



**DALLAS COUNTY
PURCHASING DEPARTMENT**
Records Building, 500 Elm Street, Suite 5500
Dallas, Texas 75202

**Michael Frosch
Purchasing Director**

November 21, 2025

**ADDENDUM #1
IFB 2026-003-7091 DESIGN & CONSTRUCTION OF CHALK HILL TRAIL PHASE 1- TAPP
PROJECT 9015**

The following changes, additions, and/or clarifications are made to the IFB documents:

I. Clarification of Estimated Project Cost

The following information is provided in response to bidder inquiries (Questions 1 and 2):

- **Question 1:** What is the estimated value of the project?
- **Question 2:** What is an estimated cost available?

Response:

The engineers estimated construction cost for this construction project is **\$3,842,944.01**. This figure is provided for reference only.

II. Addition of Construction Plans

The construction plans were inadvertently omitted from the initial IFB posting. The complete and final set of construction plans is hereby attached to this Addendum and incorporated into the IFB documents. Bidders **must** review these plans prior to submitting their bids.

- **Attachment :** Construction Plans

Whereas,

To be considered for award, the bid response must be submitted by January 15, 2026 at 2:00 p.m. (CST). Responses shall be submitted electronically through Bidnet, the County's online public solicitation platform <https://www.bidnetdirect.com/texas/dallas-county>. Although the County prefers submissions in electronic form, a respondent may elect to submit their bids in hard

copy. To submit in hard copy, the vendor may deliver or ship to: Dallas County Purchasing Department, Records Building 500 Elm Street, Suite 5500, Dallas, Texas 75202. When submitting a response in hard copy, the County requires two (2) duplicate hardcopies (one original and one copy) to be submitted.

Whereas,

All other specifications of the original qualifications remain the same.

Except as provided herein/above, all other specification requirements of the original solicitation referenced shall remain unchanged in full force and effect. This addendum should be signed and returned with your Solicitation package on or before 1/15/2026, @ 2 PM (CST).

FINAL PLANS

NAME OF CONTRACTOR: _____

DATE OF LETTING: _____

DATE WORK BEGAN: _____

DATE WORK COMPLETED: _____

DATE WORK ACCEPTED: _____

SUMMARY OF CHANGE ORDERS: _____

CITY OF DALLAS DALLAS COUNTY, TX



PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT

DALLAS COUNTY

CSJ: 0918-47-472

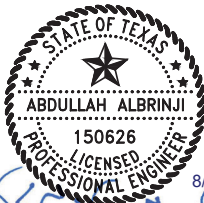
Chalk Hill Trail Phase I

LIMITS: CHALK HILL TRL PH I, ALONG FORMER RR ROW TO
GINGER AVE, COCKRELL HILL, ILLINOIS AVE

TOTAL LENGTH OF PROJECT =
ROADWAY = 4,630 FT. = 0.877 MI.
BRIDGE = 0 FT. = 0.000 MI.
TOTAL = 4,630 FT. = 0.877 MI.

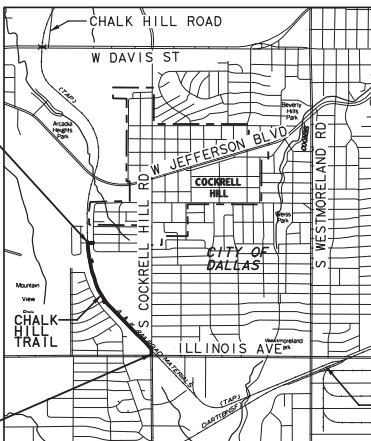
CONSTRUCTION OF A NEW SHARED USED PATH,
AND RECONSTRUCTION OF EXISTING SIDEWALK

BEGIN PROJECT
CSJ 0918-47-472
STA 97+50.00



8/14/2025

END PROJECT
CSJ 0918-47-472
STA 144+14.00



LOCATION MAP

N.T.S.

EQUATIONS: NONE
EXCEPTIONS: NONE
RAILROAD CROSSINGS: NONE

WORK WAS COMPLETED ACCORDING
TO THE PLANS AND CONTRACT.

Signature of Registrant _____, P.E.
& Date _____

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DESIGN SH	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
GRAPHICS	6			VA
VM	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK CS	TEXAS	DALLAS	DALLAS	
CHECK CONTROL	SECTION	JOB		
AA	0918	47	472	

DESIGN SPEED 18 MPH

REGISTERED ACCESSIBILITY SPECIALIST (RAS) INSPECTION REQUIRED.
TDLR NO. TABS2021002787

NOTE:
SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION,
SEPTEMBER 1, 2024, AND THE CONTRACT PROVISIONS LISTED AND DATED AS
FOLLOWS SHALL GOVERN ON THIS PROJECT. REQUIRED CONTRACT PROVISIONS
FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FROM FHWA 1273, OCTOBER 23,
2023)

AZ&B ARREDONDO, ZEPEDA & BRUNZ, LLC, FIRM F-10098
12400 COIT RD., DALLAS, TEXAS 75251 | 214.341.9900

SUBMITTED FOR LETTING August 14, 2025

CONSULTANT DESIGN ENGINEER OR PROJECT MANAGER

CONCURRENCE:

Alberta Blair 2025

CONCURRENCE:

2025

DIRECTOR OF PUBLIC WORKS
DALLAS COUNTY

DIRECTOR OF PARK AND RECREATION
CITY OF DALLAS

John Jenkins

TEXAS DEPARTMENT OF TRANSPORTATION

RECOMMENDED 9/5/2025

Signed by: James P. Campbell

98671C109B6A4C3 PLANNING & DEVELOPMENT

APPROVED 9/6/2025

Signed by: Cescon Clemente

A878E0D10CD6464...

RECOMMENDED

DocuSigned by:

9/5/2025

ENGINEER

91B8F2112C2C409...

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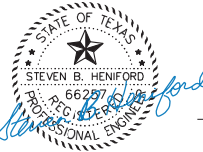
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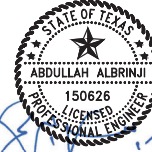


THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE BY A * HAVE BEEN ISSUED BY ME AND ARE APPLICABLE TO THIS PROJECT.

Steven B. Heniford P.E.

08/28/2025

DATE



THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE BY A ** HAVE BEEN ISSUED BY ME AND ARE APPLICABLE TO THIS PROJECT.

Abdullah Albrinji P.E.

08/28/2025

DATE

CHALK HILL TRAIL
PHASE I

\$FILES

\$DATE\$ \$TIME\$ \$USERNAME\$

PEN TABLE \$PENTBLL\$

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SHEET 1 OF 1

FED. RD. DIST. NO.	PROJECT NO.	SHEET NO.
6		2
STATE	DIST.	COUNTY
TEXAS	DAL	DALLAS
REV. NO.	CONT.	SECT.
	0918	47
	JOB	HIGHWAY NO.
	472	VA

EROSION CONTROL QUANTITIES

LOCATION	PLAN SHEET	160	162	164	168	506	506	506	506	506	506	506	506
		7002	7002	7007	7001	7002	7011	7020	7024	7039	7041	7044	7046
		FURN & PLACE TO±SOIL (4")	BLOCK SODDING	BROADCAST SEED (TEMP_WARM_C OOL)	VEGETATIVE WATERING	ROCK FILTER DAMS (INSTALL)(TY 2)	ROCK FILTER DAMS (REMOVE)	CONSTRUCTION EXITS (INSTALL) (TY 1)	CONSTRUCTION EXITS (REMOVE)	TEMP SEDMT CCNT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	BIODEG EROSN CONT LOGS (INSTL) (12")	BIODEG EROSN CONT LOGS (REMOVE)
		SY	SY	SY	TGL	LF	LF	SY	SY	LF	LF	LF	LF
From Sta. 97+50	To Sta. 107+00	113											
107+00	117+00	114											
117+00	127+00	115											
127+00	137+00	116											
137+00	144+14	117											
PROJECT TOTALS													

EXCAVATION QUANTITIES

LOCATION	PLAN SHEET	110	132	134	216
		7001	7004	7005	7001
		EXCAV (ROADWAY)	EMBANK (FNL) (DC) (TY B)	BACKFILL (TY A) (VEH)	PROOF ROLLING
		CY	CY	CY	HR
From Sta. 97+50	To Sta. 99+50	146			
99+50	102+50	147			
102+50	105+50	148			
105+50	108+50	149			
108+50	111+50	150			
111+50	114+50	151			
114+50	117+50	152			
117+50	120+50	153			
120+50	123+50	154			
123+50	126+50	155			
126+50	129+50	156			
129+50	132+50	157			
132+50	135+50	158			
135+50	138+50	159			
138+50	141+50	160			
141+50	144+14	161			
PROJECT TOTALS					



Steven B. Henford
08/28/2025

NO.	REVISIONS	BY	DATE
AZ&B ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Coll Rd. Dallas, Texas 75251 (214) 341-6900 An ARDURRA Company FIRM REGISTRATION No. F-10098			
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CHALK HILL TRAIL QUANTITY SUMMARY			
© TxDOT			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	3	

REMOVAL QUANTITIES							
LOCATION		LENGTH	PLAN SHEET	100	104	105	496
				7002	7013	7004	7002
				PREPARING ROW	REMOV CONC (SIDEWALKS, RAMP OR SUP)	RMV (4"-8") TRT/UNTRT BASE & ASPH PAV	REMOV STR (INLET)
				STA	SY	SY	EA
From Sta.	To Sta.						
97+50	100+00	250	19	2.5		54	21
100+00	110+00	1000	20	10	7		
110+00	120+00	1000	21	10		21	
120+00	130+00	1000	22	10			
130+00	140+00	1000	23	10			
140+00	144+14	414	24	4	194		2
PROJECT TOTALS				46.5	201	75	2

REMOVAL QUANTITIES (CONT.)							
LOCATION		LENGTH	PLAN SHEET	496	542	550	752
				7042	7001	7007	7001
				REMOVE STR (WOOD STR)	REMOVE METAL BEAM GUARD FENCE	CHAIN LINK FENCE (REMOVE)	TREE TRIMMING / BRUSH REMOVAL
				EA	LF	LF	M
From Sta.	To Sta.						
97+50	100+00						
100+00	110+00	1000	20		47		0.19
110+00	120+00	1000	21		25		0.19
120+00	130+00	1000	22				0.19
130+00	140+00	1000	23	1		288	0.19
140+00	144+14	414	24				0.07
PROJECT TOTALS				1	72	288	0.88

TREE MITIGATION QUANTITIES							
LOCATION		PLANSHEET	100	100	104	100	100
			7003	7004	7005	7013	7015
			PREP ROW (TREE REMOVE) (0"-12" DIA)	PREP ROW (TREE REMOVE) (12"-24" DIA)	PREP ROW (TREE REMOVE) (24"- 36" DIA)	TREE PROTECTION (INSTALL)	TREE PROTECTION (REMOVE)
			EA	EA	EA	EA	EA
From Sta.	To Sta.						
97+50	100+00						
100+00	106+00	126	10	3		20	20
100+00	106+00	128	34	16		52	52
106+00	112+00	130	7	5	1	34	34
112+00	118+00	132				19	19
118+00	124+00	133				34	34
124+00	130+00	134				75	75
130+00	136+00	135	8	3		80	80
136+00	142+50	137	2		1	10	10
142+50	144+14	138			1	1	1
PROJECT TOTALS			61	27	3	325	325



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CHALK HILL TRAIL QUANTITY SUMMARY			
© TxDOT			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	4	

PAVING QUANTITIES												
LOCATION	LENGTH	PLAN SHEET	360	420	450	531	531	540	531	5005	479	479
			7001	7052	7063	7002	7003	7001	7027	7001	7004	7007
			CONC PVMT (CRCP) (7")	CL C CONC (RAIL FOUNDATION)	RAIL (HANDRAIL) (TY F)	CONC SIDEWALKS (5")	CONC SIDEWALKS (6")	MTL W-BEAM GD FEN (TIMPOST)	FIXED BOLLARD	REMOVABLE BOLLARD	ADJUSTING MANHOLES (UTILITY BOX)	ADJUSTING MANHOLES (WATER VALVE BOX)
			SY	CY	LF	SY	SY	LF	EA	EA	EA	EA
From Sta.	To Sta.											
97+50	102+00	450	25				805					
102+00	107+00	500	26	3	80	26	811	34		1		
107+00	112+00	500	27				667					
112+00	117+00	500	28				667					
117+00	122+00	500	29	21		28	788		2	1		
122+00	127+00	500	30				743					
127+00	132+00	500	31		9	240	688					
132+00	137+00	500	32		3	85	667					
137+00	142+00	500	33				692		2	1	1	
142+00	144+14	214	34		3	88	203				1	1
PROJECT TOTALS			21	18	493	54	6731	34	4	3	2	1



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CHALK HILL TRAIL QUANTITY SUMMARY			
© TxDOT			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	5	

DRAINAGE QUANTITIES															
LOCATION	DESCRIPTION	PLAN SHEET	402	432	432	400	462	462	462	464	464	464	464	465	466
			7001	7003	7038	7010	7004	7007	7017	7004	7005	7006	7007	7346	7005
			TRENCH EXCAVATION PROTECTION	RIPRAP (CONC) (6 IN)	RIPRAP (STONE COMMON) (GROUT) (12 IN)	CEMENT STABIL BKFL	CONC BOX CULV (4 FT X 3 FT)	CONC BOX CULV (5 FT X 3 FT)	CONC BOX CULV (7 FT X 5 FT)	RC PIPE (CL III) (21 IN)	RC PIPE (CL III) (24 IN)	RC PIPE (CL III) (27 IN)	RC PIPE (CL III) (30 IN)	INLET (COMPL) (DROP)	HEADWALL (CH-FW-0) (DIA=24 IN)
			LF	CY	CY	CY	LF	LF	LF	LF	LF	LF	LF	EA	EA
C/L Sta. 98+15	Storm Drain K-1	51	60										60	1	
104+20-104+60	Storm Drain L-1	51	43								43				1
98+00	Culvert K	52	38		17			76							
104+30	Culvert L	52	59	5			59								
131+50	Culvert M	52	28	13		44			56						
141+27	Storm Drain P1	53	12									12		1	
142+31	Storm Drain P2	53	6							6					
PROJECT TOTALS			246	18	17	44	59	76	56	6	43	12	60	2	1

DRAINAGE QUANTITIES						
LOCATION	DESCRIPTION	PLAN SHEET	466	466	466	466
			7146	7148	7174	7176
			7202	7203		
			WINGWALL (FW-0) (HW=4 FT)	WINGWALL (FW-0) (HW=6 FT)	WINGWALL (PW-1) (HW= 4FT)	WINGWALL (PW-1) (HW=6 FT)
			WINGWALL (SW-0) (HW= 3 FT)	WINGWALL (SW-0) (HW= 4 FT)		
			EA	EA	EA	EA
C/L Sta. 98+15	Storm Drain K-1	51				
104+20-104+60	Storm Drain L-1	51				
98+00	Culvert K	52				2
104+30	Culvert L	52	1		1	
131+50	Culvert M	52		1		1
141+27	Storm Drain P1	53				1
142+31	Storm Drain P2	53				
PROJECT TOTALS			1	1	1	2


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CHALK HILL TRAIL QUANTITY SUMMARY			
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CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	6	

WORK ZONE QUANTITIES				
LOCATION		500	502	DC (504-01
		7001	7001	
		MOBILIZATION	BARRICADES, SIGNS AND TRAFFIC HANDLING	FIELD OFFICE (TY C)
		LS	MO	MO
From Sta. 97+50	To Sta. 144+14	1	13	13
PROJECT TOTALS		1	13	13

SIGNING QUANTITIES				
LOCATION		PLAN SHEET	644	658
			7001	7058
			IN SM RD SN SUP&AM TY10BWG(1) SA(P)	IN STL OM ASSM (OM-2Z) (WFLX) (GND)
			EA	EA
From Sta. 97+50	To Sta. 107+00	99	5	2
107+00	117+00	100		
117+00	127+00	101	2	
127+00	137+00	102		4
137+00	144+14	103	4	2
PROJECT TOTALS			11	8

PAVEMENT MARKING QUANTITIES								
LOCATION		PLAN SHEET	666	666	666	666	678	678
			7244	7272	7268	7346	7352	7001
			RE PM TY III (W) (24")X(SLD)	RE PROFILE PM TY I (Y) 4"(BRK) (100MIL)	RE PROFILE PM TY I (Y) 4"(SLD) (100MIL)	PAVEMENT SLER 4"	PAVEMENT SLER 24"	PAV SURF PREP FOR MRK (4")
			LF	LF	LF	LF	LF	LF
From Sta. 97+50	To Sta. 107+00	99	13	950	40	950	13	950
107+00	117+00	100		1000		1000		1000
117+00	127+00	101	5	1000		1000	5	1000
127+00	137+00	102		1000		1000		1000
137+00	144+14	103	8	345	124	473	8	473
PROJECT TOTALS			26	4295	164	4423	26	4423


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CHALK HILL TRAIL QUANTITY SUMMARY			
● TxDOT			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY		SHEET NO.
DAL	DALLAS		7

EXISTING FEATURES LEGEND

PIER _o	BRIDGE PIER	FPLS _o	FUEL PIPELINE SIGN
⊙	TREE	FUEL _o	FUEL PUMP
•	FOUND CORNER MONUMENT	GMH _o	GAS MANHOLE
▲	SURVEY CONTROL POINT	GM _o	GAS METER
■	MAIL BOX	GPLS _o	GAS PIPELINE SIGN
RRC _o	RAIL ROAD CROSSING	—	DITCH FLOWLINE
RRS _o	RAIL ROAD SWITCH	—	EXISTING ASPHALT
BOLO	BOLLARD	— 6" 10"	EXISTING WATER LINE
SIGN _—	EXISTING SIGN	— 6" 5"	EXISTING SANITARY SEWER LINE
FCP	FENCE CORNER POST	— — — — —	EXISTING STORM DRAIN LINE
FP	FENCE POST	— 6" 10"	EXISTING GAS PIPELINE
FGP	FENCE GATE POST	— CHE —	EXISTING OVERHEAD ELECTRIC
ICV _o	IRRIGATION CONTROL VALVE	— UGE —	EXISTING UNDERGROUND ELECTRIC
WM _o	WATER METER	—	EXISTING FIBER OPTIC LINE
WV _o	WATER VALVE		EXISTING RAILROAD TRACK
WATER VAULT _o	WATER VAULT	—	EXISTING FENCE
FR _o	FIRE HYDRANT	— 56.3 —	EXISTING MINOR CONTOUR
SSMH _o	SANITARY SEWER MANHOLE	— 55.0 —	EXISTING MAJOR CONTOUR
SSCO _o	SANITARY SEWER CLEANOUT	— — — — —	EXISTING R.O.W./PROPERTY LINE
TMH _o	TELEPHONE/COMMUNICATIONS MANHOLE	~~~~~	EXISTING TREE LINE
TPED _o	TELEPHONE PEDESTAL		
CATV _o	CABLE TV RISER		
STMH _o	STORM DRAIN MANHOLE		
—	RECESSED CURB INLET		
—	CURB INLET		
GI _o	GRATE INLET		
WYE INLET _o	WYE INLET		
CMP	CORREGATED METAL PIPE		
⊙	SURVEYED BOREHOLE		
TS _o	SIGN		
TL _o	TRAFFIC LIGHT		
TRSB _o	TELEPHONE SERVICE BOX		
LP _o	LIGHT POLE		
ELECTRIC VAULT _o	ELECTRIC VAULT		
PP _o	POWER POLE		
—	GUY WIRE		
TRANSFORMER TOWER LEG _o	TRANSFORMER TOWER LEG		
EM _o	ELECTRIC METER		
EB _o	ELECTRIC BOX		
TJB _o	JUNCTION BOX		

PROPOSED IMPROVEMENTS LEGEND

11+00	PROPOSED TRAIL CENTERLINE
— — — — —	PROPOSED EDGE OF CONCRETE TRAIL
— — — — —	PROPOSED STORM DRAIN LINE
— — — — —	PROPOSED DITCH CENTERLINE
— — — — —	PROPOSED SHOULDER
— — — — —	APPROXIMATE LIMITS OF DISTURBANCE

ABBREVIATION	DESCRIPTION
EG	EXISTING GROUND
PGL	PROFILE GRADE LINE
EL	ELEVATION
FL	FLOW LINE
TC,T/C	TOP OF CURB
TP	TOP OF PAVEMENT
P.T.	POINT OF TANGENCY
P.C.	POINT OF CURVATURE
P.C.C.	POINT OF COMPOUND CURVATURE
P.R.C.	POINT OF REVERSE CURVATURE
VC	VERTICLE CURVE
P.V.I.	POINT OF VERTICAL INTERSECTION
WL	WATER LINE
SS	SANITARY SEWER LINE
SD	STORM DRAIN LINE
HW	HEADWATER
TW	TAILWATER
RCP	REINFORCED CONCRETE PIPE
RCBC	REINFORCED CONCRETE BOX CULVERT
STR	STRUCTURE



NO.		REVISIONS		BY	DATE
ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Coll Rd, Dallas, Texas 75251 (214) 361-6900 An ARDURRA Company FIRM REGISTRATION No. F-10098					
CHALK HILL TRAIL LEGEND					
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CHALK HILL TRAIL LEGEND					
© TXDOT SHEET 1 OF 1					
CONTROL	SECTION	JOB	HIGHWAY		
0918	47	472	VA		
DISTRICT	COUNTY	SHEET NO.			
DAL	DALLAS	8			

GENERAL NOTES:

1. The Contractor Shall notify the Dallas County Department of Public Works, the City of Dallas, and utility companies within forty eight (48) hours prior to Beginning of any construction.
Dallas County Planning & Develop., Komala Narra, P.E., CFM Project Mgr 214-653-6528
Dallas County Planning & Develop., Motasem Ajaafreh, Asst. Project Mgr 214-413-4232
City of Dallas, Park & Recreation, John Reynolds, PLA, 214-670-5454
City of Dallas, Public Works, Anshi (Jason) Jin, P.E., 214-948-4253
City of Dallas Traffic Eng., Yang Jin, P.E., 214-671-9958
2. The 2024 Edition of the Texas Department of Transportation (TxDOT) Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges shall apply.
3. The City of Dallas Dept. of Public Works Standard Construction Details (251D-1) shall apply where indicated in the plans.
4. The City of Dallas Addendum to the North Central Texas Council of Governments, Fifth Edition, 2017 (NCTCOG) Standard Specifications for Public Works construction shall apply.
5. In the adoption of the Texas Department of Transportation (TxDOT) Specifications, it is understood that any reference to TxDOT, shall be interpreted To include the County of Dallas as applicable. Any conflict between the General Provisions of the NCTCOG specifications, the TxDOT specifications and/or the County of Dallas specifications, as contained herein, shall be decided by the Engineer. The general order of precedence shall be as follows:
 - a. County of Dallas General Provisions
 - b. TxDOT General Provisions and Specifications
 - c. City of Dallas Addendum to the NCTCOG General Provisions and Specifications
6. A very important feature of this contract is providing for the safety and convenience of the travelling public and abutting property owners. The schedule to be provided under Note 6 of these GENERAL NOTES shall insure this Provision. Where, in the opinion of the Engineer, local traffic and abutting property owners would be unduly inconvenience for an extended period of time, the Engineer shall limit the length of excavation that the contractor may open up at one time. For protection of the pavement subgrade and to reduce an unsightly condition, backfill behind curbs will be done in a reasonable time after pavement cures and forms are removed.
7. Prior to the start of the work, the Contractor shall develop, in detail, a construction schedule and method that shall cause minimum interference with traffic along, across, or adjacent to the project during construction. If the schedule or method becomes unworkable or unsatisfactory as works proceeds, adjustments shall be made. If, at any time during construction, the Contractor's proposed plan of operation results in unsafe traffic movement in the opinion of the Engineer, the Contractor shall immediately correct the unsatisfactory condition. Contractor shall submit a construction schedule with Itemized tasks, subtasks, etc., for approval (4 Copies) on or before the date of the Pre-Construction meeting. This construction schedule shall be updated weekly.
8. No trees other than those shown in the plans to be removed shall be removed or disturbed without specific approval by the Engineer under the guidance of the City.
9. Two-way Traffic shall be maintained at all times (at least one lane in each direction), unless otherwise authorized by the Engineer in writing. At least one lane of traffic will be maintained at all driveways and entrances at all times.
10. The Contractor shall provide for continuous supervision of construction with a superintendent present at the project site at all times during working hours. The Superintendent shall, at all times, have in his immediate possession a complete set of current contract documents including the Plans and Specifications. The Superintendent shall be fully authorized to act on behalf of the Contractor in all matters pertaining to the work.
11. The items under which payment is to be made to Contractor are as listed in the Bid Proposal. Reference to other items in the Standard Specifications as pay requirements for such requirements are to be complied with and only the provisions for direct payment is deleted, such items are non-pay, (reference) items.
12. Working hours are Monday thru Friday from 7 a.m. to 5 p.m.. Work is not allowed on Saturdays or Sundays without written permission from the Dallas County Planning & Development Project Manager. No concrete from batches after 3:00 PM will be accepted.
13. Contractor shall notify Dallas County's Project Manager a minimum of 48 Hrs. prior to commencing construction.
14. Contractor shall notify all property owners 24 Hrs. in advance of any construction near their property.
15. No open cut trenches are allowed to remain open at the end of a workday without the written approval of the County's Project Manager unless used for boring and receiving pits.
16. Contractor shall remove all excess material at the end of each workday.
17. It is the Contractor's responsibility to keep all drainage facilities operating at all times (Ditches, Inlets, culverts, etc.).

18. No storage of materials is allowed under the canopy of trees or on private property without written permission of the property owner. If written permission is obtained the Contractor shall restore the private property to original or better condition; two (2) copies of each written permission shall be delivered to the Dallas County Public Works Project Manager.
19. Contact the Traffic Engineer Division in the City of Dallas at 214-671-9958 at least 48 Hrs prior to work requiring removal, modification, or relocation of traffic signs, traffic control equipment or other traffic control appurtenances.
20. When working In Street right-of-way within 300-feet of a traffic signal, contact the Traffic Engineer Division in the City of Dallas at 214-671-9958, at least 48 hours prior to the work for locations of underground traffic signal equipment.
21. Item 502 Barricades, Sgn & Traffic Handling – Contractor shall comply with the Traffic Control Plan included in the project plans. Any changes to the TCP shall be performed by a registered engineer for the Contractor, approved by the City and will be considered subsidiary to the various pay items of the contract and will not be paid for directly. Proper construction signage and barricading in accordance with the latest edition of the Texas Manual on Uniform Traffic Control Devices (TMUTCD) is required.
22. Two (2) project identification signs shall be furnished and installed by the Contractor, one on each end of the project at locations designated by the Engineer. The sign shall be constructed as shown in the Contract documents booklet. The signs should be considered subsidiary to the pay items and will not be paid directly.
23. The Contractor shall haul away all waste material such as rubbish, pavement, concrete pipe, unacceptable soil, etc., to an approved offsite landfill. Waste disposal shall be subsidiary to the various pay items of the contract.
24. Contractor shall comply with OSHA Regulations and State of Texas laws concerning excavation, trenching and shoring.
25. All existing street and traffic signs shall be maintained as needed throughout construction. Existing signs and posts to be relocated shall be maintained in good condition. Any signs damaged prior to installation in final position shall be replaced at no cost to the Owner. Payment for this work shall be subsidiary to other items of the contract.
26. Dewatering system or systems installed during construction shall be approved by the Engineer and are subsidiary to various other items of the contract. Trench and pit bottoms and excavations shall be maintained in dry stable condition until work is complete.
27. Unpaved areas disturbed by construction, including the median area and parkway area are to be covered with cellulose Fiber Mulch Seeding, fertilized and watered, unless otherwise specified in the plans. See note on plans regarding payment for areas to receive seeding and areas considered subsidiary to the pay item Cellulose Fiber Mulch Seeding.
28. All sprinkler systems and related components, fences, signs, etc., disturbed by construction are to be restored to existing conditions or better. This is subsidiary to pay items provided as part of this contract.
29. Contractor shall field verify all dimensions and conditions before commencing work. It shall be Contractor's responsibility to report any discrepancies to the Engineer before commencing work.
30. Contractor shall be responsible for providing required security to protect his own property, equipment and work in progress.
31. Water supply for use during construction shall be approved by the Engineer and secured and paid for by the Contractor.
32. The location of existing utilities indicated on the plans have been determined from field surveys and available public records. Probes for determination of location and elevation have been made only as shown on the plans. Exact location and elevation of all utilities are not guaranteed and shall be determined in the field by the Contractor prior to construction. It shall be the duty of the Contractor to ascertain whether any additional utilities other than those shown on the plans may exist and to locate the same in the field prior to construction. The Contractor shall also become familiar with any proposed adjustments to be made by the Utility Owners and extend full cooperation. Any cost resulting from the Contractor damages to utilities shall be the sole responsibility of the Contractor. The Contractor is required to maintain existing utilities in a safe and serviceable condition. No extra compensation will be allowed for additional work or materials to maintain service.
33. Contractor shall be responsible for and adequately protect existing structures, utilities, trees, shrubs, fences, signs, sprinkler systems, mail boxes and other adjoining facilities. Damages caused by Contractor shall be reported to the appropriate Property Owner and repaired or replaced at the Contractor's expense within twenty four (24) hours.
34. All gas, telephone, cable and power lines to be adjusted shall be done by others and shall be coordinated and assisted by the Contractor.

35. All salvable material encountered on this project shall become the property of Dallas County, including but not limited to, surplus flexible base and/or flexible pavement, pipe culverts, guard fence, etc., when Dallas County Road and Bridge Districts request the material. The Contractor shall load the material on the Dallas County Trucks following removal or shall stockpile the material at an agreed adjacent site to be loaded onto the County trucks by the Contractor at a later date. The Road and Bridge District in which the project is located shall have first choice of the salvable material. If no Road and Bridge District request the material, it shall become the property of the Contractor to be disposed of by him at his entire expense. The Contractor may remove old flexible base and asphalt for embankment including subgrade material, however, this material may not be used as finished flexible base.
36. All cut and fill slopes shall not exceed 4 horizontal to 1 vertical slope. Cut slopes may be steepened to protect existing trees and fences only with prior approval of the Engineer. Property adjacent to the proposed construction shall be graded as directed by the Engineer which shall be considered subsidiary to the various pay items of the contract.
37. Where applicable, the Contractor shall place rubber mats on the pavement to protect it from track marks and/or cracking during construction.
38. All adjacent properties damaged by the proposed construction shall be restored to the same or better than condition in which it was before such work was undertaken. This shall be considered subsidiary to the various pay items of the contract and will not be paid directly.
39. The ends of the Trail, sidewalk edges, constructed curbs and driveway pavement shall match the existing paving, unless otherwise directed by the Engineer. Payment for asphalt tie-ins shall be subsidiary to other items of work.
40. No dirt, mud, or any other material shall be allowed to fall or be tracked onto the existing or finished roadway. It shall be the responsibility of the Contractor to maintain the existing traveled way in a clean condition at all times. Contractor is responsible for keeping streets and sidewalks adjacent to the project free of mud and debris from the construction.
41. The Contractor will obtain the General Permit for the storm water discharge from construction sites. The Contractor will become permittee. Costs for administering the Storm Water Pollution Prevention Plan (SWPPP) will not be paid for directly, but will be included in the various other bid items of the contract.
42. Surplus excavation and other materials must not be deposited in areas designated as Flood Plain or along natural drainage ways. Material so deposited will be required to be removed at the Contractor's expense and the area restored to its natural condition.
43. The specific density for the Embankment, Excavation, Treated Subgrade and Flexible base shall be obtained with the moisture content at the optimum or above.
44. All structural excavation, shoring, backfilling and bedding material shall not be paid for directly, but shall be considered subsidiary to the various bid items of the contract.
45. The Contractor shall prepare and submit a Trench Safety Manual specific to this project.
46. Fertilizer used will have an analysis of 12-12-12 and will be applied at 350 pounds per acre and will not be paid for directly but will be considered subsidiary to the various bid items of the contract.
47. All existing slope, drainage and temporary easement areas shown in the plans will be included in item 100, preparing Right-of-Way, as measured along the centerline of the project.
48. Prior to any excavation or drilling in close proximity to existing utilities or sewers, the Contractor shall be required to probe or expose these facilities to determine their exact location. All costs involved will be subsidiary to the related bid items.



Steven B. Heniford
3/25/20

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DISTRICT	COUNTY			SHEET NO.	
DAL	DALLAS			9	



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ITEM NOTES (CONTINUED)

Item 2:
Pre-letting questions regarding this solicitation are to be submitted, in writing, to _____ by 2:00 PM (CST), _____ day, _____, 20____. These questions will be addressed during the Pre-Bid Conference.

All questions and responses will be made available exclusively through the Dallas County website for retrieval, located at the following web address:

<http://www.dallascounty.org/department/purchasing/currentblds.html>

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 (214-320-6636) 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 incurred to the above mentioned utilities when working without having the utilities located prior to excavation.

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.

Item 7:
Repair or replace any structures and utilities that might have been damaged by negligence or a failure to have utility locates performed.

Item 8:
This Project will be a Five-Day Workweek in accordance with Article 8.3.1.1.

Item 100:
Remove the existing roadway small signs, delineators and object markers as shown on the plans, or as directed, during construction within the right of way. Small sign, delineator and object marker removals are subsidiary to this Item.

The limits of preparing right of way will be measured from Sta. 97+50 to Sta. 144+14 and each gateway connection, along the centerline of construction.

The Contractor shall be responsible for protecting all trees and shrubs. Unless designated to be removed, damaged trees and shrubs shall be replaced at the Contractor's expense.

Trees designated for removal on "Tree Removal Plans" and shall be paid for under Items 100-7003, 100-7004 or 100-7005. All other trees not designated for removal and/or that must be removed at the direction of Dallas County will be subsidiary to Item 100-7002, "Preparing R.O.W."

Trees and shrubs shall be protected by tree protection fencing and is subsidiary to the other items included in the contract.

The Contractor shall avoid placing backfill and/or compaction against or under existing tree canopies or shrubs.

Minor changes in slope grading as directed by Dallas County may be made to protect existing trees and shrubs.

Any tree or shrub removed shall be removed from the project site within 24 hours of removal.

Item 104:
In those areas where the pavement is not to be overlaid, provide a smooth surface after the curb removal. Planing or grinding is considered an acceptable method at these locations. Measurement and payment is in accordance with this item.

Sawing of concrete is not paid for directly, but is considered subsidiary to this item.

Item 105:
Take possession of recycled asphalt pavement from the project and recycle the material. Saw existing asphalt along neat lines where portions are to be left in place temporarily or permanently. Sawing is not paid for directly, but is subsidiary to this item.

Properly dispose of unsalvageable material at your own expense.

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 6 inches and compact in accordance with the specifications.

Excavation and embankment for driveways, sleeper slabs, alleys and intersections will not be paid for directly, but will be considered subsidiary to these items.

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 for embankment. Provide the test results at no expense to the County. The laboratory will sample and test soils produced by the construction project for specification requirements or material sources specified in the plans.

Earth embankment Types C1 and C2, are mainly composed of material other than shale. Furnish material that are free from vegetation or other objectionable material and that conforms to the requirements of Table 1 of this specification. 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 laboratory 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 164:
Cellulose Fiber Mulch Seeding (PERM & TEMP) shall consists of the installation and maintenance of the Native grass seeding of any disturbed areas; such areas shall be maintained and watered sufficiently until 70% re-vegetation has been established. Cellulose Fiber Mulch will be applied at the rate of 2500 pounds per acre. Fertilizer used will have an analysis of 12-12-12 and will be applied at the rate of 350 pounds per acre and will not be paid for directly but shall be considered subsidiary to this bid item. Limits for seeding are for estimate purposes only and shall be subject to field measurement. All disturbed areas within the project limits shall be sodded except park and empty lots shall be seeded.

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 two feet below natural grade as topsoil.

Item 340:
Design for a target Laboratory-molded density of 97.0% when using the Texas Gyrotory Compactor (TGC) (Tex-204-F, Part I).

Use aggregate that meets the Surface Aggregate Classification (SAC) requirement of Class B.

Provide the engineer the opportunity to witness all mixture design tests. The engineer may require a retest if not given the opportunity to witness.

Provide PG blnder 64-22 In Type B mixture.

Item 400:
Structural Excavation is not paid for directly but is considered subsidiary to pertinent items.

Item 420:
Apply an ordinary surface finish to all concrete surfaces within 30 days after form removal. Form columns to a point a minimum of one foot below the proposed future or existing bottom of channel elevation indicated on the bridge layouts by an acceptable method. This form work is not paid for directly, but is considered subsidiary to this item.



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MODEL NAMES
BOLD NAMES
BOLD NAMES

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 bld 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 471:
Tackweld all Inlet grates and manhole covers to the frame with two 1-Inch welds. Supply unpainted cast iron Inlet grate and frame and/or cast iron manhole frame and cover after an approved inspection.

Item 496:
Concrete pavement removed as a result of removing the inlets will not be paid for directly but will be considered as subsidiary to Item 496.

Inlet grates and manhole covers become the property of the contractor for disposal.

Item 500:
Material On Hand (MOH) will not be used in calculating partial payments for Mobilization.

Item 502:
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 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 and coordinate written proposed lane closure information by 1:00 pm on the business day prior to the proposed closures with the City of Dallas Transportation Department. 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 commence work on the road before sunrise. Do not operate or park any equipment/ machinery closer than 30 feet from the traveled roadway after sunset unless authorized by the Dallas County Project Manager.

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

Item 504:
Furnish one Field Office (Type C) for this project.

Provide one local phone line to the field office. Supply one phone jack and one telephone per each room in the field office. The cost of the phone installation and various monthly phone service charges will be the contractor's responsibility.

Chain link fencing shall be installed around the field office/laboratory and parking areas. Provide an all in one printer/scanner/fax/copier with software that is compatible with County equipment, cost not in excess of \$300. This is subsidiary to the various bid items.

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 County a copy of the project's completed TPDES Storm Water Program Construction Site Notice and signed Contractor Certification Statement. 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 County. 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 s storage tanks to prevent contaminated runoff and must be lined as to prevent contamination of underlying soil. Ensure pits are properly maintained including removal of concrete as not to allow over flow. The location(s) of washout area will be approved by the Dallas County Project Manager. 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."

Items 644:
Prior to taking elevations to determine lengths for fabrication of sign posts, obtain verification of all proposed locations.

Provide field galvanizing and metallizing equipment, as per Item 445, at all times and make repairs to galvanized surfaces according to the above specification item at intervals as directed.

After sign supports with signs attached have been erected, wash individual units requiring cleaning with an approved cleaning solution to remove all grease, oil, dirt, smears, streaks, and other foreign particles.

Provide two (2) sets of shop drawings for signs. The shop drawings shall conform to the details shown on the plans. The shop drawings shall show the details of the panels, wind beams, stiffeners, joint backing plates, splices, fasteners, brackets, and sign support connections. The shop drawings shall show letter types and sizes, interline spacing and message arrangements.

Affix a sign identification decal to the back of all signs and mark out the installation date in accordance with Item 636.

All sign mounts shall have a clamp base system for all small roadside sign assemblies. Removal of concrete foundations of signposts including steel shall be at full length for small and large sign assemblies, unless otherwise shown on the plans. Small sign removals are subsidiary to Item 100 - PREP ROW.

Item 730:
At the discretion of the Dallas County Project Manager, mow non-paved areas within the project prior to placement of permanent vegetation. Mow up to three (3) cycles per growing season.

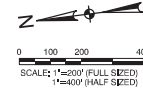
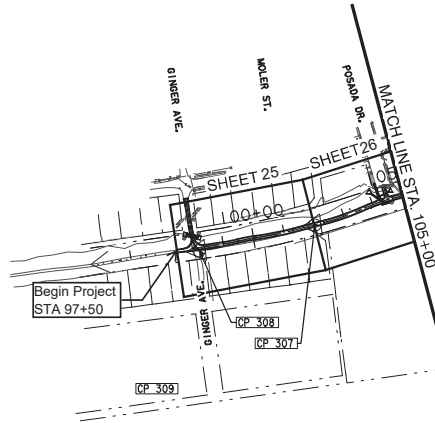


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DAL	DALLAS	12			

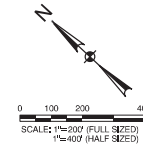
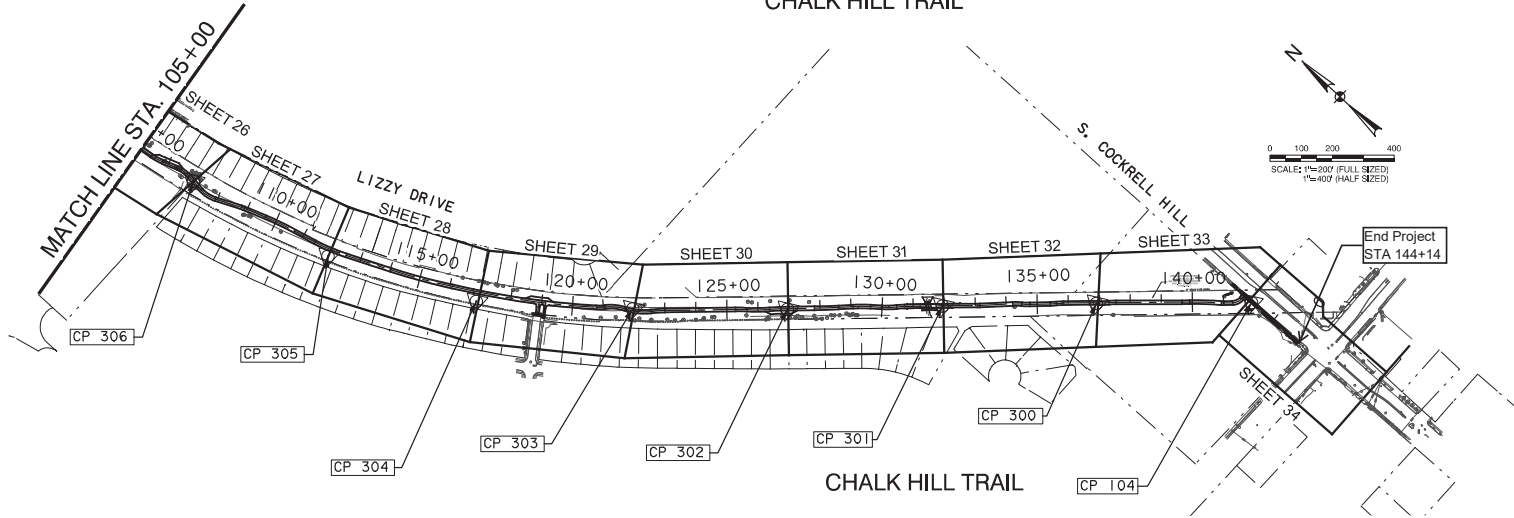
P L L L S B I A S E S I T I O N

STATES: TEXAS
SHEET: 13
PROJECT: CHALK HILL TRAIL
DATE: 10/05/20

NOTE:
Basis of Bearing is the Texas Coordinate System NAD 83, North Central Zone (4202), observed by GPS using Western Data Systems Dallas/Fort Worth area RTK Cooperative Network on 11/06/2014, Convergence Angle for Western Data Systems reference point DUNP g1012 is 01 degrees 21 minutes 48.54972 seconds, according to Corposon V6.0.1 as provided by the U.S. Army Corps of Engineers. Distances shown are surface distances, scale factor is 1.000136506.



CONTROL POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
104	6950044.35	2463440.66	633.58	SXTP
300	6950407.53	2463097.84	635.23	SIRTP4
301	6950764.44	2462754.14	637.28	SIRTP4
302	6951122.42	2462405.08	640.79	SIRTP4
303	6951487.69	2462066.48	644.41	SIRTP4
304	6951872.42	2461740.31	647.00	SIRTP4
305	6952320.95	2461520.97	648.64	SIRTP4
306	6952802.69	2461402.07	643.62	SIRTP4
307	6953287.50	2461306.01	637.03	SIRTP4
308	6953667.12	2461270.98	632.99	SIRTP4



DALLAS WATER UTILITIES BENCHMARKS

POINT NUMBER 1462.
A STANDARD WATER DEPARTMENT BENCHMARK SQUARE CUT IN THE CENTER OF A CONCRETE DRIVEWAY OF #402 SPRUCE STREET AT THE NORTHEAST CORNER OF THE INTERSECTION WITH DWIGHT STREET.
N=6958842.439
E=2458083.930
ELEV. 530.870

POINT NUMBER 1461.
A SQUARE IS CUT ON TOP OF A CONCRETE CURB AT THE SOUTHEAST CORNER OF THE INTERSECTION OF HORD AVE. AND CLARENDON DR., AT THE BASE OF POWER POLE #4 SOUTH - 6 WEST - 25.
N=6954090.892
E=2462023.585
ELEV. 644.210

POINT NUMBER 1462.
A SQUARE IS CUT ON THE WEST SIDE OF DACKI AVE. IN FRONT OF HOUSE #1321 DACKI AVE. AND 50' SOUTH OF GINGER AVE.
N=6952690.908
E=2461138.425
ELEV. 636.090

POINT NUMBER 1465.
A STANDARD WATER DEPARTMENT BENCHMARK SQUARE CUT ON THE WEST END OF CONCRETE LEAD WALK TO HOUSE #1620 COCKRELL HILL RD. AT THE NORTHEAST CORNER OF THE INTERSECTION WITH DAWES ROAD.
N=6951421.901
E=2463140.648
ELEV. 668.160

POINT NUMBER 1470.
A STANDARD WATER DEPARTMENT BENCHMARK SQUARE IS CUT ON TOP OF A CONCRETE STORM SEWER INLET AT THE NORTHWEST CORNER OF THE INTERSECTION OF COCKRELL HILL RD. AND WOOD VALLEY DRIVE.
N=6947402.842
E=2463151.170
ELEV. 627.200

POINT NUMBER 1547.
A SQUARE IS CUT ON A CONCRETE WALK AT CLOVIS STREET BAPTIST CHURCH AT 2935 CLOVIS STREET ON THE WEST SIDE OF ALVARADO ST. AND CLOVIS ST.
N=6946553.182
E=2467496.938
ELEV. 619.600

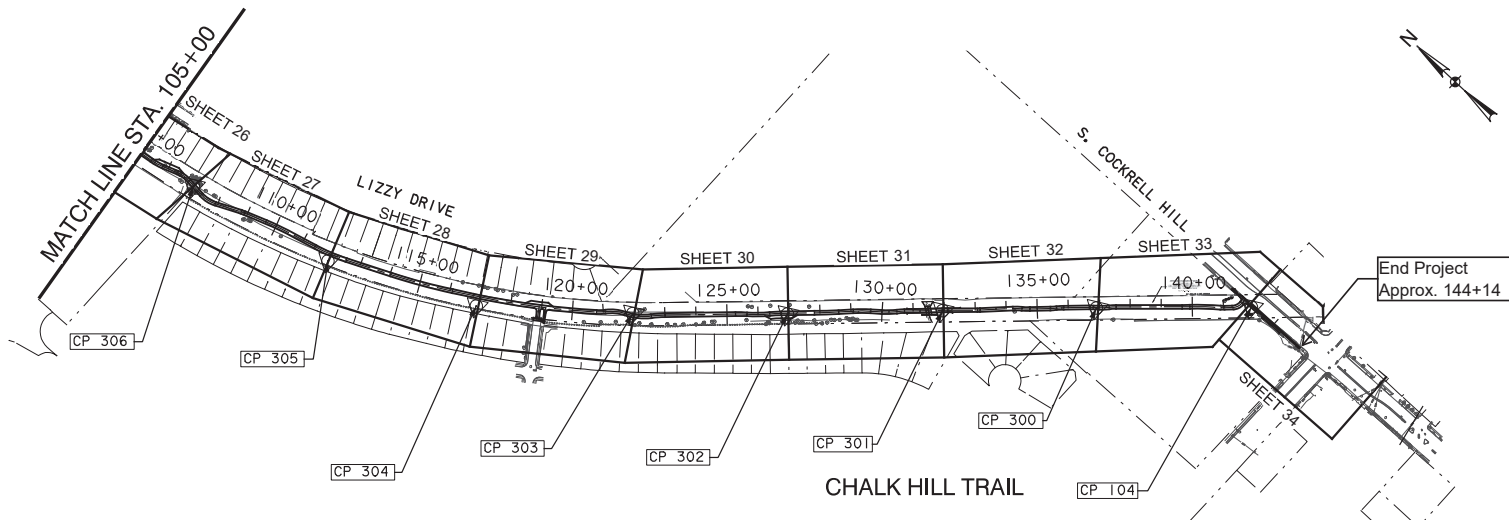


Steven B. Henford
10/05/20

NO.	REVISIONS	BY	DATE
AZ&B ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Coit Rd. Dallas, Texas 75251 (214) 341-0900 FIRM REGISTRATION No. F-10098			
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CHALK HILL TRAIL PROJECT LAYOUT/SURVEY CONTROL			
SHEET 1 OF 2			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	13	

STATES: TEXAS
SHEET: 2 OF 2
PROJECT: CHALK HILL TRAIL
DATE: 10/05/2020

NOTE:
Basis of Bearing is the Texas Coordinate System NAD 83, North Central Zone (4202),
observed by GPS using Western Data Systems Dallas/Fort Worth area RTK Cooperative
Network on 11/06/2014. Convergence Angle for Western Data Systems reference point
DUNP g1012 is 01 degree 21 minutes 48.54972 seconds, according to Corposon V6.0.1
as provided by the U.S. Army Corps of Engineers. Distances shown are surface
distances, scale factor is 1.000136506.



CONTROL POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
104	6950044.35	2463440.66	633.58	SXTP

CONTROL POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
300	6950407.53	2463097.84	635.23	SIRTP4
301	6950764.44	2462754.14	637.28	SIRTP4
302	6951122.42	2462405.08	640.79	SIRTP4
303	6951487.69	2462066.48	644.41	SIRTP4
304	6951872.42	2461740.31	647.00	SIRTP4
305	6952320.95	2461520.97	648.64	SIRTP4
306	6952802.69	2461402.07	643.62	SIRTP4

DALLAS WATER UTILITIES BENCHMARKS

POINT NUMBER 1470.
A STANDARD WATER DEPARTMENT
BENCH MARK SQUARE IS CUT ON
TOP OF A CONCRETE STORM SEWER
INLET AT THE NORTHWEST CORNER
OF THE INTERSECTION OF
COCKRELL HILL RD. AND WOOD
VALLEY DRIVE.
N=6947402.842
E=2463151.170
ELEV. 627.200

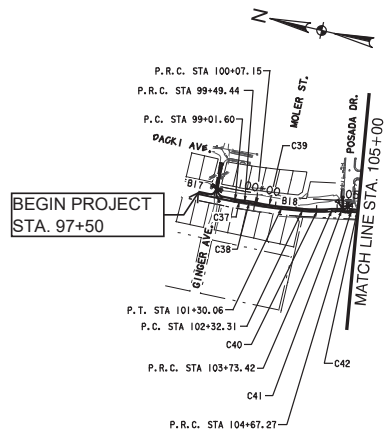
POINT NUMBER 1465.
A STANDARD WATER DEPARTMENT
BENCH MARK SQUARE CUT ON THE
WEST END OF CONCRETE LEAD WALK
TO HOUSE #1620 COCKRELL HILL
RD. AT THE NORTHEAST CORNER OF
THE INTERSECTION WITH DAWES
ROAD.
N=6951421.901
E=2463140.648
ELEV. 668.160

POINT NUMBER 1547.
A SQUARE IS CUT ON A CONCRETE
WALK AT CLOVIS STREET BAPTIST
CHURCH AT 2935 CLOVIS STREET
ON THE WEST SIDE OF ALVARADO
ST. AND CLOVIS ST.
N=6946553.182
E=2467496.938
ELEV. 619.600



Steven B. Henneford
10/05/2020

NO.	REVISIONS	BY	DATE
AZ&B ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Cot Rd, Dallas, Texas 75251 (214) 341-9900 An ARDURRA Company FIRM REGISTRATION No. F-10098			
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CHALK HILL TRAIL PROJECT LAYOUT / SURVEY CONTROL			
© TxDOT SHEET 2 OF 2			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	14	



CHALK HILL TRAIL

0 150 300 600
 SCALE: 1"=300' (FULL SIZED)
 1"=600' (HALF SIZED)

CENTERLINE CONTROL TABLE			
STATION	NORTHING	EASTING	DESCRIPTION
99+01.60	6953586.39	2461282.21	PC
99+49.44	6953538.70	2461285.68	PRC
100+07.15	6953481.13	2461289.30	PRC
101+30.06	6953358.57	2461297.48	PT
102+32.31	6953257.16	2461310.53	PC
103+73.42	6953119.51	2461340.77	PRC
104+67.27	6953027.87	2461360.35	PRC

CURVE DATA TABLE				
Curve	Delta	Radius	Tangent	Length
37	5° 28' 54"	500.00'	23.94'	47.84'
38	6° 36' 47"	500.00'	28.89'	57.71'
39	7° 02' 33"	1000.00'	61.53'	122.91'
40	10° 06' 23"	800.00'	70.74'	141.11'
41	10° 45' 14"	500.00'	47.06'	93.85'
42	2° 03' 03"	2000.00'	35.80'	71.59'

BEARING AND DISTANCE TABLE		
NAME	BEARING	DISTANCE (FT)
B17	S 1° 25' 30" E	252.81
B18	S 7° 20' 09" E	102.25

DALLAS WATER UTILITIES BENCHMARKS

POINT NUMBER 1442.
 A STANDARD WATER DEPARTMENT
 BENCH MARK SQUARE CUT IN THE
 CENTER OF A CONCRETE DRIVEWAY
 OF #402 SPRUCE STREET AT THE
 NORTHEAST CORNER OF THE
 INTERSECTION WITH DWIGHT
 STREET.
 N=6959842.439
 E=2458083.930
 ELEV. 530.870

POINT NUMBER 1461.
 A SQUARE IS CUT ON TOP OF A
 CONCRETE CURB AT THE SOUTHEAST
 CORNER OF THE INTERSECTION OF
 HORD AVE. AND CLARENDON DR.
 AT THE BASE OF POWER POLE #4
 SOUTH - 6 WEST - 25.
 N=6954090.892
 E=2462023.585
 ELEV. 644.210

POINT NUMBER 1462.
 A SQUARE IS CUT ON THE WEST
 SIDE OF DACKI AVE. IN FRONT OF
 HOUSE #1321 DACKI AVE. AND 50'
 SOUTH OF GINGER AVE.
 N=6952690.906
 E=2461138.425
 ELEV. 636.090

POINT NUMBER 1465.
 A STANDARD WATER DEPARTMENT
 BENCH MARK SQUARE CUT ON THE
 WEST END OF CONCRETE LEAD WALK
 TO HOUSE #1620 COCKRELL HILL
 RD. AT THE NORTHEAST CORNER OF
 THE INTERSECTION WITH DAWES
 ROAD.
 N=6951421.901
 E=2463140.848
 ELEV. 668.160

POINT NUMBER 1470.
 A STANDARD WATER DEPARTMENT
 BENCH MARK SQUARE IS CUT ON
 TOP OF A CONCRETE STORM SEWER
 INLET AT THE NORTHWEST CORNER
 OF THE INTERSECTION OF
 COCKRELL HILL RD. AND WOOD
 VALLEY DRIVE.
 N=6947402.842
 E=2463151.170
 ELEV. 627.200

POINT NUMBER 1547.
 A SQUARE IS CUT ON A CONCRETE
 WALK AT CLOVIS STREET BAPTIST
 CHURCH AT 2935 CLOVIS STREET
 ON THE WEST SIDE OF ALVARADO
 ST. AND CLOVIS ST.
 N=6946553.182
 E=2467496.938
 ELEV. 619.600



Steven B. Henford
 10/05/20

NO.	REVISIONS	BY	DATE

AZ&B ARREDONDO, ZEPEDA & BRUNZ, LLC
 12400 Coll Rd, Dallas, Texas 75251
 (214) 341-9900
 An ARDURRA Company FIRM REGISTRATION No. F-10098

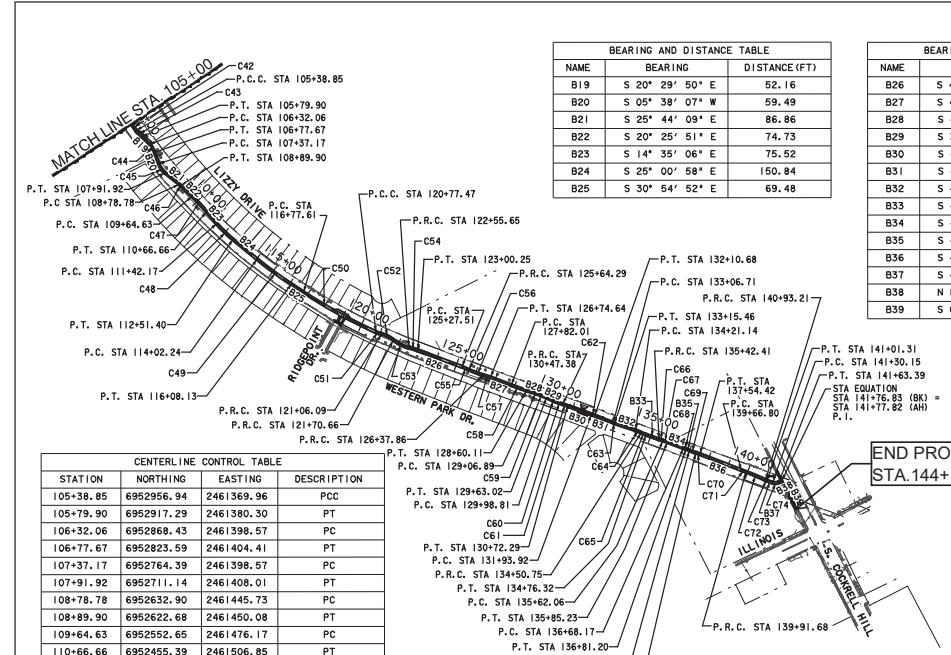
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**CHALK HILL TRAIL
 HORIZONTAL CONTROL**

© TxDOT SHEET 1 OF 2

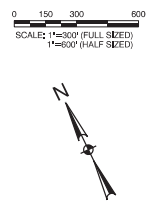
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	15	

PHILLS BATES E. NICK BROWN



NAME	BEARING	DISTANCE (FT)
B19	S 20° 29' 50" E	52.16
B20	S 05° 38' 07" W	59.49
B21	S 25° 44' 09" E	86.86
B22	S 20° 25' 51" E	74.73
B23	S 14° 35' 06" E	75.52
B24	S 25° 00' 58" E	150.84
B25	S 30° 54' 52" E	69.48

NAME	BEARING	DISTANCE (FT)
B26	S 43° 51' 47" E	227.26
B27	S 43° 51' 47" E	107.38
B28	S 46° 06' 02" E	46.78
B29	S 39° 40' 11" E	35.79
B30	S 44° 11' 24" E	121.63
B31	S 43° 13' 46" E	96.03
B32	S 45° 44' 10" E	105.68
B33	S 44° 34' 49" E	66.09
B34	S 43° 54' 33" E	82.93
B35	S 40° 14' 42" E	18.43
B36	S 43° 04' 03" E	212.38
B37	S 44° 37' 18" E	28.84
B38	N 88° 21' 14" E	13.44
B39	S 01° 38' 46" E	271.86



STATION	NORTHING	EASTING	DESCRIPTION
105+38.85	6952956.94	2461369.96	PCC
105+79.90	6952917.29	2461380.30	PT
106+32.06	6952868.43	2461398.57	PC
106+77.67	6952823.59	2461404.41	PT
107+37.17	6952764.39	2461398.57	PC
107+91.92	6952711.14	2461408.01	PT
108+78.78	6952632.90	2461445.73	PC
108+89.90	6952622.68	2461450.08	PT
109+64.63	6952552.65	2461476.17	PC
110+66.66	6952455.39	2461506.85	PT
111+42.17	6952382.31	2461525.87	PC
112+51.40	6952279.67	2461562.82	PT
114+02.24	6952142.99	2461626.60	PC
116+08.13	6951961.22	2461723.11	PT
116+77.61	6951901.61	2461758.80	PC
120+77.47	6951576.06	2461990.28	PCC
121+06.09	6951555.99	2462010.62	PRC
121+70.66	6951505.31	2462049.69	PRC
122+55.65	6951438.30	2462100.80	PRC
123+00.25	6951407.93	2462133.43	PT
125+27.51	6951244.08	2462290.91	PC
125+64.29	6951216.65	2462315.40	PRC
126+37.86	6951163.65	2462366.33	PRC
126+74.64	6951138.09	2462392.77	PT
127+82.01	6951060.68	2462467.17	PC
128+60.11	6951005.44	2462522.38	PT
129+06.89	6950973.02	2462556.08	PC
129+63.02	6950931.90	2462594.26	PT
129+98.81	6950904.35	2462617.10	PC
130+47.38	6950869.63	2462651.00	PRC
130+72.29	6950852.51	2462669.08	PT
131+93.92	6950765.30	2462753.86	PC
132+10.68	6950753.18	2462765.44	PT
133+06.71	6950683.22	2462831.22	PC
133+15.46	6950676.97	2462837.35	PT
134+21.14	6950603.21	2462913.03	PC
134+50.75	6950581.05	2462932.63	PRC
134+76.32	6950561.74	2462949.37	PT
135+42.41	6950514.67	2462995.75	PC
135+62.06	6950501.13	2463010.00	PRC
135+85.23	6950485.08	2463026.69	PT
136+68.17	6950425.33	2463084.21	PC
136+81.20	6950415.84	2463092.78	PT
136+99.63	6950401.77	2463104.69	PC
137+31.83	6950378.81	2463127.56	PRC
137+54.42	6950363.21	2463143.88	PRC

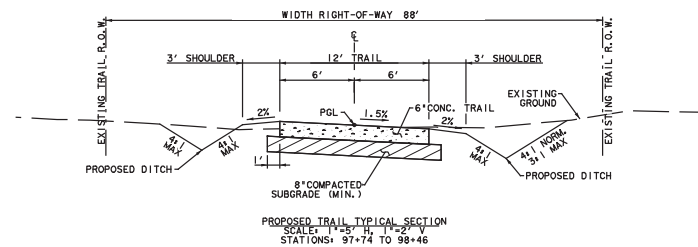
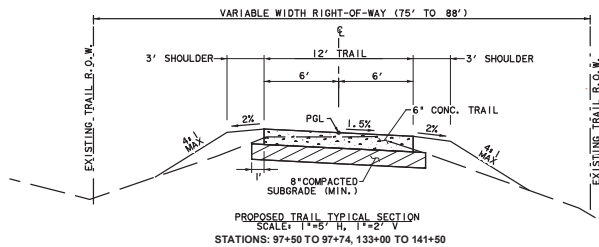
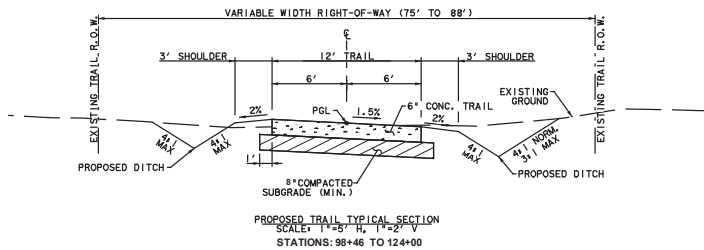
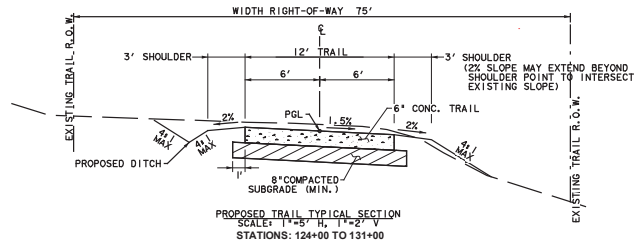
139+66.80	6950208.06	2463288.91	PC
139+91.68	6950190.06	2463306.09	PRC
140+93.21	6950113.87	2463373.13	PRC
141+01.31	6950107.81	2463378.49	PT
141+30.15	6950087.28	2463398.75	PC
141+63.39	6950075.25	2463428.74	PT
141+76.83	6950075.63	2463442.18	PI, STA EQ (BK)
141+77.82	6950075.63	2463442.18	PI, STA EQ (AH)

Curve	Delta	Radius	Tangent	Length
72	5° 49' 02"	1000.00'	50.81'	101.53'
73	6° 11' 00"	75.00'	4.05'	8.09'
74	31° 14' 38"	60.00'	16.77'	32.72'

Curve	Delta	Radius	Tangent	Length
42	2° 03' 03"	2000.00'	35.80'	71.59'
43	11° 53' 30"	200.00'	20.59'	41.04'
44	26° 07' 57"	100.00'	23.21'	45.61'
45	31° 22' 16"	100.00'	28.08'	54.75'
46	5° 18' 18"	120.00'	5.56'	11.11'
47	5° 50' 45"	1000.00'	51.06'	102.03'
48	10° 25' 52"	600.00'	54.77'	109.23'
49	5° 53' 54"	2000.00'	103.04'	205.89'
50	9° 00' 00"	2545.59'	200.34'	399.87'
51	10° 55' 46"	150.00'	14.35'	28.61'
52	26° 25' 35"	140.00'	32.87'	64.57'
53	25° 50' 01"	188.50'	43.23'	84.99'
54	11° 53' 11"	400.00'	41.64'	82.98'
55	4° 12' 54"	500.00'	18.40'	36.78'
56	8° 25' 47"	500.00'	36.85'	73.56'
57	4° 12' 54"	500.00'	18.40'	36.78'
58	2° 14' 49"	2000.00'	39.05'	78.10'
59	6° 25' 51"	500.00'	28.09'	56.12'
60	9° 16' 39"	300.00'	24.34'	48.58'
61	4° 45' 27"	300.00'	12.46'	24.91'
62	0° 57' 37"	1000.00'	8.38'	16.76'
63	2° 30' 24"	200.00'	4.38'	8.75'
64	8° 28' 59"	300.00'	14.83'	29.61'
65	7° 19' 38"	200.00'	12.81'	25.58'
66	3° 45' 14"	300.00'	9.83'	19.65'
67	4° 25' 30"	300.00'	11.59'	23.17'
68	3° 39' 51"	200.00'	6.40'	12.79'
69	9° 17' 40"	200.00'	16.26'	32.44'
70	6° 28' 19"	200.00'	11.31'	22.59'
71	1° 11' 17"	1200.00'	12.44'	24.88'

STATE OF TEXAS
COUNTY OF DALLAS
CITY OF DALLAS
ENGINEER
STEVEN B. HENIFORD
REGISTERED PROFESSIONAL ENGINEER
NO. 68257
EXPIRATION DATE 08/28/2025
08/28/2025

NO.		REVISIONS		BY	DATE
ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Coll Rd, Dallas, Texas 75251 (214) 341-9900 FIRM REGISTRATION NO. F-10098					
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CHALK HILL TRAIL					
HORIZONTAL CONTROL					
© 1x500 CONTROL SECTION JOB HIGHWAY 0918 47 472 VA DISTRICT COUNTY SHEET NO. DAL DALLAS 16					



- NOTES:
1. SEE SHEET 37 FOR CONCRETE TRAIL PAVEMENT AND SUBGRADE DETAILS.
 2. SEE SHEET 114 FOR TRAIL EDGE MULCHING AND SODDING LIMITS.
 3. SEE PLANS AND CROSS SECTIONS FOR TRAIL CROSS SLOPE DIRECTION.



Steven B. Henford
08/28/2025

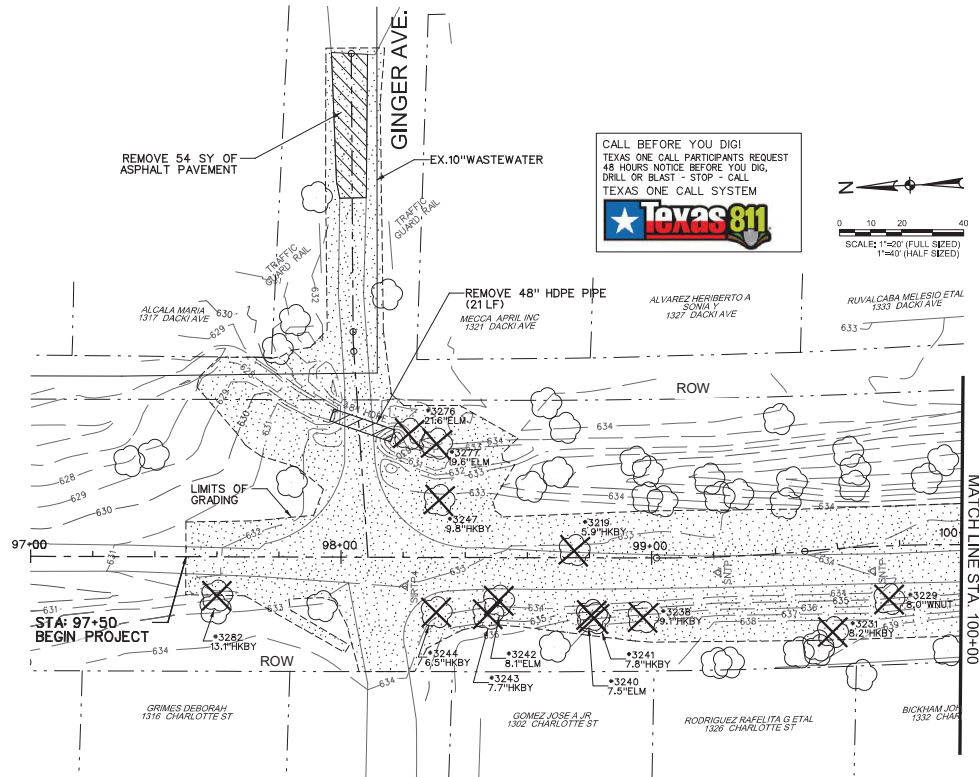
NO.	REVISIONS	BY	DATE
 An ARDURRA Company	ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Colt Rd. Dallas, Texas 75251 (214) 241-0900 FIRM REGISTRATION No. F-10098		
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CHALK HILL TRAIL TYPICAL SECTIONS			
© TxDOT		SHEET 1 OF 2	
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	17	

SPLOTTING

MODEL NAMES

SOATES STINES BUSSE SCIENTIS EPHELES

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
105-7004	RMV (4"-8") TRT/UNTRT BASE & ASPH PAV	SY	54
496-7007	REMOV STR (PIPE)	LF	21



LEGEND

	CONCRETE PAVEMENT REMOVAL
	ASPHALT PAVEMENT REMOVAL
	LIMITS OF CLEAR & GRUB
	CONCRETE SIDEWALK REMOVAL
	TREE REMOVAL & TREE I.D.
	CONCRETE CURB/GUTTER REMOVAL
	STORM DRAIN PIPE REMOVAL (UNLESS NOTED OTHERWISE)
	FENCE REMOVAL
	RAILROAD RAIL & TIE REMOVAL
	CONCRETE OR MASONRY WALL REMOVAL

NOTES:

1. LOOSE BALLAST, ROCK AND GRAVEL SHALL BE REMOVED AS DIRECTED IN THE GENERAL NOTES AND WILL BE PAID FOR AS PART OF PREPARING R.O.W.
2. CONCRETE PAVEMENT REMOVALS WILL BE TO EXISTING JOINTS.
3. TREES NOT IDENTIFIED TO BE REMOVED SHALL BE PROTECTED.

TREE ABBREVIATIONS

ASH	ASH	LVO	LIVE OAK
BCH	BEECH	MPL	MAPLE
BDA	BOIS D'ARC	MESQ	MESQUITE
CDR	CEDAR	OAK	OAK
CHER	CHERRY	PEAR	PEAR
CHBY	CHINA BERRY	PCN	PECAN
CTWD	COTTONWOOD	PRSM	PERSIMMON
ELM	ELM	PRV	PRIVET
GUM	GUM	RDBD	REDBUD
HKBY	HACKBERRY	SPBY	SOAPBERRY
HERC	HERCULES CLUB	SCAT	SOUTH CATALPA
LRL	LAUREL	WNUT	WALNUT
LOC	LOCUST	WLW	WILLOW



Steven B. Henford
10/05/20

NO.	REVISIONS	BY	DATE

AZ&B ARREDONDO, ZEPEDA & BRUNZ, LLC
12400 Coit Rd, Dallas, Texas 75251
(214) 341-9900
FIRM REGISTRATION No. F-10098

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CHALK HILL TRAIL DEMOLITION & REMOVAL PLAN BEGIN PROJECT TO STA 100+00

CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	19	

PL 013 B0101 1/10/25 B0101

SP1.TDRVSS

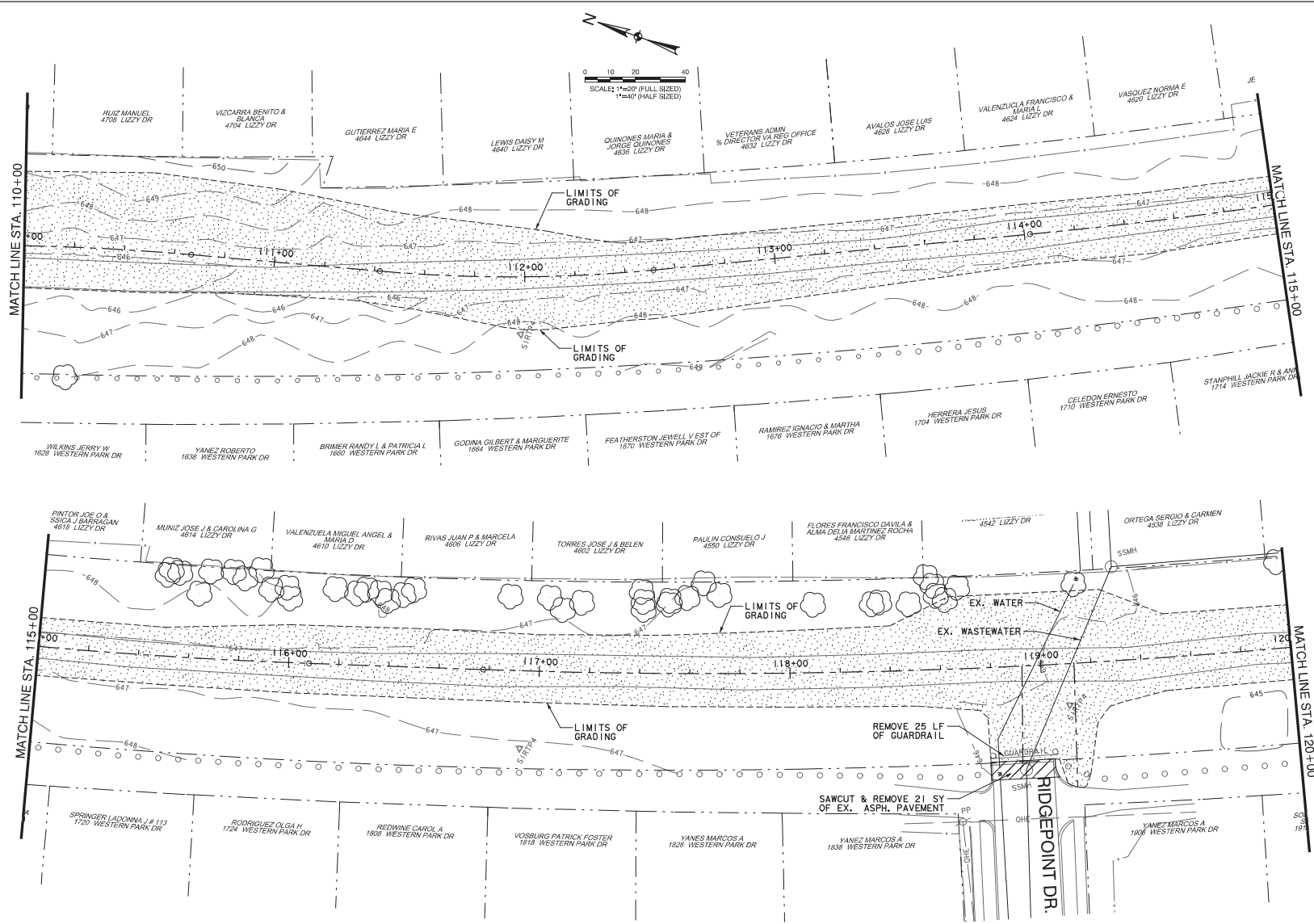
SMOELNAMES

SDATES STIMES EUSERS SCHEMITS SHELS

STATES STINES SUBSHE SCHEMITS SHEELS

MODEL NAMES

SPLIT DOWNS



LEGEND

- CONCRETE PAVEMENT REMOVAL
- ASPHALT PAVEMENT REMOVAL
- LIMITS OF CLEAR & GRUB
- CONCRETE SIDEWALK REMOVAL
- TREE REMOVAL & TREE I.D.
- CONCRETE CURB/GUTTER REMOVAL
- STORM DRAIN PIPE REMOVAL (UNLESS NOTED OTHERWISE)
- FENCE REMOVAL
- RAILROAD RAIL & TIE REMOVAL
- CONCRETE OR MASONRY WALL REMOVAL

- NOTES:**
- LOOSE BALLAST, ROCK AND GRAVEL SHALL BE REMOVED AS DIRECTED IN THE GENERAL NOTES AND WILL BE PAID FOR AS PART OF PREPARING R.O.W.
 - CONCRETE PAVEMENT REMOVALS WILL BE TO EXISTING JOINTS.
 - TREES NOT IDENTIFIED TO BE REMOVED SHALL BE PROTECTED.

TREE ABBREVIATIONS

ASH	ASH	LIVO	LIVE OAK
BCH	BEECH	MPL	MAPLE
BDA	BOIS D'ARC	MESQ	MESQUITE
COR	CEDAR	OAK	OAK
CHER	CHERRY	PEAR	PEAR
CHBY	CHINABERRY	PCN	PECAN
CLU	CLUSTER	PRSM	PERSIMMON
CTWD	COTTONWOOD	PRV	PRIVET
ELM	ELM	REDBD	REDBUD
GUM	GUM	SPBY	SOAPBERRY
HKBY	HACKBERRY	WNUT	WALNUT
HERC	HERCULES CLUB	WLW	WILLOW
LRL	LAUREL		
LOC	LOCUST		
SCAT	SOUTHERN CATALPA		

STATE OF TEXAS
STEVEN B. HANFORD
66257
PROFESSIONAL ENGINEER
Steven B. Hanford
08/28/2025

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
105-7004	RMV (4"-8") TRT/UNTRT BASE & ASPH PAV	SY	21
542-7001	REMOVE METAL BEAM GUARD FENCE	LF	25

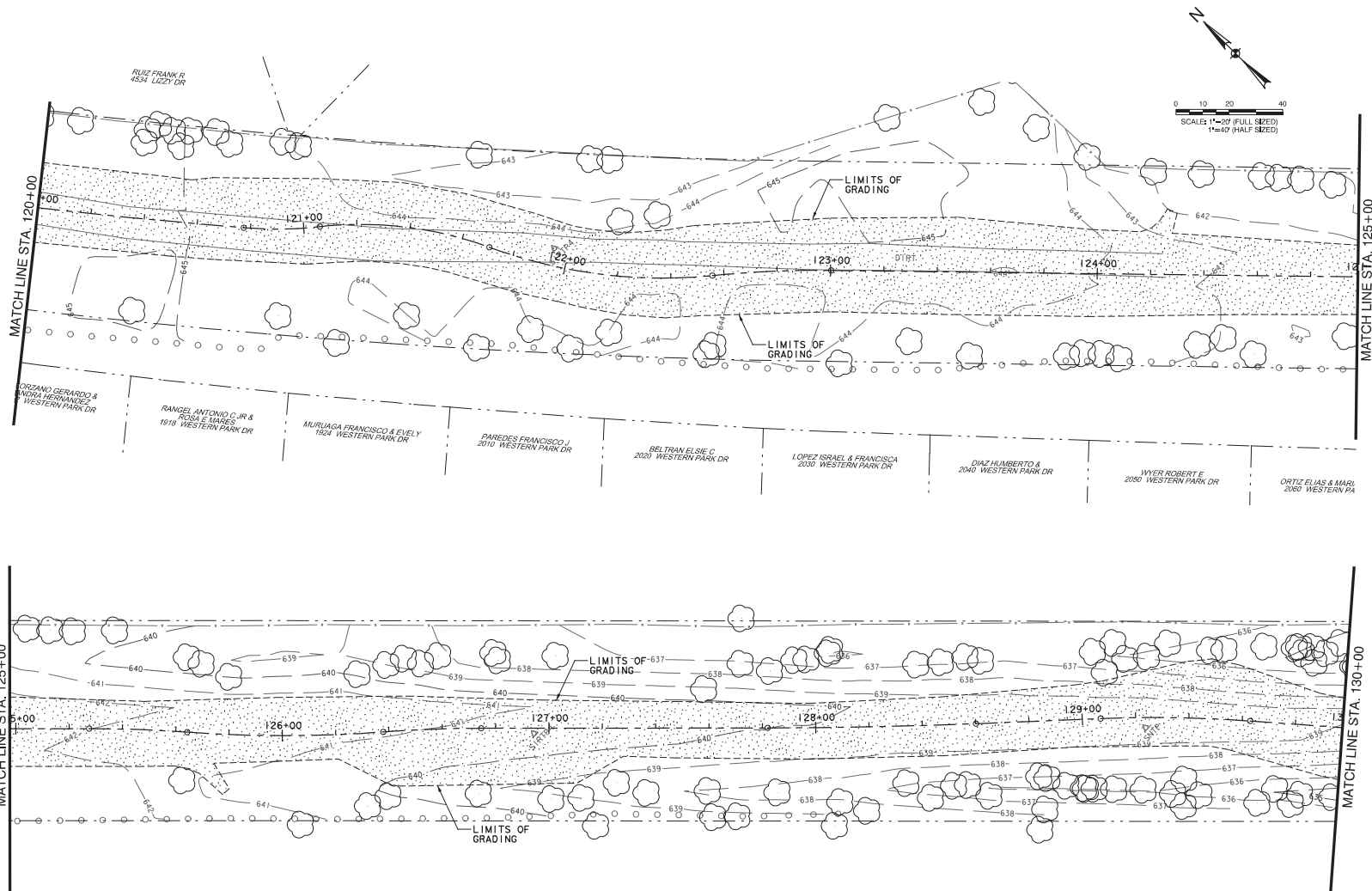
CALL BEFORE YOU DIG!
TEXAS ONE CALL PARTICIPANTS REQUEST
48 HOURS NOTICE BEFORE YOU DIG,
DRILL OR BLAST - STOP - CALL
TEXAS ONE CALL SYSTEM

Texas 811

NO.	REVISIONS	BY	DATE
AZ&B ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Coit Rd. Dallas, Texas 75251 (214) 341-5900 FIRM REGISTRATION No. F-10098			
Texas Department of Transportation ©2025 by Texas Department of Transportation all rights reserved			
CHALK HILL TRAIL DEMOLITION & REMOVAL PLAN STA 110+00 TO STA 120+00			
© 1x500'			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	21	

FILES BOOKS RACKS ROLLERS

SPLOTWORKS
MODEL NAMES
STYLES
SUBSHEET LIMITS & TIES



LEGEND	
	CONCRETE PAVEMENT REMOVAL
	ASPHALT PAVEMENT REMOVAL
	LIMITS OF CLEAR & GRUB
	CONCRETE SIDEWALK REMOVAL
	TREE REMOVAL & TREE I.O.D.
	CONCRETE CURB/GUTTER REMOVAL
	STORM DRAIN PIPE REMOVAL (UNLESS NOTED OTHERWISE)
	FENCE REMOVAL
	RAILROAD RAIL & TIE REMOVAL
	CONCRETE OR MASONRY WALL REMOVAL

- NOTES:
1. LOOSE BALLAST, ROCK AND GRAVEL SHALL BE REMOVED AS DIRECTED IN THE GENERAL NOTES AND WILL BE PAID FOR AS PART OF PREPARING R.O.W.
 2. CONCRETE PAVEMENT REMOVALS WILL BE TO EXISTING JOINTS.
 3. SEE STRUCTURAL PLANS FOR EXISTING BRIDGE STRUCTURE REMOVALS.
 4. TREES NOT IDENTIFIED TO BE REMOVED SHALL BE PROTECTED.

TREE ABBREVIATIONS

ASH	ASH	LIVO	LIVE OAK
BCH	BEECH	MPL	MAPLE
BDA	BOLIS D'ARC	MESQ	MESQUITE
COR	CEDAR	OAK	OAK
CHER	CHERRY	PEAR	PEAR
CHBY	CHINABERRY	PCN	PECAN
CLU	CLUSTER	PRSM	PERSIMMON
CTWD	COTTONWOOD	PRV	PRIVET
ELM	ELM	ROBD	REDBUD
GUM	GUM	SPBY	SOAPBERRY
HKBY	HACKBERRY	WNUT	WALNUT
HERC	HERCULES CLUB	WLW	WILLOW
LRL	LAUREL		
LOC	LOCUST		
SCAT	SOUTHERN CATALPA		

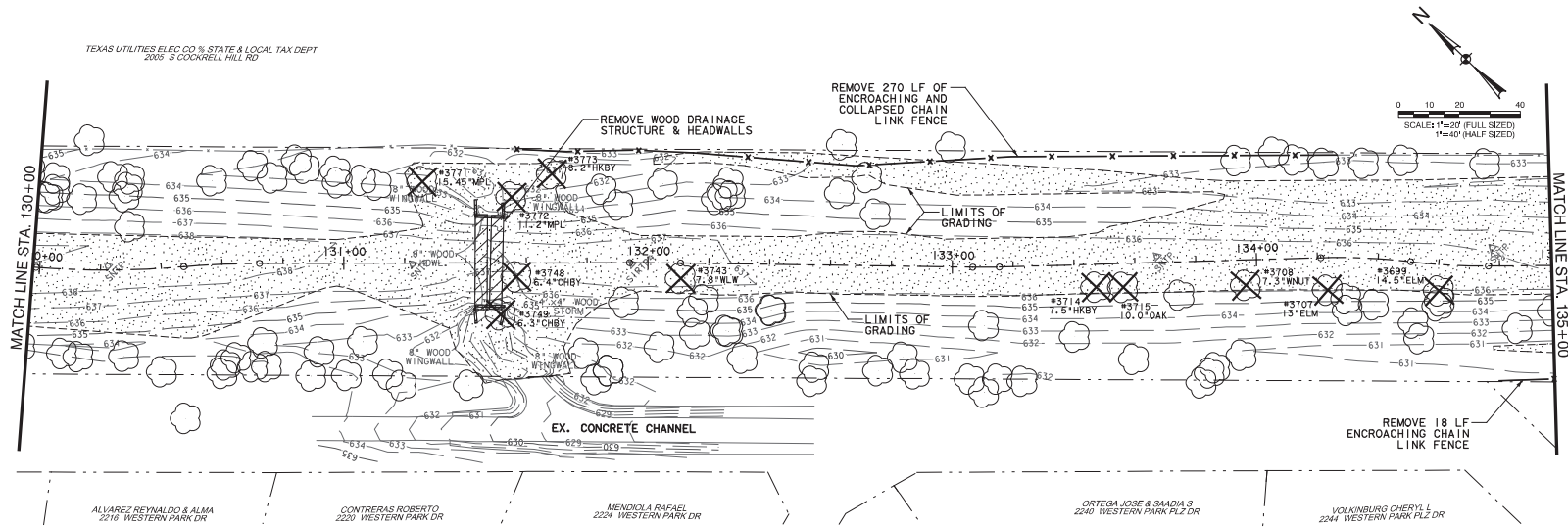


Steven B. Henford
10/05/20

NO.	REVISIONS	BY	DATE
AZ&B ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Coit Rd., Dallas, Texas 75251 (214) 341-0900 An ARDURRA Company FIRM REGISTRATION No. F-10058			
Texas Department of Transportation ©2025 by Texas Department of Transportation, all rights reserved			
CHALK HILL TRAIL DEMOLITION & REMOVAL PLAN STA 120+00 TO STA 130+00			
© TxDOT			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	22	

PLOTTER: BATES R:001

TEXAS UTILITIES ELEC CO. % STATE & LOCAL TAX DEPT
2005 S COCKRELL HILL RD



LEGEND

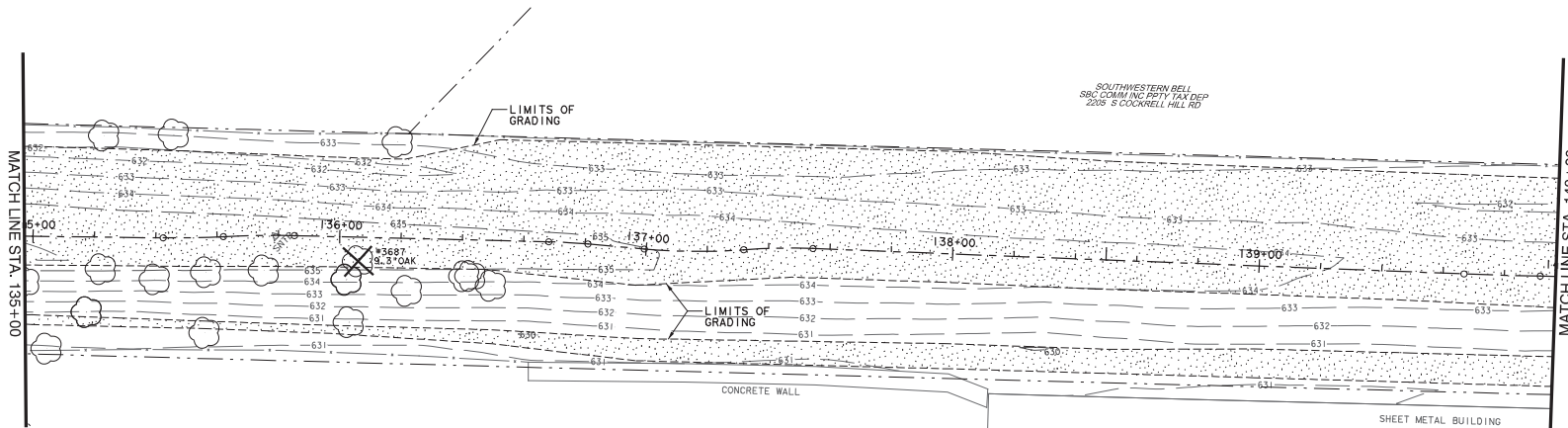
- CONCRETE PAVEMENT REMOVAL
- ASPHALT PAVEMENT REMOVAL
- LIMITS OF CLEAR & GRUB
- CONCRETE SIDEWALK REMOVAL
- TREE REMOVAL & TREE I.D.
- CONCRETE CURB/GUTTER REMOVAL
- STORM DRAIN PIPE REMOVAL (UNLESS NOTED OTHERWISE)
- FENCE REMOVAL
- RAILROAD RAIL & TIE REMOVAL
- CONCRETE OR MASONRY WALL REMOVAL

NOTES:

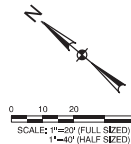
1. LOOSE BALLAST, ROCK AND GRAVEL SHALL BE REMOVED AS DIRECTED IN THE GENERAL NOTES AND WILL BE PAID FOR AS PART OF PREPARING R.O.W.
2. CONCRETE PAVEMENT REMOVALS WILL BE TO EXISTING JOINTS.
3. TREES NOT IDENTIFIED TO BE REMOVED SHALL BE PROTECTED.

TREE ABBREVIATIONS

ASH	ASH
BCH	BEECH
BDA	BOLIS D'ARC
COR	CEDAR
CHER	CHERRY
CHBY	CHINABERRY
CLU	CLUSTER
CTWD	COTTONWOOD
ELM	ELM
GUM	GUM
HKBY	HACKBERRY
HERC	HERCULES CLUB
LRL	LAUREL
LOC	LOCUST
LIVO	LIVE OAK
MPL	MAPLE
MESQ	MESQUITE
OAK	OAK
PEAR	PEAR
PCN	PECAN
PRSM	PERSIMMON
PRV	PRIVET
REDB	REDBUD
SPBY	SOAPBERRY
SCAT	SOUTHERN CATALPA
WNUT	WALNUT
WLW	WILLOW



ITEM NO.	DESCRIPTION	UNIT	QUANTITY
496-7042	REMOVE STR (WOOD STR)	EA	1
550-7007	CHAIN LINK FENCE (REMOVE)	LF	288



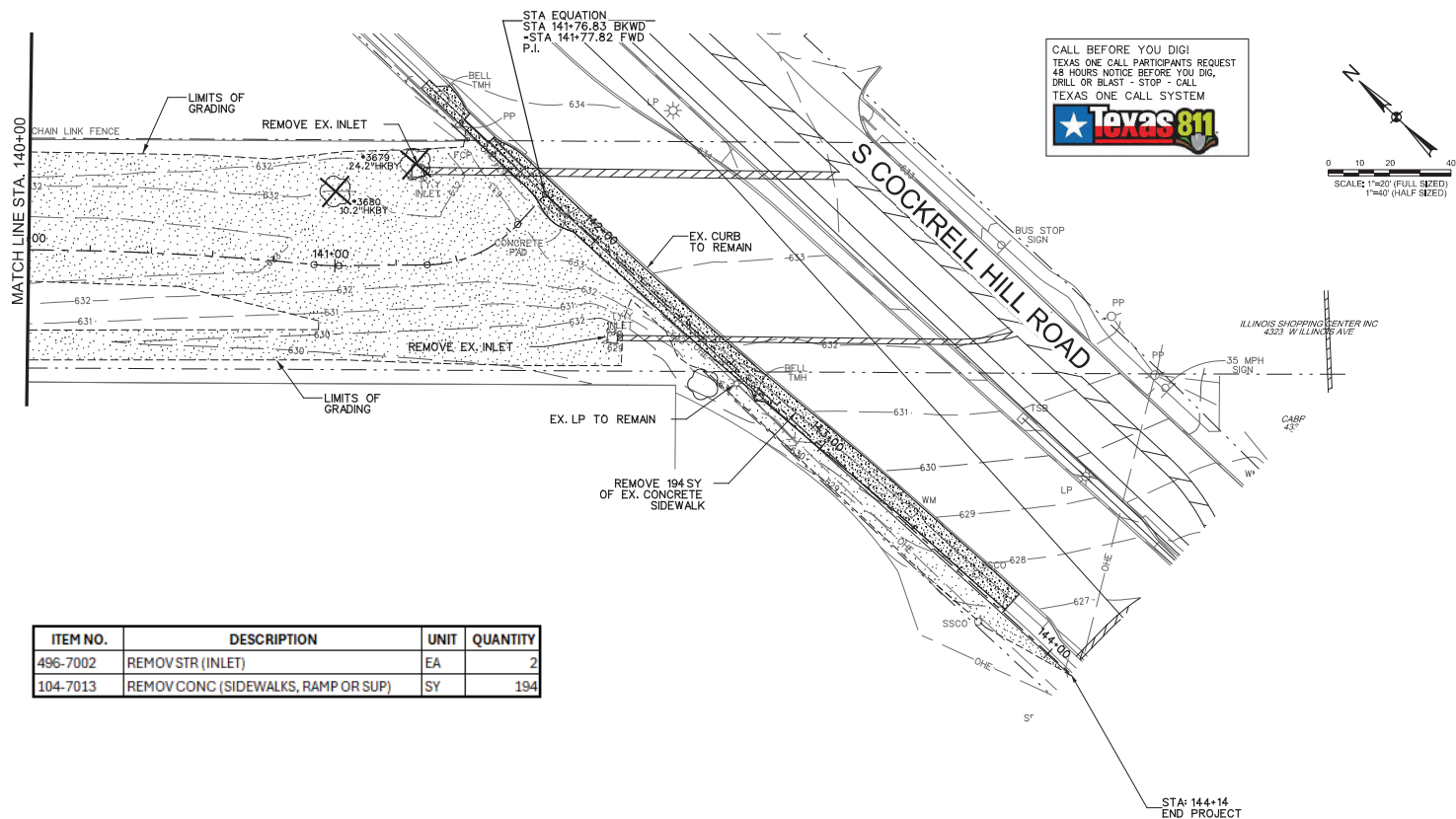
DALLAS COUNTY OF
4403 W ILLINOIS AVE



Steven B. Heniford
10/05/20

NO.	REVISIONS	BY	DATE
ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Cool Rd, Dallas, Texas 75251 (214) 341-0900 FIRM REGISTRATION No. F-10098			
Texas Department of Transportation ©2025 by Texas Department of Transportation, all rights reserved			
CHALK HILL TRAIL DEMOLITION & REMOVAL PLAN STA 130+00 TO 140+00			
© TxDOT			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	23	

PLANS BOOKS PAGES SHEETS



ITEM NO.	DESCRIPTION	UNIT	QUANTITY
496-7002	REMOV STR (INLET)	EA	2
104-7013	REMOV CONC (SIDEWALKS, RAMP OR SUP)	SY	194

LEGEND

- CONCRETE PAVEMENT REMOVAL
- ASPHALT PAVEMENT REMOVAL
- LIMITS OF CLEAR & GRUB
- CONCRETE SIDEWALK REMOVAL
- TREE REMOVAL & TREE I.D.
- CONCRETE CURB/GUTTER REMOVAL
- STORM DRAIN PIPE REMOVAL (UNLESS NOTED OTHERWISE)
- FENCE REMOVAL
- RAILROAD RAIL & TIE REMOVAL
- CONCRETE OR MASONRY WALL REMOVAL

NOTES:

1. LOOSE BALLAST, ROCK AND GRAVEL SHALL BE REMOVED AS DIRECTED IN THE GENERAL NOTES AND WILL BE PAID FOR AS PART OF PREPARING R.O.W.
2. CONCRETE PAVEMENT REMOVALS WILL BE TO EXISTING JOINTS.
3. TREES NOT IDENTIFIED TO BE REMOVED SHALL BE PROTECTED.

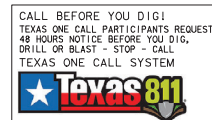
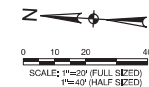
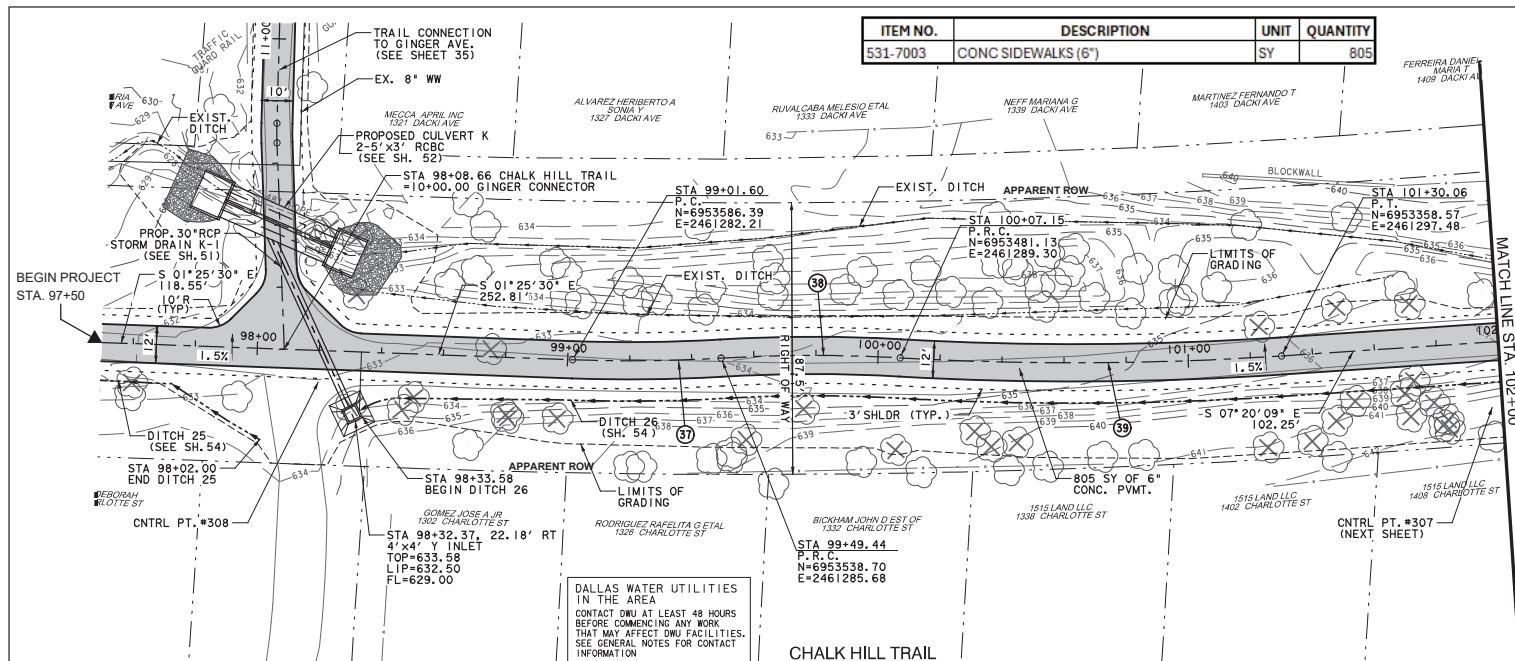
TREE ABBREVIATIONS

ASH	ASH
BOH	BEECH
BDA	BOIS D'ARC
CDR	CEDAR
CHER	CHERRY
CHBY	CHINABERRY
CLU	CLUSTER
CTWD	COTTONWOOD
ELM	ELM
GUM	GUM
HKBV	HACKBERRY
HERC	HERCULES CLUB
LRL	LAUREL
LOC	LOCUST
LIVO	LIVE OAK
MPL	MAPLE
MESQ	MESQUITE
OAK	OAK
PEAR	PEAR
PCN	PECAN
PRSM	PERSIMMON
PRV	PRIVET
ROBD	REDBUD
SPBY	SOAPBERRY
SCAT	SOUTHERN CATALPA
WNUT	WALNUT
WLW	WILLOW



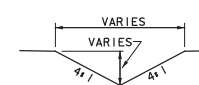
Steven B. Hanford
10/05/20

NO.	REVISIONS	BY	DATE
ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Coit Rd., Dallas, Texas 75251 (214) 341-6900 FIRM REGISTRATION No. F-10058			
Texas Department of Transportation ©2025 by Texas Department of Transportation, all rights reserved			
CHALK HILL TRAIL DEMOLITION & REMOVAL PLAN STA 140+00 TO END PROJECT			
TxDOT			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	24	

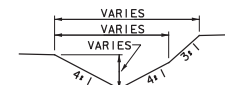


CURVE DATA TABLE

57	$\Delta=5^{\circ}28'54''$ R=500.00' T=23.94' L=47.84'	59	$\Delta=7^{\circ}02'33''$ R=1000.00' T=61.53' L=122.91'	58	$\Delta=6^{\circ}36'47''$ R=500.00' T=28.89' L=57.71'
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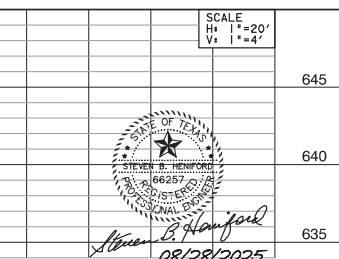
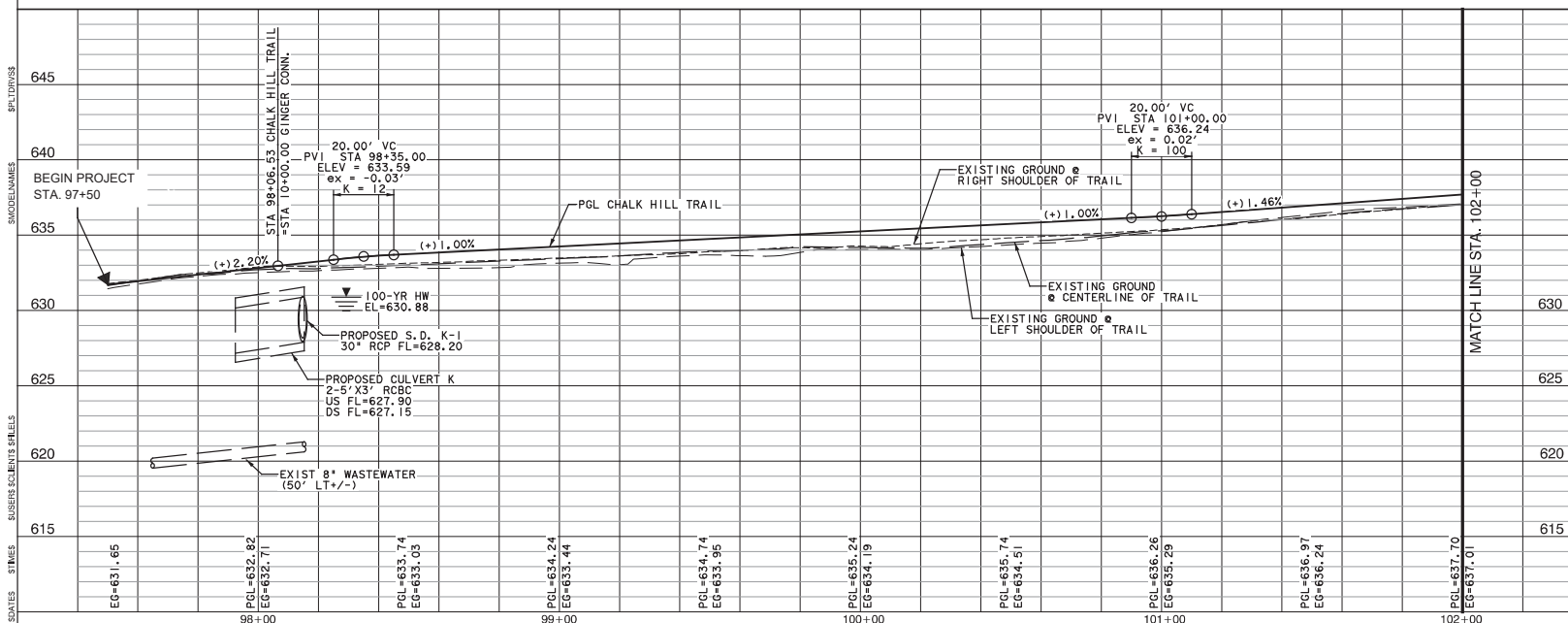
DITCH SECTION
DITCHES 25 & 26
N.T.S.
SEE DITCH PLANS &
CROSS SECTIONS



DITCH SECTION
DITCH 26
N.T.S.
SEE DITCH PLANS &
CROSS SECTIONS

NOTES:

- CONTRACTOR SHALL LOCATE ALL UTILITIES PRIOR TO DIGGING OR EXCAVATION. ANY DAMAGE TO UTILITIES WILL BE THE CONTRACTOR'S RESPONSIBILITY.
- SEE TREE SURVEY-IMPACTED TREES PLANS FOR TREE SIZE & SPECIES INFORMATION.
- PROPOSED DITCHES OUTFALL INTO EXISTING DITCHES OR DAYLIGHT INTO SLOPES. SEE SHEETS 54 THROUGH 57.
- SEE CROSS SECTIONS FOR TRAIL EDGE CONDITIONS AND SLOPES.



NO.	REVISIONS	BY	DATE
1	ARREDONDO, ZEPEDA & BRUNZ, LLC		

AZ&B ARREDONDO, ZEPEDA & BRUNZ, LLC
An ARDURRA Company
12400 Cort Rd, Dallas, Texas 75251
(214) 341-9900
FIRM REGISTRATION No. F-10098

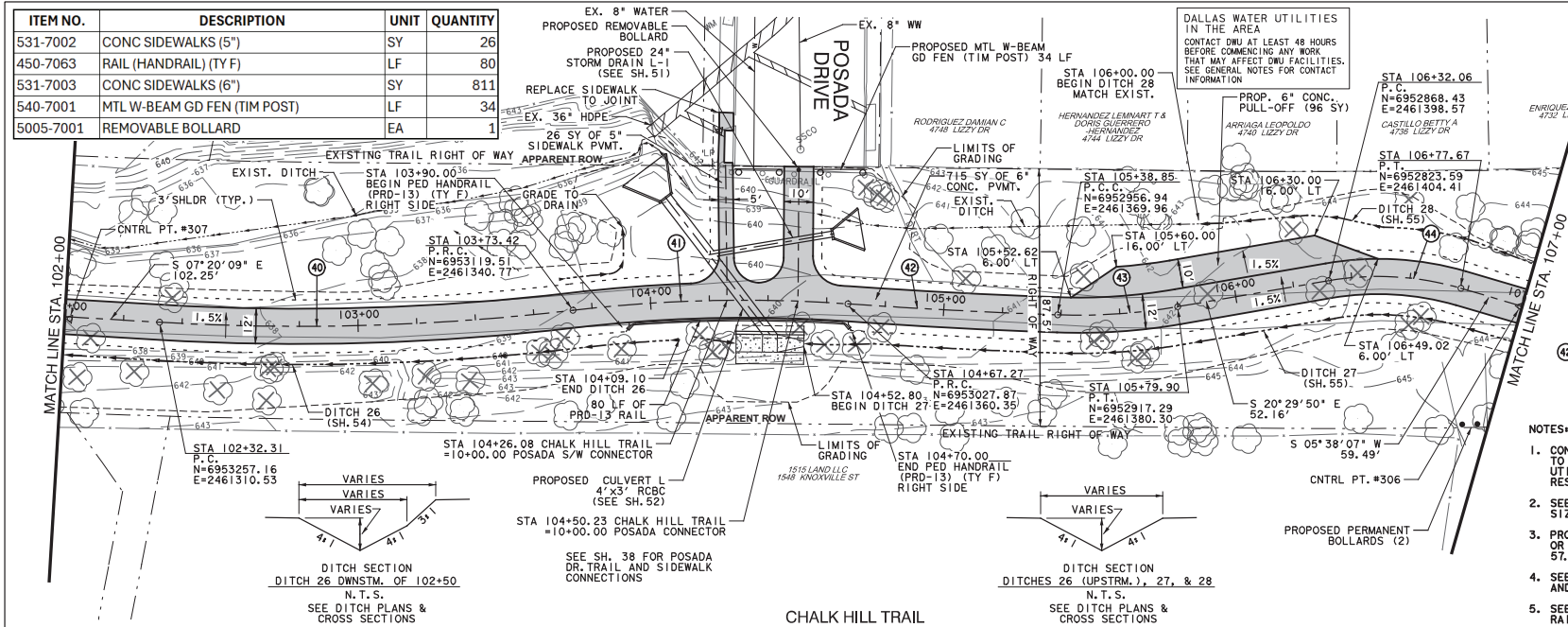
Texas Department of Transportation
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CHALK HILL TRAIL
CHALK HILL TRAIL PLAN AND PROFILE
STA 97+50 TO STA 102+00

CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	25	

PLANS SHEETS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
531-7002	CONC SIDEWALKS (5")	SY	26
450-7063	RAIL (HANDRAIL) (TY F)	LF	80
531-7003	CONC SIDEWALKS (6")	SY	811
540-7001	MTL W-BEAM GD FEN (TIM POST)	LF	34
5005-7001	REMOVABLE BOLLARD	EA	1



CALL BEFORE YOU DIG!
TEXAS ONE CALL PARTICIPANTS REQUEST
48 HOURS NOTICE BEFORE YOU DIG,
DRILL OR BLAST - STOP - CALL
TEXAS ONE CALL SYSTEM

Texas 811

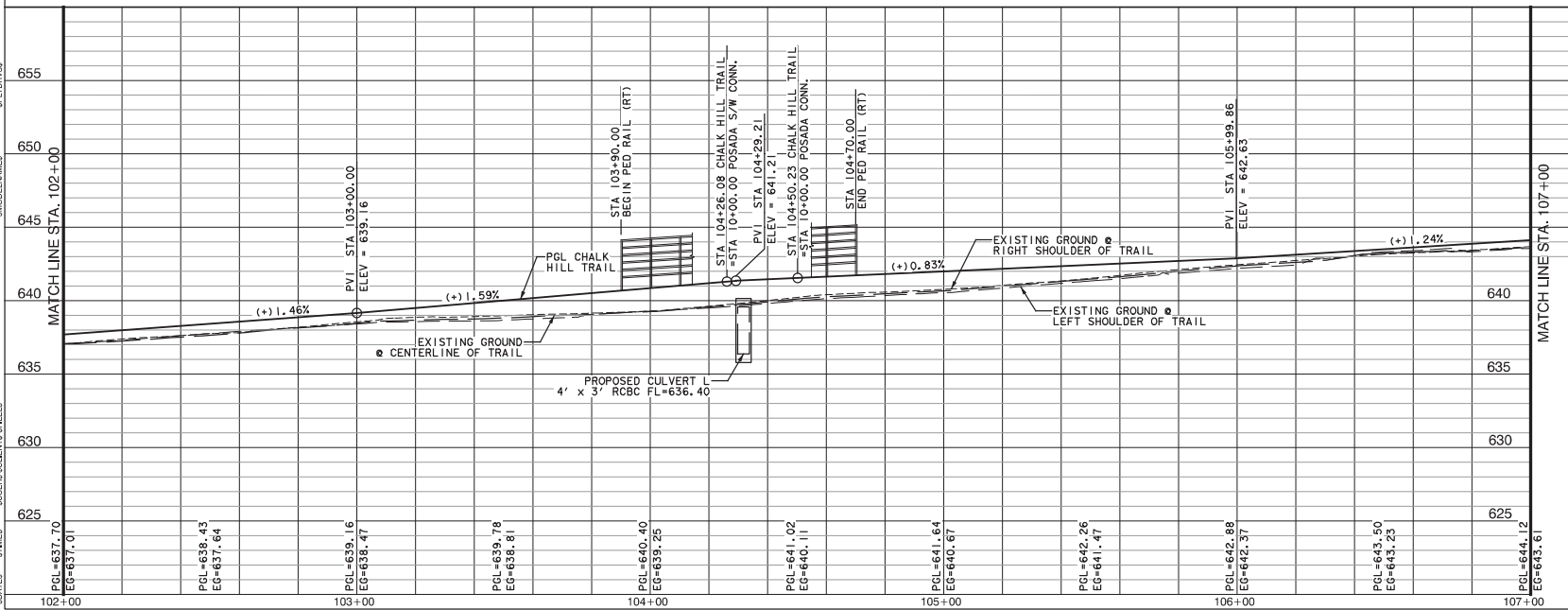
SCALE: 1"=20' (FULL SIZE)
1"=40' (HALF SIZE)

CURVE DATA TABLE

40	Δ=10°06'23"	41	Δ=10°45'14"
R=800.00'	R=800.00'	R=800.00'	R=800.00'
T=74.74'	T=74.06'	T=74.06'	T=74.06'
L=41.11'	L=41.11'	L=41.11'	L=41.11'

NOTES:

- CONTRACTOR SHALL LOCATE ALL UTILITIES PRIOR TO DIGGING OR EXCAVATION. ANY DAMAGE TO UTILITIES WILL BE THE CONTRACTOR'S RESPONSIBILITY.
- SEE TREE SURVEY-IMPACTED TREES PLANS FOR TREE SIZE & SPECIES INFORMATION.
- PROPOSED DITCHES OUTFALL INTO EXISTING DITCHES OR DAYLIGHT INTO SLOPES. SEE SHEETS 54 THROUGH 57.
- SEE CROSS SECTIONS FOR TRAIL EDGE CONDITIONS AND SLOPES.
- SEE DETAIL ON SHEET 37 FOR FLARED PEDESTRIAN RAIL END TREATMENTS.



SCALE 1"=20'
1"=4'

08/28/2025

NO. REVISIONS BY DATE

AZ&B ARREDONDO, ZEPEDA & BRUNZ, LLC
12400 Coit Rd. Dallas, Texas 75251
(214) 341-0500
FIRM REGISTRATION No. F-10098

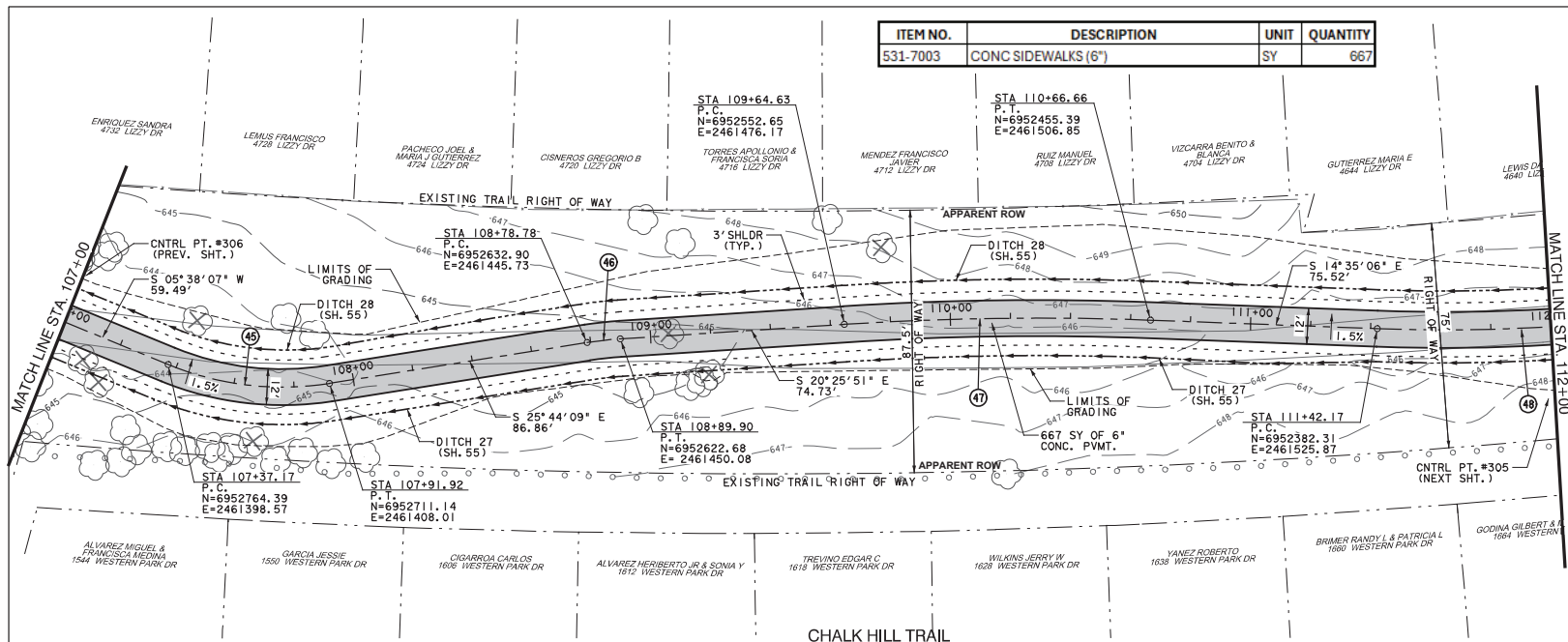
Texas Department of Transportation
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CHALK HILL TRAIL
CHALK HILL TRAIL PLAN AND PROFILE
STA 102+00 TO STA 107+00

© TxDOT

CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA

DISTRICT	COUNTY	SHEET NO.
DAL	DALLAS	26



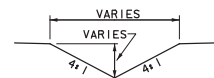
ITEM NO.	DESCRIPTION	UNIT	QUANTITY
531-7003	CONC SIDEWALKS (6")	SY	667



0 10 20 40
SCALE: 1"=20' (FULL SIZE)
1"=40' (HALF SIZE)

CURVE DATA TABLE

45	$\Delta=31^{\circ}22'16"$ R=100.00' T=28.08' L=54.75'	47	$\Delta=5^{\circ}50'45"$ R=1000.00' T=51.06' L=102.03'
46	$\Delta=5^{\circ}18'18"$ R=120.00' T=5.56' L=11.11'	48	$\Delta=10^{\circ}25'52"$ R=600.00' T=54.77' L=109.23'

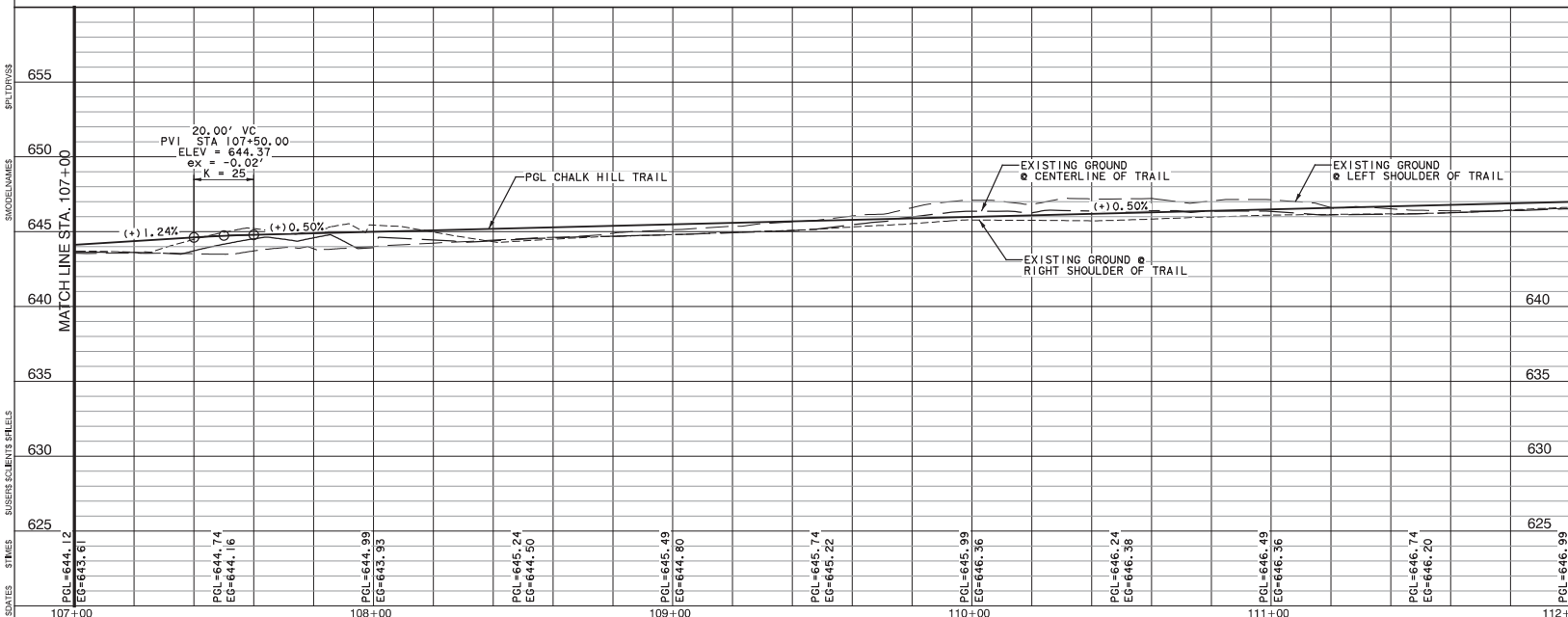


DITCH SECTION
DITCHES 27 & 28
N.T.S.

SEE DITCH PLANS &
CROSS SECTIONS

NOTES:

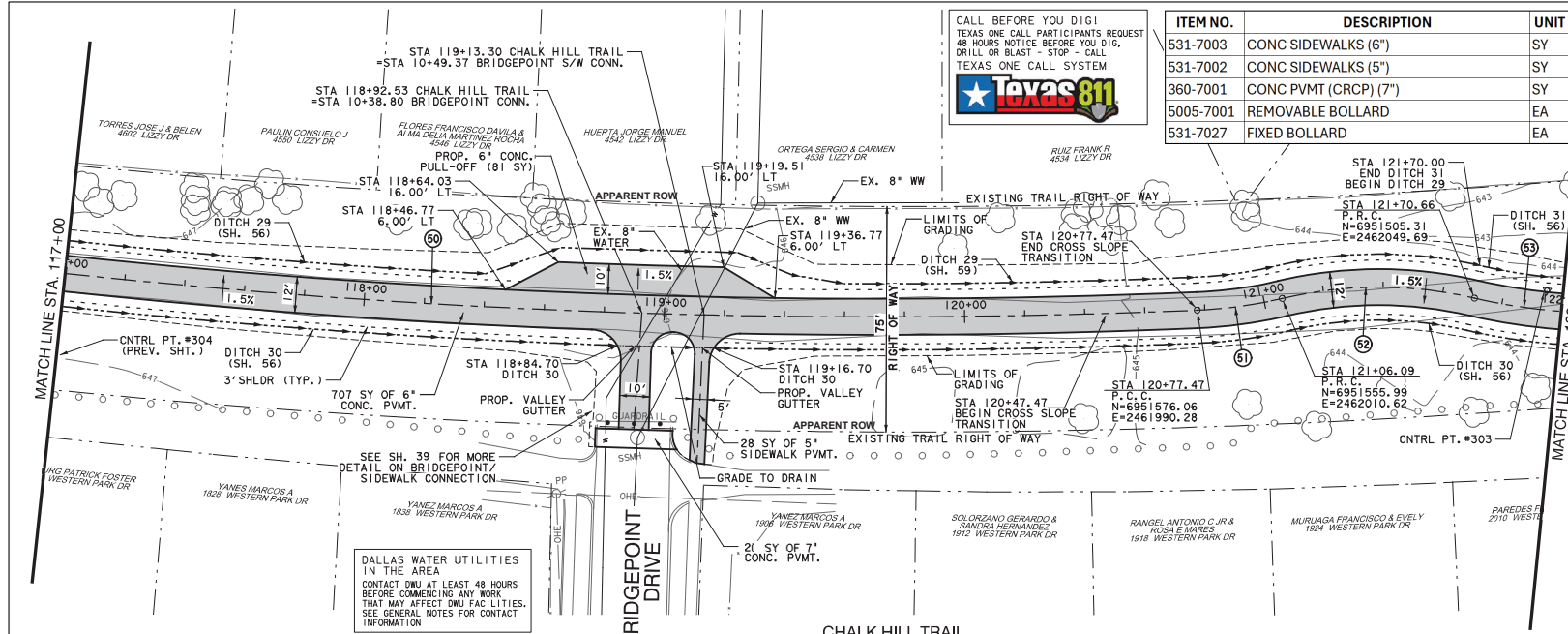
- SEE TREE SURVEY-IMPACTED TREES PLANS FOR TREE SIZE & SPECIES INFORMATION.
- PROPOSED DITCHES OUTFALL INTO EXISTING DITCHES OR DAYLIGHT INTO SLOPES. SEE SHEETS 54 THROUGH 57.
- SEE CROSS SECTIONS FOR TRAIL EDGE CONDITIONS AND SLOPES.



SCALE
H=1"=20'
V=1"=4'

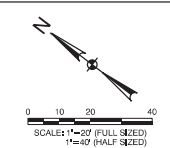
STATE OF TEXAS
STEVEN B. HENFORD
66257
Professional Engineer
10/05/20

NO.	REVISIONS	BY	DATE
AZ&B ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Coit Rd, Dallas, Texas 75251 (214) 341-5900 An ARDURRA Company FIRM REGISTRATION No. F-10098			
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CHALK HILL TRAIL CHALK HILL TRAIL PLAN AND PROFILE STA 107+00 TO STA 112+00			
© TxDOT			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	27	



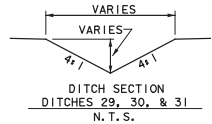
CALL BEFORE YOU DIG!
TEXAS ONE CALL PARTICIPANTS REQUEST
48 HOURS NOTICE BEFORE YOU DIG,
DRILL OR BLAST - STOP - CALL
TEXAS ONE CALL SYSTEM

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
531-7003	CONC SIDEWALKS (6")	SY	788
531-7002	CONC SIDEWALKS (5")	SY	28
360-7001	CONC PVMT (CRCP) (7")	SY	21
5005-7001	REMOVABLE BOLLARD	EA	1
531-7027	FIXED BOLLARD	EA	2



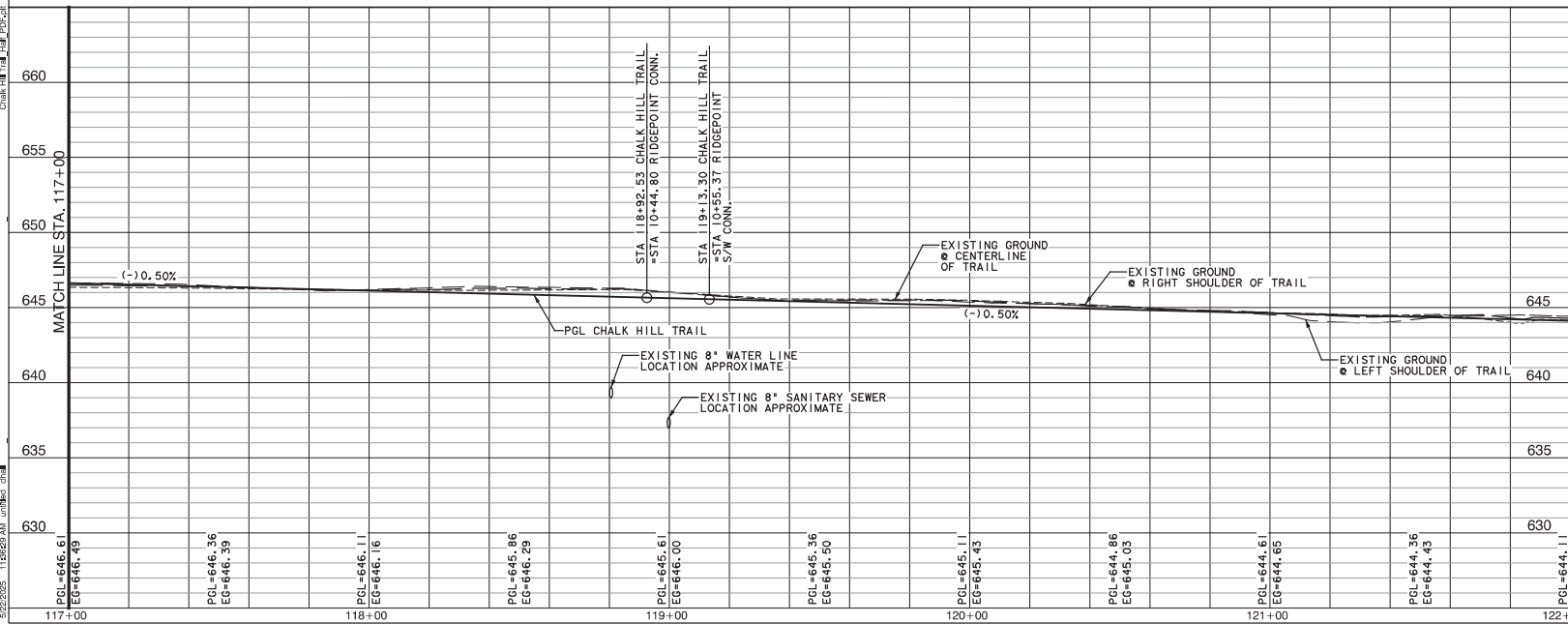
CURVE DATA TABLE

50	A=9°00'00" R=2545.59' T=200.34' L=399.87'	52	A=26°25'35" R=140.00' T=32.87' L=64.57'
51	A=10°55'46" R=150.00' T=14.35' L=28.61'	53	A=25°50'01" R=188.50' T=43.23' L=84.99'



NOTES:

- CONTRACTOR SHALL LOCATE ALL UTILITIES PRIOR TO DIGGING OR EXCAVATION. ANY DAMAGE TO UTILITIES WILL BE THE CONTRACTOR'S RESPONSIBILITY.
- SEE TREE SURVEY-IMPACTED TREES PLANS FOR TREE SIZE & SPECIES INFORMATION.
- PROPOSED DITCHES OUTFALL INTO EXISTING DITCHES OR DAYLIGHT INTO SLOPES. SEE SHEETS 54 THROUGH 57.
- SEE CROSS SECTIONS FOR TRAIL EDGE CONDITIONS AND SLOPES.



SCALE
H=1"=20'
V=1"=4'

STATE OF TEXAS
STEVEN B. HENNING
66257
PROFESSIONAL ENGINEER
08/28/2025

660

655

650

645

640

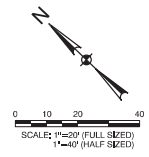
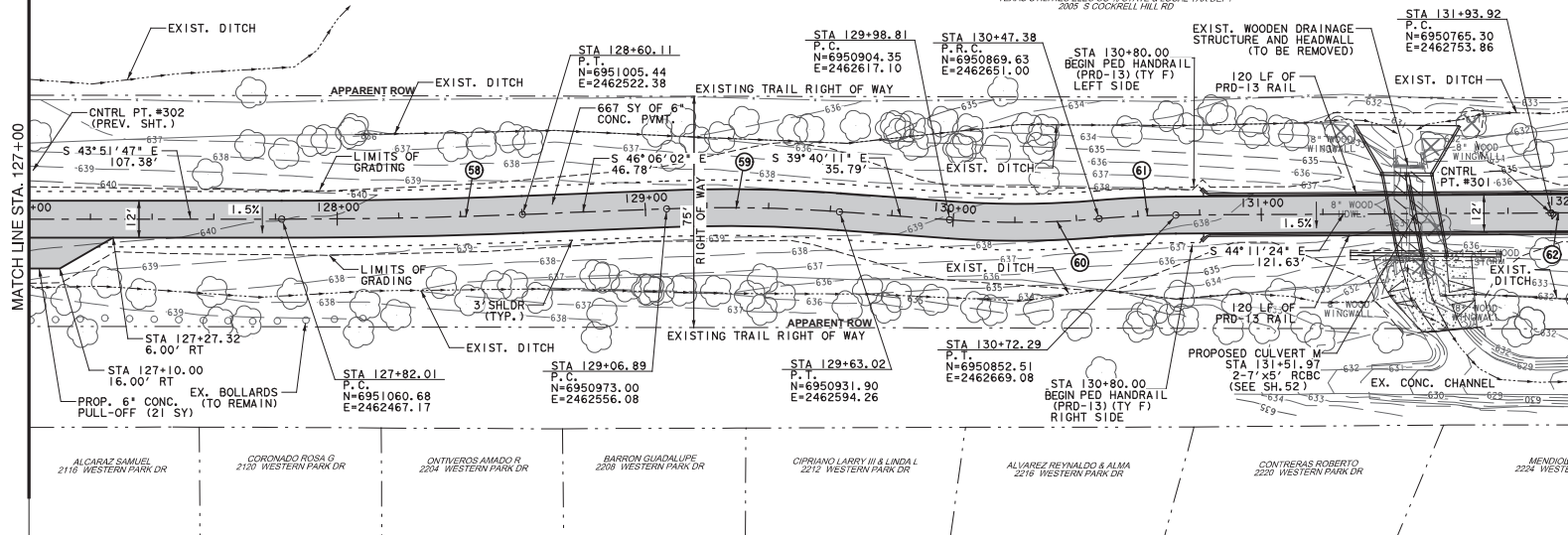
635

630

NO.	REVISIONS	BY	DATE
ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Coit Rd. Dallas, Texas 75251 (214) 341-5900 An ARDURRA Company FIRM REGISTRATION No. F-10098			
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CHALK HILL TRAIL CHALK HILL TRAIL PLAN AND PROFILE STA 117+00 TO STA 122+00			
© TxDOT			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	29	

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
531-7003	CONC SIDEWALKS (6")	SY	688
450-7063	RAIL (HANDRAIL) (TY F)	LF	240

TEXAS UTILITIES ELEC CO % STATE & LOCAL TAX DEPT
2008 S COCKRELL HILL RD

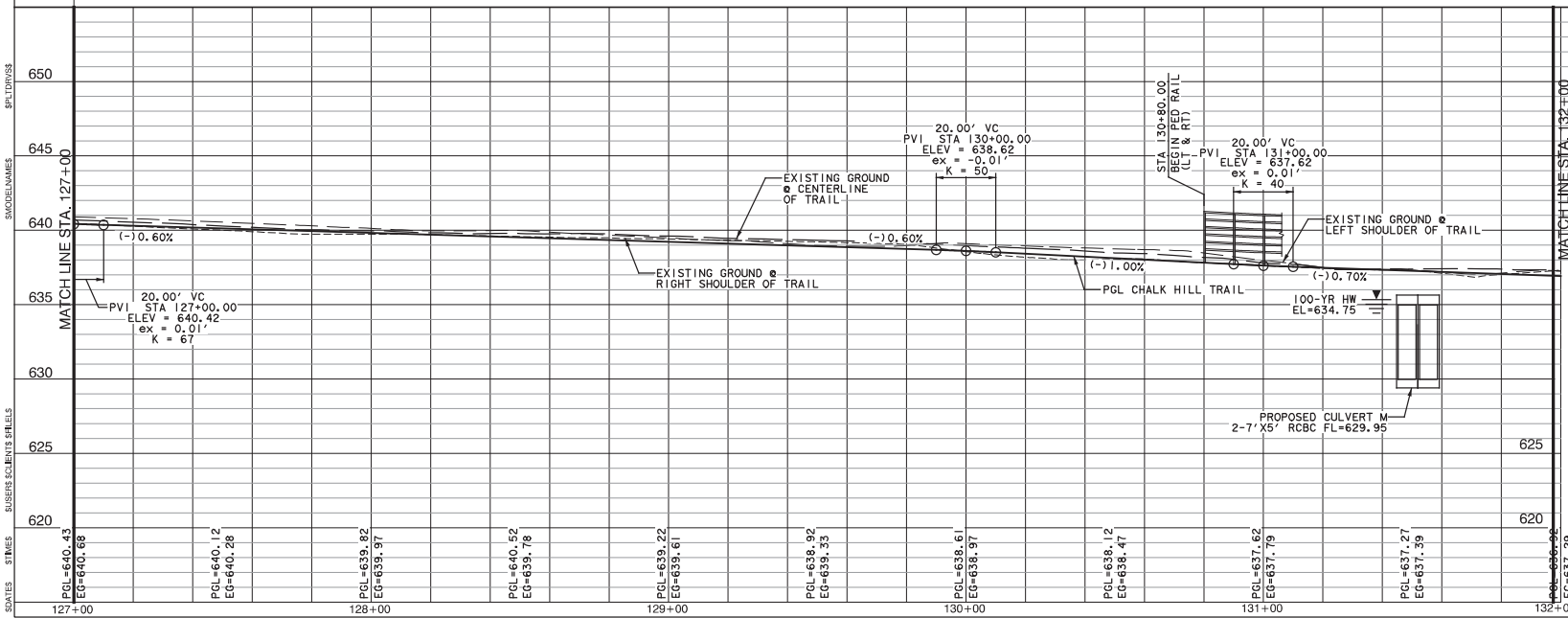


CURVE DATA TABLE

58	$\Delta=2^{\circ}14'14''$ R=2000.00' T=39.05' L=78.10'	61	$\Delta=4^{\circ}45'27''$ R=300.00' T=12.46' L=24.91'
59	$\Delta=6^{\circ}25'51''$ R=500.00' T=28.09' L=56.12'	62	$\Delta=0^{\circ}57'37''$ R=1000.00' T=8.38' L=16.76'
60	$\Delta=9^{\circ}16'39''$ R=300.00' T=24.34' L=48.58'		

NOTES:

1. SEE TREE SURVEY-IMPACTED TREES PLANS FOR TREE SIZE & SPECIES INFORMATION.
2. PROPOSED DITCHES OUTFALL INTO EXISTING DITCHES OR DAYLIGHT INTO SLOPES. SEE SHEETS 54 THROUGH 57.
3. SEE CROSS SECTIONS FOR TRAIL EDGE CONDITIONS AND SLOPES.
4. SEE DETAIL ON SHEET 37 FOR FENCED PEDESTRIAN RAIL END TREATMENTS.



SCALE
H 1"=20'
V 1"=4'

Steven B. Heniford
10/05/20

650

645

640

635

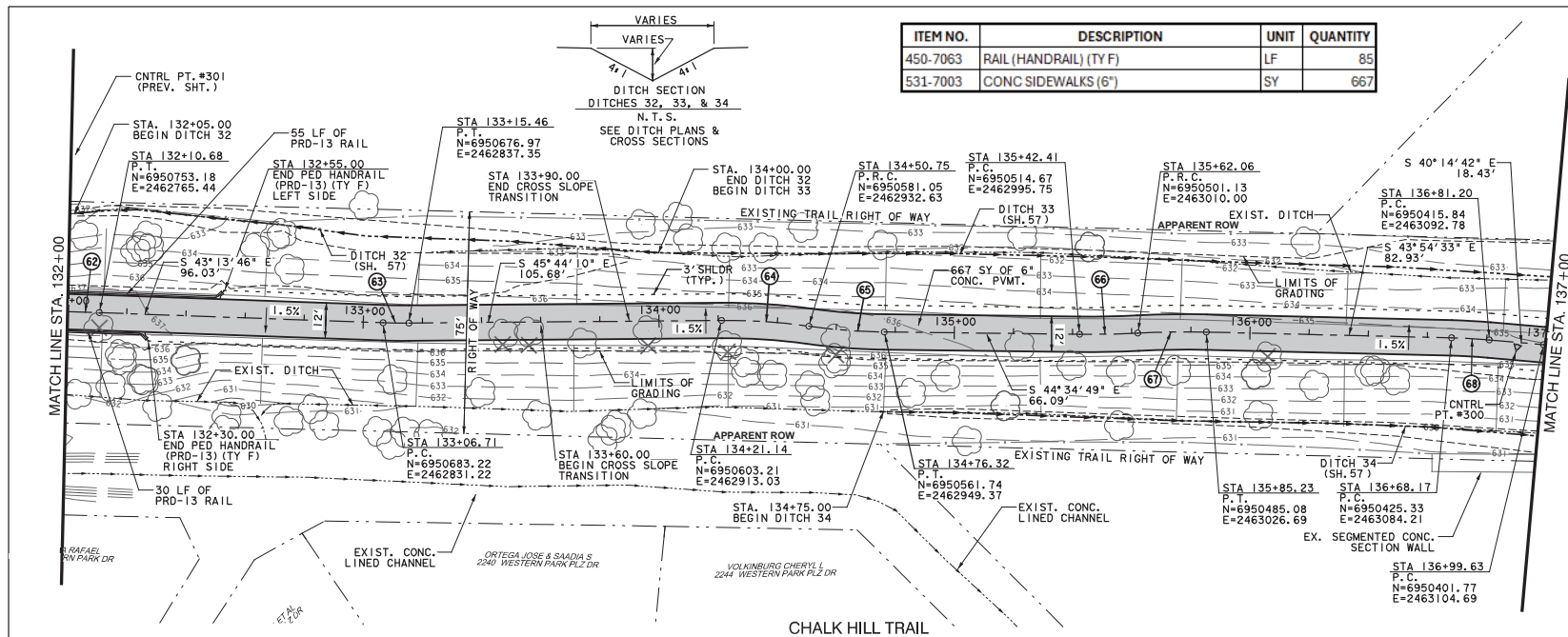
630

625

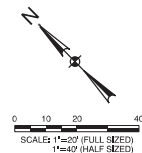
620

NO.	REVISIONS	BY	DATE														
ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Coit Rd Dallas, Texas 75251 (214) 341-0900 An ARDURRA Company FIRM REGISTRATION No. F-10098																	
 ©2025 by Texas Department of Transportation, all rights reserved																	
CHALK HILL TRAIL CHALK HILL TRAIL PLAN AND PROFILE STA 127+00 TO STA 132+00																	
• TxDOT <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>CONTROL</th> <th>SECTION</th> <th>JOB</th> <th>HIGHWAY</th> </tr> <tr> <td>0918</td> <td>47</td> <td>472</td> <td>VA</td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>DISTRICT</th> <th>COUNTY</th> <th>SHEET NO.</th> </tr> <tr> <td>DAL</td> <td>DALLAS</td> <td>31</td> </tr> </table>				CONTROL	SECTION	JOB	HIGHWAY	0918	47	472	VA	DISTRICT	COUNTY	SHEET NO.	DAL	DALLAS	31
CONTROL	SECTION	JOB	HIGHWAY														
0918	47	472	VA														
DISTRICT	COUNTY	SHEET NO.															
DAL	DALLAS	31															

PLLS BKSS RACK ROUN



ITEM NO.	DESCRIPTION	UNIT	QUANTITY
450-7063	RAIL (HANDRAIL) (TY F)	LF	85
531-7003	CONC SIDEWALKS (6")	SY	667

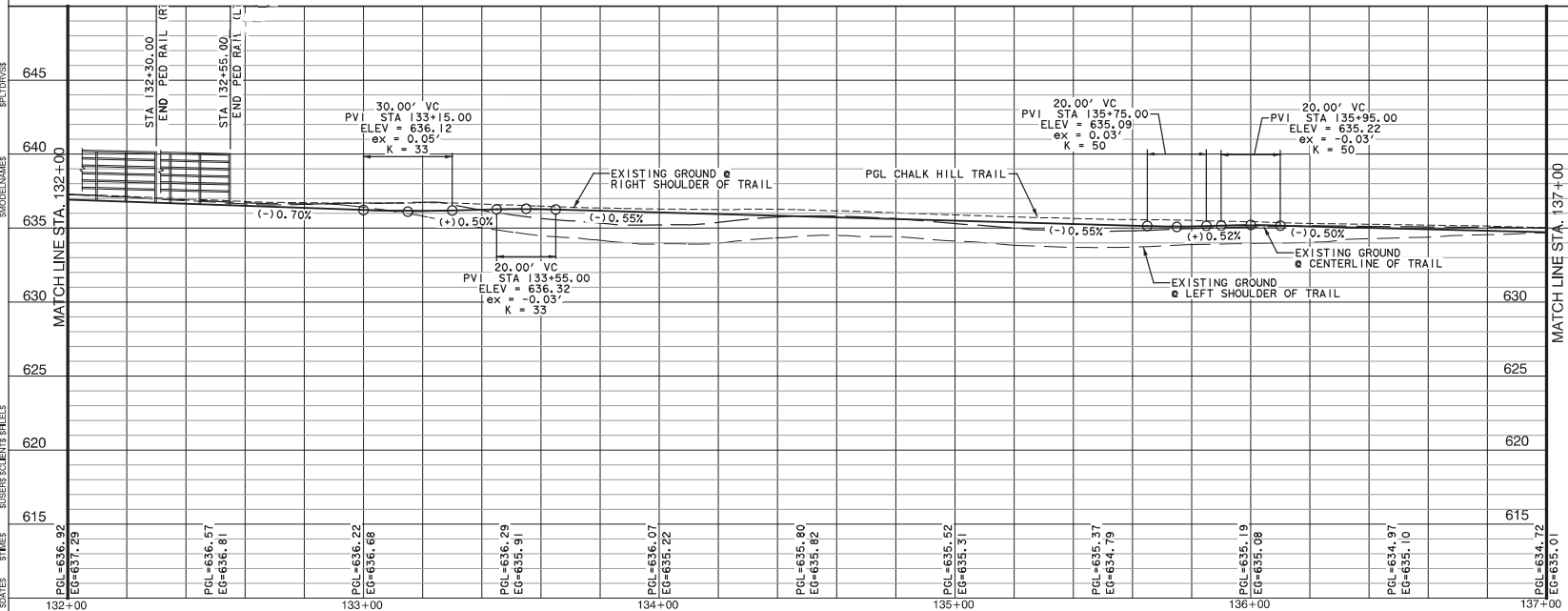


CURVE DATA TABLE

62	Δ=0° 57' 37"	R=1000.00'	T=8.38'	L=16.76'
63	Δ=2° 30' 24"	R=200.00'	T=4.38'	L=8.75'
64	Δ=8° 28' 59"	R=300.00'	T=14.83'	L=29.61'
65	Δ=07° 19' 38"	R=200.00'	T=12.81'	L=25.58'
66	Δ=3° 45' 14"	R=300.00'	T=9.83'	L=19.65'
67	Δ=4° 25' 30"	R=300.00'	T=11.59'	L=23.17'
68	Δ=3° 39' 51"	R=200.00'	T=6.40'	L=12.79'

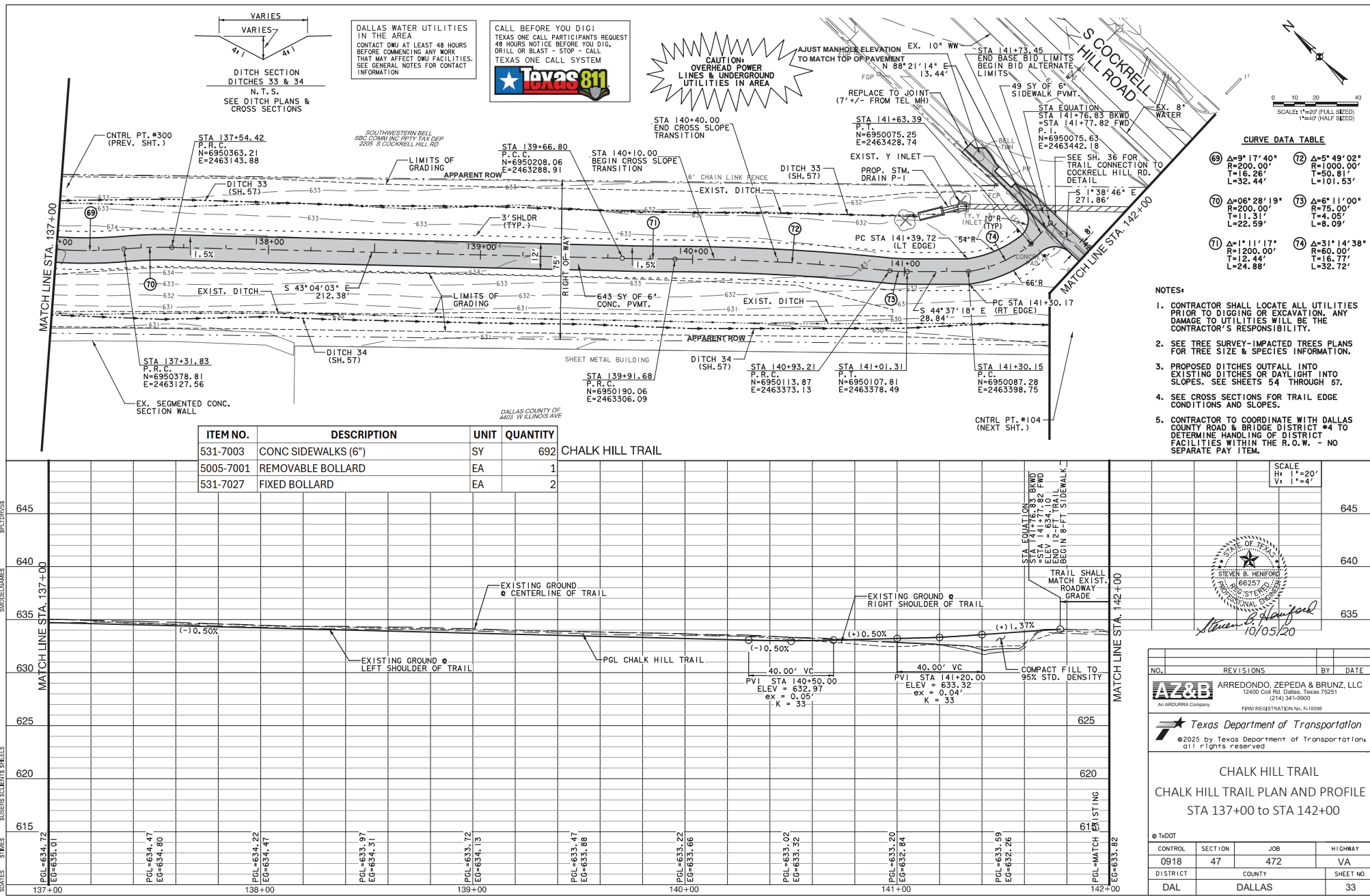
NOTES:

1. SEE TREE SURVEY-IMPACTED TREES PLANS FOR TREE SIZE & SPECIES INFORMATION.
2. PROPOSED DITCHES OUTFALL INTO EXISTING DITCHES OR DAYLIGHT INTO SLOPES. SEE SHEETS 54 THROUGH 57.
3. SEE CROSS SECTIONS FOR TRAIL EDGE CONDITIONS AND SLOPES.
4. SEE DETAIL ON SHEET 37 FOR FLARED PEDESTRIAN RAIL END TREATMENTS.



SCALE H: 1"=20' V: 1"=4'	645
	640
	635

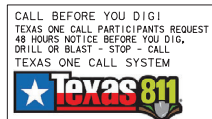
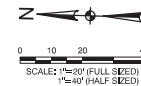
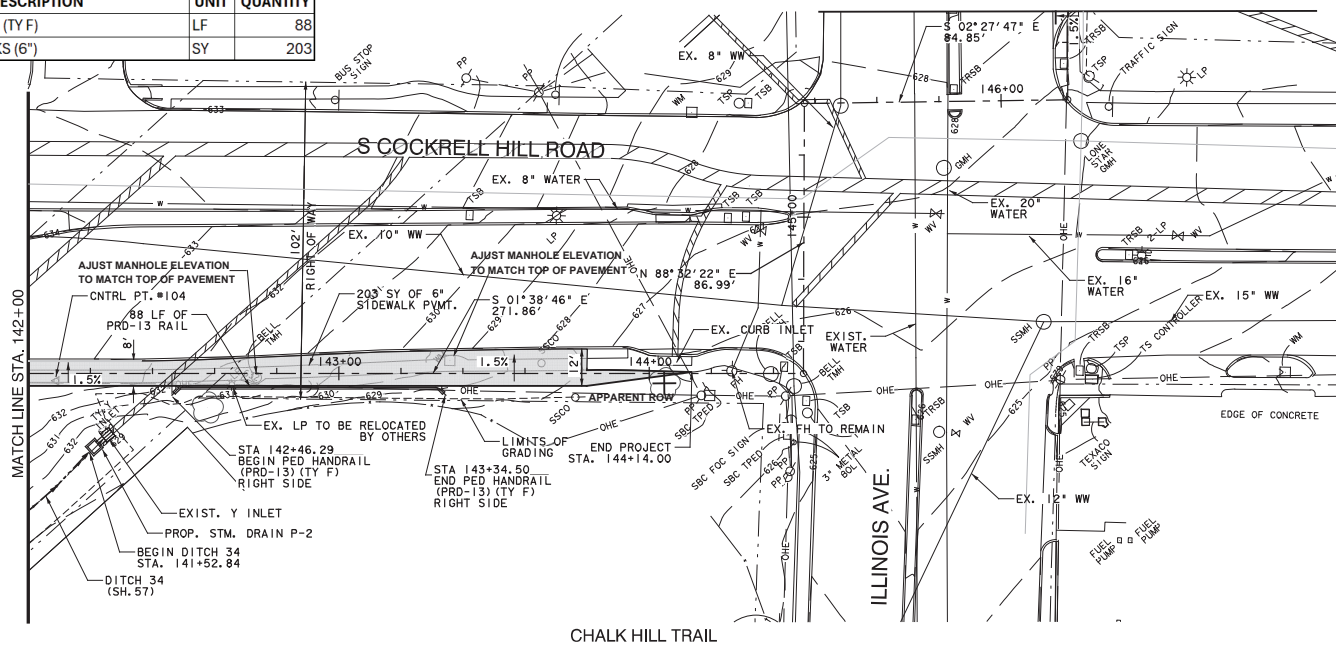
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STEVEN B. HENFORD
10/05/20

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AZ&B ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Coit Rd, Dallas, Texas 75251 (214) 341-0900 FRM REGISTRATION No. F-10098 Texas Department of Transportation ©2025 by Texas Department of Transportation, all rights reserved CHALK HILL TRAIL CHALK HILL TRAIL PLAN AND PROFILE STA 137+00 TO STA 142+00 © TxDOT <table border="1"> <thead> <tr> <th>CONTROL</th> <th>SECTION</th> <th>JOB</th> <th>HIGHWAY</th> </tr> </thead> <tbody> <tr> <td>0918</td> <td>47</td> <td>472</td> <td>VA</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>DISTRICT</th> <th>COUNTY</th> <th>SHEET NO.</th> </tr> </thead> <tbody> <tr> <td>DAL</td> <td>DALLAS</td> <td>33</td> </tr> </tbody> </table>				CONTROL	SECTION	JOB	HIGHWAY	0918	47	472	VA	DISTRICT	COUNTY	SHEET NO.	DAL	DALLAS	33
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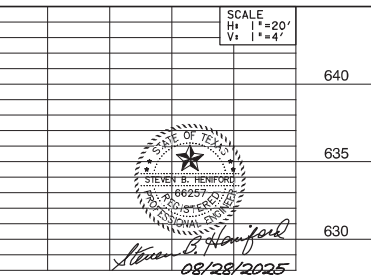
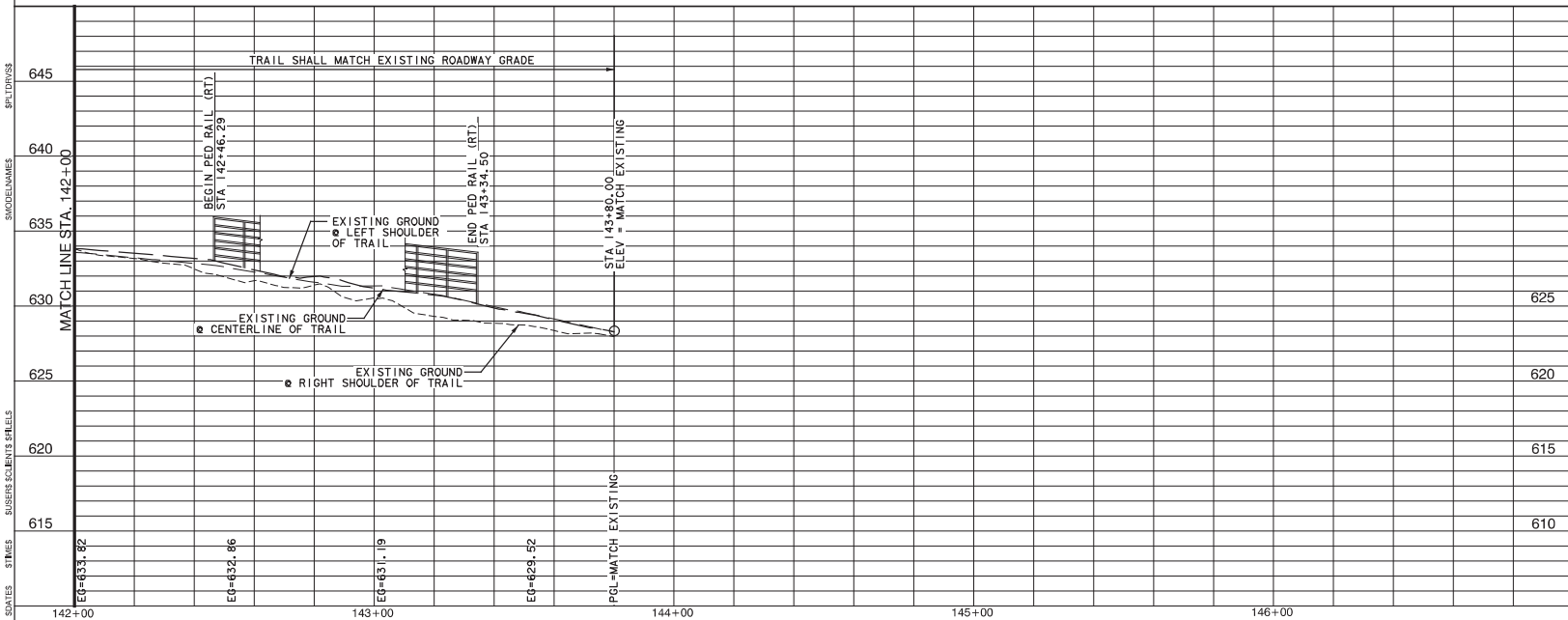
ITEM NO.	DESCRIPTION	UNIT	QUANTITY
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531-7003	CONC SIDEWALKS (6")	SY	203



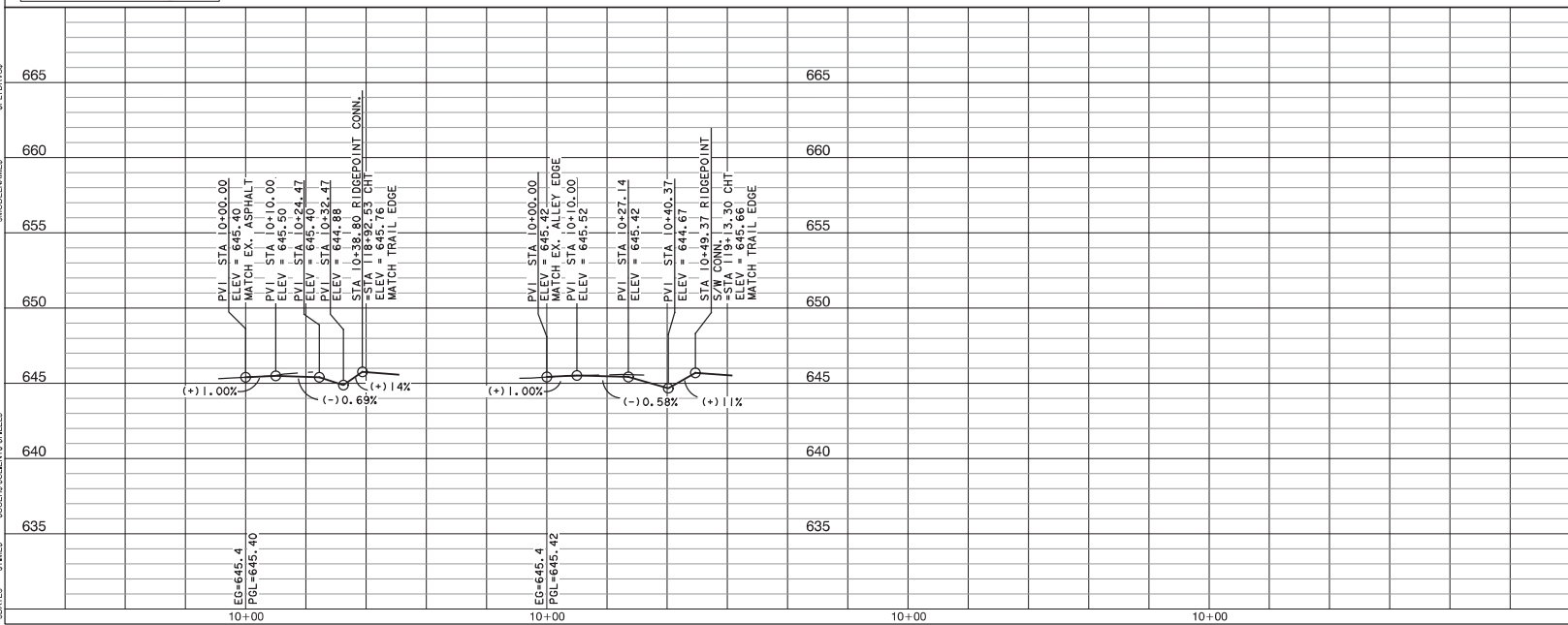
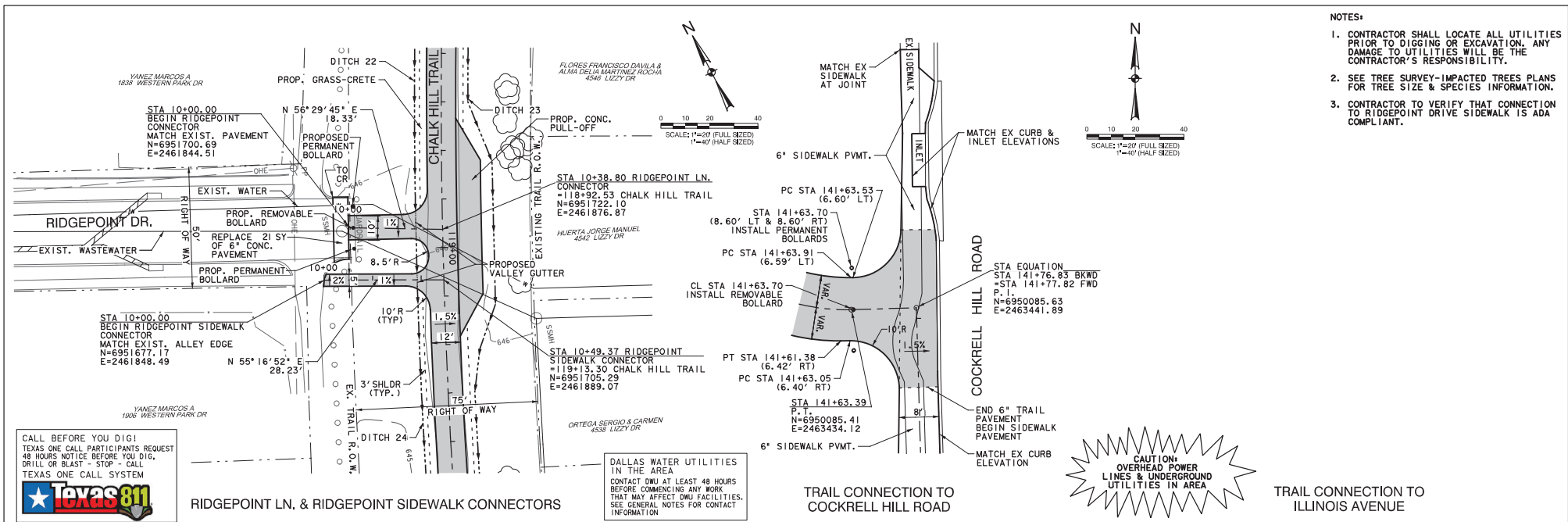
DALLAS WATER UTILITIES
IN THE AREA
CONTACT OWNERS AT LEAST 48 HOURS
BEFORE COMMENCING ANY WORK
THAT MAY AFFECT DWO FACILITIES.
SEE GENERAL NOTES FOR CONTACT
INFORMATION

NOTES:

1. CONTRACTOR SHALL LOCATE ALL UTILITIES PRIOR TO DIGGING OR EXCAVATION. ANY DAMAGE TO UTILITIES WILL BE THE CONTRACTOR'S RESPONSIBILITY.
2. SEE TREE SURVEY-IMPACTED TREES PLANS FOR TREE SIZE & SPECIES INFORMATION.
3. PROPOSED DITCHES OUTFALL INTO EXISTING DITCHES OR DAYLIGHT INTO SLOPES. SEE SHEET 57
4. SEE CROSS SECTIONS FOR TRAIL EDGE CONDITIONS AND SLOPES.
5. SEE DETAIL ON SHEET 37 FOR FLARED PEDESTRIAN RAIL END TREATMENTS.
6. CONTRACTOR TO COORDINATE WITH THE CITY OF DALLAS TO FACILITATE PLANNED CONSTRUCTION OF FUTURE QUICK-TRIP SITE.
7. SEE SHEET 04 FOR TRAFFIC SIGNAL PLANS FOR THE COCKRELL HILL RD.



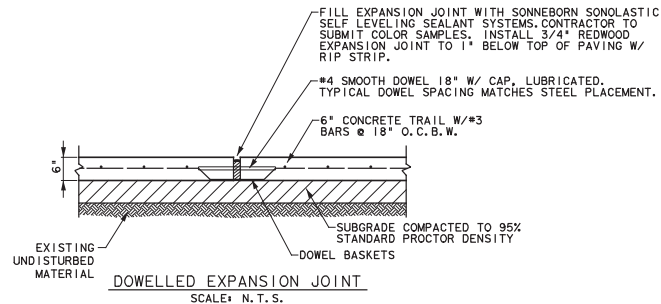
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		SCALE H: 1"=20' V: 1"=4'	
STATE OF TEXAS STEVEN B. HENIFORD 66257 REGISTERED PROFESSIONAL ENGINEER 08/28/2025 <i>Steven B. Heniford</i>			
NO.	REVISIONS	BY	DATE
AZ&B ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Coll Rd. Dallas, Texas 75251 (214) 341-0900 FIRM REGISTRATION No. F-10008  Texas Department of Transportation ©2025 by Texas Department of Transportation, all rights reserved			
CHALK HILL TRAIL			
CHALK HILL TRAIL PLAN AND PROFILE			
RIDGEPOINT DR. & SIDEWALK TRAIL TO STREET CONNS.			
© TxDOT			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	36	

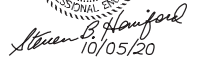


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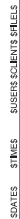
1. TRAIL PAVING TO HAVE A 1.5% CROSS SLOPE WITH DIRECTION OF SLOPE AS SHOWN ON THE PLANS.
2. TRAIL AND SHOULDERS TO HAVE A 10'-0" MIN. CLEARANCE ABOVE TRAIL. PRUNE ALL OVERHANGING TREE LIMBS TO MAINTAIN THIS CLEARANCE.
3. TRAIL PAVING TO BE ON A MAX. 5.00% LONGITUDINAL SLOPE.
4. TRAIL CONCRETE SHALL BE CLASS P AND HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI FOR MACHINE FINISH OR 4,500 PSI FOR HAND FINISH.
5. TRAIL CONCRETE TO HAVE A MEDIUM BROOM FINISH UNLESS OTHERWISE NOTED.
6. CONCRETE PAVING TO HAVE A MINIMUM THICKNESS OF 6" UNLESS OTHERWISE NOTED.
7. SUBGRADE COMPACTION REQUIREMENTS NOTED ARE A MINIMUM STANDARD. REFER TO GEOTECHNICAL REPORT BY STL ENGINEERS, INC. DATED FEBRUARY 2019.
8. ALL LOOSE SURFACE MATERIAL OR LOOSE MATERIAL ENCOUNTERED DURING SUBGRADE PREPARATION SHALL BE REMOVED.
9. THE CONTRACTOR SHALL PROOF ROLL THE SUBGRADE AS DIRECTED IN THE GEOTECHNICAL REPORT AND REPLACE ANY SOFT SUBGRADE WITH COMPACTED FILL TO 95% STANDARD PROCTOR DENSITY.

1. LOCATE DOWELED EXPANSION JOINTS ON MAXIMUM 100'-0" CENTERS.
2. THE MAXIMUM CONTROL JOINT SPACING SHALL BE THE WIDTH OF THE TRAIL OR AS SHOWN ON THE PLANS.
3. COMPACTION REQUIREMENTS NOTED ARE A MINIMUM STANDARD. REFER TO GEOTECHNICAL REPORT BY STL ENGINEERS, INC. DATED FEBRUARY 2019.



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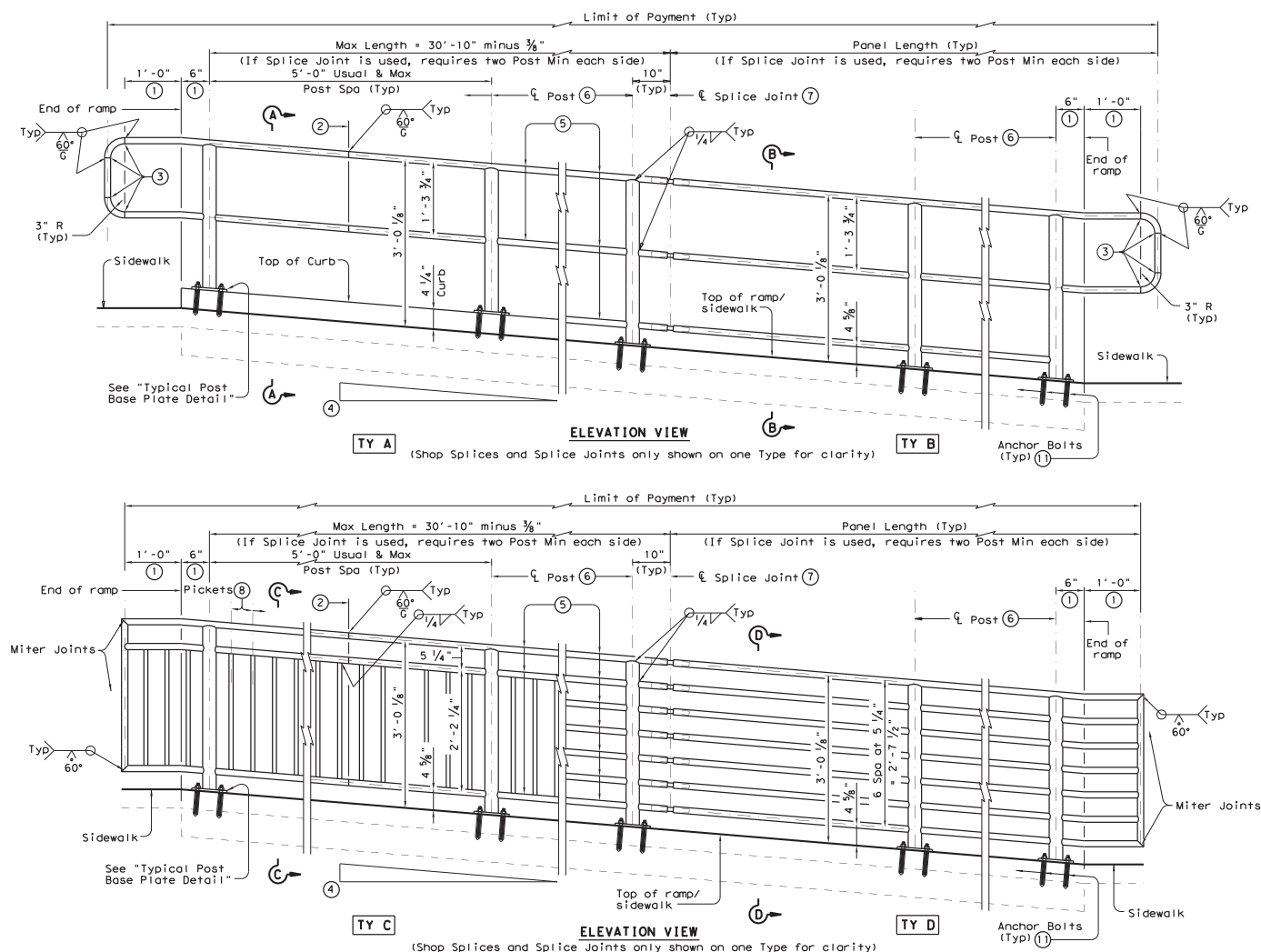
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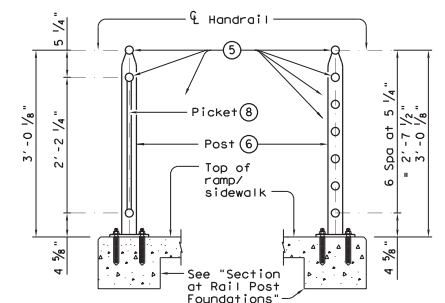
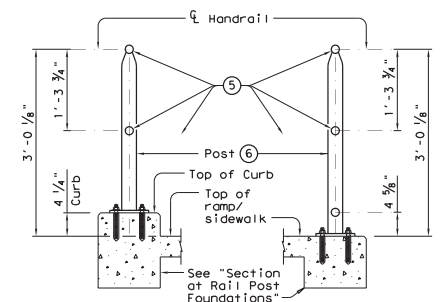
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: FILE:



- ① Parallel to ground.
- ② One shop splice per panel is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.
- ③ Shop splice is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.
- ④ See Ramp Details located elsewhere in plans for ramp slope and dimensions. Maximum ramp slope will not exceed 8.3 percent. Level landing required for each 30" rise if grade exceeds 5 percent.
- ⑤ 1 1/2" Dia. Standard Pipe (1.900" O.D., 0.145" wall thickness). Parallel to ramp / sidewalk. Provide holes as needed in 1 1/2" Dia. pipe for galvanizing drainage and venting.
- ⑥ 2 1/2" Dia. Standard Pipe (2.875" O.D., 0.203" wall thickness). See "Post Mount Detail" for crimping and trimming post to fit Dia. of top rail. Provide holes as needed in post for galvanizing drainage and venting. Plumb all posts.
- ⑦ See "Handrail Fabrication Details" for Splice Joints.
- ⑧ 1/2" Dia. Round Bar equal spacing at 4 1/2" Max. Plumb all pickets.
- ⑨ When needed for accessibility (grade > 5 percent) or as needed for pedestrian safety.
- ⑩ Not to be used on bridges.
- ⑪ See "General Notes" for anchor bolt information.

RECOMMENDED USAGE ⑨ ⑩	
Dropoff Height/Condition	Recommended Rail Options
< 30" dropoff	TY A, TY B, TY C, or TY D
≥ 30" dropoff, or along Bike Path	TY E or TY F



SHEET 1 OF 3

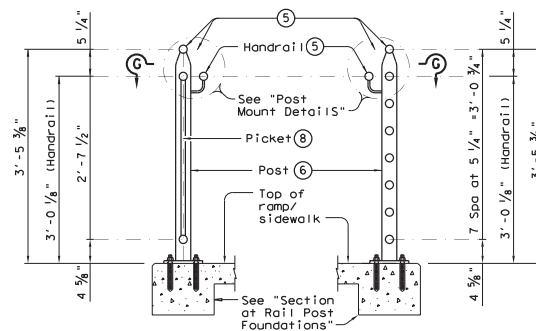
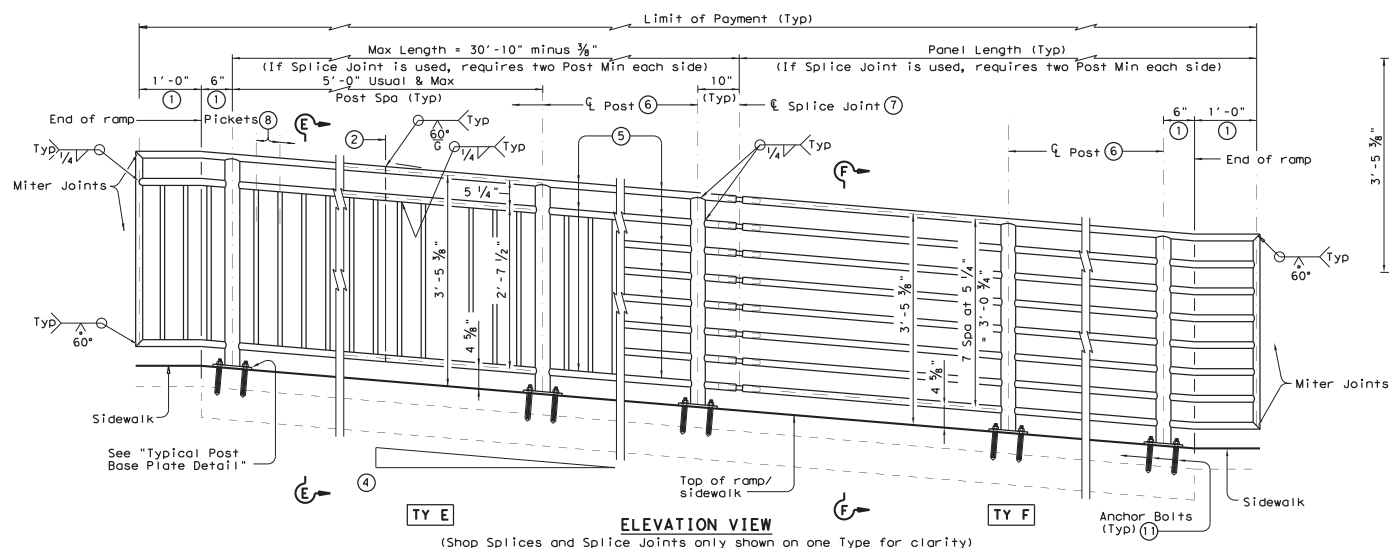


PEDESTRIAN HANDRAIL DETAILS PRD-13

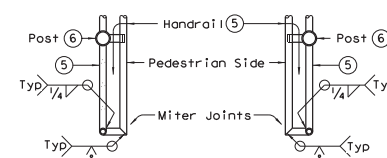
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© TxDOT December 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS	0918	47	472	VA
REVISED MAY, 2013 (VPI)	DIST	COUNTY	COUNTY	SHEET NO.
	DAL	DALLAS		39

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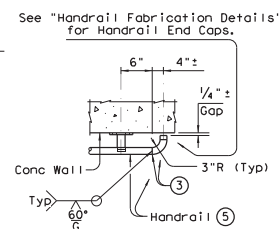
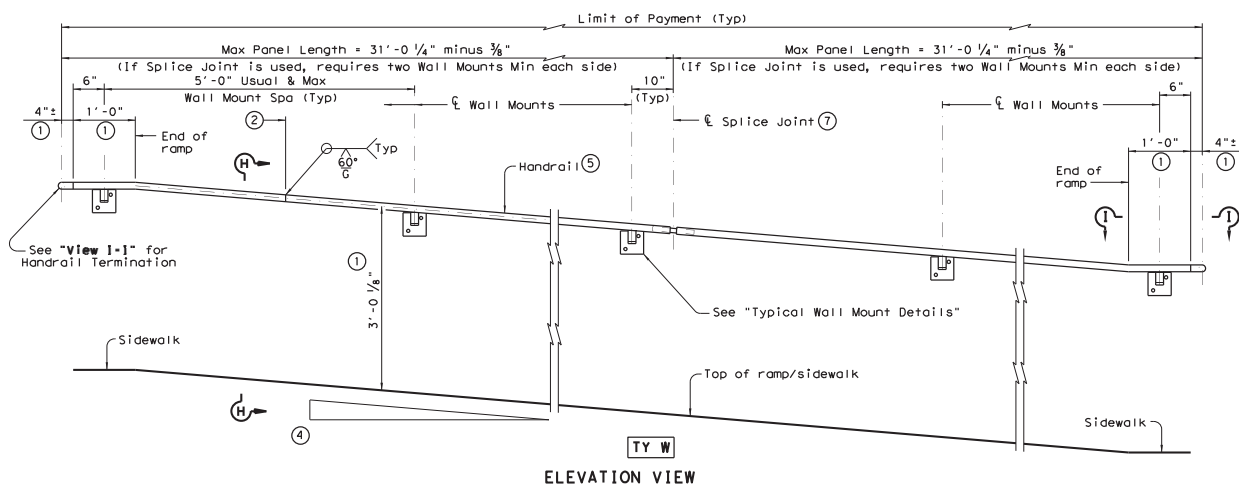
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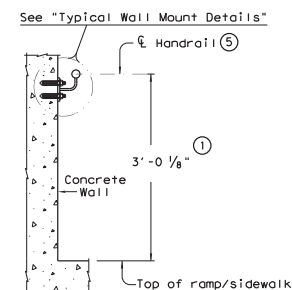
SECTION E-E (Showing Handrail TY E) SECTION F-F (Showing Handrail TY F)



SECTION G-G (Showing Handrail Termination)



VIEW I-1 (Showing Handrail Termination)



SECTION H-H (Showing Handrail TY W)

- ① Parallel to ground.
- ② One shop splice per panel is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.
- ③ Shop splice is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.
- ④ See Ramp Details located elsewhere in plans for ramp slope and dimensions. Maximum ramp slope will not exceed 8.3 percent. Level landing required for each 30" rise if grade exceeds 5 percent.
- ⑤ 1 1/2" Dia. Standard Pipe (1.900" O.D., 0.145" wall thickness). Parallel to ramp / sidewalk. Provide holes as needed in 1 1/2" Dia. pipe for galvanizing drainage and venting.
- ⑥ 2 1/2" Dia. Standard Pipe (2.875" O.D., 0.203" wall thickness). See "Post Mount Detail" for crimping and trimming post to fit Dia. of top rail. Provide holes as needed in post for galvanizing drainage and venting. Plumb all posts.
- ⑦ See "Handrail Fabrication Details" for Splice Joints.
- ⑧ 1/2" Dia. Round Bar equal spacing at 4 1/2" Max. Plumb all pickets.
- ⑪ See "General Notes" for anchor bolt information.

SHEET 2 OF 3

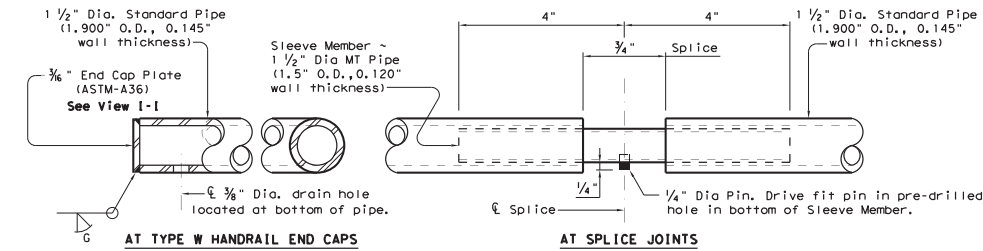


PEDESTRIAN HANDRAIL DETAILS PRD-13

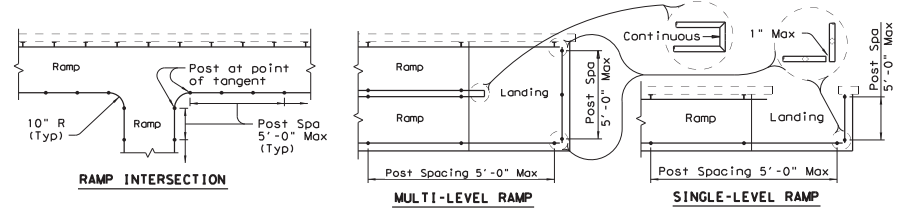
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© TxDOT December 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS	0918	47	472	VA
REVISED MAY, 2013 (VPI)	DIST	COUNTY	SHEET NO.	
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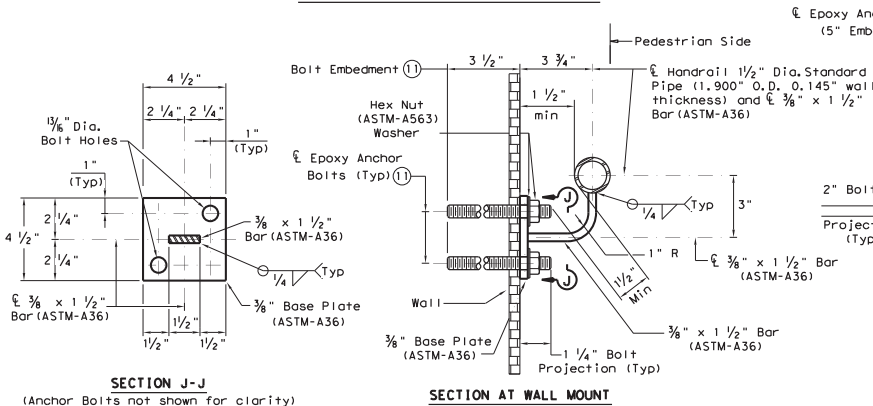
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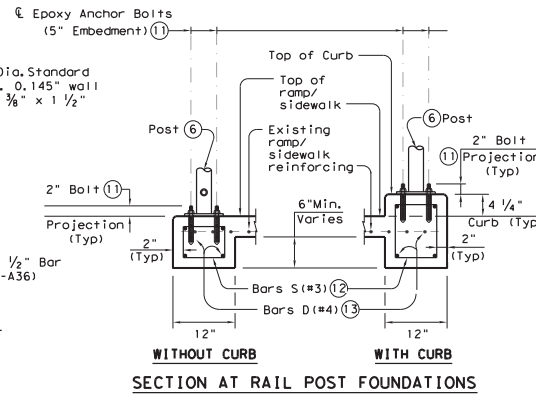
HANDRAIL FABRICATION DETAILS



PLAN SHOWING RAIL AT RAMP CONDITIONS

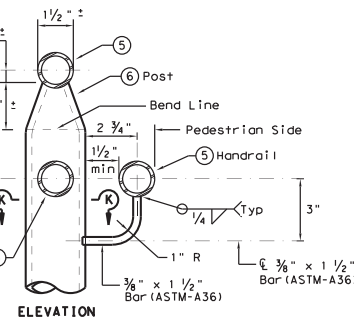
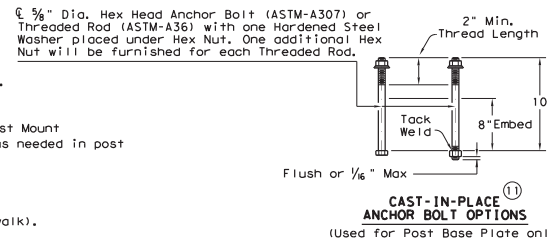


TYPICAL WALL MOUNT DETAILS

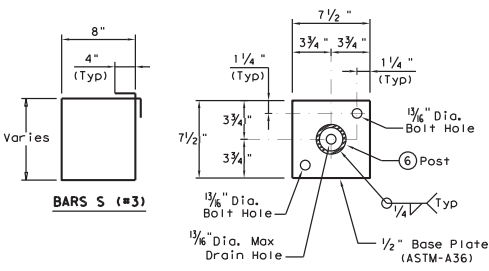


SECTION AT RAIL POST FOUNDATIONS

- (5) 1 1/2" Dia. Standard Pipe (1.900" O.D., 0.145" wall thickness). Parallel to ramp/sidewalk. Provide holes as needed in 1 1/2" Dia. pipe for galvanizing drainage and venting.
- (6) 2 1/2" Dia. Standard Pipe (2.875" O.D., 0.203" wall thickness). Plumb all posts. See "Post Mount Detail" for crimping and trimming post to fit the diameter of top rail. Provide holes as needed in post for galvanizing drainage and venting.
- (1) See "General Notes" for anchor bolt information.
- (2) Bars S (#3) spaced at 12" Max (Spaced 3" from outside edge of overall length of Ramp/Sidewalk).
- (3) Provide 1 1/2" end cover to Bars D (#4) from outside edge of overall length of Ramp/Sidewalk.



POST MOUNT DETAILS



TYPICAL POST BASE PLATE DETAIL

GENERAL NOTES

Designed according to ADAAG, Texas Accessibility Standards, Uniform Building Code, and AASHTO LRFD Specifications.

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

Pipe will conform to ASTM-A53 Grade B or A500 Grade B. Steel plates and steel bars will conform to ASTM-A36. Mechanical tubing (MT) will conform to ASTM A513 Grade 1015 or higher. Galvanize all steel components except reinforcing steel unless noted otherwise.

Concrete for foundations will be in accordance with Item 531 "Sidewalks". All reinforcing steel must be Grade 60. Bar laps, where required, will be as follows: Uncoated ~ #4 = 1'-5" Epoxy coated ~ #4 = 2'-1"

When the plans require painted steel, follow the requirements for painting galvanized steel in Item 446, "Cleaning and Painting Steel". Sleeve Members will receive galvanization and only get field painted after installation unless directed otherwise by Engineer.

Epoxy Anchor bolts for wall mount and post base plate will be 3/8" Dia. ASTM A36 threaded rods with one hex nut and one hardened steel washer at each bolt. 3/8" Dia. threaded rod embedment depth for wall mounts is 3 1/2" and embedment depth for post base plate is 5".

Embed threaded rods into concrete with a Type III (Class C) epoxy meeting the requirements of DMS-6100, "Epoxyes and Adhesives". Mix and dispense adhesive with the manufacturer's static mixing nozzle/dual cartridge system. Core drill holes (percussion drilling not permitted).

At the contractor's option the post base plate anchor bolts may be cast with the Ramp/Sidewalk (See Cast-in-Place Anchor Bolt Options).

Optional cast-in-place anchor bolts will be 3/8" Dia ASTM A307 Grade A bolts (or A36 threaded rods with one tack welded hex nut each) with one hex nut and one hardened steel washer at each bolt. Embedment depth of cast-in-place bolt will be 8" for post base plate.

Handrails and any wall or other surface adjacent to them will be free of any sharp or abrasive elements.

Submit shop drawings to the Engineer unless otherwise noted. For curved handrail applications, fabricate the handrail to the curve if radius is less than 600 ft. Shop drawings are required when rail is fabricated to the curve.

For all handrails, erection drawings will be submitted to the Engineer for approval to ensure proper installation.

Drawings will show handrail mount locations with bolts setting, spacing, ramp slope, and/or splice joint locations, and handrail lengths with identification showing where each handrail goes on the layout.

Payment for concrete sidewalks or curb ramps will be paid for in accordance with Item 531 "Sidewalks".

Payment for all items shown is to be included in unit price bid in accordance with Item 450 "Railing" of the type specified.

All exposed edges will be rounded or chamfered to approximately 1/8" by grinding.

SHEET 3 OF 3



PEDESTRIAN HANDRAIL DETAILS PRD-13

FILE: prd13.dgn	DN: TxDOT	CR: AM	DN: JTR	CR: CGL
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REVISIONS	0918	47	472	VA
REVISED MAY, 2013 (VPI)	DIST	COUNTY	SHEET NO.	
	DAL	DALLAS	41	

SP, TOPVMS

MODEL NAMES

SDATES STAMES SUBSETS SCIENTISTS SP, ELS

0 150 300 600
SCALE: 1"=300' (FULL SIZE)
1"=600' (HALF SIZE)



LEGEND

- DRAINAGE AREA NAME
XX
X.XX X.XX
C FACTOR
— DRAINAGE AREA (ACRES)
- FLOW ARROWS
— DRAINAGE AREA BOUNDARY



Steven B. Henford
08/28/2025

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CHALK HILL TRAIL OVERALL DRAINAGE AREA MAP			
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CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY		SHEET NO.
DAL	DALLAS		42

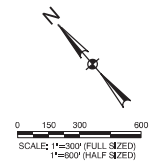
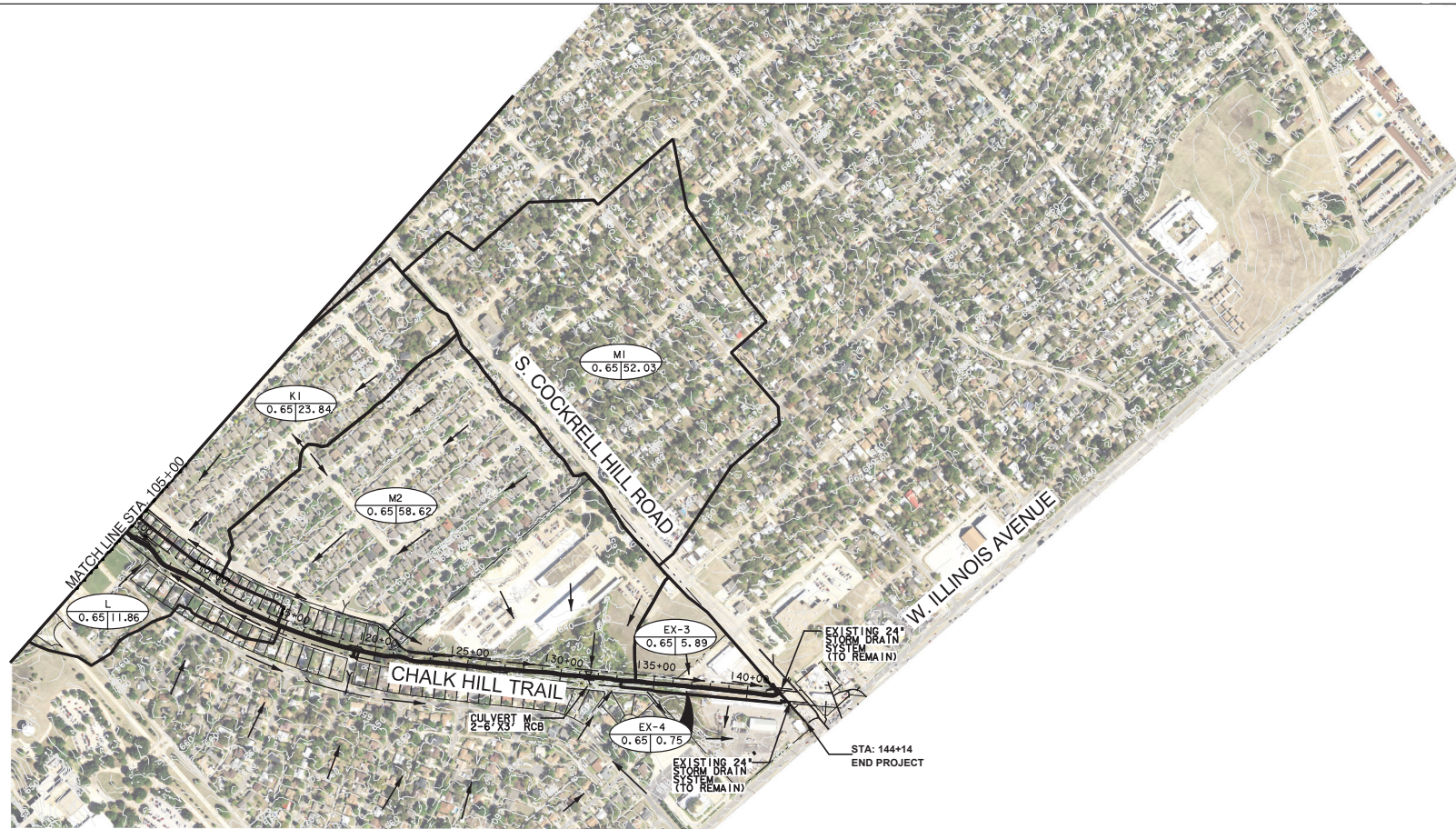
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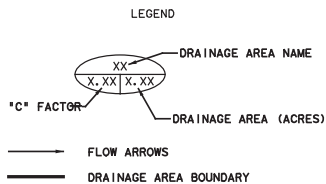
BRADEN.NAMES

BRADEN.SCHMIDTKE.SPILLS

SDATES STWAGES



STATE OF TEXAS
STEVEN B. HENFORD
66257
Professional Engineer
08/28/2025



RUNOFF COMPUTATIONS										
INLET	ACRES - DRAINED				TIME OF CONCENTRATION		10-YEAR INTENSITY (IN/HR)	100-YEAR INTENSITY (IN/HR)	10-YEAR FLOW (CFS)	100-YEAR FLOW (CFS)
	AREA (AC)	ZONING CLASS	COMPOSITE C	TOTAL CA	ACTUAL T _c (MIN)	T _c USED (MIN)				
K1	23.84	RESIDENTIAL	0.65	15.50	25.00	25.00	4.46	6.47	69.18	100.23
K2	12.23	RESIDENTIAL	0.65	7.93	20.00	20.00	5.04	7.31	39.94	57.99
K3	2.27	RESIDENTIAL	0.65	1.48	20.00	20.00	5.04	7.31	7.45	10.82
L1	2.34	RESIDENTIAL	0.65	1.52	15.00	15.00	5.61	8.16	8.53	12.40
L2	9.52	RESIDENTIAL	0.65	6.19	15.00	15.00	5.61	8.16	34.73	50.51
M1+M2	110.65	RESIDENTIAL/LT. INDUST.	0.65	71.92	30.00	30.00	3.89	5.62	279.77	404.19
P1	5.89	LIGHT INDUSTRIAL	0.90	5.30	15.00	15.00	5.61	8.16	29.73	43.25
P2	0.75	TRAIL	0.65	0.55	10.00	10.00	6.78	9.88	3.73	5.43

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Texas Department of Transportation ©2025 by Texas Department of Transportation; all rights reserved.			
CHALK HILL TRAIL OVERALL DRAINAGE AREA MAP			
© TXDOT SHEET 2 OF 2			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	43	

FILED DATE SIGNED

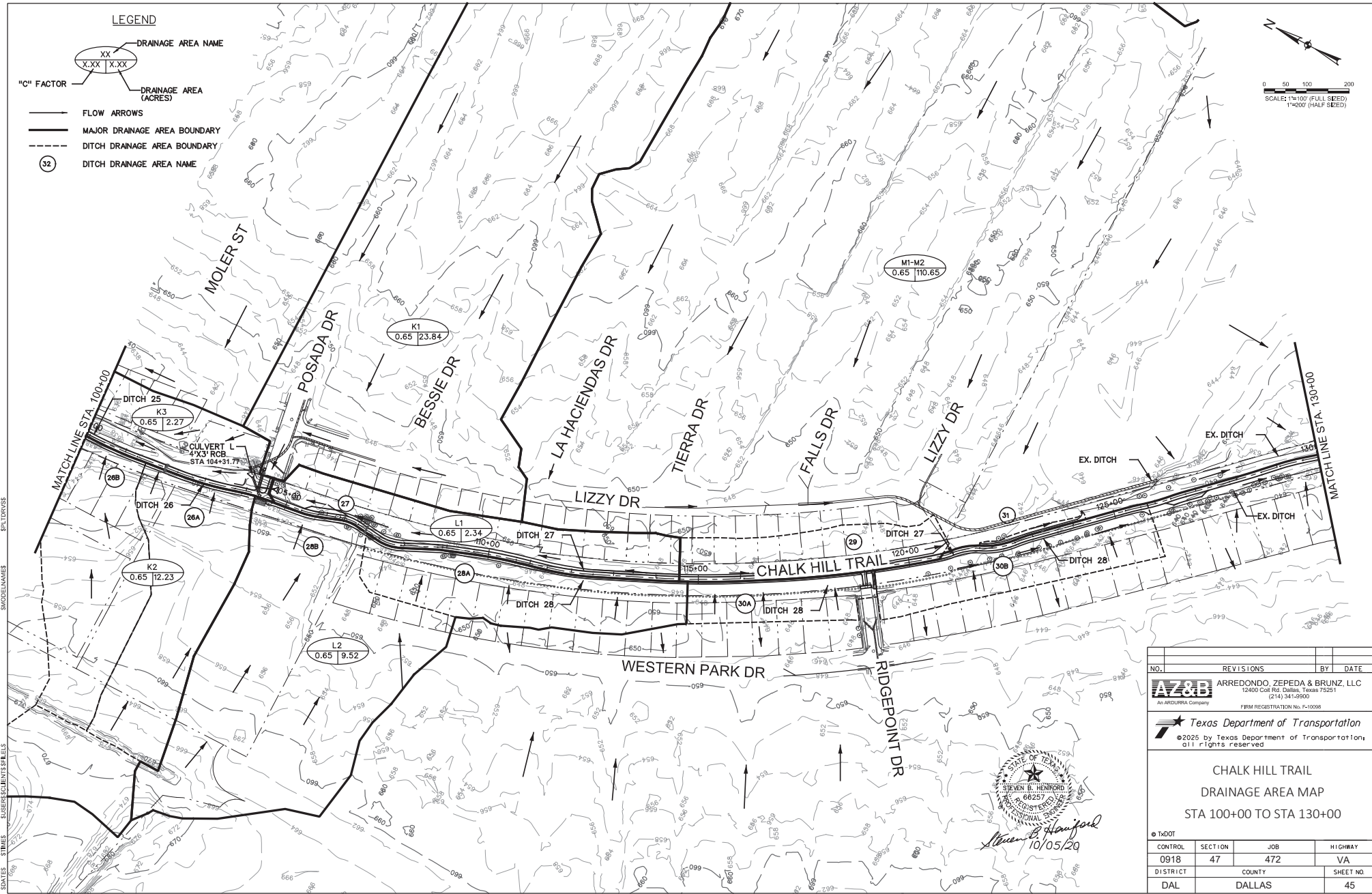


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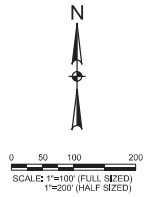
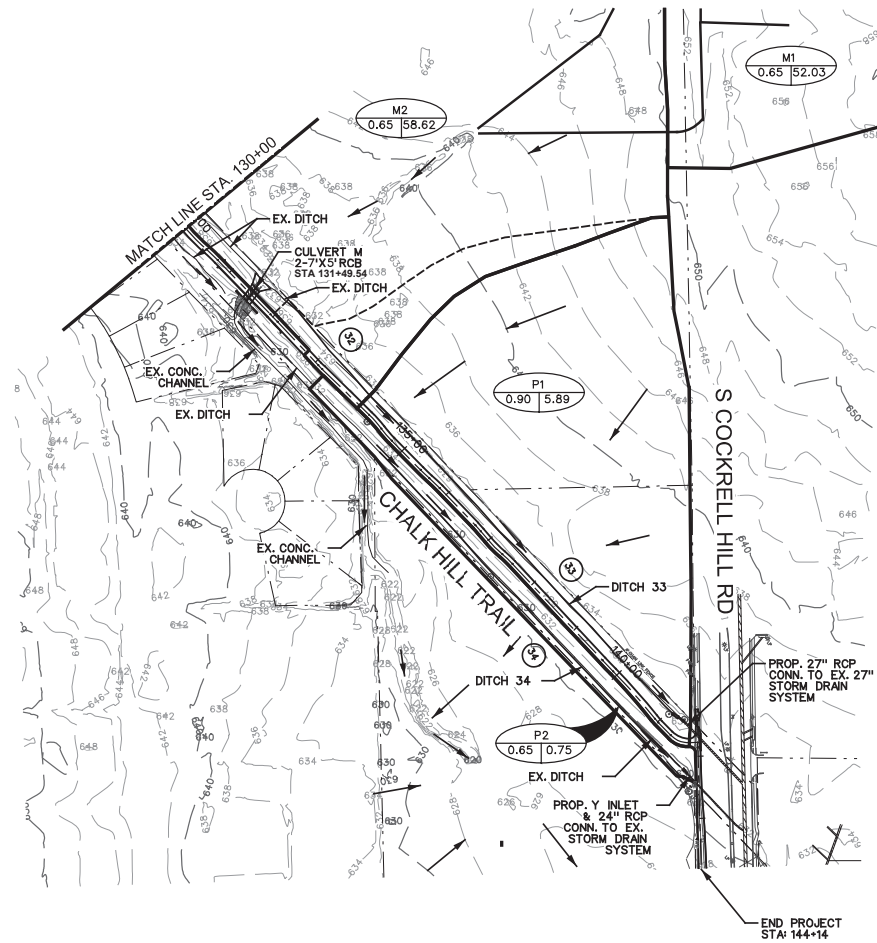
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 MAJOR DRAINAGE AREA BOUNDARY
 DITCH DRAINAGE AREA BOUNDARY
 DITCH DRAINAGE AREA NAME
 DRAINAGE AREA NAME
 DRAINAGE AREA (ACRES)
 C FACTOR



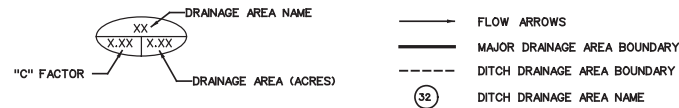
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CHALK HILL TRAIL DRAINAGE AREA MAP STA 97+50 TO STA 100+00			
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CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	44	



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CHALK HILL TRAIL DRAINAGE AREA MAP STA 100+00 TO STA 130+00			
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CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	45	



LEGEND



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© TxDOT			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	46	

CULVERT K DATA

CULVERT SUMMARY

Barrel Shape: Box Manning's n Value: 0.013
 Barrel Diameter: 5' x 3' Culvert Type: Straight
 Barrel Material: Concrete Number of Barrels: 2
 Upstream Elevation: 627.90 Downstream Elevation: 627.15
 Trail Elevation: 633.00 Culvert Length: 37.66 feet
 Culvert Slope: 1.99% $Q_{100} = 155.76$ cfs
 Max. Capacity: 533.61 cfs

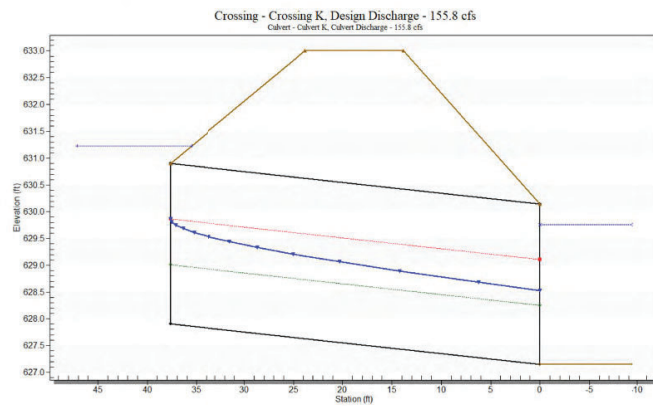


Table 2 - Culvert Summary Table: Culvert K

Discharge Names	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)
10-Year	116.7	112.14	630.51	2.63	1.80	1-S2n	0.89	1.57	1.07	2.18	10.43	3.57
100-Year	160.8	155.76	631.21	3.33	2.57	5-S2n	1.11	1.96	1.38	2.61	11.28	3.93

CULVERT L DATA

CULVERT SUMMARY

Barrel Shape: Box Manning's n Value: 0.013
 Barrel Diameter: 4' x 3' Culvert Type: Straight
 Barrel Material: Concrete Number of Barrels: 1
 Upstream Elevation: 636.50 Downstream Elevation: 636.20
 Trail Elevation: 640.50 Culvert Length: 58.86 feet
 Culvert Slope: 0.51% $Q_{100} = 58.28$ cfs
 Max. Capacity: 88.63 cfs

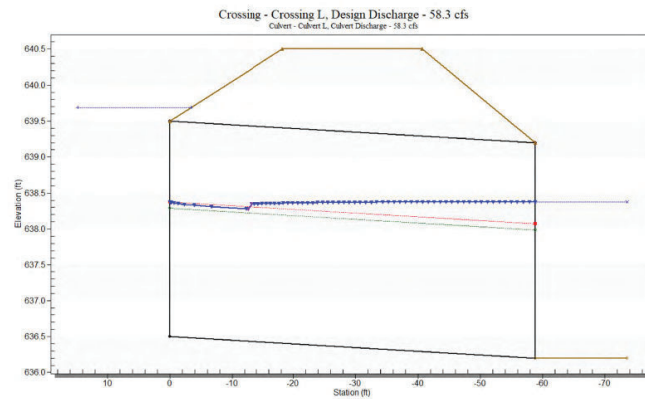


Table 2 - Culvert Summary Table: Culvert L

Discharge Names	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)
10-Year	43.25	42.55	639.06	2.56	1.91	1-JS11	1.42	1.52	1.85	1.85	5.75	2.37
100-Year	62.91	58.28	639.69	3.19	2.56	5-JS11	1.79	1.88	2.18	2.18	6.69	2.59



Steven B. Heniford
 08/28/2025

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CHALK HILL TRAIL
 CULVERT CALCULATIONS
 CULVERT K & CULVERT L

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CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	47	

0.0115 0.0115 0.0115 0.0115

CULVERT M DATA

CULVERT SUMMARY

Barrel Shape: Box

Barrel Diameter: 7' x5'

Barrel Material: Concrete

Upstream Elevation: 629.25

Trail Elevation: 637.00

Culvert Slope: 4.46%

Max. Capacity: 2980.75 cfs

Manning's n Value: 0.013

Culvert Type: Straight

Number of Barrels: 2

Downstream Elevation: 629.25

Culvert Length: 28.00 feet

Q₁₀₀ = 417.15 cfs

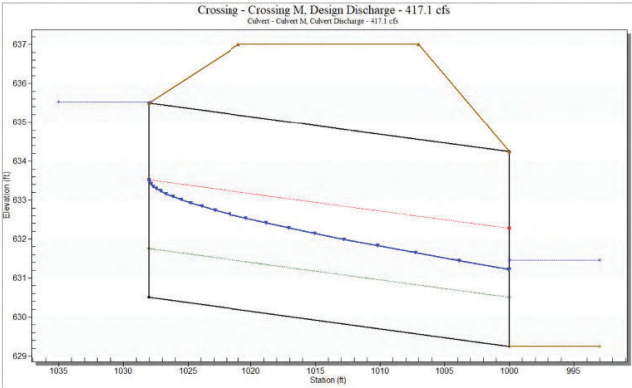


Table 2 - Culvert Summary Table: Culvert M

Discharge Names	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)
10-Year	279.77	294.88	634.45	3.35	1.58	1-S2n	0.99	2.40	1.50	1.82	14.06	10.39
100-Year	404.19	417.15	635.52	5.32	2.64	5-S2n	1.25	3.02	1.97	2.20	15.12	11.54



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AZ&B ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Coit Rd. Dallas, Texas 75251 (214) 341-3900 An ARDURRA Company FIRM REGISTRATION No. F-10098 Texas Department of Transportation ©2025 by Texas Department of Transportation, all rights reserved CHALK HILL TRAIL CULVERT CALCULATIONS CULVERT M © TxDOT <table><tr><td>CONTROL</td><td>SECTION</td><td>JOB</td><td>HIGHWAY</td></tr><tr><td>0918</td><td>47</td><td>472</td><td>VA</td></tr><tr><td>DISTRICT</td><td>COUNTY</td><td colspan="2">SHEET NO.</td></tr><tr><td>DAL</td><td>DALLAS</td><td colspan="2">48</td></tr></table>				CONTROL	SECTION	JOB	HIGHWAY	0918	47	472	VA	DISTRICT	COUNTY	SHEET NO.		DAL	DALLAS	48	
CONTROL	SECTION	JOB	HIGHWAY																
0918	47	472	VA																
DISTRICT	COUNTY	SHEET NO.																	
DAL	DALLAS	48																	

AREA INLET CALCULATIONS

Inlet		Type	Drainage Area				10-year Rainfall				100-year Rainfall							Orifice Control				Weir Control					
No.	Station		No.	Area (acres)	Runoff (cfs)	Conc. Time (min)	Intensity (in/hr)	Runoff (cfs)	Offsite Flow (cfs)	Total 10-year Runoff (cfs)	Intensity (in/hr)	Runoff (cfs)	Offsite Flow (cfs)	Total 100-year Runoff (cfs)	Design Flood (Years)	Design Flow (cfs)	Average Depth (ft)	Orifice Coefficient	Area of Opening (sf)	Inlet Capacity (cfs)	1/2 Inlet Capacity (cfs)	Weir Coefficient	Perimeter of Grate (ft)	Inlet Capacity (cfs)	3/4 Inlet Capacity (cfs)	Controlling Capacity (cfs)	Comments
P2	142+31.03	Type Y Inlet	34	0.75	0.40	10	6.49	1.95	0.00	1.95	8.88	2.66	0.00	2.66	10	1.95	0.83	0.67	6.00	24.52	12.26	3.00	10.00	22.82	17.11	12.26	To Type Y Inlet

STORM DRAIN HGL CALCULATIONS

Downstream Location From	Upstream Location (Design Point) To	Pipe Length	Drainage Area		Total Drainage Area "A"	Runoff Coefficient "C"	Incremental "CA"	Total "CA"	Time of Concentration				10-Year Intensity	100-Year Intensity	Q10 Runoff	Q100 Runoff	Inlet Bypass	Q Pipe	Design Conduit		Friction Loss		HGL		Headloss Calculations								Invert Elevation		Comments			
			Area No.	Drainage Area					Inlet Time	Travel Time In Conduit	Time Of Concentration	No. Of Conduits							Span (Box Culvert)	Pipe Diameter (Culvert Rise)	Manning's n	Friction Slope "S"	Friction Loss	Downstream HGL Elevation	Upstream HGL Elevation	Upstream Velocity(V) (V)	Downstream Velocity (V)	Upstream Velocity Head V/2g	Downstream Velocity Head V/2g	Minor Loss Coefficient K _f	K _f /2g	Total Minor Loss	Design Point Hgl Elevation	Downstream Pipe Flowline		Upstream Pipe Flowline	Upstream Ground Elev (Top of Curb)	Elev. Diff Ground-HGL
sta	sta	ft		acres	acres				min	min	min	in/hr	in/hr	cfs	cfs	cfs	cfs	ft	ft	ft	ft	ft	ft	ft/sec	ft/sec	ft	ft	ft	ft	ft	ft	ft	ft	ft	ft	ft		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19a	19b	20	21	21b	22	23	24	25	26	27	28	29	30	31	32	33	34	35		
STORM DRAIN LINES P1 & P2																																						
1+12.00	1+00.00	12.0	P1	5.89	5.89	0.90	5.30	5.30	15	0.00	15.00	5.52	7.56	29.3	40.1	-	40.1	1	-	27	0.013	0.0143	0.170	629.75	629.92	0.00	10.08	0.00	1.58	1.25	1.98	1.98	631.90	627.50	629.55	632.30	2.75	Type Y Inlet
1+06.00	1+00.00	6.0	P2	0.75	0.75	0.40	0.30	0.30	10	0.00	10.00	6.49	8.88	1.95	2.66	-	2.66	1	-	21	0.013	0.0002	0.001	627.17	627.17	0.00	1.11	0.00	0.02	1.25	0.03	0.03	627.20	625.42	625.90	628.40	2.70	Type Y Inlet



NO.

REVISIONS

BY

DATE

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12400 Coll Rd, Dallas, Texas 75251
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CHALK HILL TRAIL
HYDRAULIC CALCULATIONS
AREA INLETS AND STORM DRAINS

© TxDOT

CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	49	

DITCH CALCULATIONS																		
Ditch No.	West or East	Downstream Station	Upstream Station	Drainage Area (acres)	Zoning Class	"c"	Tc (min)	i (10 year) (in/hr)	q (10 year) (cfs)	Channel Slope (ft/ft)	Manning's Coefficient (n)	Bottom Width (ft)	Left Slope	Right Slope	Flow Depth (10 year) (ft)	Flow Velocity in Ditch (10 Year) (fps)	Design Ditch Depth (ft)	Freeboard (ft)
25A	West	97+50	98+00	3.40	Residential	0.65	15	5.52	12.19	0.0272	0.03	0	4:1	4:1	0.83	4.45	0.86	0.03
26A	West	101+50	104+09.10	3.07	Residential	0.65	15	5.52	11.35	0.0146	0.03	0	4:1	4:1	0.74	5.18	1.16	0.42
26B	West	98+31.30	101+50	6.53	Residential	0.65	15	5.52	23.88	0.0100	0.03	0	4:1	4:1	1.05	5.41	1.16	0.11
27	West	104+52.90	114+59	2.34	Residential	0.65	15	5.52	8.55	0.0124	0.03	0	4:1	4:1	0.84	3.03	1.48	0.64
28A	East	107+00	114+55	2.36	Residential	0.65	15	5.52	8.49	0.0058	0.03	0	4:1	4:1	0.97	2.28	1.48	0.51
28B	East	105+92	107+00	9.52	Residential	0.65	15	5.52	34.18	0.0168	0.03	0	4:1	4:1	1.33	4.80	1.48	0.15
29	East	121+70	114+55	1.49	Residential	0.65	15	5.52	5.34	0.0032	0.03	0	4:1	4:1	0.85	1.61	1.06	0.15
30A	West	119+16.76	114+75	1.00	Residential	0.65	10	6.48	4.22	0.0050	0.03	0	4:1	4:1	0.76	1.81	0.86	0.10
30B	West	126+14	119+16.76	2.88	Residential	0.65	15	5.52	10.33	0.0052	0.03	0	4:1	4:1	1.06	2.29	1.06	0.00
31	East	124+30.30	121+70.00	0.07	Trail	0.40	10	6.48	5.52	0.0050	0.03	0	4:1	4:1	0.23	1.93	1.06	0.22
32	East	132+01.60	134+00	0.88	Light Industrial	0.90	15	5.52	4.37	0.0033	0.03	0	4:1	4:1	0.84	1.56	2.24	1.40
33	East	132+01.60	134+00	5.89	Light Industrial	0.90	15	5.52	29.25	0.0030	0.03	0	4:1	4:1	1.74	2.42	2.98	1.24
34	West	141+52.84	134+75	0.75	Trail	0.40	10	6.48	1.95	0.0030	0.03	0	4:1	4:1	0.63	1.23	3.19	2.56



Steven B. Henneford
08/28/2025

NO.	REVISIONS	BY	DATE
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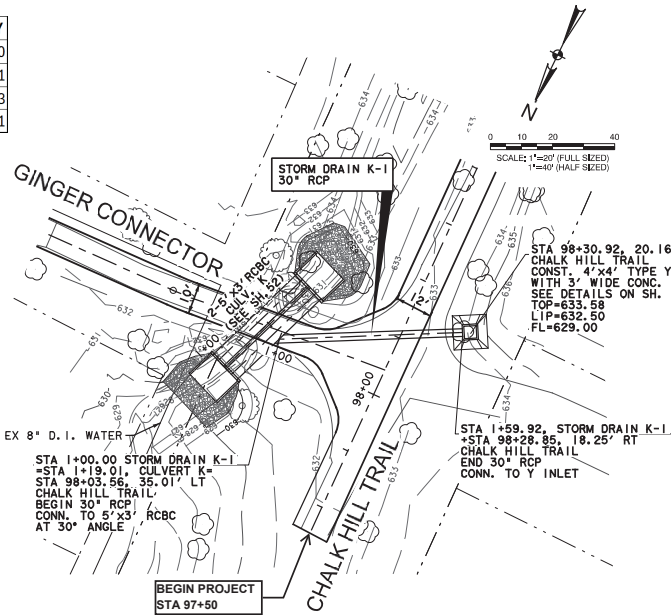
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12400 Coll Rd, Dallas, Texas 75251
(214) 341-0900
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FIRM REGISTRATION No. F-10098

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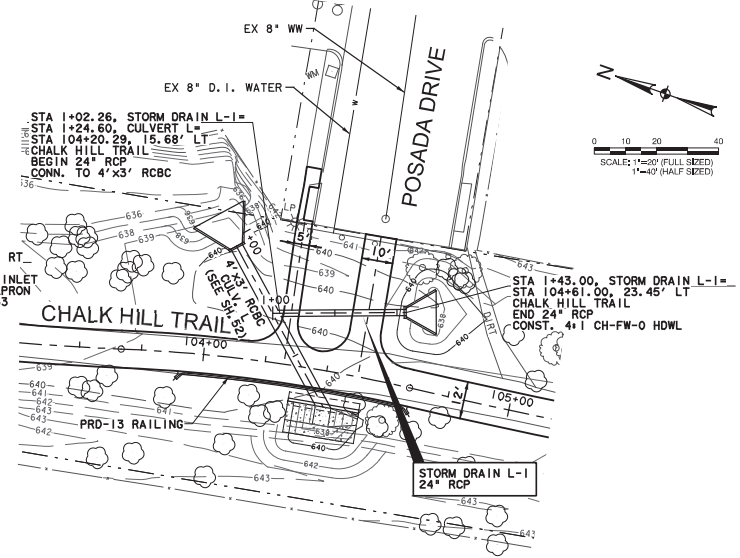
CHALK HILL TRAIL
HYDRAULIC CALCULATIONS
DITCHES, FLUMES & CHANNELS

© TxDOT			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	50	

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
464-7007	RC PIPE (CL III) (30 IN)	LF	60
465-7346	INLET(COMPL) (DROP)	EA	1
464-7005	RC PIPE (CL III) (24 IN)	LF	43
466-7005	HEADWALL (CH-FW-0) (DIA=24 IN)	EA	1



STORM DRAIN K-1



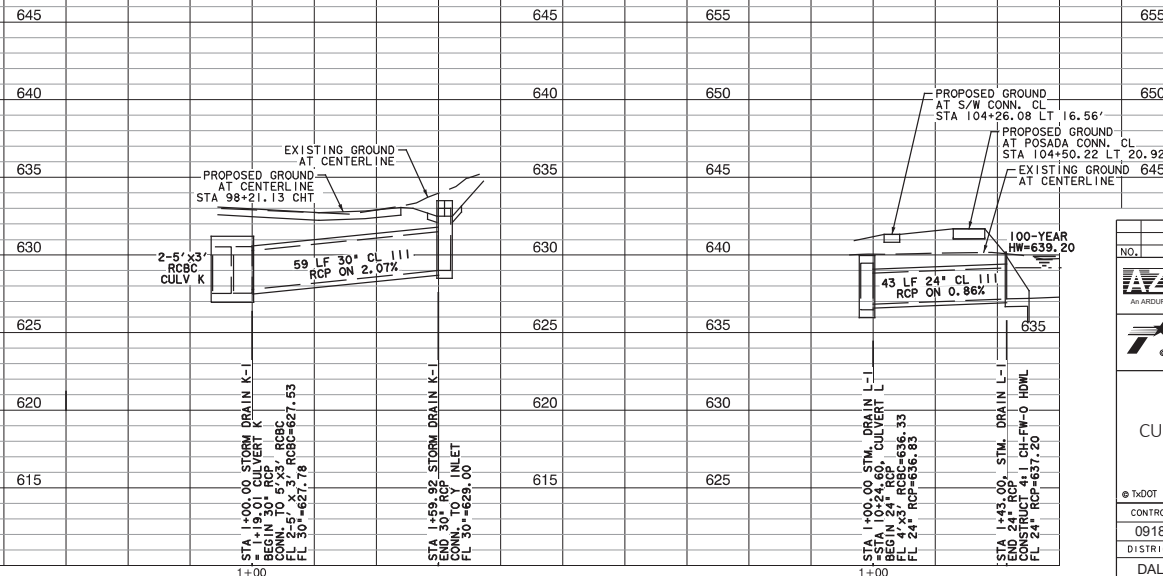
STORM DRAIN L-1

SPL TOWNS

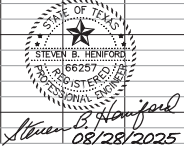
MODEL NAMES

SUBSHEET SHEETS

STATES STAGES



SCALE
H=1"=20'
V=1"=4'



NO.	REVISIONS	BY	DATE
1	REVISED	AR	08/28/2025

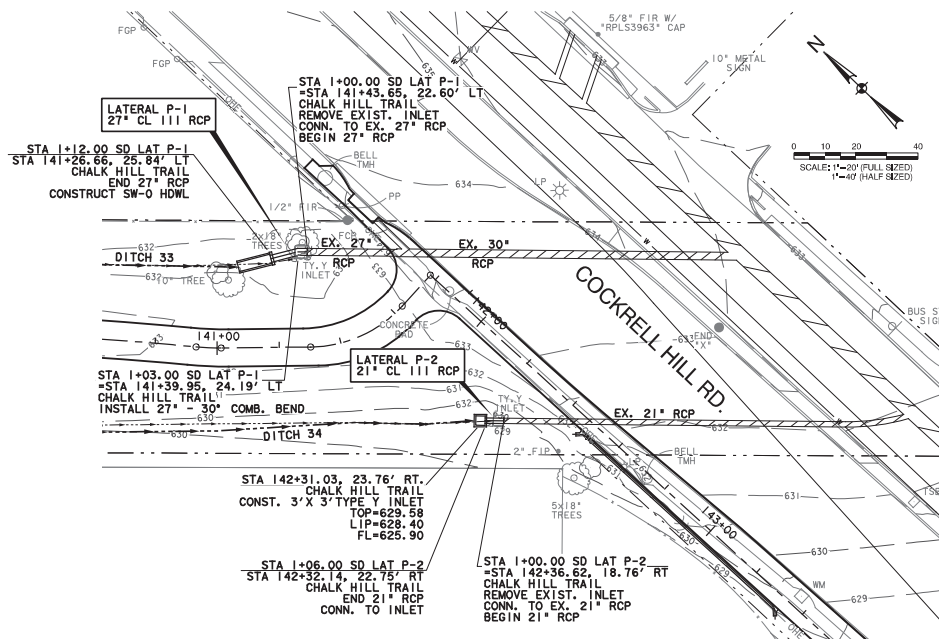
AZ&B ARREDONDO, ZEPEDA & BRUNZ, LLC
12400 Coit Rd, Dallas, Texas 75251
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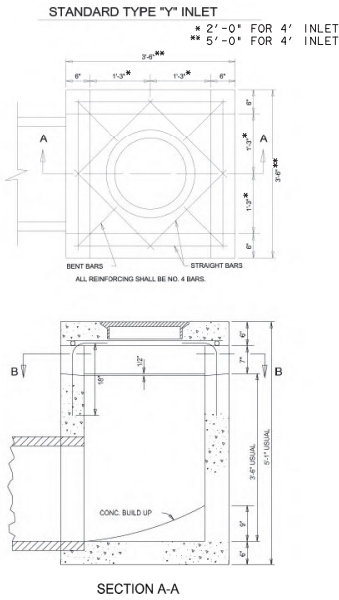
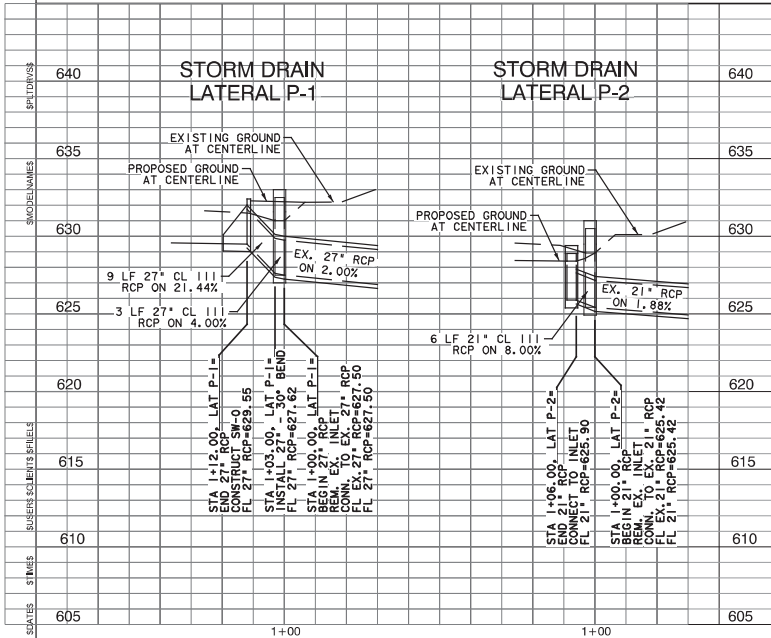
**CHALK HILL TRAIL
CULVERT & STORM DRAIN PLAN &
PROFILE
STORM DRAINS L-1 & K-1**

CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	51	

PLLS BILLS 1/2025



STORM DRAIN LATERALS P-1 & P-2

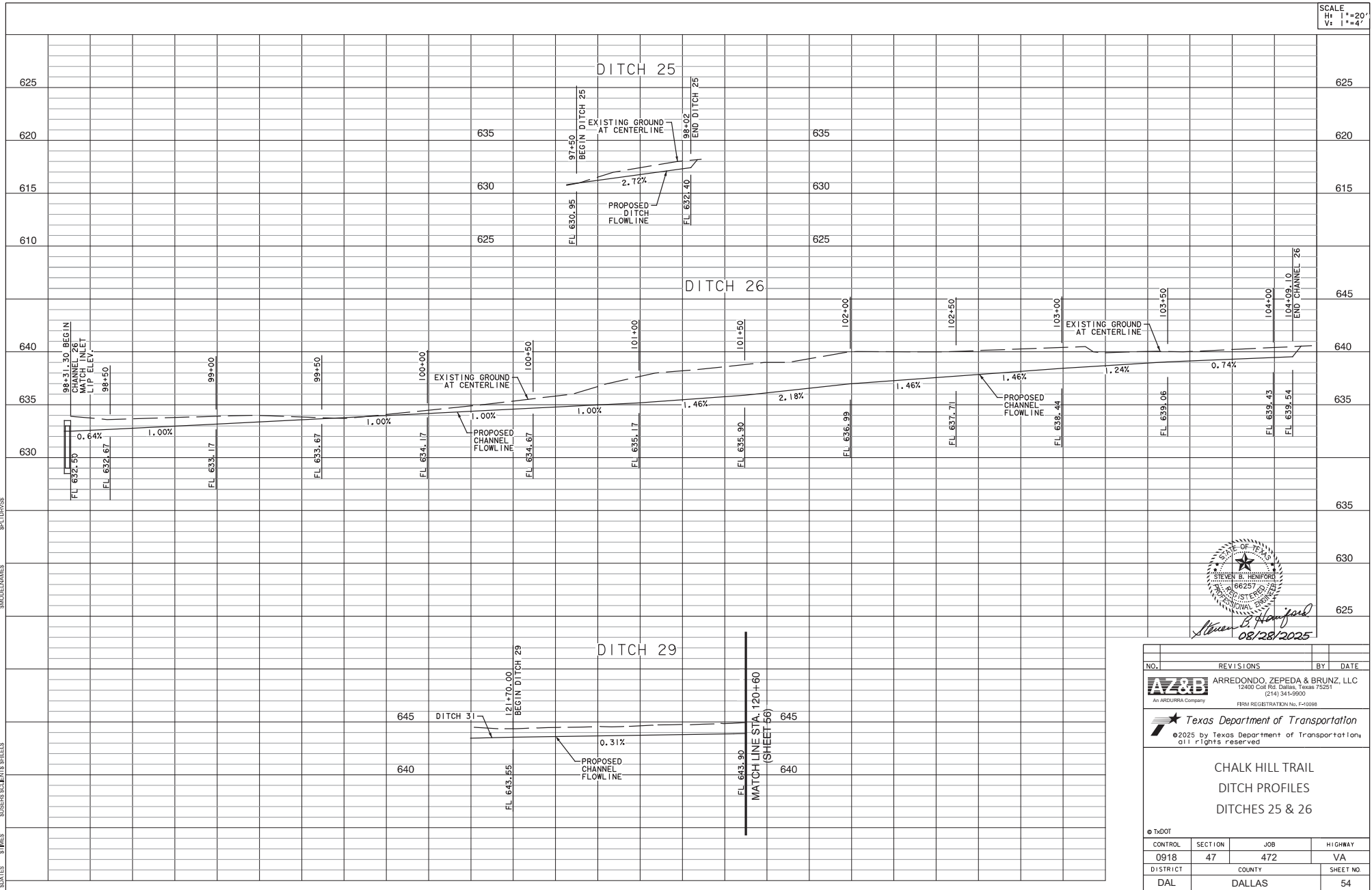
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SP1.TDR.VSS

MODEL NAMES

SUBSHEET SCHEMATIC SP1ELS

STATES STWES

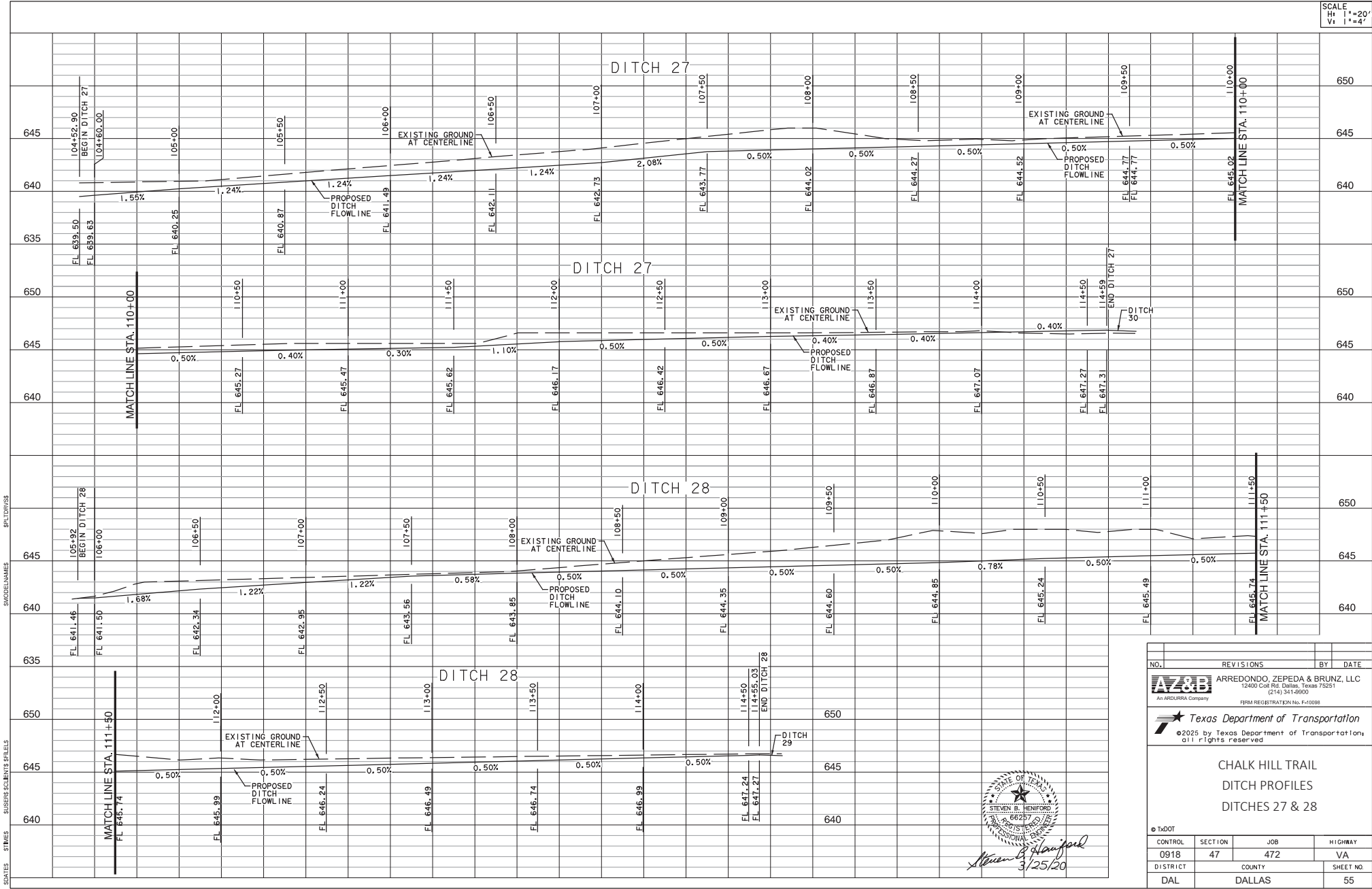


SCALE
H: 1"=20'
V: 1"=4'



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CHALK HILL TRAIL DITCH PROFILES DITCHES 25 & 26			
© TXDOT			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	54	

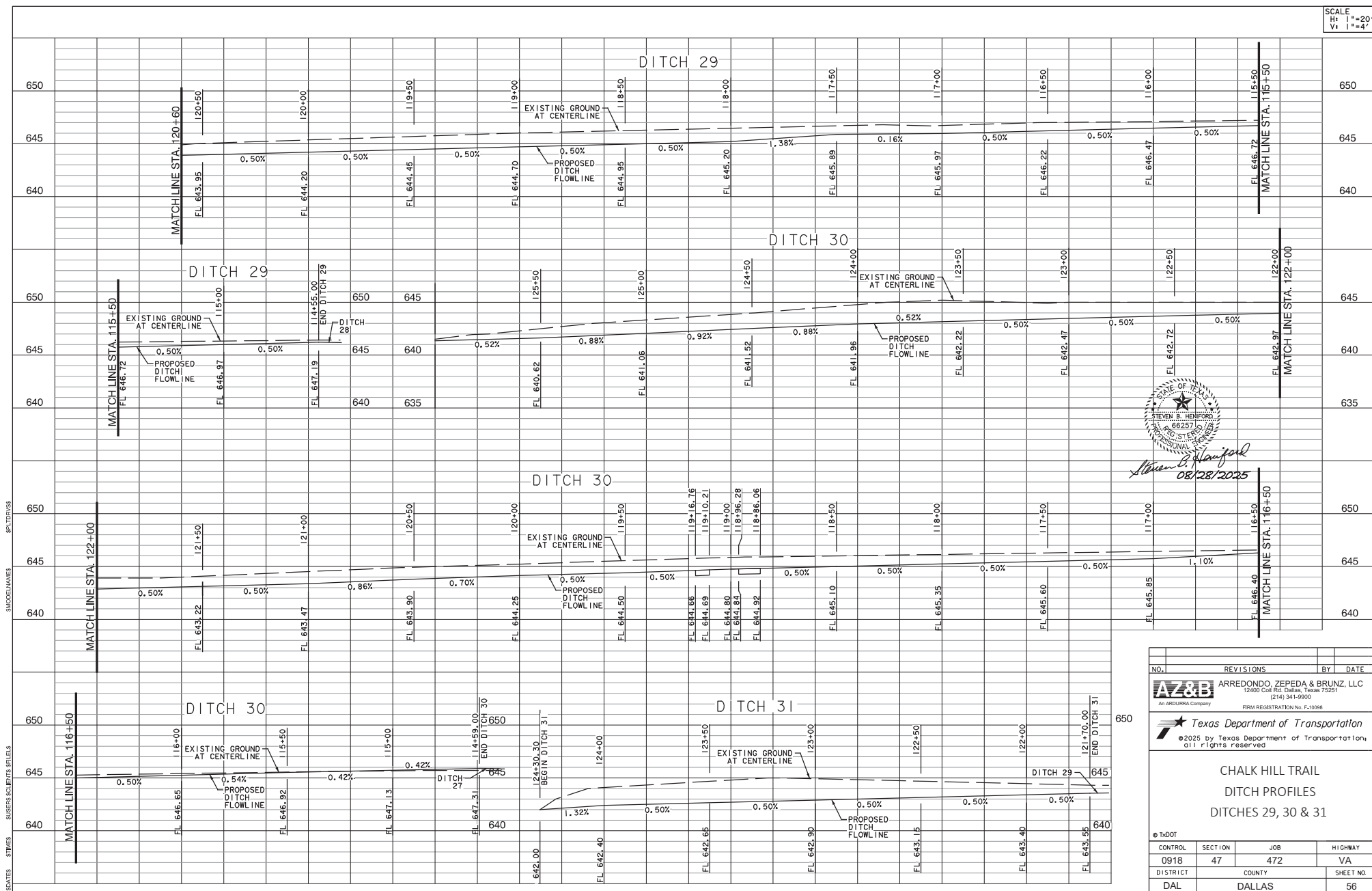
FILED DATE SIGNED



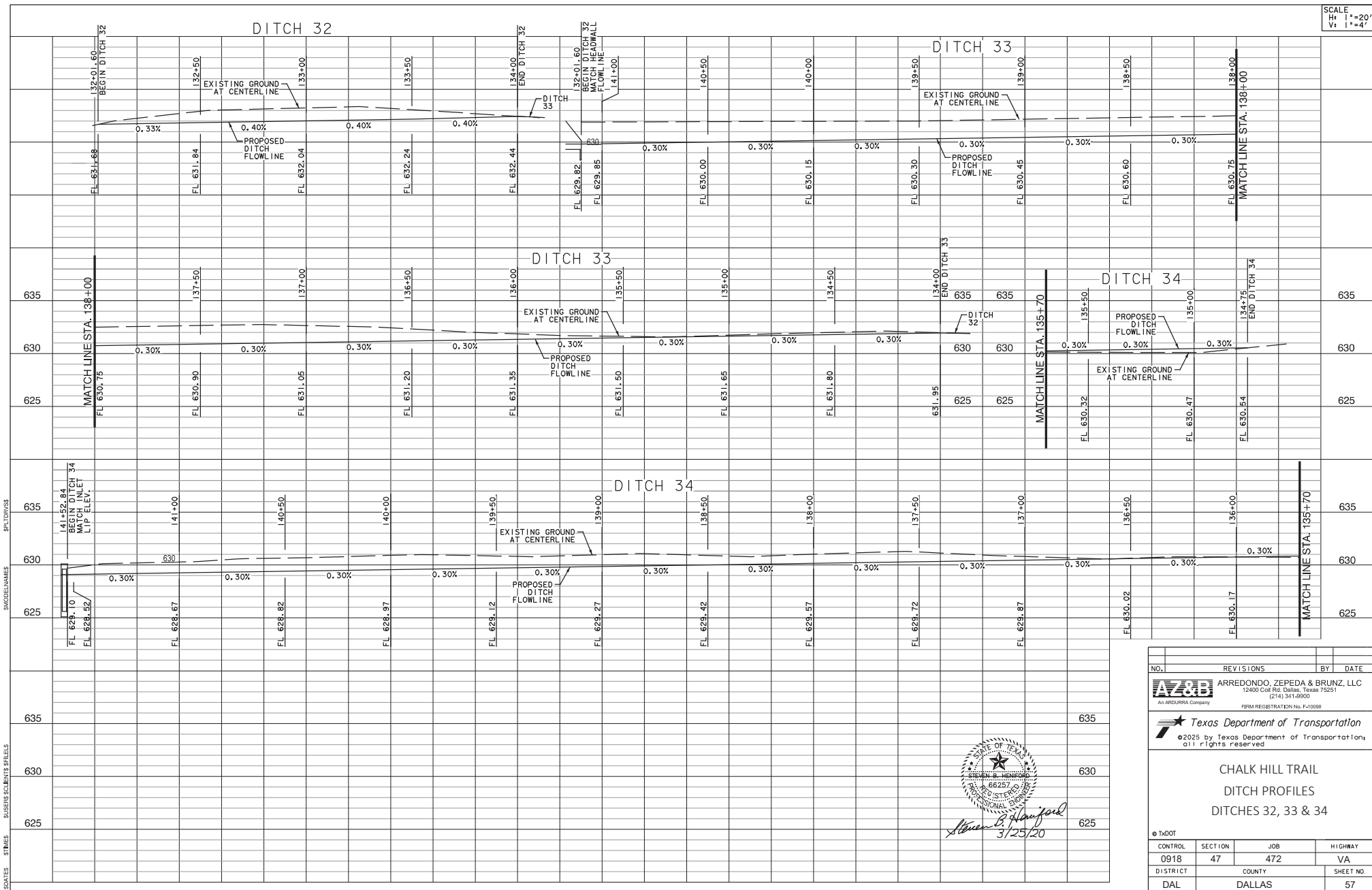
SCALE
H: 1"=20'
V: 1"=4'

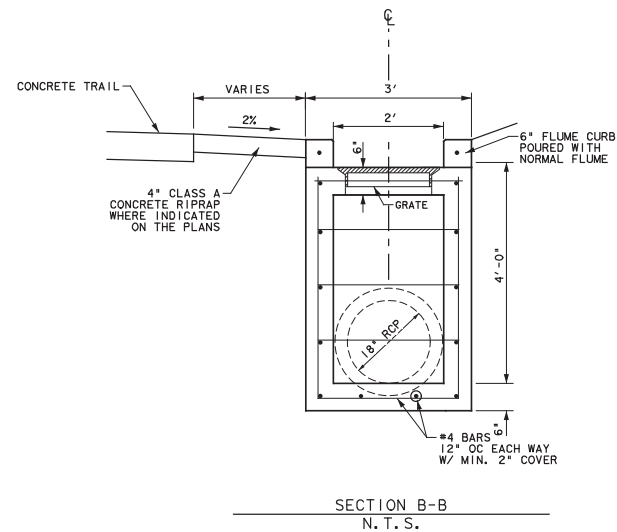
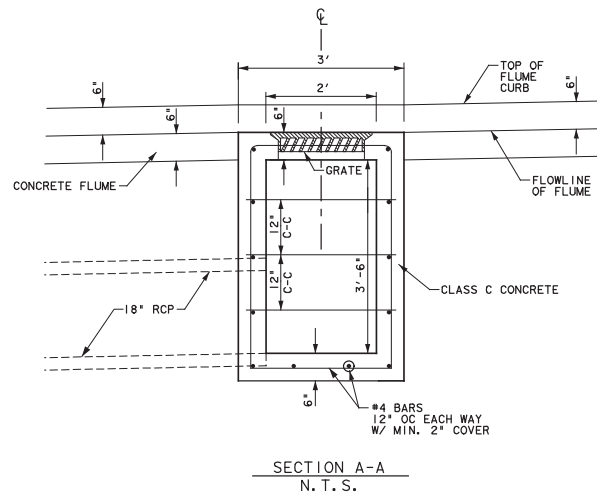
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CHALK HILL TRAIL DITCH PROFILES DITCHES 27 & 28			
© TxDOT			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	55	

STEVEN B. HENIFORD
REGISTERED PROFESSIONAL ENGINEER
No. 66257
EXPIRATION DATE 03/25/2025
3/25/20



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CHALK HILL TRAIL DITCH PROFILES DITCHES 29, 30 & 31			
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CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY		SHEET NO.
DAL	DALLAS		56





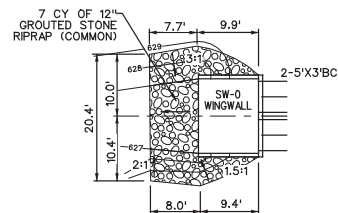
INLET NOTES:

1. ALL REINFORCING SHALL BE #4 BARS.
2. USE CITY OF DALLAS STANDARD TYPE L GRATE & FRAME PER 2510 PAGE 9010 (22" X 22" FRAME)
3. CONCRETE FOR CAST-IN-PLACE INLET CONSTRUCTION SHALL BE CLASS C (3600 PSI). CONCRETE FOR PRECAST INLETS SHALL BE CLASS H (5000 PSI).
4. STRUCTURAL EXCAVATION WILL NOT BE A SEPARATE PAY ITEM.
5. CHAMFER ALL EXPOSED EDGES AROUND INLET OPENINGS.
6. ALTERNATE CONSTRUCTION - ALTERNATE PRECAST INLETS MAY BE APPROVED ON AN INDIVIDUAL BASIS. PRECAST INLETS SHALL BE OF EQUAL STRENGTH MATERIAL AND WORKMANSHIP AND SHALL MEET THE STANDARD DESIGN CRITERIA OF THE CAST-IN-PLACE INLET SHOWN IN THIS DETAIL.

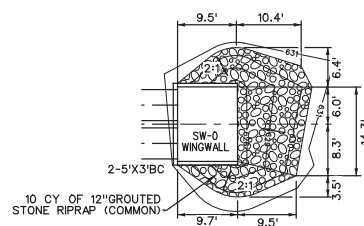


Steven B. Hamford
10/05/20

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CHALK TRAIL DITCH PROFILES FLUME, CHANNEL & FLUME INLET DETAILS			
© 7/2021			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY		SHEET NO.
DAL	DALLAS		58



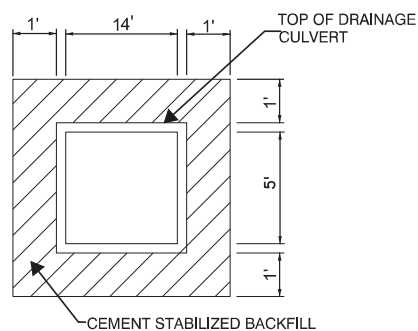
CULVERT K DOWNSTREAM



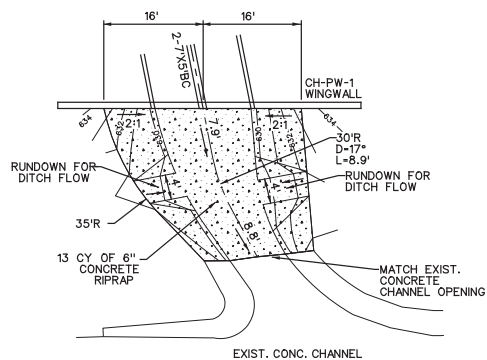
CULVERT K UPSTREAM

NOTE:

FINAL DIMENSIONS AND CONFIGURATIONS
OF CONCRETE AND STONE RIPRAP TO BE
DETERMINED IN THE FIELD AT THE
DIRECTION OF THE ENGINEER.



CEMENT STABILIZED BACKFILL DETAIL
N.T.S.



CULVERT M DOWNSTREAM

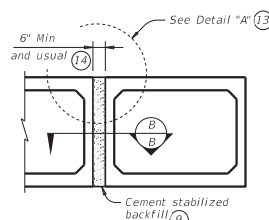


Steven B. Hammons
08/28/2022

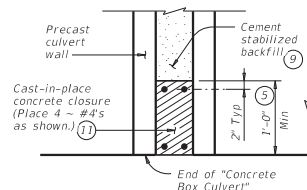
NO.	REVISONS		BY	DATE
 ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Col Rd. Dallas, Texas 75251 (214) 341-0900 An ARDURRA Company				
FORM REGISTRATION NO. FC-10598				
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CHALK HILL TRAIL DRAINAGE DETAILS - RIPRAP LAYOUTS & CEMENT STABILIZED BACKFILL DETAIL				
© TxDOT				
CONTROL	SECTION	JOB	HIGHWAY	
0918	47	472	VA	
DISTRICT	COUNTY		SHEET NO.	
DAL	DALLAS		59	

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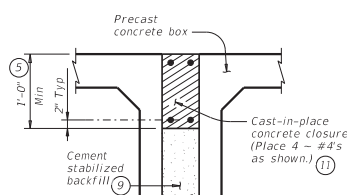
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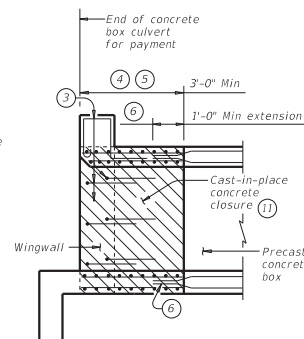
MULTIPLE UNIT PLACEMENT



SECTION B-B

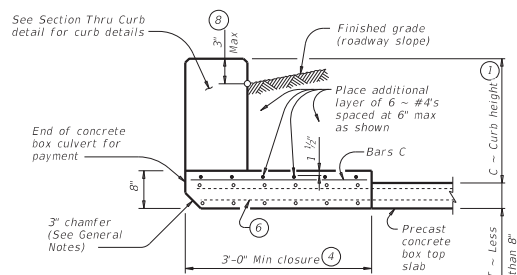


DETAIL "A"

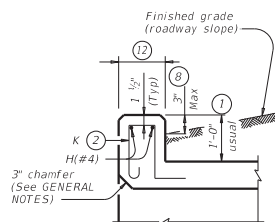


WINGWALL CONNECTION

(Also applies to safety end treatment.)

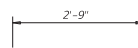


SECTION THRU TOP SLABS LESS THAN 8"

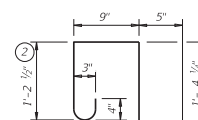


SECTION THRU CURB

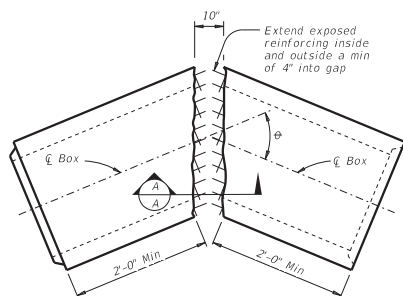
QUANTITIES PER FOOT OF CURB (10)	
Reinforcing Steel	4.12 Lb
Concrete	0.037 CY



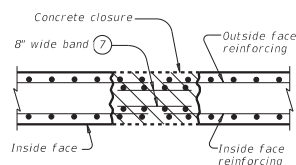
BARS C (#4)
(Spa = 1'-0" Max)



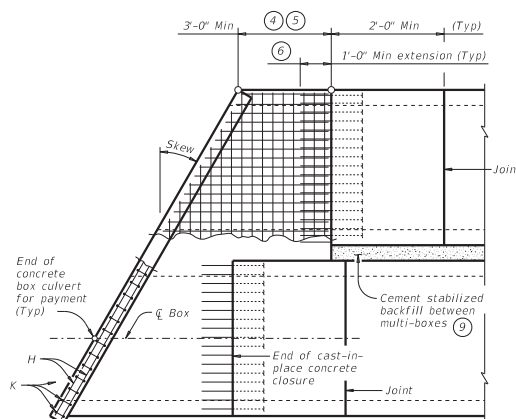
BARS K (#4)
(Spa = 1'-0" Max)
(Length = 4'-2")



ANGLE DETAIL



SECTION A-A



PLAN OF SKEWED ENDS

(Showing multi-box placement.)

- 1 0' Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail, or curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- 2 For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3' high, Bars K may be omitted.
- 3 Extend curb, wingwall, or safety end treatment reinforcing into concrete closure. Bend or trim, as necessary, any reinforcing that does not fit into closure area.
- 4 Provide a 3'-0" Min cast-in-place concrete closure. Break back boxes in the field or cast boxes short. Provide bands of reinforcing in the closure that are the same size and spacing as in the precast box section. Provide #4 longitudinal reinforcement spaced at 12 inches Max within the closure. Except where shown otherwise, construct the cast-in-place closure flush with the inside and outside faces of the precast box section.
- 5 For multiple unit placements, adjust the length of the closure for the interior walls as necessary. Provide a 3'-0" Min cast-in-place closure in the top slab, bottom slab, and exterior wall. See Section B-B detail when interior walls are cast full length.
- 6 Extend precast box reinforcing a minimum of 1'-0" into concrete closure (Typ).
- 7 Place bands of reinforcing matching the inside and outside face reinforcing in the gaps of the top and bottom slabs. Place a band matching the outside face reinforcing of the wall in the gaps of the walls (placed in the outside face only). Tack weld the bands to the exposed reinforcing at each point of contact.
- 8 For vehicle safety, the following requirements must be met:
 - For structures without bridge rail, construct curbs no more than 3" above finished grade.
 - For structures with bridge rail, construct curbs flush with finished grade. Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- 9 Cement stabilized backfill between boxes is considered part of the box culvert for payment.
- 10 All curb concrete and reinforcing is considered part of the box culvert for payment.
- 11 Any additional concrete and reinforcing required for the closures will be considered subsidiary to the box culvert for payment.
- 12 1'-0" typical. 2'-3" when the Box Culvert Rail Mounting Details (RAC) standard sheet is referred to elsewhere in the plans.
- 13 For multiple unit placement with overlay, with 1 to 2 course surface treatment, or with the top slab as the final riding surface, provide wall closure as shown in Detail "A".
- 14 This dimension may be increased with approval of the Engineer to allow the precast boxes to be tunneled or jacked in accordance with Item 476, "Jacking, Boring, or Tunneling Pipe or Box." No payment will be made for any additional material in the gap between adjacent boxes.

MATERIAL NOTES:

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

GENERAL NOTES:

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

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

HL93 LOADING

		Bridge Division Standard			
BOX CULVERTS PRECAST MISCELLANEOUS DETAILS					
SCP-MD					
FILE: CD-SCP-MD-20.dgn	CON: GAF	CK: LMW	CW: BWH/TADOT		
DATE: February 2020	CON: GAF	CK: LMW	CW: BWH/TADOT		
REVISIONS	0918	47	472		
DIST	DAL	DALLAS	60		

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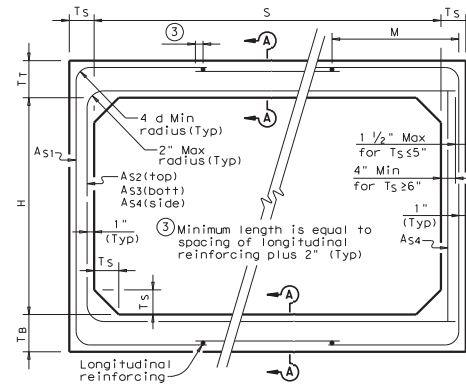
DATE:
FILE:

BOX DATA

SECTION DIMENSIONS					Fill Height (ft)	M (in)	REINFORCING (in ² /ft) ②								Lift Weight (Tons) ①
S (ft)	H (ft)	T _T (in)	T _B (in)	T _S (in)			A _{S1}	A _{S2}	A _{S3}	A _{S4}	A _{S5}	A _{S6}	A _{S7}	A _{S8}	
4	2	7.5	6	5	<2	-	0.18	0.27	0.15	0.12	0.18	0.18	0.18	0.14	4.5
4	2	5	5	5	2<3	38	0.18	0.19	0.17	0.12	-	-	-	-	3.6
4	2	5	5	5	3-5	38	0.13	0.13	0.13	0.12	-	-	-	-	3.6
4	2	5	5	5	10	38	0.12	0.12	0.12	0.12	-	-	-	-	3.6
4	2	5	5	5	15	38	0.14	0.16	0.16	0.12	-	-	-	-	3.6
4	2	5	5	5	20	38	0.18	0.20	0.21	0.12	-	-	-	-	3.6
4	2	5	5	5	25	38	0.23	0.25	0.25	0.12	-	-	-	-	3.6
4	2	5	5	5	30	38	0.28	0.30	0.30	0.12	-	-	-	-	3.6
4	3	7.5	6	5	<2	-	0.18	0.31	0.18	0.12	0.18	0.18	0.18	0.14	5.0
4	3	5	5	5	2<3	38	0.15	0.23	0.20	0.12	-	-	-	-	4.1
4	3	5	5	5	3-5	38	0.12	0.16	0.16	0.12	-	-	-	-	4.1
4	3	5	5	5	10	38	0.12	0.14	0.14	0.12	-	-	-	-	4.1
4	3	5	5	5	15	38	0.12	0.18	0.18	0.12	-	-	-	-	4.1
4	3	5	5	5	20	38	0.14	0.23	0.24	0.12	-	-	-	-	4.1
4	3	5	5	5	25	38	0.17	0.29	0.29	0.12	-	-	-	-	4.1
4	3	5	5	5	30	38	0.21	0.35	0.35	0.12	-	-	-	-	4.1
4	4	7.5	6	5	<2	-	0.18	0.33	0.20	0.12	0.18	0.18	0.18	0.14	5.5
4	4	5	5	5	2<3	38	0.12	0.26	0.23	0.12	-	-	-	-	4.6
4	4	5	5	5	3-5	38	0.12	0.18	0.18	0.12	-	-	-	-	4.6
4	4	5	5	5	10	38	0.12	0.15	0.15	0.12	-	-	-	-	4.6
4	4	5	5	5	15	38	0.12	0.19	0.20	0.12	-	-	-	-	4.6
4	4	5	5	5	20	38	0.12	0.25	0.25	0.12	-	-	-	-	4.6
4	4	5	5	5	25	38	0.14	0.31	0.31	0.12	-	-	-	-	4.6
4	4	5	5	5	30	38	0.17	0.37	0.37	0.12	-	-	-	-	4.6

① For Box Length = 8'-0"

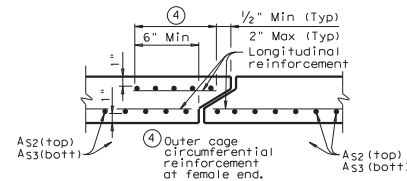
② A_{S1} thru A_{S4}, A_{S7} and A_{S8} are minimum required areas of reinforcement per linear foot of box length. A_{S6} and A_{S5} are minimum required areas of reinforcement per linear foot of box width.



CORNER OPTION "A"

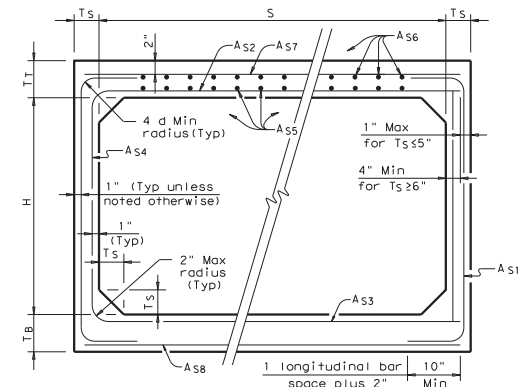
CORNER OPTION "B"

FILL HEIGHT 2 FT AND GREATER



SECTION A-A

(TOP AND BOTTOM SLAB
JOINT REINFORCEMENT)



CORNER OPTION "A"

CORNER OPTION "B"

FILL HEIGHT LESS THAN 2 FT

GENERAL NOTES:

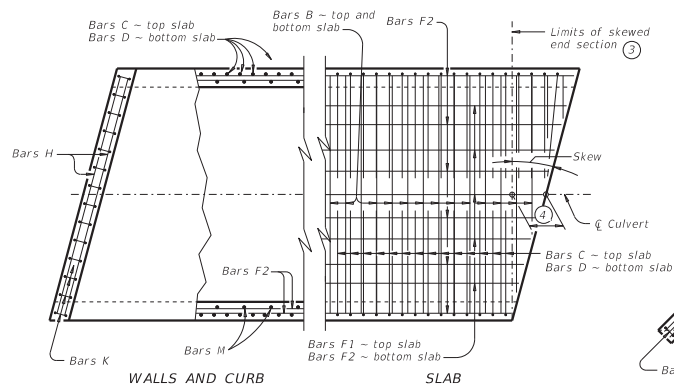
Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.
All concrete shall be Class "H" Concrete with a minimum compressive strength of 5,000 psi.
See SCP-MD standard sheet for miscellaneous details and notes not shown.
In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Shop plans for alternate designs shall be submitted in accordance with Item "Precast Concrete Structural Members (Fabrication)".

HL93 LOADING

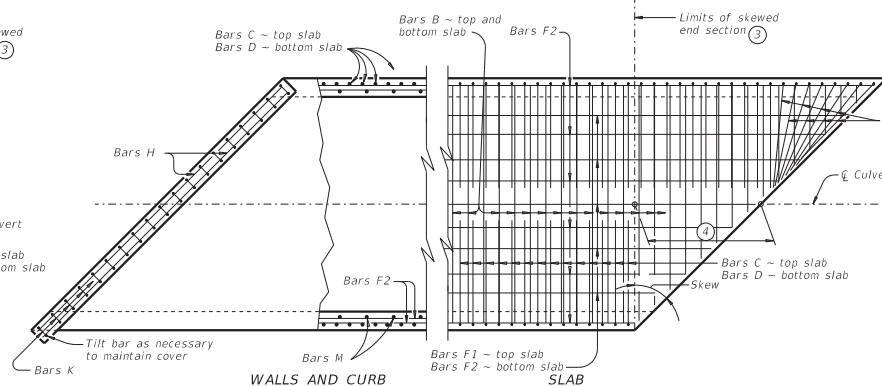
		Bridge Division Standard	
SINGLE BOX CULVERTS PRECAST 4'-0" SPAN			
SCP-4			
FILE: scp04stds.dgn	OWN: GAF	CHK: LMW	OWN: BWH/TADOT
REVISIONS	DATE	BY	APP
February 2010	0918	47	472
DIST		COUNTY	SHEET NO.
DAL		DALLAS	61

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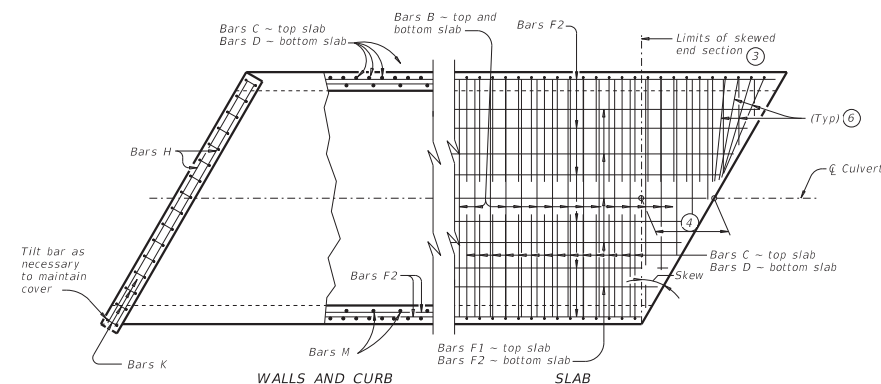
DATE: FILE:



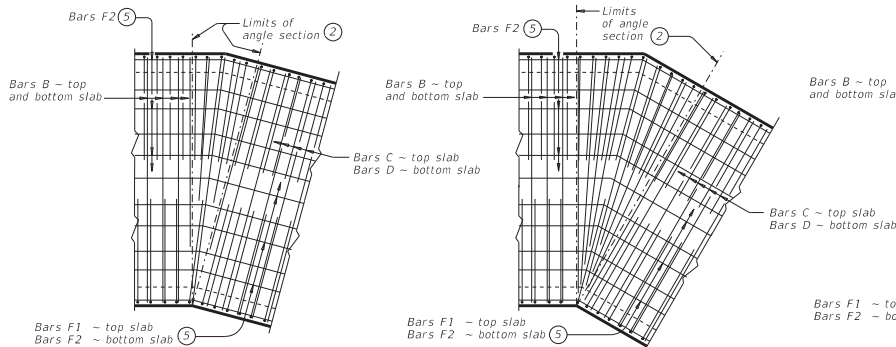
PLAN OF SKEWED ENDS ~ FROM 0° TO 15°



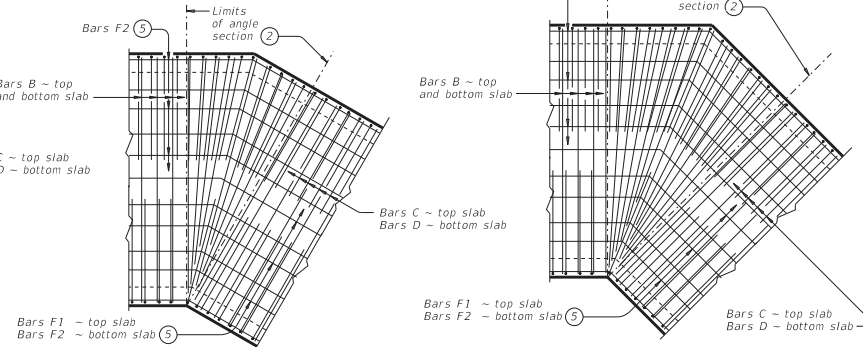
PLAN OF SKEWED ENDS ~ OVER 30° TO 45°



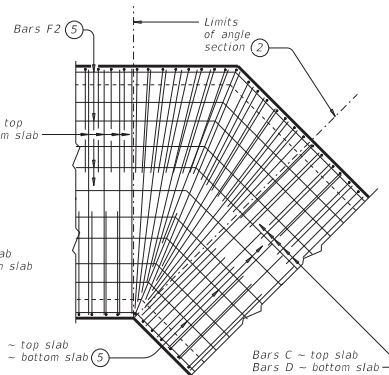
PLAN OF SKEWED ENDS ~ OVER 15° TO 30°



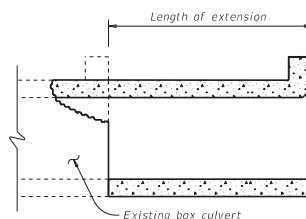
PLAN OF ANGLE SECTION ~ FROM 0° TO 15°



PLAN OF ANGLE SECTION ~ OVER 15° TO 30°



PLAN OF ANGLE SECTION ~ OVER 30° TO 45°



LENGTHENING DETAIL

- For skewed box culverts with less than 2'-0" of fill, break back the top slab to provide a 1'-10" minimum lap of the existing longitudinal bars with the longitudinal bars in the extension.
For non-skewed box culverts with less than 2'-0" of fill and for skewed or non-skewed culverts with a fill depth of 2'-0" or greater, break back the top slab to provide a 1'-10" minimum lap of the existing longitudinal bars with the longitudinal bars in the extension. Alternatively, if the box is non-skewed, embed #6 anchor bars with a Type III, C, D, E, or F anchor adhesive into the existing walls, top and bottom slab at 1'-6" center-to-center spacing. Minimum embedment depth is 8". Anchor adhesive chosen must be able to achieve a basic bond strength in tension, N_b , of 26.4 kips. Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing." Test adhesive anchors in accordance with Item 450.3.3.
Tests: Test 3 anchors per 100 anchors installed.
Break back wings and apron as necessary to install the extension. Clean and extend the exposed wingwall and apron reinforcing into the extension. When lengthening existing box culverts with dimensions different than current standard dimensions, form horizontal and vertical transitions as directed by the Engineer. Match bottom slabs to maintain an uninterrupted flow line. Field bend existing and new reinforcing into transitions and maintain specified cover requirements. For top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface, adjust the "H" dimension to provide a smooth riding surface.

- When the spacing between Bars B becomes less than half of the normal spacing, cut bars to avoid conflict.
- The length of Bars B vary in the skewed end sections.
- [One half of overall width] x [tangent of the skew angle]
- Place Bars F1 and F2 continuously through the angle section. Bend Bars F1 and F2 to remain parallel to the walls of the box culvert.
- When necessary to avoid conflict in acute corners, shorten the slab extension leg of Bars C and Bars D to a minimum of 1'-6" for skews of 30° thru 45°.
- At the Contractor's option, for skews of 15° or less, place Bars B, C, and D parallel to the skewed end while maintaining spacing along centerline of box. Increase lengths of Bars B shown on the Single Box Culverts Cast-In-Place (SCC) standard sheets to accommodate the skew.

CONSTRUCTION NOTES:
Do not use permanent forms.
When required, lap Bars H 1'-8" for uncoated or galvanized bars.
Provide a minimum of 1 1/2" clear cover.

MATERIAL NOTES:
Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel, if required elsewhere in the plans.
Provide Class C concrete ($f'_c = 3,600$ psi) with these exceptions:
provide Class S concrete ($f'_c = 4,000$ psi) for top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface.

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
Refer to Single Box Culverts Cast-in-Place (SCC) standard sheets for details of straight sections of culvert.
For skewed sections and angle sections, refer to Single Box Culverts Cast-in-Place (SCC) standard sheets for slab and wall dimensions, bar sizes, maximum bar spacing, and any other details not shown.
For skewed ends with curbs, adjust length of Bars H, number of Bars K, curb concrete volume, and reinforcing steel weight by dividing the values shown on the culvert Single Box Culverts Cast-in-Place (SCC) standard sheets by the cosine of the skew angle.

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING



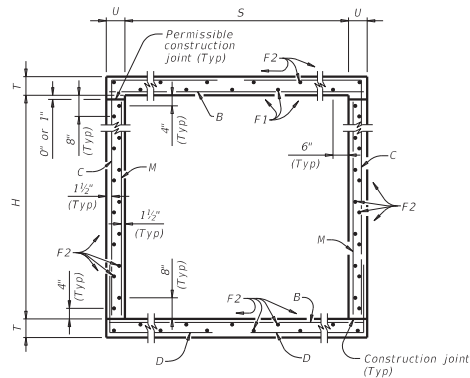
SINGLE BOX CULVERTS CAST-IN-PLACE MISCELLANEOUS DETAILS

SCC-MD

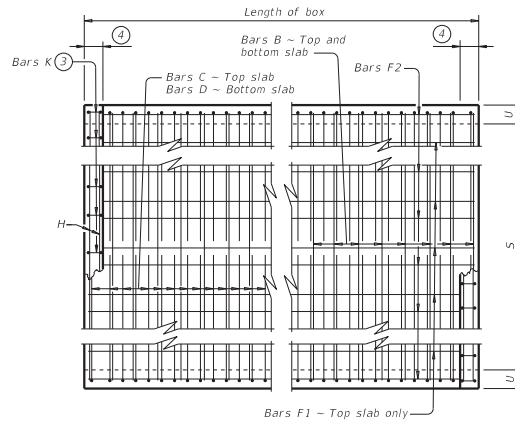
FILE: CD-SCC-MD-20.dgn	OWN: TxDOT	CHK: TxDOT	DATE: TxDOT	BY: TxDOT
0918	47	472	VA	
DIST	COUNTY	SHEET NO.		
DAL	DALLAS	62		

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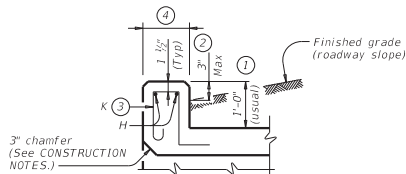
DATE: FILE:



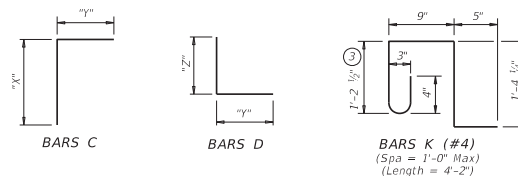
TYPICAL SECTION



PLAN OF REINF STEEL



SECTION THRU CURB



- 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Rail Anchorage Curb (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- For vehicle safety, the following requirements must be met:
 - For structures without bridge rail, construct curbs flush with finished grade.
 - For structures with bridge rail, construct curbs flush with finished grade. Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.
- 1'-0" typical. 2'-3" when the Rail Anchorage Curb (RAC) standard sheet is referred to elsewhere in the plans.

The Contractor may replace Bars B, C, D, E, F1, F2, M, Y, and/or Z with deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes. The lap length required for WWR is never less than the lap length required for uncoated #4 bars.

Example conversion: Replacing No. 6 Gr 60 at 6" Spacing with WWR.
Required WWR = (0.44 sq. in. per 0.5 ft.) x (60 ksi / 70 ksi) = 0.755 sq. in. per ft.
If D30.6 wire is used to meet the 0.755 sq. in. per ft. requirement in this example, the required spacing = (0.306 sq. in.) / (0.755 sq. in. per ft.) x (12 in. per ft.) = 4.86". Max spacing. Required lap length for the provided D30.6 wire is 2'-1" (the same minimum lap length required for uncoated #5 bars, as listed under MATERIAL NOTES).

CONSTRUCTION NOTES:

Do not use permanent forms.
Chamfer the bottom edge of the top slab 3" at the entrance.
Optionally, raise construction joints shown at the flow line by a maximum of 6". If this option is taken, Bars M may be cut off or raised, Bars C and D may be reversed.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.
Provide Class C concrete ($f'c = 3,600$ psi) for culvert barrel and curb, with the following exceptions: provide Class S concrete ($f'c = 4,000$ psi) for top slabs of:

- culverts with overlay,
- culverts with 1-to-2 course surface treatment, or
- culverts with the top slab as the final riding surface.

Provide bar laps, where required, as follows:

- Uncoated or galvanized ~ #4 = 1'-8" Min
- Uncoated or galvanized ~ #5 = 2'-1" Min

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications for the range of fill heights shown.
See the Single Box Culverts Cast-In-Place Miscellaneous Detail (SCC-MD) standard sheet for details pertaining to skewed ends, angle sections, and lengthening.

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

HL93 LOADING SHEET 1 OF 2

		Bridge Division Standard	
Texas Department of Transportation			
SINGLE BOX CULVERTS CAST-IN-PLACE 0' TO 30' FILL			
SCC-3 & 4			
FILE: CD-SCC34-21.dgn	CW: TBE	CK: BNP	CW: TxDOT
CW: TxDOT	February 2020	-CONT SELECT JOB	MESSAGE
REVISIONS		0918 47	472
04/2021 updated 1 values.		DIST	COUNTY
		DAL	DALLAS
			SHEET NO. 63

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DATE:
FILE:

SECTION DIMENSIONS				FILL HEIGHT ⑤	BILLS OF REINFORCING STEEL (For Box Length = 40 feet)																																QUANTITIES						
					Bars B					Bars C					Bars D					Bars M ~ #4				Bars F1 ~ #4 at 18" Spa		Bars F2 ~ #4 at 18" Spa		Bars H 4 ~ #4		Bars K		Per Foot of Barrel		Curb		Total							
					No.	Size	Spa	Length	Weight	No.	Size	Spa	Length	Weight	" X "	" Y "	No.	Size	Spa	Length	Weight	" Y "	" Z "	No.	Spa	Length	Weight	No.	Length	Wt	No.	Length	Weight	Length	Wt	No.	Wt	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)
S	H	T	U		No.	Size	Spa	Length	Weight	" X "	" Y "	No.	Size	Spa	Length	Weight	" Y "	" Z "	No.	Spa	Length	Weight	No.	Length	Wt	No.	Length	Weight	Length	Wt	No.	Wt	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)					
3'-0"	2'-0"	8"	7"	30'	108	#5	9"	3'-11"	441	108	#4	9"	5'-4"	385	2'-6"	2'-10"	108	#4	9"	5'-1"	367	2'-10"	2'-3"	108	9"	2'-0"	144	3	39'-9"	80	19	39'-9"	505	3'-11"	10	10	28	0.292	48.1	0.3	38	12.0	1,960
3'-0"	3'-0"	8"	7"	30'	108	#5	9"	3'-11"	441	108	#4	9"	6'-4"	457	3'-6"	2'-10"	108	#4	9"	5'-1"	367	2'-10"	2'-3"	108	9"	3'-0"	216	3	39'-9"	80	23	39'-9"	611	3'-11"	10	10	28	0.335	54.3	0.3	38	13.7	2,210
4'-0"	2'-0"	8"	7"	30'	108	#5	9"	4'-11"	554	162	#4	6"	5'-8"	613	2'-6"	3'-2"	162	#4	6"	5'-5"	586	3'-2"	2'-3"	108	9"	2'-0"	144	3	39'-9"	80	21	39'-9"	558	4'-11"	13	12	33	0.342	63.4	0.4	46	14.1	2,581
4'-0"	3'-0"	8"	7"	30'	108	#5	9"	4'-11"	554	162	#4	6"	6'-8"	721	3'-6"	3'-2"	162	#4	6"	5'-5"	586	3'-2"	2'-3"	108	9"	3'-0"	216	3	39'-9"	80	25	39'-9"	664	4'-11"	13	12	33	0.385	70.5	0.4	46	15.8	2,867
4'-0"	4'-0"	8"	7"	30'	108	#5	9"	4'-11"	554	162	#4	6"	7'-8"	830	4'-6"	3'-2"	162	#4	6"	5'-5"	586	3'-2"	2'-3"	108	9"	4'-0"	289	3	39'-9"	80	25	39'-9"	664	4'-11"	13	12	33	0.428	75.1	0.4	46	17.5	3,049

⑤ For direct traffic culverts (fill height $\leq$ 2 ft.), identify the required box size and select the option with the minimum fill height.

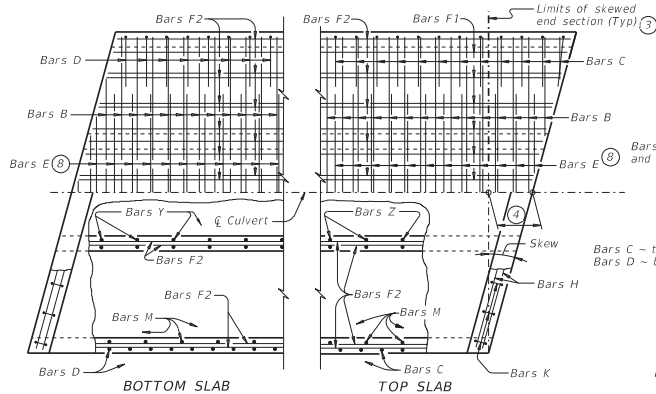
HL93 LOADING SHEET 2 OF 2

				Texas Department of Transportation				Bridge Division Standard			
SINGLE BOX CULVERTS CAST-IN-PLACE 0' TO 30' FILL											
SCC-3 & 4											
FILE: CD-SCC34-21.dgn				DW: TBE		CK: BMP		DW: TxDOT		CK: TxDOT	
CITY: TxDOT February 2020				CONF: 47		SECT: 472		JOB: VA		HIGHWAY:	
REVISIONS				0918		472		VA		SHEET NO.	
04/2021 Updated K values.				DIST: DAL		COUNTY: DALLAS		SHEET NO.: 64			

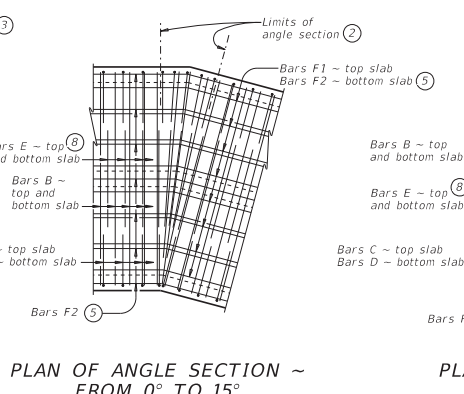
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REVISIONS:

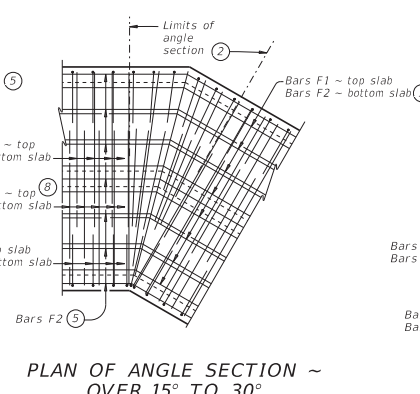
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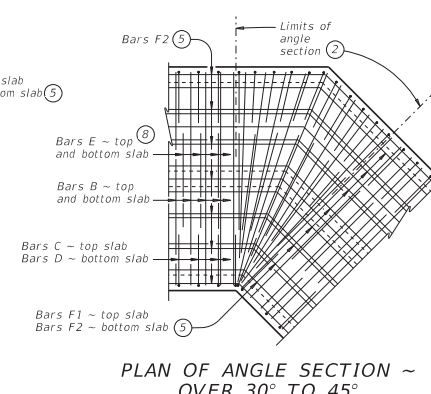
PLAN OF SKEWED ENDS ~ FROM 0° TO 15°



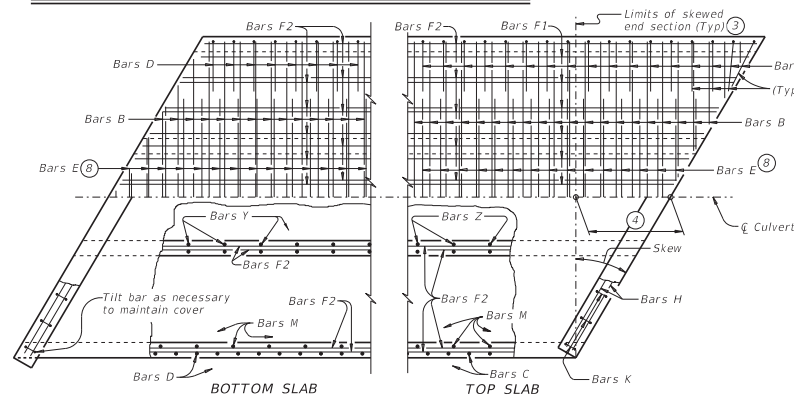
PLAN OF ANGLE SECTION ~ FROM 0° TO 15°



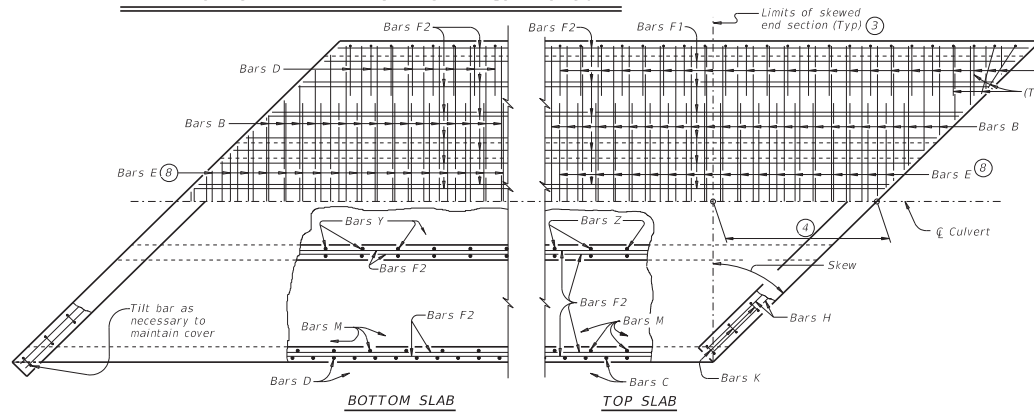
PLAN OF ANGLE SECTION ~ OVER 15° TO 30°



PLAN OF ANGLE SECTION ~ OVER 30° TO 45°



PLAN OF SKEWED ENDS ~ OVER 15° TO 30°



PLAN OF SKEWED ENDS ~ OVER 30° TO 45°

- For skewed box culverts with less than 2'-0" of fill, break back the top slab to provide a 1'-10" minimum lap of the existing longitudinal bars with the longitudinal bars in the extension.
For non-skewed box culverts with less than 2'-0" of fill and for skewed or non-skewed culverts with a fill depth of 2'-0" or greater, break back the top slab to provide a 1'-10" minimum lap of the existing longitudinal bars with the longitudinal bars in the extension. Alternatively, if the box is non-skewed, embed #6 anchor bars with a Type III, Class C, D, E, or F anchor adhesive into the existing walls, top and bottom slab at 1'-6" center-to-center spacing. Minimum embedment depth is 8". Anchor adhesive chosen must be able to achieve a basic bond strength in tension, N_{ba} , of 26.4 kips. Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to provide this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing." Test adhesive anchors in accordance with Item 450.3.3, "Tests." Test 3 anchors per 100 anchors installed.
Break back wings and apron as necessary to install the extension. Clean and extend the exposed wingwall and apron reinforcing into the extension. When lengthening existing box culverts with dimensions different than current standard dimensions, form horizontal and vertical transitions as directed by the Engineer. Match bottom slabs to maintain an uninterrupted flow line. Field bend existing and new reinforcing into transitions and maintain specified cover requirements. For top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface, adjust the "H" dimension to provide a smooth riding surface.
- When the spacing between Bars B or Bars E becomes less than half of the normal spacing, cut bars to avoid conflict.
- The length of Bars B and Bars E will vary in the skewed end sections.
- [One half of overall width] x [tangent of the skew angle]

- Place Bars F1 and F2 continuously through the angle section. Bend Bars F1 and F2 to remain parallel to the walls of the box culvert.
- When necessary to avoid conflict in acute corners, shorten the slab extension leg of Bars C and Bars D to a minimum of 1'-6" for skews of 30° thru 45°.
- At the Contractor's option, for skews of 15° or less, place Bars B, C, D, and E parallel to the skewed end while maintaining spacing along centerline of box. Increase lengths of Bars B and Bars E shown on the Multiple Box Culverts Cast-In-Place (MC) standard sheets to accommodate the skew.
- Extend Bars E as shown on the MC standard sheet for direct traffic culverts.

CONSTRUCTION NOTES:

Do not use permanent forms.
When required, lap Bars H 1'-8" for uncoated or galvanized bars.
Provide a minimum of 1 1/2" clear cover.

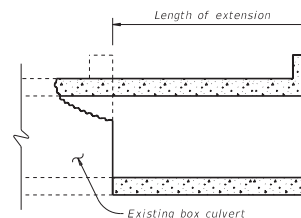
MATERIAL NOTES:

Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel, if required elsewhere in the plans.
Provide Class C concrete ($f'_c = 3,600$ psi) with these exceptions:
Provide Class S concrete ($f'_c = 4,000$ psi) for top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
Refer to Multiple Box Culverts Cast-in-Place (MC) standard sheets for details of straight sections of culvert.
For skewed sections and angle sections, refer to Multiple Box Culverts Cast-in-Place (MC) standard sheets for slab and wall dimensions, bar sizes, maximum bar spacing, and any other details not shown.
For skewed ends with curbs, adjust length of Bars H, number of Bars K, curb concrete volume, and reinforcing steel weight by dividing the values shown on the Multiple Box Culverts Cast-In-Place (MC) standard sheets by the cosine of the skew angle.

Cover dimensions are clear dimensions, unless noted otherwise.



LENGTHENING DETAIL

HL93 LOADING



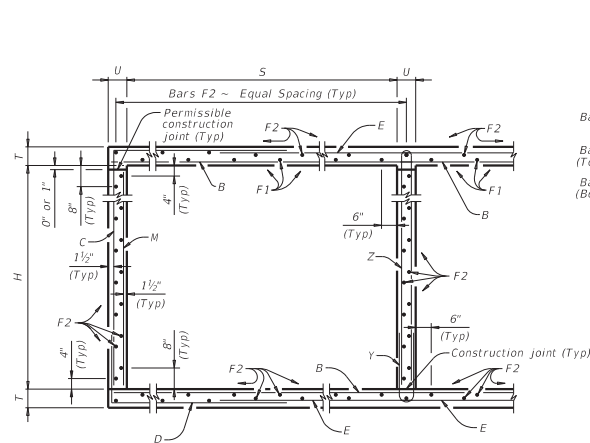
MULTIPLE BOX CULVERTS CAST-IN-PLACE MISCELLANEOUS DETAILS

MC-MD

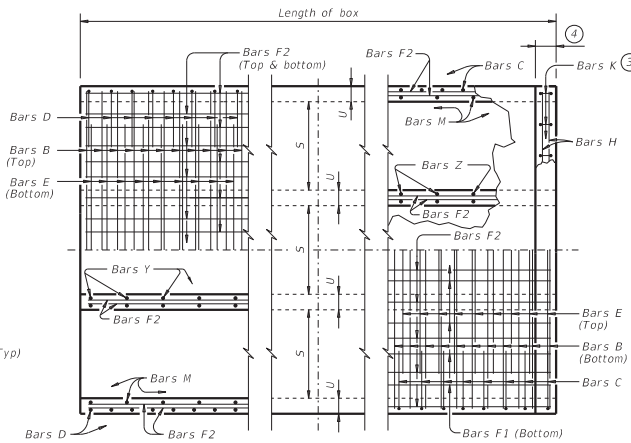
FILE: CD-MC-MD-20.dgn	CON: TxDOT	CK: TxDOT	CON: TxDOT	CK: TxDOT
0918	47	472	VA	
REVISIONS				
DIST	DAL	COUNTY	DALLAS	SHEET NO. 65

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DATE:
FILE:



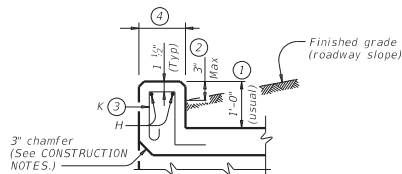
TYPICAL SECTION



BOTTOM SLAB

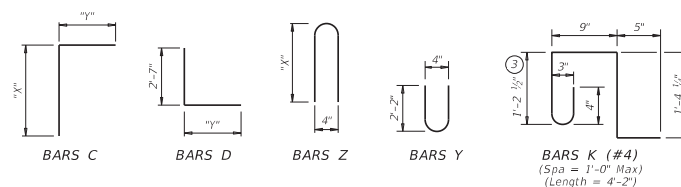
PART PLANS

TOP SLAB



SECTION THRU CURB

TABLE OF BAR DIMENSIONS			
H	"X"	"Y"	"Z"
3'-0"	3'-6 1/2"	4'-5"	4'-5"
4'-0"	4'-6 1/2"	4'-5"	4'-5"
5'-0"	5'-6 1/2"	4'-5"	4'-5"
6'-0"	6'-6 1/2"	4'-5"	4'-5"
7'-0"	7'-6 1/2"	4'-5"	4'-5"



- 1 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Rail Anchorage Curb (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- 2 For vehicle safety, the following requirements must be met:
 - For structures without bridge rail, construct curbs no more than 3" above finished grade.
 - For structures with bridge rail, construct curbs flush with finished grade. Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- 3 For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.
- 4 1'-0" typical. 2'-3" when the Rail Anchorage Curb (RAC) standard sheet is referred to elsewhere in the plans.

The Contractor may replace Bars B, C, D, E, F1, F2, M, Y, and/or Z with deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes. The lap length required for WWR is never less than the lap length required for uncoated #4 bars.

Example conversion: Replacing No. 6 Gr 60 at 6" Spacing with WWR
Required WWR = (0.44 sq. in. per 0.5 ft.) x (60 ksi / 70 ksi) = 0.755 sq. in. per ft.
If D30.6 wire is used to meet the 0.755 sq. in. per ft. requirement in this example, the required spacing = (0.306 sq. in.) / (0.755 sq. in. per ft.) x (12 in. per ft.) = 4.86" Max spacing. Required lap length for the provided D30.6 wire is 2'-1" (the same minimum lap length required for uncoated #5 bars, as listed under MATERIAL NOTES).

CONSTRUCTION NOTES:

Do not use permanent forms.
Chamfer the bottom edge of the top slab 3" at the entrance.
Optionally, raise construction joints shown at the flow line by a maximum of 6". If this option is taken, Bars M may be cut off or raised, Bars C and D may be reversed, and Bars Y and Z may be reversed.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.
Provide Class C concrete (f'c = 3,600 psi) for culvert barrel and curb, with the following exceptions: provide Class S concrete (f'c = 4,000 psi) for top slabs of:

- culverts with overlay,
- culverts with 1-to-2 course surface treatment, or
- culverts with the top slab as the final riding surface.

Provide bar laps, where required, as follows:

- Uncoated or galvanized - #4 = 1'-8" Min
- Uncoated or galvanized - #5 = 2'-1" Min
- Uncoated or galvanized - #6 = 2'-6" Min

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications for the range of fill heights shown.
See the Multiple Box Culverts Cast-In-Place Miscellaneous Detail (MC-MD) standard sheet for details pertaining to skewed ends, angle sections, and lengthening.

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

HL93 LOADING SHEET 1 OF 2



**MULTIPLE BOX CULVERTS
CAST-IN-PLACE
7'-0" SPAN
0' TO 10' FILL
MC-7-10**

FILE: CD-MC710-20.dgn	CON: TBE	CK: BNP	CHK: TxDOT	CK: TxDOT
0918	47	472	VA	
DIST	COUNTY			
DAL	DALLAS			66

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DATE: FILE:

NUMBER OF SPANS	SECTION DIMENSIONS				BILLS OF REINFORCING STEEL (For Box Length = 40 feet)																																								QUANTITIES						
					Bars B				Bars C & D				Bars E				Bars F1 ~ #4				Bars F2 ~ #4				Bars M ~ #4				Bars Y & Z ~ #4				Bars H 4 ~ #4		Bars K		Per Foot of Barrel		Curb		Total										
	S	H	T	U	No.	Size	Spa	Length	Wt	No.	Size	Spa	Length	Wt	No.	Size	Spa	Length	Wt	No.	Size	Spa	Length	Wt	No.	Size	Spa	Length	Wt	No.	Size	Spa	Length	Wt	No.	Size	Spa	Bars Y		Bars Z		Length	Wt	No.	Wt	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)
																																						Length	Wt	Length	Wt										
2	7'-0"	3'-0"	8"	7"	108	#6	9"	15'-6"	2,514	162	#5	6"	7'-11"	1,338	7'-0"	1,183	108	#6	9"	11'-5"	1,852	10	18"	39'-9"	266	54	18"	39'-9"	1,434	108	9"	3'-0"	216	54	9"	4'-7"	165	7'-3"	262	15'-6"	41	34	95	0.972	230.8	1.2	136	40.0	9,366		
3	7'-0"	3'-0"	8"	7"	108	#6	9"	23'-1"	3,744	162	#5	6"	7'-11"	1,338	7'-0"	1,183	108	#6	9"	19'-0"	3,082	15	18"	39'-9"	398	77	18"	39'-9"	2,045	108	9"	3'-0"	216	108	9"	4'-7"	331	7'-3"	523	23'-1"	62	50	139	1.412	321.5	1.7	201	58.1	13,061		
4	7'-0"	3'-0"	8"	7"	108	#6	9"	30'-8"	4,975	162	#5	6"	7'-11"	1,338	7'-0"	1,183	108	#6	9"	26'-7"	4,312	20	18"	39'-9"	531	100	18"	39'-9"	2,655	108	9"	3'-0"	216	162	9"	4'-7"	496	7'-3"	785	30'-8"	82	64	178	1.851	412.3	2.3	260	76.3	16,751		
5	7'-0"	3'-0"	8"	7"	108	#6	9"	38'-3"	6,205	162	#5	6"	7'-11"	1,338	7'-0"	1,183	108	#6	9"	34'-2"	5,542	25	18"	39'-9"	664	123	18"	39'-9"	3,266	108	9"	3'-0"	216	216	9"	4'-7"	661	7'-3"	1,046	38'-3"	102	80	223	2.290	503.0	2.8	325	94.4	20,446		
6	7'-0"	3'-0"	8"	7"	108	#6	9"	45'-10"	7,435	162	#5	6"	7'-11"	1,338	7'-0"	1,183	108	#6	9"	41'-9"	6,773	30	18"	39'-9"	797	146	18"	39'-9"	3,877	108	9"	3'-0"	216	270	9"	4'-7"	827	7'-3"	1,308	45'-10"	122	94	262	2.729	593.9	3.4	384	112.6	24,138		
2	7'-0"	4'-0"	8"	7"	108	#6	9"	15'-6"	2,514	162	#5	6"	8'-11"	1,507	7'-0"	1,183	108	#6	9"	11'-5"	1,852	10	18"	39'-9"	266	54	18"	39'-9"	1,434	108	9"	4'-0"	289	54	9"	4'-7"	165	9'-3"	334	15'-6"	41	34	95	1.037	238.6	1.2	136	42.6	9,680		
3	7'-0"	4'-0"	8"	7"	108	#6	9"	23'-1"	3,744	162	#5	6"	8'-11"	1,507	7'-0"	1,183	108	#6	9"	19'-0"	3,082	15	18"	39'-9"	398	77	18"	39'-9"	2,045	108	9"	4'-0"	289	108	9"	4'-7"	331	9'-3"	667	23'-1"	62	50	139	1.498	331.2	1.7	201	61.6	13,447		
4	7'-0"	4'-0"	8"	7"	108	#6	9"	30'-8"	4,975	162	#5	6"	8'-11"	1,507	7'-0"	1,183	108	#6	9"	26'-7"	4,312	20	18"	39'-9"	531	100	18"	39'-9"	2,655	108	9"	4'-0"	289	162	9"	4'-7"	496	9'-3"	1,001	30'-8"	82	64	178	1.959	423.7	2.3	260	80.6	17,209		
5	7'-0"	4'-0"	8"	7"	108	#6	9"	38'-3"	6,205	162	#5	6"	8'-11"	1,507	7'-0"	1,183	108	#6	9"	34'-2"	5,542	25	18"	39'-9"	664	123	18"	39'-9"	3,266	108	9"	4'-0"	289	216	9"	4'-7"	661	9'-3"	1,335	38'-3"	102	80	223	2.420	516.3	2.8	325	99.6	20,977		
6	7'-0"	4'-0"	8"	7"	108	#6	9"	45'-10"	7,435	162	#5	6"	8'-11"	1,507	7'-0"	1,183	108	#6	9"	41'-9"	6,773	30	18"	39'-9"	797	146	18"	39'-9"	3,877	108	9"	4'-0"	289	270	9"	4'-7"	827	9'-3"	1,668	45'-10"	122	94	262	2.881	608.9	3.4	384	118.6	24,740		
2	7'-0"	5'-0"	8"	7"	108	#6	9"	15'-6"	2,514	162	#5	6"	9'-11"	1,676	7'-0"	1,183	108	#6	9"	11'-5"	1,852	10	18"	39'-9"	266	60	18"	39'-9"	1,593	108	9"	5'-0"	361	54	9"	4'-7"	165	11'-3"	406	15'-6"	41	34	95	1.102	250.4	1.2	136	45.2	10,152		
3	7'-0"	5'-0"	8"	7"	108	#6	9"	23'-1"	3,744	162	#5	6"	9'-11"	1,676	7'-0"	1,183	108	#6	9"	19'-0"	3,082	15	18"	39'-9"	398	85	18"	39'-9"	2,257	108	9"	5'-0"	361	108	9"	4'-7"	331	11'-3"	812	23'-1"	62	50	139	1.584	346.1	1.7	201	65.1	14,045		
4	7'-0"	5'-0"	8"	7"	108	#6	9"	30'-8"	4,975	162	#5	6"	9'-11"	1,676	7'-0"	1,183	108	#6	9"	26'-7"	4,312	20	18"	39'-9"	531	110	18"	39'-9"	2,921	108	9"	5'-0"	361	162	9"	4'-7"	496	11'-3"	1,217	30'-8"	82	64	178	2.067	441.8	2.3	260	85.0	17,932		
5	7'-0"	5'-0"	8"	7"	108	#6	9"	38'-3"	6,205	162	#5	6"	9'-11"	1,676	7'-0"	1,183	108	#6	9"	34'-2"	5,542	25	18"	39'-9"	664	135	18"	39'-9"	3,585	108	9"	5'-0"	361	216	9"	4'-7"	661	11'-3"	1,623	38'-3"	102	80	223	2.549	537.5	2.8	325	104.8	21,825		
6	7'-0"	5'-0"	8"	7"	108	#6	9"	45'-10"	7,435	162	#5	6"	9'-11"	1,676	7'-0"	1,183	108	#6	9"	41'-9"	6,773	30	18"	39'-9"	797	160	18"	39'-9"	4,248	108	9"	5'-0"	361	270	9"	4'-7"	827	11'-3"	2,029	45'-10"	122	94	262	3.032	633.2	3.4	384	124.7	25,713		
2	7'-0"	6'-0"	8"	7"	108	#6	9"	15'-6"	2,514	162	#5	6"	10'-11"	1,845	7'-0"	1,183	108	#6	9"	11'-5"	1,852	10	18"	39'-9"	266	66	18"	39'-9"	1,752	108	9"	6'-0"	433	54	9"	4'-7"	165	13'-3"	478	15'-6"	41	34	95	1.167	262.2	1.2	136	47.8	10,624		
3	7'-0"	6'-0"	8"	7"	108	#6	9"	23'-1"	3,744	162	#5	6"	10'-11"	1,845	7'-0"	1,183	108	#6	9"	19'-0"	3,082	15	18"	39'-9"	398	93	18"	39'-9"	2,469	108	9"	6'-0"	433	108	9"	4'-7"	331	13'-3"	956	23'-1"	62	50	139	1.671	361.0	1.7	201	68.6	14,642		
4	7'-0"	6'-0"	8"	7"	108	#6	9"	30'-8"	4,975	162	#5	6"	10'-11"	1,845	7'-0"	1,183	108	#6	9"	26'-7"	4,312	20	18"	39'-9"	531	120	18"	39'-9"	3,186	108	9"	6'-0"	433	162	9"	4'-7"	496	13'-3"	1,434	30'-8"	82	64	178	2.175	459.9	2.3	260	89.3	18,655		
5	7'-0"	6'-0"	8"	7"	108	#6	9"	38'-3"	6,205	162	#5	6"	10'-11"	1,845	7'-0"	1,183	108	#6	9"	34'-2"	5,542	25	18"	39'-9"	664	147	18"	39'-9"	3,903	108	9"	6'-0"	433	216	9"	4'-7"	661	13'-3"	1,912	38'-3"	102	80	223	2.679	558.7	2.8	325	110.2	22,673		
6	7'-0"	6'-0"	8"	7"	108	#6	9"	45'-10"	7,435	162	#5	6"	10'-11"	1,845	7'-0"	1,183	108	#6	9"	41'-9"	6,773	30	18"	39'-9"	797	174	18"	39'-9"	4,620	108	9"	6'-0"	433	270	9"	4'-7"	827	13'-3"	2,390	45'-10"	122	94	262	3.183	657.6	3.4	384	130.7	26,687		
2	7'-0"	7'-0"	8"	7"	108	#6	9"	15'-6"	2,514	162	#5	6"	11'-11"	2,014	7'-0"	1,183	108	#6	9"	11'-5"	1,852	10	18"	39'-9"	266	66	18"	39'-9"	1,752	108	9"	7'-0"	505	54	9"	4'-7"	165	15'-3"	550	15'-6"	41	34	95	1.231	270.0	1.2	136	50.4	10,937		
3	7'-0"	7'-0"	8"	7"	108	#6	9"	23'-1"	3,744	162	#5	6"	11'-11"	2,014	7'-0"	1,183	108	#6	9"	19'-0"	3,082	15	18"	39'-9"	398	93	18"	39'-9"	2,469	108	9"	7'-0"	505	108	9"	4'-7"	331	15'-3"	1,100	23'-1"	62	50	139	1.757	370.7	1.7	201	72.0	15,027		
4	7'-0"	7'-0"	8"	7"	108	#6	9"	30'-8"	4,975	162	#5	6"	11'-11"	2,014	7'-0"	1,183	108	#6	9"	26'-7"	4,312	20	18"	39'-9"	531	120	18"	39'-9"	3,186	108	9"	7'-0"	505	162	9"	4'-7"	496	15'-3"	1,650	30'-8"	82	64	178	2.283	471.3	2.3	260	93.6	19,112		
5	7'-0"	7'-0"	8"	7"	108	#6	9"	38'-3"	6,205	162	#5	6"	11'-11"	2,014	7'-0"	1,183	108	#6	9"	34'-2"	5,542	25	18"	39'-9"	664	147	18"	39'-9"	3,903	108	9"	7'-0"	505	216	9"	4'-7"	661	15'-3"	2,200	38'-3"	102	80	223	2.809	571.9	2.8	325	115.2	23,202		
6	7'-0"	7'-0"	8"	7"	108	#6	9"	45'-10"	7,435	162	#5	6"	11'-11"	2,014	7'-0"	1,183	108	#6	9"	41'-9"	6,773	30	18"	39'-9"	797	174	18"	39'-9"	4,620	108	9"	7'-0"	505	270	9"	4'-7"	827	15'-3"	2,750	45'-10"	122	94	262	3.334	672.6	3.4	384	136.8	27,288		

HL93 LOADING SHEET 2 OF 2

				Bridge Division Standard			
MULTIPLE BOX CULVERTS CAST-IN-PLACE 7'-0" SPAN 0' TO 10' FILL MC-7-10</							

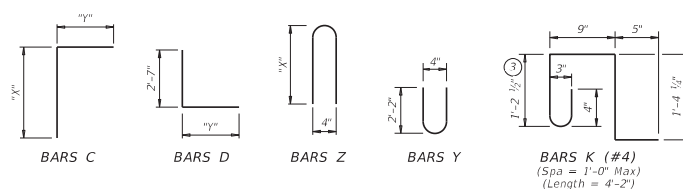
DATE: _____
FILE: _____



PART PLANS



H	"X"	"Y"
2'-0"	2'-6 1/2"	3'-8 1/2"
3'-0"	3'-6 1/2"	3'-8 1/2"
4'-0"	4'-6 1/2"	3'-8 1/2"
5'-0"	5'-6 1/2"	3'-8 1/2"



- ① 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Rail Anchorage Curb (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- ② For vehicle safety, the following requirements must be met:
 - For structures without bridge rail, construct curbs no more than 3" above finished grade.
 - For structures with bridge rail, construct curbs flush with finished grade.
 Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- ③ For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.
- ④ 1'-0" typical. 2'-3" when the Rail Anchorage Curb (RAC) standard sheet is referred to elsewhere in the plans.

The Contractor may replace Bars C, D, E, F, I, F2, M, Y, and/or Z with deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Maximum WWR spacing shall not exceed 48" on center. WWR shall be placed in the WWR of the same length required for the equivalent bar sizes, rounded up for bar sizes between conventional bar sizes. The lap length required for WWR is never less than the lap length required for uncoated #4 bars.

Example conversion: Replacing No. 6 Gr 60 at 6" Spacing with WWR (equivalent WWR 0.4 ft²/sq. yd. per ft. x 0.75 sq. in. per ft. = 0.30 sq. in. per ft. If D306 wire is used to meet the 0.65 sq. in. per ft. requirement in this example, the required spacing = (0.306 sq. in.) / (0.755 sq. in. per ft.) x (12 in./ft.) = 4.86" Max spacing. Required lap length for the provided wire is 17".

Reinforcing steel lengths and weights shall be as listed under MATERIAL NOTES.

CONSTRUCTION NOTES:

Do not use permanent forms.
Chamfer the bottom edge of the top slab 3" at the entrance.
Optionally, raise construction joints shown at the flow line by a maximum of 6". If this option is taken, Bars M may be cut off or raised, Bars C and D may be reversed, and Bars Y and Z may be reversed.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.

Provide galvanized reinforcing steel if required elsewhere in the plans.

Provide Class II concrete ($f'c = 4,000$ psi) for culvert barrel and curb, with the following exceptions: provide Class S concrete ($f'c = 4,000$ psi) for top slabs of:

- culverts with overlay,
- culverts with 1-to-2 course surface treatment, or
- culverts with the top slab as the final riding surface.

Provide bar laps, where required, as follows:

- Uncoated or galvanized – #4 = 1-8' Min
- Uncoated or galvanized – #5 = 2-1' Min
- Uncoated or galvanized – #6 = 2-6' Min

GENERAL NOTES:

See the Multiple Box Culverts Cast-In-Place Miscellaneous Detail (MC-MD) standard sheet for details pertaining to skewed ends, angle sections, and lengthening.

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



*MULTIPLE BOX CULVERTS
CAST-IN-PLACE
5'-0" SPAN
0' TO 20' FILL
MC-5-20*

FILE: CD-KC520-20.agn		DN: TBE		CK: BNP	DN: TxDOT	CK: TxDOT
TxDOT February 2020		CONT	SECT	JOB		HIGHWAY
REVISONS		0918	47	472	VA	
		DIST		COUNTY		SHEET NO.
		DAI		DAI IAS		68

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DATE: FILE:

NUMBER OF SPANS	SECTION DIMENSIONS				BILLS OF REINFORCING STEEL (For Box Length = 40 feet)																																																QUANTITIES							
					Bars B				Bars C & D				Bars E				Bars F1 ~ #4				Bars F2 ~ #4				Bars M ~ #4				Bars Y & Z ~ #4				Bars H 4 ~ #4		Bars K		Per Foot of Barrel		Curb		Total																			
	S	H	T	U	No.	Size	Spa	Length	Wt	No.	Size	Spa	Bars C		Bars D		No.	Size	Spa	Length	Wt	No.	Spa	Length	Wt	No.	Spa	Length	Wt	No.	Spa	Length	Wt	No.	Spa	Length	Wt	No.	Wt	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)															
													Length	Wt	Length	Wt																														Length	Wt	Length	Wt	Length	Wt	Length	Wt	Length	Wt	Length	Wt	Length	Wt	Length
2	5'-0"	2'-0"	8"	7"	108	#5	9"	11'-6"	1,295	108	#5	9"	6'-3"	704	6'-4"	713	108	#5	9"	8'-8"	976	8	18"	39'-9"	212	38	18"	39'-9"	1,009	108	9"	2'-0"	144	54	9"	4'-7"	165	5'-3"	189	11'-6"	31	26	72	0.710	135.2	0.9	103	29.3	5,510											
3	5'-0"	2'-0"	8"	7"	108	#5	9"	17'-1"	1,924	108	#5	9"	6'-3"	704	6'-4"	713	108	#5	9"	14'-3"	1,605	12	18"	39'-9"	319	54	18"	39'-9"	1,434	108	9"	2'-0"	144	108	9"	4'-7"	331	5'-3"	379	17'-1"	46	38	106	1.029	188.8	1.3	152	42.4	7,705											
4	5'-0"	2'-0"	8"	7"	108	#5	9"	22'-8"	2,553	108	#5	9"	6'-3"	704	6'-4"	713	108	#5	9"	19'-10"	2,234	16	18"	39'-9"	425	70	18"	39'-9"	1,859	108	9"	2'-0"	144	162	9"	4'-7"	496	5'-3"	568	22'-8"	61	48	134	1.348	242.4	1.7	195	55.6	9,891											
5	5'-0"	2'-0"	8"	7"	108	#5	9"	28'-3"	3,182	108	#5	9"	6'-3"	704	6'-4"	713	108	#5	9"	25'-5"	2,863	20	18"	39'-9"	531	86	18"	39'-9"	2,284	108	9"	2'-0"	144	216	9"	4'-7"	661	5'-3"	758	28'-3"	75	60	167	1.667	296.0	2.1	242	68.8	12,082											
6	5'-0"	2'-0"	8"	7"	108	#5	9"	33'-10"	3,811	108	#5	9"	6'-3"	704	6'-4"	713	108	#5	9"	31'-0"	3,492	24	18"	39'-9"	637	102	18"	39'-9"	2,708	108	9"	2'-0"	144	270	9"	4'-7"	827	5'-3"	947	33'-10"	90	70	195	1.986	349.6	2.5	285	82.0	14,268											
2	5'-0"	3'-0"	8"	7"	108	#6	9"	11'-6"	1,865	108	#5	9"	7'-3"	817	6'-4"	713	108	#5	9"	8'-8"	976	8	18"	39'-9"	212	44	18"	39'-9"	1,168	108	9"	3'-0"	216	54	9"	4'-7"	165	7'-3"	262	11'-6"	31	26	72	0.775	159.9	0.9	103	31.9	6,497											
3	5'-0"	3'-0"	8"	7"	108	#6	9"	17'-1"	2,771	108	#5	9"	7'-3"	817	6'-4"	713	108	#5	9"	14'-3"	1,605	12	18"	39'-9"	319	62	18"	39'-9"	1,646	108	9"	3'-0"	216	108	9"	4'-7"	331	7'-3"	523	17'-1"	46	38	106	1.115	223.5	1.3	152	45.9	9,093											
4	5'-0"	3'-0"	8"	7"	108	#6	9"	22'-8"	3,677	108	#5	9"	7'-3"	817	6'-4"	713	108	#5	9"	19'-10"	2,234	16	18"	39'-9"	425	80	18"	39'-9"	2,124	108	9"	3'-0"	216	162	9"	4'-7"	496	7'-3"	785	22'-8"	61	48	134	1.456	287.2	1.7	195	59.9	11,682											
5	5'-0"	3'-0"	8"	7"	108	#6	9"	28'-3"	4,583	108	#5	9"	7'-3"	817	6'-4"	713	108	#5	9"	25'-5"	2,863	20	18"	39'-9"	531	98	18"	39'-9"	2,602	108	9"	3'-0"	216	216	9"	4'-7"	661	7'-3"	1,046	28'-3"	75	60	167	1.796	350.8	2.1	242	73.9	14,274											
6	5'-0"	3'-0"	8"	7"	108	#6	9"	33'-10"	5,488	108	#5	9"	7'-3"	817	6'-4"	713	108	#5	9"	31'-0"	3,492	24	18"	39'-9"	637	116	18"	39'-9"	3,080	108	9"	3'-0"	216	270	9"	4'-7"	827	7'-3"	1,308	33'-10"	90	70	195	2.137	414.5	2.5	285	88.0	16,863											
2	5'-0"	4'-0"	8"	7"	108	#6	9"	11'-6"	1,865	108	#5	9"	8'-3"	929	6'-4"	713	108	#5	9"	8'-8"	976	8	18"	39'-9"	212	44	18"	39'-9"	1,168	108	9"	4'-0"	289	54	9"	4'-7"	165	9'-3"	334	11'-6"	31	26	72	0.840	166.3	0.9	103	34.5	6,754											
3	5'-0"	4'-0"	8"	7"	108	#6	9"	17'-1"	2,771	108	#5	9"	8'-3"	929	6'-4"	713	108	#5	9"	14'-3"	1,605	12	18"	39'-9"	319	62	18"	39'-9"	1,646	108	9"	4'-0"	289	108	9"	4'-7"	331	9'-3"	667	17'-1"	46	38	106	1.202	231.8	1.3	152	49.4	9,422											
4	5'-0"	4'-0"	8"	7"	108	#6	9"	22'-8"	3,677	108	#5	9"	8'-3"	929	6'-4"	713	108	#5	9"	19'-10"	2,234	16	18"	39'-9"	425	80	18"	39'-9"	2,124	108	9"	4'-0"	289	162	9"	4'-7"	496	9'-3"	1,001	22'-8"	61	48	134	1.564	297.2	1.7	195	64.3	12,083											
5	5'-0"	4'-0"	8"	7"	108	#6	9"	28'-3"	4,583	108	#5	9"	8'-3"	929	6'-4"	713	108	#5	9"	25'-5"	2,863	20	18"	39'-9"	531	98	18"	39'-9"	2,602	108	9"	4'-0"	289	216	9"	4'-7"	661	9'-3"	1,335	28'-3"	75	60	167	1.926	362.7	2.1	242	79.1	14,748											
6	5'-0"	4'-0"	8"	7"	108	#6	9"	33'-10"	5,488	108	#5	9"	8'-3"	929	6'-4"	713	108	#5	9"	31'-0"	3,492	24	18"	39'-9"	637	116	18"	39'-9"	3,080	108	9"	4'-0"	289	270	9"	4'-7"	827	9'-3"	1,668	33'-10"	90	70	195	2.288	428.1	2.5	285	94.0	17,408											
2	5'-0"	5'-0"	8"	7"	108	#6	9"	11'-6"	1,865	108	#5	9"	9'-3"	1,042	6'-4"	713	108	#5	9"	8'-8"	976	8	18"	39'-9"	212	50	18"	39'-9"	1,328	108	9"	5'-0"	361	54	9"	4'-7"	165	11'-3"	406	11'-6"	31	26	72	0.904	176.7	0.9	103	37.0	7,171											
3	5'-0"	5'-0"	8"	7"	108	#6	9"	17'-1"	2,771	108	#5	9"	9'-3"	1,042	6'-4"	713	108	#5	9"	14'-3"	1,605	12	18"	39'-9"	319	70	18"	39'-9"	1,859	108	9"	5'-0"	361	108	9"	4'-7"	331	11'-3"	812	17'-1"	46	38	106	1.288	245.3	1.3	152	52.8	9,965											
4	5'-0"	5'-0"	8"	7"	108	#6	9"	22'-8"	3,677	108	#5	9"	9'-3"	1,042	6'-4"	713	108	#5	9"	19'-10"	2,234	16	18"	39'-9"	425	90	18"	39'-9"	2,390	108	9"	5'-0"	361	162	9"	4'-7"	496	11'-3"	1,217	22'-8"	61	48	134	1.672	313.9	1.7	195	68.6	12,750											
5	5'-0"	5'-0"	8"	7"	108	#6	9"	28'-3"	4,583	108	#5	9"	9'-3"	1,042	6'-4"	713	108	#5	9"	25'-5"	2,863	20	18"	39'-9"	531	110	18"	39'-9"	2,921	108	9"	5'-0"	361	216	9"	4'-7"	661	11'-3"	1,623	28'-3"	75	60	167	2.056	382.5	2.1	242	84.3	15,540											
6	5'-0"	5'-0"	8"	7"	108	#6	9"	33'-10"	5,488	108	#5	9"	9'-3"	1,042	6'-4"	713	108	#5	9"	31'-0"	3,492	24	18"	39'-9"	637	130	18"	39'-9"	3,452	108	9"	5'-0"	361	270	9"	4'-7"	827	11'-3"	2,029	33'-10"	90	70	195	2.439	451.0	2.5	285	100.1	18,326											

HL93 LOADING

SHEET 2 OF 2



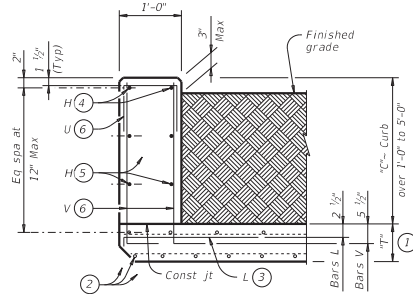
Bridge Division Standard

MULTIPLE BOX CULVERTS
CAST-IN-PLACE
5'-0" SPAN
0' TO 20' FILL
MC-5-20

FILE: CD-MC520-20.dgn	OWN: TBE	CK: BNP	OWN: TxDOT	CK: TxDOT
CTxDOT February 2020	CONT	SECT	JOB	MICHIGAN
REVISIONS	0918	47	472	VA
DIST	COUNTY		SHEET NO.	
DAL	DALLAS		69	

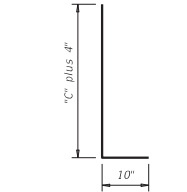
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DATE:
FILE:



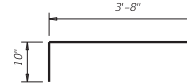
TYPICAL SECTION

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



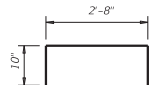
BARS V (#5) ⑥

Spaced at 12" Max



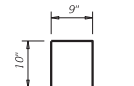
BARS L (#5) ③

Spaced at 12" Max



OPTIONAL BARS L (#5) ③ ⑦

Spaced at 12" Max



BARS U (#4) ⑥

Spaced at 12" Max

- ① T₁ is equal to the culvert top slab thickness. For precast boxes with slabs less than 8" thick, see SCP-MD standard for additional details.
- ② Adjust normal culvert slab bars as necessary to clear obstructions.
- ③ Place bars L as shown. Tilt hook as necessary to maintain cover.
- ④ Place normal culvert curb bars H(#4) as shown. Adjust as necessary to clear obstructions.
- ⑤ Additional bars H(#4) as required to maintain 12" Max spacing.
- ⑥ Replace normal culvert curb bars K with one bar U and two bars V as shown spaced at 12" Max. Adjust length of bars V as necessary to maintain clear cover.
- ⑦ Optional bars L are to be used only for precast box culverts with 3'-0" closure pour.
- ⑧ Quantities shown are for Contractor's information only. Quantities are per linear foot of curb length. The value in table can be interpolated for intermediate values of curb height, "C". Quantity includes bars K (when applicable).

CONSTRUCTION NOTES:

Adjust reinforcing steel as necessary to provide 1 1/4" cover.
For vehicle safety, top of the curb must not project more than 3" above the finished grade.

MATERIAL NOTES:

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

GENERAL NOTES:

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

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

TABLE OF ESTIMATED CURB QUANTITIES ⑧

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



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

ECD

FILE: CD-ECD-20.dgn	CHK: GAF	CHK: TxDOT	CHK: TxDOT	CHK: GAF
CTxDOT	February 2020	CONT	SECT	HIGHWAY
0918	47	472	VA	
DIST	COUNTY	SHEET NO.		
DAL	DALLAS	70		

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DATE: FILE:

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

Dimensions					Variable Reinforcing				Estimated Quantities per ft of wing length (2-wings)	
Maximum Wingwall Height Hw	W	X	Y	Z	Bars J1		Bars J2		Reinf (Lb/Ft)	Con. (CY/Ft)
					Size	Spa	Size	Spa		
2'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	33.73	0.248
3'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.07	0.261
3'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.74	0.273
4'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	38.41	0.285
4'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	41.75	0.330
5'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.09	0.343
5'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.75	0.355
6'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	46.42	0.367
7'-0"	3'-8"	1'-9"	1'-3"	7"	#4	1'-0"	#4	1'-0"	52.77	0.414
8'-0"	4'-2"	2'-0"	1'-6"	8"	#5	1'-0"	#4	1'-0"	60.19	0.486
9'-0"	4'-8"	2'-3"	1'-9"	8"	#4	6"	#4	6"	81.49	0.535
10'-0"	5'-2"	2'-6"	2'-0"	8"	#5	6"	#4	6"	97.25	0.584
11'-0"	5'-8"	2'-9"	2'-3"	8"	#6	6"	#5	6"	133.65	0.634
12'-0"	6'-2"	3'-0"	2'-6"	9"	#7	6"	#5	6"	162.29	0.721
13'-0"	6'-8"	3'-3"	2'-9"	11"	#7	6"	#5	6"	178.80	0.856
14'-0"	7'-2"	3'-6"	3'-0"	1'-0"	#8	6"	#5	6"	216.78	0.959
15'-0"	7'-8"	4'-0"	3'-0"	1'-1"	#9	6"	#6	6"	283.06	1.068
16'-0"	8'-2"	4'-6"	3'-0"	1'-3"	#9	6"	#6	6"	297.02	1.234

TABLE OF WINGWALL REINFORCING
(2-wings)

Bar	Size	No.	Spa
D	#5	~	1'-0"
E	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	4	~
M	#4	4	~
P	#4	~	1'-0"
R	#5	6	~
V	#4	~	1'-0"

TABLE OF ESTIMATED CULVERT TOEWALL QUANTITIES

Bar	Size	No.	Spa
L	#4	~	1'-6"
Q	#4	1	~
Reinf (Lb/Ft)			2.45
Conc (CY/Ft)			0.037

WING DIMENSION FORMULAS:

(All values are in feet.)
 $Hw = H + T + C - 0.250'$
 $Lw = (Hw - 0.333') (SL)$

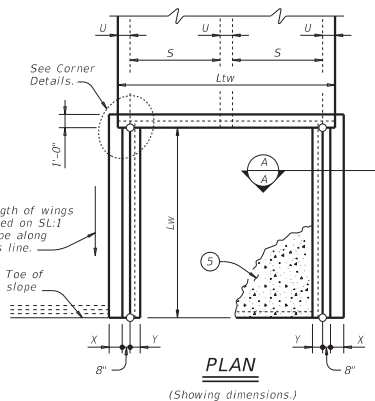
For cast-in-place culverts:
 $Ltw = (N) (S) + (N + 1) (U)$

For precast culverts:
 $Ltw = (N) (2U + S) + (N - 1) (0.5')$

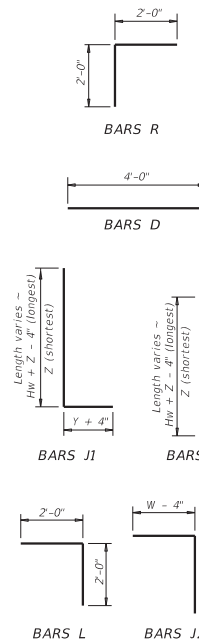
Total Wingwall Area (two wings ~ 5F) = $(Hw + 0.333') (Lw)$

Hw = Height of wingwall
SL:1 = Side slope ratio (horizontal:1 vertical)
Lw = Length of wingwall
Ltw = Culvert toewall length
N = Number of culvert spans

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



PLAN
(Showing dimensions.)



- Extend Bars P 3'-0" minimum into bottom slab of box culvert.
- Adjust as necessary to maintain 1 1/2" clear cover and 4" minimum between bars.
- Quantities shown are based on an average wing height for two wings (one structure end). To determine total quantities for two wings, multiply the tabulated values by Lw.
- Recommended values of side slope are: 2:1, 3:1, 4:1, and 6:1.
- When shown elsewhere on the plans, construct 5" deep concrete riprap. Payment for riprap is as required by Item 432, "Riprap." Unless otherwise shown on the plans or directed by the Engineer, provide a 6" wide by 1'-6" deep reinforced concrete toewall along all edges of the riprap adjacent to natural ground; reinforce the toewall by extending typical riprap reinforcing into the toewall; and extend construction joints or grooved joints oriented in the direction of flow across the full distance of the riprap at intervals of approximately 20'. When such riprap is provided, the culvert toewall shown in SECTION B-B will not be required.
- At Contractor's option, culvert toewall may be ended flush with wingwall toewall. Adjust reinforcing as needed.
- 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- For vehicle safety, the following requirements must be met:
 - For structures without bridge rail, construct curbs no more than 3" above finished grade.
 - For structures with bridge rail, construct curbs flush with finished grade.Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

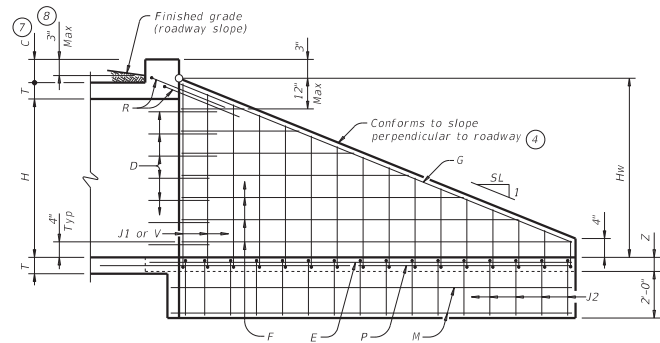
MATERIAL NOTES:

Provide Class C concrete ($f'c=3600$ psi).
Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.
In riprap concrete, synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing unless noted otherwise.

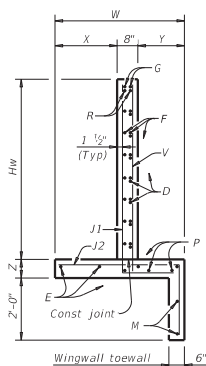
GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
When structure is founded on solid rock, depth of toewalls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer.
See Box Culvert Supplement (BCS) standard sheet for additional dimensions and information.
The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for Contractor's information only.

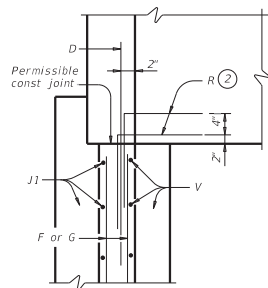
Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing dimensions are out-to-out of bars.



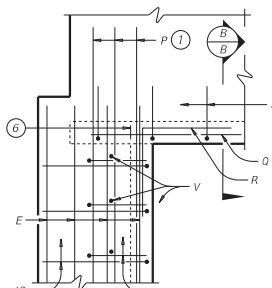
INSIDE ELEVATION
(Showing reinforcing. Culvert and culvert toewall reinforcing not shown for clarity.)



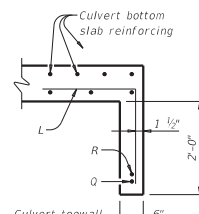
SECTION A-A



WINGWALL



FOOTING AND TOEWALL



SECTION B-B

CONCRETE WINGWALLS
WITH STRAIGHT WINGS FOR
0° SKEW BOX CULVERTS

SW-0

FILE: CD-SW0-20.dgn	OWN: GAF	CHK: CAT	OWN: TxDOT	CHK: TxDOT
CTxDOT February 2020	CON: 47	SECT: 472	JOB: VA	MICHIGAN
REVISIONS	0918	47	472	VA
DIST	DAL	COUNTY	DALLAS	SHEET NO. 71

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DATE: FILE:

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

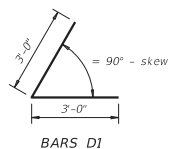
Dimensions					Variable Reinforcing				Estimated Quantities per ft of wing (2-wings)		Estimated Quantities per ft of Toewall (1-toewall)	
Maximum Wingwall Height Hw	W	X	Y	Z	Bars J1		Bars J2		Reinf Lb/ft	Conc (CY/ft)	Reinf (Lb/ft)	Conc (CY/ft)
					Size	Spa	Size	Spa				
2'-6"	2'-10"	10"	1'-0"	7"	#4	1'-0"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

TABLE OF WINGWALL REINFORCING
(2-wings)

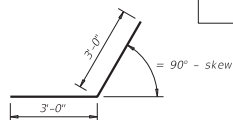
Bar	Size	No.	Spa
D1	#6	~	1'-0"
D2	#6	~	1'-0"
E1	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	~	8"
M1	#4	4	~
P	#4	~	1'-0"
V	#4	~	1'-0"

TABLE OF TOEWALL REINFORCING

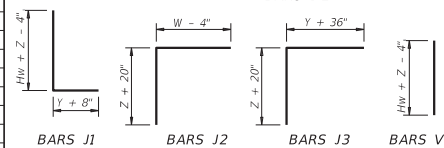
Bar	Size	No.	Spa
J3	#4	~	1'-0"
M2	#4	2	~
E2	#4	~	1'-0"



BARS D1



BARS D2



BARS J1

BARS J2

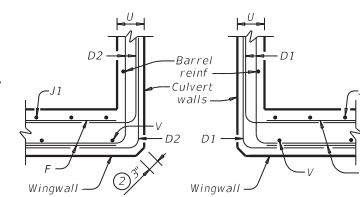
BARS J3

BARS V

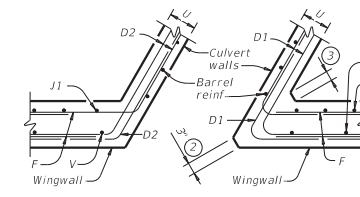
WING DIMENSION FORMULAS:
(All values are in feet.)
 $Hw = H + T + C$
 $Lw = (Hw)(SL) + \cosine(\theta)$ for Type PW-1
 $= (Hw - 1')(SL) + \cosine(\theta)$ for Type PW-2 and $Hw \geq 4'$
 $= (Hw - 0.5')(SL) + \cosine(\theta)$ for Type PW-2 and $Hw < 4'$
For cast-in-place culverts:
 $Ltw = [(N)(S) + (N + 1)(U)] + \cosine(\theta)$
For precast culverts:
 $Ltw = [(N)(2U + S) + (N - 1)(0.5') + \cosine(\theta)]$
Total Wingwall Area (two wings ~ SF)
 $= (2)(Hw)(Lw)$ for Type PW-1
 $= (2)(Hw)(Lw) - 6 SF$ for Type PW-2 and $Hw \geq 4'$
 $= (2)(Hw)(Lw) - 1.5 SF$ for Type PW-2 and $Hw < 4'$

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

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



SECTION C-C - PW-1



SECTION C-C - PW-2

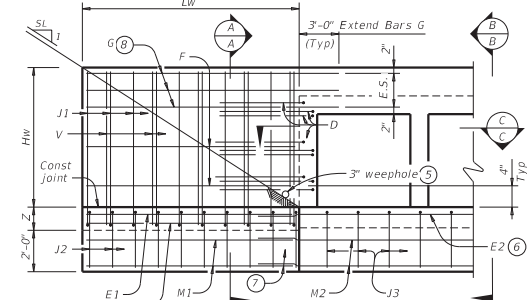
- Skew = 0°
- At discharge end, chamfer may be 3/4" minimum.
- For 15° skew ~ 1"
For 30° skew ~ 2"
For 45° skew ~ 3"
- Quantities shown are for two Type PW-1 wings. Adjust concrete volume for Type PW-2 wings. To determine estimated quantities for two wings, multiply the tabulated values by Lw. Quantities shown do not include weight of Bars D.
- Provide weepholes for Hw = 5'-0" and greater. Fill around weepholes with coarse gravel.
- Extend Bars E2 1'-6" minimum into the wingwall footing.
- Place Bars M1 1'-6" minimum with Bars M2.
- Lap Bars M1 1'-6" minimum with Bars M2.
- 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 and T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- For vehicle safety, the following requirements must be met:
 - For structures without bridge rail, construct curbs no more than 3" above finished grade.
 - For structures with bridge rail, construct curbs flush with finished grade.Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- 1'-0" typical. 2'-3" when the Box Culvert Rail Mounting Details (RAC) standard sheet is referred to elsewhere in the plans.
- 3'-0" for Hw < 4'.
- 6" for Hw < 4'.

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

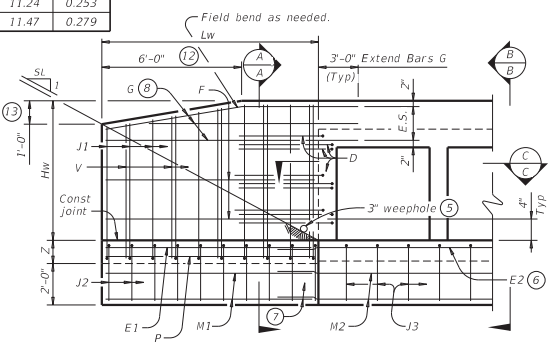
MATERIAL NOTES:
Provide Class C concrete (f'c=3,600 psi).
Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.

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

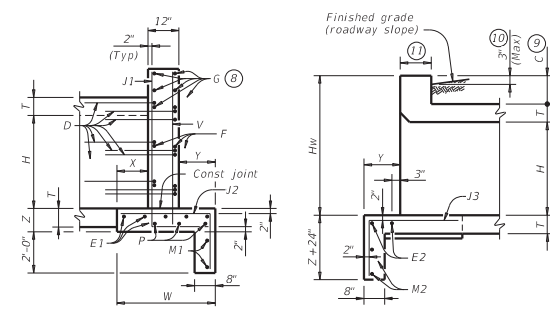
Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing dimensions are out-to-out of bars.



PARTIAL ELEVATION - PW-1

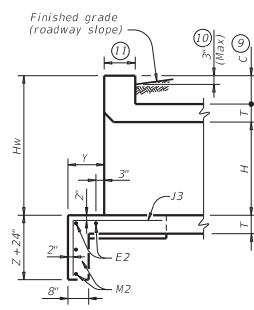


PARTIAL ELEVATION - PW-2



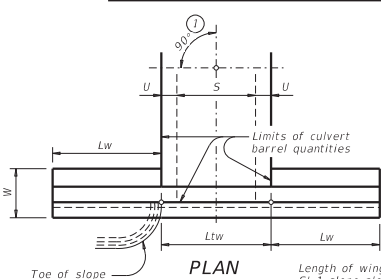
SECTION A-A

(Showing wing reinforcement.)

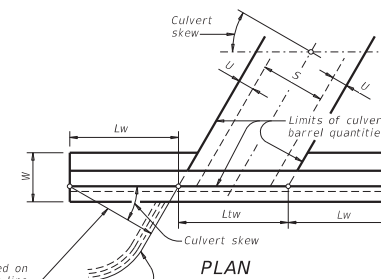


SECTION B-B

(Showing wing reinforcement.)



DETAILS FOR NON-SKEWED BOX CULVERTS



DETAILS FOR SKEWED BOX CULVERTS

(Showing 30° skew.)

Texas Department of Transportation

Bridge Division Standard

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

PW

FILE: CD-PW-20.dgn	CON: GAF	CK: CAT	DN: TxDOT	CK: TxDOT
CTxDOT	FEBRUARY 2020	CON: SECT	JOB	MICHAE
REVISIONS		0918	47	472
DIST	COUNTY			VA
DAL	DALLAS			72

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DATE: FILE:

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

Dimensions					Variable Reinforcing				Estimated Quantities per ft. of wing length (2-wings) ③	
Maximum Wingwall Height Hw	W	X	Y	Z	Bars J1		Bars J2			
					Size	Spa	Size	Spa	Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	33.73	0.248
3'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.07	0.261
3'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.74	0.273
4'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	38.41	0.285
4'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	41.75	0.330
5'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.09	0.343
5'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.75	0.355
6'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	46.42	0.367
7'-0"	3'-8"	1'-9"	1'-3"	7"	#4	1'-0"	#4	1'-0"	52.77	0.414
8'-0"	4'-2"	2'-0"	1'-6"	8"	#5	1'-0"	#4	1'-0"	60.19	0.486
9'-0"	4'-8"	2'-3"	1'-9"	8"	#4	6"	#4	6"	81.49	0.535
10'-0"	5'-2"	2'-6"	2'-0"	8"	#5	6"	#4	6"	97.25	0.584
11'-0"	5'-8"	2'-9"	2'-3"	8"	#6	6"	#5	6"	133.65	0.634
12'-0"	6'-2"	3'-0"	2'-6"	9"	#7	6"	#5	6"	162.29	0.721
13'-0"	6'-8"	3'-3"	2'-9"	11"	#7	6"	#5	6"	178.80	0.856
14'-0"	7'-2"	3'-6"	3'-0"	1'-0"	#8	6"	#5	6"	216.78	0.959
15'-0"	7'-8"	4'-0"	3'-0"	1'-1"	#9	6"	#6	6"	283.06	1.068
16'-0"	8'-2"	4'-6"	3'-0"	1'-3"	#9	6"	#6	6"	297.02	1.234

TABLE OF WINGWALL REINFORCING
(2-wings)

Bar	Size	No.	Spa
D	#5	~	1'-0"
E	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	4	~
M	#4	4	~
P	#4	~	1'-0"
R	#5	6	~
V	#4	~	1'-0"

TABLE OF ESTIMATED CULVERT TOEWALL QUANTITIES

Bar	Size	No.	Spa
L	#4	~	1'-6"
Q	#4	1	~
Reinf (Lb/Ft)			2.45
Conc (CY/Ft)			0.037

WING DIMENSION FORMULAS:

(All values are in feet.)

$$Hw = H + T + C - 0.250'$$

$$A = (Hw - 0.333') (SL)$$

$$B = (A) \tan(30^\circ)$$

$$Lw = (A) + \cosine(30^\circ)$$

For cast-in-place culverts:

$$Ltw = (N) (S) + (N + 1) (U)$$

For precast culverts:

$$Ltw = (N) (2U + S) + (N - 1) (0.5')$$

$$\text{Total wingwall area (two wings - SF)} = (Hw + 0.333') (Lw)$$

Hw = Height of wingwall

SL:1 = Side slope ratio (horizontal:1 vertical)

Lw = Length of wingwall

Ltw = Culvert toewall length

N = Number of culvert spans

S = Spacing of bars

U = Spacing of bars

V = Spacing of bars

W = Spacing of bars

X = Spacing of bars

Y = Spacing of bars

Z = Spacing of bars

1 = Spacing of bars

2 = Spacing of bars

3 = Spacing of bars

4 = Spacing of bars

5 = Spacing of bars

6 = Spacing of bars

7 = Spacing of bars

8 = Spacing of bars

9 = Spacing of bars

10 = Spacing of bars

11 = Spacing of bars

12 = Spacing of bars

13 = Spacing of bars

14 = Spacing of bars

15 = Spacing of bars

16 = Spacing of bars

17 = Spacing of bars

18 = Spacing of bars

19 = Spacing of bars

20 = Spacing of bars

21 = Spacing of bars

22 = Spacing of bars

23 = Spacing of bars

24 = Spacing of bars

25 = Spacing of bars

26 = Spacing of bars

27 = Spacing of bars

28 = Spacing of bars

29 = Spacing of bars

30 = Spacing of bars

31 = Spacing of bars

32 = Spacing of bars

33 = Spacing of bars

34 = Spacing of bars

35 = Spacing of bars

36 = Spacing of bars

37 = Spacing of bars

38 = Spacing of bars

39 = Spacing of bars

40 = Spacing of bars

41 = Spacing of bars

42 = Spacing of bars

43 = Spacing of bars

44 = Spacing of bars

45 = Spacing of bars

46 = Spacing of bars

47 = Spacing of bars

48 = Spacing of bars

49 = Spacing of bars

50 = Spacing of bars

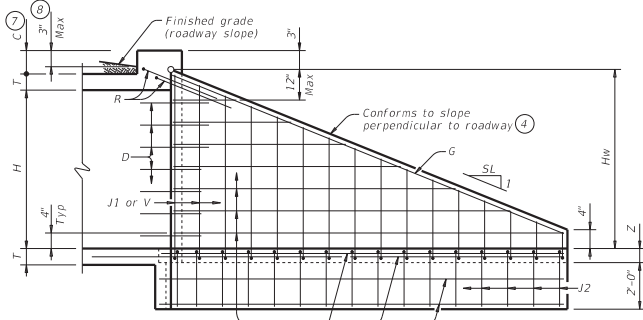
51 = Spacing of bars

52 = Spacing of bars

53 = Spacing of bars

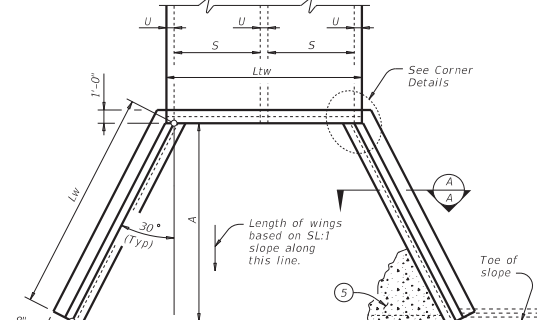
54 = Spacing of bars

55 = Spacing of bars



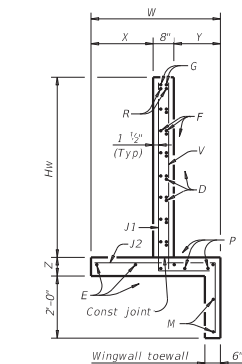
INSIDE ELEVATION

(Showing reinforcing. Culvert and culvert toewall reinforcing not shown for clarity.)

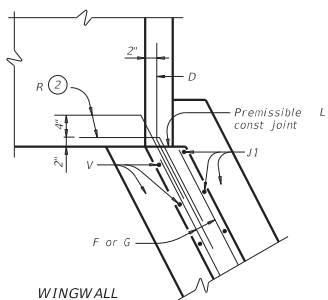


PLAN

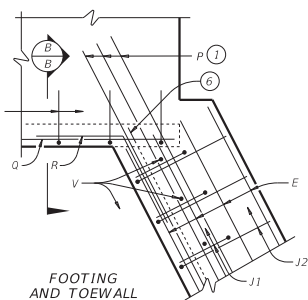
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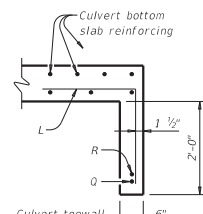
SECTION A-A



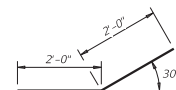
WINGWALL



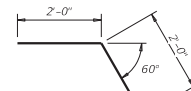
FOOTINGS AND TOEWALL



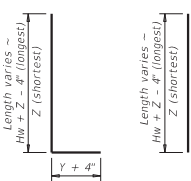
SECTION B-B (5)



BARS D

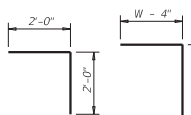


BARS R



BARS J1

BARS V



BARS L

BARS J2

- Extend Bars P 3'-0" minimum into bottom slab of box culvert.
- Adjust as necessary to maintain 1 1/2" clear cover and 4" minimum between bars.
- Quantities shown are based on an average wing height for two wings (one structure end). To determine total quantities for two wings, multiply the tabulated values by Lw.
- Recommended values of side slope are: 2:1, 3:1, 4:1, and 6:1.
- When shown elsewhere on the plans, construct 5" deep concrete riprap. Payment for riprap is as required by Item 432, "Riprap." Unless otherwise shown on the plans or directed by the Engineer, provide a 6" wide by 1'-6" deep reinforced concrete toewall along all edges of the riprap adjacent to natural ground; reinforce the toewall by extending typical riprap reinforcing into the toewall; and extend construction joints or grooved joints oriented in the direction of flow across the full distance of the riprap at intervals of approximately 20'. When such riprap is provided, the culvert toewall shown in SECTION B-B will not be required.
- At Contractor's option, culvert toewall may be ended flush with wingwall toewall. Adjust reinforcing as needed.
- 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- For vehicle safety, the following requirements must be met:
 - For structures without bridge rail, construct curbs no more than 3" above finished grade.
 - For structures with bridge rail, construct curbs flush with finished grade.Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

MATERIAL NOTES:

Provide Class C concrete (f'c=3,600 psi).

Provide Grade 60 reinforcing steel.

Provide galvanized reinforcing steel if required elsewhere in the plans.

In riprap concrete synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing unless noted otherwise.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

When structure is founded on solid rock, depth of toewalls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer.

See Box Culvert Supplement (BCS) standard sheet for additional dimensions and information.

The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for Contractor's information only.

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



CONCRETE WINGWALLS
WITH FLARED WINGS FOR
0° SKEW BOX CULVERTS

FW-0

FILE: CD-FW0-20.dgn	DN: GAF	CK: CAT	DN: TxDOT	CK: TxDOT
CTxDOT February 2020	CON: SECT	JOB	MICHIGAN	
REVISIONS	0918	47	472	VA
DIST	DAL	COUNTY	DALLAS	SHEET NO. 73

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DATE: FILE:

TABLE OF DIMENSIONS AND REINFORCING STEEL (Wings for one structure end)										
Dimensions					Variable Reinforcing				Estimated Quantities per ft of wing length (2-wings)	
Maximum Wingwall Height Hw	W	X	Y	Z	Bars J1		Bars J2			
					Size	Spa	Size	Spa	Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	33.73	0.248
3'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.07	0.261
3'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.74	0.273
4'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	38.41	0.285
4'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	41.75	0.330
5'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.09	0.343
5'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.75	0.355
6'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	46.42	0.367
7'-0"	3'-8"	1'-9"	1'-3"	7"	#4	1'-0"	#4	1'-0"	52.77	0.414
8'-0"	4'-2"	2'-0"	1'-6"	8"	#5	1'-0"	#4	1'-0"	60.19	0.486
9'-0"	4'-8"	2'-3"	1'-9"	8"	#4	6"	#4	6"	81.49	0.535
10'-0"	5'-2"	2'-6"	2'-0"	8"	#5	6"	#4	6"	97.25	0.584
11'-0"	5'-8"	2'-9"	2'-3"	8"	#6	6"	#5	6"	133.65	0.634
12'-0"	6'-2"	3'-0"	2'-6"	9"	#7	6"	#5	6"	162.29	0.721
13'-0"	6'-8"	3'-3"	2'-9"	11"	#7	6"	#5	6"	178.80	0.856
14'-0"	7'-2"	3'-6"	3'-0"	1'-0"	#8	6"	#5	6"	216.78	0.959
15'-0"	7'-8"	4'-0"	3'-0"	1'-1"	#9	6"	#6	6"	283.06	1.068
16'-0"	8'-2"	4'-6"	3'-0"	1'-3"	#9	6"	#6	6"	297.02	1.234

TABLE OF WINGWALL REINFORCING (2-wings)			
Bar	Size	No.	Spa
DL	#5	~	1'-0"
DS	#5	~	1'-0"
E	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	4	~
M	#4	4	~
P	#4	~	1'-0"
RS	#5	3	~
RL	#5	3	~
V	#4	~	1'-0"

TABLE OF ESTIMATED CULVERT TOEWALL QUANTITIES			
Bar	Size	No.	Spa
L	#4	~	1'-6"
Q	#4	1	~
Reinf (Lb/Ft)			2.45
Conc (CY/Ft)			0.037

WING DIMENSION FORMULAS:

(All values are in feet.)

$$Hw = H + T + C - 0.250'$$
$$A = (Hw - 0.333')SL$$
$$B = (A) [\tan(\theta + 15^\circ)]$$
$$Lw = (A) + [\cos(\theta + 15^\circ)]$$

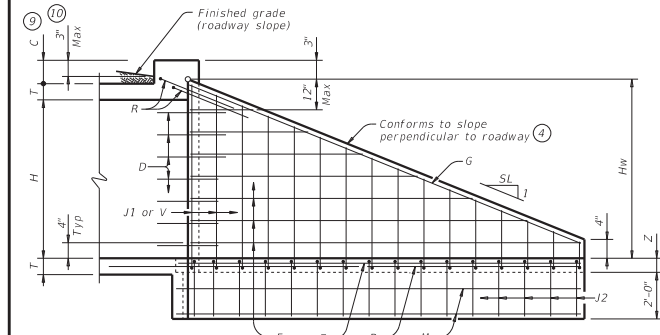
For cast-in-place culverts:
 $Ltw = [(N)(S) + (N + 1)(U)] + \cos(\theta)$

For precast culverts:
 $Ltw = [(N)(2U + S) + (N - 1)(0.5)] + \cos(\theta)$

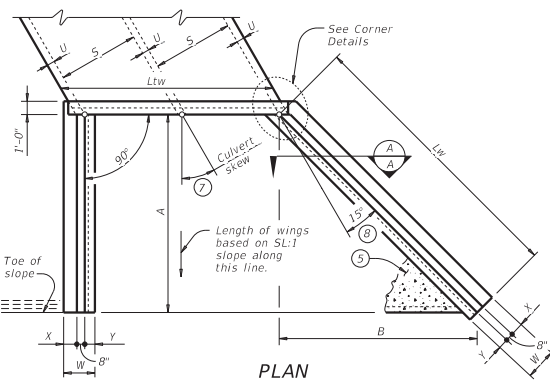
Total wingwall area (two wings - SF) = $0.5 (Hw + 0.333') (Lw + A)$

Hw = Height of wingwall
SL:1 = Side slope ratio (horizontal:1 vertical)
A = Length of short wingwalls
Lw = Length of long wingwall
Ltw = Culvert toewall length
N = Number of culvert spans
 θ = Culvert skew

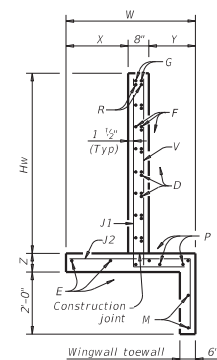
See applicable box culvert standard sheet for H, S, T, and U values.



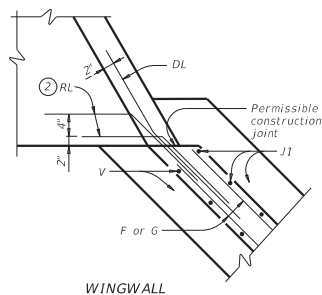
INSIDE ELEVATION
(Showing reinforcing, Culvert and culvert toewall reinforcing not shown for clarity.)



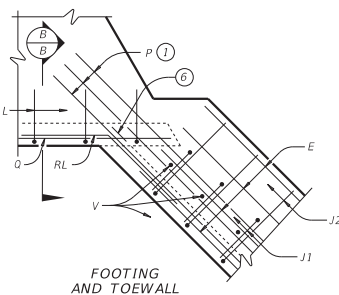
PLAN
(Showing dimensions and 30° skew.)



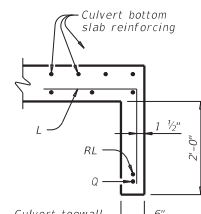
SECTION A-A



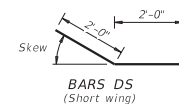
WINGWALL



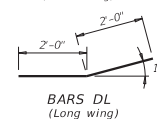
FOOTING AND TOEWALL



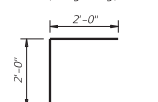
SECTION B-B



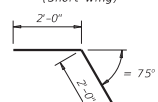
BARS DS
(Short wing)



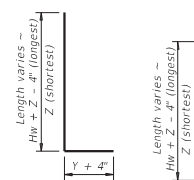
BARS DL
(Long wing)



BARS RS
(Short wing)



BARS RL
(Long wing)



BARS J1 **BARS V**

BARS L **BARS J2**

- Extend Bars P 3'-0" minimum into bottom slab of box culvert.
- Adjust as necessary to maintain 1 1/2" clear cover and 4" minimum between bars.
- Quantities shown are based on an average wing height for two wings (one structure end). To determine total quantities for two wings, multiply the tabulated values by 0.5 x (A + Lw).
- Recommended values of side slope are: 2:1, 3:1, 4:1, and 6:1.
- When shown elsewhere on the plans, construct 5' deep concrete riprap. Payment for riprap is as required by Item 432, "Riprap." Unless otherwise shown on the plans or directed by the Engineer, provide a 6' wide by 1'-6" deep reinforced concrete toewall along all edges of the riprap adjacent to natural ground; reinforce the toewall by extending typical riprap reinforcing into the toewall; and extend construction joints or grooved joints oriented in the direction of flow across the full distance of the riprap at intervals of approximately 20'. When such riprap is provided, the culvert toewall shown in SECTION B-B will not be required.
- At Contractor's option, culvert toewall may be ended flush with wingwall toewall. Adjust reinforcing as needed.
- Applicable values of skew are: 15°, 30°, and 45°.
- Typical wingwall angle for all skews.
- 0' Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- For vehicle safety, the following requirements must be met:
 - For structures without bridge rail, construct curbs no more than 3" above finished grade.
 - For structures with bridge rail, construct curbs flush with finished grade.Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

MATERIAL NOTES:

Provide Class C concrete (f'c=3,600 psi).
Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.
In riprap concrete, synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
When structure is founded on solid rock, depth of toewalls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer.
See Box Culvert Supplement (BCS) standard sheet for additional dimensions and information.
The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for Contractor's information only.

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



CONCRETE WINGWALLS WITH FLARED WINGS FOR SKEWED BOX CULVERTS

FW-S

FILE: CD-FWS-20.dgn	DN: GAF	CK: CAT	DN: TxDOT	CK: TxDOT
CTxDOT February 2020	CONT	SECT	JOB	MICHIGAN
REVISIONS	0918	47	472	VA
DIST	DAL	COUNTY	DALLAS	SHEET NO. 74

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DATE: FILE:

TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL ⑤

Slope	Dia of Pipe (D)	Values for One Pipe				Values to be Added for Each Add'l Pipe			
		W	X	Y	L	Reinf (Lbs)	Conc (CY)	X and W	Reinf (Lbs)
2:1	12"	4' - 7 1/2"	2' - 6"	2' - 10"	3' - 3 1/4"	88	0.6	1' - 9"	20
	15"	5' - 5 3/4"	2' - 9 1/2"	3' - 4"	3' - 10 1/4"	103	0.7	2' - 2"	24
	18"	6' - 4 1/4"	3' - 1"	3' - 10"	4' - 5"	124	0.9	2' - 8"	32
	21"	7' - 2 3/4"	3' - 4 1/2"	4' - 4"	5' - 0"	143	1.1	3' - 1"	43
	24"	8' - 2 1/2"	3' - 9 1/2"	4' - 10"	5' - 7"	164	1.3	3' - 7"	50
	27"	9' - 1"	4' - 1"	5' - 4"	6' - 2"	179	1.5	3' - 11"	56
	30"	9' - 11 1/2"	4' - 4 1/2"	5' - 10"	6' - 8 3/4"	203	1.7	4' - 4"	65
	33"	10' - 10"	4' - 8"	6' - 4"	7' - 3 3/4"	224	2.0	4' - 8"	71
	36"	11' - 8 1/4"	4' - 11 1/2"	6' - 10"	7' - 10 3/4"	249	2.2	5' - 1"	81
	42"	13' - 5 1/4"	5' - 6 1/2"	7' - 10"	9' - 0 1/2"	298	2.8	5' - 10"	97
	48"	15' - 9"	6' - 1 1/2"	9' - 4"	10' - 9 1/4"	360	3.8	6' - 7"	117
	54"	17' - 5 3/4"	6' - 8 1/2"	10' - 4"	11' - 11 1/4"	427	4.5	7' - 6"	151
3:1	60"	19' - 2 3/4"	7' - 3 1/2"	11' - 4"	13' - 1"	481	5.3	8' - 3"	174
	66"	20' - 11 1/2"	7' - 10 1/2"	12' - 4"	14' - 3"	544	6.2	8' - 9"	194
	72"	22' - 8 1/2"	8' - 5 1/2"	13' - 4"	15' - 4 3/4"	601	7.1	9' - 4"	213
	12"	6' - 3"	2' - 6"	4' - 3"	4' - 11"	118	0.8	1' - 9"	22
	15"	7' - 5"	2' - 9 1/2"	5' - 0"	5' - 9 1/4"	137	1.1	2' - 2"	28
	18"	8' - 6 3/4"	3' - 1"	5' - 9"	6' - 7 3/4"	170	1.3	2' - 8"	37
	21"	9' - 8 3/4"	3' - 4 1/2"	6' - 6"	7' - 6"	195	1.6	3' - 1"	48
	24"	11' - 0"	3' - 9 1/2"	7' - 3"	8' - 4 1/2"	227	2.0	3' - 7"	58
	27"	12' - 2"	4' - 1"	8' - 0"	9' - 2 3/4"	251	2.3	3' - 11"	67
	30"	13' - 4"	4' - 4 1/2"	8' - 9"	10' - 1 1/4"	293	2.7	4' - 4"	77
	33"	14' - 5 3/4"	4' - 8"	9' - 6"	10' - 11 3/4"	318	3.1	4' - 8"	84
	36"	15' - 7 3/4"	4' - 11 1/2"	10' - 3"	11' - 10"	351	3.5	5' - 1"	96
4:1	42"	17' - 11 1/2"	5' - 6 1/2"	11' - 9"	13' - 6 3/4"	432	4.5	5' - 10"	119
	48"	21' - 1 3/4"	6' - 1 1/2"	14' - 0"	16' - 2"	537	6.1	6' - 7"	146
	54"	23' - 5 1/2"	6' - 8 1/2"	15' - 6"	17' - 10 3/4"	630	7.3	7' - 6"	186
	60"	25' - 9 1/4"	7' - 3 1/2"	17' - 0"	19' - 7 1/2"	719	8.7	8' - 3"	219
	66"	28' - 1"	7' - 10 1/2"	18' - 6"	21' - 4 1/4"	811	10.1	8' - 9"	242
	72"	30' - 4 3/4"	8' - 5 1/2"	20' - 0"	23' - 1 1/4"	924	11.7	9' - 4"	272
	12"	7' - 10 3/4"	2' - 6"	5' - 8"	6' - 6 1/2"	148	1.1	1' - 9"	24
	15"	9' - 4"	2' - 9 1/2"	6' - 8"	7' - 8 1/2"	181	1.5	2' - 2"	32
	18"	10' - 9 1/2"	3' - 1"	7' - 8"	8' - 10 1/4"	221	1.9	2' - 8"	42
	21"	12' - 2 3/4"	3' - 4 1/2"	8' - 8"	10' - 0"	260	2.3	3' - 1"	57
	24"	13' - 9 1/2"	3' - 9 1/2"	9' - 8"	11' - 2"	301	2.8	3' - 7"	67
	27"	15' - 3"	4' - 1"	10' - 8"	12' - 3 3/4"	334	3.3	3' - 11"	77
6:1	30"	16' - 8 1/4"	4' - 4 1/2"	11' - 8"	13' - 5 3/4"	385	3.8	4' - 4"	89
	33"	18' - 1 3/4"	4' - 8"	12' - 8"	14' - 7 1/2"	425	4.5	4' - 8"	101
	36"	19' - 7"	4' - 11 1/2"	13' - 8"	15' - 9 1/4"	472	5.1	5' - 1"	115
	42"	22' - 5 3/4"	5' - 6 1/2"	15' - 8"	18' - 1"	583	6.5	5' - 10"	141
	48"	26' - 6 1/4"	6' - 1 1/2"	18' - 8"	21' - 6 3/4"	730	8.9	6' - 7"	175
	54"	29' - 5"	6' - 8 1/2"	20' - 8"	23' - 10 1/4"	875	10.7	7' - 6"	226
	60"	32' - 3 3/4"	7' - 3 1/2"	22' - 8"	26' - 2"	996	12.7	8' - 3"	264
	66"	35' - 2 1/2"	7' - 10 1/2"	24' - 8"	28' - 5 3/4"	1,140	14.9	8' - 9"	300
	72"	38' - 1 1/4"	8' - 5 1/2"	26' - 8"	30' - 9 1/2"	1,297	17.3	9' - 4"	334
	12"	11' - 2"	2' - 6"	8' - 6"	9' - 9 3/4"	224	1.9	1' - 9"	28
	15"	13' - 2 1/4"	2' - 9 1/2"	10' - 0"	11' - 6 1/2"	268	2.5	2' - 2"	37
	18"	15' - 2 1/2"	3' - 1"	11' - 6"	13' - 3 1/4"	330	3.2	2' - 8"	50

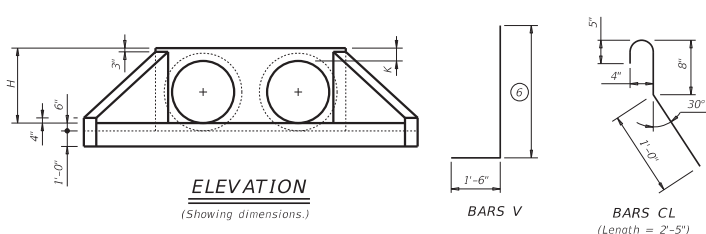
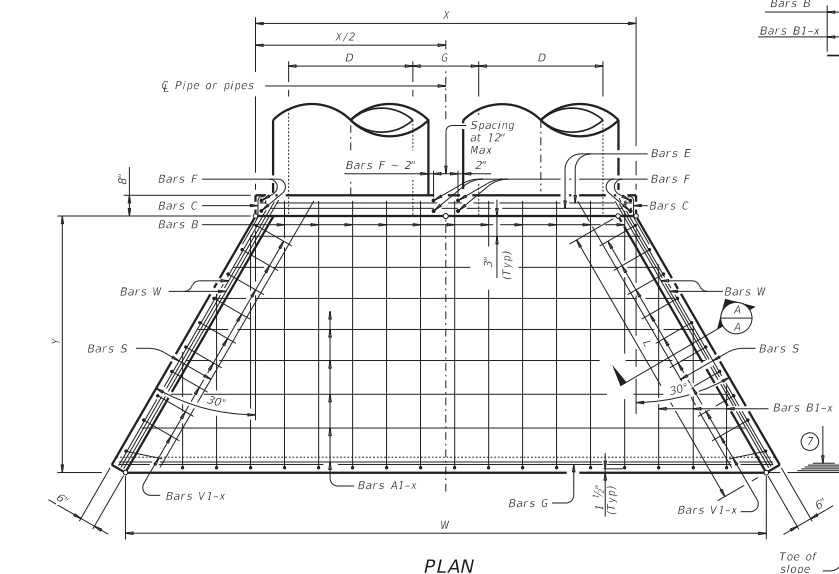


TABLE OF ⑤ REINFORCING STEEL			
Bar	Size	Spa	No.
A	#4	1' - 0"	~
B	#3	1' - 6"	~
C	#4	1' - 0"	~
D	#3	1' - 0"	~
E	#5	~	4
F	#5	~	~
G	#3	~	2
S	#4	~	6
V	#4	1' - 0"	~
W	#5	~	4

TABLE OF CONSTANT DIMENSIONS			
Dia of Pipe (D)	G	K ④	H
12"	0' - 9"	1' - 0"	2' - 0"
15"	0' - 11"	1' - 0"	2' - 3"
18"	1' - 2"	1' - 0"	2' - 6"
21"	1' - 4"	1' - 0"	2' - 9"
24"	1' - 7"	1' - 0"	3' - 0"
27"	1' - 8"	1' - 0"	3' - 3"
30"	1' - 10"	1' - 0"	3' - 6"
33"	1' - 11"	1' - 0"	3' - 9"
36"	2' - 1"	1' - 0"	4' - 0"
42"	2' - 4"	1' - 0"	4' - 6"
48"	2' - 7"	1' - 3"	5' - 3"
54"	3' - 0"	1' - 3"	5' - 9"
60"	3' - 3"	1' - 3"	6' - 3"
66"	3' - 3"	1' - 3"	6' - 9"
72"	3' - 4"	1' - 3"	7' - 3"



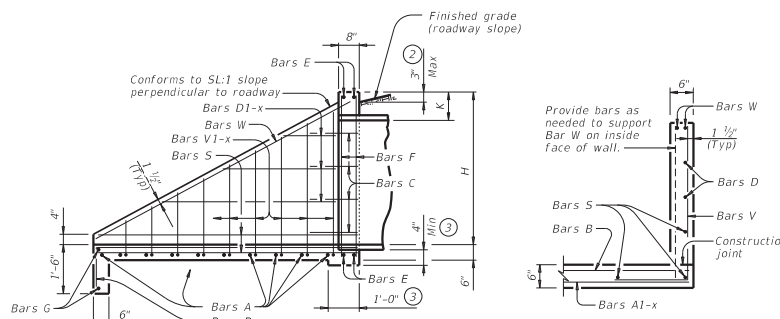
BARS B and B1-x

- Quantities shown are for concrete pipe and will increase slightly for metal pipe installations.
- 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.
- Provide a 1'-0" footing as shown where required to maintain 4" minimum cover for pipes.
- Dimensions shown are usual and maximum.
- Quantities shown are for one structure end only (one headwall).
- Min Length = $6' + 3' \times \left(\frac{12 \times H - 7}{12 \times L} \right)$
Max Length = $12 \times H - 3' \times \left(\frac{12 \times H - 7}{12 \times L} \right) - 1'$
- Lengths of wings based on SL:1 slope along this line.

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.

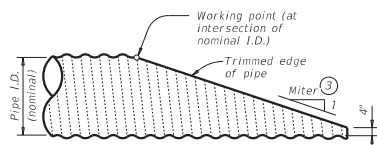


TYPICAL WING ELEVATION

SECTION A-A

		Bridge Division Standard			
CONCRETE HEADWALLS WITH FLARED WINGS FOR 0° SKEW PIPE CULVERTS					
CH-FW-0					
FILE: CD-CH-FW-20.dgn	CON: TxDOT	CK: TxDOT	CON: TxDOT		
REVISIONS	0918	47	VA		
DIST	DALLAS	COUNTY	SHEET NO.		
DAL	DALLAS	COUNTY	75		

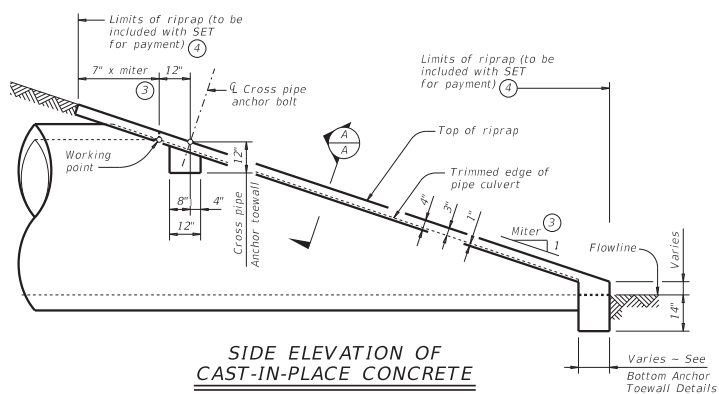
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NOTE: All pipe runners, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

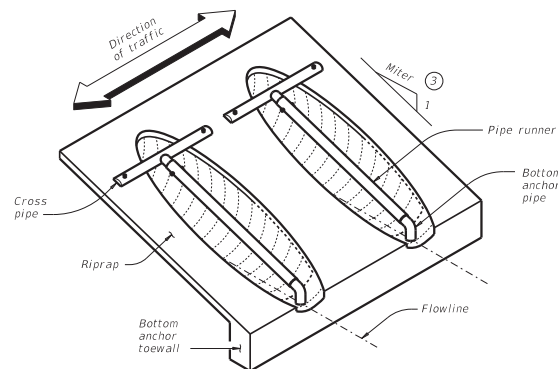
SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

(Showing corrugated metal pipe (CMP) culvert.
Details of reinforced concrete pipe (RCP) culvert are similar.)



SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

(Showing reinforced concrete pipe (RCP) culvert.
Details of corrugated metal pipe (CMP) culvert are similar. Pipe runners not shown for clarity.)



ISOMETRIC VIEW OF TYPICAL INSTALLATION

(Showing installation with no skew.)

CROSS PIPE LENGTHS AND PIPE RUNNER LENGTHS ①②

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

TYPICAL PIPE CULVERT MITERS ③

Side Slope	0° Skew	15° Skew	30° Skew	45° Skew
3:1	3:1	3.106:1	3.464:1	4.243:1
4:1	4:1	4.141:1	4.619:1	5.657:1
6:1	6:1	6.212:1	6.928:1	8.485:1

CONDITIONS WHERE PIPE RUNNERS ARE NOT REQUIRED ②

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

STANDARD PIPE SIZES AND MAX PIPE RUNNER LENGTHS ①

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

ESTIMATED CONCRETE RIPRAP QUANTITIES (CY) ⑤

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

① Provide pipe runner of the size shown in the tables. Provide cross pipe of the same size as the pipe runner. Provide cross pipe stub out and bottom anchor pipe of the next smaller size pipe as shown in the Standard Pipe Sizes and Max Pipe Runner Lengths table.

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

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

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

③ Miter = slope of mitered end of pipe culvert.

④ Riprap placed beyond the limits shown will be paid for as concrete riprap in accordance with Item 432, "Riprap."

⑤ Quantities shown are for one end of one reinforced concrete pipe (RCP) culvert. For multiple pipe culverts or for corrugated metal pipe (CMP) culverts, quantities will need to be adjusted. Riprap quantities are for Contractor's information only.

SHEET 1 OF 2



Bridge Division Standard

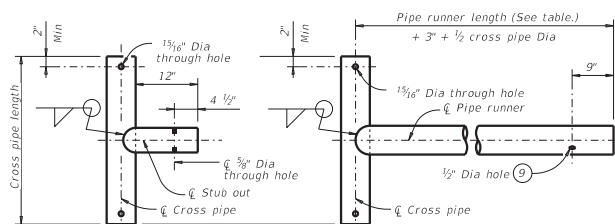
SAFETY END TREATMENT FOR 12" DIA TO 60" DIA PIPE CULVERTS TYPE II ~ CROSS DRAINAGE SETP-CD

FILE: CD-SETP-CD-20.dgn	OWN: GAF	CHK: CAT	CHK: JRP	CHK: GAF
CTxDOT February 2020	CONF: SECT	JOB	MICHIGAN	
REVISIONS	091847	472	VA	
DIST	COUNTY			
DAL	DALLAS			76

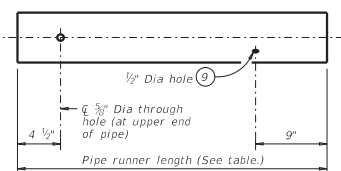
DATE: FILE:

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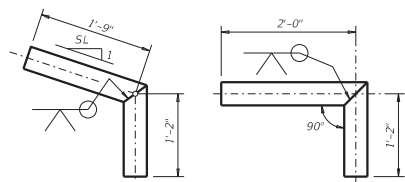


OPTION A1
OPTION A2
CROSS PIPE AND CONNECTIONS DETAILS

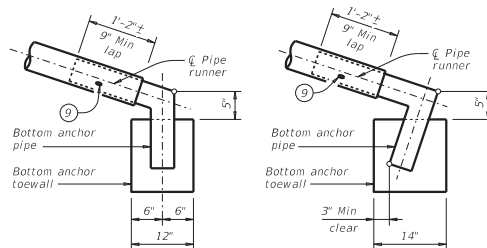


NOTE: The separate pipe runner shown is required when Cross Pipe Connection Option A1 is used.

PIPE RUNNER DETAILS



OPTION B1
OPTION B2
BOTTOM ANCHOR PIPE DETAILS 10



OPTION B1
OPTION B2
BOTTOM ANCHOR TOEWALL DETAILS

(Culvert and riprap not shown for clarity.)

MATERIAL NOTES:

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Provide pipe runners, cross pipes, and anchor pipes conforming to the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 Gr B, or API 5LX52.

Provide ASTM A307 bolts and nuts. Galvanize all steel components, except concrete reinforcing, after fabrication.

Repair galvanizing damaged during transport or construction in accordance with the specifications.

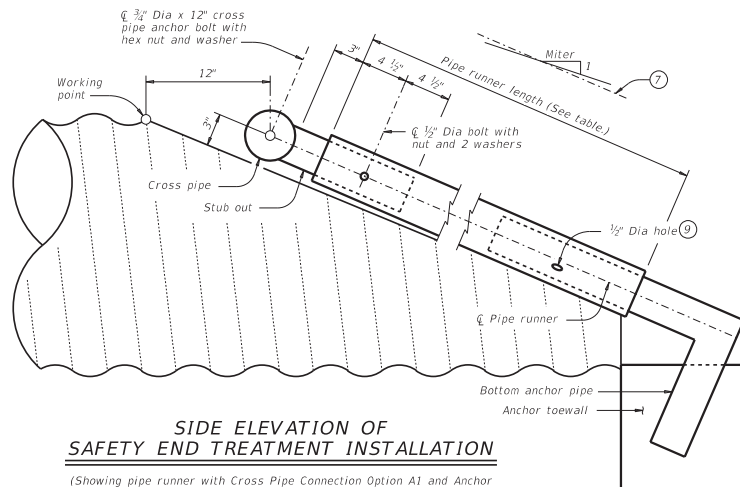
GENERAL NOTES:

Pipe runners are designed for a traversing load of 1,800 pounds at yield as recommended by Research Report 280-1, "Safety Treatment of Roadside Cross-Drainage Structures", Texas Transportation Institute, March 1981.

Safety end treatments (SET) shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the pipe runners.

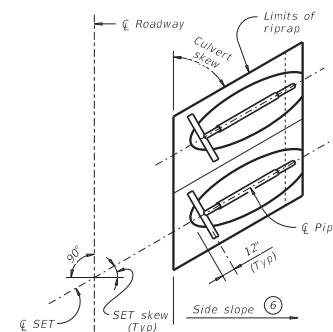
Payment for riprap and toewall is included in the price bid for each safety end treatment.

Construct concrete riprap and all necessary inverts in accordance with the requirements of Item 432, "Riprap."

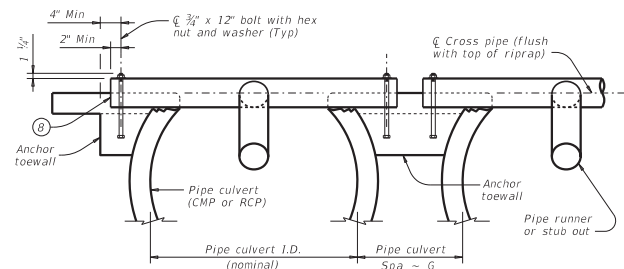


SIDE ELEVATION OF SAFETY END TREATMENT INSTALLATION

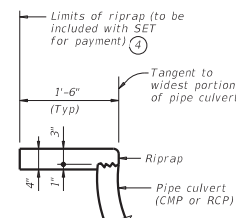
(Showing pipe runner with Cross Pipe Connection Option A1 and Anchor Pipe Option B2 on corrugated metal pipe (CMP) culvert. Reinforced concrete pipe culvert (RCP) details are similar. Riprap not shown for clarity)



PLAN OF SKEWED INSTALLATION



SHOWING CROSS PIPE AND ANCHOR TOEWALL



SHOWING TYPICAL PIPE CULVERT AND RIPRAP

SECTION A-A

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

SHEET 2 OF 2



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

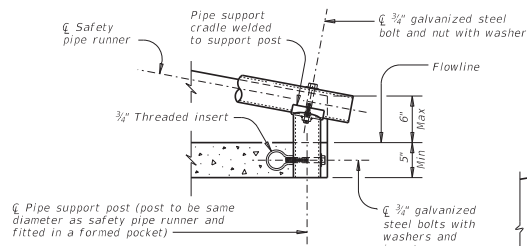
FILE: CD-SETP-CD-20.dgn	DN: GAF	CK: CAT	DN: JRP	CK: GAF
CTxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0918	47	472	VA
DIST	DAL	COUNTY	DALLAS	SHEET NO. 77

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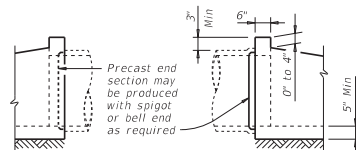
REQUIREMENTS FOR CULVERT PIPES AND SAFETY PIPE RUNNERS

Pipe I.D.	RCP Wall "B" Thickness	TP Wall Thickness (8)	"D" (1)	Slope	Min Length of Unit	Single Pipe		Multiple Pipes	
						Skew	Pipe Runners Required	Skew	Pipe Runners Required
12"	2"	1.15"	17.00"	3:1	2' - 11"	≤ 45°	No	≤ 45°	No
				4:1	3' - 6"				
				6:1	4' - 9"				
15"	2 1/4"	1.30"	20.50"	3:1	3' - 8"	≤ 45°	No	≤ 45°	No
				4:1	4' - 7"				
				6:1	6' - 5"				
18"	2 1/2"	1.60"	24.00"	3:1	4' - 6"	≤ 45°	No	≤ 45°	No
				4:1	5' - 8"				
				6:1	8' - 0"				
24"	3"	1.95"	31.00"	3:1	6' - 2"	≤ 45°	No	= 30°	No
				4:1	7' - 10"			> 30°	Yes
				6:1	11' - 3"				
30"	3 1/2"	2.65"	38.50"	3:1	7' - 10"	= 15°	No	= 15°	No
				4:1	10' - 1"			> 15°	Yes
				6:1	14' - 8"				
36"	4"	2.75"	45.50"	3:1	9' - 5"	= 0°	No	≥ 0°	Yes
				4:1	12' - 3"				
				6:1	17' - 11"				
42"	4 1/2"	2.7"	52.50"	3:1	11' - 1"	≈ 0°	Yes	≈ 0°	Yes
				4:1	14' - 5"				
				6:1	21' - 2"				



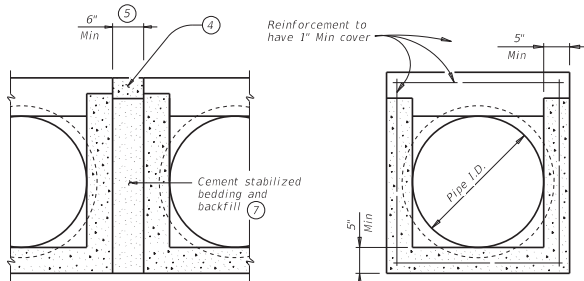
END DETAIL FOR INSTALLATION OF SAFETY PIPE RUNNERS

(If required)

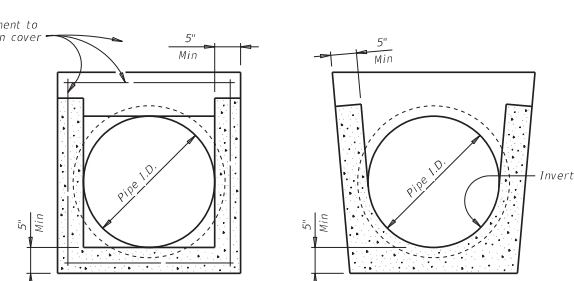


OPTIONAL JOINT FOR RCP

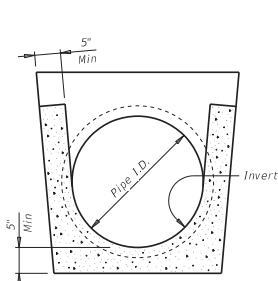
(Showing joint between RCP and precast safety end treatment)



MULTIPLE PIPE INSTALLATION

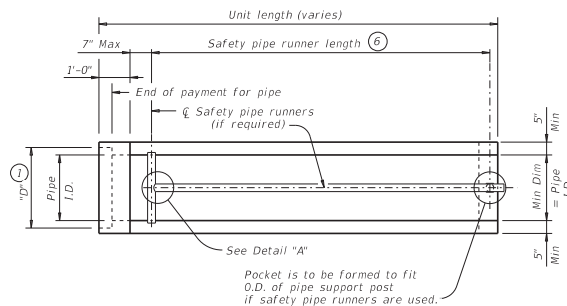


OPTION WITH SQUARE BOTTOM



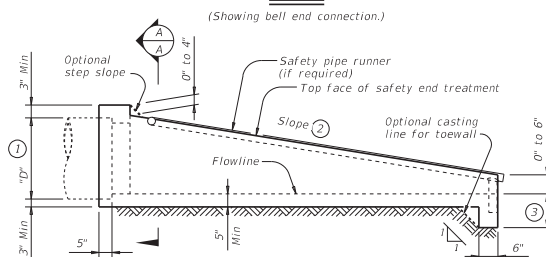
OPTION WITH INVERT BOTTOM

SECTION A-A



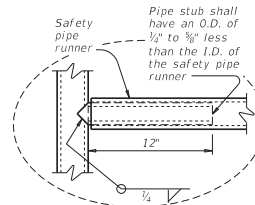
PLAN

(Showing bell end connection.)

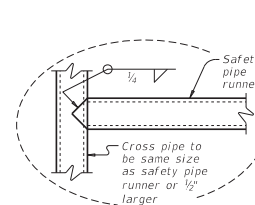


LONGITUDINAL ELEVATION

(Showing bell end connection.)

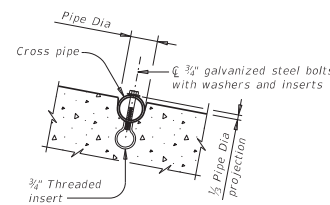


OPTION A



OPTION B

DETAIL A (If required)



INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)

SAFETY PIPE RUNNER DIMENSIONS

Max Safety Pipe Runner Length	Required Pipe Runner Size		
	Pipe Size	Pipe O.D.	Pipe I.D.
11' - 2"	3" STD	3.500"	3.068"
15' - 6"	3 1/2" STD	4.000"	3.548"
20' - 10"	4" STD	4.500"	4.026"
35' - 4"	5" STD	5.563"	5.047"

- Dimension "D" is based on reinforced concrete pipe (RCP) meeting the requirements of ASTM C-76, Class III, (RCP Wall "B" thickness). Adjust "D" for any other wall thickness used. For thermoplastic pipe (TP) take into account the annular space requirements for grouted connections.
- Slope as shown elsewhere in plans. Slope of 3:1 or flatter is required for vehicle safety.
- Toewall to be used only when dimension is shown elsewhere in the plans.
- Fill the top 4" of void between precast end treatments with concrete riprap. Concrete riprap is considered subsidiary to the Item 467, "Safety End Treatment."
- Adjust clear distance between pipes to provide for the minimum distance between safety end treatments.
- Measured along slope.
- Provide cement stabilized bedding and backfill in accordance with the Item 400, "Excavation and Backfill for Structures." Bedding and backfill is considered subsidiary to the Item 467, "Safety End Treatment." When concrete riprap is specified around the safety end treatment, backfill as directed by Engineer.
- Thermoplastic pipe wall thickness may vary. Adjust accordingly. Thermoplastic pipe requires the safety end treatments to have a bell end for grouted connections.

GENERAL NOTES:

Precast safety end treatment for reinforced concrete pipe (RCP), and thermoplastic pipe (TP) may be used for TYPE II end treatment as specified in Item "Safety End Treatment."

When precast safety end treatment is used as a Contractor's alternate to mitered RCP, riprap will not be required unless noted otherwise on the plans.

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Manufacture this product in accordance with Item 467, "Safety End Treatment" except as noted below:

A. Provide minimum reinforcing of #4 at 6" (Grade 40) or #4 at 9" (Grade 60) each way or 6"x6" - D12 x D12 or 5"x5" - D10 x D10 welded wire reinforcement (WWR).

B. For precast (steel formed) sections, provide class "C" concrete (f'c = 3,600 psi).

At the option and expense of the Contractor, the next larger size of safety end treatment may be furnished as long as the "D" dimension cast is that of the required size of pipe.

Pipe runners are designed for a traversing load of 1,800 Lbs at yield as recommended by Research Report 280-1, "Safety Treatment of Roadside Cross-Drainage Structures", Texas Transportation Institute, March 1981.

Provide safety pipe runners, cross pipes, pipe support posts, and pipe stubs meeting the requirements of ASTM A53 (Type E or S, Grade B), ASTM A500 (Grade B), or API 5LX52.

Galvanize all steel components except reinforcing steel after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

Connect RCP using the Optional Joint for RCP detail shown or in accordance with Item 464 "Reinforced Concrete Pipe." Connect TP by grouting. See Pipe and Box Grouted Connections (PBGC) standard for grouted connections with TP and precast safety end treatment.



Bridge
Division
Standard

PRECAST SAFETY END TREATMENT TYPE II ~ CROSS DRAINAGE

PSET-SC

FILE: CD-PSET-SC-21.dgn	DN: RLW	CK: KLR	DN: JTR	CK: GAF
OTXDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0918	47	472	VA
(12-21) ADDN OF TP	DIST	COUNTY		SHEET NO.
DAL	DALLAS			78

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DATE:
FILE:

	Size	MAX DEPTH = 15 ft. to top of BASE SLAB											MAX DEPTH = 25 ft. to top of BASE SLAB											Min Height (See Gen Note 3)	Max HOLE DIA (See Tab Note 2)	Max KC DIA (See Tab Note 2)
		Base Slab			Base Unit or Riser Walls			Below Grade Slab (w/PJB) Reducing Slab (w/PB)				Base Slab			Base Unit or Riser Walls			Below Grade Slab (w/PJB) Reducing Slab (w/PB)								
		Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Reduced Riser Size	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Reduced Riser Size	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness					
X x Y	Ashort	Along	BS	Bshort	Blong	W	RWSxRWL or ID	Dshort	Dlong	TS	Ashort	Along	BS	Bshort	Blong	W	RWSxRWL or ID	Dshort	Dlong	TS	BH MIN	HOLE DIA	KO DIA			
ft.	in ² /ft	in ² /ft	in.	in ² /ft	in ² /ft	in.	ft. **	in ² /ft	in ² /ft	in.	in ² /ft	in ² /ft	in.	in ² /ft	in ² /ft	in.	ft. **	in ² /ft	in ² /ft	in.	ft.	in.	in.			
Precast Junction Box (PJB)	3x3	0.23	0.23	6	0.19	0.19	6	N/A	0.37	0.37	9	0.29	0.29	6	0.24	0.24	6	N/A	0.37	0.37	9	3.5	36	36		
	4x4	0.29	0.29	6	0.24	0.24	6	N/A	0.41	0.41	9	0.47	0.47	6	0.38	0.38	6	N/A	0.41	0.41	9	4.5	48	48		
	3x5	0.29	0.18	6	0.19	0.35	6	N/A	0.48	0.48	9	0.39	0.18	6	0.23	0.59	6	N/A	0.48	0.48	9	3.5	36/60	36/60		
	4x5	0.36	0.18	6	0.22	0.34	6	N/A	0.42	0.42	9	0.53	0.26	6	0.39	0.59	6	N/A	0.42	0.42	9	4.5	48/60	48/60		
	5x5	0.36	0.36	6	0.34	0.34	6	N/A	0.43	0.43	9	0.62	0.62	6	0.59	0.59	6	N/A	0.43	0.43	9	5.5	60	60		
	5x6	0.27	0.27	9	0.34	0.45	6	N/A	0.48	0.48	9	0.47	0.45	9	0.38	0.48	8	N/A	0.48	0.48	9	5.5	60/72	60/72		
	6x6	0.27	0.27	9	0.45	0.45	6	N/A	0.56	0.56	9	0.52	0.52	9	0.54	0.54	8	N/A	0.56	0.56	9	6.5	72	72		
	8x8	0.46	0.46	9	0.51	0.51	8	N/A	0.45	0.45	12	0.87	0.87	9	0.59	0.59	10	N/A	0.45	0.45	12	8.5	96	72		
Precast Base (PB)	3x3	0.23	0.23	6	0.19	0.19	6	N/A	N/A	N/A	N/A	0.29	0.29	6	0.24	0.24	6	N/A	N/A	N/A	N/A	3.5	36	36		
	4x4	0.29	0.29	6	0.24	0.24	6	N/A	N/A	N/A	N/A	0.47	0.47	6	0.38	0.38	6	N/A	N/A	N/A	N/A	4.5	48	48		
	3x5	0.29	0.18	6	0.19	0.35	6	3x3	0.30	0.34	9	0.39	0.18	6	0.23	0.59	6	3x3	0.40	0.40	9	3.5	36/60	36/60		
	4x5	0.36	0.18	6	0.22	0.34	6	3x3	0.30	0.30	9	0.53	0.26	6	0.39	0.59	6	3x3	0.46	0.37	9	4.5	48/60	48/60		
	4x5	0.36	0.18	6	0.22	0.34	6	4x4	0.30	0.30	9	0.53	0.26	6	0.39	0.59	6	4x4	0.39	0.39	9	4.5	48/60	48/60		
	4x5	0.36	0.18	6	0.22	0.34	6	48"	0.39	0.39	9	0.53	0.26	6	0.39	0.59	6	48"	0.47	0.47	9	4.5	48/60	48/60		
	4x5	0.36	0.18	6	0.22	0.34	6	3x5	0.33	0.40	9	0.53	0.26	6	0.39	0.59	6	3x5	0.48	0.48	9	4.5	48/60	48/60		
	5x5	0.36	0.36	6	0.34	0.34	6	3x3	0.34	0.34	9	0.62	0.62	6	0.59	0.59	6	3x3	0.53	0.53	9	5.5	60	60		
	5x5	0.36	0.36	6	0.34	0.34	6	4x4	0.36	0.36	9	0.62	0.62	6	0.59	0.59	6	4x4	0.64	0.64	9	5.5	60	60		
	5x5	0.38	0.38	6	0.34	0.34	6	48"	0.36	0.36	9	0.62	0.62	6	0.59	0.59	6	48"	0.64	0.64	9	5.5	60	60		
	5x5	0.36	0.36	6	0.34	0.34	6	3x5	0.34	0.40	9	0.62	0.62	6	0.59	0.59	6	3x5	0.53	0.53	9	5.5	60	60		
	5x6	0.31	0.31	9	0.34	0.45	6	3x3	0.34	0.34	9	0.47	0.45	9	0.38	0.54	8	3x3	0.61	0.50	9	5.5	60/72	60/72		
	5x6	0.27	0.27	9	0.34	0.45	6	4x4	0.36	0.45	9	0.47	0.45	9	0.38	0.54	8	4x4	0.74	0.57	9	5.5	60/72	60/72		
	5x6	0.29	0.29	9	0.34	0.45	6	48"	0.36	0.45	9	0.47	0.45	9	0.38	0.54	8	48"	0.74	0.57	9	5.5	60/72	60/72		
	5x6	0.29	0.29	9	0.34	0.45	6	3x5	0.45	0.45	9	0.47	0.45	9	0.38	0.54	8	3x5	0.61	0.61	9	5.5	60/72	60/72		
	6x6	0.29	0.29	9	0.45	0.45	6	3x3	0.41	0.41	9	0.52	0.52	9	0.54	0.54	8	3x3	0.74	0.74	9	6.5	72	72		
	6x6	0.27	0.27	9	0.45	0.45	6	4x4	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	4x4	0.87	0.87	9	6.5	72	72		
	6x6	0.29	0.29	9	0.45	0.45	6	48"	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	48"	0.87	0.87	9	6.5	72	72		
	6x6	0.29	0.29	9	0.45	0.45	6	3x5	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	3x5	0.87	0.87	9	6.5	72	72		
	8x8	0.52	0.52	9	0.51	0.51	8	3x3	0.61	0.61	12	0.91	0.91	9	0.70	0.70	10	3x3	0.85	0.85	12	8.5	96	72		
	8x8	0.52	0.52	9	0.51	0.51	8	4x4	0.70	0.70	12	0.87	0.87	9	0.70	0.70	10	4x4	1.01	1.01	12	8.5	96	72		
	8x8	0.52	0.52	9	0.51	0.51	8	48"	0.70	0.70	12	0.87	0.87	9	0.70	0.70	10	48"	1.01	1.01	12	8.5	96	72		
	8x8	0.52	0.52	9	0.51	0.51	8	3x5	0.70	0.85	12	0.87	0.87	9	0.70	0.70	10	3x5	1.01	1.01	12	8.5	96	72		

** Unless otherwise indicated.

FABRICATION NOTES:

- Maximum spacing of reinforcement is 8".
- At manufacturer's option, provide cast or cored holes or thin wall panels (KO) to the maximum diameter shown for each. When no penetration is required, it is acceptable to provide a wall with no sectional reduction.

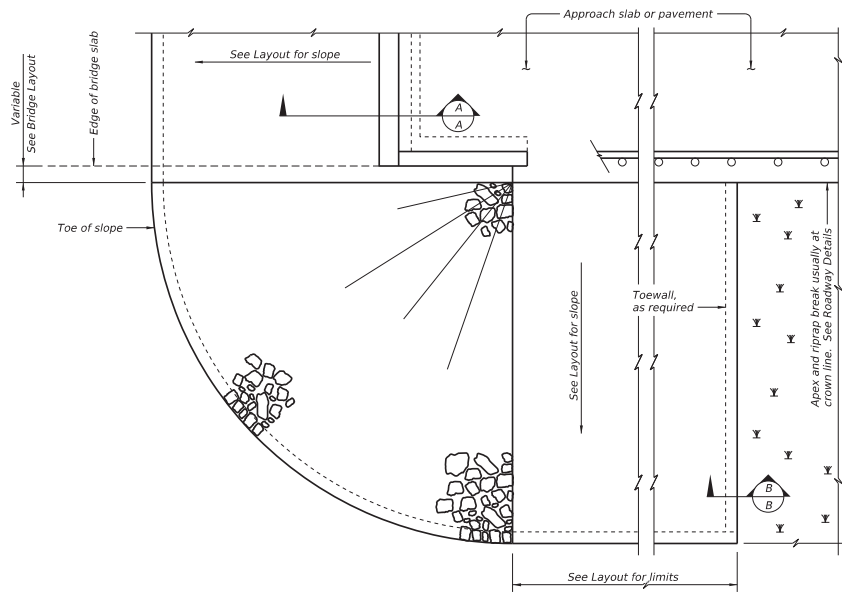
GENERAL NOTES:

- Precast Junction Box consists of base slab, base unit, risers (as required), and below grade slab. See sheet PJB for details.
- Precast Base consists of base slab, base unit, risers (as required), reducing slab (as required), and reduced risers (as required). See sheet PB for details.
- Min Height shown is for stock base units. Use stock base units whenever practical. Smaller height base units can be used in special installation circumstances, when noted elsewhere in the plans. Absolute minimum height of base units is 2'-6".

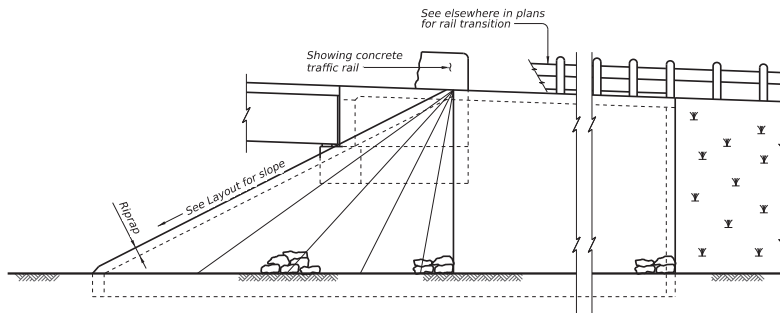
HL93 LOADING

 Texas Department of Transportation	Bridge Division Standard					
DESIGN DATA FOR PRECAST BASE AND JUNCTION BOX						
PDD						
FILE: CD-PDD-20.dgn	DN: TxDOT	CK: TxDOT	DN: TxDOT			
CT: TxDOT	REVISIONS	CONT	SECT			
	0918	47	472			
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	DAL	DALLAS	80			

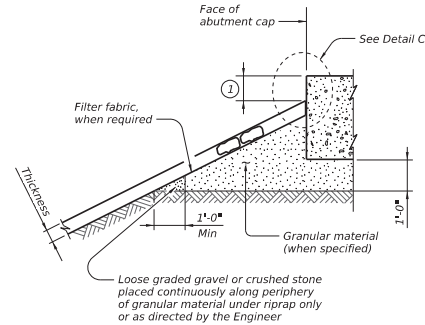
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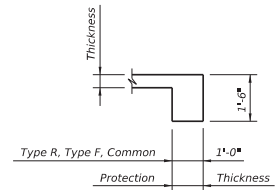
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ELEVATION



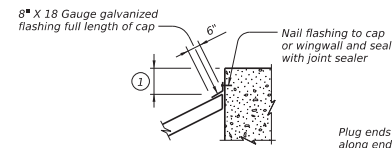
SECTION A-A AT CAP



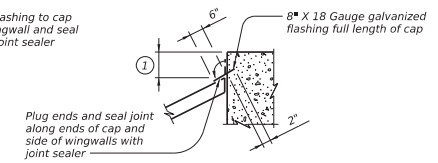
SECTION B-B

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

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.



CAP OPTION A



CAP OPTION B

DETAIL C

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



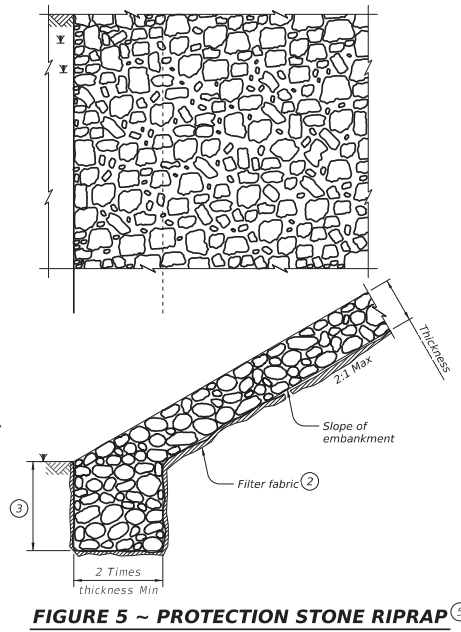
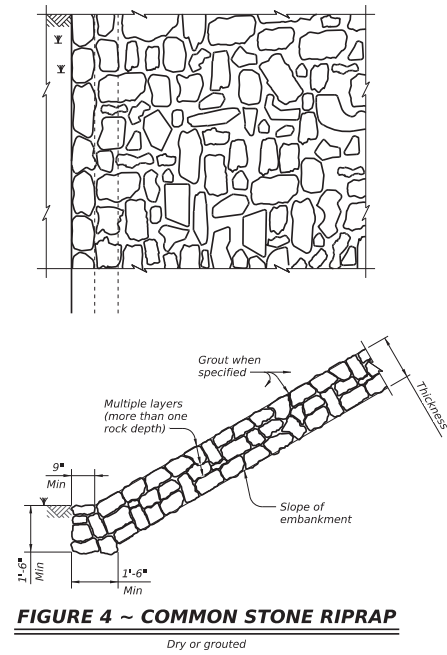
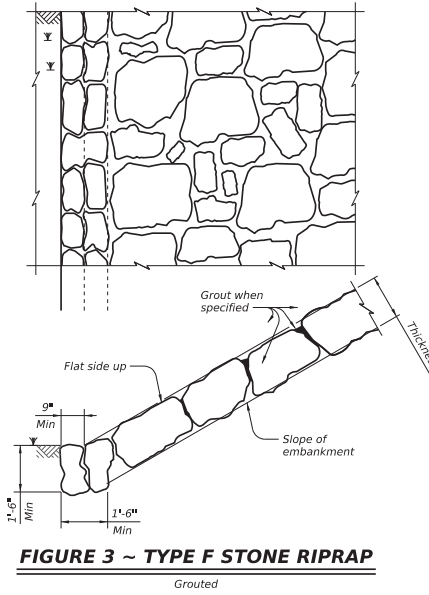
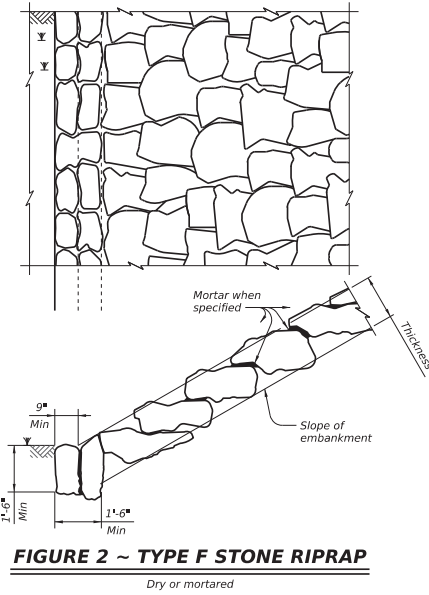
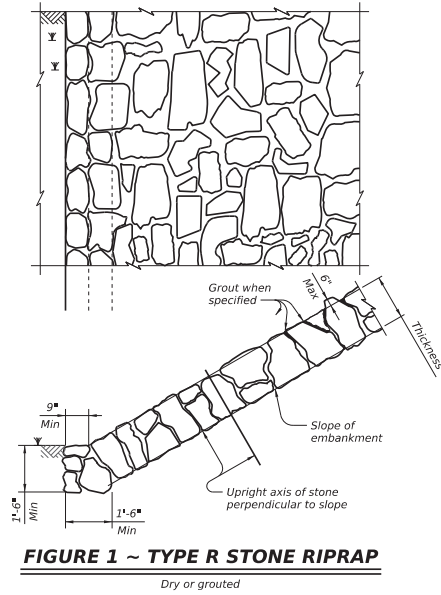
Texas Department of Transportation

Bridge Division Standard

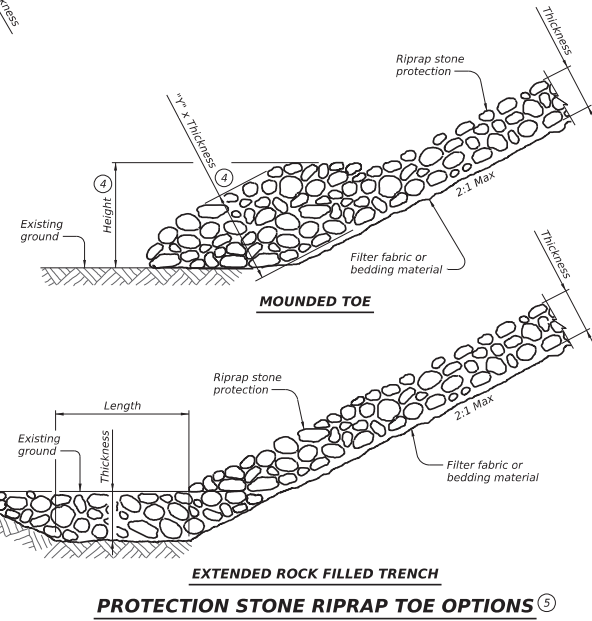
STONE RIPRAP

SRR

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- 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 2 times the riprap thickness (typical) or as shown elsewhere in the plans.
- 4 X 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

SHEET 2 OF 2



STONE RIPRAP

SRR

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REVISIONS	0918	47	472	VA
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				82

TCP GENERAL NOTES

1. CONTRACTOR TO BE RESPONSIBLE FOR PROVIDING AND MAINTAINING ALL BARRICADES, WARNING SIGNS, FLASHING LIGHTS AND TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH PART VI OF THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES," (TEXAS M.U.T.C.D. MOST RECENT EDITION AS REVISED) DURING CONSTRUCTION. FOR INFORMATION, CALL 214-670-3260.

2. ANY CHANGES TO THE TRAFFIC CONTROL PLANS SHALL BE SUBMITTED TO THE TRAFFIC OPERATIONS DIVISION IN WRITING WITH APPROPRIATE DRAWINGS AND BASIS FOR CHANGE TWO WEEKS PRIOR TO PROPOSED IMPLEMENTATION. THESE PLANS SHALL BE DRAWN TO AN ACCEPTABLE SCALE AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER. THESE PLANS SHALL BE A PART OF THE CONTRACT DRAWINGS. FOR INFORMATION, CALL 214-670-3260.

3. CONTRACTOR TO COORDINATE THIS TRAFFIC CONTROL PLAN WITH OTHER ONGOING PROJECTS IN THE VICINITY.

4. CONTRACTOR SHALL PROVIDE ACCESS TO ALL BUSINESS AND PRIVATE RESIDENTIAL PROPERTIES ALONG THIS PROJECT AT ALL TIMES DURING CONSTRUCTION.

5. ANY EXCAVATED PAVEMENT EXPOSED TO TRAFFIC DURING NON-WORKING HOURS SHALL BE COVERED WITH ANCHORED STEEL PLATES.

6. THE CONTRACTOR SHALL COVER OR REMOVE ALL EXISTING SIGNS AND REMOVE ALL EXISTING MARKINGS WHICH ARE IN CONFLICT WITH THE CONSTRUCTION SIGNS AND MARKINGS. EXISTING PAVEMENT MARKINGS SHALL BE REMOVED IN AREAS WHERE TRAFFIC IS DIRECTED TO CROSS THEM. IF REMOVED, THE SIGNS SHALL BE PROPERLY STORED IN A SAFE PLACE UNTIL THE CONSTRUCTION HAS BEEN COMPLETED AND REINSTALLED AS DIRECTED BY THE ENGINEER.

7. AT CORNERS WHERE CONSTRUCTION FENCE OR CONSTRUCTION TRAFFIC CONTROL DEVICES ARE INSTALLED, CONTRACTOR SHALL MAKE SURE THAT EXISTING TRAFFIC SIGNALS ARE NOT BLOCKED FROM MOTORISTS FIELD OF VIEW.

8. CONTRACTOR SHALL RESTORE ALL ITEMS NOT SPECIFICALLY INCLUDED IN STREET RECONSTRUCTION WHICH ARE DISTURBED DURING INSTALLATION OF TEMPORARY TRAFFIC CONTROL TO ORIGINAL OR BETTER CONDITION.

9. AN APPROVED SET OF TRAFFIC CONTROL PLANS AND SIDEWALK CLOSURE PERMIT SHALL BE AVAILABLE FOR INSPECTION ON JOB SITE AT ALL TIMES.

10. REQUEST FOR SIDEWALK CLOSURE, SHALL BE DIRECTED TO PUBLIC WORKS AND TRANSPORTATION 48-HOURS IN ADVANCE OF SUCH CLOSURE. PERMISSION MAY BE OBTAINED BY CALLING THE TRAFFIC CONSTRUCTION COORDINATOR, MR. RUSSELL FINLEY AT (469) 583-3654 OR MR. PAUL THOMPSON AT (469) 258-7305. CLOSURE OF TRAFFIC LANES OR SIDEWALKS ALONG ANY PUBLIC ROADWAY SHALL BE RESTRICTED TO THE HOURS OF 9:00 AM TO 3:30 PM WORKDAYS, UNLESS APPROVED OTHERWISE BY THE CITY STAFF.

11. CONTRACTOR TO COORDINATE WITH DALLAS AREA RAPID TRANSIT (DART) AND PROJECT ENGINEER FOR TEMPORARY BUS STOP LOCATIONS.

12. CONTRACTOR TO COORDINATE WITH CITY OF DALLAS STAFF AT (214)-670 3260 FOR ANY TEMPORARY SIGNAL MODIFICATION, RELOCATIONS OR SIGNAGE NEEDS.

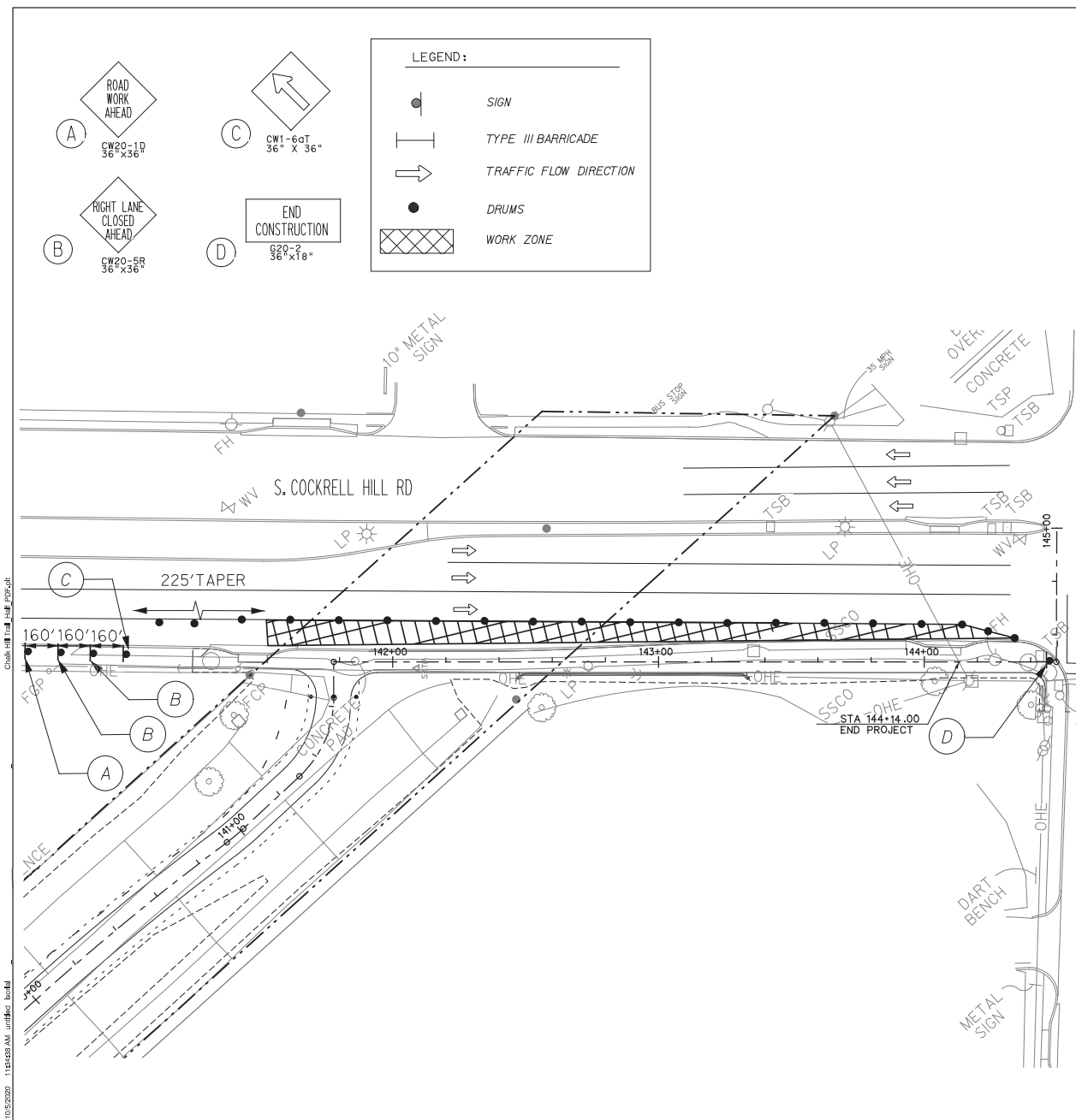
13. RELOCATE ANY EXISTING UTILITIES THAT WOULD BE IN CONFLICT WITH THE TRAFFIC CONTROL PLAN SUCH AS FIRE HYDRANTS, GAS METERS, ETC UNDER NO SEPARATE PAY ITEM (NSPI)

14. PROVIDE AND MAINTAIN DRAINAGE THRU WORK ZONES AT ALL TIMES AT NO ADDITIONAL COST. NO SEPARATE PAY ITEM (NSPI).

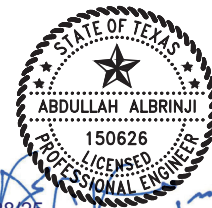
15. PROVIDE TXMUTCD COMPLIANT TRAFFIC CONTROL PLANS FOR TRAIL IMPROVEMENT RELATED WORK AT ALL STREET CROSSINGS.



NO.	REVISIONS	BY	DATE
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Texas Department of Transportation ©2025 by Texas Department of Transportation all rights reserved			
CHALK HILL TRAIL TRAFFIC CONTROL PLAN GENERAL NOTES			
© TxDOT UEG urbanengineersgroup 161 Let a creek flow, she a Dallas, Texas 75207 214-324-1807 FIRM REGISTRATION No. F1002			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	83	



- CONSTRUCTION & MAINTENANCE OF TRAFFIC:
1. REMOVE SIDEWALK AND BUILD TRAIL.
 2. SOUTHBOUND RIGHT TRAFFIC LANE WILL BE CLOSED FOR PHASE 1 CONSTRUCTION.
 3. MAINTAIN AT LEAST 2 LANES OPEN TO TRAFFIC IN EACH DIRECTION. MAINTAIN AT LEAST 10' LANES IN EACH DIRECTION.



NO.	REVISONS	BY	DATED
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CHALK HILL TRAIL TRAFFIC CONTROL PLAN PHASE 1 S COCKRELL HILL ROAD			
   1677 Luria Street, Suite 200, Dallas, Texas 75207 214-742-2200 FAX: 214-742-2201			
CONTROL	SECTION	JOB	HIGHWAY
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DISTRICT	COUNTY		SHEET NO.
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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

WORKER SAFETY NOTES:

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT
<http://www.txdot.gov>

COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
MATERIAL PRODUCER LIST (MPL)
ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS)"
STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)
TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD)
TRAFFIC ENGINEERING STANDARD SHEETS

SHEET 1 OF 12



BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1) - 21

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9-07	8-14	DIST	COUNTY	SHEET NO.					
5-10	5-21	DAL	DALLAS	85					

95

DATE: _____
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TYPICAL LOCATION OF CROSSROAD SIGNS

The diagram shows a crossroad intersecting a project area. The project area is indicated by a shaded region labeled "PROJECT".

Sign Locations and Distances:

- Top Crossroad:**
 - Left Side:** "END ROAD WORK" sign (G20-2) located at distance X from the project start.
 - Right Side:** "ROAD WORK" sign (G20-1aT) located at distance X from the project start. An optional "ROAD WORK AHEAD" sign (CW20-1D) is shown further ahead.
- Bottom Crossroad:**
 - Left Side:** "ROAD WORK AHEAD" sign (CW20-1D) located at distance X from the project start.
 - Right Side:** "END ROAD WORK" sign (G20-2) located at distance X from the project start.

Distances are marked as X from the project start to the sign locations. Optional signs are noted as "(Optional see Note 1 and 4)".

1. 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.
2. 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 Traffic Control" for sign sizes. The Engineer may omit the advance warning signs on low volume crossroads. The Engineer will determine whether a road is low volume as per MUTCD Part 5. This information shall be shown in the plans.
3. 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.
4. The "ROAD WORK NEXT X MILES" (G20-1a) sign shall be required of 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.
5. Additional traffic control devices may be required as shown in the plans for higher volume crossroads.
6. When work occurs in the intersection area, appropriate traffic control devices, as shown elsewhere in the plans or as determined by the Engineer/Inspector, shall be in place.

T-INTERSECTION

The diagram illustrates a T-intersection where a horizontal roadway intersects a vertical roadway. Key features include:

- Horizontal Roadway (Left to Right):**
 - Left Side:** Labeled "INTERSECTED ROADWAY". It includes a "ROAD WORK NEXT X MILES" sign and a "BEGIN WORK ZONE" sign. Traffic control markers include "X * G20-2bT", "X * G20-9TP", "X * R20-5T", and "X * R20-5aTP".
 - Center:** Labeled "1 Block - City" and "1000' - 1500' - Hwy". A distance "X" is marked from the work zone start to the intersection.
 - Right Side:** Labeled "1000' - 1500' - Hwy" and "1 Block - City". It includes a "ROAD WORK NEXT X MILES" sign and a "BEGIN WORK ZONE" sign. Traffic control markers include "X * G20-9TP", "X * R20-5T", and "X * R20-5aTP".
- Vertical Roadway (Top to Bottom):**
 - Top:** Labeled "T-INTERSECTION". It includes a "ROAD WORK NEXT X MILES" sign and a "BEGIN WORK ZONE" sign. Traffic control markers include "X * G20-9TP", "X * R20-5T", and "X * R20-5aTP".
 - Center:** Labeled "PROJECT". A distance "X" is marked from the intersection to the project start.
 - Bottom:** Labeled "END WORK ZONE". It includes a "ROAD WORK NEXT X MILES" sign and a "BEGIN WORK ZONE" sign. Traffic control markers include "X * G20-2bT", "X * G20-9TP", "X * R20-5T", and "X * R20-5aTP".
- Signage and Markings:**
 - Work Zone Signs:** "BEGIN WORK ZONE", "TRAFFIC FINES DOUBLE", "ROAD WORK NEXT X MILES", and "END WORK ZONE".
 - Project Sign:** "PROJECT" with fields for "NAME", "ADDRESS", "CITY", "STATE", and "CONTRACTOR".
 - CSJ Limit:** A sign indicating the "CSJ Limit".
 - Distance Markers:** "X" and "80' min." are used to indicate distances.

1. The Engineer will determine the types and location of any additional traffic control devices, such as a flogger and accompanying signs, or other signs, that should be used when work is being performed at or near an intersection.
2. If construction closes the road at a T-intersection, the Contractor shall place the "CONTRACTOR NAME" (G20-6T) 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.

[illegible]

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.

The diagram illustrates the layout of a Type 3 Barricade or Channelizing Device for a road closure. The layout includes the following elements from left to right:

- ROAD CLOSED** sign (R11-2) with a left-pointing arrow.
- Type 3 Barricade or channelizing devices** (CW1-6) at the **WORK SPACE**.
- Channelizing Devices** (CW1-13-1P) and **CW1-4L** signs.
- ROAD AHEAD** sign (CW20-1D).
- ROAD WORK 1/2 MILE** sign (CW20-1E).
- BEGIN ROAD WORK NEXT X MILES** sign (R2-1) with fields for NAME, ADDRESS, CITY, STATE, and CONTRACTOR.
- SPEED LIMIT** sign (R2-1) with 'X' marks.
- WORK ZONE** sign (G20-9TP) with 'X' marks.
- TRAFFIC FINES DOUBLE** sign (XR20-5T) with 'X' marks.
- STAY ALERT** sign (G20-10T) with 'X' marks.
- OBEY WARNING SIGNS STATE LAW** sign (R20-3T) with 'X' marks.
- END ROAD WORK** sign (G20-2) with 'X' marks.
- SPEED LIMIT** sign (R2-1) with 'X' marks.
- END WORK ZONE** sign (G20-2bT) with 'X' marks.

The diagram also shows a **CSJ Limit** (Crested Section Junction Limit) and various distances marked with 'X' and 'd'.

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

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

1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (W20-10) signs may be used on low volume crossroads at the discretion of the engineer as per TMTUCD Part 5. See Note 2 under "Typical Location of Crossroad Signs".
5. Only diamond shaped warning sign sizes are indicated.
6. See sign size listing in "TMTUCD", Sign Appendix or the "Standard Highway Sign Designs for Texas" manual for complete list of available sign design sizes.

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

SHEET 2 OF 12



**BARRICADE AND CONSTRUCTION
PROJECT LIMIT**

BC (2) - 21

FILE:	bc-21.dgn	DW:	TxDOT	CK:	TxDOT	DW:	TxDOT	CK:	TxDOT
© TxDOT November 2002		CONT	SECT	JOB		HIGHWAY			
REVISONS		0918	47	472		VA			
9-07	8-14	DIST	COUNTY				SHEET NO.		
7-13	5-21	DAL	DALLAS				R6		

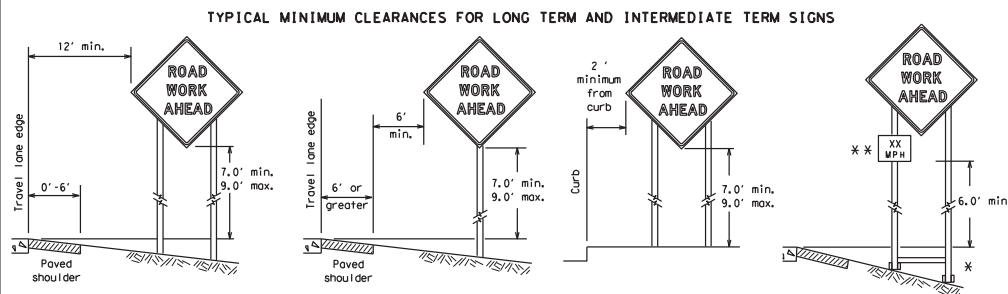
96

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.

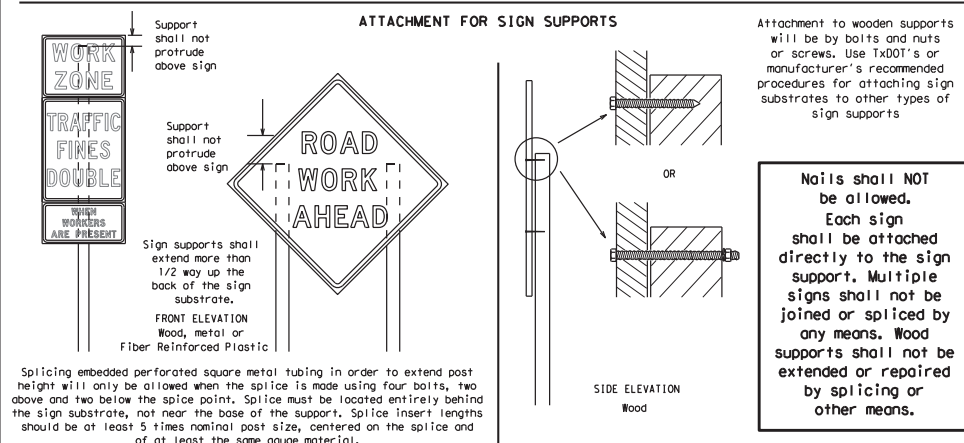
- The "BEGIN WORK ZONE" (G20-9TP) and "END WORK ZONE" (G20-2BT) shall be used as shown on the sample layout when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a part of the work zone lying outside the CSJ Limits where traffic fines may double if workers 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.

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* When placing skid supports on uneven 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.

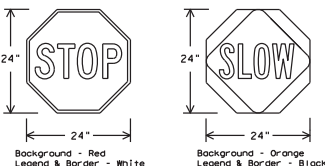
** When plaques are placed on dual-leg supports, they should be attached to the upright nearest the travel lane. Supplemental plaques (advisory or distance) should not cover the surface of the parent sign.



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

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

- 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 (L000), 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.
- 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.
- When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
- If existing signs are to be relocated on their original supports, they shall be 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.
- 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 CRZTCD 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.
- 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

- Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
- Wooden sign posts shall be painted white.
- Barricades shall NOT be used as sign supports.
- All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to regulate, warn, and guide the traveling public safely through the work zone.
- The Contractor may 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 TMDOT but may have been omitted from the plans. Any deviation 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.
- The Contractor shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD) for small roadside signs. Supports for temporary large roadside signs shall meet the requirements detailed on the Temporary Large Roadside Signs (TLRS) standard sheets. The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so the Engineer can verify the correct procedures are being followed.
- The Contractor is responsible for installing signs on approved supports and replacing signs with damaged or cracked substrates and/or damaged or marred reflective sheeting as directed by the Engineer/Inspector.
- Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1 inch.
- 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)

- 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.
 - Long-term stationary - work that occupies a location more than 3 days.
 - 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.
 - Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
 - Short, duration - work that occupies a location up to 1 hour.
 - Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN MOUNTING HEIGHT

- The bottom of Long-term/Intermediate-term signs shall be at least 7 feet, but not more than 9 feet, above the paved surface, except as shown for supplemental plaques mounted below other signs.
- 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.
- Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
- 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.
- Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

SIGN SIZES

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

SIGN SUBSTRATES

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

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

SIGN LETTERS

- All sign letters and numbers shall be clear, and open rounded type uppercase alphabet letters as approved by the Federal Highway Administration (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

- When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
- Long-term stationary or intermediate stationary signs installed on square metal tubing may be turned away from traffic 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.
- 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.
- 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.
- Burlap shall NOT be used to cover signs.
- Duct tape or other adhesive material shall NOT be affixed to a sign face.
- Signs and anchor studs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT HEIGHTS

- Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, clean, washed sand should be used.
- The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign supports.
- 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 fire inner tubes) shall NOT be used.
- 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 CRZTCD list.
- 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.
- Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

FLAGS ON SIGNS

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

SHEET 4 OF 12



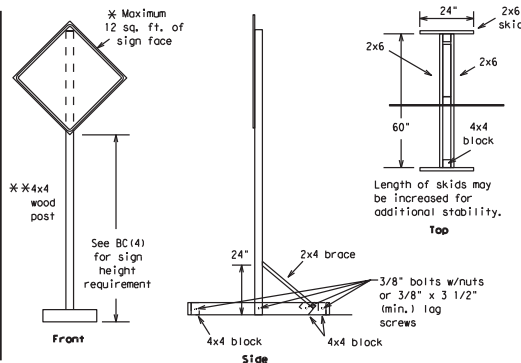
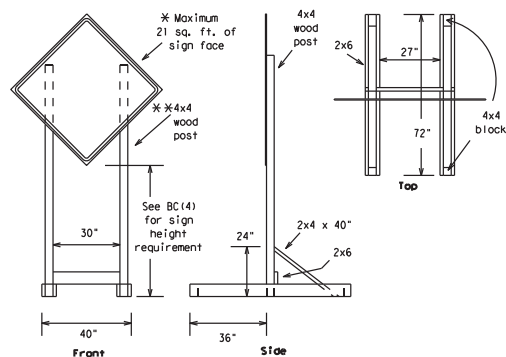
BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC (4) - 21

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DIST	COUNTY	SHEET NO.							
DAL	DALLAS	88							

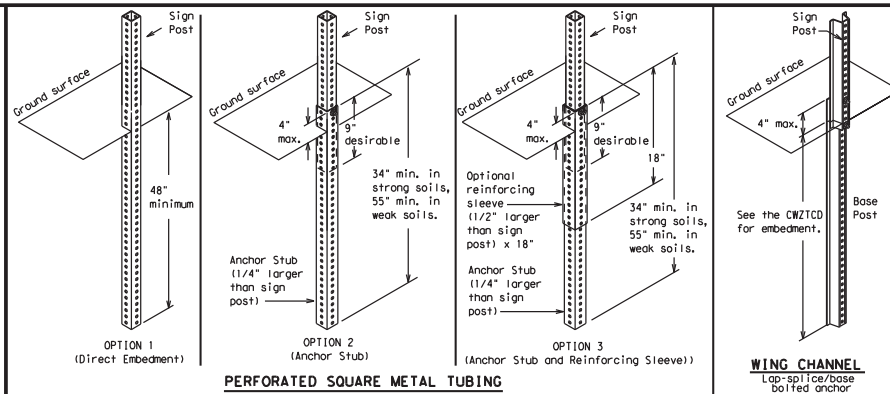
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DATE: FILE:



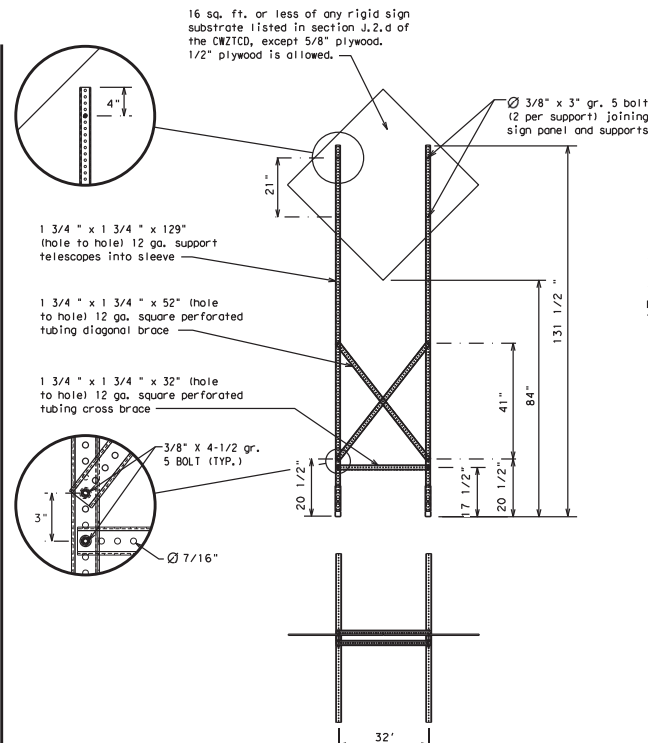
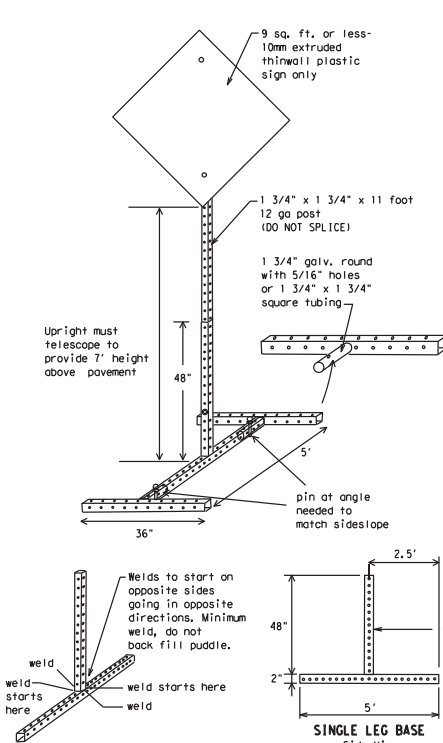
SKID MOUNTED WOOD SIGN SUPPORTS

* 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.

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Texas Department of Transportation
Traffic Safety Division
Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5) - 21

FILE:	DC-21.dgn	DWG:	TxDOT	CHK:	TxDOT	DWG:	TxDOT	CHK:	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
9-07	8-14	0918	47	472	VA				
7-13	5-21	DIST	COUNTY	DALLAS	SHEET NO.				
		DAL	DALLAS		89				

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by the Texas Department of Transportation for the use of this standard or for incorrect results or damages resulting from its use.

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

WORD OR PHRASE	ABBREVIATION	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 DOWNTN
Hazardous Driving	HAZ DRIVING	Traffic	TRAF
Hazardous Material	HAZMAT	Travelers	TRVLRS
High Occupancy	HOV	Tuesday	TUES
Vehicle	VEH	Time Minutes	TIME MIN
Hour(s)	HR, HRS	Upper Level	UPR LEVEL
Information	INFO	Vehicles (s)	VEH, VEHs
ITS	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	LRV LEVEL	Wet Pavement	WET PVMT
Maintenance	MAINT	Will Not	WONT

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

FREEWAY CLOSED X MILE	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
XXXXXXXXX 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
XXXXXXXXX TO XXXXXXX
US XXX TO FM XXXX

Warning List

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

** Advance Notice List

TUE-FRI XX AM- X PM
APR XX- XX X PM-X AM
BEGINS MONDAY
BEGINS MONDAY
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

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

SHEET 6 OF 12



Traffic Safety Division Standard

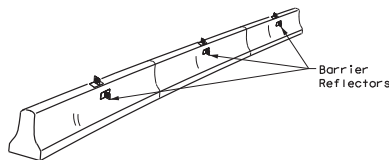
BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC (6) - 21

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0918	47	472	VA						
9-07	8-14	DIST	COUNTY	SHEET NO.					
7-13	5-21	DAL	DALLAS	90					

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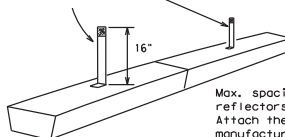
- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors shall be as specified in the TMTUCD. The cost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

Barrier Reflector on 16" tall plastic bracket

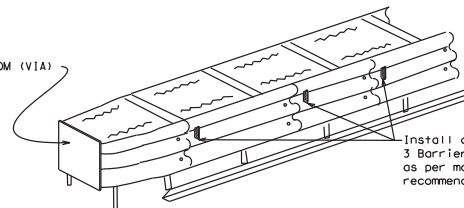


LOW PROFILE CONCRETE BARRIER (LPCB)

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

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



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

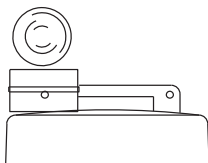
- Warning lights shall meet the requirements of the TMTUCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet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

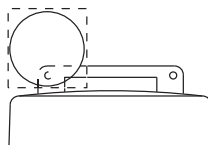
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing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



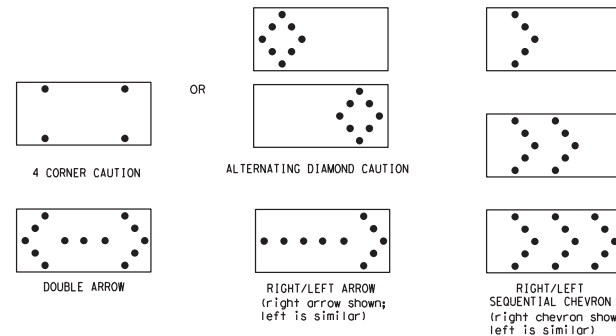
Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



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 PWM 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

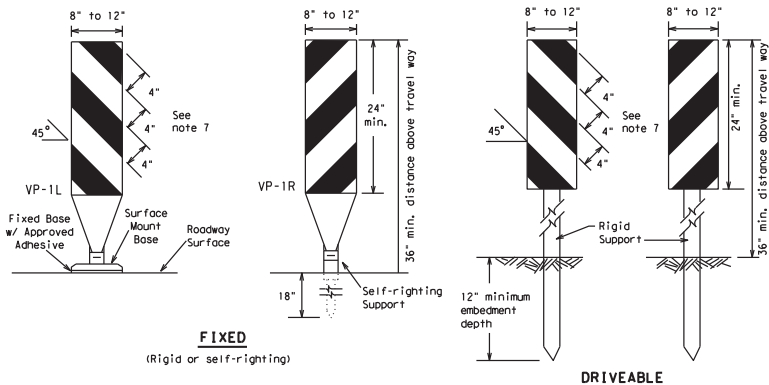
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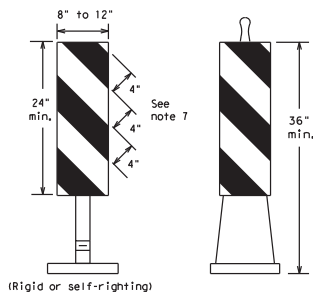
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REVISONS		0918	47	472			VA		
4-03	8-14	DIST			COUNTY			SHEET NO.	
9-07	5-21	DAL			DALLAS			92	
7-13									

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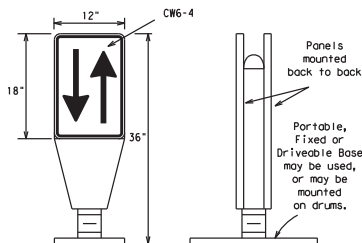


1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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



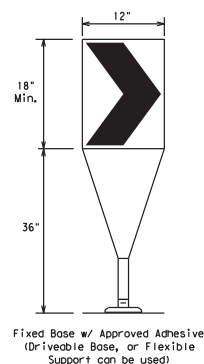
PORTABLE

VERTICAL PANELS (VP's)



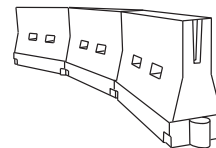
OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

1. Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base is secured to the pavement with an adhesive or rubber weight to minimize movement caused by a vehicle impact or wind gust.
2. The OTLD may be used in combination with 42" cones or VPs.
3. Spacing between the OTLD shall not exceed 500 feet. 42" cones or VPs placed between the OTLD's should not exceed 100 foot spacing.
4. The OTLD shall be orange with a black non-reflective legend. Sheeting for the OTLD shall be retroreflective Type B₁ or Type C₁ conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.



1. The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
2. Chevrons are intended to give notice of a sharp change of alignment with the direction of travel and provide additional emphasis and guidance for vehicle operators with regard to changes in horizontal alignment of the roadway.
3. Chevrons, when used, shall be erected on the outside of a sharp curve or turn, or on the far side of an intersection. They shall be in line with and at right angles to approaching traffic. Spacing should be such that the motorist always has three in view, until the change in alignment eliminates its need.
4. To be effective, the chevron should be visible for at least 500 feet.
5. Chevrons shall be orange with a black nonreflective legend. Sheeting for the chevron shall be retroreflective Type B₁ or Type C₁ conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.
6. For Long Term Stationary use on tapers or transitions on freeways and divided highways, self-righting chevrons may be used to supplement plastic drums but not to replace plastic drums.

CHEVRONS



LONGITUDINAL CHANNELIZING DEVICES (LCD)

1. LCDs are crashworthy, lightweight, deformable devices that are highly visible, have good target value and can be connected together. They are not designed to contain or redirect a vehicle on impact.
2. LCDs may be used instead of a line of cones or drums.
3. LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
5. LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the travel lanes.
6. LCDs used as barricades placed perpendicular to traffic should have at least one row of reflective sheeting meeting the requirements for barricade rails as shown on BC(10). Place reflective sheeting near the top of the LCD along the full length of the device.

WATER BALLASTED SYSTEMS USED AS BARRIERS

1. Water ballasted systems used as barriers shall not be used solely to channelize road users, but also to protect the work space per the appropriate Manual for Assessing Safety Hardware (MASH) crashworthiness requirements based on roadway speed and barrier application.
2. Water ballasted systems used to channelize vehicular traffic shall be supplemented with retroreflective delineation or channelizing devices to improve daytime/nighttime visibility. They may also be supplemented with pavement markings.
3. Water ballasted systems used as barriers shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. Water ballasted systems used as barriers should not be used for a merging taper except in low speed (less than 45 MPH) urban areas. When used on a taper in a low speed urban area, the taper shall be delineated and the taper length should be designed to optimize road user operations considering the available geometric conditions.
5. When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to a point outside the clear zone.

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

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

GENERAL NOTES

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

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

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REVISIONS	NOVEMBER 2002	CONT:	SECT:	JOB:	VA	HIGHWAY			
9-07	8-1	0918	47	472					
7-13	5-21				COUNTY				
		DAL		DALLAS					
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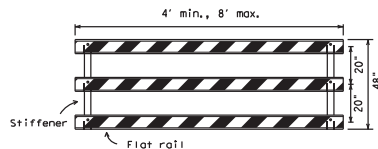
TYPE 3 BARRICADES

1. Refer to the Compliant Work Zone Traffic Control Devices List (CWZTCD) for details of the Type 3 Barricades and a list of all materials used in the construction of Type 3 Barricades.
2. Type 3 Barricades shall be used at each end of construction projects closed to all traffic.
3. Barricades extending across a roadway should have stripes that slope downward in the direction toward which traffic must turn in detouring. When both right and left turns are provided, the chevron striping may slope downward in both directions from the center of the barricade. Where no turns are provided at a closed road, striping should slope downward in both directions toward the center of roadway.
4. Striping of rails, for the right side of the roadway, should slope downward to the left. For the left side of the roadway, striping should slope downward to the right.
5. Identification markings may be shown only on the back of the barricade rails. The maximum height of letters and/or company logos used for identification shall be 1".
6. Barricades shall not be placed parallel to traffic unless an adequate clear zone is provided.
7. Warning lights shall NOT be installed on barricades.
8. Where barricades require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand is recommended. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight. Sand bags shall not be stacked in a manner that covers any portion of a barricade rails reflective sheeting. Rock, concrete, iron, steel or other solid objects will NOT be permitted. Sandbags 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.

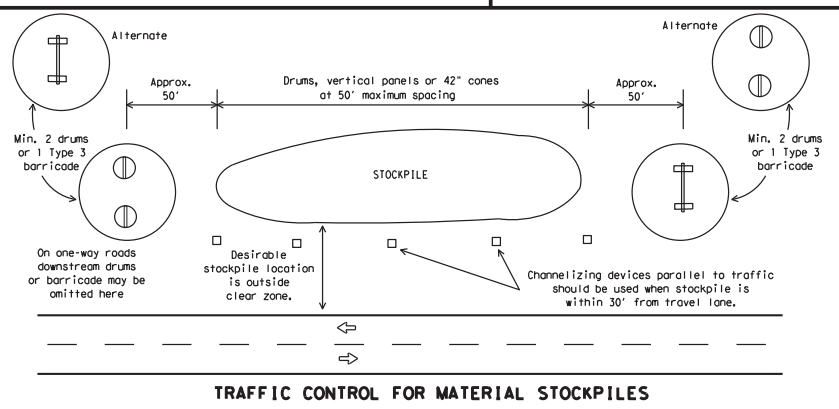
Barricades shall NOT be used as a sign support.



TYPICAL STRIPING DETAIL FOR BARRICADE RAIL

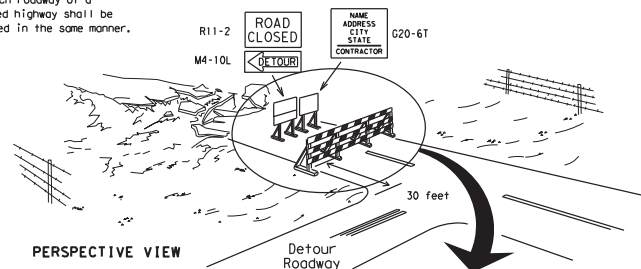


TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

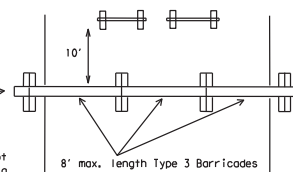
Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

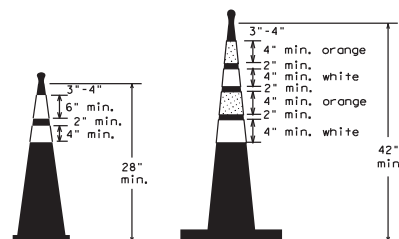
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.

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.



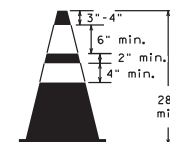
PLAN VIEW

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



Two-Piece cones

CONES



One-Piece cones

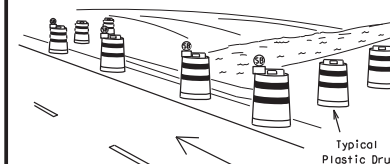


Tubular Marker

28" Cones shall have a minimum weight of 9 1/2 lbs.

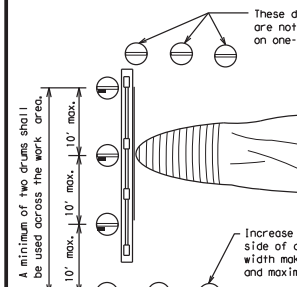
42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

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.



PERSPECTIVE VIEW

These drums are not required on one-way roadway



PLAN VIEW

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

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

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

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS

SHEET 10 OF 12



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (10) - 21

FILE	DC-21.dgn	CON	TXDOT	CH	TXDOT	DR	TXDOT	SH	TXDOT
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DIST	9-07	8-14	7-13	5-21	DAL	DALLAS			94

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WORK ZONE PAVEMENT MARKINGS

GENERAL

1. The Contractor shall be responsible for maintaining work zone and existing pavement markings, in accordance with the standard specifications and special provisions, on all roadways open to traffic within the CSJ limits unless otherwise stated in the plans.
2. Color, patterns and dimensions shall be in conformance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
3. Additional supplemental pavement marking details may be found in the plans or specifications.
4. Pavement markings shall be installed in accordance with the TMUTCD and as shown on the plans.
5. When short term markings are required on the plans, short term markings shall conform with the TMUTCD, the plans and details as shown on the Standard Plan Sheet WZ(STPM).
6. When standard pavement markings are not in place and the roadway is opened to traffic, DO NOT PASS signs shall be erected to mark the beginning of the sections where passing is prohibited and PASS WITH CARE signs at the beginning of sections where passing is permitted.
7. All work zone pavement markings shall be installed in accordance with Item 662, "Work Zone Pavement Markings."

RAISED PAVEMENT MARKERS

1. Raised pavement markers are to be placed according to the patterns on BC(112).
2. All raised pavement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAVEMENT MARKERS" and Departmental Material Specification DMS-4200 or DMS-4300.

PREFABRICATED PAVEMENT MARKINGS

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

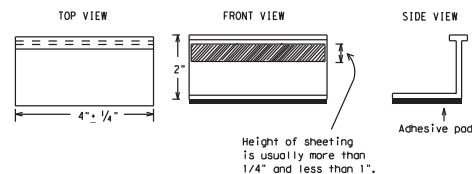
MAINTAINING WORK ZONE PAVEMENT MARKINGS

1. The Contractor will be responsible for maintaining work zone pavement markings within the work limits.
2. Work zone pavement markings shall be inspected in accordance with the frequency and reporting requirements of work zone traffic control device inspections as required by Form 599.
3. The markings should provide a visible reference for a minimum distance of 300 feet during normal daylight hours and 160 feet when illuminated by automobile low-beam headlights at night, unless sight distance is restricted by roadway geometrics.
4. Markings failing to meet this criteria within the first 30 days after placement shall be replaced at the expense of the Contractor as per Specification Item 662.

REMOVAL OF PAVEMENT MARKINGS

1. Pavement markings that are no longer applicable, could create confusion or direct a motorist toward or into the closed portion of the roadway shall be removed or obliterated before the roadway is opened to traffic.
2. The above shall not apply to detours in place for less than three days, where flaggers and/or sufficient channelizing devices are used in lieu of markings to outline the detour route.
3. Pavement markings shall be removed to the fullest extent possible, so as not to leave a discernable marking. This shall be by any method approved by TxDOT Specification Item 677 for "Eliminating Existing Pavement Markings and Markers".
4. The removal of pavement markings may require resurfacing or seal coating portions of the roadway as described in Item 677.
5. Subject to the approval of the Engineer, any method that proves to be successful on a particular type pavement may be used.
6. Blast cleaning may be used but will not be required unless specifically shown in the plans.
7. Over-painting of the markings SHALL NOT BE permitted.
8. Removal of raised pavement markers shall be as directed by the Engineer.
9. Removal of existing pavement markings and markers will be paid for directly in accordance with Item 677, "ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS," unless otherwise stated in the plans.
10. Black-out marking tape may be used to cover conflicting existing markings for periods less than two weeks when approved by the Engineer.

Temporary Flexible-Reflective Roadway Marker Tabs



STAPLES OR NAILS SHALL NOT BE USED TO SECURE
TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER
TABS TO THE PAVEMENT SURFACE

1. Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
2. Tabs detailed on this sheet are to be inspected and accepted by the Engineer or designated representative. Sampling and testing is not normally required, however at the option of the Engineer, either "A" or "B" below may be imposed to assure quality before placement on the roadway.
 - A. Select five (5) or more tabs at random from each lot or shipment and submit to the Construction Division, Materials and Pavement Section to determine specification compliance.
 - B. Select five (5) tabs and perform the following test. Affix five (5) tabs at 24 inch intervals on an asphaltic pavement in a straight line. Using a medium size passenger vehicle or pickup, run over the markers with the front and rear tires at a speed of 35 to 40 miles per hour, four (4) times in each direction. No more than one (1) out of the five (5) reflective surfaces shall be lost or displaced as a result of this test.
3. Small design variances may be noted between tab manufacturers.
4. See Standard Sheet WZ(STPM) for tab placement on new pavements. See Standard Sheet TCP(T-1) for tab placement on seal coat work.

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

1. Raised pavement markers used as guidemarks shall be from the approved product list, and meet the requirements of DMS-4200.
2. All temporary construction raised pavement markers provided on a project shall be of the same manufacturer.
3. Adhesive for guidemarks shall be bituminous material hot applied or butyl rubber pad for all surfaces, or thermoplastic for concrete surfaces.

Guidemarks shall be designated as:

YELLOW - (two amber reflective surfaces with yellow body).
WHITE - (one silver reflective surface with white body).

DEPARTMENTAL MATERIAL SPECIFICATIONS

PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
TRAFFIC BUTTONS	DMS-4300
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY REMOVABLE, PREFABRICATED PAVEMENT MARKINGS	DMS-8241
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS	DMS-8242

A list of prequalified reflective raised pavement markers, non-reflective traffic buttons, roadway marker tabs and other pavement markings can be found at the Material Producer List web address shown on BC(11).

SHEET 11 OF 12



BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

FILE: Dc-21.dgn	DWG: TxDOT	CHK: TxDOT	APP: TxDOT	CHK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0918	47	472	VA
2-98 9-07 5-21	DIST	COUNTY		SHEET NO.
1-02 7-13	DAL	DALLAS		95
11-02 8-14				

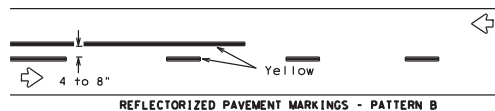
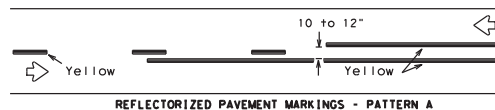
105

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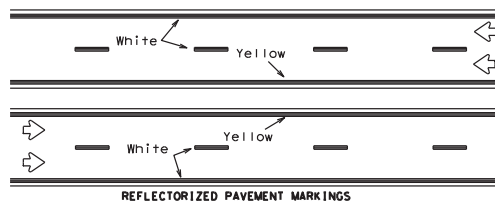
DATE:

PAVEMENT MARKING PATTERNS



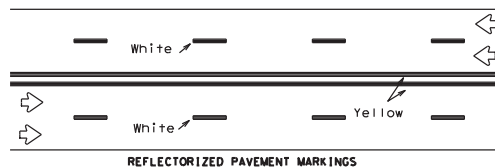
Pattern A is the TxDOT Standard, however Pattern B may be used if approved by the Engineer. Prefabricated markings may be substituted for reflectORIZED pavement markings.

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



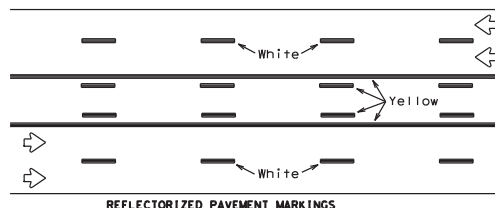
Prefabricated markings may be substituted for reflectORIZED pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



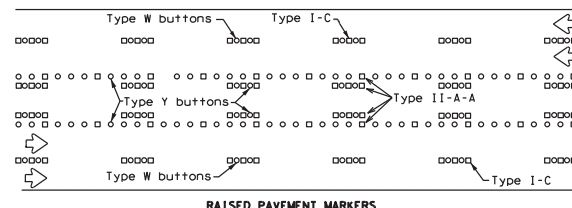
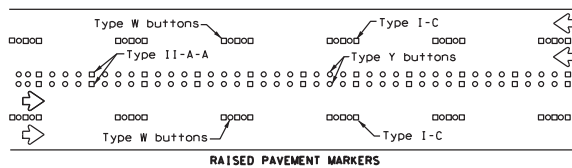
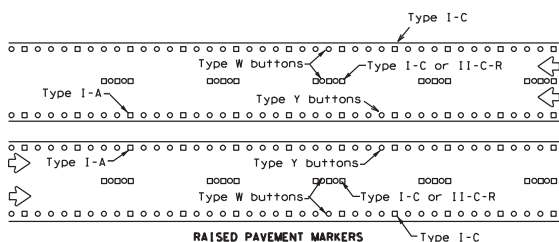
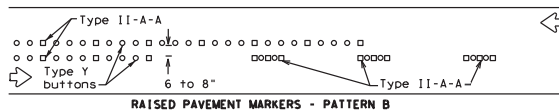
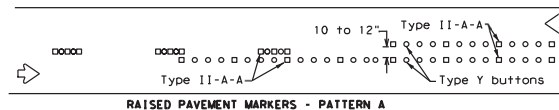
Prefabricated markings may be substituted for reflectORIZED pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS

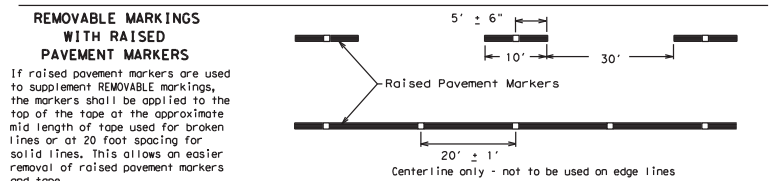
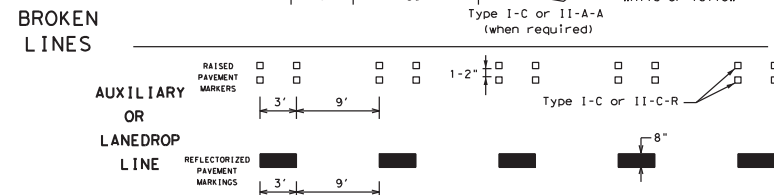
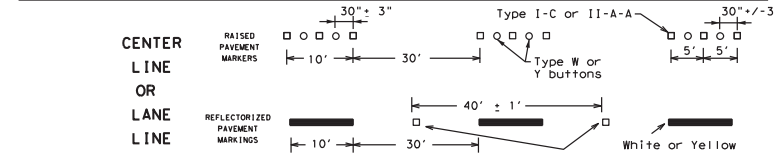
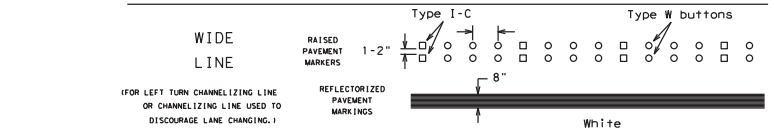
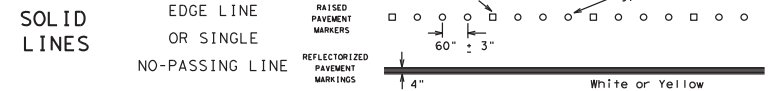
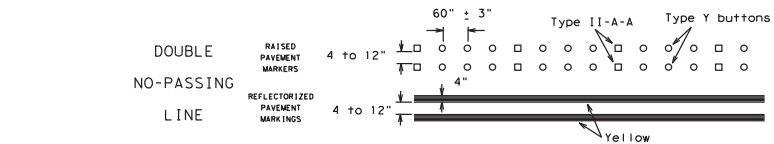


Prefabricated markings may be substituted for reflectORIZED pavement markings.

TWO-WAY LEFT TURN LANE



STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



SHEET 12 OF 12



BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

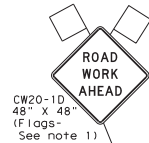
BC(12)-21

FILE:	DC-21.dgn	DN:	TxDOT	CR:	TxDOT	DN:	TxDOT	CR:	TxDOT
REVISIONS	1-97	9-07	5-21	2-98	7-13	11-02	8-14		
CONTRACT	0918	47	472						
COUNTY									
DIST	DAL		DALLAS						
SHEET NO.									

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."

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DATE: FILE:



Channelizing Devices (See note 2) ▲

Channelizing devices may be omitted if the work area is a minimum of 30' from the nearest traveled way.

Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. (See notes 4 & 5)

Channelizing Devices (See note 2) ▲

TCP (1-1a)

WORK SPACE NEAR SHOULDER

Conventional Roads



CW20-1D
48" X 48"
(Flags-
See note 1)

X for 50 mph or less
3X for over 50 mph



G20-2
48" X 24"
(See note 2) ▲

Channelizing Devices (See note 2) ▲

Shoulder
100' Max.
Devices at
20' spacing
(See note 2)

10' Min.

Work Space

150' Min.

Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. (See notes 4 & 5)



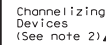
G20-2
48" X 24"
(See note 2)

Channelizing Devices (See note 2) ▲

TCP (1-1b)

WORK SPACE ON SHOULDER

Conventional Roads



CW20-1D
48" X 48"
(Flags-
See note 1)

X for 50 mph or less
3X for over 50 mph



G20-2
48" X 24"
(See note 2) ▲

Channelizing Devices (See note 2) ▲

Shoulder
100' Max.
Devices at
20' spacing
(See note 2)

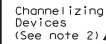
10' Min.

Work Space

150' Min.

Work vehicles or other equipment necessary for the work operation, such as trucks, movable cranes, etc., shall remain in areas separated from lanes of traffic by channelizing devices at all times.

Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. (See notes 4 & 5)



CW20-1D
48" X 48"
(Flags-
See note 1)

Channelizing Devices (See note 2) ▲

TCP (1-1c)

WORK VEHICLES ON SHOULDER

Conventional Roads

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

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

* Conventional Roads Only

** Taper Lengths have been rounded off.

L=Length of Taper (FT) W=Width of Offset (FT) S=Posted Speed (MPH)

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

GENERAL NOTES

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



Traffic
Operations
Division
Standard

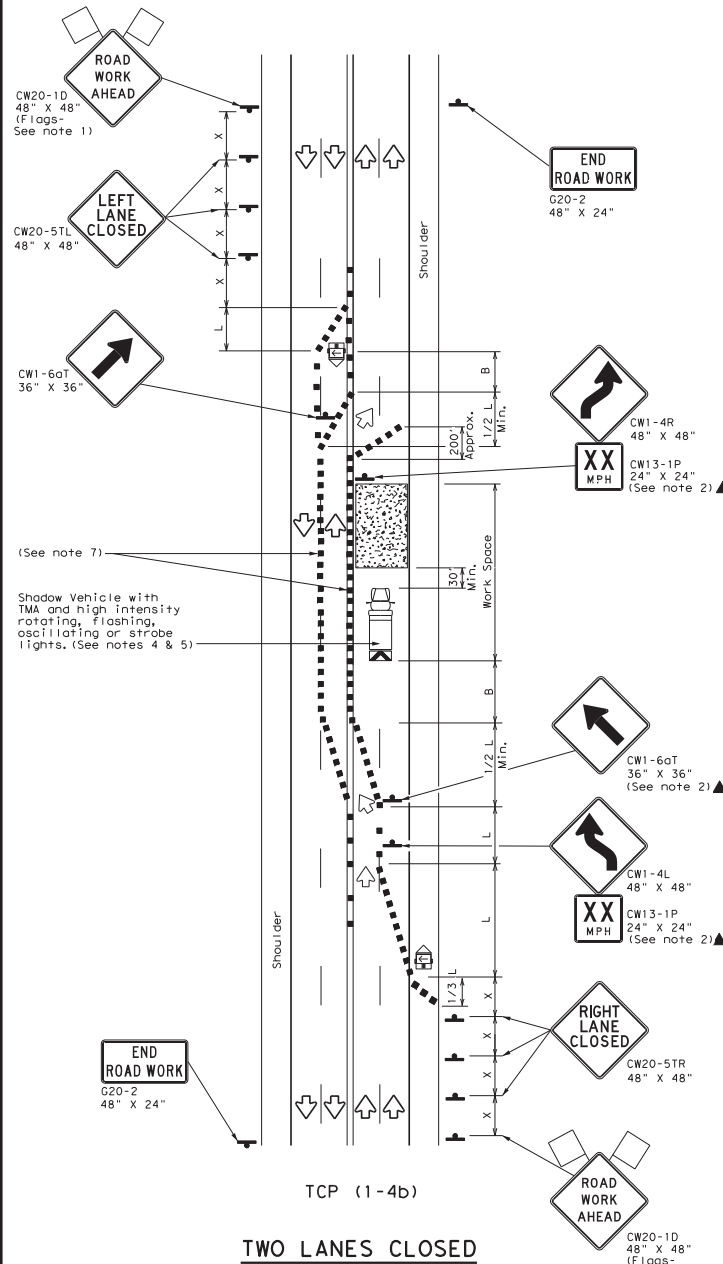
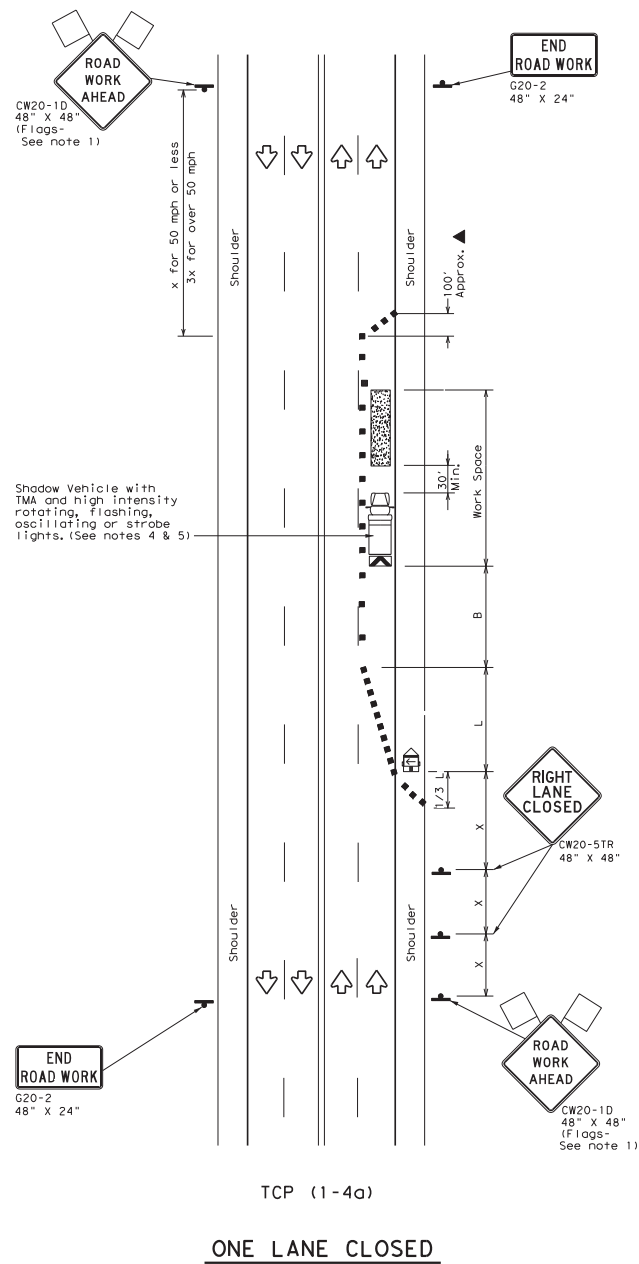
TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP (1-1) - 18

FILE: tcp1-1-18.dgn	DATE: December 1985	BY: 0918	CHK: 47	DATE: 4-98	REVISIONS
0918	4-98	47	472	4-98	2-12
1-97	2-18	DAL	DALLAS	97	

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DATE: FILE:



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

Posted Speed * S	Formula	Minimum Desirable Taper Lengths * L	Suggested Maximum Spacing of Channelizing Devices * On a Taper On a Tangent	Minimum Sign Spacing * Distance	Suggested Longitudinal Buffer Space * "B"
30	$L = \frac{WS^2}{60}$	150'	30'	120'	90'
35		205'	35'	160'	120'
40		265'	40'	240'	155'
45	L=WS	450'	45'	320'	195'
50		500'	50'	400'	240'
55		550'	55'	500'	295'
60		600'	60'	600'	350'
65		650'	65'	700'	410'
70		700'	70'	800'	475'
75		750'	75'	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.
 - The CW20-1D "ROAD WORK AHEAD" sign may be repeated if the visibility of the work zone is less than 1500 feet.
 - A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
 - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
- TCP (1-4a)**
- If this TCP is used for a left lane closure, CW20-5TL "LEFT LANE CLOSED" signs shall be used and channelizing devices shall be placed on the centerline where needed to protect the work space from opposing traffic with the arrow panel placed in the closed lane near the end of the merging taper.
- TCP (1-4b)**
- Where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2S where S is the speed in mph. This tighter device spacing is intended for the areas of conflicting markings, not the entire work zone.

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN

LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP (1-4) - 18

FILE: tcp1-4-18.dgn	DATE: December 1985	BY: 0918	CHECKED: 472	DESIGNED: 472	DRAWN: 472
© TxDOT		REVISIONS	JOB	HIGHWAY	
2-94	4-98	0918	472	VA	
8-95	2-12	DIST	COUNTY	SHEET NO.	
1-97	2-18	DAL	DALLAS	98	

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
666-7244	RE PM TY III (W) (24") (SLD)	LF	13
666-7272	RE PROFILE PM TY I (Y) 4" (BRK) (100MIL)	LF	950
666-7268	RE PROFILE PM TY I (Y) 4" (SLD) (100MIL)	LF	40

0 10 20 40
SCALE: 1"=20' (FULL SIZE)
1"=40' (HALF SIZE)

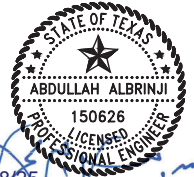


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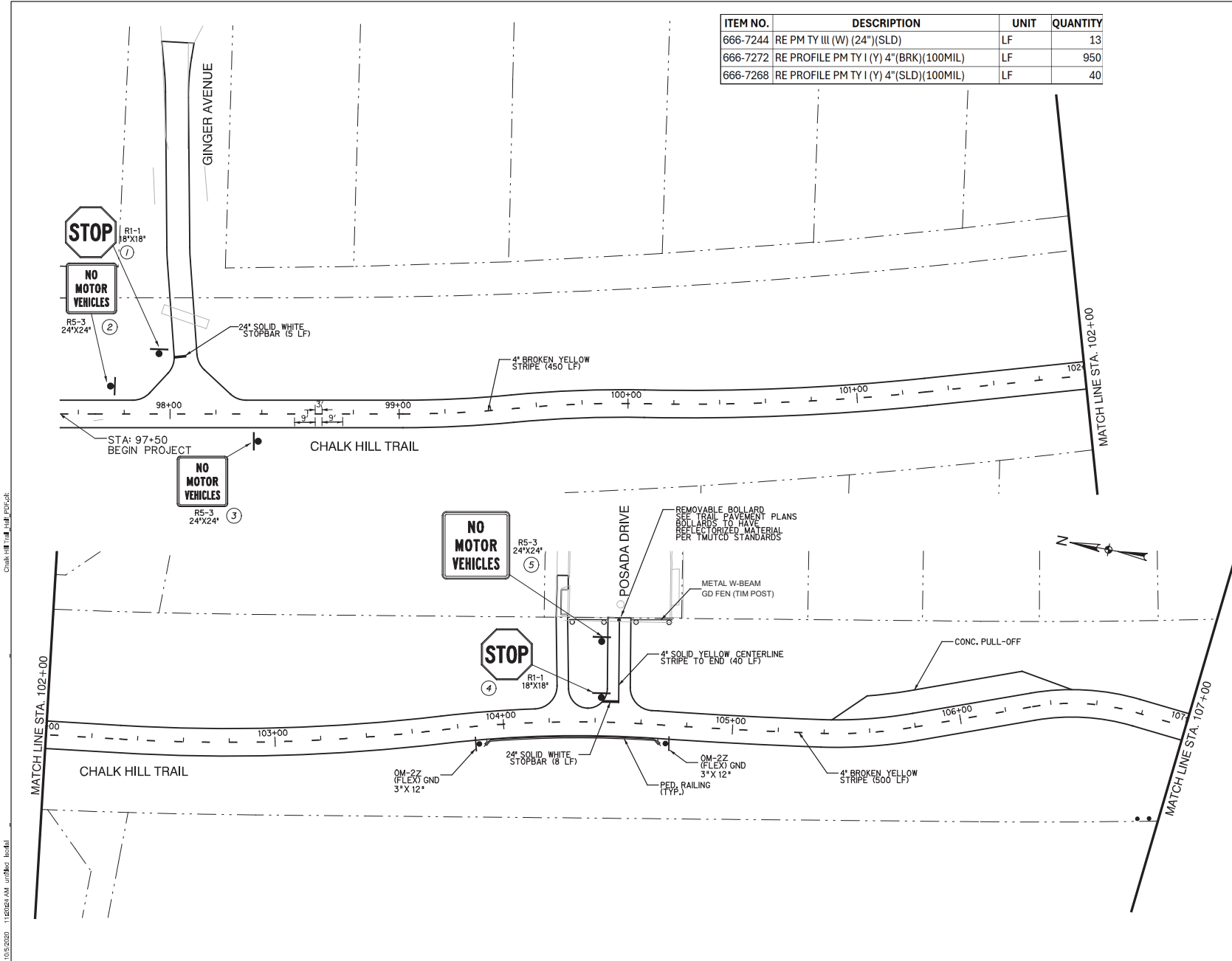
- ④ PROPOSED SIGN
- SIGN IDENTIFICATION

NOTES:

- SEE GENERAL NOTES ON SHEETS 9-12.
- REFER TO SUMMARY OF SMALL SIGNS FOR MOUNTING DESIGNATION.



NO.	REVISIONS	BY	DATE
ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Coll Rd, Dallas, Texas 75251 (214) 341-0900 An ARDURRA Company FIRM REGISTRATION No. F-10058			
Texas Department of Transportation ©2025 by Texas Department of Transportation, all rights reserved.			
CHALK HILL TRAIL CHALK HILL TRAIL PAVEMENT MARKING & SIGNING PLAN STA 97+50 TO 107+00			
© TXDOT UEC Engineering Group 10/15/2020 10:11:20 AM unfiled local 10/15/2020 10:11:20 AM unfiled local			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	99	



Chalk Hill Trail Plan.dwg

10/15/2020 10:11:20 AM unfiled local

Chalk Hill Trail 112+00

10/5/2020 11:21:00 AM unfiled local

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
666-7272	RE PROFILE PM TY I (Y) 4"(BRK)(100MIL)	LF	1000

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SCALE: 1"=20' (FULL SIZE)
1"=40' (HALF SIZE)

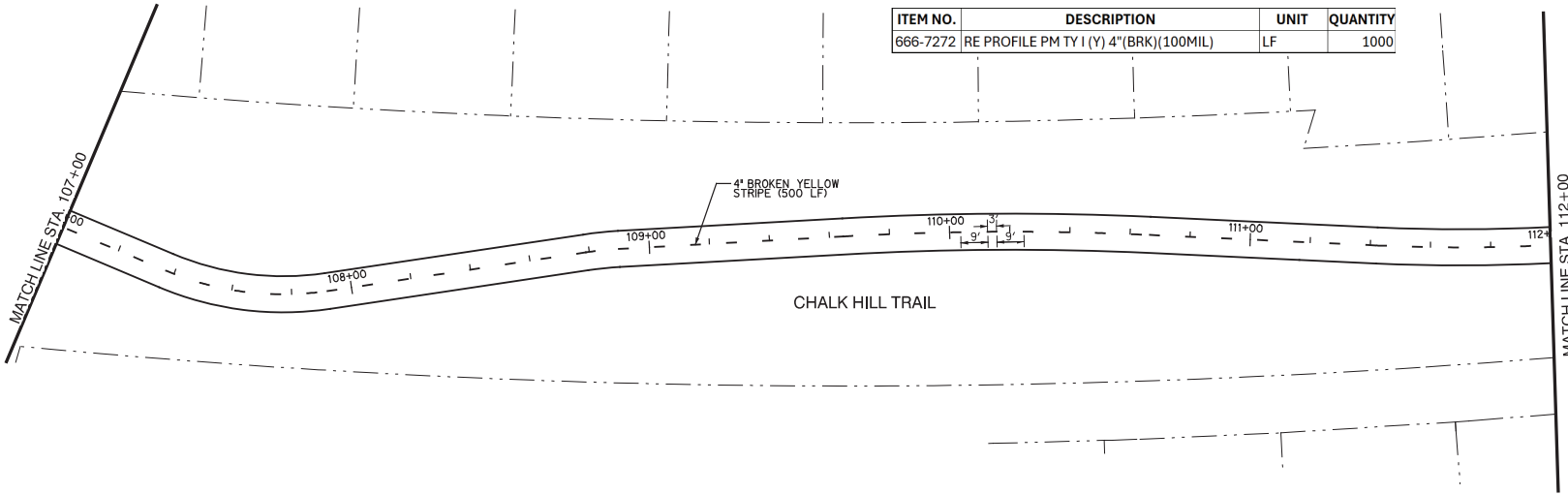


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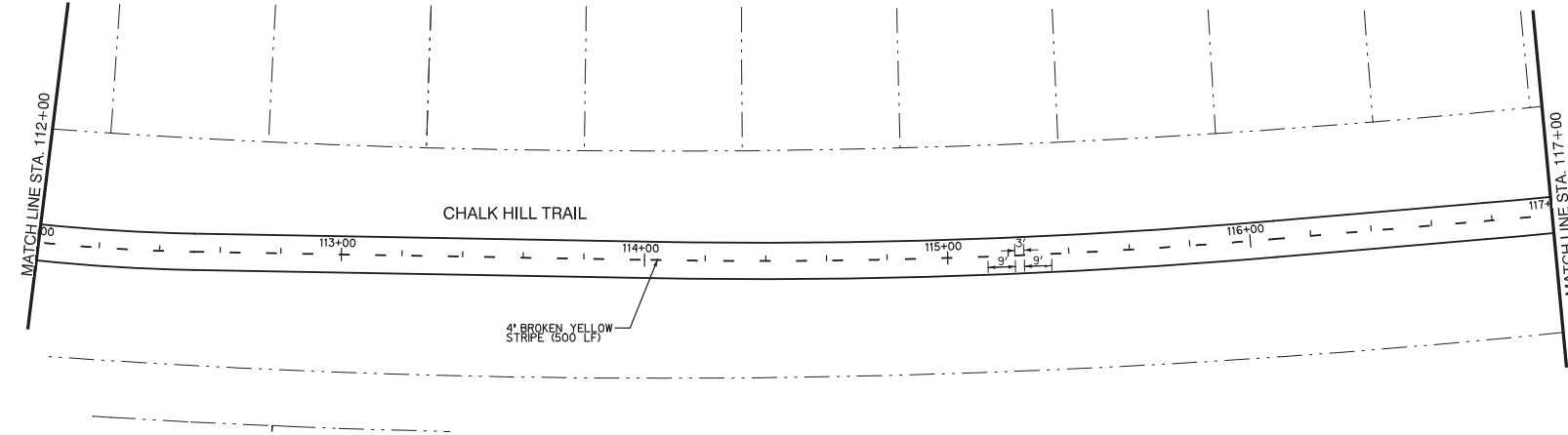
- PROPOSED SIGN
SIGN IDENTIFICATION

NOTES:

1. SEE GENERAL NOTES ON SHEETS 9-12.
2. REFER TO SUMMARY OF SMALL SIGNS FOR MOUNTING DESIGNATION.



CHALK HILL TRAIL



CHALK HILL TRAIL

4" BROKEN YELLOW STRIPE (500 LF)

NO.	REVISIONS	BY	DATE
AZ&B ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Coll Rd, Dallas, Texas 75251 (214) 341-9900 An ARDURRA Company FIRM REGISTRATION No. F-10098			
Texas Department of Transportation ©2025 by Texas Department of Transportation, all rights reserved.			
CHALK HILL TRAIL CHALK HILL TRAIL PAVEMENT MARKING & SIGNING PLAN STA 107+00 TO 117+00			
© TxDOT U2C Urban Engineering Group U2C is a registered service mark of U2C, Inc. U2C is a registered service mark of U2C, Inc. U2C is a registered service mark of U2C, Inc. SHEET 2 OF 5			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	100	

10/5/2020 11:21:00 AM unfiled local

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
666-7272	RE PROFILE PM TY I (Y) 4"(BRK)(100MIL)	LF	1000
666-7244	RE PM TY III (W) (24") (SLD)	LF	5
666-7268	RE PROFILE PM TY I (Y) 4"(SLD)(100MIL)	LF	30

0 10 20 40
SCALE: 1"=20' (FULL SIZE)
1"=40' (HALF SIZE)



LEGEND:

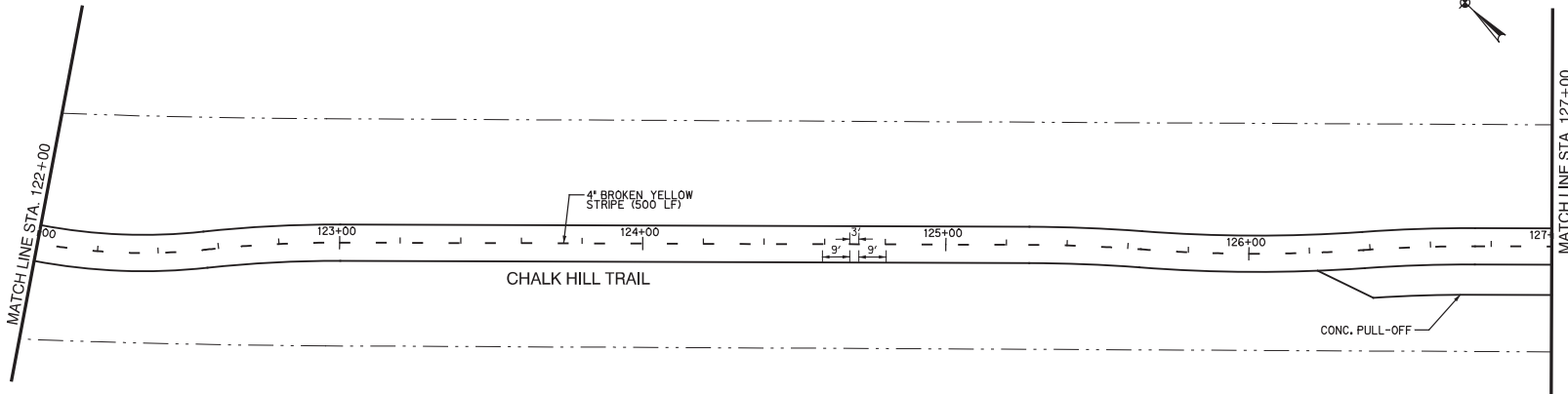
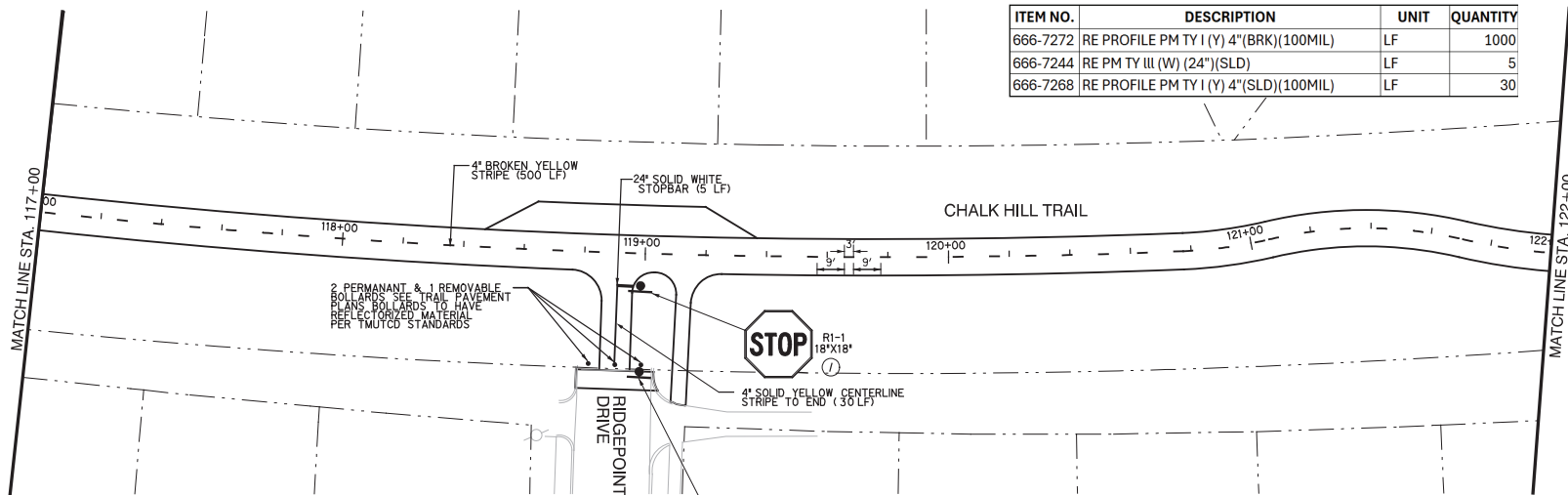
- ⬮ PROPOSED SIGN
- ⊕ SIGN IDENTIFICATION

NOTES:

- SEE GENERAL NOTES ON SHEETS 9-12.
- REFER TO SUMMARY OF SMALL SIGNS FOR MOUNTING DESIGNATION.



NO.	REVISIONS	BY	DATE
ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Coit Rd., Dallas, Texas 75251 (214) 341-2500 An ARDURRA Company FIRM REGISTRATION No. F-10098			
Texas Department of Transportation ©2025 by Texas Department of Transportation all rights reserved			
CHALK HILL TRAIL CHALK HILL TRAIL PAVEMENT MARKING & SIGNING PLAN STA 117+00 TO STA 127+00			
© TxDOT		UFG	
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	101	



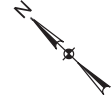
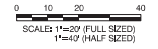
Chalk Hill Trail_half_plan.dwg

10/5/2020 11:22:14 AM unldes borlak

Chalk Hill Trail Pavement

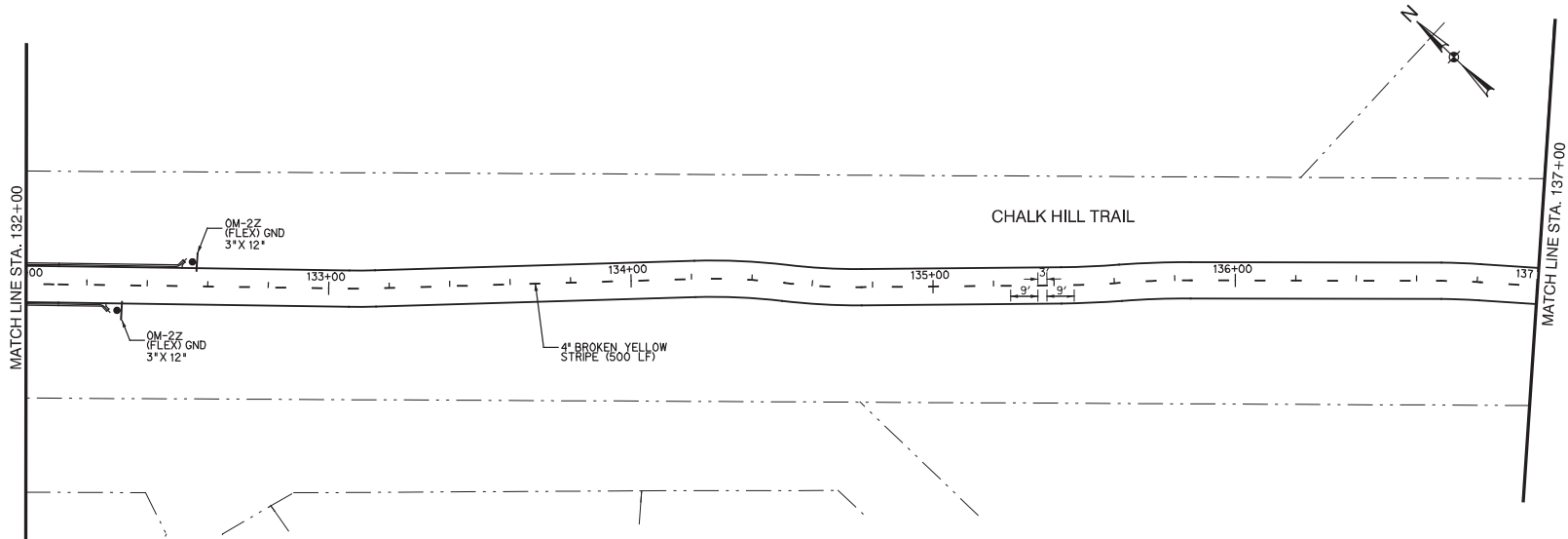
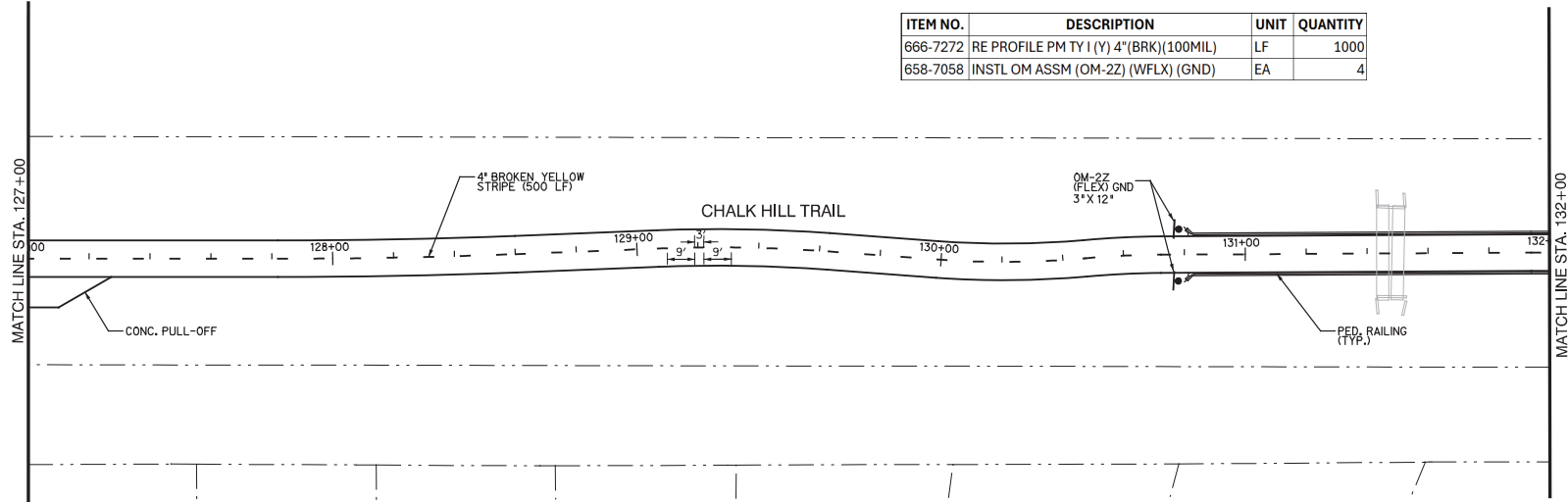
10/3/2020 11:22:55 AM unfiled local

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
666-7272	RE PROFILE PM TY I (Y) 4" (BRK)(100MIL)	LF	1000
658-7058	INSTL OM ASSM (OM-22) (WFLX) (GND)	EA	4



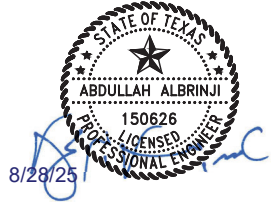
LEGEND:

- PROPOSED SIGN
- SIGN IDENTIFICATION



NOTES:

1. SEE GENERAL NOTES ON SHEETS 9-12.
2. REFER TO SUMMARY OF SMALL SIGNS FOR MOUNTING DESIGNATION.



NO.	REVISIONS	BY	DATE
AZ&B ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Coll Rd, Dallas, Texas 75251 (214) 341-9900 An ARDURRA Company FIRM REGISTRATION No. F-10098			
Texas Department of Transportation ©2025 by Texas Department of Transportation, all rights reserved.			
CHALK HILL TRAIL CHALK HILL TRAIL PAVEMENT MARKING & SIGNING PLAN STA 127+00 TO STA 137+00			
© TxDOT UEC K&S		SHEET 4 OF 5	
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	102	

10/3/2020 11:22:55 AM unfiled local

DSC:KJW:R
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10/5/2020
SUM SS 01.dgn

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)					BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)
							POST TYPE	POSTS 1 or 2	ANCHOR TYPE	MOUNTING DESIGNATION		
										PREFABRICATED	TEXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	
99	1	R1-1	STOP	18"x18"	X		10 BWG	1	SA	P		
	2	R5-3	NO MOTOR VEHICLES	24"x24"	X		10 BWG	1	SA	P		
	3	R5-3	NO MOTOR VEHICLES	24"x24"	X		10 BWG	1	SA	P		
	4	R1-1	STOP	18"x18"	X		10 BWG	1	SA	P		
	5	R5-3	NO MOTOR VEHICLES	24"x24"	X		10 BWG	1	SA	P		
101	1	R1-1	STOP	18"x18"	X		10 BWG	1	SA	P		
	2	R5-3	NO MOTOR VEHICLES	24"x24"	X		10 BWG	1	SA	P		
103	1	W3-1	STOP AHEAD	18"x18"	X		10 BWG	1	SA	P		
	2	M4-6G	END	12"x6"	X		10 BWG	1	SA	P		
		D11-1	BIKE ROUTE	24"x18"	X							
	3	R1-1	STOP	18"x18"	X		10 BWG	1	SA	P		
	4	R5-3	NO MOTOR VEHICLES	24"x24"	X		10 BWG	1	SA	P		

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

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

NOTE:

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



SHEET 1 OF 1

				Traffic Operations Division Standard	
SUMMARY OF SMALL SIGNS					
SOSS					
FILE: sumsl6.dgn	DATE: TxDOT	CH: TxDOT	BY: TxDOT	CHK: TxDOT	CHK: TxDOT
©TxDOT May 1987	CONT: 47	SECT: 472	JOB: VA	HIGHWAY	
4-16 REVISIONS	DIST: COUNTY	DALLAS		SHEET NO. 104	
8-16	18				

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DATE: FILE:

REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS					DELINEATORS				D & OM DESCRIPTIVE CODES								
DEVICE	SIZE 1	SIZE 2	SIZE 3	SIZE 4	DEVICE	SINGLE		DOUBLE		INSTL DEL ASSM (D-XX)SZ X (XXXX)XXX(XX) 1 or 2 NUMBER OF REFLECTORS S = Single D = Double COLOR OF REFLECTORS W = White Y = Yellow R = Red REFLECTOR UNIT SIZE TYPE OF POST OR DELINEATOR WC = Wing Channel Post YFLX = Yellow Flexible Post WFLX = White Flexible Post BRF = Barrier Reflector TYPE OF MOUNT GND = Embedded (drivable or set in concrete) CTB = Concrete Barrier Mount GF1 or GF2 = Guard Fence Attachment SRF = Surface Mount DIRECTION If Required BI = Bi-Directional BR = Bi-Directional with red on back INSTL OM ASSM (OM-XX) (XXXX)XXX(XX) TYPE OF OBJECT MARKER 1, 2, 3, or 4 NUMBER OF REFLECTORS OR DIRECTION X = 3-Size 2 reflector units (Type 2 only) Y = 1-Size 3 reflector unit (Type 2 only) Z = 3-Size 1 or 1-Size 4 reflector unit(s) (Type 2 only) L = Left Side (Type 3 Object Marker only) R = Right Side (Type 3 Object Marker only) C = Center (Type 3 Object Marker only) TYPE OF POST WC = Wing Channel Post WFLX = White Flexible Post TWT = Thin Walled Tubing TYPE OF MOUNT GND = Embedded (drivable) SRF = Surface Mount WAS = Wedge Anchor Steel WAP = Wedge Anchor Plastic DIRECTION If Required BI = Bi-Directional							
	SIZE 1	SIZE 2	SIZE 3	SIZE 4		SINGLE	DOUBLE										
1. Size 1 and 4 - Direct applied reflective sheeting for use on flexible post (flx). 2. Size 2 and 3 - For use on wing channel (wc) post only. Use approved metal, plastic or fiberglass backplate with 17/64" mounting holes.					1-Size 2 reflector unit 1-Size 1 reflector unit 2-Size 2 reflector units 2-Size 1 reflector units												
SHEETING Yellow, White or Red Type B or C reflective sheeting					SHEETING Yellow, White or Red Type B or C Reflective Sheeting												
NOTE					POST TYPE WC YFLX, WFLX WC YFLX, WFLX												
MOUNT TYPE GND GND, SRF GND GND, SRF																	
OBJECT MARKERS																	
DEVICE	Type 1 (OM-1)	Type 2 (OM-2)			Type 3 (OM-3)			Type 4 (OM-4)									
	OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	OM-4									
3-Size 2 reflector units 1-Size 3 reflector unit 3-Size 1 reflector units or 1-Size 4 reflector unit																	
SHEETING Yellow-Type B _{FL} or C _{FL} Sheeting Yellow - Type B or C Sheeting Alternating acrylic black and retroreflective yellow - Type B _{FL} or C _{FL} Sheeting Red -Type B _{FL} or C _{FL} Sheeting																	
POST TYPE TWT WC WC WFLX TWT TWT																	
MOUNT TYPE WAS, WAP GND GND GND, SRF WAS, WAP WAS, WAP																	
BARRIER REFLECTORS (BRF)				CHEVRONS				ONE DIRECTION LARGE ARROW				NOTE:					
DEVICE	GF1	GF2	CTB	W1-8				W1-6				Delineator and object marker substrates and sign substrates shall be 0.080" Aluminum sign blank to conform to ASTM B-209 Alloy 6061-T6 or approved alternative.					
1. Barrier reflectors shall meet the requirements of DMS 8600. 2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov .				SIZE (W x L) 18"x 24" (Conventional) 24"x 30" (Conventional Oversize) 30"x 36" (Expressway) 36" x 48" (Freeway)				SIZE (W x L) 48" x 24" (Conventional) 60" x 30" (Expressway & Freeway)									
MOUNTING HEIGHT 4'-0" or 7'-0"				7'-0" Only				MOUNTING HEIGHT 7'-0"									
SHEETING Yellow, White, Red				NOTE				1. CHEVRON (W1-8) signs and ONE DIRECTION LARGE ARROW (W1-6) Signs shall be installed per Sign Mounting Details (SMD) Standard Sheets and paid under Item 644 (Small Roadside Sign Assemblies). 2. When there is a need to increase conspicuity, the Texas version of the ONE DIRECTION LARGE ARROW sign (W1-9T) may be used instead of the ONE DIRECTION LARGE ARROW (W1-6).									
NOTE 1. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.																	



DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION
D & OM(1)-20

FILE: dcm1-20.dgn	DN: TXDOT	CR: TXDOT	DN: TXDOT	CR: TXDOT
© TXDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0918	47	472	VA
10-09 3-15	DIST	COUNTY	SHEET NO.	
4-10 7-20	DAL	DALLAS	104-A	

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SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

Post Type

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

Number of Posts (1 or 2)

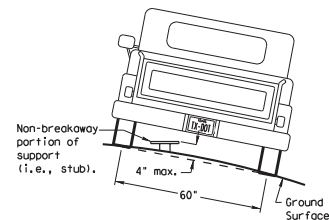
Anchor Type

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

Sign Mounting Designation

P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
IF REQUIRED
TEXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
WC = 1, 12 #/ft. Wing Channel (see SMD(SLIP-1) to (SLIP-3))
EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-3))

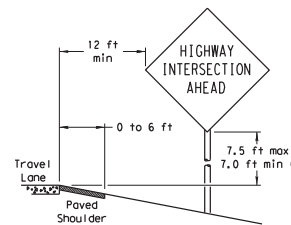
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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

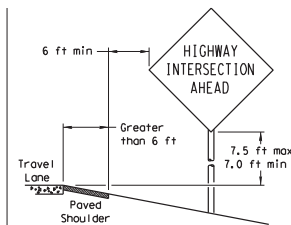
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

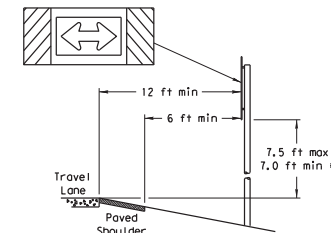
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



GREATER THAN 6 FT. WIDE

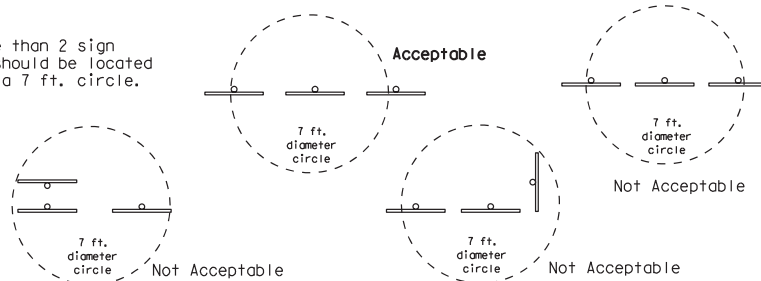
When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

T-INTERSECTION

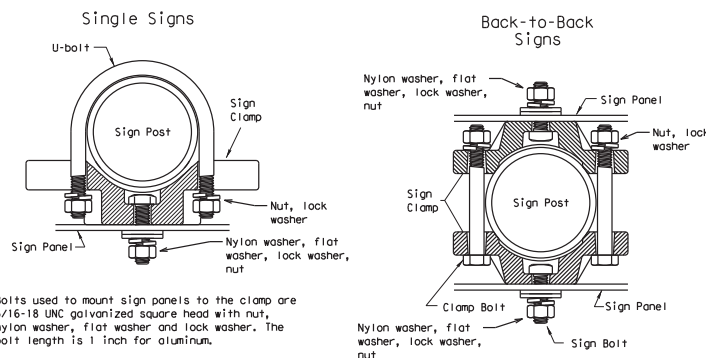


When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.

No more than 2 sign posts should be located within a 7 ft. circle.



TYPICAL SIGN ATTACHMENT DETAIL



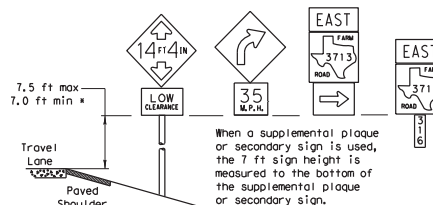
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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

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

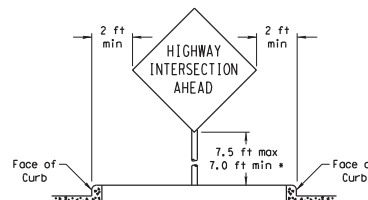
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES

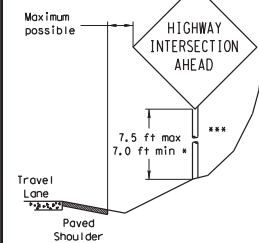


When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY (When 6 ft min. is not possible.)



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

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

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

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

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

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

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

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD (GEN) -08

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9-08	REVISIONS	CONT	SECT	JOB	HIGHWAY
		0918	47	472	VA
		DIST		COUNTY	SHEET NO.
		DAL		DALLAS	105

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

Post
10 BWG Tubing or
Schedule 80 Pipe
(See General Note 3)

Slip Base

SIDE VIEW 1-1

Post
10 BWG Tubing or
Schedule 80 Pipe
(See General Note 3)

Slip Base

SIDE VIEW 2-2



1. Slip base shall be permanently marked to indicate manufacturer, method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as part with this system shall conform to the following specifications:
 - a. 10 BWG Tubing (2.875" outside diameter)
 1. 0.134" nominal wall thickness
 - Seamless or electric-resistance welded steel tubing or pipe
 - Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
 - Other steels may be used if they meet the following:
 - 55,000 PSI minimum yield strength
 - 70,000 PSI minimum tensile strength
 - 20% minimum elongation in 2"
 - Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
 - Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
 - Galvanization shall be ASTM A123 or ASTM A653 D20. For pre-coated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
 - b. Schedule 80 Pipe (2.875" outside diameter)
 1. 0.276" nominal wall thickness
 - Steel tubing per ASTM A500 Gr C
 - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
 - 46,000 PSI minimum yield strength
 - 62,000 PSI minimum tensile strength
 - 21% minimum elongation in 2"
 - Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
 - Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
 - Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is:
<http://www.txdot.gov/publications/traffic.htm>
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

Foundation

1. Prepare 12-inch diameter by 42-inch deep hole, if solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, batch plant when the Contractor has approved procedures for concrete placement, curing, hand mixing in suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth until the stub is seated in the concrete. The stub must be seated in the concrete to the stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

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

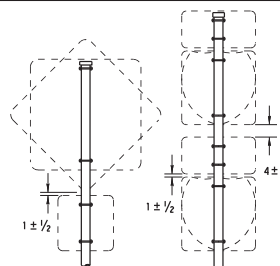
10-2010



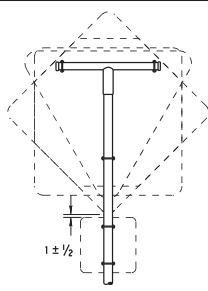
© TxDOT July 2002		DN: TXDOT	CK: TXDOT	DR: TXDOT	CK: TXDOT
9-08	REVISIONS	CONT	SECT	JOB	HIGHWAY
12-10 (DISTRICT)		0918	47	472	VA
ADDED CLAMP BASE		DIST	COUNTY		SHEET NO.
DETAIL FOR SLIP		DAL	DALLAS		106
BASE INSTALLATION					

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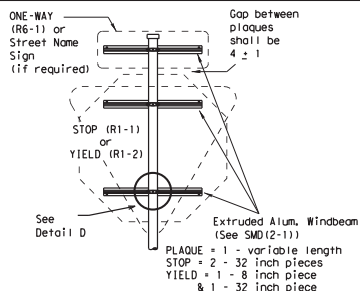
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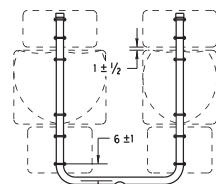
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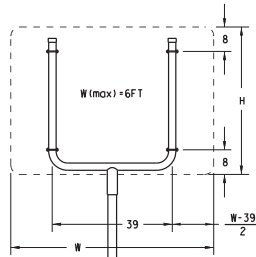
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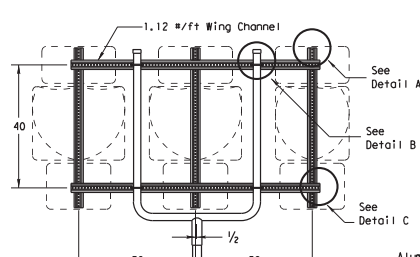
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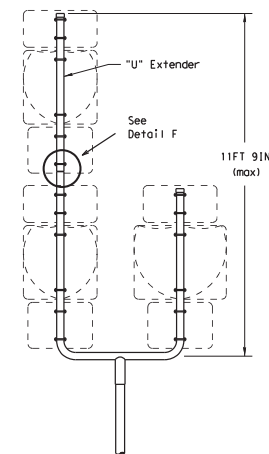
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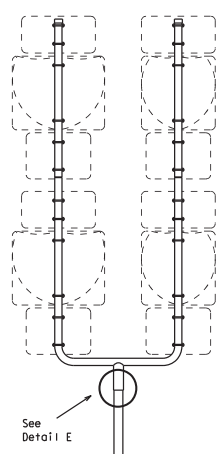
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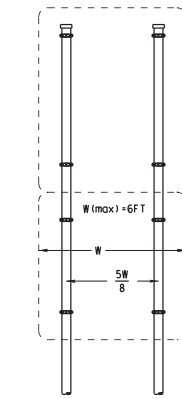
SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)



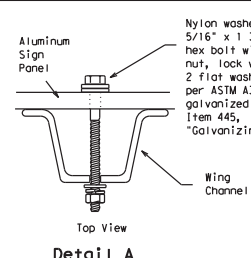
SM RD SGN ASSM TY S80(1)XX(U-TEXT)



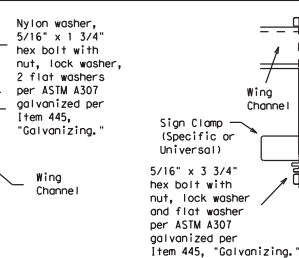
SM RD SGN ASSM TY S80(1)XX(U-TEXT)



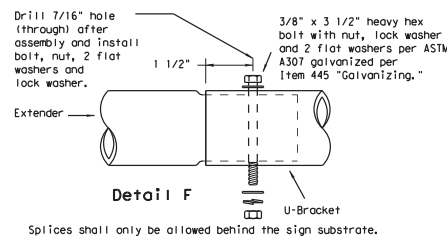
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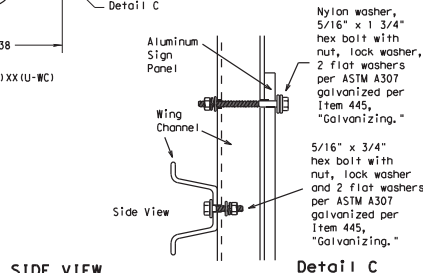
Detail A



Detail B

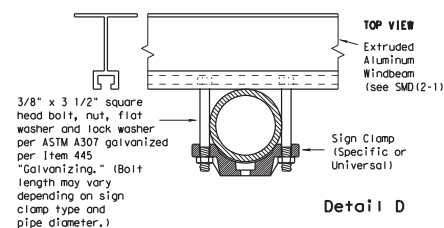


Splices shall only be allowed behind the sign substrate.

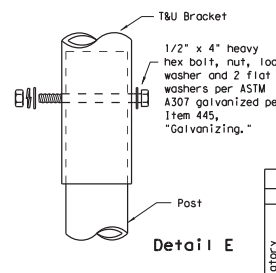


SIDE VIEW

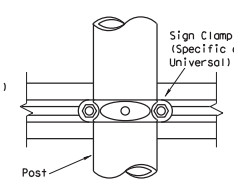
Detail C



Detail D



Detail E



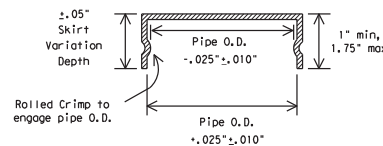
Detail F

GENERAL NOTES:

1. SIGN SUPPORT # OF POSTS MAX. SIGN AREA
10 BWG 1 16 SF
10 BWG 2 32 SF
Sch 80 1 32 SF
Sch 80 2 64 SF
2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 S5 Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.

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

FRICION CAP DETAIL



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes. The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture. Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/Zn 8.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

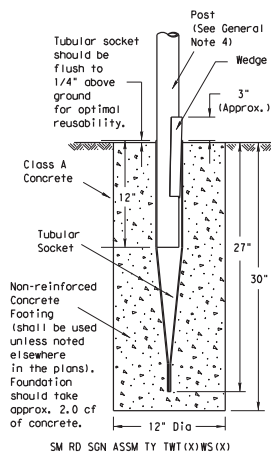
SMD(SLIP-2)-08

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		DAL	DALLAS	SHEET NO.
				107

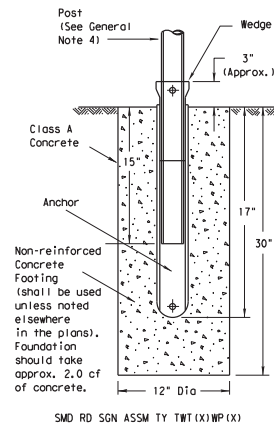
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DATE: FILE:

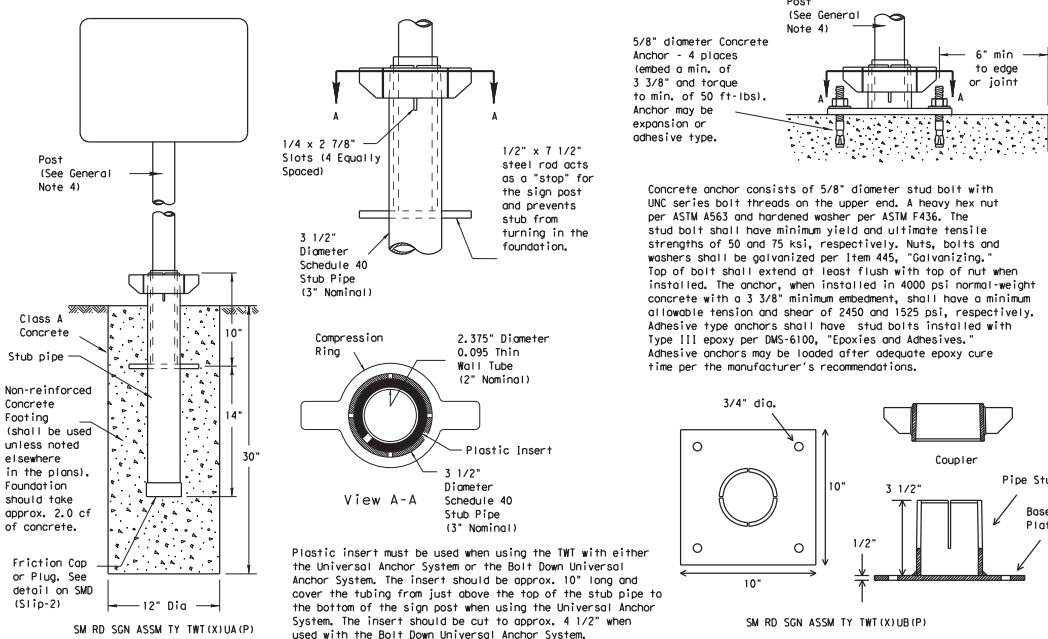
Wedge Anchor Steel System



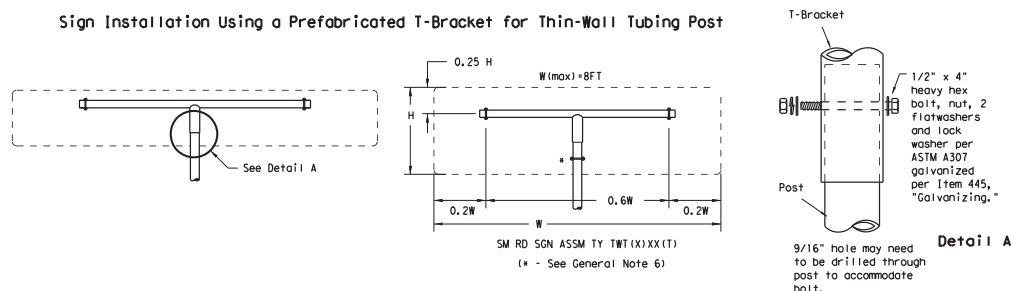
Wedge Anchor High Density Polyethylene (HDPE) System



Universal Anchor System with Thin-Walled Tubing Post



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



NOTE

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

GENERAL NOTES:

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

WEDGE ANCHOR SYSTEM INSTALLATION PROCEDURE

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

UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURE

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

Texas Department of Transportation
Traffic Operations Division

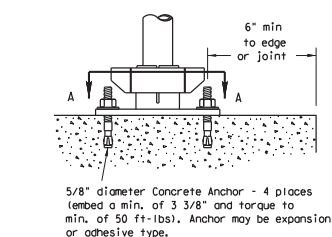
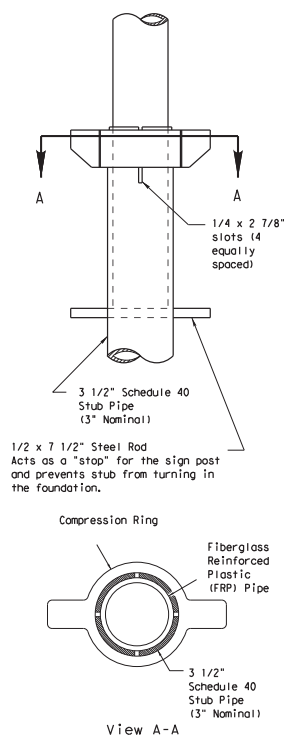
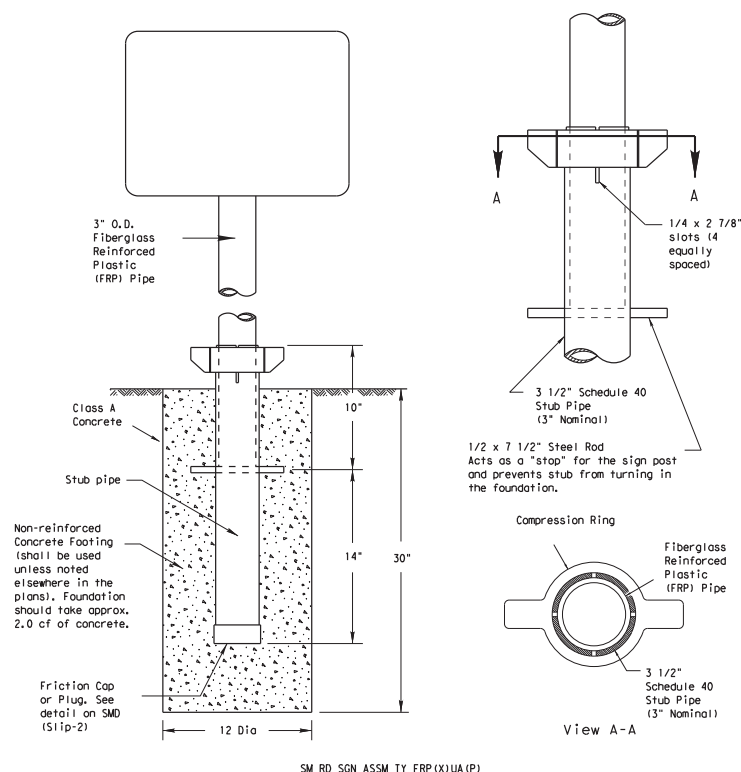
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS WEDGE & UNIVERSAL ANCHOR WITH THIN WALL TUBING POST SMD(TWT) -08

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		DIST	COUNTY		SHEET NO.
		DAL	DALLAS		108

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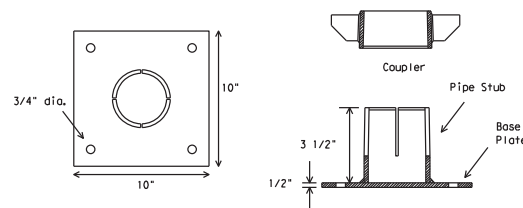
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Universal Anchor System with Fiberglass Reinforced Plastic (FRP) Post



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

BOLT-DOWN DETAILS



GENERAL NOTES:

- FRP sign supports for a single type sign support may be used for signs up to and including 16 square feet. Dual post installation may be used for signs up to and including 32 square feet.
- All nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing."
- See the Traffic Operations Division website for detailed drawings of sign clamps. The website address is: <http://www.txdot.gov/publications/traffic.htm>

FRP POST REQUIREMENTS

- Materials shall conform to the requirements of Departmental Material Specification DMS-4410 and will be furnished in a yellow or gray color as specified elsewhere in the plans.
- Thickness of FRP sign support is 0.125" ± 0.031", - 0.0".
- FRP sign supports are prequalified by the Traffic Operations Division. Prequalification procedures are obtained by writing:
Texas Department of Transportation
Traffic Operations Division
125 East 11th Street
Austin, Texas 78701-2483

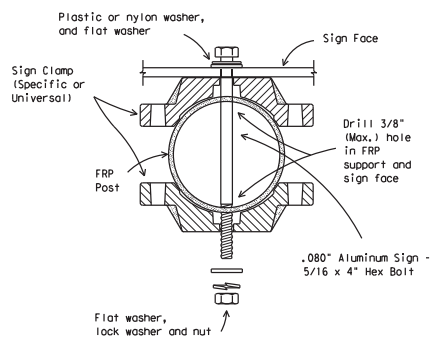
UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURES

- Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD (GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
- The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
- Insert base post in foundation hole to depths shown and fill hole with concrete. Cut base post from bottom and ensure a minimum of 18" embedment if installed in solid rock.
- Level and plumb the base post with coupler using a torpedo level and let concrete set a minimum of 4 days, unless otherwise directed by Engineer. Bottom of base post slots shall be above the concrete footing.
- Attach sign to FRP post.
- Insert sign post into base post. Lower until the post comes to rest on the steel rod.
- Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
- Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

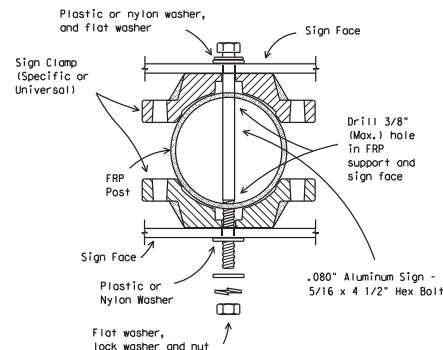
BOLT DOWN SIGN SUPPORT

- Position base plate with coupler on existing concrete.
- Drill holes into concrete and insert the 5/8" diameter bolts with wedge anchors, and tighten nuts.
- Attach sign to FRP post.
- Insert bottom of sign post into pipe stub.
- Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
- Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

Typical Sign Mounting Detail for FRP Support with Single Sign



Typical Sign Mounting Detail for FRP Support with Back-to-Back Signs



Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS UNIVERSAL ANCHOR SYSTEM WITH FRP POST

SMD (FRP) -08

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		DIST	COUNTY	HIGHWAY
		DAL	DALLAS	109

I. STORMWATER POLLUTION PREVENTION-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. Refer to TxDOT Standard Specifications and/or the SW3P sheets included in the plan set.

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. Refer to the SW3P sheets included in the plan set for Best Management Practices applicable to 401 General Conditions.

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)
☐ Other Nationwide Permit Required: NWP# 3(a)

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

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical. Refer to TxDOT Standard Specifications in order to comply with requirements for invasive species, beneficial landscaping and tree/brush removal.

- ☒ No Action Required ☐ Required Action

V. FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES.

Avoid impacts to Federal and/or State species. Refer to Beneficial Management Practices for avoiding, minimizing, and mitigating impacts to State listed species available at <https://txdot.gov/content/dam/docs/environmental/toolkit/300-01-bmp.pdf>

- ☐ No Action Required ☒ Required Action

Action Number:

1. The Migratory Bird Treaty 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. The contractor would remove all old inactive 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 nests between February 15 to October 1. Exclusion devices can be installed after the removal of inactive nests. This can be accomplished by hand every 3-4 days, netting or bird repellent gel. If migratory birds are encountered on-site during project construction, avoid adverse impacts on birds, active nests, eggs and/or young. Active migratory bird nests on structures or trees within the project limits cannot be destroyed.

LIST OF ABBREVIATIONS

BMP: Best Management Practice	SPC: Spill Prevention Control and Countermeasure
CGP: Construction General Permit	SW3P: Storm Water Pollution Prevention Plan
DSS: Texas Department of State Health Services	PCN: Pre-Construction Notification
FHW: 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	TSE: Threatened and Endangered Species
NWP: Nationwide Permit	USACE: U.S. Army Corps of Engineers
NOI: Notice of Intent	USFWS: U.S. Fish and Wildlife Service

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

Refer to TxDOT Standard Specifications in the event potentially contaminated materials are observed, such as dead or distressed vegetation, trash disposal areas, drums, canisters, barrels, leaching or seepage of substance, unusual smells or odors, or stained soil, cease work in the immediate area and contact the Engineer immediately.

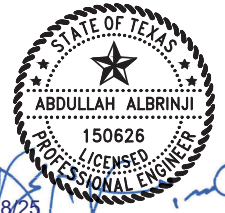
Hazardous Materials or Contamination Issues:

- ☒ No Action Required ☐ Action Required

VII. OTHER ENVIRONMENTAL ISSUES

(Issues such as Noise Abatement Walls, etc.)

- ☒ No Action Required ☐ Required Action



ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)

CONT	SECT	JOB	HIGHWAY
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DIST	COUNTY	SHEET NO.	
DAL	DALLAS	110	

Revised 04/29/2025

General Notes:

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.

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

This SWP3 has been developed in accordance with the TPDES Construction General Permit TXR150000 (CGP). The Texas Department of Transportation (TxDOT) ensures that project specifications include adequate best management practices (BMPs) for this project.

For all projects with soil disturbing activity and for projects that have Environmental, Permits, Issues, and Commitments (EPICs) dependent on stormwater controls and water quality measures TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office, Area Office, or electronically.

This SWP3 is consistent with requirements specified in applicable stormwater plans and the projects environmental permits, issues, and commitments (EPICs). A copy of the CGP is included in Attachment 2.12 of the SWP3 binder.

1.0 CHALK HILL TRAIL**1.1 (CSJ): 0918-47-472****1.2 PROJECT LIMITS:**From: Chalk Hill Trl Ph 1; along former RR ROWTo: Ginger Ave, Cockrell Hill, Illinois Ave**1.3 PROJECT COORDINATES:**BEGIN: (Lat) 32.7314°, (Long) 96.8984°END: (Lat) 32.7206°, (Long) 96.8916°**1.4 TOTAL PROJECT AREA (Acres):** 8.7285 Acres**1.5 TOTAL AREA TO BE DISTURBED (Acres):** 4.0379 Acres**1.6 NATURE OF CONSTRUCTION ACTIVITY:**SHALLOW GRADING TO INSTALL HIKE AND BIKE TRAIL**1.7 MAJOR SOIL TYPES:**

Soil Type	Description
AUSTIN-URBAN LAND COMPLEX, 2 TO 5 PERCENT SLOPES	GENTLY SLOPING, WELL DRAINED SOILS AND AREAS OF URBAN LAND ON UPLANDS.
STEPHEN-URBAN LAND COMPLEX, 1 TO 4 PERCENT SLOPES	SHALLOW WELL DRAINED, GENTLY SLOPING SOILS AND AREAS OF URBAN LAND OVERLAYING AUSTIN CHALK FORMATION.

*Vegetative cover consists of mature woodlands dominated by American elm (Ulmus americana) and hackberry (Celtis spp.) with estimated canopy closure between 75 and 95 percent.

1.8 PROJECT SPECIFIC LOCATIONS (PSLs):

PSLs must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. PSLs may be identified during preconstruction meetings or during the construction process. Please choose from the options below:

- ☒ PSLs determined during preconstruction meeting
☐ PSLs determined during construction
☐ No PSLs planned for construction

Type	Sheet #s

All off-ROW PSLs required by the Contractor are the Contractor's responsibility. The Contractor shall secure all permits required by local, state, federal laws for off-ROW PSLs. The contractor shall provide diagrams, areas of disturbance, acreage, and BMPs for all off-ROW PSLs within one mile of the project.

1.9 CONSTRUCTION ACTIVITIES:

(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.5.)

- ☒ Mobilization
☒ Install sediment and erosion controls
☒ Blade existing topsoil into windrows, prep ROW, clear and grub
☐ Remove existing pavement
☒ Grading operations, excavation, and embankment
☐ Excavate and prepare subgrade for proposed pavement widening
☒ Remove existing culverts, safety end treatments (SETs)
☒ Remove existing metal beam guard fence (MBGF), bridge rail
☒ Install proposed pavement per plans
☒ Install culverts, culvert extensions, SETs
☐ Install mow strip, MBGF, bridge rail
☒ Place flex base
☒ Rework slopes, grade ditches
☐ Blade windrowed material back across slopes
☒ Revegetation of unpaved areas
☒ Achieve site stabilization and remove sediment and erosion control measures

☐ Other: _____☐ Other: _____☐ Other: _____**1.10 POTENTIAL POLLUTANTS AND SOURCES:**

- ☒ Sediment laden stormwater from stormwater conveyance over disturbed area
☒ Fuels, oils, and lubricants from construction vehicles, equipment, and storage
☒ Solvents, paints, adhesives, etc. from various construction activities
☒ Transported soils from offsite vehicle tracking
☒ Construction debris and waste from various construction activities
☐ Contaminated water from excavation or dewatering pump-out water
☒ Sanitary waste from onsite restroom facilities
☒ Trash from various construction activities/receptacles
☒ Long-term stockpiles of material and waste
☒ Discharges from concrete washout activities, runoff from concrete cutting activities, and other concrete related activities

☐ Other: _____☐ Other: _____☐ Other: _____**1.11 RECEIVING WATERS:**

Receiving waters must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. Include Segment # for receiving waters.

Tributaries	Classified Waterbody
Unnamed Tributary to Fivemile Creek	Fivemile Creek (Segment 0805D). No impairments
Unnamed Tributary to West Fork Trinity River	Lower West Fork Trinity River (Segment 0841). Impairments Dioxin and PCBs in edible tissue

* Add (*) for impaired waterbodies with pollutant in ().

1.12 ROLES AND RESPONSIBILITIES: TxDOT

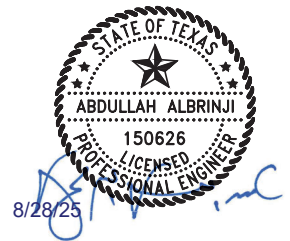
- ☒ Development of plans and specifications
☒ Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
☒ Post Construction Site Notice
☒ Submit NOI/CSN to local MS4
☒ Perform SWP3 inspections
☒ Maintain SWP3 records and update to reflect daily operations
☒ Complete and submit Notice of Termination to TCEQ
☒ Maintain SWP3 records for 3 years
☐ Other: _____

☐ Other: _____☐ Other: _____**1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR**

- ☒ Day To Day Operational Control
☒ Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
☒ Post Construction Site Notice
☒ Submit NOI/CSN to local MS4
☒ Maintain schedule of major construction activities
☒ Install, maintain and modify BMPs
☒ Complete and submit Notice of Termination to TCEQ
☒ Maintain SWP3 records for 3 years

☐ Other: _____☐ Other: _____☐ Other: _____**1.14 LOCAL MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) OPERATOR COORDINATION:****MS4 Entity**

Refer to EPIC sheet

**STORMWATER POLLUTION PREVENTION PLAN (SWP3)**

© 2023 July 2023 Sheet 1 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			111
STATE	STATE SECT.	COUNTY	
TEXAS	DAL	DALLAS	
CONT.	SECT.	JOB	HIGHWAY NO.
0918	47	472	VA

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

2.0 BEST MANAGEMENT PRACTICES (BMPs)
AND CONTROLS, INSPECTION, AND
MAINTENANCE

The Contractor shall be the responsible party for implementing the BMPs described herein and for complying with the SWP3 for control of erosion and sedimentation during day-to-day operations. The Contractor shall implement changes to this SWP3 approved by TxDOT within the times specified in this SWP3 or the CGP.

2.1 EROSION CONTROL AND SOIL
STABILIZATION BMPs:

T / P

- ☒ ☐ Protection of Existing Vegetation
☐ ☐ Vegetated Buffer Zones
☐ ☐ Soil Retention Blankets
☐ ☐ Geotextiles
☐ ☐ Mulching/ Hydromulching
☐ ☐ Soil Surface Treatments
☒ ☐ Temporary Seeding
☐ ☒ Permanent Planting, Sodding or Seeding
☒ ☐ Biodegradable Erosion Control Logs
☒ ☐ Rock Filter Dams/ Rock Check Dams
☐ ☐ Vertical Tracking
☐ ☐ Interceptor Swale
☐ ☒ Riprap
☐ ☐ Diversion Dike
☐ ☐ Temporary Pipe Slope Drain
☐ ☐ Embankment for Erosion Control
☐ ☐ Paved Flumes
☐ ☐ Other: _____
☐ ☐ Other: _____
☐ ☐ Other: _____
☐ ☐ Other: _____

2.2 SEDIMENT CONTROL BMPs:

T / P

- ☒ ☐ Biodegradable Erosion Control Logs
☐ ☐ Dewatering Controls
☒ ☐ Inlet Protection
☒ ☐ Rock Filter Dams/ Rock Check Dams
☐ ☐ Sandbag Berms
☒ ☐ Sediment Control Fence
☒ ☐ Stabilized Construction Exit
☐ ☐ Floating Turbidity Barrier
☐ ☐ Vegetated Buffer Zones
☐ ☐ Vegetated Filter Strips
☐ ☐ Other: _____
☐ ☐ Other: _____
☐ ☐ Other: _____
☐ ☐ Other: _____

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

Sediment control BMPs requiring design capacity calculations (See SWP3 Attachment 1.3.):

T / P

- ☐ ☐ Sediment Trap
☐ ☐ Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
☐ ☐ 3,600 cubic feet of storage per acre drained
☐ ☐ Sedimentation Basin
☒ ☐ Not required (<10 acres disturbed)
☐ ☐ Required (>10 acres) and implemented.
☐ ☐ Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
☐ ☐ 3,600 cubic feet of storage per acre drained
☐ ☐ Required (>10 acres), but not feasible due to:
☐ ☐ Available area/Site geometry
☐ ☐ Site slope/Drainage patterns
☐ ☐ Site soils/Geotechnical factors
☐ ☐ Public safety
☐ ☐ Other: _____

2.3 PERMANENT CONTROLS:

(Coordinate post-construction BMPs with appropriate TxDOT maintenance sections.)

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

- ☒ Excess dirt/mud on road removed daily
☒ Haul roads dampened for dust control
☒ Loaded haul trucks to be covered with tarpaulin
☒ Stabilized construction exit
☒ Daily street sweeping

- ☐ Other: _____
☐ Other: _____
☐ Other: _____
☐ Other: _____
☐ Other: _____

2.5 POLLUTION PREVENTION MEASURES:

- ☒ Chemical Management
☒ Concrete and Materials Waste Management
☒ Debris and Trash Management
☒ Dust Control
☒ Sanitary Facilities

- ☐ Other: _____
☐ Other: _____
☐ Other: _____
☐ Other: _____
☐ Other: _____

2.6 VEGETATED BUFFER ZONES:

Natural vegetated buffers shall be maintained as feasible to protect adjacent surface waters. If vegetated natural buffer zones are not feasible due to site geometry, the appropriate additional sediment control measures have been incorporated into this SWP3.

Type	Stationing	
	From	To

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

- ☒ Fire hydrant flushings
☒ Irrigation drainage
☒ Pavement washwater (where spills or leaks have not occurred, and detergents are not used)
☒ Potable water sources
☒ Springs
☒ Uncontaminated groundwater
☒ Water used to wash vehicles or control dust
☒ Other allowable non-stormwater discharges as allowed by TPDES GP TXR150000.

2.8 DEWATERING:

Dewatering discharges of accumulated stormwater, groundwater, and surface water including discharges from dewatering of trenches, excavations, foundations, vaults, and other points of accumulation are prohibited unless managed by appropriate controls to prevent and minimize the offsite discharge of sediment and other pollutants.

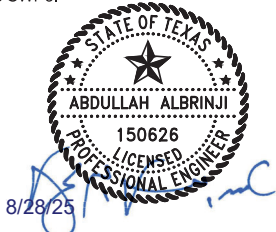
2.9 INSPECTIONS:

All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.5 of this SWP3.

When dewatering activities are present, a daily inspection will be conducted once per day during those activities and documented in accordance with CGP and TxDOT requirements.

2.10 MAINTENANCE:

Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. Maintenance shall be performed by the Contractor as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.5 of this SWP3.



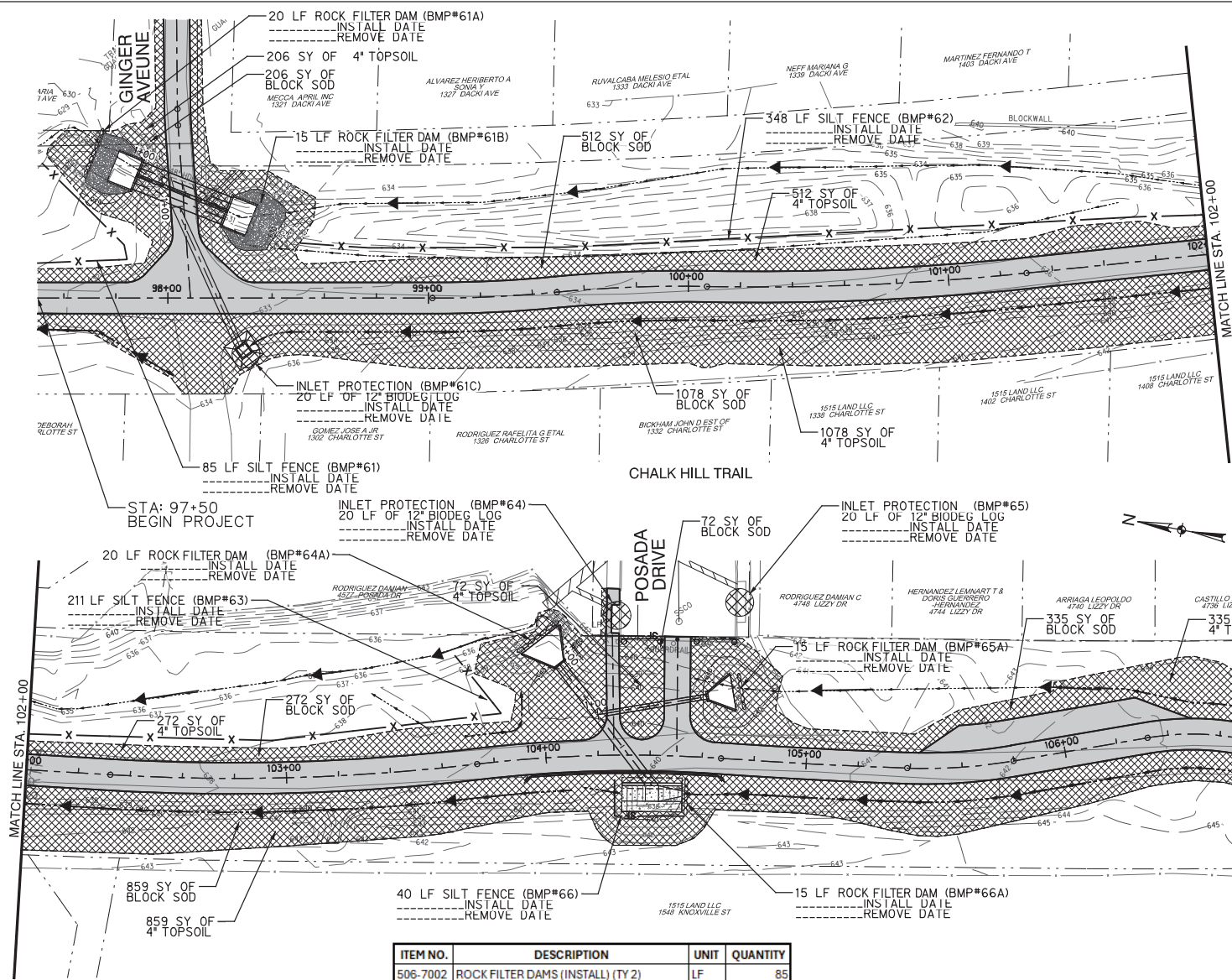
STORMWATER POLLUTION
PREVENTION PLAN (SWP3)

© 2023 July 2023 Sheet 2 of 2
Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			112
STATE	STATE SECT.	COUNTY	
TEXAS	DAL	DALLAS	
CONT.	SECT.	JOB	HIGHWAY NO.
0918	47	472	VA

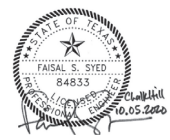
Chalk Hill Trail Erosion Control Plan

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LEGEND:

- PROP. 6\"/>
- CONSTRUCTION ENTRANCE 15' x 30' (TYPE 1)
- BLOCK SOD (DISTURBED AREA)
- PERMANENT SEEDING
- 500.0 EXISTING SPOT
- 570 EXISTING CONTOUR
- EXISTING RIGHT-OF-WAY
- INLET PROTECTION (ECL)
- SILT FENCE
- ROCK FILTER DAM



NO.	REVISIONS	BY	DATE
AZ&B ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Cort Rd. Dallas, Texas 75251 (214) 361-0900 FIRM REGISTRATION No. F-10098			

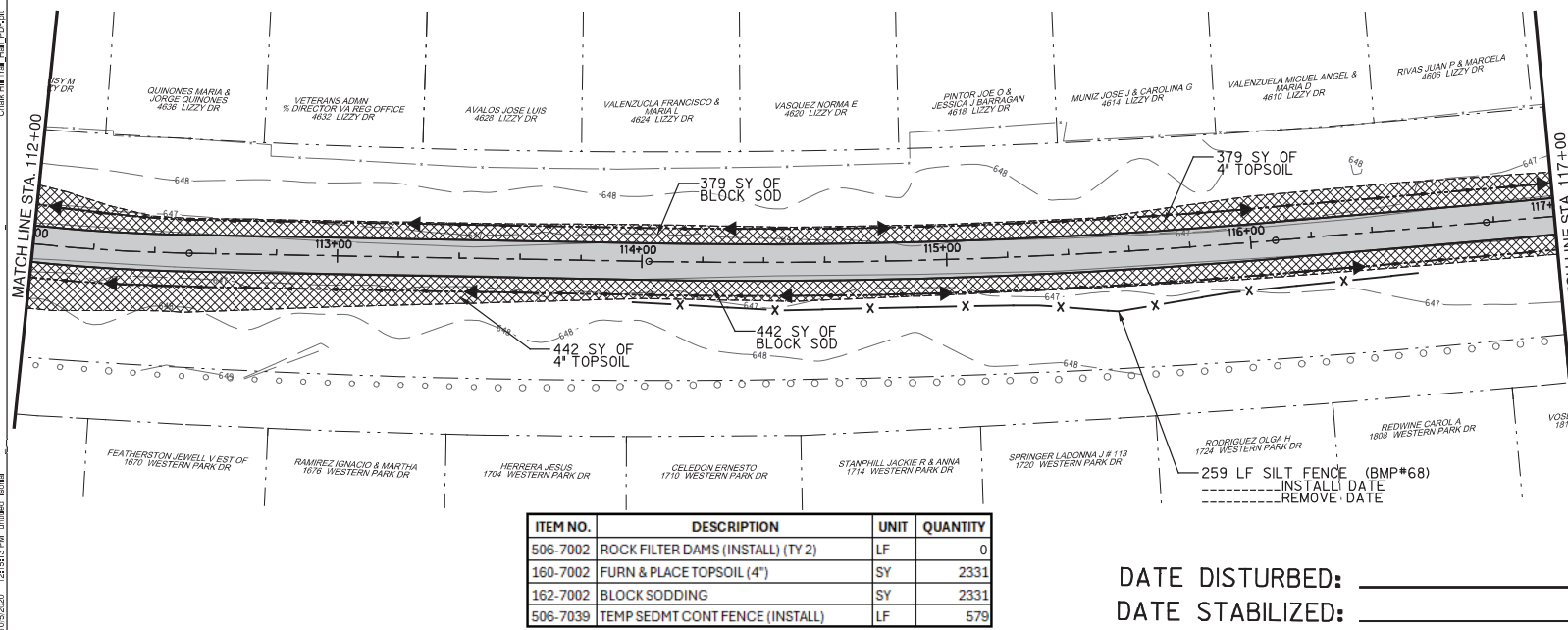
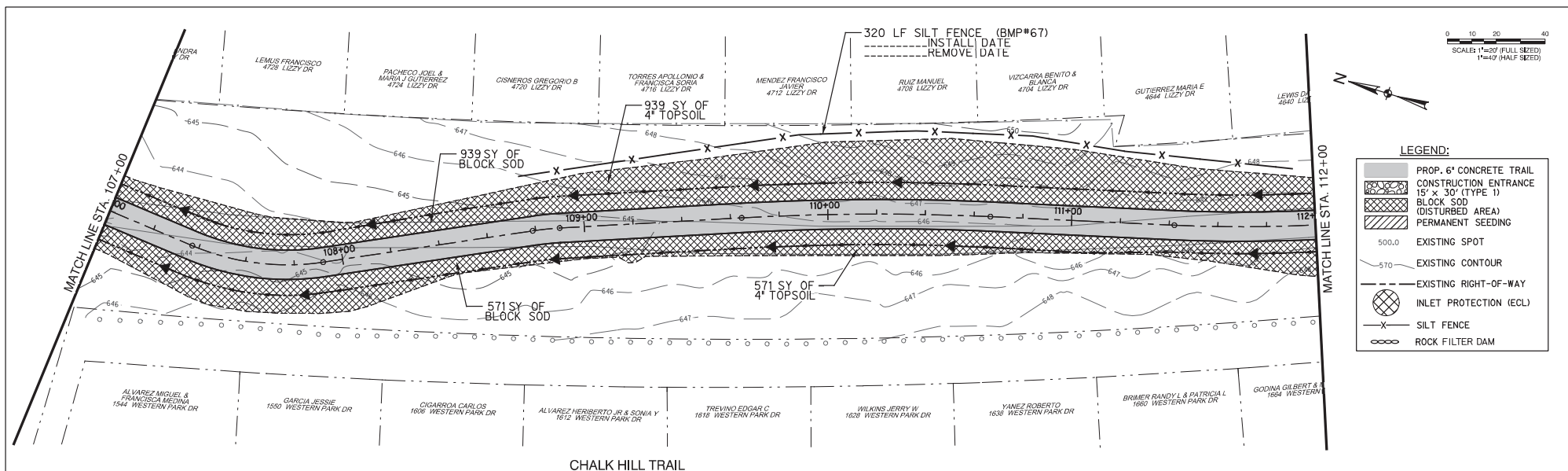
Texas Department of Transportation
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**CHALK HILL TRAIL
EROSION CONTROL PLAN
STA 97+50 TO STA 107+00**

CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	113	

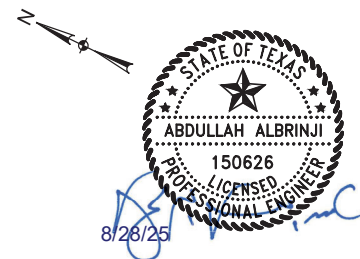
ITEM NO.	DESCRIPTION	UNIT	QUANTITY
506-7002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	85
160-7002	FURN & PLACE TOPSOIL (4")	SY	3334
162-7002	BLOCK SODDING	SY	3334
506-7039	TEMP SEDMT CONT FENCE (INSTALL)	LF	684
506-7044	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	60

DATE DISTURBED: _____
DATE STABILIZED: _____



ITEM NO.	DESCRIPTION	UNIT	QUANTITY
506-7002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	C
160-7002	FURN & PLACE TOPSOIL (4")	SY	233;
162-7002	BLOCK SODDING	SY	233;
506-7039	TEMP SEDMT CONT FENCE (INSTALL)	LF	575

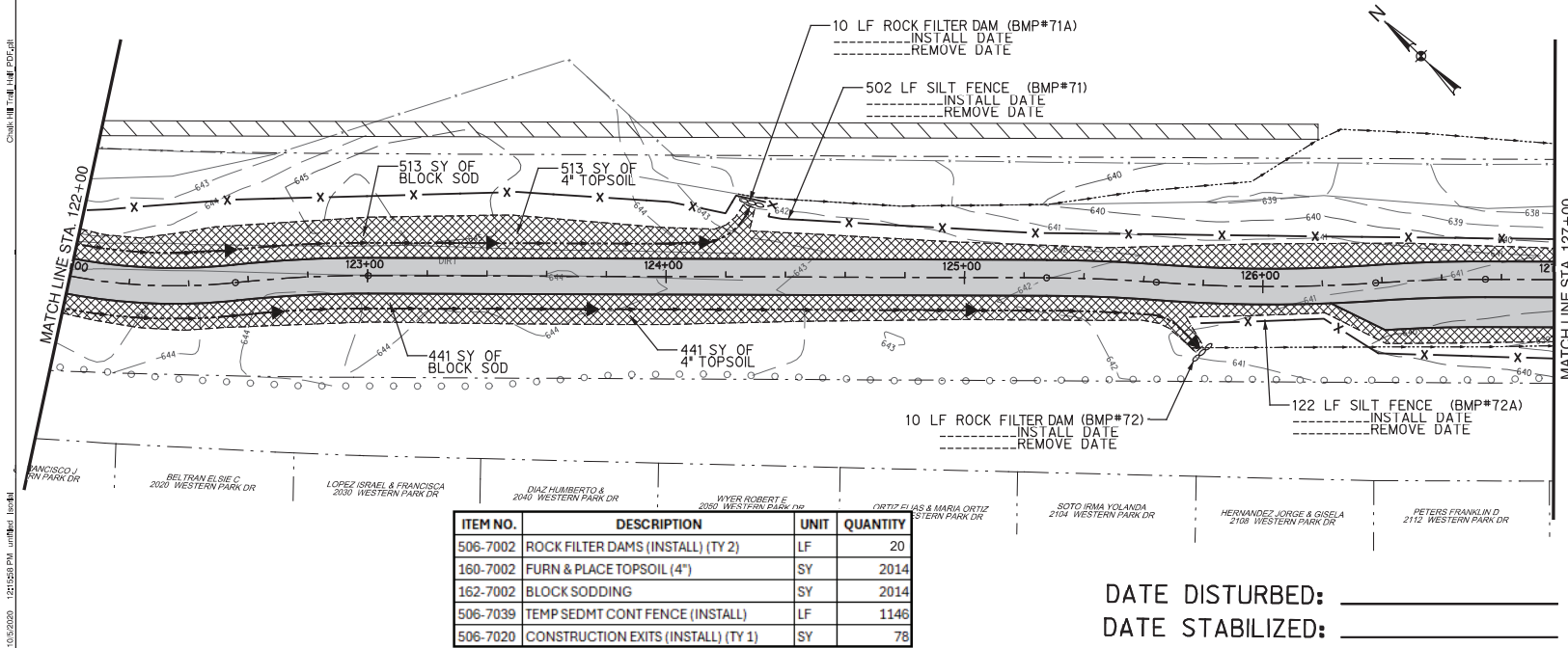
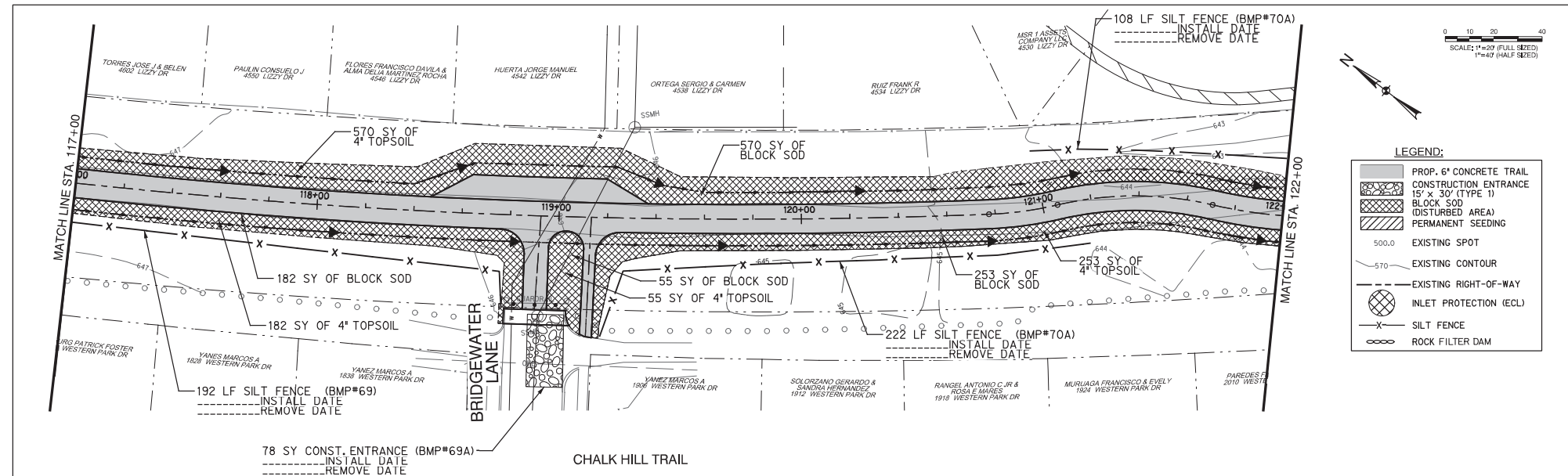
DATE DISTURBED: _____
DATE STABILIZED: _____



NO.	REVISONS		BY	DATE
 ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Col. Rd. Dallas, Texas 75251 An ARBURCO Company FROM REGISTRATION No. F-1008				
 Texas Department of Transportation ©2025 by Texas Department of Transportation all rights reserved				
CHALK HILL TRAIL EROSION CONTROL PLAN STA 107+00 TO STA 117+00				
  (seal) (signature) (stamp) For use only when the design meets TxDOT minimum standards. TxDOT reserves the right to reject any design that does not meet these standards.				
CONTROL	SECTION	JOB	M I CHWAY	
0918	47	472	VA	
DISTRICT	COUNTY		SHEET NO.	
DAL	DALLAS		114	

Chalk Hill Trail Erosion Control Plan

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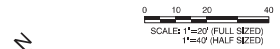
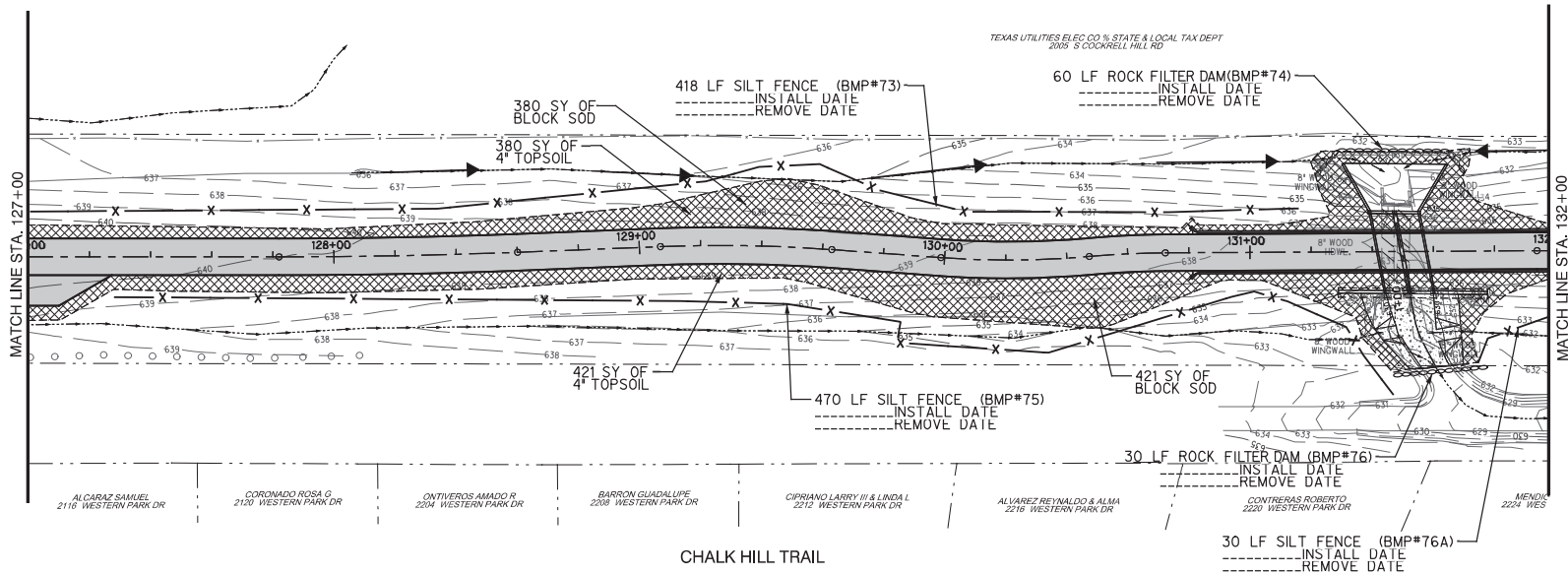
ITEM NO.	DESCRIPTION	UNIT	QUANTITY
506-7002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	20
160-7002	FURN & PLACE TOPSOIL (4")	SY	2014
162-7002	BLOCK SODDING	SY	2014
506-7039	TEMP SEDMT CONT FENCE (INSTALL)	LF	1146
506-7020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	78

DATE DISTURBED: _____
DATE STABILIZED: _____

NO.	REVISIONS	BY	DATE
AZ&B ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Coll Rd Dallas, Texas 75251 (214) 341-9900 An ARCADURA Company FIRM REGISTRATION NO. F-10266			
Texas Department of Transportation ©2025 by Texas Department of Transportation, all rights reserved			
CHALK HILL TRAIL EROSION CONTROL PLAN STA 117+00 TO STA 127+00			
ThDOT UEG			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	115	

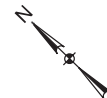
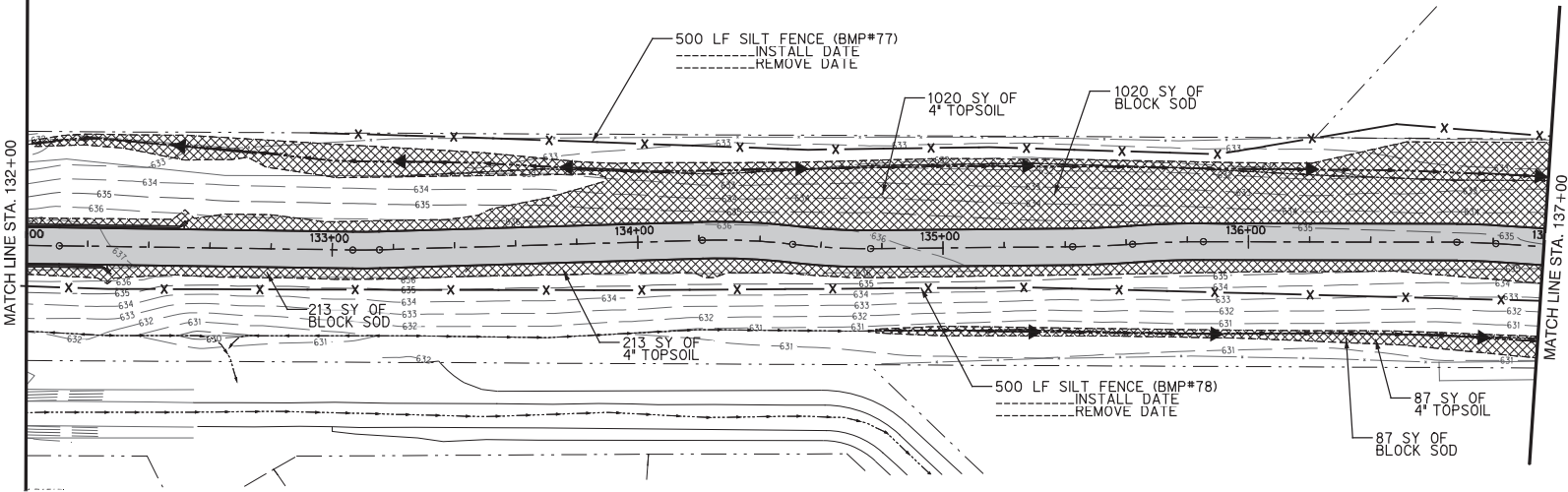
Chalk Hill Trail Erosion Control Plan

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LEGEND:

	PROP. 6" CONCRETE TRAIL
	CONSTRUCTION ENTRANCE
	15' x 30' (TYPE I)
	BLOCK SOD
	(DISTURBED AREA)
	PERMANENT SEEDING
	500.0 EXISTING SPOT
	EXISTING CONTOUR
	EXISTING RIGHT-OF-WAY
	INLET PROTECTION (ECL)
	SILT FENCE
	ROCK FILTER DAM



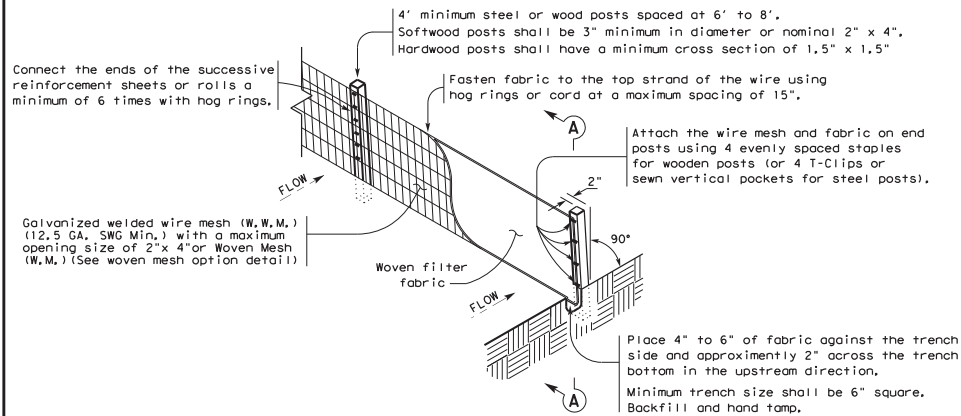
ITEM NO.	DESCRIPTION	UNIT	QUANTITY
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160-7002	FURN & PLACE TOPSOIL (4")	SY	2121
162-7002	BLOCK SODDING	SY	2121
506-7039	TEMP SEDMT CONT FENCE (INSTALL)	LF	1918

DATE DISTURBED: _____
DATE STABILIZED: _____

NO.	REVISIONS	BY	DATE
ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Carl Rd. Dallas, Texas 75251 (214) 341-0900 An ARDURRA Company FIRM REGISTRATION NO. F-10088			
 ©2025 by Texas Department of Transportation, all rights reserved.			
CHALK HILL TRAIL EROSION CONTROL PLAN STA 127+00 TO STA 137+00			
© TxDOT	UEG	rdm	engines
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	116	

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DATE
FILE



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.

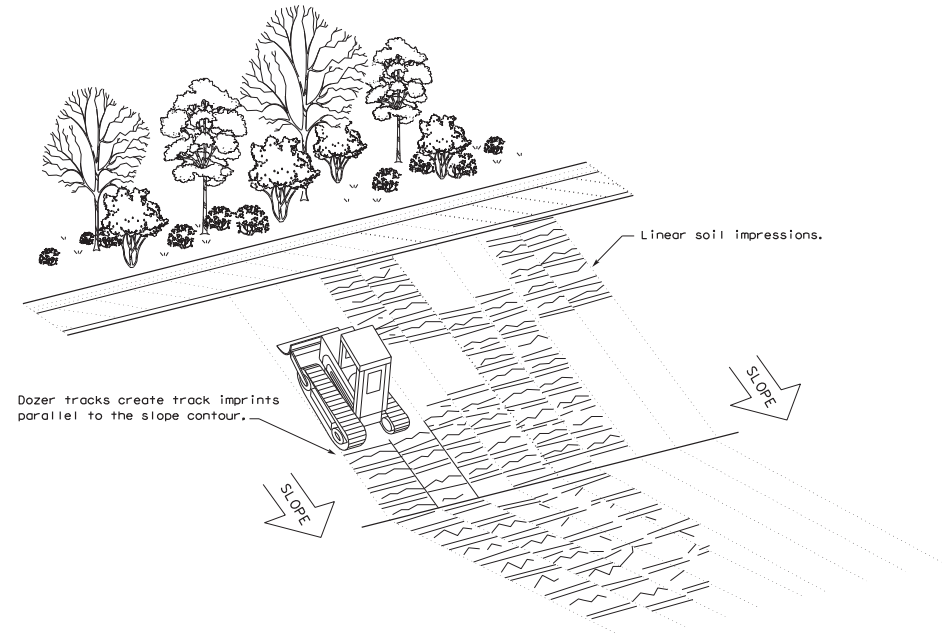
LEGEND

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.

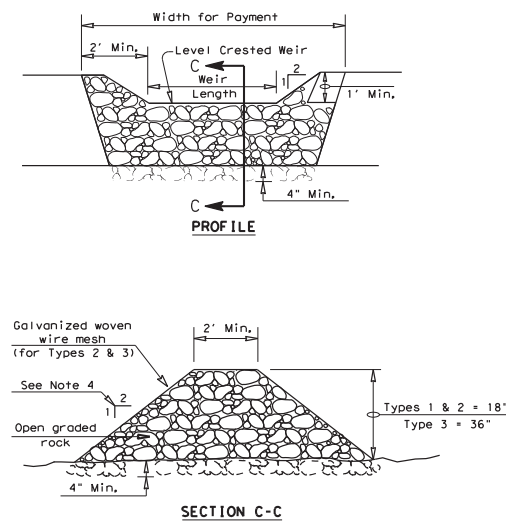
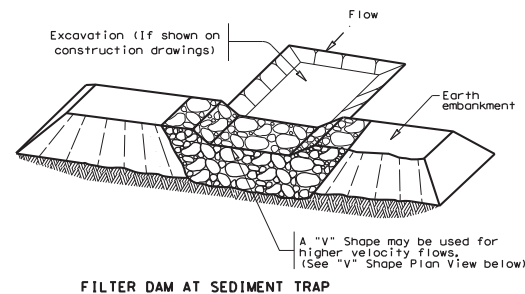
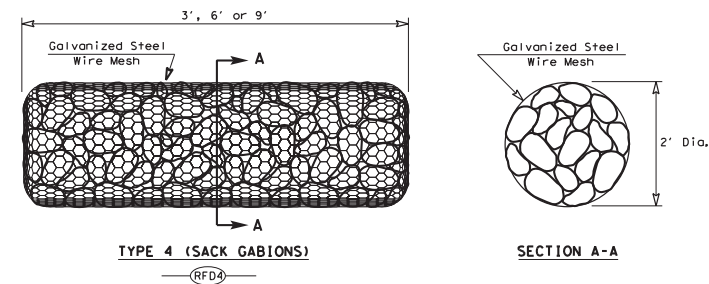
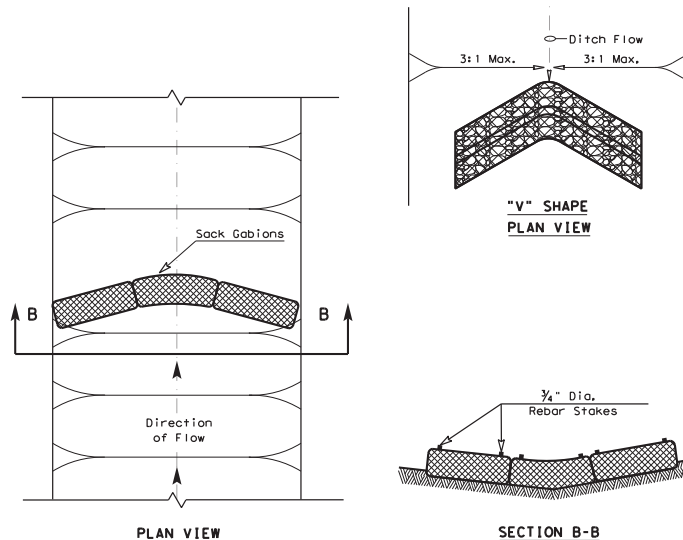
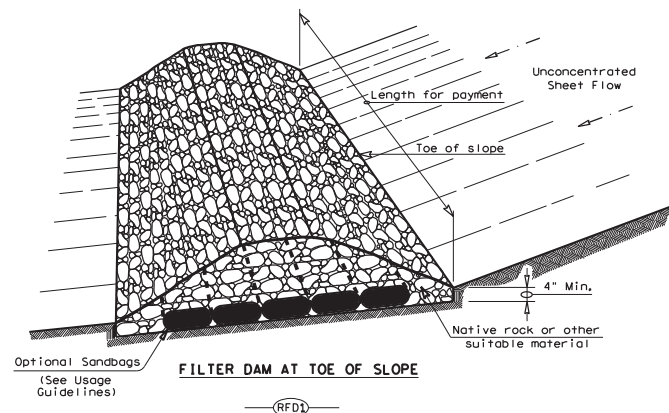


VERTICAL TRACKING

 Texas Department of Transportation				Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES FENCE & VERTICAL TRACKING EC(1)-16					
FILE: ec116	DW:TxDOT	CK: KM	DW: VP	DW:CK:LS	
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0918	47	472	VA	
	DIST	COUNTY			SHEET NO.
	DAL	DALLAS			118

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DATE: FILE:



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.

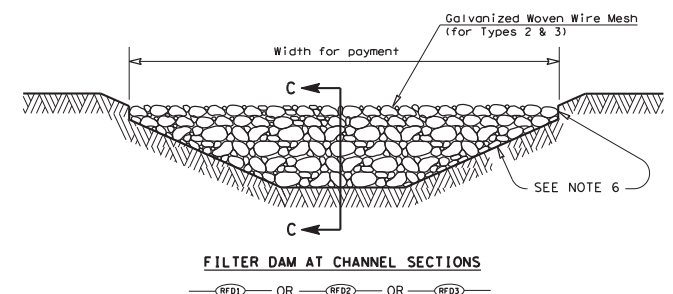
Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity 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 of 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.

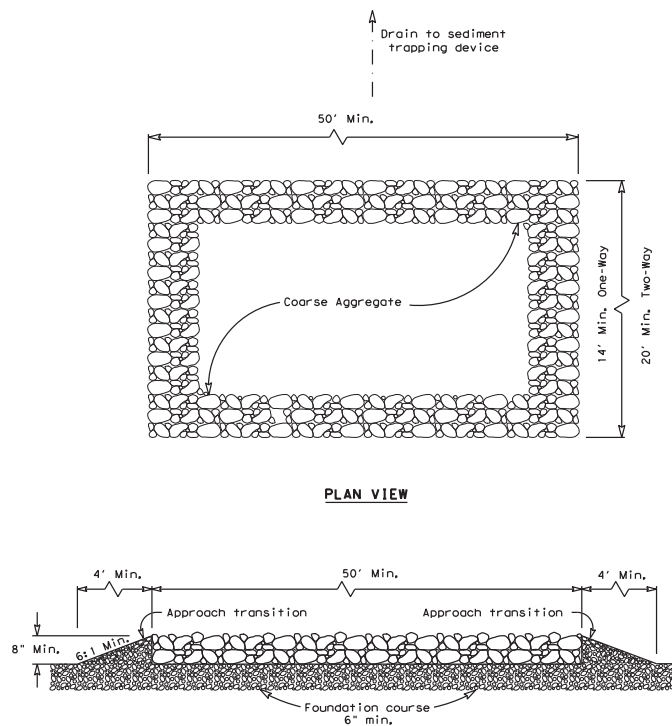
PLAN SHEET LEGEND

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

		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES			
ROCK FILTER DAMS			
EC(2) - 16			
FILE: ec216	DNV TxDOT	CR: KM	DNV: VP
© TxDOT: JULY 2016	CONT	SECT	JOB
REVISIONS	0918	47	472
91ST	COUNTY	VA	SHEET NO.
DAL	DALLAS		119

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DATE: 08/01/16
FILE: 08/01/16



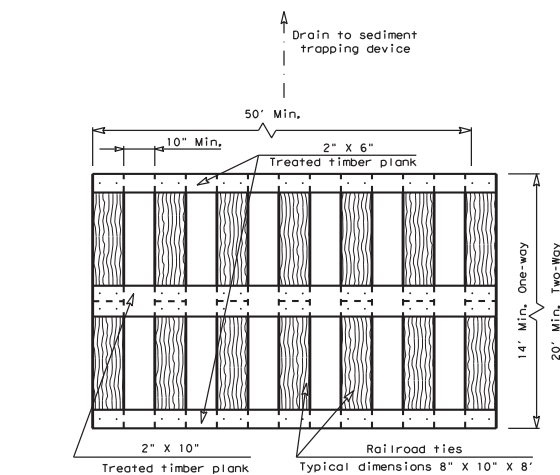
PLAN VIEW

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.



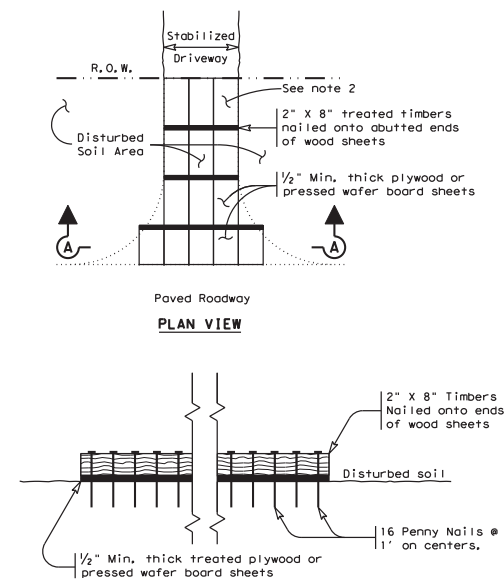
PLAN VIEW

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.



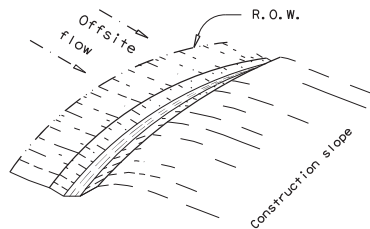
PLAN VIEW

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.

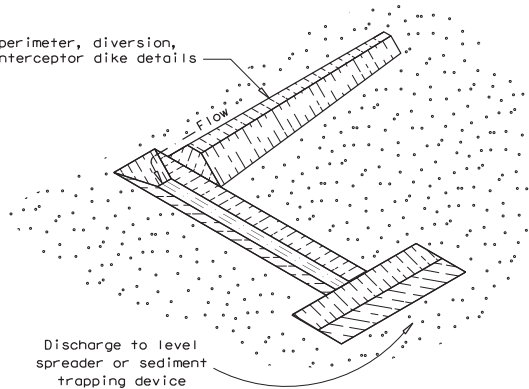
Texas Department of Transportation		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES CONSTRUCTION EXITS EC (3) - 16			
FILE: ec316	DATE: 08/01/16	DATE: 08/01/16	DATE: 08/01/16
REVISIONS	0918 47	472	VA
DIST	DAL	COUNTY	DALLAS
SHEET NO.	120		



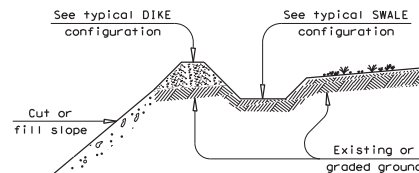
PERIMETER SWALE



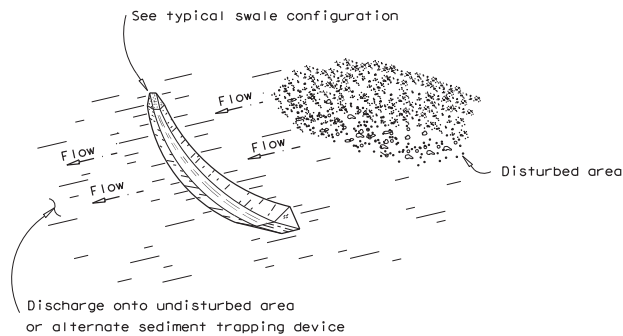
See perimeter, diversion, or interceptor dike details



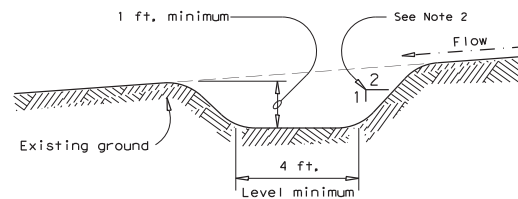
DIVERSION SWALE



DIVERSION DIKE WITH SWALE



INTERCEPTOR SWALE



TYPICAL SWALE CONFIGURATION

GENERAL NOTE

1. Dimensions of swale may be modified with prior approval of the Engineer.
2. Side slopes within the safety clear zone of a roadway shall be 6:1 or flatter.
3. Grading shall be shown elsewhere on the plans or as directed by the Engineer.
4. The Engineer reserves the right to modify the dimensions shown for the swale dependent on runoff volume characteristics.
5. Swales that are in place for more than 14 calendar days should be stabilized through seeding or other measures to control sediment runoff.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
7. Remove sediment and debris when accumulation affects the performance of the devices, after a rain and when directed by the Engineer.

SWALE AND DIKE/SWALE USAGE GUIDELINES

A swale or dike/swale may be used to intercept runoff and divert it around unstabilized areas or to divert sediment laden runoff to an erosion control device (sediment basin or trap, rock filter dam, etc.).

The drainage area contributing runoff to a swale or dike/swale should not exceed 5 acres. The spacing of swales and dike/swales should be as follows:

Slope of disturbed areas above dike	greater than 10%	5 - 10%	less than 5%
Maximum distance between dikes	100'	200'	300'

Intercepted runoff flowing in a swale or dike/swale should outlet to a stabilized area (vegetation, rock, etc.).

PLAN SHEET LEGEND

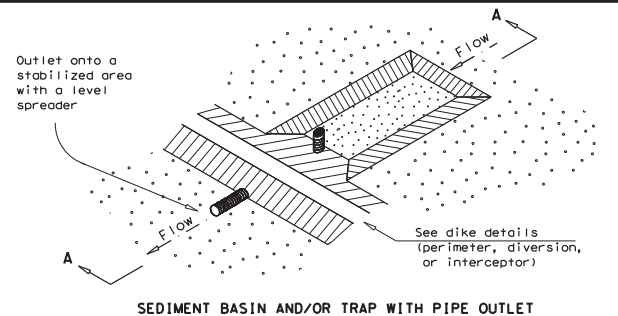
SWALE → S →

DIKE → D →

		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES SWALES (EARTHWORK FOR EROSION CONTROL) EC (5) - 16			
FILE: ec516	DW: TxDOT	CR: KM	DW: VP
© TxDOT: JULY 2016	CONT	SECT	JOB
REVISIONS	0918	47	472
	QIST	COUNTY	SHEET NO.
	DAL	DALLAS	121

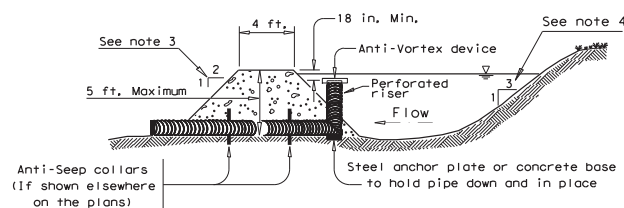
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DATE:
FILE:

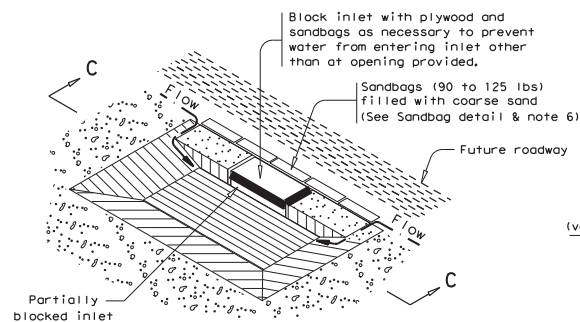


SEDIMENT BASIN AND/OR TRAP WITH PIPE OUTLET

ST/PO

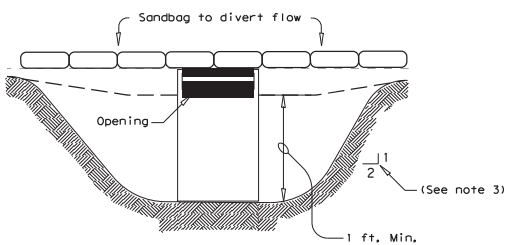


SECTION A-A

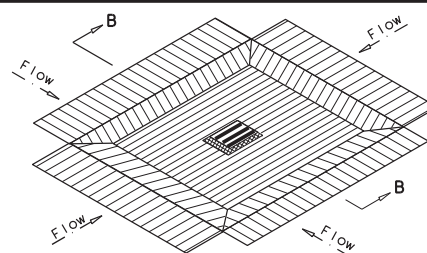


CURB INLET SEDIMENT TRAP

ST-CI

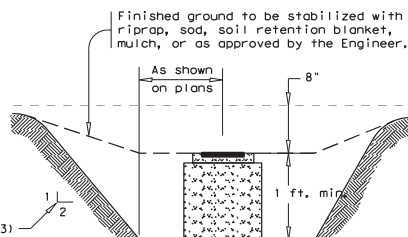


SECTION C-C

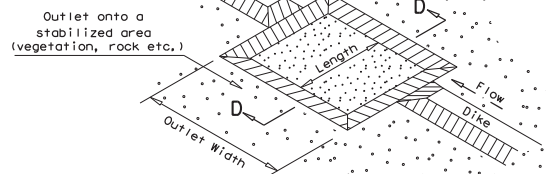


DROP INLET SEDIMENT TRAP

ST-DI

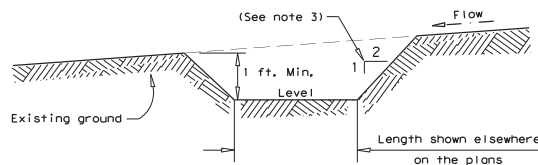


SECTION B-B



SEDIMENT TRAP WITH LEVEL STABILIZED OUTLET

ST



SECTION D-D

GENERAL NOTES

1. Pipe outlet material shall conform to the Item "Pipe Underdrains" or as accepted by the Engineer.
2. All pipe connections shall be watertight.
3. Side slopes within the safety clear zone of a roadway shall be 6:1 or flatter. Protect the traveling public from inlet stacks within the clear zone.
4. Sediment basins shall have side slopes of 3:1 or flatter.
5. The dimensions and limits of excavation for sediment basins and traps will be as shown elsewhere on the plans.
6. The sandbag material shall be made of polypropylene, polyethylene or polyamide woven fabric, min. unit weight 4 ounces /SY, Mullen burst strength exceeding 300 psi and ultraviolet stability exceeding 70%.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

SEDIMENT BASIN & TRAP USAGE GUIDELINES

A sediment basin and/or trap may be used to precipitate sediment out of runoff draining from an unstabilized area.

Basins: The drainage area for a sediment basin should not exceed 100 acres. The basin capacity shall be at least 1800 CF/Acre of drainage area (0.5" over the drainage area). If the disturbed area draining to the basin is larger than 10 acres, the basin capacity should be 3600 CF/Acre (1.0" over the drainage area).

The basin should have a 40 hour draw-down time with an emergency spillway. The spillway may be designed to pass the peak rate of runoff from a 25 year frequency storm. The 100 year storm should be investigated to consider possible flooding impacts.

The entrance into the basin should be protected from erosion. The basin should be cleaned when the capacity has been reduced by 1/3.

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).

Sediment traps should be placed in the following locations:

1. Within drainage ditches spaced @ 500' on center
2. Immediately preceding ditch inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way

The trap outlet may either be through a perforated riser and pipe assembly designed to achieve a 40 hour draw-down time or over a level stabilized area (vegetation, rock, etc.).

The trap should be cleaned when the capacity has been reduced by 1/2 or the sediment has accumulated to a depth of 1', whichever is less.

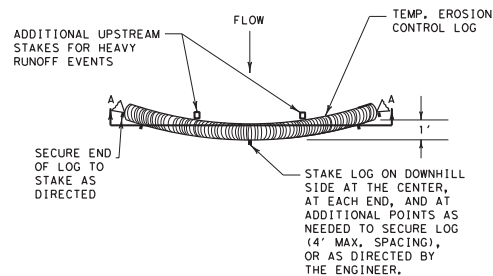
PLANS SHEET LEGEND

- ST/PO
Sediment Basin and / or Trap with Pipe Outlet
- ST-DI
Drop Inlet Sediment Trap
- ST-CI
Curb Inlet Sediment Trap
- ST
Sediment Trap with Level Stabilized Outlet

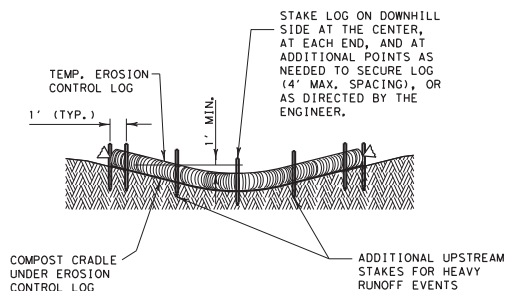
 Texas Department of Transportation				Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES SEDIMENT BASINS AND TRAPS (EARTHWORK FOR EROSION CONTROL)					
EC (6) - 16					
FILE: ec616	DW:TXDOT	CK:KM	DW:VP	DW:CK	LS
© TXDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0918	47	472	VA	
	DIST	COUNTY		SHEET NO.	
	DAL	DALLAS		122	

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DATE: FILE:



PLAN VIEW

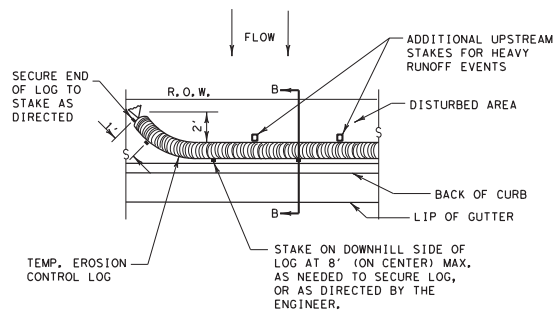


SECTION A-A

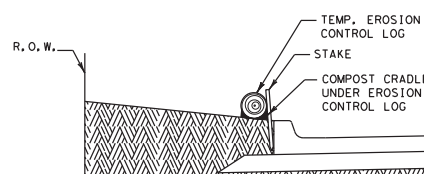
EROSION CONTROL LOG DAM

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

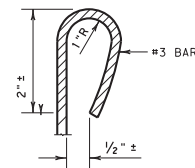


PLAN VIEW

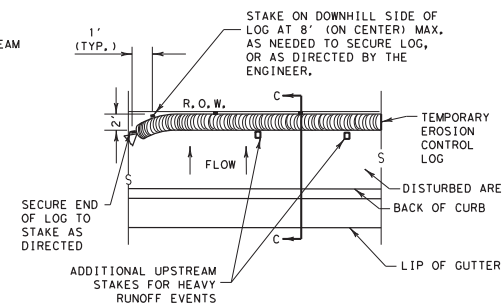


SECTION B-B

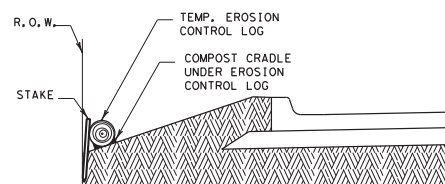
EROSION CONTROL LOG AT BACK OF CURB



REBAR STAKE DETAIL

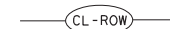


PLAN VIEW

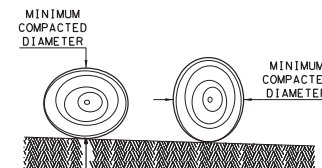


SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY



- 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.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

SHEET 1 OF 3

Texas Department of Transportation		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES			
EROSION CONTROL LOG			
EC (9) - 16			
FILE: ec916	DW:TXDOT	CK: KM	DW: LS/PT
© TXDOT: JULY 2016	CONT	SECT	JOB
REVISIONS	0918	47	472
01ST	COUNTY	VA	SHEET NO.
DAL	DALLAS		123

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).

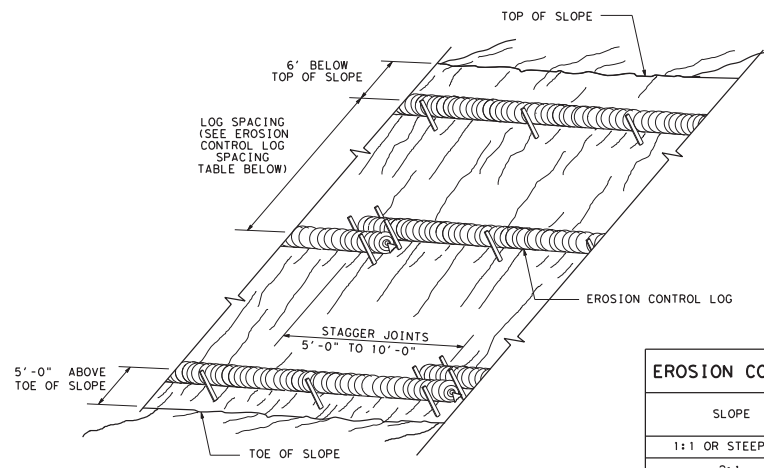
- Control logs should be placed in the following locations:
1. Within drainage ditches spaced as needed or min. 500' on center
 2. Immediately preceding ditch inlets or drain inlets
 3. Just before the drainage enters a water course
 4. Just before the drainage leaves the right of way
 5. Just before 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.

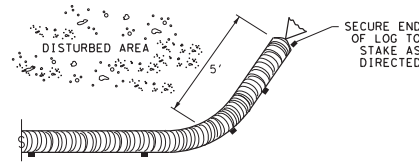
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DATE: FILE:



EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

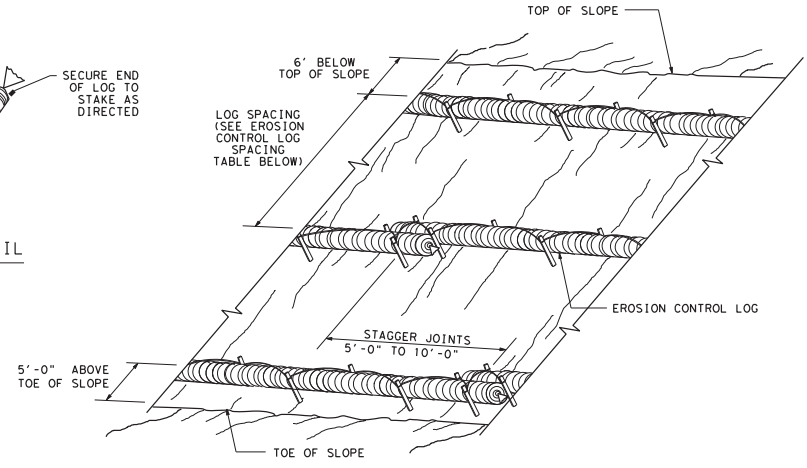
CL-SST



END SECTION RAP DETAIL

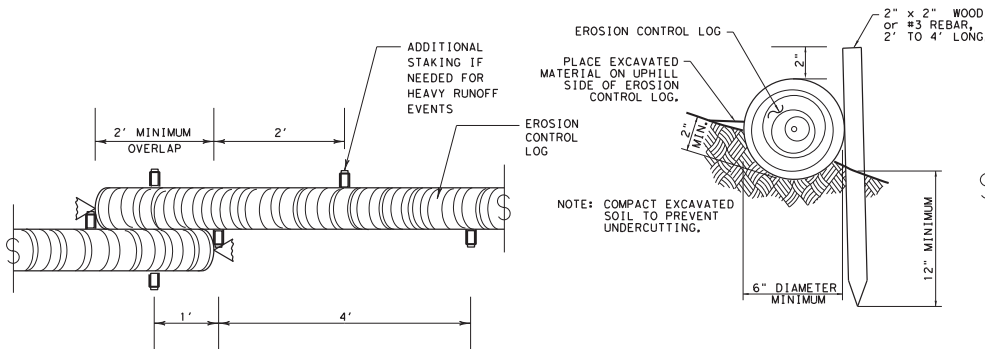
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

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



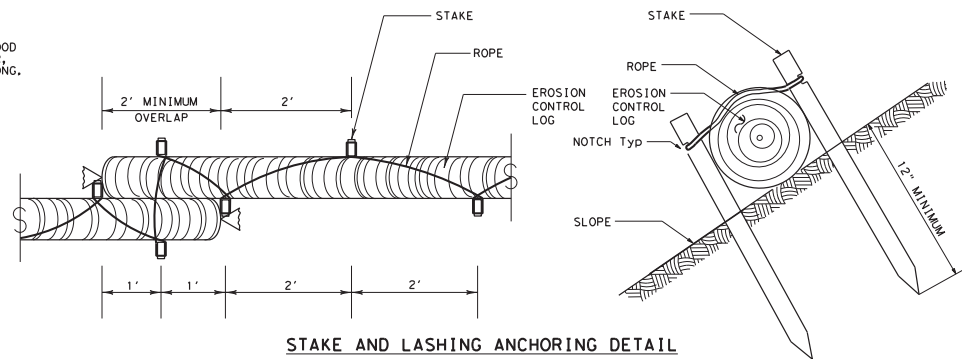
EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL



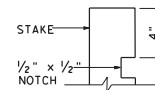
STAKE AND TRENCHING ANCHORING DETAIL

CL-SST



STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

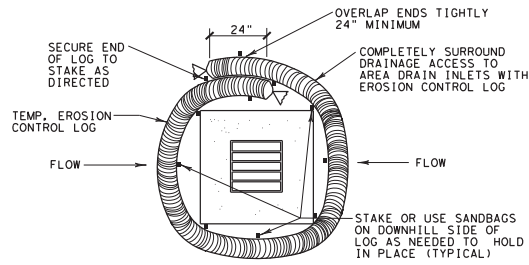
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"

SHEET 2 OF 3

		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES EROSION CONTROL LOG EC (9) - 16			
FILE: ec116	DW: TxDOT	CK: KM	DW: LS/PT
© TxDOT: JULY 2016	CONT	SECT	JOB
REVISIONS	0918	47	472
DIST	COUNTY	SHEET NO.	
DAL	DALLAS	124	

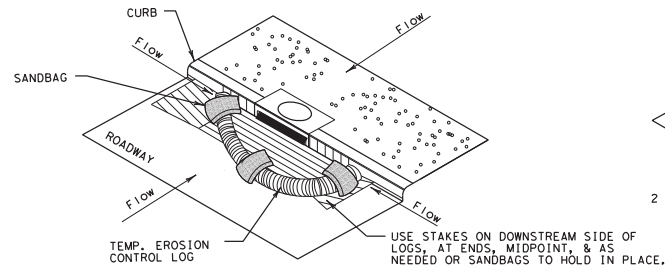
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DATE:
FILE:



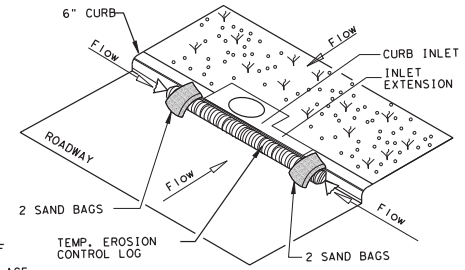
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

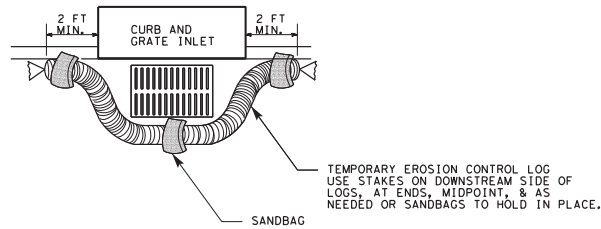
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

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

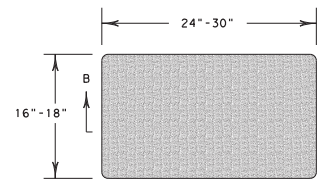


EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI



SECTION B-B



SANDBAG DETAIL

SHEET 3 OF 3

 Texas Department of Transportation		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES			
EROSION CONTROL LOG			
EC (9) - 16			
FILE: ec916	DN: TxDOT	CK: KM	DN: LS/PT
© TxDOT: JULY 2016	CONT	SECT	JOB
REVISIONS	0918	47	472
	DIST	COUNTY	VA
	DAL	DALLAS	SHEET NO. 125

TREES TO BE REMOVED						
TREE TAG #	SPECIES	COMMON NAME	CONDITION	SIZE (IN)	CLASS	CALC. REPL. SIZE (IN)
3229	Juglans nigra	WALNUT	GOOD	7.95	2	0.0
3231	Celtis laevigata	HACKBERRY	GOOD	8.15	3	8.3
3238	Celtis laevigata	HACKBERRY	GOOD	9.10	3	3.6
3239	Celtis laevigata	HACKBERRY	GOOD	7.80	3	0.0
3240	Ulmus americana	ELM	GOOD	7.50	2	0.0
3242	Ulmus americana	ELM	GOOD	8.05	2	5.6
3243	Celtis laevigata	HACKBERRY	GOOD	7.85	3	0.0
3244	Celtis laevigata	HACKBERRY	GOOD	6.50	3	0.0
3219	Celtis laevigata	HACKBERRY	GOOD	5.90	3	0.0
3247	Celtis laevigata	HACKBERRY	GOOD	9.80	3	3.9
3276	Ulmus americana	ELM	GOOD	21.60	2	15.1
3277	Ulmus americana	ELM	GOOD	19.55	2	13.7

TREES TO BE REMOVED						
TREE TAG #	SPECIES	COMMON NAME	CONDITION	SIZE (IN)	CLASS	CALC. REPL. SIZE (IN)
3282	Celtis laevigata	HACKBERRY	GOOD	13.10	3	5.2

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
100-7013	TREE PROTECTION (INSTALL)	EA	20

STA. 97+50
BEGIN PROJECT

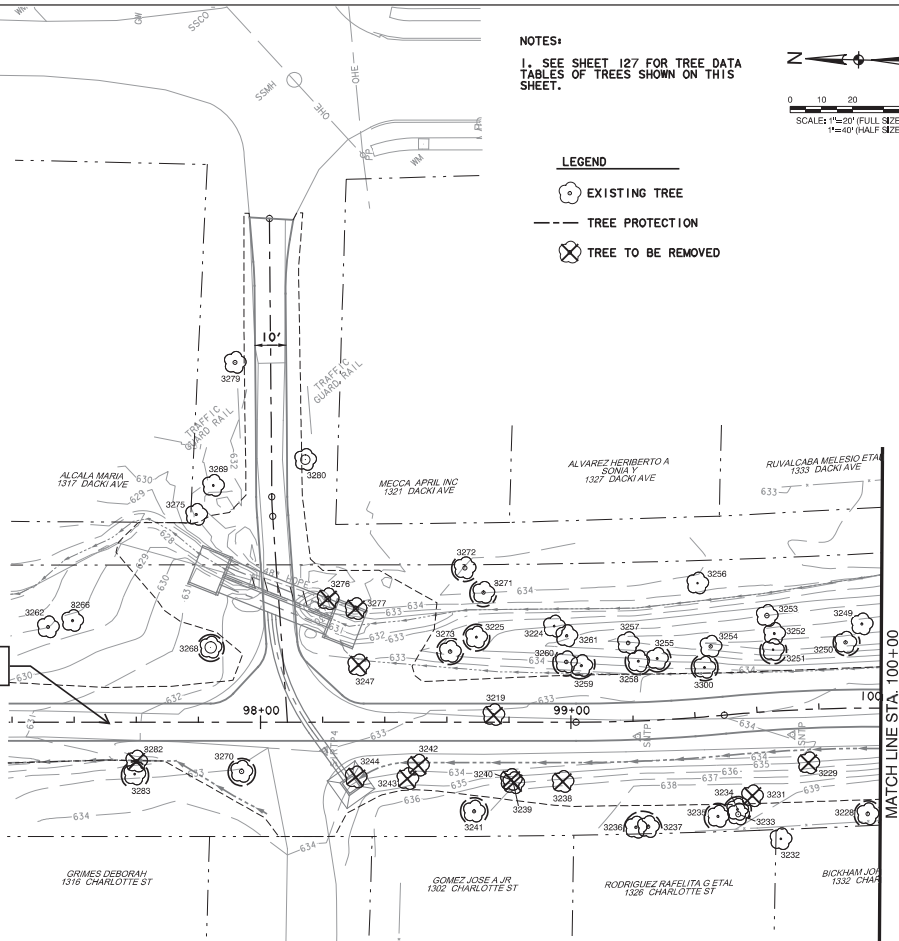
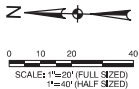
NOTES:
1. SEE SHEET 127 FOR TREE DATA TABLES OF TREES SHOWN ON THIS SHEET.

LEGEND

EXISTING TREE

TREE PROTECTION

TREE TO BE REMOVED



NO.	REVISIONS	BY	DATE
AZ&B ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Cool Rd. Dallas, Texas 75251 (214) 341-9900 An ARDURRA Company FIRM REGISTRATION No. F-10098			
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CHALK HILL TRAIL TREE SURVEY - IMPACTED TREES STA 97+50 TO STA 100+00			
© TxDOT			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	126	



Steven B. Henford
1/17/20

SPLDTRVSS

SMODELNAME

SDATES STINES BUSSEH SCIENTIS PHILLES

TREES SURVEYED

TREE TAG #	SPECIES	COMMON NAME	CONDITION	SIZE (IN)	CLASS
3228	Ulmus crassifolia	ELM	GOOD	14.10	2
3229	Juglans nigra	WALNUT	GOOD	7.95	2
3231	Celtis laevigata	HACKBERRY	GOOD	8.15	3
3232	Celtis laevigata	HACKBERRY	GOOD	6.25	3
3233	Celtis laevigata	HACKBERRY	POOR	19.40	3
3234	Celtis laevigata	HACKBERRY	GOOD	8.00	3
3235	Populus deltoides	COTTONWOOD	GOOD	6.60	3
3236	Ulmus crassifolia	ELM	GOOD	9.65	2
3237	Celtis laevigata	HACKBERRY	GOOD	13.20	3
3238	Celtis laevigata	HACKBERRY	GOOD	9.10	3
3239	Celtis laevigata	HACKBERRY	GOOD	7.80	3
3240	Ulmus americana	ELM	GOOD	7.50	2
3241	Juniperus virginiana	CEDAR	FAIR	12.20	2
3242	Ulmus americana	ELM	GOOD	8.05	2
3243	Celtis laevigata	HACKBERRY	GOOD	7.65	3
3244	Celtis laevigata	HACKBERRY	GOOD	6.50	3
3249	Celtis laevigata	HACKBERRY	GOOD	7.70	3
3250	Celtis laevigata	HACKBERRY	GOOD	12.80	3
3251	Celtis laevigata	HACKBERRY	GOOD	6.00	3
3252	Celtis laevigata	HACKBERRY	GOOD	7.30	3
3253	Ulmus americana	ELM	GOOD	17.10	2
3254	Celtis laevigata	HACKBERRY	GOOD	12.70	3
3300	Ulmus americana	ELM	GOOD	6.80	2
3255	Ulmus americana	ELM	GOOD	7.55	2
3257	Ulmus americana	ELM	GOOD	19.40	2
3258	Ulmus americana	ELM	GOOD	7.70	2
3259	Ulmus americana	ELM	GOOD	8.30	2
3260	Celtis laevigata	HACKBERRY	GOOD	13.90	3
3261	Celtis laevigata	HACKBERRY	GOOD	9.00	3
3256	Malus ioensis	CHINA BERRY	GOOD	6.05	N/A
3271	Celtis laevigata	HACKBERRY	GOOD	12.50	3
3272	Juglans nigra	WALNUT	GOOD	15.25	2
3224	Ulmus americana	ELM	GOOD	6.00	2
3225	Celtis laevigata	HACKBERRY	GOOD	7.50	3
3219	Celtis laevigata	HACKBERRY	GOOD	5.90	3
3273	Juglans nigra	WALNUT	GOOD	13.50	2
3247	Celtis laevigata	HACKBERRY	GOOD	9.80	3
3276	Ulmus americana	ELM	GOOD	21.60	2
3277	Ulmus americana	ELM	GOOD	19.25	2
3280	Salix nigra	WILLOW	GOOD	37.00	3
3279	Ulmus americana	ELM	GOOD	15.20	2
3269	Celtis laevigata	HACKBERRY	GOOD	7.00	3
3275	Celtis laevigata	HACKBERRY	GOOD	9.00	3
3268	Ulmus americana	ELM	GOOD	44.30	2
3270	Gleditsia triacanthos	LUCUST	GOOD	16.80	3

NOTES:

1. SEE SHEET 126 FOR PLAN VIEW OF TREES CONTAINED IN THIS SHEET'S TABLES.



NO.		REVISIONS		BY	DATE
AZ&B ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Coit Rd. Dallas, Texas 75251 (214) 341-0900 An ARDURRA Company FIRM REGISTRATION No. F-10098					
Texas Department of Transportation ©2025 by Texas Department of Transportation, all rights reserved					
CHALK HILL TRAIL					
TREE SURVEY - IMPACTED TREES					
STA 97+50 TO STA 100+00					
© TxDOT					
CONTROL	SECTION	JOB		HIGHWAY	
0918	47	472		VA	
DISTRICT	COUNTY			SHEET NO.	
DAL	DALLAS			127	

NOTES:

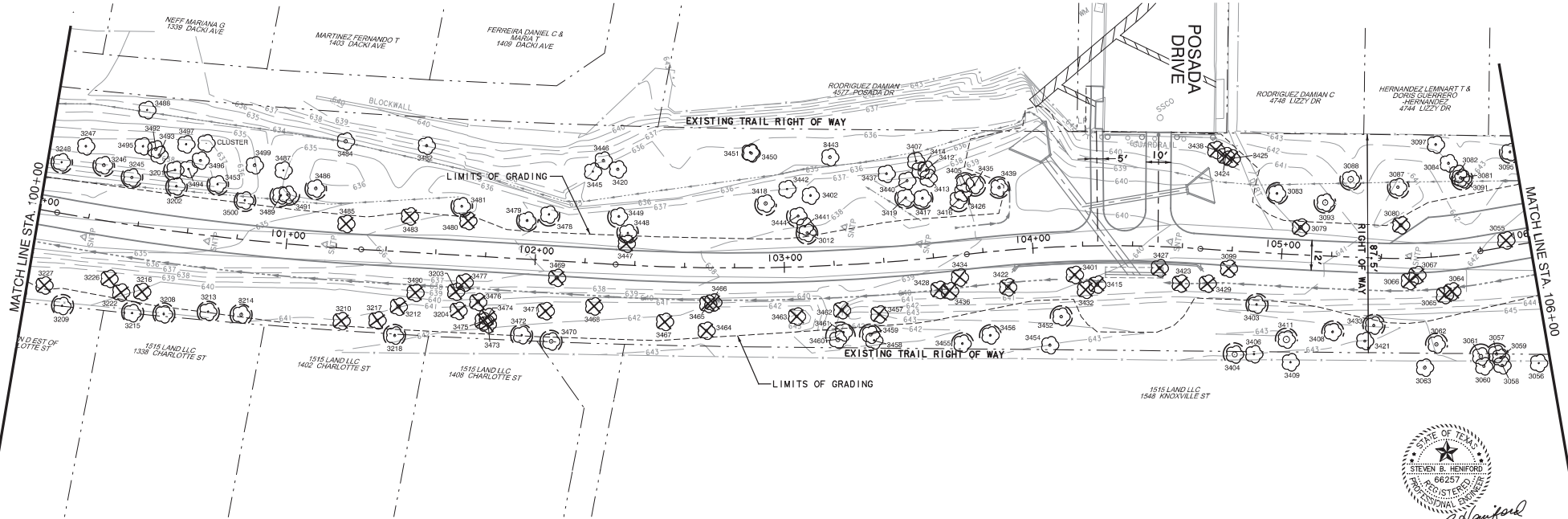
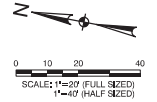
1. SEE SHEET 129 FOR TREE DATA
TABLES OF TREES SHOWN ON THIS
SHEET.

LEGEND

○ EXISTING TREE

--- TREE PROTECTION

⊗ TREE TO BE REMOVED



TREES TO BE REMOVED:

TREE TAG #	SPECIES	COMMON NAME	CONDITION	SIZE (IN)	CLASS	CALC. REPL. SIZE (IN)
3056	Salix nigra	WILLOW	GOOD	6,50	3	0.0
3064	Ulmus americana	ELM	GOOD	10,00	2	7.0
3065	Fraxinus americana	ASH	GOOD	11,40	2	8.0
3066	Ulmus americana	ELM	GOOD	10,30	2	7.2
3067	Fraxinus americana	ASH	GOOD	7,70	2	0.0
3080	Ulmus americana	ELM	GOOD	16,50	2	11.6
3079	Ulmus americana	ELM	GOOD	16,80	2	13.2
3099	Ulmus americana	ELM	GOOD	6,40	2	0.0
3425	Celtis laevigata	HACKBERRY	GOOD	15,50	3	6.2
3424	Celtis laevigata	HACKBERRY	GOOD	9,55	3	3.8
3438	Celtis laevigata	HACKBERRY	GOOD	12,60	3	5.0
3423	Ulmus americana	ELM	GOOD	15,04	2	10.5
3429	Ulmus americana	ELM	GOOD	6,40	2	0.0
3427	Ulmus americana	ELM	GOOD	14,30	2	10.0
3415	Ulmus americana	ELM	GOOD	17,40	2	12.2
3401	Ulmus americana	ELM	GOOD	12,25	2	8.6
3432	Juglans nigra	WALNUT	GOOD	6,00	2	0.0
3422	Ulmus americana	ELM	GOOD	21,00	2	14.7

TREES TO BE REMOVED:

TREE TAG #	SPECIES	COMMON NAME	CONDITION	SIZE (IN)	CLASS	CALC. REPL. SIZE (IN)
3434	Ulmus americana	ELM	GOOD	6,35	2	0.0
3436	Ulmus americana	ELM	GOOD	7,45	2	0.0
3428	Celtis laevigata	HACKBERRY	GOOD	9,50	3	3.8
3447	Juglans nigra	WALNUT	GOOD	10,80	2	7.6
3457	Celtis laevigata	HACKBERRY	GOOD	13,10	3	5.2
3462	Celtis laevigata	HACKBERRY	GOOD	16,00	3	6.4
3463	Ulmus americana	ELM	GOOD	12,10	2	8.5
3464	Celtis laevigata	HACKBERRY	GOOD	11,00	3	4.4
3465	Celtis laevigata	HACKBERRY	GOOD	8,70	3	3.5
3466	Celtis laevigata	HACKBERRY	GOOD	7,70	3	0.0
3467	Celtis laevigata	HACKBERRY	GOOD	10,25	3	4.1
3468	Celtis laevigata	HACKBERRY	FAIR	6,80	3	0.0
3469	Celtis laevigata	HACKBERRY	FAIR	17,40	3	7.0
3471	Fraxinus americana	ASH	GOOD	10,63	2	7.4
3473	Celtis laevigata	HACKBERRY	GOOD	6,50	3	0.0
3474	Sideroxylon lanuginosum	GUM, BUMELIA	FAIR	8,60	3	3.4
3475	Celtis laevigata	HACKBERRY	GOOD	10,25	3	4.1

TREES TO BE REMOVED:

TREE TAG #	SPECIES	COMMON NAME	CONDITION	SIZE (IN)	CLASS	CALC. REPL. SIZE (IN)
3476	Ulmus americana	ELM	GOOD	17,20	2	0.0
3477	Celtis laevigata	HACKBERRY	GOOD	6,50	3	0.0
3480	Diospyros virginiana	PERSIMMON	GOOD	6,00	2	0.0
3483	Ulmus americana	ELM	GOOD	6,50	2	0.0
3485	Celtis laevigata	HACKBERRY	GOOD	7,30	3	3.8
3203	Molle azedarach	CHINABERRY	GOOD	9,50	N/A	0.0
3204	Celtis laevigata	HACKBERRY	GOOD	12,10	3	4.8
3490	Ulmus americana	ELM	GOOD	8,85	2	6.2
3212	Ulmus americana	ELM	GOOD	19,00	2	13.3
3217	Celtis laevigata	HACKBERRY	POOR	11,80	3	4.7
3210	Celtis laevigata	HACKBERRY	GOOD	6,40	3	0.0
3216	Celtis laevigata	HACKBERRY	GOOD	8,25	3	3.3
3222	Celtis laevigata	HACKBERRY	GOOD	6,90	3	3.6
3226	Celtis laevigata	HACKBERRY	GOOD	8,30	3	3.3
3227	Celtis laevigata	HACKBERRY	GOOD	5,90	3	0.0

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
100-7013	TREE PROTECTION (INSTALL)	EA	52



Steven B. Henford
10/05/20

NO.	REVISIONS	BY	DATE
ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Coit Rd. Dallas, Texas 75251 (214) 341-9900 FIRM REGISTRATION No. F-10098			
©2025 by Texas Department of Transportation, all rights reserved.			
CHALK HILL TRAIL TREE SURVEY - IMPACTED TREES STA 100+00 TO STA 106+00			
© TxDOT			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	128	

NOTES:
1. SEE SHEET 128 FOR PLAN VIEW OF TREES CONTAINED IN THIS SHEET'S TABLES.

TREES SURVEYED

TREE TAG #	SPECIES	COMMON NAME	CONDITION	SIZE (IN)	CLASS
3055	Salk nigra	WILLOW	GOOD	6,50	3
3057	Celtis laevigata	HACKBERRY	GOOD	11,70	3
3058	Celtis laevigata	HACKBERRY	GOOD	10,50	3
3059	Celtis laevigata	HACKBERRY	FAIR	10,80	3
3060	Celtis laevigata	HACKBERRY	GOOD	11,40	3
3061	Celtis laevigata	HACKBERRY	GOOD	18,00	3
3062	Celtis laevigata	HACKBERRY	GOOD	16,30	3
3063	Celtis laevigata	HACKBERRY	GOOD	14,10	3
3064	Ulmus americana	ELM	GOOD	10,00	2
3065	Fraxinus americana	ASH	GOOD	11,40	2
3066	Ulmus americana	ELM	GOOD	10,30	2
3067	Fraxinus americana	ASH	GOOD	7,70	2
3094	Celtis laevigata	HACKBERRY	GOOD	7,30	3
3095	Celtis laevigata	HACKBERRY	GOOD	9,75	3
3095	Celtis laevigata	HACKBERRY	FAIR	9,30	3
3082	Celtis laevigata	HACKBERRY	GOOD	9,85	3
3091	Celtis laevigata	HACKBERRY	GOOD	11,10	3
3084	Celtis laevigata	HACKBERRY	GOOD	10,20	3
3081	Celtis laevigata	HACKBERRY	GOOD	12,35	3
3097	Celtis laevigata	HACKBERRY	GOOD	9,85	3
3087	Celtis laevigata	HACKBERRY	GOOD	12,45	3
3090	Ulmus americana	ELM	GOOD	16,50	2
3088	Juglans nigra	WALNUT	GOOD	27,30	2
3093	Ulmus americana	ELM	GOOD	25,20	2
3079	Ulmus americana	ELM	GOOD	18,90	2
3083	Juglans nigra	WALNUT	GOOD	8,80	2
3099	Ulmus americana	ELM	GOOD	6,40	2
3403	Juglans nigra	WALNUT	GOOD	7,50	2
3404	Celtis laevigata	HACKBERRY	GOOD	24,50	3
3406	Celtis laevigata	HACKBERRY	GOOD	6,80	3
3411	Celtis laevigata	HACKBERRY	GOOD	30,80	3
3409	Ulmus americana	ELM	POOR	7,05	2
3408	Celtis laevigata	HACKBERRY	POOR	8,90	3
3421	Celtis laevigata	HACKBERRY	GOOD	9,80	3
3433	Celtis laevigata	HACKBERRY	GOOD	10,80	3
3425	Celtis laevigata	HACKBERRY	GOOD	15,50	3
3424	Celtis laevigata	HACKBERRY	GOOD	9,55	3
3438	Celtis laevigata	HACKBERRY	GOOD	12,60	3
3423	Ulmus americana	ELM	GOOD	15,04	2
3429	Ulmus americana	ELM	GOOD	6,40	2
3427	Ulmus americana	ELM	GOOD	14,30	2
3415	Ulmus americana	ELM	GOOD	17,40	2
3401	Ulmus americana	ELM	GOOD	12,25	2
3432	Juglans nigra	WALNUT	GOOD	6,00	2
3422	Ulmus americana	ELM	GOOD	21,00	2
3434	Ulmus americana	ELM	GOOD	6,35	2
3436	Ulmus americana	ELM	GOOD	7,45	2
3428	Celtis laevigata	HACKBERRY	GOOD	9,50	3
3439	Celtis laevigata	HACKBERRY	GOOD	12,10	3
3435	Diospyros virginiana	PERSIMMON	GOOD	8,55	2
3416	Melia azedarach	CHINABERRY	GOOD	10,60	N/A
3426	Diospyros virginiana	PERSIMMON	GOOD	7,80	2
3405	Diospyros virginiana	PERSIMMON	GOOD	7,40	2
3413	Diospyros virginiana	PERSIMMON	GOOD	6,20	2
3412	Diospyros virginiana	PERSIMMON	FAIR	8,35	2
3414	Diospyros virginiana	PERSIMMON	GOOD	8,70	2
3407	Salk nigra	WILLOW	GOOD	7,40	3
3417	Diospyros virginiana	PERSIMMON	GOOD	9,40	2
3440	Diospyros virginiana	PERSIMMON	GOOD	10,00	2
3419	Diospyros virginiana	PERSIMMON	GOOD	9,20	2
3437	Salk nigra	WILLOW	GOOD	9,40	3
3012	Ulmus americana	ELM	GOOD	10,50	2
3441	Salk nigra	WILLOW	GOOD	6,80	3
3444	Ulmus americana	ELM	GOOD	9,80	2

TREES SURVEYED

TREE TAG #	SPECIES	COMMON NAME	CONDITION	SIZE (IN)	CLASS
3442	Populus deltoides	COTTONWOOD	GOOD	6,80	3
3420	Salk nigra	WILLOW	GOOD	12,10	3
3402	Salk nigra	WILLOW	GOOD	8,45	3
3443	Salk nigra	WILLOW	GOOD	13,60	3
3418	Salk nigra	WILLOW	GOOD	16,00	3
3445	Salk nigra	WILLOW	GOOD	6,50	3
3446	Melia azedarach	CHINABERRY	GOOD	11,88	N/A
3447	Juglans nigra	WALNUT	GOOD	10,90	2
3448	Ulmus americana	ELM	GOOD	7,45	2
3449	Ulmus americana	ELM	GOOD	8,05	2
3450	Salk nigra	WILLOW	GOOD	9,80	3
3451	Salk nigra	WILLOW	GOOD	8,15	3
3452	Celtis laevigata	HACKBERRY	GOOD	12,63	3
3454	Celtis laevigata	HACKBERRY	GOOD	11,70	3
3456	Celtis laevigata	HACKBERRY	GOOD	8,65	3
3455	Celtis laevigata	HACKBERRY	GOOD	8,70	3
3457	Celtis laevigata	HACKBERRY	GOOD	13,10	3
3458	Celtis laevigata	HACKBERRY	GOOD	6,65	3
3459	Celtis laevigata	HACKBERRY	FAIR	13,35	3
3460	Ulmus americana	ELM	GOOD	18,25	2
3461	Celtis laevigata	HACKBERRY	GOOD	7,20	3
3462	Celtis laevigata	HACKBERRY	GOOD	16,00	3
3463	Ulmus americana	ELM	GOOD	12,10	2
3464	Celtis laevigata	HACKBERRY	GOOD	11,00	3
3465	Celtis laevigata	HACKBERRY	GOOD	8,70	3
3466	Celtis laevigata	HACKBERRY	GOOD	7,70	3
3467	Celtis laevigata	HACKBERRY	GOOD	10,25	3
3468	Celtis laevigata	HACKBERRY	FAIR	6,80	3
3469	Celtis laevigata	HACKBERRY	FAIR	17,40	3
3470	Ulmus americana	ELM	FAIR	17,80	2
3471	Fraxinus americana	ASH	GOOD	10,63	2
3472	Celtis laevigata	HACKBERRY	GOOD	6,15	3
3473	Celtis laevigata	HACKBERRY	GOOD	6,50	3
3474	Sideroxylon lanuginosum	GUM, BUMELIA	FAIR	8,60	3
3475	Celtis laevigata	HACKBERRY	GOOD	10,25	3
3476	Ulmus americana	ELM	GOOD	17,20	2
3477	Celtis laevigata	HACKBERRY	GOOD	6,50	3
3478	Ulmus americana	ELM	GOOD	6,95	2
3479	Ulmus americana	ELM	GOOD	9,45	2
3480	Diospyros virginiana	PERSIMMON	GOOD	6,00	2
3481	Ulmus americana	ELM	GOOD	9,40	2
3482	Melia azedarach	CHINABERRY	GOOD	10,90	N/A
3483	Ulmus americana	ELM	GOOD	6,50	2
3484	Ulmus americana	ELM	GOOD	16,35	2
3485	Melia azedarach	CHINABERRY	GOOD	7,30	N/A
3486	Melia azedarach	CHINABERRY	GOOD	13,00	N/A
3487	Celtis laevigata	HACKBERRY	GOOD	5,80	3
3489	Ulmus americana	ELM	GOOD	6,40	2
3491	Ulmus americana	ELM	GOOD	9,00	2
3499	Celtis laevigata	HACKBERRY	GOOD	13,10	3
3500	Ulmus crassifolia	ELM	GOOD	6,80	2
3483	Ulmus crassifolia	ELM	GOOD	6,60	2
3496	Celtis laevigata	HACKBERRY	GOOD	10,70	3
	CLUSTER	CLUSTER	NA	0,20	2
3494	Celtis laevigata	HACKBERRY	GOOD	7,80	3
3497	Celtis laevigata	HACKBERRY	GOOD	7,20	3
3492	Acer negundo	MAPLE	GOOD	11,25	2
3490	Celtis laevigata	HACKBERRY	GOOD	10,00	3
3495	Celtis laevigata	HACKBERRY	GOOD	7,20	3
3488	Melia azedarach	CHINABERRY	GOOD	6,20	N/A
3201	Celtis laevigata	HACKBERRY	GOOD	8,20	3
3202	Ulmus americana	ELM	GOOD	8,80	2
3203	Celtis laevigata	HACKBERRY	GOOD	9,50	3
3204	Celtis laevigata	HACKBERRY	GOOD	12,10	3

TREES SURVEYED

TREE TAG #	SPECIES	COMMON NAME	CONDITION	SIZE (IN)	CLASS
3490	Ulmus americana	ELM	GOOD	8,85	2
3212	Ulmus americana	ELM	GOOD	18,00	2
3217	Celtis laevigata	HACKBERRY	POOR	11,80	3
3218	Celtis laevigata	HACKBERRY	POOR	10,50	3
3210	Celtis laevigata	HACKBERRY	GOOD	6,40	3
3214	Ulmus americana	ELM	GOOD	14,20	2
3213	Celtis laevigata	HACKBERRY	GOOD	7,90	3
3208	Celtis laevigata	HACKBERRY	GOOD	7,30	3
3215	Celtis laevigata	HACKBERRY	GOOD	6,20	3
3216	Celtis laevigata	HACKBERRY	GOOD	8,25	3
3222	Celtis laevigata	HACKBERRY	GOOD	8,80	3
3226	Celtis laevigata	HACKBERRY	FAIR	8,20	3
3209	Celtis laevigata	HACKBERRY	GOOD	5,25	3
3227	Celtis laevigata	HACKBERRY	FAIR	5,20	3
3245	Celtis laevigata	HACKBERRY	GOOD	10,90	3
3246	Celtis laevigata	HACKBERRY	GOOD	14,00	3
3247	Celtis laevigata	HACKBERRY	GOOD	8,20	3
3248	Celtis laevigata	HACKBERRY	GOOD	6,20	3



Steven B. Hanford
10/05/20

NO.	REVISIONS	BY	DATE
ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Cool Rd. Dallas, Texas 75251 (214) 341-2900 An ARDURRA Company FIRM REGISTRATION No. F-10088			
Texas Department of Transportation ©2025 by Texas Department of Transportation, all rights reserved.			
CHALK HILL TRAIL			
TREE SURVEY - IMPACTED TREES			
STA 100+00 TO STA 106+00			
© TxDOT			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	129	

NOTES:

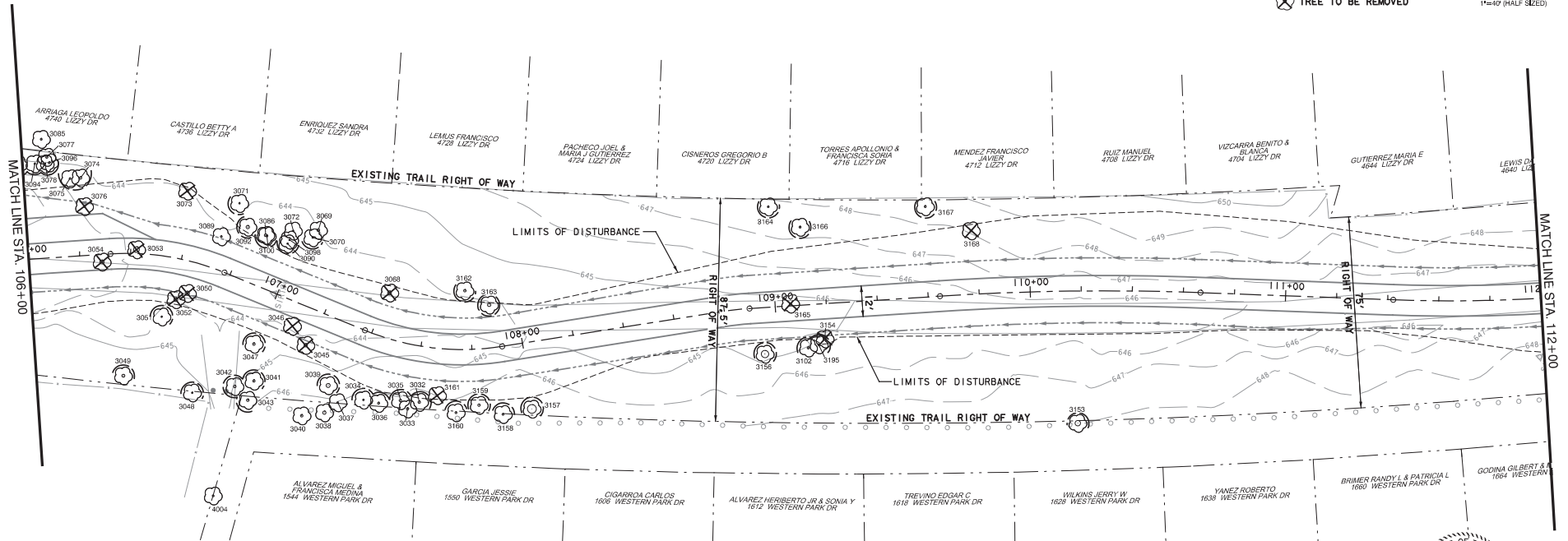
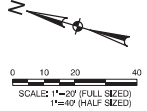
1. SEE SHEET 131 FOR TREE DATA TABLES OF TREES SHOWN ON THIS SHEET.

LEGEND

○ EXISTING TREE

--- TREE PROTECTION

⊗ TREE TO BE REMOVED



TREES TO BE REMOVED:

TREE TAG #	SPECIES	COMMON NAME	CONDITION	SIZE (IN)	CLASS	CALC. REPL. SIZE (IN)
3154	Celtis laevigata	HACKBERRY	GOOD	16,70	3	6,7
3161	Celtis laevigata	HACKBERRY	GOOD	7,20	3	0,0
3165	Celtis laevigata	HACKBERRY	GOOD	9,90	3	4,0
3168	Celtis laevigata	HACKBERRY	GOOD	10,10	3	4,0
3045	Ulmus americana	ELM	FAIR	15,50	2	10,9
3046	Ulmus americana	ELM	GOOD	6,70	2	0,0
3050	Ulmus americana	ELM	FAIR	20,40	2	14,3
3052	Ulmus americana	ELM	GOOD	15,60	2	13,0
3053	Salix nigra	WILLOW	FAIR	26,25	3	40,4
3054	Populus deltoides	COTTONWOOD	GOOD	19,20	3	7,7
3068	Fraxinus americana	ASH	GOOD	18,50	2	13,0
3089	Juglans nigra	WALNUT	GOOD	8,25	2	6,0
3076	Celtis laevigata	HACKBERRY	GOOD	9,00	3	3,6

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
100-7013	TREE PROTECTION (INSTALL)	EA	34

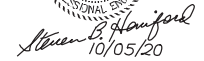


Steven B. Henkford
10/05/20

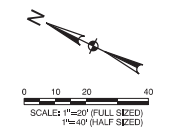
NO.	REVISIONS	BY	DATE
ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Cort Rd Dallas, Texas 75251 (214) 341-9900 An ARDURRA Company FIRM REGISTRATION No. F-10098			
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CHALK HILL TRAIL TREE SURVEY - IMPACTED TREES STA 106+00 TO STA 112+00			
© TxDOT			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	130	

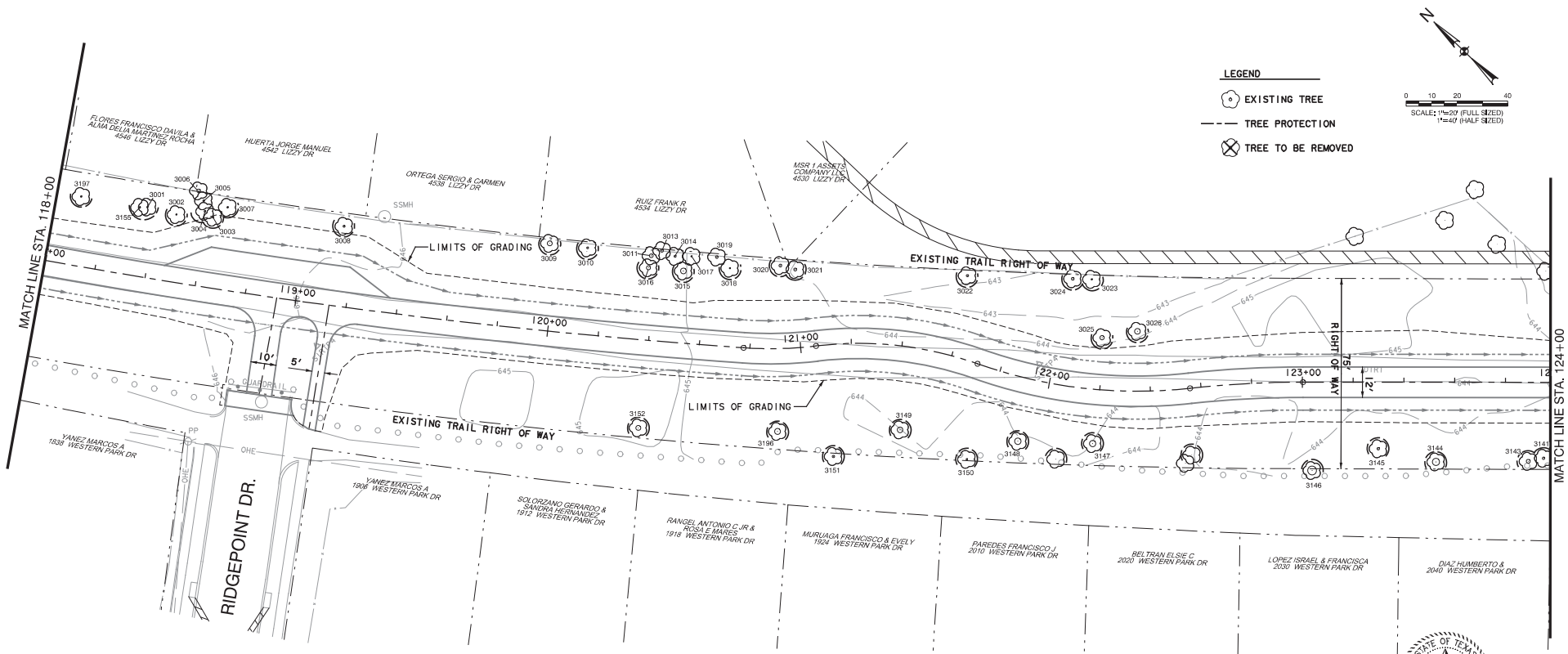
[illegible]

1. SEE SHEET 130 FOR PLAN VIEW
OF TREES CONTAINED IN THIS
SHEET'S TABLES.



NO.	REVISONS		BY	DATE
 ARREDONDO, ZEPEDA & BRUNZ, LLC 12402 Cot Rd, Dallas, Texas 75251 (214) 341-0900 An ARDURIA Company				
FPM REGISTRATION No. F-10098				
 Texas Department of Transportation ©2025 by Texas Department of Transportation, all rights reserved				
CHALK HILL TRAIL TREE SURVEY - IMPACTED TREES STA 106+00 TO STA 112+00				
© TXDOT				
CONTROL	SECTION	JOB	HIGHWAY	
0918	47	472	VA	
DISTRICT		COUNTY	SHEET NO.	
DAL		DALLAS	131	





TREES SURVEYED

TREE TAG #	SPECIES	COMMON NAME	CONDITION	SIZE (IN)	CLASS
3141	Ulmus americana	ELM	GOOD	11,40	2
3143	Ulmus americana	ELM	GOOD	16,25	2
3144	Ulmus americana	ELM	GOOD	33,90	2
3145	Diospyros virginiana	PERSIMMON	GOOD	12,00	2
3146	Ulmus americana	ELM	GOOD	41,80	2
3147	Ulmus americana	ELM	FAIR	26,50	2
3148	Ulmus americana	ELM	GOOD	30,00	2
3149	Ulmus americana	ELM	GOOD	26,40	2
3150	Celtis laevigata	HACKBERRY	GOOD	7,55	3
3151	Celtis laevigata	HACKBERRY	GOOD	11,40	3
3156	Ulmus americana	ELM	GOOD	27,80	2
3152	Juniperus ashei	CEDAR	GOOD	23,20	3
3197	Gleditsia triacanthos	LUCUST	GOOD	7,20	3
3155	Celtis laevigata	HACKBERRY	GOOD	7,50	3
3001	Celtis laevigata	HACKBERRY	GOOD	6,00	3
3002	Celtis laevigata	HACKBERRY	GOOD	6,00	3
3003	Ulmus americana	ELM	GOOD	7,50	2
3004	Celtis laevigata	HACKBERRY	GOOD	8,20	3
3005	Celtis laevigata	HACKBERRY	GOOD	8,40	3
3006	Celtis laevigata	HACKBERRY	GOOD	17,00	3

TREES SURVEYED

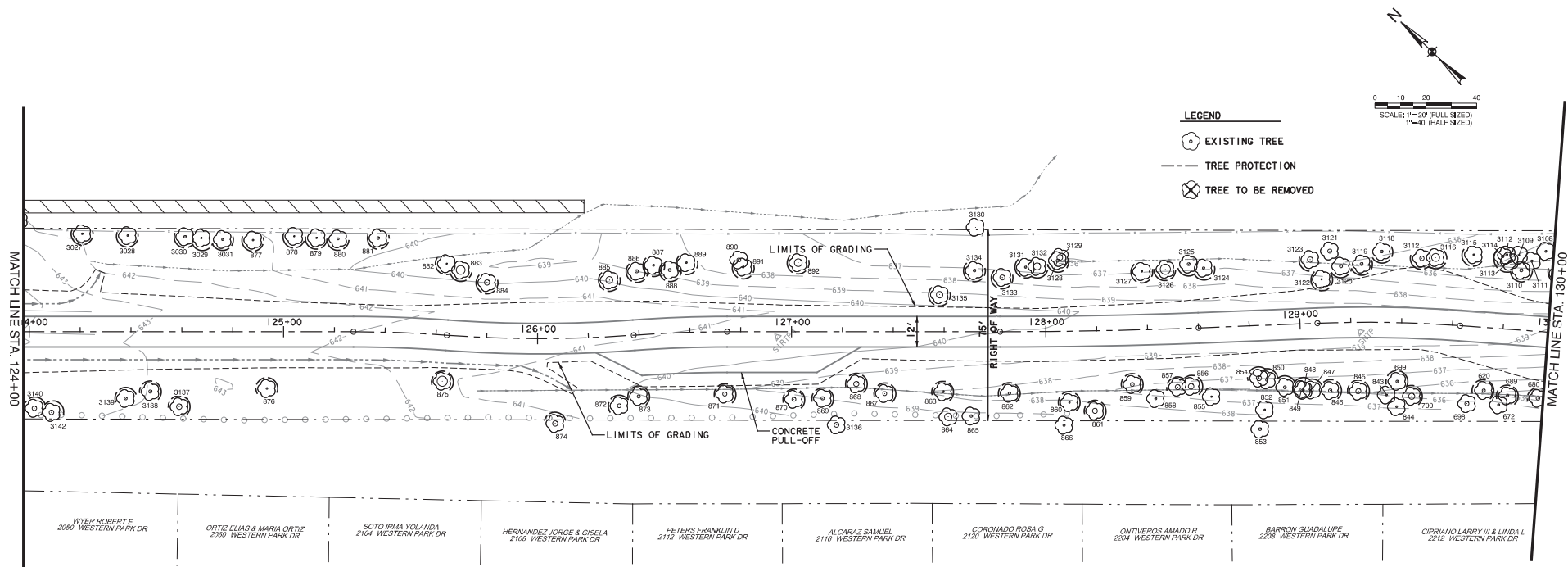
TREE TAG #	SPECIES	COMMON NAME	CONDITION	SIZE (IN)	CLASS
3007	Ulmus americana	ELM	GOOD	6,80	2
3008	Celtis laevigata	HACKBERRY	GOOD	9,20	3
3009	Ulmus americana	ELM	GOOD	23,00	2
3010	Ulmus americana	ELM	GOOD	8,75	2
3011	Celtis laevigata	HACKBERRY	GOOD	15,40	3
3013	Ulmus americana	ELM	GOOD	13,85	2
3014	Ulmus americana	ELM	GOOD	10,00	2
3015	Ulmus americana	ELM	GOOD	27,00	2
3016	Ulmus americana	ELM	GOOD	18,40	2
3017	Diospyros virginiana	PERSIMMON	GOOD	6,10	2
3018	Celtis laevigata	HACKBERRY	GOOD	6,15	3
3019	Celtis laevigata	HACKBERRY	GOOD	12,70	3
3020	Celtis laevigata	HACKBERRY	GOOD	13,40	3
3021	Ulmus americana	ELM	GOOD	14,10	2
3022	Ulmus americana	ELM	FAIR	10,50	2
3023	Ulmus americana	ELM	GOOD	13,00	2
3024	Celtis laevigata	HACKBERRY	GOOD	6,45	3
3025	Ulmus americana	ELM	GOOD	20,50	2
3026	Ulmus americana	ELM	GOOD	26,60	2

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
100-7013	TREE PROTECTION (INSTALL)	EA	34



Steven B. Hanford
10/05/20

NO.	REVISIONS	BY	DATE
AZ&B ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Cot Rd Dallas, Texas 75251 (214) 341-5900 An ARDURRA Company FIRM REGISTRATION No. F-10098			
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CHALK HILL TRAIL TREE SURVEY - IMPACTED TREES STA 118+00 TO STA 124+00			
© TxDOT			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	133	



TREES SURVEYED

	SPECIES	COMMON NAME	CONDITION	SIZE (IN)	CLASS
680	Ulmus americana	ELM	GOOD	17,10	2
689	Ulmus americana	ELM	GOOD	11,25	2
672	Ulmus americana	ELM	GOOD	10,00	2
620	Ulmus americana	ELM	GOOD	14,65	2
698	Ulmus americana	ELM	GOOD	18,55	2
699	Ulmus americana	ELM	GOOD	11,80	2
700	Ulmus americana	ELM	GOOD	29,05	2
843	Ulmus americana	ELM	GOOD	7,80	2
844	Ulmus americana	ELM	GOOD	8,90	2
845	Ulmus americana	ELM	GOOD	23,50	2
846	Ulmus americana	ELM	GOOD	15,85	2
848	Ulmus americana	ELM	GOOD	8,65	2
847	Ulmus americana	ELM	GOOD	13,60	2
849	Ulmus americana	ELM	GOOD	14,80	2
850	Ulmus americana	ELM	GOOD	12,40	2
851	Ulmus americana	ELM	GOOD	13,40	2
852	Ulmus americana	ELM	GOOD	13,35	3
853	Ulmus americana	ELM	GOOD	7,40	2
854	Ulmus americana	ELM	GOOD	23,80	2
855	Acer negundo	MAPLE	POOR	6,40	2
856	Ulmus americana	ELM	GOOD	26,10	2
857	Ulmus americana	ELM	GOOD	23,40	2
858	Ulmus americana	ELM	GOOD	10,10	2
859	Ulmus americana	ELM	GOOD	18,00	2
860	Ulmus americana	ELM	GOOD	6,90	3
861	Ulmus americana	ELM	GOOD	23,50	2
862	Ulmus americana	ELM	GOOD	11,35	3
863	Ulmus americana	ELM	GOOD	9,30	3
864	Ulmus americana	ELM	GOOD	34,50	3
865	Ulmus americana	ELM	GOOD	12,10	3
866	Ulmus americana	ELM	GOOD	10,70	3
867	Acer negundo	MAPLE	GOOD	18,50	2
868	Ulmus americana	ELM	GOOD	24,30	2

TREES SURVEYED

	SPECIES	COMMON NAME	CONDITION	SIZE (IN)	CLASS
869	Ulmus americana	ELM	GOOD	16,00	2
870	Juglans nigra	WALNUT	GOOD	18,50	2
871	Acer negundo	MAPLE	GOOD	19,40	2
872	Acer negundo	MAPLE	GOOD	18,10	2
873	Ulmus americana	ELM	GOOD	14,95	3
874	Acer negundo	MAPLE	GOOD	24,60	2
875	Ulmus americana	ELM	GOOD	47,95	2
876	Ulmus americana	ELM	GOOD	8,00	3
877	Acer negundo	MAPLE	GOOD	7,50	3
878	Acer negundo	MAPLE	GOOD	6,00	2
879	Acer negundo	MAPLE	GOOD	6,45	2
880	Acer negundo	MAPLE	GOOD	9,85	2
881	Ulmus americana	ELM	GOOD	12,63	3
882	Ulmus americana	ELM	GOOD	6,00	2
883	Ulmus americana	ELM	GOOD	41,25	2
884	Ulmus americana	ELM	GOOD	25,10	2
885	Ulmus americana	ELM	GOOD	32,30	2
886	Acer negundo	MAPLE	GOOD	15,60	2
887	Acer negundo	MAPLE	GOOD	8,40	2
888	Acer negundo	MAPLE	GOOD	13,75	2
889	Acer negundo	MAPLE	GOOD	7,00	2
890	Ulmus americana	ELM	GOOD	16,00	2
891	Acer negundo	MAPLE	GOOD	8,40	2
892	Ulmus americana	ELM	GOOD	36,85	2
893	Ulmus americana	ELM	GOOD	10,00	2
894	Acer negundo	MAPLE	GOOD	9,20	2
895	Acer negundo	MAPLE	GOOD	6,80	2
896	Ulmus americana	ELM	GOOD	15,00	2
897	Ulmus americana	ELM	GOOD	10,40	2
898	Acer negundo	MAPLE	GOOD	9,80	2
899	Ulmus americana	ELM	GOOD	8,80	2
900	Ulmus americana	ELM	GOOD	12,20	2
901	Acer negundo	MAPLE	GOOD	6,70	2

TREES SURVEYED

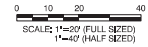
TREE TAG #	SPECIES	COMMON NAME	CONDITION	SIZE (IN)	CLASS
3116	Ulmus americana	ELM	GOOD	36,00	2
3112	Acer negundo	MAPLE	GOOD	21,10	2
3118	Acer negundo	MAPLE	GOOD	12,40	2
3119	Acer negundo	MAPLE	GOOD	13,85	2
3120	Ulmus americana	ELM	FAIR	15,10	2
3121	Ulmus americana	ELM	GOOD	18,80	2
3122	Acer negundo	MAPLE	FAIR	6,20	2
3123	Acer negundo	MAPLE	GOOD	24,80	2
3124	Ulmus americana	ELM	GOOD	10,80	2
3125	Ulmus americana	ELM	GOOD	13,30	2
3126	Ulmus americana	ELM	GOOD	47,95	2
3127	Acer negundo	MAPLE	GOOD	6,80	2
3128	Ulmus americana	ELM	GOOD	14,20	2
3129	Ulmus americana	ELM	GOOD	27,00	2
3130	Ulmus americana	ELM	GOOD	7,80	2
3131	Acer negundo	MAPLE	GOOD	10,30	2
3132	Ulmus americana	ELM	GOOD	33,10	2
3133	Acer negundo	MAPLE	FAIR	23,40	2
3134	Ulmus americana	ELM	GOOD	11,80	2
3135	Ulmus americana	ELM	GOOD	30,30	2
3137	Ulmus americana	ELM	GOOD	25,75	2
3138	Ulmus americana	ELM	GOOD	15,35	2
3139	Ulmus americana	ELM	GOOD	13,50	2
3140	Ulmus americana	ELM	GOOD	21,20	2
3142	Ulmus americana	ELM	GOOD	21,90	3
3027	Juglans nigra	WALNUT	GOOD	7,60	2
3028	Juglans nigra	WALNUT	GOOD	7,20	2
302	Quercus alba	WHITE OAK	FAIR	11,60	2
3030	Ulmus americana	ELM	GOOD	6,70	3
3031	Acer negundo	MAPLE	FAIR	13,00	2

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
100-7013	TREE PROTECTION (INSTALL)	EA	75



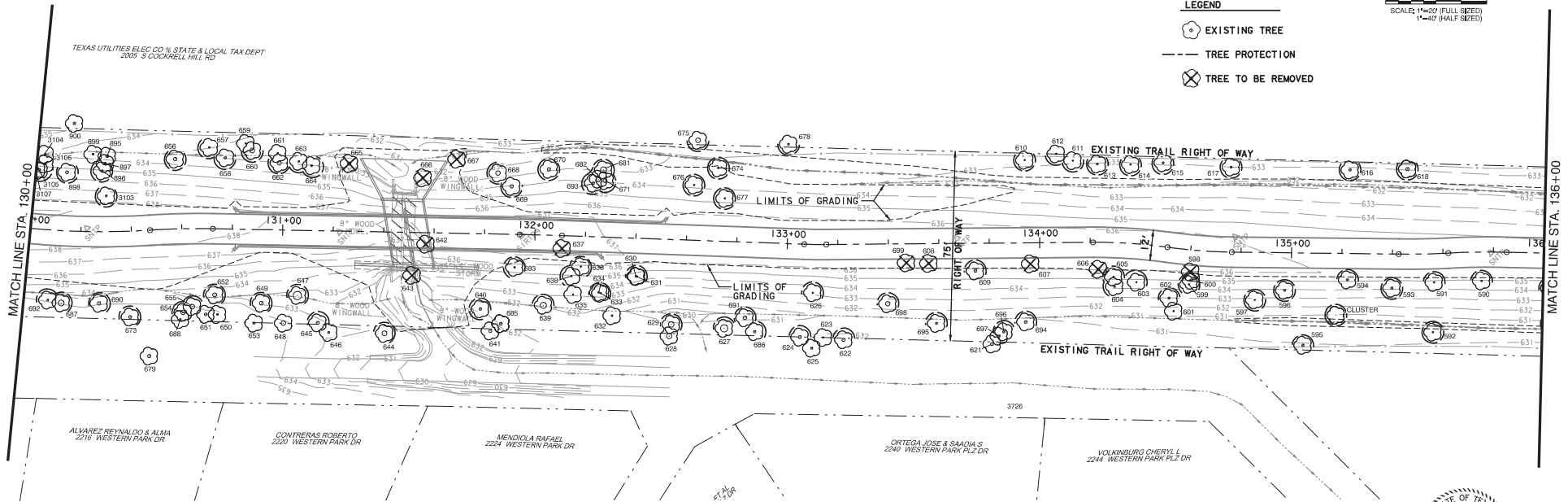
NO.	REVISIONS	BY	DATE
AZ&B ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Carl Rd. Dallas, Texas 75251 (214) 341-9900 An ARDURRA Company FIRM REGISTRATION NO. F-10098			
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CHALK HILL TRAIL TREE SURVEY - IMPACTED TREES STA 124+00 TO STA 130+00			
© TxDOT			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	134	

1. SEE SHEET 136 FOR TREE DATA
TABLES OF TREES SHOWN ON THIS
SHEET.



 EXISTING TREE

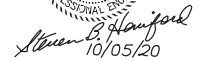
 EXISTING TREE

 TREE TO BE REMOVED

TREES TO BE REMOVED:

TRF TAG #	SPECIES	COMMON NAME	CONDITION	SIZE (IN)	CLASS	CALC. REPL. SIZE (IN)
598	<i>Ulmus americana</i>	ELM	GOOD	14.45	2	10.4
606	<i>Ulmus americana</i>	ELM	GOOD	13.00	2	8.4
607	<i>Juglans nigra</i>	WALNUT	GOOD	7.25	2	0.0
609	<i>Celtis laevigata</i>	HACKBERRY	GOOD	7.50	3	0.0
608	<i>Quercus shumardii</i>	OAK	GOOD	10.03	2	7.0
637	<i>Celtis nigra</i>	WILLOW	GOOD	7.80	3	0.0
642	<i>Malva asclepias</i>	CHINA-BERRY	GOOD	6.40	N/A	0.0
643	<i>Malva asclepias</i>	CHINA-BERRY	GOOD	6.20	N/A	0.0
655	<i>Acer negundo</i>	MAPLE	7/8"	15.45	1	10.8
666	<i>Acer negundo</i>	MAPLE	GOOD	11.20	2	7.8
667	<i>Celtis laevigata</i>	HACKBERRY	GOOD	8.20	3	3.3

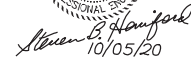
ITEM NO.	DESCRIPTION	UNIT	QUANTITY
100-7013	TREE PROTECTION (INSTALL)	EA	80



NO.	REVISONS	BY	DATE
 ARREDONDO, ZEPEDA & BRUNZ, LLC AN ARDURIA COMPANY 12400 Coit Rd. Dallas, Texas 75251 (214) 341-0500 FIRM REGISTRATION No. F-10098			
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CHALK HILL TRAIL TREE SURVEY - IMPACTED TREES STA 130+00 TO STA 136+00			
© TxDOT			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY		SHEET NO.
DAL	DALLAS		135

SO	DATE\$	STIME\$	SUSER\$	SCUENT\$	SFILE\$
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Tree Tag #	Species	Common Name	Condition	Size (in)	Class
643	Melia azadirach	CHINABERRY	GOOD	6.20	N/A
644	Ulmus americana	ELM	GOOD	22.90	2
645	Acer negundo	MAPLE	GOOD	14.50	2
646	Liquidum japonicum	PRIVET	GOOD	9.20	3
647	Ulmus americana	ELM	GOOD	38.40	2
648	Ulmus americana	ELM	GOOD	21.50	2
649	Ulmus americana	ELM	GOOD	17.10	2
650	Ulmus americana	ELM	GOOD	7.70	2
651	Ulmus americana	ELM	GOOD	12.40	2
652	Ulmus americana	ELM	GOOD	18.90	2
653	Ulmus americana	ELM	GOOD	9.85	2
654	Ulmus americana	ELM	GOOD	21.00	2
655	Ulmus americana	ELM	GOOD	22.00	2
656	Ulmus americana	ELM	GOOD	16.10	2
657	Acer negundo	MAPLE	GOOD	7.20	2
658	Ulmus americana	ELM	GOOD	10.50	2
659	Ulmus americana	ELM	GOOD	5.50	2
660	Acer negundo	MAPLE	GOOD	22.70	2
661	Ulmus americana	ELM	GOOD	7.70	2
662	Acer negundo	MAPLE	GOOD	18.20	2
663	Acer negundo	MAPLE	GOOD	6.70	2
664	Acer negundo	MAPLE	GOOD	9.20	2
665	Acer negundo	MAPLE	FAIR	15.45	2
666	Acer negundo	MAPLE	GOOD	11.20	2
667	Celtis baccata	HACKBERRY	GOOD	8.20	3
668	Ulmus americana	ELM	GOOD	20.50	2
669	Ulmus americana	ELM	GOOD	16.00	2
670	Ulmus americana	ELM	GOOD	15.50	2
671	Ulmus americana	ELM	GOOD	17.75	2
682	Fraxinus americana	ASH	POOR	20.90	2
693	Fraxinus americana	ASH	POOR	12.45	2
681	Ulmus americana	ELM	GOOD	28.95	2
674	Acer negundo	MAPLE	FAIR	8.20	2
675	Juglans nigra	WALNUT	FAIR	22.00	2
676	Acer negundo	MAPLE	GOOD	6.70	2
677	Acer negundo	MAPLE	GOOD	6.20	2
678	Ulmus americana	ELM	POOR	9.20	2
691	Juglans nigra	WALNUT	GOOD	16.70	2
686	Juglans nigra	WALNUT	GOOD	11.50	2
683	Liquidum japonicum	PRIVET	GOOD	7.20	3
685	Acer negundo	MAPLE	GOOD	13.55	2
688	Ulmus americana	ELM	GOOD	7.20	2
679	Ulmus americana	ELM	GOOD	15.15	2
680	Ulmus americana	ELM	GOOD	16.00	2
673	Ulmus americana	ELM	GOOD	13.85	2
682	Ulmus americana	ELM	GOOD	8.25	2
687	Ulmus americana	ELM	GOOD	27.90	2
685	Acer negundo	MAPLE	FAIR	13.70	2
686	Ulmus americana	ELM	GOOD	8.50	2
697	Acer negundo	MAPLE	GOOD	9.90	2
688	Acer negundo	MAPLE	GOOD	14.60	2
699	Acer negundo	MAPLE	FAIR	8.20	2
900	Ulmus americana	ELM	GOOD	12.50	2
3103	Ulmus americana	ELM	GOOD	8.80	2
3104	Ulmus americana	ELM	GOOD	7.80	2
3106	Acer negundo	MAPLE	GOOD	9.80	2



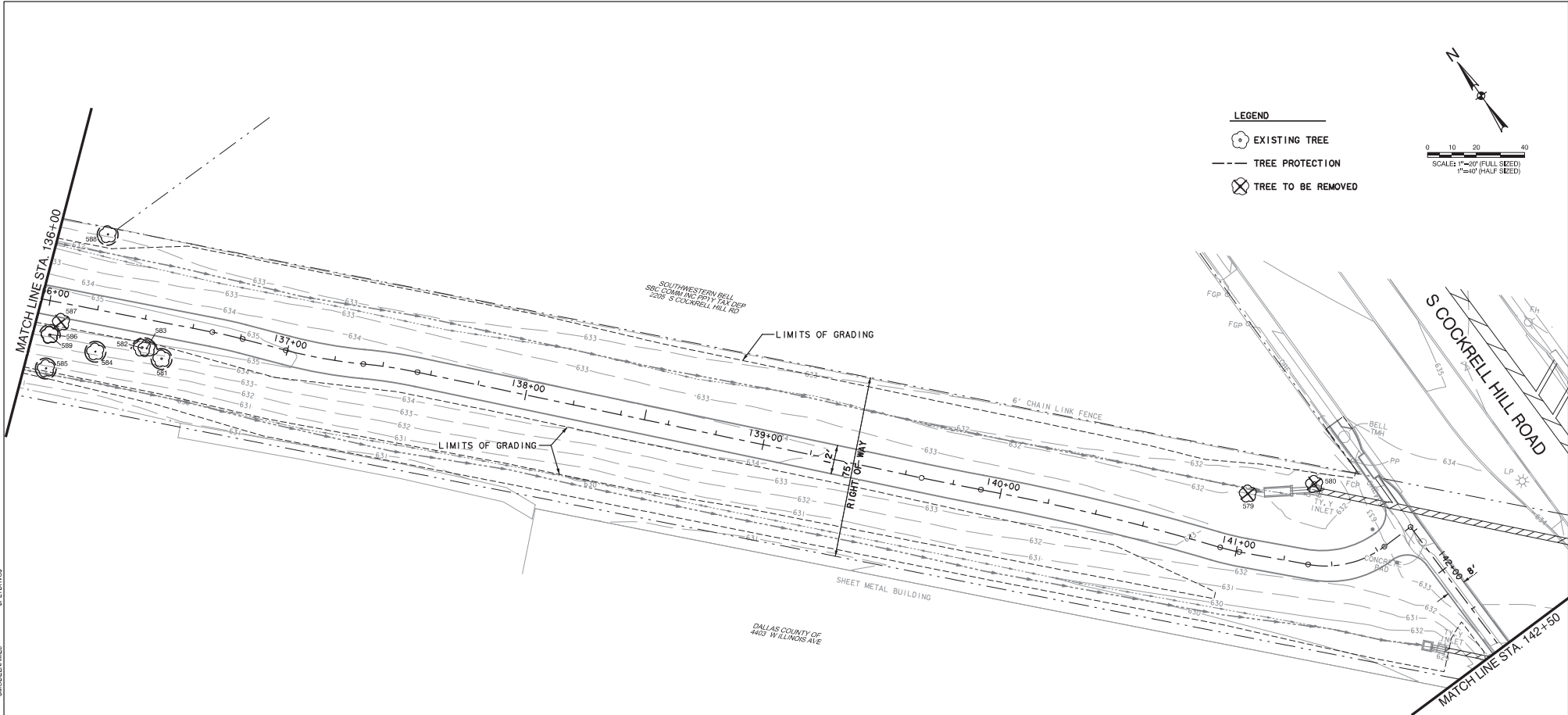
NO.		REVISONS				BY		DATE	
		ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Col Rd. Dallas, Texas 75251 (214) 341-6900							
		IFPM REGISTRATION NO. F-10098							
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CHALK HILL TRAIL TREE SURVEY - IMPACTED TREES STA 130+00 TO STA 136+00									
● 5x60ft									
CONTROL		SECTION		JOB		HIGHWAY			
0918		47		472		VA			
DISTRICT		COUNTY				SHEET NO.			
DAL		DALLAS				136			

SPLDTRN5

MODELNAME5

S04TES STN05 BUS05RE SC05LENTS SP05NEL5

S04TES STN05

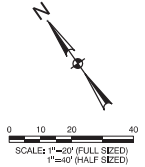


LEGEND

EXISTING TREE

TREE PROTECTION

TREE TO BE REMOVED



TREES SURVEYED:

TREE TAG #	SPECIES	COMMON NAME	CONDITION	SIZE (IN)	CLASS
580	Celtis laevigata	HACKBERRY	GOOD	24,20	2
579	Celtis laevigata	HACKBERRY	GOOD	10,20	2
581	Fraxinus americana	ASH	GOOD	8,60	2
582	Zanthox. dave-heroldii	HERC. CLUB	GOOD	10,30	2
583	Quercus shumardii	OAK	GOOD	6,40	2
584	Juniperus virginiana	CEDAR	GOOD	6,20	2
587	Quercus shumardii	OAK	GOOD	9,30	2
588	Celtis laevigata	HACKBERRY	GOOD	7,25	2

TREES TO BE REMOVED:

TREE TAG #	SPECIES	COMMON NAME	CONDITION	SIZE (IN)	CLASS
580	Celtis laevigata	HACKBERRY	GOOD	24,20	3
579	Celtis laevigata	HACKBERRY	GOOD	10,20	3
587	Quercus shumardii	OAK	GOOD	9,30	2

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
100-7013	TREE PROTECTION (INSTALL)	EA	10



Steven B. Henford
10/05/20

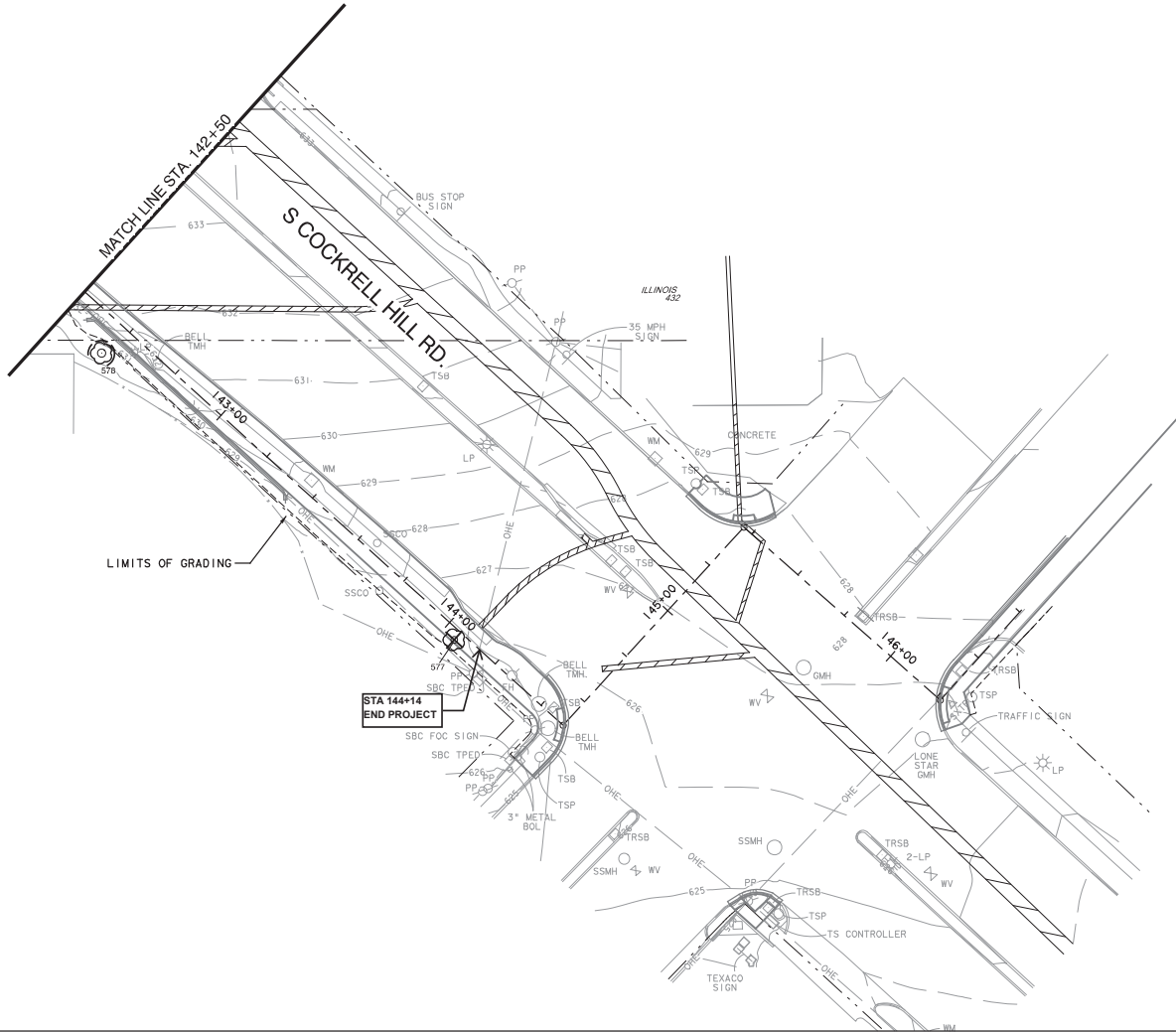
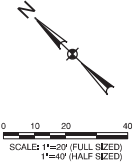
NO.	REVISIONS	BY	DATE
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CHALK HILL TRAIL TREE SURVEY - IMPACTED TREES STA 136+00 TO STA 142+50			
© TxDOT			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	137	

P&S05 DATES 07/05/20

TREES SURVEYED					
TREE TAG #	SPECIES	COMMON NAME	CONDITION	SIZE (IN)	CLASS
577	Ulmus americana	ELM	GOOD	26.30	2
578	Juniperus ashei	CEDAR	GOOD	31.80	3

TREES TO BE REMOVED					
TREE TAG #	SPECIES	COMMON NAME	CONDITION	SIZE (IN)	CLASS
577	Ulmus americana	ELM	GOOD	26.30	2

- LEGEND**
- EXISTING TREE
 - TREE PROTECTION
 - TREE TO BE REMOVED



Steven B. Henkford
10/05/20

NO.	REVISIONS	BY	DATE
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CHALK HILL TRAIL TREE SURVEY - IMPACTED TREES STA 142+50 TO STA 144+14			
© TxDOT			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	138	

P:1111 B:1111 C:1111 R:1111



Standard Construction Details

for
City of Dallas
Park and Recreation Department

Typical Construction Details

PAVEMENT &
PARKING DETAILS

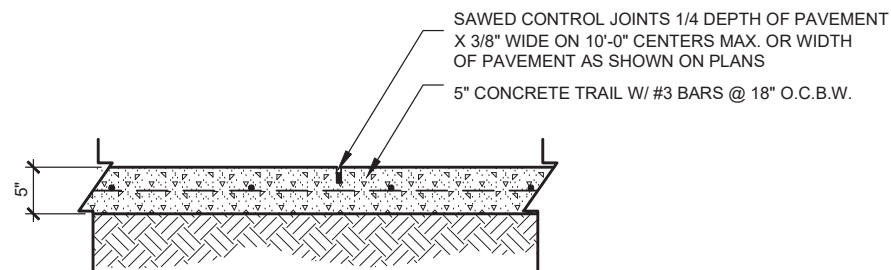
DOWELED
EXPANSION
AND CONTROL
JOINT DETAILS

issue date

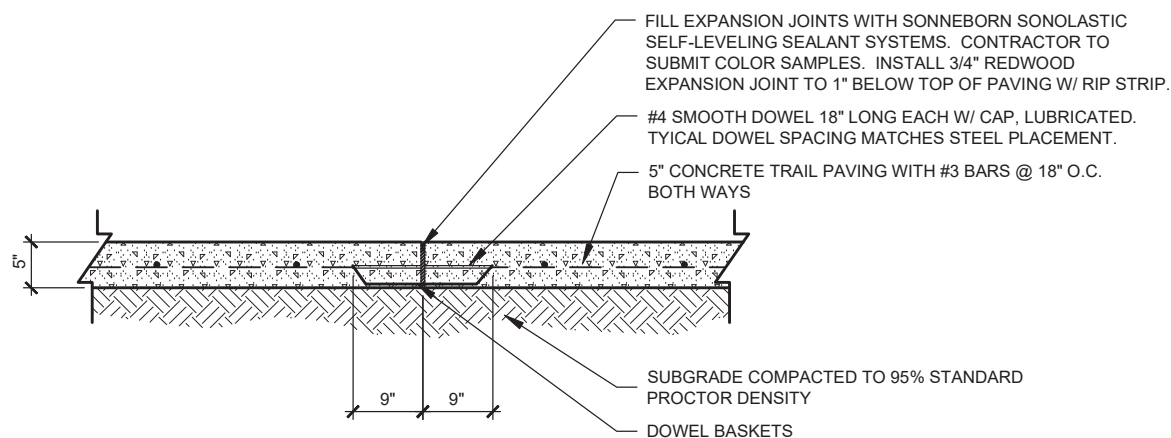
revisions

DETAIL A-2

139



CONTROL JOINT



DOWELED EXPANSION JOINT

GENERAL NOTES:

1. LOCATE DOWELED EXPANSION JOINTS ON MAXIMUM 100'-0" CENTERS.
2. THE MAXIMUM CONTROL JOINT SPACING SHALL BE THE WIDTH OF THE TRAIL OR AS SHOWN ON THE PLANS.
3. COMPACTION REQUIREMENTS NOTED ARE A MINIMUM STANDARD. REFER TO GEOTECHNICAL REPORT FOR SPECIFIC PROJECT REQUIREMENTS WHICH SHALL PREVAIL.

A
2 DOWELED EXPANSION AND CONTROL JOINT DETAILS

SCALE : 3/4" = 1'-0"



scale:
and:
drawn:
approved:

Standard Construction Details

for
City of Dallas
Park and Recreation Department

Typical Construction Details

PAVEMENT & PARKING DETAILS

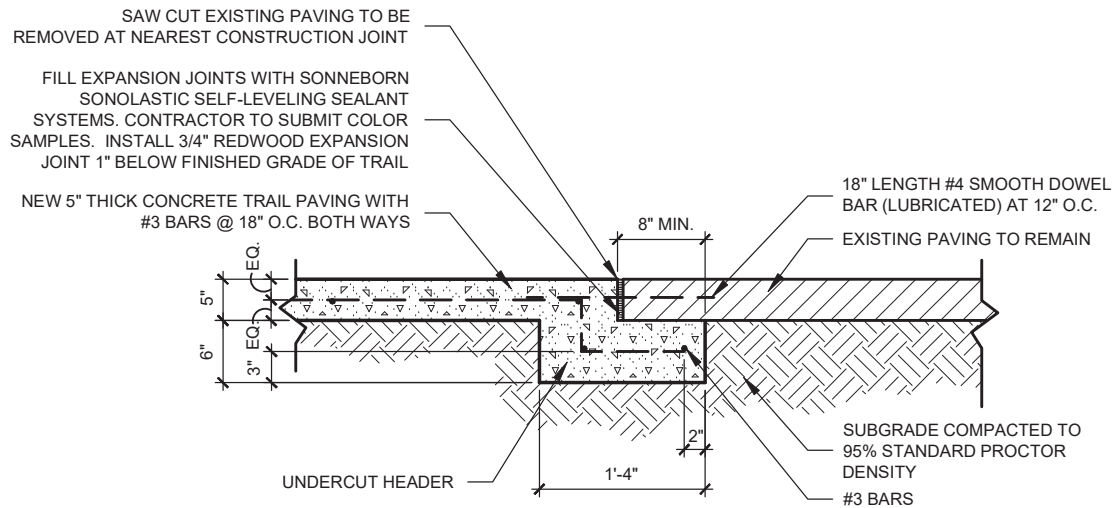
UNDERCUT HEADER DETAIL

issue date

revisions

DETAIL A-3

140



GENERAL NOTES:

1. UNDERCUT HEADER TO BE CONTINUOUS ALONG EXISTING PAVEMENT WHERE ADJACENT TO NEW PAVEMENT.
2. NEW PAVEMENT BARS TO BE BENT DOWN INTO HEADER. HEADER AND NEW PAVEMENT TO BE MONOLITHIC.
3. COMPACTION REQUIREMENTS NOTED ARE A MINIMUM STANDARD. REFER TO GEOTECHNICAL REPORT FOR SPECIFIC PROJECT REQUIREMENTS WHICH SHALL PREVAIL.

A
3 UNDERCUT HEADER DETAIL

SCALE : 1" = 1'-0"



Standard Construction Details

for
City of Dallas
Park and Recreation Department

Typical Construction Details

PAVEMENT & PARKING DETAILS

LONGITUDINAL BUTT JOINT DETAIL

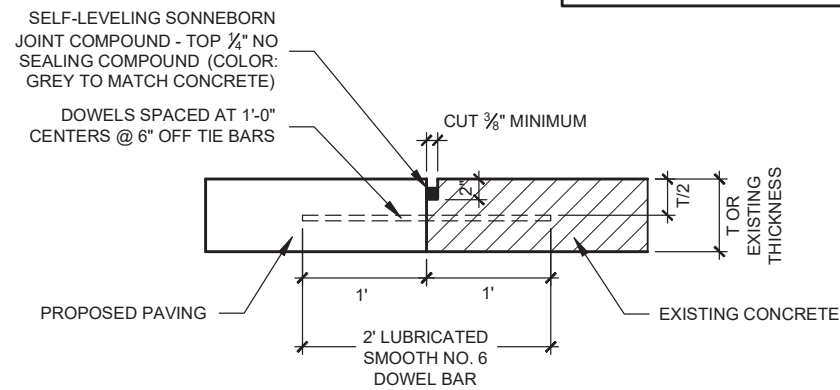
issue date

revisions

DETAIL A-4

141

NOTE:
DOWEL BARS SHALL BE DRILLED INTO PAVEMENT
HORIZONTALLY BY USE OF A MECHANICAL RIG.



A 4 LONGITUDINAL BUTT JOINT DETAIL

SCALE : 1" = 1'-0"



Standard Construction Details

for
City of Dallas
Park and Recreation Department

Typical Construction Details

PAVEMENT &
PARKING DETAILS

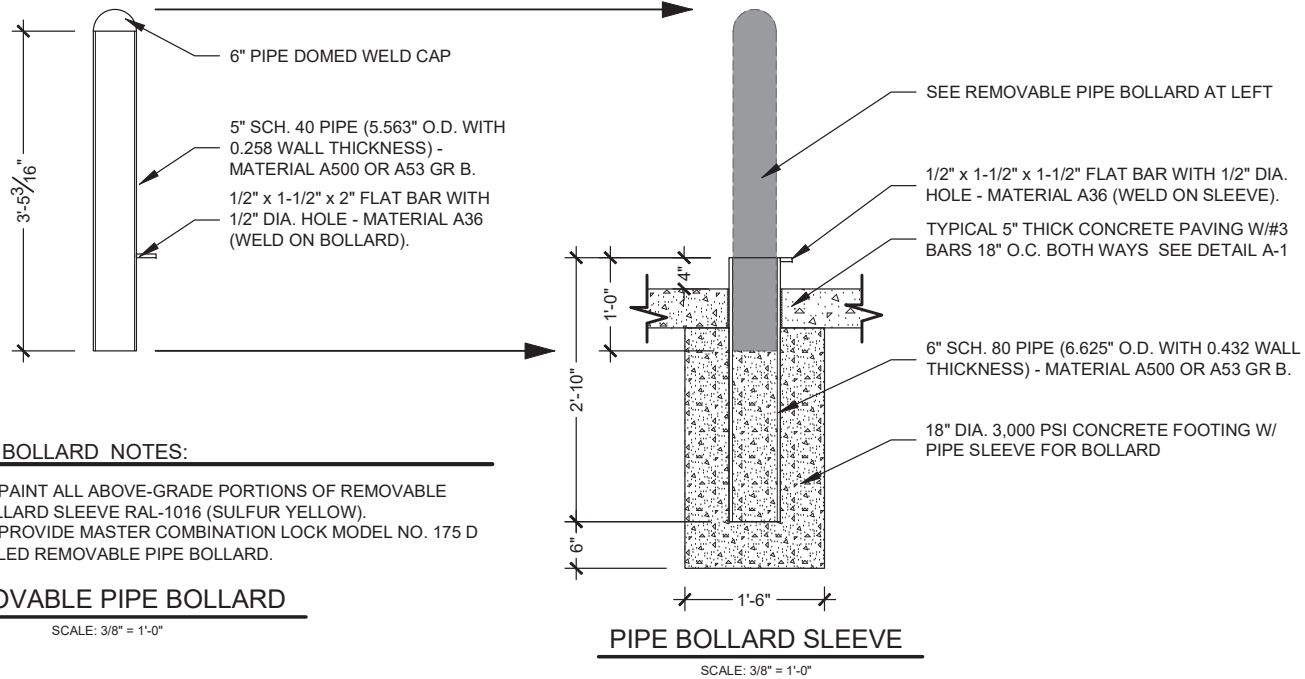
TRAIL RAMP
SECTION AND
REMOVABLE
BOLLARD DETAIL

issue date

revisions

DETAIL A-7

143

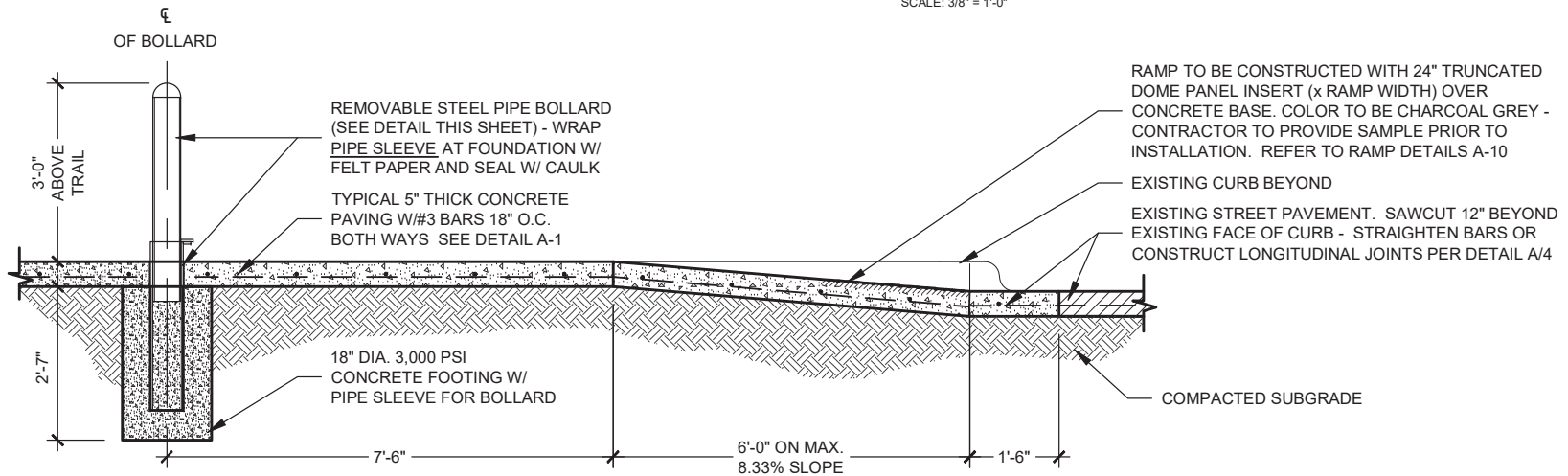


REMOVABLE PIPE BOLLARD NOTES:

1. CONTRACTOR TO PAINT ALL ABOVE-GRADE PORTIONS OF REMOVABLE BOLLARD AND BOLLARD SLEEVE RAL-1016 (SULFUR YELLOW).
2. CONTRACTOR TO PROVIDE MASTER COMBINATION LOCK MODEL NO. 175 D FOR EACH INSTALLED REMOVABLE PIPE BOLLARD.

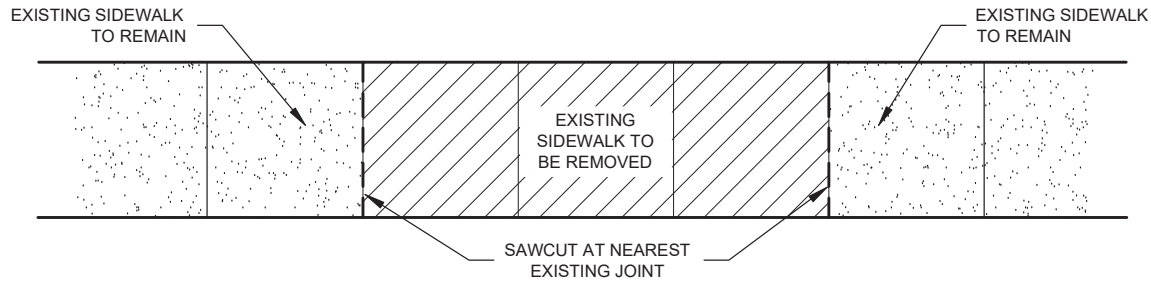
REMOVABLE PIPE BOLLARD

SCALE: 3/8" = 1'-0"



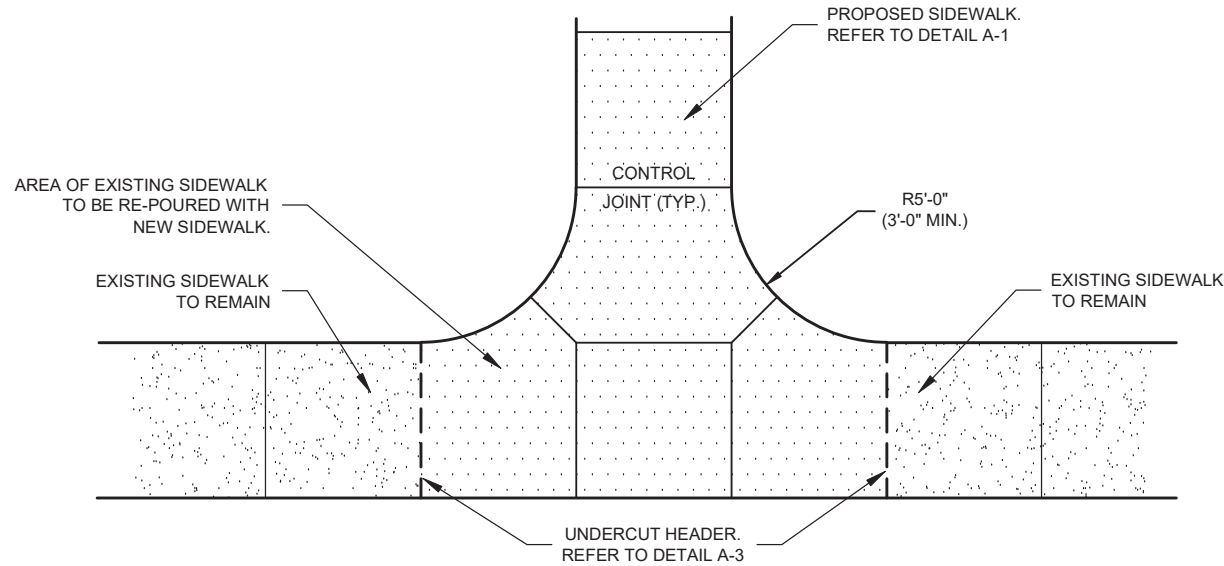
A 7 TRAIL RAMP SECTION AND REMOVABLE BOLLARD DETAIL FOR TRAILS 10' OR GREATER

SCALE: 1/2" = 1'-0"



EXISTING SIDEWALK REMOVAL

SCALE: 1/4" = 1'-0"



SIDEWALK REPLACEMENT

SCALE: 1/4" = 1'-0"

Department of
Park and Recreation



City of Dallas
Texas

scale:
and:
drawn:
approved:

Standard Construction Details

for
City of Dallas
Park and Recreation Department

Typical Construction Details

PAVEMENT &
PARKING DETAILS

SIDEWALK
CONNECTION
AT EXISTING
SIDEWALK

issue date

revisions

DETAIL A-19

144

A
19

SIDEWALK CONNECTION AT EXISTING SIDEWALK

SCALE : 1/4" = 1'-0"



Standard Construction Details

for
City of Dallas
Park and Recreation Department

Typical Construction Details

LANDSCAPE
DETAILS

TREE PROTECTION DETAIL

issue date

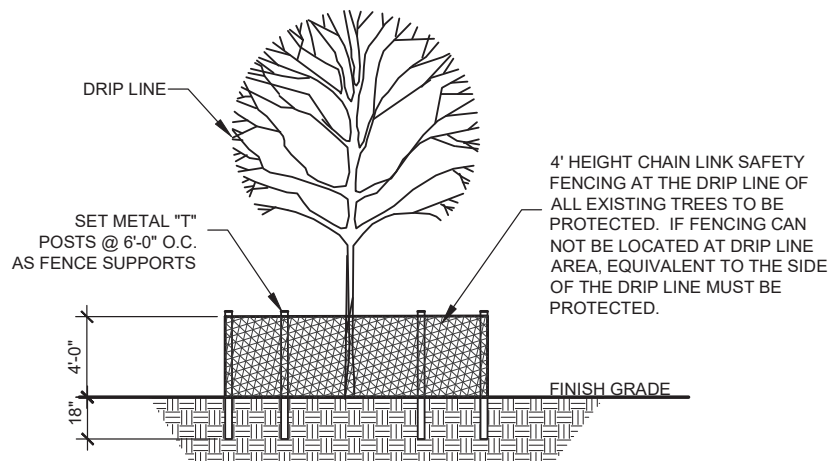
revisions

DETAIL F-1

145

NOTES:

1. FENCE TO BE MAINTAINED AND REPAIRED AS NEEDED DURING CONSTRUCTION.
2. NO CONSTRUCTION TRAFFIC, GRADING, STORAGE OR WASTE DISPOSAL ALLOWED WITHIN THE FENCED AREA AROUND TREES.



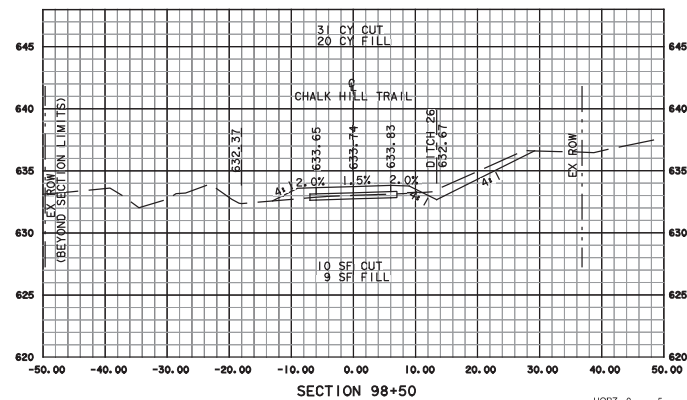
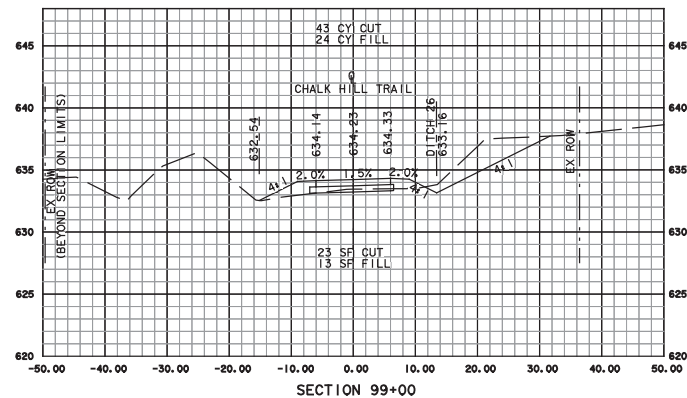
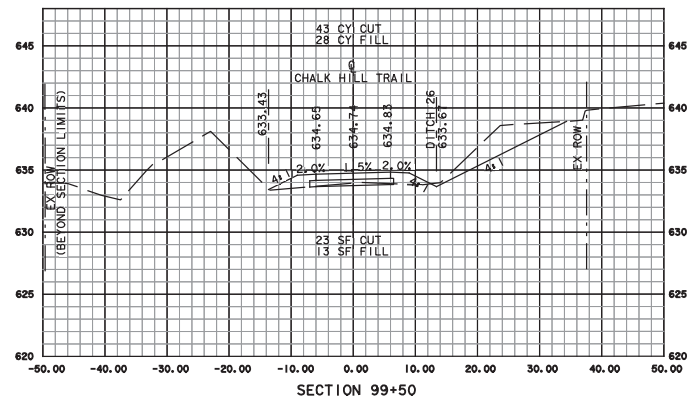
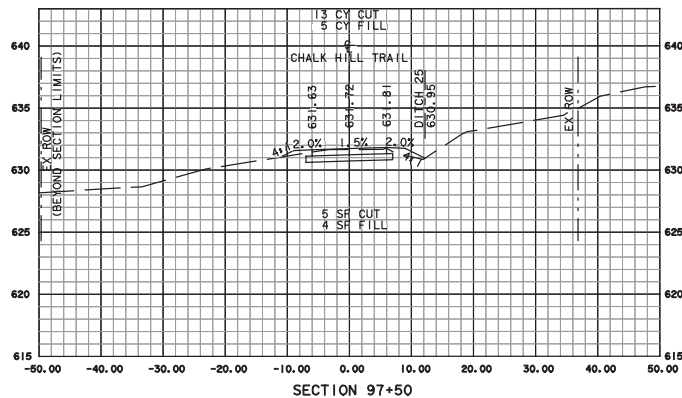
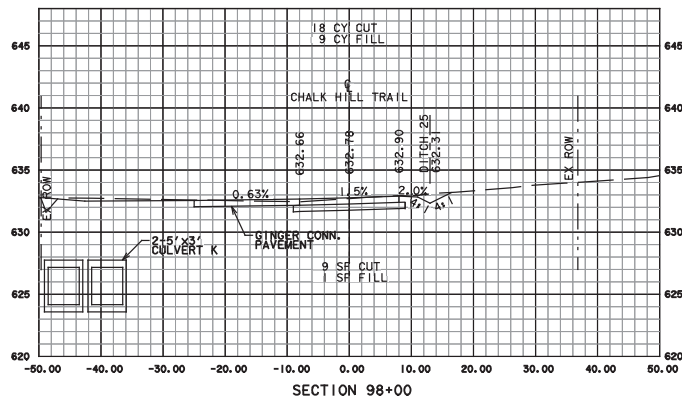
TREE PROTECTION NOTES

1. EXISTING TREES SHOWN TO REMAIN ARE TO BE PROTECTED DURING CONSTRUCTION. CHAINLINK FENCING (MIN. 4'-0" HEIGHT) SHALL BE INSTALLED AT THE DRIP LINE OF ALL TREES OR TREE GROUPS TO REMAIN. PARKING OF VEHICLES OR PERFORMING WORK WITHIN THESE AREAS OTHER THAN SHOWN ON THE PLAN, WILL NOT BE ALLOWED. THE TREE PROTECTION SHALL REMAIN DURING CONSTRUCTION. OTHER TREE PROTECTION MEASURES SHALL BE IN ACCORDANCE WITH THE CITY'S STANDARDS AND ORDINANCES.
2. DISPOSAL OF ANY WASTE MATERIAL SUCH AS, BUT NOT LIMITED TO, PAINT, ASPHALT, OIL SOLVENTS, CONCRETE, MORTAR, ETC. WITHIN THE CANOPY AREA OF THE EXISTING TREES SHALL NOT BE ALLOWED.
3. NO ATTACHMENTS OR WIRES OF ANY KIND, OTHER THAN THOSE OF A PROTECTIVE NATURE, SHALL BE ATTACHED TO ANY TREE.
4. NO FILL OR EXCAVATION OF ANY NATURE SHALL OCCUR WITHIN THE DRIP LINE OF A TREE TO BE PRESERVED, UNLESS THERE IS A SPECIFIED WELL OR RETAINING WALL SHOWN ON THE GRADING PLAN.
5. NO MATERIALS SHALL BE STORED WITHIN THE DRIPLINE AREA OF A TREE TO BE PRESERVED.

NOT TO SCALE

F
1

TREE PROTECTION DETAIL

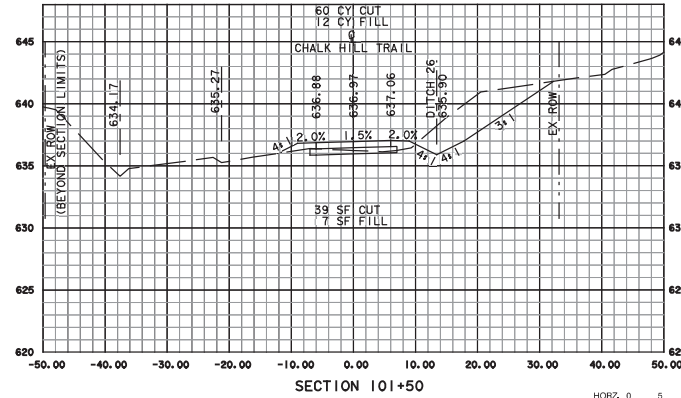
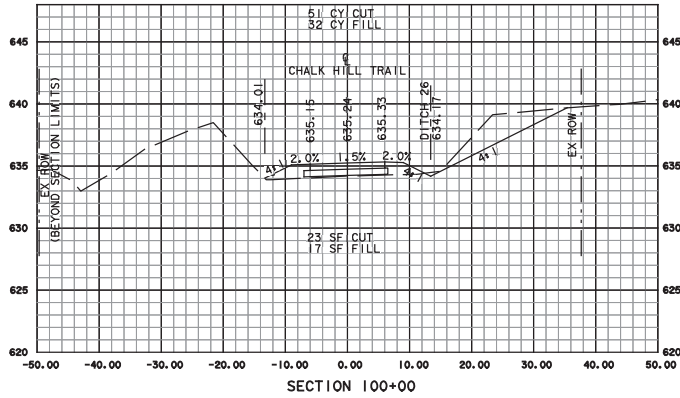
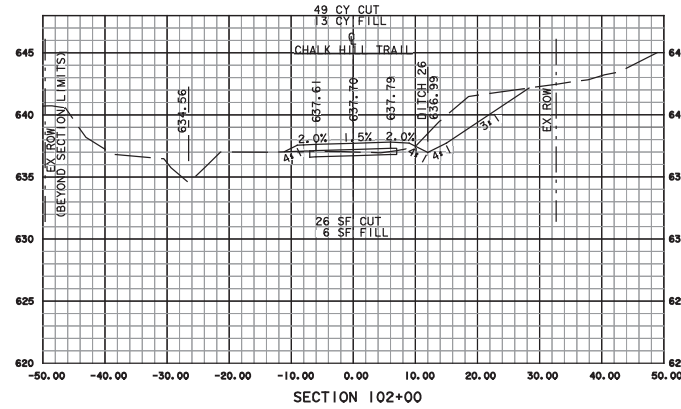
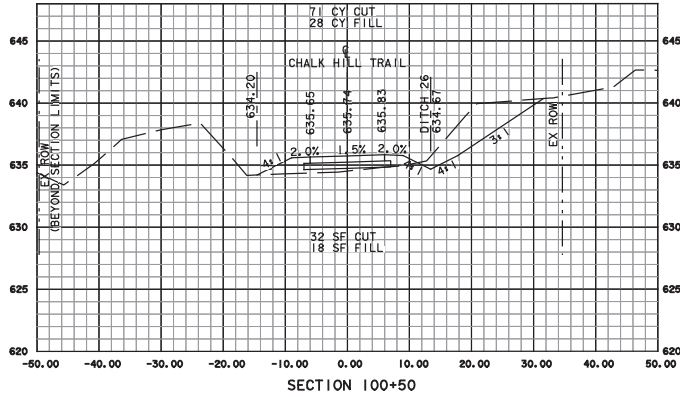
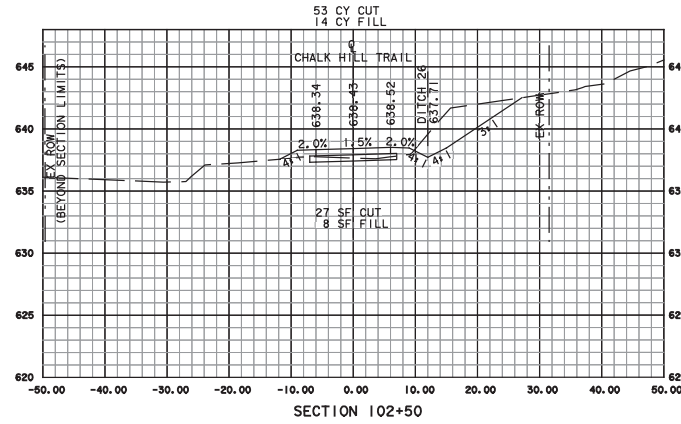
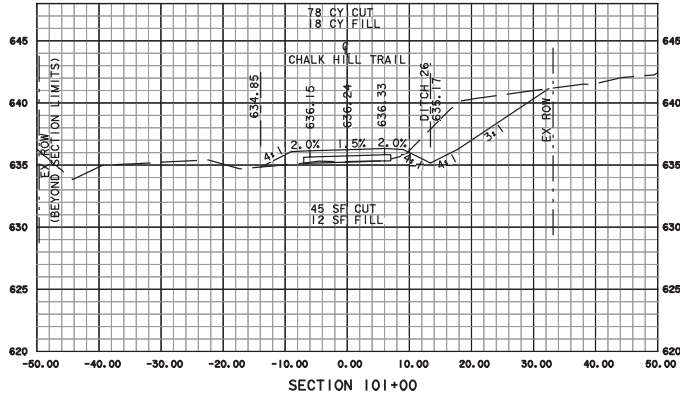


HORZ. 0 5 10 15 20
VERT. 0 5 10

SHEET TOTALS
148 CY CUT
86 CY FILL



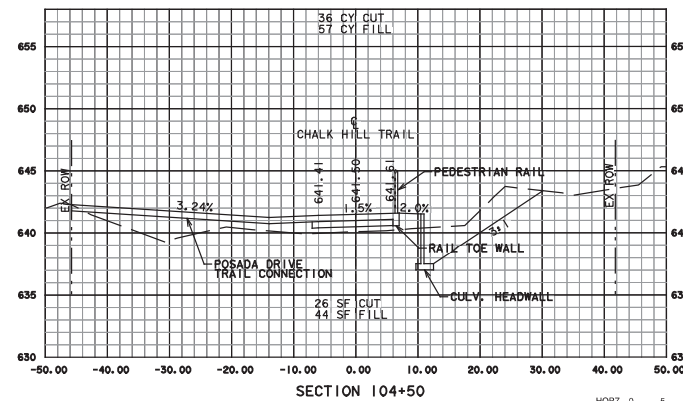
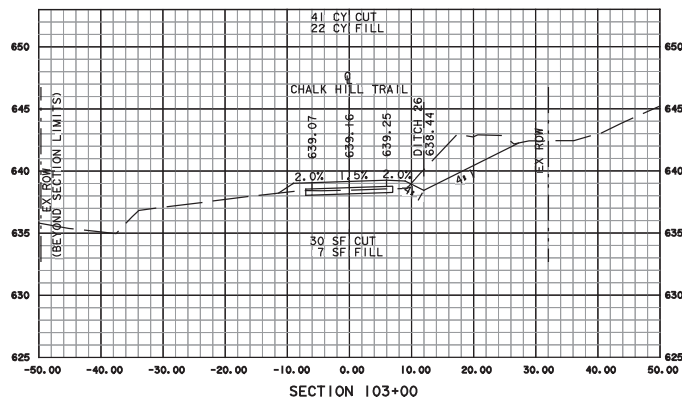
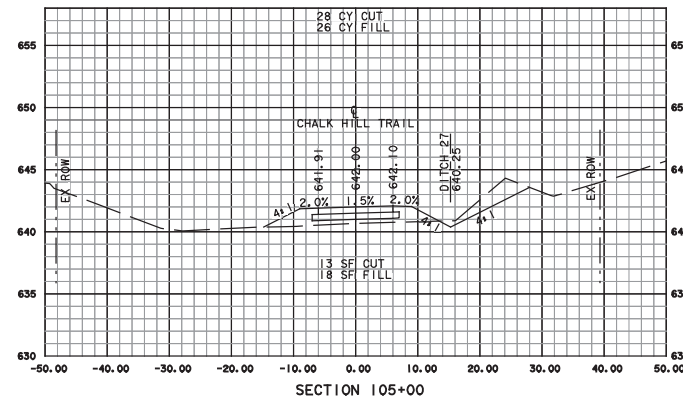
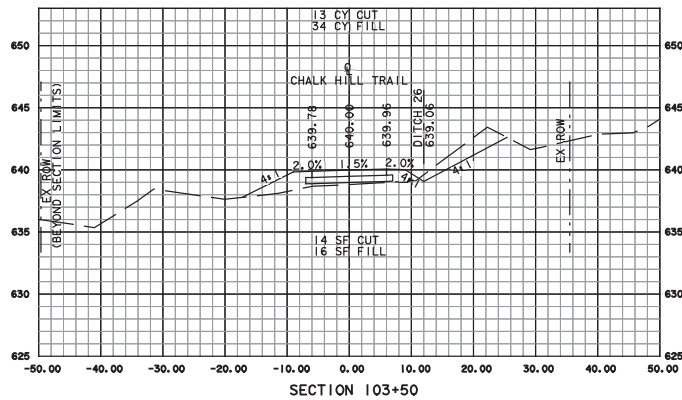
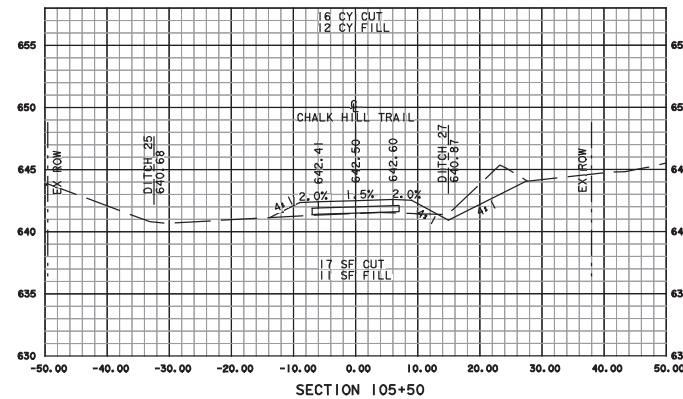
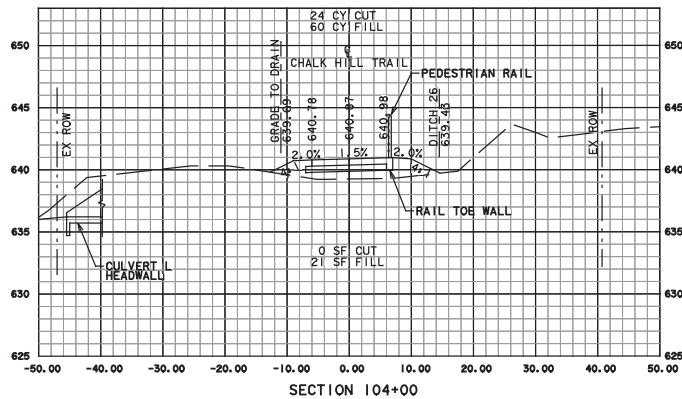
NO.			REVISIONS			BY		DATE	
		ARREDONDO, ZEPEDA & BRUNZ, LLC 12401 Cot Col Rd, Dallas, Texas 75251 (214) 341-0003 an ARDURIA Company							
FRM REGISTRATION No. F-10008									
		<i>Texas Department of Transportation</i> ©2025 by Texas Department of Transportation, all rights reserved							
CHALK HILL TRAIL CHALK HILL TRAIL CROSS SECTIONS STA 97+50 TO 99+50									
© TxDOT									
CONTROL		SECTION		JOB		HIGHWAY			
0918		47		472		VA			
DISTRICT		COUNTY				SHEET NO.			
DAL		DALLAS				146			



SHEET TOTALS
362 CY CUT
117 CY FILL



NO.	REVISIONS	BY	DATE
AZ&B ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Cole Rd. Dallas, Texas 75251 (214) 341-9900 FIRM REGISTRATION No. F-10098			
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CHALK HILL TRAIL CHALK HILL TRAIL CROSS-SECTIONS STA 100+00 TO 102+50			
© TxDOT			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	147	

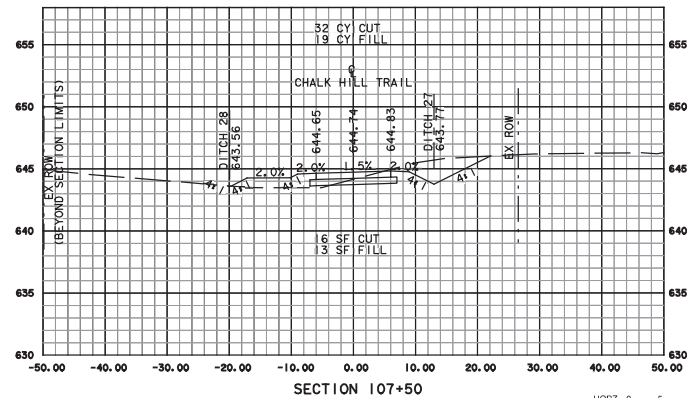
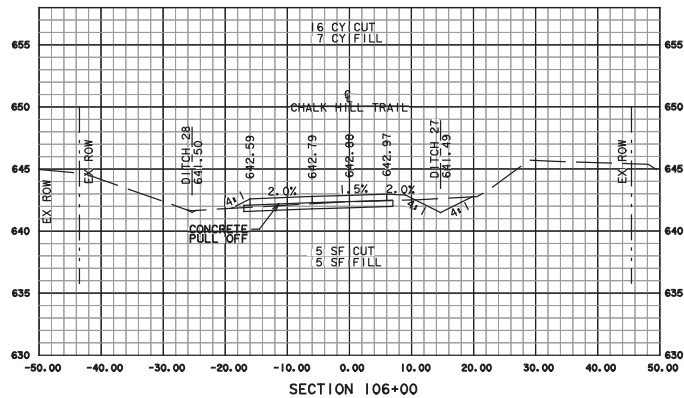
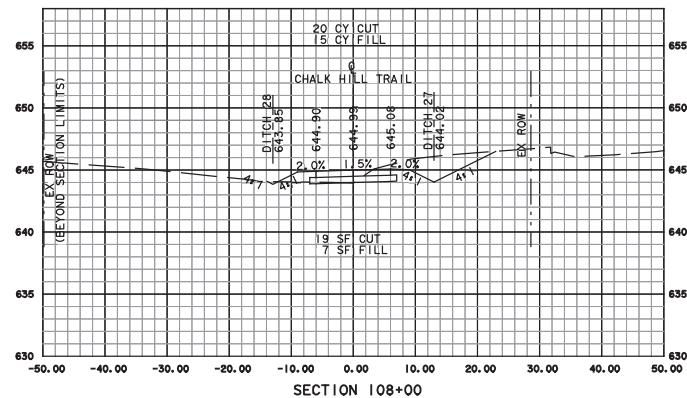
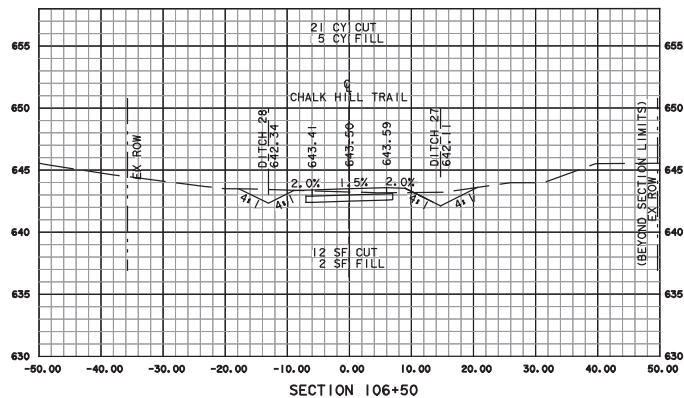
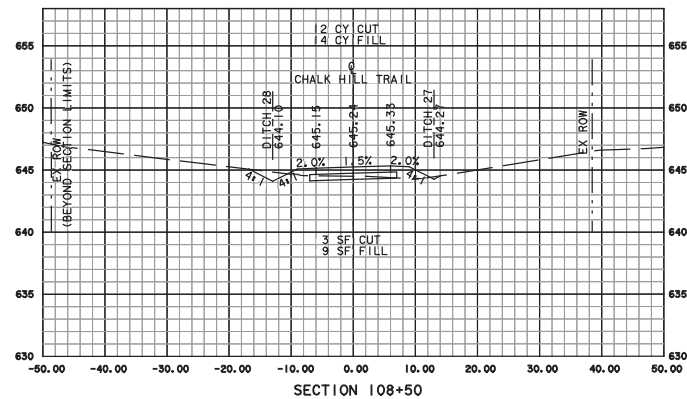
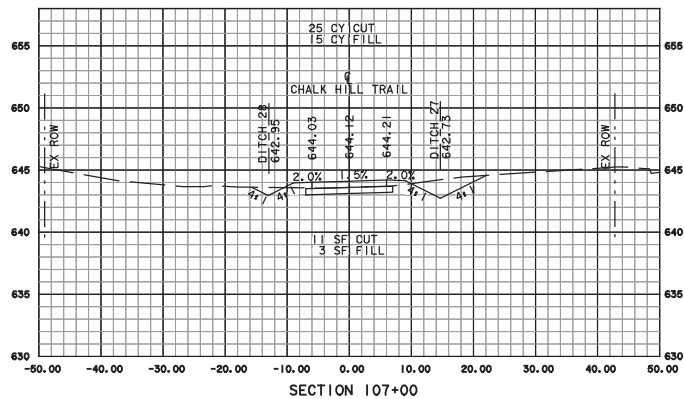


SHEET TOTALS
158 CY CUT
211 CY FILL



Steven B. Hamford
08/28/2025

NO.	REVISONS				BY		DATE		
 ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Cot Rd, Dallas, Texas 75251 (214) 344-0900 AN ARDURUS Company (FORM REGISTRATION NO. F-1008)									
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CHALK HILL TRAIL CHALK HILL TRAIL CROSS-SECTIONS STA 103+00 TO 105+50									
© txdot									
CONTROL	SECTION		JOB		HIGHWAY				
0918	47		472		VA				
DISTRICT		COUNTY				SHEET NO.			
DAL		DALLAS				148			



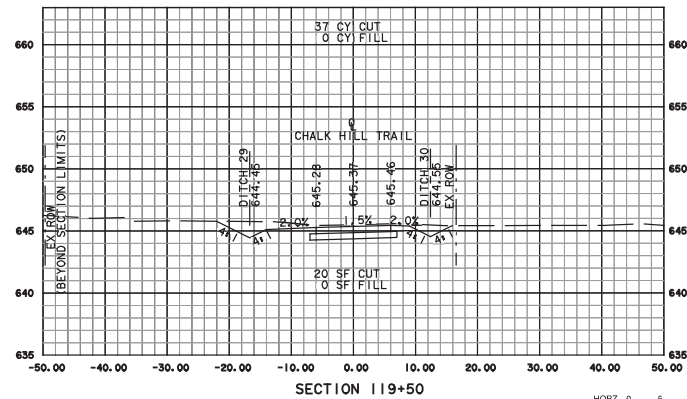
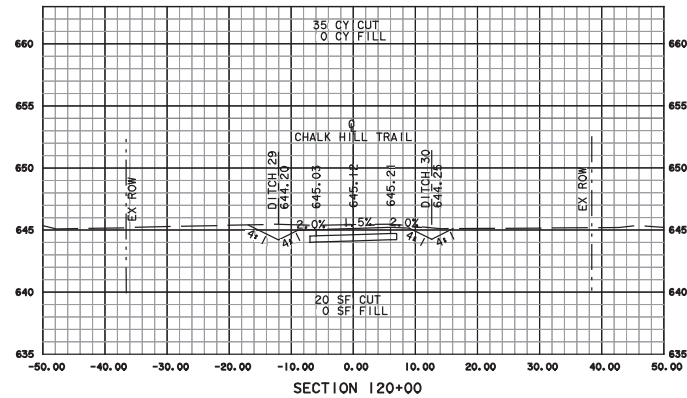
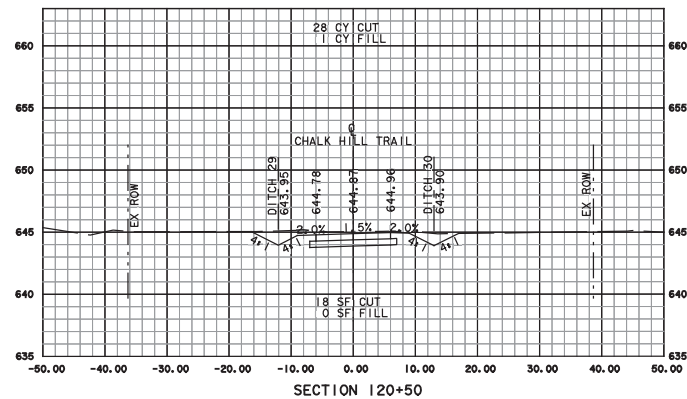
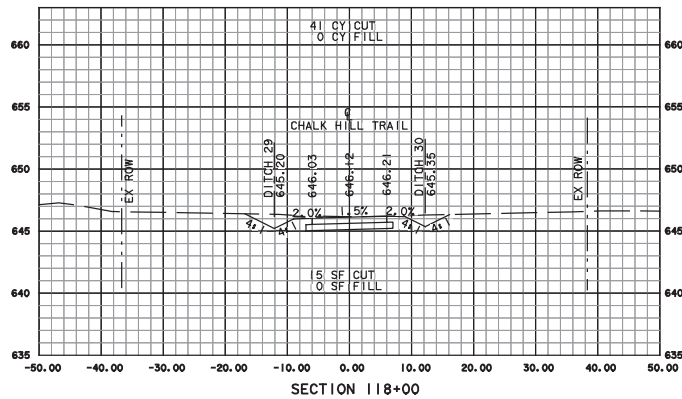
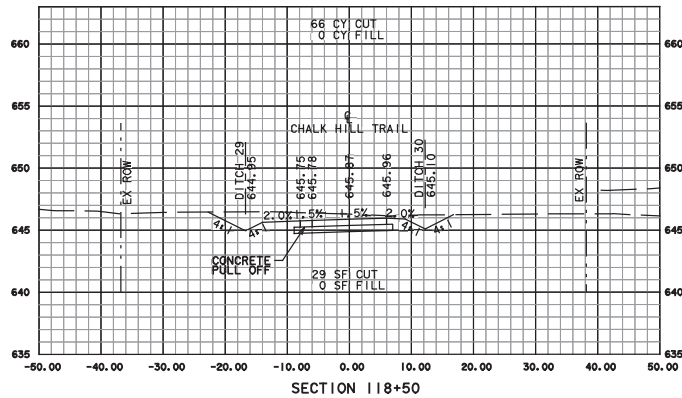
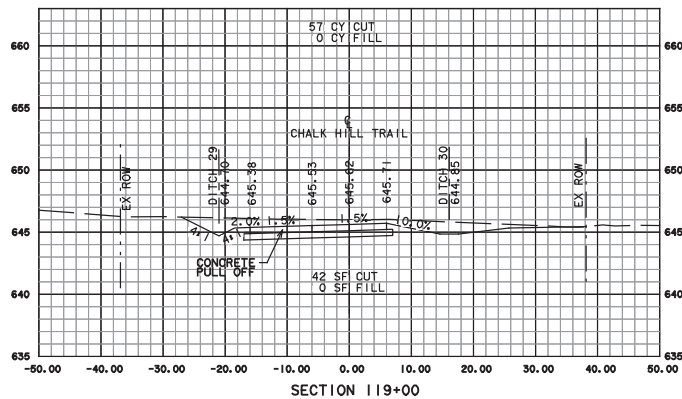
SHEET TOTALS
126 CY CUT
75 CY FILL



Steven B. Hamford
10/05/20

NO.	REVISIONS	BY	DATE
 ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Col Rd Dallas, Texas 75251 (214) 341-6000 An ARDURRA Company			
FIRM REGISTRATION NO. F-10098			
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CHALK HILL TRAIL CHALK HILL TRAIL CROSS-SECTIONS STA 106+00 TO 108+50			
			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY		SHEET NO.
DAL	DALLAS		149



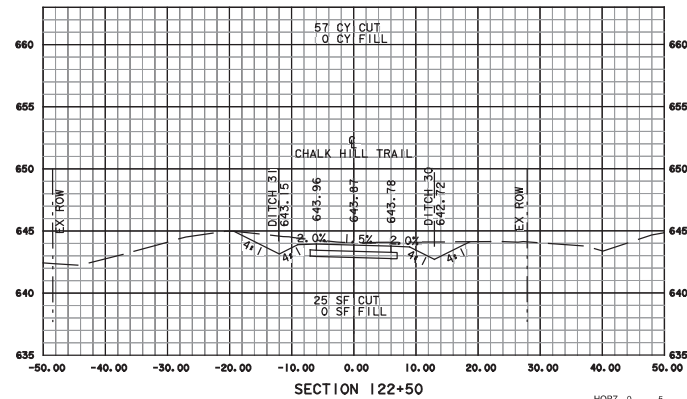
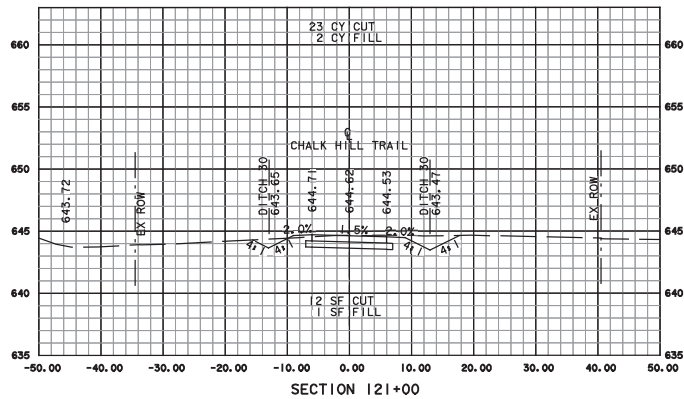
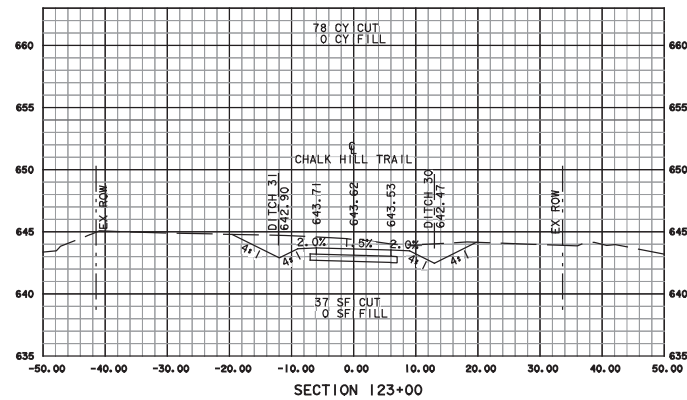
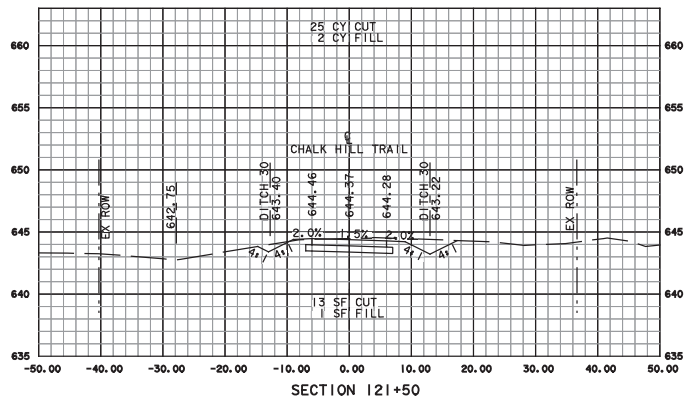
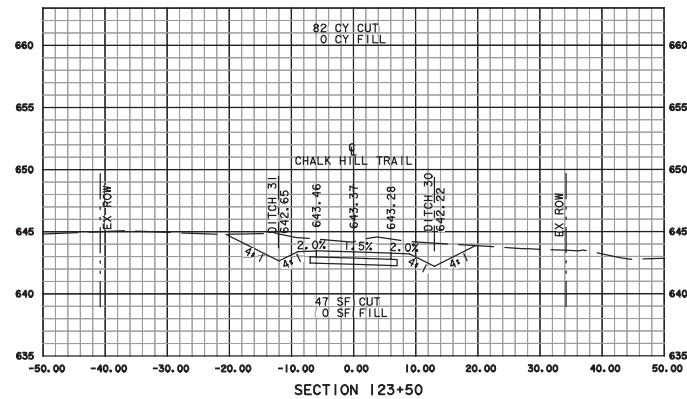
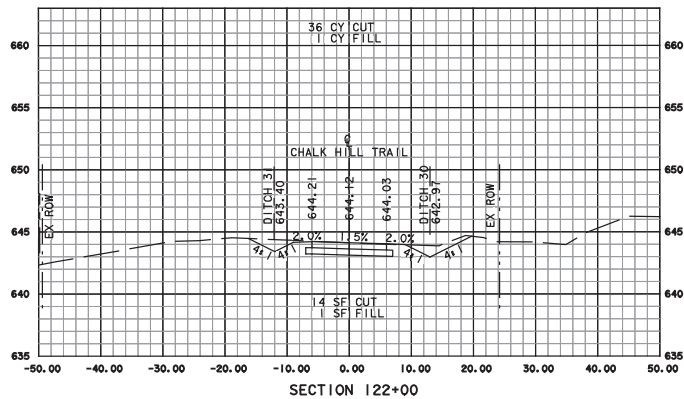


SHEET TOTALS
264 CY CUT
1 CY FILL



Steven B. Hamford
10/05/20

NO.		REVISONS				BY		DATE	
		ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Coit Rd. Dallas, Texas 75251 (214) 341-6900 An AROURA Company							
		IFRM REGISTRATION No. TC-10086							
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CHALK HILL TRAIL CHALK HILL TRAIL CROSS-SECTIONS STA 118+00 TO STA 120+50									
© TxDOT									
CONTROL		SECTION		JOB		HIGHWAY			
0918		47		472		VA			
DISTRICT		COUNTY				SHEET NO.			
DAL		DALLAS				153			

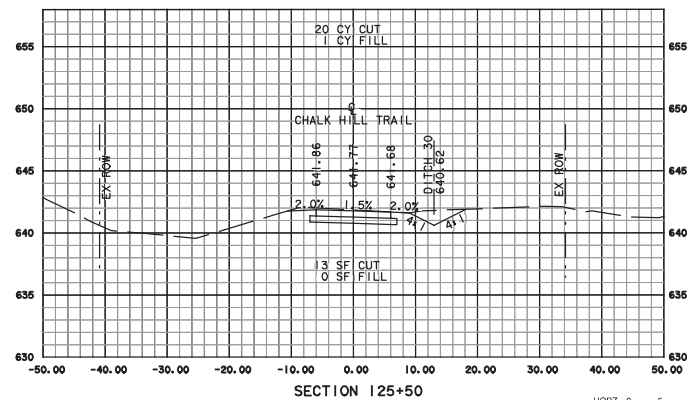
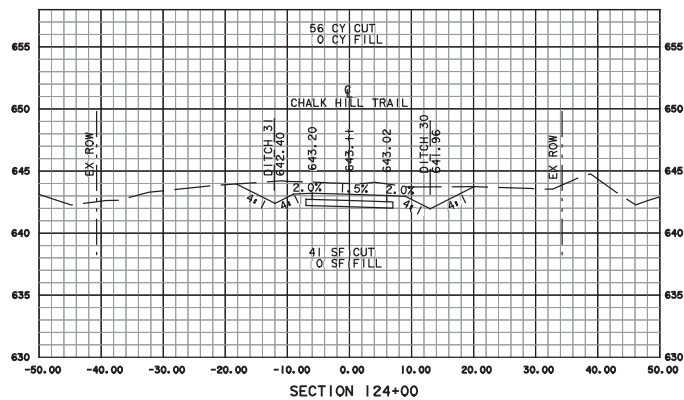
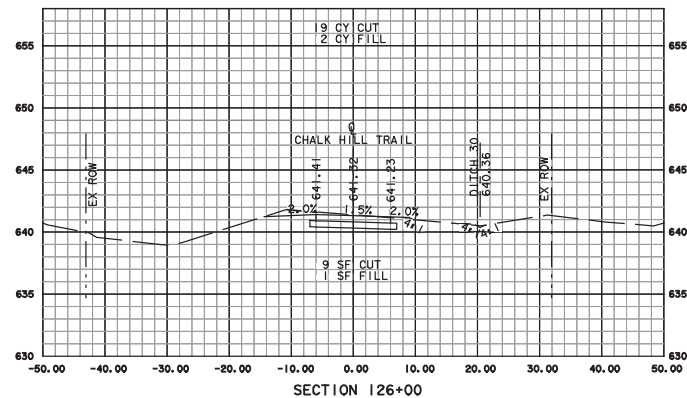
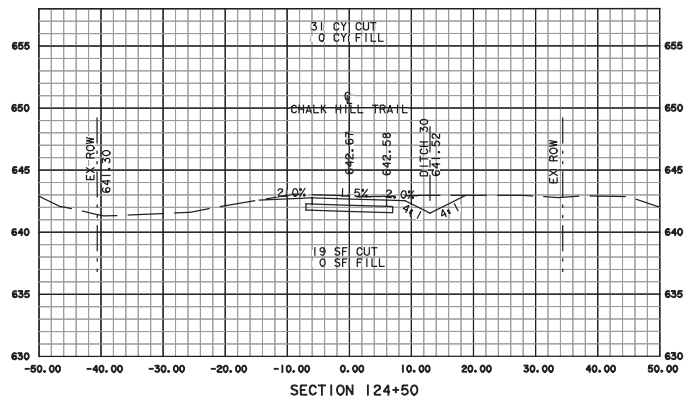
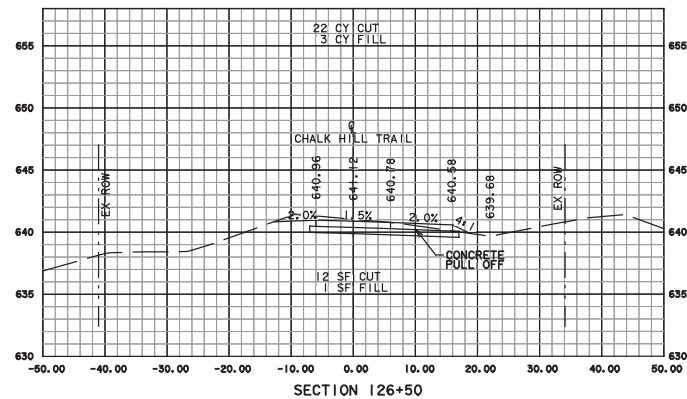
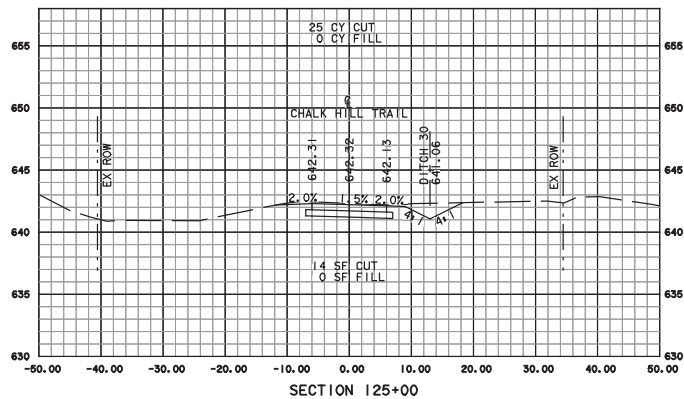


SHEET TOTALS
301 CY CUT
5 CY FILL



Steven B. Hamford
10/05/20

NO.	REVISONS	BY	DATE
 ARREDONDO, ZEPEDA & BRUNZ, LLC 12402 Cot Rd, Dallas, Texas 75251 (214) 344-0900 An ARJOURN Company (FORM REGISTRATION No. F-1009)			
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© TxDOT			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY		SHEET NO.
DAL	DALLAS		154

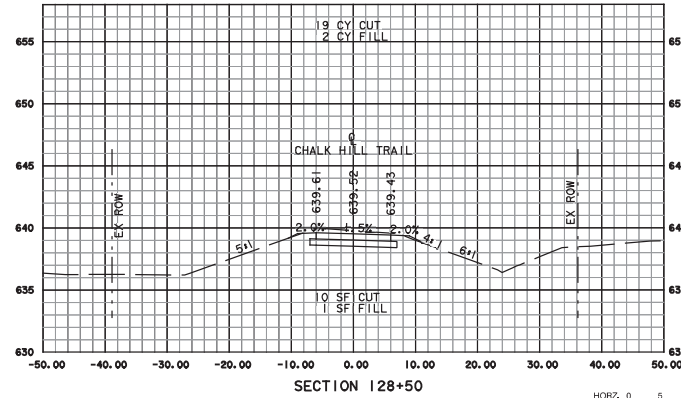
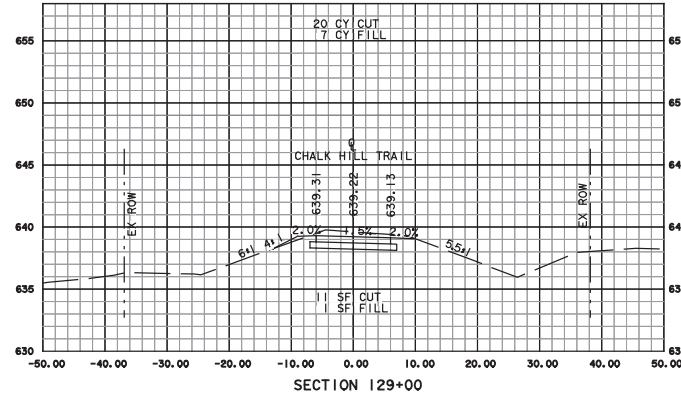
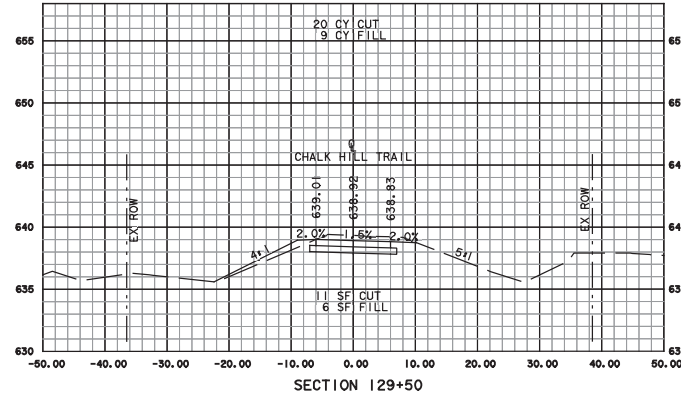
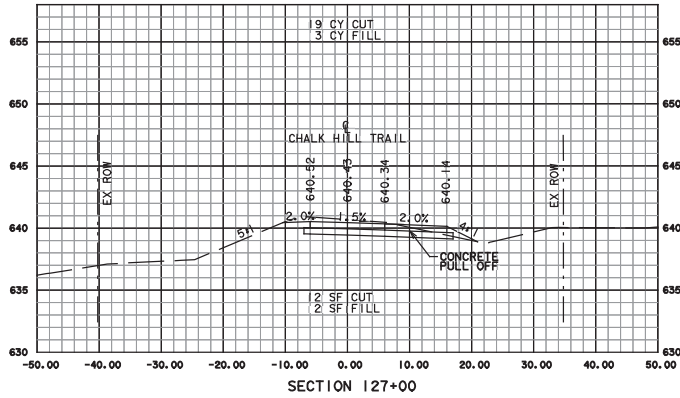
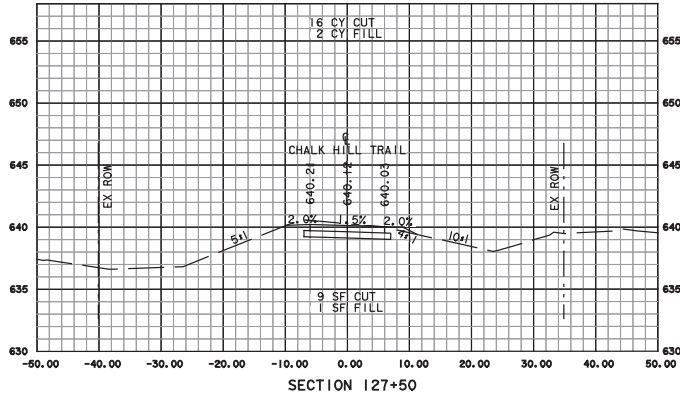
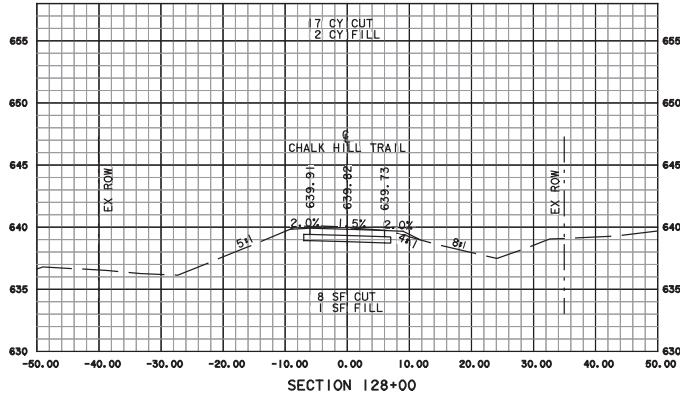


SHEET TOTALS
173 CY CUT
6 CY FILL



Steven B. Hamford
10/05/20

NO.	REVIEWS		BY	DATE
 ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Cool Rd. Dallas, Texas 75251 (214) 341-6000 An ARDURUS Company FIRM REGISTRATION No. F-10098				
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CHALK HILL TRAIL CHALK HILL TRAIL CROSS-SECTIONS STA 124+00 TO 126+50				
© TxDOT				
CONTROL	SECTION	JOB	HIGHWAY	
0918	47	472	VA	
DISTRICT	COUNTY		SHEET NO.	
DAL	DALLAS		155	



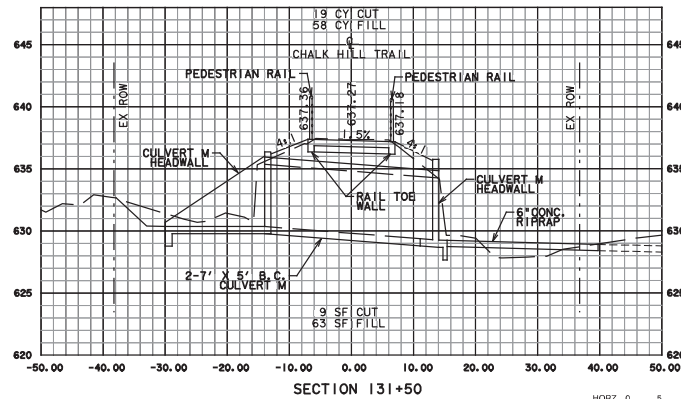
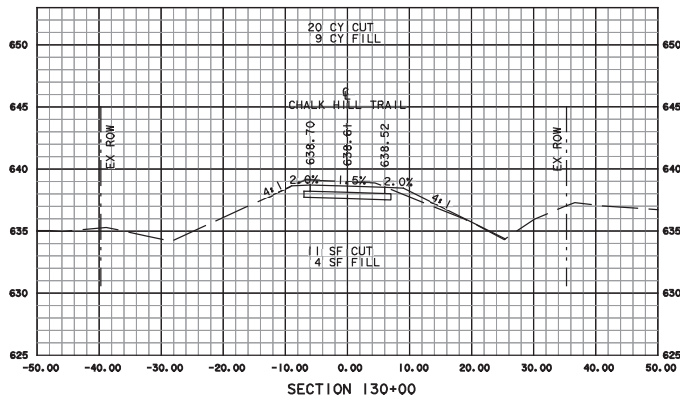
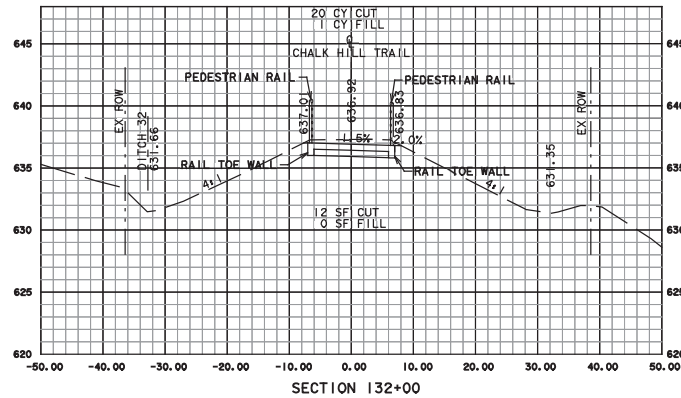
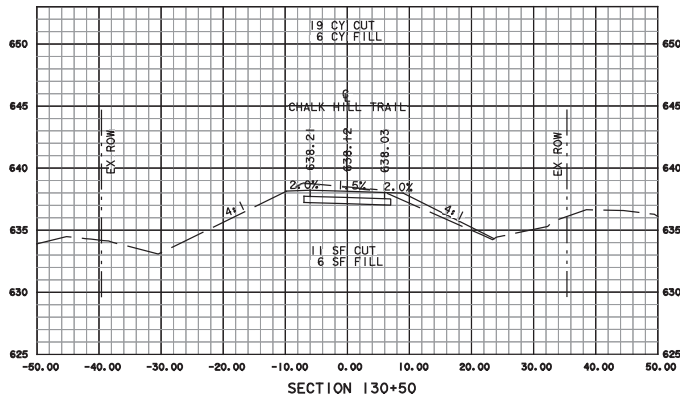
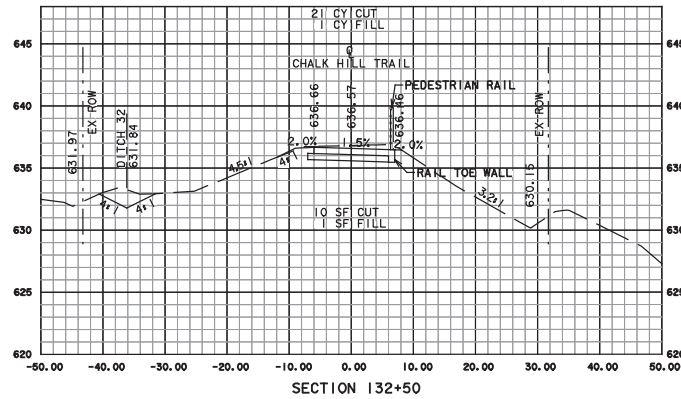
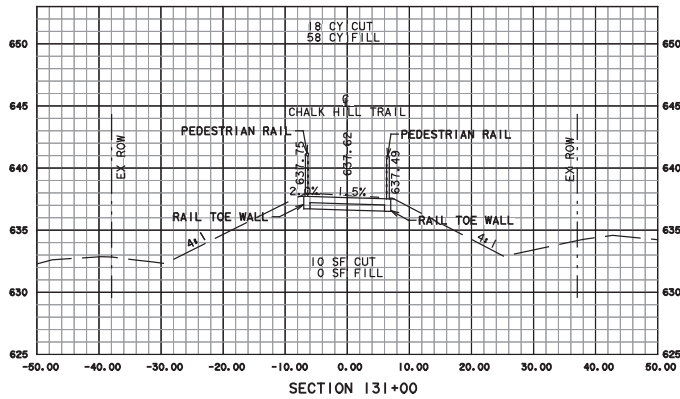
SHEET TOTALS
111 CY CUT
25 CY FILL



NO.	REVISIONS	BY	DATE
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	156	

CHALK HILL TRAIL
CHALK HILL TRAIL CROSS-SECTIONS
STA 127+00 TO 129+50

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HORZ. 0 5 10 15 20
VERT. 0 5 10

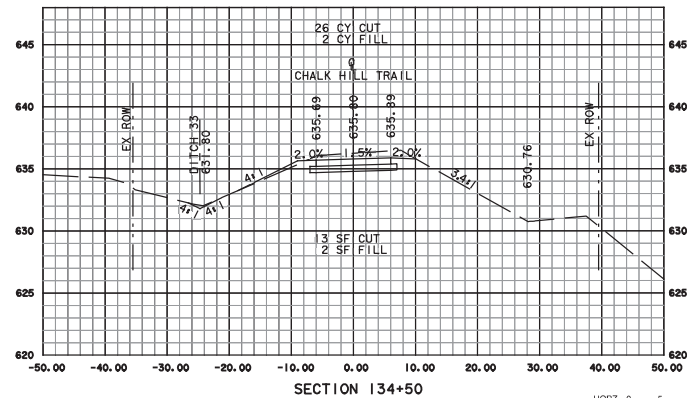
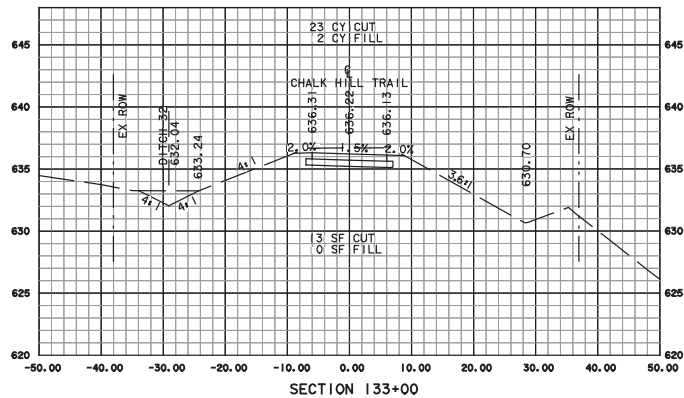
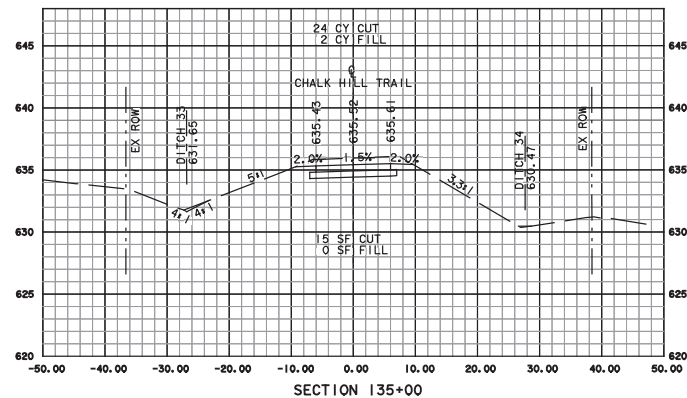
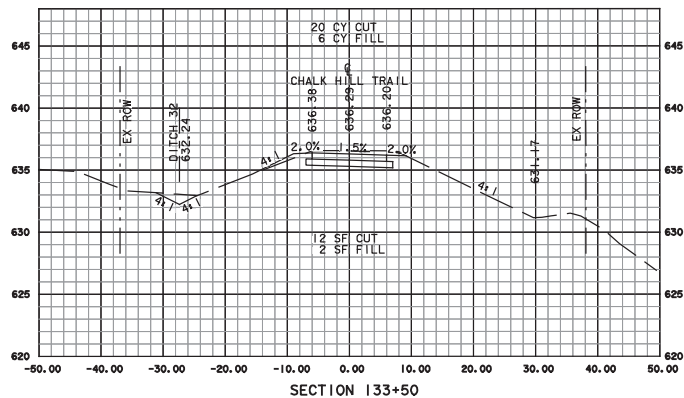
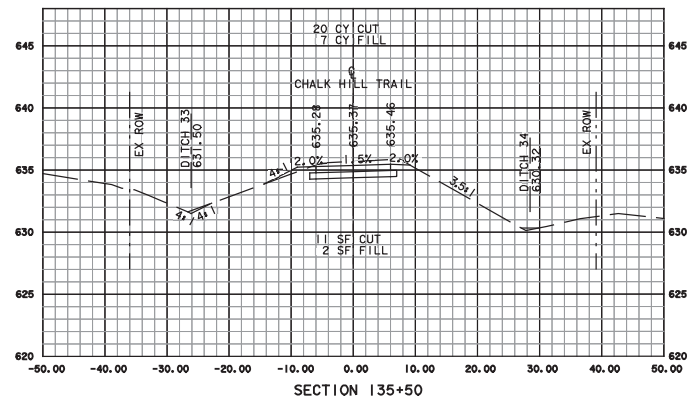
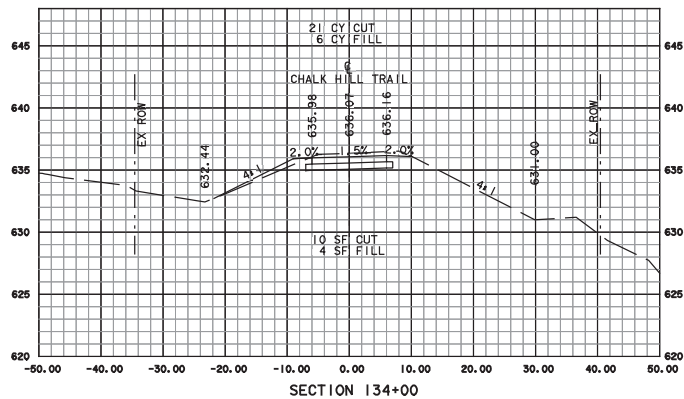
SHEET TOTALS
117 CY CUT
133 CY FILL



Steven B. Brunz
10/05/20

NO.	REVISIONS	BY	DATE
AZ&B ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Cole Rd. Dallas, Texas 75251 (214) 341-9900 FIRM REGISTRATION No. F-10098			
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CHALK HILL TRAIL CHALK HILL TRAIL CROSS-SECTIONS STA 130+00 TO 132+50			
© TxDOT			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	157	

PH1116 BAY115 D1115 BAY116



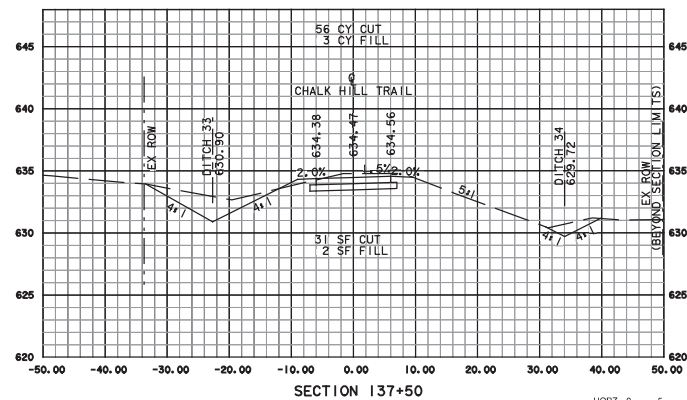
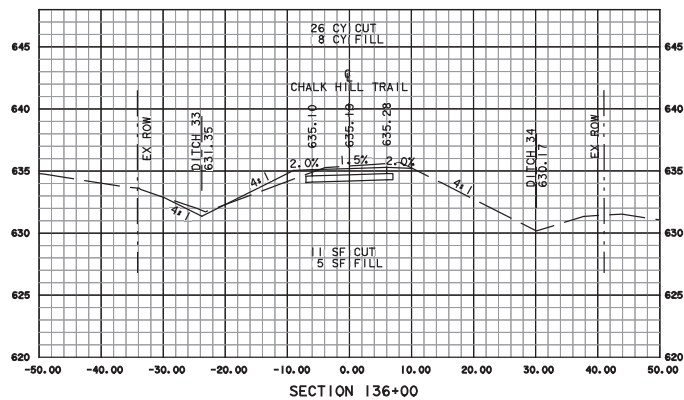
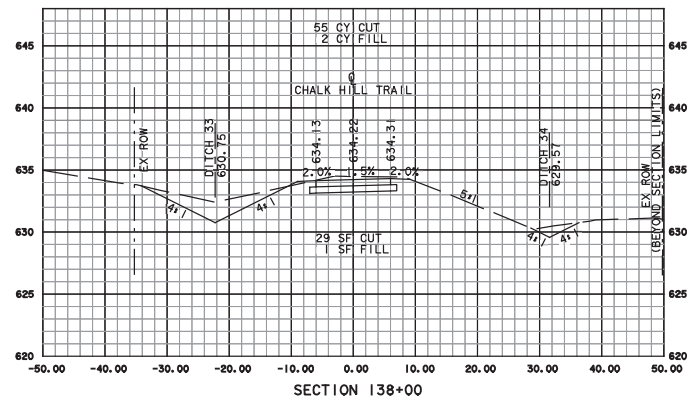
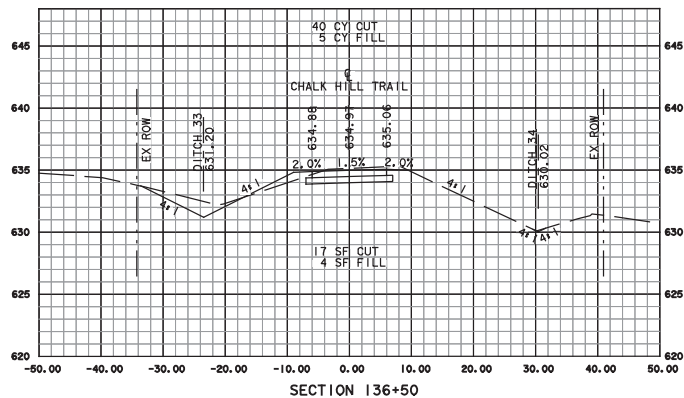
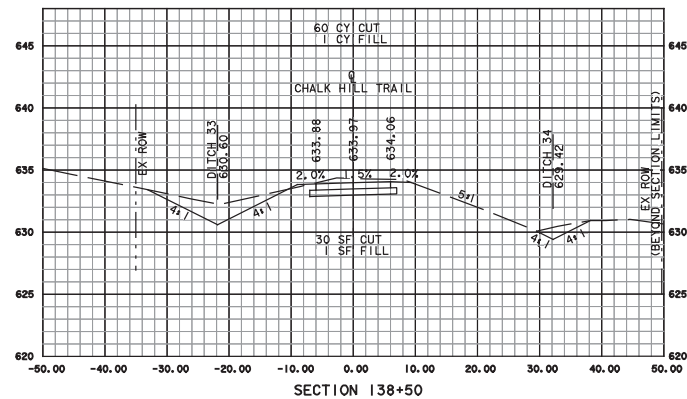
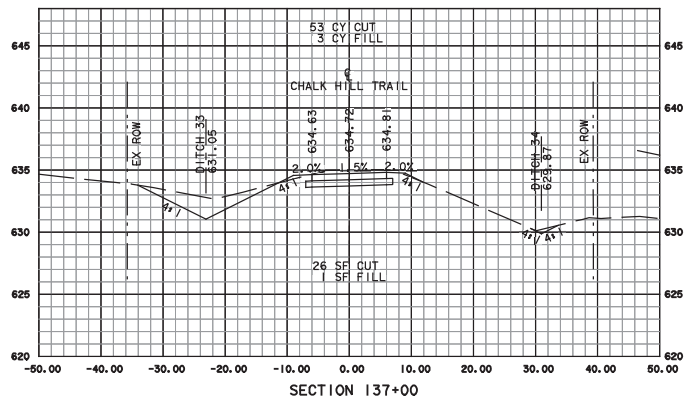
SHEET TOTALS
134 CY CUT
25 CY FILL



Steven B. Hamford
10/05/20

NO.	REVISONS	BY	DATE
 AZ&B AN ARDURIOUS Company			
124000 COIT RD. GUILLES, TEXAS 75251 (714) 341-0900 FPMR REGISTRATION No. F-10068			
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CHALK HILL TRAIL CHALK HILL TRAIL CROSS-SECTIONS STA 133+00 TO 135+50			
© TWDOT			
CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY		SHEET NO.
DAL	DALLAS		158



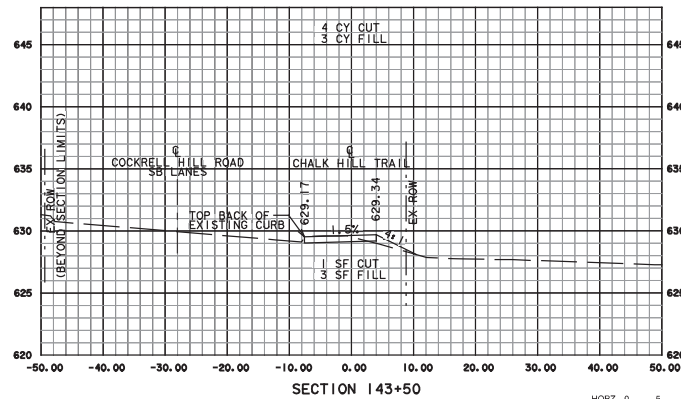
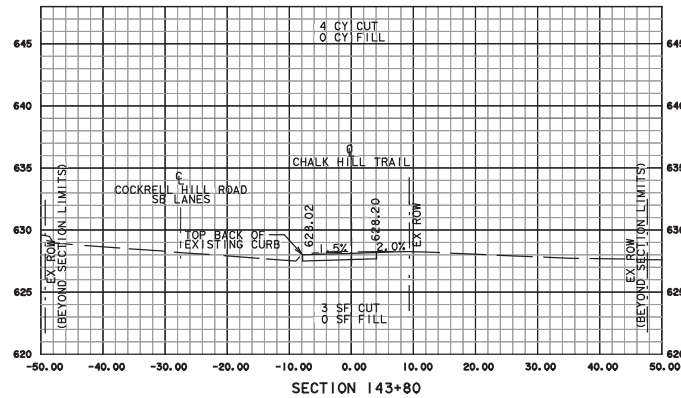
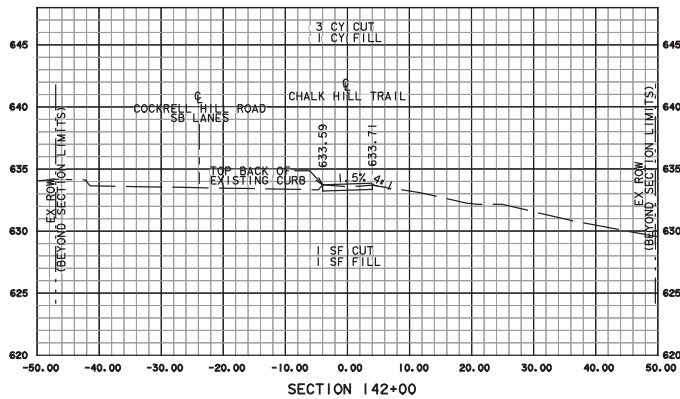
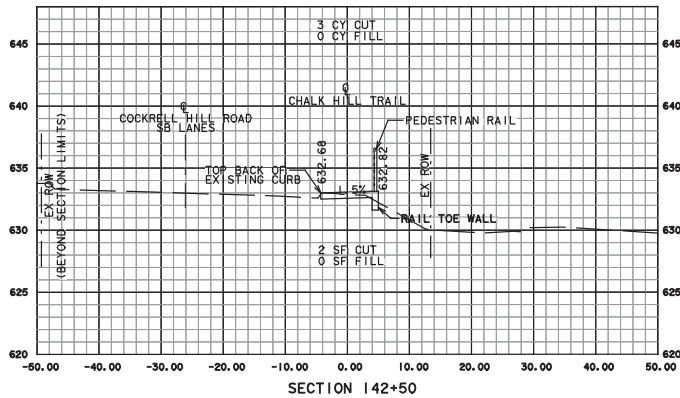
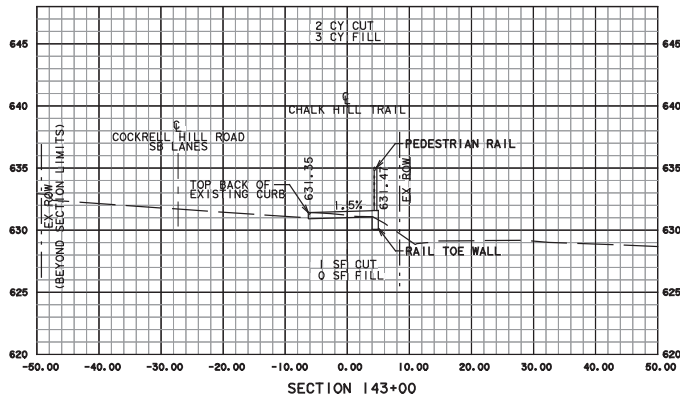


SHEET TOTALS
290 CY CUT
22 CY FILL



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10/05/20

NO.	REVISIONS	BY	DATE
 ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Coe Rd, Dallas, Texas 75251 (214) 341-4000 AN AECORUSA Company (FIRM REGISTRATION No. F-10098)			
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CONTROL	SECTION	JOB	HIGHWAY
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DISTRICT	COUNTY		SHEET NO.
DAL	DALLAS		159



SHEET TOTALS
16 CY CUT
7 CY FILL



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10/05/20

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AZ&B ARREDONDO, ZEPEDA & BRUNZ, LLC 12400 Coit Rd. Dallas, Texas 75251 (214) 341-2900 An ARDURRA Company FIRM REGISTRATION No. F-10098			
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CONTROL	SECTION	JOB	HIGHWAY
0918	47	472	VA
DISTRICT	COUNTY	SHEET NO.	
DAL	DALLAS	161	



Thank you for your interest in our procurement opportunities; we welcome your response. Please carefully review and comply with all specifications and requirements. **If you require technical assistance, please contact the BidNet Support Team at 800-835-4603, option 2.**

Addendum Description

Addressed through attached Addendum

Notice Modifications

Notice Information	From Value	To Value
No entries		

Category Modifications

Added Categories
No Categories Added

Removed Categories
No Categories Removed

Added Documents[A]

Document	Size	Uploaded Date	Language
Addendum No. 1.docx [docx]	155 Kb	11/21/2025 02:45 PM CST	English
Construction Plans_Chalk Hill Phase 1-TAPP Project 90155.pdf [pdf]	66 Mb	11/21/2025 02:46 PM CST	English

Questions & Answers

Buyer Organization Dallas County
Question Acceptance Deadline 01/02/2026 10:00 AM CST
Closing Date 01/15/2026 02:00 PM CST

No	Vendor Name	Question/Answer	Question Date Answer Date
Q1	3i Construction Management LLC	Question: Estimated value of project (by <i>Ben Sepehripour</i>) What is the estimated value of the project?	11/19/2025 03:46 PM CST
		Public Answer: (by <i>Marina Valley</i>) Addressed through attached Addendum 1	Ready for Publication
Q2	Hearn Company	Question: Estimated Cost (by <i>Kris Hearn</i>) Is an estimated cost available?	11/20/2025 10:23 AM CST
		Public Answer: (by <i>Marina Valley</i>) Addressed through attached Addendum 1	Ready for Publication