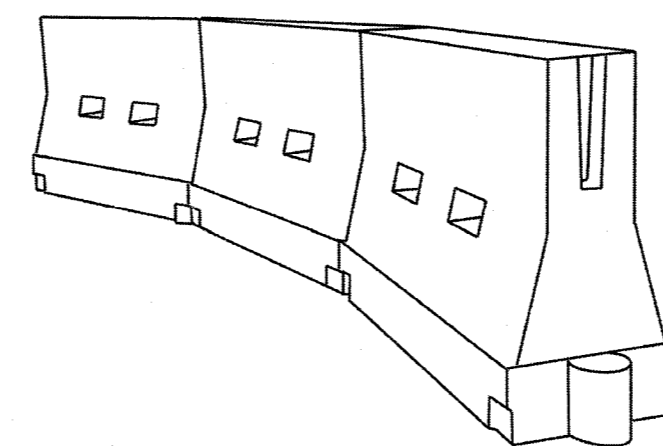
- Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base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



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

- The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
- 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.
- 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.
- To be effective, the chevron should be visible for at least 500 feet.
- Chevrons shall be orange with a black nonreflective legend. Sheeting for the chevron shall be retroreflective Type B<sub>FL</sub> or Type C<sub>FL</sub> conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.
- 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**



**LONGITUDINAL CHANNELIZING DEVICES (LCD)**

- 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.
- LCDs may be used instead of a line of cones or drums.
- LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
- LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
- LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the travel lanes.
- 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) placed near the top of the LCD along the full length of the device.

**WATER BALLASTED SYSTEMS USED AS BARRIERS**

- 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 NCHRP 350 crashworthiness requirements based on roadway speed and barrier application.
- 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.
- 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.
- 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.
- 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**

**GENERAL NOTES**

- 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).
- 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.
- 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).
- 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.
- Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh a minimum of 30 lbs.
- 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.
- 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.

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices	
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent
30	L = WS <sup>2</sup> / 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



**BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES**

**BC (9) - 14**

FILE:	bc-14.dgn	DATE:	TxDOT	CREATED:	TxDOT	DATE:	TxDOT	CREATED:	TxDOT
© TxDOT	November 2002	CONT:	SECT:	JOB:		HIGHWAY:			
REVISIONS									
9-07	8-14	DIST:		COUNTY:		SHEET NO.:			
7-13									44

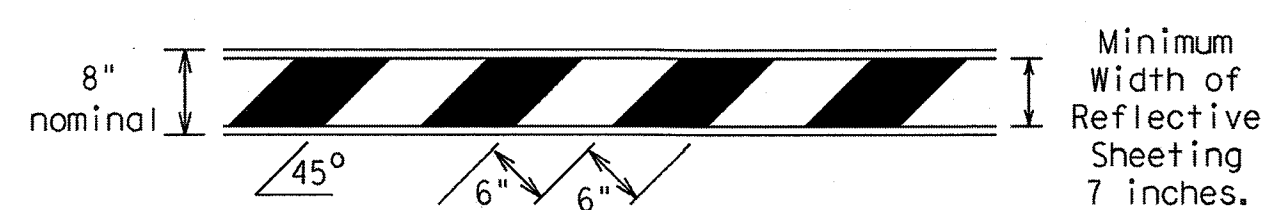
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any particular project. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: FILE:

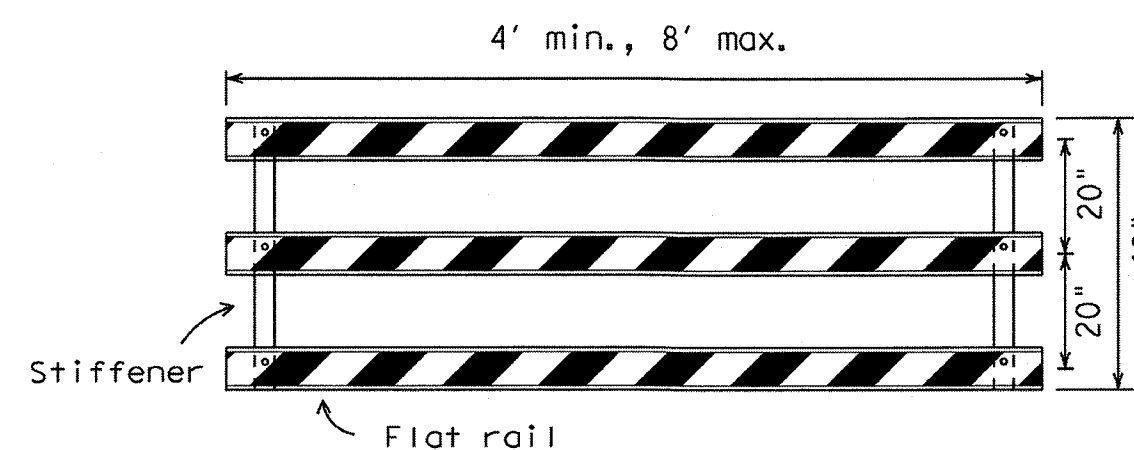
**TYPE 3 BARRICADES**

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 conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.

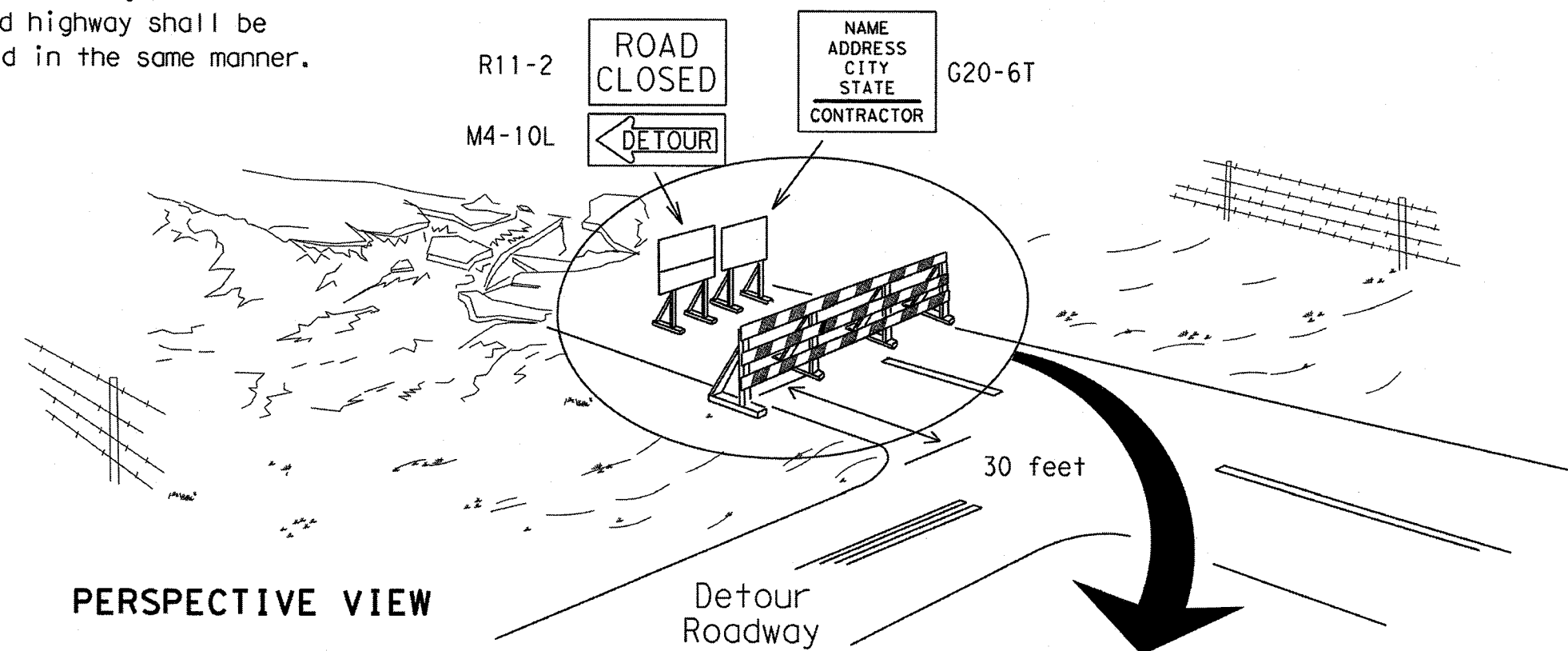


**TYPICAL STRIPING DETAIL FOR BARRICADE RAIL**



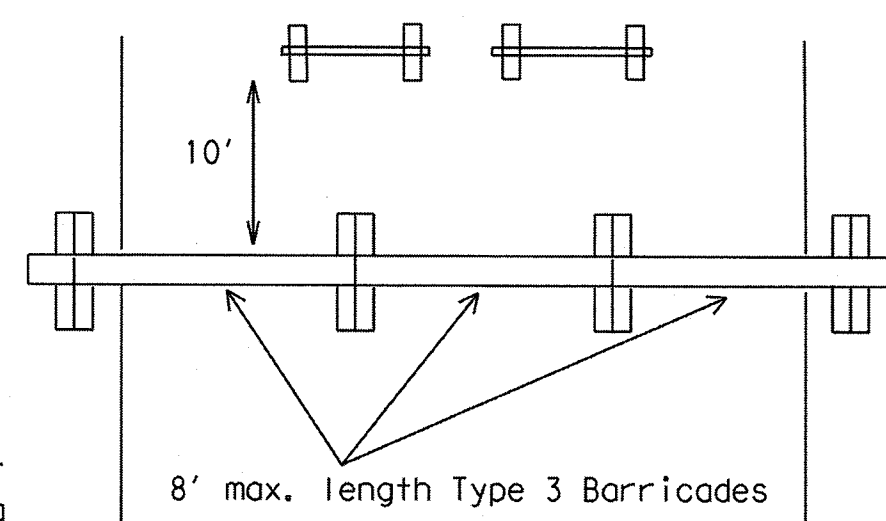
**TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES**

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



PERSPECTIVE VIEW

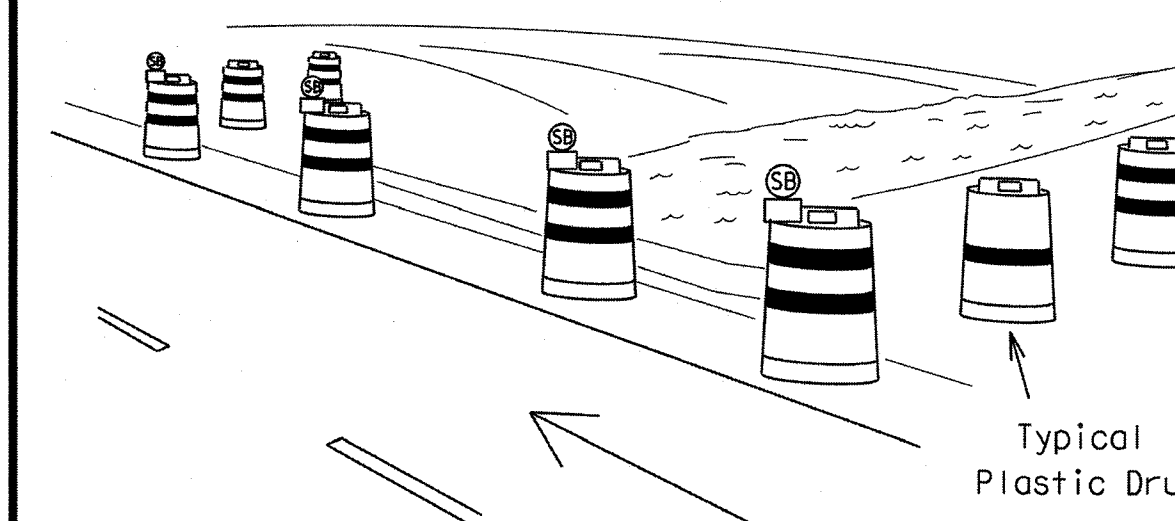
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.



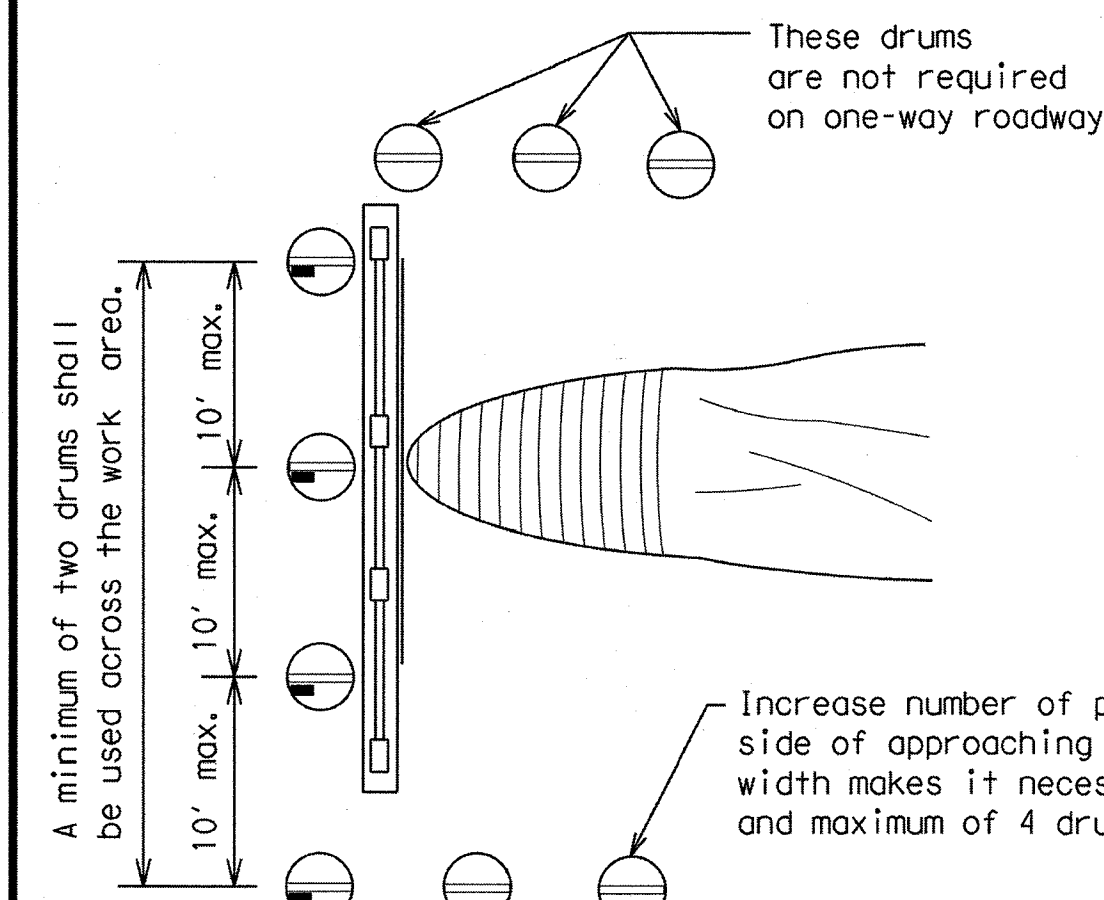
PLAN VIEW

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

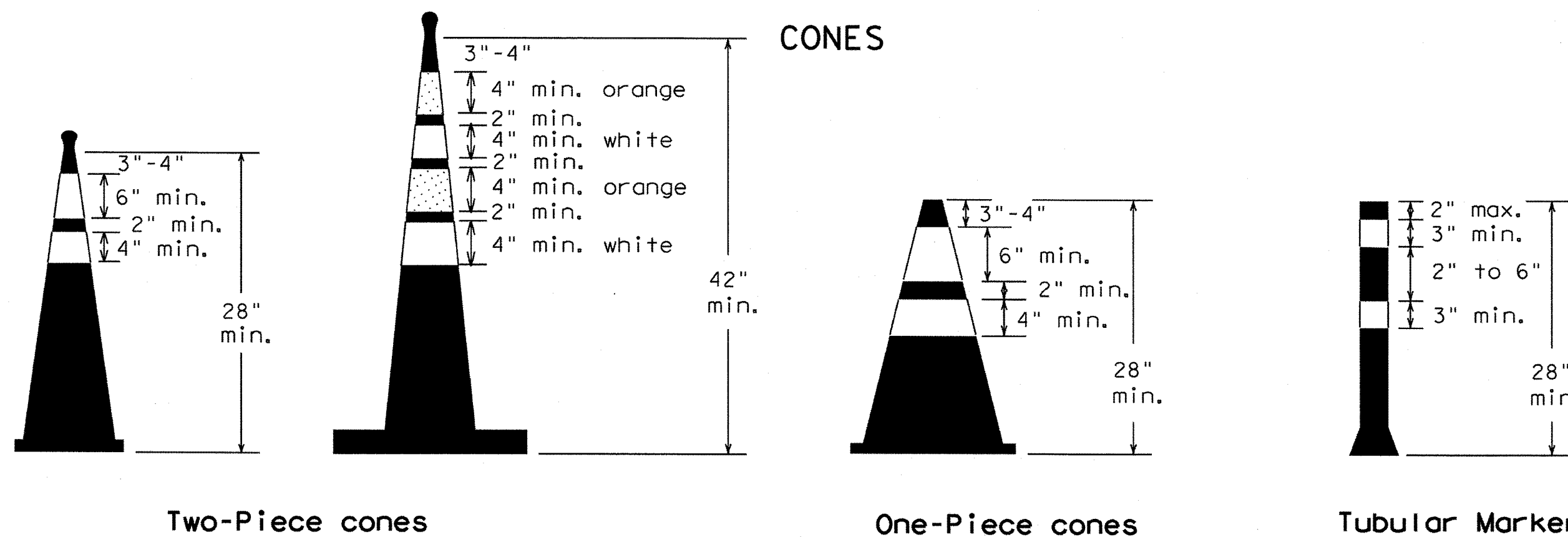


PLAN VIEW

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

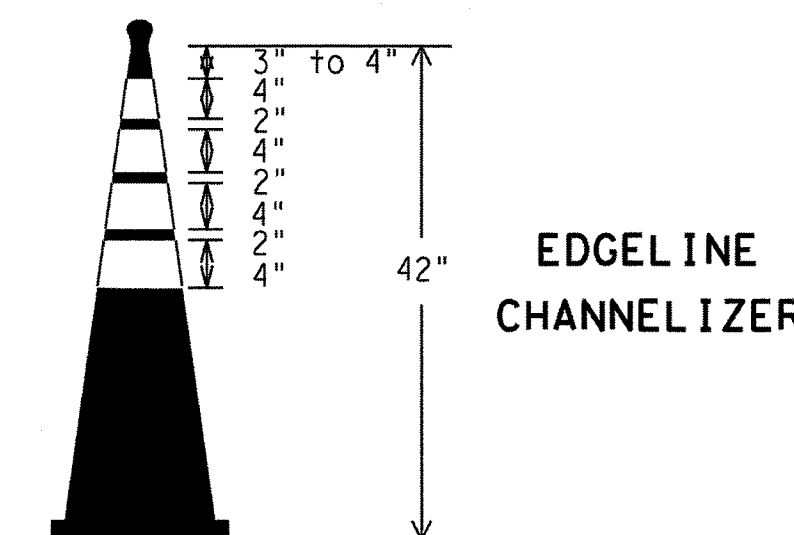
LEGEND	
	Plastic drum
	Plastic drum with steady burn light or yellow warning reflector
	Steady burn warning light or yellow warning reflector

**CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS**



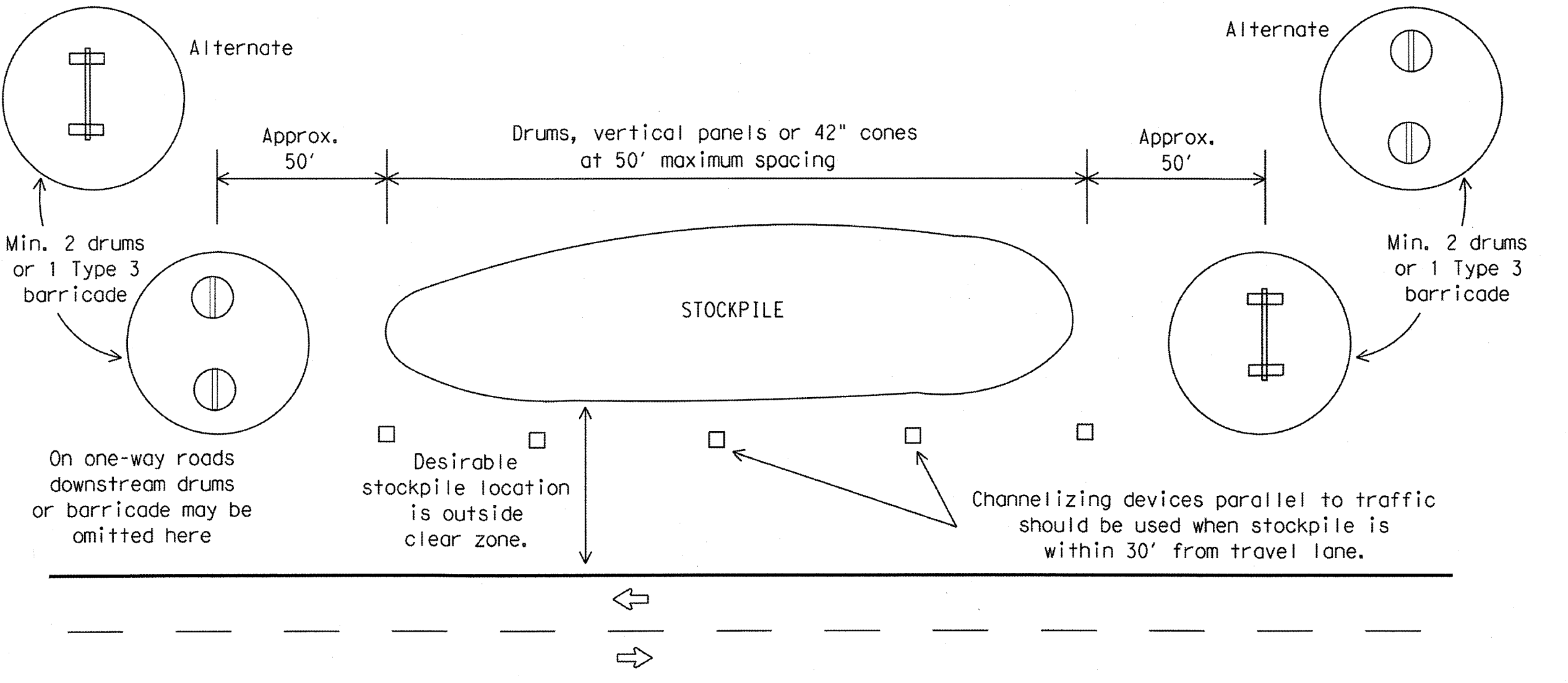
28" Cones shall have a minimum weight of 9 1/2 lbs.  
42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

THIS DEVICE SHALL NOT BE USED ON PROJECTS LET AFTER MARCH 2014.



EDGELINE CHANNELIZER

1. This device is intended only for use in place of a vertical panel to channelize traffic by indicating the edge of the travel lane. It is not intended to be used in transitions or tapers.
2. This device shall not be used to separate lanes of traffic (opposing or otherwise) or warn of objects.
3. This device is based on a 42 inch, two-piece cone with an alternate striping pattern: four 4 inch retroreflective bands, with an approximate 2 inch gap between bands. The color of the band should correspond to the color of the edgeline (yellow for left edgeline, white for right edgeline) for which the device is substituted or for which it supplements. The reflectorized bands shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300, unless otherwise noted.
4. The base must weigh a minimum of 30 lbs.



**TRAFFIC CONTROL FOR MATERIAL STOCKPILES**

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 used at night 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.
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.

		<b>Traffic Operations Division Standard</b>	
<p><b>BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES</b></p>			
<p><b>BC (10) - 14</b></p>			
FILE: bc-14.dgn	DWG: TxDOT	CHK: TxDOT	DWG: TxDOT
© TxDOT November 2002	CONT	SECT	JOB
REVISIONS			
9-07	8-14		
7-13			
DIST	COUNTY	SHEET NO.	
		45	

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:

## WORK ZONE PAVEMENT MARKINGS

### GENERAL

- 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.
- Color, patterns and dimensions shall be in conformance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
- Additional supplemental pavement marking details may be found in the plans or specifications.
- Pavement markings shall be installed in accordance with the TMUTCD and as shown on the plans.
- 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).
- 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.
- All work zone pavement markings shall be installed in accordance with Item 662, "Work Zone Pavement Markings."

### RAISED PAVEMENT MARKERS

- Raised pavement markers are to be placed according to the patterns on BC(12).
- 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

- Removable prefabricated pavement markings shall meet the requirements of DMS-8241.
- Non-removable prefabricated pavement markings (foil back) shall meet the requirements of DMS-8240.

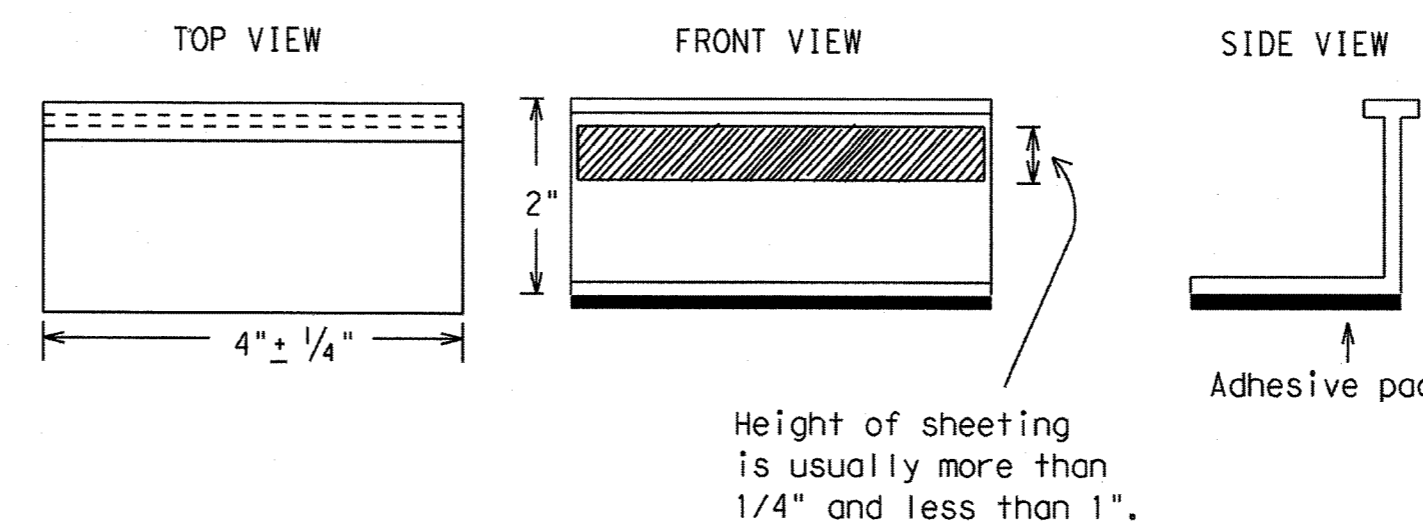
### MAINTAINING WORK ZONE PAVEMENT MARKINGS

- The Contractor will be responsible for maintaining work zone pavement markings within the work limits.
- 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.
- 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.
- 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

- 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.
- 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.
- 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".
- The removal of pavement markings may require resurfacing or seal coating portions of the roadway as described in Item 677.
- Subject to the approval of the Engineer, any method that proves to be successful on a particular type pavement may be used.
- Blast cleaning may be used but will not be required unless specifically shown in the plans.
- Over-painting of the markings SHALL NOT BE permitted.
- Removal of raised pavement markers shall be as directed by the Engineer.
- 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.
- 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**

- Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
- 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.
  - 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.
  - 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.
- Small design variances may be noted between tab manufacturers.
- 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

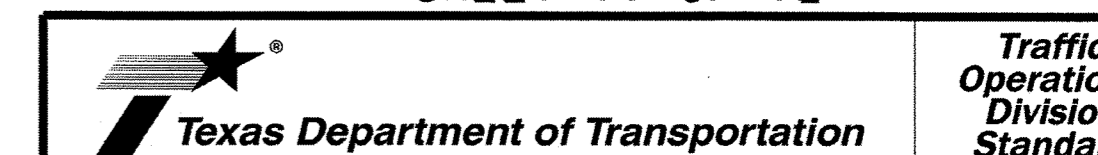
- Raised pavement markers used as guidemarks shall be from the approved product list, and meet the requirements of DMS-4200.
- All temporary construction raised pavement markers provided on a project shall be of the same manufacturer.
- Adhesive for guidemarks shall be bituminous material hot applied 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



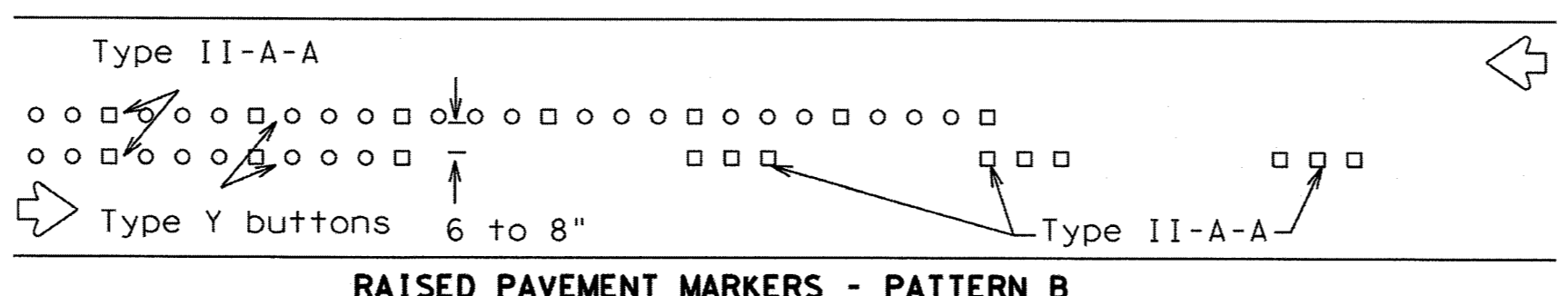
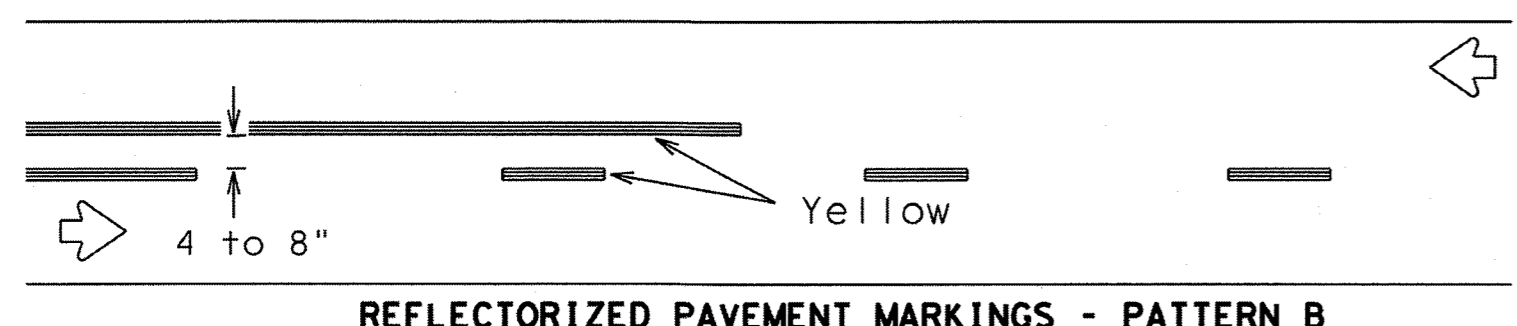
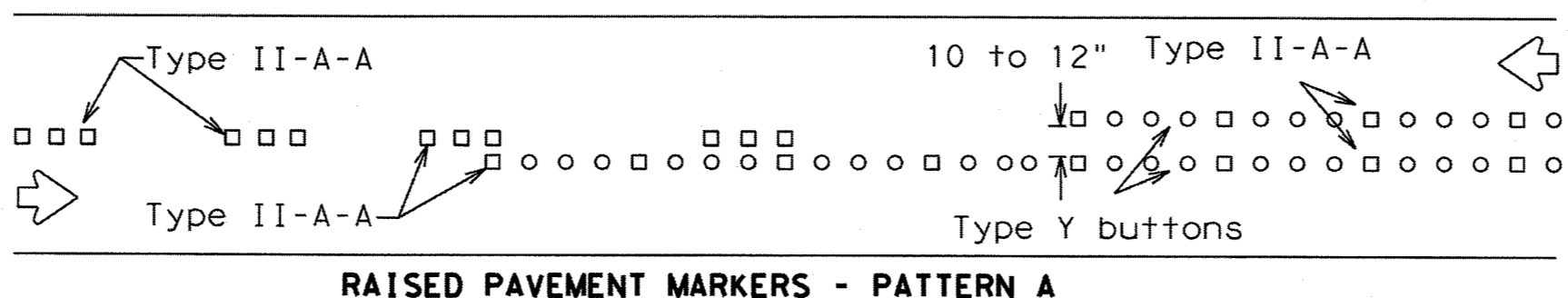
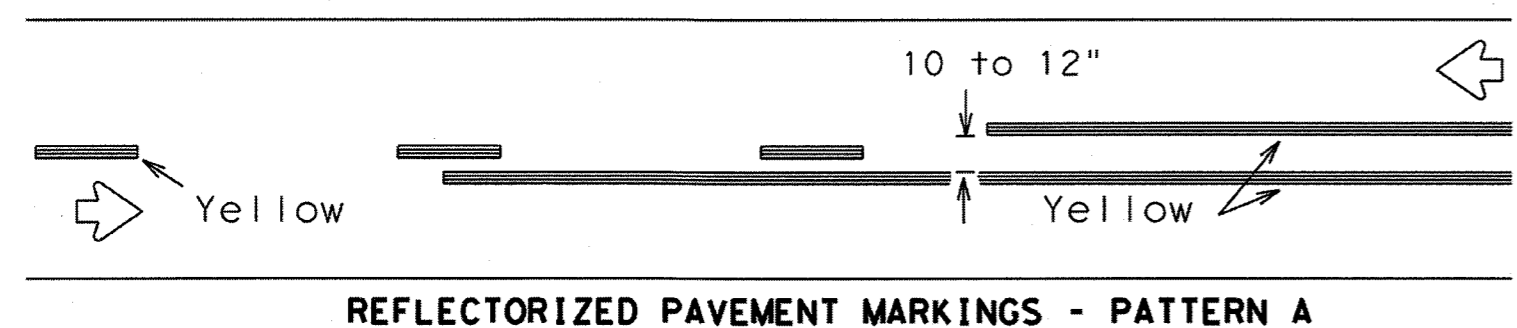
## BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11) - 14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS				
2-98 9-07				
1-02 7-13				
11-02 8-14				
	DIST	COUNTY	SHEET NO.	
			46	

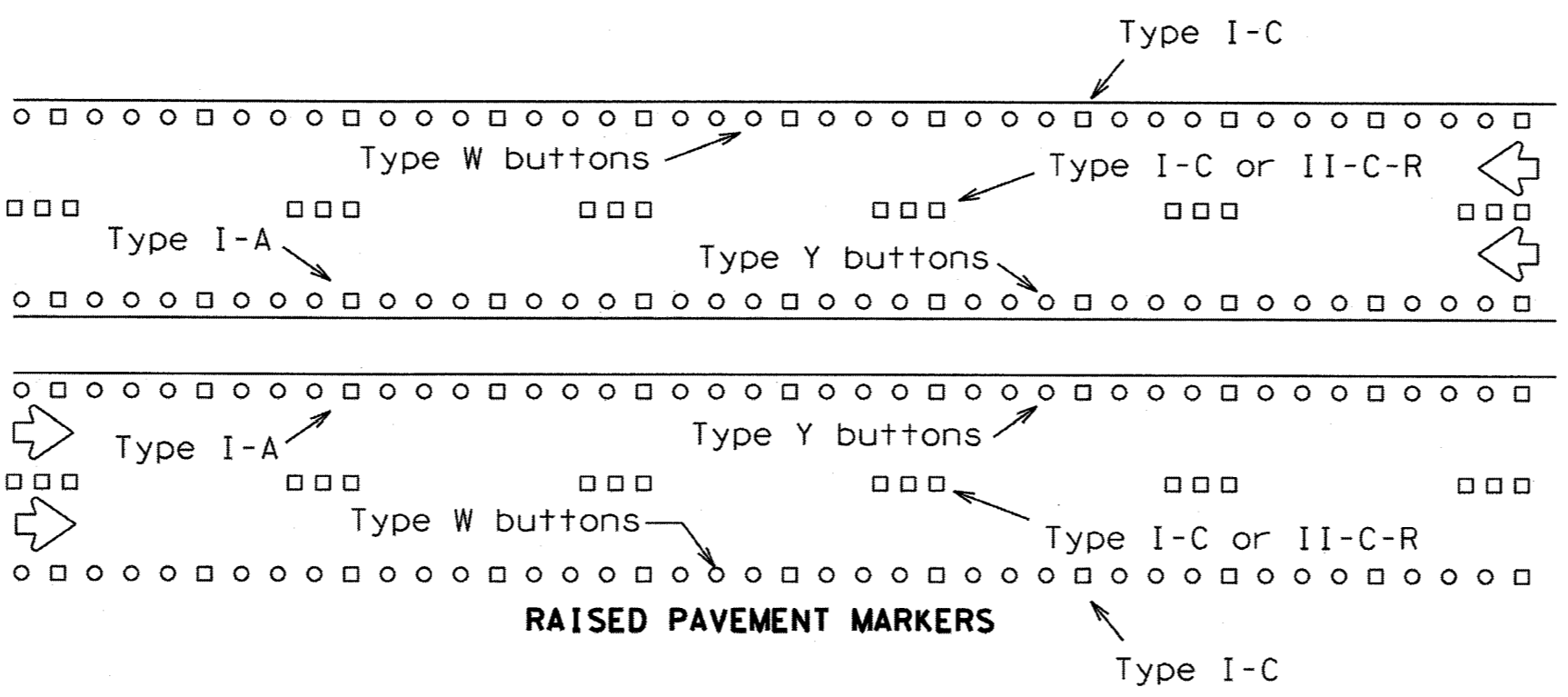
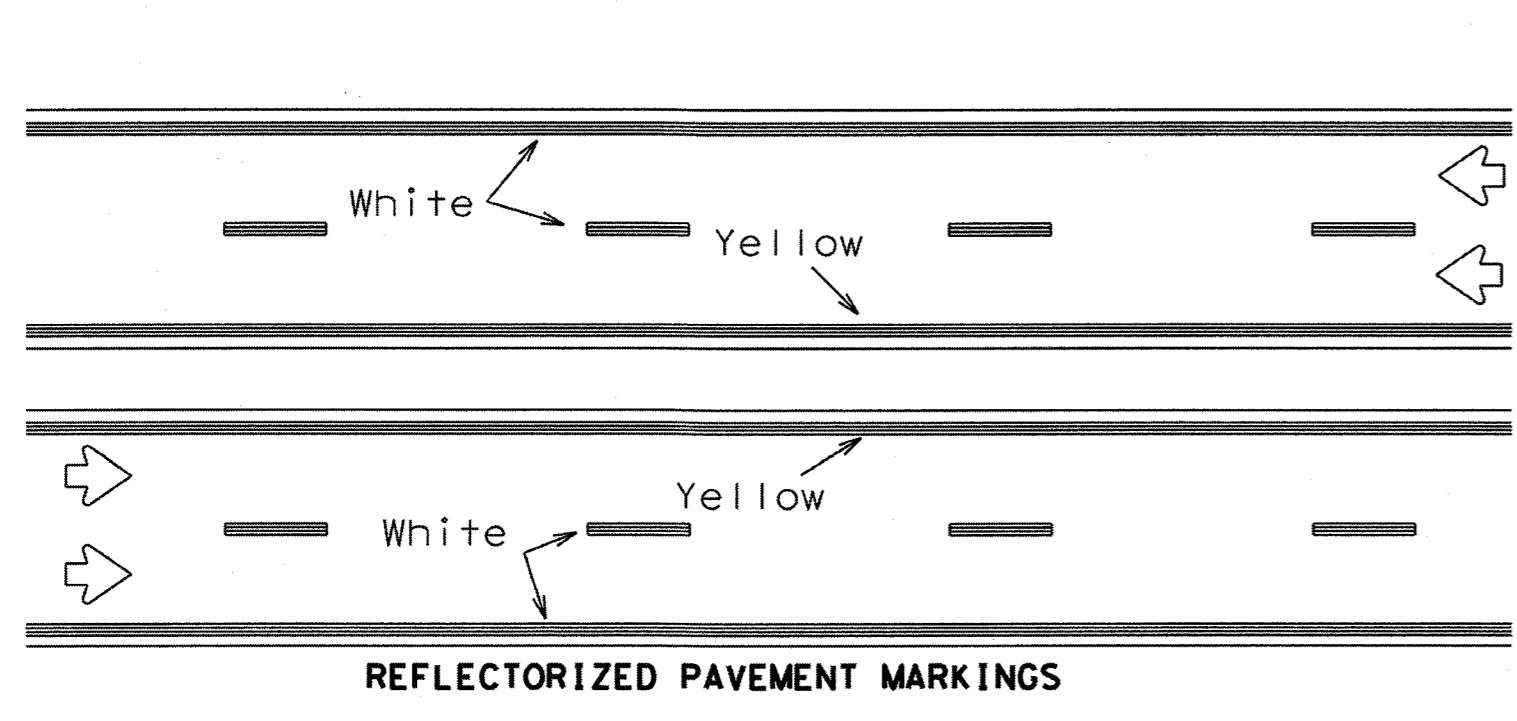
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

### PAVEMENT MARKING PATTERNS



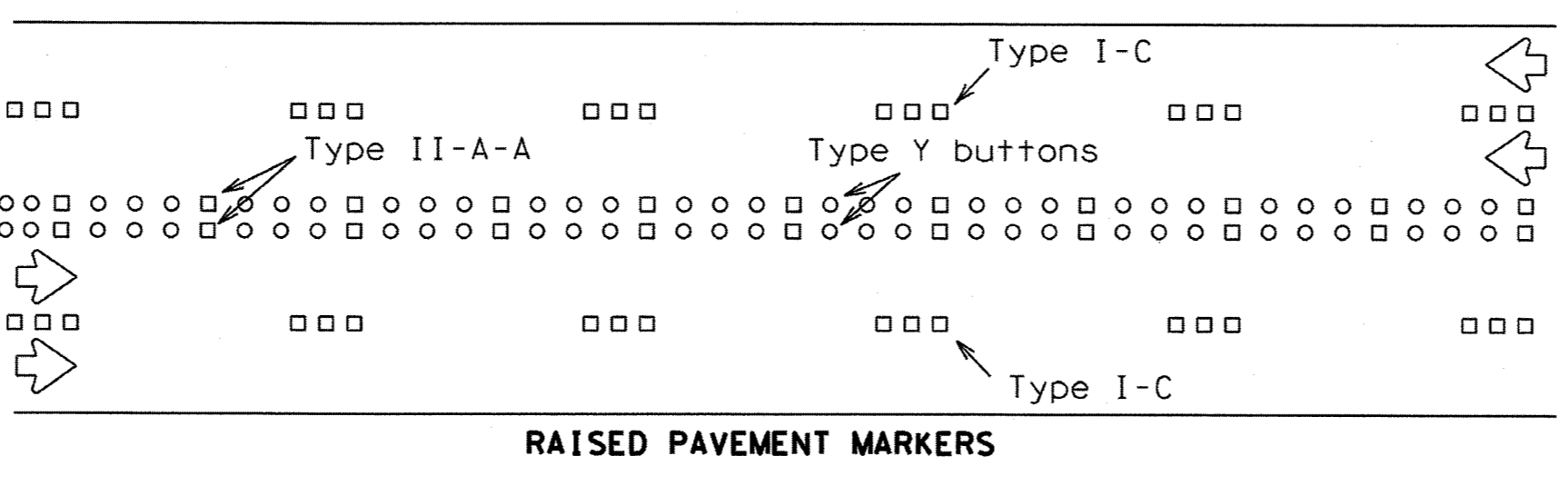
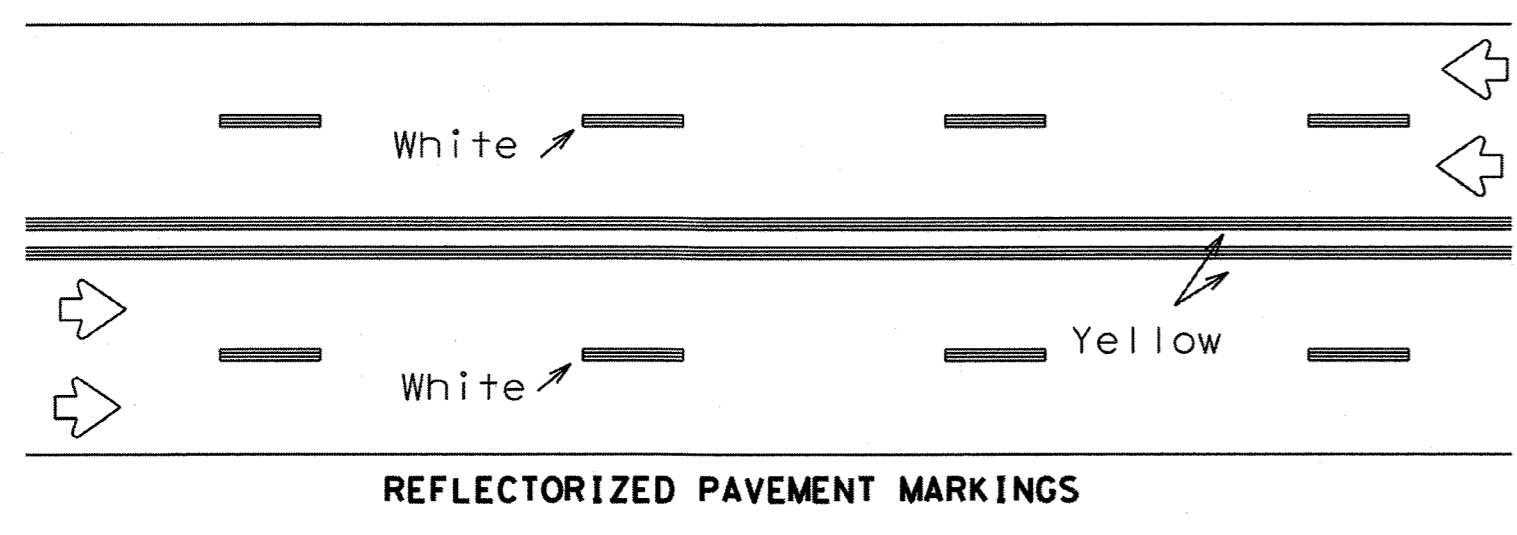
Pattern A is the TxDOT Standard, however Pattern B may be used if approved by the Engineer. Prefabricated markings may be substituted for reflectORIZED pavement markings.

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



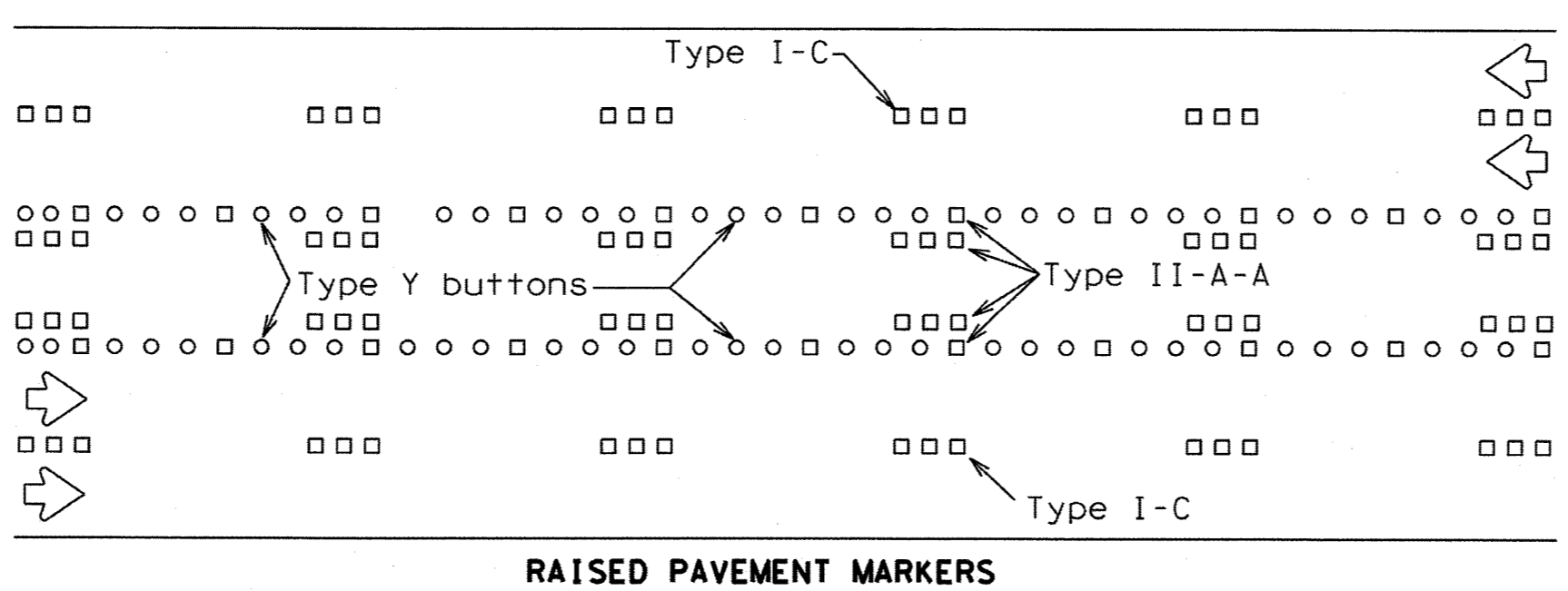
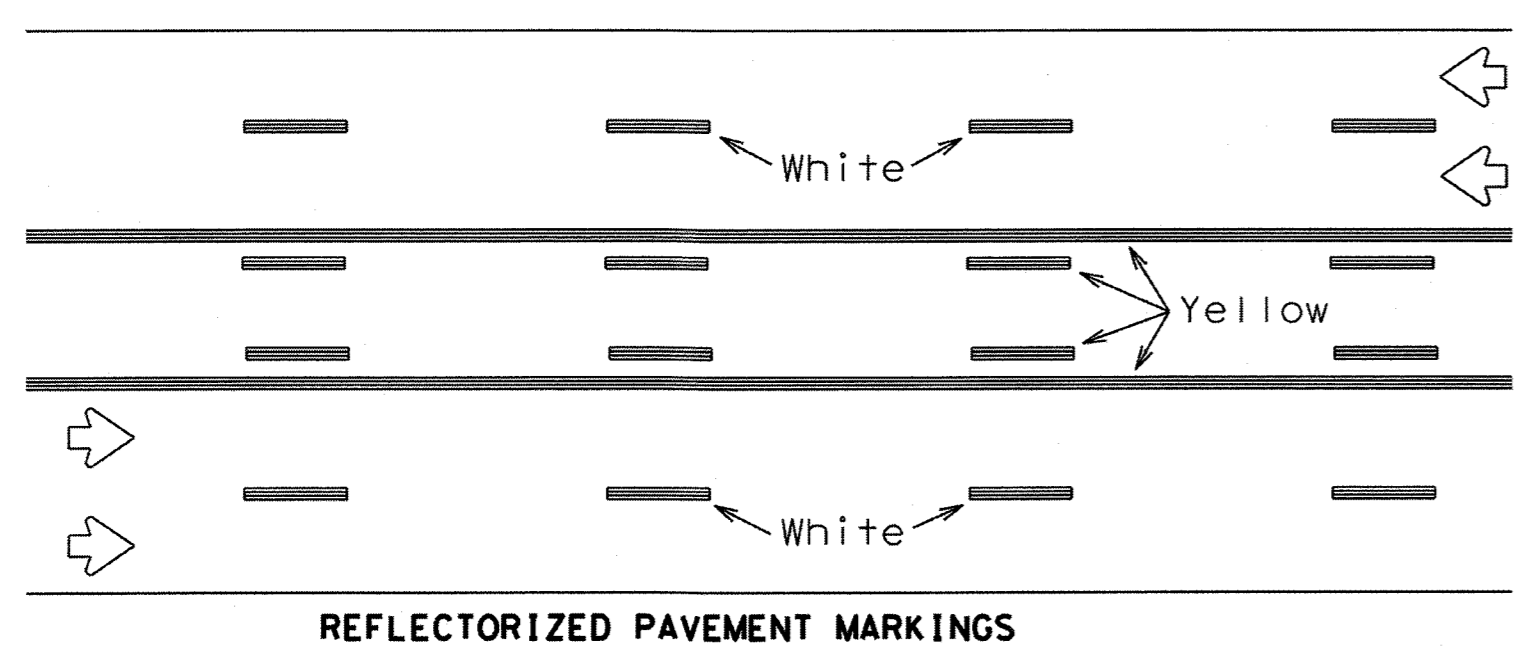
Prefabricated markings may be substituted for reflectORIZED pavement markings.

### EDGE & LANE LINES FOR DIVIDED HIGHWAY



Prefabricated markings may be substituted for reflectORIZED pavement markings.

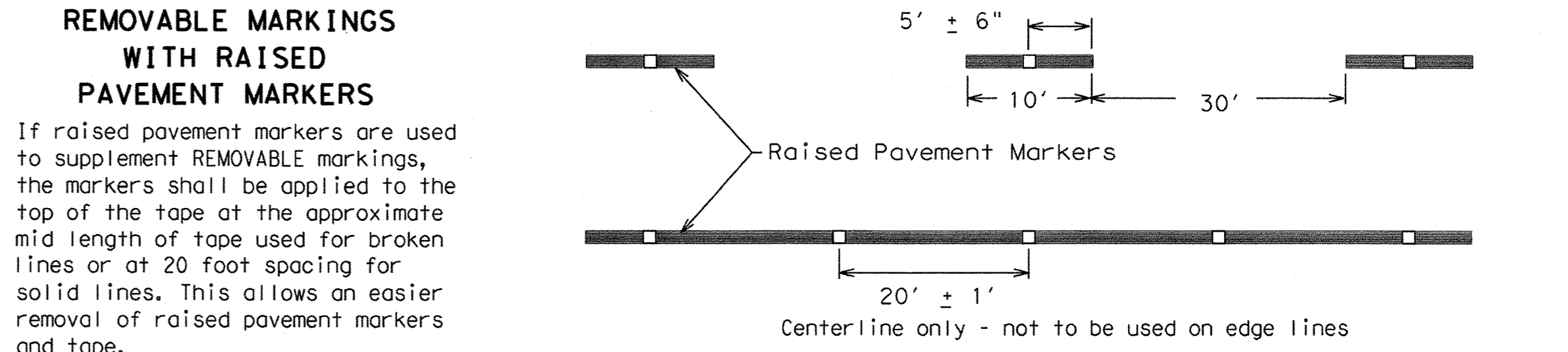
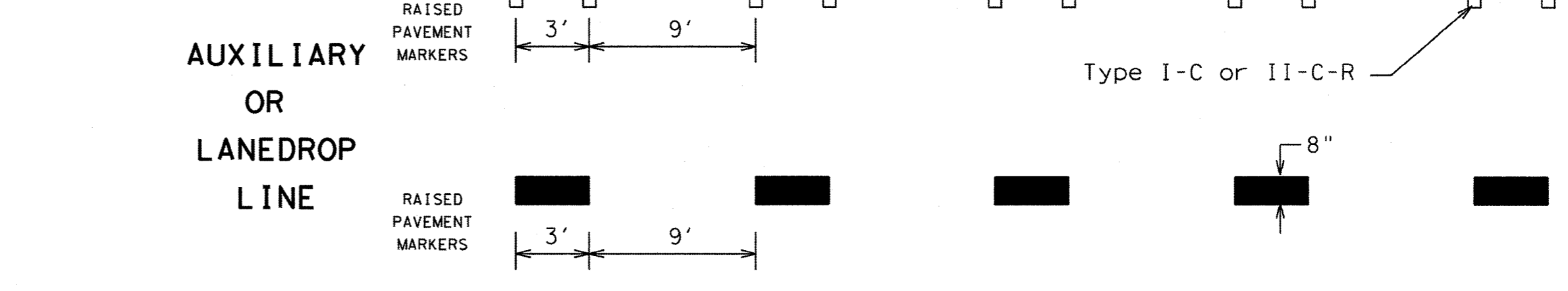
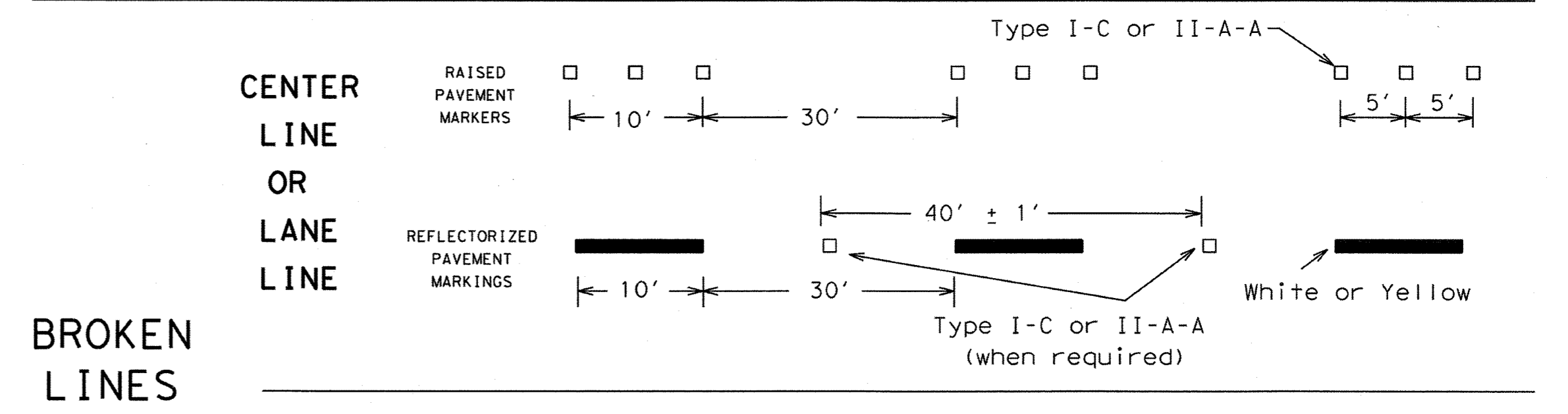
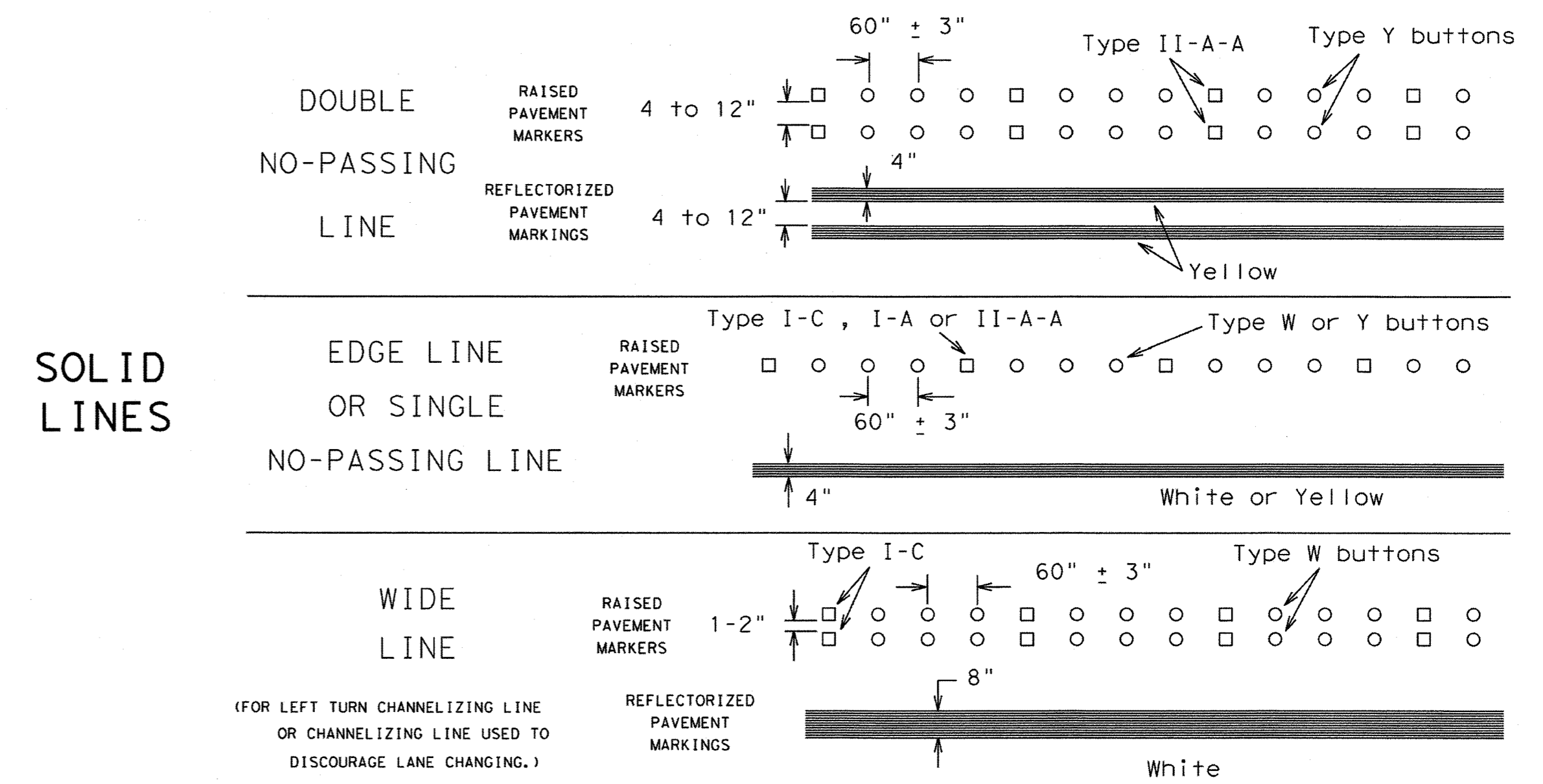
### LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



Prefabricated markings may be substituted for reflectORIZED pavement markings.

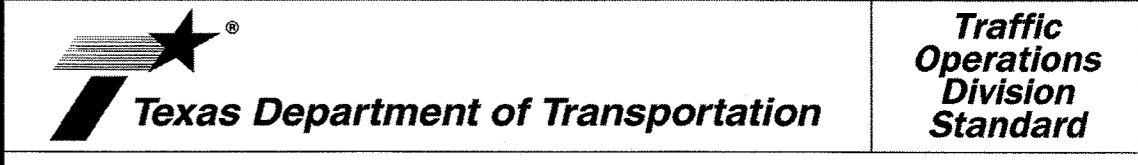
### TWO-WAY LEFT TURN LANE

### STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



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



### BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC (12) - 14

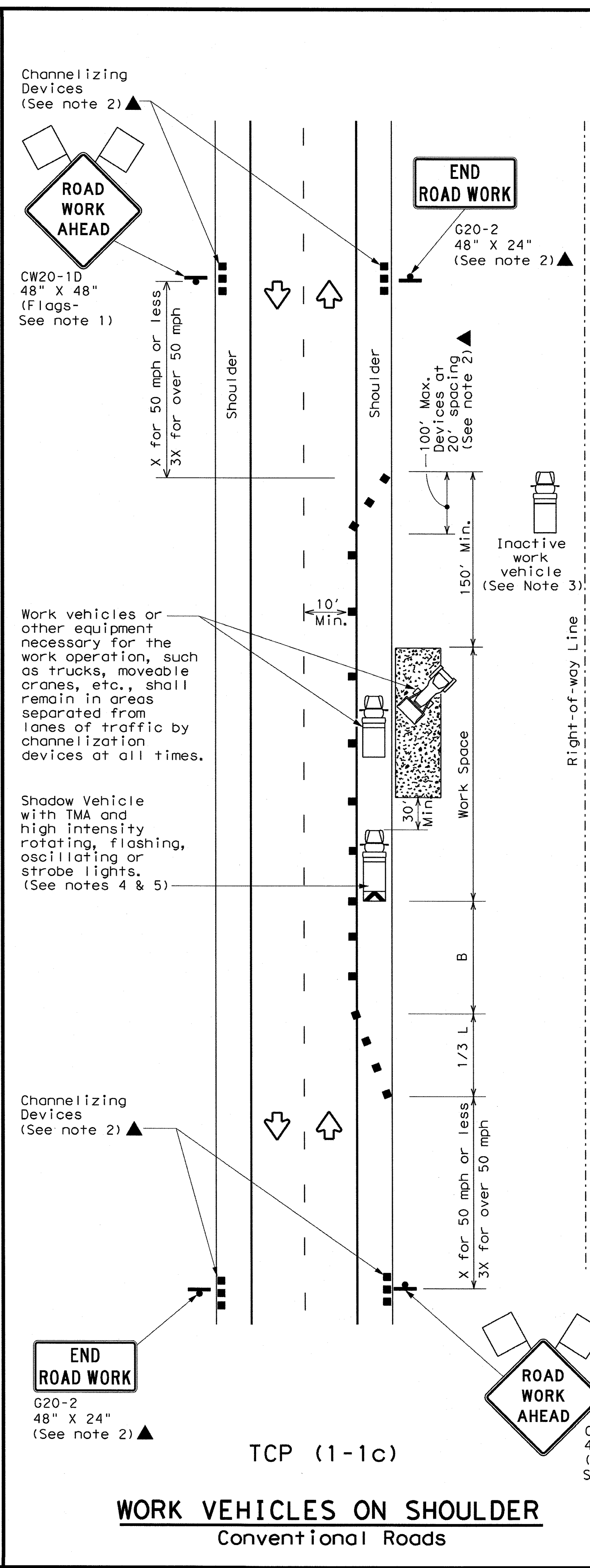
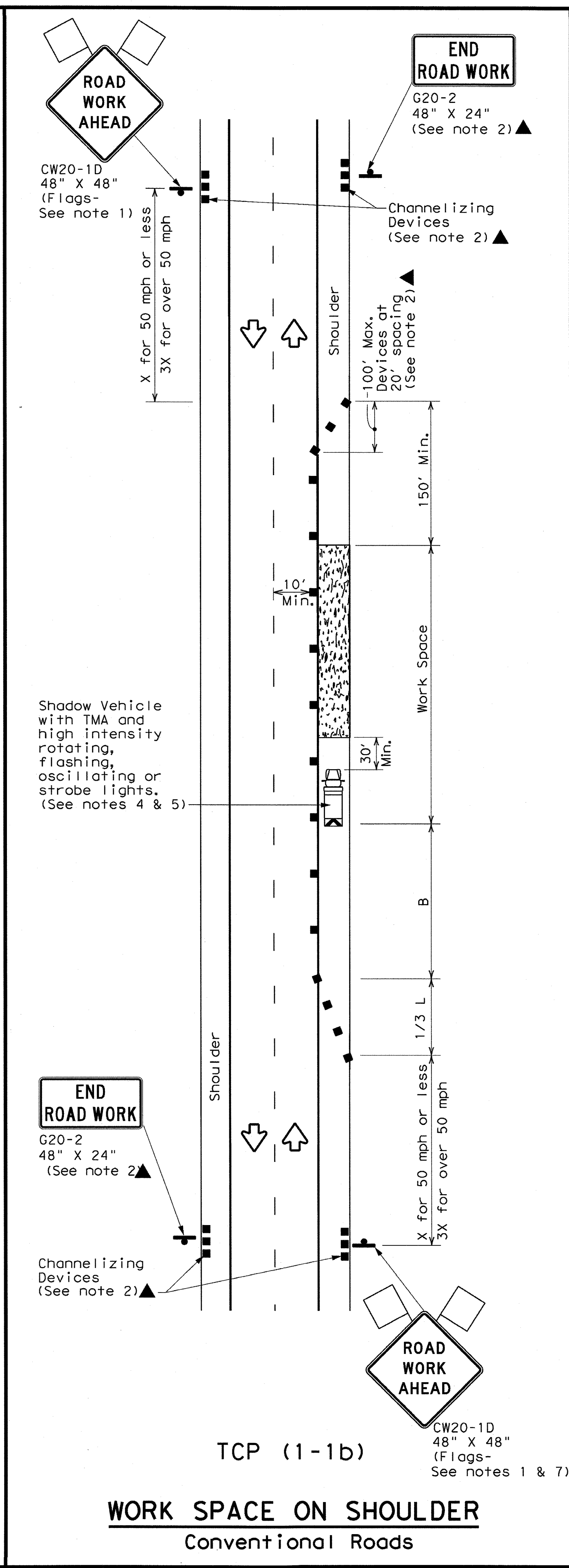
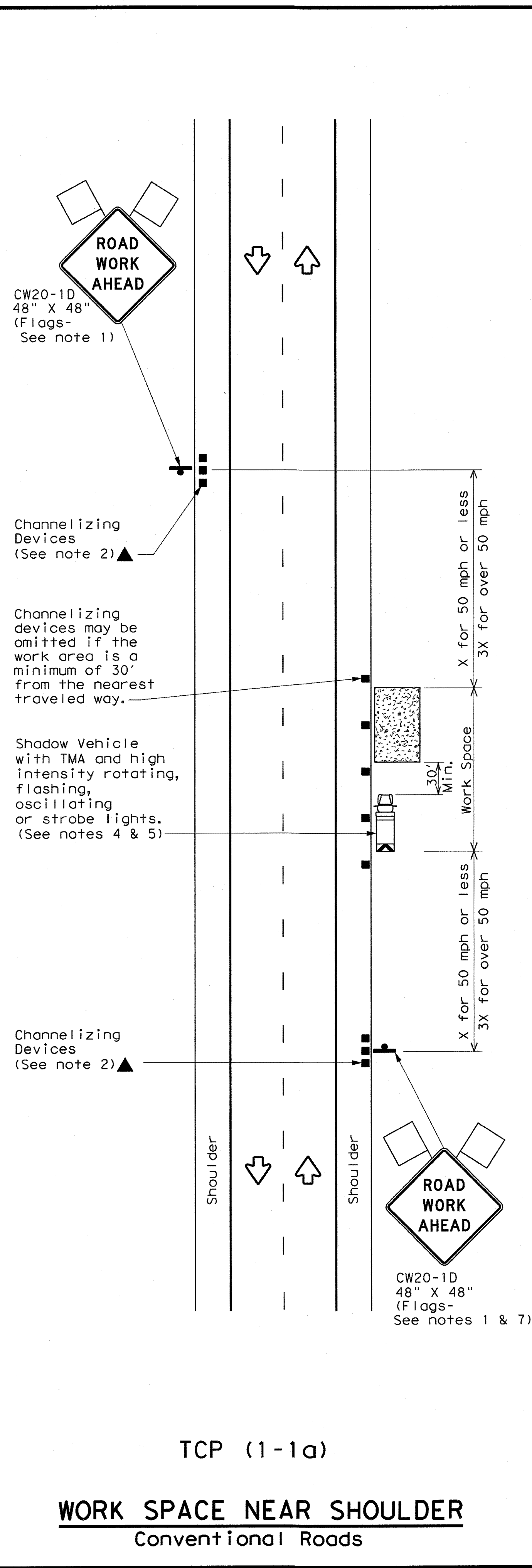
FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS				
1-97 9-07				
2-98 7-13				
11-02 8-14				
DIST	COUNTY	SHEET NO.		

DATE: FILE:



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:



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

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "x" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
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**

- Flags attached to signs where shown are REQUIRED.
- 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.
- Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
- 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.
- Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
- See TCP (5-1) for shoulder work on divided highways, expressways and freeways.
- CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.



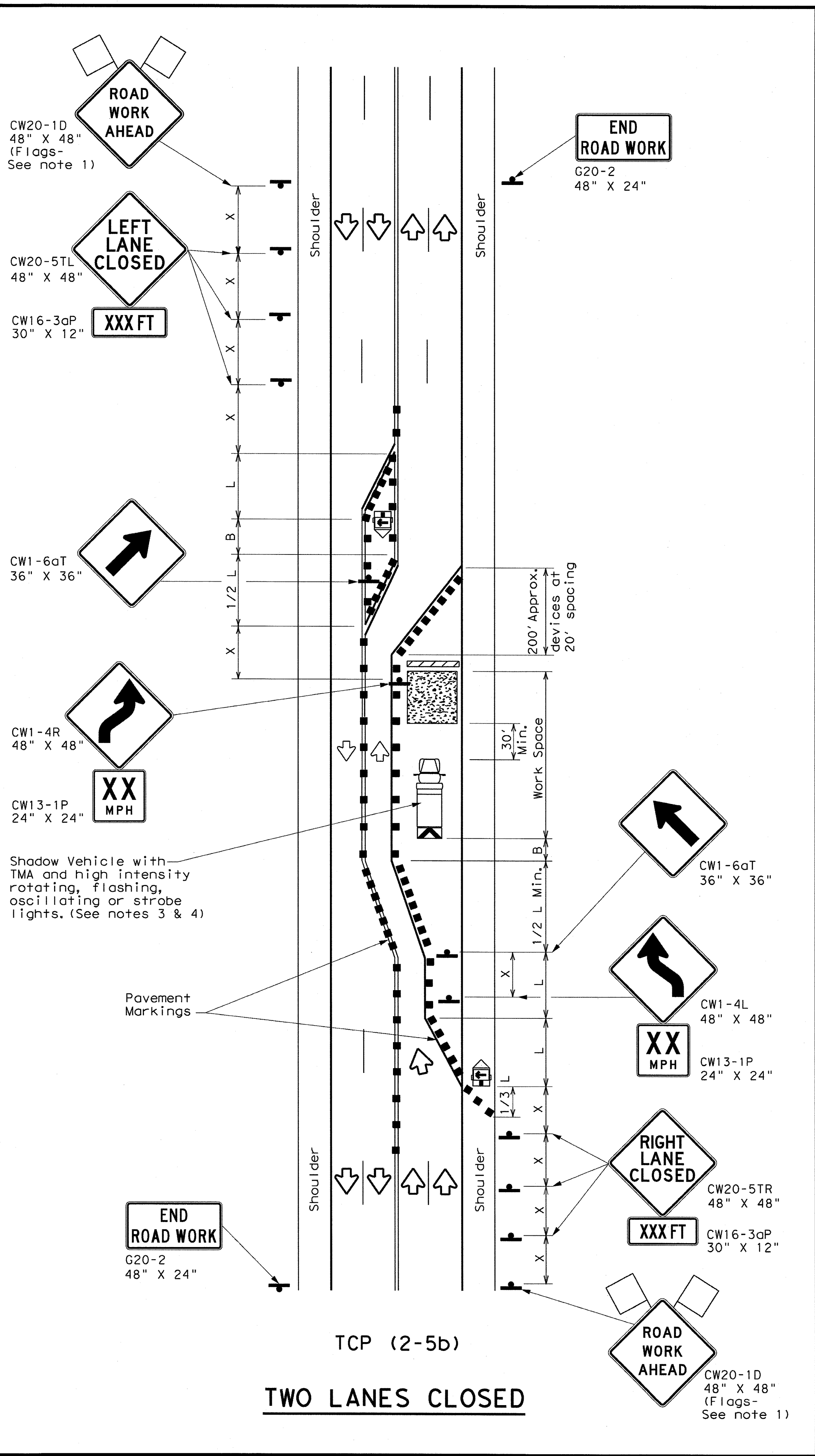
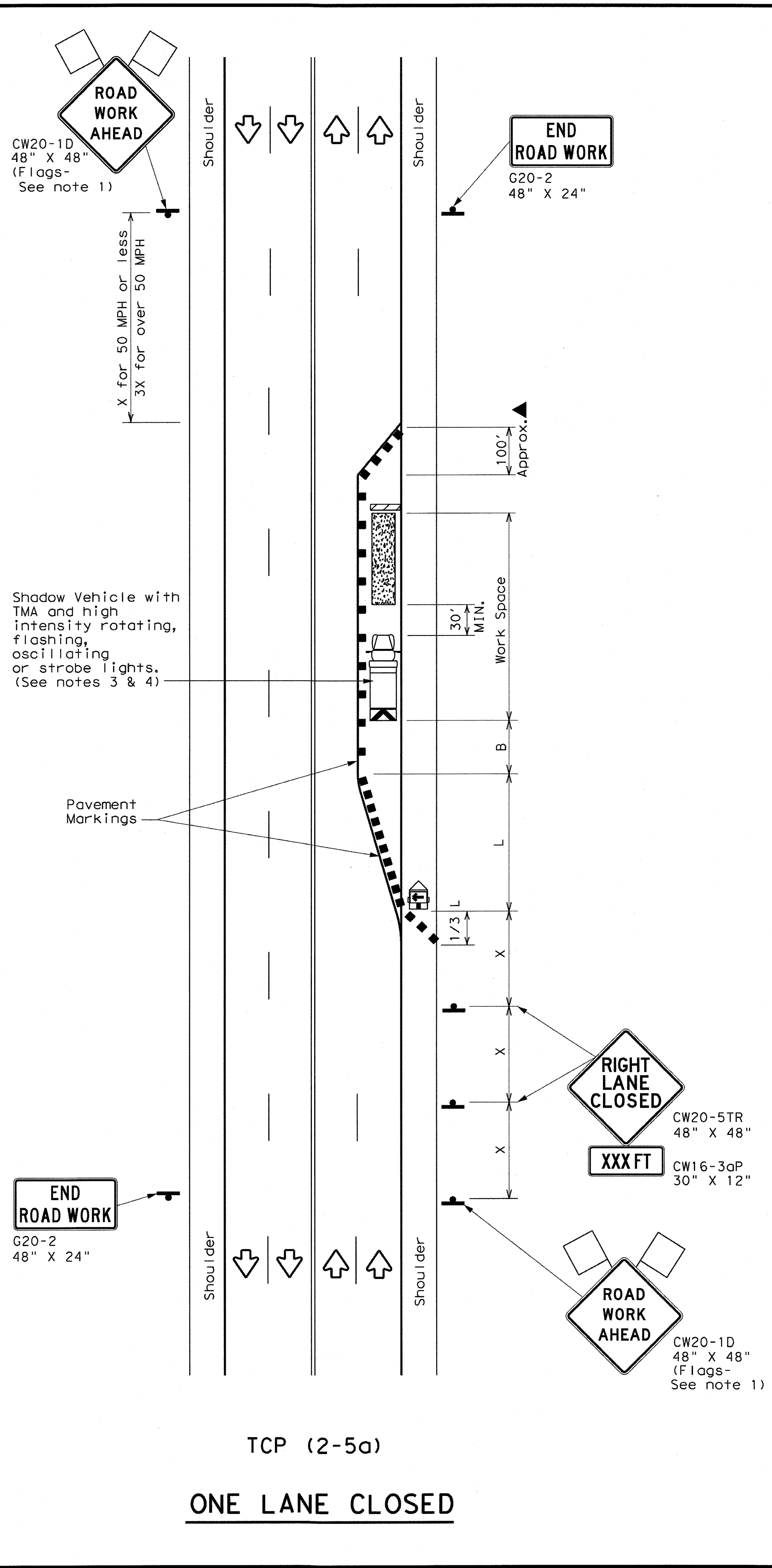
**TRAFFIC CONTROL PLAN**  
**CONVENTIONAL ROAD**  
**SHOULDER WORK**

**TCP (1-1) - 18**

FILE: tcp1-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS				
2-94 4-98				
8-95 2-12				
1-97 2-18				
	DIST	COUNTY	SHEET NO.	

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:



**LEGEND**

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

Posted Speed * X	Formula L = WS <sup>2</sup> / 60	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	L = WS <sup>2</sup> / 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**
- Flags attached to signs where shown, are REQUIRED.
  - 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.
  - 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.
  - 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.
  - The downstream taper is optional. When used, it should be 100 feet approximately per lane, with channelizing devices spaced at 20 feet.
- TCP (2-5a)**
- 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 (2-5b)**
- Conflicting pavement markings shall be removed for long-term projects.

**Texas Department of Transportation** *Traffic Operations Division Standard*

**TRAFFIC CONTROL PLAN  
LONG TERM LANE CLOSURES  
MULTILANE CONVENTIONAL RDS.**

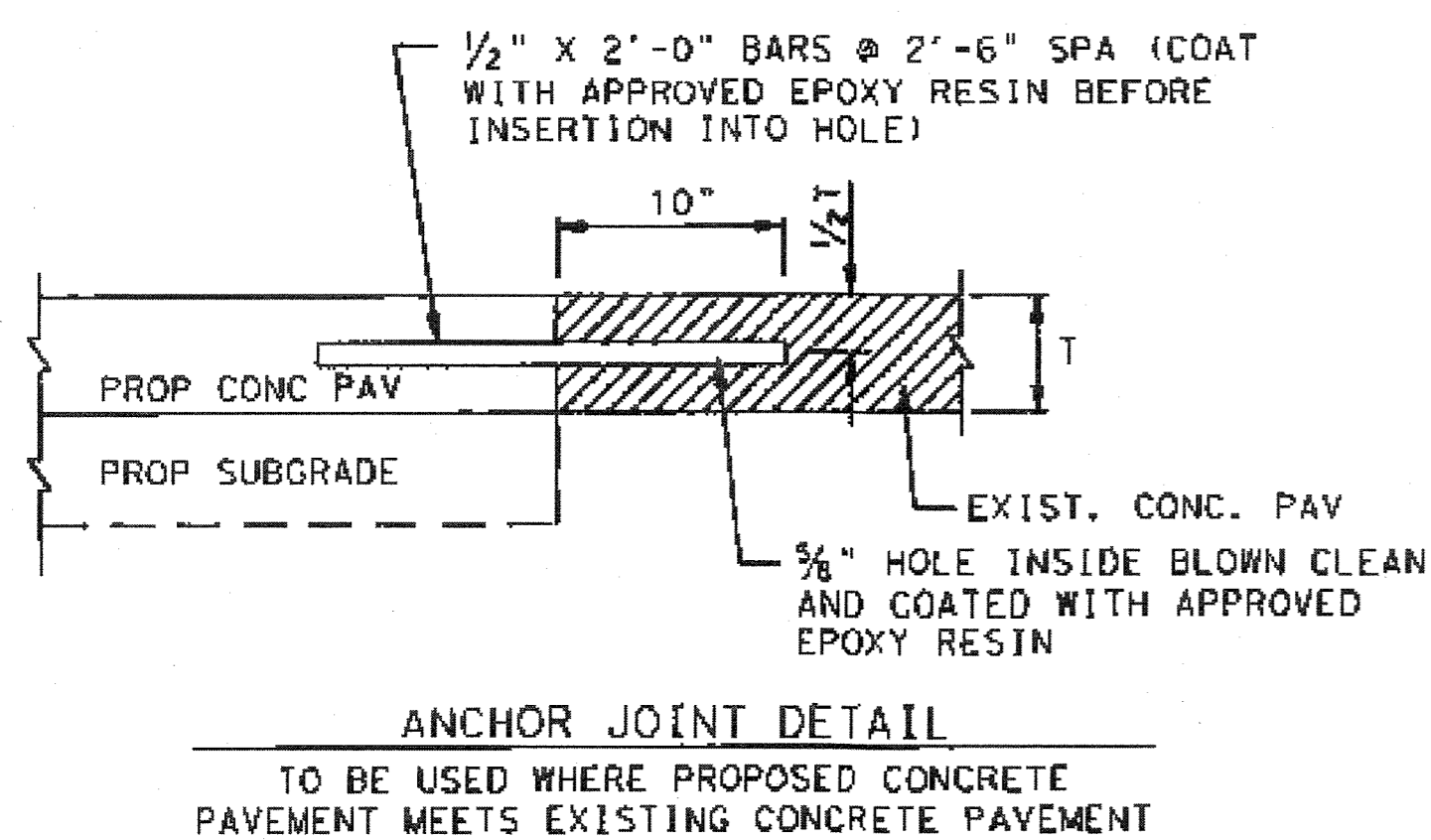
**TCP (2-5) - 18**

FILE: tcp2-5-18.dgn	DIN:	CHK:	OW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
8-95 2-12 REVISIONS				
1-97 3-03	DIST	COUNTY		SHEET NO.
4-98 2-18				

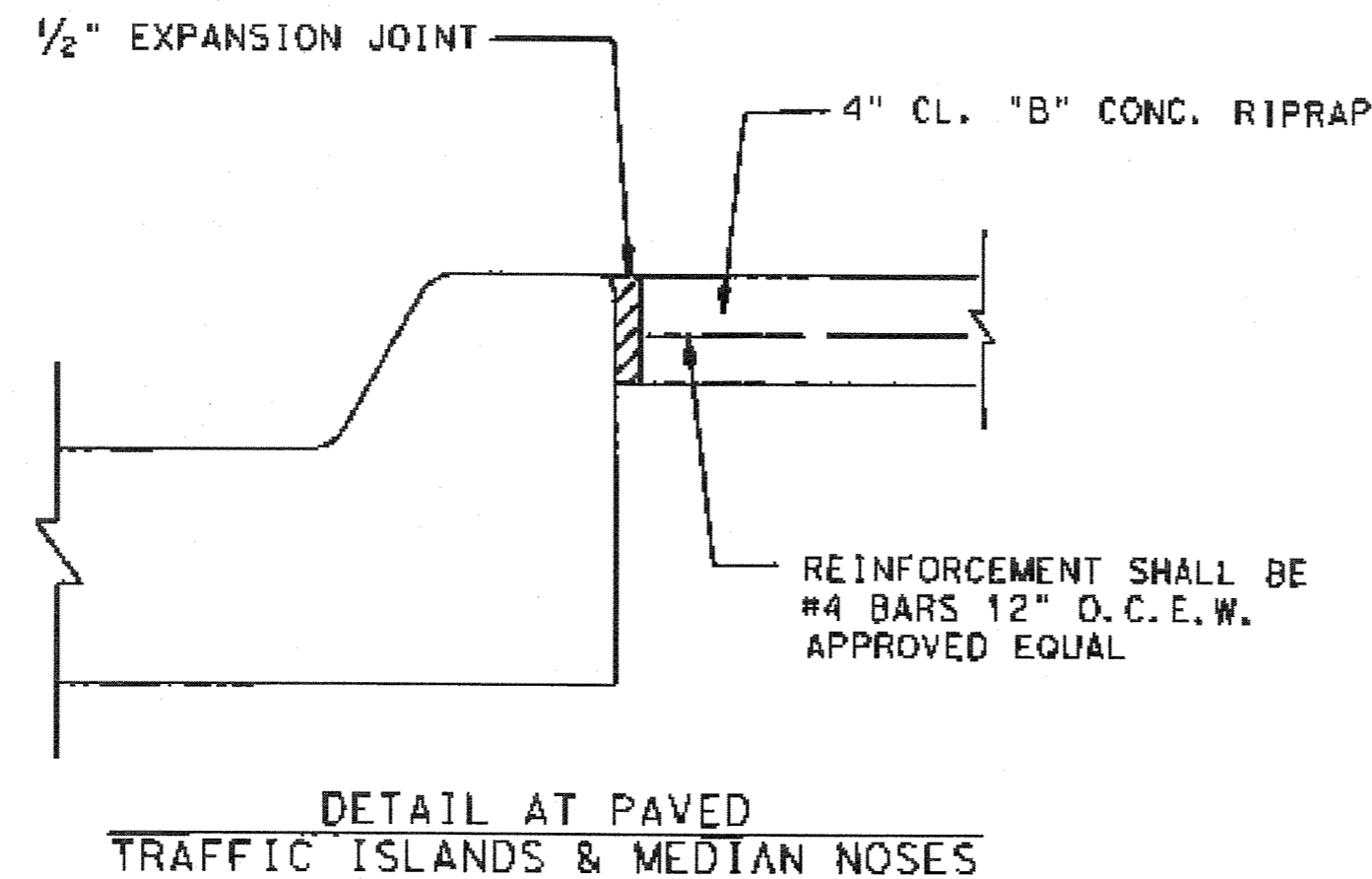
1165

4/30/2013 8:05:58 AM

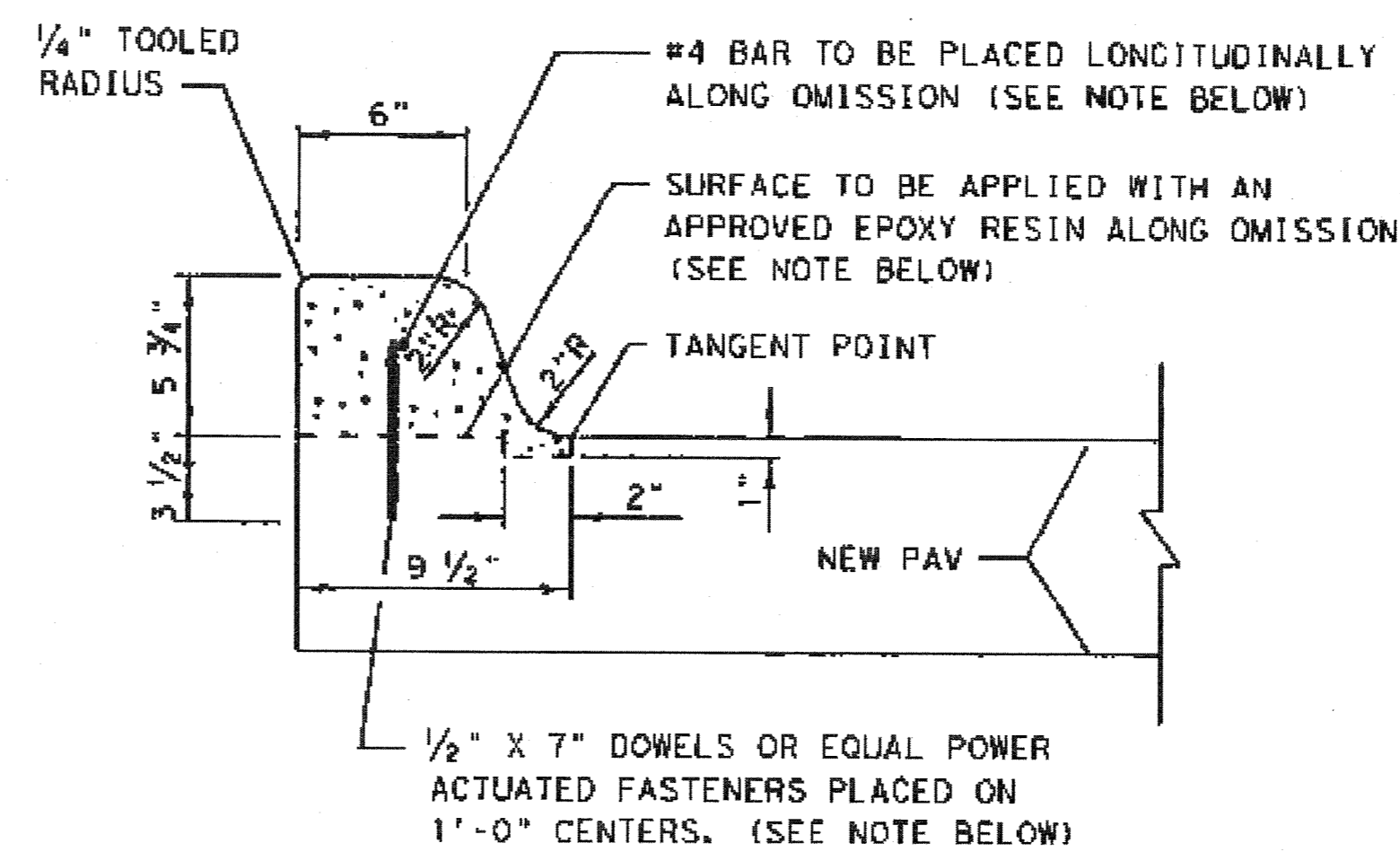
T:\2009-0655 Rockwall County On-System\01\FM740\TRC\DCM\ORDY\FM740\MISCDET\MEDIAN.dgn



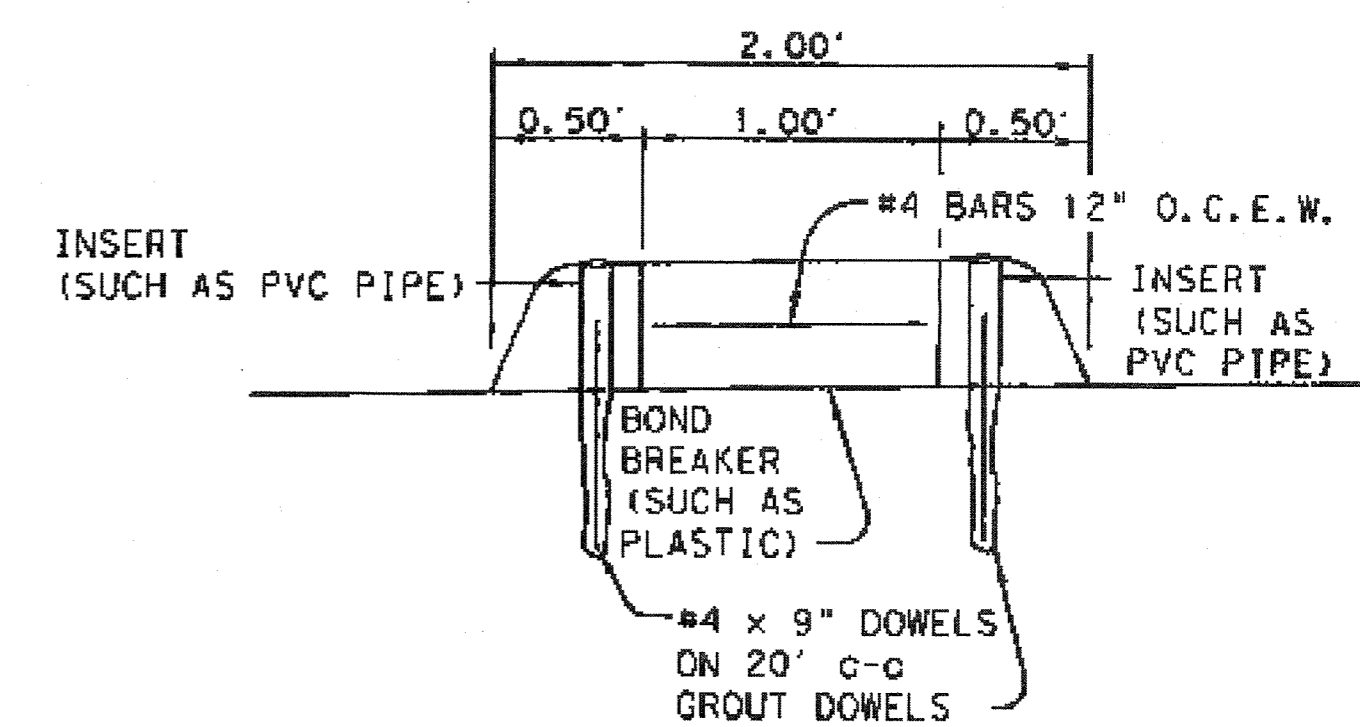
**ANCHOR JOINT DETAIL**  
TO BE USED WHERE PROPOSED CONCRETE PAVEMENT MEETS EXISTING CONCRETE PAVEMENT



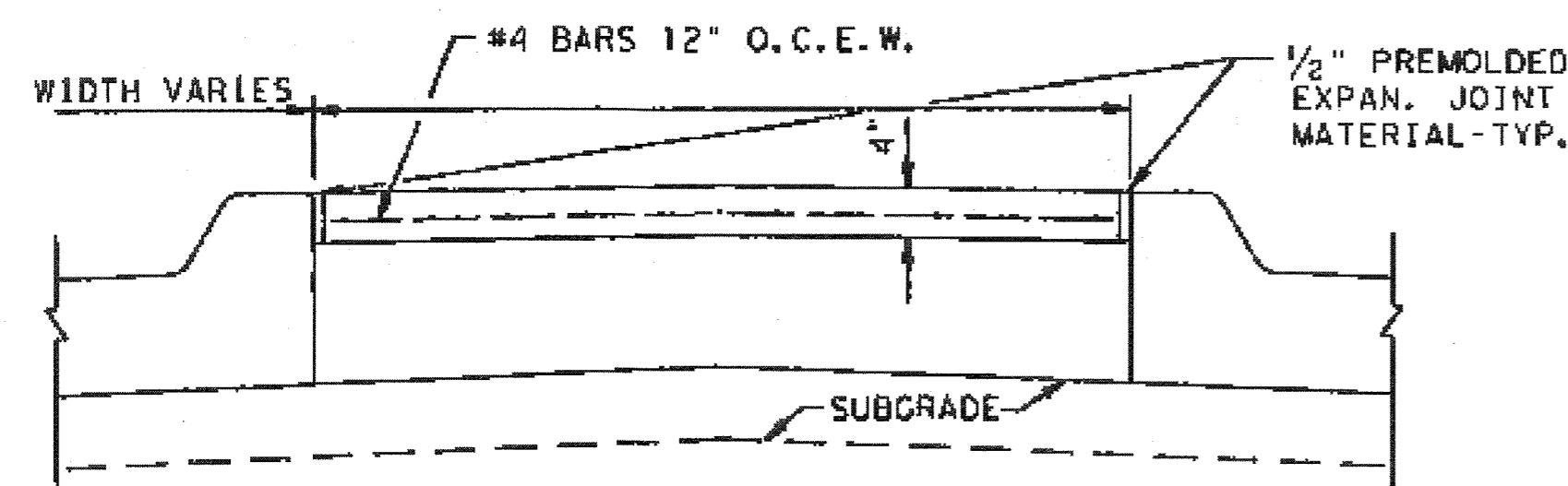
**DETAIL AT PAVED TRAFFIC ISLANDS & MEDIAN NOSES**



**TYPE II CURB (DOWEL)**

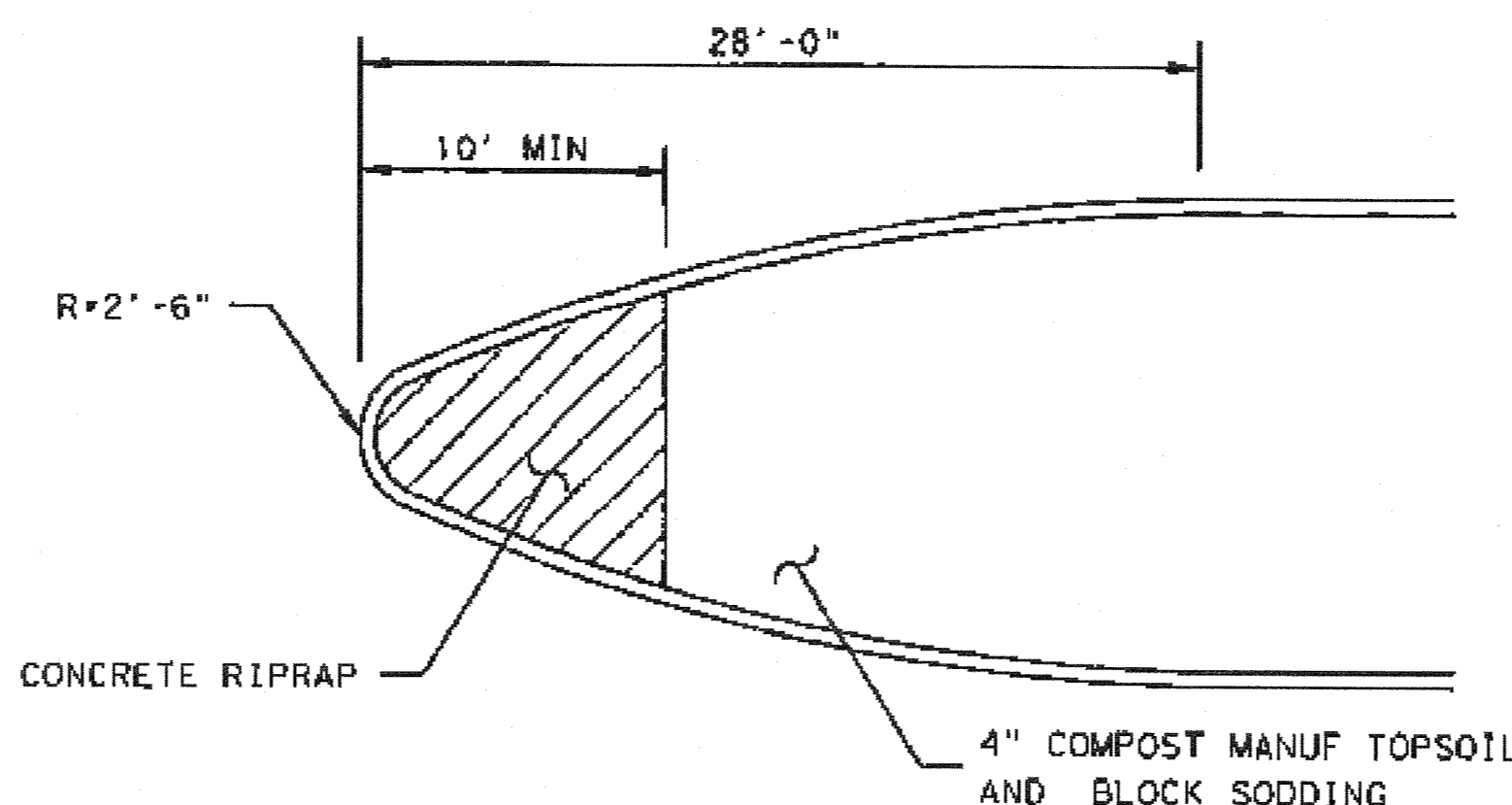


**MEDIAN DETAILS CONC MEDIAN (TY I) (DOWEL)**

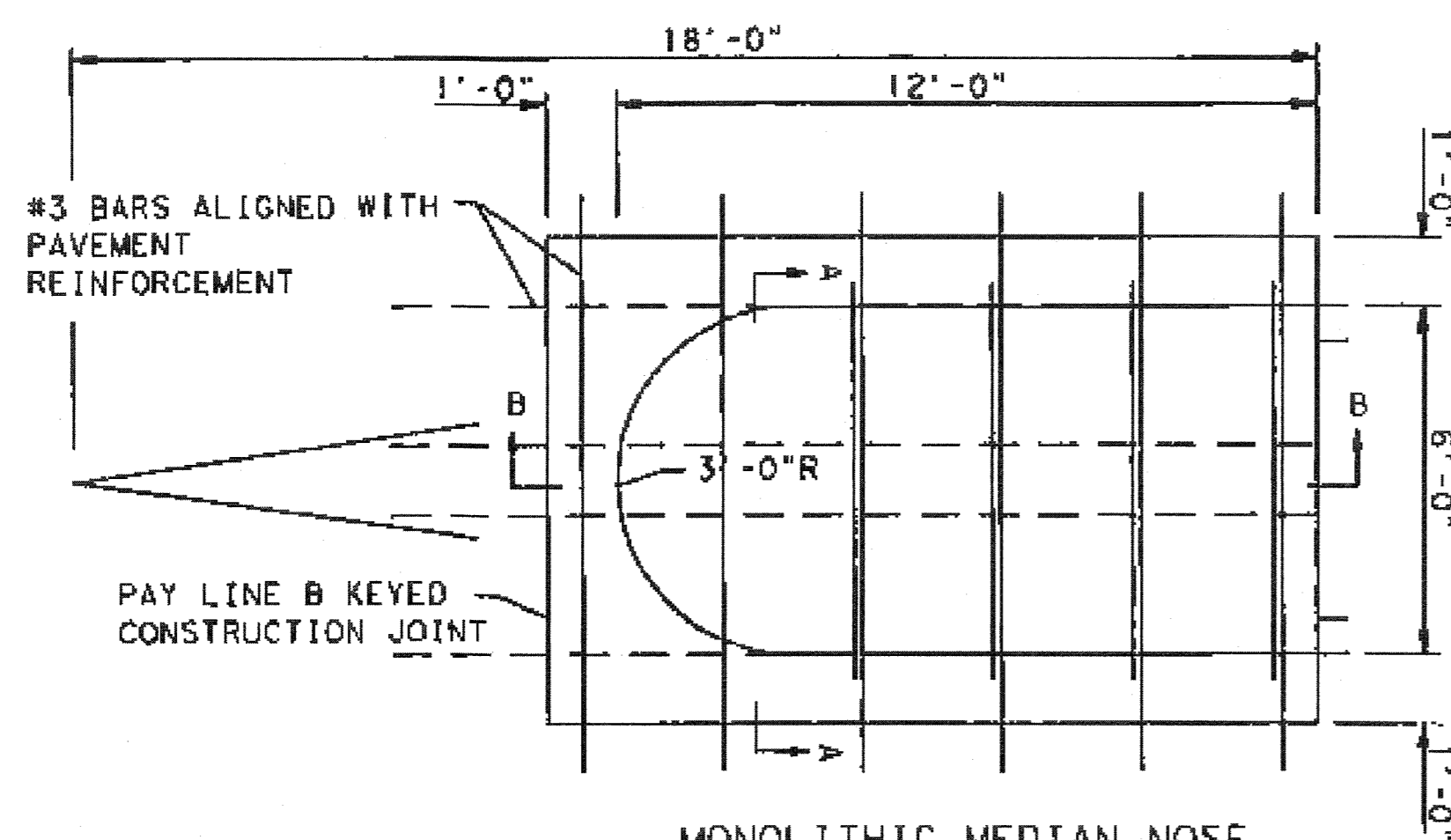


PROVIDE SAWED CONTRACTION JOINTS 3/8" WIDE BY 1" DEEP AT 15' INTERVALS. PLACE JOINT SEALING COMPOUND IN ACCORDANCE WITH JOINT SEALS CONCRETE PAVING DETAILS.

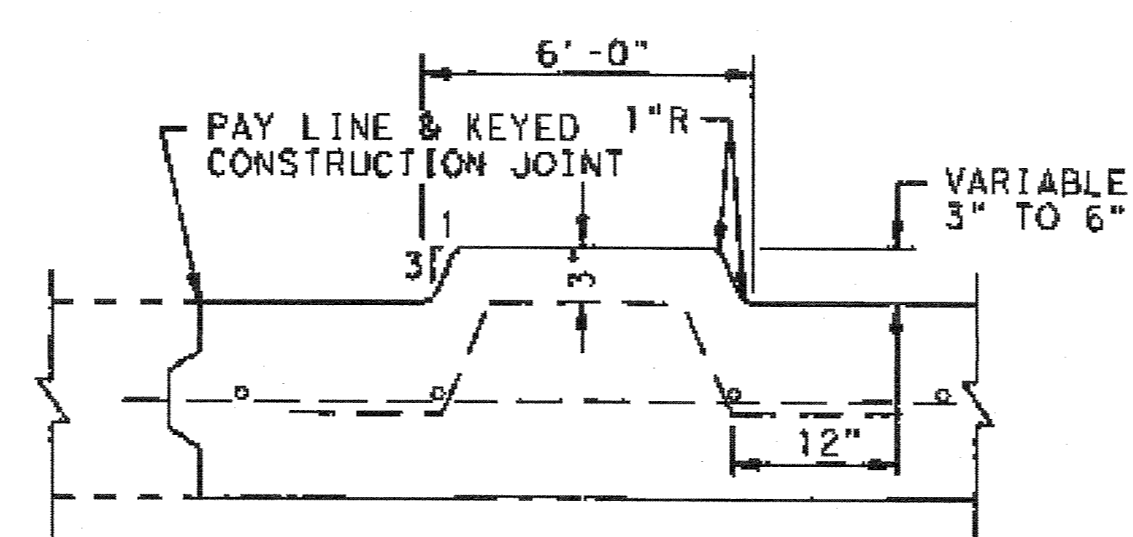
**TYPICAL MEDIAN SECTION CONCRETE**



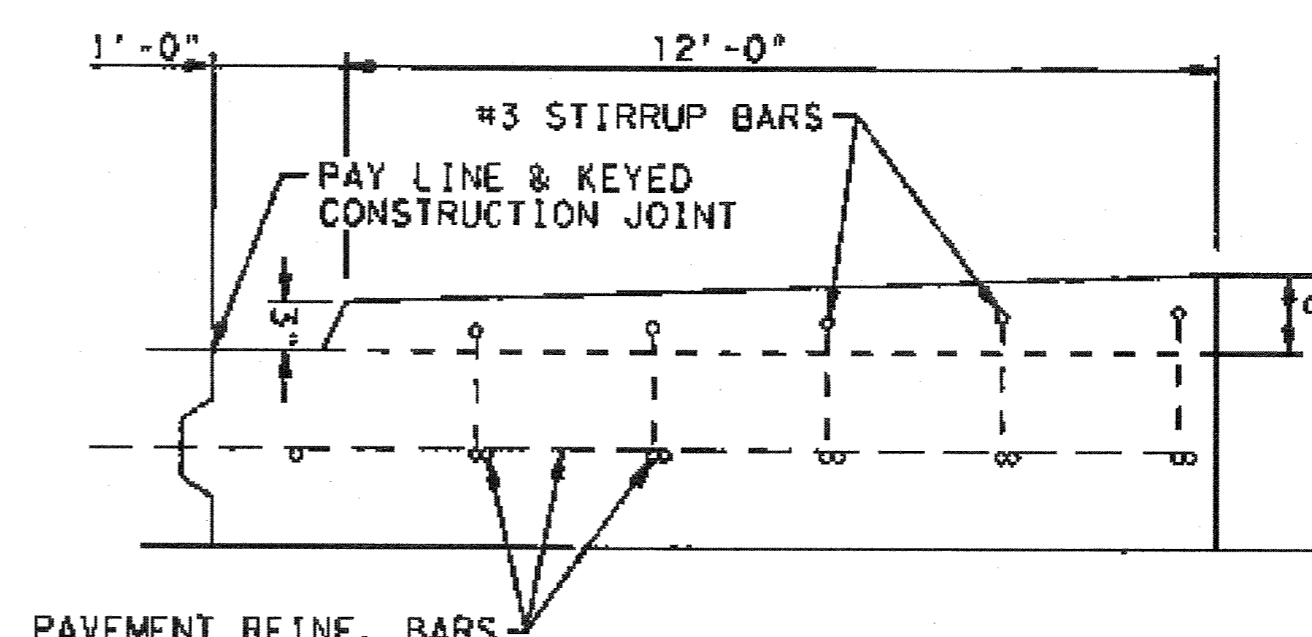
**MEDIAN NOSE DETAIL NO TURN LANE**



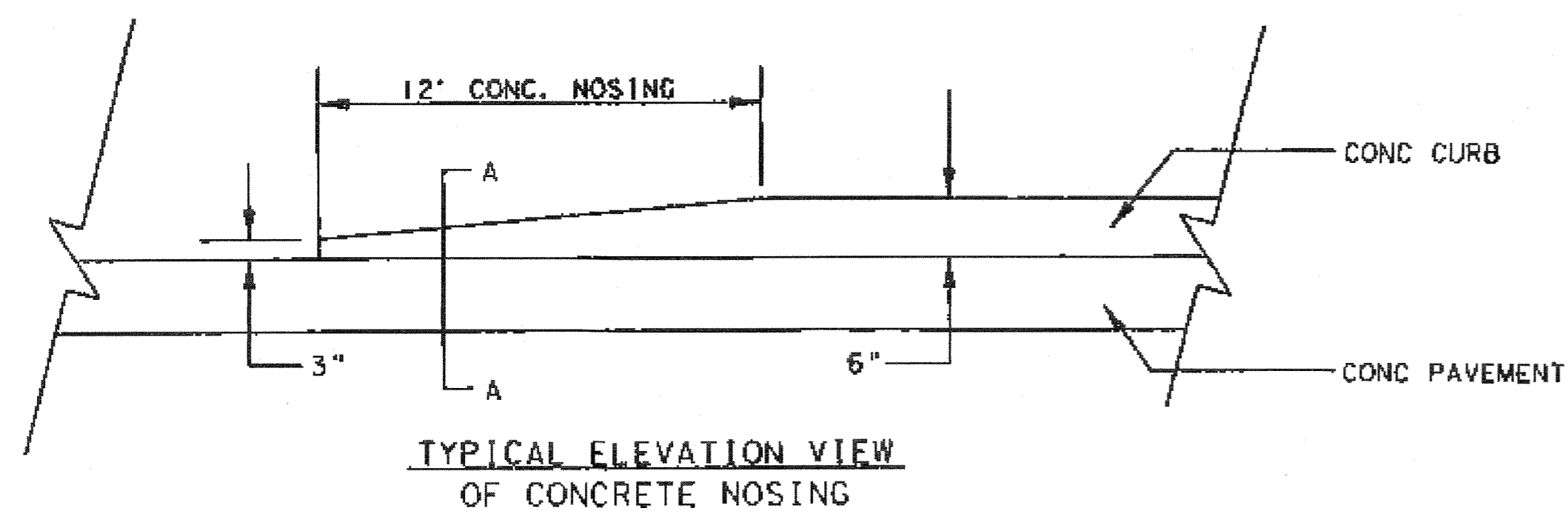
**MONOLITHIC MEDIAN NOSE**  
MONOLITHIC MEDIAN NOSE & PAVEMENT WITHIN PAY LINES SHALL BE PAID FOR AS CONCRETE MEDIAN BY THE SQUARE YARD.



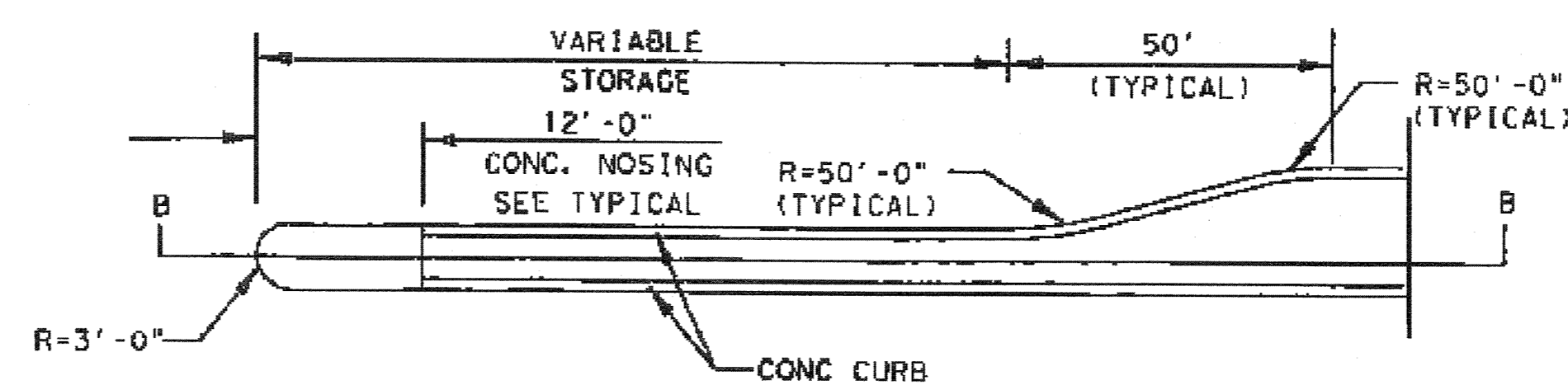
**SECTION A-A**



**SECTION B-B**



**TYPICAL ELEVATION VIEW OF CONCRETE NOSING**



**TYPICAL PLAN VIEW MEDIAN NOSE & LEFT TURN BAY**  
(ALL MEASUREMENTS ARE FROM FACE OF CURB)

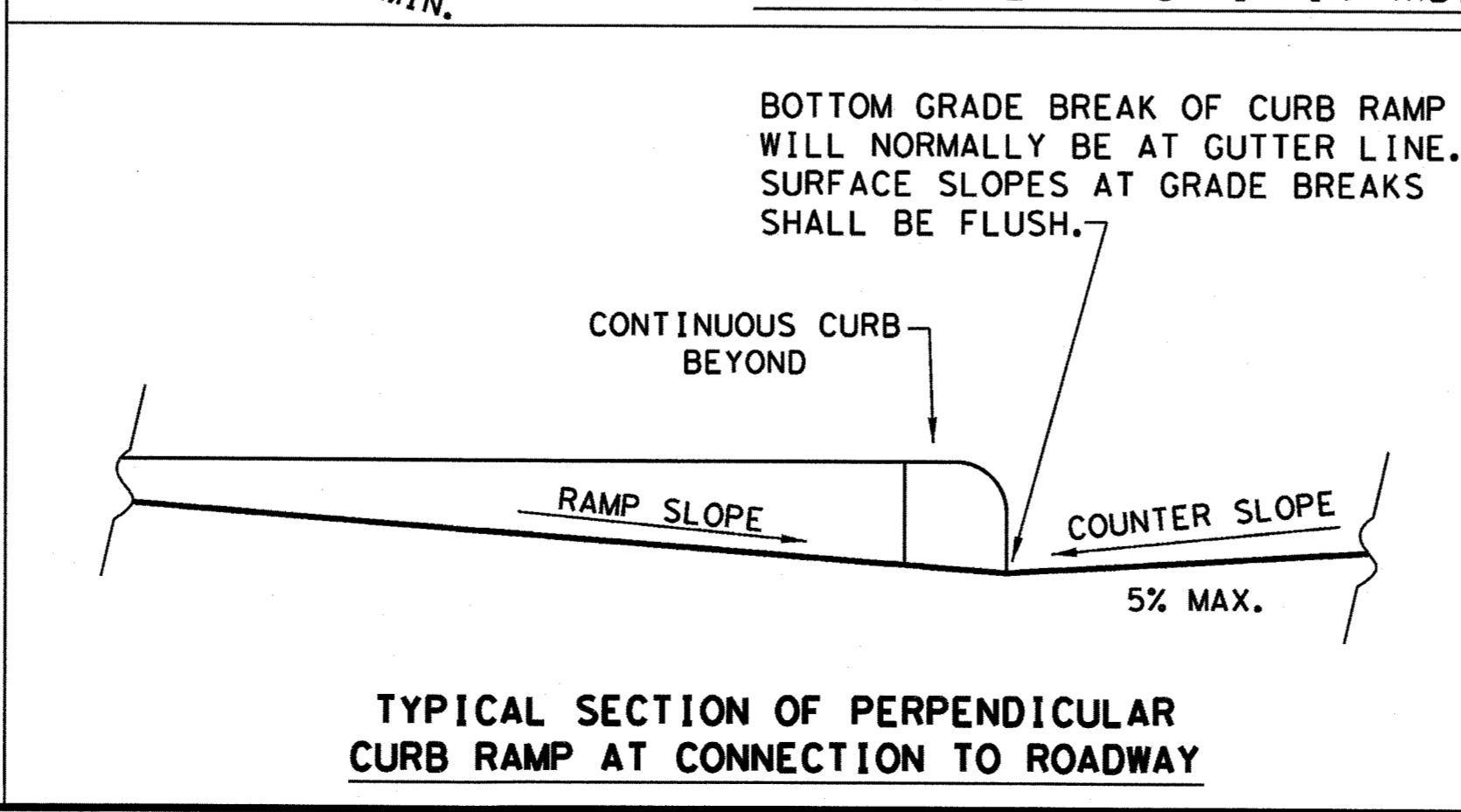
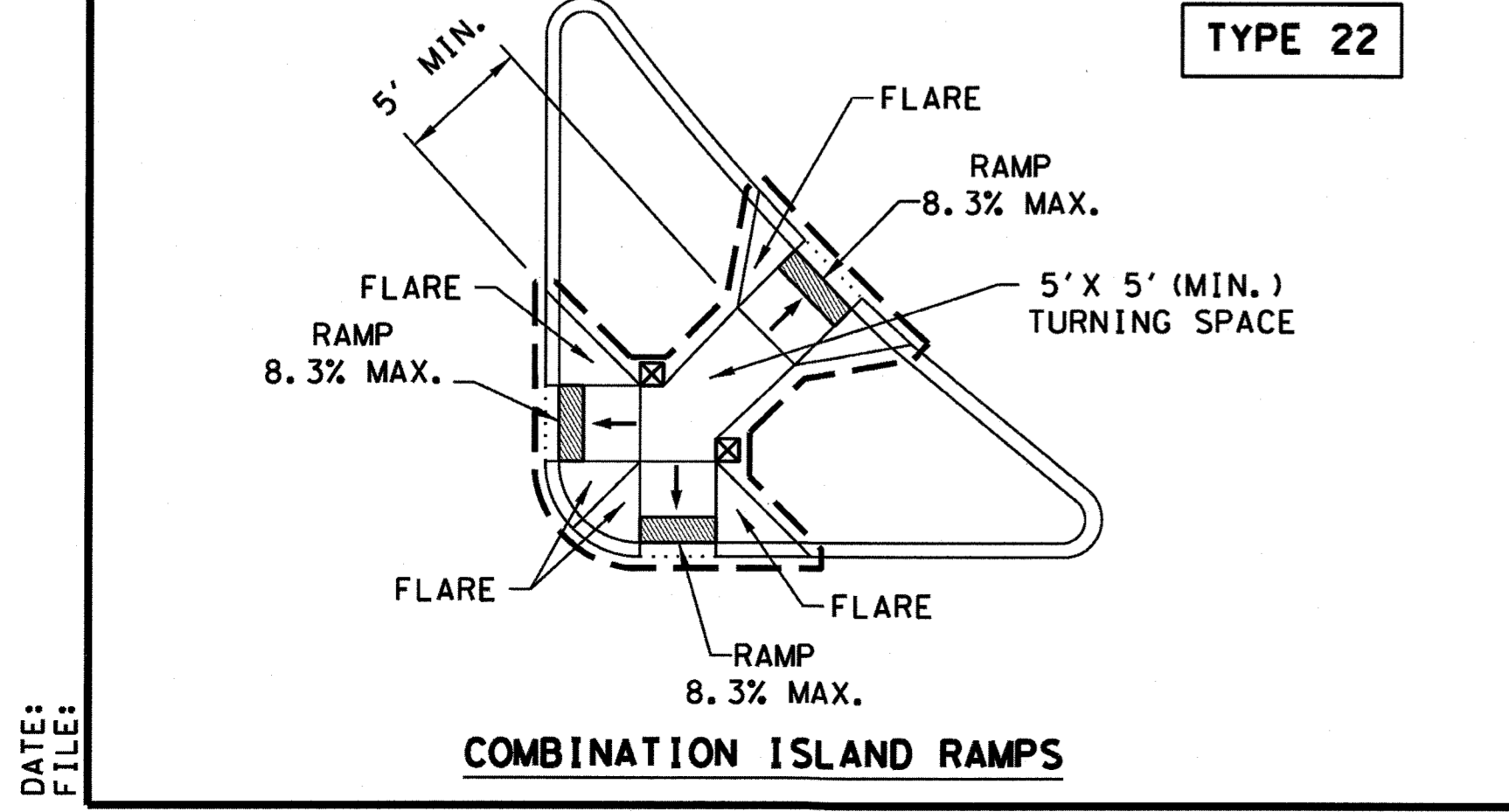
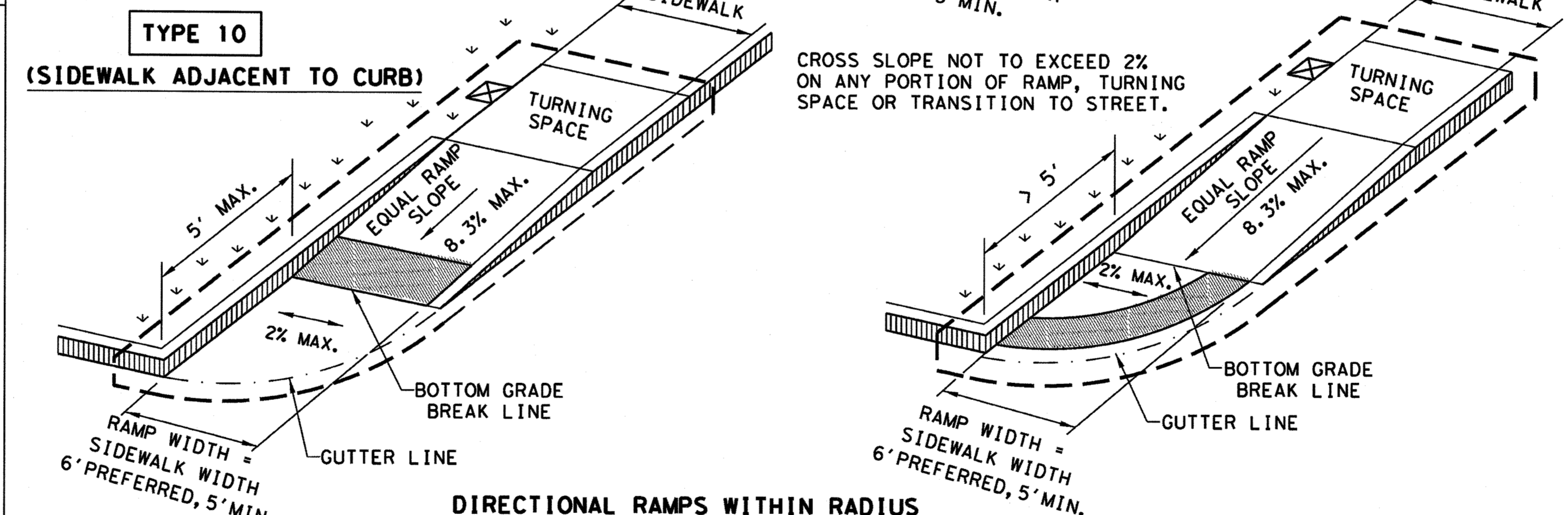
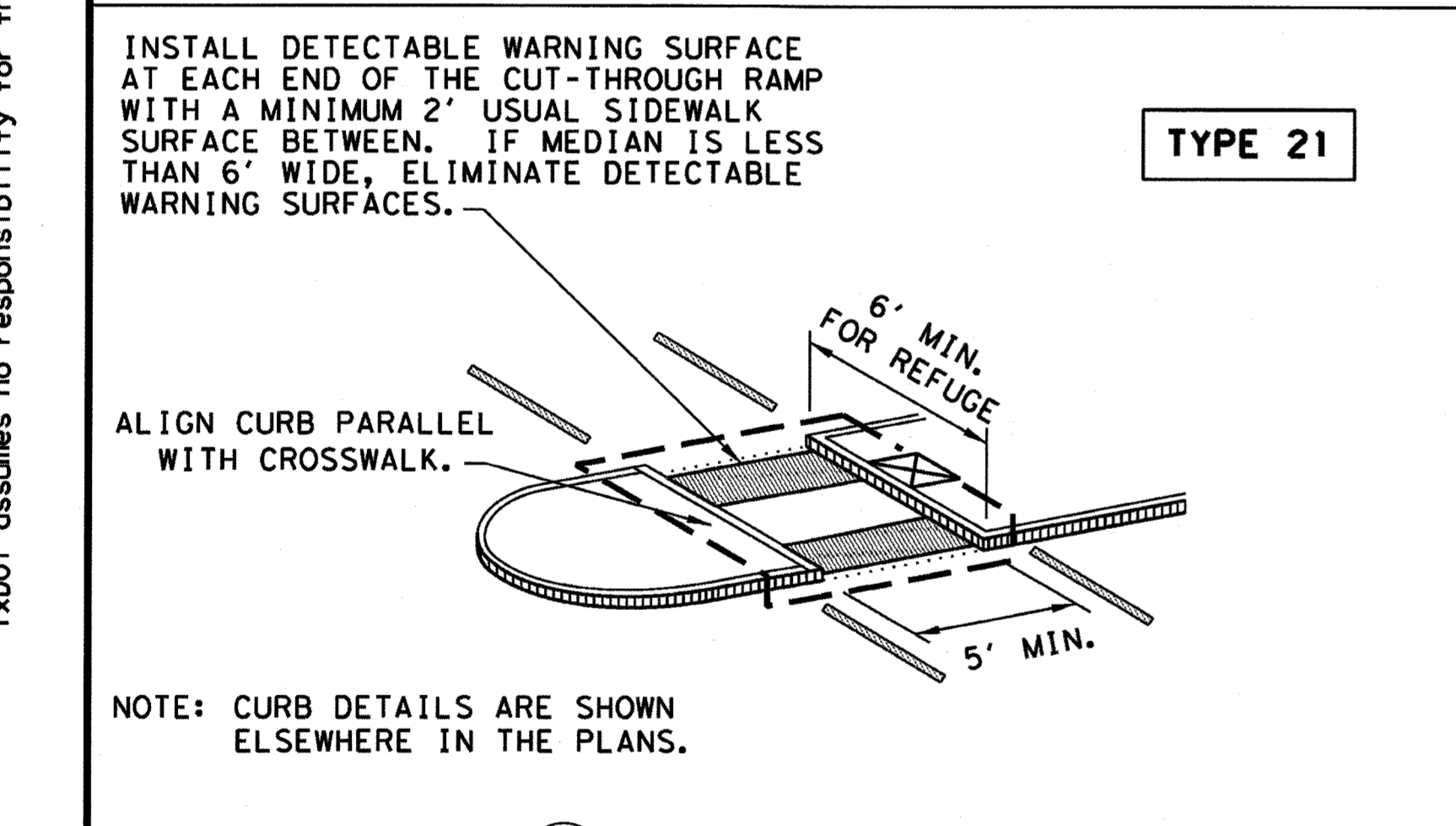
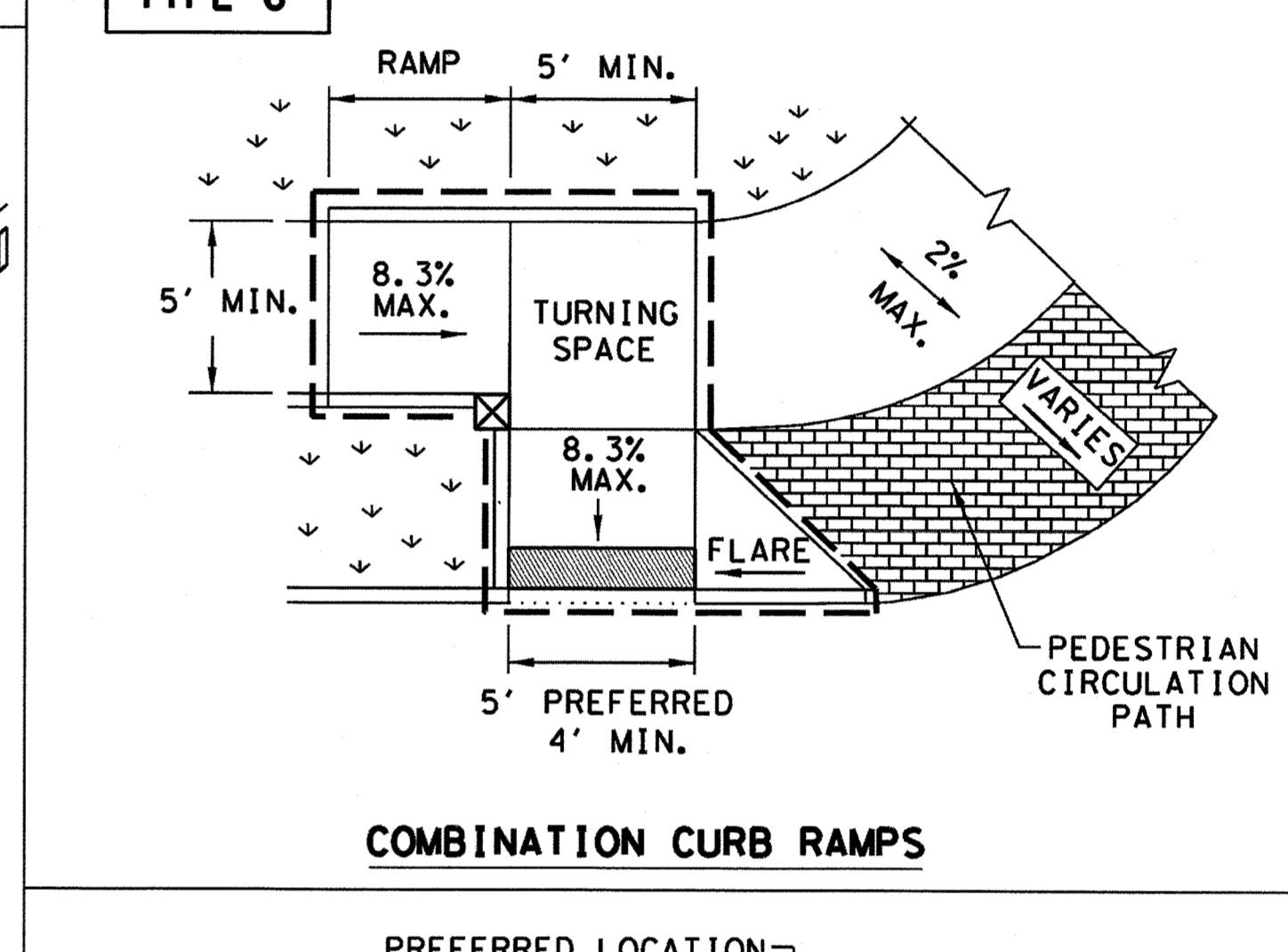
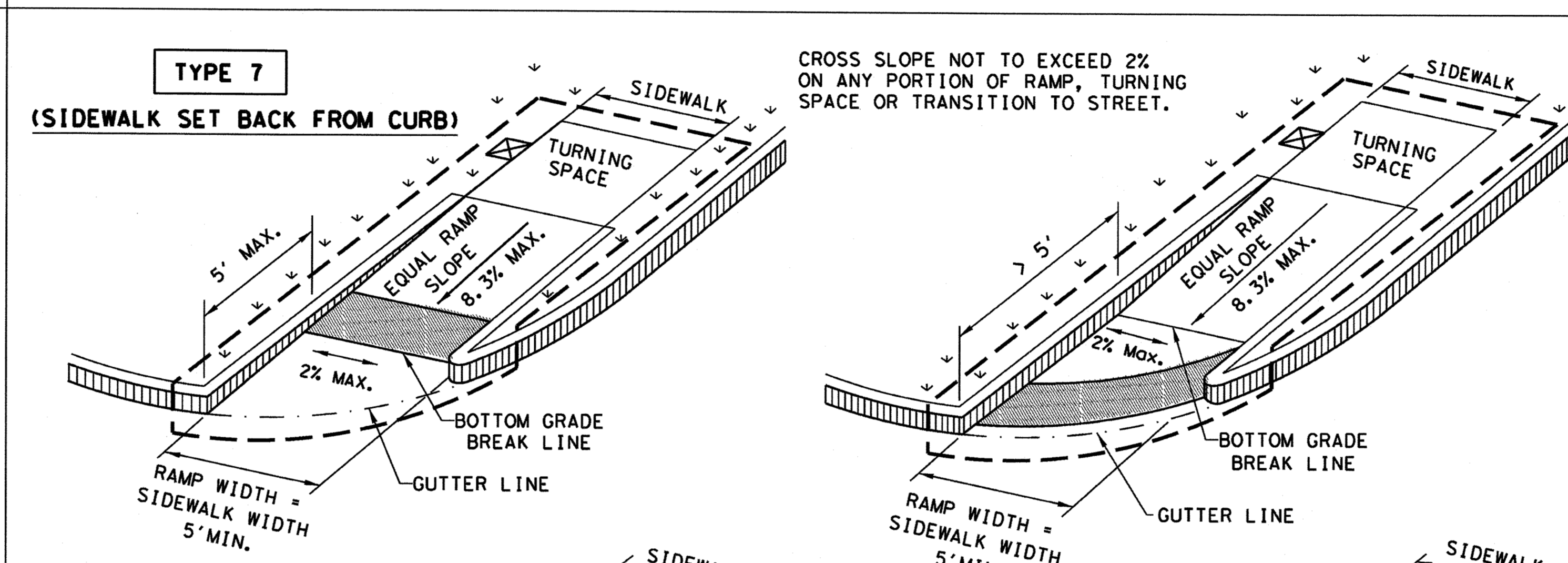
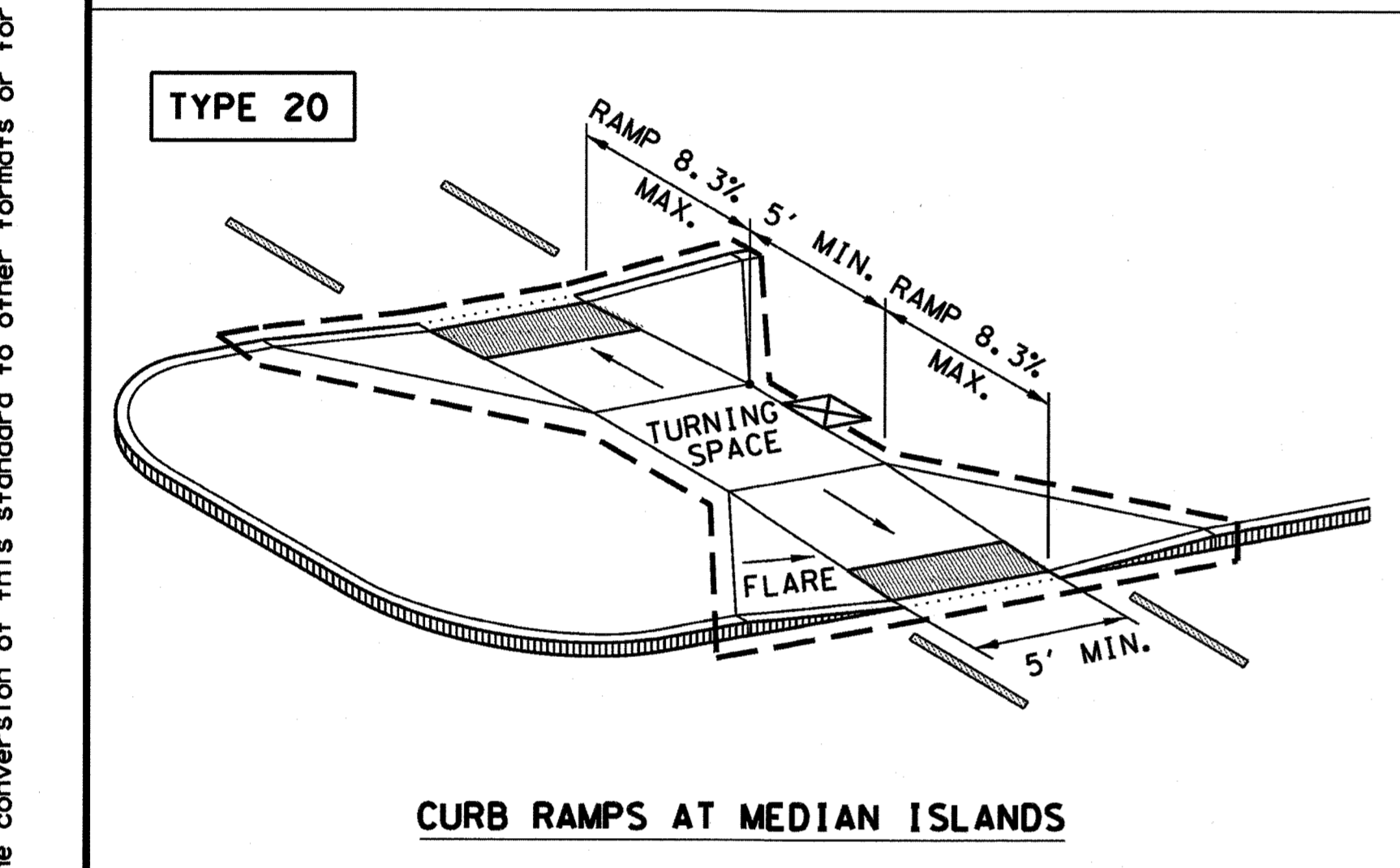
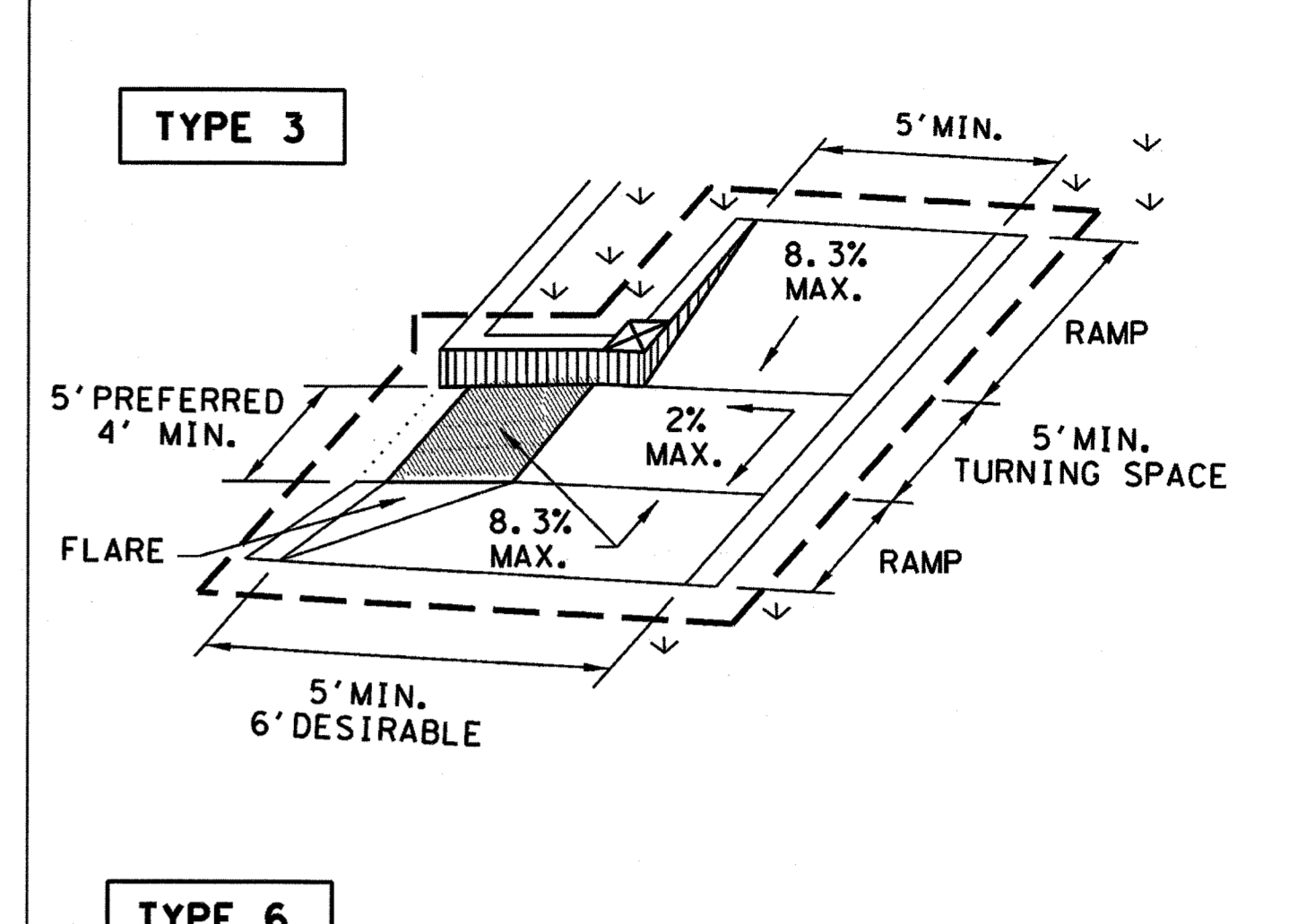
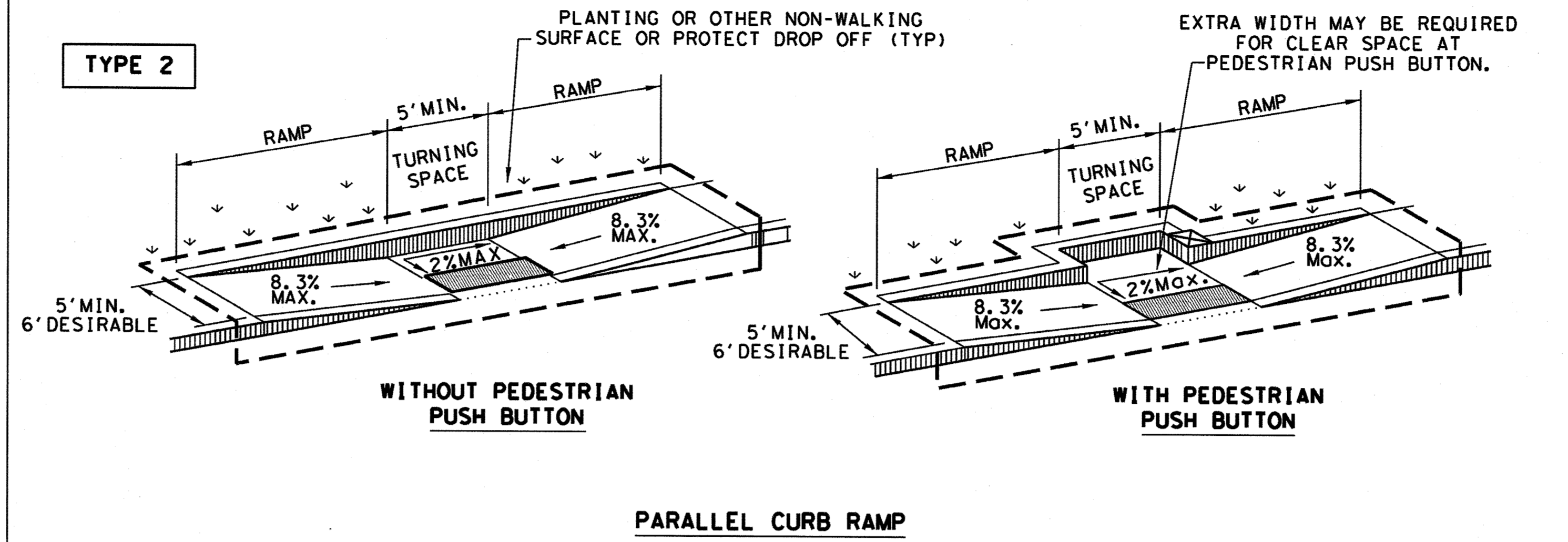
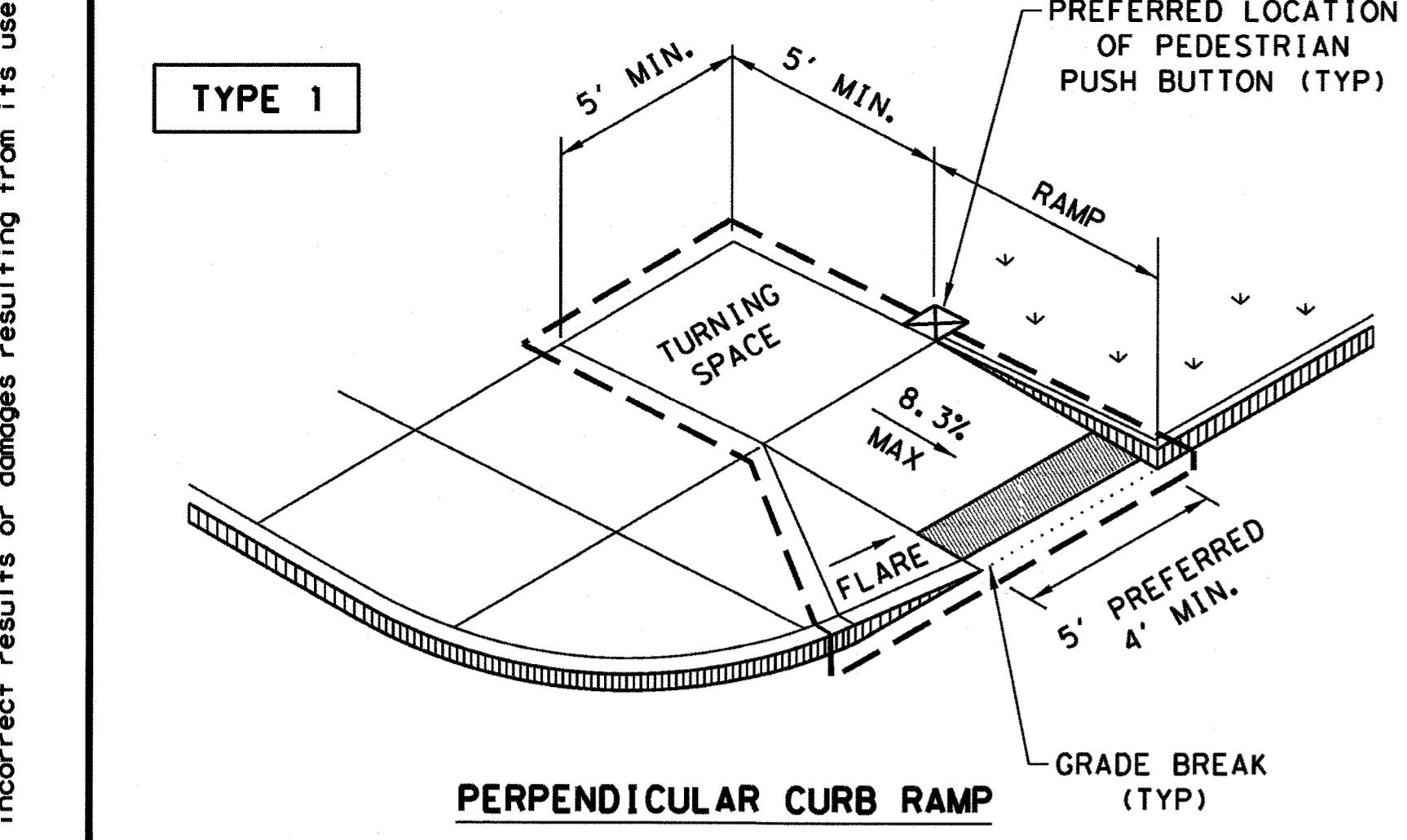
NOTE:  
IF CONTINUOUS MONOLITHIC CURB HAS TO BE OMITTED FOR ANY REASON, THE CURB SHALL BE DOWELED AS SHOWN ABOVE.

**LOCHNER**  
12001 N Central Expressway, Suite 1050  
Dallas, Texas 75243  
P 214.373.7879 | F 214.373.7875 | Firm # F-10488  
Texas Department of Transportation  
© 2013

**FM 740 MISCELLANEOUS ROADWAY DETAILS**

SCALE: NONE		SHEET 1 OF 2	
DESIGN MAN	FED RD DIV NO	STATE PROJECT NO.	HIGHWAY NO
GRAPHICS CAD	6	SEE TITLE SHEET	FM 740
CHECK CPH	STATE	DISTRICT	COUNTY
CHECK MAN	TEXAS	DAL	ROCKWALL
	CONTROL SECTION	JOB	258
	1014	03	049, ETC

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.



**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.

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.

DATE: \_\_\_\_\_  
FILE: \_\_\_\_\_

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

## GENERAL NOTES

### 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 applicable standards may remain in place unless otherwise shown on the plans.

### DETECTABLE WARNING MATERIAL

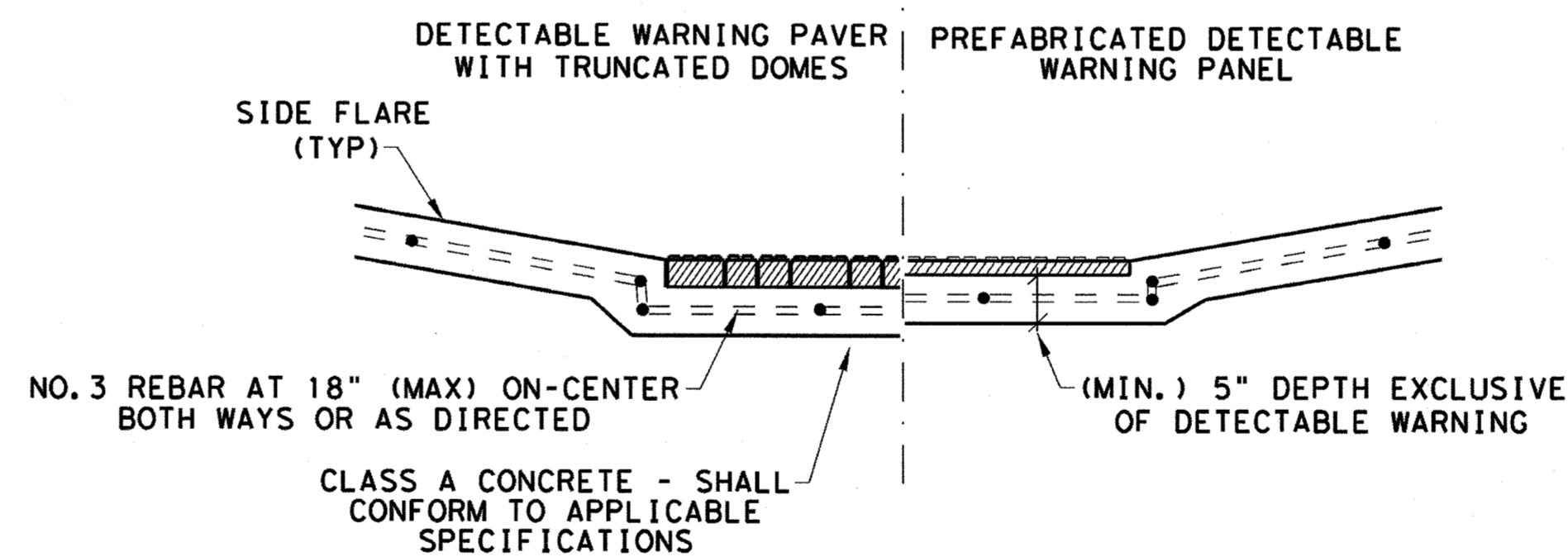
19. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with PROWAG. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material 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.

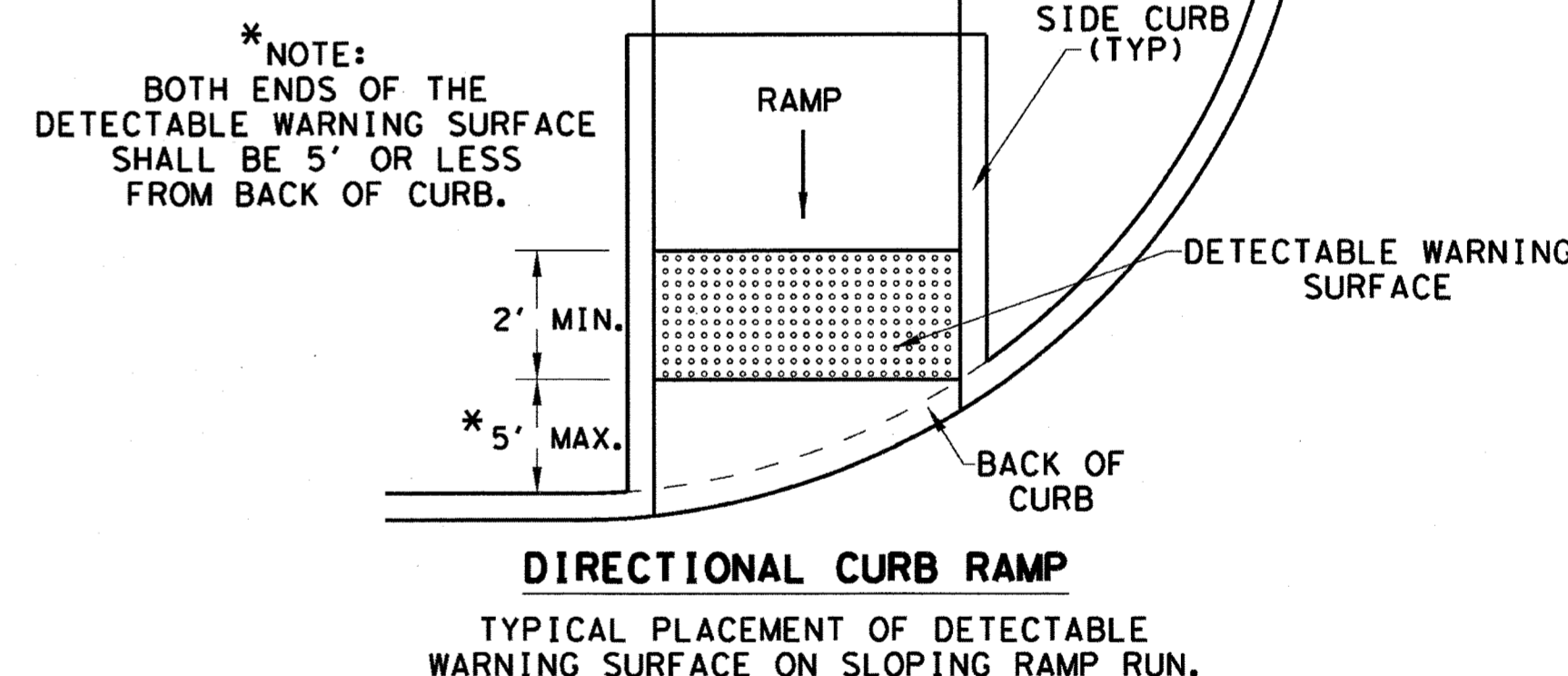
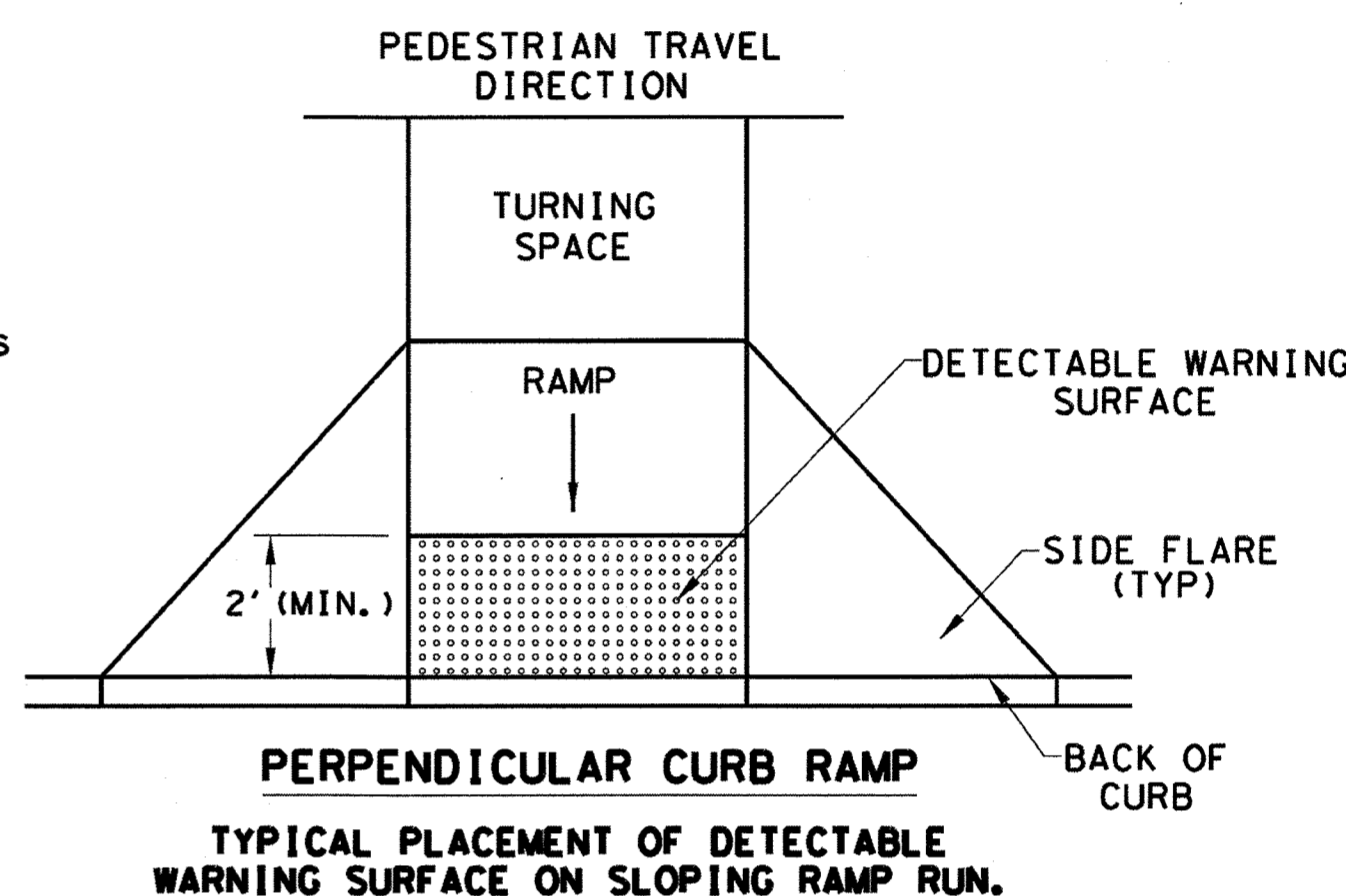
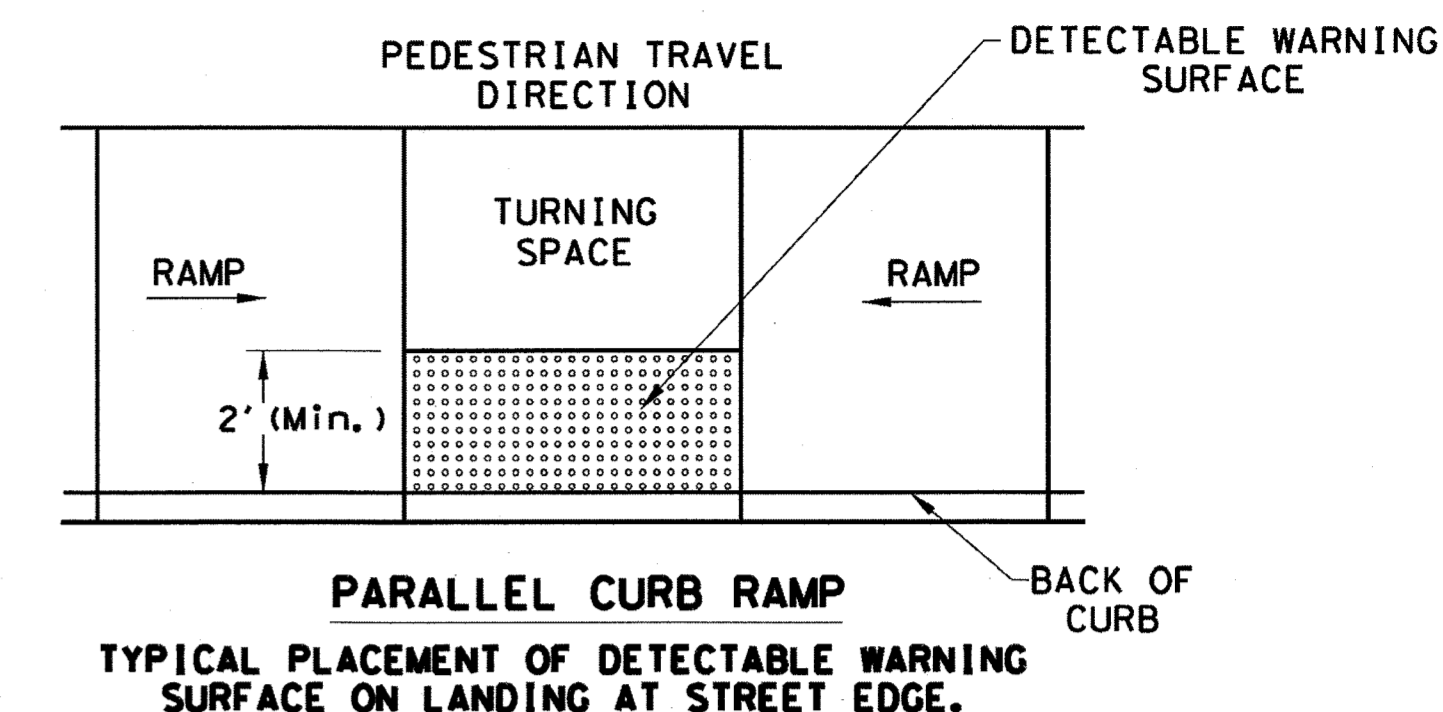
### SIDEWALKS

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



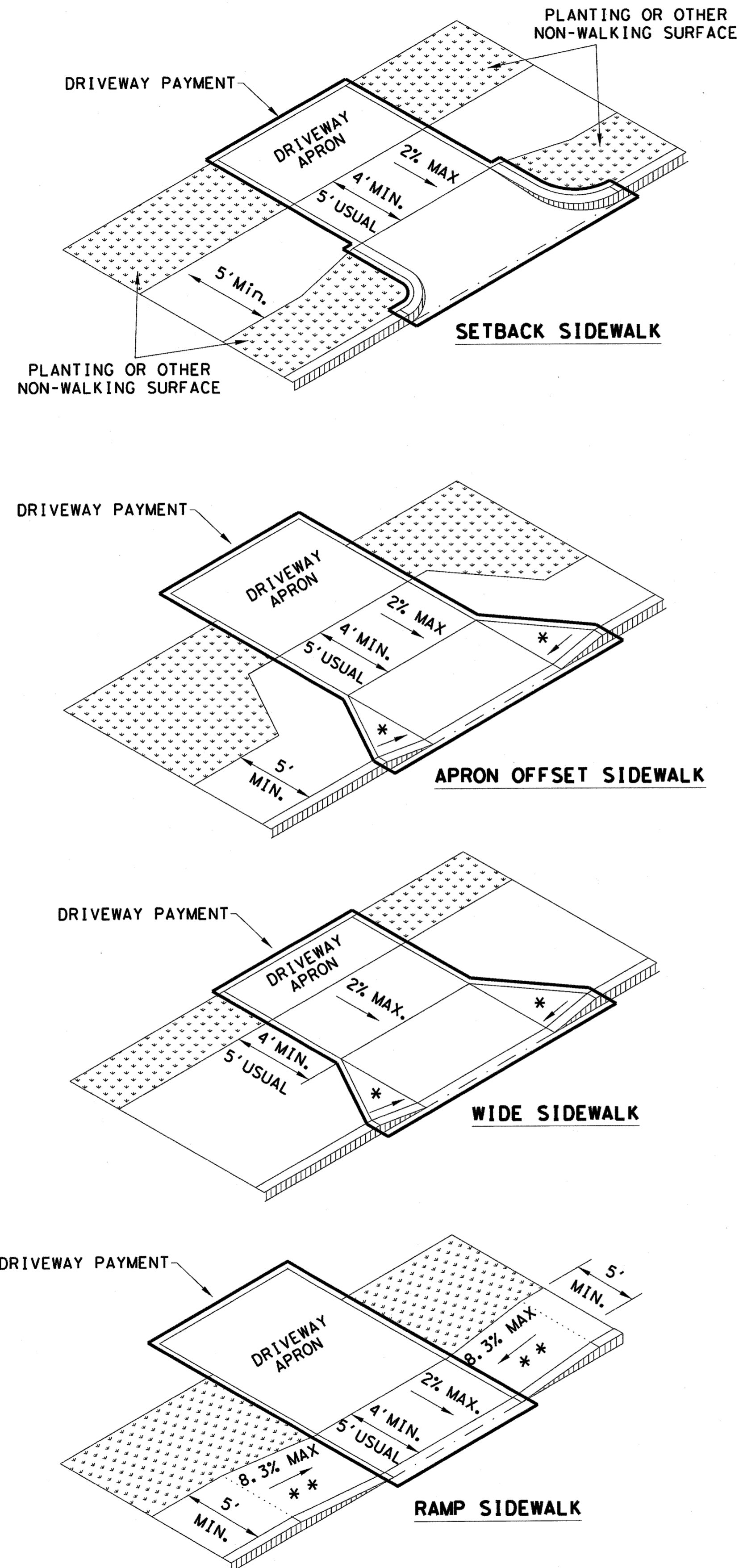
SHEET 2 OF 4

Texas Department of Transportation		Design Division Standard	
PEDESTRIAN FACILITIES CURB RAMPS			
PED-18			
FILE: ped18	DN: TxDOT	DW: VP	CK: KM
© TxDOT: MARCH, 2002	CONT	SECT	JOB
REVISIONS		DIST	SHEET NO.
REVISED 08, 2005			
REVISED 06, 2012			
REVISED 01, 2018			

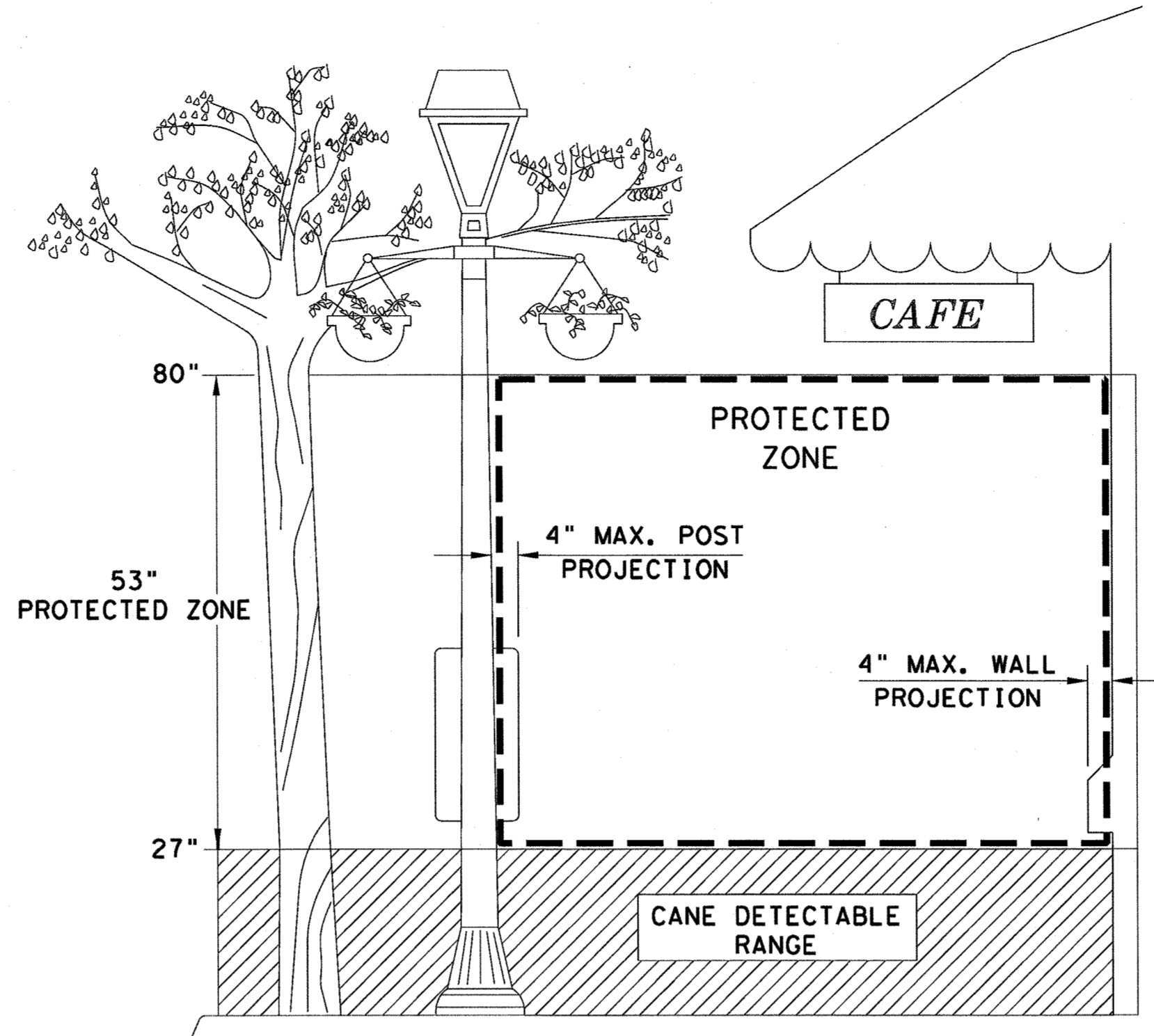
DATE: FILE:

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.

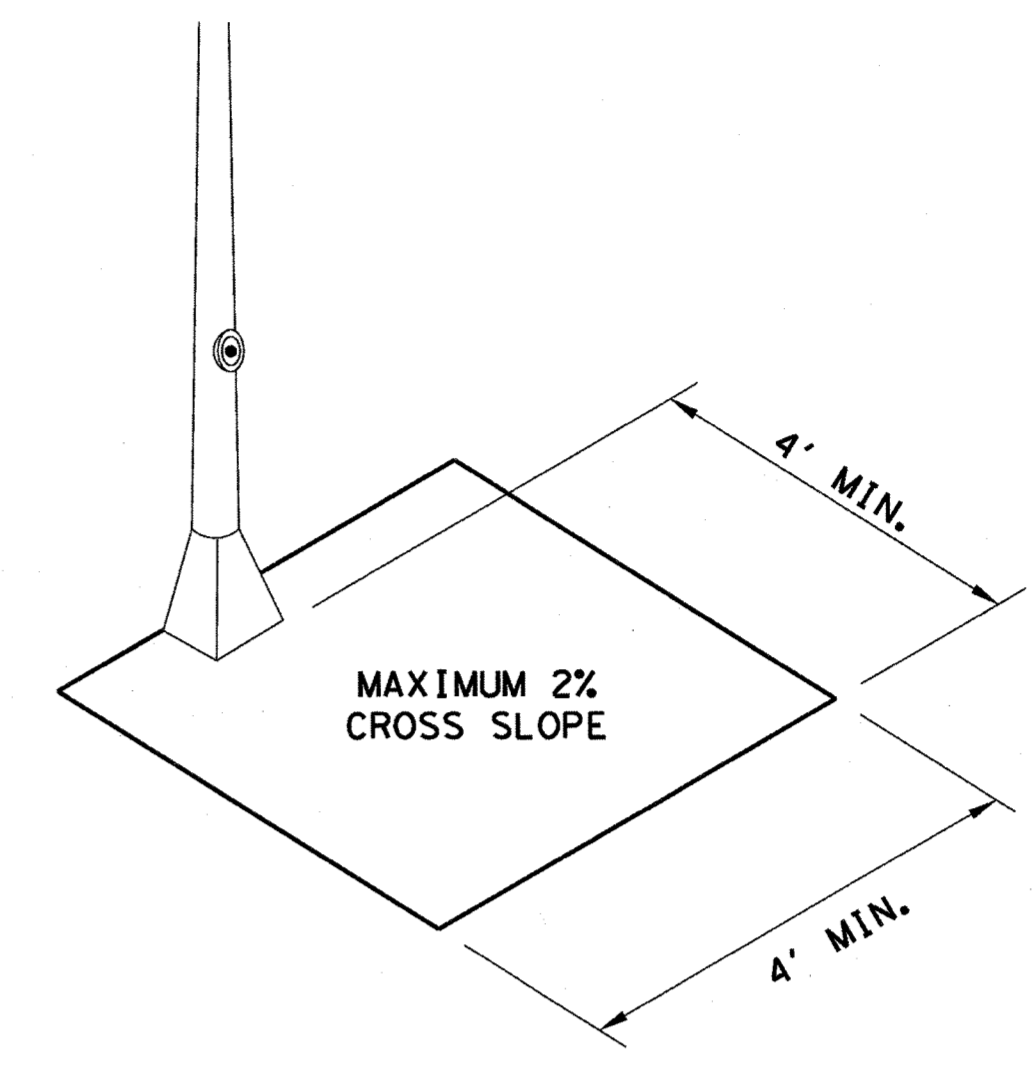
**SIDEWALK TREATMENT AT DRIVEWAYS**



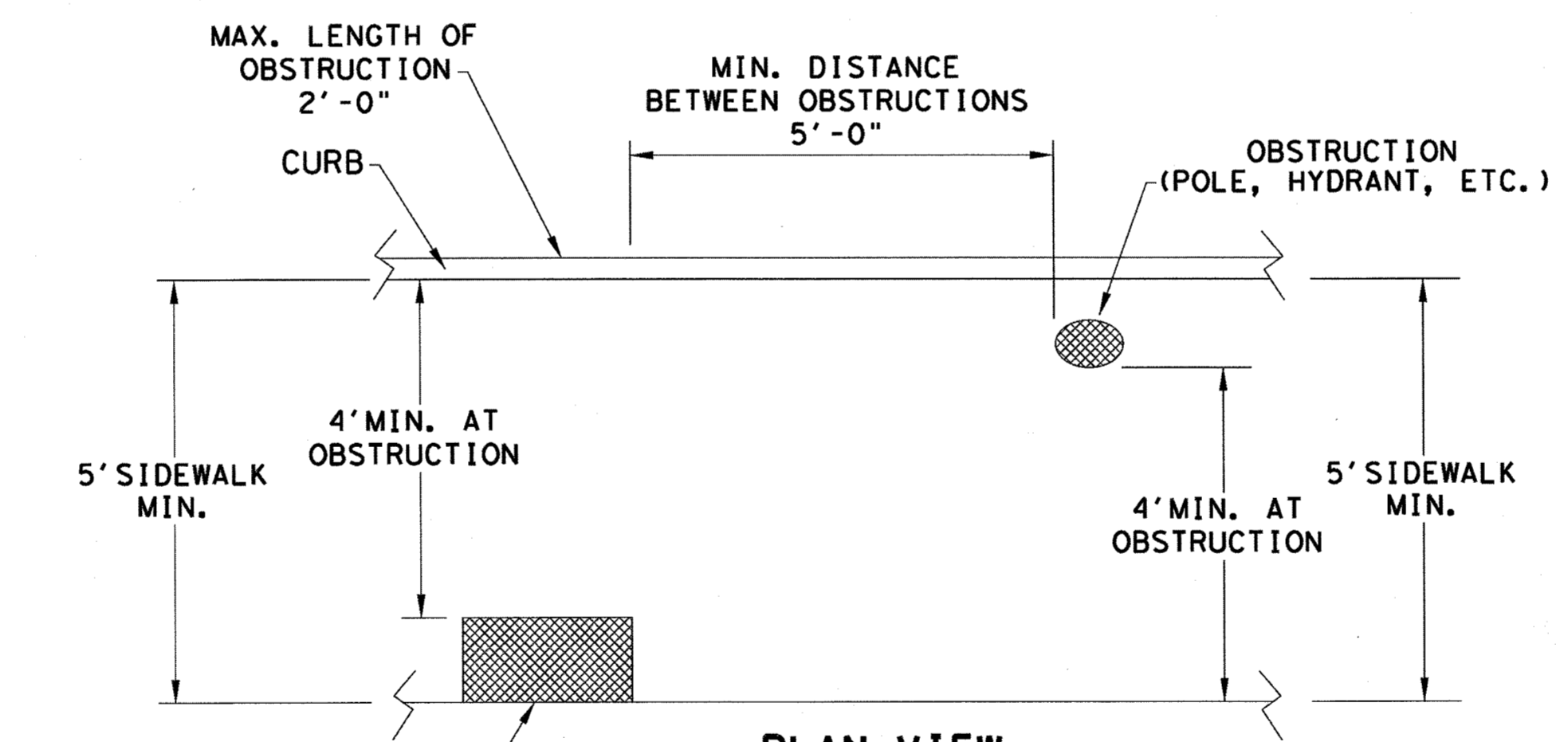
NOTES:  
 \* WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.  
 \*\* IF CURB HEIGHT IS GREATER THAN 6 INCHES, USE GRADE LESS THAN OR EQUAL TO 5%. HANDRAIL AND DETECTABLE WARNING ARE NOT REQUIRED.



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

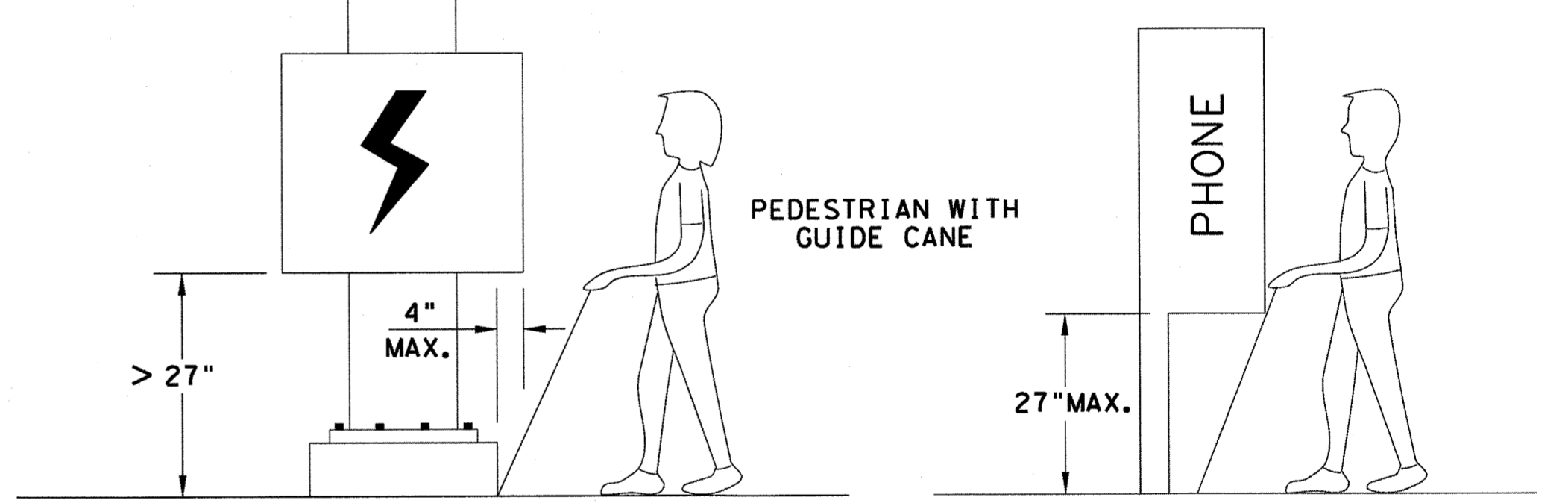


**CLEAR SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON**



**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"**

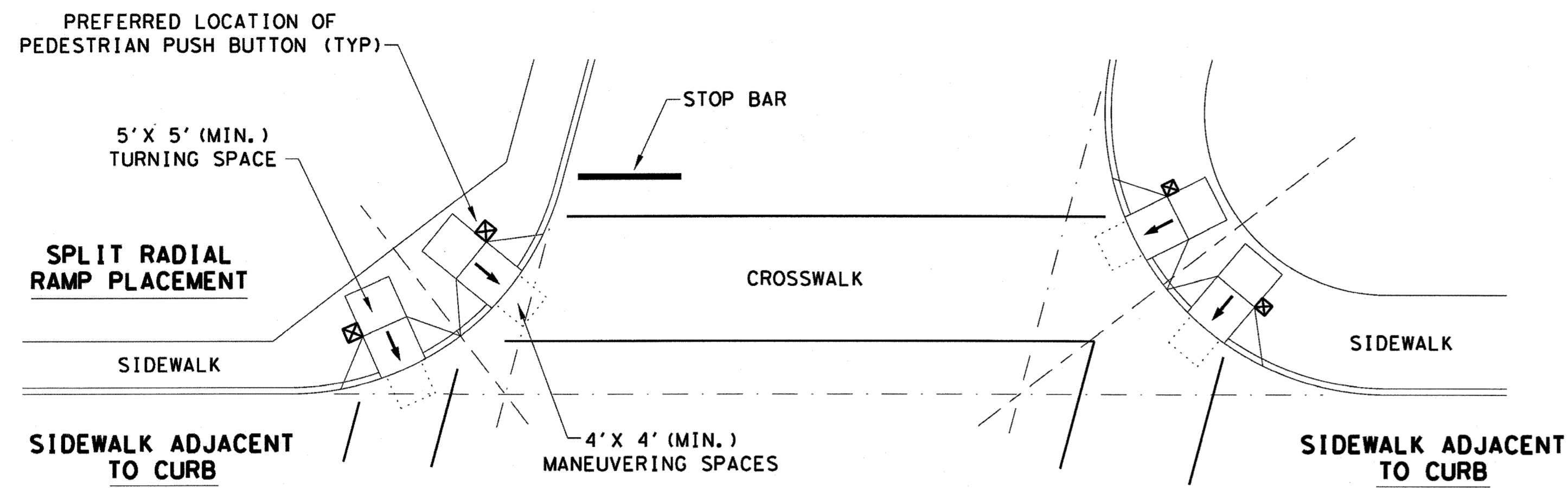
Texas Department of Transportation  
 Design Division Standard

**PEDESTRIAN FACILITIES**  
**CURB RAMPS**  
**PED-18**

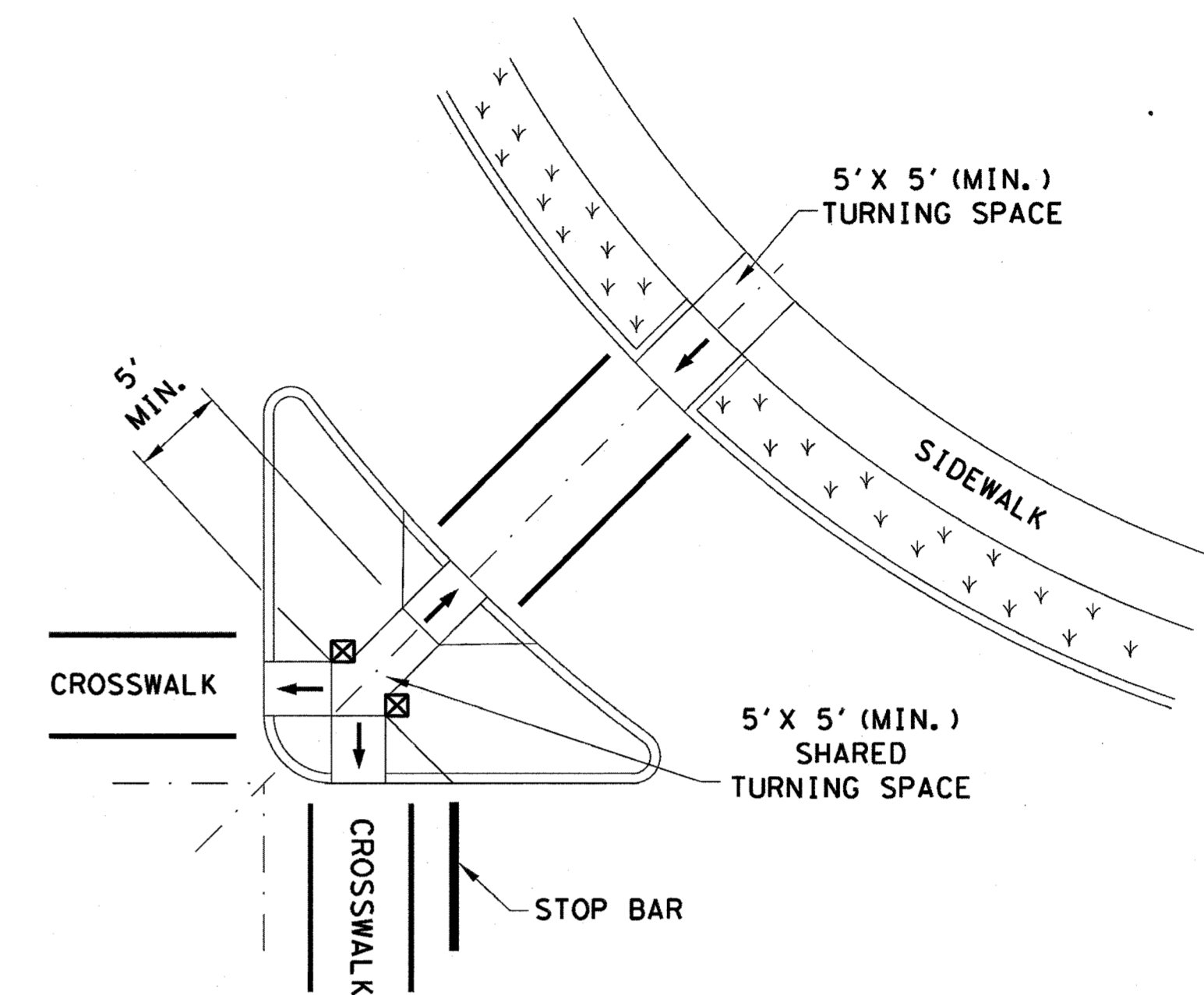
FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISED 08, 2009	REVISIONS			
REVISED 06, 2012	DIST	COUNTY	SHEET NO.	
REVISED 01, 2018				

DATE: FILE:

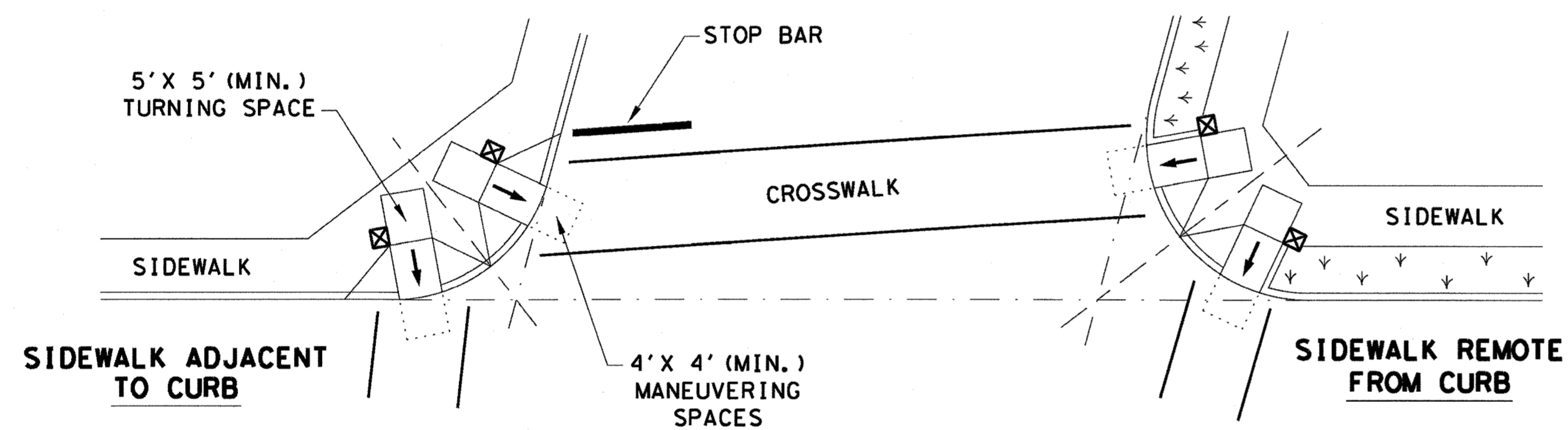
TYPICAL CROSSING LAYOUTS  
SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



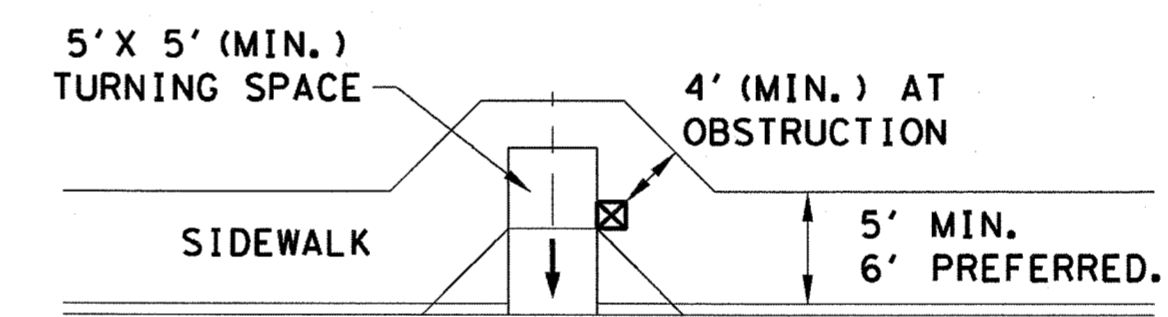
SKewed INTERSECTION WITH "LARGE" RADIUS



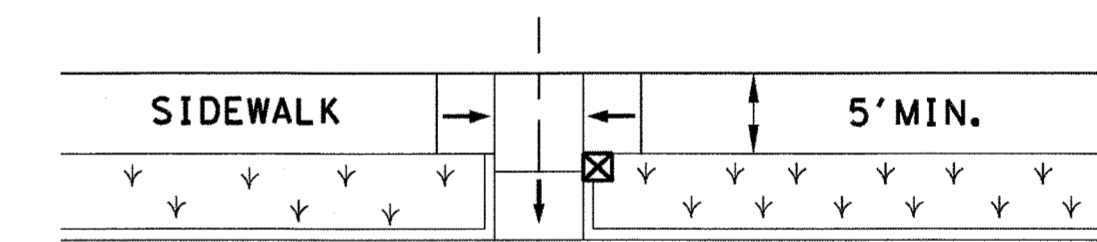
AT INTERSECTION  
W/FREE RIGHT TURN & ISLAND



SKewed INTERSECTION WITH "SMALL" RADIUS

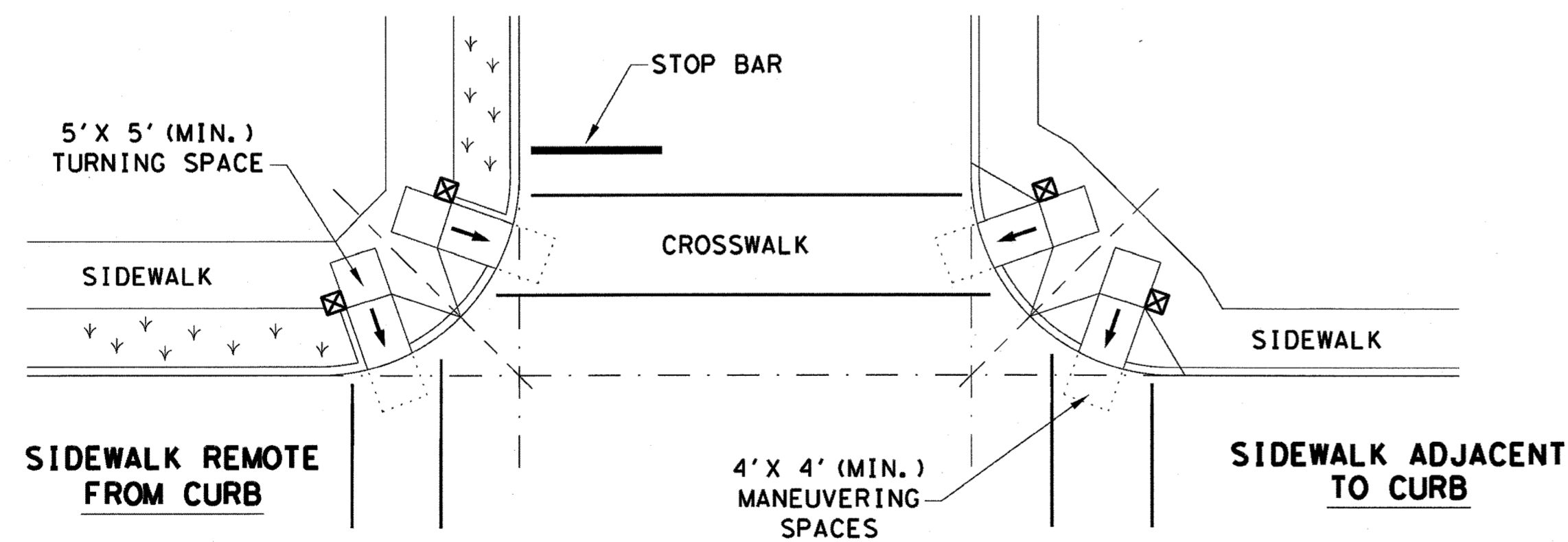


SIDEWALK ADJACENT  
TO CURB



SIDEWALK REMOTE  
FROM CURB

MID-BLOCK PLACEMENT  
PERPENDICULAR RAMPS



NORMAL INTERSECTION WITH "SMALL" RADIUS

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. ↙ ↘ ↙ ↘ ↙ ↘

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

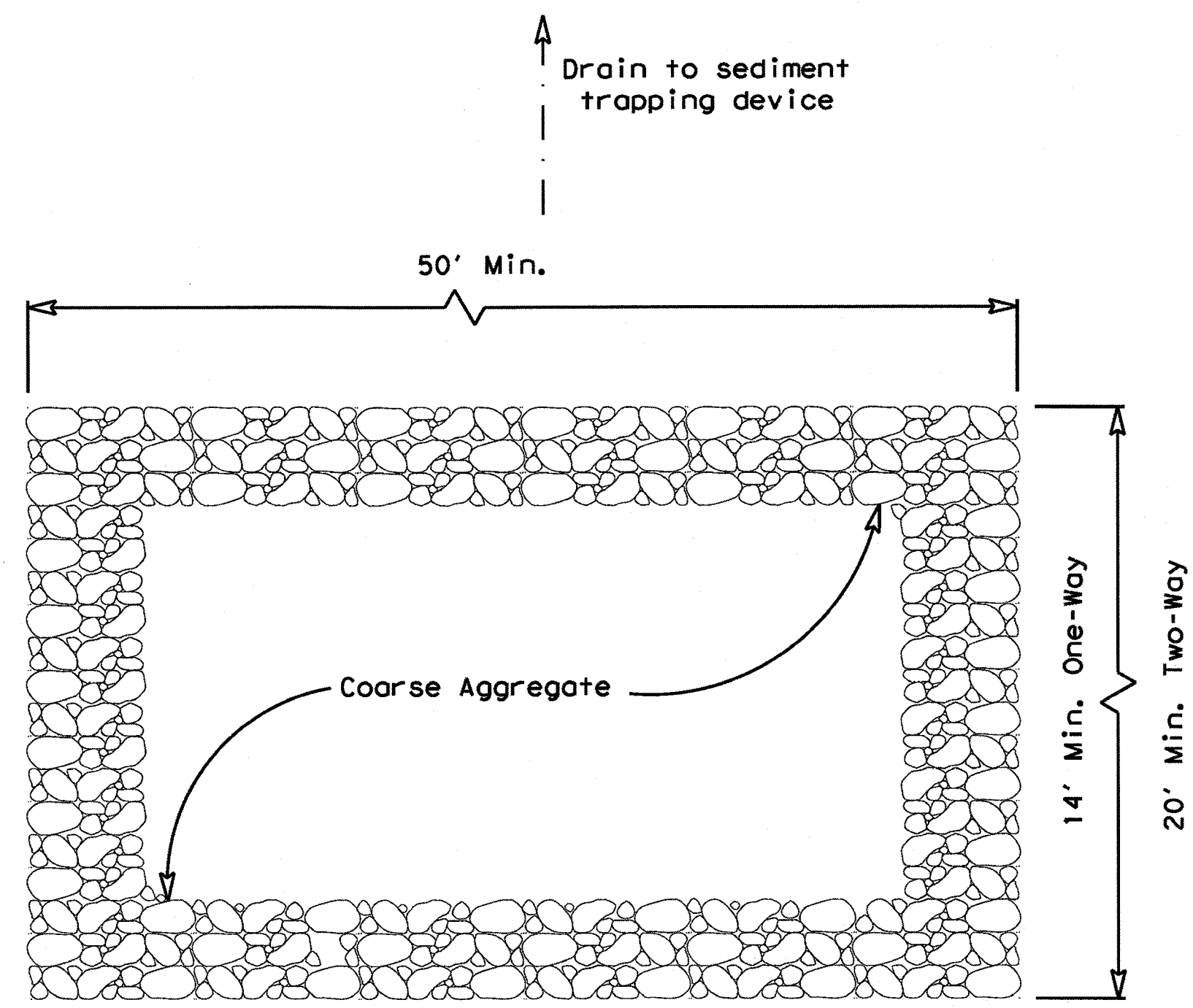
DATE:  
FILE:

SHEET 4 OF 4

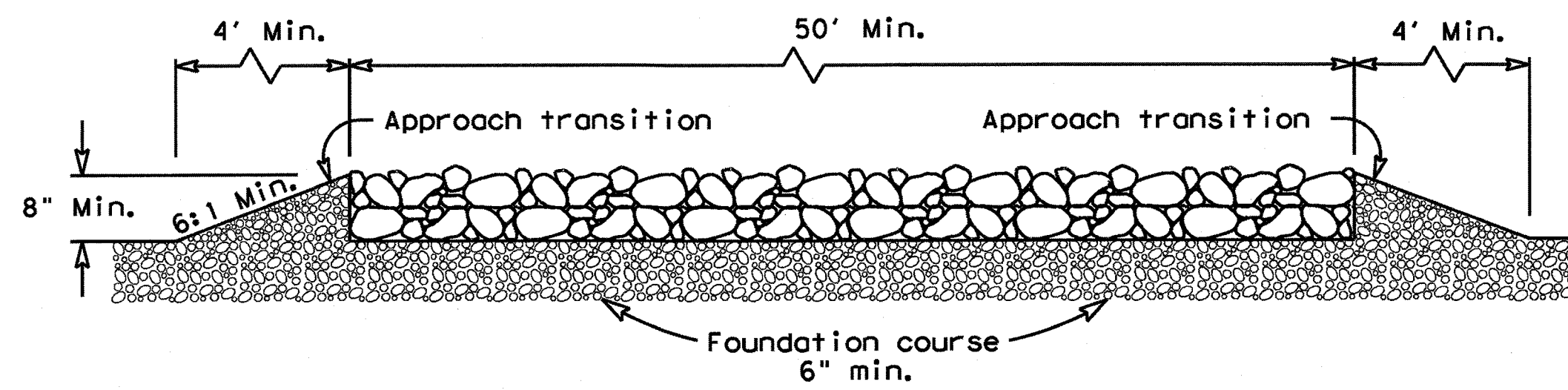
		Design Division Standard	
<h2>PEDESTRIAN FACILITIES CURB RAMPS</h2> <h3>PED-18</h3>			
FILE: ped18	DN: TxDOT	DW: VP	CK: KM
© TxDOT: MARCH, 2002	CONT	SECT	JOB
REVISED 08, 2005	REVISONS		HIGHWAY
REVISED 06, 2012	DIST	COUNTY	SHEET NO.
REVISED 01, 2018			

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: \$DATES  
FILE: \$FILES



PLAN VIEW

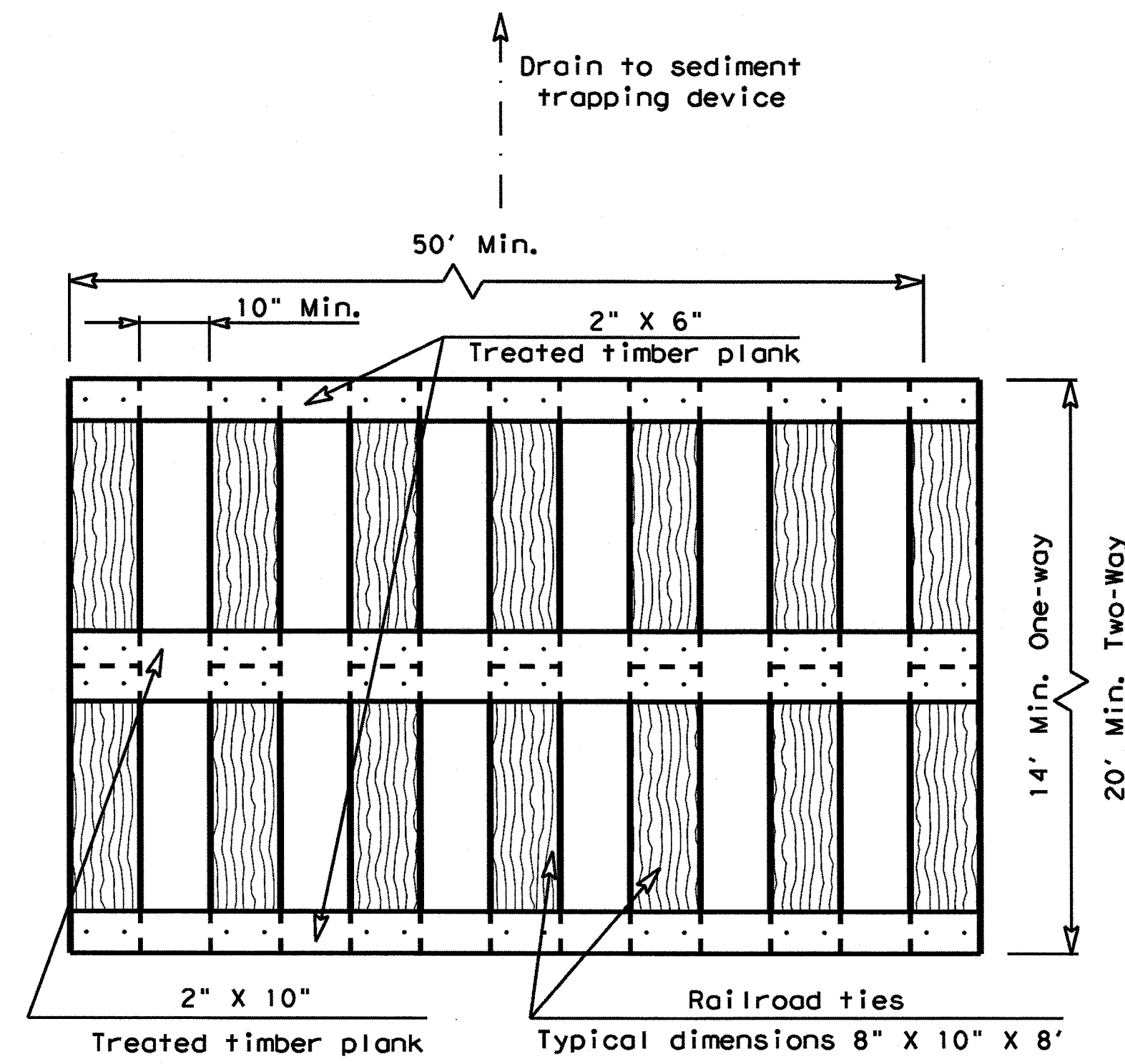


ELEVATION VIEW

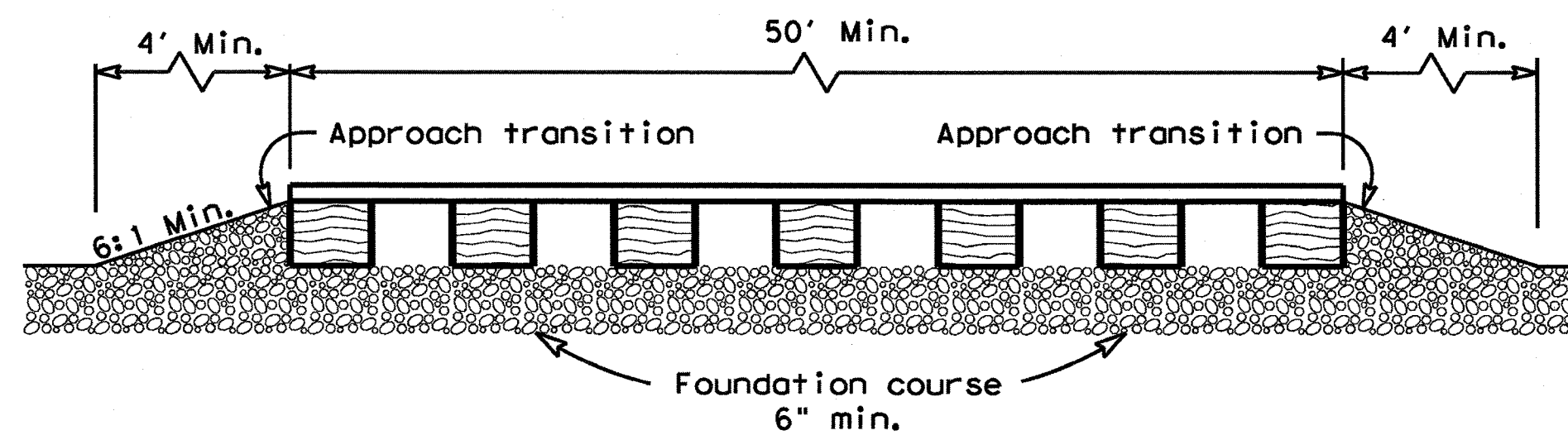
CONSTRUCTION EXIT (TYPE 1)  
ROCK CONSTRUCTION (LONG TERM)

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 materials 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.



PLAN VIEW

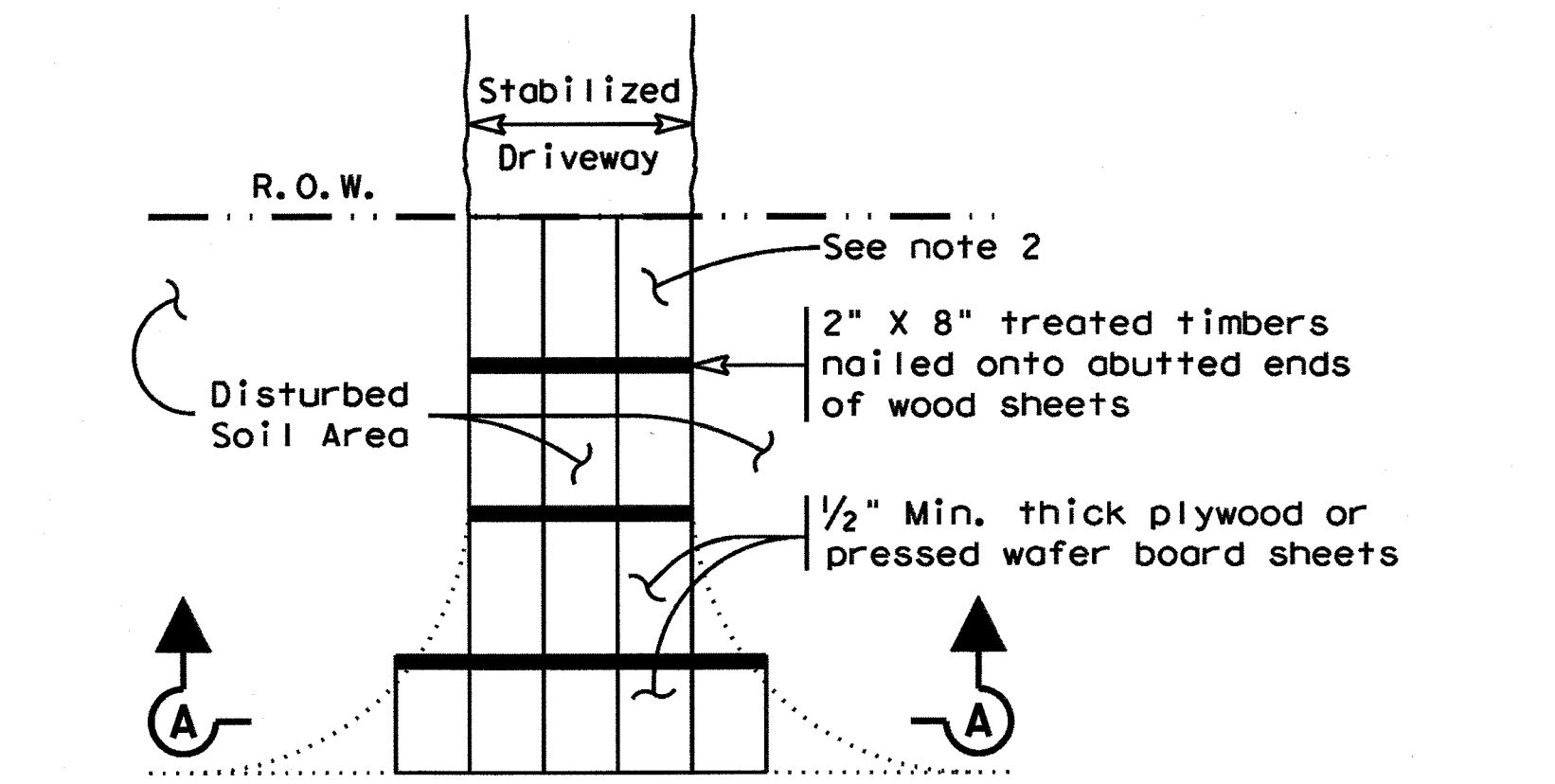


ELEVATION VIEW

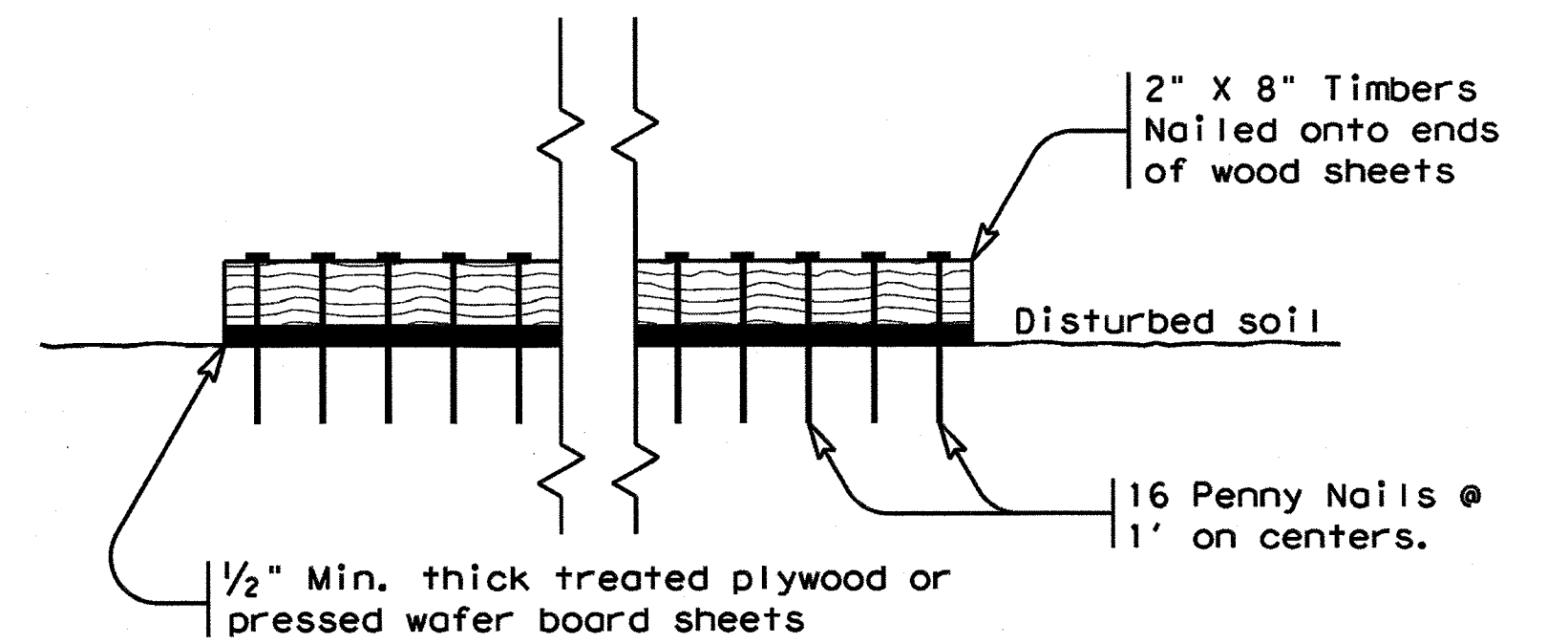
CONSTRUCTION EXIT (TYPE 2)  
TIMBER CONSTRUCTION (LONG TERM)

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 1/2" 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.



PLAN VIEW



SECTION A-A  
CONSTRUCTION EXIT (TYPE 3)  
SHORT TERM

GENERAL NOTES (TYPE 3)

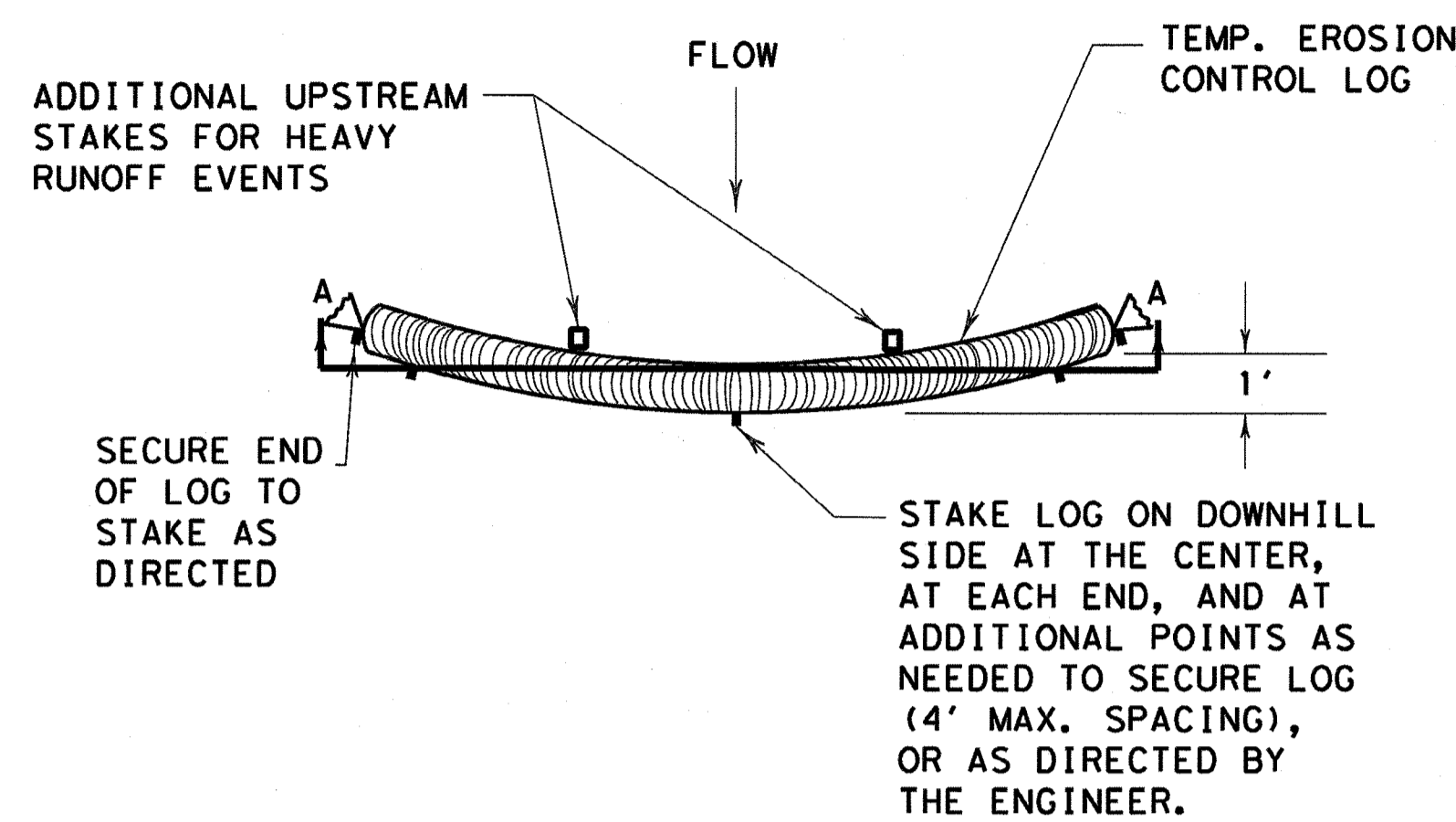
1. The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
2. The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
3. The treated 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.

		<b>Design Division Standard</b>	
<b>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES CONSTRUCTION EXITS EC(3)-16</b>			
FILE: ec316	DN: TxDOT	CK: KM	DW: VP
© TxDOT: JULY 2016	CONT	SECT	JOB
REVISIONS	\$CS	\$SS	\$JWS
DIST	COUNTY	SHEET NO.	
\$DST	\$CTYS	\$EC(3A)-16	

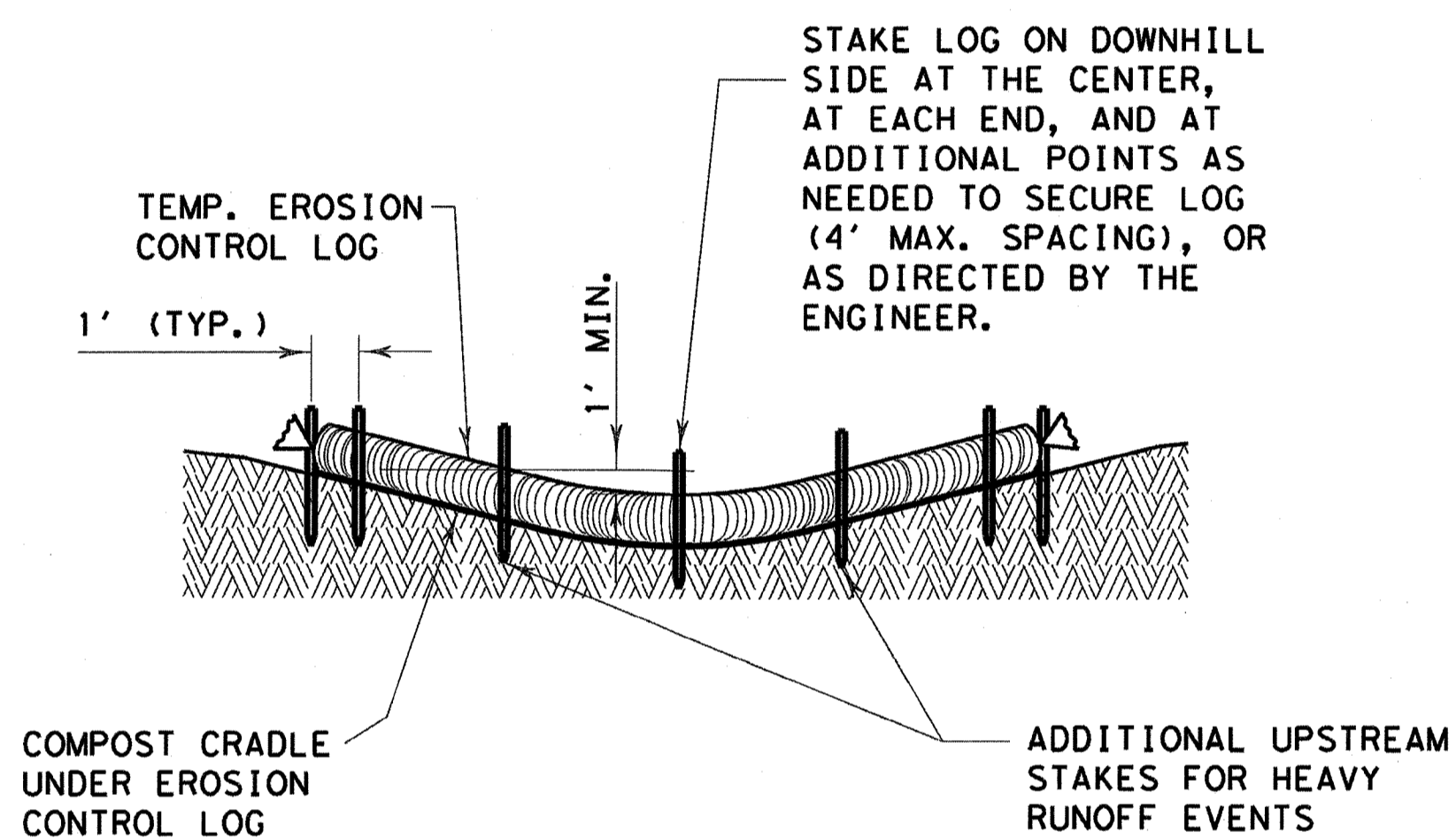


DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: FILE:



PLAN VIEW



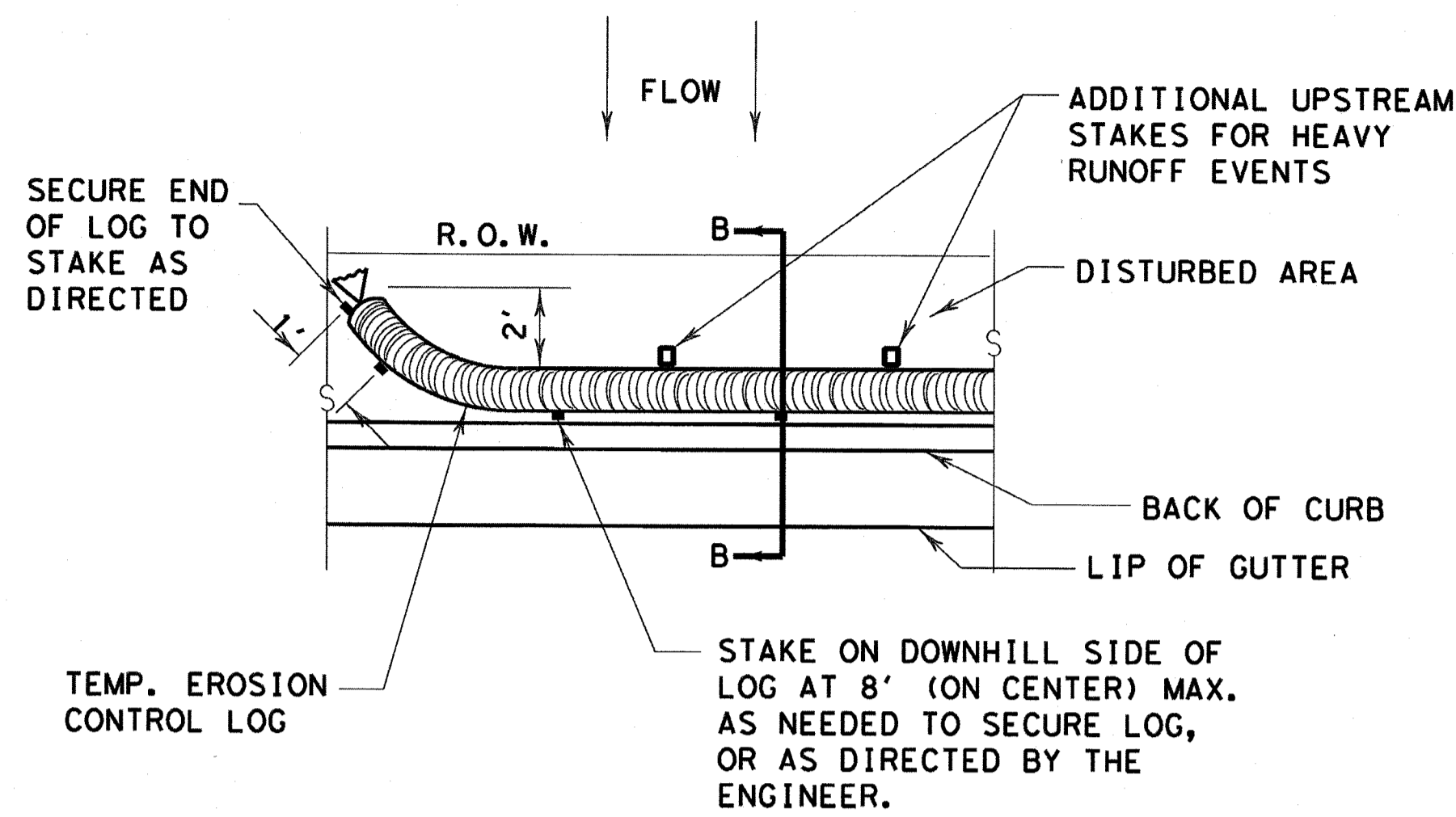
SECTION A-A

EROSION CONTROL LOG DAM

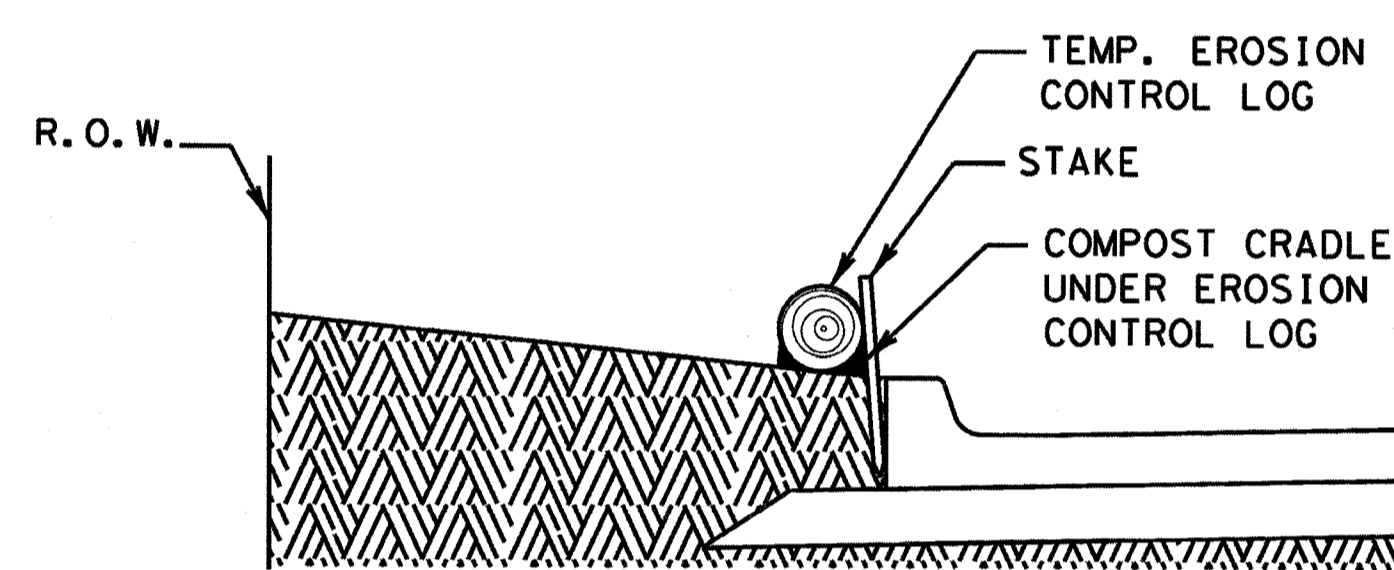
CL-D

LEGEND

- CL-D EROSION CONTROL LOG DAM
- CL-BOC EROSION CONTROL LOG AT BACK OF CURB
- CL-ROW EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
- CL-SST EROSION CONTROL LOGS ON SLOPES STAKE AND TRENCHING ANCHORING
- CL-SSL EROSION CONTROL LOGS ON SLOPES STAKE AND LASHING ANCHORING
- CL-DI EROSION CONTROL LOG AT DROP INLET
- CL-CI EROSION CONTROL LOG AT CURB INLET
- CL-GI EROSION CONTROL LOG AT CURB & GRATE INLET



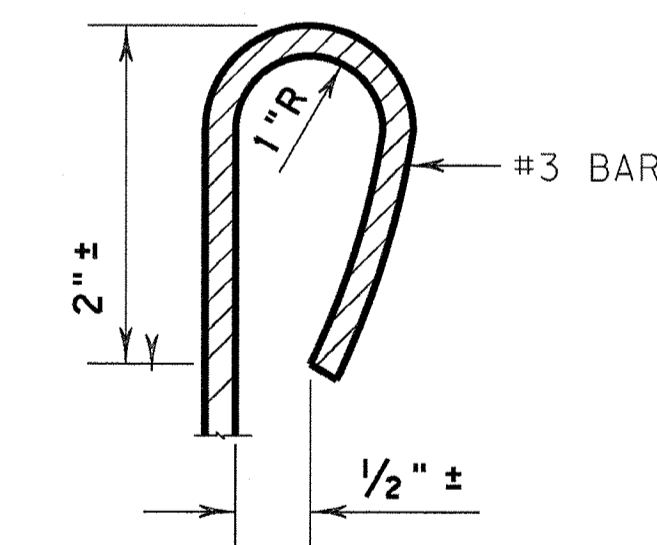
PLAN VIEW



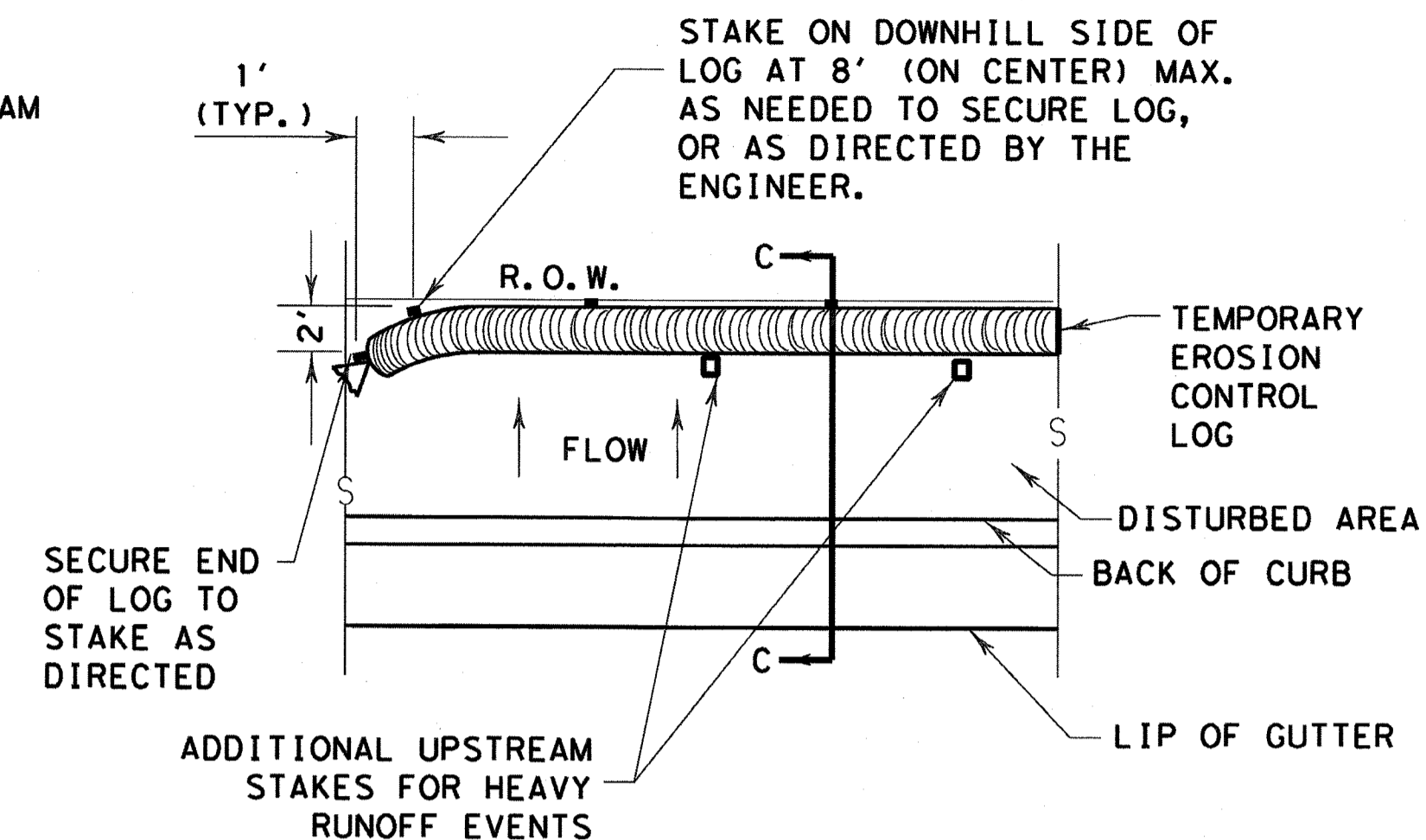
SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

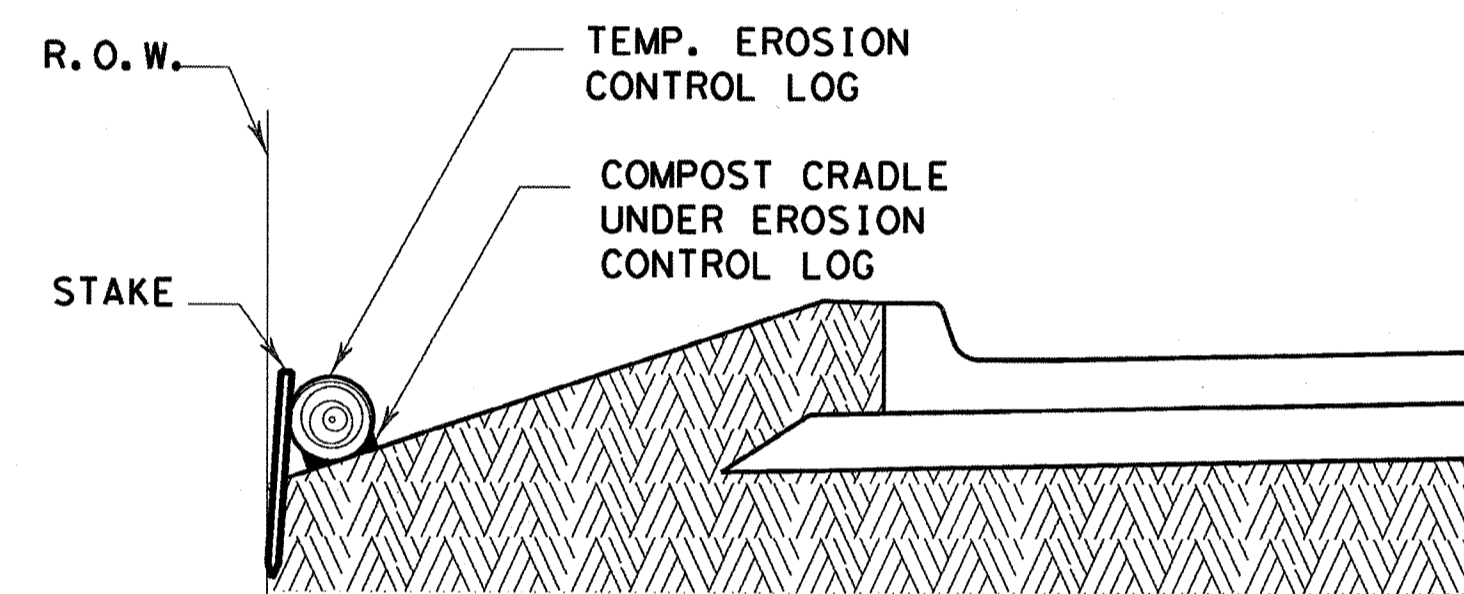
CL-BOC



REBAR STAKE DETAIL



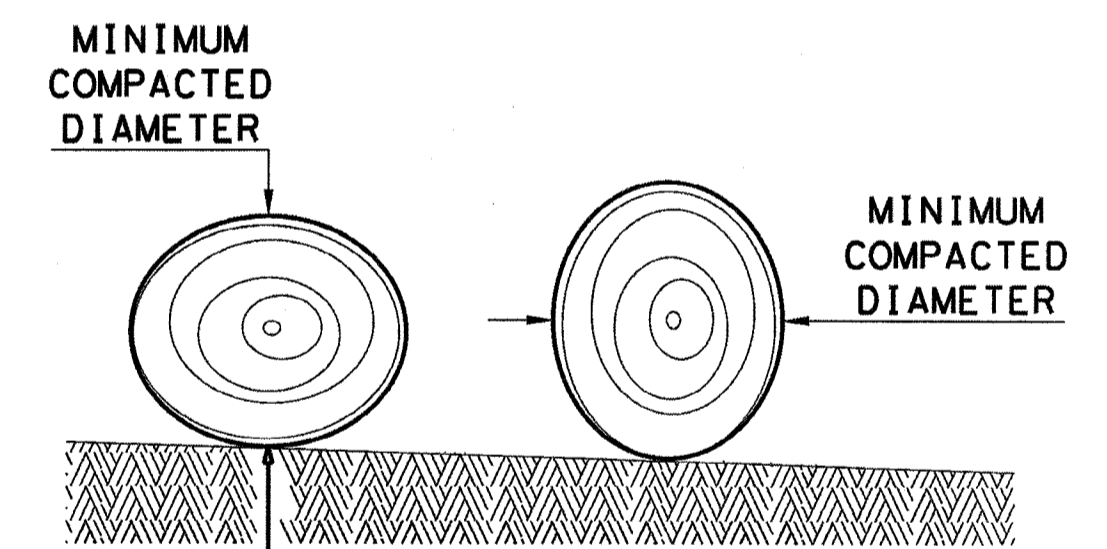
PLAN VIEW



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

GENERAL NOTES:

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
4. FILL LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE THE MINIMUM COMPACTED DIAMETER SPECIFIED IN THE PLANS WITHOUT EXCESSIVE DEFORMATION.
5. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 2'-4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED BY THE ENGINEER.
6. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.
7. COMPOST CRADLE MATERIAL IS INCIDENTAL & WILL NOT BE PAID FOR SEPARATELY.
8. SANDBAGS USED AS ANCHORS SHALL BE PLACED ON TOP OF LOGS & SHALL BE OF SUFFICIENT SIZE TO HOLD LOGS IN PLACE.
9. TURN THE ENDS OF EACH ROW OF LOGS UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE LOG.
10. FOR HEAVY RUNOFF EVENTS, ADDITIONAL UPSTREAM STAKES MAY BE NECESSARY TO KEEP LOG FROM FOLDING IN ON ITSELF.

SEDIMENT BASIN & TRAP USAGE GUIDELINES

An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

**Log Traps:** The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Control logs should be placed in the following locations:

1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

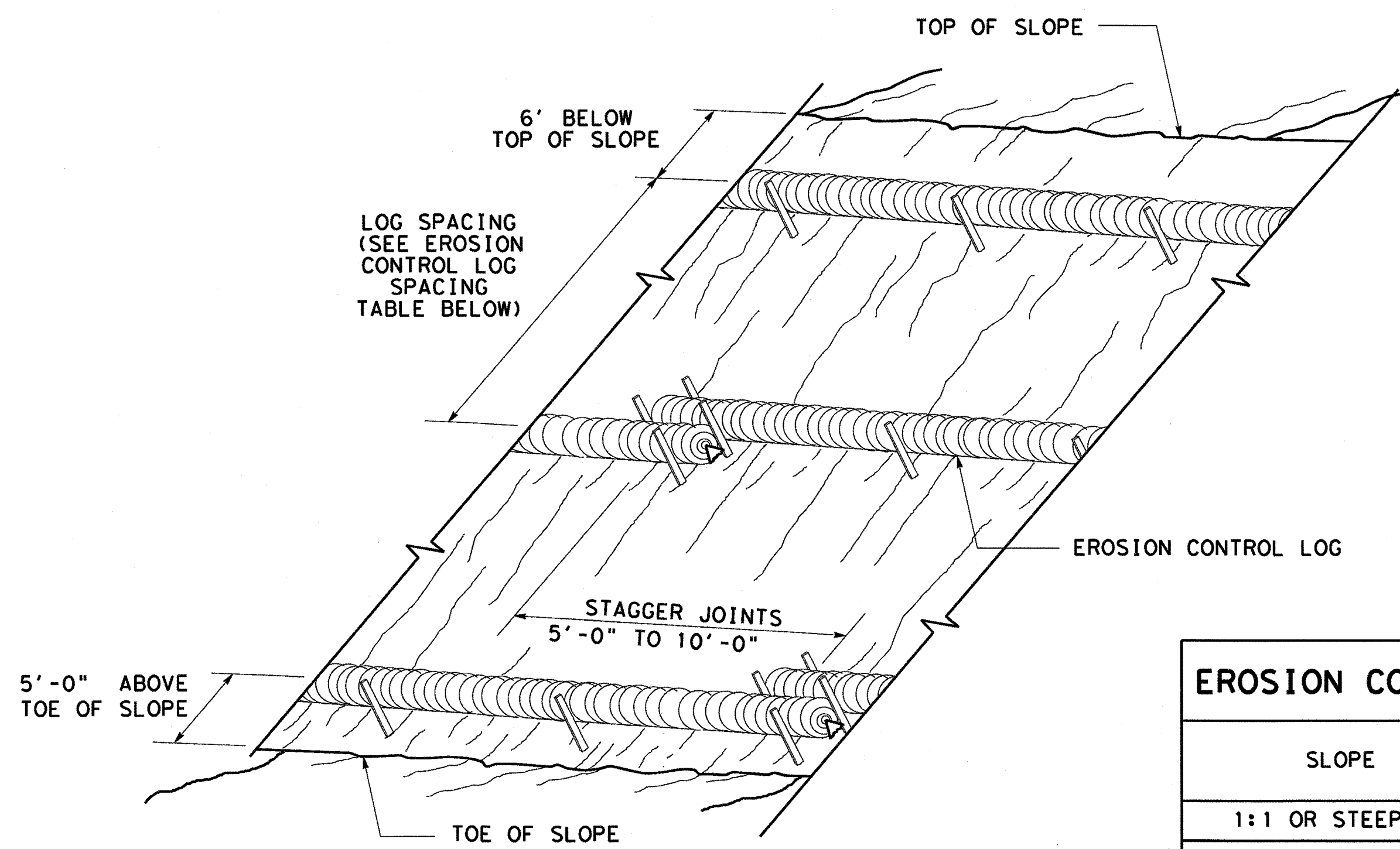
Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.

SHEET 1 OF 3

		Design Division Standard	
<b>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES</b> <b>EROSION CONTROL LOG</b> <b>EC(9)-16</b>			
FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT
© TxDOT: JULY 2016	CONT	SECT	JOB
REVISTONS			HIGHWAY
	DIST	COUNTY	SHEET NO.

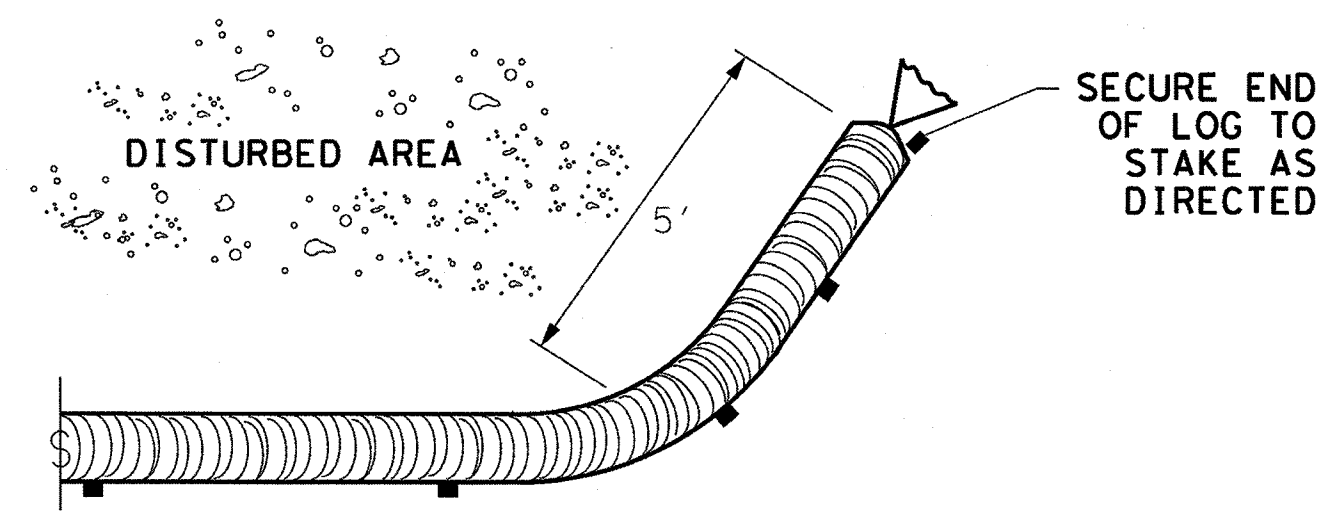
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:  
FILE:



**EROSION CONTROL LOGS ON SLOPES  
STAKE AND TRENCHING ANCHORING**

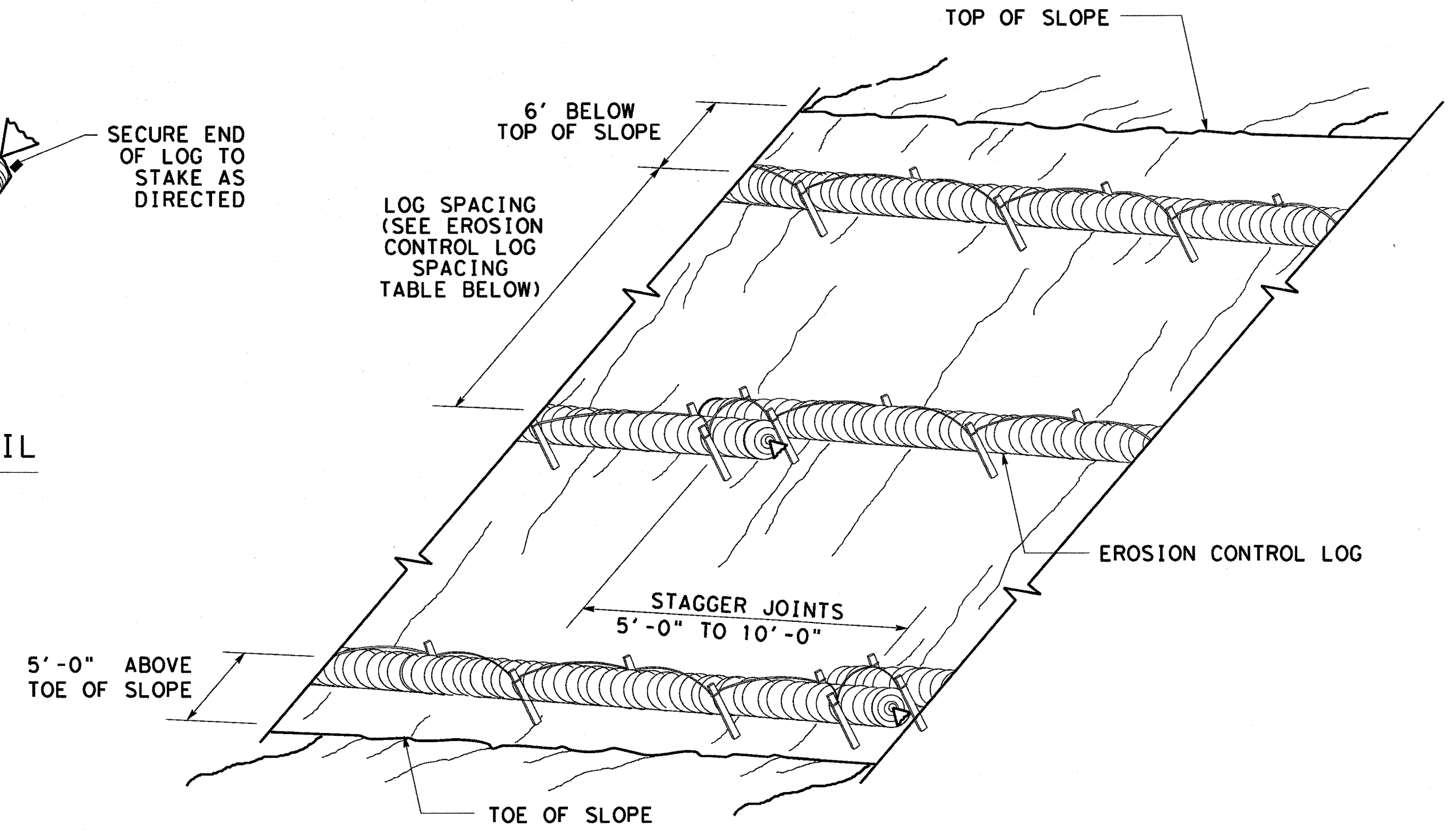
CL-SST



**END SECTION RAP DETAIL**

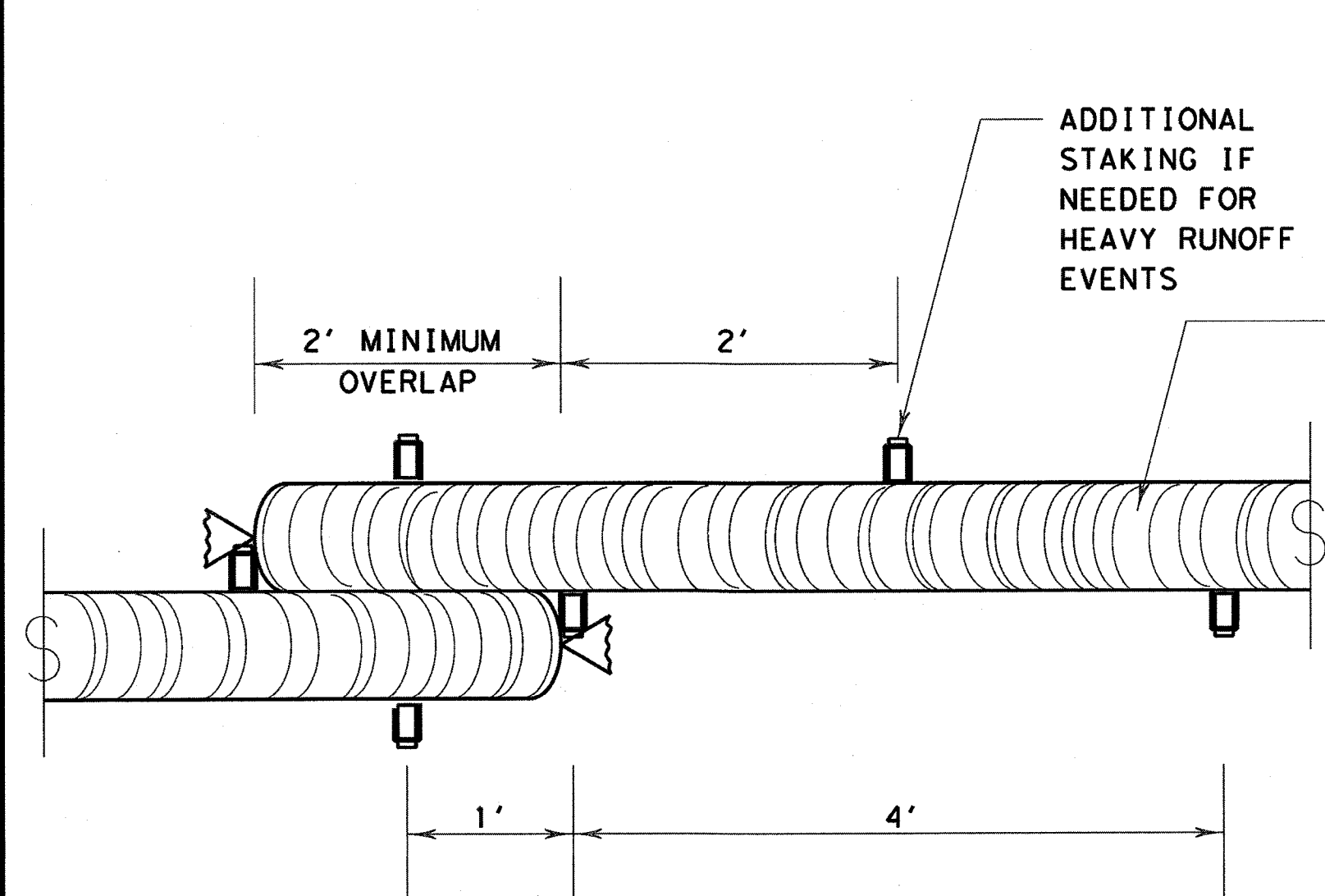
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

\* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:  
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;  
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



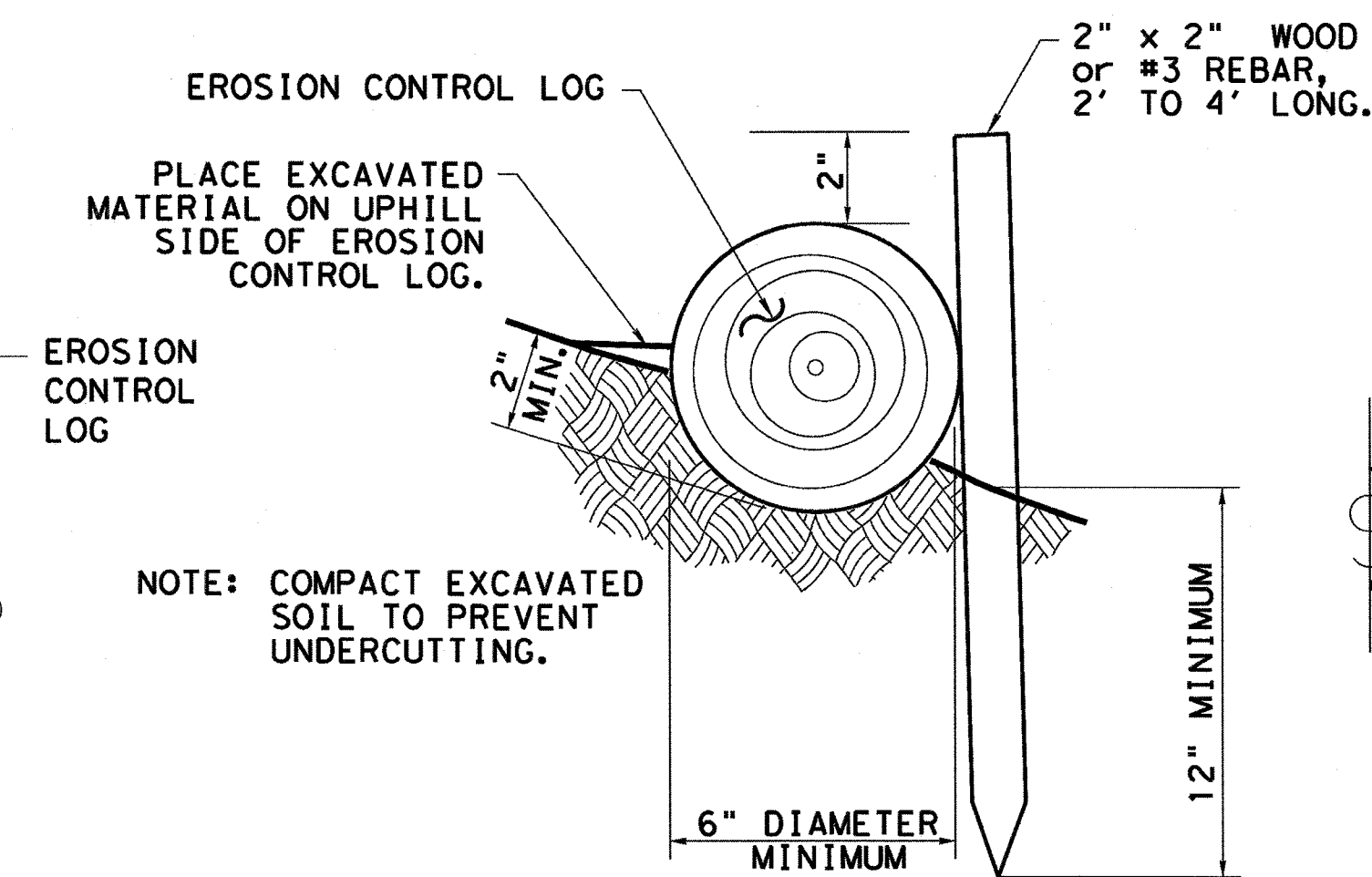
**EROSION CONTROL LOGS ON SLOPES  
STAKE AND LASHING ANCHORING**

CL-SSL



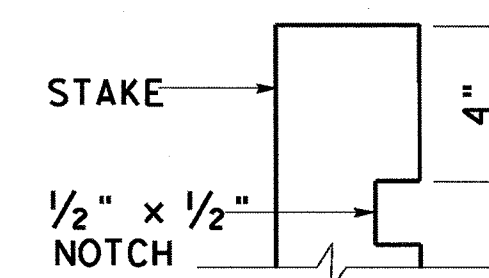
**STAKE AND TRENCHING ANCHORING DETAIL**

CL-SST



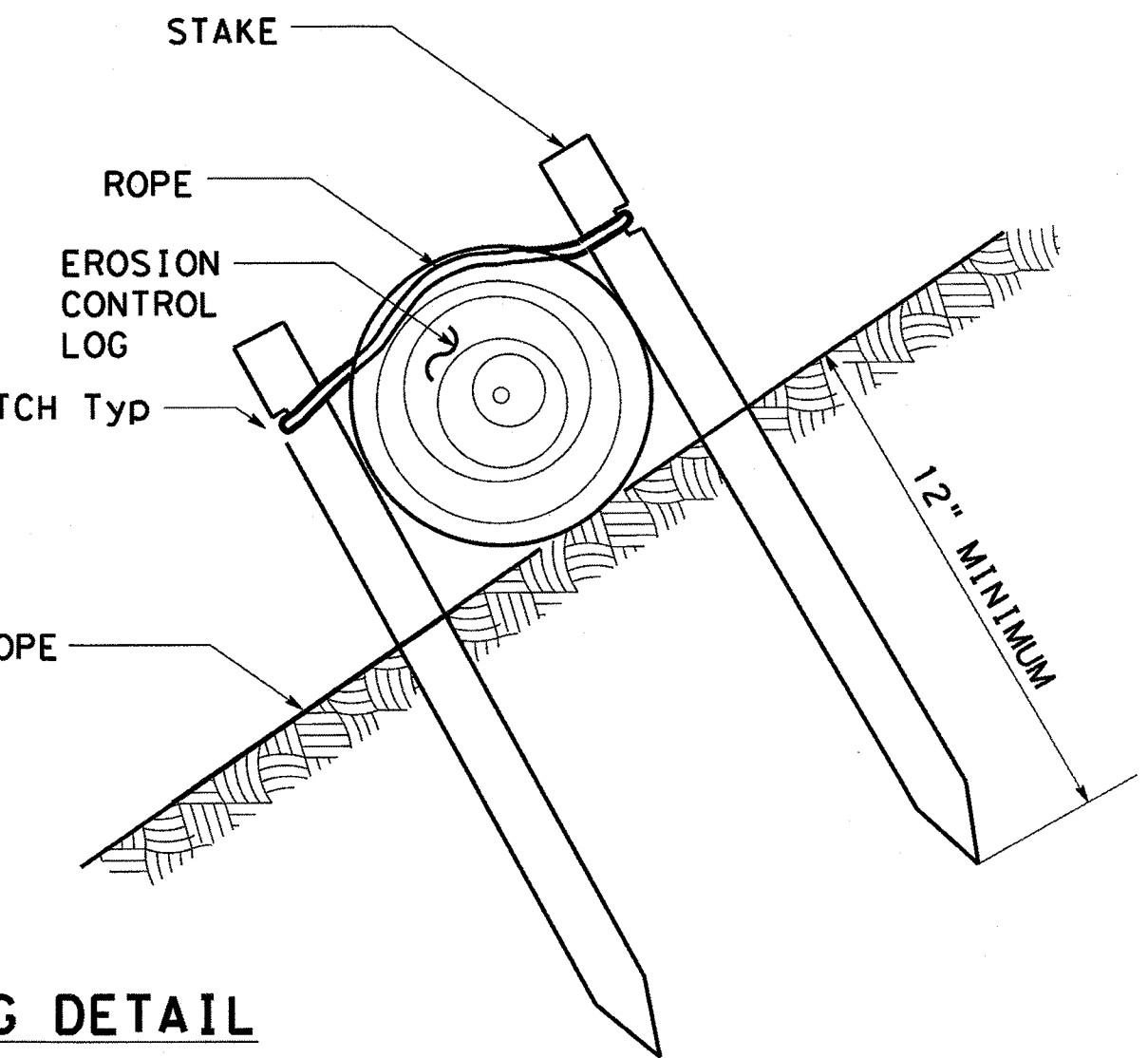
**STAKE AND LASHING ANCHORING DETAIL**

CL-SSL



**STAKE NOTCH DETAIL**

TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"

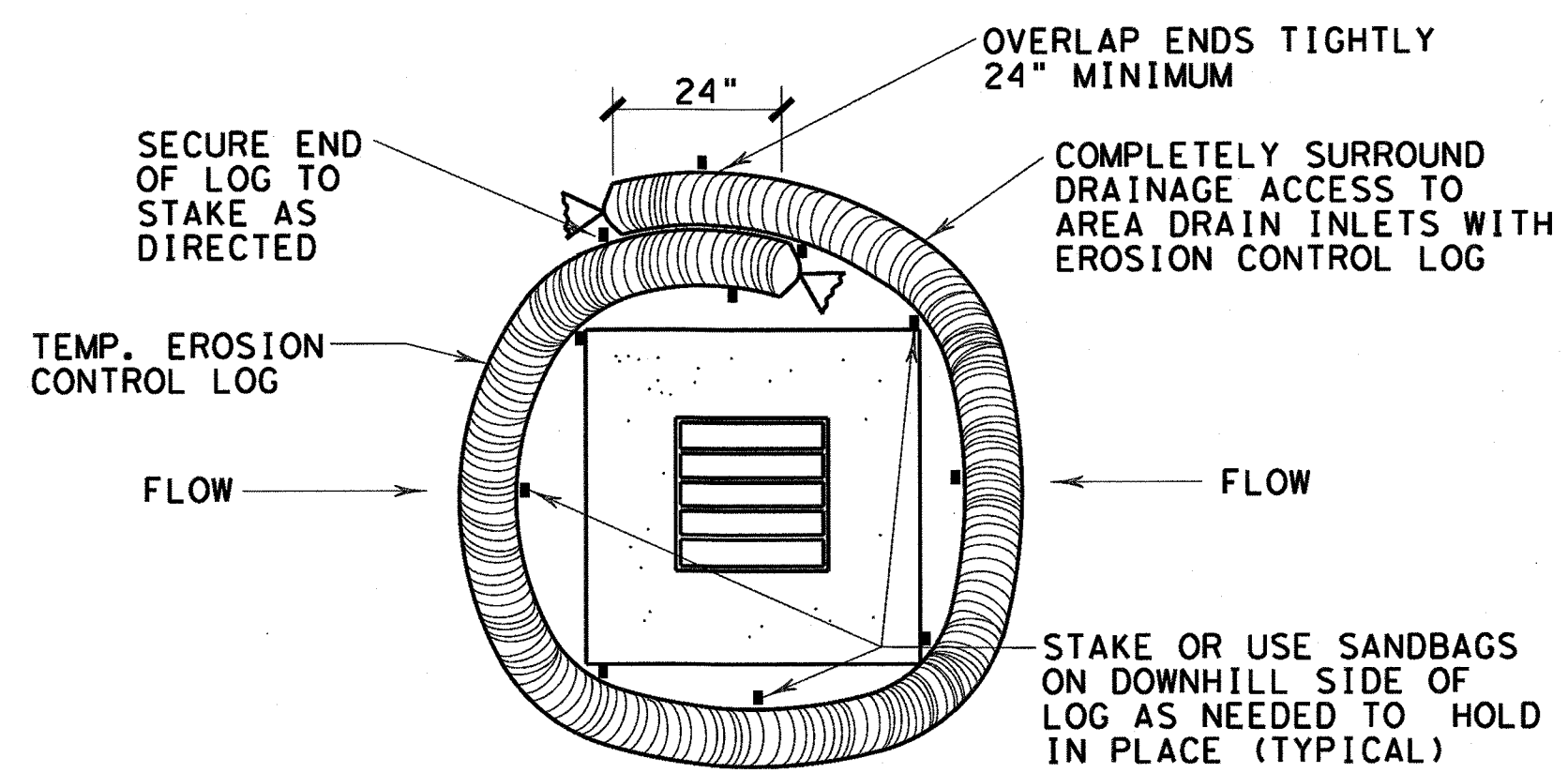


SHEET 2 OF 3

		Design Division Standard	
<b>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES EROSION CONTROL LOG EC(9)-16</b>			
FILE: ec116	DW: TxDOT	CK: KM	DW: LS/PT
© TxDOT: JULY 2016	CONT	SECT	JOB
REVISIONS	DIST		COUNTY
			SHEET NO.

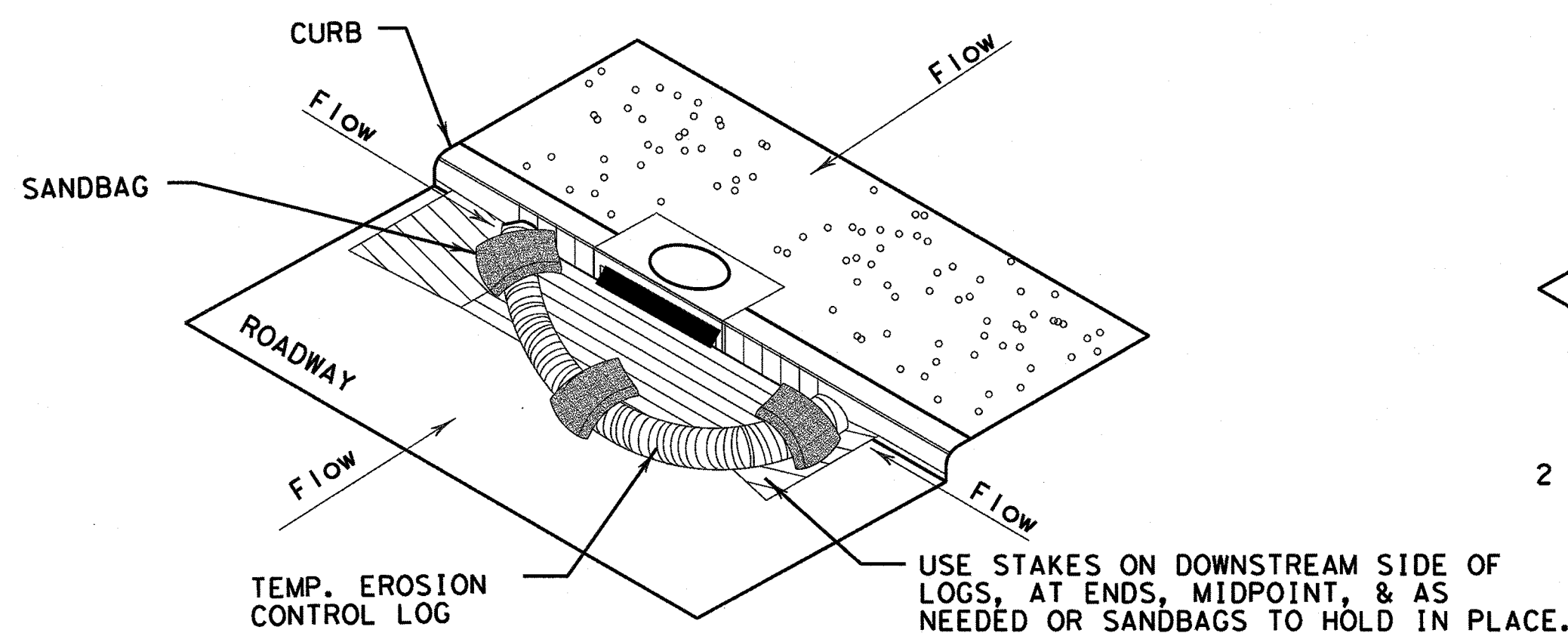
DISCLAIMER: This standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:  
FILE:



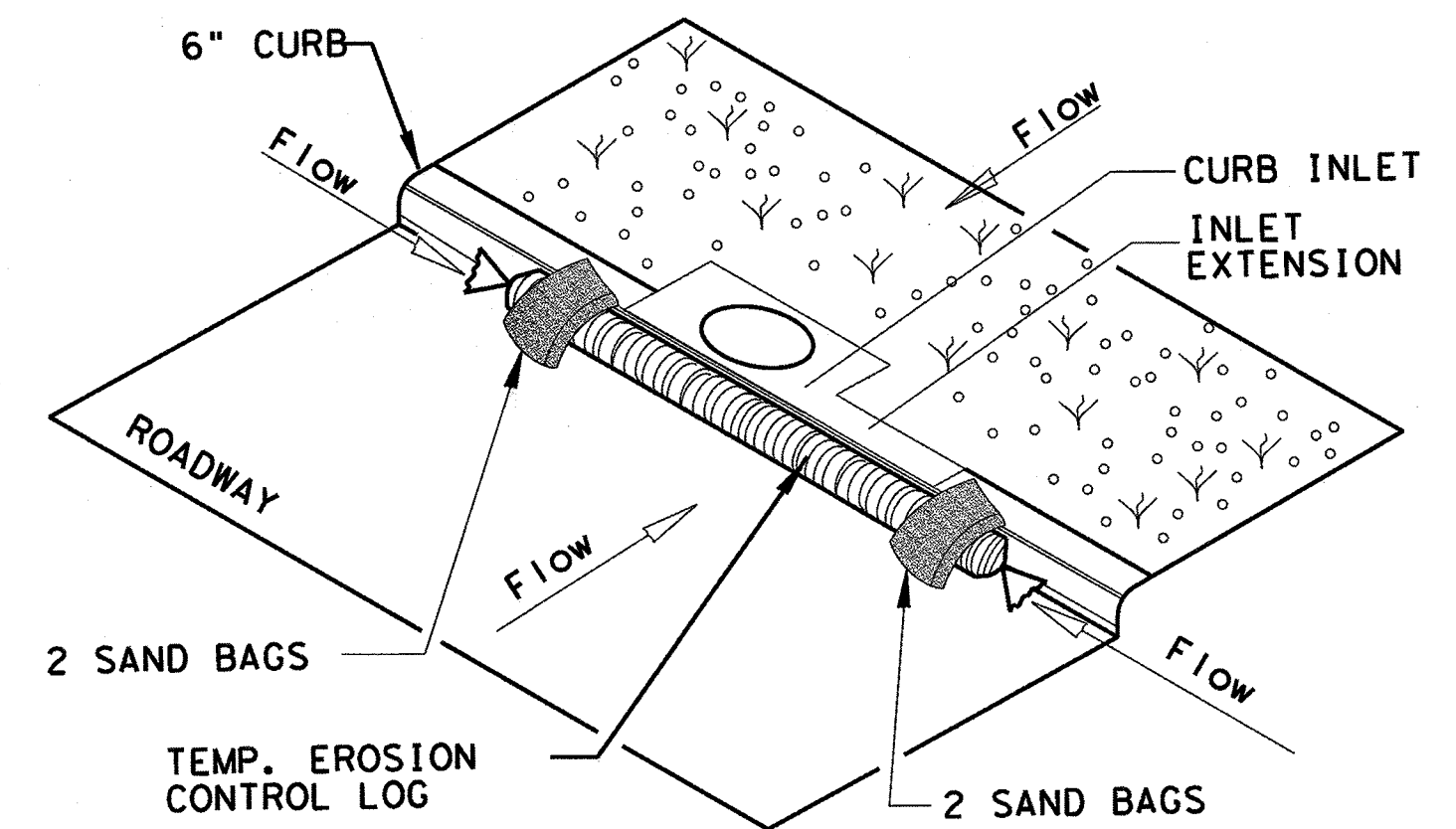
**EROSION CONTROL LOG AT DROP INLET**

CL-DI



**EROSION CONTROL LOG AT CURB INLET**

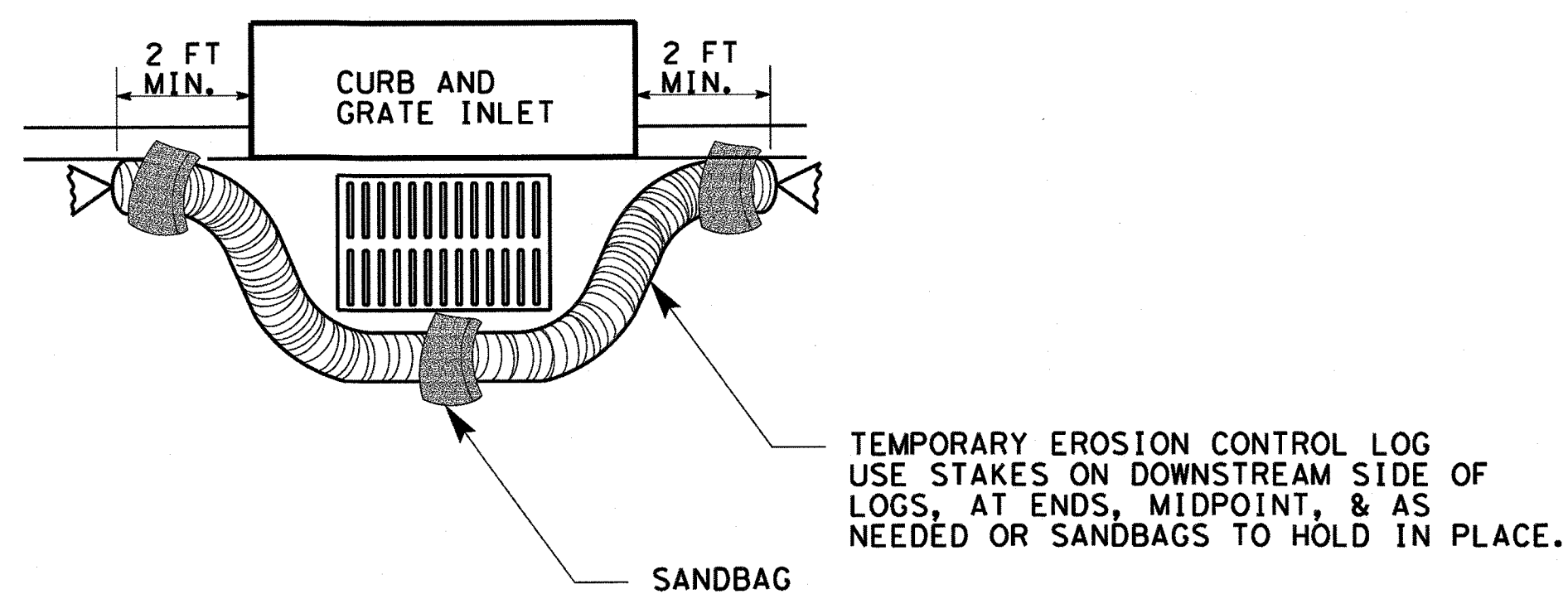
CL-CI



**EROSION CONTROL LOG AT CURB INLET**

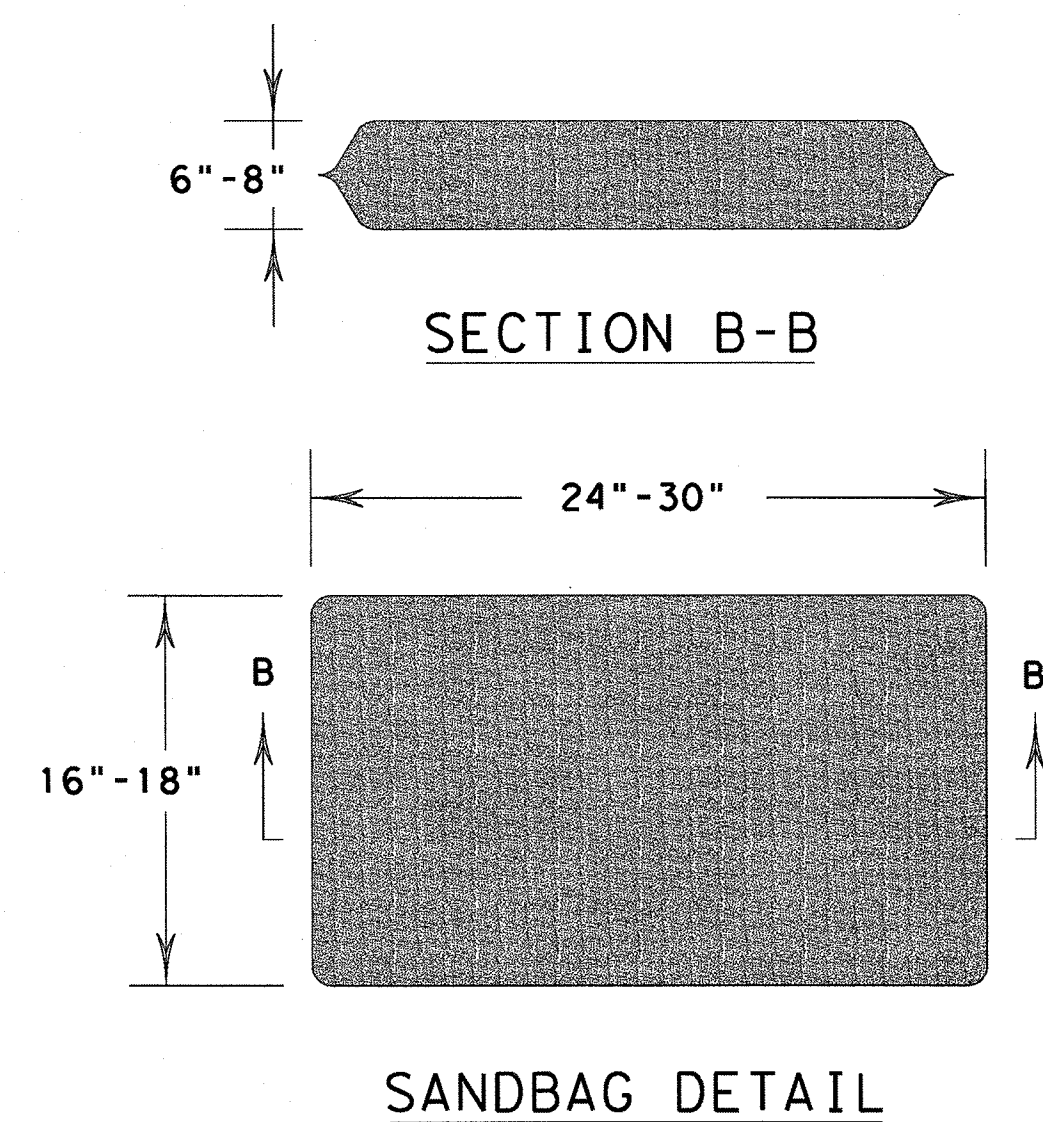
CL-CI

**NOTE:**  
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



**EROSION CONTROL LOG AT CURB & GRADE INLET**

CL-GI



**SANDBAG DETAIL**

SHEET 3 OF 3

		<b>Design Division Standard</b>	
<b>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES</b> <b>EROSION CONTROL LOG</b> <b>EC (9) - 16</b>			
FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT
© TxDOT: JULY 2016	CONT	SECT	JOB
REVISIONS		HIGHWAY	
DIST		COUNTY	SHEET NO.