

FINAL PLANS

NAME OF CONTRACTOR: _____
 DATE OF LETTING: _____
 DATE WORK BEGAN: _____
 DATE WORK COMPLETED: _____
 DATE WORK ACCEPTED: _____
 SUMMARY OF CHANGE ORDERS:

STATE OF TEXAS
 DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
 STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT
 STP 2023(439)HES, ETC.
 CCSJ: 1047-03-076, ETC.

FM 1382
DALLAS COUNTY

LIMITS: FM 1382: CSJ 1047-03-076 FROM 700' NORTH OF CAMP WISDOM RD
 TO 400' SOUTH OF W SPINE RD

FM 1382: CSJ 1047-03-080 FROM NORTH OF PENN BRANCH PKWY

TOTAL LENGTH OF PROJECT =

ROADWAY	= 15,282.72 FT.	= 2.894 MI.
BRIDGE	= 000.00 FT.	= 0.000 MI.
TOTAL	= 15,282.72 FT.	= 2.894 MI.

TYPE OF WORK: SAFETY IMPROVEMENT PROJECTS, CULVERT & STORM DRAINAGE WORK

CONSISTING OF: INSTALL MEDIAN BARRIER & CULVERT REPLACEMENT

DESIGN DN	FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. STP 2023(439)HES, ETC.	HIGHWAY NO. FM 1382
GRAPHICS DN	STATE	DISTRICT DALLAS	COUNTY DALLAS
CHECK NP	TEXAS	DALLAS	DALLAS
CHECK AM	CONTROL 1047	SECTION 03	JOB 076, ETC.
			SHEET NO. 1

FUNCTIONAL CLASSIFICATION : PRINCIPAL ARTERIAL

DESIGN SPEEDS : N/A

ADT : 20,791 (2022)

ADT : 28,787 (2042)

NOTE:

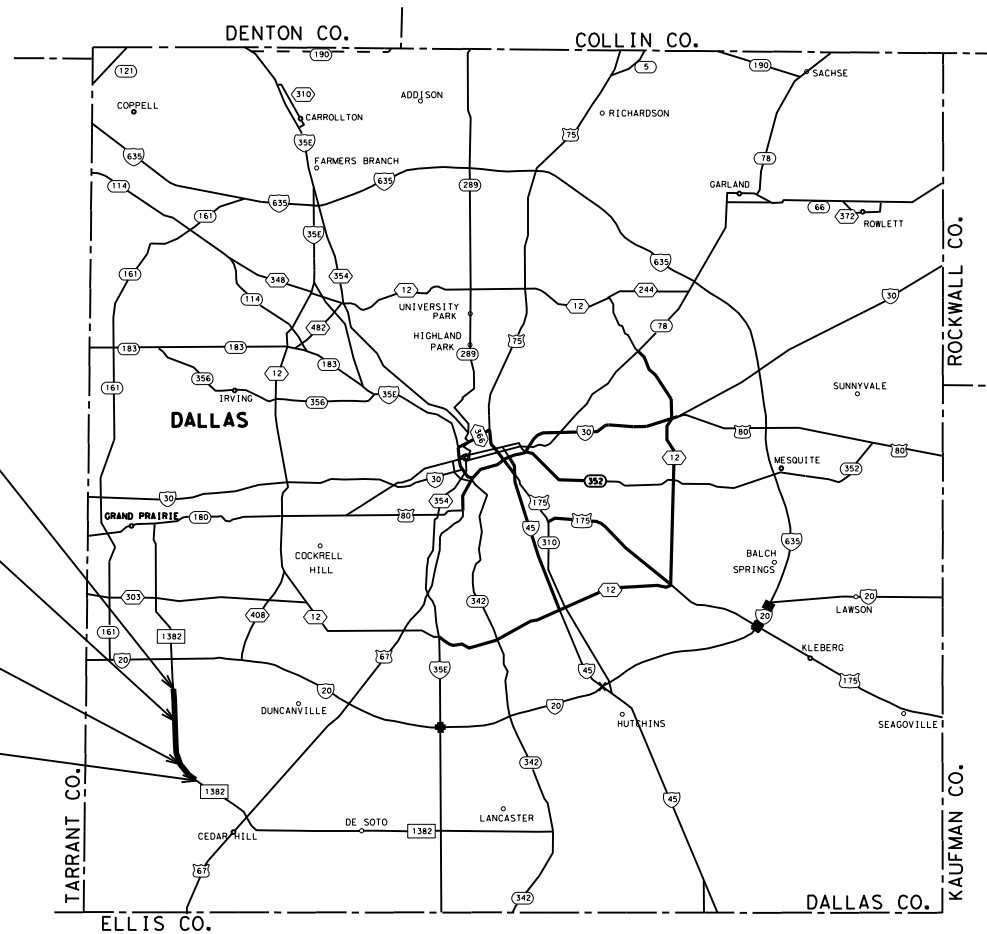
SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014, AND THE CONTRACT PROVISIONS LISTED AND DATED AS FOLLOWS SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, JULY 5, 2022)

BEGIN PROJECT
 CSJ: 1047-03-076
 STA. 248+90.40
 TRM: 274+0.446

BEGIN PROJECT
 CSJ: 1047-03-080
 STA. 347+95.68
 TRM: 276+0.283

END PROJECT
 CSJ: 1047-03-080
 STA. 386+52.48
 TRM: 276+1.013

END PROJECT
 CSJ: 1047-03-076
 STA. 401+73.12
 TRM: 276+1.301



EQUATIONS: NONE
 EXCEPTIONS: STA. 317+50 TO STA. 344+00
 STA. 350+00 TO STA. 384+00
 RAILROAD CROSSINGS: NONE

WORK WAS COMPLETED ACCORDING
 TO THE PLANS AND CONTRACT.

_____, P.E.
 Signature of Registrant & Date

DALLAS COUNTY
 SCALE 0 1 2 3 4 MILES
 DALLAS DISTRICT

TEXAS DEPARTMENT OF TRANSPORTATION

SUBMITTED FOR LETTING 11/16/2022
 [Signature] , P.E.
 DESIGN ENGINEER

RECOMMENDED FOR LETTING 11/17/2022
 [Signature] , P.E.
 DEPUTY DISTRICT ENGINEER

RECOMMENDED FOR LETTING 11/17/2022
 [Signature] , P.E.
 DESIGN ENGINEER

APPROVED FOR LETTING 11/17/2022
 [Signature] , P.E.
 DISTRICT ENGINEER

INDEX OF SHEETS

I. GENERAL

- 1 TITLE SHEET
- 2 INDEX OF SHEETS
- 3-6 PROJECT LAYOUT
- 7 TYPICAL SECTION
- 8,8A-8D GENERAL NOTES
- 9-9A ESTIMATE & QUANTITY
- 10 QUANTITY SUMMARY

II. TRAFFIC CONTROL PLAN

- 11 TCP NARRATIVE
- 12-13 MISCELLANEOUS TCP DETAIL
- 14 CRASH CUSHION SUMMARY SHEET

TRAFFIC CONTROL PLAN STANDARDS

- # 15-26 BC (1)-21 THRU BC (12)-21
- # 27 TCP (1-5)-18
- # 28 TCP (2-6)-18
- # 29 TCP (3-2)-13
- # 30 TCP (5-1)-18
- # 31 WZ (RS)-22
- # 32 TREATMENT FOR VARIOUS EDGE CONDITIONS
- # 33-34 CSB (1)-10
- # 35 ABSORB(M)-19
- # 36 SLED-19

III. ROADWAY DETAILS

NONE

ROADWAY STANDARDS

- # 37 CASS(TL4)-14
- # 38 GBRLTR(TL4)-14
- # 39-40 NU-CABLE(TL4)-14

IV. RETAINING WALL DETAILS

NONE

V. DRAINAGE DETAILS

- 41 EXTERIOR DRAINAGE AREA MAP
- 42 CULVERT S-6 LAYOUT
- 43-44 CULVERT S-6 HYDRAULIC DATA SHEET
- 45 CULVERT S-8 LAYOUT
- 46-47 CULVERT S-8 HYDRAULIC DATA SHEET
- 48-53 TEMPORARY SHORING LAYOUT
- 54 CULVERT S-6 DRAINAGE CONTOURS
- 55 CULVERT S-8 DRAINAGE CONTOURS
- 56 CORE BORING DATA

DRAINAGE STANDARDS

- # 57 CH-PW-S
- # 58 CH-PW-0
- # 59 POD
- # 60-61 SRR

VI. UTILITIES

NONE

VII. BRIDGE

NONE

VIII. TRAFFIC ITEMS

NONE

IX. ENVIRONMENTAL ISSUES

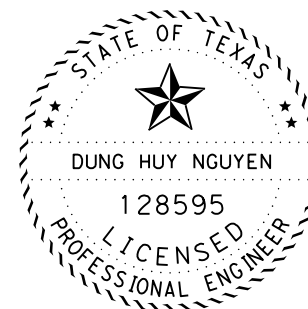
- 62 STORMWATER POLLUTION PREVENTION PLAN (SW3P)(DAL)
- 63-64 ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)(DAL)
- 65-70 SW3P SITE MAP

ENVIRONMENTAL ISSUES STANDARDS

- # 71-73 EC(1)-16 THRU EC(3)-16
- # 74-76 EC(9)-16
- # 77 VEGETATIVE ESTABLISHMENT SHEET (DAL)
- # 78 SW3P SIGN (DAL)

X. RAILROAD

NONE



THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

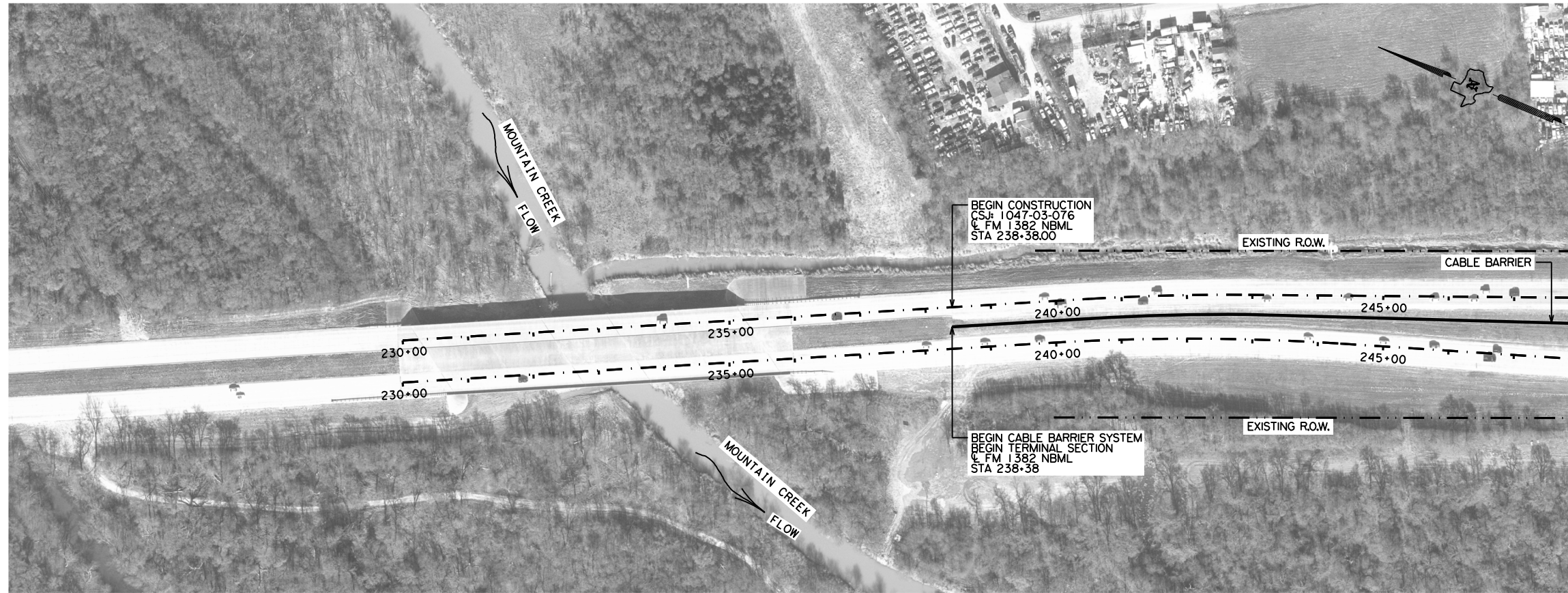
_____, P. E. 11/15/2022
 Signature of Registrant & Date



FM 1382
INDEX OF SHEETS

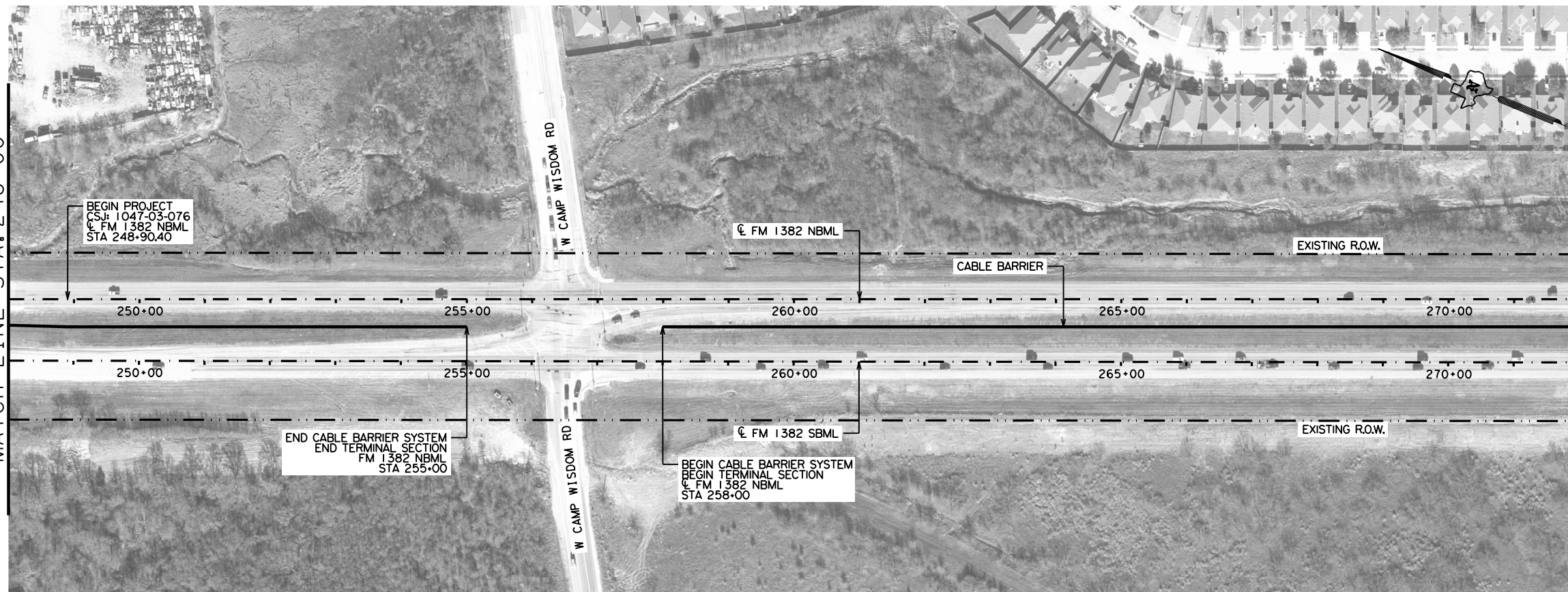
SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
GRAPHICS	6	SEE TITLE SHEET		FM 1382
CHECK	TEXAS	DAL	DALLAS	2
CHECK	CONTROL	SECTION	JOB	
	1047	03	076, ETC.	



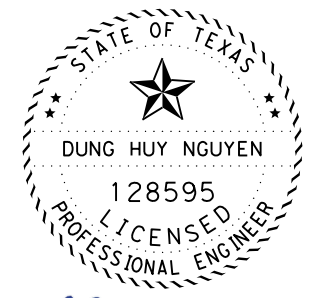
MATCH LINE STA. 248+00

NOTE:
NO PROPOSED CONSTRUCTION FROM STA. 317+50
TO 344+00 AND STA. 350+00 TO STA. 384+00



MATCH LINE STA. 248+00

MATCH LINE STA. 272+00



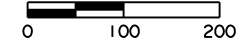
Dung Nguyen
 Signature of Registrant & Date
 P.E. 11/15/2022

Texas Department of Transportation
 © 2022

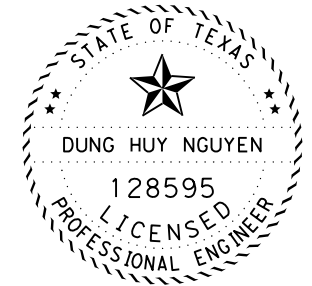
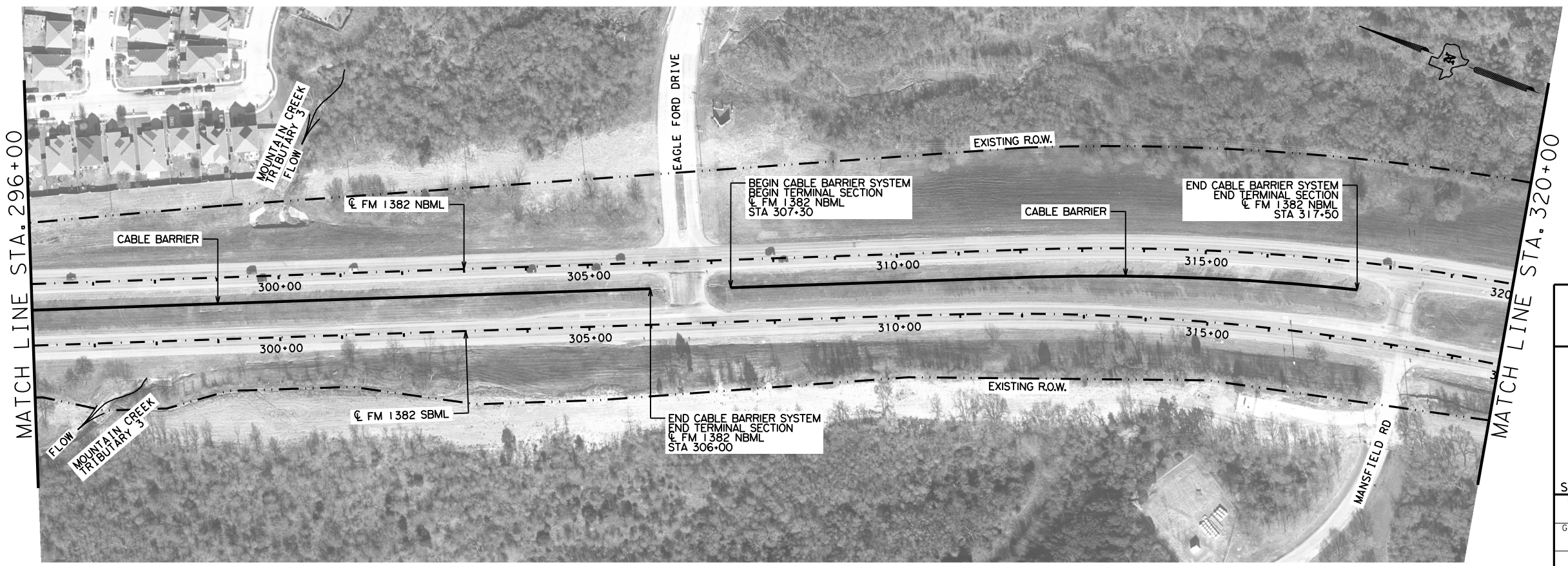
**FM 1382
 PROJECT LAYOUT**

SCALE: 1"=200' SHEET 1 OF 4

DESIGN	FED. RD. DIV. NO. 6	PROJECT NO. SEE TITLE SHEET		HIGHWAY NO. FM 1382
GRAPHICS	STATE TEXAS	DISTRICT DAL	COUNTY DALLAS	SHEET NO. 3
CHECK	CONTROL 1047	SECTION 03	JOB 076, ETC.	



NOTE:
NO PROPOSED CONSTRUCTION FROM STA. 317+50
TO 344+00 AND STA. 350+00 TO STA. 384+00



Dung Nguyen
Signature of Registrant & Date
P.E. 11/15/2022

Texas Department of Transportation
© 2022

FM 1382 PROJECT LAYOUT

SCALE: 1"=200' SHEET 2 OF 4

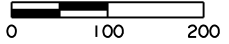
DESIGN	FED. RD. DIV. NO. 6	PROJECT NO. SEE TITLE SHEET		HIGHWAY NO. FM 1382
GRAPHICS	STATE TEXAS	DISTRICT DAL	COUNTY DALLAS	SHEET NO. 4
CHECK	CONTROL 1047	SECTION 03	JOB 076, ETC.	

TxDOT

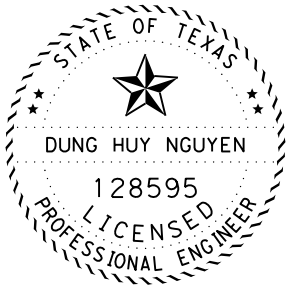
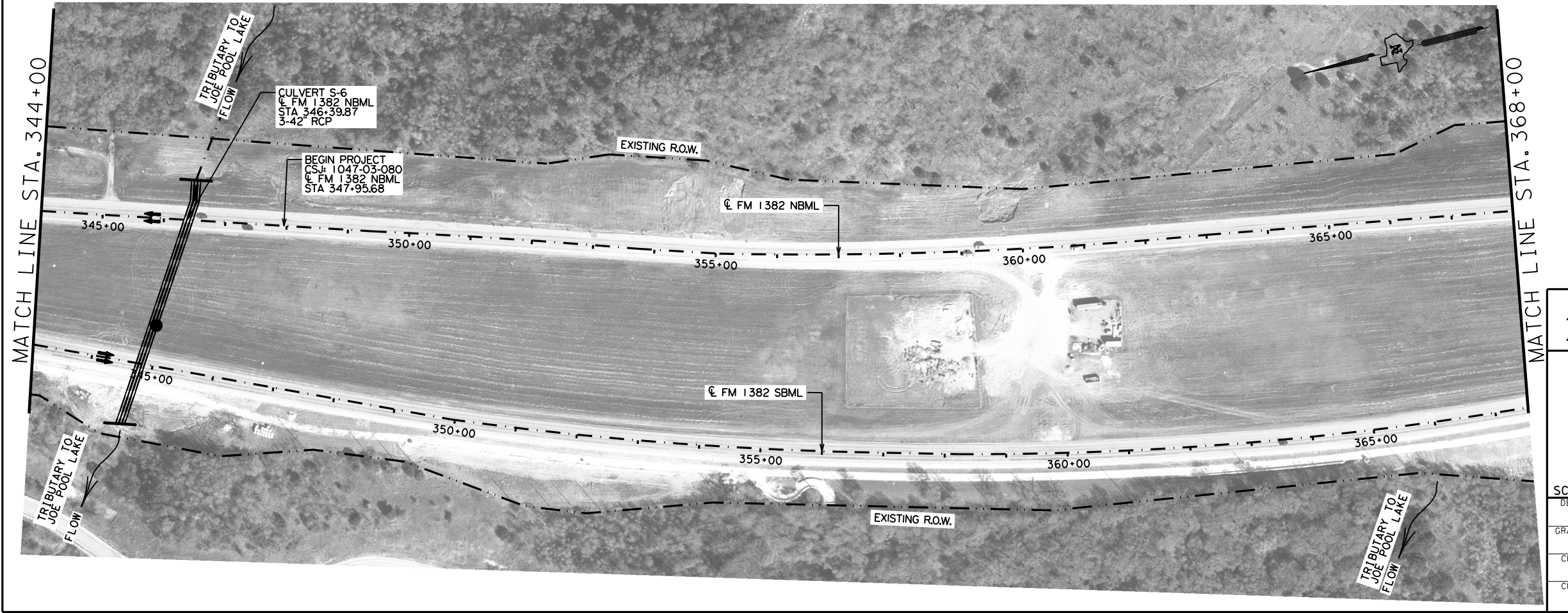
12:58:45 PM

11/15/2022

T:\DALAO\PROJECTS\01\FM1382\Culvert replacement\rehab_options\Sheets\GEN\Project Layout.dgn



NOTE:
NO PROPOSED CONSTRUCTION FROM STA. 317+50
TO 344+00 AND STA. 350+00 TO STA. 384+00



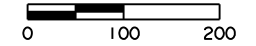
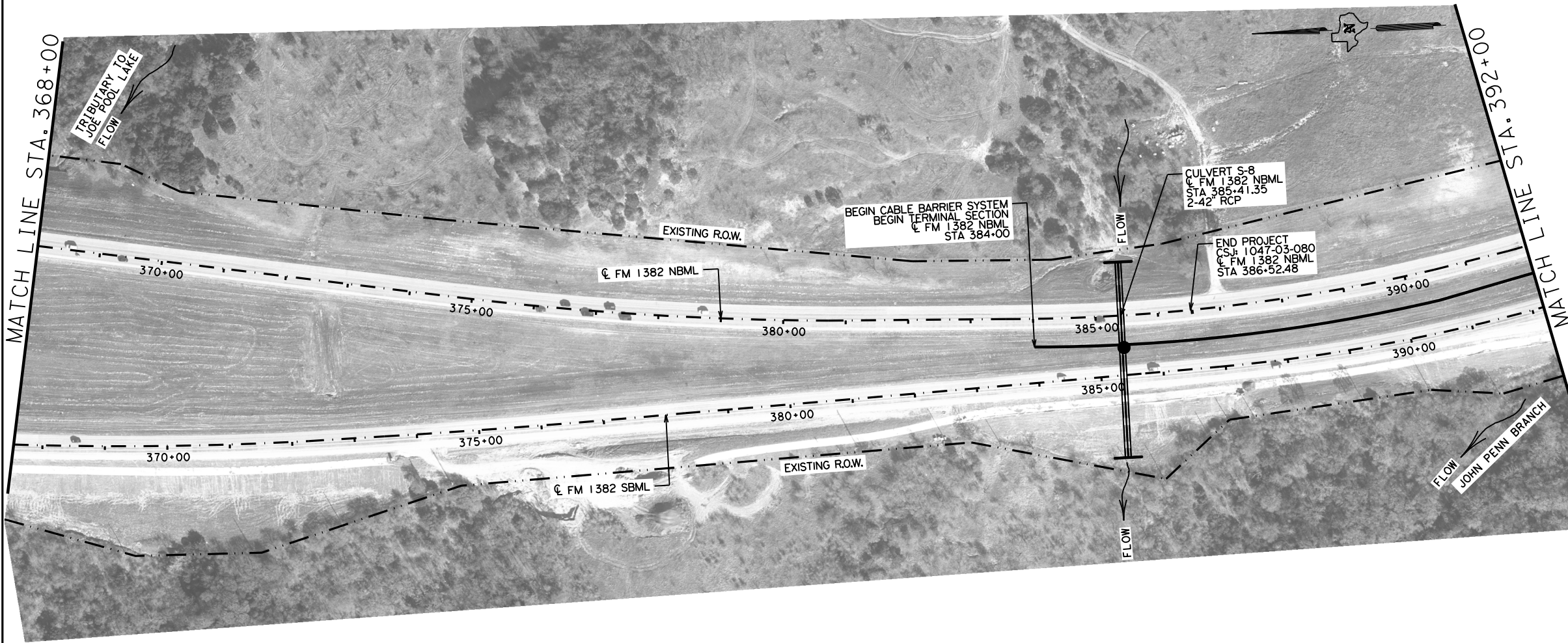
Dung Nguyen, P.E. 11/15/2022
Signature of Registrant & Date

Texas Department of Transportation
© 2022

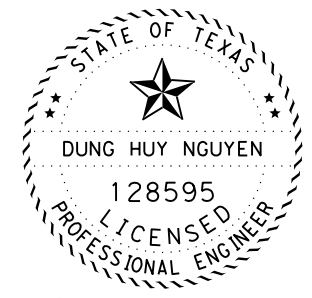
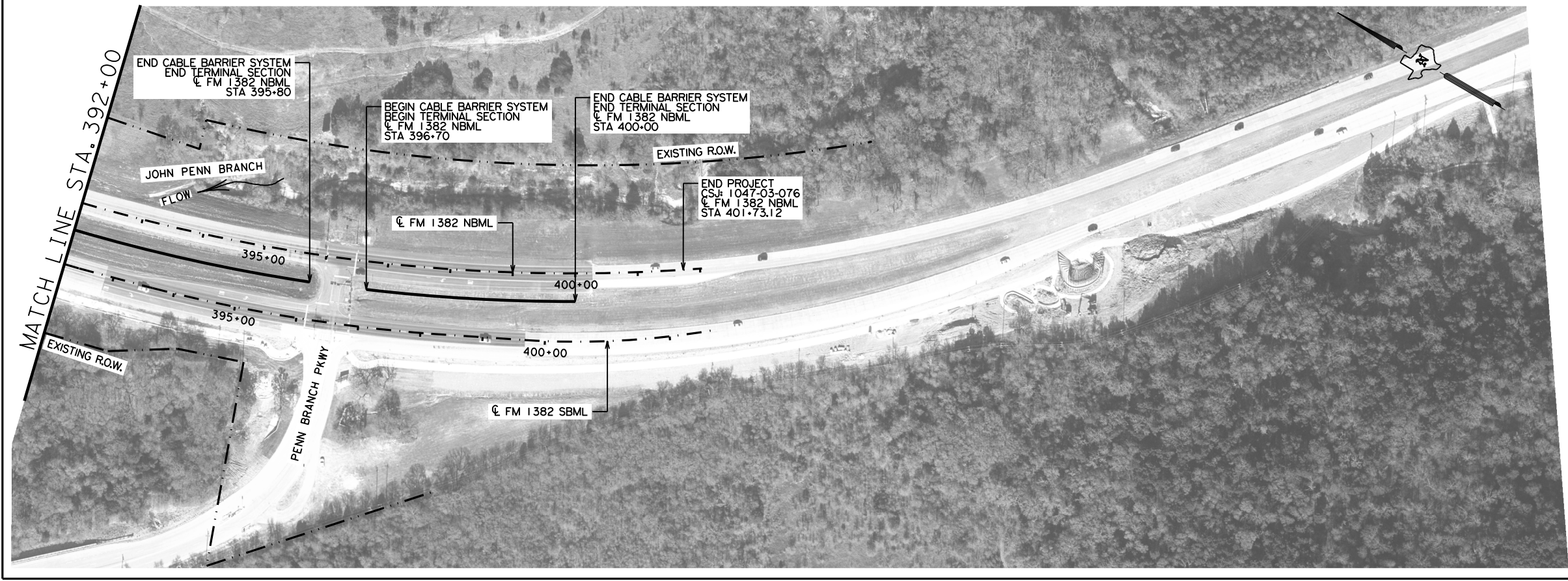
FM 1382
PROJECT LAYOUT

SCALE: 1"=200' SHEET 3 OF 4

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
GRAPHICS	6	SEE TITLE SHEET		FM 1382
CHECK	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	DAL	DALLAS	5
CHECK	CONTROL	SECTION	JOB	
	1047	03	076, ETC.	



NOTE:
NO PROPOSED CONSTRUCTION FROM STA. 317+50
TO 344+00 AND STA. 350+00 TO STA. 384+00



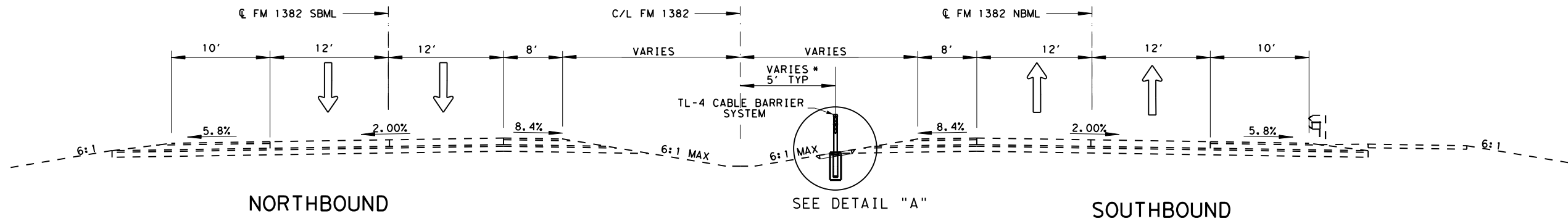
Dung Nguyen, P.E. 11/15/2022
Signature of Registrant & Date

Texas Department of Transportation
© 2022

FM 1382
PROJECT LAYOUT

SCALE: 1"=200' SHEET 4 OF 4

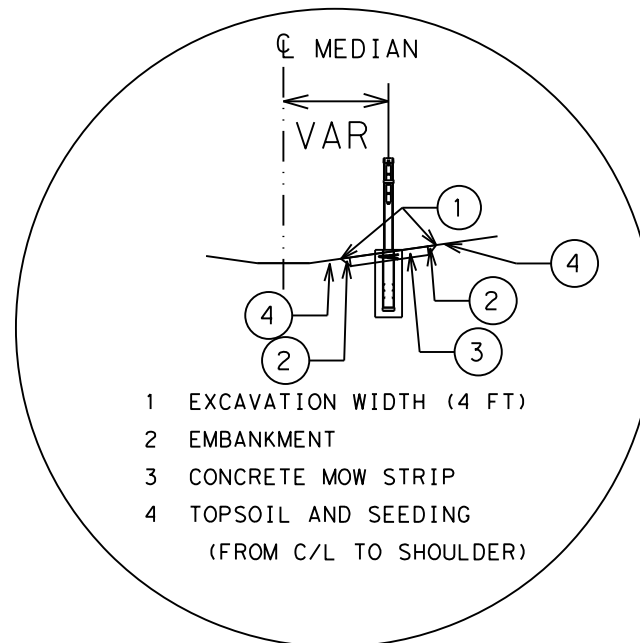
DESIGN	FED. RD. DIV. NO. 6	PROJECT NO. SEE TITLE SHEET		HIGHWAY NO. FM 1382
GRAPHICS	STATE TEXAS	DISTRICT DAL	COUNTY DALLAS	SHEET NO. 6
CHECK	CONTROL 1047	SECTION 03	JOB 076, ETC.	



EXISTING AND PROPOSED TYPICAL SECTION

- STA 238+38 TO STA 255+00
- STA 258+00 TO STA 275+00
- STA 277+00 TO STA 306+00
- STA 307+30 TO STA 317+50
- STA 384+00 TO STA 395+80
- STA 396+70 TO STA 400+00

DETAIL "A"



NOT TO SCALE

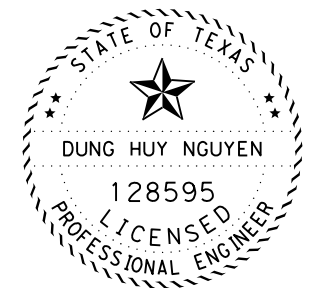
* - THE LOCATION OF THE BARRIER ON EITHER SIDE OF C/L. THE BARRIER LOCATION MAY BE ADJUSTED FOR FIELD CONDITIONS WITH THE APPROVAL OF THE ENGINEER.

NOTE: WIRE ROPE/CABLE SAFETY SYSTEM WILL BEGIN 50' FROM TURN AROUND. AT BRIDGE LOCATIONS WIRE ROPE/CABLE SAFETY SYSTEM WILL TERMINATE PRIOR TO BRIDGE ENDS. SEE CABLE BARRIER STANDARDS FOR DETAILS NOT SHOWN.

UPON COMPLETION OF THE INSTALLATION OF WIRE ROPE/CABLE SAFETY SYSTEM, CONSTRUCT 3' CONCRETE MOW STRIP TO THE LENGTH SHOWN ELSEWHERE ON PLANS TO ELIMINATE VEGETATION AROUND THE DEVICES.

MOW STRIPS SHALL BE REINFORCED CONCRETE WITH STEEL WIRE MESH.

NO PROPOSED CONSTRUCTION BETWEEN STA. 317+50 TO STA. 344+00 AND STA. 350+00 TO STA. 384+00



Dung Nguyen, P.E. 11/15/2022
Signature of Registrant & Date



FM 1382 TYPICAL SECTION

N. T. S.			SHEET 1 OF 1	
DESIGN DN	FED. RD. DIV. NO. 6	PROJECT NO. SEE TITLE SHEET		HIGHWAY NO. FM 1382
GRAPHICS DN	STATE TEXAS	DISTRICT DAL	COUNTY DALLAS	SHEET NO. 7
CHECK NP	CONTROL	SECTION	JOB	
CHECK AM	1047	03	076, ETC.	

SPECIFICATION DATA

Table 1: Soil Constants Requirements				
Item	Description	Plasticity Index		Note
		Max	Min	
132	EMBANKMENT (FINAL)(DC)(TY C)	40	8	1
132	EMBANKMENT (FINAL)(OC)(TY B)	40	8	1

Note 1: Material excavated from the project must meet the PI requirements when used in the top 10 feet of embankment that supports the pavement structure or other locations shown in the plans. Do not use shale and obtain approval to incorporate shaley clay produced by the construction project.

Table 2: Basis of Estimate for Permanent Construction					
Item	Description	Thickness	Rate		Quantity
161	Compost Manuf Topsoil	4"			37,007 SY
162	Block Sod	N/A	See Specifications		5,258 SY
164	Drill Seeding (Perm)(Rural)(Clay)	N/A	See Specifications		31,749 SY
166 *	Fertilizer (12-6-6)	N/A	500	Lbs./Ac	1,912 Ton
168	Vegetative Watering (Warm)**	N/A	12	MG/Ac/Day	5,506 MG

*For contractor's information only
 **Use Summer rate for calculation, adjust for actual field conditions/temperatures as necessary. See Vegetation Establishment Plan Sheet for estimated daily rates.

Table 3: Basis of Estimate for Temporary Erosion Control Items				
Item	Description	Rate		Quantity
164	Drill Seeding (Temp) (Warm or Cool)	See Specifications		37,007 SY
166*	Fertilizer (12-6-6)	500	Lb/Ac	1,912 Ton
168	Vegetative Watering (Warm)**	12	MG/Ac/Day	5,506 MG

*For Contractor's Information Only.
 **Use Summer rate for calculation, adjust for Actual Field Conditions/Temperatures as Necessary. See Vegetation Establishment Sheet for estimated daily rates.

GENERAL

The construction, operation and maintenance of the proposed project will be consistent with the state implementation plan as prepared by the Texas Commission on Environmental Quality.

The disturbed area for this project, as shown on the plans is 7.65 acres. However, the Total Disturbed Area (TDA) will establish the required authorization for storm water discharges. The TDA of this project will be determined by the sum of the disturbed area in all project locations in the contract, and all disturbed area on all Project-Specific Locations (PSL) located in the project limits and/or within 1 mile of the project limits. The department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction site as shown on the plans, according to the TDA of the project. The contractor will obtain any required authorization from the TCEQ for the discharge of storm water from any PSL for construction support activities on or off of the project row according to the TDA of the project. When the TDA for the project exceeds 1 acre, provide a copy of the appropriate application of permit (NOI, or Construction Site Notice) to the engineer, for any PSL located in the project limits or within 1 mile of the project limits. Follow the directives and adhere to all requirements set forth in the TCEQ, Texas Pollution Discharge Elimination System, Construction General Permit (TPDES, CGP).

This project required formal consultation and/or permtng with environmental resources agencies. There is a high probability that an environmentally sensitive area could be encountered on the contractor designated Project-Specific Locations (PSL) for this project (haul roads, equipment staging areas, borrow pits, disposal sites, field offices, storage areas, parking areas, etc.). Item 7.6 "Project-Specific Locations", provides a listing of regulatory agencies that may need to be contacted regarding this project.

The following Conservation Measures for the Golden-cheeked Warbler will be implemented for this project:

- Limit the operation of heavy machinery to paved areas, areas free of native vegetation, and to areas with slopes that are less than 33 percent consisting of stable soils.
- Confirm the presence of listed species at or near the project site through pre-construction surveys or assume they are present and implement appropriate protection measures.
- Minimize impacts to listed species and their habitats by limiting grading or topsoil removal to areas where this activity is absolutely necessary for construction activities.
- Schedule the most effective amount of personnel and equipment to complete construction to reduce the time of disturbance to listed species.
- Review temporary roadside material storage locations and notify contractors of the areas with potential to support habitat for rare, threatened, and endangered species and of the conservation need to avoid these areas.
- Avoid use of non-native invasive plant species.
- Sterilize equipment for tree trimming between trees in areas affected by surface transferable bacterial, viral, and fungal diseases.

- Do not disturb, destroy, or remove active nests during the nesting season.
- Do not collect, capture, relocate, or transport birds, eggs, young, or active nests without a permit.
- Limit the use of machinery in habitat that may support ground-nesting birds during the spring and early summer months.
- Coordinate with ENV and the District Environmental Coordinators prior to grading and blading activities for wildfire management and control.
- Train maintenance crews on how to handle hazardous chemicals if used, and encourage them to use them sparingly and only when absolutely necessary.
- Retain existing vegetation whenever possible.
- Use general good housekeeping practices and do not leave waste behind on the job site.
- Use care to avoid spills, leaks and drips of equipment and cleaning fluids when cleaning tools, servicing equipment or doing routine maintenance.
- Projects that would involve clearing or trimming of individual trees or shrubs in or near (within 300 feet of) potential habitat would be phased so that any clearing activities would occur outside the breeding season (between September 1st and February 28th) to minimize impacts to GCW.
- TxDOT personnel and project contractors, as appropriate, will be informed of these Programmatic Consultation requirements.
- Projects that would require trimming or removal of more than a few individual trees or shrubs or linear strips of woody vegetation will be inspected by qualified TxDOT biologists. Biologists would determine if areas of vegetation to be disturbed meet the criteria for potential GCW habitat and make an effect call based on the potential impacts in order to determine if a project-specific consultation is warranted.

Leave all right of way areas undisturbed until actual construction is to be performed in said areas.

Contractor questions on this project are to be addressed to the following individuals:

Amanda Miller Amanda.Moser@txdot.gov
Nathan Petter Nathan.Petter@txdot.gov

Contractor questions will be accepted through email, phone, and in person by the above individuals.

All contractor questions will be reviewed by the Engineer. Once a response is developed, it will be posted to TxDOT's Public FTP at the following Address:

<https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting%20Responses/>

All questions submitted that generate a response will be posted through this site. The site is organized by District, Project Type (Construction or Maintenance), Letting Date, CCSJ/Project Name.

Item 5:

Underground utilities owned by the Texas Department of Transportation may be present within the Right-Of-Way on this project. For signal, illumination, surveillance, and communications & control maintained by TxDOT, call the TxDOT Traffic Signal Office (214-320-6682) for locates a minimum of 48 hours in advance of excavation. For irrigation systems, call TxDOT Landscape Office (214-320-6205) for locates a minimum of 48 hours in advance of excavation. If city or town owned irrigation facilities are present, call the appropriate department of the local city or town a minimum of 48 hours in advance of excavation. The Contractor is liable for all damages when utilities are damaged due to Contractor's negligence including, but not limited to, repair or replacement at the Contractor's expense.

For the project to be deemed complete, permanently stabilize all unpaved disturbed areas of the project with a vegetative cover at a minimum of 70% density for the control of erosion.

Place construction stakes/station markings at intervals of no more than 100 feet or as directed by the Engineer. Place stakes and markings so as not to interfere with normal construction operations.

Submit all shop drawings, working drawings, or other documents which require review sufficiently in advance of scheduled construction to allow no less than thirty (30) calendar days for review and response.

Item 6:

To comply with the latest provisions of Build America, Buy America Act (BABA Act) of the Bipartisan Infrastructure Law, the contractor must submit a notarized original of the TxDOT Construction Material Buy America Certification Form for all items classified as construction materials. This form is not required for materials classified as a manufactured product.

Refer to the Buy America Material Classification Sheet for clarification on material categorization.

The Buy America Material Classification Sheet is located at the below link.

<https://www.txdot.gov/business/resources/materials/buy-america-material-classification-sheet.html> for clarification on material categorization.

Item 7:

Repair or replace any structures and utilities that might have been damaged by negligence or a failure to have utility locates performed.

Perform all electrical work in accordance with the National Electrical Code and Texas Department of Transportation Specifications.

County: Dallas

Highway: FM 1382

Consult with appropriate electric company representatives according to their respective area to coordinate electrical services installations.

Patrol vehicles must be clearly marked to correspond with the officer's agency and equipped with appropriate lights to identify them as law enforcement. For patrol vehicles not owned by a law enforcement agency, markings will be retroreflective and legible from 100 ft. from both sides and the rear of the vehicle. Lights will be high intensity and visible from all angles.

Holiday restrictions – The Engineer may decide that no lane closures or construction operations shall be allowed during the restricted periods listed in the following holiday schedule. TxDOT has the right to lengthen, shorten, or otherwise modify these restricted periods as actual, or expected, traffic conditions may warrant. Working days will not be charged for these restricted periods. No additional compensation will be allowed for these closures (i.e., overhead, delays, stand-by, barricades or any other associated cost impacts).

- New Year's Eve and Day (5 am on December 31 thru 10:00 pm January 1)
- Easter Holiday weekend (5 am on Friday thru 10:00 pm Sunday)
- Memorial Day weekend (5 am on Friday thru 10:00pm Monday)
- Independence Day (5 am on July 3 thru 10:00 pm on July 5)
- Labor Day weekend (5 am on Friday thru 10:00 pm Monday)
- Thanksgiving Holiday (5 am on Wednesday thru 10:00 pm Sunday)
- Christmas Holiday (5 am on December 23 thru 10:00 pm December 26)

No significant traffic generator events identified.

Item 8:

This Project will be a Standard Workweek.

Nighttime work is allowed in accordance with Article 8.3.3.

Meet weekly with the engineer to notify him or her of planned work for the upcoming week.

Provide the engineer with a daily work schedule of planned work.

Critical Path Method (CPM) schedule in P6 format will be required for this project. Submit baseline schedule and obtain approval prior to beginning construction. The Estimate will be held if monthly schedule update is not submitted.

Item 110:

Excavated shale is not an acceptable material for embankment.

Items 110 and 132:

Scarify and loosen the excavated areas, unpaved surface areas, except rock, to a depth of at least 8 inches and compact in accordance with the specifications.

County: Dallas

Highway: FM 1382

Item 132:

Excavated material from the project site has not been determined to be suitable for embankment. The bidder assumes all risk for the use of excavated materials for embankment and is expected to meet all material requirements for embankment regardless of the source.

Perform Tex-106-E (Plasticity Index) by an approved laboratory on excavated soils from sources outside right of way when used in roadway embankment. Provide the test results at no expense to the department. The engineer will sample and test soils produced by the construction project for specification requirements or material sources specified in the plans.

Earth embankment Type C, is mainly composed of material other than shale. Furnish material that is free from vegetation or other objectionable material and that conforms to the requirements of Table 1 (Sheet A). If necessary, treat material with lime slurry in accordance with Item 260, "Lime Treatment (Road-Mixed)" in order to meet these requirements. Use Tex-121-E, figure 1, page 4 to calculate the amount of lime required. When lime treated subgrade is specified, 3000 PPM is the maximum allowed sulfate content in the top 3 feet when material comes from borrow source. Follow recommendations of 260.4.4 for mixing and mellowing. The engineer will test material placed or excavated to a depth of one foot below and laterally to one foot outside the proposed treatment limit. Lime treatment of this material will not be paid for directly, but will be considered subsidiary to this item. Do not use shaley clays in embankment unless approved in writing.

Item 160:

Sequence construction operations to salvage topsoil from one location and spread on areas ready to receive topsoil. Keep stockpiling of topsoil to a minimum.

Use fertile clay or loam from the project site not more than six inches below natural grade as topsoil.

Item 161:

Provide tickets representing quantity of compost delivered to site.

Item 400:

Structural Excavation is not paid for directly but is considered subsidiary to pertinent Items.

When placing concrete storm drain pipe on slopes of greater than 10 percent, provide cement stabilized backfill to a depth shown on the plans.

Item 420:

Apply an ordinary surface finish to all concrete surfaces within 30 days after form removal.

Item 421:

Furnish mix designs to the Engineer in a format compatible to the latest version of the Department's Construction Management System (Site Manager). Mix Design templates will be provided by the Engineer.

Strength evaluation using maturity testing, Tex-426-A, may be used for all concrete elements except drilled shafts and mass concrete pours.

County: Dallas

Highway: FM 1382

Provide a digital hydraulic compression testing Machine and accessories. The machine shall have a minimum testing range of 2500 pounds force to 250,000 pounds force with a hydraulic switching valve to allow for rapid advancing, hold, controlled advancing and rapid retracting. The machine shall have a load cell to measure compressive forces within the testing range and shall be calibrated and verified in accordance with ASTM latest version. The Machine can meet or exceed the following when approved by the Engineer:

ELE International ACCU-TEK250 Digital Compression Tester including accessories or Forney F-250EX Standard Compression Machine including accessories or TxDOT approved equal.

Supply the Engineer with a list of certified personnel and copies of their current ACI certificates before beginning production and when personnel changes are made. Supply hard copies of calibration reports for testing equipment when required by the Engineer.

Item 464:

The concrete collars and the connections of pipes to existing or proposed concrete boxes or pipe will not be paid for directly but will be considered subsidiary to the various bid items. At locations where storm drains dead-end, plug with a concrete plug of a thickness equal to 1 ½ inches per foot of diameter of pipe with a minimum thickness of 3 inches. The cost of the plugs shall be included in the unit price bid per foot of the various storm drain pipes.

Item 465:

All manholes, junction boxes and inlets will require inverts unless otherwise directed.

Item 479:

Accept ownership of inlet grates and manhole covers and properly dispose of them outside the limits of the right of way in accordance with federal, state and local regulations.

Submit a plan detailing proposed methods of handling phased construction at manholes and water valves.

Payment for the phase construction will be considered subsidiary to this item.

Item 500:

Material On Hand (MOH) will not be used in calculating partial payments for Mobilization.

Item 502:

The Contractor Force Account "Safety Contingency" that has been established for this project is intended to be utilized for work zone enhancements, to improve the effectiveness of the Traffic Control Plan, that could not be foreseen in the project planning and design stage. These enhancements will be mutually agreed upon by the Engineer and the Contractor's Responsible Person based on weekly or more frequent traffic management reviews on the project. The Engineer may choose to use existing bid items if it does not slow the implementation of enhancement.

Access will be provided to all business and residences at all times. Where turning radii are limited during phased construction at intersections, provide all weather surfaces such as RAP or

County: Dallas

Highway: FM 1382

base in turning movements to accommodate and to protect the traffic from edge drop-offs. Materials, labor, maintenance and removal for these temporary accesses and radii will not be paid for directly but will be considered subsidiary to the various bid items.

Provide written proposed lane closure information by 1:00 pm on the business day prior to the proposed closures. Do not close lanes when this requirement is not met.

When excavation is required next to a pavement lane carrying traffic and the widening is not completed by the end of the work day, backfill against the edge of the pavement with at least a 3:1 slope using an acceptable material to support vehicular traffic. Carefully remove and dispose of this material when work resumes. Backfilling pavement edges, and the materials required for the work will be subsidiary to this item.

Place barricades and signs in locations that do not obstruct the sight distance of drivers entering the highway from driveways or side streets.

Do not operate or park any equipment/machinery closer than 30 feet from the traveled roadway after sunset unless authorized by the engineer.

When moving unlicensed equipment on or across any pavement or public highways, protect the pavement from all damage using an acceptable method.

Limit lane closures along FM 1382 to the hours between 9:00 am and 3:30 pm or nightly from 9pm to 5am. Work in other areas of the project is not restricted to this time frame.

Traffic Control Plans with Lane Closures causing backups of 20 minutes or greater in duration will be modified by the Engineer up to and including removal of the lane closure and adjustment of lane closure times.

Work in other areas of the project is not restricted to this time frame.

Additional lanes may be closed, started earlier, or extended later with written permission of the Engineer.

The Lane Closure Assessment Fee is shown on the following table. The fee applies to the Contractor for closures or obstructions that overlap into restricted hour traffic for each half hour or portion thereof, per lane, regardless of the length of the lane closure or obstruction.

**Table 1
Lane Closure Assessment Fee Table**

Roadway	Amount Per Lane Per Half Hour
FM 1382	\$500

County: Dallas

Highway: FM 1382

Item 506:

Take all practicable precautions to prevent debris from being discharged into the Waters of Texas or a designated wetland. Install Best Management Practices before demolition begins and maintain them during the demolition. Remove any debris or construction material that escapes containment devices and are discharged into the restricted areas, before the next rain event or within 24 hours of the discharge.

If temporary construction stream crossings are allowed under a Nationwide Permit, submit in writing for approval the type and location of each temporary stream crossing. Use temporary bridges, timber mats, or other structurally sound and non-eroding material for temporary stream crossings. A temporary culvert crossing will consist of storm sewer pipes and 4- to 8-inch nominal size rock. Temporary stream crossings must not cause more than minimal changes to the hydraulic flow characteristics of the stream, increase flooding, or cause more than minimal degradation of water quality. Remove the temporary stream crossings in their entirety and return the affected areas to their pre-existing elevation. All work and materials use for temporary construction stream crossings will not be paid for directly but are subsidiary to pertinent Items.

Provide SW3P Signs. Obtain from the Engineer a copy of the project's completed TPDES Storm Water Program Construction Site Notice and Contractor Site Notice. Laminate the sheets and bond with adhesive to 36" X 36" plywood sign blanks. Ensure the sheets remain dry. Apply Type C Blue reflective sheeting as the background and add the text "SW3P" in 5" white lettering, centered at the top. Attach the signs to approved temporary mounts and locate at each of the project limits just inside the right of way line at a readable height or as directed by the Engineer. If the sign cannot be placed outside the clear zone, it must adhere to the TMUTCD. SW3P signs, maintenance, and reposting (for replacement or as needed to ensure readability) will be subsidiary to Item 502.

Concrete Washouts are required per the CGP. The Concrete Washout Area(s) structural controls must consist of temporary berms, temporary shallow pits, and/or temporary storage tanks to prevent contaminated runoff and must be lined as to prevent contamination of underlying soil. Ensure pits properly maintained including removal of concrete as not to allow over flow. The location(s) of washout area will be approved by the Engineer. When washout pits are no longer needed, they will be removed and area will be restored to original condition. This work, materials and labor will not be measured or paid for directly but will be subsidiary to Item 506, "Temporary Erosion, Sedimentation, and Environmental Controls."

Item 512:

The contractor will furnish pre-cast F Shape Barriers for traffic control, and remove and retain possession of non-permanent barriers at the end of the project. Pre-cast F Shape Barriers must have drainage slots as detailed on the Concrete Safety Barrier Standards. Submit for approval the type of barrier joint connection proposed for the project.

Item 730:

At the discretion of the Engineer, mow non-paved areas within the project prior to placement of permanent vegetation. Mow up to three (3) cycles per growing season.

County: Dallas

Highway: FM 1382

Item 6185:

The total number of truck mounted attenuators (TMAs) or trailer attenuators (TAs) required when utilizing the traffic control standards are shown in the tables below.

TCP 1 Series	Scenario	Required TMA/TA
(1-5)-18		1

TCP 2 Series	Scenario	Required TMA/TA
(2-6)-18	All	1

TCP 3 Series	Scenario	Required TMA/TA
(3-2)-13	All	3

TCP 5 Series	Scenario		Required TMA/TA
(5-1)-18	A	B	1

The contractor will be responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMAs/TAs needed for the project. Additional TMAs/TAs used that are not specified in the plans in which the contractor expects compensation will require prior approval from the Engineer.



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 1047-03-076

DISTRICT Dallas
HIGHWAY FM 1382

COUNTY Dallas

CONTROL SECTION JOB				1047-03-076		1047-03-080		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00176690		A00188322			
COUNTY				Dallas		Dallas			
HIGHWAY				FM 1382		FM 1382			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL		
	110-6001	EXCAVATION (ROADWAY)	CY	326.000		4,617.000		4,943.000	
	132-6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	109.000				109.000	
	132-6006	EMBANKMENT (FINAL)(DENS CONT)(TY C)	CY			540.000		540.000	
	161-6017	COMPOST MANUF TOPSOIL (4")	SY	31,749.000		5,258.000		37,007.000	
	162-6002	BLOCK SODDING	SY			5,258.000		5,258.000	
	164-6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	31,749.000				31,749.000	
	164-6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	31,749.000		5,258.000		37,007.000	
	168-6001	VEGETATIVE WATERING	MG	9,446.000		1,566.000		11,012.000	
	400-6005	CEM STABIL BKFL	CY			84.000		84.000	
	401-6001	FLOWABLE BACKFILL	CY			359.000		359.000	
	402-6001	TRENCH EXCAVATION PROTECTION	LF			10.000		10.000	
	403-6001	TEMPORARY SPL SHORING	SF			9,831.000		9,831.000	
	432-6030	RIPRAP (STONE COMMON)(GROUT)(12 IN)	CY			37.000		37.000	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	326.000				326.000	
	464-6017	RC PIPE (CL IV)(18 IN)	LF			35.000		35.000	
	464-6028	RC PIPE (CL V)(42 IN)	LF			1,049.000		1,049.000	
	465-6052	INLET (COMPL)(POD)(SFG)(4FTX4FT)	EA			2.000		2.000	
	466-6102	HEADWALL (CH - PW - 0) (DIA= 42 IN)	EA			3.000		3.000	
	466-6135	HEADWALL (CH - PW - S) (DIA= 42 IN)	EA			1.000		1.000	
	476-6031	JACK BOR OR TUN PIPE(42 IN)(RC)(CL V)	LF			830.000		830.000	
	500-6001	MOBILIZATION	LS	0.160		0.840		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	6.000				6.000	
	506-6003	ROCK FILTER DAMS (INSTALL) (TY 3)	LF			360.000		360.000	
	506-6011	ROCK FILTER DAMS (REMOVE)	LF			360.000		360.000	
	506-6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	819.000		410.000		1,229.000	
	506-6024	CONSTRUCTION EXITS (REMOVE)	SY	819.000		410.000		1,229.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	1,533.000		1,092.000		2,625.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	1,533.000		1,092.000		2,625.000	
	506-6042	BIODEG EROSN CONT LOGS (IN STL) (18")	LF			84.000		84.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF			84.000		84.000	
	512-6005	PORT CTB (FUR & INST)(F-SHAPE)(TY 1)	LF			900.000		900.000	
	512-6029	PORT CTB (MOVE)(F-SHAPE)(TY 1)	LF			300.000		300.000	
	512-6053	PORT CTB (REMOVE)(F-SHAPE)(TY 1)	LF			900.000		900.000	
	543-6002	CABLE BARRIER SYSTEM (TL-4)	LF	8,792.000				8,792.000	
	543-6020	CABLE BARRIER TERMINAL SECTION (TL-4)	EA	12.000				12.000	
	545-6003	CRASH CUSH ATTEN (MOVE & RESET)	EA			1.000		1.000	
	545-6005	CRASH CUSH ATTEN (REMOVE)	EA			3.000		3.000	



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 1047-03-076

DISTRICT Dallas
HIGHWAY FM 1382

COUNTY Dallas

CONTROL SECTION JOB				1047-03-076		1047-03-080		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00176690		A00188322			
COUNTY				Dallas		Dallas			
HIGHWAY				FM 1382		FM 1382			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL		
	545-6019	CRASH CUSH ATTEN (INSTL)(S)(N)(TL3)	EA			3.000		3.000	
	730-6107	FULL - WIDTH MOWING	CYC	3.000				3.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	2.000				2.000	
	6185-6002	TMA (STATIONARY)	DAY	130.000		75.000		205.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000				1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000				1.000	
		LAW ENFORCEMENT: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000				1.000	

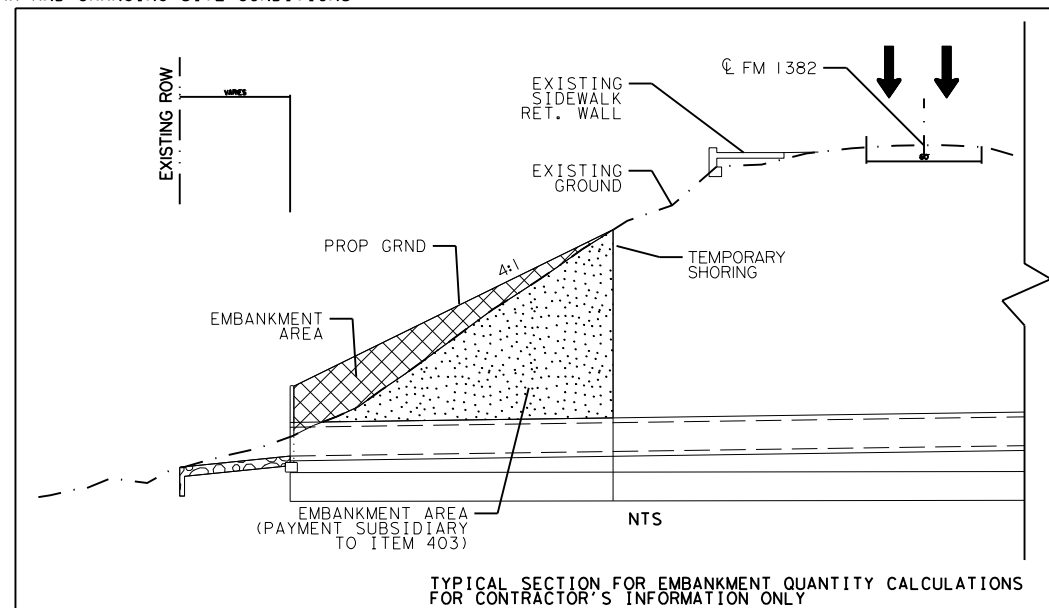
SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS						
LOCATION	512 6005	512 6029	512 6053	545 6003	545 6005	545 6019
	PORT CTB (FUR & INST) (F-SHAPE) (TY 1)	PORT CTB (MOVE) (F-SHAPE) (TY 1)	PORT CTB (REMOVE) (F-SHAPE) (TY 1)	CRASH CUSH ATTN (MOVE & RESET)	CRASH CUSH ATTN (REMOVE)	CRASH CUSH ATTN (INSTL) (S) (N) (TL3)
	LF	LF	LF	EA	EA	EA
CSJ 1047-03-080						
CULVERT S-6	900		600		2	3
CULVERT S-8		300	300	1	1	
PROJECT TOTALS	900	300	900	1	3	3

SUMMARY OF DRAINAGE ITEMS												
LOCATION	132 6006	400 6005	401 6001	402 6001	403 6001	432 6030	464 6017	464 6028	465 6052	466 6102	466 6135	476 6031
	EMBANKMENT (FINAL) (DENS CONT) (TY C)	CEM STABIL BKFL	FLOWABLE BACKFILL	TRENCH EXCAVATION PROTECTION	TEMPORARY SPL SHORING	RIPRAP (STONE COMMON) (GROUT) (12 IN)	RC PIPE (CL IV) (18 IN)	RC PIPE (CL V) (42 IN)	INLET (COMPL) (POD) (SF G) (4FTX4FT)	HEADWALL (CH - PW - 0) (DIA= 42 IN)	HEADWALL (CH - PW - S) (DIA= 42 IN)	JACK BOR OR TUN PIPE (42 IN) (RC) (CL V)
	CY	CY	CY	LF	SF	CY	LF	LF	EA	EA	EA	LF
CSJ 1047-03-080												
CULVERT S-6	225		203		5816		8	795	1	1	1	456
CULVERT S-8	315	84	156	10	4015	37	27	254	1	2		374
PROJECT TOTALS	540	84	359	10	9831	37	35	1049	2	3	1	830

SUMMARY OF EROSION CONTROL ITEMS														
LOCATION	161 6017	162 6002	164 6035	164 6051	168 6001	506 6003	506 6011	506 6020	506 6024	506 6038	506 6039	506 6042	506 6043	730 6107
	COMPOST MANUF TOPSOIL (4")	BLOCK SODDING	DRILL SEEDING (PERM) (RURAL) (CLAY)	DRILL SEED (TEMP) (WARM OR COOL)	VEGETATIVE WATERING	ROCK FILTER DAMS (INSTALL) (TY 3)	ROCK FILTER DAMS (REMOVE)	CONSTRUCTION EXITS (INSTALL) (TY 1)	CONSTRUCTION EXITS (REMOVE)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	BIODEG EROSN CONT LOGS (INSTL) (18")	BIODEG EROSN CONT LOGS (REMOVE)	FULL - WIDTH MOWING
	SY	SY	SY	SY	MG	LF	LF	SY	SY	LF	LF	LF	LF	CYC
CSJ 1047-03-080														
CULVERT S-6	3680	3680		3680	1096	180	180	234	234	710	710	40	40	
CULVERT S-8	1578	1578		1578	470	180	180	156	156	330	330	40	40	
CSJ 1047-03-076	31749		31749	31749	9446			780	780	1460	1460			3
5% ADDITIONAL QUANTITY*								59	59	125	125	4	4	
PROJECT TOTALS	37,007	5,258	31,749	37,007	11,012	360	360	1229	1229	2625	2625	84	84	3

*ADDITIONAL QUANTITY IS FOR PERISHABLE BMPS TO ALLOW FOR THEIR PERIODIC REPLACEMENT DUE TO NORMAL WEAR AND CHANGING SITE CONDITIONS

SUMMARY OF ROADWAY ITEMS					
LOCATION	110 6001	132 6003	432 6045	543 6002	543 6020
	EXCAVATION (ROADWAY)	EMBANKMENT (FINAL) (ORD COMP) (TY B)	RIPRAP (MOW STRIP) (4 IN)	CABLE BARRIER SYSTEM (TL-4)	CABLE BARRIER TERMINAL SECTION (TL-4)
	CY	CY	CY	LF	EA
CSJ 1047-03-080	4,617				
CSJ 1047-03-076	326	109	326	8,792	12
PROJECT TOTALS	4,943	109	326	8,792	12



FM 1382
SUMMARY OF QUANTITIES

SHEET 1 OF 1			
DESIGN DN	FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
GRAPHICS DN	6	SEE TITLE SHEET	FM 1382
CHECK NP	STATE	DISTRICT	COUNTY
CHECK AM	TEXAS	DAL	DALLAS
	CONTROL	SECTION	JOB
	1047	03	076, ETC.
			SHEET NO. 10

GENERAL NOTES:

1. INSTALL BARRICADES AND ADVANCED WARNING SIGNS PER BC STANDARDS, TCP STANDARDS WORK ZONE STANDARDS AND/OR AS DIRECTED BY THE ENGINEER. THE SIGNS, BARRICADES, OR OTHER WARNING DEVICES SHOWN SHALL BE CONSIDERED MINIMUM AND ADDITIONAL SIGNS, BARRICADES, OR WARNING DEVICES DEEMED NECESSARY BY THE ENGINEER OR DICTATED BY FIELD CONDITIONS SHALL BE PROVIDED ACCORDING TO ALL APPLICABLE STANDARDS. ADDITIONAL SIGNS OR BARRICADES WILL NOT BE PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO THE BID ITEM "BARRICADES, SIGNS, AND TRAFFIC HANDLING"
2. INSTALL TEMPORARY SW3P EROSION CONTROL MEASURES BEFORE (BUT NO SOONER THAN TWO WEEKS PRIOR) SOIL DISTURBANCE OR POTENTIAL POLLUTANT-GENERATING ACTIVITIES IN THEIR CONTROL AREA. TEMPORARY SW3P EROSION CONTROL MEASURES SHALL BE REMOVED WITHIN TWO WEEKS OF VEGETATION ESTABLISHMENT IN THEIR CONTROL AREA, OR AS APPROVED BY THE ENGINEER.
3. SUBMIT A DETAILED SCHEDULE OF WORK TO THE PROJECT ENGINEER FOR APPROVAL PRIOR TO THE BEGINNING OF CONSTRUCTION WHICH GENERALLY CONFORMS TO THE SEQUENCE SHOWN ON THE TCP SEQUENCE OF WORK (SEE BELOW).
4. SUBMIT ANY REQUEST TO ALTER SEQUENCE OF OPERATION OF TRAFFIC CONTROL PLANS TO THE ENGINEER FOR WRITTEN APPROVAL PRIOR TO BEGIN OF CONSTRUCTION. ADDITIONAL COST OR TIME IS AT THE EXPENSE OF THE CONTRACTOR.
5. MAINTAIN TEMPORARY SIGNS WITHIN THE PROJECT LIMITS AND COVER OR REMOVE ANY EXISTING SIGN OR PAVEMENT MARKING THAT CONFLICTS WITH TCP TO AVOID CONFUSION FOR THE TRAVELING PUBLIC. TEMPORARY SIGNING SHALL BE PLACED AS NEEDED DURING ALL PHASES. PAYMENT FOR THIS WORK SHALL BE SUBSIDIARY TO ITEM 502 BARRICADES.
6. THE COMPLETE CLOSURE OF ANY ROADWAY REQUIRES THE APPROVAL OF THE ENGINEER.
7. MAINTAIN TEMPORARY AND POSITIVE DRAINAGE THROUGHOUT ALL PHASES OF CONSTRUCTION. THIS WORK WILL BE SUBSIDIARY TO VARIOUS BID ITEMS.
8. PROVIDE ACCESS TO PRIVATE PROPERTY AT ALL TIMES. MATERIALS, MAINTENANCE AND LABOR IS SUBSIDIARY.

SUGGESTED SEQUENCE OF CONSTRUCTION:

CSJ 1047-03-080 (CULVERT REPLACEMENT)

PHASE 1

1. INSTALL ADVANCED WARNING SIGNS, WORK ZONE SIGNAGE, AND CHANNELIZING DEVICES.
2. INSTALL STORM WATER POLLUTION PREVENTION DEVICES NEEDED FOR THIS PHASE.
3. CONSTRUCT TEMPORARY SHORING. JACK AND BORE PROPOSED SECTIONS OF CULVERT S-6 AND S-8. CONSTRUCT THE REMAINING SECTIONS OF CULVERTS S-6 AND S-8.
4. REMOVE EXISTING CULVERT SECTIONS AS SHOWN IN THE PLANS AND FILL EXISTING CULVERTS WITH FLOWABLE BACKFILL AS SHOWN ON THE PLANS.

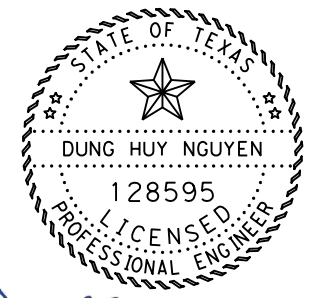
PHASE 2

1. INSTALL PERMANENT SW3P STABILIZATION AS SHOWN IN PLANS.
2. PERFORM FINAL PROJECT CLEAN UP.

SUGGESTED SEQUENCE OF CONSTRUCTION:

CSJ 1047-03-076 (SAFETY CABLE BARRIER)

1. INSTALL ADVANCED WARNING SIGNS, WORK ZONE SIGNAGE, BARRICADES AND CHANNELIZING DEVICES.
2. INSTALL STORM WATER POLLUTION PREVENTION DEVICES NEEDED FOR THIS PHASE.
3. EXCAVATE TO THE WIDTH SHOWN IN THE PLANS.
4. INSTALL CABLE BARRIER AND TERMINAL SECTIONS ACCORDING TO THE STANDARDS.
5. INSTALL CONCRETE MOW STRIP AND EMBANKMENT WITH APPROVED MATERIALS.
6. INSTALL PERMANENT SW3P STABILIZATION AS SHOWN IN PLANS.
7. REMOVE BARRICADES AND ADVANCED WARNING SIGNS.
8. PERFORM FINAL PROJECT CLEAN-UP.



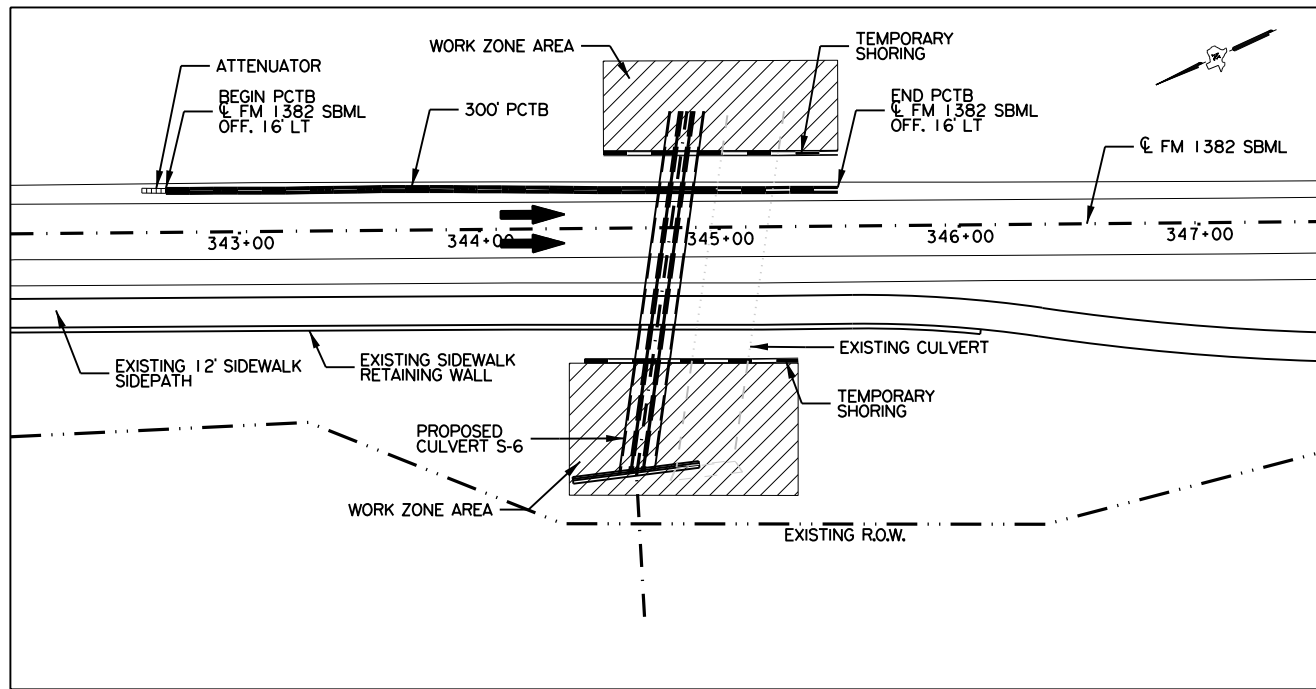
Dung Nguyen
 P.E. 11/15/2022
 Signature of Registrant & Date

Texas Department of Transportation
 © 2022

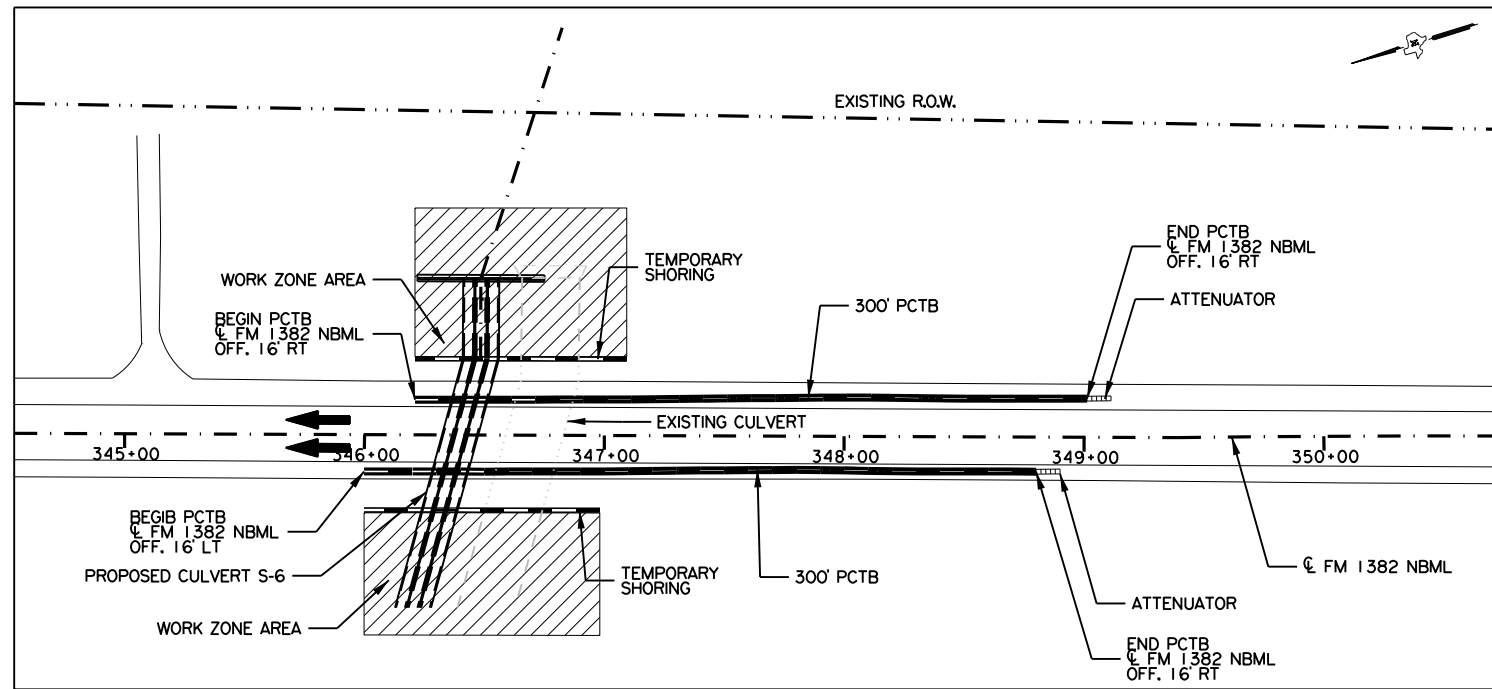
FM 1382
TCP NARRATIVE

SHEET 1 OF 1

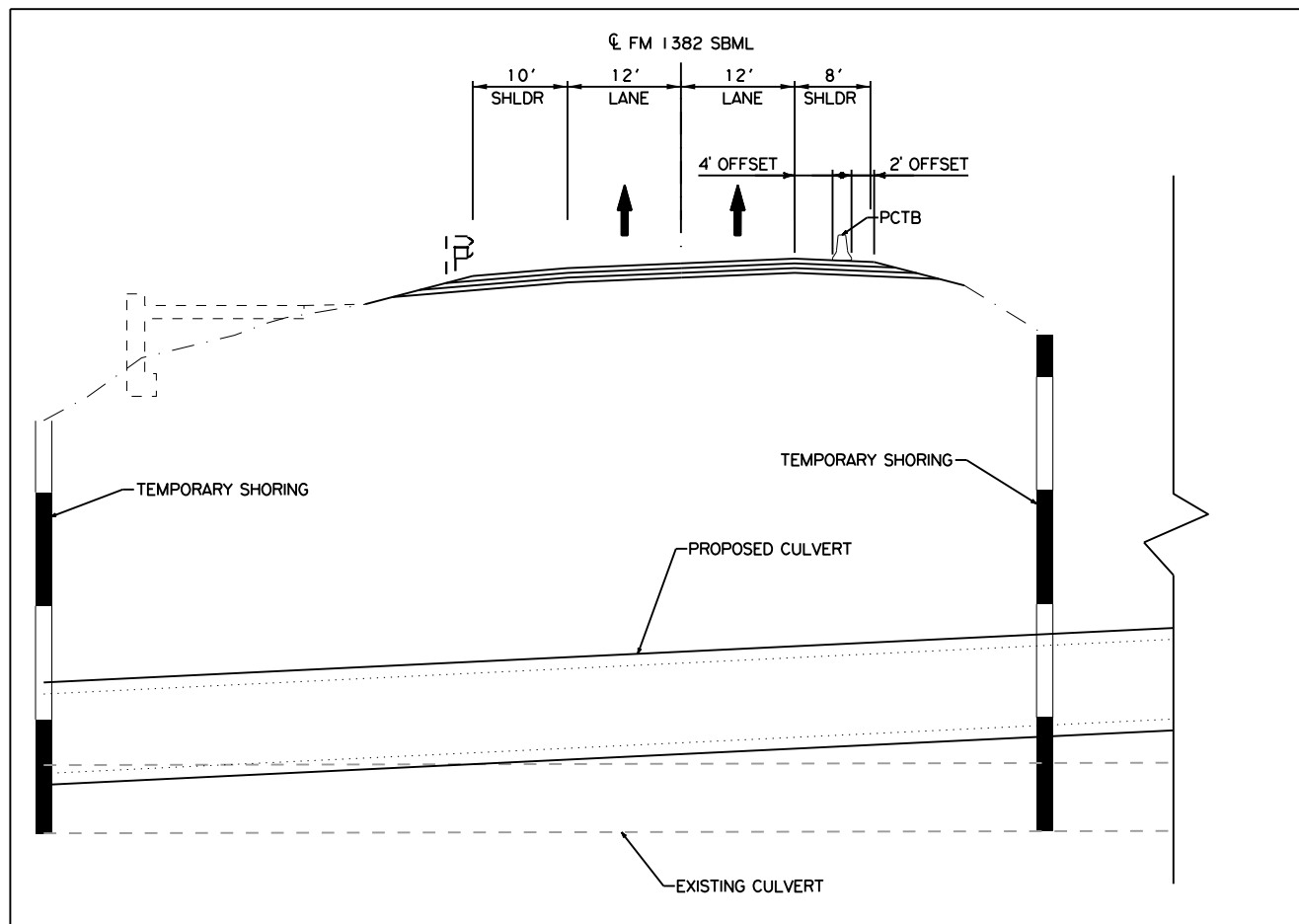
DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
GRAPHICS	6	SEE TITLE SHEET		FM 1382
CHECK	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	DAL	DALLAS	
	CONTROL	SECTION	JOB	
	1047	03	076, ETC.	



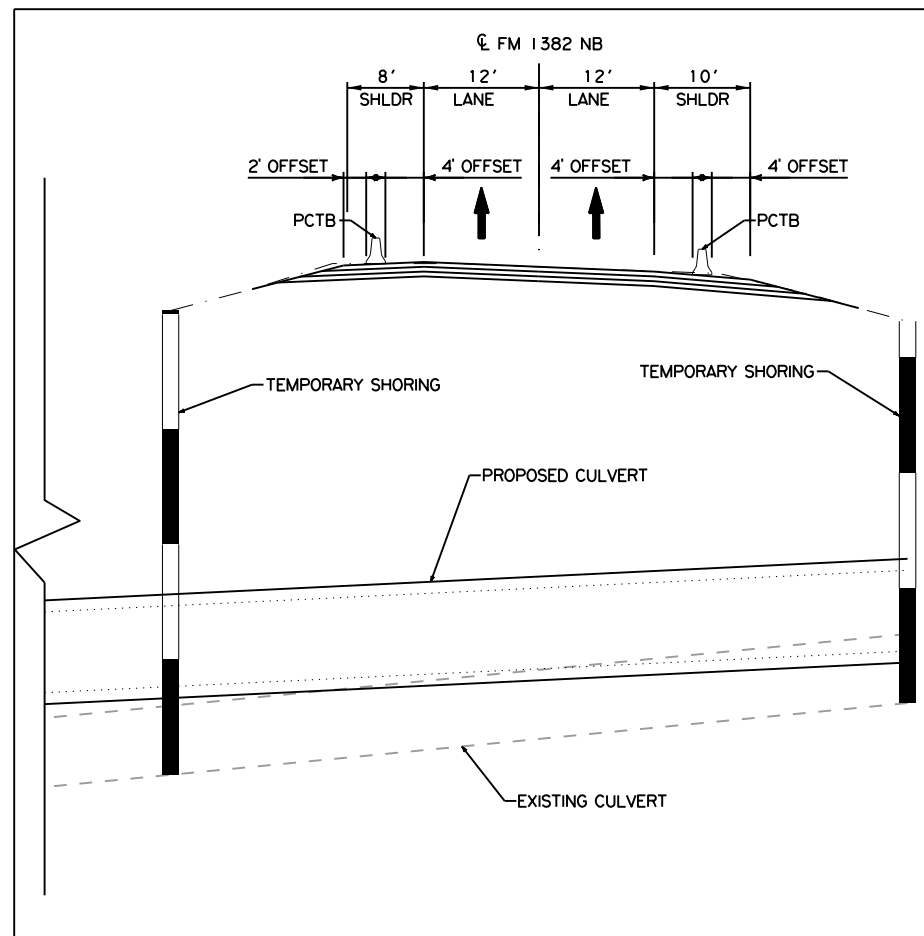
CULVERT S-6 FM 1382 SBML
PLAN VIEW (NTS)



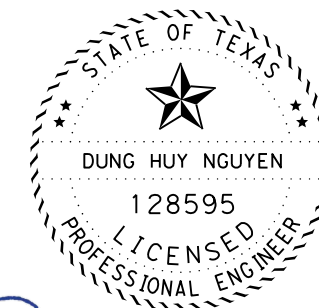
CULVERT S-6 FM 1382 NBML
PLAN VIEW (NTS)



CULVERT S-6 FM 1382 SBML
TYPICAL SECTION (NTS)



CULVERT S-6 FM 1382 NBML
TYPICAL SECTION (NTS)



Dung Nguyen 11/15/2022
 Signature of Registrant & Date

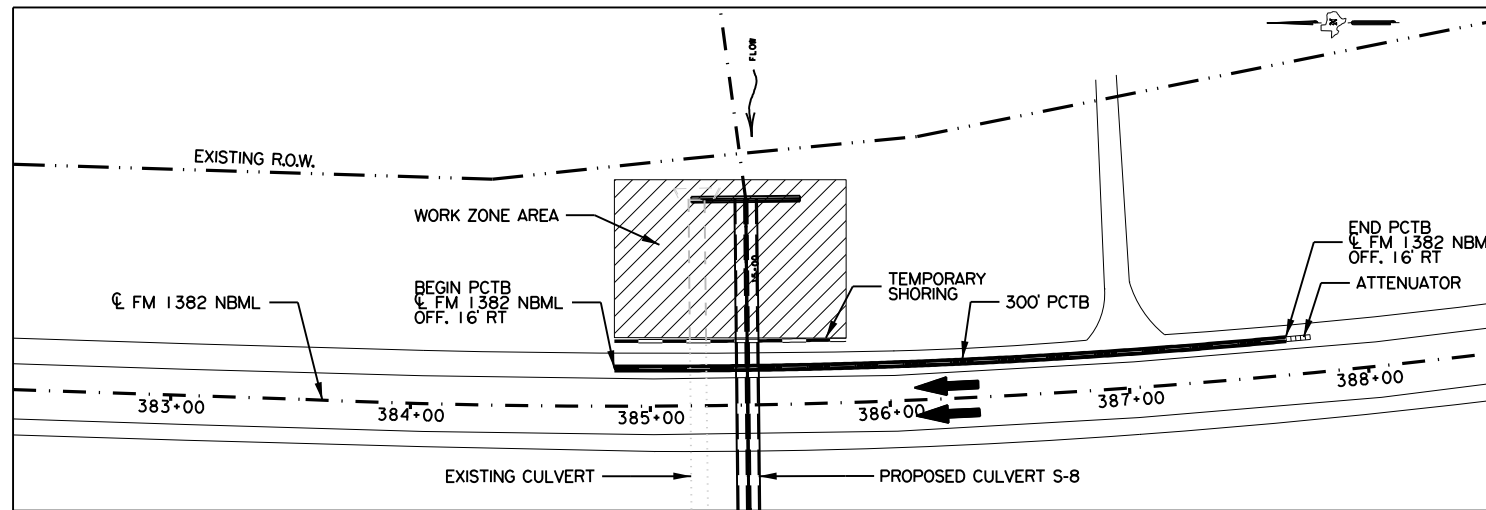
TCP NOTES:

- PLACE SIGNS ACCORDING TO APPLICABLE TCP STANDARDS
- SEE TCP STANDARDS FOR DETAILS NOT SHOWN HERE

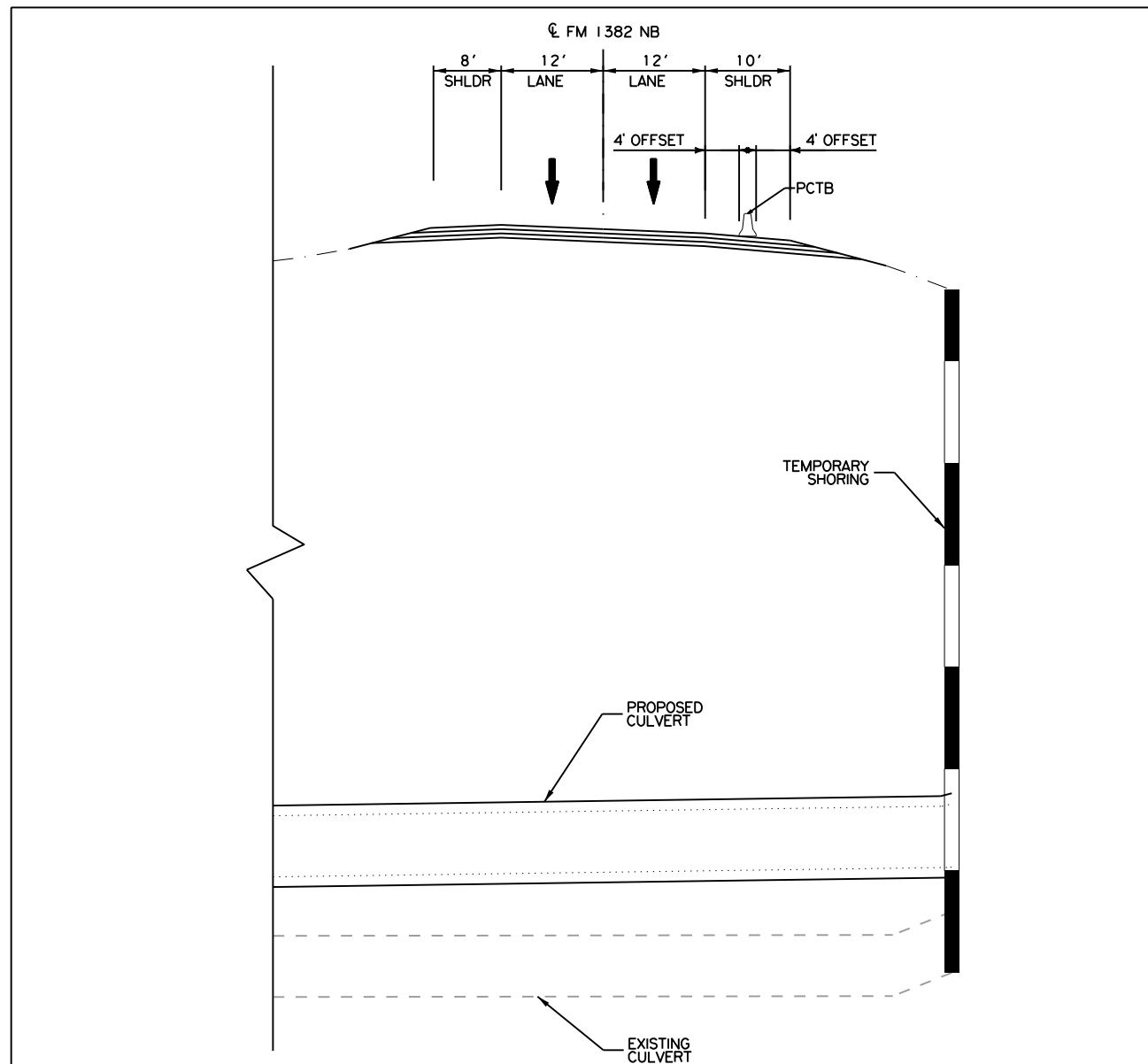


FM 1382
TCP MISCELLANEOUS
DETAIL

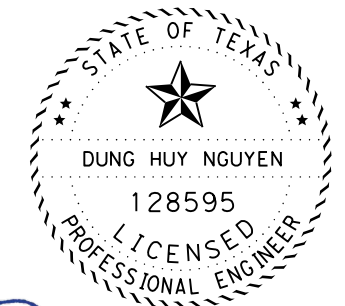
N. T. S.				SHEET 1 OF 2	
DESIGN DN	FED. RD. DIV. NO. 6	PROJECT NO. SEE TITLE SHEET		HIGHWAY NO. FM 1382	
GRAPHICS DN	STATE TEXAS	DISTRICT DAL	COUNTY DALLAS	SHEET NO. 12	
CHECK NP	CONTROL	SECTION	JOB		
CHECK AM	1047	03	076, ETC.		



CULVERT S-8 FM 1382 NBML
PLAN VIEW (NTS)



CULVERT S-8 FM 1382 NBML
TYPICAL SECTION (NTS)



Dung Nguyen 11/15/2022
 Signature of Registrant & Date

TCP NOTES:

- PLACE SIGNS ACCORDING TO APPLICABLE TCP STANDARDS
- SEE TCP STANDARDS FOR DETAILS NOT SHOWN HERE



FM 1382
TCP MISCELLANEOUS
DETAIL

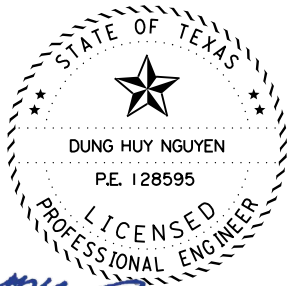
N. T. S.				SHEET 2 OF 2
DESIGN DN	FED. RD. DIV. NO. 6	PROJECT NO. SEE TITLE SHEET		HIGHWAY NO. FM 1382
GRAPHICS DN	STATE TEXAS	DISTRICT DAL	COUNTY DALLAS	SHEET NO. 13
CHECK NP	CONTROL 1047	SECTION 03	JOB 076, ETC.	

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.

LOC NO.	TCP PHASE	PLAN SHEET NUMBER	LOCATION	STA	TEST LEVEL	DIRECTION OF TRAFFIC (UNI/BI)	FOUNDATION PAD		BACKUP SUPPORT			AVAILABLE SITE LENGTH	CRASH CUSHION											
							PROPOSED MATERIAL	PROPOSED THICKNESS	DESCRIPTION	WIDTH	HEIGHT		INSTALL	REMOVE	MOVE / RESET		L	L	R	R	S	S		
															MOVE / RESET	FROM LOC. #	N	W	N	W	N	W		
1	PHASE 1	12	NB FM 1382 OUTSIDE SHLD	349+21	TL-3	UNI	EXIST	N/A	PCTB	24"	32"		1	1							X			
2	PHASE 1	12	NB FM 1382 INSIDE SHLD	349+21	TL-3	UNI	EXIST	N/A	PCTB	24"	32"		1	1								X		
3	PHASE 1	12	SB FM 1382 INSIDE SHLD	342+50	TL-3	UNI	EXIST	N/A	PCTB	24"	32"		1									X		
4	PHASE 1	13	NB FM 1382 OUTSIDE SHLD	387+85	TL-3	UNI	EXIST	N/A	PCTB	24"	32"			1	1							X		
TOTALS												3	3	1										

LEGEND:
L=LOW MAINTENANCE
R=REUSABLE
S=SACRIFICIAL
N=NARROW
W=WIDE

FOR DEFINITIONS SEE THE "CRASH CUSHION CATEGORIZATION CHART.PDF" AT THE DESIGN DIVISION (ROADWAY STANDARDS) WEBSITE. USE QUICK LINKS TO ACCESS ATTENUATORS / CRASH CUSHIONS SECTION.
<http://www.dot.state.tx.us/insdot/orgchart/cmd/cserve/standard/rdwylse.htm>



Dung Nguyen
11/15/2022

CRASH CUSHION SUMMARY SHEET

FILE: CCSS.dgn	DN: TxDOT	CK:	CK:
© TxDOT	CONT	SECT	JOB
REVISIONS	1047	03	076, ETC. FM 1382
	DIST	COUNTY	
	DAL	DALLAS	
	PROJECT NO.		SHEET NO.
	SEE TITLE SHEET		14

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 into any other format or for incorrect results or damages resulting from its use.

DATE: 11/15/2022 12:59:59 PM
 FILE: I:\DALAO\PROJECTS\On\FM1382\Culvert replacement\rehab options\Sheets\TMUTCD\bc-21.dgn

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

WORKER SAFETY NOTES:

1. Workers on foot who are exposed to traffic or to construction equipment within the right-of-way shall wear high-visibility safety apparel meeting the requirements of ISEA "American National Standard for High-Visibility Apparel," or equivalent revisions, and labeled as ANSI 107-2004 standard performance for Class 2 or 3 risk exposure. Class 3 garments should be considered for high traffic volume work areas or night time work.
2. Except in emergency situations, flagger stations shall be illuminated when flagging is used at night.

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

1. Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources.
2. Work zone traffic control devices shall be compliant with the Manual for Assessing safety Hardware (MASH).

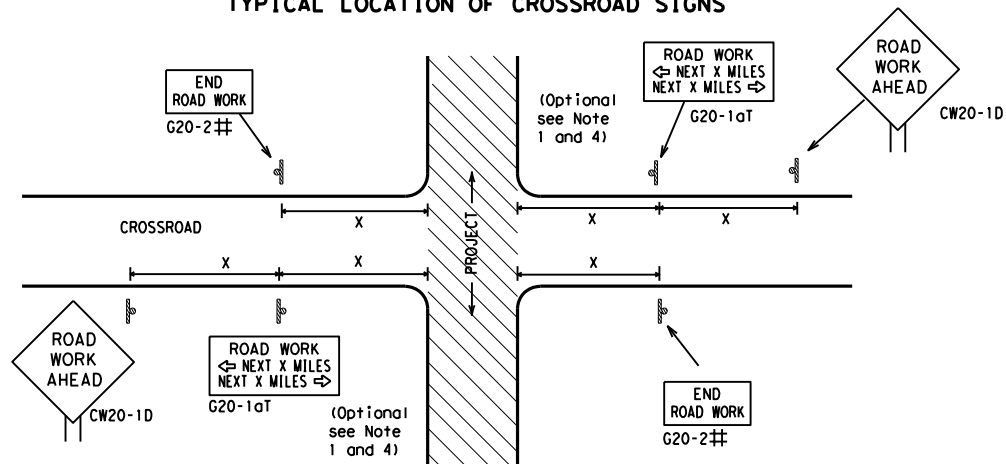
<p>THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT http://www.txdot.gov</p>
COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
MATERIAL PRODUCER LIST (MPL)
ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS)"
STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)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

SHEET 1 OF 12

Texas Department of Transportation		Traffic Safety Division Standard
<p>BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS</p> <p>BC (1) - 21</p>		
FILE:	bc-21.dgn	DN: TxDOT
© TxDOT	November 2002	ck: TxDOT
REVISIONS	CONT SECT	JOB
4-03 7-13	1047 03	076, ETC.
9-07 8-14	DIST	COUNTY
5-10 5-21	DAL	DALLAS
HIGHWAY	SHEET NO.	15

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 units or for incorrect results or damages resulting from its use.

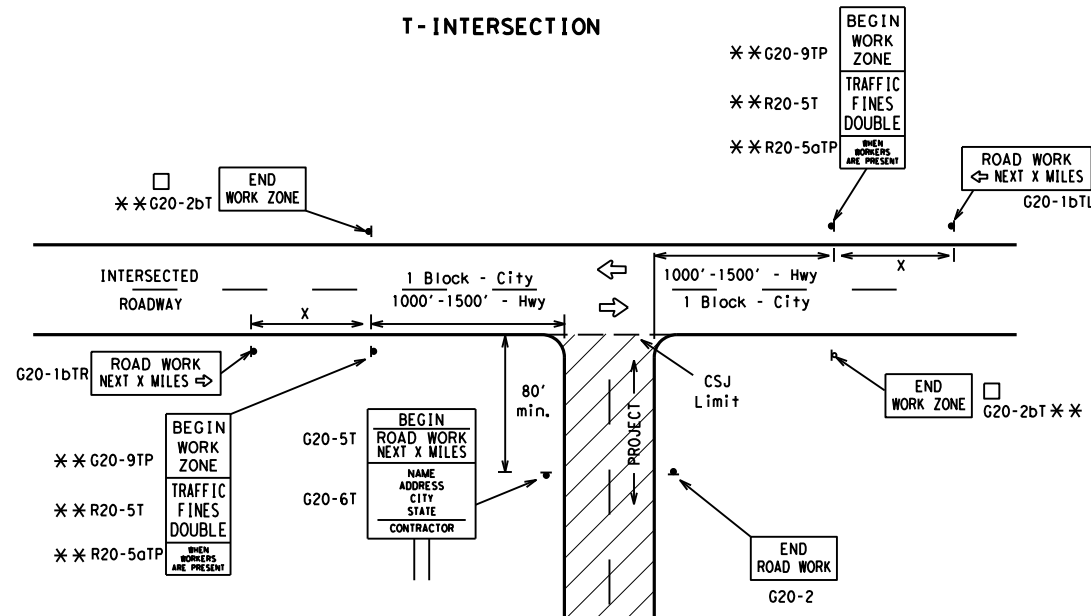
TYPICAL LOCATION OF CROSSROAD SIGNS



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 as per TMUTCD Part 5. 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^{1,5,6}

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

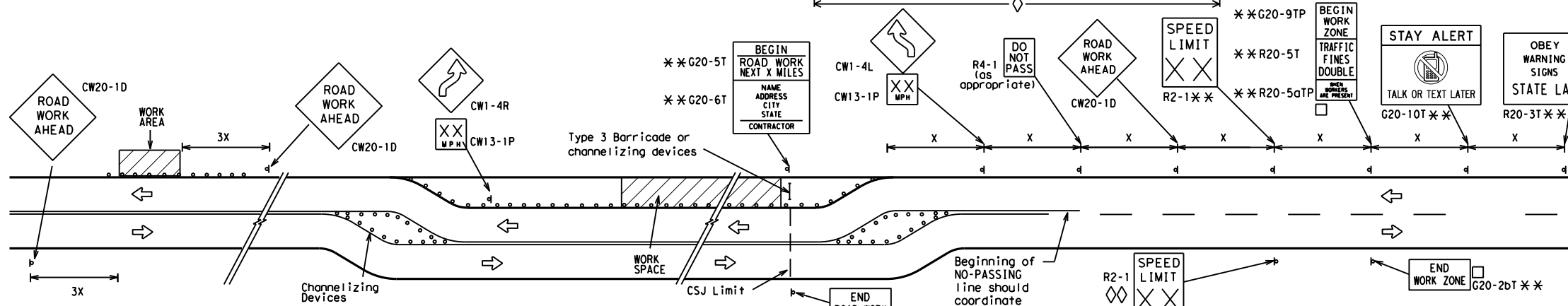
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

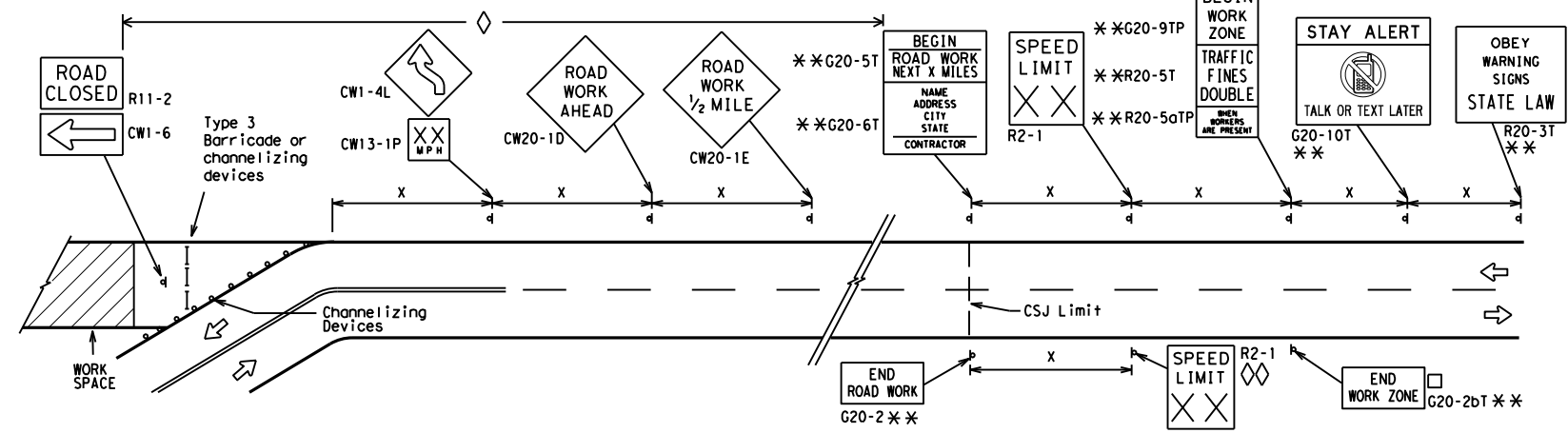
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be used on low volume crossroads at the discretion of the Engineer as per TMUTCD Part 5. 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

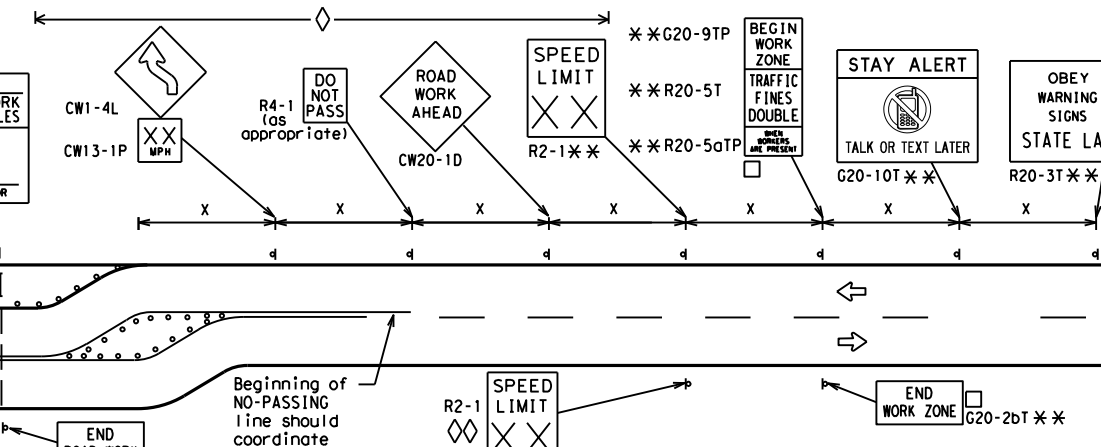


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD" (CW20-1D) signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing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

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



SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT 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.
- CSJ limit signing is required for highway construction and maintenance work, with the exception of mobile operations.
- 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.

SHEET 2 OF 12



BARRICADE AND CONSTRUCTION PROJECT LIMIT

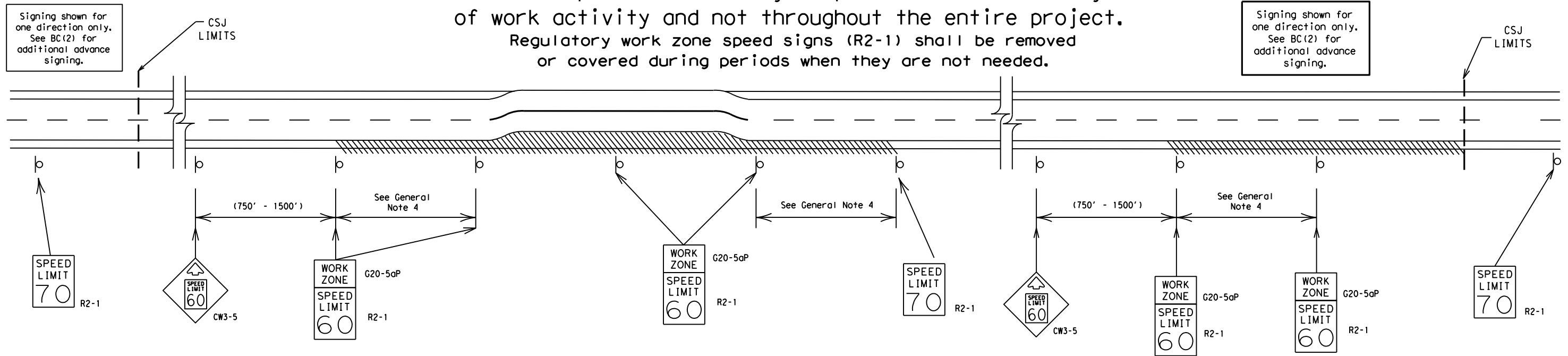
BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1047	03	076, ETC.	FM 1382
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	DAL	DALLAS	16	

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 traveled way.

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

GENERAL NOTES

- 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 units or for the use of this standard in any project.

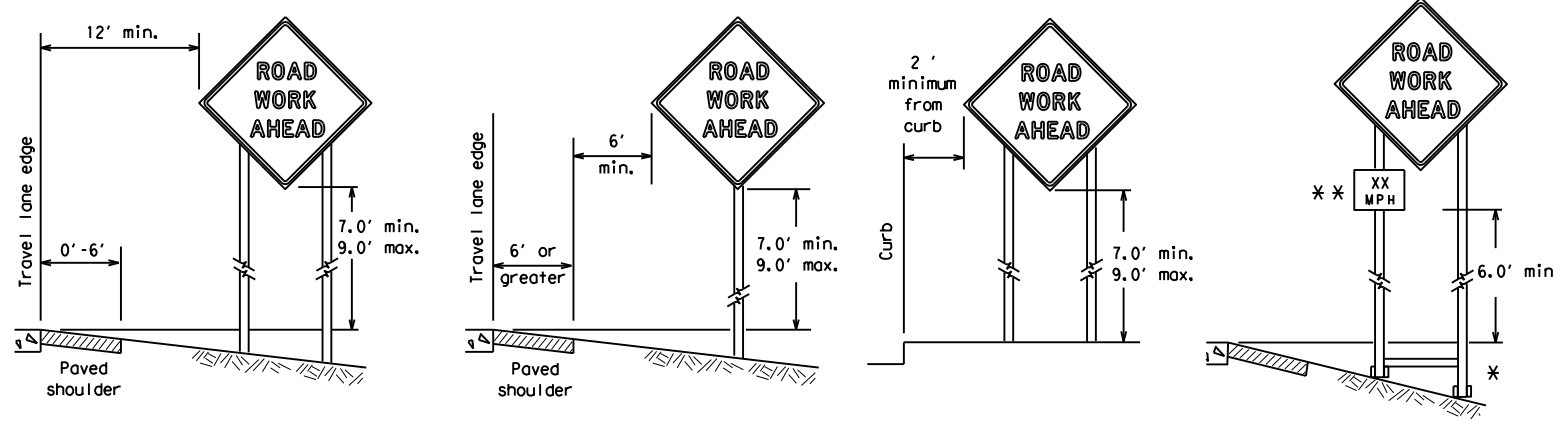
DATE: 11/15/2022 12:59:59 PM
 FILE: T:\DALAO\PROJECTS\On\FM1382\Culvert replacement\rehab options\Sheet 3.dwg

SHEET 3 OF 12

		Traffic Safety Division Standard	
<h2>BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT</h2>			
<h3>BC (3) - 21</h3>			
FILE:	bc-21.dgn	DW:	TxDOT
© TxDOT	November 2002	CONT:	03
REVISIONS	1047	JOB	076, ETC.
9-07	8-14	HIGHWAY	FM 1382
7-13	5-21	DIST:	DALLAS
		COUNTY:	DALLAS
		SHEET NO.:	17

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.

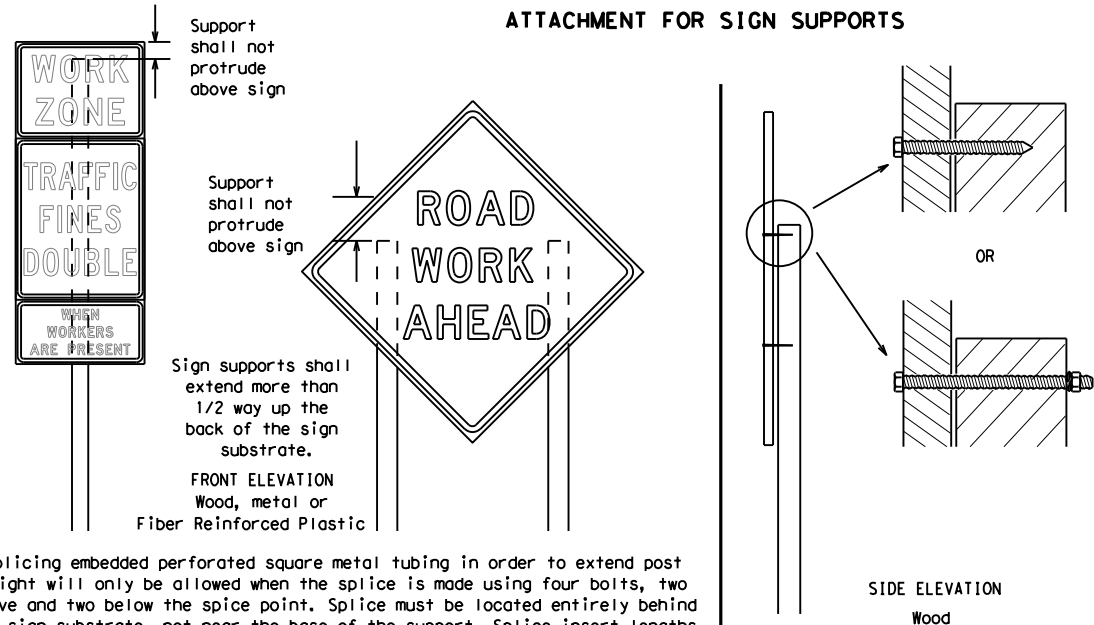
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



* 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



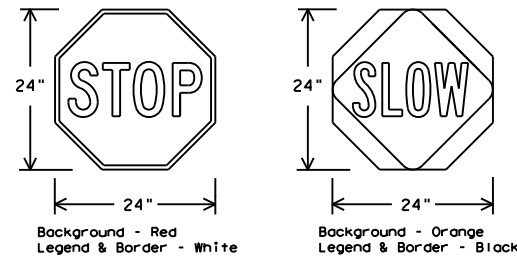
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

Splicing embedded perforated square metal tubing in order to extend post height will only be allowed when the splice is made using four bolts, two above and two below the 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".
2. STOP/SLOW paddles shall be retroreflectORIZED when used at night.
3. STOP/SLOW paddles may be attached to a staff with a minimum length of 6' to the bottom of the sign.
4. Any lights incorporated into the STOP or SLOW paddle faces shall only be as specifically described in Section 6E.03 Hand Signaling Devices in the TMUTCD.



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

1. Permanent signs are used to give notice of traffic laws or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, specific service (LOGO), or cultural information. Drivers proceeding through a work zone need the same, if not better route guidance as normally installed on a roadway without construction.
2. When permanent regulatory or warning signs conflict with work zone conditions, remove or cover the permanent signs until the permanent sign message matches the roadway condition. For details for covering large guide signs see the TS-CD standard.
3. When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
4. If existing signs are to be relocated on their original supports, they shall be installed on crashworthy bases as shown on the SMD Standard sheets. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards. This work should be paid for under the appropriate pay item for relocating existing signs.
5. If permanent signs are to be removed and relocated using temporary supports, the Contractor shall use crashworthy supports as shown on the BC standard sheets, TLRs standard sheets or the CWZTC list. The signs shall meet the required mounting heights shown on the BC, or the SMD standard sheets during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
6. Any sign or traffic control device that is struck or damaged by the Contractor or his/her construction equipment shall be replaced as soon as possible by the Contractor to ensure proper guidance for the motorists. This will be subsidiary to Item 502.

GENERAL NOTES FOR WORK ZONE SIGNS

1. Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to regulate, warn, and guide the traveling public safely through the work zone.
5. The Contractor may furnish either the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD). The Engineer/Inspector may require the Contractor to furnish other work zone signs that are shown in the TMUTCD but may have been omitted from the plans. Any variation in the plans shall be documented by written agreement between the Engineer and the Contractor's Responsible Person. All changes must be documented in writing before being implemented. This can include documenting the changes in the Inspector's TxDOT diary and having both the Inspector and Contractor initial and date the agreed upon changes.
6. The Contractor shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (CWZTC) for small roadside signs. Supports for temporary large roadside signs shall meet the requirements detailed on the Temporary Large Roadside Signs (TLRS) standard sheets. The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so the Engineer can verify the correct procedures are being followed.
7. The Contractor is responsible for installing signs on approved supports and replacing signs with damaged or cracked substrates and/or damaged or marred reflective sheeting as directed by the Engineer/Inspector.
8. Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1 inch.
9. The Contractor shall replace damaged wood posts. New or damaged wood sign posts shall not be spliced.

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

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

SIGN MOUNTING HEIGHT

1. The bottom of Long-term/Intermediate-term signs shall be at least 7 feet, but not more than 9 feet, above the paved surface, except as shown for supplemental plaques mounted below other signs.
2. The bottom of Short-term/Short Duration signs shall be a minimum of 1 foot above the pavement surface but no more than 2 feet above the ground.
3. Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
4. Short-term/Short Duration signs shall be used only during daylight and shall be removed at the end of the workday or raised to appropriate Long-term/Intermediate sign height.
5. Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

1. Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign support weights.
4. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs.
5. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall NOT be used.
6. Rubber ballasts designed for channelizing devices should not be used for ballast on portable sign supports. Sign supports designed and manufactured with rubber bases may be used when shown on the CWZTC 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



BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

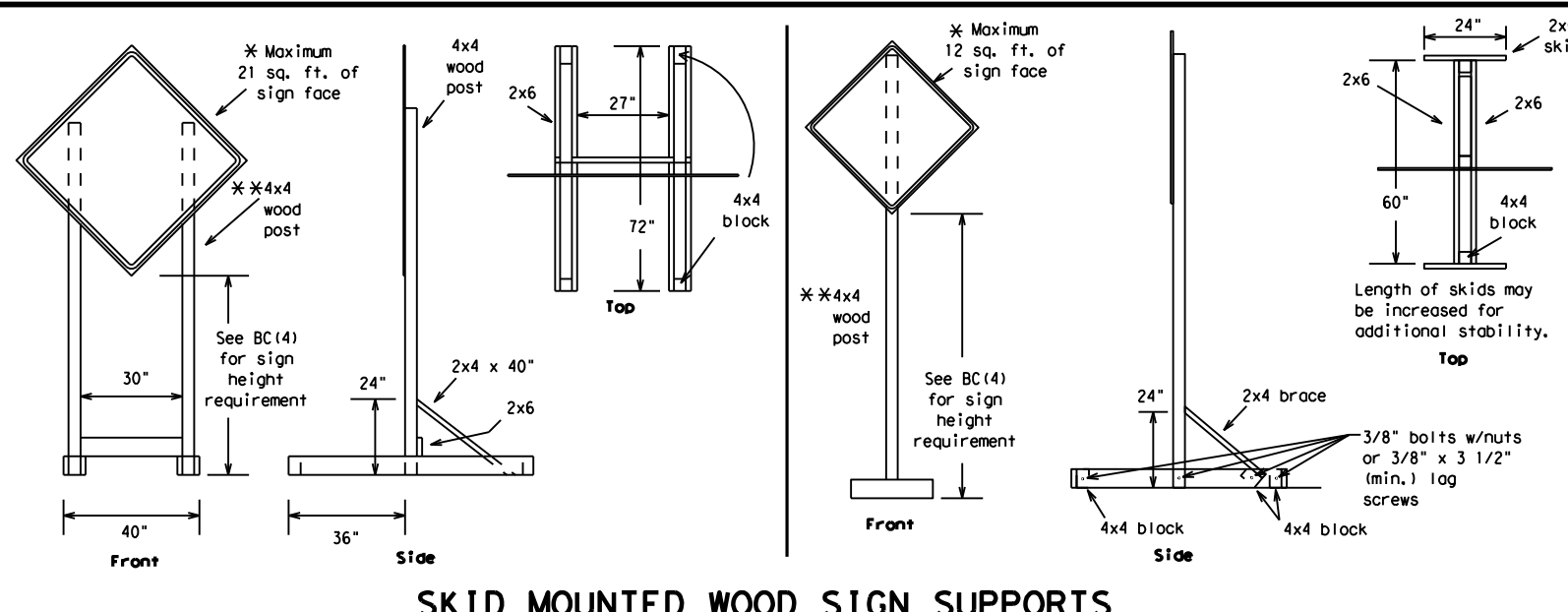
BC (4) - 21

FILE:	bc-21.dgn	DN:	TxDOT	CR:	TxDOT	OW:	TxDOT	CK:	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS		1047	03	076, ETC.	FM 1382				
9-07	8-14	DIST	COUNTY	SHEET NO.					
7-13	5-21	DAL	DALLAS	18					

DATE: 11/15/2022 12:59:59 PM
FILE: T:\DALAO\PROJECTS\On\FM1382\Culvert replacement\rehab_options\Sheets\STND\TCP\bc-21.dgn

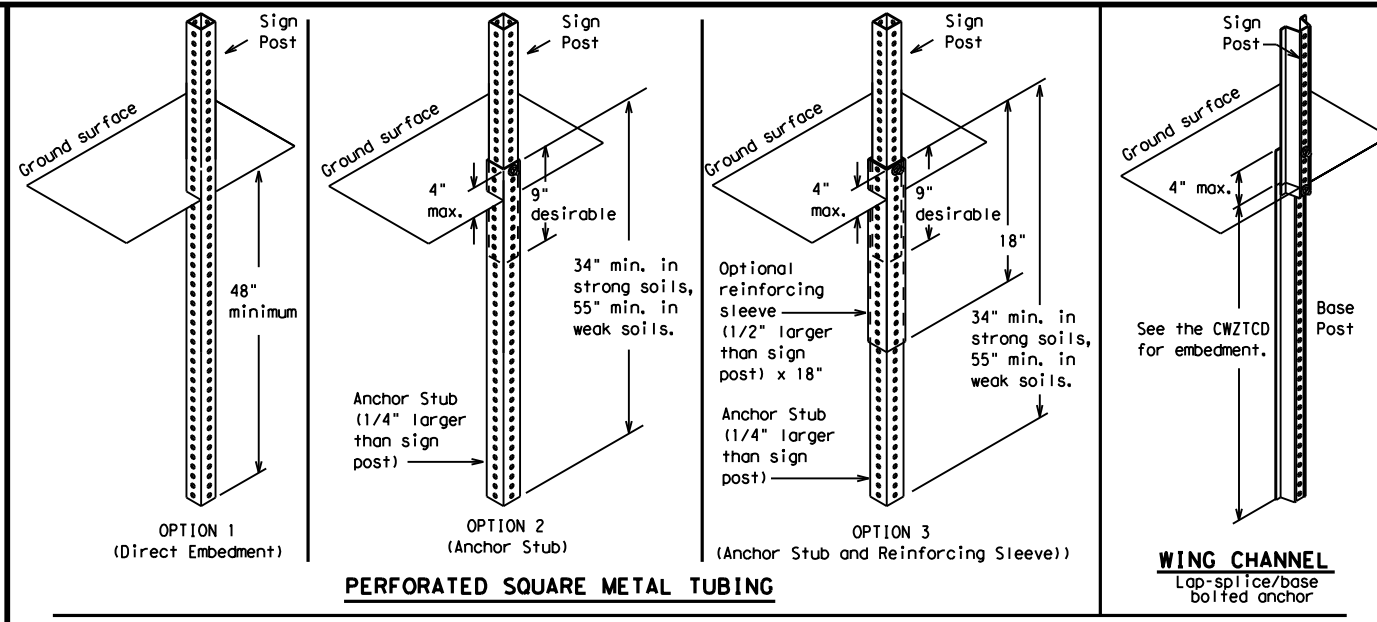
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 11/15/2022 1:00:00 PM
 FILE: T:\DALAO\PROJECTS\On\FM1382\Culvert replacement\rehab options\Sheets\STD\TCP\bc-21.dgn



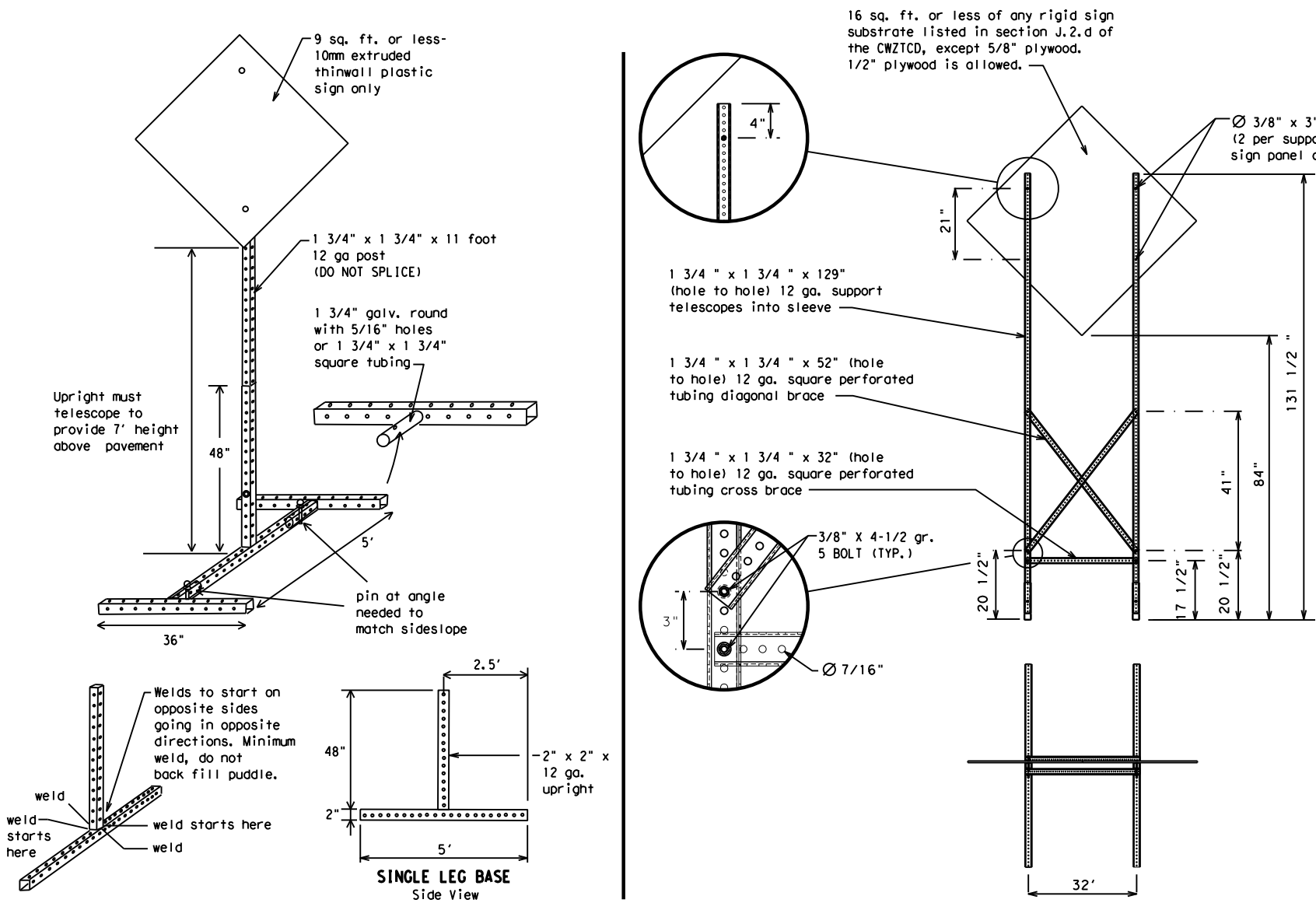
SKID MOUNTED WOOD SIGN SUPPORTS

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



GROUND MOUNTED SIGN SUPPORTS

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



SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

SHEET 5 OF 12



BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5) - 21

FILE:	bc-21.dgn	DN:	TxDOT	CK:	TxDOT	DW:	TxDOT	CR:	TxDOT
©TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS		1047	03	076, ETC.	FM 1382				
9-07	8-14	DIST	COUNTY	SHEET NO.					
7-13	5-21	DAL	DALLAS	19					

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

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.

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

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.

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 DWNTN
Hazardous Driving	HAZ DRIVING	Traffic	TRAF
Hazardous Material	HAZMAT	Travelers	TRVLR
High-Occupancy Vehicle	HOV	Tuesday	TUES
Highway	HWY	Time Minutes	TIME MIN
Hour(s)	HR, HRS	Upper Level	UPR LEVEL
Information	INFO	Vehicles (s)	VEH, VEHS
It Is	ITS	Warning	WARN
Junction	JCT	Wednesday	WED
Left	LFT	Weight Limit	WT LIMIT
Left Lane	LFT LN	West	W
Lane Closed	LN CLOSED	Westbound	(route) W
Lower Level	LWR LEVEL	Wet Pavement	WET PVMT
Maintenance	MAINT	Will Not	WONT

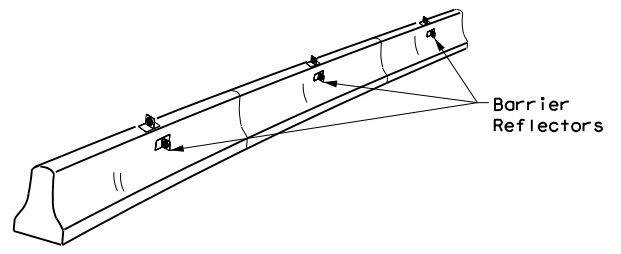
Roadway designation # IH-number, US-number, SH-number, FM-number

<h3>BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)</h3>			
<h2>BC (6) - 21</h2>			
FILE:	bc-21.dgn	DN:	TxDOT
© TxDOT	November 2002	CR:	TxDOT
REVISIONS	1047	DW:	TxDOT
9-07	8-14	CK:	TxDOT
7-13	5-21	CON:	SECT
		JOB:	076, ETC.
		HIGHWAY:	FM 1382
		DIST:	COUNTY
		SHEET NO.:	20

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.

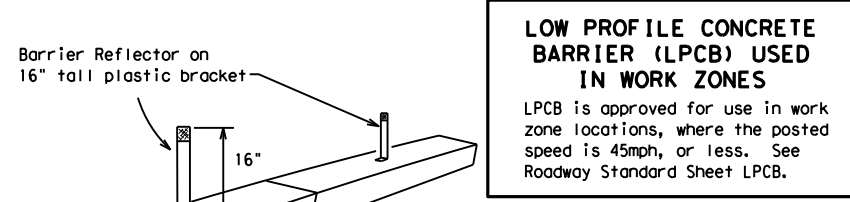
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

- 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.



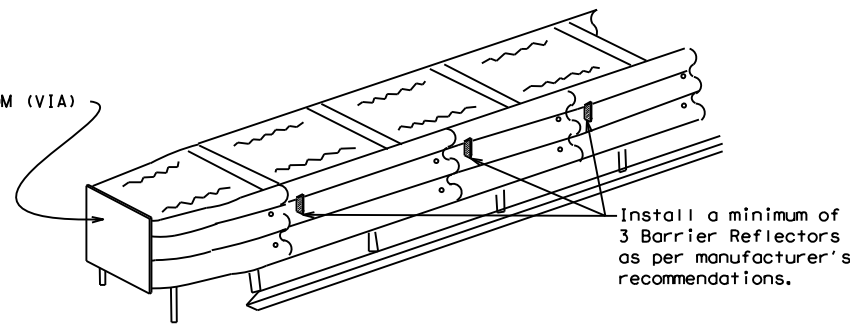
CONCRETE TRAFFIC BARRIER (CTB)

- 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.



LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES
 LPCB is approved for use in work zone locations, where the posted speed is 45mph, or less. See Roadway Standard Sheet LPCB.

LOW PROFILE CONCRETE BARRIER (LPCB)



DELINEATION OF END TREATMENTS

END TREATMENTS FOR CTB'S USED IN WORK ZONES
 End treatments used on CTB's in work zones shall meet the appropriate crashworthy standards as defined in the Manual for Assessing Safety Hardware (MASH). Refer to the CWZTCD List for approved end treatments and manufacturers.

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

WARNING LIGHTS

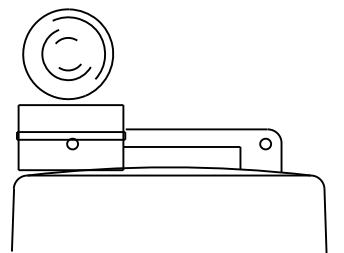
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet 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_{FL} or C_{FL} 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

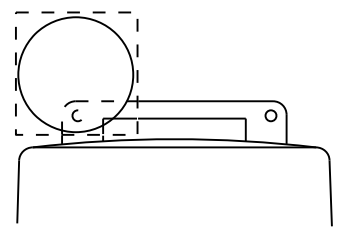
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing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



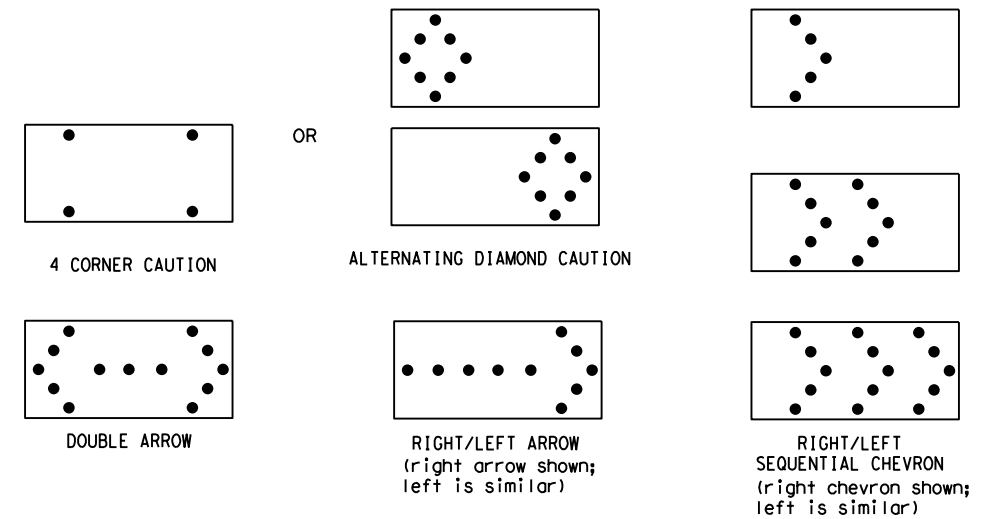
Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



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

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.

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

ATTENTION
 Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

- Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in 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) -21

FILE:	bc-21.dgn	DN:	TxDOT	CR:	TxDOT	OW:	TxDOT	CK:	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS		1047	03	076, ETC.		FM 1382			
9-07	8-14	DIST	COUNTY		SHEET NO.				
7-13	5-21	DAL	DALLAS		21				

DATE: 11/15/2022 1:00:01 PM
 FILE: I:\DALAO\PROJECTS\On\FM1382\Culvert replacement\rehab options\Sheets\STND\TCP\bc-21.dgn
 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

- 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:

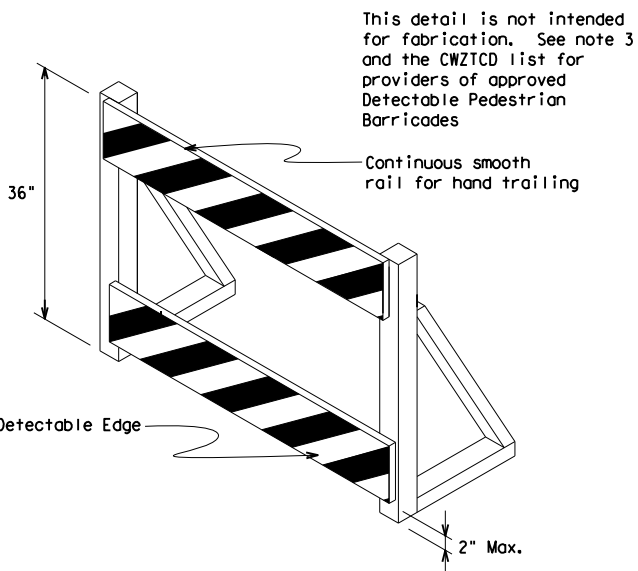
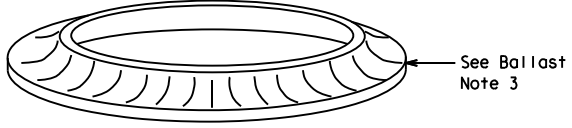
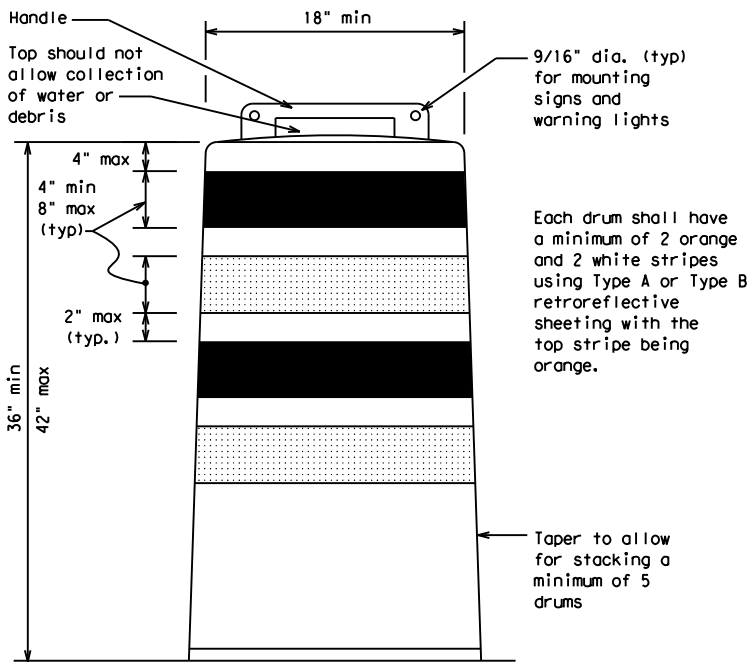
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
- The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

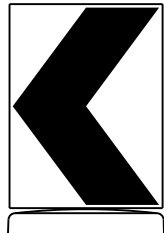
BALLAST

- 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.

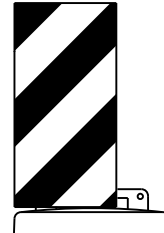


DETECTABLE PEDESTRIAN BARRICADES

- 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. Refer to WZ(BTS-2) for Pedestrian Control requirements for Sidewalk Diversions, Sidewalk Detours and Crosswalk Closures.
- Where pedestrians with visual disabilities normally use the closed sidewalk, a Detectable Pedestrian Barricade shall be placed across the full width of the closed sidewalk instead of a Type 3 Barricade.
- 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 (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 should use 8" nominal barricade rails as shown on BC(10) provided that the top rail provides a smooth continuous rail suitable for hand trailing with no splinters, burrs, or sharp edges.



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

- 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_{FL} or Type C_{FL} Orange sheeting meeting the color and retroreflectivity requirements of DMS-8300, "Sign Face Material," unless otherwise specified in the plans.
- Vertical Panels shall be manufactured with orange and white sheeting meeting the requirements of DMS-8300 Type A or Type B. Diagonal stripes on Vertical Panels shall slope down toward the intended traveled lane.
- 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 on 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



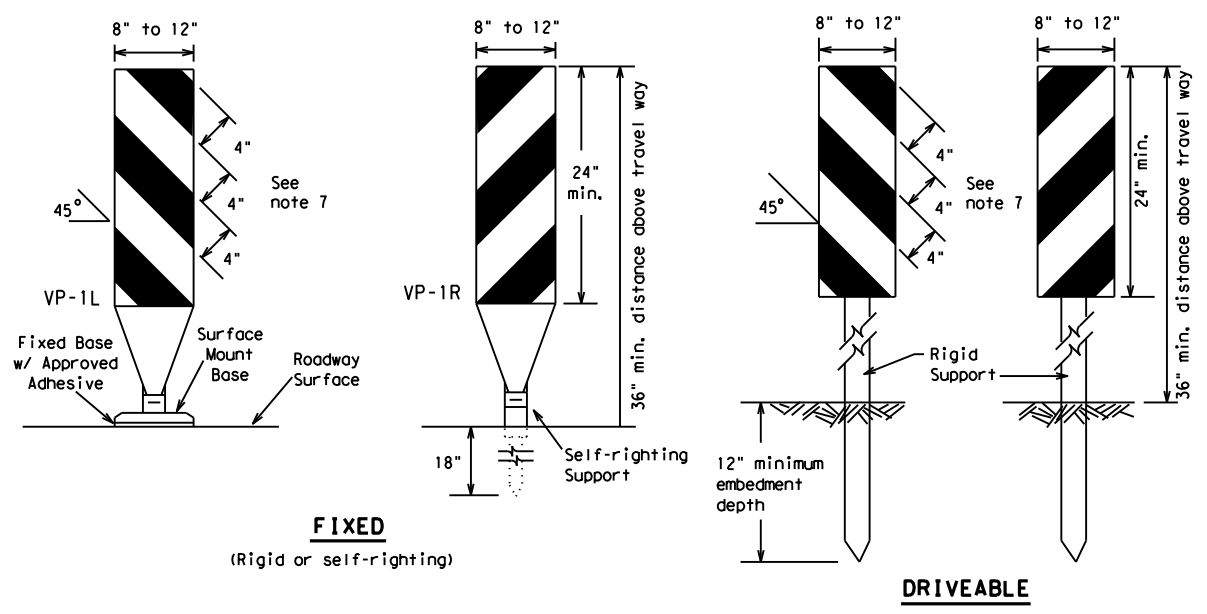
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (8) - 21

FILE:	bc-21.dgn	DN:	TxDOT	CK:	TxDOT	DW:	TxDOT	CR:	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS		1047	03	076, ETC.		FM 1382			
4-03	8-14	DIST	COUNTY	SHEET NO.					
9-07	5-21	DAL	DALLAS	22					
7-13									

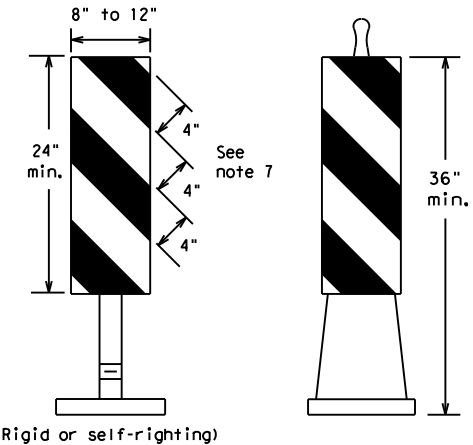
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 11/15/2022 1:00:01 PM
 FILE: I:\DALAO\PROJECTS\On\FM1382\Culvert_replacement\rehab_options\Sheets\STND\TCP\bc-21.dgn



FIXED
(Rigid or self-righting)

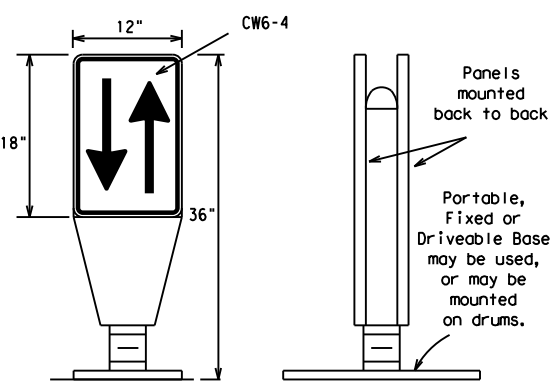
DRIVEABLE



PORTABLE

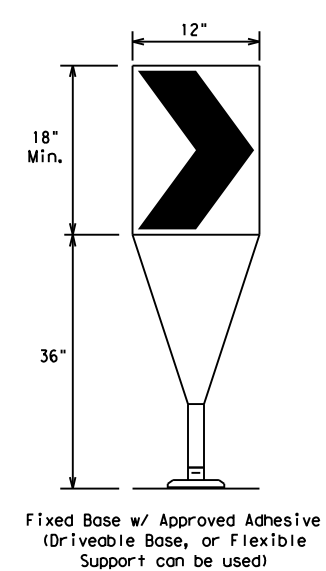
VERTICAL PANELS (VPs)

- 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 for additional requirements on the use 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 or Type B 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)

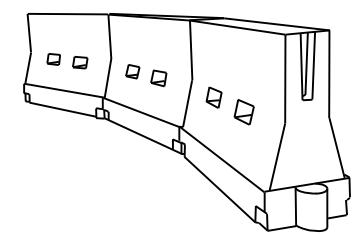
- Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base 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_{FL} or Type C_{FL} 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_{FL} or Type C_{FL} 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). Place reflective sheeting 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 Manual for Assessing Safety Hardware (MASH) 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 ² / 60	150'	165'	180'	30'	60'
35		205'	225'	245'	35'	70'
40		265'	295'	320'	40'	80'
45	L = WS	450'	495'	540'	45'	90'
50		500'	550'	600'	50'	100'
55		550'	605'	660'	55'	110'
60		600'	660'	720'	60'	120'
65		650'	715'	780'	65'	130'
70		700'	770'	840'	70'	140'
75		750'	825'	900'	75'	150'
80		800'	880'	960'	80'	160'

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (9) - 21

FILE:	bc-21.dgn	DN:	TxDOT	CK:	TxDOT	DW:	TxDOT	CR:	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	SECT	HIGHWAY			
REVISIONS		1047	03	076, ETC.	FM 1382				
9-07	8-14	DIST	COUNTY		SHEET NO.				
7-13	5-21	DAL	DALLAS		23				

DATE: 11/15/2022 1:00:02 PM
 FILE: I:\DALAO\PROJECTS\On\FM1382\Culvert replacement\rehab_options\Sheets\STND\TCP\bc-21.dgn
 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.

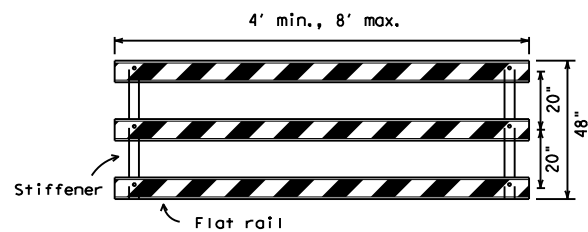
TYPE 3 BARRICADES

1. Refer to the Compliant Work Zone Traffic Control Devices List (CWZTCD) for details of the Type 3 Barricades and a list of all materials used in the construction of Type 3 Barricades.
2. Type 3 Barricades shall be used at each end of construction projects closed to all traffic.
3. Barricades extending across a roadway should have stripes that slope downward in the direction toward which traffic must turn in detouring. When both right and left turns are provided, the chevron striping may slope downward in both directions from the center of the barricade. Where no turns are provided at a closed road, striping should slope downward in both directions toward the center of roadway.
4. Striping of rails, for the right side of the roadway, should slope downward to the left. For the left side of the roadway, striping should slope downward to the right.
5. Identification markings may be shown only on the back of the barricade rails. The maximum height of letters and/or company logos used for identification shall be 1".
6. Barricades shall not be placed parallel to traffic unless an adequate clear zone is provided.
7. Warning lights shall NOT be installed on barricades.
8. Where barricades require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand is recommended. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight. Sand bags shall not be stacked in a manner that covers any portion of a barricade rails reflective sheeting. Rock, concrete, iron, steel or other solid objects will NOT be permitted. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall not be used for sandbags. Sandbags shall only be placed along or upon the base supports of the device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners.
9. Sheeting for barricades shall be retroreflective Type A or Type B conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.

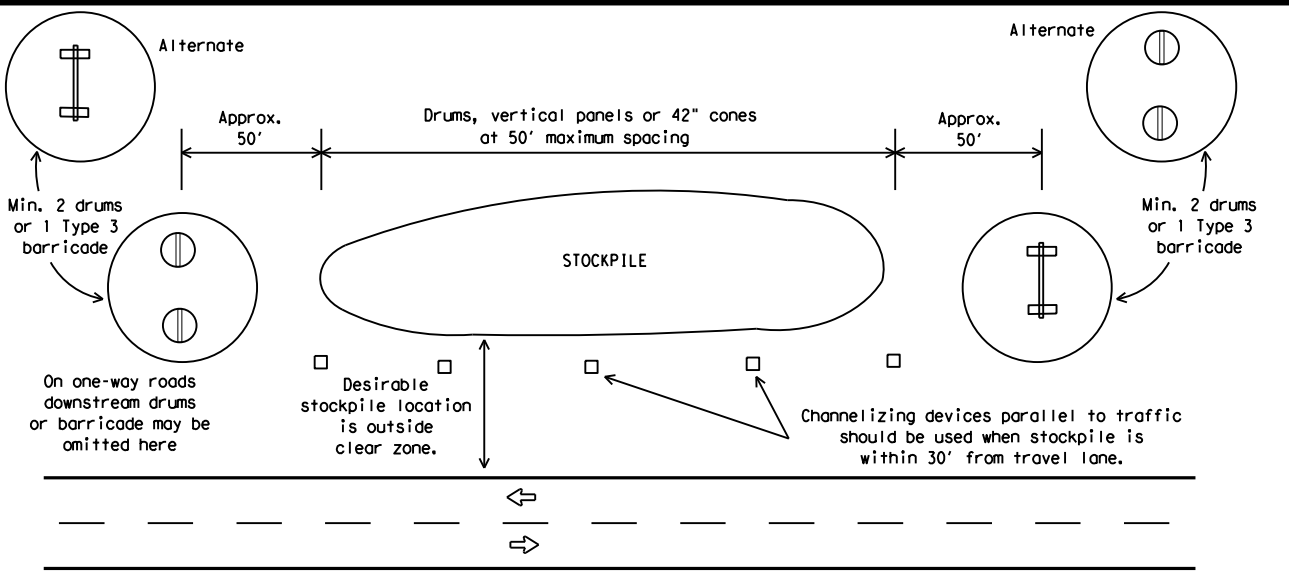


TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



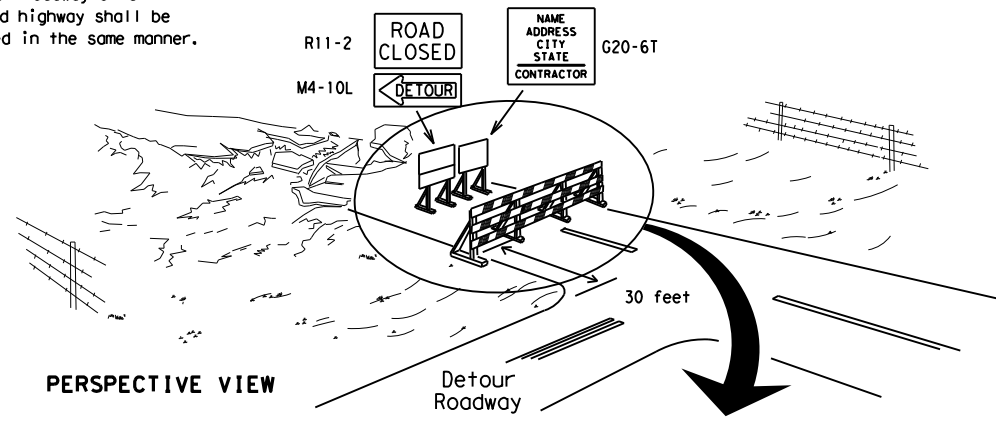
Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES



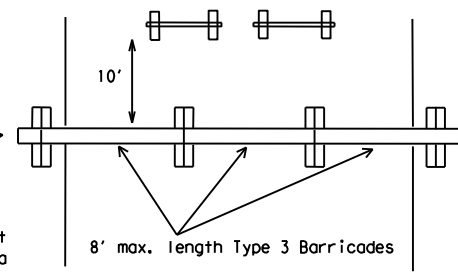
TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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



PERSPECTIVE VIEW

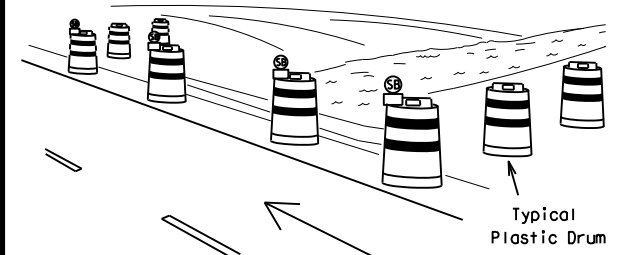
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.



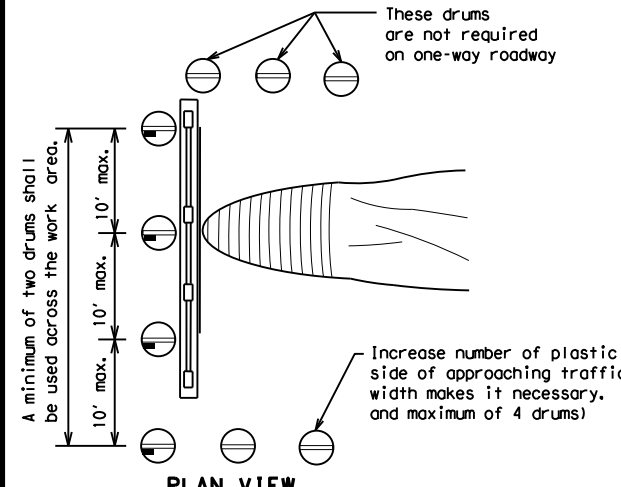
PLAN VIEW

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

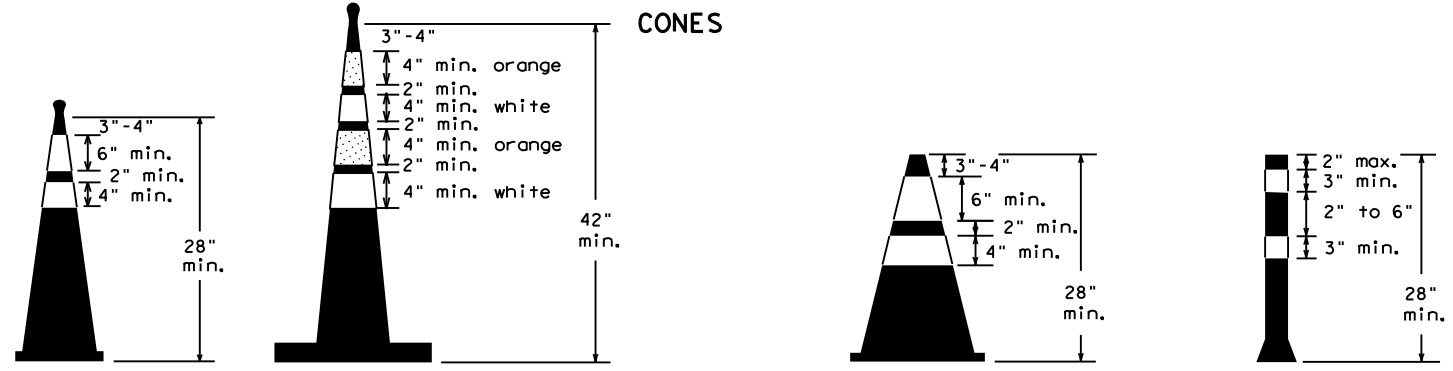


PLAN VIEW

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS

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



Two-Piece cones

One-Piece cones

Tubular Marker

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

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

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (10) - 21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT	CR: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	1047	03	076, ETC.	FM 1382
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	DAL	DALLAS	24	

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.

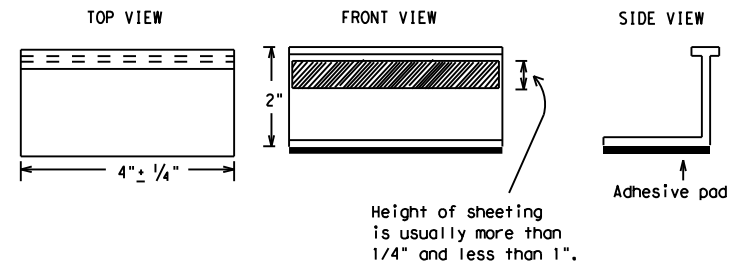
MAINTAINING WORK ZONE PAVEMENT MARKINGS

- 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)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	1047	03	076, ETC.	FM 1382
2-98 9-07 5-21	DIST	COUNTY	SHEET NO.	
1-02 7-13	DAL	DALLAS	25	
11-02 8-14				

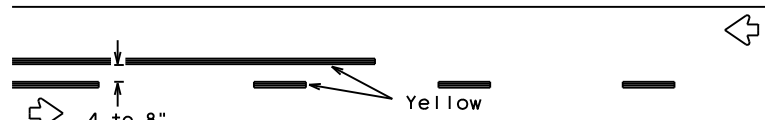
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 11/15/2022 1:00:02 PM
 FILE: I:\DALAO\PROJECTS\On\FM1382\Culvert_replacement\rehab_options\Sheets\TND\TCP\bc-21.dgn

PAVEMENT MARKING PATTERNS

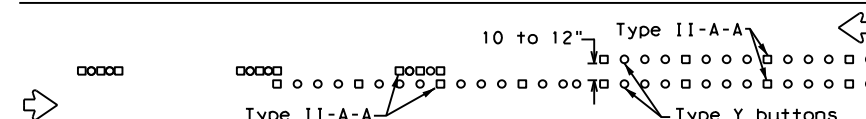


REFLECTORIZED PAVEMENT MARKINGS - PATTERN A

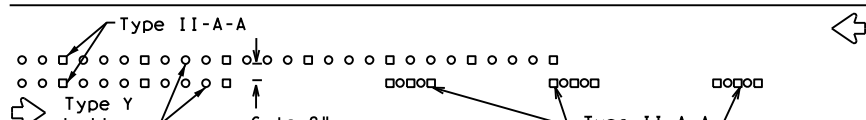


REFLECTORIZED PAVEMENT MARKINGS - PATTERN B

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



RAISED PAVEMENT MARKERS - PATTERN A



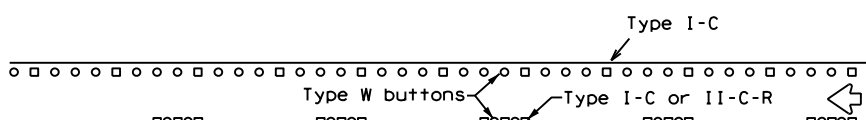
RAISED PAVEMENT MARKERS - PATTERN B

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



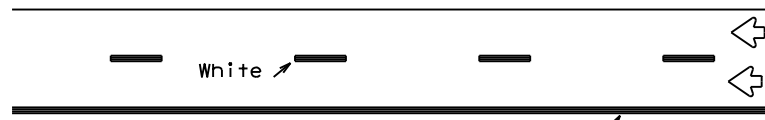
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



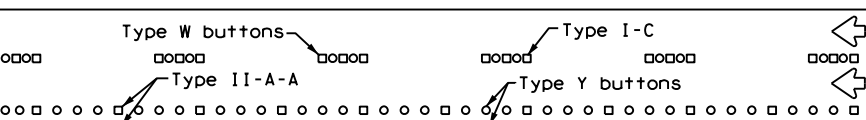
RAISED PAVEMENT MARKERS

EDGE & LANE LINES FOR DIVIDED HIGHWAY



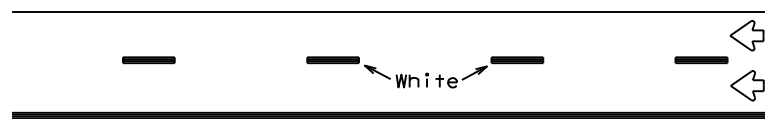
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



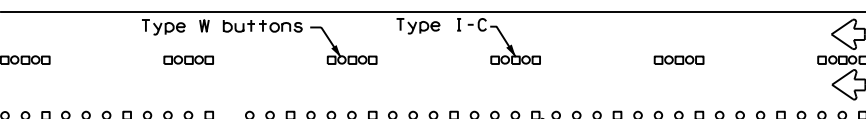
RAISED PAVEMENT MARKERS

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

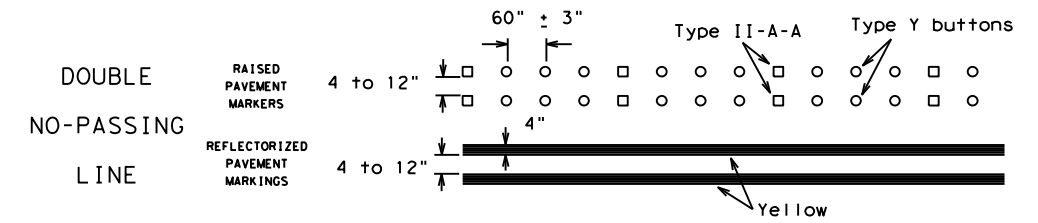
Prefabricated markings may be substituted for reflectORIZED pavement markings.



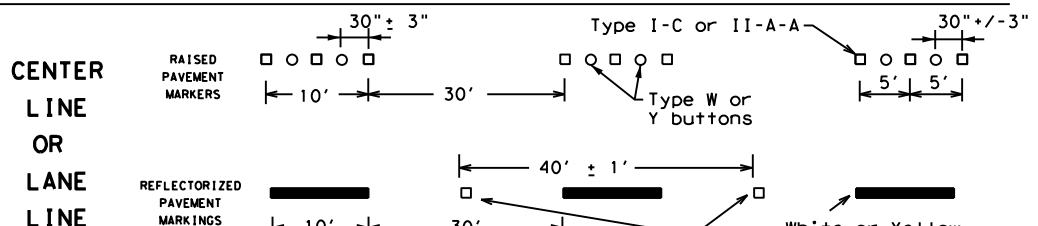
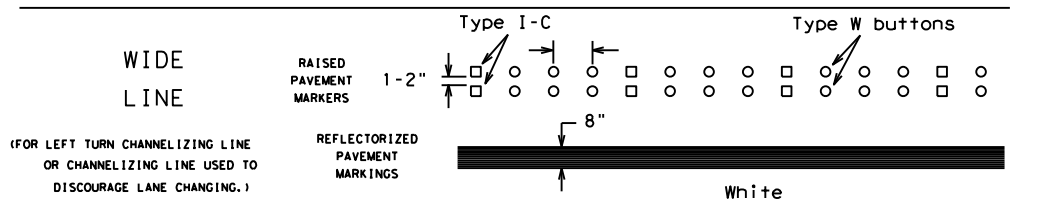
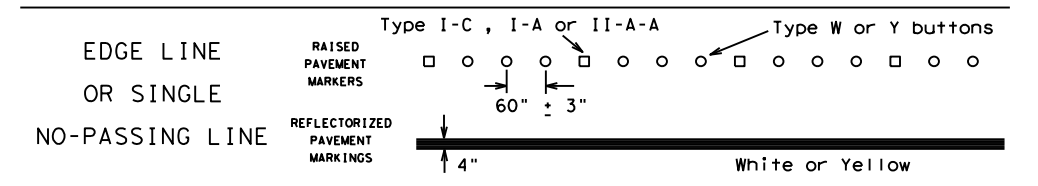
RAISED PAVEMENT MARKERS

TWO-WAY LEFT TURN LANE

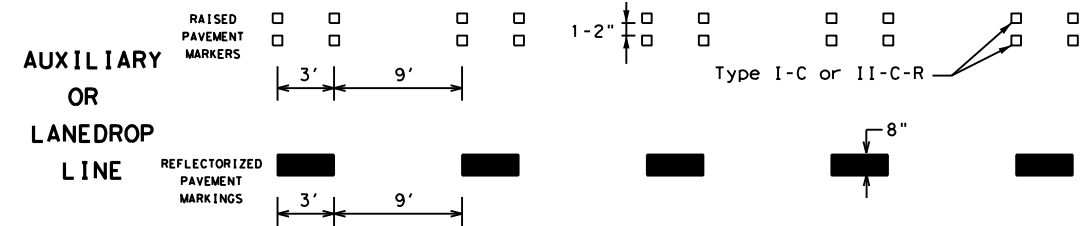
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



SOLID LINES

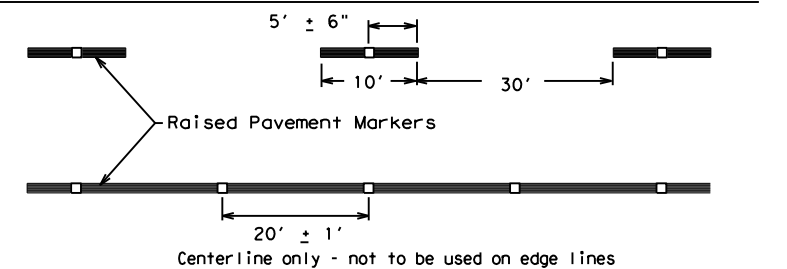


BROKEN LINES



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

If raised pavement markers are used to supplement REMOVABLE markings, the markers shall be applied to the top of the tape at the approximate mid length of tape used for broken lines or at 20 foot spacing for solid lines. This allows an easier removal of raised pavement markers and tape.



SHEET 12 OF 12



BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

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."

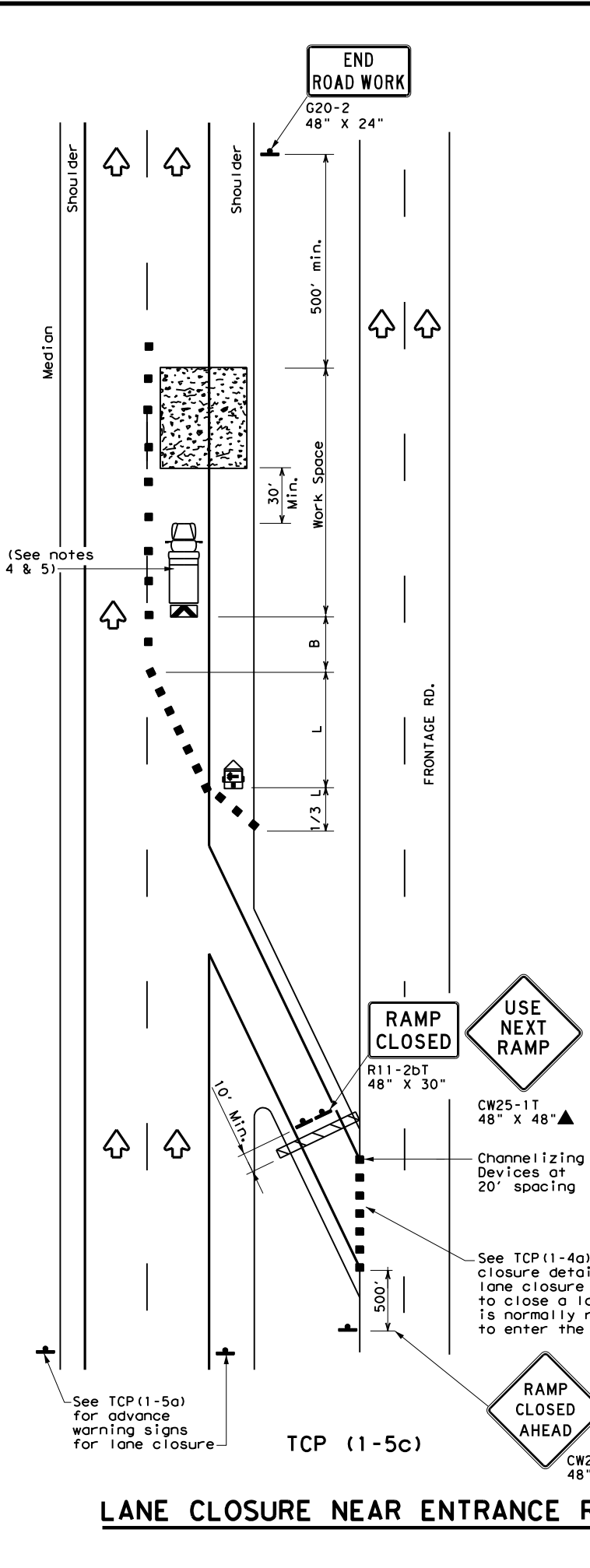
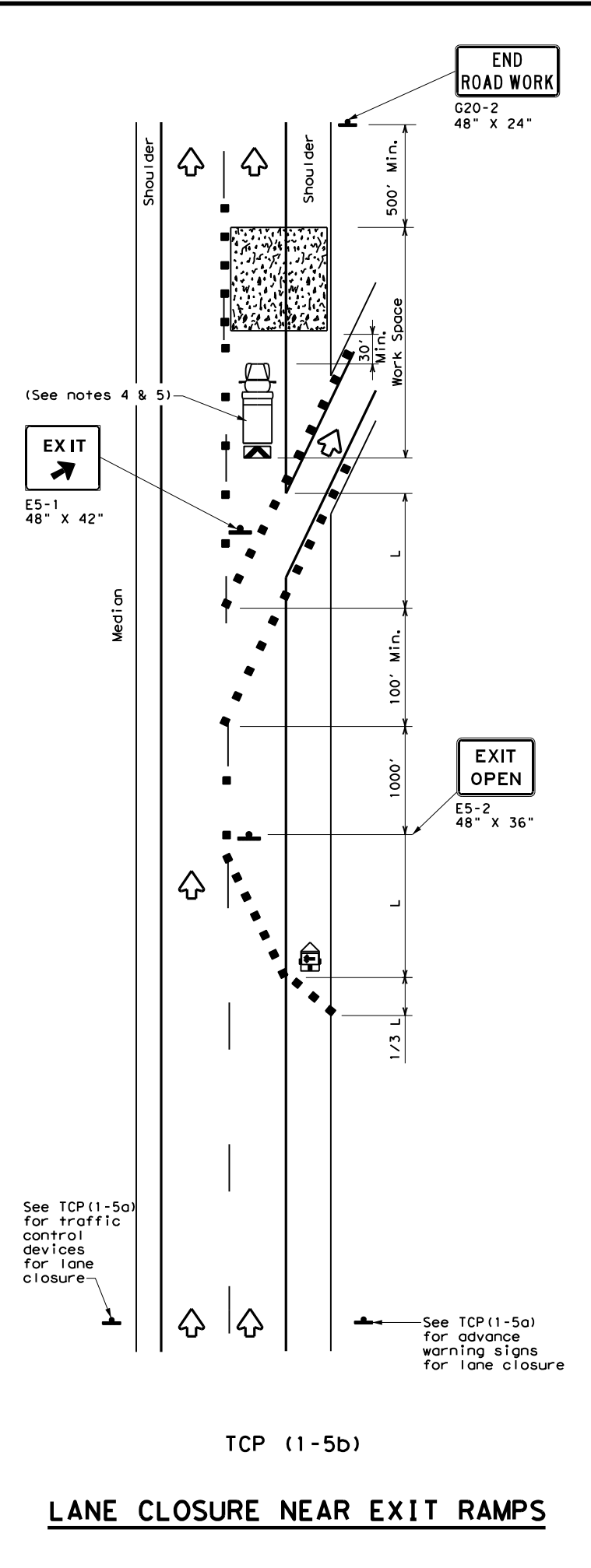
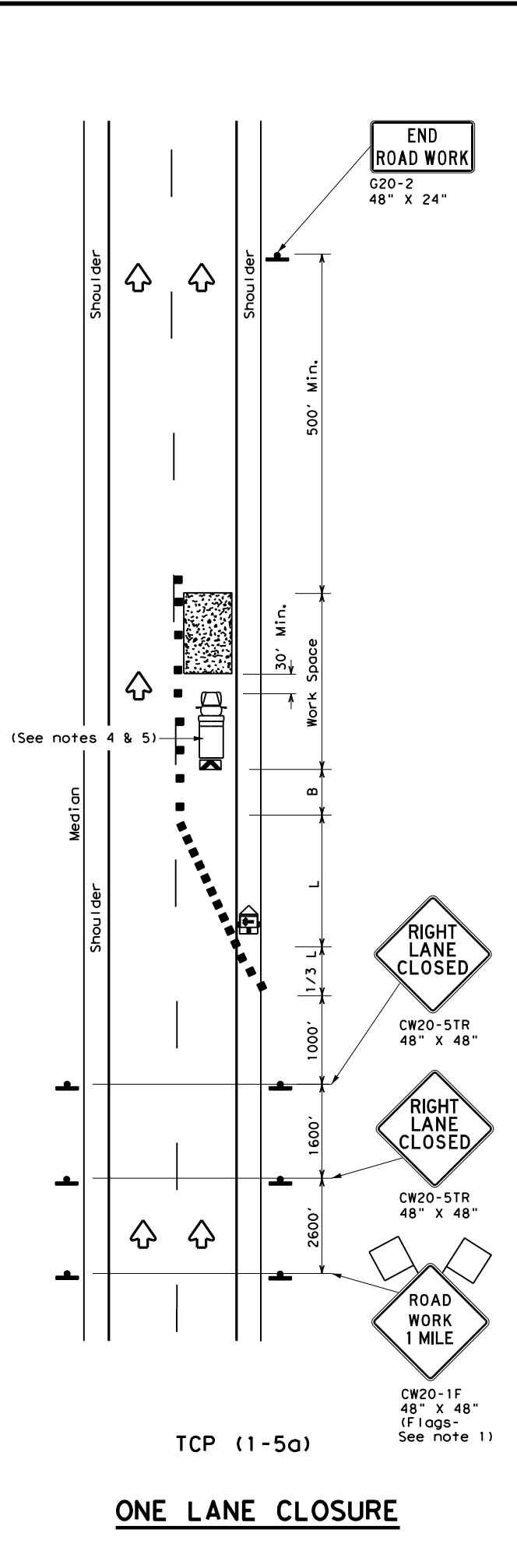
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	1047	03	076, ETC.	FM 1382
1-97 9-07 5-21	DIST	COUNTY	SHEET NO.	
2-98 7-13	DAL	DALLAS	26	
11-02 8-14				

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: 11/15/2022 1:00:02 PM
 FILE: I:\DALAO\PROJECTS\On\FM1382\Culvert replacement\rehab options\Sheets\STND\TCP\bc-21.dgn

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 units or for incorrect results or damages resulting from its use.

DATE: 11/15/2022 1:00:03 PM
 FILE: T:\DALAO\PROJECTS\On\FM1382\Culvert replacement\rehab options\Sheet\TCP (1-5) - 18.dwg



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.
 - Channelizing devices used to close lanes may be supplemented with the Chevron Alignment Sign placed on every other channelizing device. Chevrons may be attached to plastic drums as per BC Standards.
 - Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
 - 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.

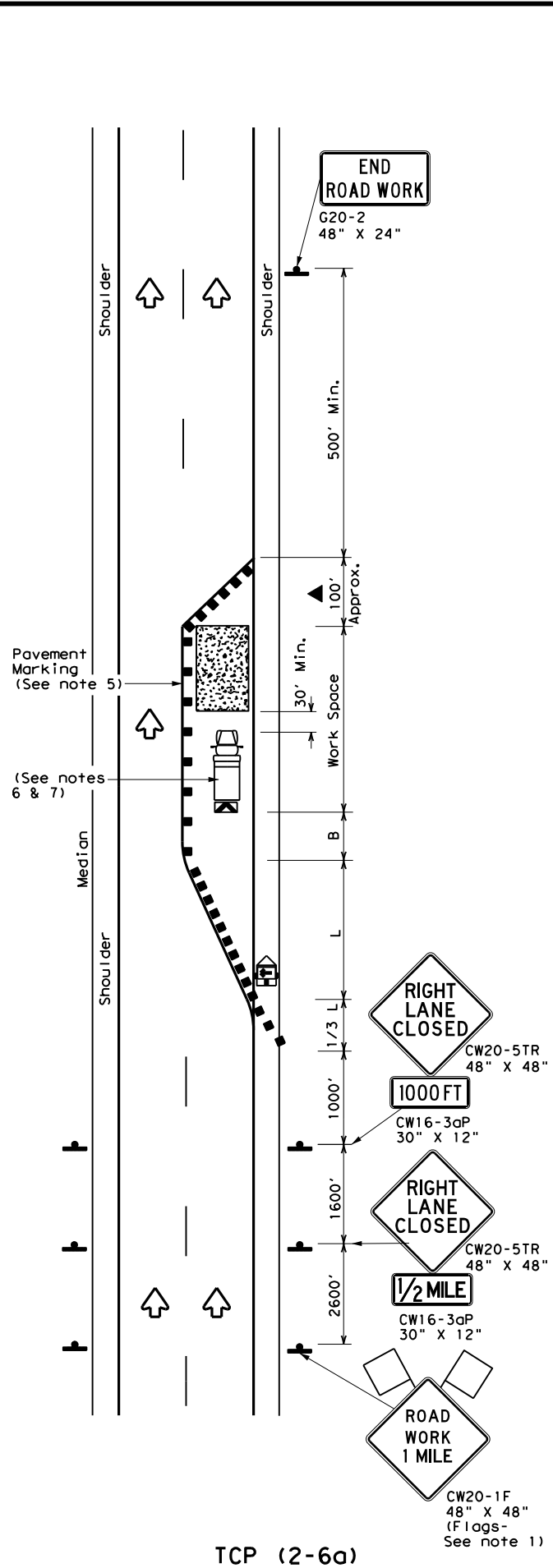
Texas Department of Transportation
 Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES FOR DIVIDED HIGHWAYS

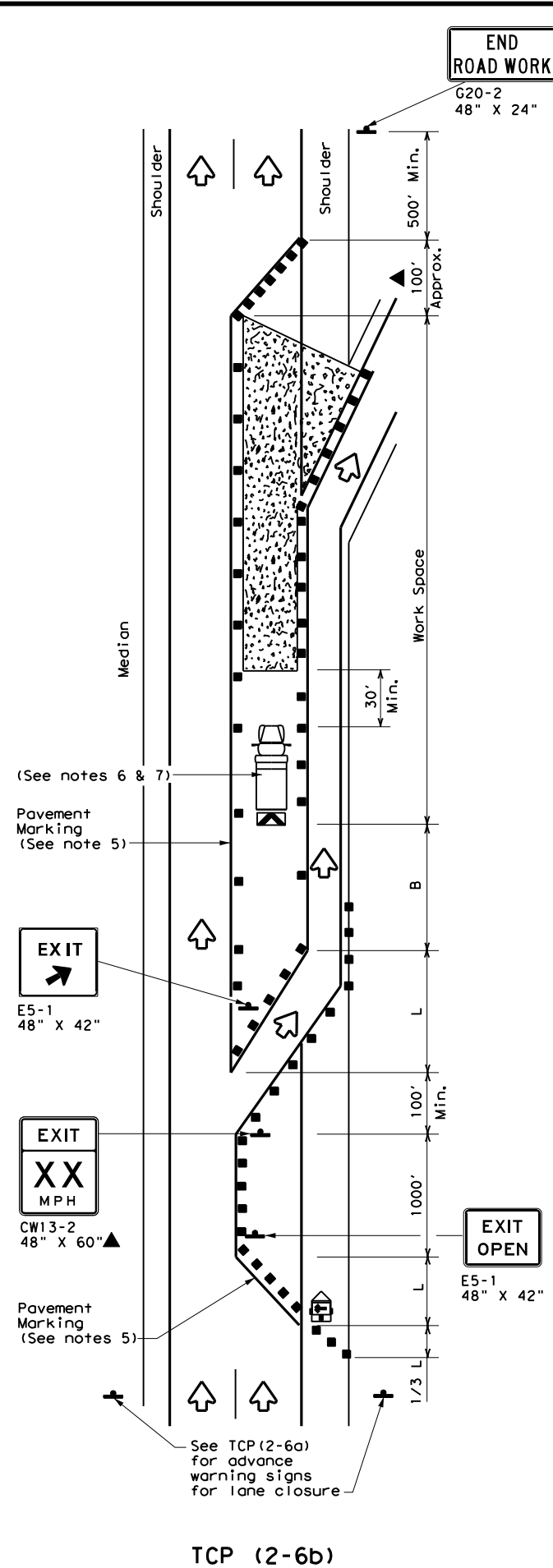
TCP (1-5) - 18

FILE: tcp1-5-18.dgn	DN:	CK:	DW:	CK:
© TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
2-18	1047	03	076, ETC.	FM 1382
	DIST	COUNTY	SHEET NO.	
	DAL	DALLAS	27	

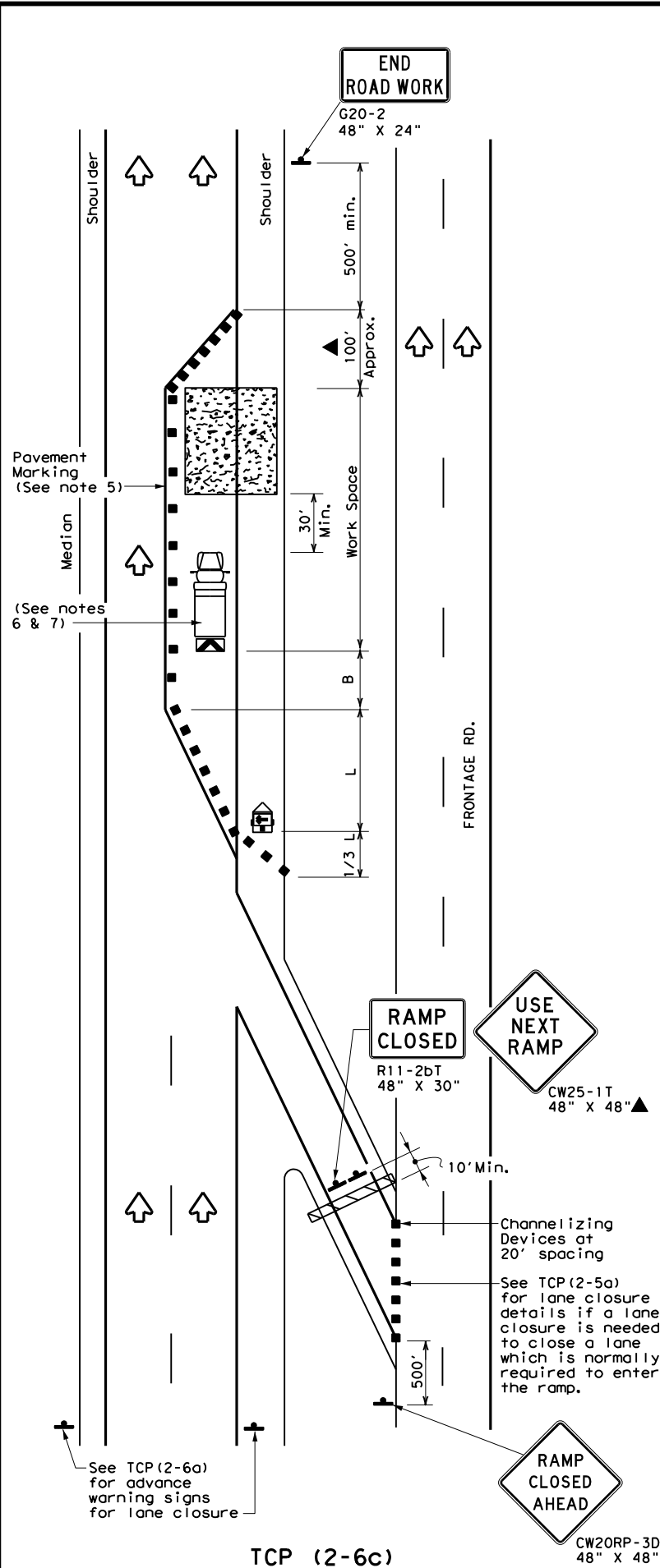
DATE: 11/15/2022 1:00:03 PM
 FILE: I:\DALAO\PROJECTS\On\FM1382\Culvert replacement\rehab options\STP\TCP (2-6) - 18.dgn
 DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for incorrect results or damages resulting from its use.



TCP (2-6a)
ONE LANE CLOSURE



TCP (2-6b)
LANE CLOSURE NEAR EXIT RAMP



TCP (2-6c)
LANE CLOSURE NEAR ENTRANCE RAMP

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.
 - Channelizing devices used to close lanes may be supplemented with the Chevron Alignment Sign placed on every other channelizing device. Chevrons may be attached to plastic drums as per BC Standards.
 - Channelizing devices used along the work space or along tangent sections may be supplemented with vertical panels (VP) placed on every other channelizing device. If night time conditions make it difficult to see at least two VPs, the VPs may be placed on each channelizing device.
 - The placement of pavement markings may be omitted on intermediate-term stationary work zones with the approval of the Engineer.
 - Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
 - 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.

Texas Department of Transportation
 Traffic Operations Division Standard

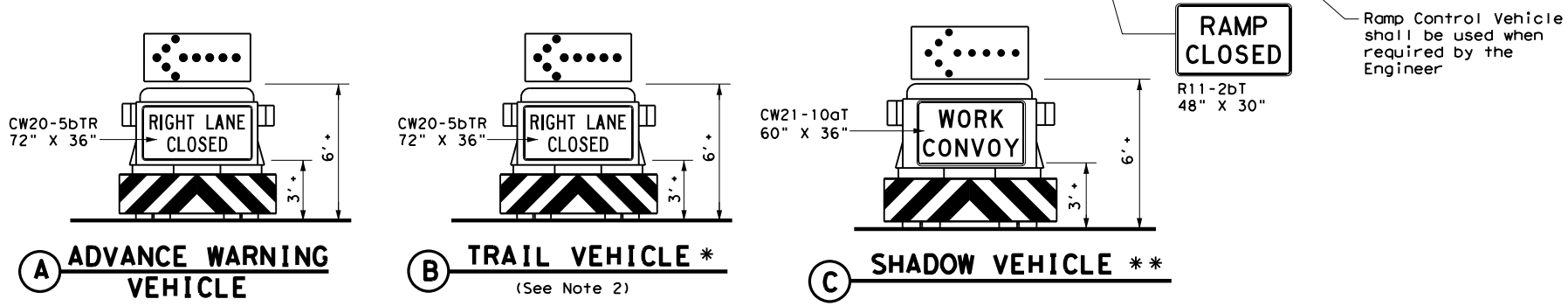
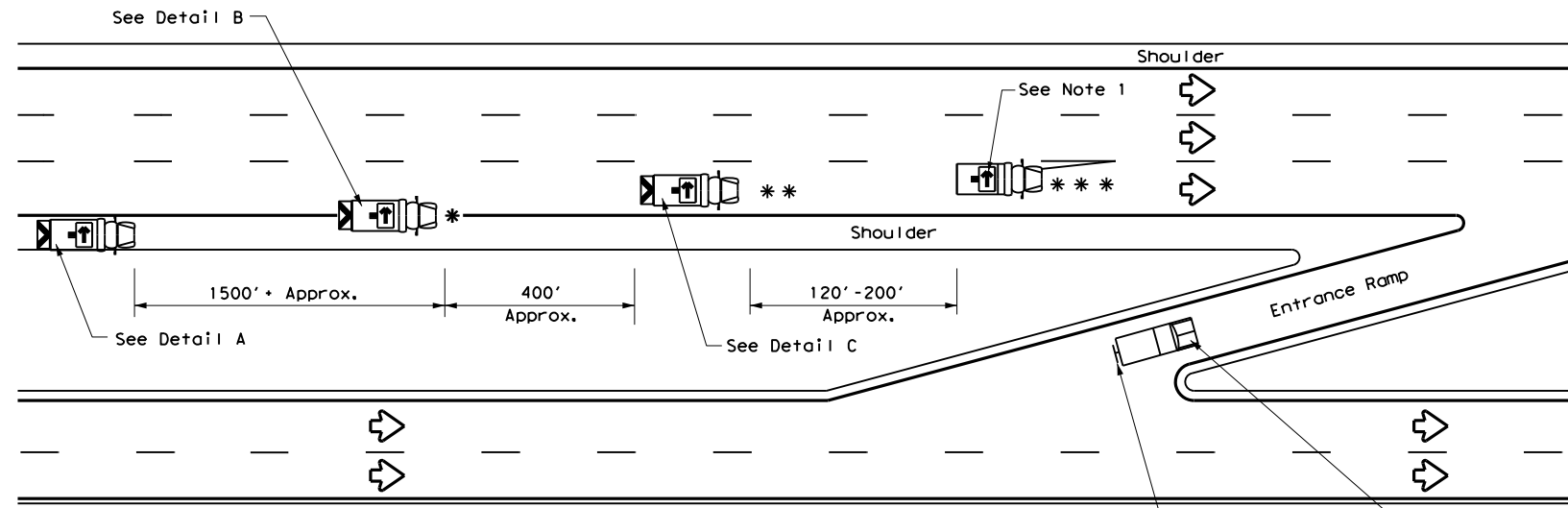
TRAFFIC CONTROL PLAN LANE CLOSURES ON DIVIDED HIGHWAYS

TCP (2-6) - 18

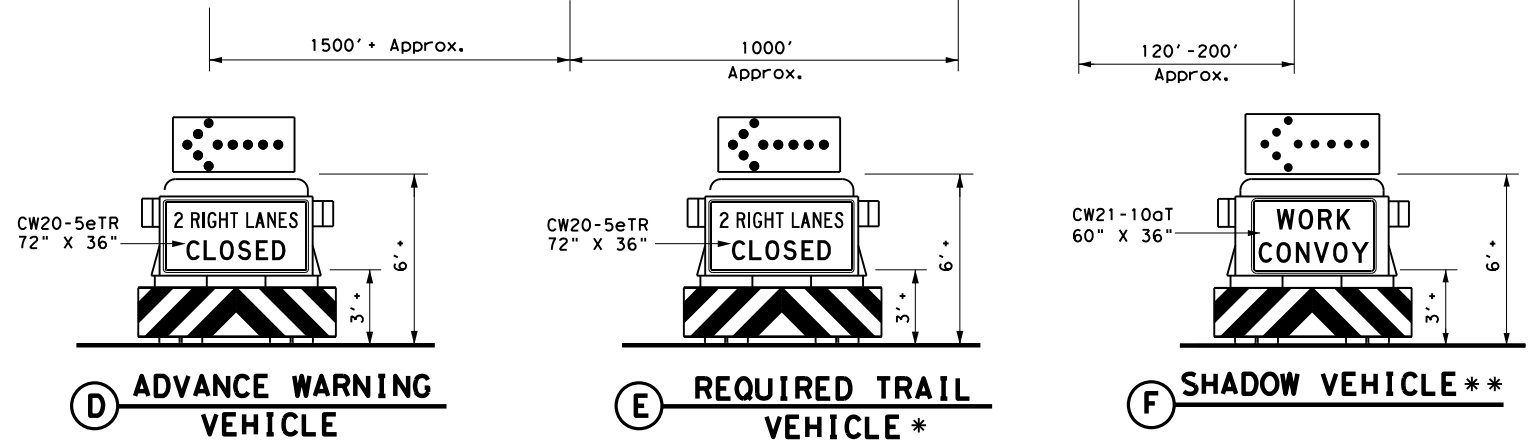
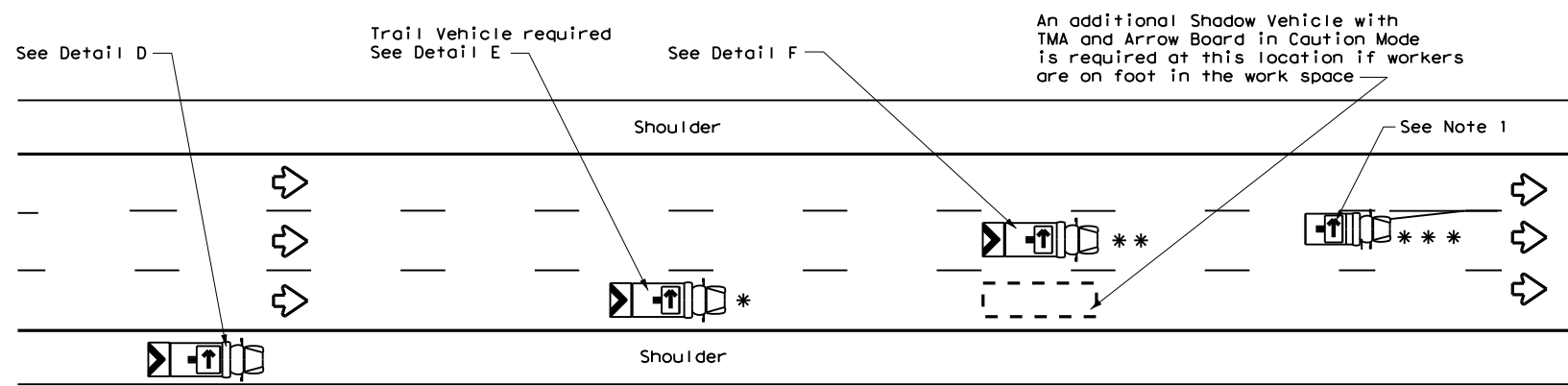
FILE: tcp2-6-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	1047	03	076, ETC.	FM 1382
2-94 4-98	DIST	COUNTY	SHEET NO.	
8-95 2-12	DAL	DALLAS	28	
1-97 2-18				

166

DATE: 11/15/2022 1:00:04 PM
 FILE: I:\DALAO\PROJECTS\On\FM1382\Culvert replacement\rehab options\striping\striping.dwg
 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 electronic files to paper format or for incorrect results or damages resulting from its use.



RIGHT LANE CLOSURE ON DIVIDED HIGHWAY - TCP(3-2a)



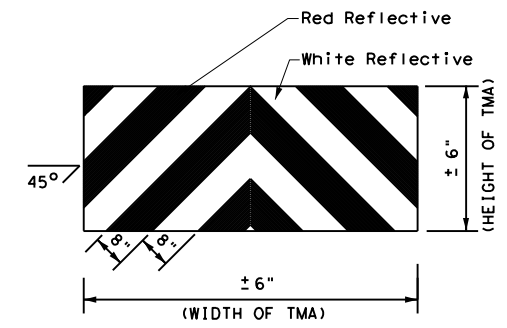
INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

LEGEND			
*	Trail Vehicle	ARROW BOARD DISPLAY	
**	Shadow Vehicle		
***	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

GENERAL NOTES

- ADVANCE WARNING, TRAIL and SHADOW vehicles shall be equipped with Type B or Type C flashing arrow boards as per the Barricade and Construction (BC) standards. Arrow boards on WORK vehicles will be optional based on the type of work being performed. The arrow boards shall be operated from inside the vehicle.
- For TCP(3-2a) the Engineer will determine if the TRAIL VEHICLE is required based on prevailing roadway conditions, traffic volume, and sight distance restrictions. All other vehicles shown for both TCP(3-2a) and TCP(3-2b) are required.
- The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
- The use of truck mounted attenuators (TMA) on the ADVANCE WARNING, SHADOW, and TRAIL vehicles are required.
- Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DMS 8300, Type A.
- Each vehicle shall have two-way radio communication capability.
- When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
- Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE may vary according to terrain, work activity and other factors.
- Standard 48" X 48" diamond shaped warning signs with the same message as those shown may be used where adequate mounting space exists.
- The signs shown should be used on the Advance Warning Vehicle. As an option, a portable changeable message sign (PCMS) or a truck mounted changeable message sign (TMCMS) with a minimum character height of 12", and displaying the same legend may be substituted for these signs. An appropriate directional arrow display, simulating the size and legibility of the flashing arrow board, must be used in the second phase of the PCMS/TMCMS message. When this is done, the arrow board will not be required on the Advance Warning Vehicle.
- Standard diamond shape versions of the CW20-5 series signs may be used as an option if the rectangular signs shown are not available.
- The principles on this sheet may be used to close lanes from the left side of the roadway considering the number of lanes, shoulder width, sight distance, and ramp frequency.
- Signs and flashing arrow board modes shall be appropriately altered when implementing left lane closures or interior closures which close the left lanes.
- The Advance Warning Vehicle may straddle the edgeline when shoulder width makes it necessary.



STRIPING FOR TMA

Texas Department of Transportation
Traffic Operations Division Standard

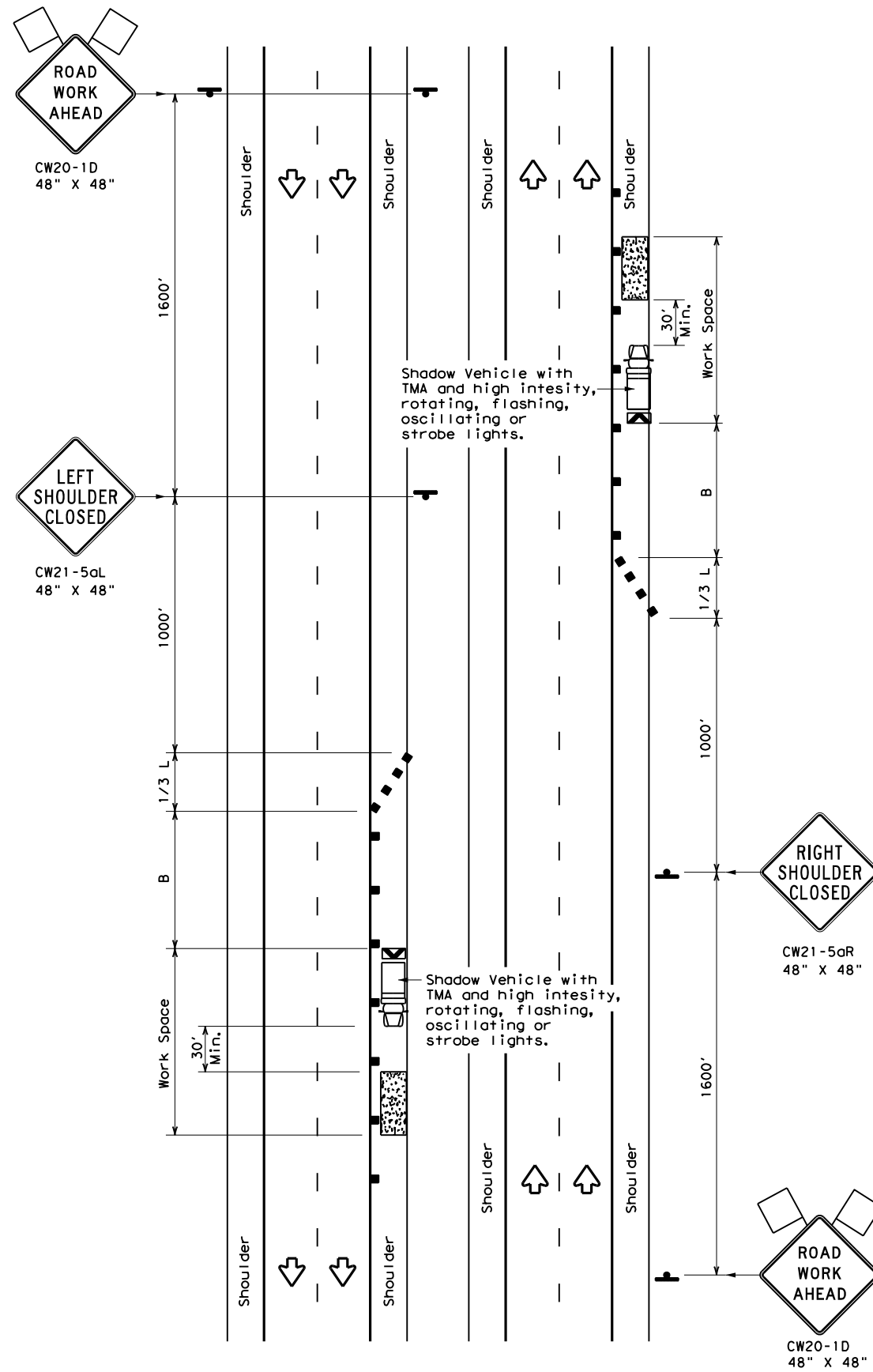
TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS

TCP(3-2)-13

FILE: tcp3-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	1047	03	076, ETC.	FM 1382
2-94 4-98	DIST	COUNTY	SHEET NO.	
8-95 7-13	DAL	DALLAS	29	
1-97				

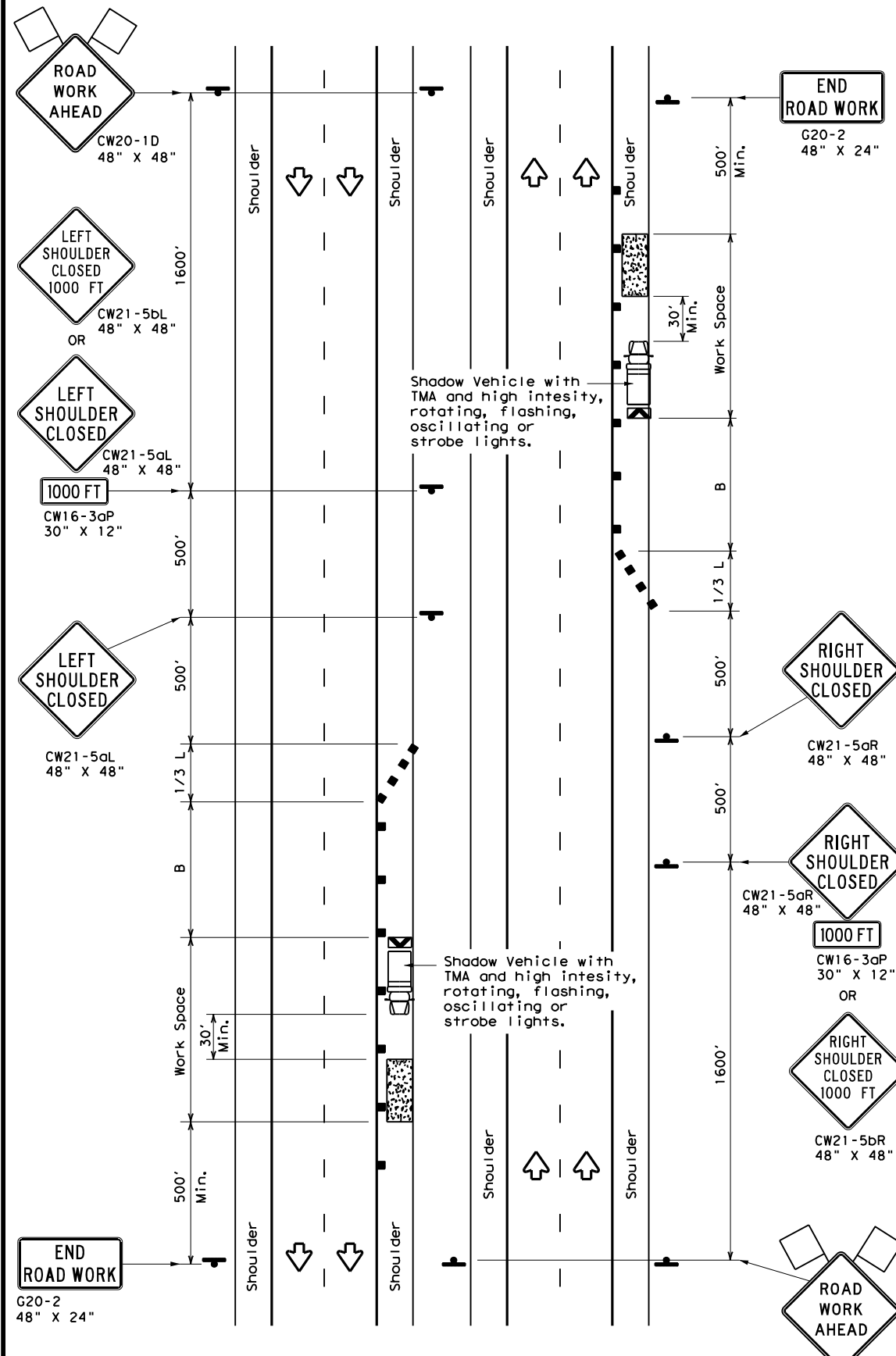
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for incorrect results or damages resulting from its use.

DATE: 11/15/2022 1:00:04 PM
 FILE: T:\DALAO\PROJECTS\On\FM1382\Culvert replacement\rehab options\STW\TCP (5-1) - 18.dgn



TCP (5-1a)

WORK AREA ON SHOULDER



TCP (5-1b)

WORK AREA ON SHOULDER

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		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'	90'
35		205'	225'	245'	35'	70'	120'
40		265'	295'	320'	40'	80'	155'
45	L = WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

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

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	TCP (5-1a)	TCP (5-1b)	TCP (5-1b)	

GENERAL NOTES

1. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the performance or quality of the work. Type 3 barricades or drums may be substituted when workers on foot are no longer present when approved by the Engineer.
2. 28" tall or taller one-piece cones will be allowed only for Short Duration or Short Term stationary operations when workers are present to maintain the devices upright and in proper location. Intermediate Term stationary work areas should use Drums, Vertical Panels or 42" tall two-piece cones.



**TRAFFIC CONTROL PLAN
 SHOULDER WORK FOR
 FREEWAYS / EXPRESSWAYS**

TCP (5-1) - 18

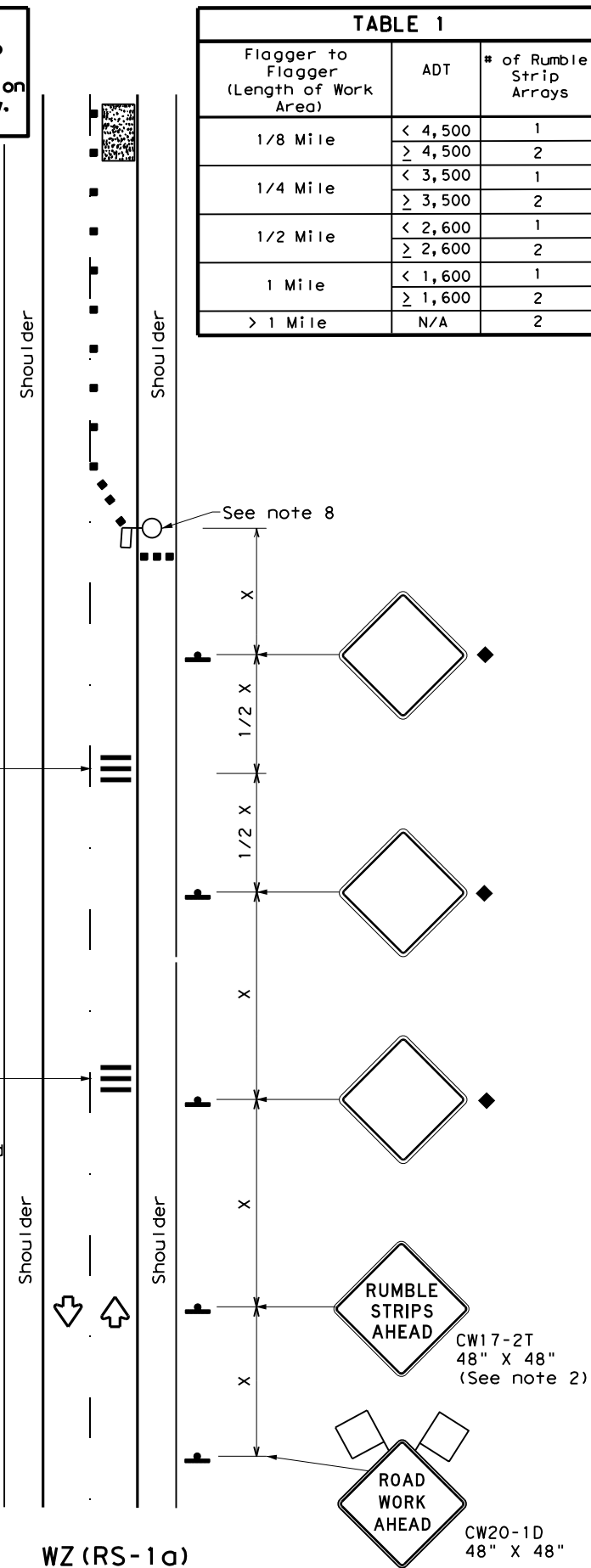
FILE: tcp5-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
2-18	REVISIONS	1047 03	076, ETC.	FM 1382
	DIST	COUNTY	SHEET NO.	
	DAL	DALLAS	30	

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 units or for incorrect results or damages resulting from its use.

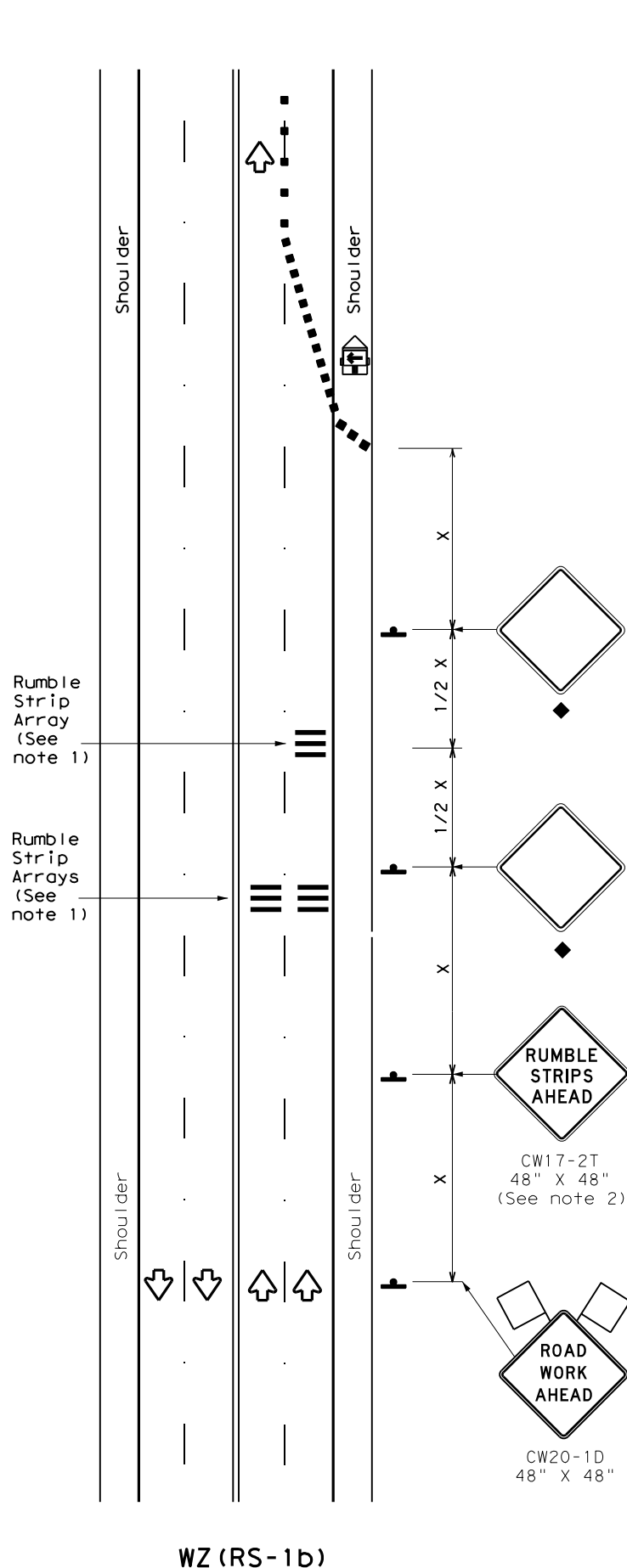
DATE: 11/15/2022 1:00:05 PM
 FILE: T:\DALAO\PROJECTS\On\FM1382\Culvert replacement\rehab options\Sheet\WZ(RS-22).dgn

Warning sign and rumble strip sequence in opposite direction is same as below.

Flagger to Flagger (Length of Work Area)	ADT	# of Rumble Strip Arrays
1/8 Mile	< 4,500	1
	≥ 4,500	2
1/4 Mile	< 3,500	1
	≥ 3,500	2
1/2 Mile	< 2,600	1
	≥ 2,600	2
1 Mile	< 1,600	1
	≥ 1,600	2
> 1 Mile	N/A	2



RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

- Each Rumble Strip Array should consist of three rumble strips spaced center to center at the spacing shown in Table 2, placed transverse across the lane at locations shown.
- The CW17-2T "RUMBLE STRIPS AHEAD" sign should be located after the CW20-1D "ROAD WORK AHEAD" sign and spaced as shown. If traffic is observed to be queuing, or is expected to queue beyond the Rumble Strips, the CW17-2T sign and the first Rumble Strip Array may be located upstream of the CW20-1D sign as necessary to provide needed warning.
- Temporary Rumble Strips will be considered subsidiary to Item 502, and shall be a product listed on the Compliant Work Zone Traffic Control Devices.
- Remove Temporary Rumble Strips before removing the advanced warning signs.
- Temporary Rumble Strips should not be used on horizontal curves, loose gravel, soft or bleeding asphalt, heavily rutted pavements or unpaved surfaces.
- Temporary Rumble Strips shall be installed and maintained as per manufacturer's recommendations.
- This standard sheet shall be used in conjunction with other appropriate TCP standard, TMUTCD typical application or project specific detail for the project.
- The one-lane two-way application may utilize a flagger, an Automated Flagger Assistance Device (AFAD) or a Portable Traffic Signal (PTS).
- Replace defective Temporary Rumble Strips as directed by the Engineer.
- Temporary Rumble Strips may be used on freeways or expressways based on engineering judgment and written direction from the Engineer.

Speed	Approximate distance between strips in an array
≤ 40 MPH	10'
> 40 MPH & ≤ 55 MPH	15'
= 60 MPH	20'
≥ 65 MPH	* 35' +

	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Panel		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 = 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)

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

◆ Signs are for illustrative purposes only. Signs required may vary depending on the TCP, TMUTCD Typical Application, or project specific details for the project.

* For posted speeds in excess of 65 MPH, it is recommended that spacing is increased as speed limits increase. Increasing space between rumble strips will improve effectiveness.

Texas Department of Transportation
 Traffic Safety Division Standard

TEMPORARY RUMBLE STRIPS

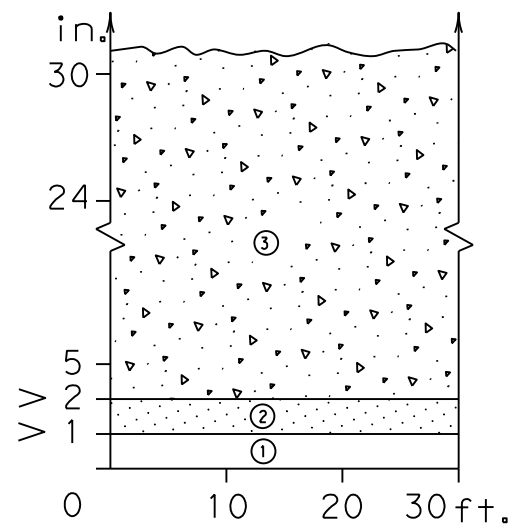
WZ (RS) - 22

FILE: wzrs22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS	1047	03	076, ETC.	FM 1382
2-14 1-22	DIST	COUNTY	SHEET NO.	
4-16	DAL	DALLAS	31	

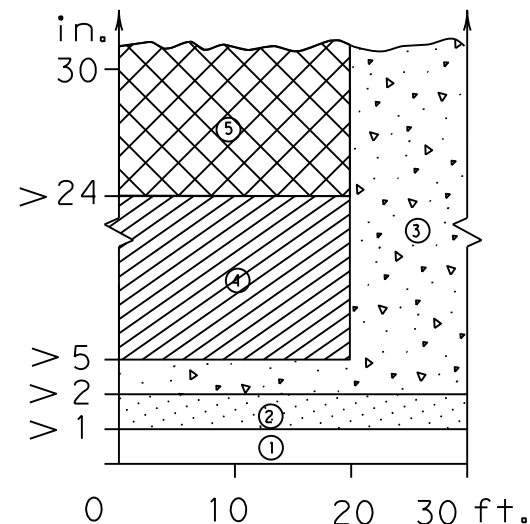
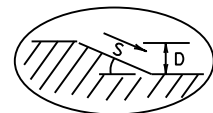
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DEFINITION OF TREATMENT ZONES FOR VARIOUS EDGE CONDITIONS

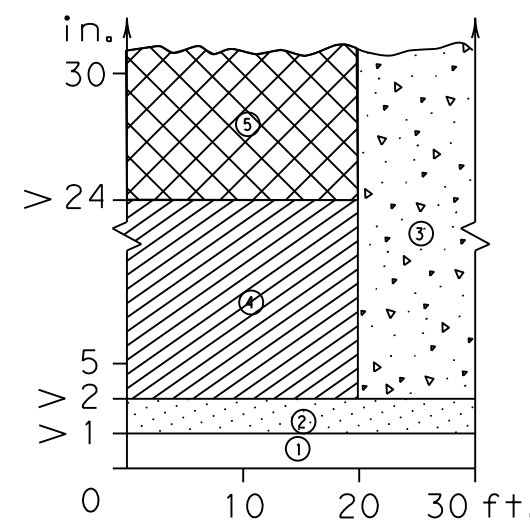
Edge Height (D) in Inches versus Lateral Clearance (Y) in Feet



Edge Condition I
S = (3:1) (or flatter)



Edge Condition II
S = ((2.99):1) to (1:1)



Edge Condition III
S is steeper than (1:1)

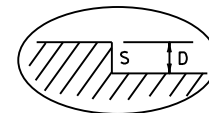
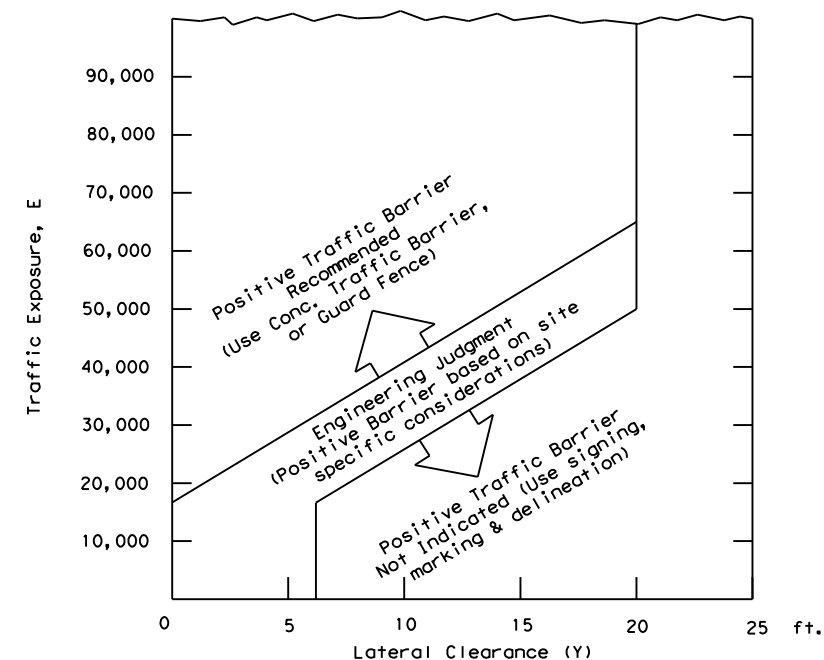


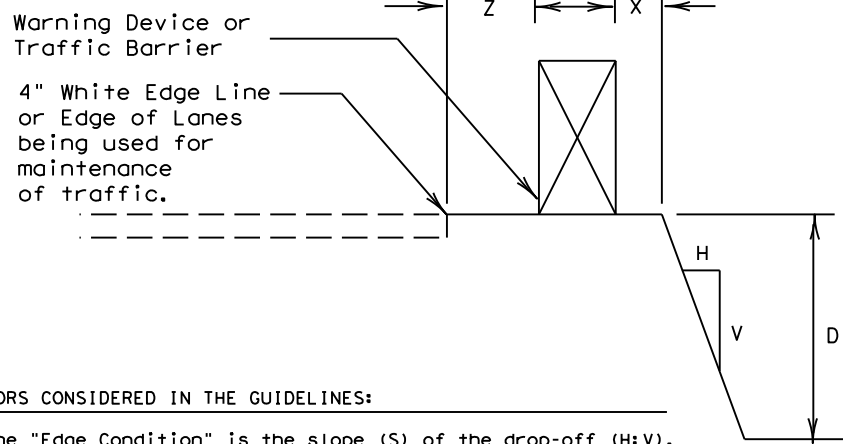
FIGURE-1: CONDITIONS INDICATING USE OF POSITIVE BARRIER FOR ZONE 5 ([Cross-hatched symbol])



- E = ADT x T
Where ADT is that portion of the average daily traffic volume traveling within 20 feet (generally two adjacent lanes) of the edge dropoff condition; and, T is the duration time in years of the dropoff condition.
- Figure-1 provides a practical approach to the use of positive barriers for the protection of vehicles from pavement drop-offs. Other factors, such as the presence of heavy machinery, construction workers, or the mix and volume of traffic may make the use of positive barriers appropriate, even when the edge condition alone may not justify the use of a barrier.
- An approved end treatment should be provided for any positive barrier end located within a lateral offset of 20 feet from the edge of the travel lane.

Zone	Treatment Types Guidelines:
①	No treatment.
②	CW 8-11 "Uneven Lanes" signs.
③	CW 8-9a "Shoulder Drop-Off" or CW 8-11 signs plus vertical panels.
④	CW 8-9a or CW 8-11, signs plus drums. Where restricted space precludes the use of drums, use vertical panels. An edge fill may be provided to change the edge slope to that of the preferable Edge Condition I.
⑤	Check indications (Figure-1) for positive barrier. Where positive barrier is not indicated, the treatment shown above for Zone- 4 may be used after consideration of other applicable factors.

These guidelines apply to temporary traffic control areas or work zones where continuous pavement edges or drop-offs exists parallel and adjacent to a lane used by traffic. The edge conditions may be present between shoulders and travel lanes, between adjacent or opposing travel lanes, or at intermediate points across the width of the paved surface. Due to the variability in construction operations, tolerances in the variables may be allowed by the engineer. These guidelines do not apply to short term operations. These guidelines do not constitute a rigid standard or policy; rather, they are guidance to be used in conjunction with engineering judgement. These guidelines may be updated on the Design Division's on-line manuals.



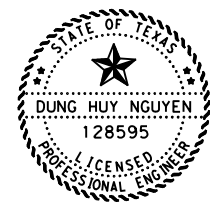
Warning Device or Traffic Barrier
4" White Edge Line or Edge of Lanes being used for maintenance of traffic.

FACTORS CONSIDERED IN THE GUIDELINES:

- The "Edge Condition" is the slope (S) of the drop-off (H:V). The "Edge Height" is the depth of the drop-off "D".
- Distance "X" is to be the maximum practical under job conditions. Two feet minimum for high speed conditions. Distance "Y" is the lateral clearance from edge of travel lane to edge of dropoff. Distance "Z" does not have a minimum.
- In addition to the factors considered in the guidelines, each construction zone drop-off situation should be analyzed individually, taking into account other variables, such as: traffic mix, posted speed in the construction zone, horizontal curvature, and the practicality of the treatment options.
- The conditions for indicating the use of positive or protective barriers are given by Zone-5 and Figure-1. Traffic barriers are primarily applicable for high speed conditions. Urban areas with speeds of 30 mph or less may have a lesser need for signing, delineation, and barriers. Right-angled edges, however, with "D" greater than 2 inches and located within a lateral offset of 6 feet, may indicate a higher level of treatment.
- If the distance "Y" must be less than 3 feet, the use of a positive barrier may not be feasible. In such a case, consider either: 1) narrowing the lanes to a desired 11 to 12 feet or 10 foot minimum (see CW20-8 sign), or 2) provide an edge slope such as Edge Condition I.

Edge Condition Notes:

- Edge Condition I: Most vehicles are able to traverse an edge condition with a slope rate of (3 to 1) or flatter. The slope must be constructed with a compacted material capable of supporting vehicles.
- Edge Condition II: Most vehicles are able to traverse an edge condition with a slope between (2.99 to 1) and (1 to 1) so long as "D" does not exceed 5 inches. Under-carriage drag on most automobiles will occur when "D" exceeds 6 inches. As "D" exceeds 24 inches, the possibility for rollover is greater in most vehicles.
- Edge Condition III: When slopes are greater than (1 to 1) and where "D" is greater than 2 inches, a more difficult control factor may exist for some vehicles, if not properly treated. For example, where "D" is greater than 2 inches and up to 24 inches different types of vehicles may experience different steering control at different edge heights. Automobiles might experience more steering control differential when "D" is greater than 2 inches and up to 5 inches. Trucks, particularly those with high loads, have more steering control differential when "D" is greater than 5 inches and up to 24 inches. When "D" exceeds 24 inches, the possibility of rollover is greater for most vehicles.
- Milling or overlay operations that result in Edge Condition III should not be in place without appropriate warning treatments, and these conditions should not be left in place for extended periods of time.



Signature of Registrant & Date
11/15/2022

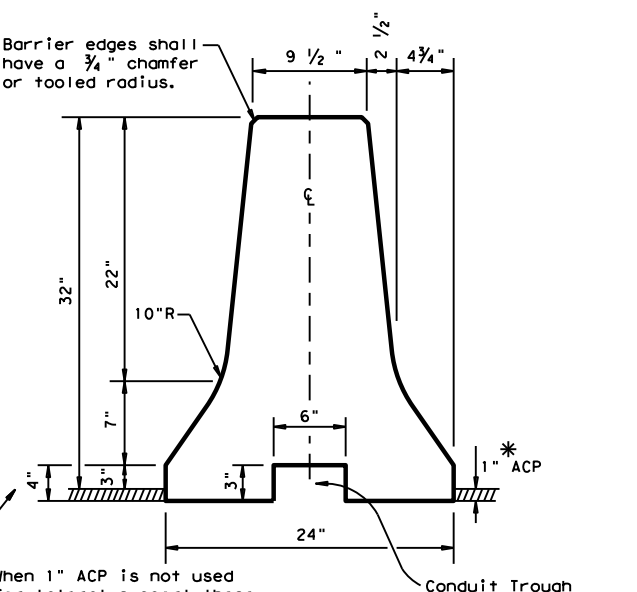
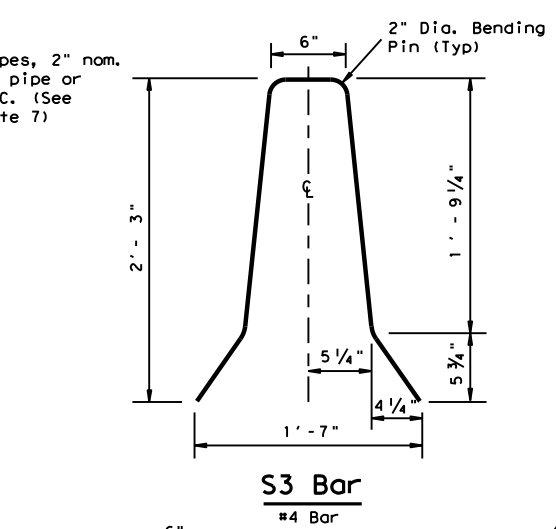
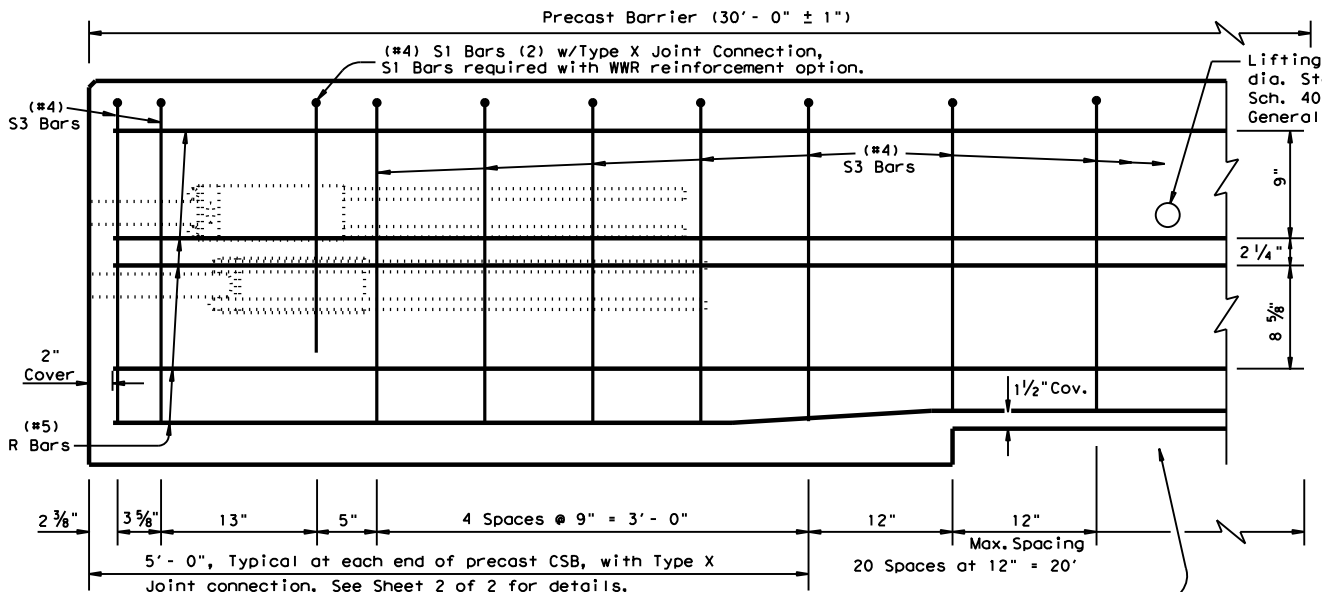
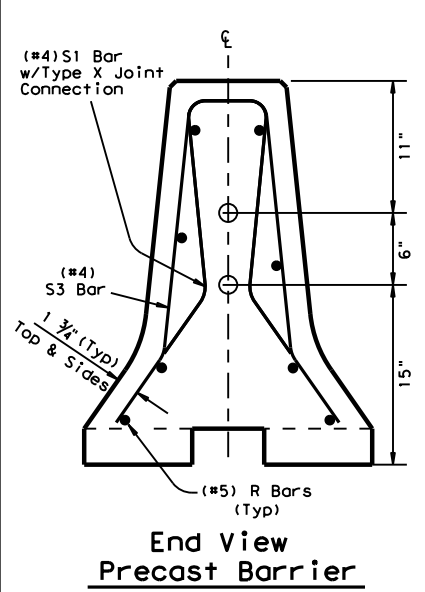


TREATMENT FOR VARIOUS EDGE CONDITIONS

© TxDOT August 2000		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS					
CONTRACT	SECTION	JOB	HIGHWAY		
1047	03	076, ETC.	FM 1382		
DIST		COUNTY	SHEET NO.		
DAL		DALLAS	32		

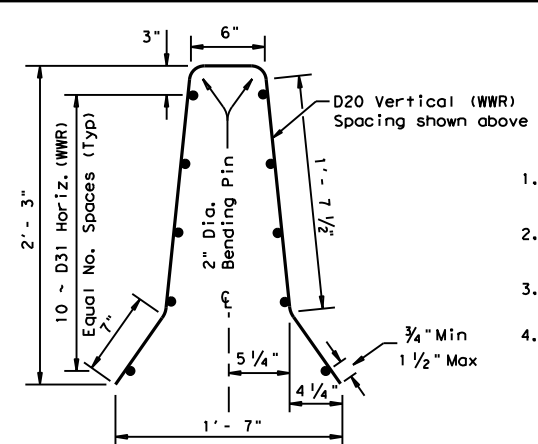
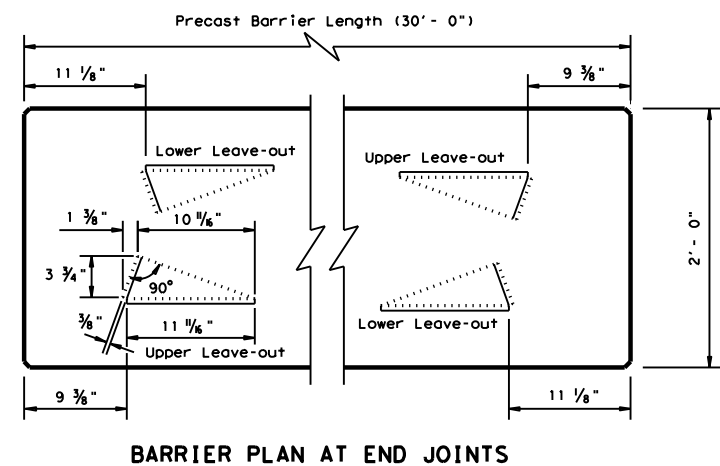
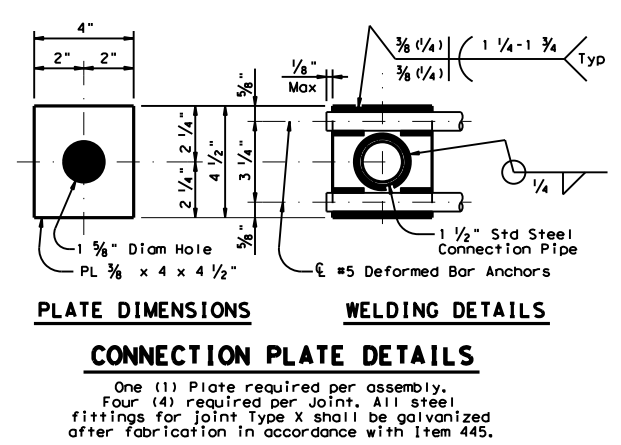
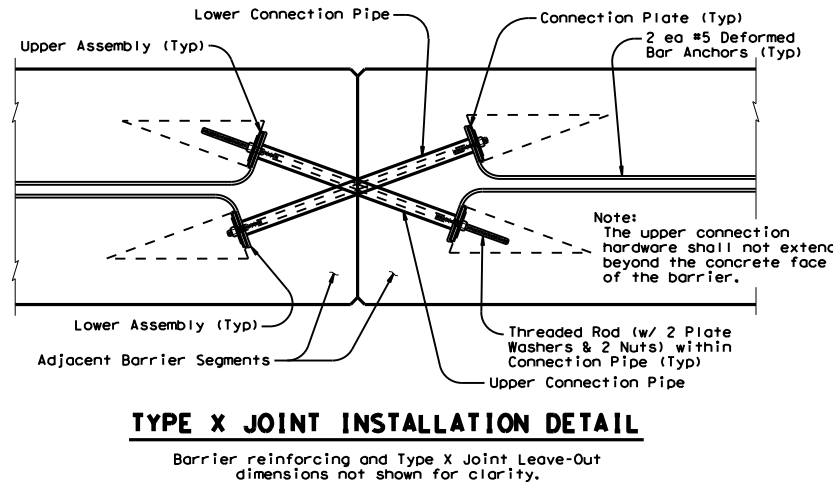
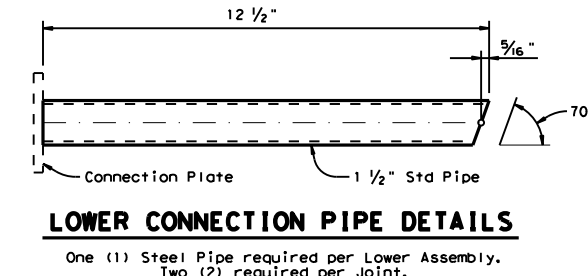
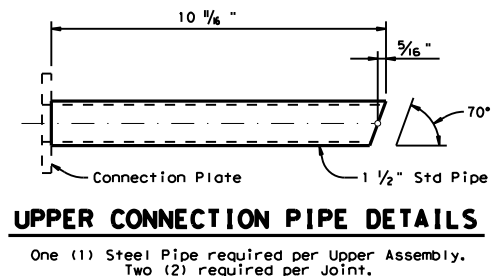
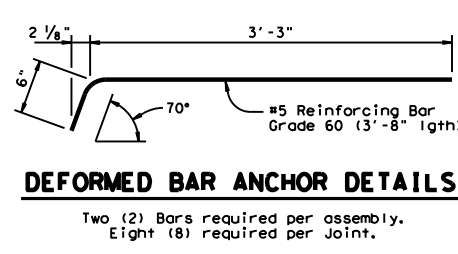
DATE: FILE:

DATE: 11/15/2022 1:00:06 PM
 FILE: T:\DALAO\PROJECTS\On\FM1382\Culvert replacement\rehab options\Sheets\STND\TCP\csb110.dgn
 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.



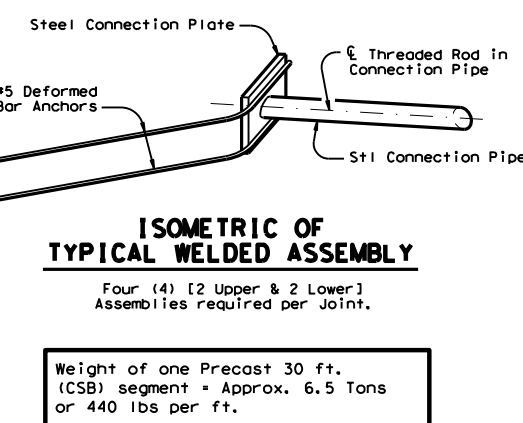
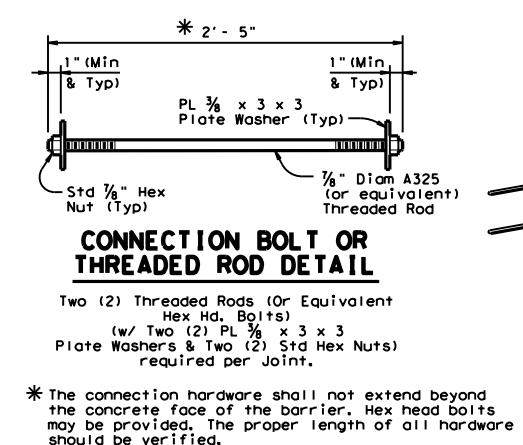
GENERAL NOTES

- Concrete shall be Class H with a minimum compressive strength of 3,600 psi.
- Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
- Precast barrier length shall be 30 ft. unless otherwise specified on the plans.
- All precast barrier edges shall have a 3/4" chamfer or toolled radius.
- All concrete, reinforcement, joint connection systems, grout etc. as shown, are considered as part of the barrier payment.
- All steel assemblies for joint shall be galvanized after fabrication in accordance with Item 445, "Galvanizing."
- Regardless of the method of handling, barrier lifting points shall be approx. 7.5 feet from the ends of the barrier. Lifting devices and attachments to barrier sections shall be approved by the Engineer.
- Surface finishing and grouting (where required) shall be two parts sand one part cement with enough water to make the mixture plastic. Grouting shall be done in a manner that will assure a smooth surface. Surface finishing shall be considered subsidiary to the various bid items involved.
- Conduit trough when required shall be shown elsewhere on the plans, or as directed by the Engineer.



Welded Wire Reinforcement (WWR) General Notes

- Deformed Welded Wire Reinforcement (WWR) shall conform to ASTM A497.
- Welded wire cage may be cut or bent to accommodate the Type X joint connection and drainage slots, as directed by the Engineer.
- All reinforcement shall comply with Item 440, "Reinforcing Steel."
- Combinations of reinforcing steel and WWR will be permitted, as directed by the Engineer. The dimension from the end of the barrier section to the first wire shall not exceed 3".



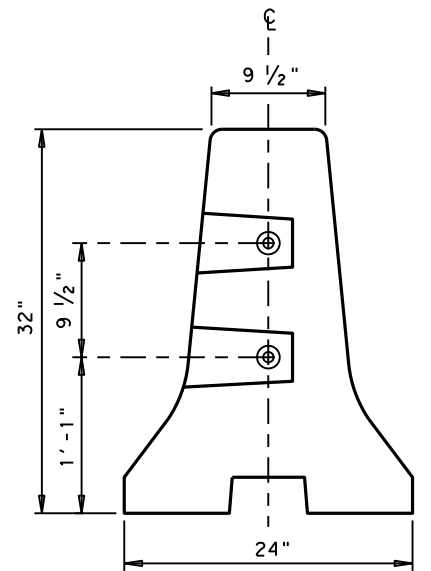
Weight of one Precast 30 ft. (CSB) segment = Approx. 6.5 Tons or 440 lbs per ft.

SHEET 1 OF 2

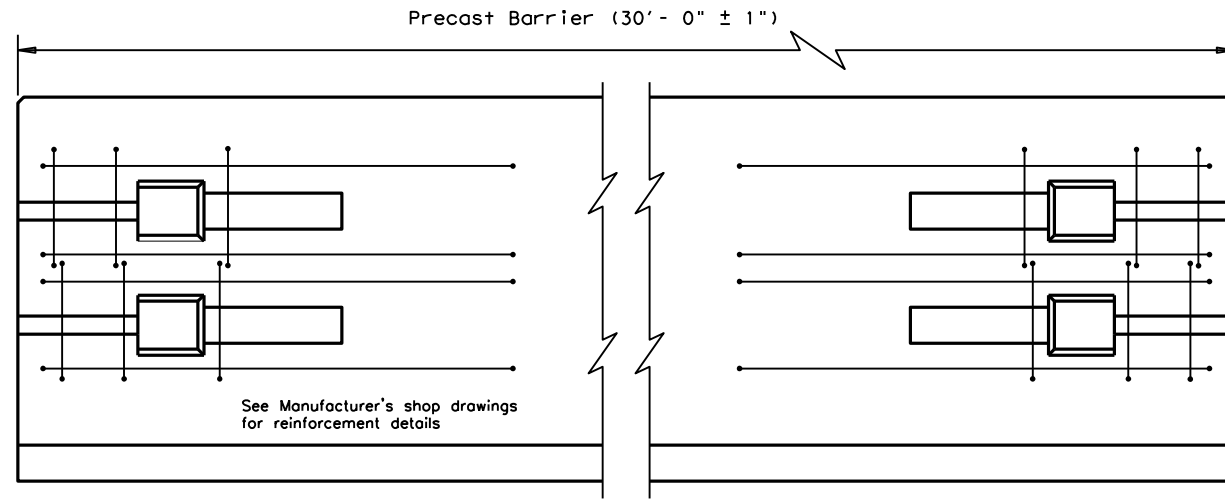
		Design Division Standard	
<h2 style="margin: 0;">CONCRETE SAFETY BARRIER (F-SHAPE)</h2>			
<h3 style="margin: 0;">PRECAST BARRIER (TYPE 1)</h3>			
<h2 style="margin: 0;">CSB(1)-10</h2>			
FILE: csb110.dgn	DN: TxDOT	CK: AM	DW: BD
© TxDOT December 2010	CONT: 1047	SECT: 03	JOB: 076, ETC.
REVISIONS			FM 1382
DIST: DAL	COUNTY: DALLAS	SHEET NO. 33	

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.

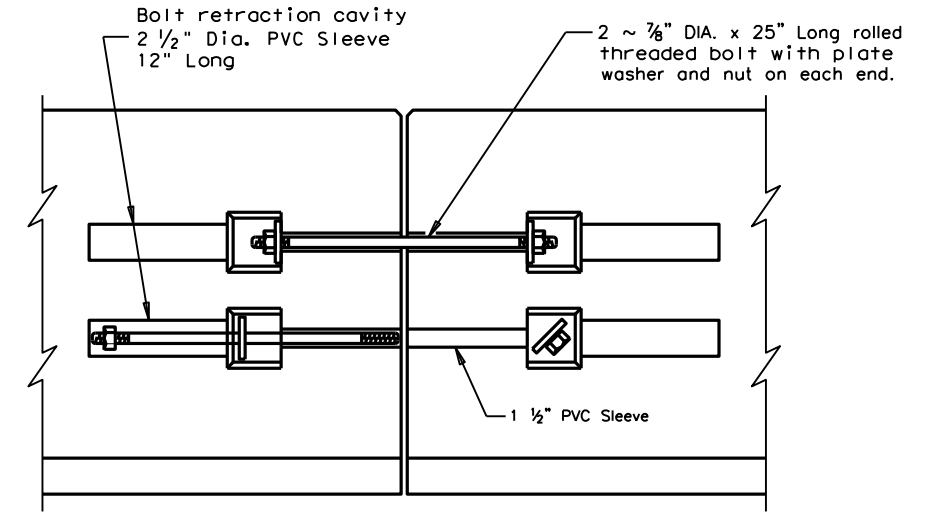
DATE: 11/15/2022 1:00:06 PM
 FILE: I:\DALAO\PROJECTS\On\FM1382\Culvert replacement\rehab_options\Sheets\STND\TCP\csb110.dgn



END VIEW (CSB) QUICK-BOLT
 QUICK-BOLT POCKET LOCATIONS

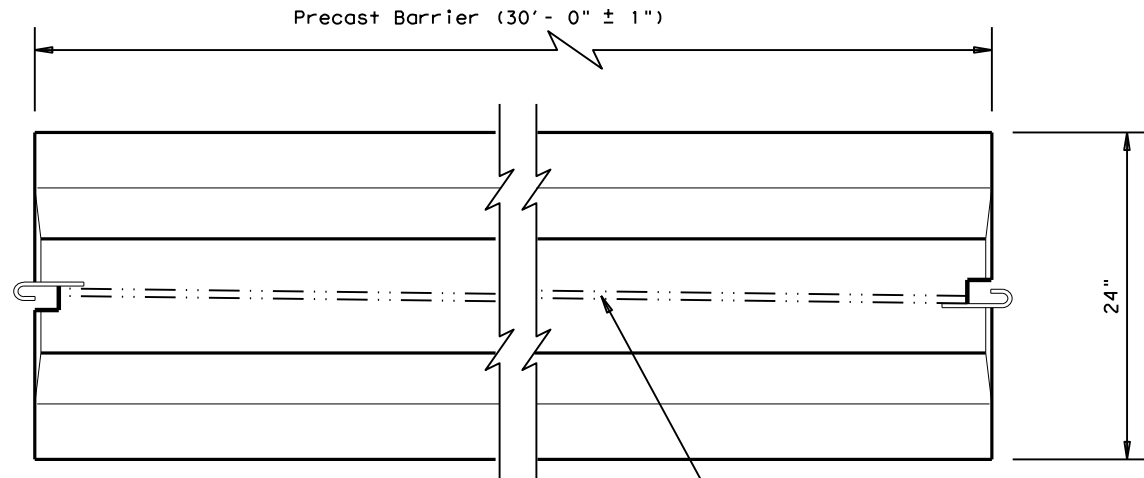


ELEVATION (CSB) QUICK-BOLT
 See Manufacturer's shop drawing for additional details

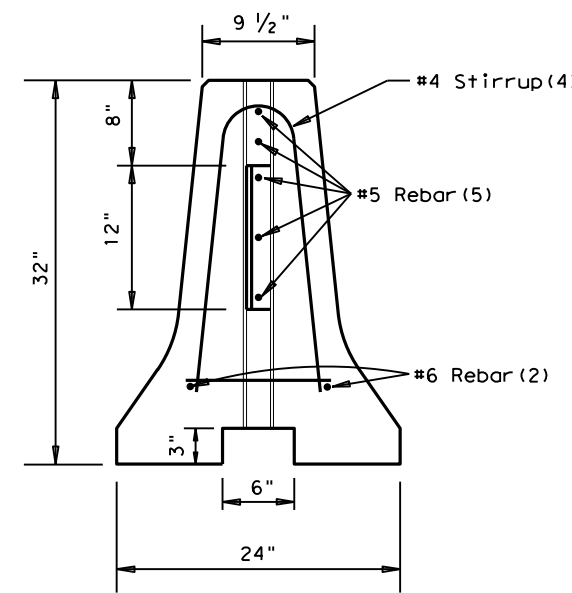


ELEVATION VIEW SHOWING JOINT CONNECTION
"QUICK-BOLT"

Joint Connection (Type Q)

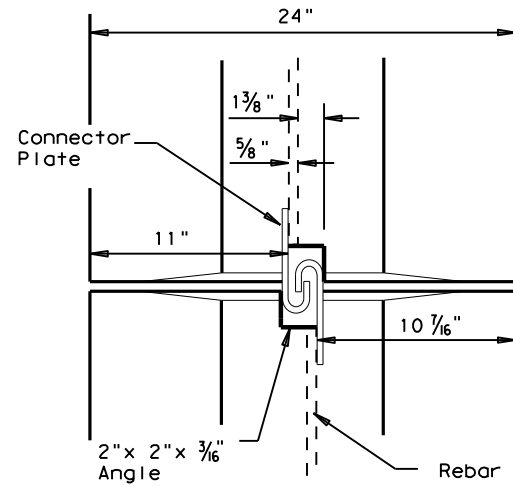


TOP VIEW
PRECAST (CSB) WITH J-J HOOKS
 See Manufacturer's shop drawing for additional details



END VIEW
J-J HOOK CONNECTION

Joint Connection (Type J)



VIEW FROM ABOVE
J-J HOOK CONNECTION

Proprietary Joint Connections (CSB)

Two proprietary joint connections are acceptable as alternates to the (Type X) connection shown, here on. These joint connections types are:

J-J Hooks by Easi-Set Industries, (800)547-4045
 Quick-Bolt by Bexar Concrete, (210)497-3773

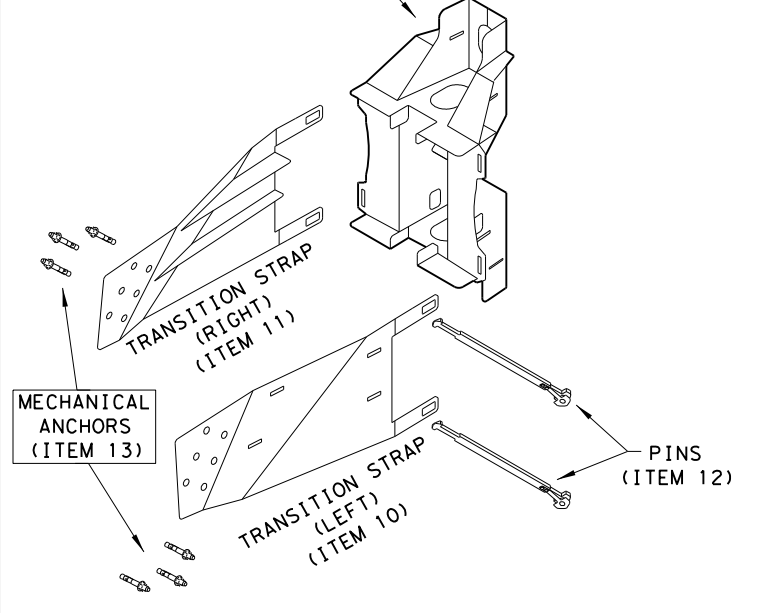
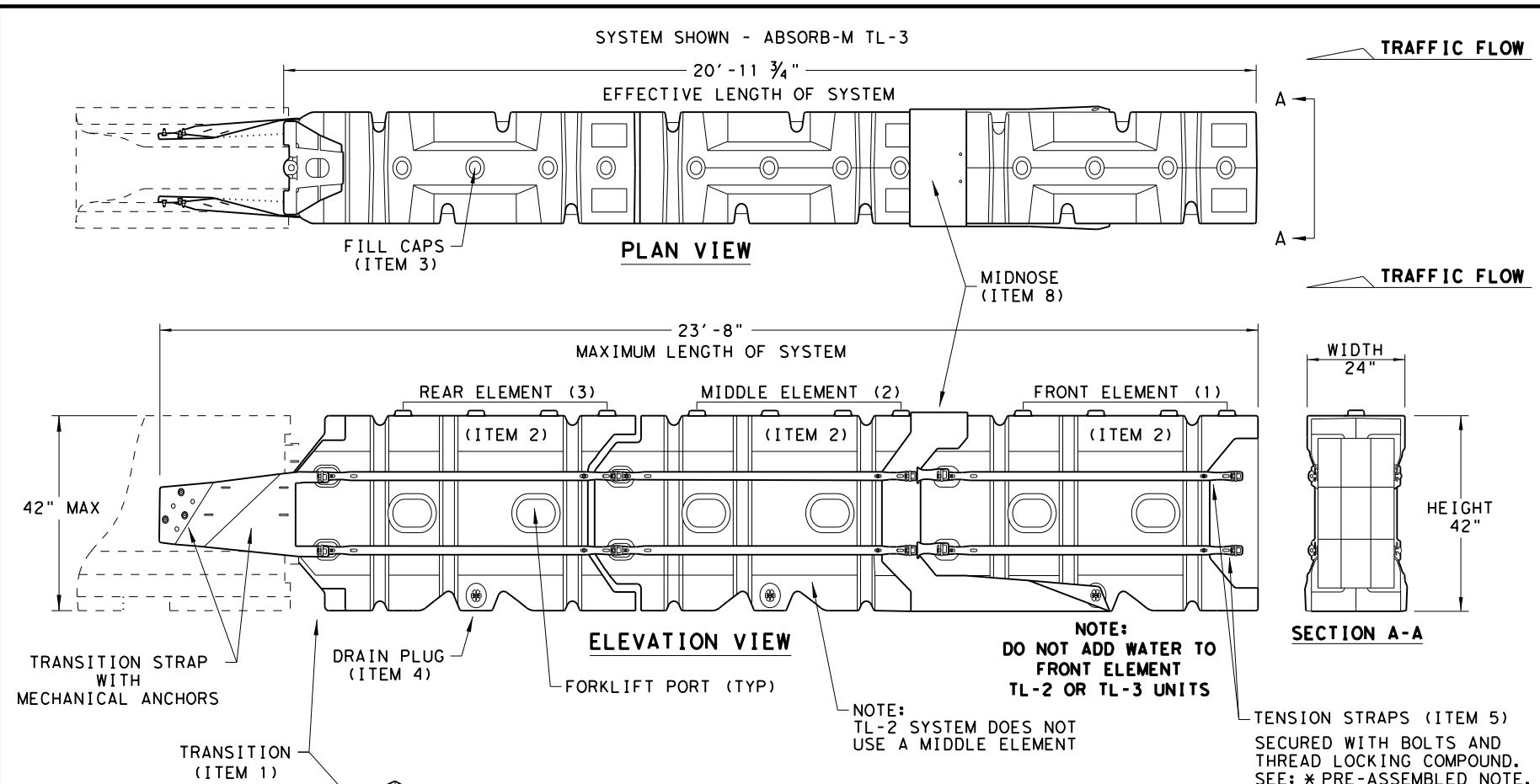
If one of these connection systems are exclusively specified in the plans, prior approval for sole source use must be obtained. Details of the connection components and barrier reinforcement for these systems, will be shown on the manufacturer's shop drawing(s) furnished to the Engineer.

SHEET 2 OF 2

		<i>Design Division Standard</i>	
CONCRETE SAFETY BARRIER (F-SHAPE) PRECAST BARRIER (TYPE 1) CSB(1)-10			
FILE: csb110.dgn	DN: TxDOT	CK: AM	DW: BD
© TxDOT December 2010	CONT	SECT	JOB
REVISIONS	1047	03	076, ETC.
	DIST	COUNTY	SHEET NO.
	DAL	DALLAS	34

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: 11/15/2022
 FILE: T:\DALAO\PROJECTS\On\FM1382\Culvert replacement\rehab_options\Sheets\STND\TCP\absorbm19.dgn

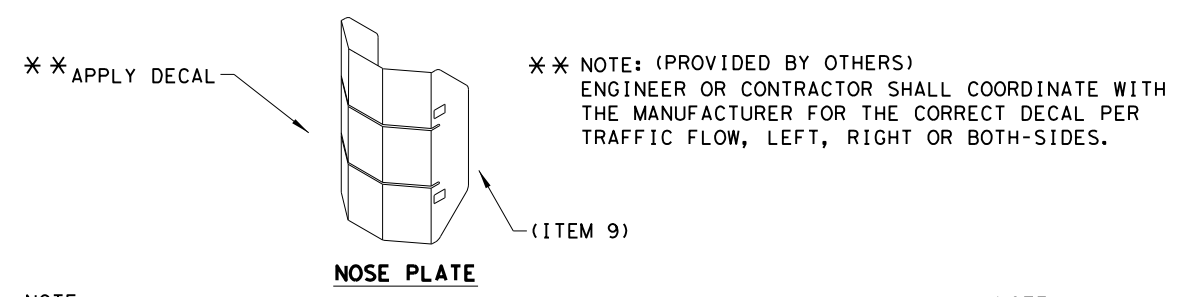


THE ABSORB-M IS A NON-REDIRECTIVE, GATING, CRASH CUSHION DESIGNED TO MEET THE LATEST TL-3 & TL-2 MASH REQUIREMENTS.

THE SYSTEM IS DESIGNED TO ACCOMMODATE A VARIETY OF F-SHAPE AND SINGLE SLOPE CONCRETE BARRIERS. CONTACT THE MANUFACTURER FOR GUIDANCE REGARDING OTHER ALLOWABLE SHAPES.

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

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

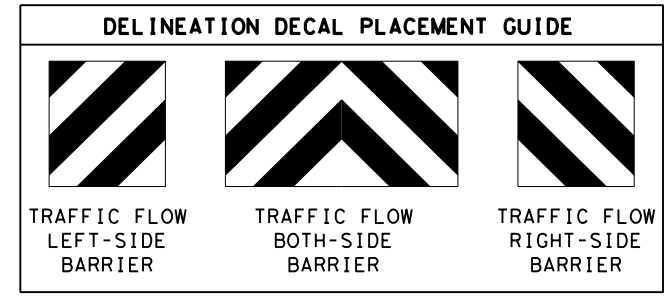


NOTE: APPLY A HIGH REFLECTIVE DECAL TO THE NOSE PLATE. DELINEATION DECAL ORIENTATION IS SHOWN ON THE CONSTRUCTION PLAN SET AND SHALL BE IN ACCORDANCE WITH THE TEXAS MUTCD FOR (TRAFFIC CONTROL DEVICES). DECALS ARE AVAILABLE FOR TRAFFIC FLOW ON THE LEFT-SIDE, BOTH -SIDES AND RIGHT-SIDE.

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

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

* COMPONENTS PRE-ASSEMBLED WITH ELEMENT ASSEMBLY



SACRIFICIAL

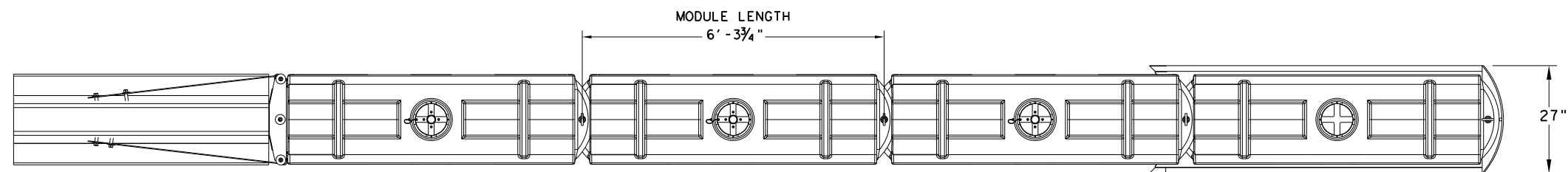
Texas Department of Transportation
 Design Division Standard

LINDSAY TRANSPORTATION SOLUTIONS
CRASH CUSHION
(MASH TL-3 & TL-2)
TEMPORARY - WORK ZONE
ABSORB (M) - 19

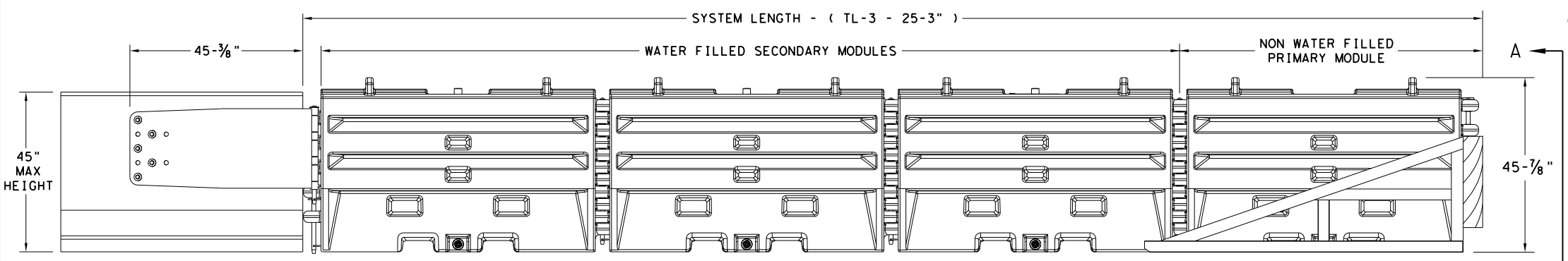
FILE: absorbm19	DN: TxDOT	CK: KM	DW: VP	CK:
© TxDOT: JULY 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	1047	03	076, ETC.	FM 1382
DIST	COUNTY	SHEET NO.		
DAL	DALLAS	35		

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: 11/15/2022
 FILE: T:\DALAO\PROJECTS\On\FM1382\Culvert replacement\rehab options\Sheets\STND\TCP\sled19.dgn



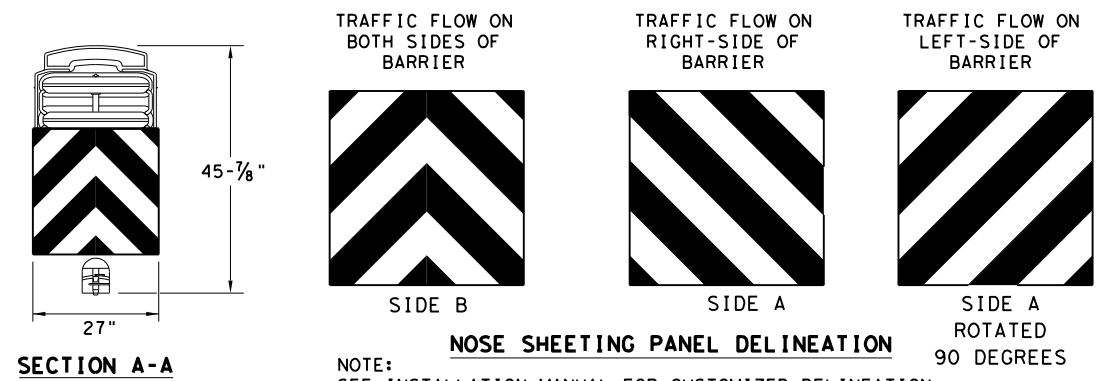
PLAN VIEW



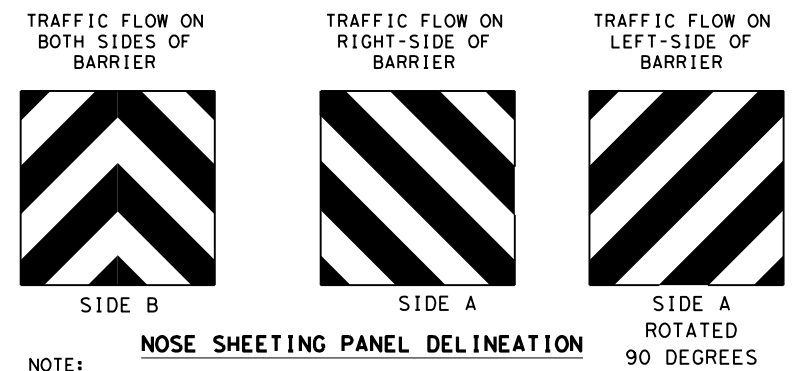
ELEVATION VIEW

GENERAL NOTES

1. REFER TO THE INSTALLATION MANUAL FOR SPECIFIC SYSTEM ASSEMBLY AND MODULE ORIENTATION. FOR ADDITIONAL INFORMATION, CONTACT TRAFFIX, INC. AT (949) 361-5663.
2. THE SLED SYSTEM IS A MASH APPROVED TEST LEVEL 3 (TL-3) CRASH CUSHION APPROVED FOR USE IN TEMPORARY WORK ZONES. THE SLED SYSTEM IS A NON-REDIRECTIVE, GATING CRASH CUSHION THAT DOES NOT NEED TO BE ATTACHED TO THE GROUND AND CAN BE INSTALLED ON CONCRETE, ASPHALT, GRAVEL OR COMPACTED SOIL.
3. MAXIMUM PERMISSIBLE CROSS SLOPE IS 8° (DEGREES) (14%).
4. THE INSTALLATION AREA SHOULD BE FREE FROM CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
5. THE SLED SYSTEM CAN BE ATTACHED TO:
 - CONCRETE BARRIER, TEMPORARY OR PERMANENT, 45" MAXIMUM HEIGHT
 - STEEL BARRIER
 - PLASTIC BARRIER
 - CONCRETE BRIDGE ABUTMENTS
 - W-BEAM GUARD RAIL
 - THRIE BEAM GUARD RAIL



SECTION A-A

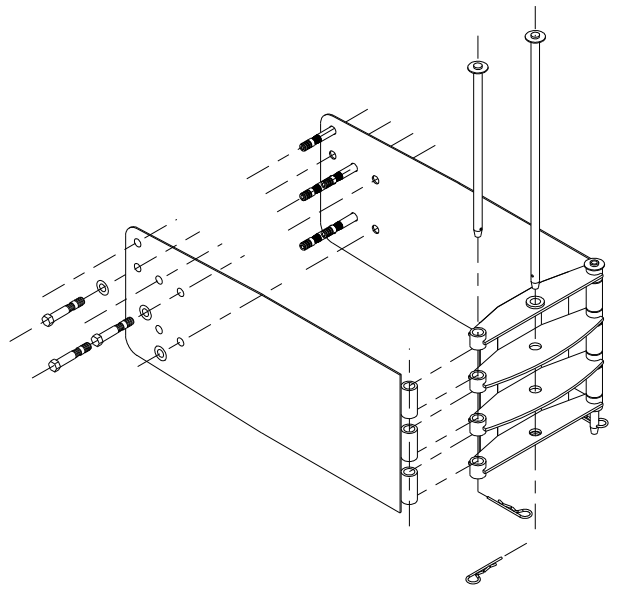


NOSE SHEETING PANEL DELINEATION

NOTE:
SEE INSTALLATION MANUAL FOR CUSTOMIZED DELINEATION NOSE SHEETING FOR DECAL PLACEMENT.

TEST LEVEL	NUMBER OF SECONDARY MODULES	SYSTEM LENGTH
TL-3	3	25' 3"

BILL OF MATERIAL		
PART NUMBER	DESCRIPTION	QTY: TL-3
45131	TRANSITION FRAME, GALVANIZED	1
45150	TRANSITION PANEL, GALVANIZED	2
45147-CP	TRANSITION SHORT DROP PIN W/ KEEPER PIN, GALVANIZED	2
45148-CP	TRANSITION LONG DROP PIN W/ KEEPER PIN, GALVANIZED	1
45050	ANCHOR BOLTS	9
12060	WASHER, 3/4" ID X 2" OD	9
45044-Y	SLED YELLOW WATER FILLED MODULE	3
45044-YH	SLED YELLOW "NO FILL" MODULE	1
45044-S	CIS (CONTAINMENT IMPACT SLED), GALVANIZED	1
45043-CP	T-PIN W/ KEEPER PIN	4
18009-B-I	FILL CAP W/ "DRIVE BY" FLOAT INDICATOR	3
45033-RC-B	DRAIN PLUG	3
45032-DPT	DRAIN PLUG REMOVAL TOOL	1



SLED TRANSITION COMPONENTS FOR ATTACHMENT TO CMB

NOTE:
SEE MANUFACTURER'S INSTALLATION MANUAL FOR FURTHER DETAILS.

TRANSITION OPTIONS
SLED TRANSITION TO CONCRETE TRAFFIC BARRIER (TEMPORARY OR PERMANENT)
SLED TRANSITION TO STEEL TRAFFIC BARRIER (CONTACT MFGR FOR PROPER TRANSITION)
SLED TRANSITION TO PLASTIC TRAFFIC BARRIER (CONTACT MFGR FOR PROPER TRANSITION)
SLED TRANSITION TO W-BEAM OR THRIE BEAM GUARD RAIL (CONTACT MFGR FOR PROPER TRANSITION)
SLED TRANSITION TO CONCRETE BRIDGE ABUTMENT

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE SLED, IT IS NOT INTENDED TO REPLACE THE INSTALLATION INSTRUCTIONS MANUAL.

SACRIFICIAL

Design Division Standard

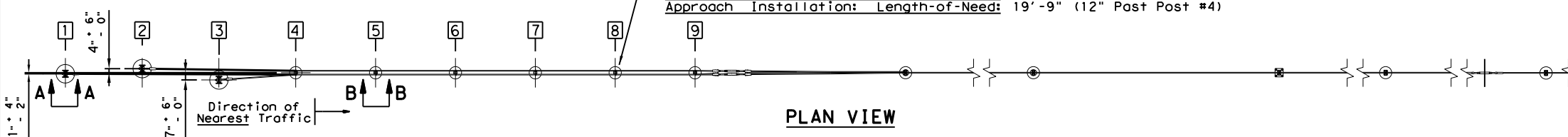
SLED
 CRASH CUSHION
 TL-3 MASH COMPLIANT
 (TEMPORARY, WORK ZONE)
 SLED-19

FILE: sled19.dgn	DN: TxDOT	CK: KM	DW: VP	CK:
© TxDOT: DECEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	1047	03	076, ETC.	FM 1382
DIST	COUNTY		SHEET NO.	
DAL	DALLAS		36	

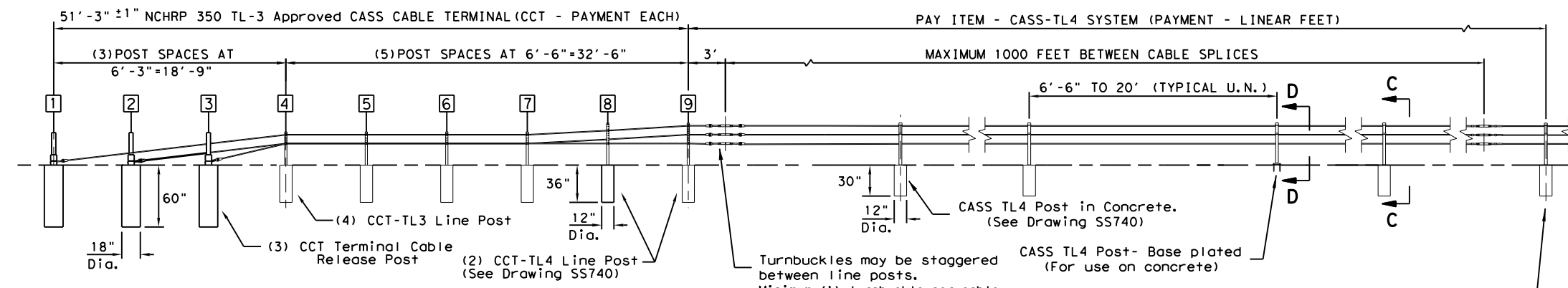
DATE: 11/15/2022
 FILE: T:\DALAO\PROJECTS\01\FM1382\Culvert replacement\rehab options\Sheets\STND\RDW\casst1414.dgn
 DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

Preferred Installation: Locate post #2 away from nearest traffic.
 System has been successfully tested with opposite installation.

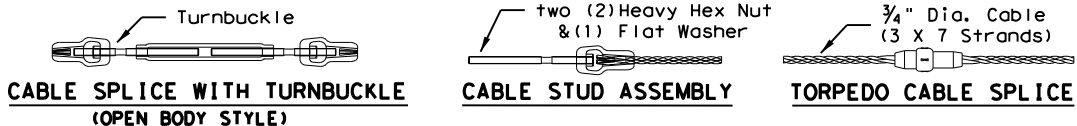
Length-of-Need Cass Cable Terminal (CCT):
Departure Installation: Length-of-Need: 44'-9" (At Post #8)
Approach Installation: Length-of-Need: 19'-9" (12" Post Post #4)



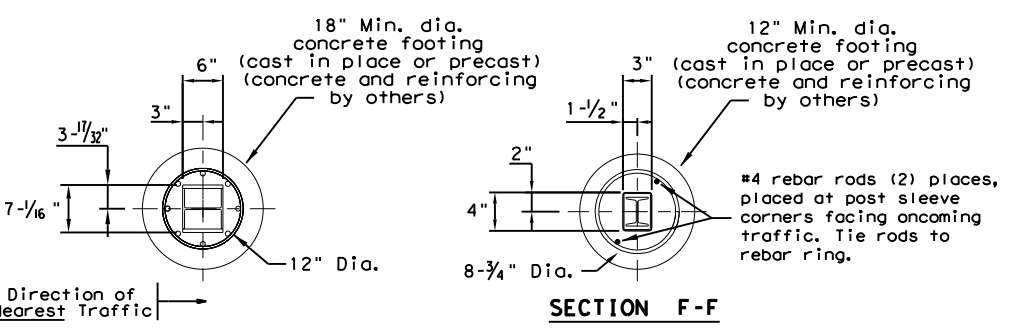
PLAN VIEW



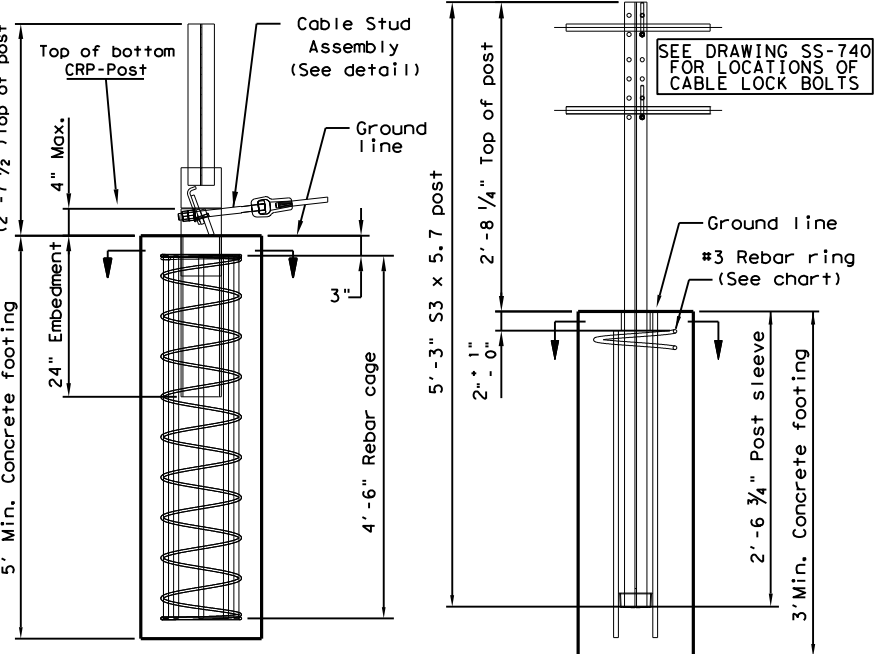
ELEVATION VIEW (TYPICAL LAY-OUT)



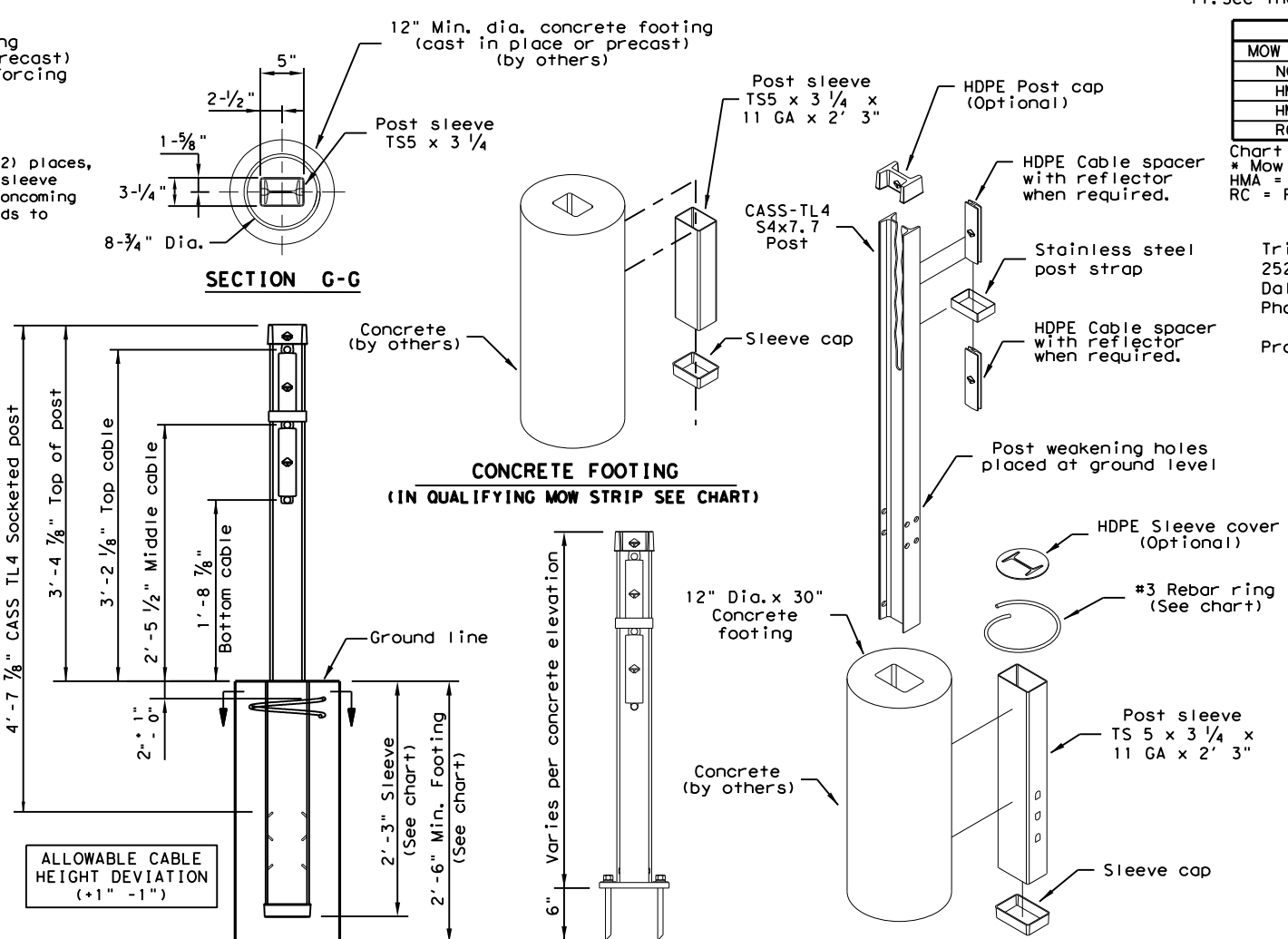
CABLE SPLICE WITH TURNBUCKLE (OPEN BODY STYLE)
CABLE STUD ASSEMBLY
TORPEDO CABLE SPLICE



SECTION E-E
SECTION F-F



VIEW A-A (CABLE RELEASE POST 1-3)
VIEW B-B (TERMINAL LINE POST 4-7)



SECTION C-C (SOCKETED POST)
SECTION D-D (BASE PLATED POST)
STANDARD POST & CONCRETE FOOTING (SOCKETED POST)

GENERAL NOTES

- This drawing is a general overview of CASS TL-4 Barrier System. See SS-740 (latest version) for specific details of CASS cable terminal (CCT) and cable safety system (CASS) requirements, proper installation, options and specification.
- CASS is designed for bi-directional traffic flows and can be installed on either side of the median. Contact Trinity (800-527-6050) or consult the design, installation, or repair manual(s) for additional information.
- All concrete for CASS footings shall be TxDOT class A. If class A or stronger concrete is utilized for the mowstrip, please see chart below for allowable footing depth and sleeve deviations.
- All posts shall be socketed unless otherwise specified. All cables shall be pre-stretched unless otherwise specified.
- For payment see Special Specification "Cable Barrier System".
- CASS-TL4 shall be installed on shoulders or medians with slopes of 6:1 or flatter without obstructions, depressions, etc. That may significantly affect the stability of an errant vehicle. Grading of site and/or appropriate fill materials may be required. The designer/installer shall "Flatten" or "Round" various topographical inconsistencies that could interfere with the ability of the installer to consistently maintain the design height (in relation to the terrain) of the cables. Please consult manual(s) and/or TxDOT Memo(s) for installations in "Ditch Sections".
- CASS TL-4 post spacing may be modified to avoid obstacles that conflict with the installation of cass-tl4 line posts or to reduce deflection on radiuses. No post space can exceed the maximum post TxDOT space limit of 20'. Reducing or increasing post spacing affects deflection. CASS TL-4 may be laterally transferred at a rate not to exceed 30:1.
- Post foundations may be drilled through existing pavement. Please see line post foundation chart for minimum footing requirements in various applications.
- For aesthetic purposes Trinity recommends all sleeves, driven posts, and lower cable release posts to be installed reasonably plumb (approximately 1/8" per foot).
- CASS TL-4 shall be installed in well-drained, compacted, NCHRP Report 350 Standard soil. If soil does not meet this classification, if solid rock/concrete is encountered below grade or if soil is susceptible to severe freeze/thaw cycles, please contact Trinity about alternate footing design(s). Trinity suggests the use of "Mow strips" for erosion prevention and ease of maintenance / installation.
- See the Texas MUTCD for proper "Barrier" Delineation.

MOW STRIP DETAIL*			CONCRETE FOOTING CHART		
MOW STRIP	DEPTH	WIDTH	FOOTING	TUBE SLEEVE	REBAR RING
NONE			30" Min.	27" Min.	YES
HMA	6" Min.	3' Min.	27" Min.	15" Min.	NO
HMA	8" Min.	3' Min.	24" Min.	15" Min.	NO
RC	3" Min.	3' Min.	24" Min.	15" Min.	NO

Chart does not apply to Terminal Posts 1 thru 9.
 * Mow strip or pavement.
 HMA = Hot Mix Asphalt (Not Recycled Asphalt Pavement).
 RC = Reinforced Concrete (TxDOT Class A Minimum).

Trinity Highway Products, LLC.
 2525 Stemmons Freeway
 Dallas, TX 75207
 Phone: (800) 644-7976
 Product: INFO@TRIN.NET

CABLE TENSION CHART	
FAHRENHEIT DEGREES	PRE-STRETCHED LB / FORCE
-10	7300
0	7000
10	6600
20	6300
30	6000
40	5600
50	5300
60	5000
70	4600
80	4300
90	4000
100	3600
110	3300
120	3000
130	2700
140	2500
150	2300

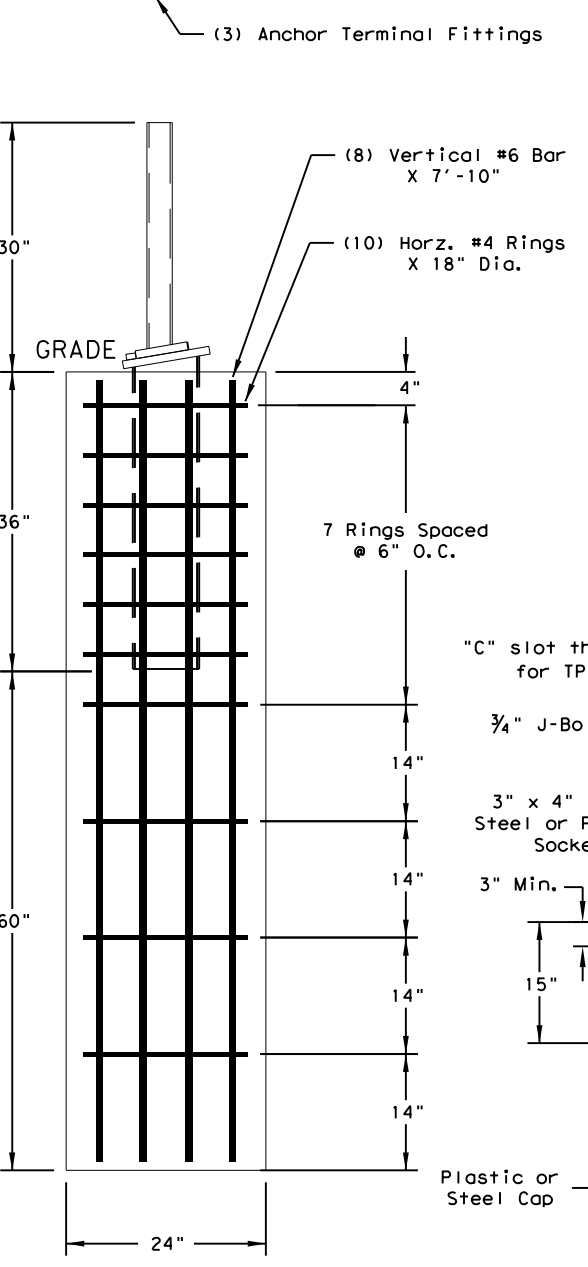
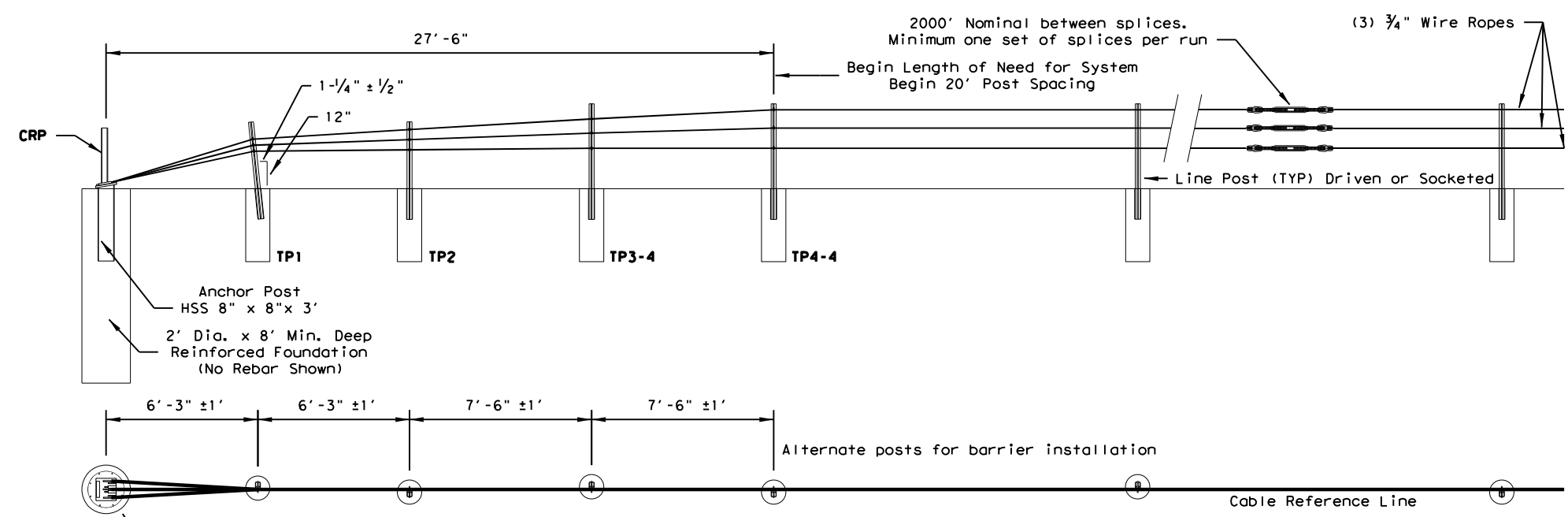
Allowable deviation from chart in tangent sections: +800, -200 pounds/force. Cable tension readings are typically higher in curved cable sections.

Texas Department of Transportation
TRINITY CABLE SAFETY SYSTEM (TL-4)
CASS (TL4) - 14

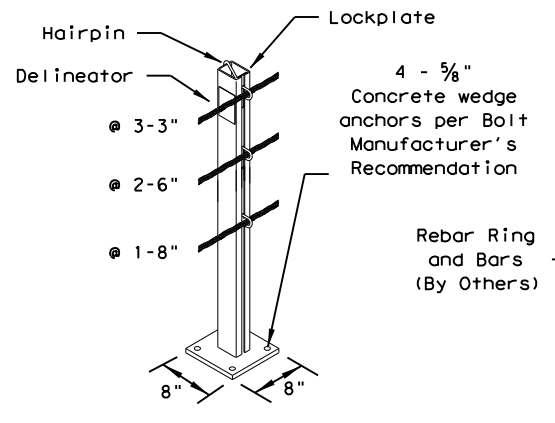
FILE: casst1414.dgn	DN: TxDOT	CK: RM	DW: VP	CK:
©TxDOT: March 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	1047	03	076, ETC.	FM 1382
DIST	COUNTY	SHEET NO.		
DAL	DALLAS			37

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.

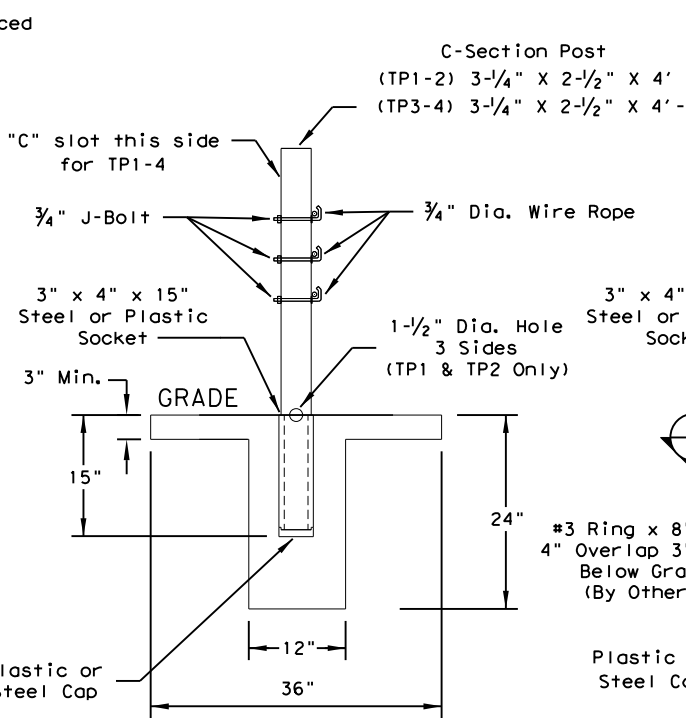
DATE: 11/15/2022
 FILE: T:\DALAO\PROJECTS\On\FM1382\FM1382 Culvert replacement\rehab options\Sheets\STND\RDW\gbr\trt1414.dgn



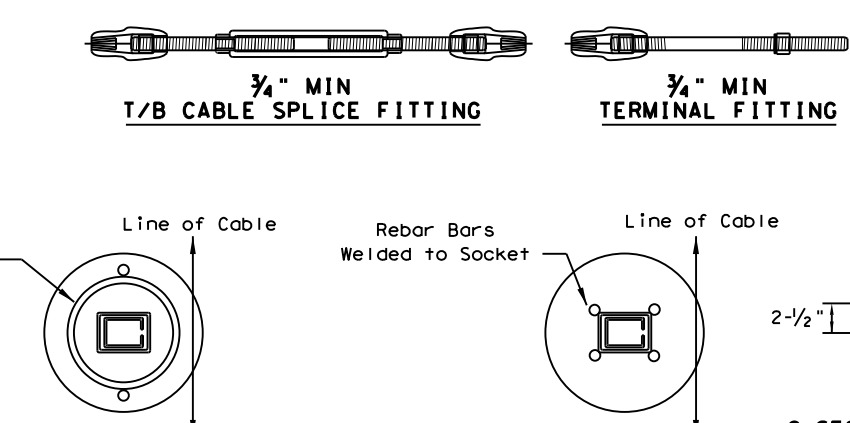
CABLE RELEASE AND ANCHOR POST



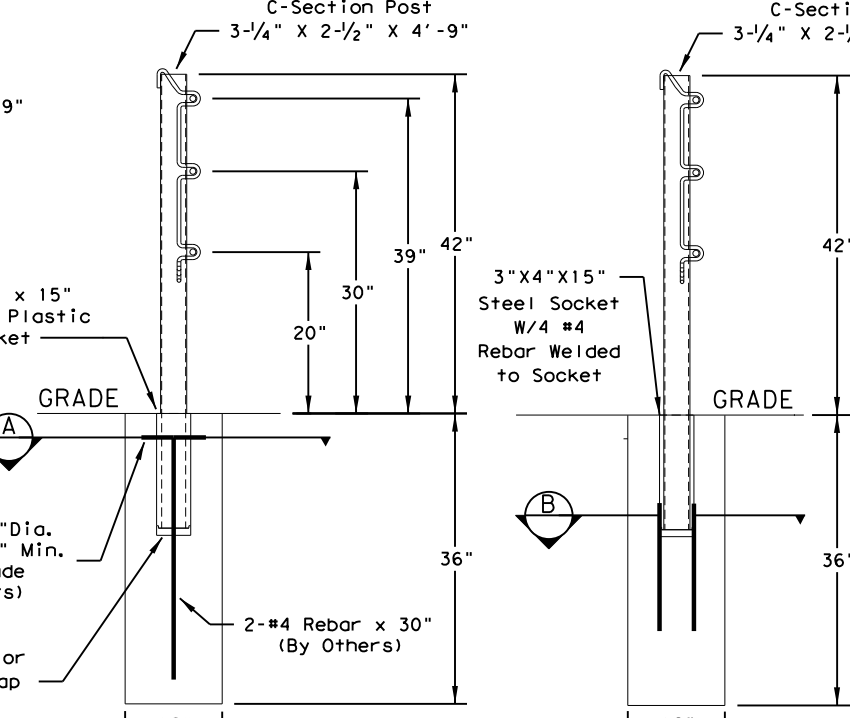
LINE POST (BASE-PLATED OPTION)
 Low-Fill Box Culvert Less than 15" Fill



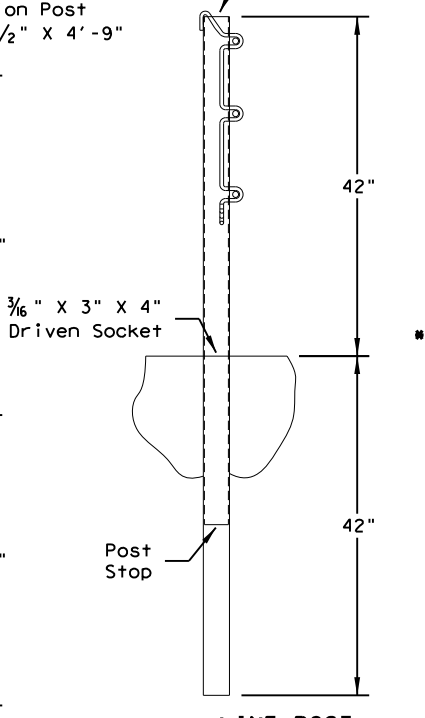
TERMINAL POST (SHOWN WITH TUBE PLATE OPTION)
 (Shown with Tube Plate Option) (See Note 10)



SECTION A **SECTION B**



LINE POST SOCKETED
 (Shown with Rebar Ring/Bars Socket Option) (See Note 9)



LINE POST SOCKETED
 (Shown with Welded Rebar Socket Option) (See Note 9)

LINE POST (DRIVEN OPTION)
 (Shown with Driven Socket Option) (See Note 9)

- GENERAL NOTES**
- For additional information contact Gibraltar, Inc. at 1-800-495-8957, 830-798-5444, or see the manufacturer's product manual.
 - All concrete shall be CLASS A.
 - The Cable Barrier System shall be installed on shoulders or on medians with slopes of 6:1 or flatter. If installed on slopes steeper than 6:1 up to 4:1 the TL-4 system performs as a TL-3 and Gibraltar must be contacted for various guidelines related to placement.
 - The Cable Barrier System is accepted by the FHWA Test Level - 4.
 - See the Texas MUTCD for proper "Barrier" delineation.
 - Rock Clause: Where solid rock is encountered:
 - For socketed post, continue digging 12" diameter, 15" deep into rock or the required plan depth, whichever comes first.
 - For driven post, core drill a 4" diameter hole 18" deep into rock or the required plan depth, whichever comes first.
 - For Anchor post, continue digging 24" diameter, 30" deep into rock or the required plan depth, whichever comes first.
 - Tolerances:
 - * LP = 3" out of plumb, at top
 - * Cable height = 1"
 - * Anchor Post = 5" off of Cable Reference Line
 - The Gibraltar cable barrier system shall be installed in NCHRP Report 350 standard compacted soil. Soil must be well drained.
 - All non-welded rebar by others.
 - Minimum recommended line post foundation.
 - Without mowstrip, 36" Deep x 12" diameter foundations with #3 rebar ring x 8" diameter with two #4 rebar vertical bars 30" long
 - With 4" minimum depth hot mix asphalt, 30" deep x 12" diameter foundations with #3 rebar ring x 8" diameter with two #4 rebar vertical bars 30" long.
 - With 3" minimum depth concrete mowstrip, 24" deep x 12" diameter foundations. (No rebar required)
 - Direct drive post 42" deep.

Temperature (°F)	Tension
-10 °F	8000
0 °F	7600
10 °F	7200
20 °F	6800
30 °F	6400
40 °F	6000
50 °F	5600
60 °F	5200
70 °F	4800
80 °F	4400
90 °F	4000
100 °F	3600
110 °F	3200

Deflection	Post Spacing
8'-0"	20 FT
7'-0"	12 FT
6'-8"	10 FT

* Allowable Deviation from Chart +/- 10%

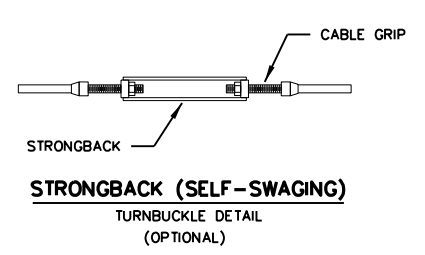
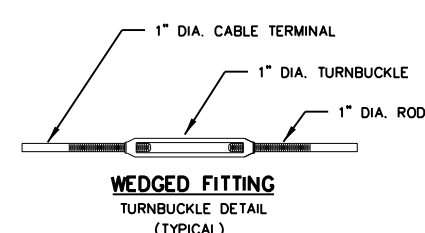
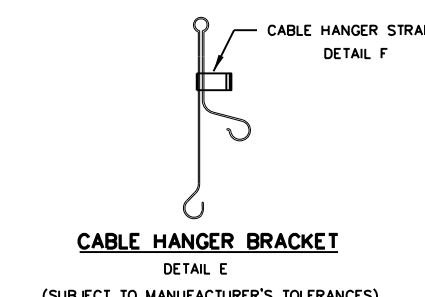
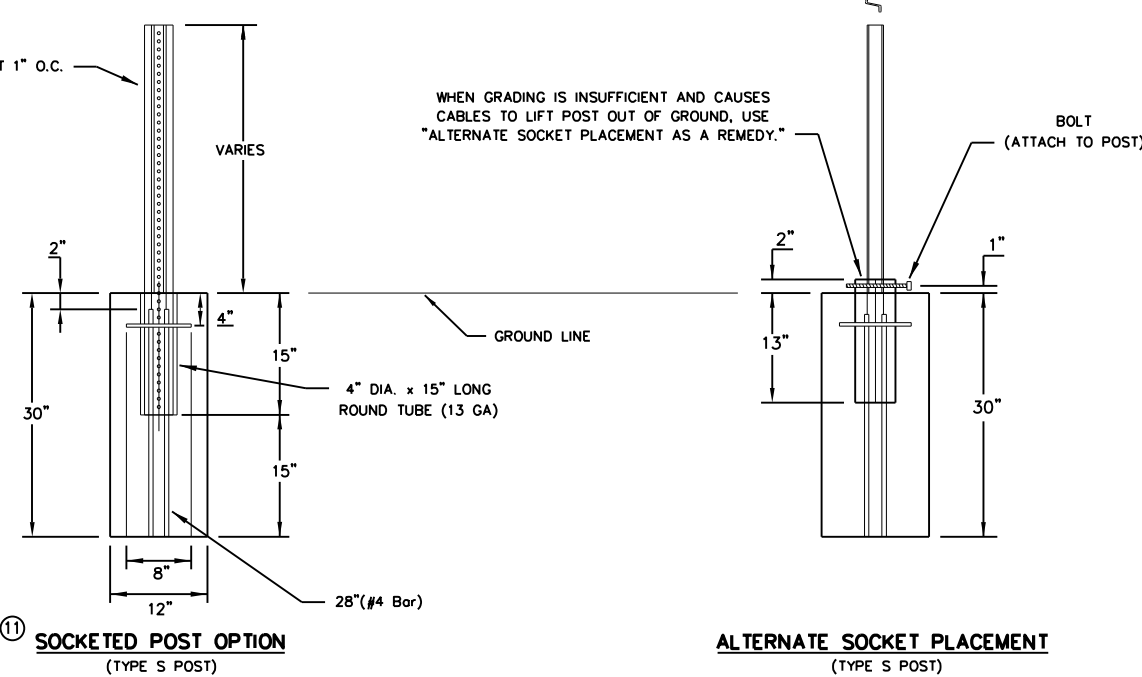
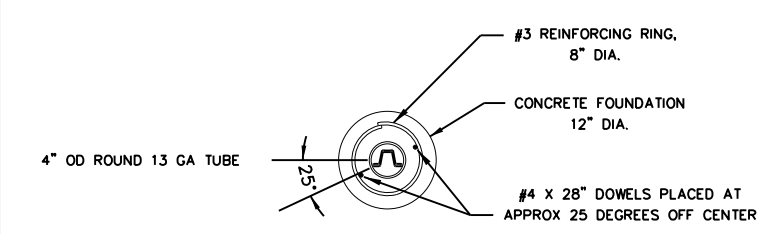
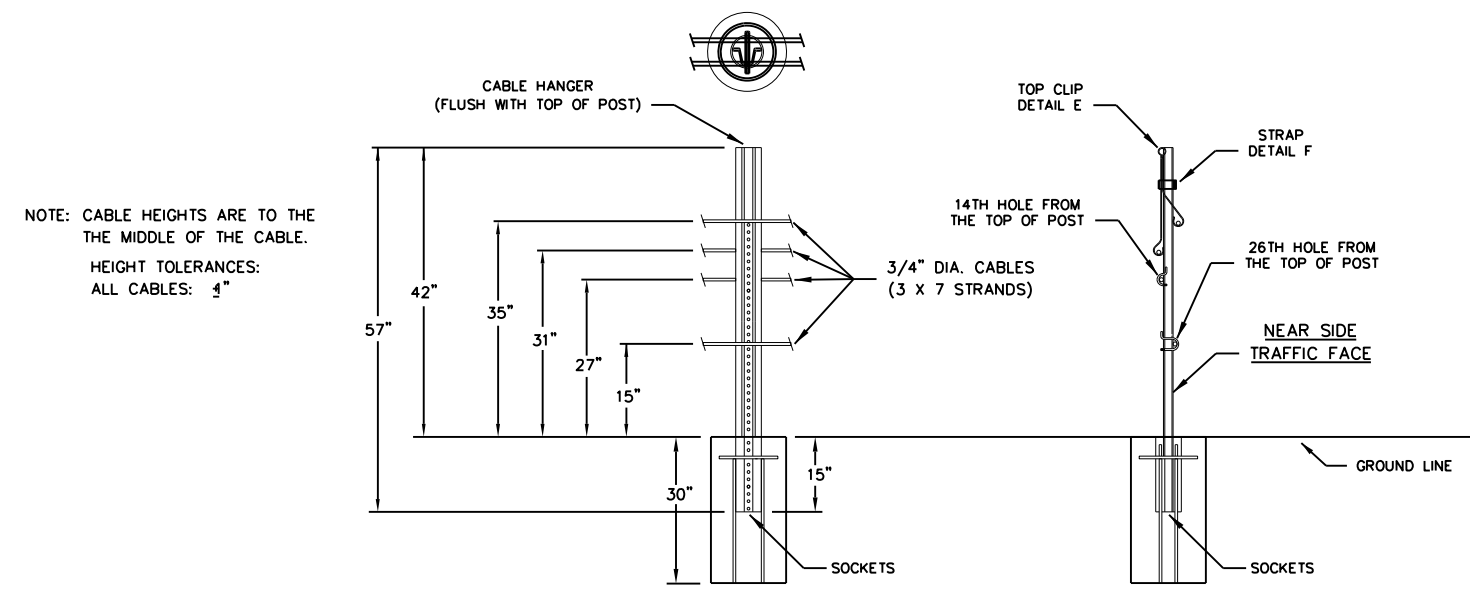
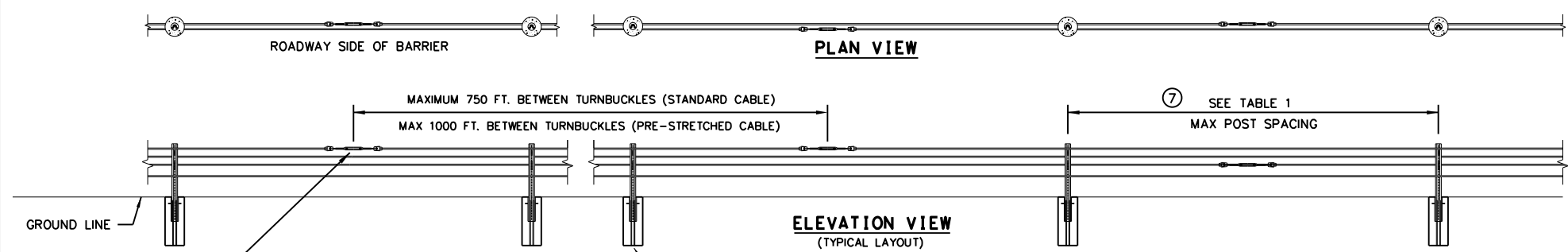
Texas Department of Transportation
 Design Division Standard

GIBRALTAR CABLE BARRIER SYSTEM (TL-4)

GBRL TR (TL4) - 14

FILE: gbrltr1414.dgn	DN: TxDOT	CK: RM	DW: VP	CK:
© TxDOT: March 2014	CONT: 1047	SECT: 03	JOB: 076, ETC.	HIGHWAY: FM 1382
REVISIONS	DIST: DAL	COUNTY: DALLAS	SHEET NO. 38	

DATE: 11/15/2022
 FILE: T:\DALAO\PROJECTS\On\FM1382\FM1382 Culvert replacement\rehab_options\Sheets\STND\RDWY\nucab\let1414.dgn
 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

- FOR ADDITIONAL INFORMATION CONTACT YOUR DISTRIBUTOR OR NUCOR STEEL MARION, INC. AT (740) 383-4011.
- FOR PAYMENT SEE SPECIAL SPECIFICATION "CABLE BARRIER SYSTEM".
- FOR ADDITIONAL INFORMATION SEE THE MANUFACTURER'S PRODUCT MANUAL.
- THE NU-CABLE SYSTEM IS DESIGNED FOR BI-DIRECTIONAL TRAFFIC FLOWS. SEE THE MANUFACTURER'S PRODUCT MANUAL FOR PLACEMENT ADJACENT TO GUARDRAIL END TREATMENTS.
- THE NU-CABLE SYSTEM SHALL BE INSTALLED ON MEDIANS WITH SLOPES OF 6:1 OR FLATTER WITHOUT OBSTRUCTIONS, DEPRESSIONS, ETC; THAT MAY SIGNIFICANTLY AFFECT THE STABILITY OF AN ERRANT VEHICLE.
- THE NU-CABLE SYSTEM MAY BE INSTALLED ON EITHER SIDE OF THE ROADWAY. Rib-Bak™ CABLE LINE POSTS MAY BE SOCKETED OR DRIVEN DESIGN.
- THE TL-4 FOR 6:1 SLOPES CAN USE 4# / LF POST. SEE TABLE #1 FOR POST SIZE PER SPACING.
- SEE (TABLE 2) FOR TENSION AMOUNT AT SPECIFIC CABLE TEMPERATURE FOR INITIAL INSTALLATION.
- SEE (TABLE 3) FOR TENSION AMOUNT AT SPECIFIC CABLE TEMPERATURE FOR MAINTENANCE.
- FOURTH (LOWEST) CABLE IS NOT OPTIONAL ON THE TL-4 SYSTEM.
- CONSULT YOUR PROJECT PLAN SHEETS AND CABLE BARRIER SPECIFICATIONS FOR DESIRED SOCKET MATERIAL.
- ALL FOUNDATION DESIGNS ARE BASED ON NCHRP 350 STRONG (S1) SOIL. CONSULT THE MANUFACTURER FOR SPECIFIC FOUNDATION DESIGN IF SOIL TYPES DIFFER.

⑦ **TABLE 1**

POST SIZE TABLE	
POST SPACING	POST SIZE
0' - 17'-6"	4# / LF X 4' OR 6' POST
17'-6" - 20'	5# / LF X 4' POST

POST SPACING IS PER 8 FOOT DEFLECTION REQUIREMENTS. CONSULT PRODUCT MANUAL IF GREATER DEFLECTION IS PERMISSIBLE.

⑧ **TABLE 2**

CABLE TENSION CHART	
INITIAL INSTALL	
F	LBF
120	4624
110	4986
100	5350
90	5713
80	6077
70	6440
60	7167
50	7894
40	8619
30	9346
20	10073
10	10800
0	11525
-10	12252
-20	12979
-30	13706

⑨ **TABLE 3**

CABLE TENSION CHART	
MAINTENANCE	
F	LBF
120	4021
110	4336
100	4652
90	4968
80	5284
70	5600
60	6232
50	6864
40	7495
30	8127
20	8759
10	9391
0	10022
-10	10654
-20	11286
-30	11918

SHEET 1 OF 2

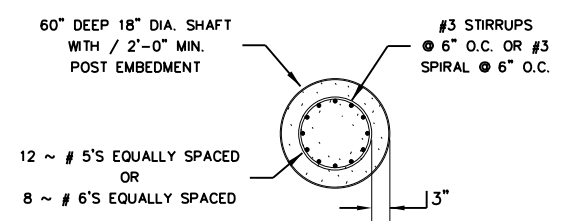
Design Division Standard

NU-CABLE BARRIER SYSTEM (TL-4)
(4 CABLE)
NU-CABLE (TL4) - 14

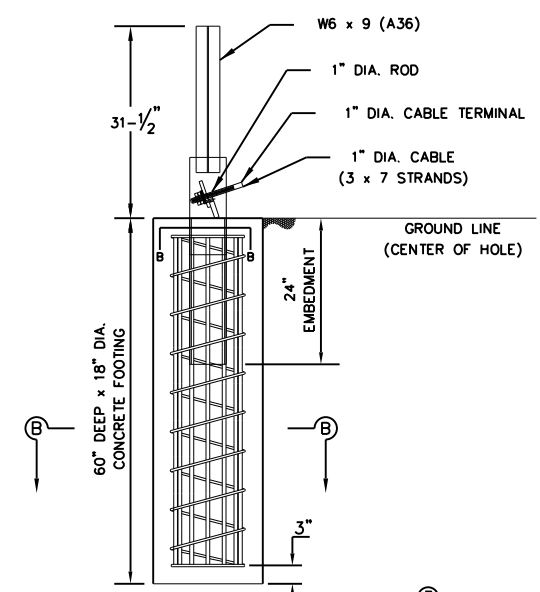
FILE:	DN:	CK:	DW:	CK:
© TxDOT:	CONT	SECT	JOB	HIGHWAY
REVISIONS	1047	03	076, ETC.	FM 1382
	DIST	COUNTY	SHEET NO.	
	DAL	DALLAS	39	

DATE: 11/15/2022
 FILE: T:\DALAO\PROJECTS\On\FM1382\FM1382 Culvert replacement\rehab_options\Sheets\STND\RDWY\ncubablet1414.dgn

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.



SECTION B-B
(CABLE RELEASE POST)



DETAIL A - CRP IN CONCRETE FOOTING
(3000 PSI MIN CONCRETE)

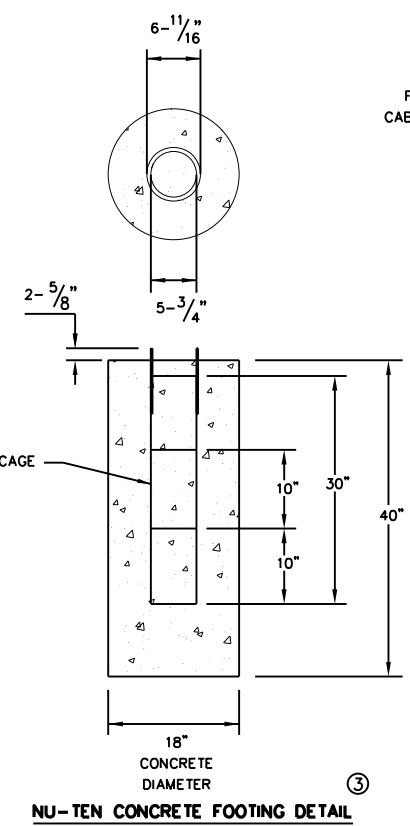
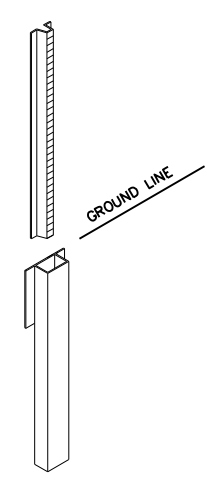
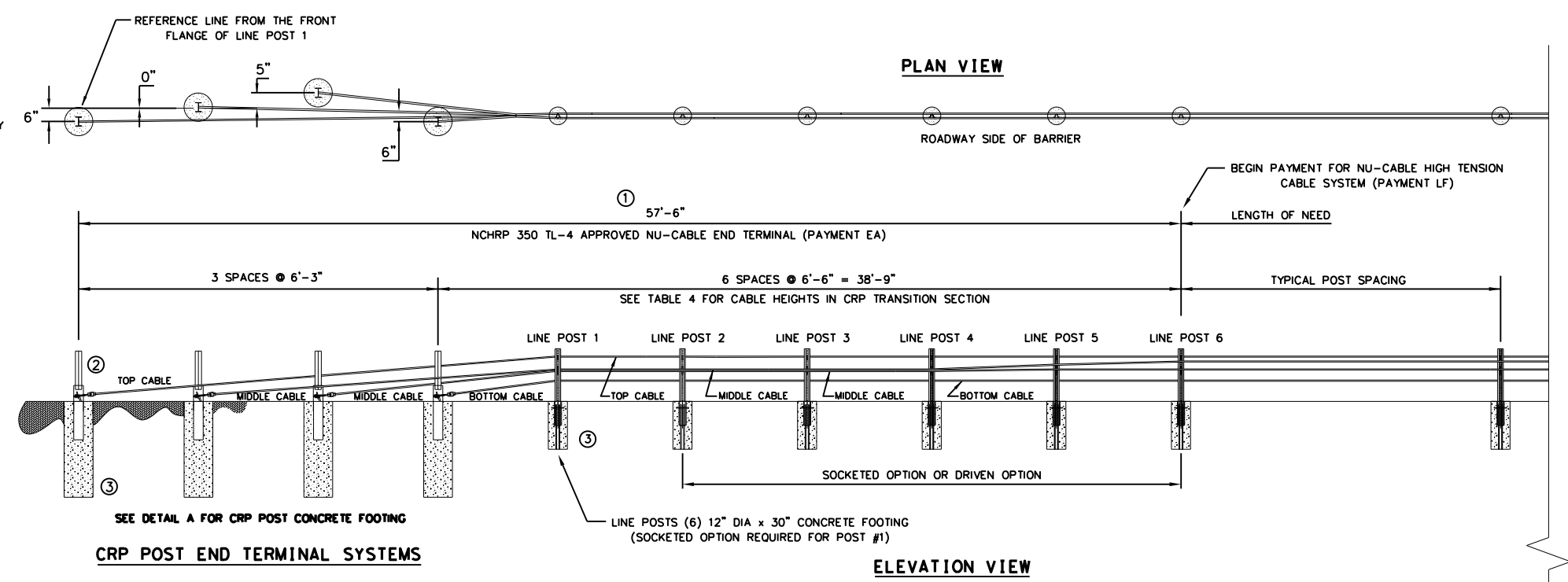
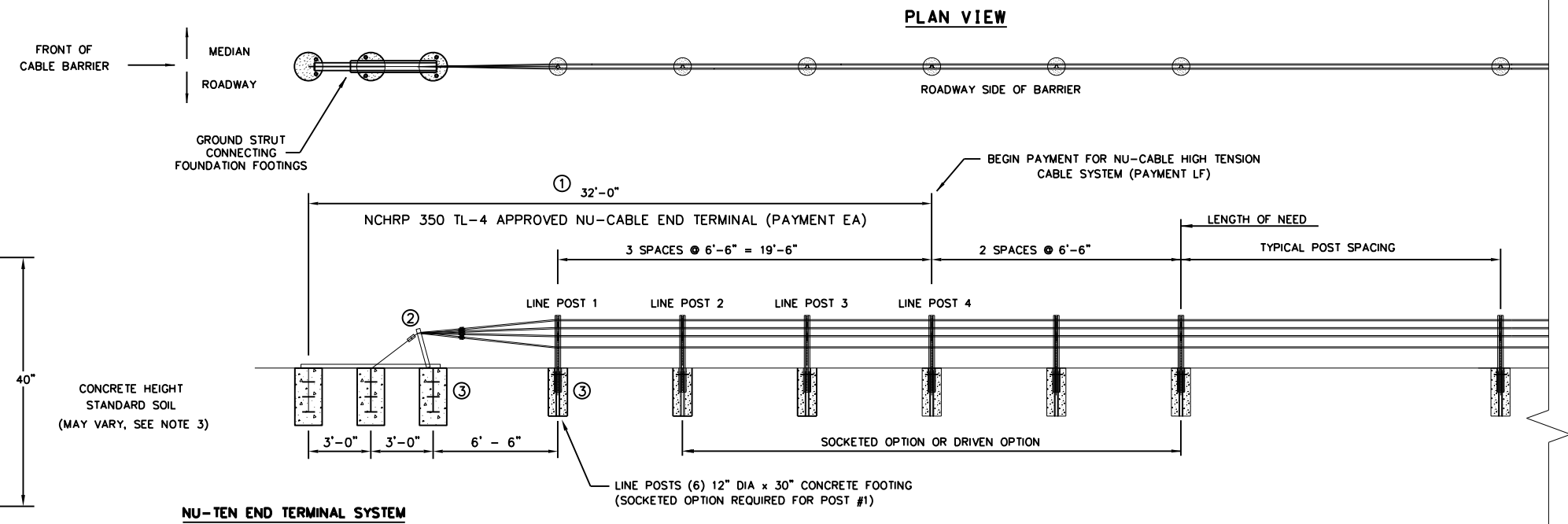


TABLE 4

CRP END TERMINAL CABLE HEIGHTS - TL-4						
	LP 1	LP 2	LP 3	LP 4	LP 5	LP 6
TOP CABLE	34"	34"	34"	34"	34"	34"
UPPER-MIDDLE CABLE	27"	27"	27"	27"	28"	31"
BOTTOM-MIDDLE CABLE	24"	24"	24"	24"	24"	24"
BOTTOM CABLE	15"	15"	15"	15"	15"	15"



① THE OPPOSING END TREATMENTS ON A PARTICULAR RUN ARE MIRRORED IN THEIR LAYOUT.



NOTES

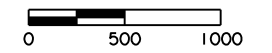
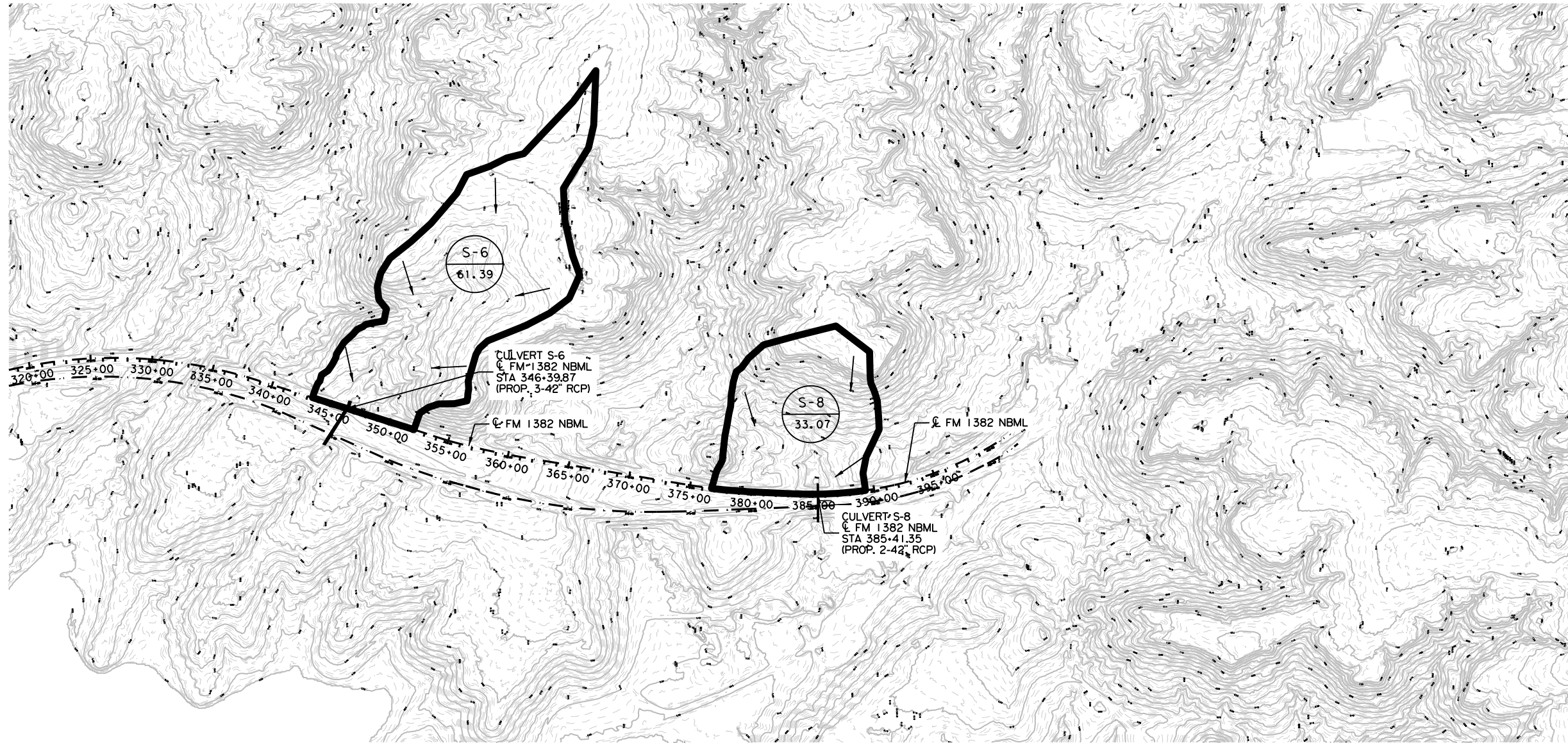
1. THE OPPOSING END TREATMENTS ON A PARTICULAR RUN ARE MIRRORED IN THEIR LAYOUT. SYSTEM PAYMENT IS PER EACH (EA). REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL PAYMENT INFORMATION
2. REFER TO INSTALLATION MANUAL FOR CABLE END ASSEMBLY DETAIL.
3. ALL FOUNDATION DESIGNS ARE BASED ON NCHRP 350 STRONG (S1) SOIL. CONSULT THE MANUFACTURER FOR SPECIFIC FOUNDATION DESIGNS IF SOIL TYPES DIFFER.
4. SEE TABLE 4 CABLE HEIGHTS IN CRP TRANSITION SECTION.

Texas Department of Transportation
 Design Division Standard

NU-CABLE BARRIER SYSTEM (TL-4) (4 CABLE)

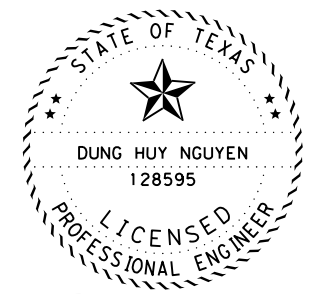
NU-CABLE (TL4) - 14

FILE:	DN:	CK:	DW:	CK:
© TxDOT:	CONT:	SECT:	JOB:	HIGHWAY:
REVISIONS:	1047	03	076, ETC.	FM 1382
DIST:	COUNTY:		SHEET NO.	
DAL	DALLAS		40	



- LEGEND**
- XXXX
XXXX DRAINAGE AREA NO.
ACRES
 - DIRECTION OF FLOW
 - BOUNDARY

NOTE: CONTOURS WERE DERIVED FROM THE USGS MAP



Dung Nguyen
Signature of Registrant & Date
P.E. 11/15/2022



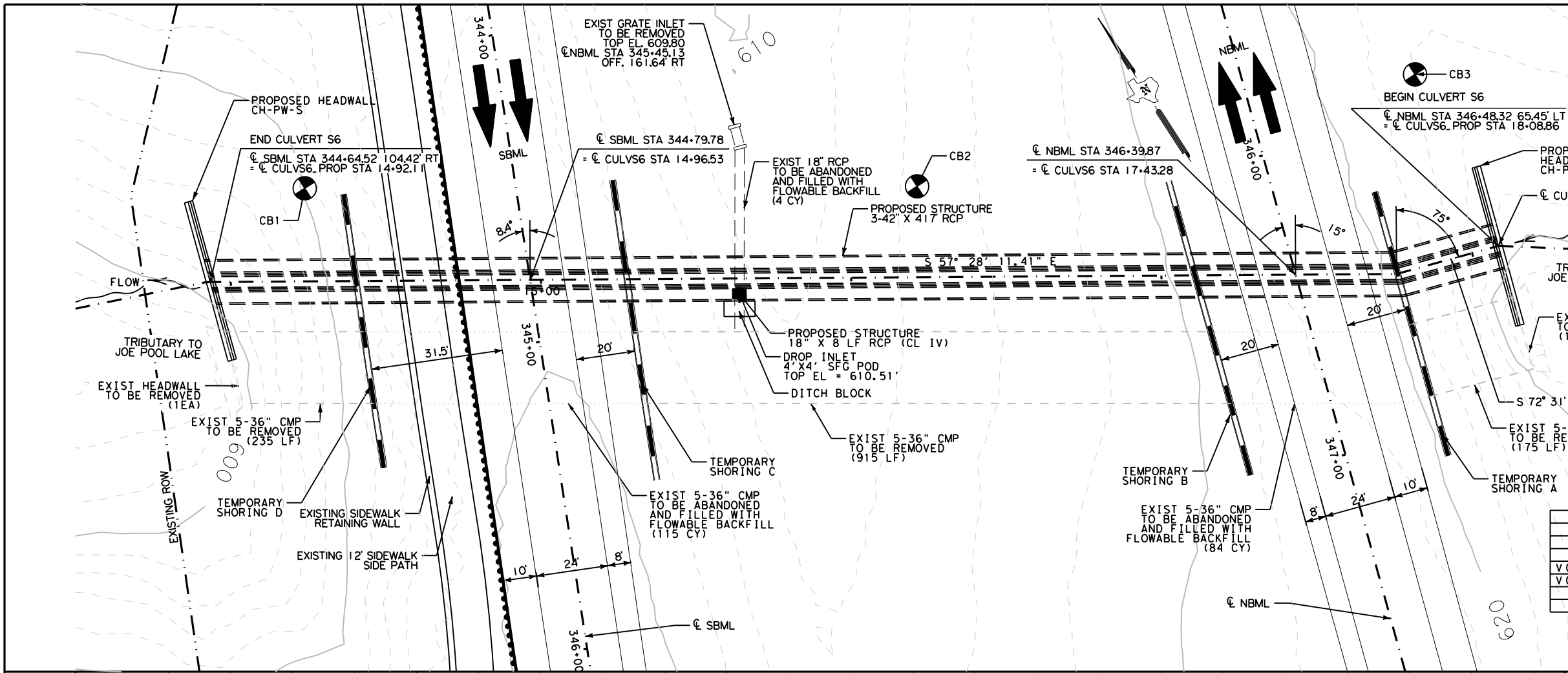
DISCHARGE CALCULATIONS (RATIONAL METHOD)																					
CULVERT ID	AREA	CULVERT	AREA				C	Tc ACTUAL	Tc USED	INTENSITY						FLOW (Q=CIA)					
	AC	STATION	Cr	Ci	Cv	Cs		NRCS METHOD	I2	I5	I10	I25	I50	I100	Q2	Q5	Q10	Q25	Q50	Q100	
																					MINUTES
S-6	61.39	STA. 346+39.87	0.20	0.12	0.06	0.12	0.50	24	24	2.93	3.79	4.44	5.29	5.93	6.57	89.94	116.33	136.29	162.38	182.02	201.67
S-8	33.07	STA. 385+41.35	0.28	0.12	0.08	0.12	0.60	12	12	4.11	5.29	6.17	7.33	8.18	9.03	81.46	104.92	122.50	145.40	162.33	179.19

FM 1382			
EXTERIOR DRAINAGE			
AREA MAP			
(RATIONAL METHOD)			
SCALE: 1"=1000'		SHEET 1 OF 1	
DESIGN CB	FED. RD. DIV. NO. 6	PROJECT NO. SEE TITLE SHEET	HIGHWAY NO. FM 1382
GRAPHICS CB	STATE TEXAS	DISTRICT DAL	COUNTY DALLAS
CHECK AM	CONTROL 1047	SECTION 03	JOB 076, ETC.
			SHEET NO. 41

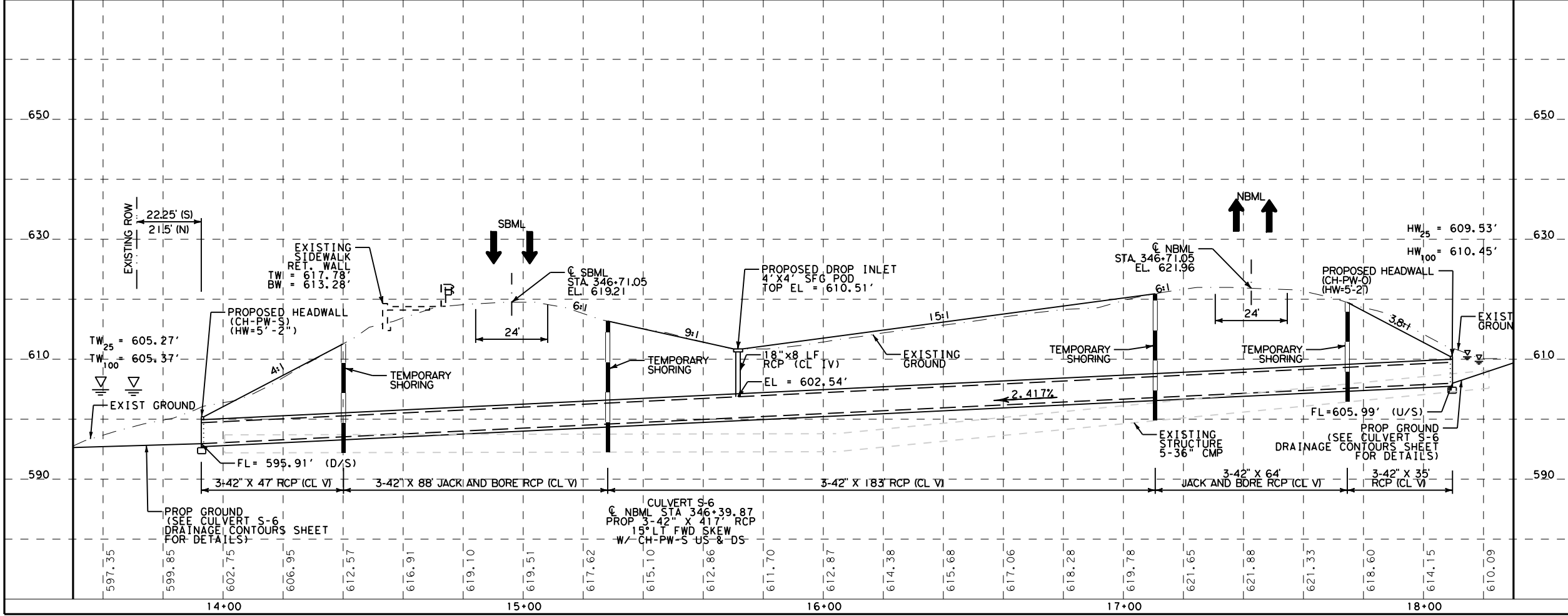
- DESIGN NOTES:
- ADT (2022) = 20,791
ADT (2042) = 28,787
 - FUNCTIONAL CLASS: PRINCIPAL ARTERIAL
 - DESIGNED AS PRECAST
 - APPLICABLE FEMA FLOOD INSURANCE RATE MAP DALLAS CO., TX, PANEL NO. 48113C0465L, MAP REVISED ON 3/21/2019 AND LIES WITHIN A REGULATORY FLOODPLAIN (ZONE X)
 - H&H FILES WERE SENT TO THE LOCAL FLOODPLAIN ADMINISTRATOR STEVE PARKER AND ROBERT WOODBURY ON 10/18/2022.

REQUIRED STANDARDS:
CH-PW-S: PARALLEL WINGS FOR SKEWS PIPE

NOTE: REMOVAL OF EXISTING PIPES, HEADWALLS, AND INLETS ARE SUBSIDIARY TO VARIOUS BID FLOW ITEMS.



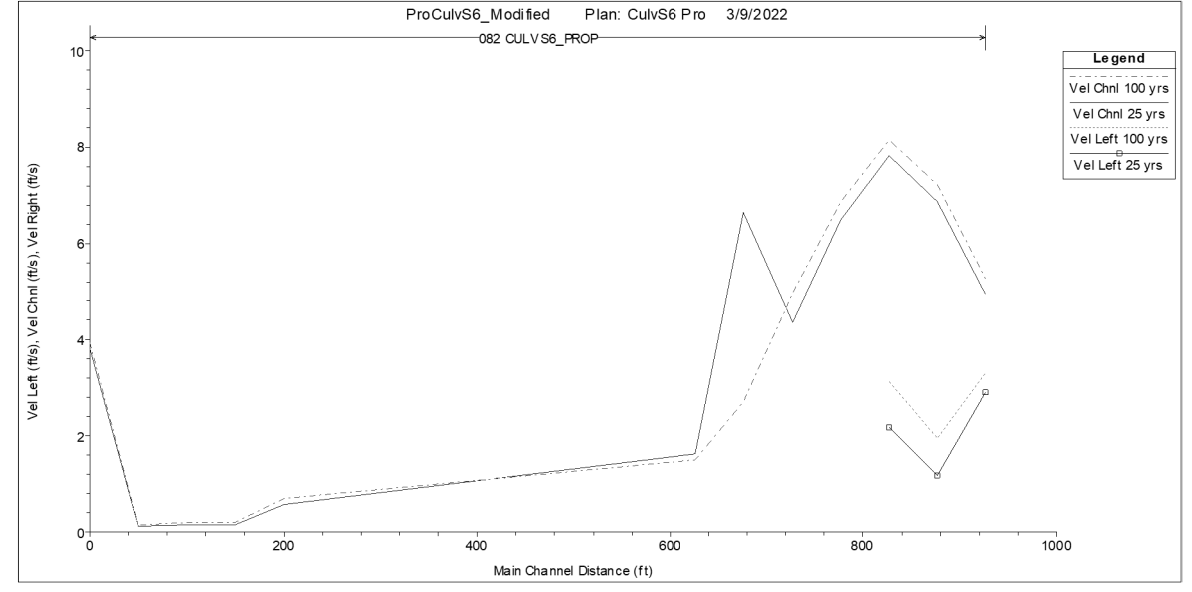
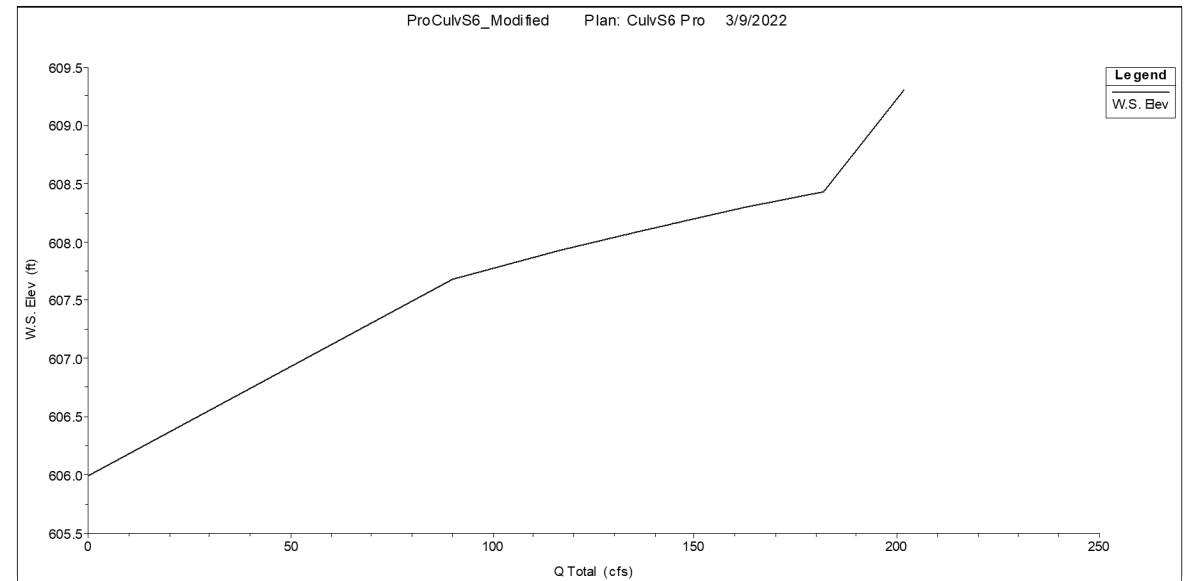
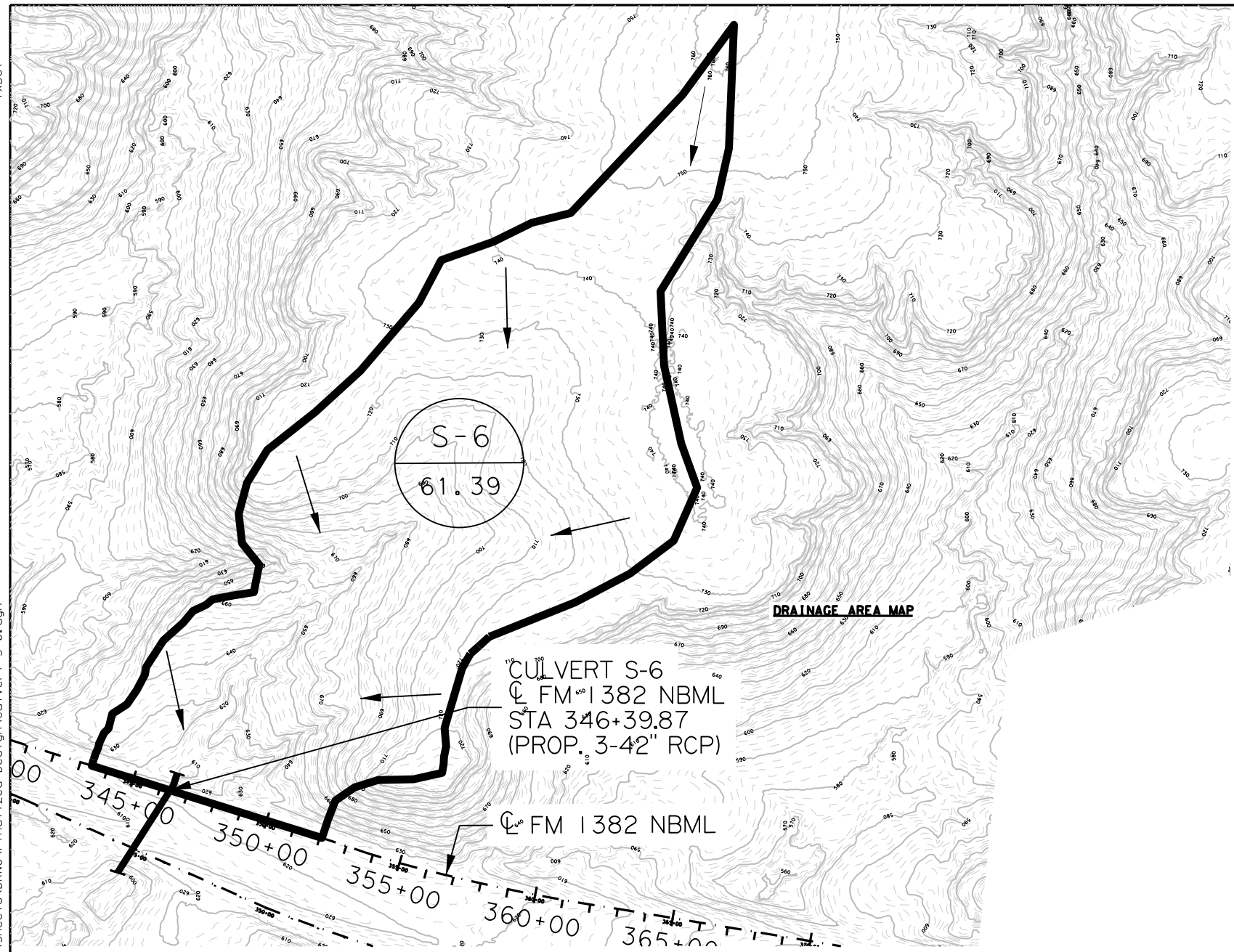
PROPOSED HYDRAULIC DATA			
DRAINAGE AREA = 61.39 ACRES			
25 YEAR		100 YEAR	
Q (CFS)	162.38	Q (CFS)	201.67
V (US) (FT/S)	8.06	V (US) (FT/S)	7.14
V (DS) (FT/S)	5.63	V (DS) (FT/S)	6.99
HW (FT)	609.53	HW (FT)	610.45
TW (FT)	605.27	TW (FT)	605.37



STATE OF TEXAS
DUNG HUY NGUYEN
128595
LICENSED PROFESSIONAL ENGINEER
Signature of Registrant & Date
P.E. 11/16/2022

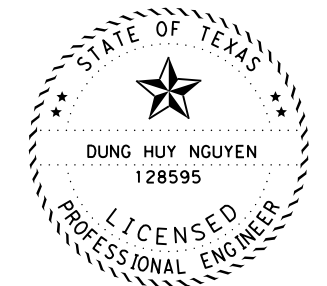
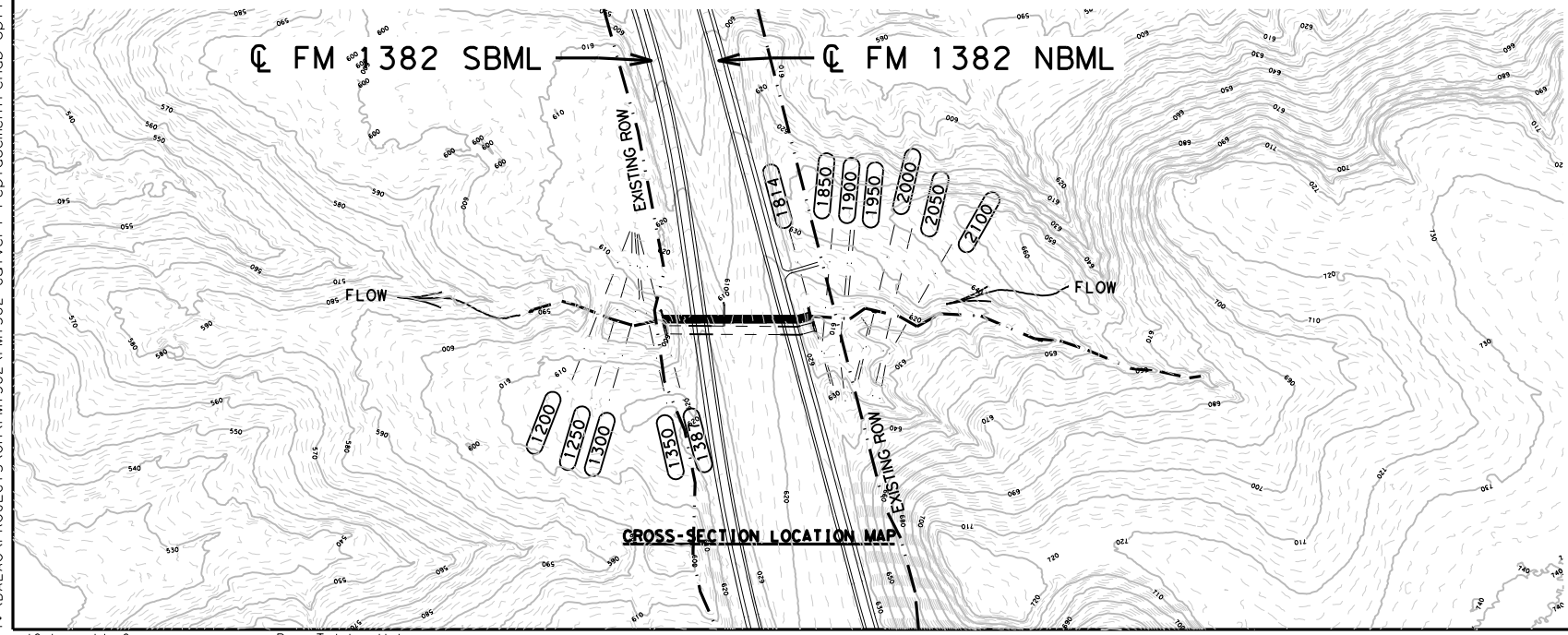
Texas Department of Transportation
© 2022

FM 1382			
CULVERT S-6			
(LAYOUT)			
SCALE: 1" = 40' - H		SHEET 1 OF 3	
1" = 20' - V			
DESIGN DN	FED. RD. DIV. NO. 6	PROJECT NO. SEE TITLE SHEET	HIGHWAY NO. FM 1382
GRAPHICS DN	STATE TEXAS	DISTRICT DAL	COUNTY DALLAS
CHECK NP	CONTROL 1047	SECTION 03	JOB 076, ETC.
CHECK AM			SHEET NO. 42



- NOTES:**
- 1) USACE HEC-RAS VERSION 5.0.6 UTILIZED FOR THE ANALYSIS.
 - 2) THIS SITE IS DESIGNATED AS A ZONE "X" AS SHOWN PANEL NO. 48113C0465L.
 - 3) ALL ELEVATIONS BASED ON THE NAVD88 VERTICAL DATUM.
 - 4) THE BOUNDARY CONDITION WAS ESTABLISHED USING UPSTREAM AND DOWNSTREAM CHANNEL SLOPE.
 - 5) H&H FILES WERE SENT TO THE LOCAL FLOODPLAIN ADMINISTRATOR STEVE PARKER AND ROBERT WOODBURY ON 10/18/2022.

- REFERENCES:**
- 1) TXDOT'S HYDRAULIC DESIGN MANUAL (SEPTEMBER 2019).
 - 2) TOPOGRAPHIC DATA SOURCE (TNRIS, DALLAS COUNTY DIGITAL RASTER GRAPHICS, 24K)



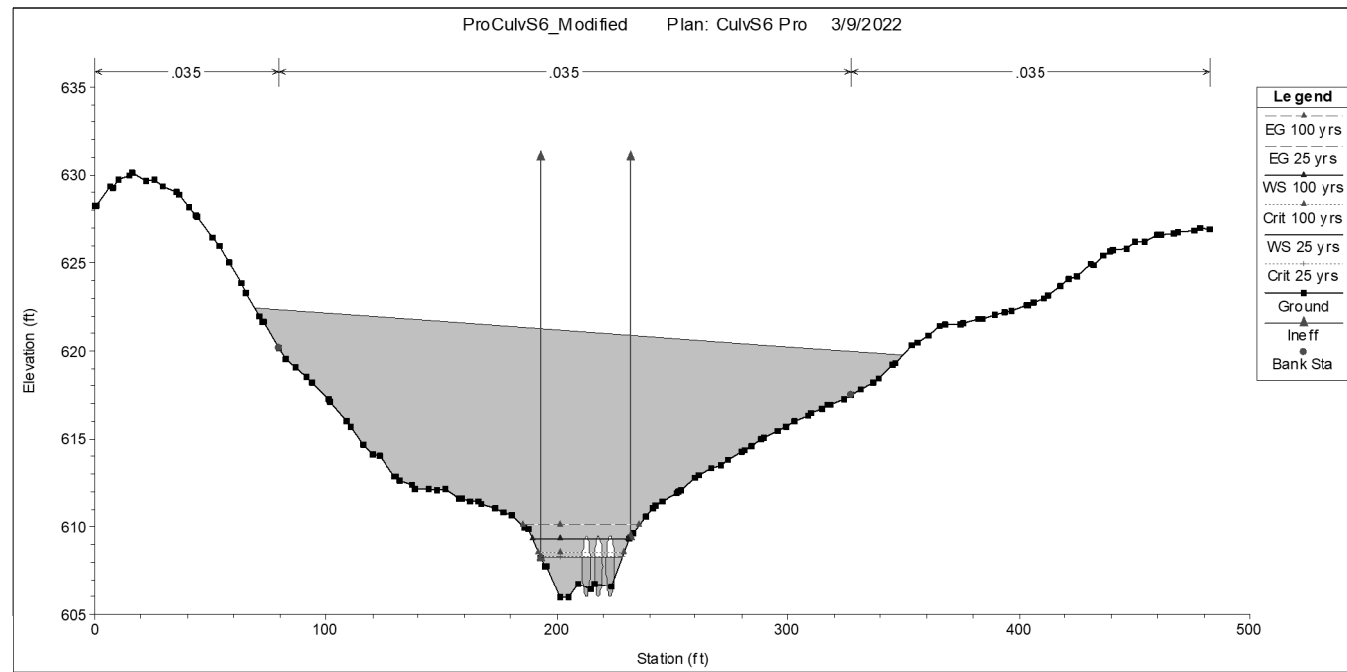
Dung Nguyen
P.E. 11/15/2022
Signature Registrant & Date



**FM 1382
CULVERT S-6
(HYDRAULIC DATA SHEET)**

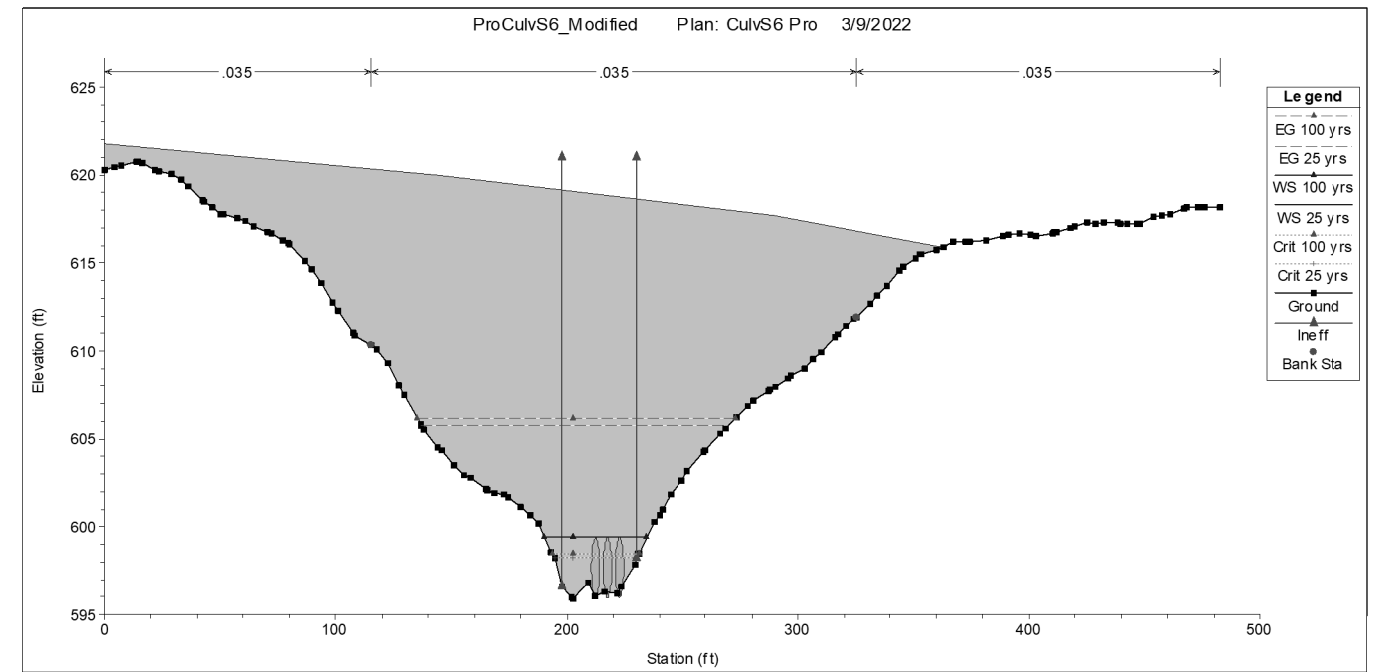
N. T. S. SHEET 2 OF 3

DESIGN DN	FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	FM 1382	
GRAPHICS DN	STATE	DISTRICT	COUNTY
CHECK	TEXAS	DAL	DALLAS
CHECK AM	CONTROL	SECTION	JOB
	1047	03	076, ETC.
			SHEET NO.
			43



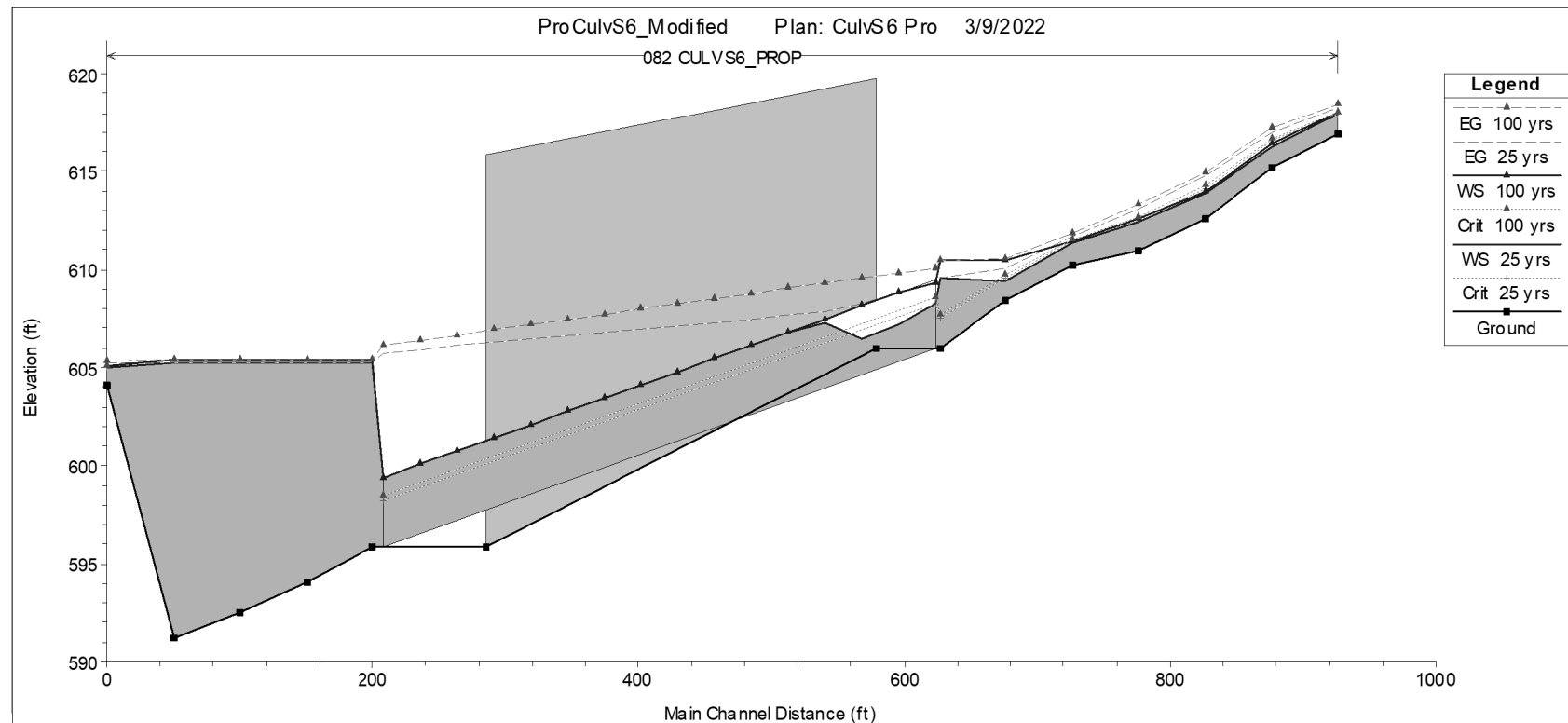
PROPOSED CULVERT S-6 DATA:

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)
CULV6*PROP	1850	25 yrs	162.4	608.42	609.37	609.57	610.06	0.042386	6.64	24.45	36.81
CULV6*PROP	1850	100 yrs	201.7	608.42	610.43	609.7	610.54	0.003189	2.7	74.79	62.49
CULV6*PROP	1814	25 yrs	162.4	605.97	609.53	607.52	609.57	0.000429	1.63	99.41	43.38
CULV6*PROP	1814	100 yrs	201.7	605.97	610.45	607.68	610.49	0.00024	1.5	134.79	55.43
CULV6*PROP	1601		Culvert								
CULV6*PROP	1387	25 yrs	162.4	595.88	605.27		605.28	0.00001	0.56	287.57	127.39
CULV6*PROP	1387	100 yrs	201.7	595.88	605.37		605.38	0.000015	0.69	290.77	128.59
CULV6*PROP	1350	25 yrs	162.4	594.07	605.28		605.28	0.000001	0.16	1014.6	150.33
CULV6*PROP	1350	100 yrs	201.7	594.07	605.38		605.38	0.000002	0.2	1029.6	151.46
CULV6*PROP	1300	25 yrs	162.4	592.53	605.28		605.28	0.000001	0.16	1046.1	151.46
CULV6*PROP	1300	100 yrs	201.7	592.53	605.38		605.38	0.000002	0.19	1061.2	152.47



EXISTING CULVERT S-6 DATA:

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)
CULV6*PROP	1850	25 yrs	162.4	608.42	609.37	609.57	610.06	0.042386	6.64	24.45	36.81
CULV6*PROP	1850	100 yrs	201.7	608.42	611.3	609.7	611.33	0.00061	1.47	137.48	82.81
CULV6*PROP	1814	25 yrs	162.4	605.97	609.07	607.52	609.13	0.000778	1.98	82	39.86
CULV6*PROP	1814	100 yrs	201.7	605.97	611.3	607.68	611.32	0.000117	1.21	167.17	76.6
CULV6*PROP	1601		Culvert								
CULV6*PROP	1387	25 yrs	162.4	595.88	605.27		605.28	0.00001	0.56	287.57	127.39
CULV6*PROP	1387	100 yrs	201.7	595.88	605.37		605.38	0.000015	0.69	290.77	128.59
CULV6*PROP	1350	25 yrs	162.4	594.07	605.28		605.28	0.000001	0.16	1014.6	150.33
CULV6*PROP	1350	100 yrs	201.7	594.07	605.38		605.38	0.000002	0.2	1029.6	151.46
CULV6*PROP	1300	25 yrs	162.4	592.53	605.28		605.28	0.000001	0.16	1046.1	151.46
CULV6*PROP	1300	100 yrs	201.7	592.53	605.38		605.38	0.000002	0.19	1061.2	152.47



NOTES:

- 1) USACE HEC-RAS VERSION 5.0.6 UTILIZED FOR THE ANALYSIS.
- 2) THIS SITE IS DESIGNATED AS A ZONE "X" AS SHOWN PANEL NO. 48113C0465L.
- 3) ALL ELEVATIONS BASED ON THE NAVD88 VERTICAL DATUM.
- 4) THE BOUNDARY CONDITION WAS ESTABLISHED USING UPSTREAM AND DOWNSTREAM CHANNEL SLOPE.
- 5) H&H FILES WERE SENT TO THE LOCAL FLOODPLAIN ADMINISTRATOR STEVE PARKER AND ROBERT WOODBURY ON 10/18/2022.

REFERENCES:

- 1) TXDOT'S HYDRAULIC DESIGN MANUAL (SEPTEMBER 2019).
- 2) TOPOGRAPHIC DATA SOURCE (TNRIS, DALLAS COUNTY DIGITAL RASTER GRAPHICS, 24K)

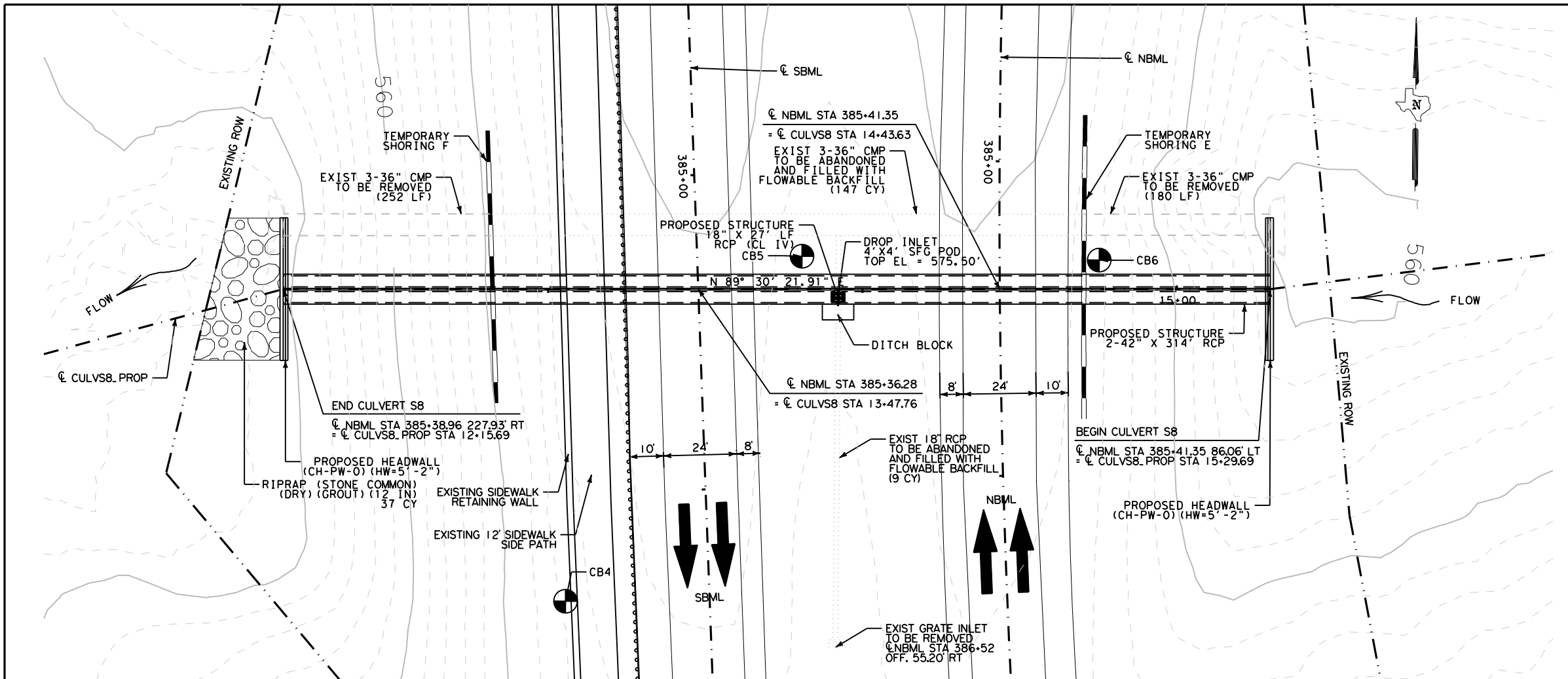
Signature of Registrant & Date
 P.E. 11/15/2022



FM 1382
CULVERT S-6
(HYDRAULIC DATA SHEET)

SHEET 3 OF 3

DESIGN DN	FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	FM 1382	
GRAPHICS DN	STATE	DISTRICT	COUNTY
CHECK	TEXAS	DAL	DALLAS
CHECK AM	CONTROL	SECTION	JOB
	1047	03	076, ETC.
			SHEET NO. 44

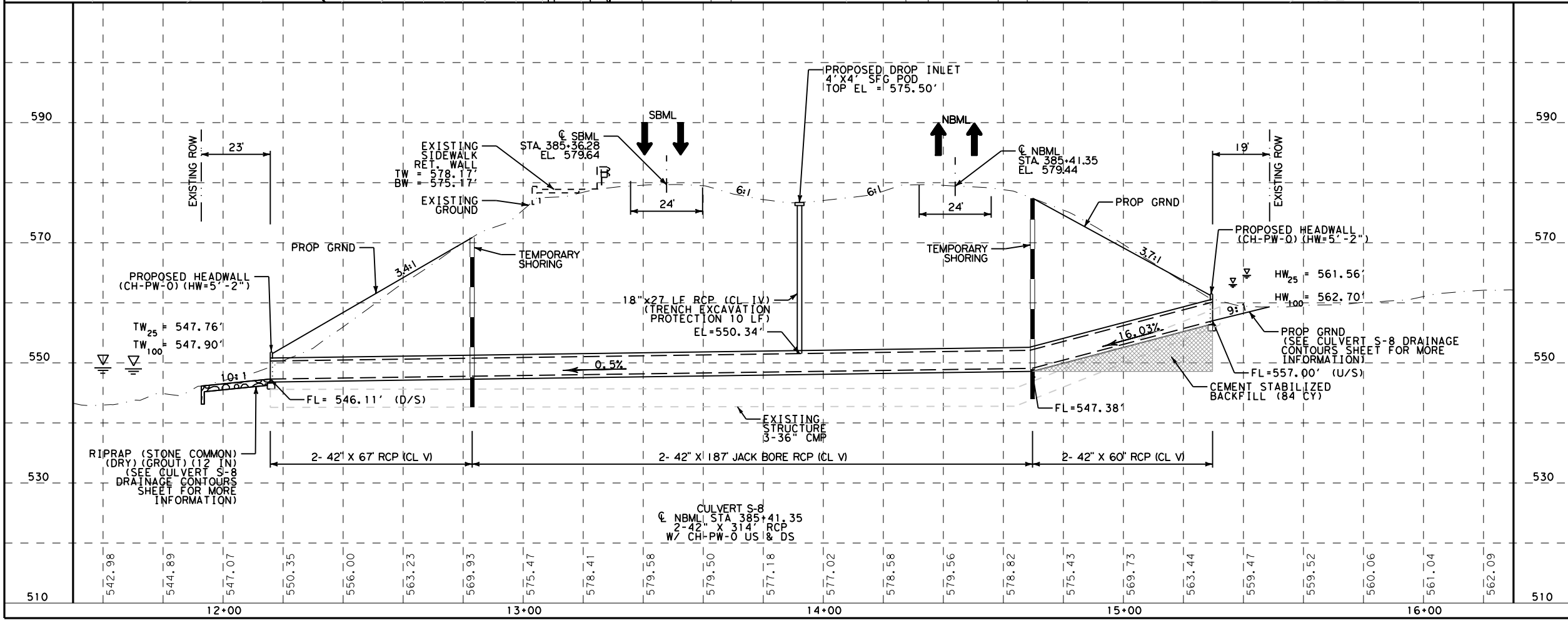


- DESIGN NOTES:
1. ADT (2022) = 20,791
ADT (2042) = 28,787
 2. FUNCTIONAL CLASS: PRINCIPAL ARTERIAL
 3. DESIGNED AS PRECAST
 4. APPLICABLE FEMA FLOOD INSURANCE RATE MAP DALLAS CO., TX, PANEL NO. 48113C0605K, MAP REVISED ON 7/07/2014 AND LIES WITHIN A REGULATORY FLOODPLAIN (ZONE X)
 5. H&H FILES WERE SENT TO THE LOCAL FLOODPLAIN ADMINISTRATOR STEVE PARKER AND ROBERT WOODBURY ON 10/18/2022.

REQUIRED STANDARDS:
CH-PW-0: PARALLEL WINGS FOR NON-SKEWS PIPE

NOTE: REMOVAL OF EXISTING PIPES, HEADWALLS, AND INLETS ARE SUBSIDIARY TO VARIOUS BID ITEMS.

PROPOSED HYDRAULIC DATA			
DRAINAGE AREA = 33.07 ACRES			
25 YEAR		100 YEAR	
Q (CFS)	145.4	Q (CFS)	179.19
V (DS) (FT/S)	10.83	V (DS) (FT/S)	11.85
HW (FT)	560.83	HW (FT)	561.78
TW (FT)	547.76	TW (FT)	547.9



STATE OF TEXAS
DUNG HUY NGUYEN
128595
LICENSED PROFESSIONAL ENGINEER

Dung Nguyen
P.E. 11/16/2022
Signature of Registrant & Date

Texas Department of Transportation
© 2022

**FM 1382
CULVERT S-8
(LAYOUT)**

SCALE: 1" = 40' - H
1" = 20' - V

SHEET 1 OF 3

DESIGN DN	FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	FM 1382	
CHECK NP	STATE	DISTRICT	COUNTY
	TEXAS	DAL	DALLAS
CHECK AM	CONTROL	SECTION	JOB
	1047	03	076, ETC.
			SHEET NO. 45

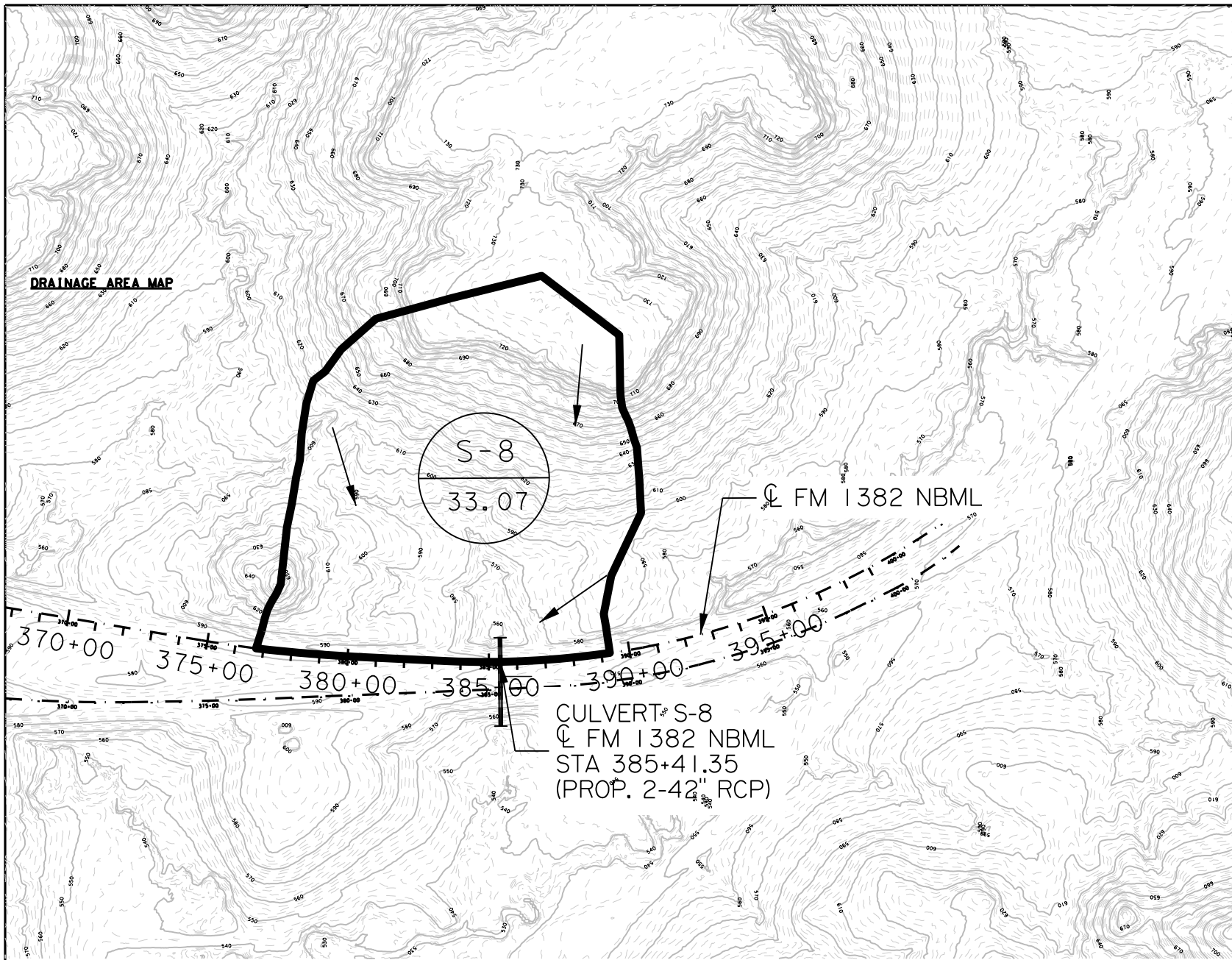


Table 1 - Summary of Culvert Flows at Crossing: Culvert S-8

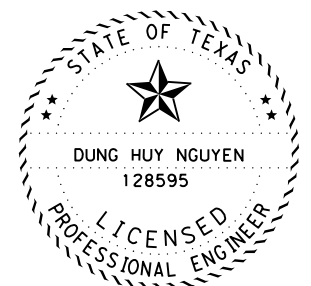
Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
559.94	81.46	81.46	0	1
560.16	91.23	91.23	0	1
560.39	101.01	101.01	0	1
560.62	110.78	110.78	0	1
560.87	120.55	120.55	0	1
561.13	130.32	130.32	0	1
561.4	140.1	140.1	0	1
561.56	145.4	145.4	0	1
562.01	159.64	159.64	0	1
562.35	169.42	169.42	0	1
562.7	179.19	179.19	0	1
577.32	403.13	403.13	0	Overtopping

Table 3 - Downstream Channel Rating Curve (Crossing: Culvert S-8)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
81.46	547.44	1.33	8.35	4.15	1.8
91.23	547.5	1.39	8.59	4.33	1.82
101.01	547.55	1.44	8.82	4.5	1.83
110.78	547.6	1.49	9.02	4.66	1.84
120.55	547.65	1.54	9.21	4.81	1.85
130.32	547.7	1.59	9.4	4.95	1.86
140.1	547.74	1.63	9.57	5.09	1.87
145.4	547.76	1.65	9.66	5.16	1.87
159.64	547.82	1.71	9.88	5.35	1.88
169.42	547.86	1.75	10.03	5.47	1.89
179.19	547.9	1.79	10.17	5.58	1.9

Tailwater Channel Data - Culvert S-8

Tailwater Channel Option: Triangular Channel
 Side Slope (H:V): 5.50 (_:1)
 Channel Slope: 0.0500
 Channel Manning's n: 0.0300
 Channel Invert Elevation: 546.11 ft



Dung Nguyen
 P.E. 11/15/2022
 Signature of Registrant & Date

Table 2 - Culvert Summary Table: Culvert 1

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
81.46 cfs	81.46 cfs	559.94	2.94	0.0*	1-S2n	0	0	1.54	1.33	9.97	8.35
91.23 cfs	91.23 cfs	560.16	3.16	0.0*	1-S2n	0	0	1.61	1.39	10.52	8.59
101.01 cfs	101.01 cfs	560.39	3.39	0.0*	1-S2n	0	0	1.68	1.44	11.05	8.82
110.78 cfs	110.78 cfs	560.62	3.62	0.0*	5-S2n	0	0	1.75	1.49	11.54	9.02
120.55 cfs	120.55 cfs	560.87	3.87	0.0*	5-S2n	0	0	1.81	1.54	12	9.21
130.32 cfs	130.32 cfs	561.13	4.13	0.0*	5-S2n	0	0	1.87	1.59	12.43	9.4
140.10 cfs	140.10 cfs	561.4	4.4	0.0*	5-S2n	0	0	1.94	1.63	12.83	9.57
145.40 cfs	145.40 cfs	561.56	4.56	0.0*	5-S2n	0	1.3	1.97	1.65	13.03	9.66
159.64 cfs	159.64 cfs	562.01	5.01	0.0*	5-S2n	0	0	2.06	1.71	13.55	9.88
169.42 cfs	169.42 cfs	562.35	5.35	0.0*	5-S2n	0	0	2.12	1.75	13.89	10.03
179.19 cfs	179.19 cfs	562.7	5.7	0.0*	5-S2n	0	0	2.18	1.79	14.2	10.17

NOTES:

- 1) HY-8 VERSION 7.50 (BROKEN BACK CULVERT ANALYSIS)
- 2) THIS SITE IS DESIGNATED AS A ZONE "X" AS SHOWN PANEL NO. 48113C0605K.
- 3) ALL ELEVATIONS BASED ON THE NAVD88 VERTICAL DATUM.
- 4) THE BOUNDARY CONDITION WAS ESTABLISHED USING UPSTREAM AND DOWNSTREAM CHANNEL SLOPE.
- 5) H&H FILES WERE SENT TO THE LOCAL FLOODPLAIN ADMINISTRATOR STEVE PARKER AND ROBERT WOODBURY ON 10/18/2022.

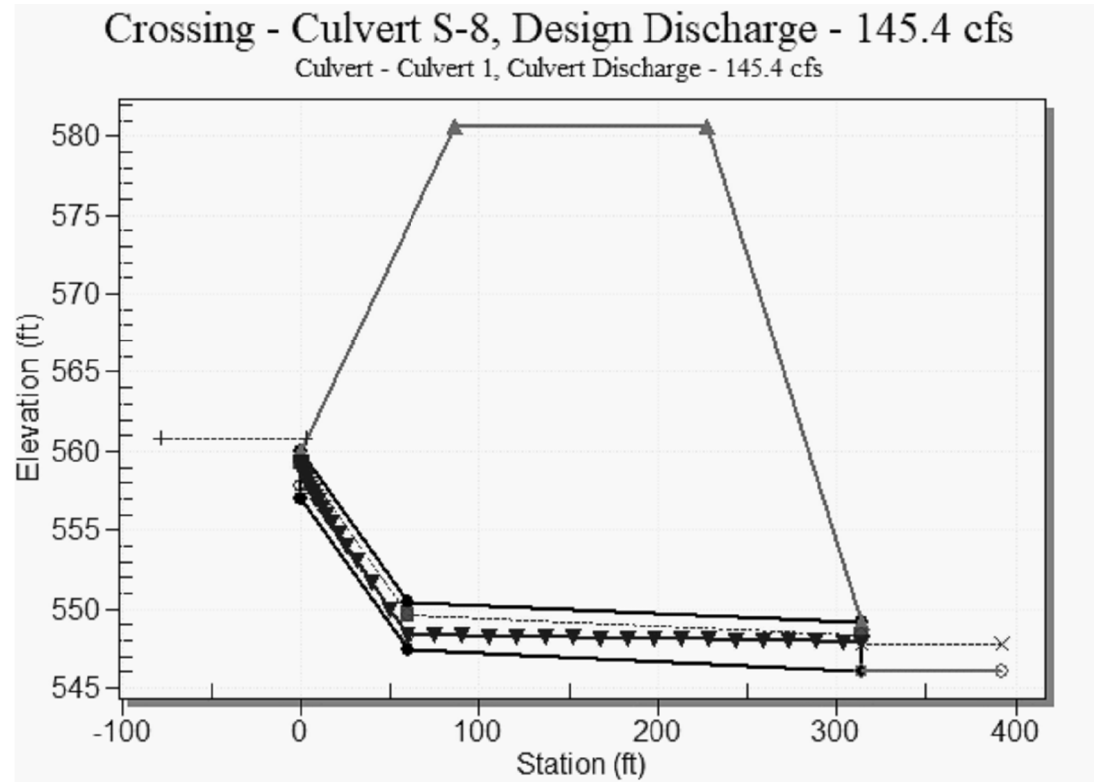
REFERENCES:

- 1) TXDOT'S HYDRAULIC DESIGN MANUAL (SEPTEMBER 2019).
- 2) TOPOGRAPHIC DATA SOURCE (TNRIS, DALLAS COUNTY DIGITAL RASTER GRAPHICS, 24K)



FM 1382			
CULVERT S-8			
(HYDRAULIC DATA SHEET)			
N. T. S.		SHEET 2 OF 3	
DESIGN DN	FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
6	6	SEE TITLE SHEET	FM 1382
GRAPHICS DN	STATE	DISTRICT	COUNTY
NP	TEXAS	DAL	DALLAS
CHECK AM	CONTROL	SECTION	JOB
1047	03	076, ETC.	46

Water Surface Profile Plot for Culvert: Culvert 1



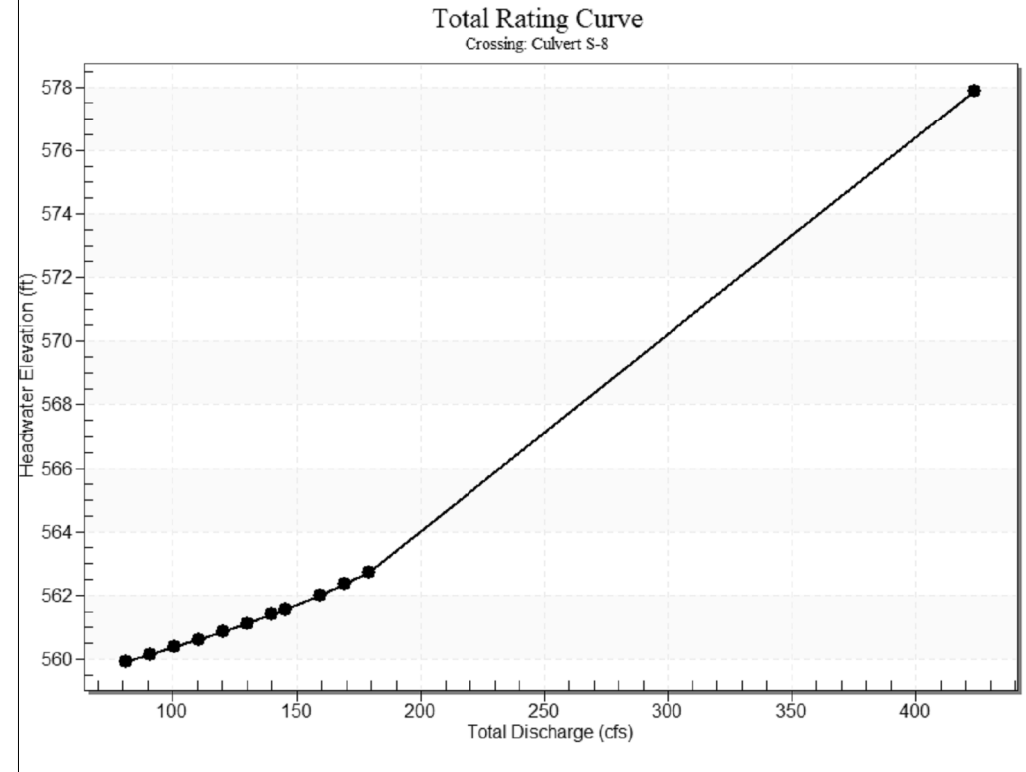
Site Data - Culvert 1

Site Data Option: Culvert Invert Data
 Inlet Station: 0.00 ft
 Inlet Elevation: 557.00 ft
 Break Station: 60.00 ft
 Break Elevation: 547.38 ft
 Outlet Station: 314.00 ft
 Outlet Elevation: 546.11 ft
 Number of Barrels: 3

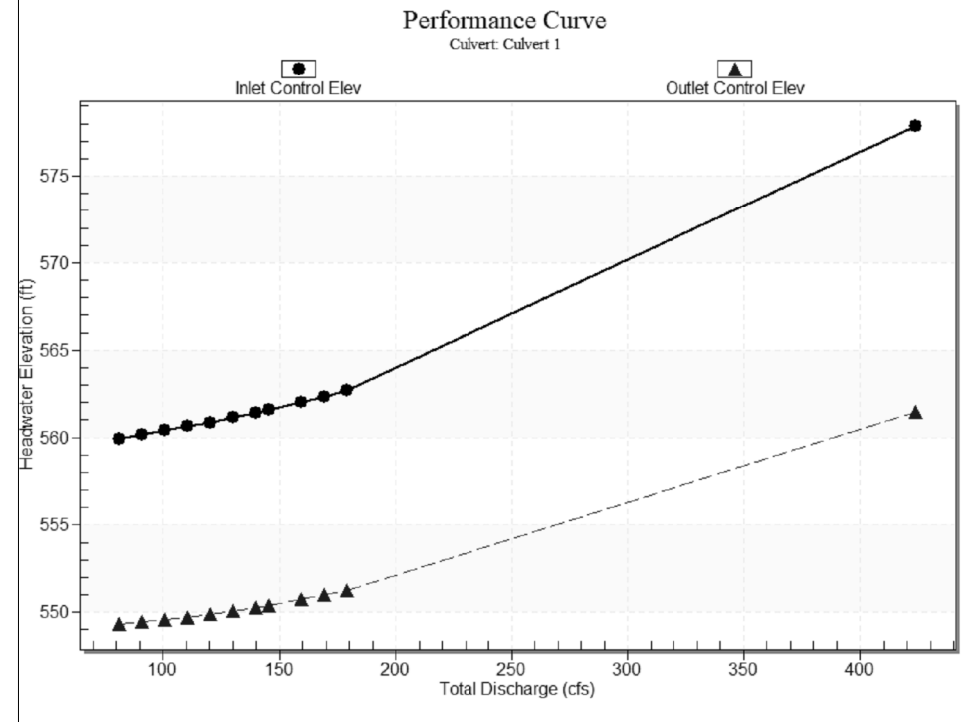
Culvert Data Summary - Culvert 1

Barrel Shape: Circular
 Barrel Diameter: 3.00 ft
 Upper Section Material: Concrete
 Lower Section Material:
 Embedment: 0.00 in
 Upper Section Manning's n: 0.0120
 Lower Section Manning's n: 0.0120

Rating Curve Plot for Crossing: Culvert S-8



Culvert Performance Curve Plot: Culvert 1

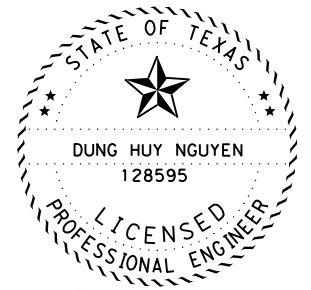


NOTES:

- 1) HY-8 VERSION 7.50 (BROKEN BACK CULVERT ANALYSIS)
- 2) THIS SITE IS DESIGNATED AS A ZONE "X" AS SHOWN PANEL NO. 48113C0605K.
- 3) ALL ELEVATIONS BASED ON THE NAVD88 VERTICAL DATUM.
- 4) THE BOUNDARY CONDITION WAS ESTABLISHED USING UPSTREAM AND DOWNSTREAM CHANNEL SLOPE.
- 5) H&H FILES WERE SENT TO THE LOCAL FLOODPLAIN ADMINISTRATOR STEVE PARKER AND ROBERT WOODBURY ON 10/18/2022.

REFERENCES:

- 1) TXDOT'S HYDRAULIC DESIGN MANUAL (SEPTEMBER 2019).
- 2) TOPOGRAPHIC DATA SOURCE (TNRIS, DALLAS COUNTY DIGITAL RASTER GRAPHICS, 24K)



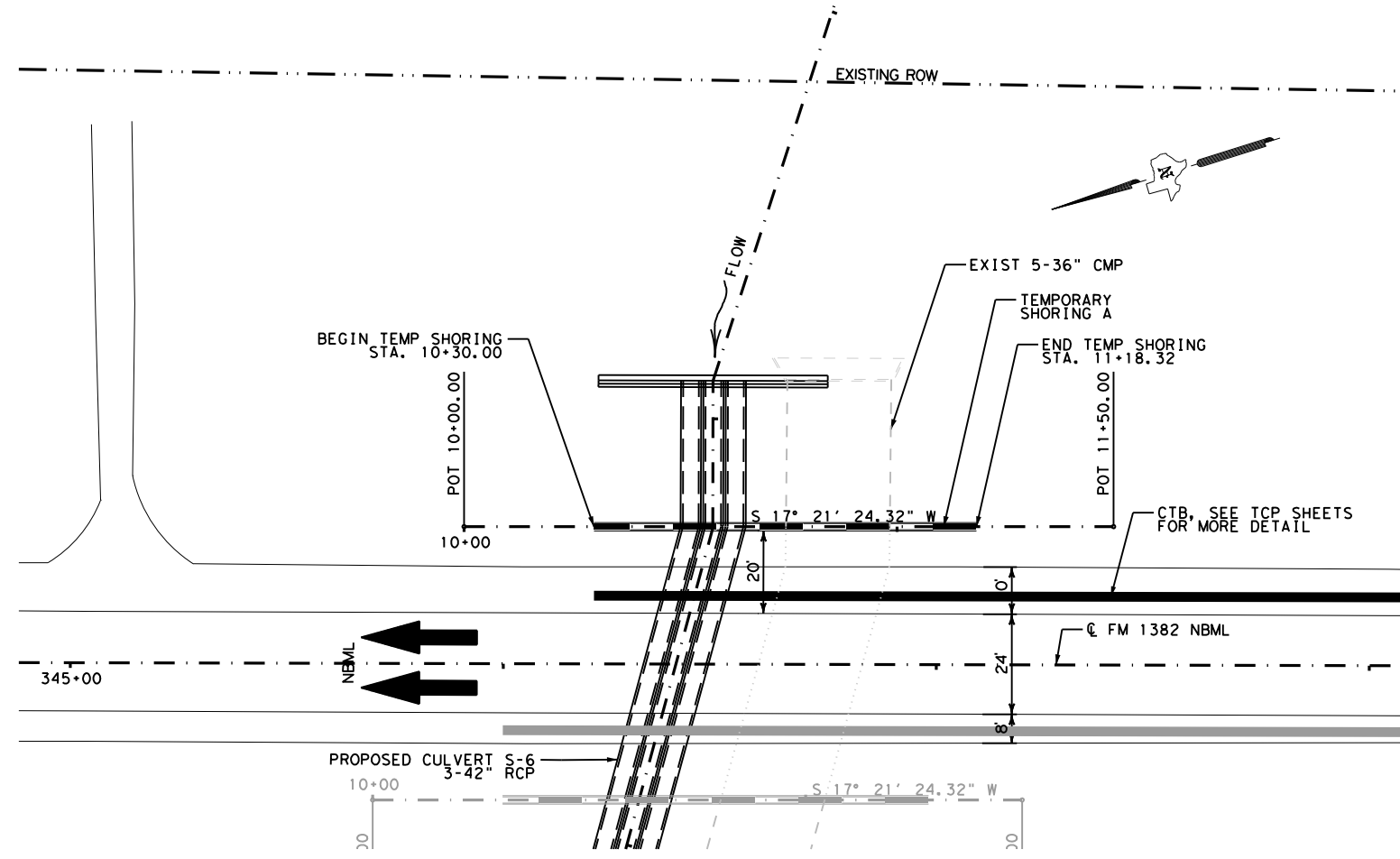
Dung Nguyen
 Signature of Registrant & Date
 P. E. 11/15/2022



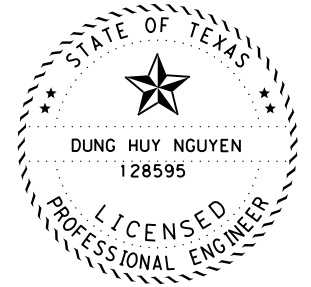
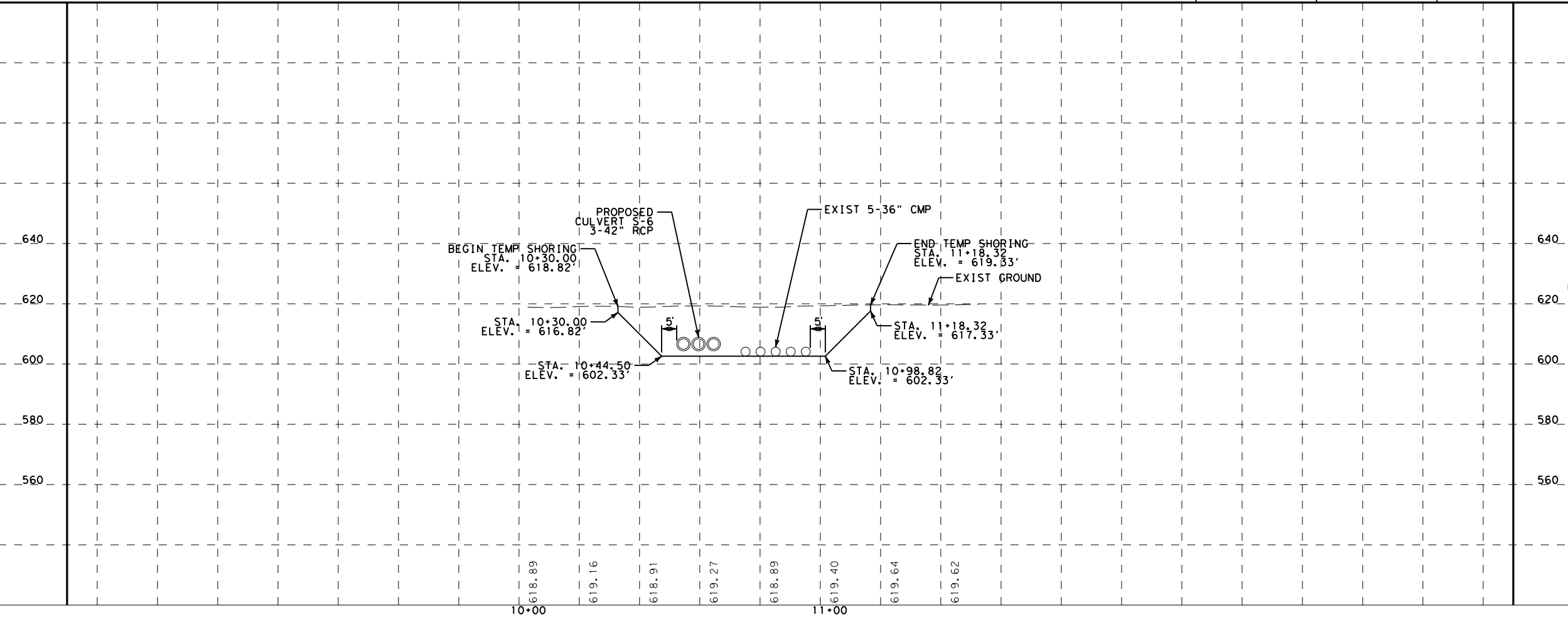
FM 1382
CULVERT S-8
(HYDRAULIC DATA SHEET)

SHEET 3 OF 3

DESIGN DN	FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
	6	SEE TITLE SHEET	FM 1382
CHECK NP	STATE	DISTRICT	COUNTY
	TEXAS	DAL	DALLAS
CHECK AM	CONTROL	SECTION	JOB
	1047	03	076, ETC.
			SHEET NO. 47



ALIGNMENT DATA TEMP SHORING A				
STATION	POINT	NORTHING	EASTING	BEARING
10+00.00	BEGIN	6915705.3717	2438127.7014	S 17° 21' 24.32" W
11+50.00	END	6915562.2019	2438082.9533	



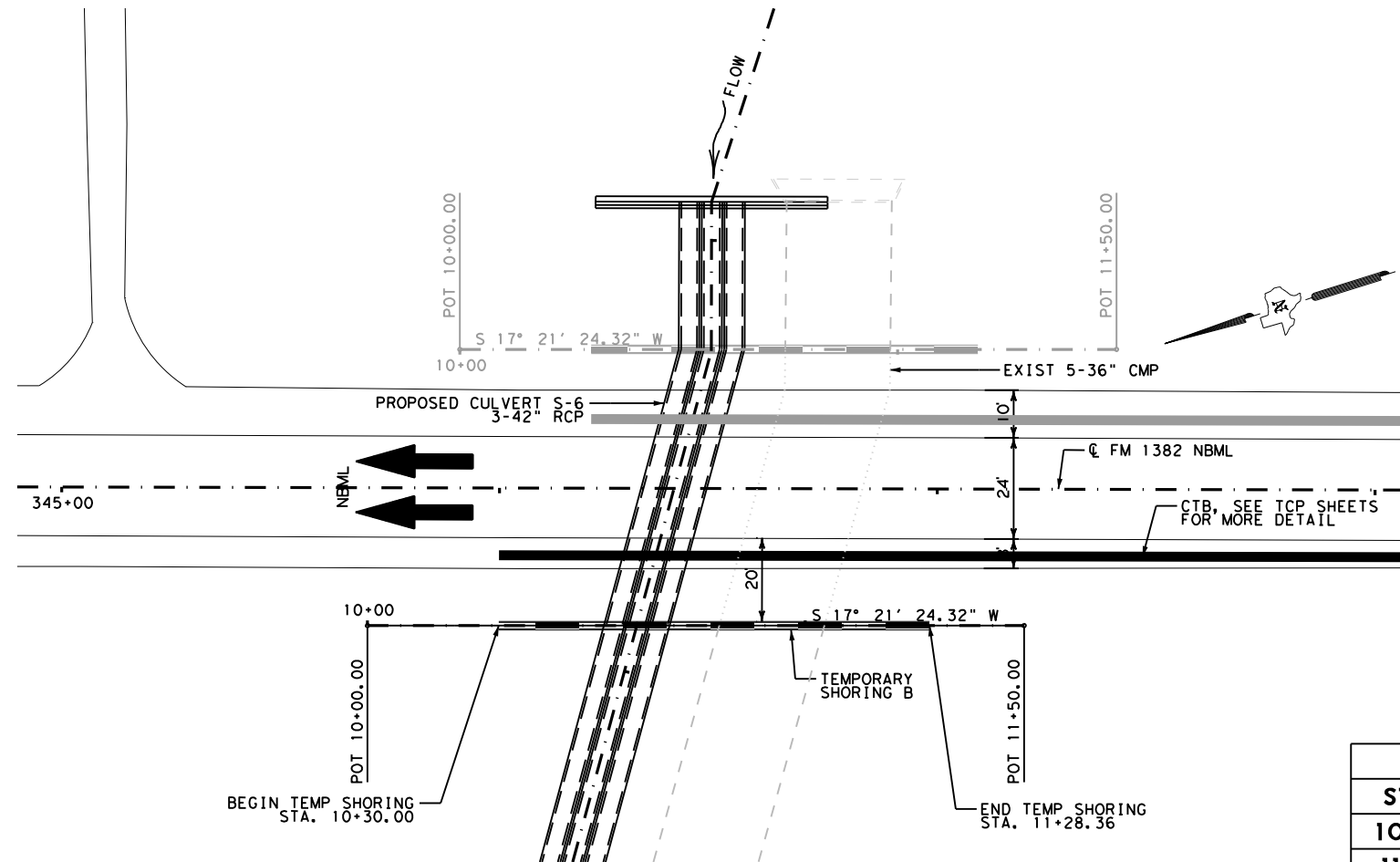
Dung Nguyen
Signature of Registrant & Date
P.E. 11/15/2022



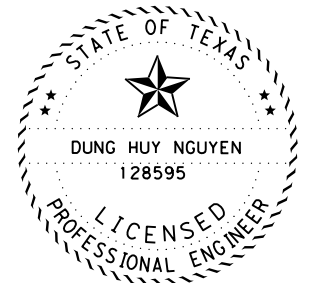
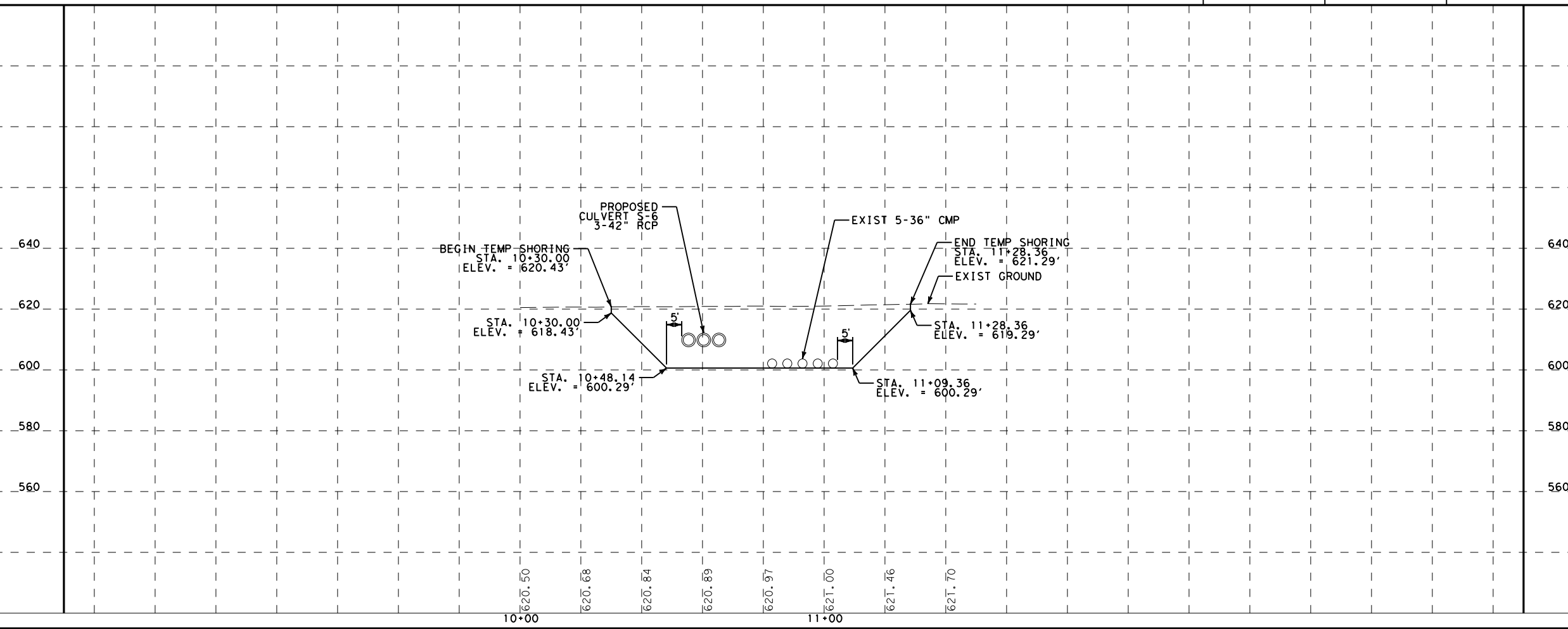
FM 1382
TEMPORARY SHORING LAYOUT
(SHORING A)

SCALE: 1"=20' -H
1"=20' -V
SHEET 1 OF 6

DESIGN DN	FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
GRAPHICS DN	6	SEE TITLE SHEET	FM 1382
CHECK NP	STATE	DISTRICT	COUNTY
CHECK AM	TEXAS	DAL	DALLAS
	CONTROL	SECTION	JOB
	1047	03	076, ETC.
			SHEET NO. 48



ALIGNMENT DATA TEMP SHORING B				
STATION	POINT	NORTHING	EASTING	BEARING
10+00.00	BEGIN	6915744.3425	2438073.7799	S 17° 21' 24.32" W
11+50.00	END	6915601.1726	2438029.0318	



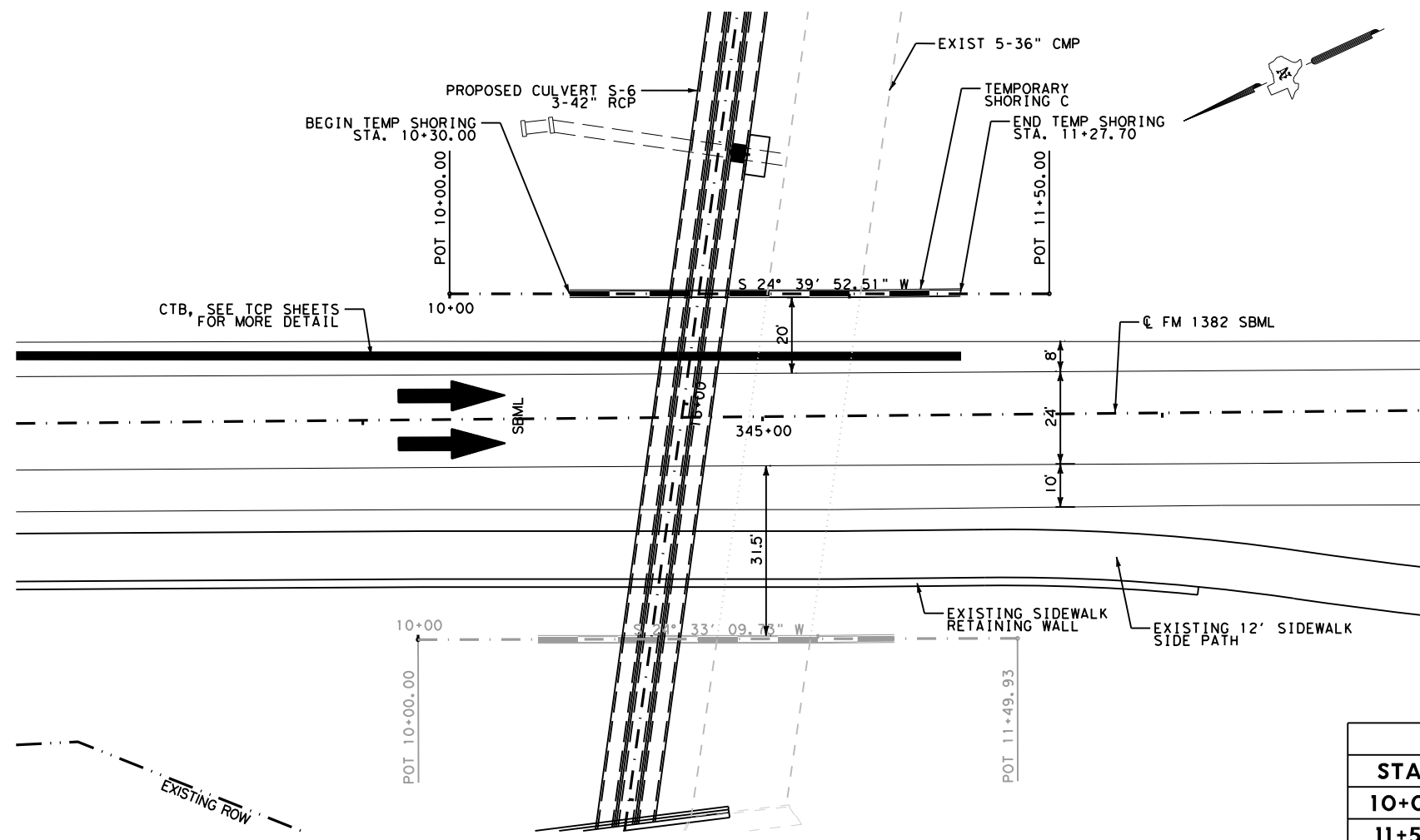
Dung Nguyen
P.E. 11/15/2022
Signature of Registrant & Date



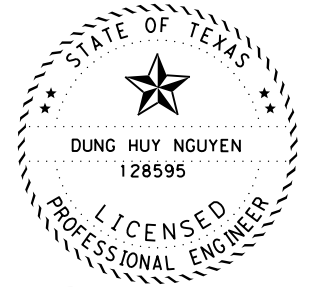
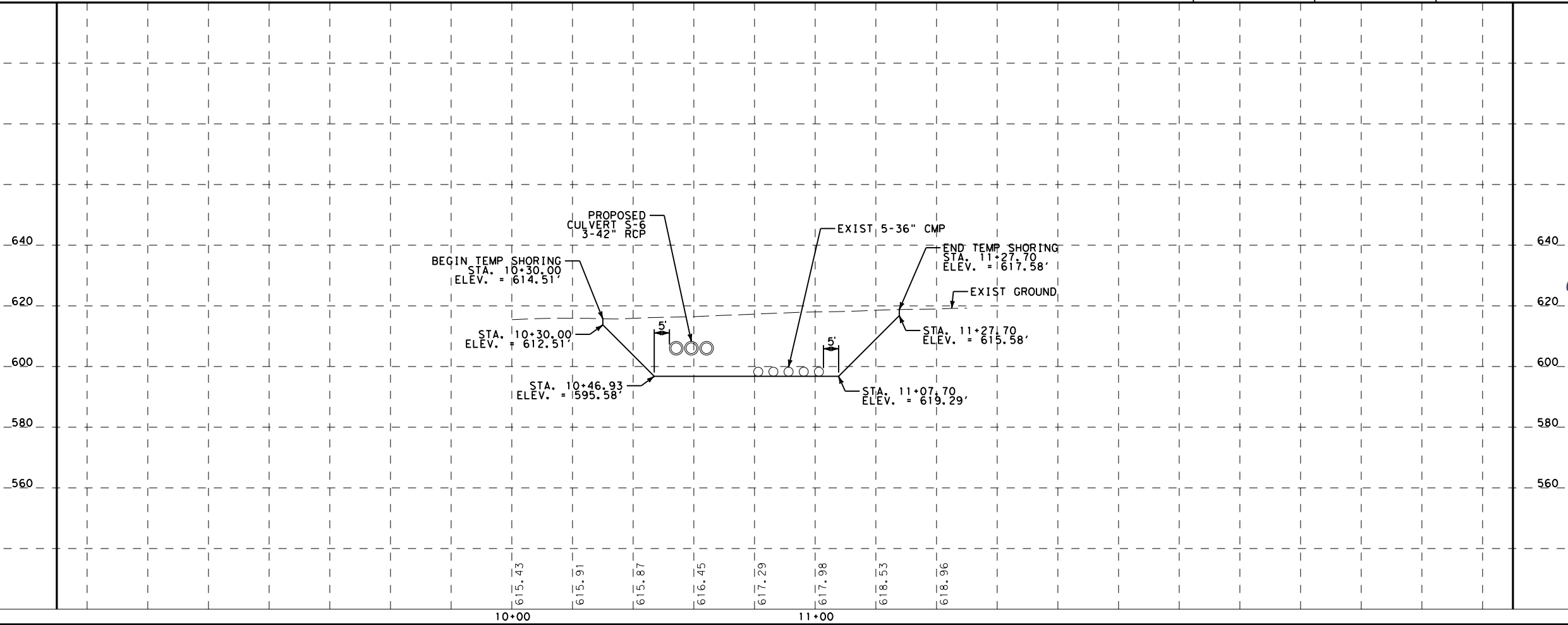
FM 1382
TEMPORARY SHORING LAYOUT
(SHORING B)

SCALE: 1"=20'-H
1"=20'-V
SHEET 2 OF 6

DESIGN DN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
GRAPHICS DN	6	SEE TITLE SHEET		FM 1382
CHECK NP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK AM	TEXAS	DAL	DALLAS	49
	CONTROL	SECTION	JOB	
	1047	03	076, ETC.	



ALIGNMENT DATA TEMP SHORING C				
STATION	POINT	NORTHING	EASTING	BEARING
10+00.00	BEGIN	6915840.6910	2437927.1166	S 24° 39' 52.51" W
11+50.00	END	6915704.3761	2437864.5208	



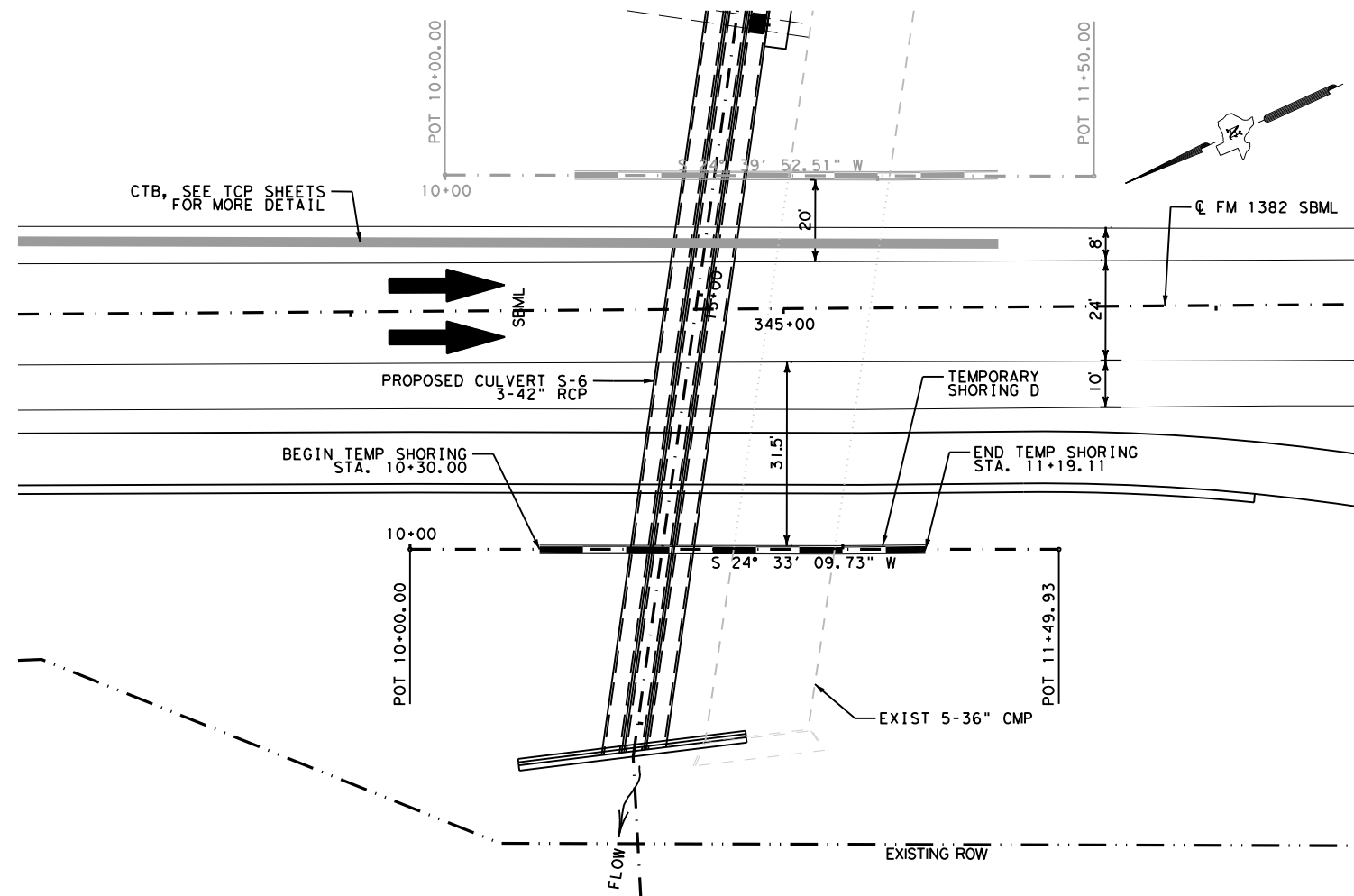
Dung Nguyen
Signature of Registrant & Date
P.E. 11/15/2022



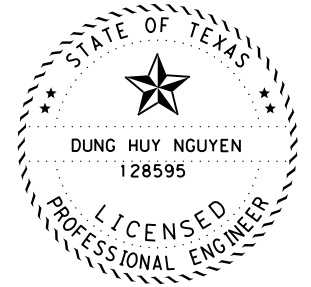
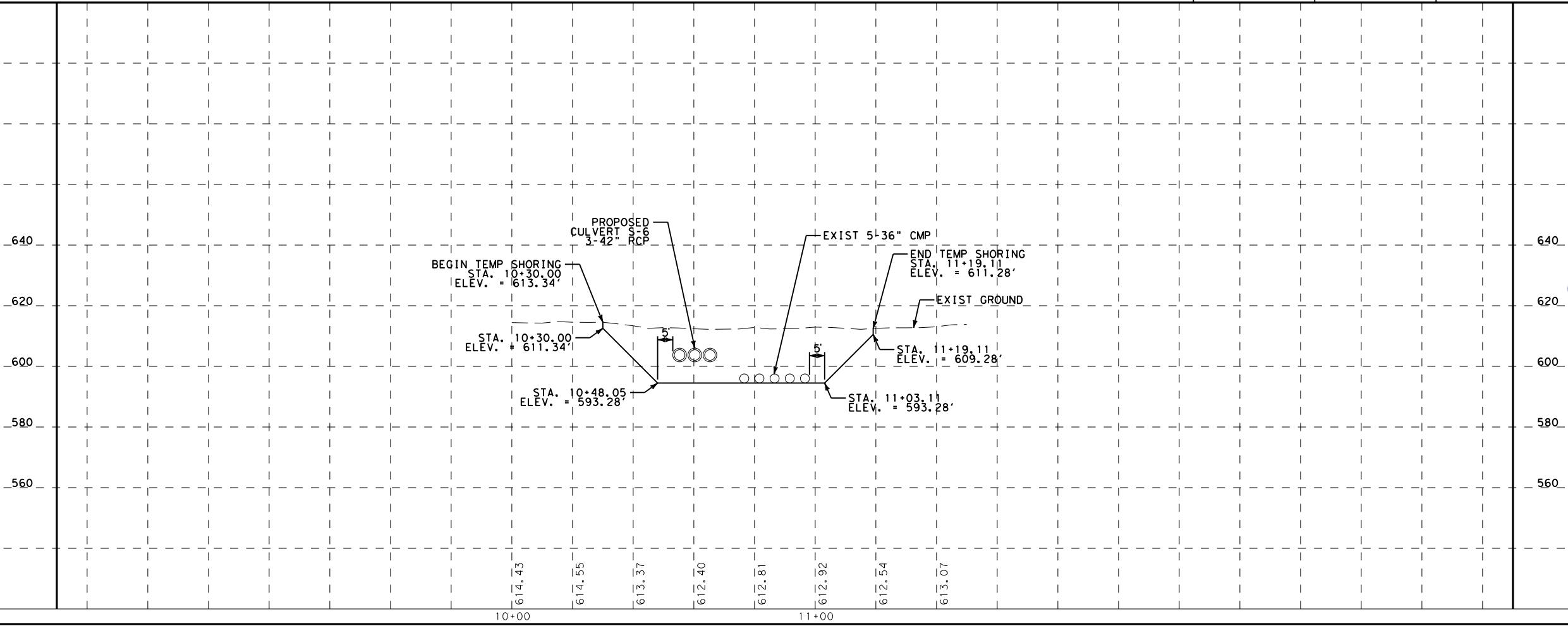
FM 1382
TEMPORARY SHORING LAYOUT
(SHORING C)

SCALE: 1"=20'-H
1"=20'-V
SHEET 3 OF 6

DESIGN DN	FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
GRAPHICS DN	6	SEE TITLE SHEET	FM 1382
CHECK NP	STATE	DISTRICT	COUNTY
CHECK AM	TEXAS	DAL	DALLAS
	CONTROL	SECTION	JOB
	1047	03	076, ETC.
			SHEET NO. 50



ALIGNMENT DATA TEMP SHORING D				
STATION	POINT	NORTHING	EASTING	BEARING
10+00.00	BEGIN	6915883.9805	2437851.7435	S 24° 33' 09.73" W
11+49.93	END	6915747.6032	2437789.4412	



Dung Nguyen
P.E. 11/15/2022
Signature of Registrant & Date

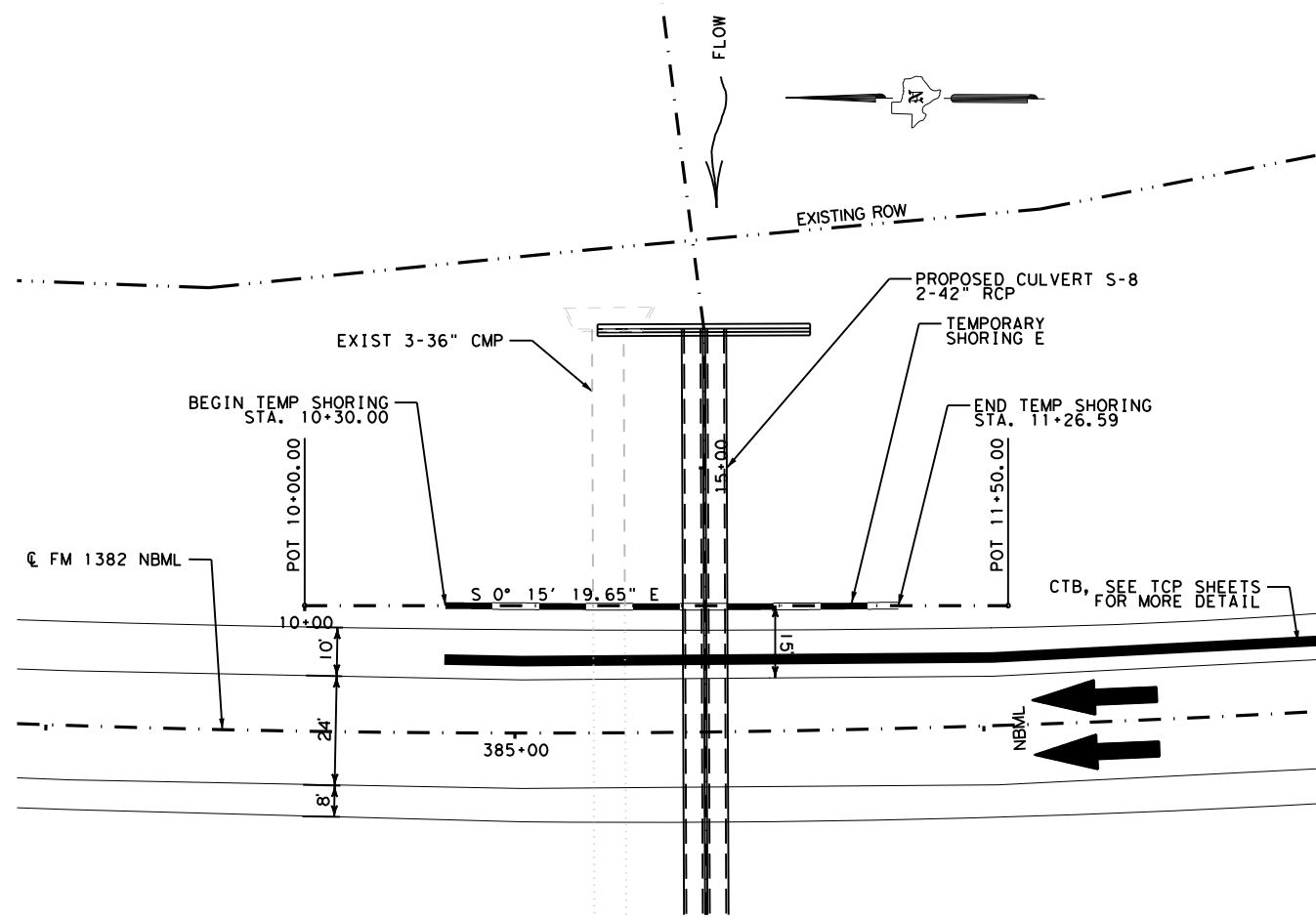


FM 1382
TEMPORARY SHORING LAYOUT
(SHORING D)

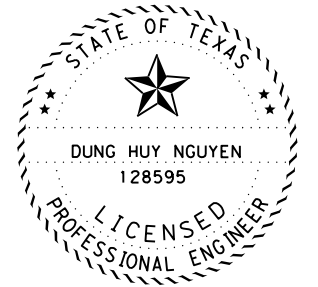
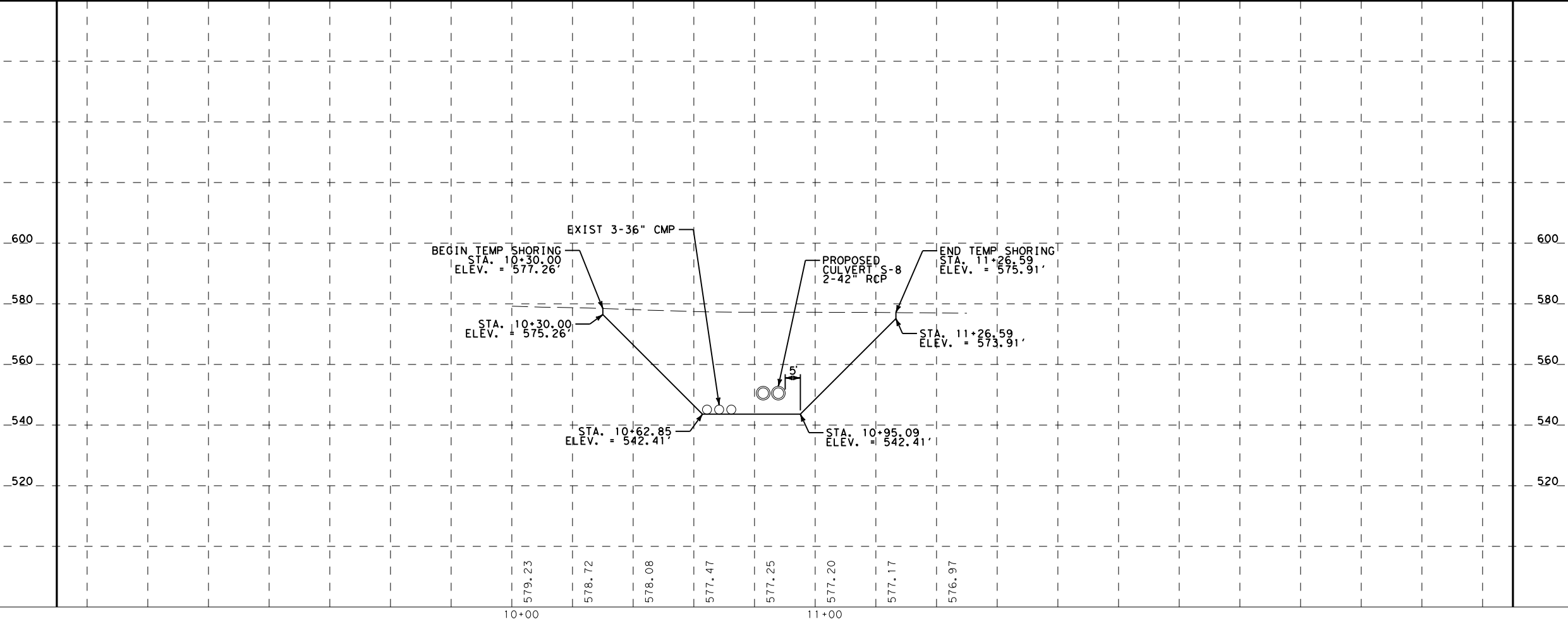
SCALE: 1"=20'-H
1"=20'-V

SHEET 4 OF 6

DESIGN DN	FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
GRAPHICS DN	6	SEE TITLE SHEET	FM 1382
CHECK NP	STATE	DISTRICT	COUNTY
CHECK AM	TEXAS	DAL	DALLAS
	CONTROL	SECTION	JOB
	1047	03	076, ETC.
			SHEET NO.
			51



ALIGNMENT DATA TEMP SHORING E				
STATION	POINT	NORTHING	EASTING	BEARING
10+00.00	BEGIN	6911931.0027	2437413.9738	S 0° 15' 19.65" E
11+50.00	END	6911781.0042	2437414.6425	



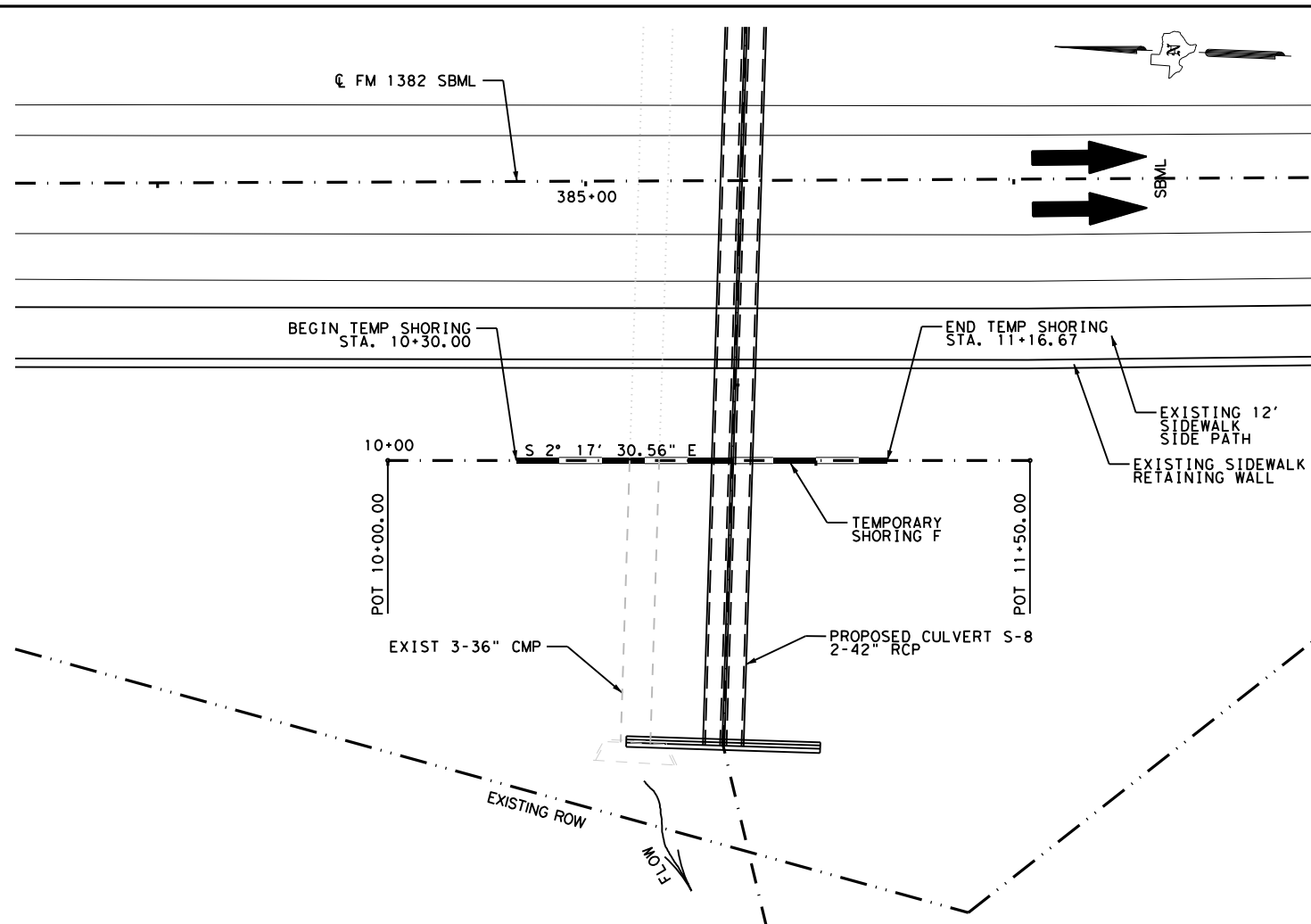
Dung Nguyen
P.E. 11/15/2022
Signature of Registrant & Date



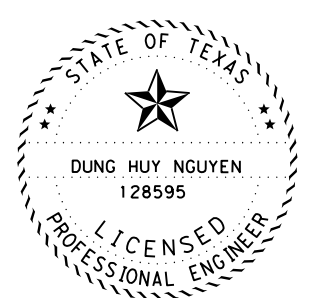
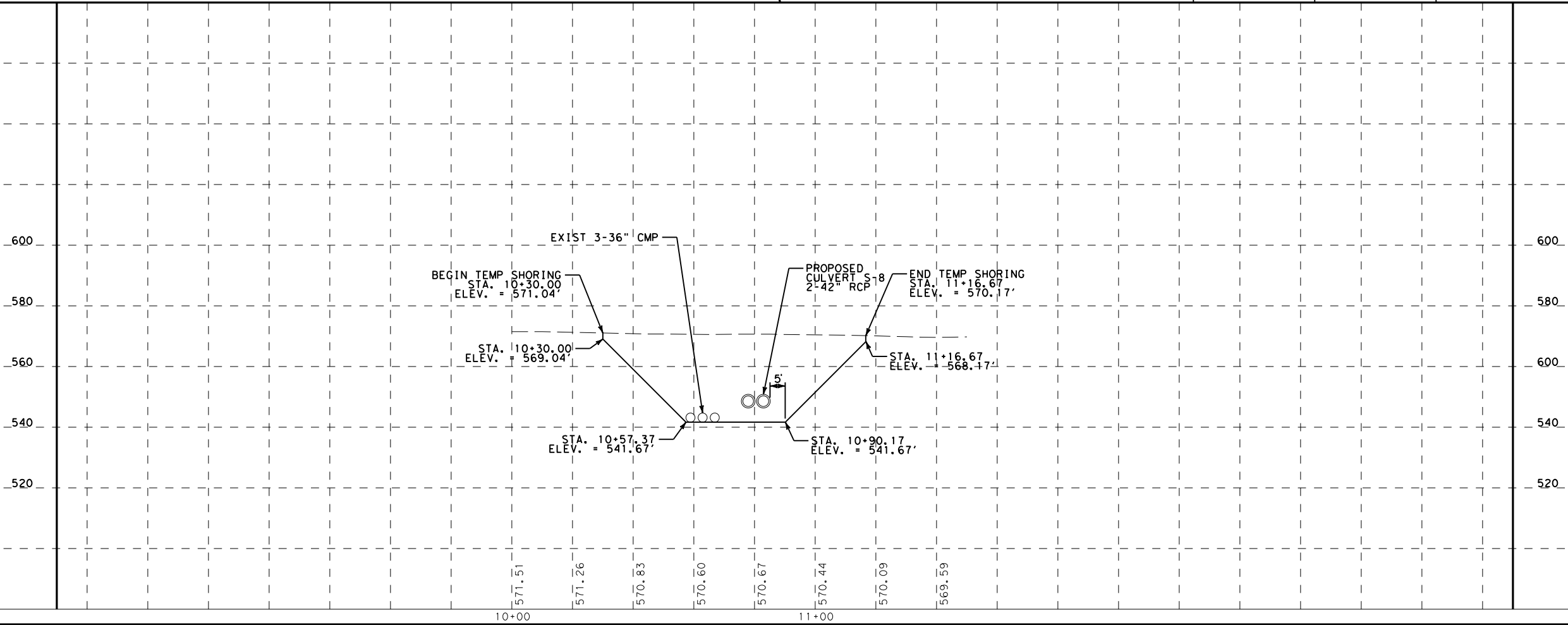
FM 1382
TEMPORARY SHORING LAYOUT
(SHORING E)

SCALE: 1"=20'-H
1"=20'-V
SHEET 5 OF 6

DESIGN DN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
GRAPHICS DN	6	SEE TITLE SHEET		FM 1382
CHECK NP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK AM	TEXAS	DAL	DALLAS	52
	CONTROL	SECTION	JOB	
	1047	03	076, ETC.	



ALIGNMENT DATA TEMP SHORING F				
STATION	POINT	NORTHING	EASTING	BEARING
10+00.00	BEGIN	6911924.3909	2437222.8500	S 2° 17' 30.56" E
11+50.00	END	6911774.5109	2437228.8484	



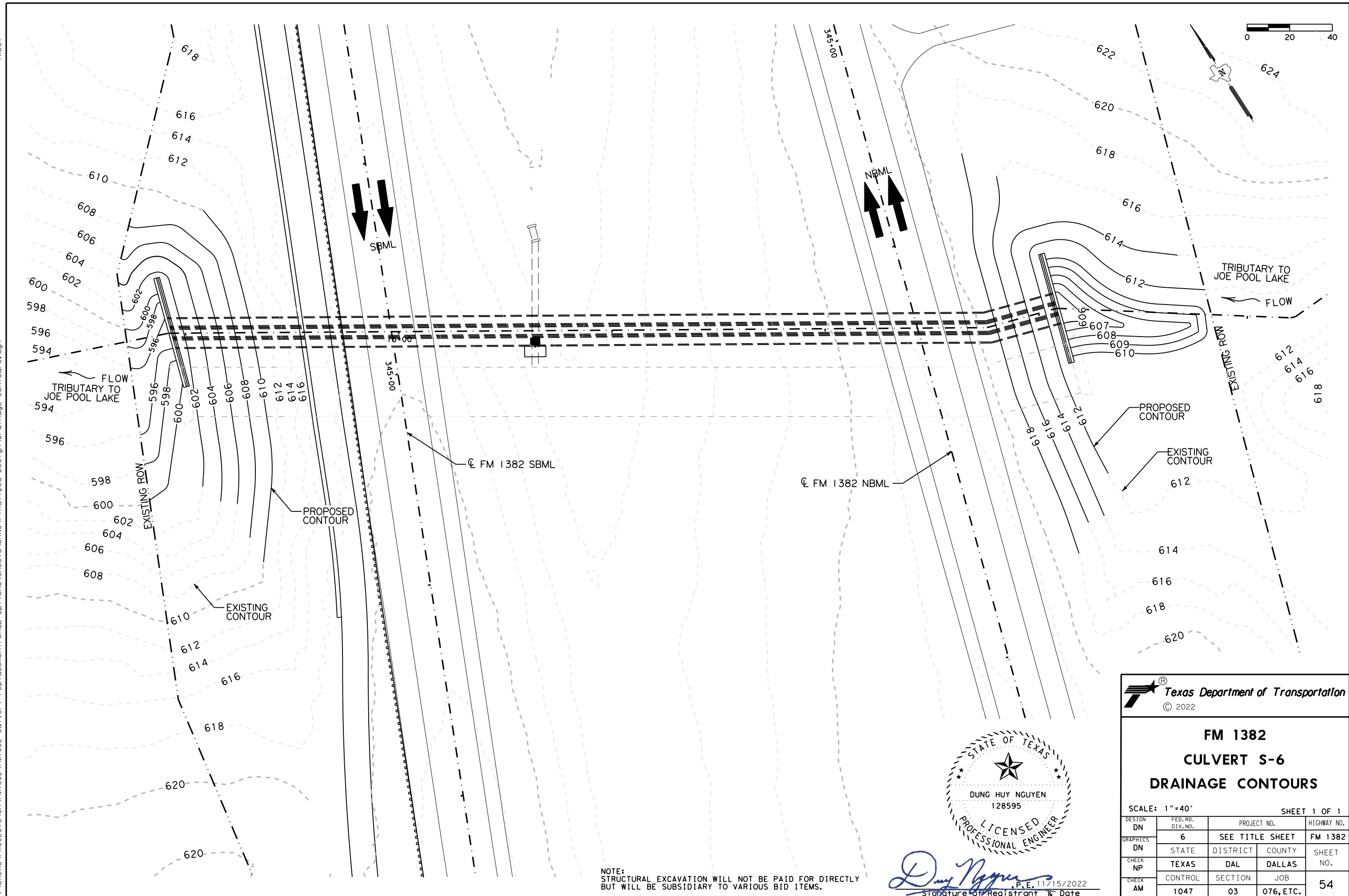
Dung Nguyen
Signature of Registrant & Date
P.E. 11/15/2022



FM 1382
TEMPORARY SHORING LAYOUT
(SHORING F)

SCALE: 1"=20'-H
1"=20'-V
SHEET 6 OF 6

DESIGN DN	FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
GRAPHICS DN	6	SEE TITLE SHEET	FM 1382
CHECK NP	STATE	DISTRICT	COUNTY
CHECK AM	TEXAS	DAL	DALLAS
	CONTROL	SECTION	JOB
	1047	03	076, ETC.
			SHEET NO. 53

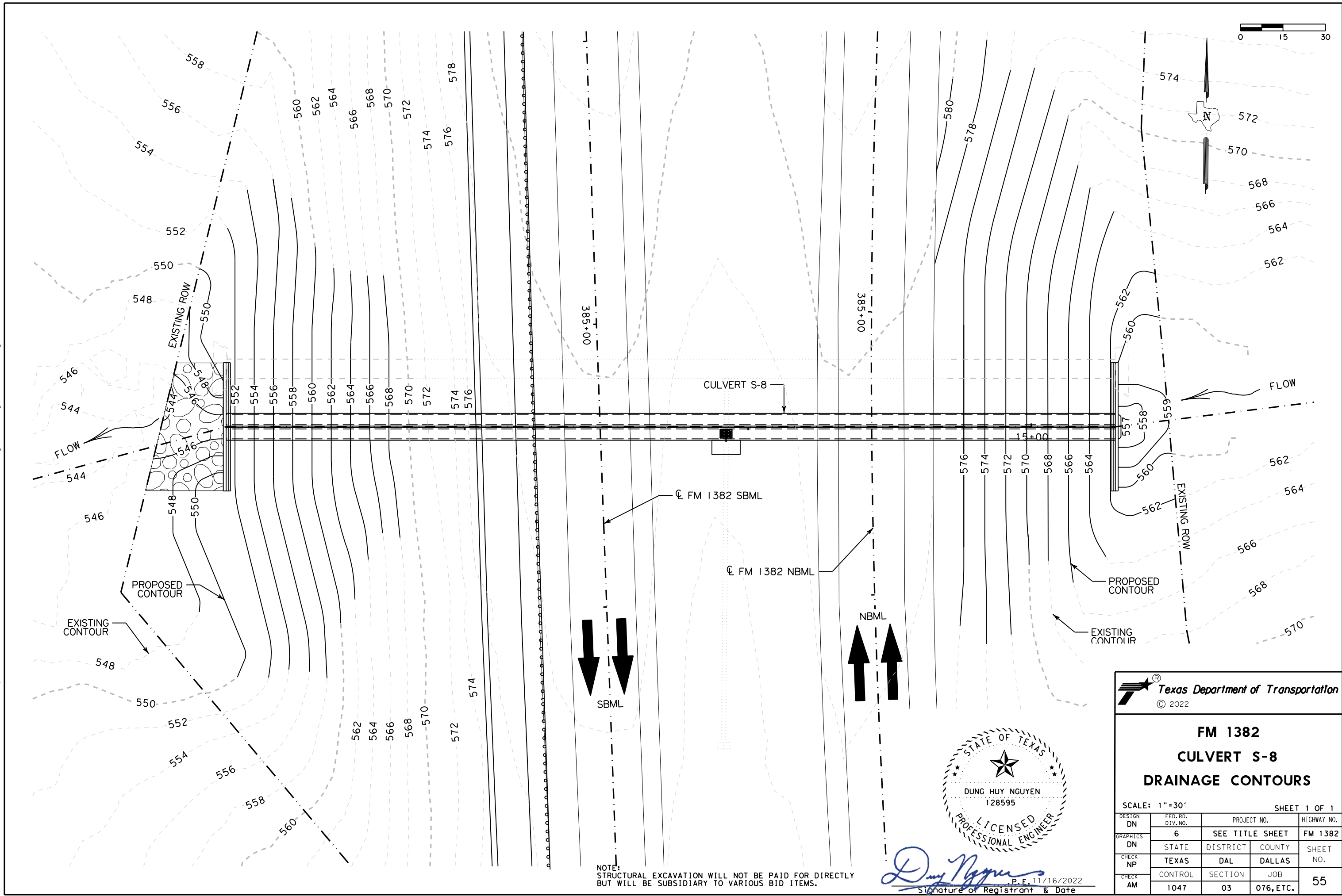


NOTE:
STRUCTURAL EXCAVATION WILL NOT BE PAID FOR DIRECTLY
BUT WILL BE SUBSIDIARY TO VARIOUS BID ITEMS.

STATE OF TEXAS
DUNG HUY NGUYEN
128595
LICENSED PROFESSIONAL ENGINEER
Dung Nguyen
Signature of Registrant & Date



FM 1382 CULVERT S-6 DRAINAGE CONTOURS			
SCALE: 1" = 40'		SHEET 1 OF 1	
DESIGN DN	FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
GRAPHICS DN	6	SEE TITLE SHEET	FM 1382
CHECK NP	TEXAS	DAL	DALLAS
CHECK AM	CONTROL	SECTION	JOB
	1047	03	076, ETC.
			SHEET NO. 54



NOTE:
STRUCTURAL EXCAVATION WILL NOT BE PAID FOR DIRECTLY
BUT WILL BE SUBSIDIARY TO VARIOUS BID ITEMS.

STATE OF TEXAS
DUNG HUY NGUYEN
128595
LICENSED PROFESSIONAL ENGINEER
Dung Nguyen
P.E. 11/16/2022
Signature of Registrant & Date



FM 1382			
CULVERT S-8			
DRAINAGE CONTOURS			
SCALE: 1"=30'			SHEET 1 OF 1
DESIGN DN	FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
GRAPHICS DN	6	SEE TITLE SHEET	FM 1382
CHECK NP	STATE	DISTRICT	COUNTY
CHECK AM	TEXAS	DAL	DALLAS
	CONTROL	SECTION	JOB
	1047	03	076, ETC.
			SHEET NO. 55

Test Hole No. CB-1
EI 615.84

EL 615.84	
EL 610.84	CLAY, hard, brown and light brown, with limestone fragments
EL 605.84	CLAY, hard, brown and light brown, with limestone fragments
EL 600.84	CLAY, hard, brown and gray, weathered, laminated, with iron staining
EL 595.84	

B/H = 595.84

Test Hole No. CB-2
EI 612.74

EL 612.74	
EL 607.74	CLAY, hard, brown, with calcareous nodules and limestone fragments
EL 602.74	
EL 597.74	CLAY, very stiff, brown, shaley, with calcareous nodules
EL 592.74	CLAY, very stiff, brown and gray, laminated, with iron staining and gypsum

B/H = 592.74

Test Hole No. CB-3
EI 618.94

EL 618.94	
EL 613.94	CLAY, hard, brown, with limestone fragments, calcareous nodules and iron staining
EL 608.94	CLAY, very stiff to hard, brown, shaley, with calcareous nodules
EL 603.94	
EL 598.94	CLAY, stiff to very stiff, brown and gray, laminated, with iron staining

B/H = 598.94

Test Hole No. CB-4
EI 574.52

EL 574.52	
EL 569.52	CLAY, hard, dark brown, with limestone fragments and iron staining
	CLAY, hard, brown, shaley, with iron staining
EL 564.52	
EL 559.52	CLAY, hard, brown and gray, laminated, with iron staining and gypsum
EL 554.52	CLAY, hard, gray
EL 549.52	50(3) 50(3)
EL 544.52	50(3) 50(2.5) SHALE, soft to hard, gray
EL 539.52	50(1.5) 50(1.5)

B/H = 539.52

Test Hole No. CB-5
EI 576.06

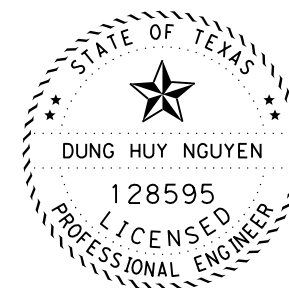
EL 576.06	
EL 571.06	CLAY, hard, dark brown, with limestone fragments
EL 566.06	CLAY, hard, brown, with calcareous nodules and iron staining
EL 561.06	CLAY, hard, gray
EL 556.06	CLAY, hard, brown, light brown and gray, shaley, with calcareous nodules and iron staining
EL 551.06	CLAY, hard, gray
EL 546.06	CLAY, very stiff to hard, brown and light brown, shaley, with gravel and iron staining
EL 541.06	

B/H = 541.06

Test Hole No. CB-6
EI 579

EL 579	SAND, compact, brown and light brown, clayey, with clay seams and limestone fragments
EL 574	CLAY, very stiff, brown and gray, shaley, with iron staining
EL 569	CLAY, hard, gray
EL 564	CLAY, very stiff, brown and gray, blocky, laminated, with iron staining
EL 559	CLAY, hard, brown, shaley, with trace gravel and iron staining
EL 554	
EL 549	CLAY, hard, brown and dark brown, blocky, laminated, with iron staining and trace gravel
EL 544	

B/H = 544



Dung Nguyen
Signature of Registrant & Date
11/15/2022

Texas Department of Transportation
© 2022

FM 1382
CORE BORING DATA

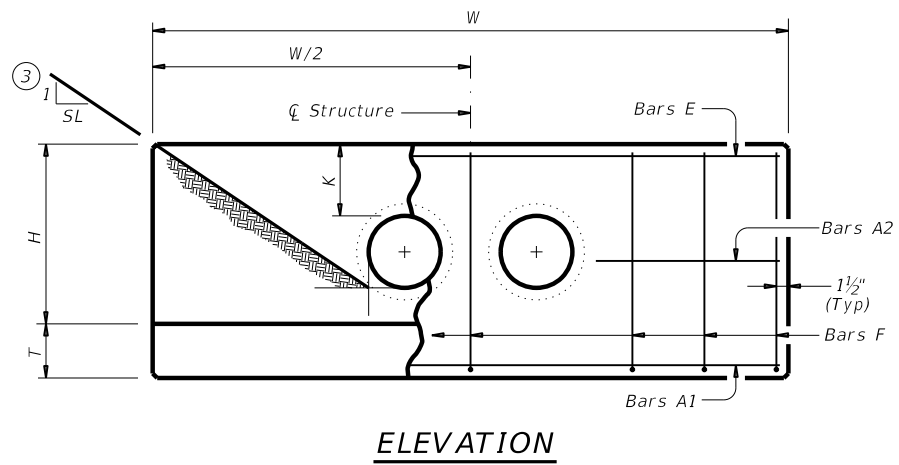
N. T. S.				SHEET 1 OF 1
DESIGN DN	FED. RD. DIV. NO. 6	PROJECT NO. SEE TITLE SHEET		HIGHWAY NO. FM 1382
GRAPHICS DN	STATE TEXAS	DISTRICT DAL	COUNTY DALLAS	SHEET NO. 56
CHECK NP	CONTROL	SECTION	JOB	
CHECK AM	1047	03	076, ETC.	

CORE BORING	LATITUDE	LONGITUDE
CB1	32.633429	-96.974334
CB2	32.633166	-96.973808
CB3	32.632904	-96.973311
CB4	32.62197	-96.976334
CB5	32.62243	-96.976088
CB6	32.622435	-96.975815

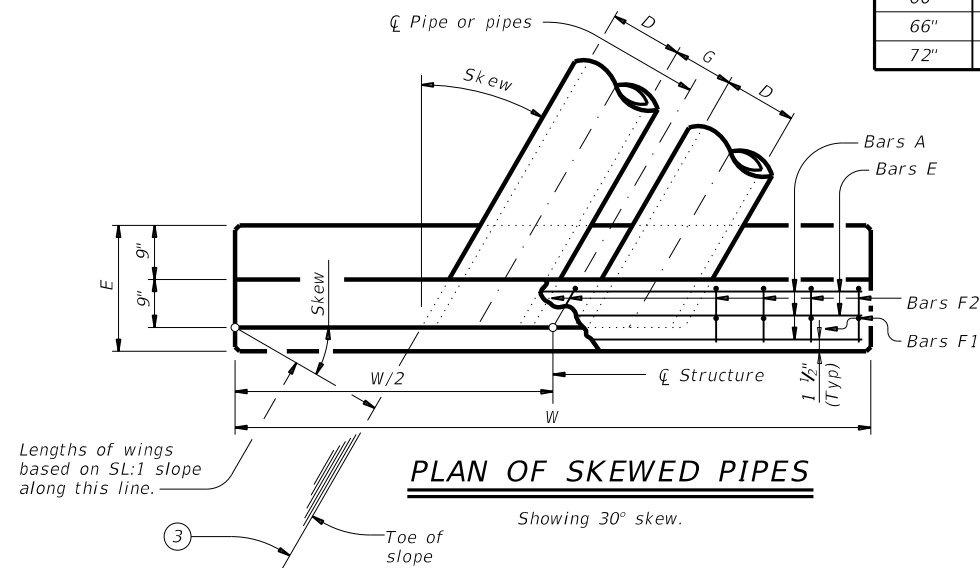
11/15/2022 1:00:56 PM
DATE: T:\DALAO\PROJECTS\On\FM1382\Culvert replacement\rehab_options_Sheet\FINAL\CH-PW-S-20.dgn
FILE: T:\DALAO\PROJECTS\On\FM1382\Culvert replacement\rehab_options_Sheet\FINAL\CH-PW-S-20.dgn
11/15/2022 1:00:56 PM
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of any information from one format to another. This standard is intended for use by those who are familiar with it and who are responsible for the design and construction of the project.

TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL ⑤

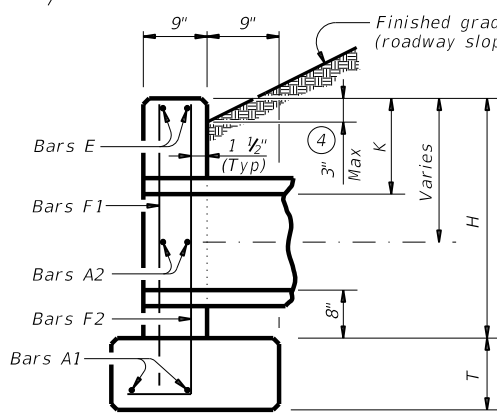
Slope	15° Skew			30° Skew			45° Skew												
	Values for One Pipe		Values To Be Added For Each Add'l Pipe	Values for One Pipe		Values To Be Added For Each Add'l Pipe	Values for One Pipe		Values To Be Added For Each Add'l Pipe										
	W	Reinf (Lbs) ①	Conc (CY) ②	W	Reinf (Lbs) ①	Conc (CY) ②	W	Reinf (Lbs) ①	Conc (CY) ②	W	Reinf (Lbs) ①	Conc (CY) ②	W	Reinf (Lbs) ①	Conc (CY) ②				
2:1	12"	9'-4"	124	1.1	1'-9 3/4"	15	0.2	10'-5"	130	1.2	2'-0"	16	0.2	12'-9"	159	1.5	2'-5 3/4"	17	0.3
	15"	10'-7"	136	1.3	2'-3"	17	0.2	11'-10"	159	1.5	2'-6"	18	0.2	14'-6"	191	1.8	3'-0 3/4"	20	0.3
	18"	11'-11"	165	1.5	2'-9"	19	0.3	13'-3"	174	1.7	3'-1"	29	0.3	16'-3"	207	2.1	3'-9 1/4"	33	0.4
	21"	13'-2"	203	1.9	3'-2 1/4"	31	0.4	14'-9"	233	2.1	3'-6 3/4"	33	0.4	18'-0"	276	2.6	4'-4 1/4"	36	0.5
	24"	14'-6"	240	2.1	3'-8 1/4"	34	0.4	16'-2"	251	2.4	4'-1 3/4"	36	0.5	19'-10"	318	2.9	5'-0 3/4"	39	0.6
	27"	15'-9"	258	2.5	4'-0 3/4"	38	0.5	17'-7"	292	2.8	4'-6 1/4"	39	0.6	21'-7"	342	3.4	5'-6 1/4"	44	0.7
	30"	17'-1"	297	2.8	4'-5 3/4"	40	0.6	19'-1"	311	3.1	5'-0"	42	0.6	23'-4"	388	3.8	6'-1 3/4"	47	0.8
	33"	18'-5"	320	3.3	4'-9 3/4"	43	0.6	20'-6"	358	3.6	5'-4 3/4"	46	0.7	25'-1"	439	4.4	6'-7 1/4"	51	0.9
	36"	19'-8"	401	4.0	5'-3"	47	0.9	21'-11"	422	4.5	5'-10 3/4"	50	0.9	26'-10"	517	5.5	7'-2 1/4"	55	1.2
	42"	22'-3"	476	5.0	6'-0 3/4"	53	1.1	24'-10"	528	5.6	6'-8 3/4"	56	1.2	30'-5"	634	6.9	8'-3"	76	1.4
3:1	12"	13'-6"	178	1.6	1'-9 3/4"	15	0.2	15'-0"	189	1.8	2'-0"	15	0.2	18'-5"	237	2.2	2'-5 3/4"	17	0.2
	15"	15'-3"	212	1.9	2'-3"	17	0.2	17'-0"	223	2.1	2'-6"	17	0.3	20'-10"	276	2.6	3'-0 3/4"	20	0.3
	18"	17'-1"	231	2.3	2'-9"	19	0.3	19'-1"	259	2.5	3'-1"	29	0.3	23'-4"	318	3.1	3'-9 1/4"	32	0.4
	21"	18'-11"	306	2.7	3'-2 1/4"	31	0.4	21'-1"	339	3.0	3'-6 3/4"	33	0.4	25'-10"	413	3.7	4'-4 1/4"	36	0.5
	24"	20'-8"	345	3.1	3'-8 3/4"	35	0.4	23'-1"	384	3.5	4'-1 3/4"	36	0.5	28'-3"	462	4.2	5'-0 3/4"	40	0.6
	27"	22'-6"	376	3.7	4'-0 3/4"	38	0.5	25'-1"	438	4.1	4'-6 1/4"	39	0.6	30'-9"	522	5.0	5'-6 1/4"	44	0.7
	30"	24'-4"	422	4.1	4'-5 3/4"	40	0.6	27'-2"	466	4.6	5'-0"	42	0.6	33'-3"	578	5.6	6'-1 3/4"	47	0.8
	33"	26'-2"	476	4.8	4'-10"	43	0.6	29'-2"	522	5.3	5'-4 3/4"	46	0.7	35'-9"	644	6.5	6'-7 1/4"	51	0.9
	36"	27'-11"	590	5.9	5'-3"	47	0.8	31'-2"	645	6.6	5'-10 3/4"	50	0.9	38'-2"	787	8.0	7'-2 1/4"	56	1.2
	42"	31'-7"	684	7.3	6'-0 1/4"	53	1.1	35'-3"	776	8.2	6'-8 3/4"	56	1.2	43'-2"	933	10.0	8'-3"	79	1.4
4:1	12"	17'-7"	232	2.1	1'-9 3/4"	15	0.2	19'-8"	259	2.4	2'-0"	16	0.2	24'-0"	314	2.9	2'-5 3/4"	18	0.2
	15"	19'-11"	272	2.5	2'-3"	17	0.2	22'-3"	301	2.8	2'-6"	18	0.3	27'-3"	361	3.5	3'-0 3/4"	21	0.3
	18"	22'-3"	313	3.0	2'-9"	19	0.3	24'-10"	344	3.3	3'-1"	29	0.3	30'-5"	427	4.0	3'-9 1/4"	32	0.4
	21"	24'-7"	407	3.6	3'-2 1/4"	31	0.4	27'-5"	446	4.0	3'-6 3/4"	33	0.4	33'-7"	549	4.9	4'-4 1/4"	36	0.5
	24"	26'-11"	455	4.1	3'-8 3/4"	35	0.4	30'-0"	499	4.5	4'-1 3/4"	36	0.5	36'-9"	609	5.6	5'-0 3/4"	40	0.6
	27"	29'-3"	514	4.8	4'-0 3/4"	38	0.5	32'-7"	562	5.4	4'-6 1/4"	40	0.6	39'-11"	703	6.6	5'-6 1/4"	43	0.7
	30"	31'-7"	568	5.4	4'-5 3/4"	40	0.6	35'-3"	620	6.0	5'-0"	42	0.6	43'-2"	768	7.4	6'-1 3/4"	49	0.8
	33"	33'-11"	634	6.2	4'-10"	43	0.7	37'-10"	710	7.0	5'-4 3/4"	46	0.7	46'-4"	848	8.5	6'-7 1/4"	52	0.9
	36"	36'-3"	776	7.7	5'-3"	48	0.9	40'-5"	868	8.6	5'-10 3/4"	49	0.9	49'-6"	1,058	10.6	7'-2 1/4"	56	1.1
	42"	40'-11"	921	9.6	6'-0 1/4"	53	1.0	45'-7"	1,022	10.7	6'-8 3/4"	57	1.2	55'-10"	1,262	13.1	8'-3"	78	1.4
6:1	12"	25'-11"	342	3.1	1'-9 3/4"	15	0.2	28'-10"	374	3.5	2'-0"	16	0.2	35'-4"	456	4.3	2'-5 3/4"	17	0.2
	15"	29'-3"	390	3.7	2'-3"	17	0.2	32'-7"	442	4.2	2'-6"	18	0.2	39'-11"	549	5.1	3'-0 3/4"	20	0.3
	18"	32'-7"	459	4.4	2'-9"	20	0.3	36'-4"	515	4.9	3'-1"	29	0.3	44'-7"	629	6.0	3'-9 1/4"	33	0.4
	21"	36'-0"	608	5.3	3'-2 1/4"	31	0.4	40'-2"	660	5.9	3'-6 3/4"	33	0.4	49'-2"	823	7.2	4'-4 1/4"	38	0.5
	24"	39'-4"	672	6.0	3'-8 3/4"	35	0.4	43'-11"	748	6.7	4'-1 3/4"	36	0.5	53'-9"	920	8.2	5'-0 3/4"	42	0.6
	27"	42'-8"	770	7.1	4'-0 3/4"	38	0.5	47'-8"	852	8.0	4'-6 1/4"	41	0.5	58'-4"	1,039	9.7	5'-6 1/4"	45	0.7
	30"	46'-1"	839	8.0	4'-5 3/4"	40	0.6	51'-5"	949	8.9	5'-0"	44	0.6	62'-11"	1,162	10.9	6'-1 3/4"	48	0.8
	33"	49'-5"	947	9.2	4'-10"	45	0.7	55'-2"	1,040	10.3	5'-4 3/4"	48	0.7	67'-6"	1,292	12.6	6'-7 1/4"	50	0.9
	36"	52'-10"	1,151	11.4	5'-3"	49	0.8	58'-11"	1,287	12.7	5'-10 3/4"	51	1.0	72'-1"	1,583	15.6	7'-2 1/4"	55	1.1
	42"	59'-6"	1,365	14.2	6'-0 1/4"	55	1.0	66'-5"	1,530	15.8	6'-8 3/4"	57	1.2	81'-4"	1,875	19.4	8'-3"	76	1.4



ELEVATION



PLAN OF SKEWED PIPES



SECTION AT CENTER OF PIPE

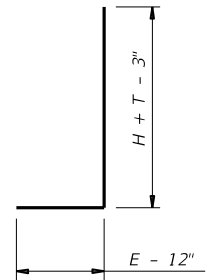
- Total quantities include one 3'-1" lap for bars over 60' in length.
- Quantities shown are for concrete pipe and will increase slightly for metal pipe installations.
- Indicated slope is perpendicular to centerline pipe or pipes.
- For vehicle safety, construct curbs no more than 3" above finished grade. Reduce curb heights, if necessary, to meet these requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- Dimensions shown are usual and maximum.
- Quantities shown are for one structure end only (one headwall).

TABLE OF CONSTANT DIMENSIONS

Dia of Pipe (D)	G	K ⑤	H	T	E
12"	0'-9"	1'-0"	2'-8"	0'-9"	1'-9"
15"	0'-11"	1'-0"	2'-11"	0'-9"	1'-9"
18"	1'-2"	1'-0"	3'-2"	0'-9"	1'-9"
21"	1'-4"	1'-0"	3'-5"	0'-9"	2'-0"
24"	1'-7"	1'-0"	3'-8"	0'-9"	2'-0"
27"	1'-8"	1'-0"	3'-11"	0'-9"	2'-3"
30"	1'-10"	1'-0"	4'-2"	0'-9"	2'-3"
33"	1'-11"	1'-0"	4'-5"	0'-9"	2'-6"
36"	2'-1"	1'-0"	4'-8"	1'-0"	2'-6"
42"	2'-4"	1'-0"	5'-2"	1'-0"	2'-9"
48"	2'-7"	1'-3"	5'-11"	1'-0"	3'-0"
54"	3'-0"	1'-3"	6'-5"	1'-0"	3'-3"
60"	3'-3"	1'-3"	6'-11"	1'-0"	3'-6"
66"	3'-3"	1'-3"	7'-5"	1'-0"	3'-9"
72"	3'-4"	1'-3"	7'-11"	1'-0"	4'-0"

TABLE OF ⑥ REINFORCING STEEL

Bar	Size	Spa	No.
A1	#5	~	2
A2	#5	1'-6"	~
E	#5	~	2
F	#5	1'-0"	~



BARS F2

MATERIAL NOTES:
Provide Grade 60 reinforcing steel.
Provide Class C concrete ($f'c = 3,600$ psi).

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
Do not mount bridge rails of any type directly to these culvert headwalls.
This standard may not be used for wall heights, H, exceeding the values shown.

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

Texas Department of Transportation
CONCRETE HEADWALLS WITH PARALLEL WINGS FOR SKEWED PIPE CULVERTS
CH-PW-S

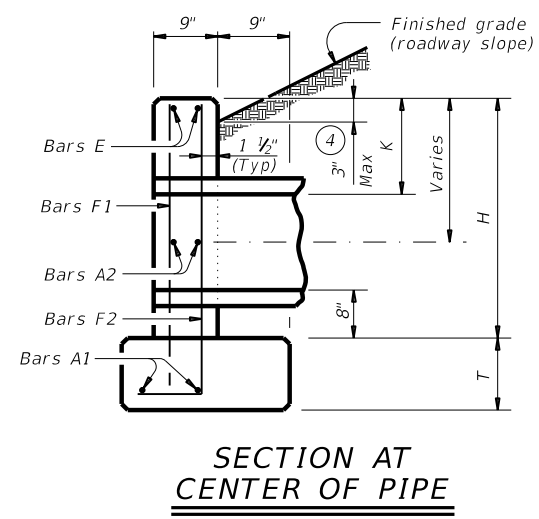
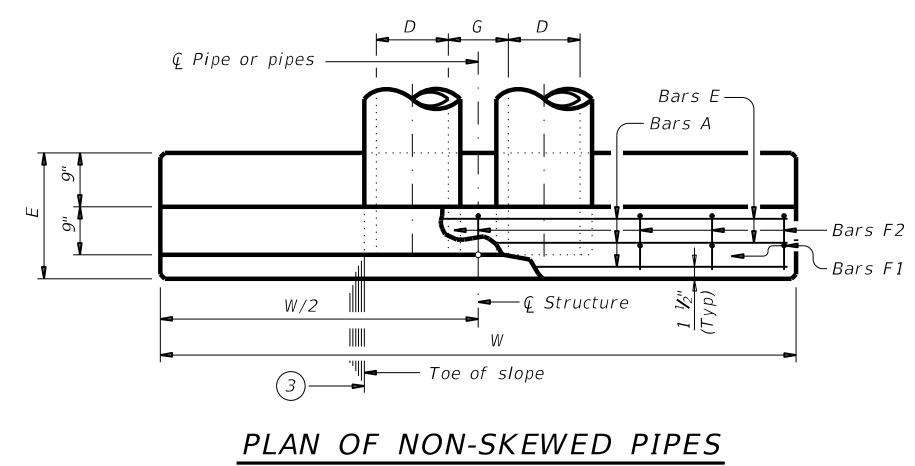
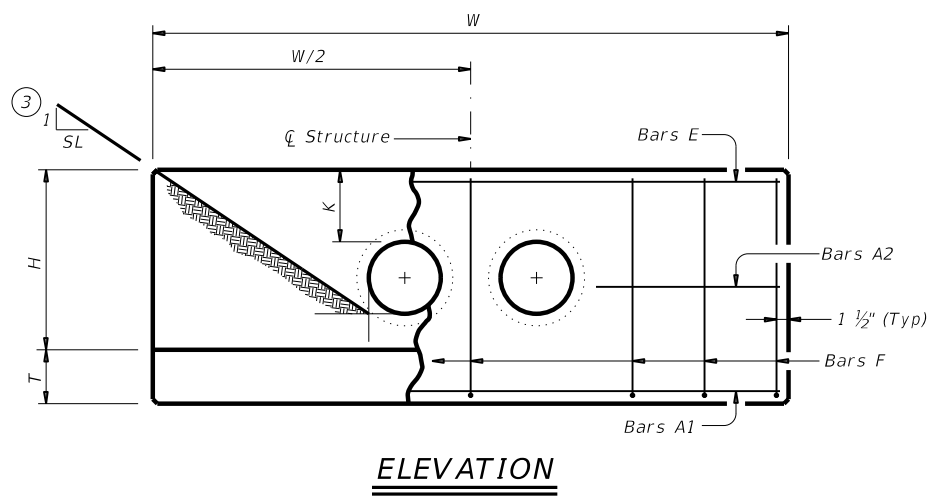
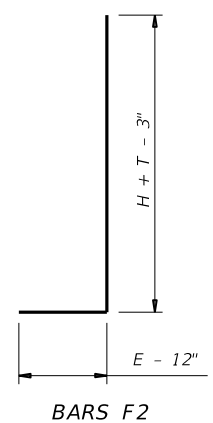
FILE: chpwsste-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS	1047	03	076, ETC.	FM 1382
DIST	COUNTY		SHEET NO.	
DAL	DALLAS		57	

Bridge Division Standard

11/15/2022 1:00:57 PM
 DATE: T:\DALAO\PROJECTS\On\FM1382\Culvert replacement\rehab options\Sheet\STANDARD\CH-PW-0.dgn
 FILE:

**TABLE OF VARIABLE DIMENSIONS (5)
AND QUANTITIES FOR ONE HEADWALL**

Slope	Dia of Pipe (D)	Values for One Pipe			Values To Be Added for Each Add'l Pipe		
		W	Reinf (Lbs) (1)	Conc (CY) (2)	W	Reinf (Lbs) (1)	Conc (CY) (2)
2:1	12"	9'-0"	122	1.1	1'-9"	15	0.2
	15"	10'-3"	136	1.3	2'-2"	16	0.2
	18"	11'-6"	163	1.5	2'-8"	19	0.3
	21"	12'-9"	200	1.8	3'-1"	31	0.4
	24"	14'-0"	217	2.1	3'-7"	34	0.4
	27"	15'-3"	254	2.4	3'-11"	37	0.5
	30"	16'-6"	272	2.7	4'-4"	40	0.6
	33"	17'-9"	314	3.1	4'-8"	43	0.6
	36"	19'-0"	371	3.9	5'-1"	46	0.8
	42"	21'-6"	442	4.9	5'-10"	52	1.0
	48"	25'-0"	569	6.4	6'-7"	59	1.3
	54"	27'-6"	701	7.5	7'-6"	82	1.6
60"	30'-0"	794	8.8	8'-3"	90	1.8	
66"	32'-6"	894	10.2	8'-9"	96	2.0	
72"	35'-0"	1,055	11.7	9'-4"	103	2.3	
3:1	12"	13'-0"	175	1.6	1'-9"	14	0.2
	15"	14'-9"	193	1.9	2'-2"	17	0.2
	18"	16'-6"	228	2.2	2'-8"	19	0.3
	21"	18'-3"	299	2.6	3'-1"	31	0.4
	24"	20'-0"	323	3.0	3'-7"	33	0.4
	27"	21'-9"	371	3.5	3'-11"	37	0.5
	30"	23'-6"	415	4.0	4'-4"	40	0.5
	33"	25'-3"	469	4.6	4'-8"	43	0.6
	36"	27'-0"	556	5.7	5'-1"	46	0.8
	42"	30'-6"	675	7.1	5'-10"	52	1.0
	48"	35'-6"	837	9.2	6'-7"	59	1.3
	54"	39'-0"	1,015	11.0	7'-6"	84	1.6
60"	42'-6"	1,171	12.9	8'-3"	91	1.8	
66"	46'-0"	1,298	14.9	8'-9"	98	2.0	
72"	49'-6"	1,561	17.1	9'-4"	103	2.3	
4:1	12"	17'-0"	229	2.0	1'-9"	15	0.2
	15"	19'-3"	266	2.4	2'-2"	17	0.2
	18"	21'-6"	308	2.9	2'-8"	19	0.3
	21"	23'-9"	382	3.5	3'-1"	31	0.3
	24"	26'-0"	430	3.9	3'-7"	34	0.4
	27"	28'-3"	486	4.7	3'-11"	37	0.5
	30"	30'-6"	539	5.2	4'-4"	40	0.6
	33"	32'-9"	603	6.0	4'-8"	42	0.6
	36"	35'-0"	738	7.5	5'-1"	47	0.8
	42"	39'-6"	881	9.3	5'-10"	52	1.0
	48"	46'-0"	1,102	12.1	6'-7"	61	1.3
	54"	50'-6"	1,364	14.4	7'-6"	84	1.6
60"	55'-0"	1,547	16.9	8'-3"	91	1.8	
66"	59'-6"	1,741	19.5	8'-9"	98	2.0	
72"	64'-0"	2,077	22.4	9'-4"	102	2.3	
6:1	12"	25'-0"	336	3.0	1'-9"	14	0.2
	15"	28'-3"	384	3.6	2'-2"	17	0.2
	18"	31'-6"	452	4.2	2'-8"	19	0.3
	21"	34'-9"	581	5.1	3'-1"	31	0.4
	24"	38'-0"	644	5.8	3'-7"	34	0.4
	27"	41'-3"	737	6.9	3'-11"	37	0.5
	30"	44'-6"	807	7.7	4'-4"	39	0.6
	33"	47'-9"	912	8.9	4'-8"	44	0.6
	36"	51'-0"	1,108	11.0	5'-1"	48	0.8
	42"	57'-6"	1,318	13.7	5'-10"	54	1.0
	48"	67'-0"	1,682	17.9	6'-7"	59	1.3
	54"	73'-6"	2,072	21.3	7'-6"	83	1.6
60"	80'-0"	2,351	24.9	8'-3"	89	1.8	
66"	86'-6"	2,643	28.9	8'-9"	96	2.0	
72"	93'-0"	3,121	33.1	9'-4"	101	2.3	



- ① Total quantities include one 3'-1" lap for bars over 60' in length.
- ② Quantities shown are for concrete pipe and will increase slightly for metal pipe installations.
- ③ Indicated slope is perpendicular to centerline pipe or pipes.
- ④ For vehicle safety, construct curbs no more than 3" above finished grade. Reduce curb heights, if necessary, to meet these requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- ⑤ Dimensions shown are usual and maximum.
- ⑥ Quantities shown are for one structure end only (one headwall).

TABLE OF CONSTANT DIMENSIONS

Dia of Pipe (D)	G	K (5)	H	T	E
12"	0'-9"	1'-0"	2'-8"	0'-9"	1'-9"
15"	0'-11"	1'-0"	2'-11"	0'-9"	1'-9"
18"	1'-2"	1'-0"	3'-2"	0'-9"	1'-9"
21"	1'-4"	1'-0"	3'-5"	0'-9"	2'-0"
24"	1'-7"	1'-0"	3'-8"	0'-9"	2'-0"
27"	1'-8"	1'-0"	3'-11"	0'-9"	2'-3"
30"	1'-10"	1'-0"	4'-2"	0'-9"	2'-3"
33"	1'-11"	1'-0"	4'-5"	0'-9"	2'-6"
36"	2'-1"	1'-0"	4'-8"	1'-0"	2'-6"
42"	2'-4"	1'-0"	5'-2"	1'-0"	2'-9"
48"	2'-7"	1'-3"	5'-11"	1'-0"	3'-0"
54"	3'-0"	1'-3"	6'-5"	1'-0"	3'-3"
60"	3'-3"	1'-3"	6'-11"	1'-0"	3'-6"
66"	3'-3"	1'-3"	7'-5"	1'-0"	3'-9"
72"	3'-4"	1'-3"	7'-11"	1'-0"	4'-0"

TABLE OF REINFORCING STEEL (6)

Bar	Size	Spa	No.
A1	#5	~	2
A2	#5	1'-6"	~
E	#5	~	2
F	#5	1'-0"	~

MATERIAL NOTES:
 Provide Grade 60 reinforcing steel.
 Provide Class C concrete (f'c = 3,600 psi).

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications.
 Do not mount bridge rails of any type directly to these culvert headwalls.
 This standard may not be used for wall heights, H, exceeding the values shown.

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

Bridge Division Standard

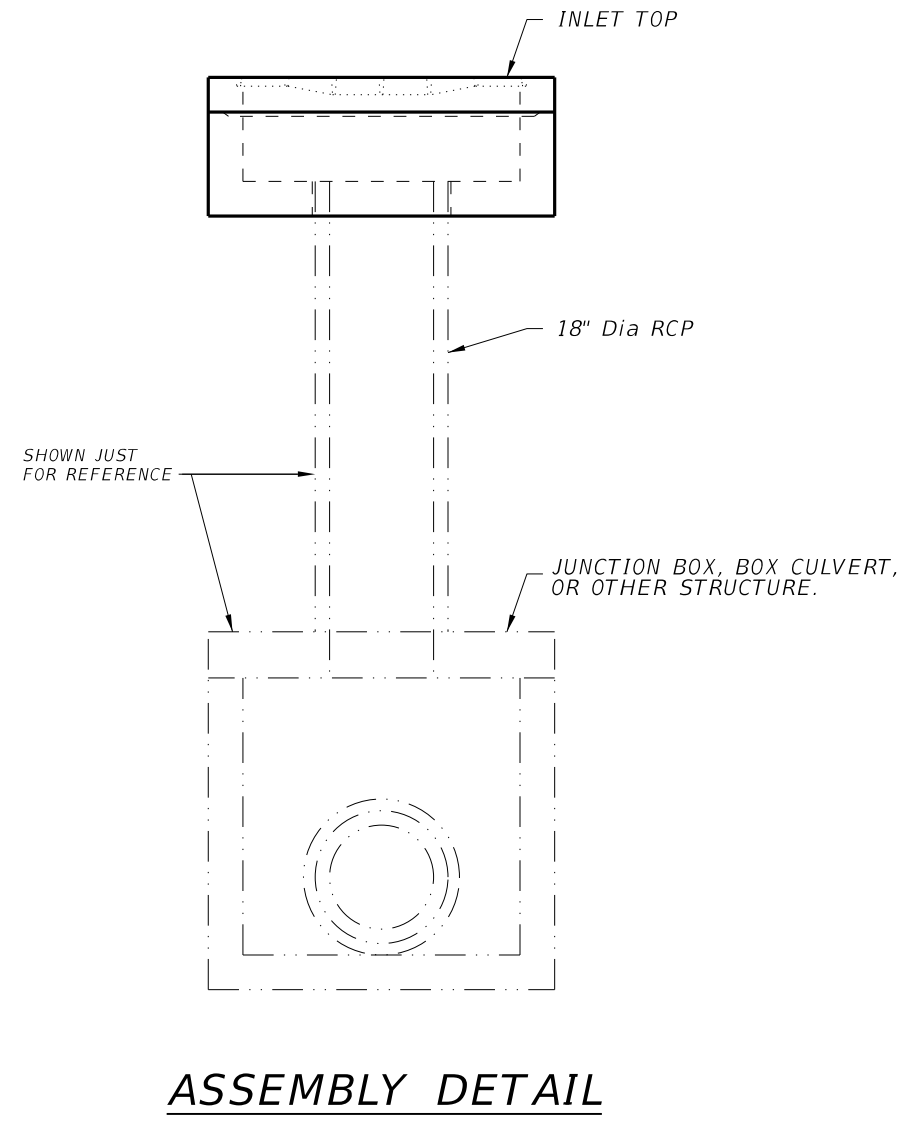
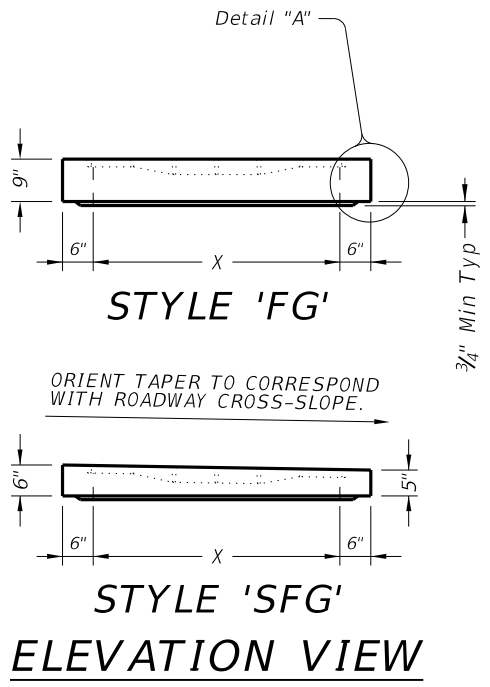
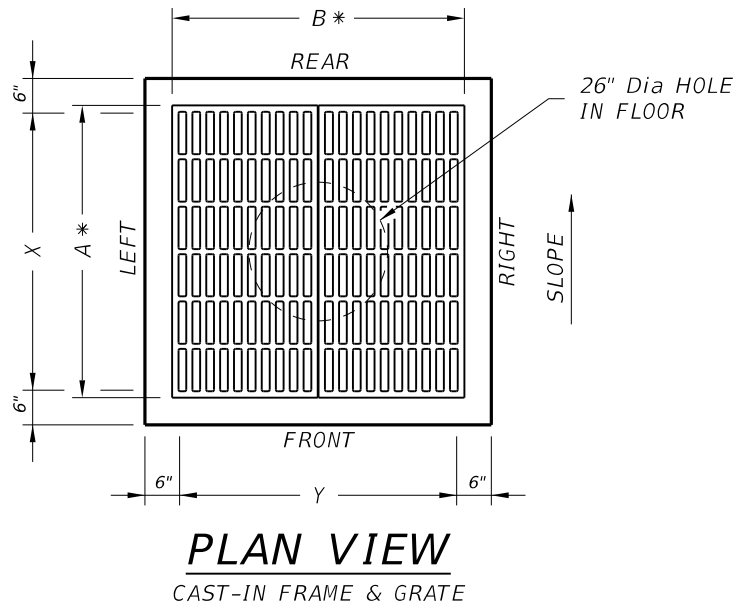
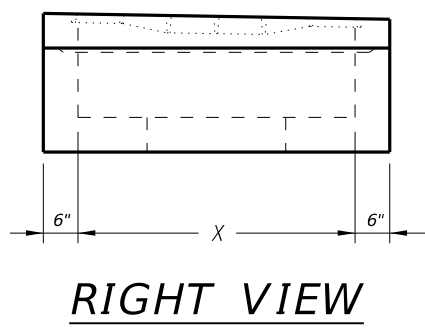
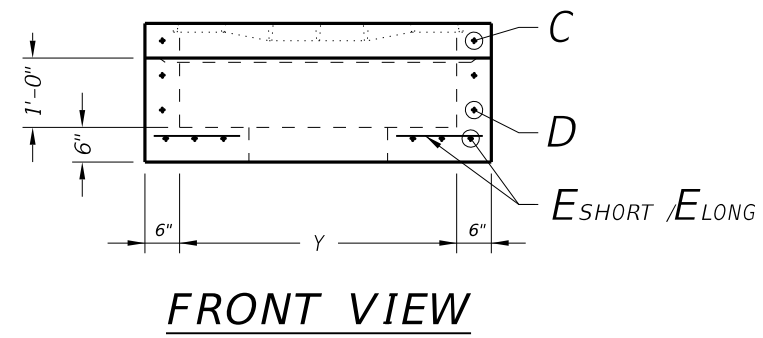
CONCRETE HEADWALLS
WITH PARALLEL WINGS FOR
NON-SKEWED PIPE CULVERTS

CH-PW-0

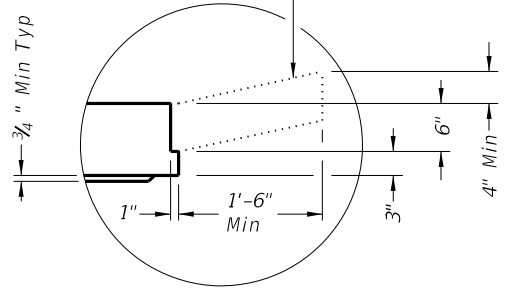
FILE: chpw0ste-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1047	03	076, ETC.	FM 1382
DIST	COUNTY		SHEET NO.	
DAL	DALLAS		58	

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 units or for any errors or omissions that may appear hereon.

DATE: 11/15/2022 1:00:58 PM
 FILE: T:\DALAO\PROJECTS\On\FM1382\Culvert replacement\renab options\Sheet\STANDARD\PRESTD06-20.dgn



Construct cast-in-place reinforced concrete apron, when shown elsewhere in plans. Use Class "A" concrete. Apron is subsidiary to POD. Apron is 1'-6" Min width around precast overpass drain.



FABRICATION NOTES:

1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
2. Provide Grade 60 reinforcing steel or equivalent area of WWR.
3. Provide clear cover of 1 1/2" to reinforcing steel from inside surfaces. Place short span reinforcing steel closest to surface.
4. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is 3/4".
5. Provide lifting devices in conformance with Manufacturer's recommendations.
6. Place additional diagonal #4 bars, length = Dia + 4", at 1" clear cover around opening in floor.
7. Provide cast iron standard grate, unless noted otherwise elsewhere in plans.

INSTALLATION NOTES:

1. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendation. Tongue and groove joints may be grouted no more than 1" between each section, or 1/2 the joint depth, whichever is greater.
2. Do not grout rubber gasket joints without Manufacturer's recommendation.
3. Orient long dimension of grate slots perpendicular to direction of traffic, unless noted otherwise on plans.

GENERAL NOTES:

1. Designed according to ASTM C913.
2. Precast Overpass Drain may connect into junction box, box culvert, or other new or existing structure. See details for connecting 18" Dia RCP into structure elsewhere.
3. Payment for inlet is per Item 465, "Junction Boxes, Manholes, and Inlets" by type, style, and size.

Style	Size (X x Y)	A x B *	C	D	E Short	E Long
FG	3'x3'	3'x3'	0.37 in ² /ft	0.18 in ² /ft	0.18 in ² /ft	0.18 in ² /ft
SFG	3'x3'	3'x3'	0.32 in ² /ft	0.18 in ² /ft	0.18 in ² /ft	0.18 in ² /ft
FG	4'x4'	4'x4'	0.41 in ² /ft	0.18 in ² /ft	0.21 in ² /ft	0.21 in ² /ft
SFG	4'x4'	4'x4'	0.32 in ² /ft	0.18 in ² /ft	0.21 in ² /ft	0.21 in ² /ft
FG	3'x5'	3'x5'	0.48 in ² /ft	0.18 in ² /ft	0.22 in ² /ft	0.18 in ² /ft
SFG	3'x5'	3'x5'	0.32 in ² /ft	0.18 in ² /ft	0.22 in ² /ft	0.18 in ² /ft

*Nominal frame and grate size.

HL93 LOADING



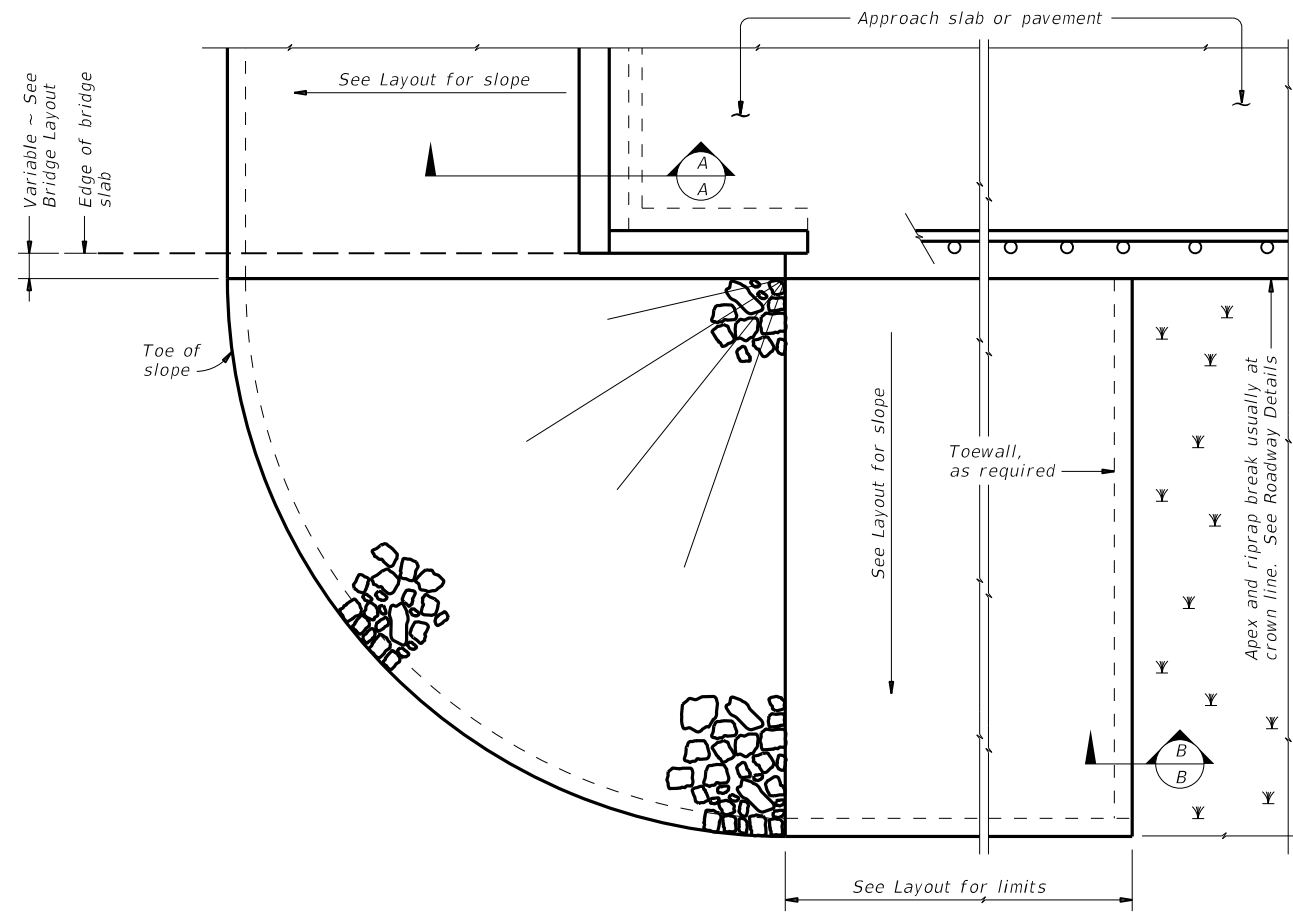
PRECAST OVERPASS DRAIN

POD

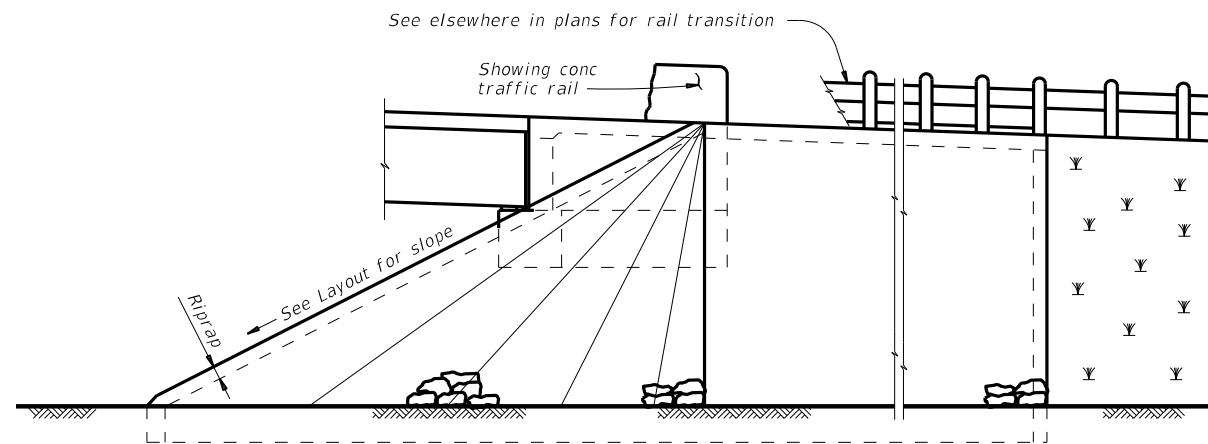
FILE: prest06-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	1047	03	076, ETC.	FM 1382
DIST	COUNTY		SHEET NO.	
DAL	DALLAS		59	

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 units or for any errors or omissions in this drawing. The user of this drawing shall be responsible for its use.

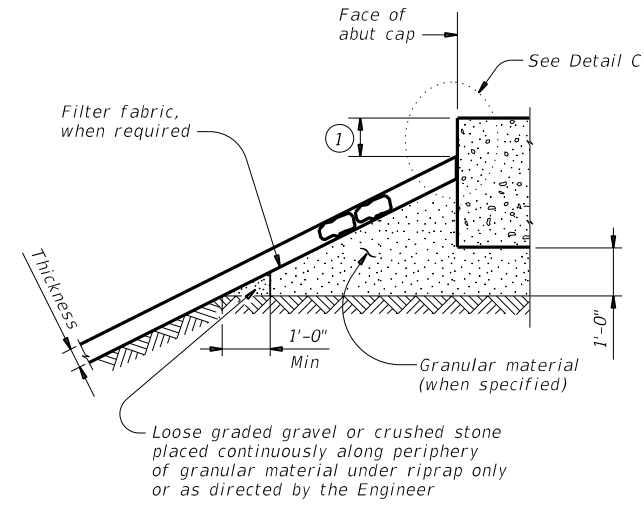
DATE: 11/15/2022 1:00:59 PM
 FILE: T:\DALAO\PROJECTS\On\FM1382\Culvert replacement\rehab options\Sheet\STDRIP\STDRIP.dgn



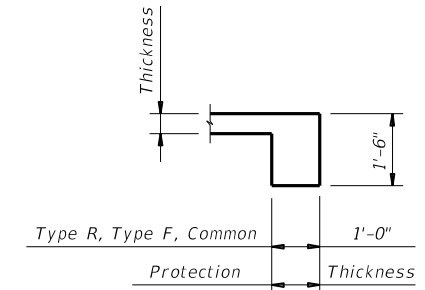
PLAN



ELEVATION

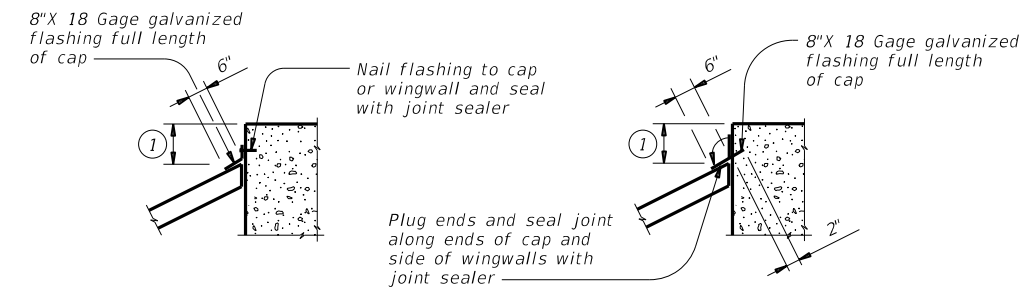


SECTION A-A AT CAP



SECTION B-B

Provide toewall when shoulder drain is located adjacent to limits of stone riprap. Omit toewall when thickness of protection riprap is greater than 18".



CAP OPTION A

CAP OPTION B

DETAIL C

① Top of cap to top of riprap dimension varies as directed by the Engineer. Provide 9" Min for beam/slab type bridges and 1'-6" for slab span, box beam, or slab beam bridges.

GENERAL NOTES:
 Refer to Item 432, "Riprap" for stone size and gradation, and construction details. See Layout for limits and thickness of riprap specified.
 See elsewhere in plans for locations and details of shoulder drains.

SHEET 1 OF 2

		Bridge Division Standard	
<h1>STONE RIPRAP</h1>			
<h2>SRR</h2>			
FILE: srrstde1-19.dgn	DN: AES	CK: JGD	DW: BWH
©TxDOT April 2019	CONT	SECT	JOB
REVISIONS	1047	03	076, ETC. FM 1382
DIST	COUNTY	SHEET NO.	
DAL	DALLAS	60	

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 units or for any errors or omissions in this standard. The user of this standard is advised to verify the accuracy of the information contained herein. DATE: 11/15/2022 1:00:59 PM FILE: T:\DALAO\PROJECTS\On\FM1382\Culvert replacement\rehab options_Sheets\STND\DRNG\SRR\side 1.dgn

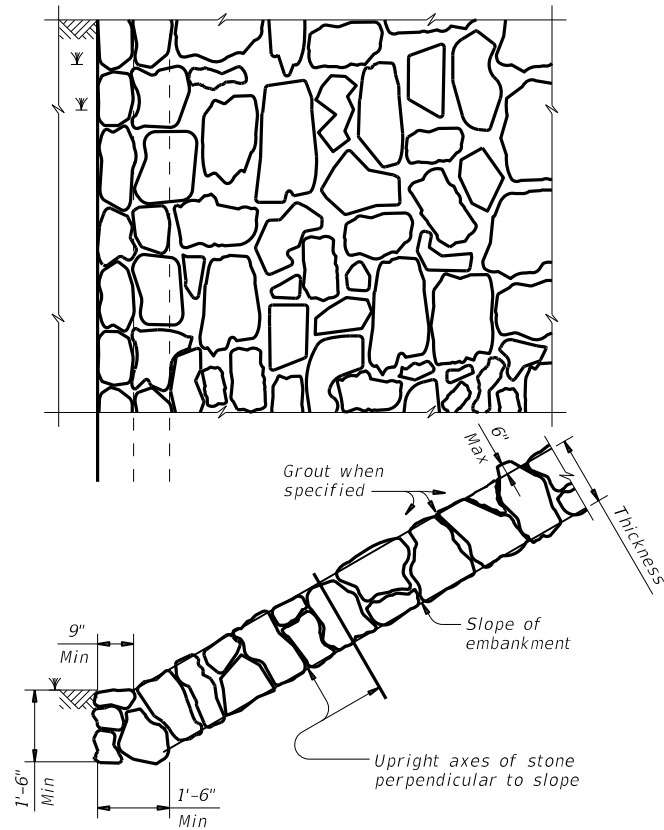


FIGURE 1 ~ TYPE R STONE RIPRAP
dry or grouted

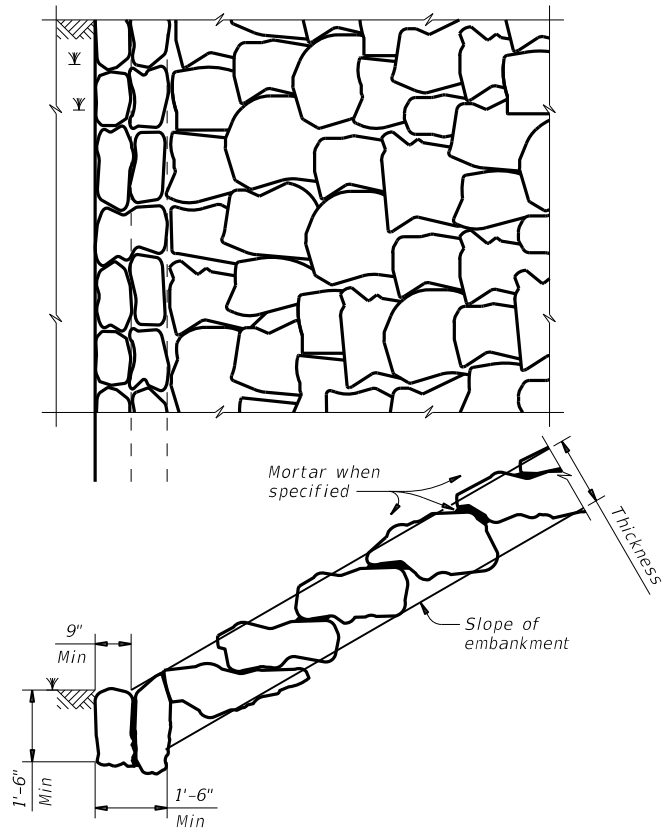


FIGURE 2 ~ TYPE F STONE RIPRAP
dry or mortared

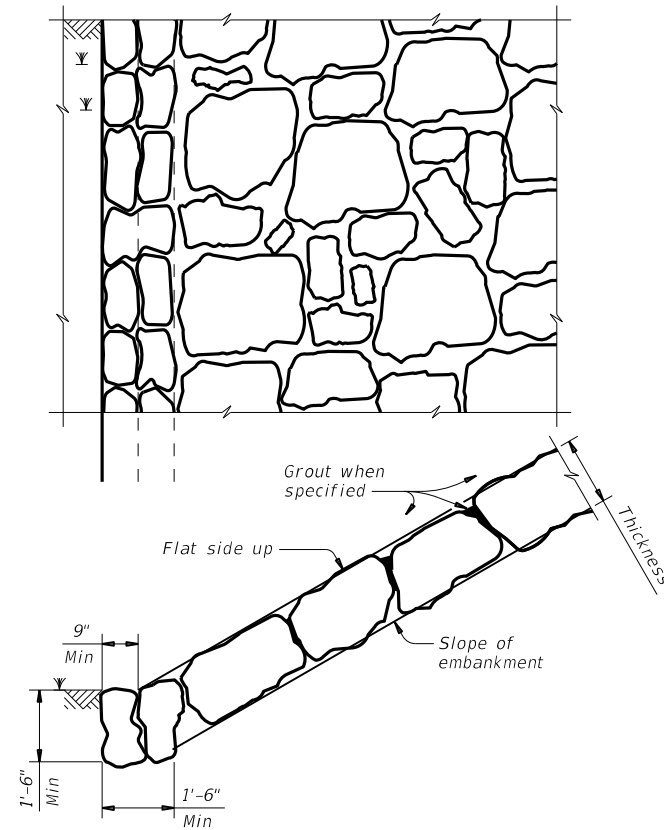
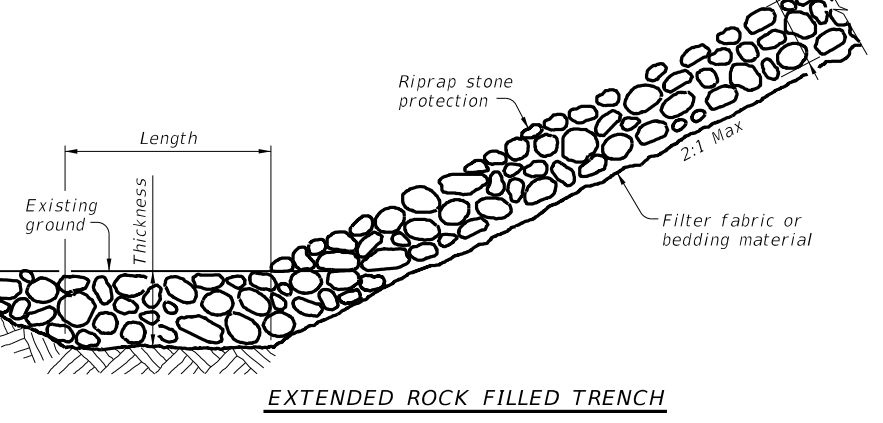
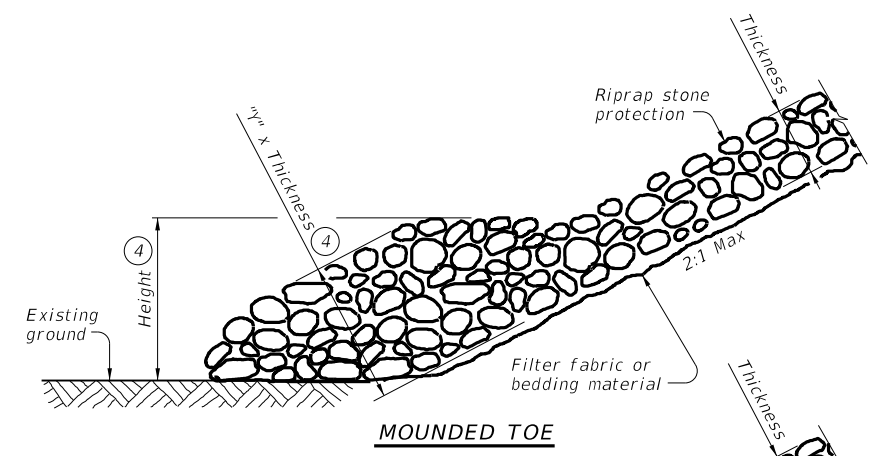


FIGURE 3 ~ TYPE F STONE RIPRAP
grouted

- ② Provide bedding material instead of filter fabric if shown elsewhere in plans. See Layout for thickness of bedding material.
- ③ Minimum toe depth is the larger of the maximum scour depth or 2 times the riprap thickness.
- ④ "y" and Height need to be defined. See layout or detail sheet for values if this option is used.
- ⑤ List Stone Protection as size (XX inch) and thickness (YY inch) on the layout.
Example: Riprap (Stone Protection) XX inch, Thickness = YY inch.



PROTECTION STONE RIPRAP TOE OPTIONS ⑤

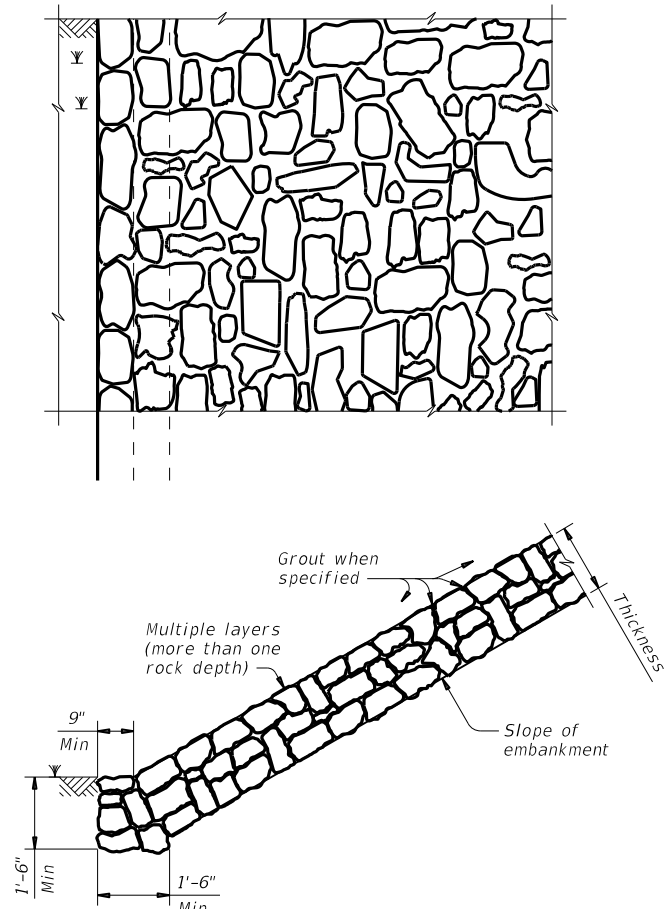


FIGURE 4 ~ COMMON STONE RIPRAP
dry or grouted

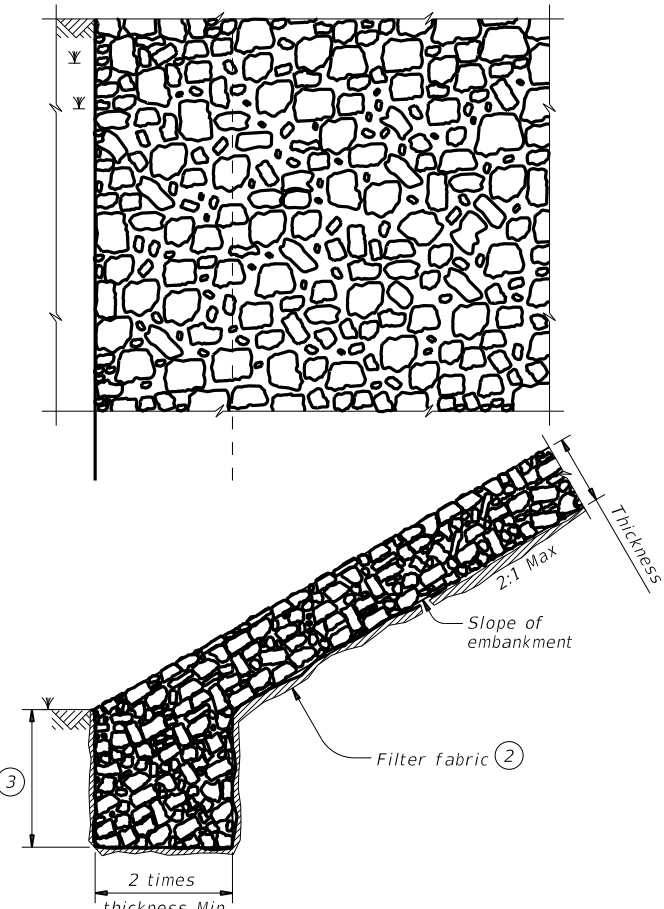


FIGURE 5 ~ PROTECTION STONE RIPRAP ⑤

SHEET 2 OF 2



STONE RIPRAP

SRR

FILE: srrside1-19.dgn	DN: AES	CK: JGD	DW: BWH	CK: AES
©TxDOT April 2019	CONT SECT	JOB	HIGHWAY	
REVISIONS	1047 03	076, ETC.	FM 1382	
DIST	COUNTY	SHEET NO.		
DAL	DALLAS	61		

A. GENERAL SITE DATA

1. PROJECT LIMITS:

FM 1382 FROM 700' N OF CAMP WISDOM RD TO 400' SOUTH OF W SPINE RD
 Begin Project Coordinates : Latitude (N) : 32.6585201 Longitude (W) : -96.9807388
 End Project Coordinates : Latitude (N) : 32.6184756 Longitude (W) : -96.9748017

2. PROJECT SITE MAPS:

- * Project Location Map: The Title Sheet and Project Layout (Sheets 3-6)
- * Drainage Patterns: Drainage Area Maps (Sheets 41)
- * Slopes Anticipated After Major Gradings or Areas of Soil Disturbance: (Sheets 42 & 45)
- * Location of Erosion and Sediment Controls: SW3P Site Maps (Sheets 65-70)
- * Surface Waters and Discharge Locations: Drainage and Culvert Layouts (Sheets 41-55)
- * Project Specific Location(s) (PSL): To be determined by the project Construction Personnel. Location(s) shown on SW3P Site Map (if PSL location(s) is within one mile of project) and information located in project SW3P Binder (Reference Item *10 below).

3. PROJECT DESCRIPTION:

CULVERT REPLACEMENT & INSTALLING MEDIAN CABLE BARRIER

4. MAJOR SOIL DISTURBING ACTIVITIES:

SOIL DISTURBING ACTIVITIES WILL INCLUDE THE FOLLOWING: EXCAVATION AND BACKFILLING, GRADING, CULVERT JACK AND BORE, CULVERT CONSTRUCTION, EROSION AND SEDIMENT CONTROL, AND SODDING.

5. EXISTING CONDITION OF SOIL & VEGETATIVE COVER AND % OF EXISTING VEGETATIVE COVER:

Existing soil for most of the project is Vertel Clay, 5 to 12 percent slopes, with various grasses in good condition and cover 95% of exposed ground.

6. TOTAL PROJECT AREA: 136.41 Acres

7. TOTAL AREA TO BE DISTURBED: 7.65 Acres (5.6%)

8. WEIGHTED RUNOFF COEFFICIENT

BEFORE CONSTRUCTION: 0.55
 AFTER CONSTRUCTION: 0.55

9. NAME OF RECEIVING WATERS:

MOUNTAIN CREEK TRIBUTARY 3, MOUNTAIN CREEK TRIBUTARY 2, TRIBUTARY TO JOE POOL LAKE, JOHN PENN BRANCH, MOUNTAIN CREEK (SEGMENT 084W)
 PROJECT AREA WATERS FLOW TO JOE POOL LAKE (SEGMENT 083B; NO WATER QUALITY IMPAIRMENTS).

10. PROJECT SW3P Binder:

- A. For projects disturbing one to five acres, TxDOT will maintain a SW3P Binder at the project field office (if there is not a project field office, should be kept at the Area Office) which contains the following: Index Sheet, TCEQ Signature Authority, TxDOT's and Contractor's Small Construction Site Notice, SW3P Inspector Qualification Statements, EPIC Sheet, SW3P Sheet, Site Location Maps, Inspection and Maintenance Reports (Form 2118), Construction Stage Gate Checklists (CSGC), Stored Material Lists specifying associated control measures and the Appendix which contains the TPDES Construction General Permit, TxDOT and Contractor MS4 Operator Notification(s) and the Construction PSL Permits per all applicable requirements.
- B. For projects disturbing 5 acres or more, TxDOT will follow the actions listed in (10.A.) above with the addition of the following: TxDOT and Contractor Notice Of Intent (N.O.I.) and Fee Payment Form, TxDOT and Contractor Large Construction Site Notice (to be used instead of Small Site Notice), and TPDES Permit Coverage Notice.
- C. For projects disturbing less than one acre, actions described in (10.A.) and (10.B.) above are not required. Acreage is calculated by adding Total Area To Be Disturbed Acres on project (See *7 above) and the PSL(s) acreage located within one mile of project.

B. EROSION AND SEDIMENT CONTROLS

1. SOIL STABILIZATION PRACTICES: (Select T = Temporary or P = Permanent, as applicable)

- | | |
|---|--|
| <input checked="" type="checkbox"/> T TEMPORARY SEEDING | <input type="checkbox"/> P PRESERVATION OF NATURAL RESOURCES |
| <input type="checkbox"/> MULCHING (Hay or Straw) | <input type="checkbox"/> FLEXIBLE CHANNEL LINER |
| <input type="checkbox"/> BUFFER ZONES | <input type="checkbox"/> RIGID CHANNEL LINER |
| <input type="checkbox"/> PLANTING | <input type="checkbox"/> SOIL RETENTION BLANKET |
| <input type="checkbox"/> SEEDING | <input type="checkbox"/> COMPOST MANUFACTURED TOPSOIL |
| <input type="checkbox"/> SODDING | <input checked="" type="checkbox"/> T VERTICAL TRACKING |
| | <input type="checkbox"/> OTHER: NONE |

2. STRUCTURAL PRACTICES: (Select T = Temporary or P = Permanent, as applicable)

- T SILT FENCES
- T EROSION CONTROL LOGS
- EROSION CONTROL COMPOST BERMS (Low Velocity)
- T ROCK FILTER DAMS
- DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
- DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
- DIVERSION DIKE AND SWALE COMBINATIONS
- PIPE SLOPE DRAINS
- PAVED FLUMES
- T ROCK BEDDING AT CONSTRUCTION EXIT
- TIMBER MATTING AT CONSTRUCTION EXIT
- CHANNEL LINERS
- SEDIMENT TRAPS
- SEDIMENT BASINS
- STORM INLET SEDIMENT TRAP
- STONE OUTLET STRUCTURES
- CURBS AND GUTTERS
- STORM SEWERS
- VELOCITY CONTROL DEVICES
- OTHER: NONE

NOTE: TOP OF BMP'S SHOULD NOT BE HIGHER THAN ROADWAY ELEVATION AS NOT TO FLOOD ROADWAY UNLESS PRIOR APPROVAL FROM ENGINEER IS OBTAINED.

3. STORM WATER MANAGEMENT:

A. STORM WATER DRAINAGE WILL BE PROVIDED BY DITCHES, INLETS, AND STORM WATER SYSTEMS WHICH CARRY DRAINAGE WITHIN THE R.O.W. TO THE LAWS WITHIN THE ROADWAY AND PROJECT SITE WHICH DRAINS TO NATURAL FACILITIES.

B. DO NOT STAGE PORTABLE SANITARY UNITS, CONCRETE WASHOUT PIT OR CHEMICAL STORAGE WITH 50 FEET UPGRADIENT OF A STORMWATER DRAINAGE FEATURE OR RECEIVING WATER WITHOUT APPROPRIATE STORMWATER QUALITY CONTROLS

4. STORM WATER MANAGEMENT ACTIVITIES: (Sequence of Construction)

- 1) For detail construction activities see traffic control plan phase narrative, and see construction progress schedule for schedule durations of relevant soil disturbance and stabilization activities.
- 2) Prior to the start of construction activities in their control area, install SW3P control devices as appropriate to protect adjacent and downslope water features and receiving waters, adjacent properties, and active roadways and pedestrian facilities. Install in accordance with the applicable standards, as directed by the Engineer.
- 3) Minimize soil disturbance and preserve existing vegetative buffer to minimize erosion and sedimentation to the extent practicable.
- 4) Where work has temporarily ceased in a disturbed area (i.e. will exceed 14 days before next soil disturbance activity or initiation of final stabilization measures), temporarily stabilize soils per TXR150000 with vertical tracking, temporary seeding and/or other soil cover, and velocity and downslope perimeter controls as appropriate and/or as directed by the Engineer.
- 5) Re-vegetate disturbed soils in complete project areas as soon as practicable or as directed by the Engineer.
- 6) When construction activity is complete and site is stabilized and approved by the engineer, remove all temporary structural control measures and reseed or resod any areas disturbed by their removal.

5. NON-STORM WATER DISCHARGES:

Filter non-storm water discharges, or hold in retention basins, before being allowed to mix with storm water. These discharges consist of, but not limited to, non-polluted ground water, spring water, foundation or footing drain water, water used for dust control or pavement washing and vehicle washwater containing no detergents.

C. OTHER REQUIREMENTS & PRACTICES

1. MAINTENANCE:

Maintain all erosion and sediment controls in good working order. Perform any necessary cleaning/repairs/replacements at the earliest possible date prior to next rain event, but no later than 7 calendar days. Ensure the surrounding ground has dried sufficiently to prevent damage from equipment. "Too Wet" is the only reason for not adhering to timeframes described. When construction activities permanently or temporarily cease and are not expected to resume for 14 or more days on a disturbed portion of the site, stabilization measures must be initiated immediately.

2. INSPECTION:

A TxDOT Inspector will perform a regularly scheduled SW3P Inspection every 7 calendar days. An Inspection and Maintenance Report, signed by the TxDOT Inspector and the Contractor, will be filed for each inspection. Revise/clean/repair/replace each BMP control device in accordance with the current Field Inspection and Maintenance Report (Form 2118) and Item 1 (Maintenance) above.

3. WASTE MATERIALS:

On a daily basis, or as may be directed, collect all waste materials, trash and debris from the construction site and deposit into a metal dumpster having a secure cover and which meets all state and local city solid waste management requirements. Empty the dumpster as required by regulation, or as may be directed, at a local approved landfill site. Do not bury construction waste on the construction project site.

4. HAZARDOUS WASTE & SPILL REPORTING:

As a minimum, any products in the following categories are considered to be hazardous: Paints, Acids, Solvents, Fuels, Asphalt Products, Chemical Additives for Soil Stabilization, and Concrete Curing Compounds or Additives. When storing hazardous material on the project site, or at a Project Specific Location, take all practicable precaution to prevent and/or contain any spillage of these materials. In the event of a spill, contact the spill coordinator immediately.

5. SANITARY WASTE:

Use a licensed sanitary waste management contractor to collect all sanitary waste from portable units as may be required by local regulation, or as directed.

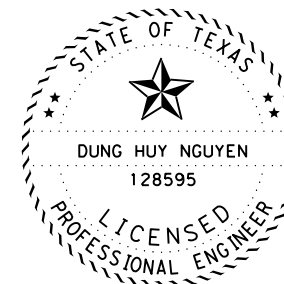
6. CONSTRUCTION VEHICLE TRACKING:

On a regular basis, or as may be directed, dampen haul roads for dust control and construct construction entrances/exits. Provide for a motorized broom or vacuum type sweeper to be available on a daily basis, or as may be directed, to remove sediment from paved roadways on project, abutting and traversing the project site.

7. MANAGEMENT PRACTICES:

- A. Construct disposal areas, stockpiles, haul roads and PSL's in a manner that will minimize and control the amount of sediment that may enter receiving waters. Do not locate disposal areas in any wetland, waterbody or streambed.
- B. Locate construction staging areas, vehicle maintenance and PSL's areas in a manner to minimize the runoff of pollutants.
- C. When working in or near a wetland, install and maintain operating soil erosion and sediment controls at all times during construction and isolate the work from the wetland.
- D. Clear all waterways as soon as practicable of temporary embankment, temporary bridges, matting, falsework, piling, debris or other obstructions placed during construction operations that are not a part of the finished work.
- E. Procedures and/or practices should be taken to control dust.
- F. Sediment to be removed from roadways daily or when work begins after weather events if construction activities have ceased due to weather event.

FILE NAME _____ DATE _____ DESIGNER _____



Dung Nguyen
 Signature of Registrant & Date
 P.E. 11/16/2022



DALLAS DISTRICT ENVIRONMENTAL

STORM WATER POLLUTION PREVENTION PLAN (SW3P)

TEMPLATE REVISION DATE: 02/07/18

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
DN	6	SEE TITLE SHEET		FM 1382
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
DN	TEXAS	DALLAS	DALLAS	62
CHECK	CONTROL	SECTION	JOB	
NP	1047	03	076, ETC.	
CHECK	AM			

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 damage resulting from its use.

Notes To Designer: 1. Do not alter Sheet Design or Font style, size or weight - match text attributes. 2. If additional space is needed for a numbered section, fence and adjust sections up or down as needed for proportioning and readability but do not relocate from its relative position. 3. All areas should be addressed thoroughly and verify the necessary pay items are set up to support actions needed. Filled Out: XX/XX/XXXX Prepared By: Name/Section

I. STORMWATER POLLUTION PREVENTION PLAN-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506. List adjacent MS 4 Operator(s) that receive discharges from this project. They need to be notified prior to construction activities. (Note: Leave blank only if no adjacent MS 4 Operator(s) are affected.)

1. City of Dallas Phase I MS 4 - Contact Kevin Hurley
2. City of Cedar Hill Phase II MS 4 - Contact Duy Vu

No Action Required Required Action

Action Number:

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000.
2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

II. WORK IN OR NEAR STREAMS, WATERBODIES AND WETLANDS CLEAN WATER ACT SECTIONS 401 AND 404

USACE Permit required for filling, dredging, excavating or other work in any water bodies, rivers, creeks, streams, wetlands or wet areas. No equipment is allowed in any stream channel below the ordinary High Water Mark except on approved temporary stream crossings or drill pads.

The Contractor must adhere to all of the terms and conditions associated with the following permit(s):

- No Permit Required
- Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)
- Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)
- Individual 404 Permit Required
- Other Nationwide Permit Required: NWP# 3(a)

Required Actions: List Waters of the US Permit applies to, location in project and check Best Management Practices planned to control erosion, sedimentation and post-project TSS.

1. Culvert S-6 - STA 346+39.87 - Unnamed Tributary to Joe Pool Lake - Stream Impacts
2. Culvert S-8 - STA 385+41.35 - Unnamed Tributary to Joe Pool Lake - Stream Impacts

The elevation of the ordinary high water marks of any areas requiring work to be performed in the waters of the US requiring the use of a nationwide permit can be found on the Bridge Layouts.

Best Management Practices for applicable 401 General Conditions: (Note: If CORP Permit not required, do not check boxes.)

Erosion	Sedimentation	Post-Construction TSS
<input checked="" type="checkbox"/> Temporary Vegetation	<input checked="" type="checkbox"/> Silt Fence	<input type="checkbox"/> Vegetative Filter Strips
<input type="checkbox"/> Blankets/Matting	<input type="checkbox"/> Rock Berm	<input type="checkbox"/> Retention/Irrigation Systems
<input type="checkbox"/> Mulch	<input type="checkbox"/> Triangular Filter Dike	<input type="checkbox"/> Extended Detention Basin
<input type="checkbox"/> Sodding	<input type="checkbox"/> Sand Bag Berm	<input type="checkbox"/> Constructed Wetlands
<input type="checkbox"/> Interceptor Swale	<input type="checkbox"/> Straw Bale Dike	<input type="checkbox"/> Wet Basin
<input type="checkbox"/> Diversion Dike	<input type="checkbox"/> Brush Berms	<input type="checkbox"/> Erosion Control Compost
<input type="checkbox"/> Erosion Control Compost	<input type="checkbox"/> Erosion Control Compost	<input type="checkbox"/> Mulch Filter Berm and Socks
<input type="checkbox"/> Mulch Filter Berm and Socks	<input type="checkbox"/> Mulch Filter Berm and Socks	<input type="checkbox"/> Compost Filter Berm and Socks
<input type="checkbox"/> Compost Filter Berm and Socks	<input type="checkbox"/> Compost Filter Berm and Socks	<input checked="" type="checkbox"/> Vegetation Lined Ditches
	<input type="checkbox"/> Stone Outlet Sediment Traps	<input type="checkbox"/> Sand Filter Systems
	<input type="checkbox"/> Sediment Basins	<input type="checkbox"/> Grassy Swales

III. CULTURAL RESOURCES

Refer to TxDOT Standard Specifications in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

No Action Required Required Action

Action Number:

- 1.

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical. Contractor must adhere to Construction Specification Requirements Specs 162, 164, 192, 193, 506, 730, 751 & 752 in order to comply with requirements for invasive species, beneficial landscaping and tree/brush removal commitments.

No Action Required Required Action

Action Number:

- 1.

V. FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES, CANDIDATE SPECIES AND MIGRATORY BIRDS TREATY ACT.

No Action Required Required Action

Action Number:

1. The following species could occur in the project area: Golden-cheeked Warbler, monarch butterfly, Woodhouse's toad, eastern spotted skunk, long-tailed weasel, western hog-nosed skunk, eastern box turtle, pygmy rattlesnake, Texas garter snake, and timber (canebrake) rattlesnake. Follow the special note and the BMPs listed below to protect these species.

2. Contractor to implement the following required conservation measures for the Golden-cheeked Warbler, per the Programmatic Consultation for BCV and GCW:
 - a) Limit the operation of heavy machinery to paved areas, areas free of native vegetation, and to areas with slopes that are less than 33 percent consisting of stable soils.

REFER TO EPIC SHEET 2 OF 2 FOR SECTION V - CONTINUATION

Special Notes:

1. Avoid harming all wildlife species if encountered and allow them to safely leave the project site. Due diligence should be used to avoid killing or harming any wildlife species in the implementation of transportation projects.
2. If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately. The work may not remove active nests from bridges and other structures during nesting season of the birds associated with the nests. If caves or sinkholes are discovered, cease work in the immediated area, and contact the Engineer immediately.
3. The Migratory Bird Act of 1918 states that it is unlawful to kill, capture, collect, possess, buy, sell, trade or transport any migratory bird, nest, young, feather or egg in part or in whole, without a federal permit issued in accordance within the Act's policies and regulations. The contractor would remove all old migratory bird nests from any structure or trees where work would be done from October 1 to February 15. In addition, the contractor would be prepared to prevent migratory birds from building nest(s) between February 15 to October 1. In the event that migratory birds are encountered on-site during project construction, efforts to avoid adverse impacts on protected birds, active nests, eggs and/or young would be observed.

LIST OF ABBREVIATIONS

BMP: Best Management Practice	SPCC: Spill Prevention Control and Countermeasure
CGP: Construction General Permit	SW3P: Storm Water Pollution Prevention Plan
DSHS: Texas Department of State Health Services	PCN: Pre-Construction Notification
FHWA: Federal Highway Administration	PSL: Project Specific Location
MOA: Memorandum of Agreement	TCEQ: Texas Commission on Environmental Quality
MOU: Memorandum of Understanding	TPDES: Texas Pollutant Discharge Elimination System
MS4: Municipal Separate Stormwater Sewer System	TPWD: Texas Parks and Wildlife Department
MBTA: Migratory Bird Treaty Act	TxDOT: Texas Department of Transportation
NOT: Notice of Termination	T&E: Threatened and Endangered Species
NWP: Nationwide Permit	USACE: U.S. Army Corp of Engineers
NOI: Notice of Intent	USFWS: U.S. Fish and Wildlife Service

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used. Obtain and keep on-site Safety Data Sheets (SDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act. Maintain an adequate supply of on-site spill response materials, as indicated in the SDS. In the event of a spill, take actions to mitigate the spill as indicated in the SDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:

- * Dead or distressed vegetation (not identified as normal)
- * Trash piles, drums, canisters, barrels, etc.
- * Undesirable smells or odors
- * Evidence of leaching or seepage of substances

Does the project involve any bridge class structure rehabilitation(s) or replacement(s) (bridge class structures not including box culverts)?

Yes No

If "No", then no further action is required.

If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

Are the results of the asbestos inspection positive (is asbestos present)?

Yes No

If "Yes", then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled demolition.

If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

In either case, the Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and asbestos consultant in order to minimize construction delays and subsequent claims.

Any other evidence indicating possible hazardous materials or contamination discovered on site. Hazardous Materials or Contamination Issues Specific to this Project:

No Action Required Required Action

Action Number:

- 1.

VII. OTHER ENVIRONMENTAL ISSUES

(includes regional issues such as Edwards Aquifer District, etc.)

No Action Required Required Action

Action Number:

- 1.

GENERAL NOTE:

Any change orders and/or deviations from the final design must be reported to the Engineer prior to commencement of construction activities, as additional environmental clearance may be required.



ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		FM 1382
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	DALLAS	SHEET NO.
CONTROL	SECTION	JOB	
1047	03	080, ETC.	63

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 damage resulting from its use.

Notes To Designer:
 1. Do not alter Sheet Design or Font style, size or weight - match text attributes.
 2. If additional space is needed for a numbered section, fence and adjust sections up or down
 as needed for proportioning and readability but do not relocate from its relative position.
 3. All areas should be addressed thoroughly and verify the necessary pay items are set up to
 support actions needed.

Filled Out: XX.XX.XXXX
 Prepared By: Name/Section

V. FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES, CANDIDATE SPECIES AND MIGRATORY BIRDS TREATY ACT.

(CONTINUATION FROM EPIC SHEET 1 OF 2)

Action Number:

- b) Confirm the presence of listed species at or near the project site through pre-construction surveys or assume they are present and implement appropriate protection measures. (Assume present during the nesting season: March 1 to August 31)
- c) Minimize impacts to listed species and their habitats by limiting grading or topsoil removal to areas where this activity is absolutely necessary for construction activities.
- d) Schedule the most effective amount of personnel and equipment to complete construction to reduce the time of disturbance to listed species.
- e) Avoid use of non-native invasive plant species.
- f) Sterilize equipment for tree trimming between trees in areas affected by surface transferable bacterial, viral, and fungal diseases.
- g) Do not disturb, destroy, or remove active nests during the nesting season.
- h) Do not collect, capture, relocate, or transport birds, eggs, young, or active nests without a permit.
- i) Limit the use of machinery in habitat that may support ground-nesting birds during the spring and early summer months.
- j) Coordinate with ENV and the District Environmental Coordinators prior to grading and blading activities for wildfire management and control.
- k) Train maintenance crews on how to handle hazardous chemicals if used, and encourage them to use them sparingly and only when absolutely necessary.
- l) Retain existing vegetation whenever possible.
- m) Use general good housekeeping practices and do not leave waste behind on the job site.
- n) Use care to avoid spills, leaks and drips of equipment and cleaning fluids when cleaning tools, servicing equipment or doing routine maintenance.
- o) Projects that would involve clearing or trimming of individual trees or shrubs in or near (within 300 feet of) potential habitat would be phased so that any clearing activities would occur outside the breeding season (between September 1st and February 28th) to minimize impacts to GCW.

3. TxDOT to implement the following required conservation measures for the Golden-cheeked Warbler, per the Programmatic Consultation for BCV and GCW:

- a) Review temporary roadside material storage locations and notify contractors of the areas with potential to support habitat for rare, threatened, and endangered species and of the conservation need to avoid these areas.
- b) TxDOT personnel and project contractors, as appropriate, will be informed of these Programmatic Consultation requirements. DAL Biologist must be invited to and attend the pre-construction meeting.
- c) Projects that would require trimming or removal of more than a few individual trees or shrubs or linear strips of woody vegetation will be inspected by qualified TxDOT biologists. Biologists would determine if areas of vegetation to be disturbed meet the criteria for potential GCW habitat and make an effect call based on the potential impacts in order to determine if a project-specific consultation is warranted. (Completed by TxDOT 9/22/2022. Trees within ROW are not suitable habitat. Removal must be performed during the non-nesting season according to dates in the Special Notes for MBTA.)

4. Contractor to implement the following BMPs from "Beneficial Management Practices: Avoiding, Minimizing, and Mitigating Impacts of Transportation Projects on State Natural Resources" available at <https://ftp.txdot.gov/pub/txdot-info/env/toolkit/300-01-bmp.pdf>.

V. FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES, CANDIDATE SPECIES AND MIGRATORY BIRDS TREATY ACT. (CONTINUED)

- a) Section 2.6.1 Aquatic Amphibian and Reptile BMP (barrier fencing not required)
- b) Section 2.6.2 Terrestrial Amphibian and Reptile BMP
- c) Section 1.4 Water Quality BMP
- d) Section 1.2 Vegetation BMP

LIST OF ABBREVIATIONS

BMP: Best Management Practice	SPCC: Spill Prevention Control and Countermeasure
CGP: Construction General Permit	SW3P: Storm Water Pollution Prevention Plan
DSHS: Texas Department of State Health Services	PCN: Pre-Construction Notification
FHWA: Federal Highway Administration	PSL: Project Specific Location
MOA: Memorandum of Agreement	TCEQ: Texas Commission on Environmental Quality
MOU: Memorandum of Understanding	TPDES: Texas Pollutant Discharge Elimination System
MS4: Municipal Separate Stormwater Sewer System	TPWD: Texas Parks and Wildlife Department
MBTA: Migratory Bird Treaty Act	TxDOT: Texas Department of Transportation
NOT: Notice of Termination	T&E: Threatened and Endangered Species
NMP: Nationwide Permit	USACE: U.S. Army Corp of Engineers
NOI: Notice of Intent	USFWS: U.S. Fish and Wildlife Service

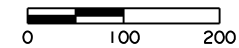
GENERAL NOTE:

Any change orders and/or deviations from the final design must be reported to the Engineer prior to commencement of construction activities, as additional environmental clearance may be required.



ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		FM 1382
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	DALLAS	DALLAS	
CONTROL	SECTION	JOB	64
1047	03	080, ETC.	

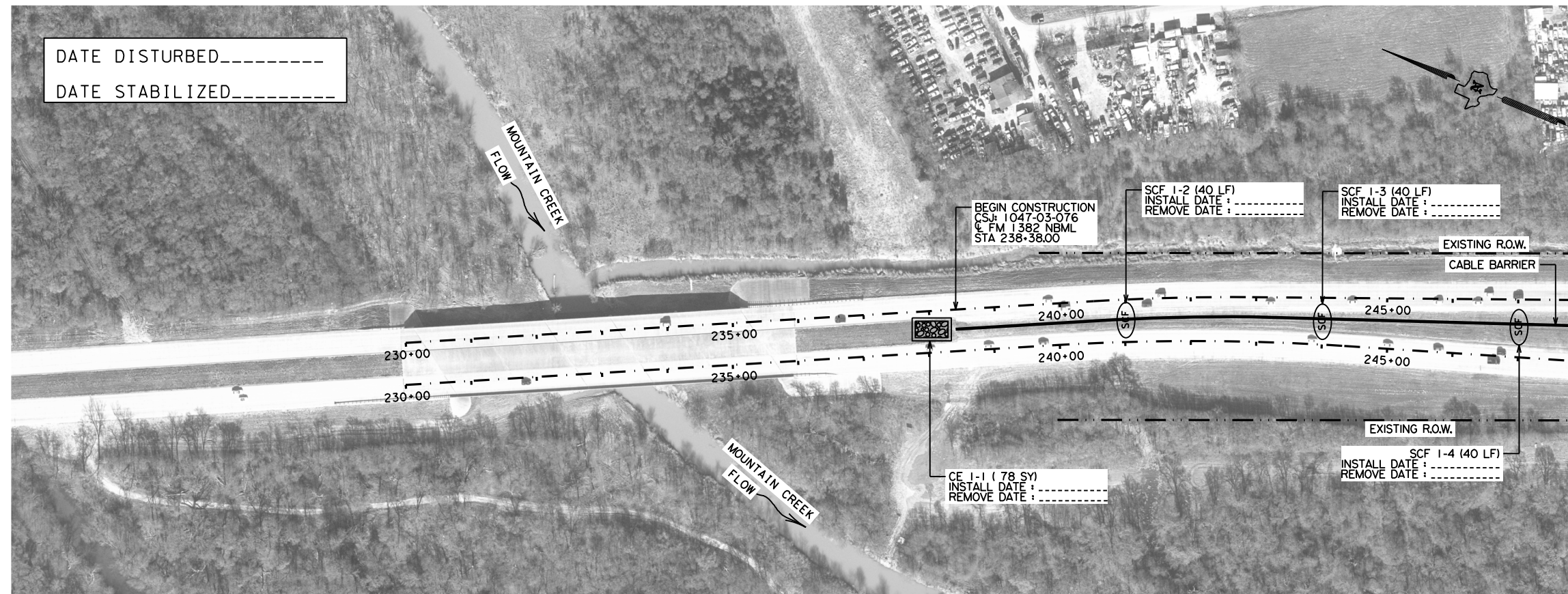


LEGEND:

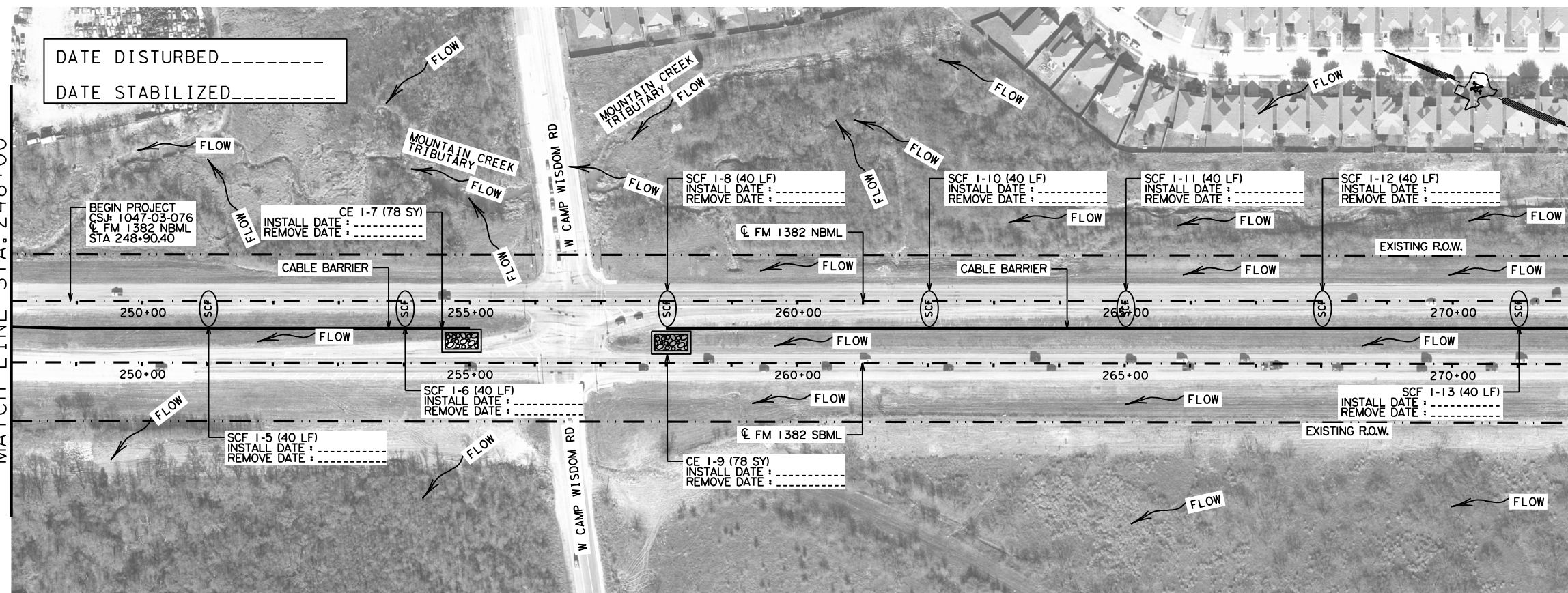
- FLOW
- BLOCK SODDING
- CONSTRUCTION EXIT (TY 1)
- SCF SEDIMENT CONTROL FENCE
- ECL EROSION CONTROL LOG
- RFD2 ROCK FILTER DAM (TY 2)

NOTES:

1. BMPs SHALL BE INSTALLED NO SOONER THAN TWO WEEKS PRIOR TO SOIL DISTURBANCE OR POTENTIAL POLLUTANT-GENERATING ACTIVITIES IN THEIR CONTROL AREA.
2. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIMEFRAMES.
3. CONSTRUCTION EXITS AND OTHER BMPs MAY BE ADJUSTED AS NEEDED, WITH ENGINEER'S APPROVAL OR DIRECTION.
4. SEE EPIC SHEET SECTION V REGARDING WORK WITHIN 300-FOET OF POTENTIAL WILDLIFE HABITAT, AND COMPLY WITH RESTRICTIONS REGARDING CONSTRUCTION SCHEDULE, EQUIPMENT, USE, ETC.

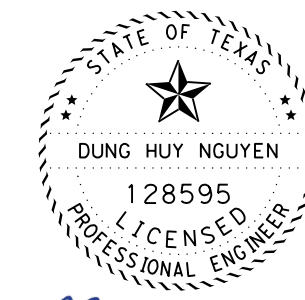


MATCH LINE STA. 248+00



MATCH LINE STA. 248+00

MATCH LINE STA. 272+00



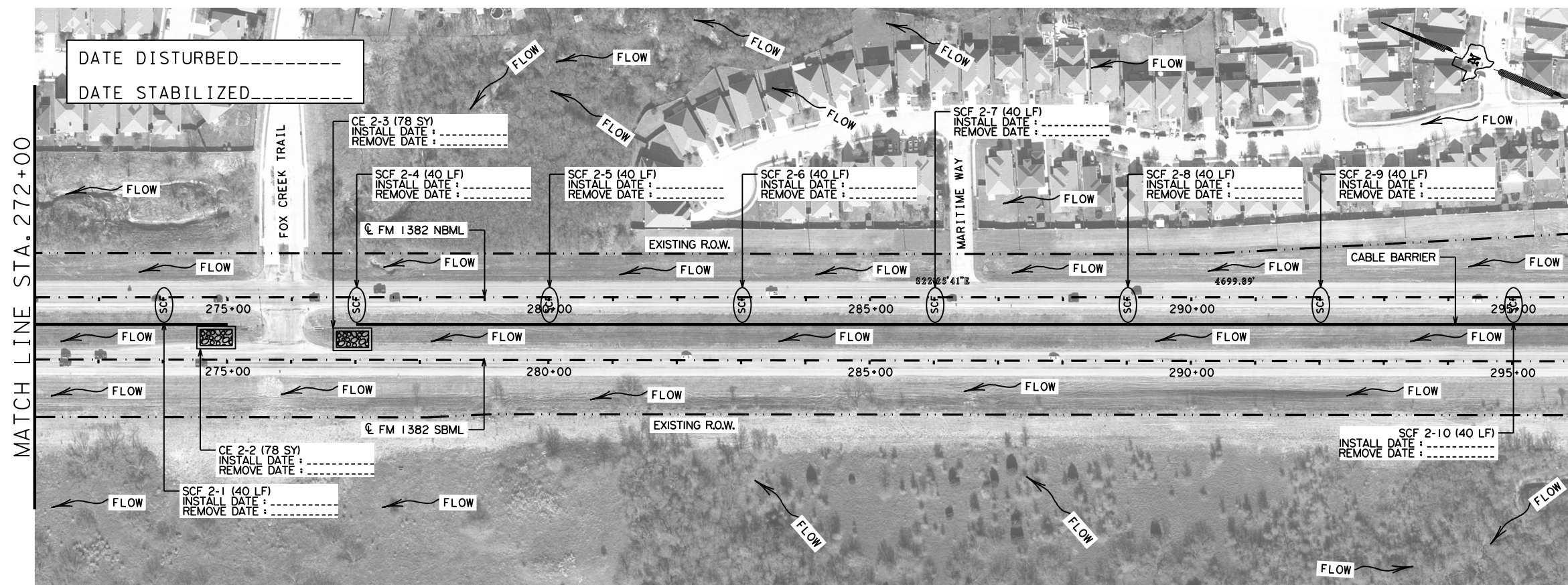
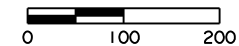
Dung Nguyen
 P.E. 11/15/2022
 Signature of Registrant & Date



FM 1382
SW3P SITE MAP

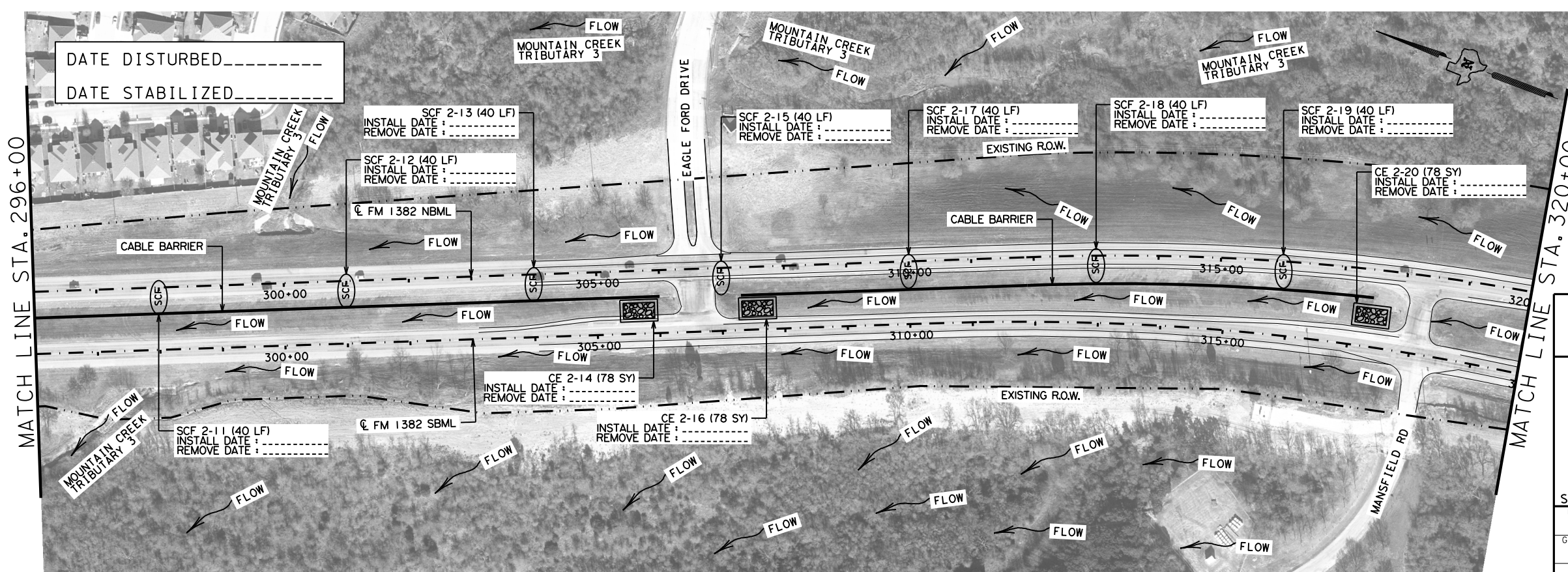
SCALE: 1"=200' SHEET 1 OF 6

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
DN	6	SEE TITLE SHEET		FM 1382
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
DN	TEXAS	DAL	DALLAS	65
CHECK	CONTROL	SECTION	JOB	
NP	1047	03	076, ETC.	



- LEGEND:**
- FLOW
 - BLOCK SODDING
 - CONSTRUCTION EXIT (TY 1)
 - SCF SEDIMENT CONTROL FENCE
 - ECL EROSION CONTROL LOG
 - RFD ROCK FILTER DAM (TY 2)

- NOTES:**
1. BMPs SHALL BE INSTALLED NO SOONER THAN TWO WEEKS PRIOR TO SOIL DISTURBANCE OR POTENTIAL POLLUTANT-GENERATING ACTIVITIES IN THEIR CONTROL AREA.
 2. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIMEFRAMES.
 3. CONSTRUCTION EXITS AND OTHER BMPs MAY BE ADJUSTED AS NEEDED, WITH ENGINEER'S APPROVAL OR DIRECTION.
 4. SEE EPIC SHEET SECTION V REGARDING WORK WITHIN 300-FOET OF POTENTIAL WILDLIFE HABITAT, AND COMPLY WITH RESTRICTIONS REGARDING CONSTRUCTION SCHEDULE, EQUIPMENT, USE, ETC.



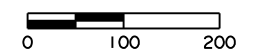
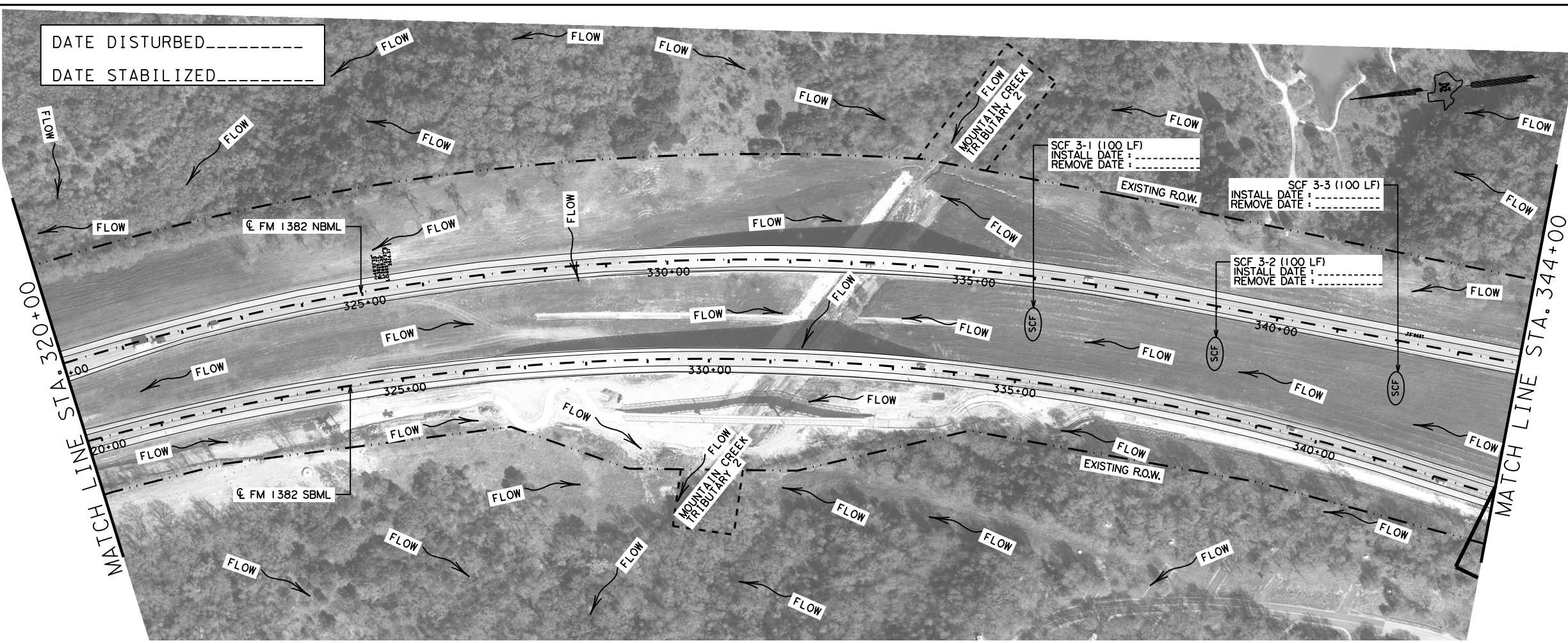
STATE OF TEXAS
 DUNG HUY NGUYEN
 128595
 LICENSED PROFESSIONAL ENGINEER
 Signature of Registrant & Date
 P.E. 11/15/2022

Texas Department of Transportation
 © 2022

**FM 1382
 SW3P SITE MAP**

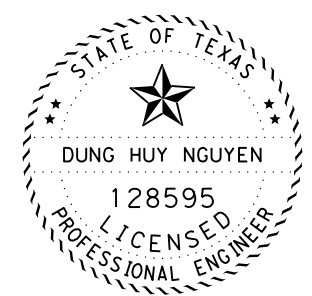
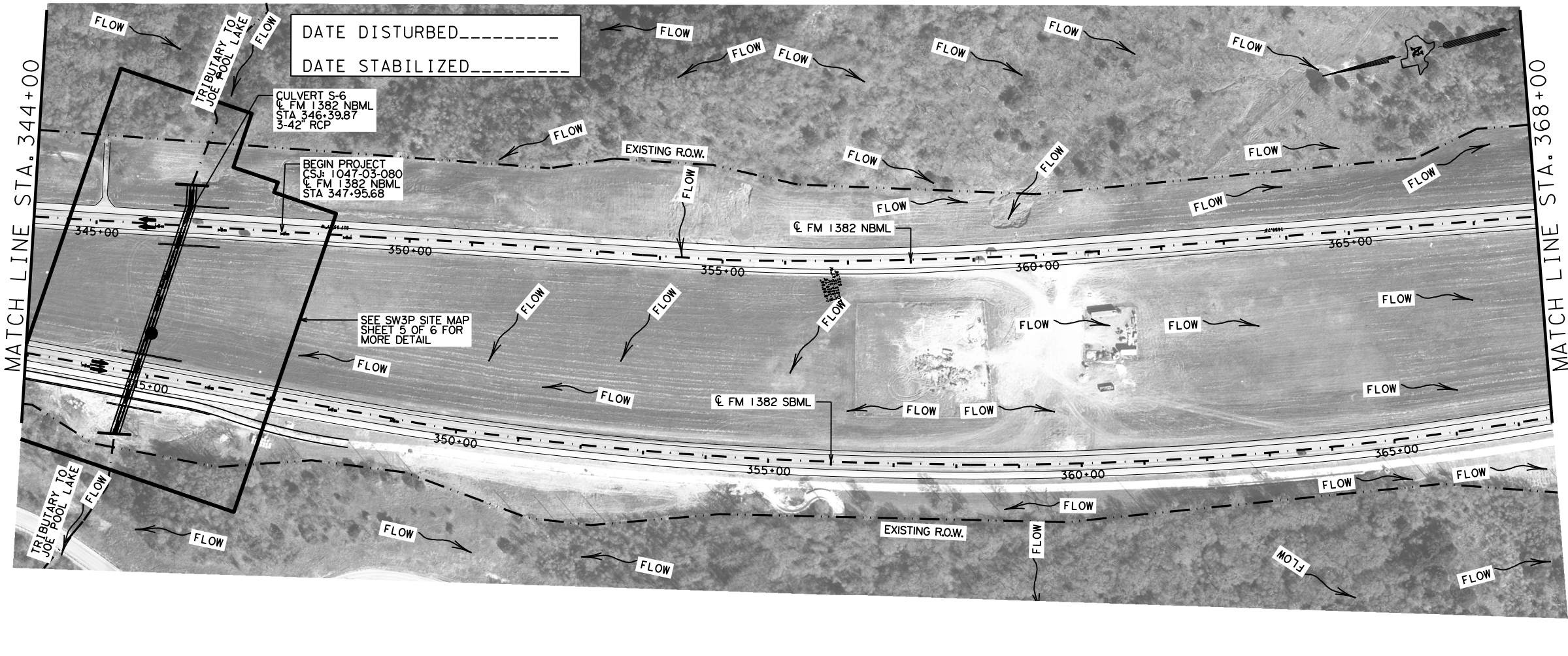
SCALE: 1"=200' SHEET 2 OF 6

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
DN	6	SEE TITLE SHEET		FM 1382
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
DN	TEXAS	DAL	DALLAS	66
CHECK	CONTROL	SECTION	JOB	
NP	1047	03	076, ETC.	



- LEGEND:**
- FLOW
 - BLOCK SODDING
 - CONSTRUCTION EXIT (TY 1)
 - SCF SEDIMENT CONTROL FENCE
 - ECL EROSION CONTROL LOG
 - RFD2 ROCK FILTER DAM (TY 2)

- NOTES:**
1. BMPs SHALL BE INSTALLED NO SOONER THAN TWO WEEKS PRIOR TO SOIL DISTURBANCE OR POTENTIAL POLLUTANT-GENERATING ACTIVITIES IN THEIR CONTROL AREA.
 2. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIMEFRAMES.
 3. CONSTRUCTION EXITS AND OTHER BMPs MAY BE ADJUSTED AS NEEDED, WITH ENGINEER'S APPROVAL OR DIRECTION.
 4. SEE EPIC SHEET SECTION V REGARDING WORK WITHIN 300-FOET OF POTENTIAL WILDLIFE HABITAT, AND COMPLY WITH RESTRICTIONS REGARDING CONSTRUCTION SCHEDULE, EQUIPMENT, USE, ETC.



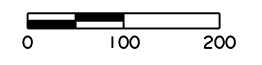
Dung Nguyen
 Signature of Registrant & Date
 P.E. 11/15/2022



**FM 1382
 SW3P SITE MAP**

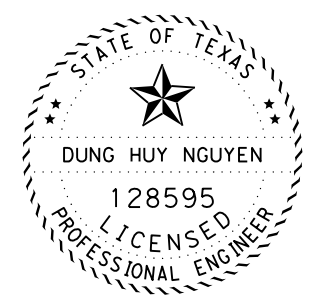
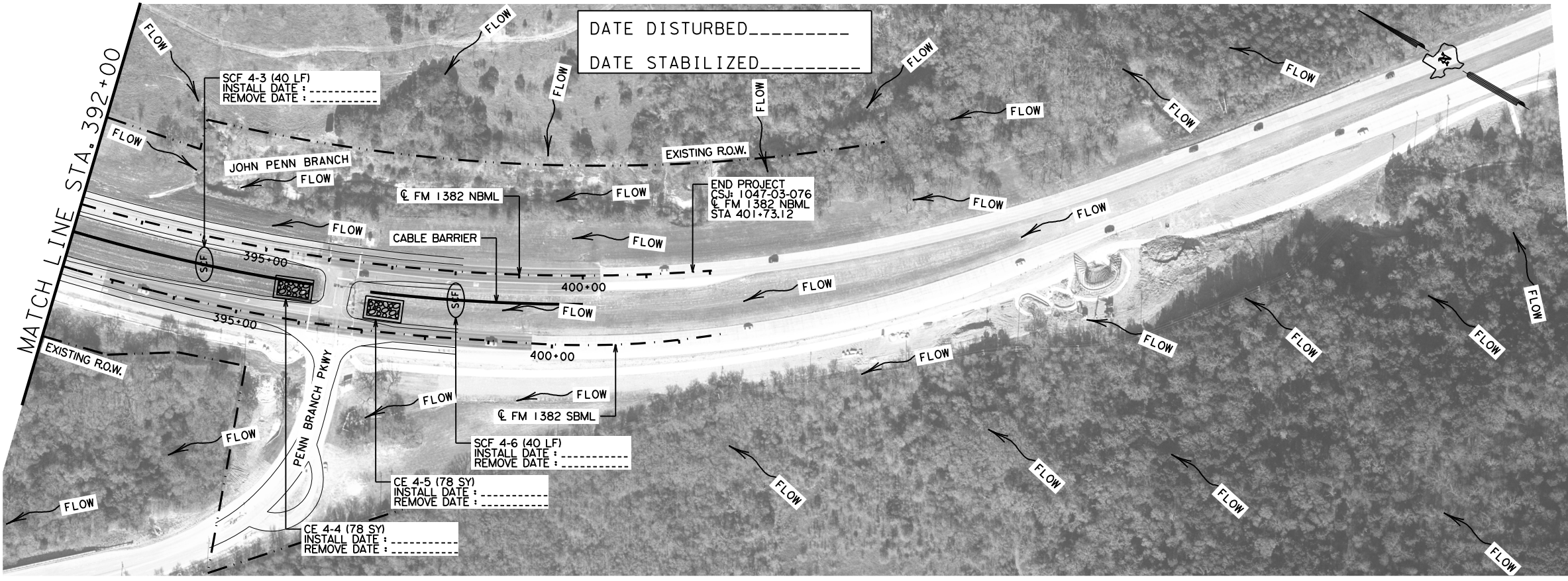
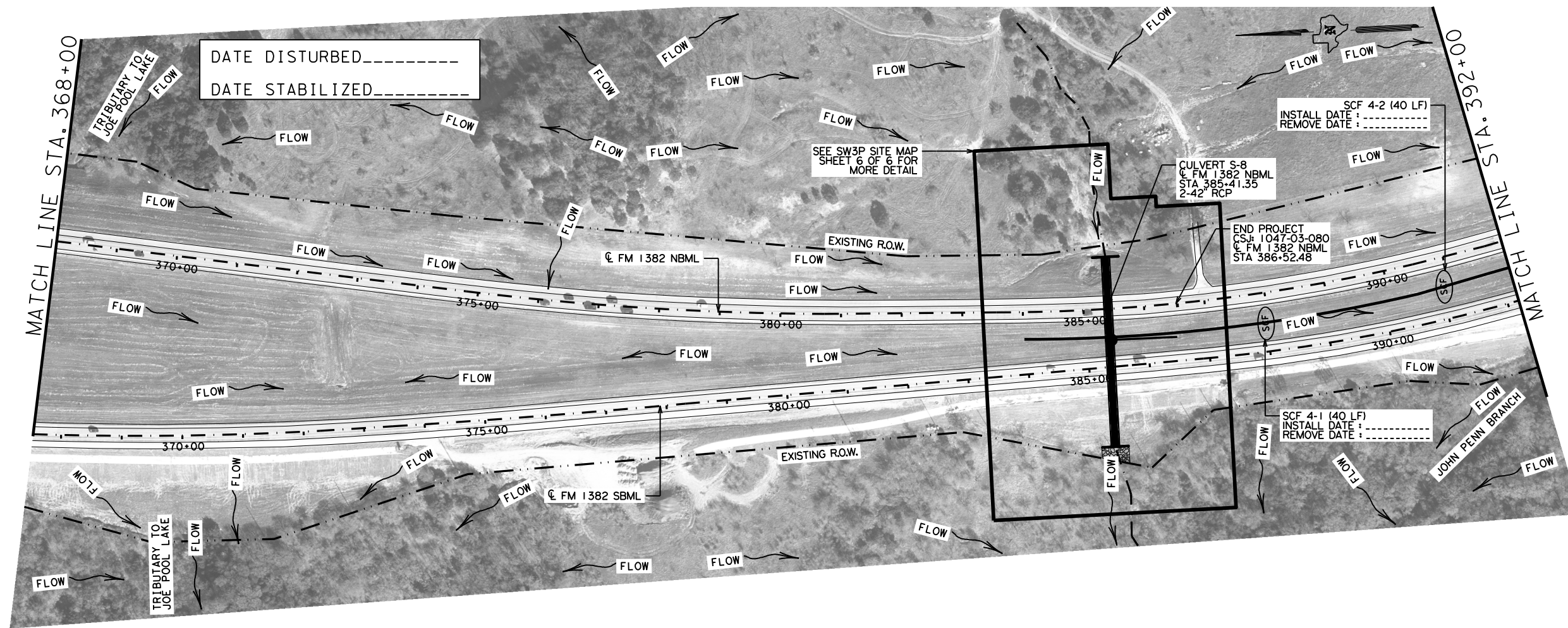
SCALE: 1"=200' SHEET 3 OF 6

DESIGN DN	FED. RD. DIV. NO. 6	PROJECT NO. SEE TITLE SHEET		HIGHWAY NO. FM 1382
GRAPHICS DN	STATE TEXAS	DISTRICT DAL	COUNTY DALLAS	SHEET NO. 67
CHECK NP	CONTROL	SECTION 03	JOB 076, ETC.	
CHECK AM	1047			



- LEGEND:**
- FLOW
 - BLOCK SODDING
 - CONSTRUCTION EXIT (TY 1)
 - SCF SEDIMENT CONTROL FENCE
 - ECL EROSION CONTROL LOG
 - RFD2 ROCK FILTER DAM (TY 2)

- NOTES:**
1. BMPs SHALL BE INSTALLED NO SOONER THAN TWO WEEKS PRIOR TO SOIL DISTURBANCE OR POTENTIAL POLLUTANT-GENERATING ACTIVITIES IN THEIR CONTROL AREA.
 2. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIMEFRAMES.
 3. CONSTRUCTION EXITS AND OTHER BMPs MAY BE ADJUSTED AS NEEDED, WITH ENGINEER'S APPROVAL OR DIRECTION.
 4. SEE EPIC SHEET SECTION V REGARDING WORK WITHIN 300-FOET OF POTENTIAL WILDLIFE HABITAT, AND COMPLY WITH RESTRICTIONS REGARDING CONSTRUCTION SCHEDULE, EQUIPMENT, USE, ETC.



Dung Nguyen, P.E. 11/15/2022
Signature of Registrant & Date

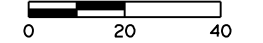
Texas Department of Transportation
© 2022

**FM 1382
SW3P SITE MAP**

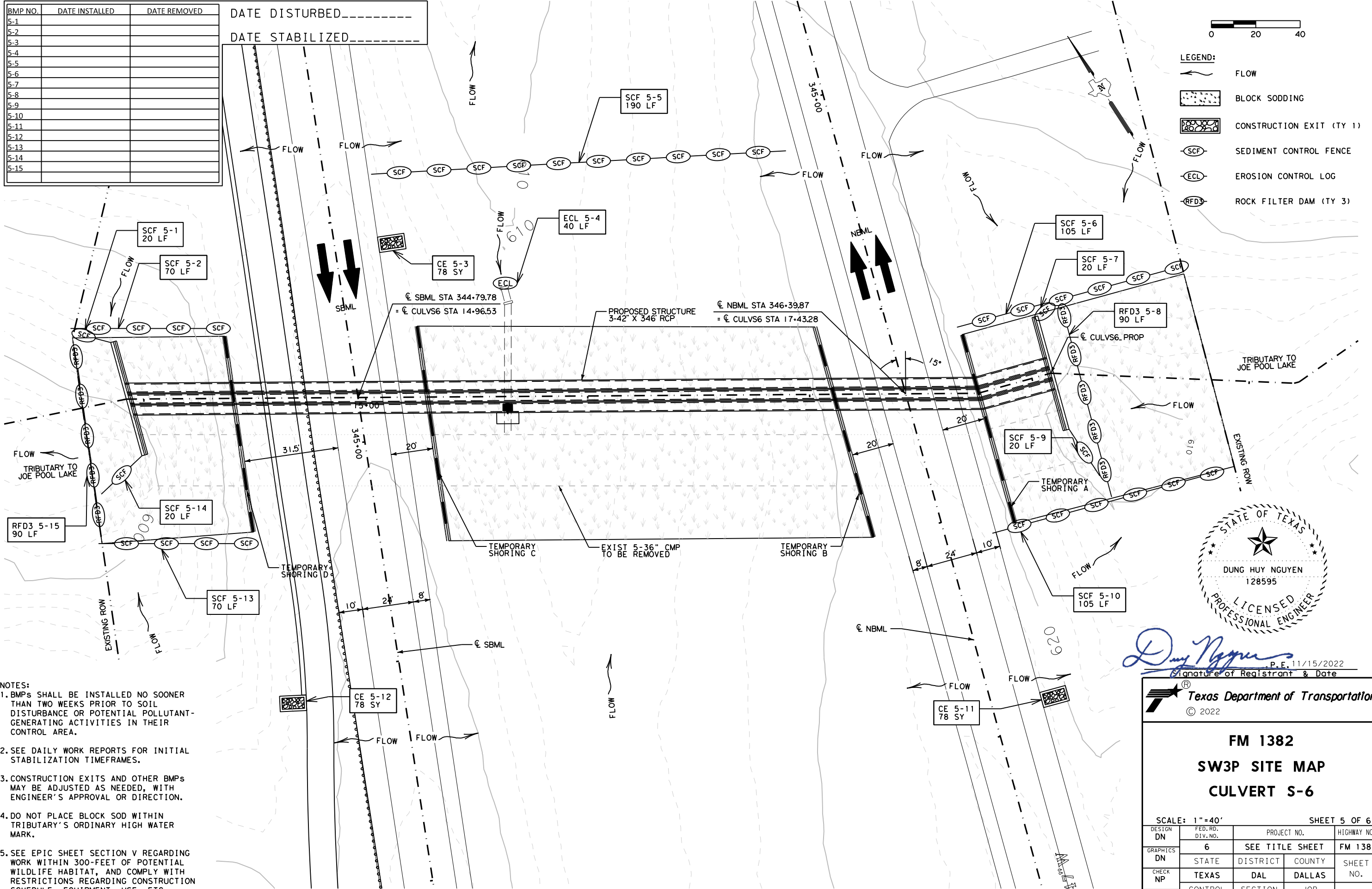
SCALE: 1"=200' SHEET 4 OF 6

DESIGN DN	FED. RD. DIV. NO. 6	PROJECT NO. SEE TITLE SHEET		HIGHWAY NO. FM 1382
GRAPHICS DN	STATE TEXAS	DISTRICT DAL	COUNTY DALLAS	SHEET NO. 68
CHECK NP	CONTROL	SECTION 03	JOB 076, ETC.	
CHECK AM	1047			

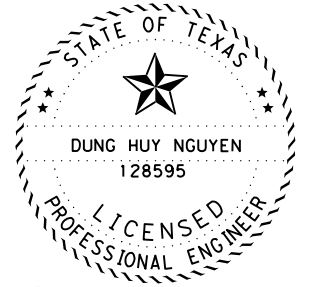
BMP NO.	DATE INSTALLED	DATE REMOVED	DATE DISTURBED	DATE STABILIZED
5-1				
5-2				
5-3				
5-4				
5-5				
5-6				
5-7				
5-8				
5-9				
5-10				
5-11				
5-12				
5-13				
5-14				
5-15				



- LEGEND:**
- FLOW
 - BLOCK SODDING
 - CONSTRUCTION EXIT (TY 1)
 - SEDIMENT CONTROL FENCE
 - EROSION CONTROL LOG
 - ROCK FILTER DAM (TY 3)



- NOTES:**
- BMPs SHALL BE INSTALLED NO SOONER THAN TWO WEEKS PRIOR TO SOIL DISTURBANCE OR POTENTIAL POLLUTANT-GENERATING ACTIVITIES IN THEIR CONTROL AREA.
 - SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIMEFRAMES.
 - CONSTRUCTION EXITS AND OTHER BMPs MAY BE ADJUSTED AS NEEDED, WITH ENGINEER'S APPROVAL OR DIRECTION.
 - DO NOT PLACE BLOCK SOD WITHIN TRIBUTARY'S ORDINARY HIGH WATER MARK.
 - SEE EPIC SHEET SECTION V REGARDING WORK WITHIN 300-FEET OF POTENTIAL WILDLIFE HABITAT, AND COMPLY WITH RESTRICTIONS REGARDING CONSTRUCTION SCHEDULE, EQUIPMENT, USE, ETC.



Dung Nguyen
P. E. 11/15/2022
Signature of Registrant & Date

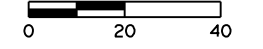
Texas Department of Transportation
© 2022

**FM 1382
SW3P SITE MAP
CULVERT S-6**

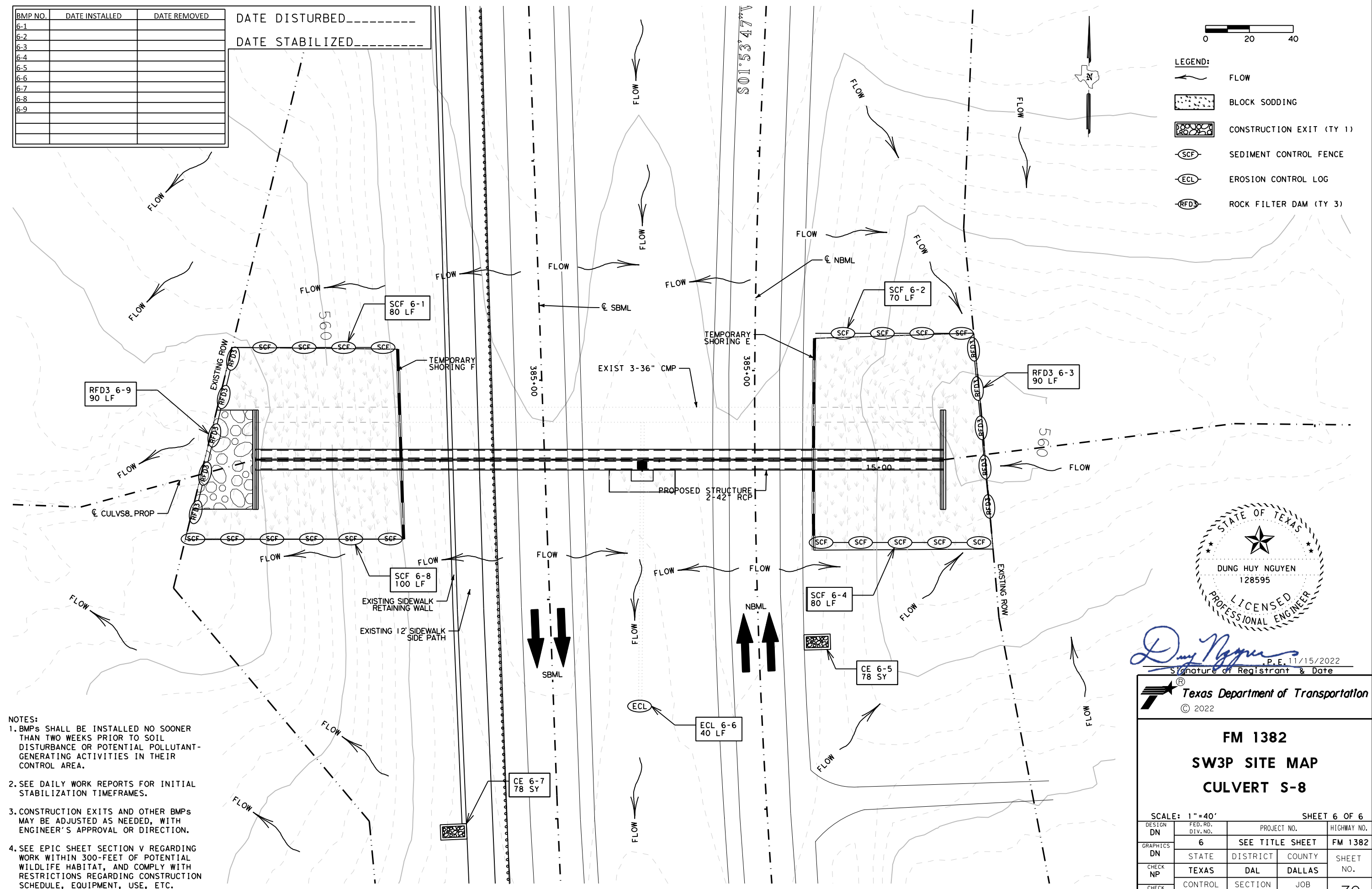
SCALE: 1" = 40' SHEET 5 OF 6

DESIGN DN	FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
	6	SEE TITLE SHEET	FM 1382
GRAPHICS DN	STATE	DISTRICT	COUNTY
	TEXAS	DAL	DALLAS
CHECK NP	CONTROL	SECTION	JOB
	1047	03	076, ETC.
			SHEET NO. 69

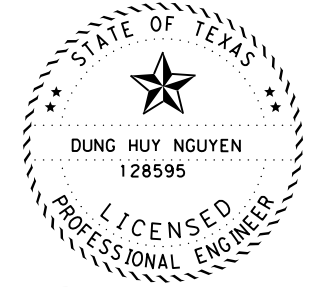
BMP NO.	DATE INSTALLED	DATE REMOVED	DATE DISTURBED	DATE STABILIZED
6-1				
6-2				
6-3				
6-4				
6-5				
6-6				
6-7				
6-8				
6-9				



- LEGEND:**
- FLOW
 - BLOCK SODDING
 - CONSTRUCTION EXIT (TY 1)
 - SEDIMENT CONTROL FENCE
 - EROSION CONTROL LOG
 - ROCK FILTER DAM (TY 3)



- NOTES:**
- BMPs SHALL BE INSTALLED NO SOONER THAN TWO WEEKS PRIOR TO SOIL DISTURBANCE OR POTENTIAL POLLUTANT-GENERATING ACTIVITIES IN THEIR CONTROL AREA.
 - SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIMEFRAMES.
 - CONSTRUCTION EXITS AND OTHER BMPs MAY BE ADJUSTED AS NEEDED, WITH ENGINEER'S APPROVAL OR DIRECTION.
 - SEE EPIC SHEET SECTION V REGARDING WORK WITHIN 300-FOET OF POTENTIAL WILDLIFE HABITAT, AND COMPLY WITH RESTRICTIONS REGARDING CONSTRUCTION SCHEDULE, EQUIPMENT, USE, ETC.

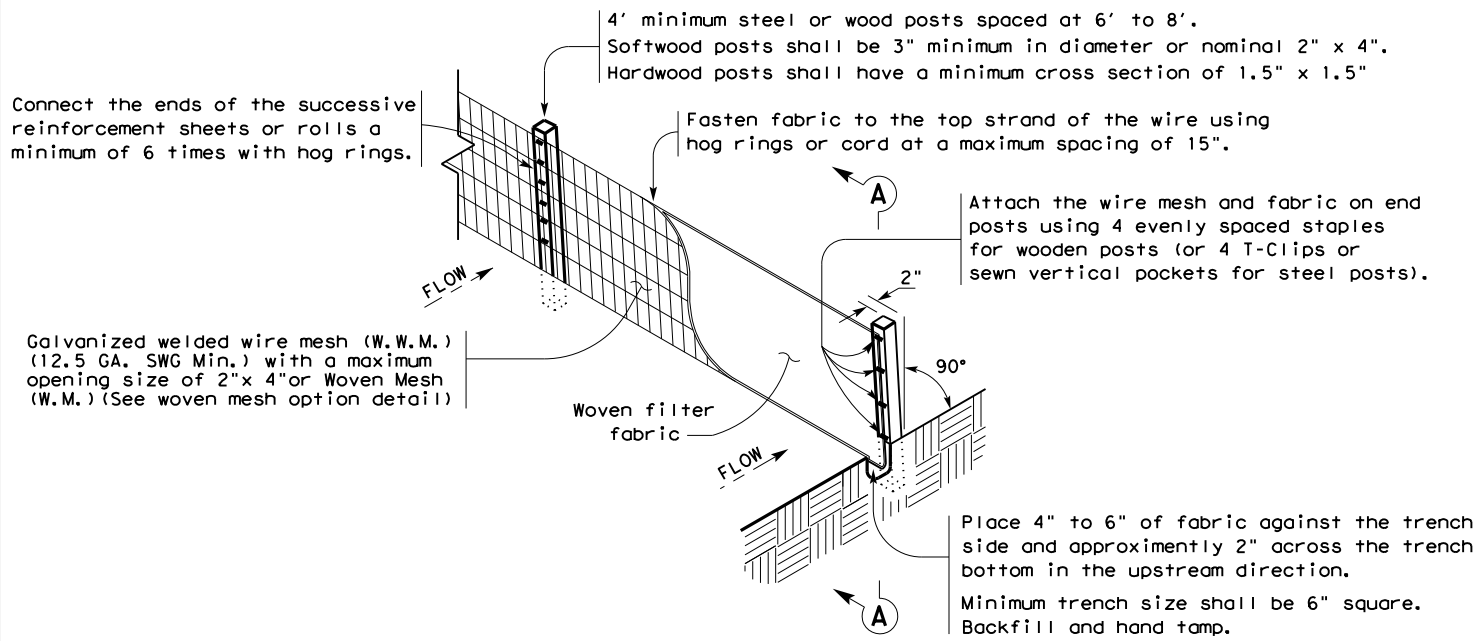


Dung Nguyen
P.E. 11/15/2022
Signature of Registrant & Date



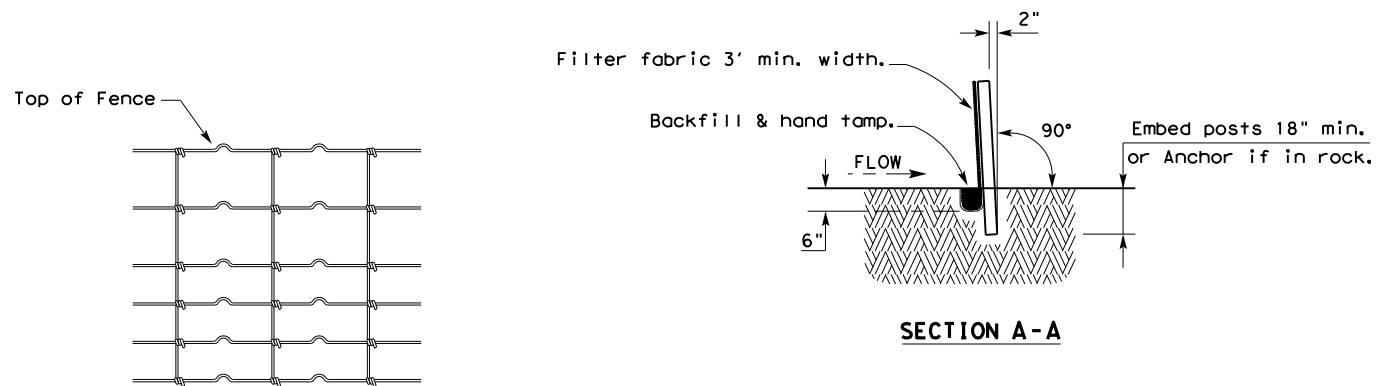
FM 1382			
SW3P SITE MAP			
CULVERT S-8			
SCALE: 1"=40'		SHEET 6 OF 6	
DESIGN DN	FED. RD. DIV. NO.	PROJECT NO.	HIGHWAY NO.
	6	SEE TITLE SHEET	FM 1382
GRAPHICS DN	STATE	DISTRICT	COUNTY
	TEXAS	DAL	DALLAS
CHECK NP	CONTROL	SECTION	JOB
	1047	03	076, ETC.
CHECK AM			SHEET NO.
			70

10/16/2022
 T:\IDELAO\PROJECTS\04\FM1382\FM1382\Culvert_replacement\rehab_options\Sheets\STND\SW3p\ec116.dgn
 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.



TEMPORARY SEDIMENT CONTROL FENCE

SCF



HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

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

SEDIMENT CONTROL FENCE USAGE GUIDELINES

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

Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT². Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

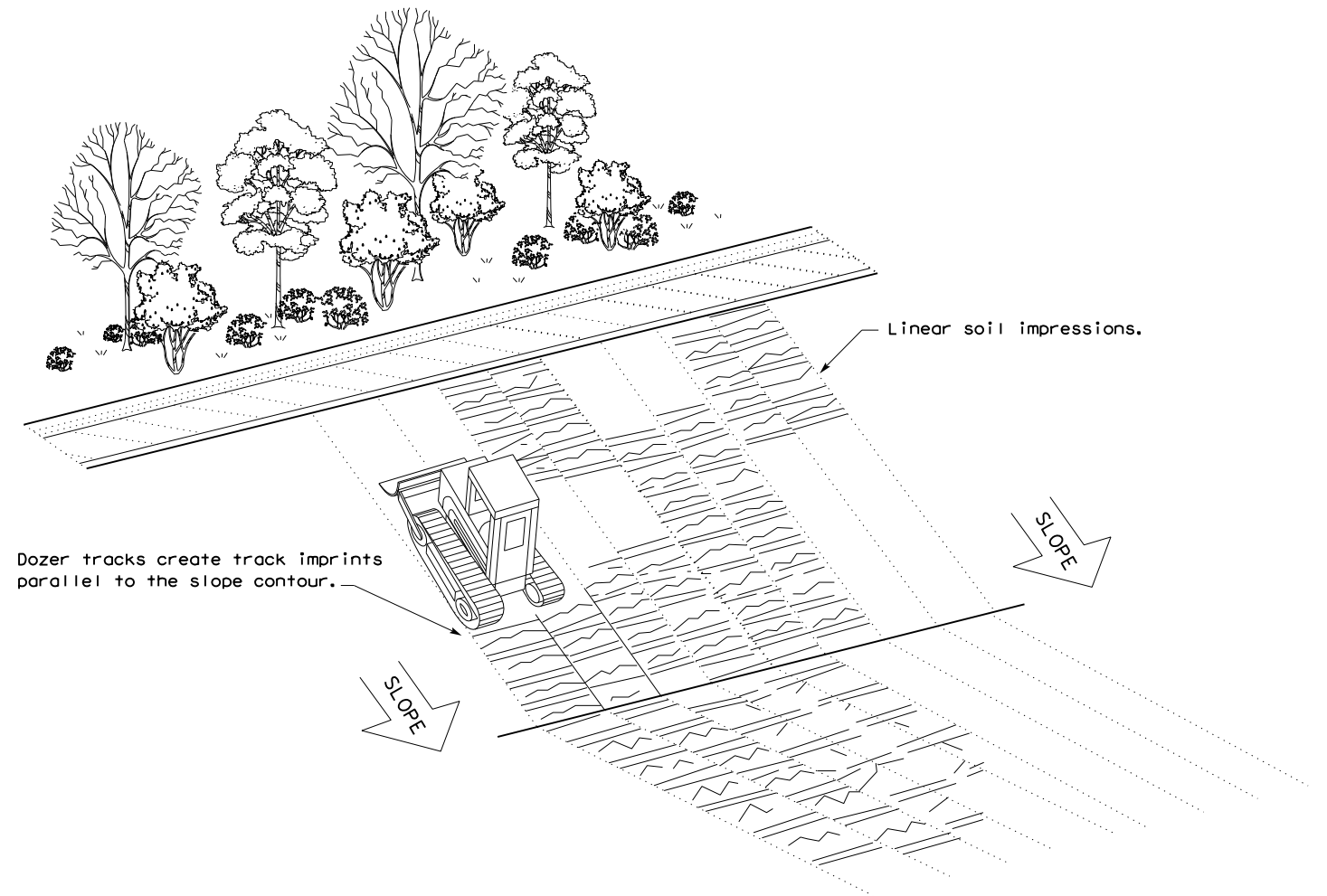
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

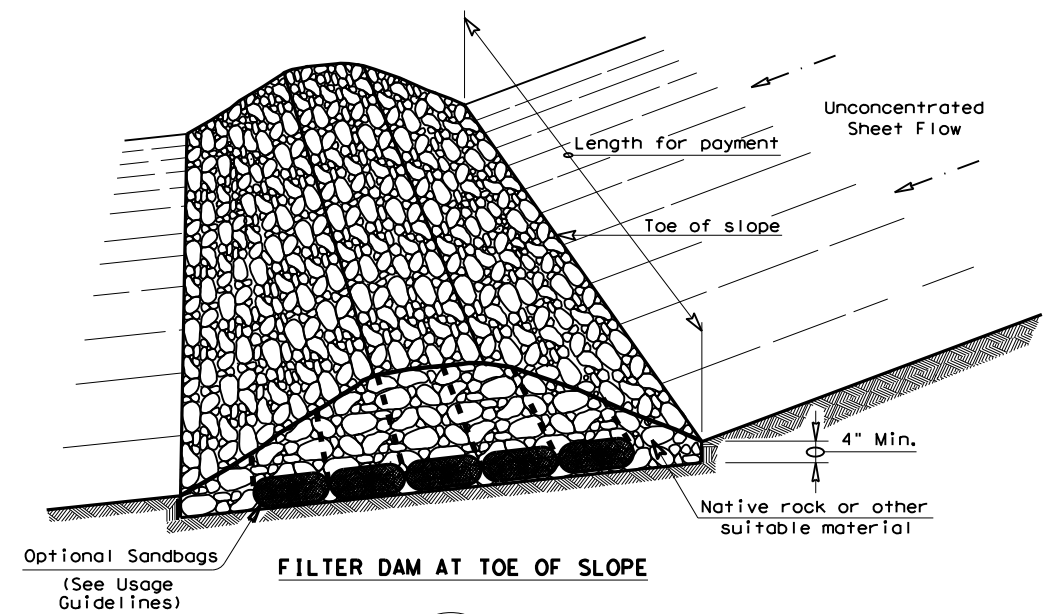
1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum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



VERTICAL TRACKING

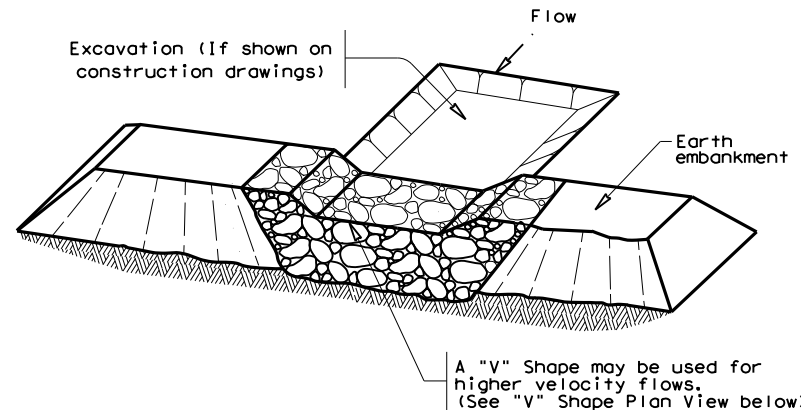
				Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES FENCE & VERTICAL TRACKING EC(1) - 16					
FILE: ec116	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS	
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY	
REVISIONS	1047	03	076, ETC.	FM 1382	
	DIST	COUNTY	SHEET NO.		
	DAL	DALLAS	71		

DATE: 11/15/2022
 FILE: T:\DALAO\PROJECTS\On\FM1382\FM1382 Culvert replacement\rehab options\SHEET\SW3P\ec216.dgn
 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.



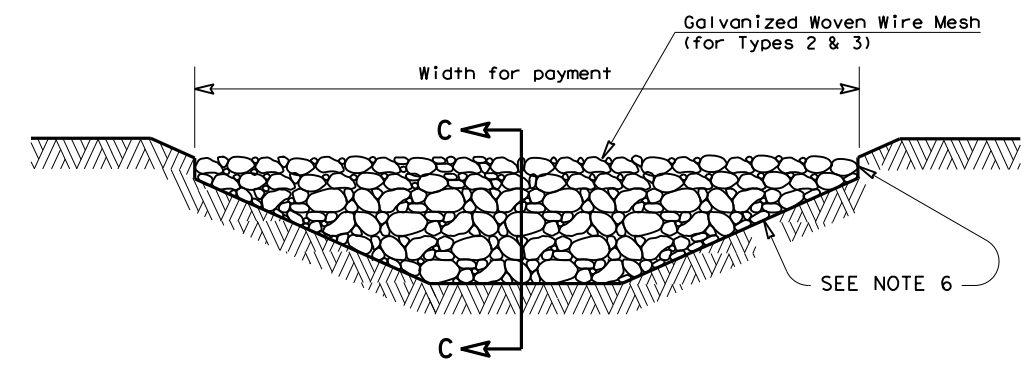
FILTER DAM AT TOE OF SLOPE

(RFD1)



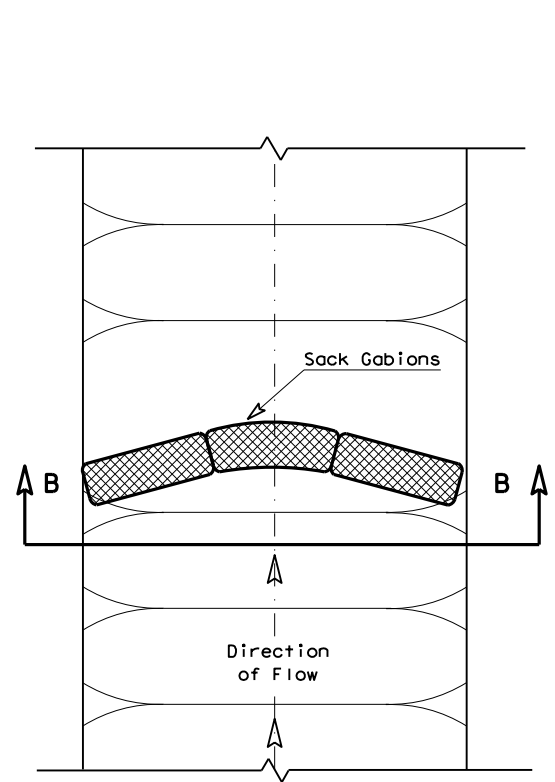
FILTER DAM AT SEDIMENT TRAP

(RFD1) OR (RFD2)

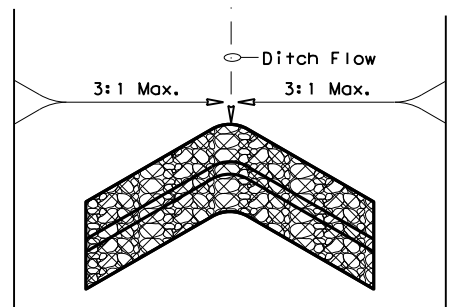


FILTER DAM AT CHANNEL SECTIONS

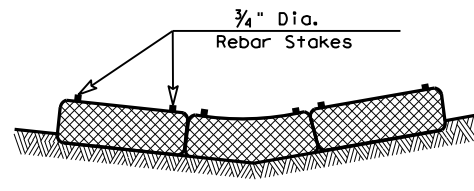
(RFD1) OR (RFD2) OR (RFD3)



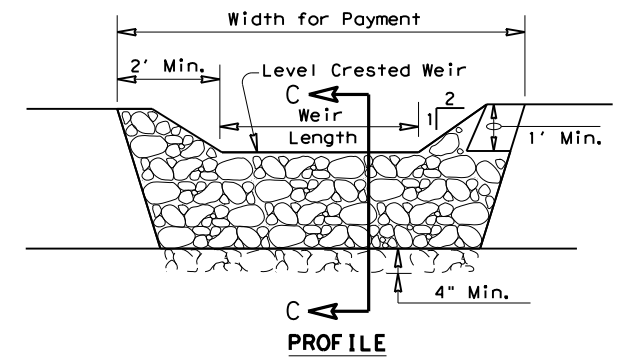
PLAN VIEW



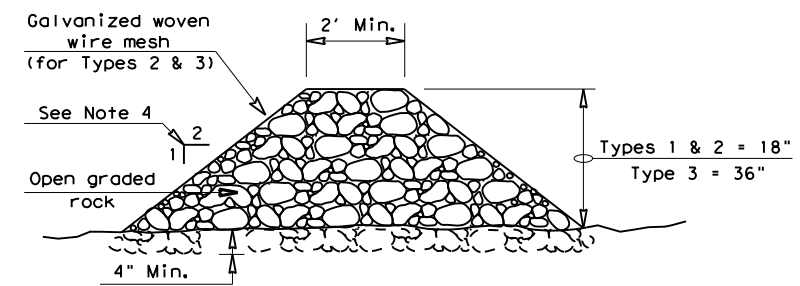
"V" SHAPE PLAN VIEW



SECTION B-B



PROFILE



SECTION C-C

ROCK FILTER DAM USAGE GUIDELINES

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT² of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

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

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

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

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

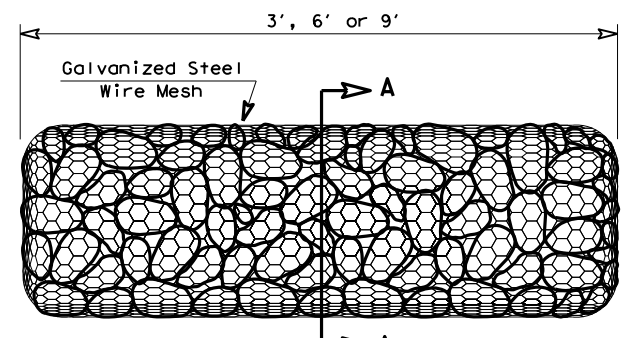
Type 5: Provide rock filter dams as shown on plans.

GENERAL NOTES

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

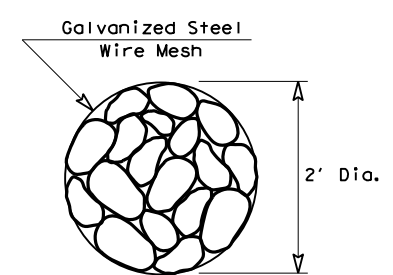
PLAN SHEET LEGEND

- Type 1 Rock Filter Dam (RFD1)
- Type 2 Rock Filter Dam (RFD2)
- Type 3 Rock Filter Dam (RFD3)
- Type 4 Rock Filter Dam (RFD4)



TYPE 4 (SACK GABIONS)

(RFD4)

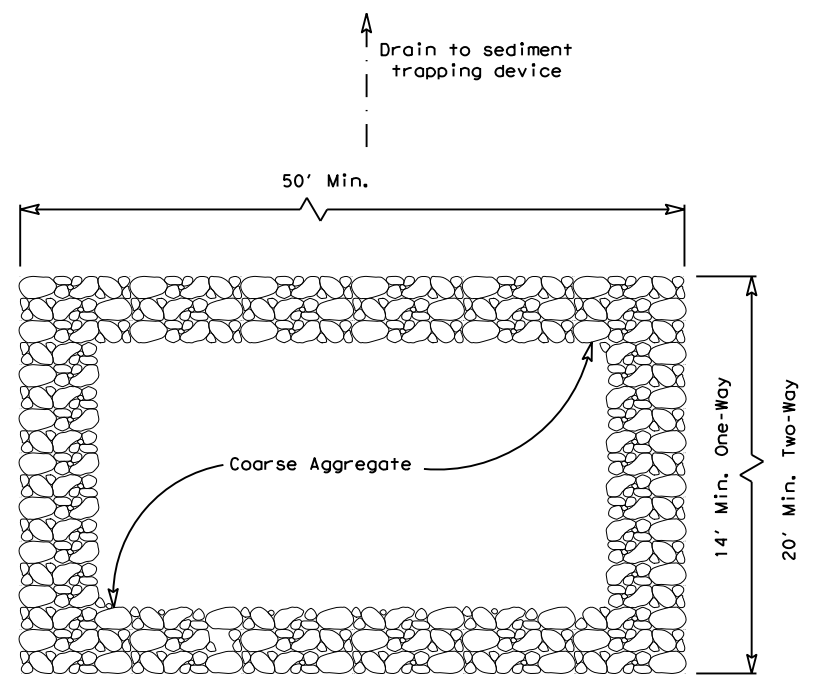


SECTION A-A

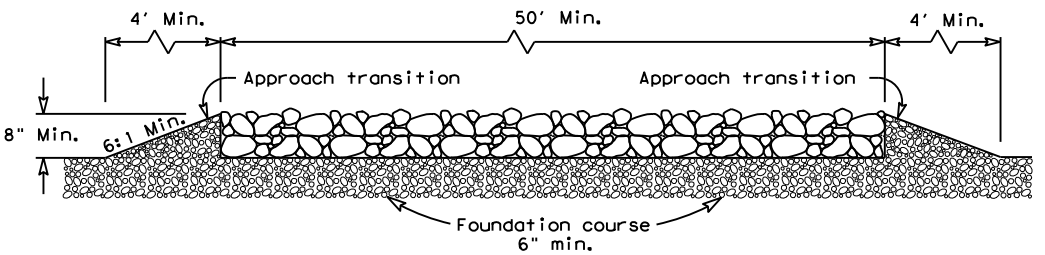
		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES ROCK FILTER DAMS EC(2) - 16			
FILE: ec216	DN: TxDOT	CK: KM	DW: VP
© TxDOT: JULY 2016	CONT	SECT	JOB
REVISIONS	1047	03	076, ETC.
	DIST	COUNTY	SHEET NO.
	DAL	DALLAS	72

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: 11/15/2022
 FILE: I:\DALAO\PROJECTS\On\FM1382\Culvert replacement\rehab_options\Sheets\STND\SW3P\ec316.dgn



PLAN VIEW

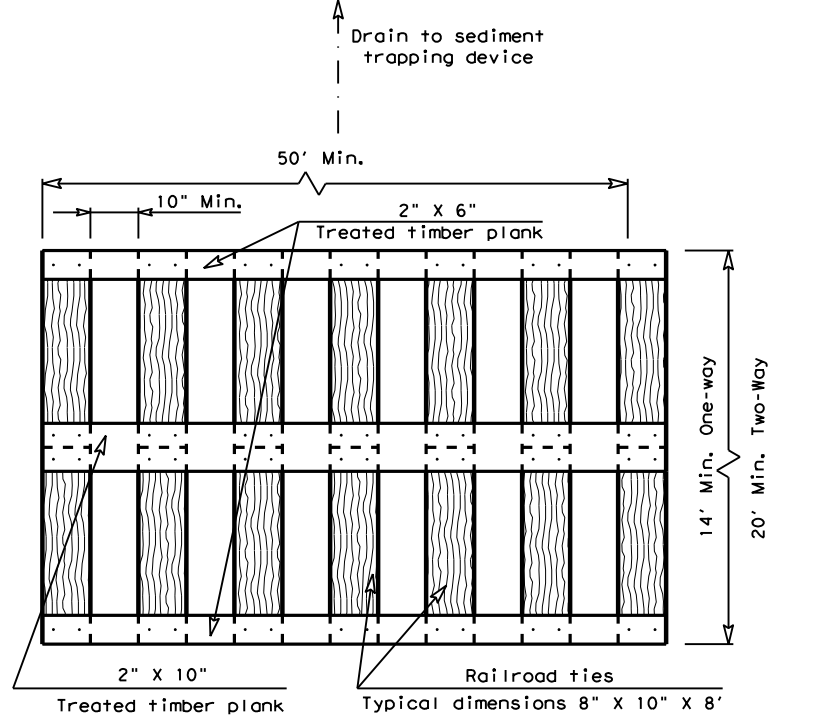


ELEVATION VIEW

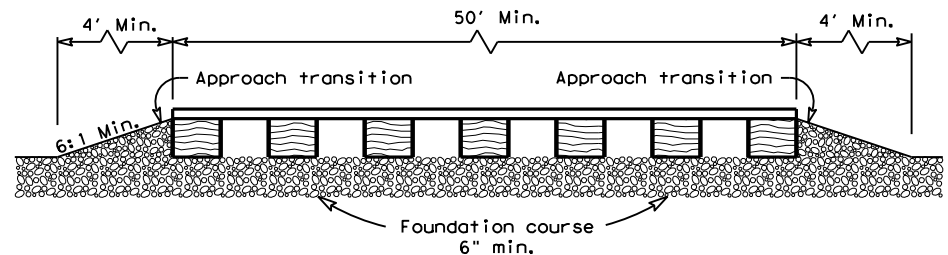
CONSTRUCTION EXIT (TYPE 1)
 ROCK CONSTRUCTION (LONG TERM)

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

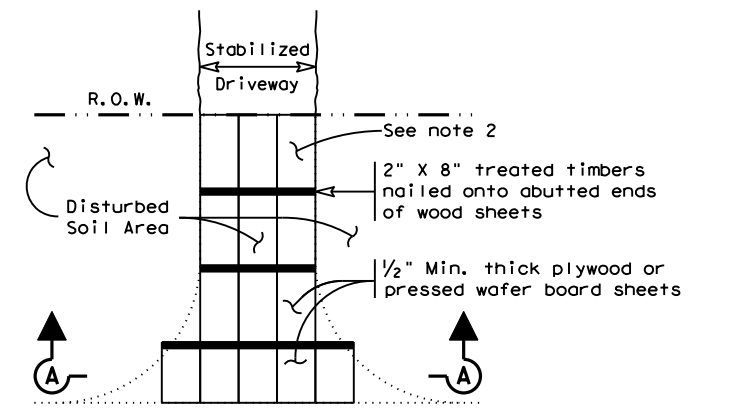


ELEVATION VIEW

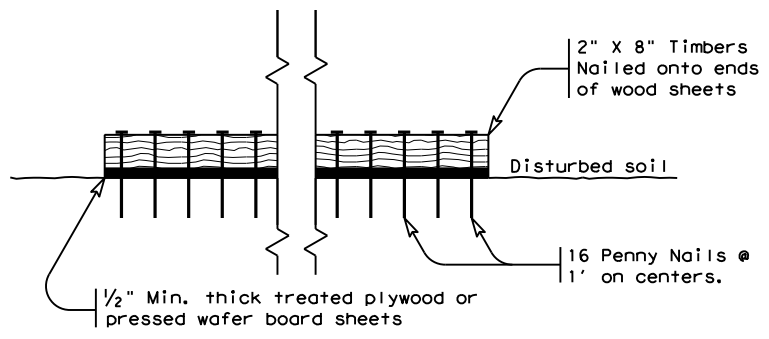
CONSTRUCTION EXIT (TYPE 2)
 TIMBER CONSTRUCTION (LONG TERM)

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



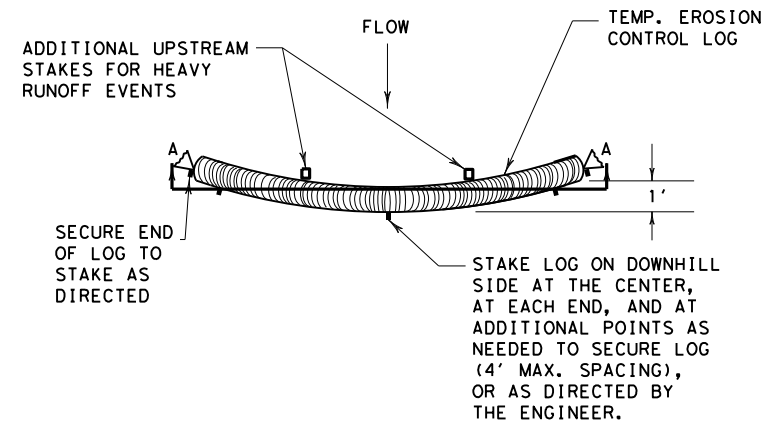
SECTION A-A
 CONSTRUCTION EXIT (TYPE 3)
 SHORT TERM

GENERAL NOTES (TYPE 3)

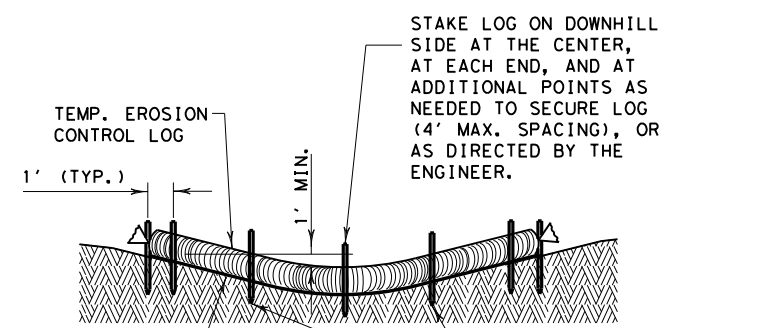
1. The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
2. The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
3. The treated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

		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES CONSTRUCTION EXITS EC(3)-16			
FILE: ec316	DN: TxDOT	CK: KM	DW: VP
© TxDOT: JULY 2016	CONT SECT	JOB	HIGHWAY
REVISIONS	1047 03	076, ETC.	FM 1382
DIST	COUNTY	SHEET NO.	
DAL	DALLAS	73	

DATE: 11/15/2022
 FILE: T:\DALAO\PROJECTS\On\FM1382\FM1382 Culvert replacement\rehab options\Sheets\STND\SW3P\ec916.dgn
 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.



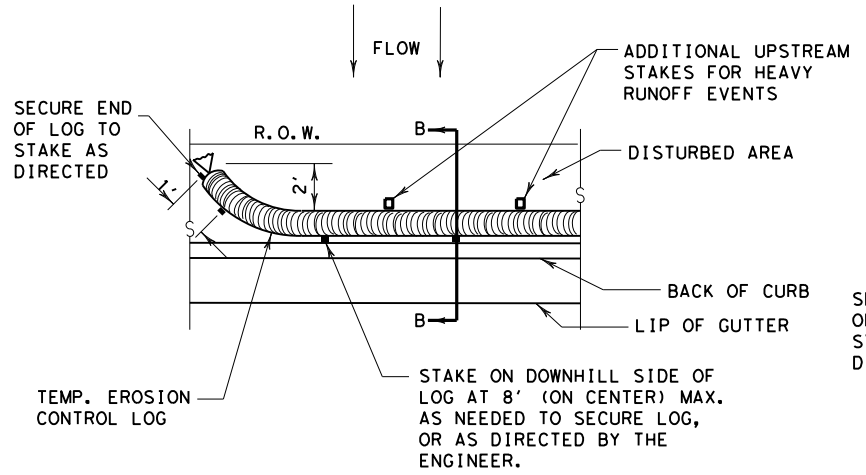
PLAN VIEW



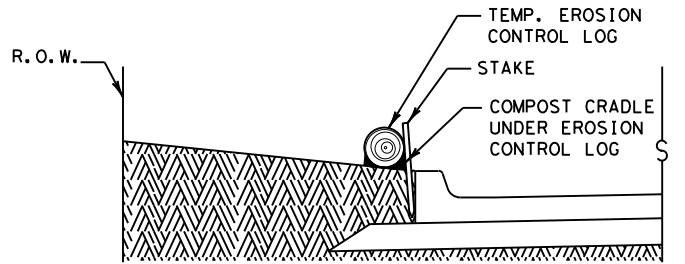
SECTION A-A
EROSION CONTROL LOG DAM

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

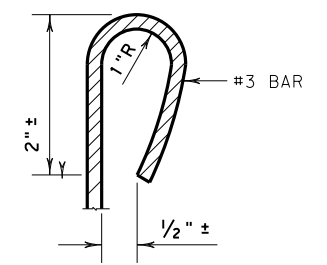


PLAN VIEW

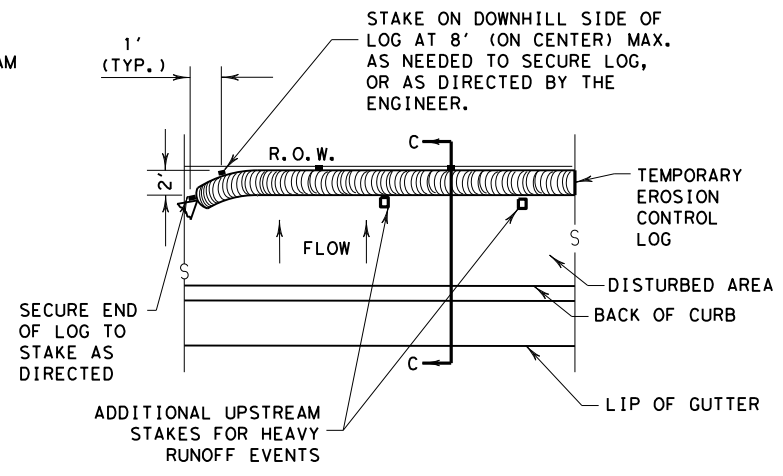


SECTION B-B
EROSION CONTROL LOG AT BACK OF CURB

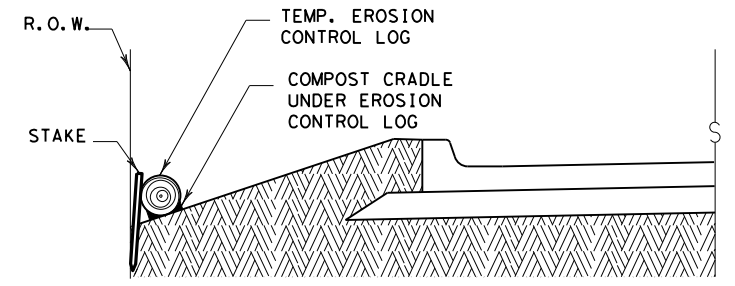
CL-BOC



REBAR STAKE DETAIL



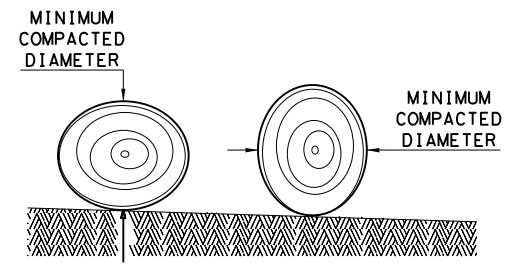
PLAN VIEW



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

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.

GENERAL NOTES:

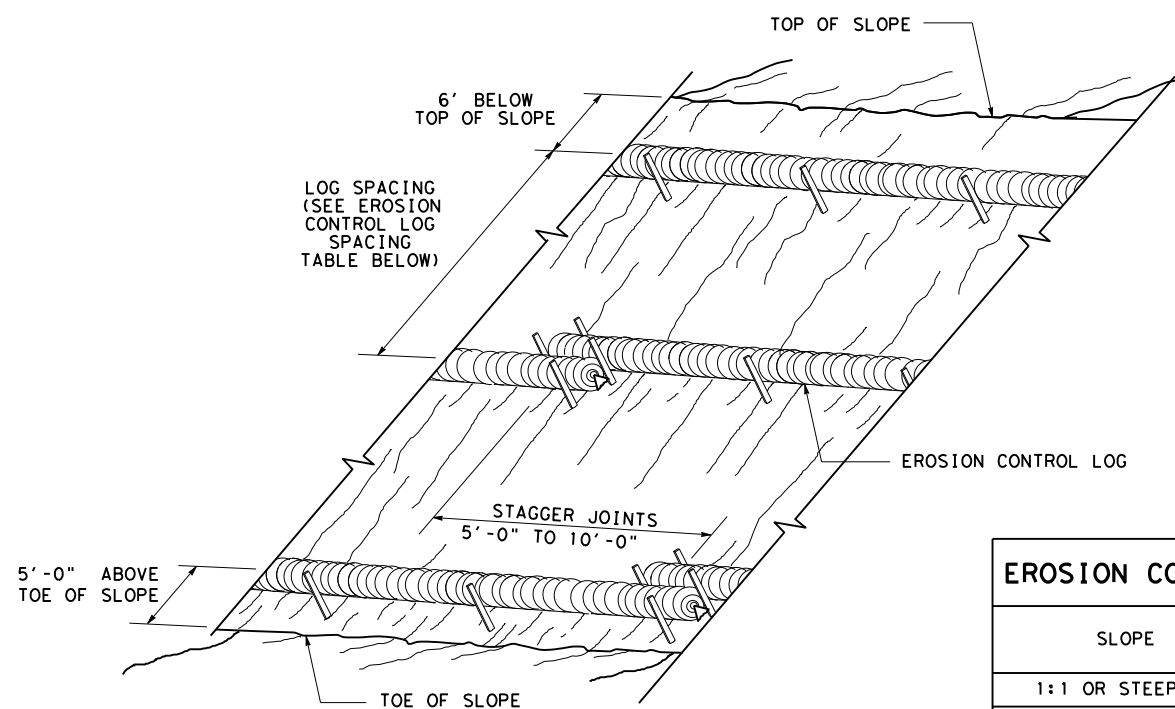
1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE 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.

SHEET 1 OF 3

		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES EROSION CONTROL LOG EC (9) - 16			
FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT
© TxDOT: JULY 2016	CONT SECT	JOB	HIGHWAY
REVISIONS	1047 03	076, ETC.	FM 1382
DIST	COUNTY	SHEET NO.	
DAL	DALLAS	74	

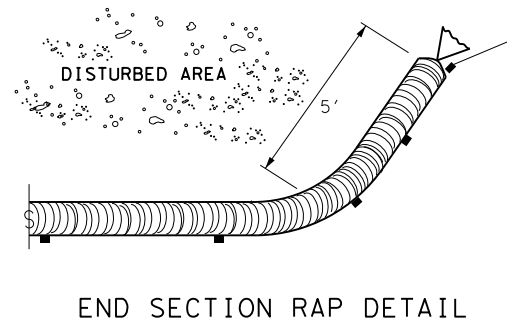
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 11/15/2022
 FILE: T:\DALAO\PROJECTS\On\FM1382\FM1382 Culvert replacement\rehab options\Sheets\STND\SW3P\ec916.dgn



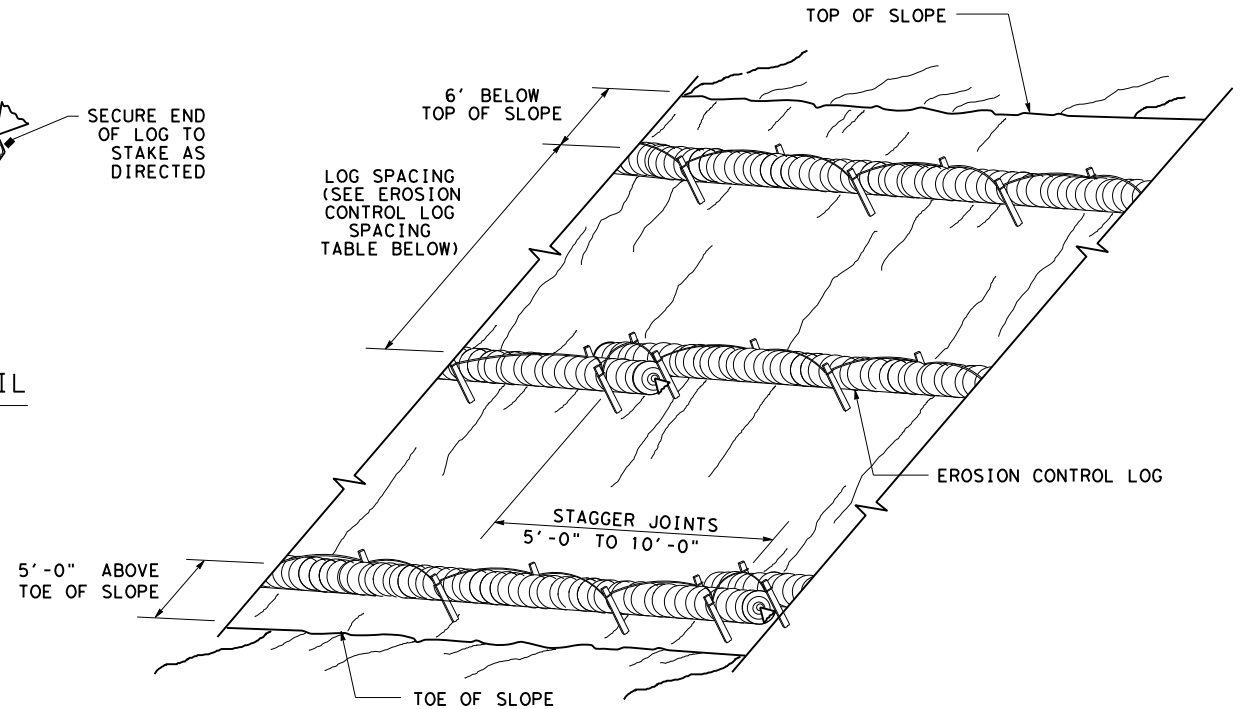
**EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING**

CL-SST



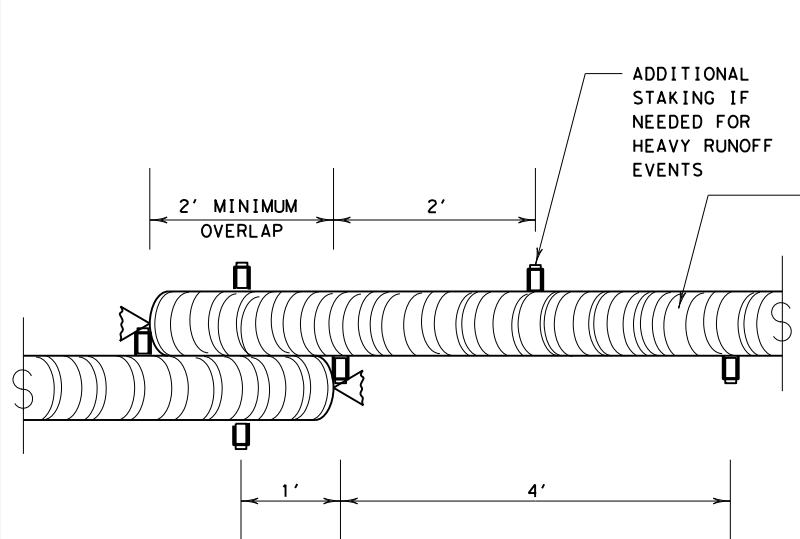
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

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



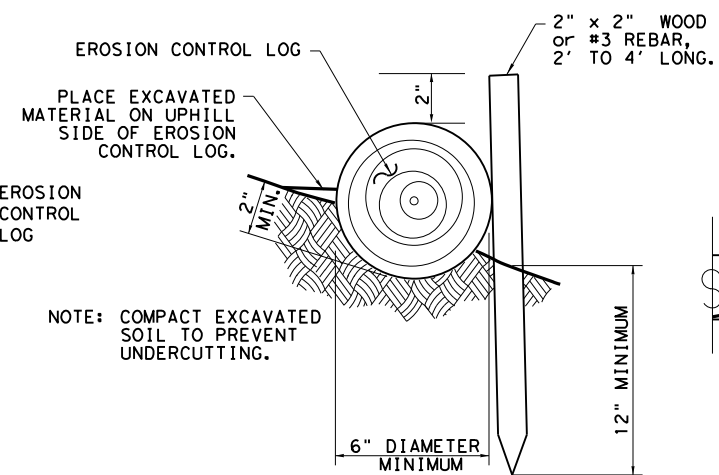
**EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING**

CL-SSL



STAKE AND TRENCHING ANCHORING DETAIL

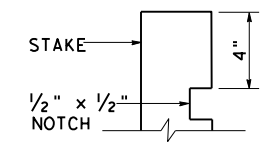
CL-SST



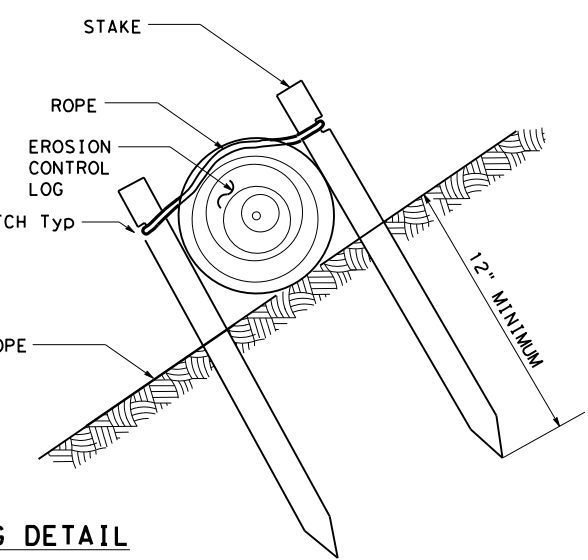
STAKE AND LASHING ANCHORING DETAIL

CL-SSL

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



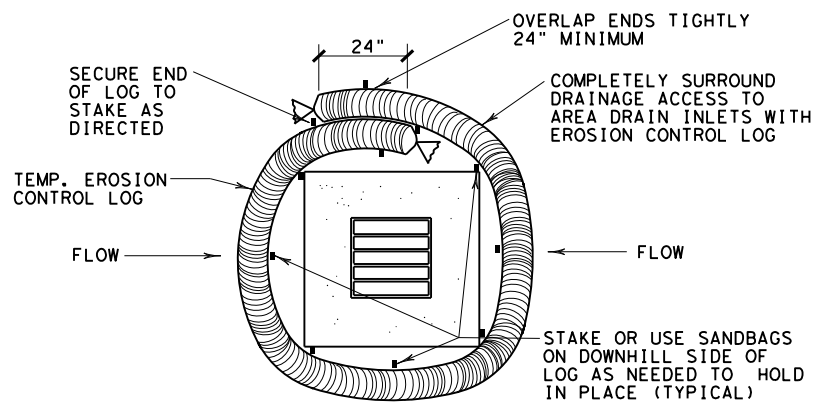
STAKE NOTCH DETAIL



SHEET 2 OF 3

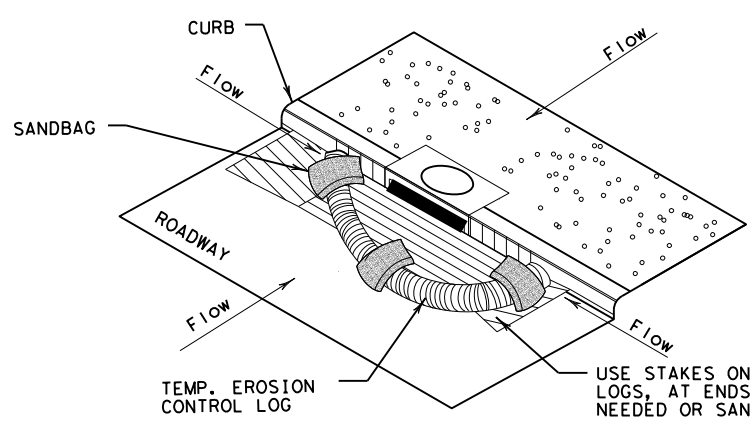
		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES EROSION CONTROL LOG EC (9) - 16			
FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT
© TxDOT: JULY 2016	CONT SECT	JOB	HIGHWAY
REVISIONS	1047 03	076, ETC.	FM 1382
DIST	COUNTY	SHEET NO.	
DAL	DALLAS	75	

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: 11/15/2022
 FILE: T:\DALAO\PROJECTS\On\FM1382\FM1382 Culvert replacement\rehab options\STND\SW3P\ec916.dgn



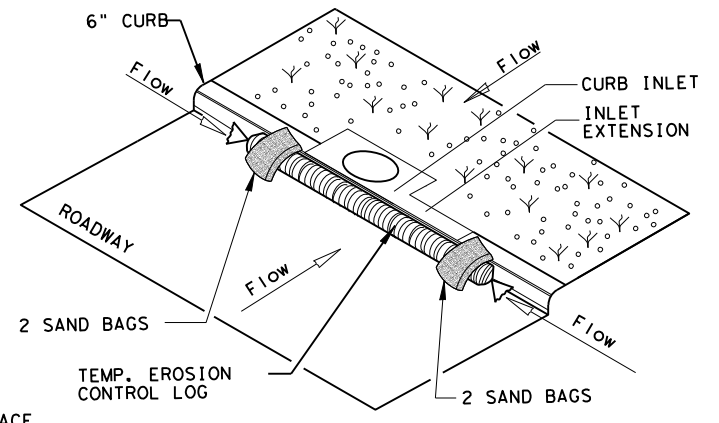
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

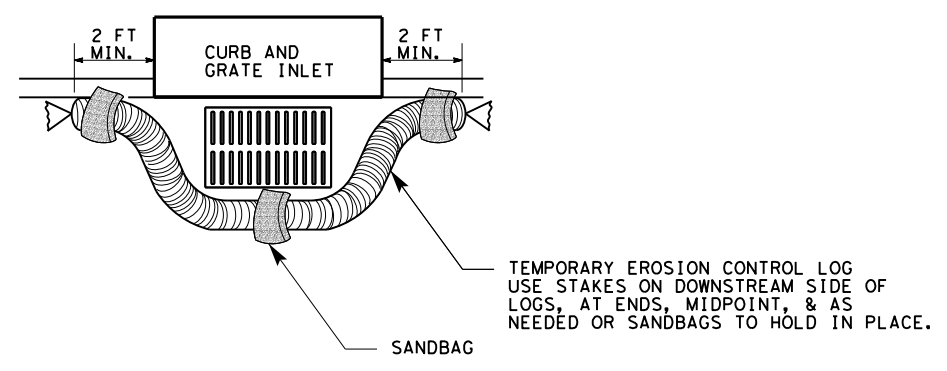
CL-CI



EROSION CONTROL LOG AT CURB INLET

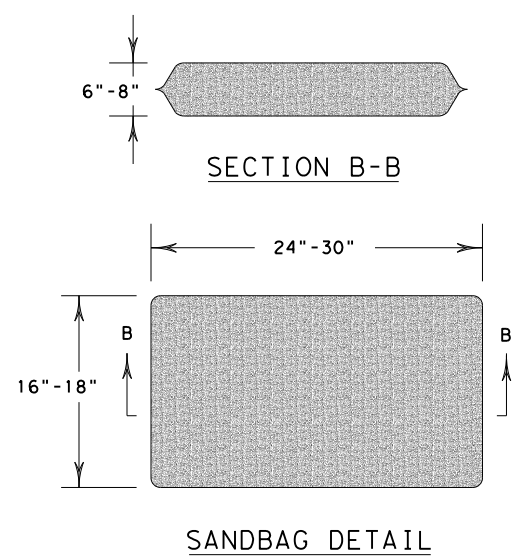
CL-CI

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



SHEET 3 OF 3

		<i>Design Division Standard</i>	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES EROSION CONTROL LOG EC (9) - 16			
FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT
© TxDOT: JULY 2016	CONT	SECT	JOB
REVISIONS	1047	03	076, ETC.
	DIST	COUNTY	SHEET NO.
	DAL	DALLAS	76

SURFACE PREPARATION ITEM 160* TOPSOIL SY / ITEM 161* COMPOST MANUF. TOPSOIL (BOS) (4") SY

SURFACE PREPARATION

Prepare planting area surface BEFORE placing Topsoil, Compost, Fertilizer, Seed and/or Sod. Once project area has been completed to final lines, grade and compaction, remove objectionable materials from planting area surface and cultivate existing surface to a depth of 4 inches, unless otherwise specified or directed.

Refer to Items 160 and 161 of TxDOT 2014 Standard Specifications* for specifications, dimensions, volumes, and measurements that have been modified or not shown in plans. Materials and construction shall meet all specifications.

TOPSOIL NOTES:

- When Topsoil is specified under Item 160, use suitable material salvaged from the project ROW in accordance with Item 160 specifications, and/or secure additional good material from approved sources.
- Topsoil shall include only the top 6 inches of its native surface, and be easily cultivated, fertile, erosion-resistant and free of objectionable materials.
- Topsoil obtained from sites outside of the ROW must come from approved sources and have a pH between 5.5 and 8.5 su.
- Place Topsoil on pre-cultivated surface, spread to a uniform loose cover at thickness specified, and shape per plans. Water and roll the finished surface with a light roller or other suitable equipment per Item 160.3; do not over-compact.

COMPOST NOTES:

- When Compost Manufactured Topsoil (4") is specified under Item 161, use compost meeting all requirements of Item 161.2 and Table 1. Provide quality control (QC) documentation and obtain Engineer approval prior to compost delivery.
- Contractor shall provide tickets/invoices that document material type, quantity and placement for all compost delivered.
- Additional topsoil may be required to be imported to achieve the compost/topsoil mix ratio. Topsoil must meet Item 160 specifications.

APPLICATION OF COMPOST MANUFACTURED TOPSOIL (4")

AFTER Surface Preparation, uniformly spread a 1-inch layer of compost on-grade with 3 inches topsoil over pre-cultivated planting area. (25% compost and 75% topsoil = 1" compost and 3" topsoil.) Then mix compost and topsoil together by cultivating the compost into the topsoil (by till or disk) to a 4-inch (4") depth. Roll the finished surface with a light corrugated drum; do not over-compact.

FERTILIZER ITEM 166* FERTILIZER AC

SOIL ANALYSIS FOR FERTILIZER APPLICATION RATE

Unless otherwise stated in the plans, Contractor shall perform at least one soil analysis on each project before fertilization, and submit results to Engineer with recommended fertilizer rates based on soil analysis. Engineer may direct sample location(s). Soil analysis may be waived if both compost and sod are used on entire project.

FERTILIZER NOTES:

- Refer to Item 166 of TxDOT 2014 Standard Specifications* for specifications, dimensions, volumes, and measurements that have been modified or not shown in plans. Materials and construction shall meet all specifications.
- Apply fertilizer BEFORE seeding, or AFTER placing sod.
- Use fertilizer containing nitrogen (N), phosphoric acid (P) and potash (K) nutrients, unless otherwise specified. At least 50% of the Nitrogen component shall be a slow-release sulfur-coated urea as described in Item 166.3. Do not apply more than 60 lbs Nitrogen per acre without Engineer concurrence.
- Deliver fertilizer in bags, clearly labeled to show contents, unless otherwise specified or approved prior to delivery. When non-bagged, loose fertilizer is approved, provide documentation for each load of material delivered, to validate authenticity of the material.
- Apply fertilizer uniformly, as a dry, granular material, essentially dust-free, and do not mix with water for application as a slurry.
- When both temporary and permanent seeding are specified for the same area, apply half of the required fertilizer before the temporary seeding operation and the other half before the permanent seeding operation.

SEEDING FOR EROSION CONTROL ITEM 164* DRILL SEEDING AC

RECOMMENDED PLANTING SEASON	PERMANENT RURAL SEED MIX ITEM 164 - DRILL SEEDING (PERM) (RURAL) (CLAY)	PERMANENT URBAN SEED MIX ITEM 164 - DRILL SEEDING (PERM) (URBAN) (CLAY)	TEMPORARY DRILL SEED MIX ITEM 164 - DRILL SEEDING (TEMP) (WARM OR COOL)																														
WARM SEASON Mar. 15th, April, May, June, July, August, Sept. 15th	<table border="1"> <tr><td>Green Sprangletop (Van Horn)</td><td>- 1.0 lbs/AC</td></tr> <tr><td>Sideoats Grama (Haskell)</td><td>- 1.0 lbs/AC</td></tr> <tr><td>Texas Grama (Atascosa)</td><td>- 1.0 lbs/AC</td></tr> <tr><td>Hairy Grama (Chaparral)</td><td>- 0.4 lbs/AC</td></tr> <tr><td>Shortspike Windmillgrass (Welder)</td><td>- 0.2 lbs/AC</td></tr> <tr><td>Little Bluestem (OK Select)</td><td>- 0.8 lbs/AC</td></tr> <tr><td>Purple Prairie Clover (Cuero)</td><td>- 0.6 lbs/AC</td></tr> <tr><td>Engelmann Daisy (Eldorado)</td><td>- 0.75 lbs/AC</td></tr> <tr><td>Illinois Bundlesflower</td><td>- 1.3 lbs/AC</td></tr> <tr><td>Awnless Bushsunflower (Plateau)</td><td>- 0.2 lbs/AC</td></tr> </table>	Green Sprangletop (Van Horn)	- 1.0 lbs/AC	Sideoats Grama (Haskell)	- 1.0 lbs/AC	Texas Grama (Atascosa)	- 1.0 lbs/AC	Hairy Grama (Chaparral)	- 0.4 lbs/AC	Shortspike Windmillgrass (Welder)	- 0.2 lbs/AC	Little Bluestem (OK Select)	- 0.8 lbs/AC	Purple Prairie Clover (Cuero)	- 0.6 lbs/AC	Engelmann Daisy (Eldorado)	- 0.75 lbs/AC	Illinois Bundlesflower	- 1.3 lbs/AC	Awnless Bushsunflower (Plateau)	- 0.2 lbs/AC	<table border="1"> <tr><td>Green Sprangletop (Leptochloa dubia)</td><td>- 0.3 lbs/AC</td></tr> <tr><td>Sideoats Grama (El Reno) (Bouteloua curtipendula)</td><td>- 3.6 lbs/AC</td></tr> <tr><td>Buffalograss (Texoka) (Buchloe dactyloides)</td><td>- 1.6 lbs/AC</td></tr> <tr><td>Bermudagrass (Cynodon dactylon)</td><td>- 2.4 lbs/AC</td></tr> </table>	Green Sprangletop (Leptochloa dubia)	- 0.3 lbs/AC	Sideoats Grama (El Reno) (Bouteloua curtipendula)	- 3.6 lbs/AC	Buffalograss (Texoka) (Buchloe dactyloides)	- 1.6 lbs/AC	Bermudagrass (Cynodon dactylon)	- 2.4 lbs/AC	<table border="1"> <tr><td>Foxtail Millet (Setaria italica)</td><td>- 34 lbs/AC</td></tr> </table>	Foxtail Millet (Setaria italica)	- 34 lbs/AC
Green Sprangletop (Van Horn)	- 1.0 lbs/AC																																
Sideoats Grama (Haskell)	- 1.0 lbs/AC																																
Texas Grama (Atascosa)	- 1.0 lbs/AC																																
Hairy Grama (Chaparral)	- 0.4 lbs/AC																																
Shortspike Windmillgrass (Welder)	- 0.2 lbs/AC																																
Little Bluestem (OK Select)	- 0.8 lbs/AC																																
Purple Prairie Clover (Cuero)	- 0.6 lbs/AC																																
Engelmann Daisy (Eldorado)	- 0.75 lbs/AC																																
Illinois Bundlesflower	- 1.3 lbs/AC																																
Awnless Bushsunflower (Plateau)	- 0.2 lbs/AC																																
Green Sprangletop (Leptochloa dubia)	- 0.3 lbs/AC																																
Sideoats Grama (El Reno) (Bouteloua curtipendula)	- 3.6 lbs/AC																																
Buffalograss (Texoka) (Buchloe dactyloides)	- 1.6 lbs/AC																																
Bermudagrass (Cynodon dactylon)	- 2.4 lbs/AC																																
Foxtail Millet (Setaria italica)	- 34 lbs/AC																																
COOL SEASON Sept 16th, Oct, Nov, Dec, Jan, Feb, Mar 14th			<table border="1"> <tr><td>Tall Fescue (Festuca arundinaceae)</td><td>- 4.5 lbs/AC</td></tr> <tr><td>Western Wheatgrass (Agropyron smithii)</td><td>- 5.6 lbs/AC</td></tr> <tr><td>Red Winter Wheat (Triticum aestivum)</td><td>- 34 lbs/AC</td></tr> <tr><td>Cereal Rye</td><td>- 34 lbs/AC</td></tr> </table>	Tall Fescue (Festuca arundinaceae)	- 4.5 lbs/AC	Western Wheatgrass (Agropyron smithii)	- 5.6 lbs/AC	Red Winter Wheat (Triticum aestivum)	- 34 lbs/AC	Cereal Rye	- 34 lbs/AC																						
Tall Fescue (Festuca arundinaceae)	- 4.5 lbs/AC																																
Western Wheatgrass (Agropyron smithii)	- 5.6 lbs/AC																																
Red Winter Wheat (Triticum aestivum)	- 34 lbs/AC																																
Cereal Rye	- 34 lbs/AC																																

SEEDING NOTES:

- When seeding is specified under Item 164, refer to TxDOT 2014 Standard Specifications* for specifications, dimensions, volumes, and measurements that have been modified or not shown. Materials and construction shall meet specifications.
- Conduct seeding upon completion of each applicable construction stage (dependent upon planting season requirements), without compensation for additional move-ins.
- Place seed AFTER preparing planting area surface. Refer to Surface Preparation detail in this sheet, as well as Topsoil Item 160 and Compost Manufactured Topsoil Item 161 when specified. Apply fertilizer per Item 166 BEFORE seeding, per specifications and this sheet, to help drill the fertilizer into the soil.
- When temporary grasses are well-established and more than 2 inches tall, mow planting area before seeding permanent grasses; mowing for this purpose will be subsidiary. When vegetation is not already well-established, cultivate planting area to a depth as described in Item 164.3, before temporary seeding and before permanent seeding.
- Seed material must be appropriate to the location, soil type and season. Use the seed mix species and pure live seed rates designated in Tables 1-4 of the TxDOT 2014 Standard Specifications* for Item 164, unless otherwise specified.
- All seed shall meet labeling, delivery, analysis, and testing requirements described in Item 164.2.1. Deliver seed in labeled, unopened bags or containers to Engineer prior to planting.
- Uniformly plant seed over the designated planting area, along the contour of slopes, and drill seed to a depth as described in Item 164.3.4.
- Hydroseeding may be allowed, when specified or Engineer concurs.
- Implement and continue Vegetative Watering per the schedule, rate and volume specified under Item 168.

TXDOT REFERENCE MATERIALS:

- "STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS, AND BRIDGES" 2014
- "A GUIDANCE TO ROADSIDE VEGETATION ESTABLISHMENT" 2004
- ONLINE TRAINING COURSE: MNT415 REVEGETATION DURING CONSTRUCTION
- DALLAS DISTRICT "VEGETATION ESTABLISHMENT GUIDELINES"

SODDING FOR EROSION CONTROL ITEM 162* BLOCK SOD (BERMUDA) SY

BLOCK OR ROLL SOD	COMMON NAME	BOTANICAL NAME
	Common Bermuda Grass	Cynodon dactylon

SODDING NOTES:

- Refer to Item 162 of TxDOT 2014 Standard Specifications* for specifications, dimensions, volumes, and measurements that have been modified or not shown in plans. Materials and construction shall meet all specifications.
- Place sod between the average date of the last freeze in the Spring and 6 weeks before the average date of the first freeze in the Fall, per the Texas Almanac for the project area.
- Place sod only AFTER soil surface preparation is complete as detailed in this sheet. Dry soil may require pre-watering.
- Place all sod (blocks or rolls) within 24 hours of delivery to the site, and keep moist from the time it is dug up until it is planted. Sod with dried roots will not be accepted.
- Place sod with joints alternating on each row to prevent all joints from lining up, and place blocks firmly against adjacent blocks. Roll, tamp and trim sod per Item 162.3.
- Place fertilizer promptly AFTER sodding operation is complete in each area.
- Water sod immediately following placement, and continue Vegetative Watering per Item 168.

VEGETATIVE WATERING FOR ESTABLISHING SEED AND SOD ITEM 168* VEGETATIVE WATERING MG

SEASON (Usual Months)	RATE	TIME SCHEDULE	TOTAL WATER ESTIMATE
SPRING & FALL (March, April, May, October)	7,000 gallons/acre per working day	Vegetative watering for seed shall begin on the day after rainfall described below and continue for 60 consecutive working days; vegetative watering for sod shall begin on the day the sod is placed and continue for a minimum of 15 consecutive working days.	420,000 gallons/acre (60 working days)
SUMMER (June, July, August, September)	12,000 gallons/acre per working day		720,000 gallons/acre (60 working days)
WINTER (November through February)	1,000 gallons/acre per working day	Vegetative watering for seed and/or sod shall begin on the day after placement for 15 consecutive working days	15,000 gallons/acre (15 working days)

Notes: Rate and frequency may be adjusted, with the approval of the Engineer, to meet site conditions (especially with sod). For informational purposes only: 1,000 gallons equals 1 MG

VEGETATIVE WATERING NOTES:

- Refer to Item 168 of TxDOT 2014 Standard Specifications* for specifications, dimensions, volumes, and measurements that have been modified or not shown in plans. Materials and construction shall meet all specifications.
- Use clean water free of industrial waste and other substances harmful to vegetation growth, per Item 168.2.
- Use Vegetative Watering to keep the seed bed moist during germination; not to provide initial watering. After drill seeding, postpone watering operations until site receives at least 1/2-inch of natural rainfall in a single day. Delay watering operations for warm season grasses until soil temperature exceeds 70 degrees F.
- For sod, water immediately.
- All water distribution equipment shall be furnished and operated to provide water at a uniform and controllable rate. Use a metering device on all watering equipment.
- Evenly distribute water over entire area designated for seeding and/or sodding, using even spray patterns that do not disturb seed bed and/or dislodge seed from seed bed.
- Do not water between the hours of 12:00 p.m. and 6:00 p.m. when daytime temperatures exceed 95 degrees F.
- After initial establishment period, continue intermittent watering of newly established seed or sod at a rate of approximately 1-inch water/week, during summer months until end of contract.
- If 1/4-inch or more of rainfall occurs on site on any given working day, no vegetative watering will be needed on that working day. (Note: 1/4-inch rain equals 7,000 gallons of water per acre.)
- Should the Contractor fail to apply the specified amount of water within the time allowed, any seed or sod in poor condition shall be replaced, fertilized, and watered at Contractor's expense.


ROADSIDE MOWING ITEM 730* PROJECT MAINTENANCE AC

MOWING NOTES:

- During project construction, once seed is established, use mowing to promote permanent grasses by mowing any remaining temporary grasses.
- Also mow established turf and ROW grasses in designated areas of project limits as specified or directed by Engineer.
- Remove litter and debris prior to mowing.
- Do not mow on wet ground when soil rutting can occur.
- Hand-trim around obstructions and stormwater control devices as needed.
- Maintain paved surfaces free of tracked soils and clipped vegetation.

SEQUENCE OF WORK:

- CULTIVATE SURFACE SOIL.
- PREPARE / PLACE TOPSOIL, OR
- PREPARE / PLACE COMPOST MANUFACTURED TOPSOIL.
- APPLY FERTILIZER AND THEN PLACE SEEDING, OR
- PLACE SOD AND THEN APPLY FERTILIZER.
- CONDUCT VEGETATIVE WATERING.
- CONDUCT ROADSIDE MOWING, AS DIRECTED.



 © 2019

VEGETATION ESTABLISHMENT SHEET

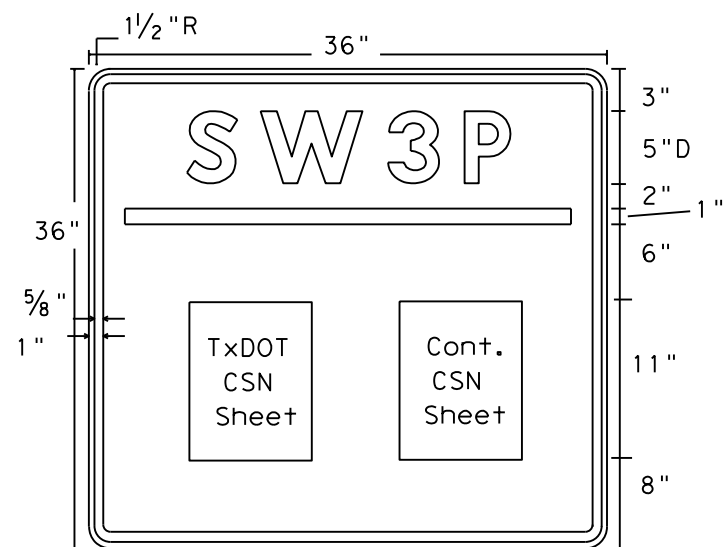
(DALLAS DISTRICT)

TEMPLATE REVISION DATE: 02/21/19

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
CPB	6	(See Title Sheet)		FM 1382
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
XXX	TEXAS	DALLAS	DALLAS	77
CHECK	CONTROL	SECTION	JOB	
XXX	1047	03	076, 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.

LEVELS DISPLAYED	1
PATH:	



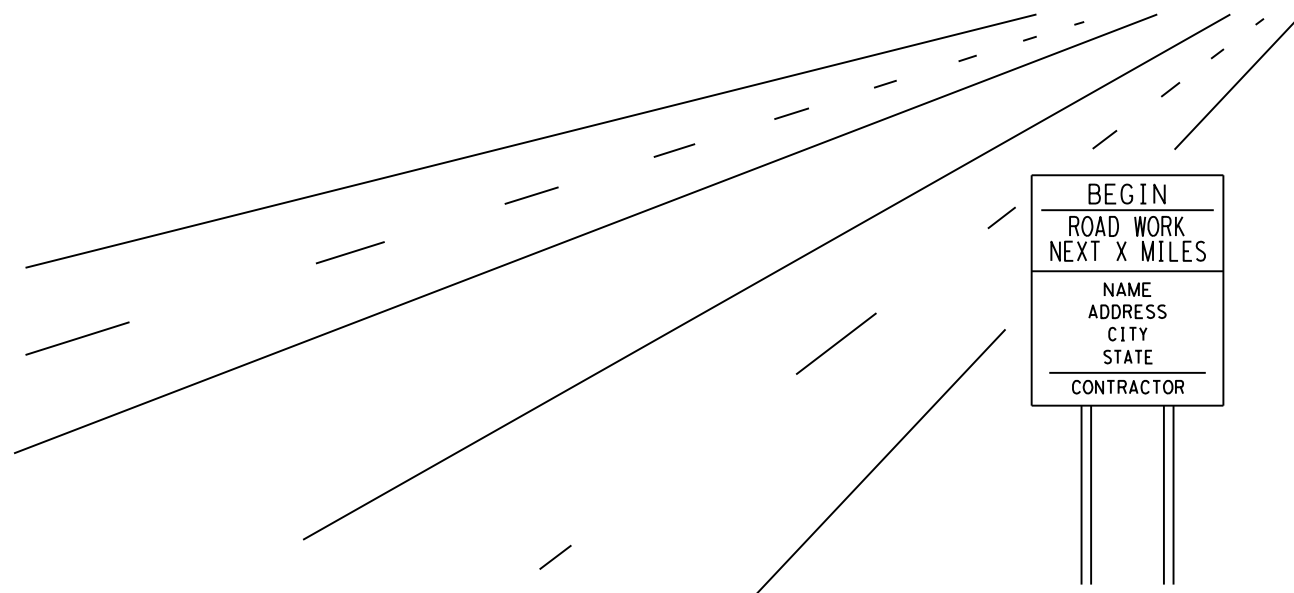
Sign Dimensions

36" X 36"

- Letters - White
- Numbers - White
- Border - White
- Background - Blue

SW3P SIGN

TxDOT & Contractor
Construction Site Note
(CSN)



GENERAL NOTES:

- The alphabets and lateral spacing between letters and numerals shall conform with the "Texas Manual on Uniform Traffic Control Devices for Streets and Highways", (TMUTCD) latest edition, and the "Compliant Work Zone Traffic Control Devices List". Lateral spacing of text shall provide a balanced appearance. All materials shall conform to Department Specifications.
- Legend and border may be applied by reverse screening process with transparent colored ink, cut-out white reflective sheeting applied to colored background or combination thereof. Background shall be reflective sheeting Type C.
- CSN Sheets will be laminated and attached to the sign with an adhesive. Ensure sheets remain dry. (See Figure 1).
- SW3P Signs should be placed just inside the ROW line at the project limits at a readable height. It may be placed perpendicular or parallel to ROW line. If the sign cannot be placed outside the clear zone, it will be mounted per TMUTCD requirements.
- Final location of the signs will be as approved by the Engineer.

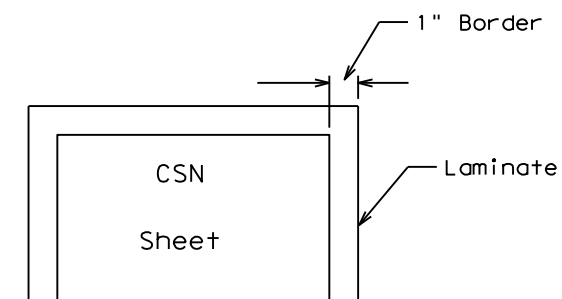


Figure 1

DEPARTMENT MATERIAL SPECIFICATIONS	
PLYWOOD SIGN BLANKS	DMS-7100
FLAT SURFACE REFLECTIVE SHEETING	DMS-8300
VINYL NON-REFLECTIVE DECAL SHEETING	DMS-8320

COLOR	USAGE	REFLECTIVE SHEETING OR OTHER MATERIAL
BLUE	BACKGROUND	TYPE C (FLUORESCENT PRISMATIC)
WHITE	LEGEND & BORDERS	VINYL NON-REFLECTIVE DECAL SHEETING

Texas Department of Transportation
DALLAS DISTRICT STANDARD

SW3P SIGN SHEET

FILE#	DW: I&D	CK:	DW:	CK:
©TxDOT 2016	DISTRICT	PROJECT NO.		SHEET
	18	SEE TITLE SHEET		78
REVISION DATE: 10-16-15	COUNTY	CONTROL	SECT	JOB HIGHWAY
	DALLAS	1047	03	076 FM 1382