

FINAL PLANS

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

SEE INDEX SHEET 002

STATE OF TEXAS DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT NO.: F2024 054

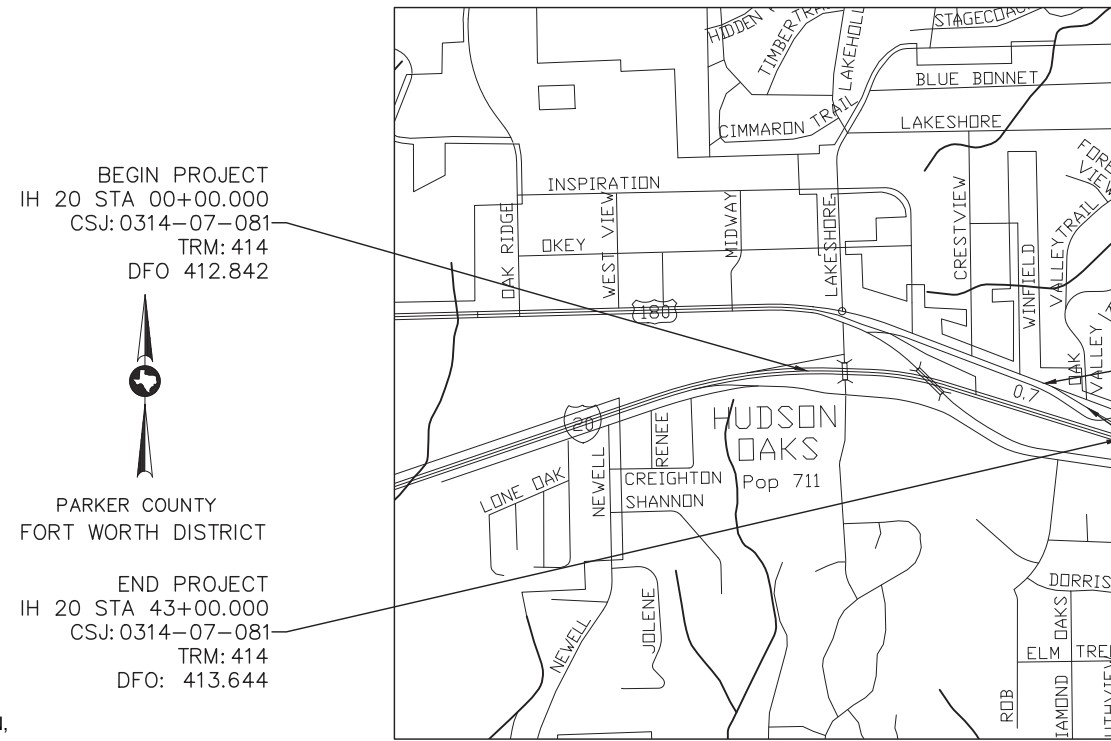
IH-20, ETC. PARKER COUNTY

LIMITS: FROM: EXIT 411 TO EXIT 414
 LENGTH OF CSJ: 0314-07-081 I-20 PROJECT = 4,350FT = 0.83 MI
 LENGTH OF CSJ: 0008-03-138 US 180 PROJECT = 550FT = 0.10 MI
 TOTAL LENGTH: 4,900FT = 0.93 MI

FOR THE CONSTRUCTION OF LANDSCAPE & SCENIC ENHANCEMENT WORK
 CONSISTING OF PLANTING AND IRRIGATION IMPROVEMENTS

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
GRAPHICS	6	F2024 054		IH-20
CHECK	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	FTW	PARKER	001
	CONTROL	SECTION	JOB	
	0314	07	081, Etc.	

DESIGN SPEED = 70 MPH IH20
 DESIGN SPEED = 45 MPH US 180



BEGIN PROJECT
 IH 20 STA 00+00.000
 CSJ: 0314-07-081
 TRM: 414
 DFO 412.842

PARKER COUNTY
 FORT WORTH DISTRICT

END PROJECT
 IH 20 STA 43+00.000
 CSJ: 0314-07-081
 TRM: 414
 DFO: 413.644

BEGIN PROJECT
 US 180 STA 00+00.000
 CSJ: 0008-03-138
 TRM: 554
 DFO: 300.537

END PROJECT
 US 180 STA 5+50.000
 CSJ: 0008-03-138
 TRM: 554
 DFO: 300.826

EXCEPTIONS: NONE
 EQUATIONS: NONE
 RAILROADS: NONE



SUBMITTED FOR LETTING: 08/15/2023
 _____, R.L.A.
 CONSULTANT DESIGN ENGINEER OR PROJECT MANAGER

LANDSCAPE MAINTENANCE AGREEMENT (LMA) NUMBER:
 02-Hudson Oaks-LMA-0001-091923

NOTE:
 SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014 AND THE CONTRACT PROVISIONS LISTED AND DATED AS FOLLOWS SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, OCTOBER 23, 2023).



WORK WAS COMPLETED ACCORDING TO THE PLANS AND CONTRACT.

Final Plans Only _____, P.E.
 Signature of Registrant & Date



CONCURRENCE FOR LETTING: 8/15/2023
 DocuSigned by:
 Sterling Adams
 F5415AAC375143D...

RECOMMENDED FOR LETTING: 8/21/2023
 DocuSigned by:

 7879B0B92E55403... DIRECTOR OF TP&D

SUBMITTED FOR LETTING: 8/15/2023
 DocuSigned by:
 Corey D. Colwell, P.E.
 6538CC6BE43A... AREA ENGINEER

APPROVED FOR LETTING: 8/21/2023
 DocuSigned by:
 David M Salazar, P.E.
 B741E64A... DISTRICT ENGINEER

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 006 QUANTITY SUMMARY
 006a ASSET MAINTENANCE

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SHEET NO. DESCRIPTION

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 037-042 PLANTING PLAN
 043 PLANTING DETAILS
 044-049 IRRIGATION PLAN
 050 IRRIGATION DETAILS

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ON THIS PAGE (*) HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

Mark C. Schluter 08/15/2023
 MARK C. SCHLUTER, P.E. DATE

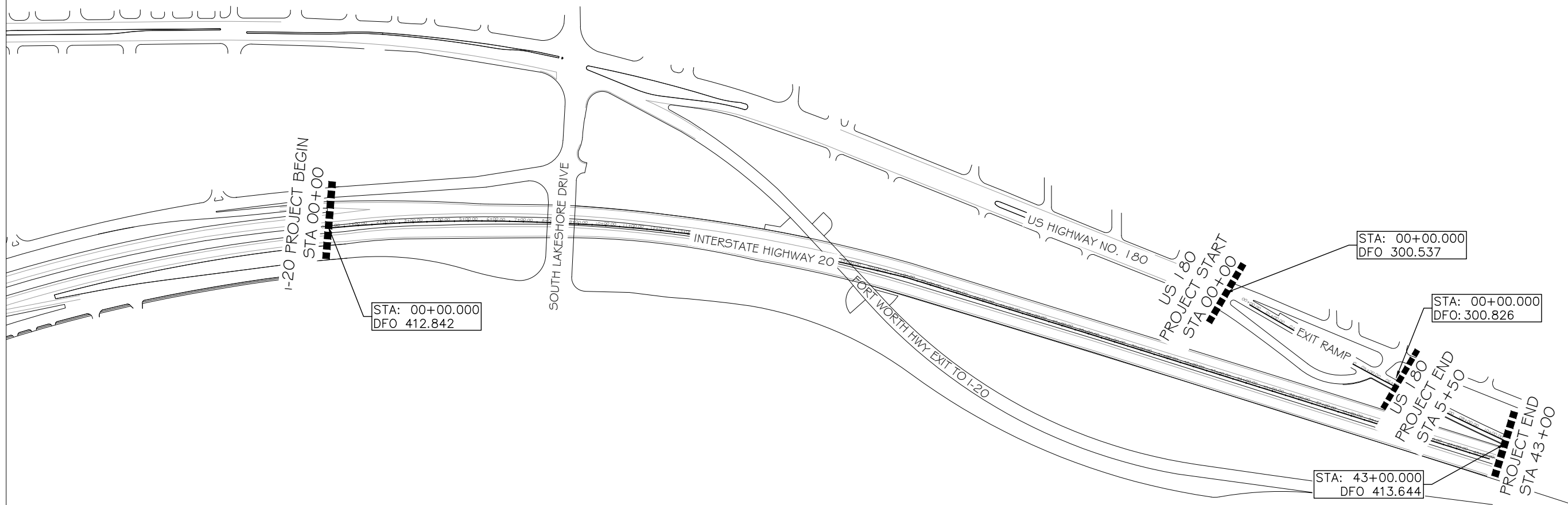
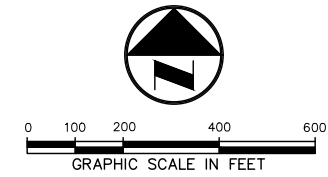
Pacheco Koch | 4060 BRYANT IRVIN ROAD
 FORT WORTH, TX 76109
 817.412.7155
 a Westwood company
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 Texas Department of Transportation

INDEX OF SHEETS

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	SEE SHEET 1	002
STATE	DISTRICT	COUNTY
TEXAS	FTW	PARKER
CONTROL	SECTION	JOB
0314	07	081
		HIGHWAY NO
		IH-20



TX REG. ENGINEERING FIRM F-469
 TX REG. SURVEYING FIRM LS-10008001



1 GENERAL LAYOUT

GENERAL NOTE:
 TXDOT HAS FIBER OPTIC CABLE IN THIS AREA. CONTACT TXDOT SIGNAL SHOP AT 817-370-3664 TO REQUEST LOCATES PRIOR TO BEGINNING ANY EXCAVATION IN THE AREA OF EXISTING UTILITIES TO PREVENT ANY DAMAGE OR INTERFERENCE WITH PRESENT FACILITIES. THE CONTRACTOR IS RESPONSIBLE FOR UTILITY COORDINATION AND LOCATES. IF THE FIBER OPTIC CABLE AND OTHER CABLE SYSTEMS ARE DAMAGED DURING CONSTRUCTION, REPLACE OR REPAIR THE DAMAGED CABLES, AS DIRECTED BY THE ENGINEER AT CONTRACTOR'S OWN EXPENSE. THE REPLACEMENT OR REPAIR METHOD MUST BE APPROVED BY THE ENGINEER, PRIOR TO IMPLEMENTATION. REPAIR THE DAMAGED CABLES WITHIN 4 HOURS WITH THE CONTRACTOR'S OWN FORCE OR BE RESPONSIBLE TO PAY A THIRD PARTY FOR THE REPAIR. DEPENDING ON THE SEVERITY OF THE DAMAGE, REPLACE THE DAMAGED FIBER, AS DIRECTED BY THE ENGINEER AT THE CONTRACTOR'S OWN EXPENSE.

Pacheco Koch 4060 BRYANT IRVIN ROAD
 FORT WORTH, TX 76109
 817.412.7155
 a Westwood company

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TX REG. ENGINEERING FIRM F-469
 TX REG. SURVEYING FIRM LS-10008001

GENERAL LAYOUT OVERVIEW

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	SEE SHEET 1	003	
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY NO.
0314	07	081	IH-20

DJW/MYER
 06/22/2023 - 9:21PM
 N: \\DWG-53\5356-23\02\DWG\LANDSCAPE.FX 2018\SHEETS\TITLE SHEET.DWG

JUNE 2023 - 95% PLAN SUBMITTAL

Control: 0314-07-081, Etc.

County: PARKER

Highway: IH 20

Special Notes

Electronic files containing answered pre-letting questions and other project related design information will be placed in the following FTP site periodically.

Check this site for new information. Notices of new postings will not be sent out by the Engineer.

The data located in these files is for non-construction purposes only and can be found at TxDOT's public FTP site at <https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting Responses/>.

Access is read-only.

All files in the FTP site are subject to the License Agreement shown on the FTP site.

To obtain a copy of the project plans free of charge, submit a request from the following site: <http://www.txdot.gov/business/letting-bids/plans-online.html>

Contractor questions on this project are to be addressed to the following individual(s):

Area Engineer's Email: Korey.Coburn@txdot.gov
Assistant Area Engineer's Email: Gary.Beck@txdot.gov
Design Manager's Email: Chadwick.Dabbs@txdot.gov

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

For Q&A's on Proposals navigate to <https://tableau.txdot.gov/views/ProjectInformationDashboard/NoticetoContractors>. Use the dashboard to navigate to the project you are interested in by scrolling or filtering the dashboard using the controls on the left. Hover over the blue hyperlink for the project you want to view the Q&A for and click on the link in the window that pops up.

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

Contract Prosecution: Each contract awarded by the Department stands on its own, and as such, is separate from other contracts. A contractor awarded multiple contracts must be capable and sufficiently staffed to concurrently process and/or execute all contracts at the same time.

Control: 0314-07-081, Etc.

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Highway: IH 20

Single lane closures, except as otherwise shown in the plans, will be restricted to off-peak hours as defined in the following table:

Peak Hours		Off-Peak Hours	
6 to 9 AM Monday through Friday	3 to 7 PM Monday through Friday	9 AM to 3 PM and 7 PM to 6 AM Monday through Friday	All day Saturday and Sunday

Work that requires closure of multiple travel lanes in the same direction, except as otherwise shown in the plans, are restricted to night hours between 9 PM and 6 AM.

Existing storm sewers and utilities are shown from the best available information. Verify the location of all underground facilities prior to starting work.

For dimensions of right-of-way not shown on the plans, see right-of-way map on file at the TxDOT District Office.

Modifications to Lane Closure / Work Restrictions:

Submit a request in writing for approval by the Engineer a minimum of 10 days in advance of implementing a change to lane closure restrictions.

When deemed necessary, the Engineer will lengthen, shorten, or otherwise modify lane closure restrictions as traffic conditions warrant.

When deemed necessary, the Engineer will modify the list of major events when new events develop, existing events are rescheduled, or when warranted.

Remove any obstructions to existing drainage due to the contractor's operations, as required, at the contractor's expense.

Special Events/ Special Situations will be handled on a case-by-case basis. No work restricting lane closures is allowed from 3 PM a day before to 9 AM the day after the Special Event or Special Situation.

Item 4. Scope of Work

Reimbursement for project overhead will not be considered until project completion has extended beyond the original Contract Time.

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County: PARKER

Highway: IH 20

Item 5. Control of the Work

When supplementary bridge plans, shop drawings, shop details, erection drawings, working drawings, forming plans, or other drawings are required, prepare and submit drawings on sheets 8-1/2 by 11 inches, 17 by 22 inches, or full size drawings reduced to half scale if completely legible. If, in the opinion of the Engineer, the drawings are not completely legible, prepare and submit on sheets 22 by 34 inches, with a 1-1/2 inch left margin, and 1/2 inch top, right, and bottom margins.

Submit all sheets with a title in the lower right hand corner. The title must include the sheet index data shown on the lower right corner of the project plans, name of the structure or element or stream, sheet numbering for the shop drawings, name of the fabricator and the name of the Contractor.

Item 6. Control of Materials

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

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

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

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

Item 7. Legal Relations and Responsibilities

Do not initiate activities in a project specific location (PSL) associated with a U.S. Army Corps of Engineers (USACE) permit area that has not been previously evaluated by the USACE as part of the permit review of this project. Such activities include, but are not limited to haul roads, equipment staging areas, borrow and disposal sites. "Associated" as defined here means materials are delivered to or from the PSL. The permit area includes all waters of the U.S. or associated wetlands affected by activities associated with this project. Special restrictions may be required for such work. The contractor will be responsible for all consultations with the USACE regarding activities, including project specific locations (PSLs) that have not been previously evaluated by the USACE. Provide the Department with a copy of all consultations or approvals from the USACE prior to initiating activities.

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Highway: IH 20

The Contractor may proceed with activities in PSLs that do not affect a USACE permit area if a self-determination has been made that the PSL is non-jurisdictional or proper USACE clearances have been obtained in jurisdictional areas or have been previously evaluated by the USACE as part of the permit review of this project. The contractor is solely responsible for documenting any determinations that their activities do not affect a USACE permit area. Maintain copies of these determinations for review by the Department or any regulatory agency.

Document and coordinate with the USACE, if required, prior to any excavation hauled from or embankment hauled into a USACE permit area by either (1) or (2) below.

- (1) **Restricted Use of Materials for Previously Evaluated Permit Areas.** Document both the project specific location (PSL) and its authorization. Maintain copies for review by the Department or any regulatory agency. When an area within the project limits has been evaluated by the USACE as part of the permit process for this project:
 - a. Suitable excavation of required material in the areas shown on the plans and cross sections as specified in Item 110 is used for permanent or temporary fill (Item 132, Embankment) within a USACE permit area;
 - b. Suitable embankment (Item 132) from within the USACE permit area is used as fill within a USACE evaluated area; and
 - c. Unsuitable excavation or excess excavation ["Waste"] (Item 110) that is disposed of at a location approved by the Engineer within a USACE evaluated area.
- (2) **Contractor Materials from Areas Other than Previously Evaluated Areas.** Provide the Department with a copy of all USACE coordination or approvals prior to initiating any activities for an area within the project limits that has not been evaluated by the USACE or for any off right of way locations used for the following:
 - a. Item 132, Embankment, used for temporary or permanent fill within a USACE permit area; and
 - b. Unsuitable excavation or excess excavation ["Waste"] (Item 110, Excavation) that is disposed of outside a USACE evaluated area.

The total area disturbed for this project is .48 acres. The disturbed area in this project, all project locations in the Contract, and the Contractor project specific locations (PSLs), within 1 mile of the project limits, for the Contract will further establish the authorization requirements for storm water discharges. The Department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. The Contractor is to obtain required authorization from the TCEQ for Contractor PSLs for construction support activities on or off the right of way. When the total area disturbed in the Contract and PSLs within 1 mile of the project limits exceeds 5 acres, provide a copy of the Contractor NOI for PSLs on the right of way to the Engineer and to the local government that operates a separate storm sewer system.

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Highway: IH 20

Prevention of Migratory Bird Nesting

It is anticipated that migratory birds, a protected group of species, may try to nest on bridges, culverts, vegetation, or gravel substrate, at any time of the year. The preferred nesting season for migratory birds is from February 15 through October 1. When practicable, schedule construction operations outside of the preferred nesting season. Otherwise, avoid nests containing migratory birds and perform no work in the nesting areas until the young birds have fledged.

The following Holiday/Event lane closure restriction requirements apply to this project: No work that restricts or interferes with traffic shall be allowed between 3 PM on the day preceding a Holiday or Event and 9 AM on the day after the Holiday or Event.

Holiday Lane Closure Restrictions	
New Year's Eve and New Year's Day (December 31 through January 1)	3 PM December 30 through 9 AM January 2
Easter Holiday Weekend (Friday through Sunday)	3PM Thursday through 9 AM Monday
Memorial Day Weekend (Friday through Monday)	3 PM Thursday through 9 AM Tuesday
Independence Day (July 3 through July 5)	3 PM July 2 through 9 AM July 6
Labor Day Weekend (Friday through Monday)	3 PM Thursday through 9 AM Tuesday
Thanksgiving Holiday (Wednesday through Sunday)	3 PM Tuesday through 9 AM Monday
Christmas Holiday (December 23 through December 26)	3 PM December 22 through 9 AM December 27

Plan work schedules around the appropriate dates above to ensure productive work is performed without lane closures.

Event Lane Closure Restrictions	
3 PM the day before Event to 9 AM the day after the Event	
Weatherford Peach Festival	

Item 8. Prosecution and Progress

Working days will be computed and charged in accordance with Section 8.3.1.1, 'Five-Day Workweek.'

Control: 0314-07-081, Etc.

County: PARKER

Highway: IH 20

Item 100. Preparing Right of Way

Measurement for this item will be along the centerline of the project with the limits of measurements as shown on the plans.

Mow all existing vegetation in the work area to a height of no more than 6". One to two weeks following this mowing, apply general non-selective herbicide to all vegetation within the work area per manufacturer's recommendations. When vegetation has died, drag or otherwise strip and remove the dead surface vegetation preserving some topsoils in place to be used for the planting mix. Following dead vegetation removal, wait a minimum of two weeks, then re-apply non-selective herbicide to all new vegetation. Following visible die off, work may begin in the area to be improved per the plans.

This item includes the removal of 38 dead trees as indicated on the plans. Contractor shall mark trees for removal prior to and inform the city for inspection. All work needed to remove the trees and reestablish the area, including stumps, shall be subsidiary to this item.

Item 161. Compost

Place approximately 4" of compost manufactured topsoil (CMT) on all cut and fill slopes (except drainage channels where flexible channel liners are indicated), at other locations shown on the plans, or as directed.

Where "blended on-site" CMT is specified, produce the compost manufactured topsoil by incorporating 1" of compost with 3" of furnished topsoil as shown on the plans.

Where "pre-blended" CMT is specified, amend suitable soil material, as directed, with 25% compost, by volume, to produce the compost manufactured topsoil. Place the compost manufactured topsoil in a loose layer approximately 4" thick, as shown on the plans.

Item 170. Irrigation System

Contact the City of Hudson Oaks project engineer, Chris Orozcoat (682) 229-2400, regarding existing mainline locations. The Contractor is to pay for the installation & fees.

Contact and coordinate all electrical connections with Oncor Electric prior to the beginning of construction. Any fees required for the installation of the irrigation system including the electric meter, pedestal base, conduit, wiring and ground box, which must meet current electrical code, shall be the responsibility of the contractor and shall be considered subsidiary to this item. All electrical connections to be made by a licensed electrician.

Irrigation system under this pay item is defined as the total system from the outlet of the water meter. Contractor to verify functionality of the existing system prior to construction.

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County: PARKER

Highway: IH 20

Costs for water applied through the irrigation system will be subsidiary to Item 170 – Irrigation System and Item 193 – Irrigation System Operation and Maintenance. See Irrigation Specifications sheet for details.

The drawings are generally diagrammatic and indicative of the work to be installed. Due to the scale of the drawings, it is not possible to indicate all offsets, fittings, and sleeves which may be required. Carefully investigate the site conditions affecting all work and plan work accordingly, furnishing such offsets, fittings, and sleeves as may be required to meet site conditions.

Unless otherwise noted on the plans, all materials shall be new and unused. The irrigation equipment and materials shall be delivered to the jobsite in unbroken reels, cartons or other packaging to demonstrate that such material is new and of quality and grade according to specifications.

Provide two individually bound manuals detailing operation and maintenance requirements for the irrigation systems. Manuals shall be delivered to the Engineer no later than 10 days prior to final acceptance of the work.

Item 192. Landscape Planting

Plant material and planting bed locations. The Engineer may make adjustments to the plant and planting bed locations to meet field conditions. These changes are considered incidental and there will be no additional compensation.

Neither work subsoil for planting operations when moisture content is so great that excessive compaction will occur, nor when it is so dry that the clods will not break readily. Apply water if necessary. These conditions will be determined by the Engineer as planting operations begin.

It may be necessary to suspend planting operations if the Engineer determines that unusually hot, dry weather or water restrictions will affect thriving growth of plant material. If planting operations are suspended, time charges will also be suspended until the Engineer determines that planting operations can begin again. Continue to maintain previously planted plants during time suspension. No extra compensation will be allowed due to such suspensions.

Planting beds shall be prepared in the following manner:

The planting bed area shall be laid out in the field in such a manner that the configuration may be examined and approved by the Engineer.

Finished grade of planting beds shall have positive drainage and meet slopes as indicated on the drawings.

No planting shall occur between June 1st and September 15th without written approval from the Engineer. Begin the 90-day maintenance period only after all live plant material and functional irrigation systems have been installed as shown on plans.

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County: PARKER

Highway: IH 20

Plant materials should be full and matching. Temporary Irrigation for plant materials prior to completion of the irrigation system shall be pay for under item 170.

Tree staking shall be subsidiary to this item.

Item 193. Landscape Establishment

The Contractor shall maintain the project area and be responsible for the adequate irrigation of the trees and planting beds during the 12-month establishment period.

Begin the additional establishment period covered under this item only after all maintenance activities have been completed under items 170 and 192 and after all plant material and irrigation systems have been installed as shown on plans. The Engineer may authorize in writing beginning the 12-month establishment period at individual locations provided the installations are complete at those locations.

Replace dead or dying plant material within 10 days of notification by the Engineer unless otherwise indicated in the notification. Plant material replacement will be subsidiary to this item unless determined otherwise by the Engineer.

Contractor will continue to pay for water used through the irrigation meter during the maintenance period under this item. Transfer the meter to the City at the end of the project.

Item 502. Barricades, Signs, and Traffic Handling

The contractor force account 'safety contingency' that has been established for this project is intended to be utilized for work zone enhancements to improve the effectiveness of the traffic control plan that could typically not be foreseen in the project planning and design stage. These enhancements will be mutually agreed upon by the Engineer and the Contractor's responsible person based on weekly or more frequent traffic management reviews on the project. The Engineer may choose to use existing bid items if it does not slow the implementation of enhancement.

Permanent signs may be installed when construction in an area is complete and they will not conflict with the traffic control plan for the remainder of the job.

Existing signs are to remain as long as they do not interfere with construction and they do not conflict with the traffic control plan.

Any sign not detailed in the plans but called for in the layout will be as shown in the current "Standard Highway Sign Designs for Texas".

When traffic is obstructed, arrange warning devices in accordance with the latest edition of the "Texas Manual on Uniform Traffic Control Devices".

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County: PARKER

Highway: IH 20

Cover or remove any work zone signs when work or condition referenced is not occurring.

Do not place barricades, signs, or any other traffic control devices where they interfere with sight distance at driveways or side streets. Provide access to all driveways during all phases of construction unless otherwise noted in the plans or as directed.

Any TMA requirements as result of the of the TCP plans shall be subsidiary to this item.

Item 506. Temporary Erosion, Sedimentation, and Environmental Controls

Remove accumulated sediment or replace SW3P controls when the capacity has been reduced by 50% or when the depth of sediment at the control structure exceeds one foot.

Item 6001. Portable Changeable Message Signs

Provide all portable changeable message signs and arrow panels with a photoelectric device to allow for automatic dimming of operations to approximately 50% of their normal brightness when ambient light drops to approximately five footcandles, and then increase back again for daytime operations.

One electronic portable changeable message sign unit(s) will be required. Individual or collective use of signs will be required by the Engineer when deemed necessary to supplement the traffic control plan.

Each sign must have programmed in its permanent memory the following 15 messages:

1. Exit Closed Ahead
2. Use Other Routes
3. Right Lane
4. Left Lane
5. Closed Ahead
6. Two Lane
7. Detour Ahead
8. Thru Traffic
9. Prepare To Stop
10. Merging Traffic
11. Expect 15 Minute Delay
12. Max Speed ** MPH
13. Merge Right
14. Merge Left
15. No Exit Next ** Miles



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0314-07-081

DISTRICT Fort Worth
HIGHWAY IH 20, US 180

COUNTY Parker

CONTROL SECTION JOB				0008-03-138		0314-07-081		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00194539		A00194538			
COUNTY				Parker		Parker			
HIGHWAY				US 180		IH 20			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL		
	100-6001	PREPARING ROW	AC			0.480		0.480	
	100-6013	PREP ROW (TREE) (2" TO 12" DIA)	EA			38.000		38.000	
	161-6024	GENERAL USE COMPOST (2")	SY	1,998.000				1,998.000	
	170-6001	IRRIGATION SYSTEM	LS			1.000		1.000	
	180-6001	WILDFLOWER SEEDING	AC	0.380				0.380	
	192-6003	PLANT MATERIAL (3-GAL)	EA	3,177.000				3,177.000	
	192-6013	MULCH	SY	1,998.000				1,998.000	
	192-6025	PLANT MATERIAL (45 GAL) (TREE)	EA			100.000		100.000	
	192-6026	PLANT MATERIAL (65 GAL) (TREE)	EA			35.000		35.000	
	192-6097	CONC LNDSCP EDG (12 IN WIDTH)	LF	1,944.000				1,944.000	
	193-6001	PLANT MAINTENANCE	MO			12.000		12.000	
	193-6007	IRRIGATION SYSTEM OPER AND MAINT	MO			12.000		12.000	
	500-6001	MOBILIZATION	LS			1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO			3.000		3.000	
	506-6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	78.000		234.000		312.000	
	506-6024	CONSTRUCTION EXITS (REMOVE)	SY	78.000		234.000		312.000	
	506-6040	BIODEG EROSN CONT LOGS (INSTL) (8")	LF	2,163.000				2,163.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	2,163.000				2,163.000	
	618-6034	CONDT (PVC) (SCH 40) (4") (BORE)	LF	75.000				75.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY			60.000		60.000	
	18	SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS			1.000		1.000	
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS			1.000		1.000	

FULL PROJECT SUMMARY OF ITEMS				
LOCATION	100-6001	500-6001	502-6001	6001-6001
	PREPARING ROW	MOBILIZATION	BARRICADES, SIGNS AND TRAFFIC HANDLING	PORTABLE CHANGEABLE MESSAGE SIGN
	AC	LS	MO	DAY
GENERAL	0.48	1	3	60

CSJ: 0314-07-081 I-20 SUMMARY OF ITEMS				
LOCATION	506-6040	506-6043	506-6020	506-6024
	BIODEG EROSN CONT LOGS (INSTL) (8")	BIODEG EROSN CONT LOGS (REMOVE)	CONSTRUCTION EXITS (INSTL) (TYP 1)	CONSTRUCTION EXITS (REMOVE)
	LF	LF	SY	SY
EROSION CONTROL PLAN (1 OF 1)			234	234
TOTAL			234	234

CSJ: 0008-03-138 US 180 SUMMARY OF ITEMS				
LOCATION	506-6040	506-6043	506-6020	506-6024
	BIODEG EROSN CONT LOGS (INSTL) (8")	BIODEG EROSN CONT LOGS (REMOVE)	CONSTRUCTION EXITS (INSTL) (TYP 1)	CONSTRUCTION EXITS (REMOVE)
	LF	LF	SY	SY
EROSION CONTROL PLAN (1 OF 1)	2163	2163	78	78
TOTAL	2163	2163	78	78

CSJ: 0314-07-081 I-20 PROJECT SUMMARY OF ITEMS				
LOCATION	100-6013	192-6025	192-6026	193-6001
	PREP ROW (TREE) (2" TO 12")	PLANT MATERIAL (45 GAL) (TREE)(ORNAMENTAL)	PLANT MATERIAL (65 GAL) (TREE)	PLANT MAINTENANCE
	EA	EA	EA	MO
PLANTING (1 OF 6)	5	12	5	
PLANTING (2 OF 6)	4	16	3	
PLANTING (3 OF 6)	3	12	3	
PLANTING (4 OF 6)	15	19	13	
PLANTING (5 OF 6)	6	27	6	
PLANTING (6 OF 6)	5	14	5	
TOTAL	38	100	35	12

CSJ: 0008-03-138 US 180 PROJECT SUMMARY OF ITEMS						
LOCATION	161-6024	180-6001	192-6003	192-6013	193-6001	192-6097
	GENERAL USE COMPOST (2")	WILDFLOWER SEEDING	LANDSCAPE PLANTING (3 GAL)	LANDSCAPE PLANTING (MULCH) (BARK)	PLANT MAINTENANCE	CONC LNDSACP EDG (12 IN WIDTH)
	SY	AC	EA	SY	MO	LF
PLANTING (1 OF 6)						
PLANTING (2 OF 6)						
PLANTING (3 OF 6)						
PLANTING (4 OF 6)						
PLANTING (5 OF 6)	1,040	0.27	1,349	1,040		1,017
PLANTING (6 OF 6)	958	0.11	1,828	958		927
TOTAL	1,998	0.38	3,177	1,998	12	1,944

FULL PROJECT SUMMARY OF ITEMS				
LOCATION	506-6040	506-6043	506-6020	506-6024
	BIODEG EROSN CONT LOGS (INSTL) (8")	BIODEG EROSN CONT LOGS (REMOVE)	CONSTRUCTION EXITS (INSTL) (TYP 1)	CONSTRUCTION EXITS (REMOVE)
	LF	LF	SY	SY
EROSION CONTROL PLAN (1 OF 1)	2163	2163	312	312
TOTAL	2163	2163	312	312

FULL PROJECT SUMMARY OF ITEMS									
LOCATION	100-6013	161-6024	180-6001	192-6003	192-6013	192-6025	192-6026	193-6001	192-6097
	PREP ROW (TREE) (2" TO 12")	GENERAL USE COMPOST (2")	WILD FLOWER SEEDING	LANDSCAPE PLANTING (3 GAL)	LANDSCAPE PLANTING (MULCH) (BARK)	PLANT MATERIAL (45 GAL) (TREE)(ORNAMENTAL)	PLANT MATERIAL (65 GAL) (TREE)	PLANT MAINTENANCE	CONC LNDSACP EDG (12 IN WIDTH)
	EA	SY	AC	EA	SY	EA	EA	MO	LF
PLANTING (1 OF 6)	5					12	5		
PLANTING (2 OF 6)	4					16	3		
PLANTING (3 OF 6)	3					12	3		
PLANTING (4 OF 6)	14					19	13		
PLANTING (5 OF 6)	6	1,040	0.27	1,349	1,040	27	6		1,017
PLANTING (6 OF 6)	5	958	0.11	1,828	958	14	5		927
TOTAL	37	1,998	0.38	3,177	1,998	100	35	12	1,944

FULL SUMMARY OF ITEMS			
LOCATION	170-6002	193-6007	618-6034
	IRRIGATION SYSTEM (TY I)	IRRIG SYS OPER AND MAINT	CONDT (PVC) (SCH 40) (4") (BORE)
	LS	MO	LF
IRRIGATION (1 OF 6)			
IRRIGATION (2 OF 6)			
IRRIGATION (3 OF 6)			
IRRIGATION (4 OF 6)			
IRRIGATION (5 OF 6)			32
IRRIGATION (6 OF 6)			43
TOTAL	1	12	75



QUANTITY SUMMARY

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	SEE SHEET 1	006
STATE	DISTRICT	COUNTY
TEXAS	FTW	PARKER
CONTROL	SECTION	JOB
0314	07	081
		HIGHWAY NO
		IH-20



TX REG. ENGINEERING FIRM F-469
TX REG. SURVEYING FIRM LS-10008001

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DATE:
FILE:

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

WORKER SAFETY NOTES:


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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

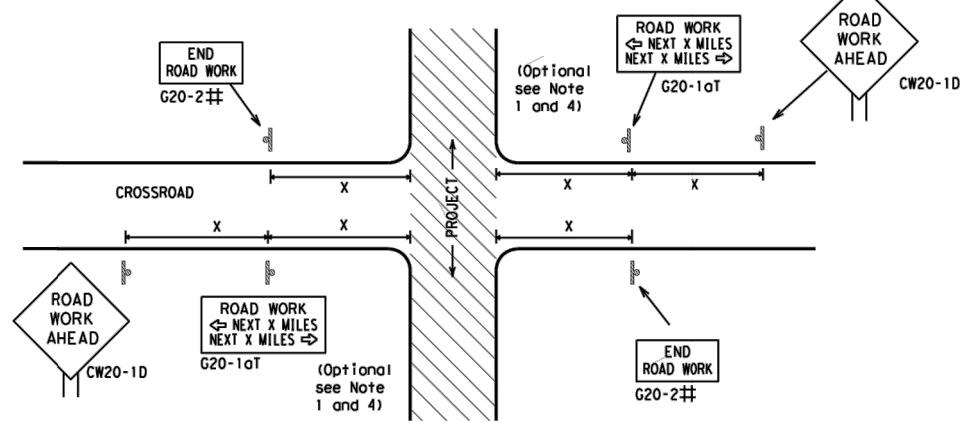
THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT http://www.txdot.gov
COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
MATERIAL PRODUCER LIST (MPL)
ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS)"
STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)
TEXAS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

SHEET 1 OF 12

 Texas Department of Transportation	<i>Traffic Safety Division Standard</i>
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS	
BC(1)-21	
FILE: bc-21.dgn D#: TxDOT C#: TxDOT DW: TxDOT CK: TxDOT	
© TxDOT November 2002 CONT SECT JOB HIGHWAY	
REVISIONS 0314 07 081 IH-20	
4-03 7-13 DIST COUNTY SHEET NO.	
9-07 8-14 FTW PARKER 007	
5-10 5-21	

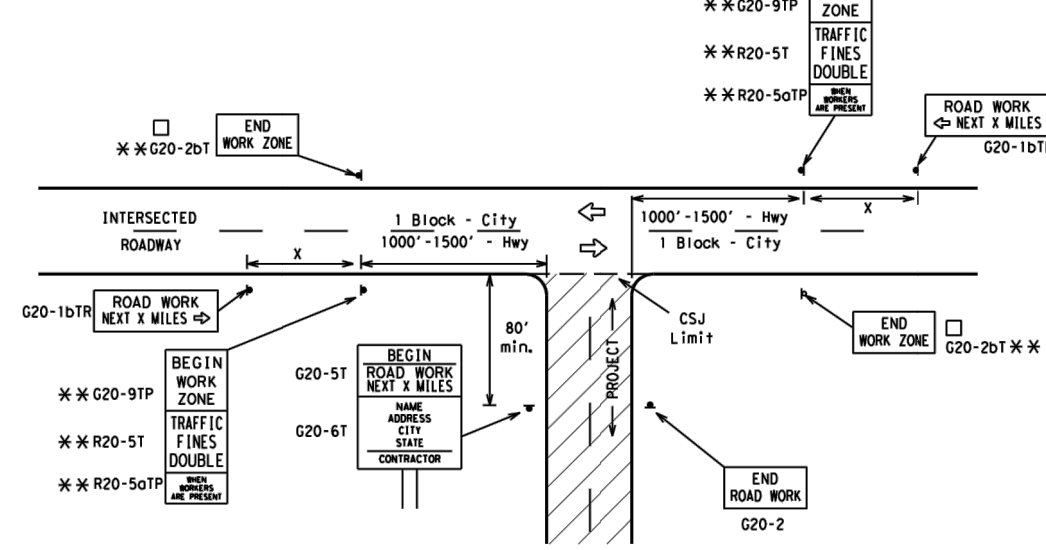
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TYPICAL LOCATION OF CROSSROAD SIGNS



- ## May be mounted on back of "ROAD WORK AHEAD" (CW20-1D) sign with approval of Engineer. (See note 2 below)
- The typical minimum signing on a crossroad approach should be a "ROAD WORK AHEAD" (CW20-1D) sign and a (G20-2) "END ROAD WORK" sign, unless noted otherwise in plans.
 - The Engineer may use the reduced size 36" x 36" ROAD WORK AHEAD (CW20-1D) sign mounted back to back with the reduced size 36" x 18" "END ROAD WORK" (G20-2) sign on low volume crossroads (see Note 4 under "Typical Construction Warning Sign Size and Spacing"). See the "Standard Highway Sign Designs for Texas" manual for sign details. The Engineer may omit the advance warning signs on low volume crossroads. The Engineer will determine whether a road is low volume as per TMUTCD Part 5. This information shall be shown in the plans.
 - Based on existing field conditions, the Engineer/Inspector may require additional signs such as FLAGGER AHEAD, LOOSE GRAVEL, or other appropriate signs. When additional signs are required, these signs will be considered part of the minimum requirements. The Engineer/Inspector will determine the proper location and spacing of any sign not shown on the BC sheets, Traffic Control Plan sheets or the Work Zone Standard Sheets.
 - The "ROAD WORK NEXT X MILES" (G20-1aT) sign shall be required at high volume crossroads to advise motorists of the length of construction in either direction from the intersection. The Engineer will determine whether a roadway is considered high volume.
 - Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
 - When work occurs in the intersection area, appropriate traffic control devices, as shown elsewhere in the plans or as determined by the Engineer/Inspector, shall be in place.

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING^{1,5,6}

Sign Number or Series	SIZE		SPACING	
	Conventional Road	Expressway/Freeway	Posted Speed	Sign Δ Spacing "X"
CW20 ⁴ CW21 CW22 CW23 CW25	48" x 48"	48" x 48"	MPH	Feet (Apprx.)
			30	120
			35	160
			40	240
			45	320
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"	50	400
			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

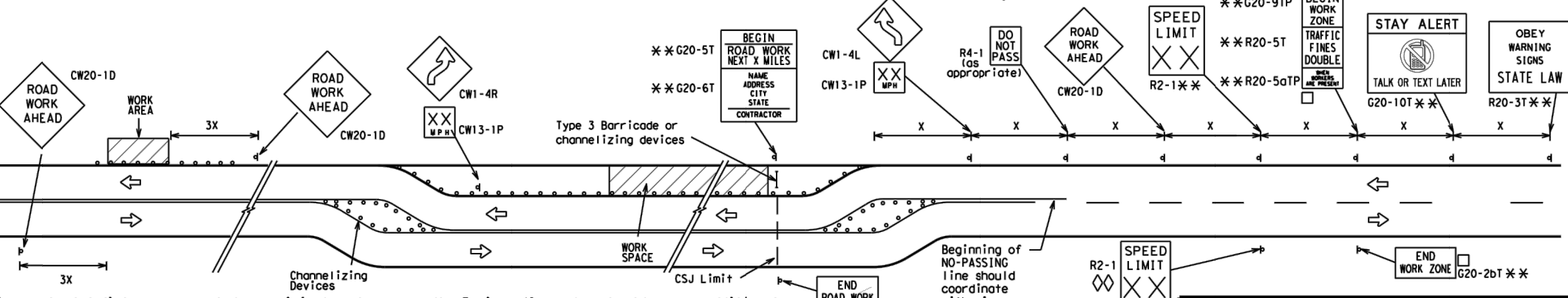
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

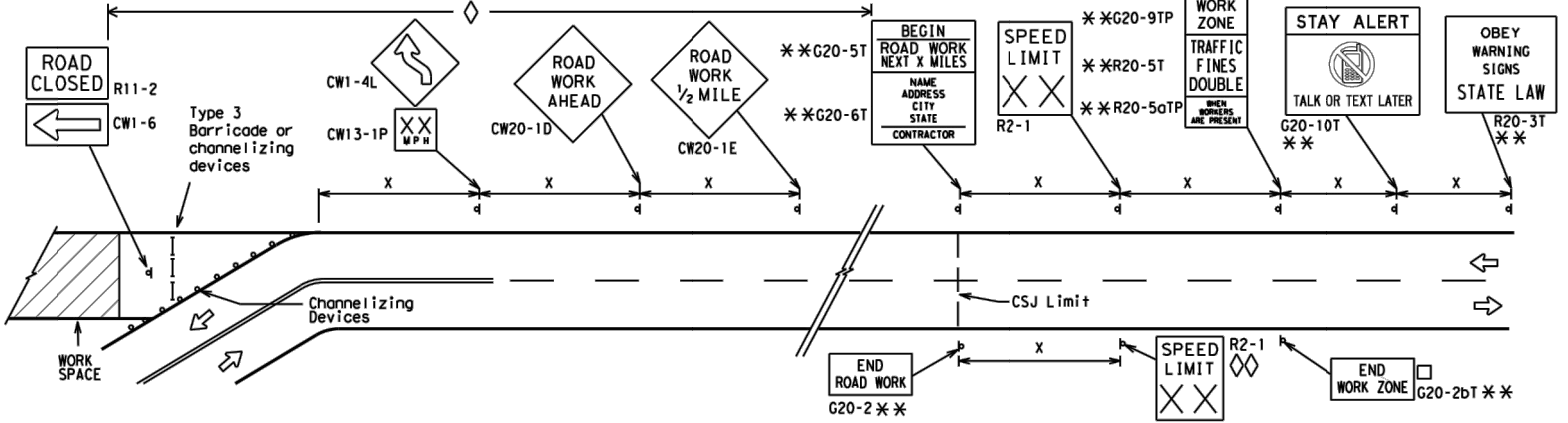
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be used on low volume crossroads at the discretion of the Engineer as per TMUTCD Part 5. See Note 2 under "Typical Location of Crossroad Signs".
- Only diamond shaped warning sign sizes are indicated.
- See sign size listing in "TMUTCD", Sign Appendix or the "Standard Highway Sign Designs for Texas" manual for complete list of available sign design sizes.

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

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



NOTES

- The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and "BEGIN ROAD WORK NEXT X MILES" (G20-5T) sign for each specific project. This distance shall replace the "X" and shall be rounded to the nearest whole mile with the approval of the Engineer. No decimals shall be used.
- The "BEGIN WORK ZONE" (G20-9TP) and "END WORK ZONE" (G20-2bT) shall be used as shown on the sample layout when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a part of the work zone lying outside the CSJ Limits where traffic fines may double if workers are present.
 - ** CSJ limit signing is required for highway construction and maintenance work, with the exception of mobile operations.
 - ◇ Area for placement of "ROAD WORK AHEAD" (CW20-1D) sign and other signs or devices as called for on the Traffic Control Plan.
 - ◇◇ Contractor will install a regulatory speed limit sign at the end of the work zone.

LEGEND

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

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE#	bc-21.dgn	DATE	TxDOT	DATE	TxDOT	DATE	TxDOT	DATE	TxDOT
REV#	0314	REV#	07	REV#	081	REV#	07	REV#	07
DATE	9-07	DATE	8-14	DATE	7-13	DATE	5-21	DATE	008
DIST	FTW	COUNTY	PARKER	SHEET NO.	008				

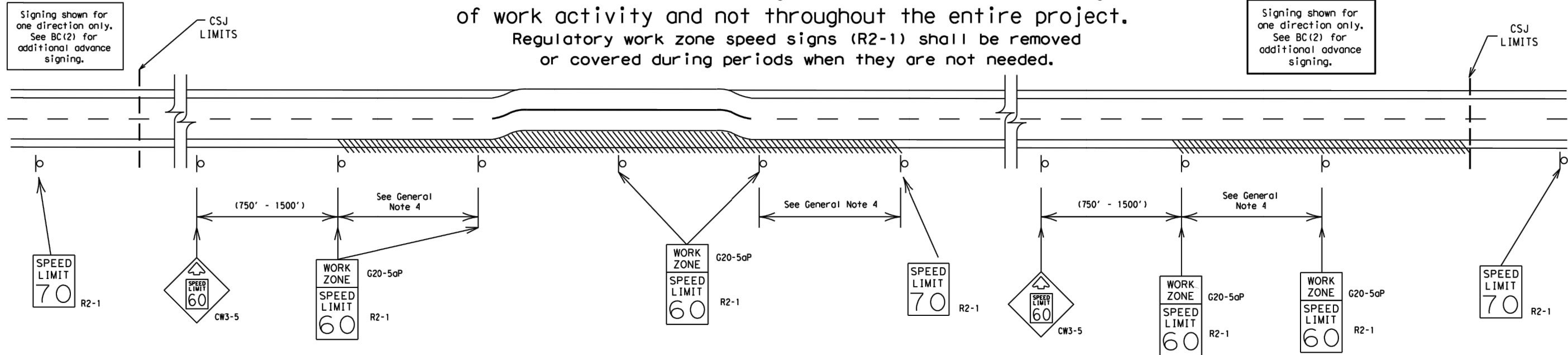
DATE: FILE:

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TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

DATE: FILE:



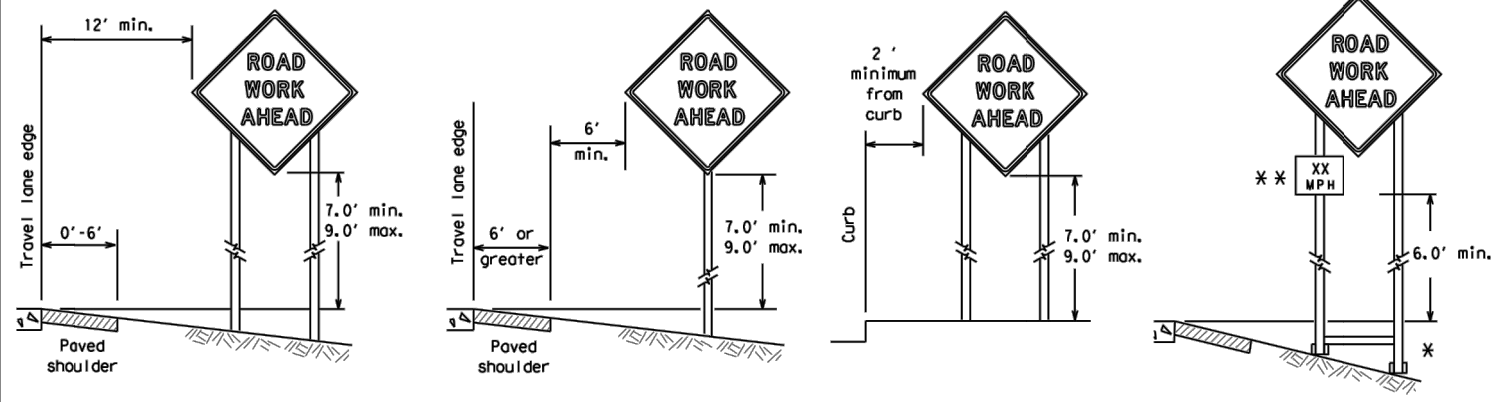
BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC (3) - 21

FILE#	bc-21.dgn	DN# TxDOT	CK# TxDOT	DW# TxDOT	CK# TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS		0314	07	081	IH-20
9-07	8-14	DIST	COUNTY	SHEET NO.	
7-13	5-21	FTW	PARKER	009	

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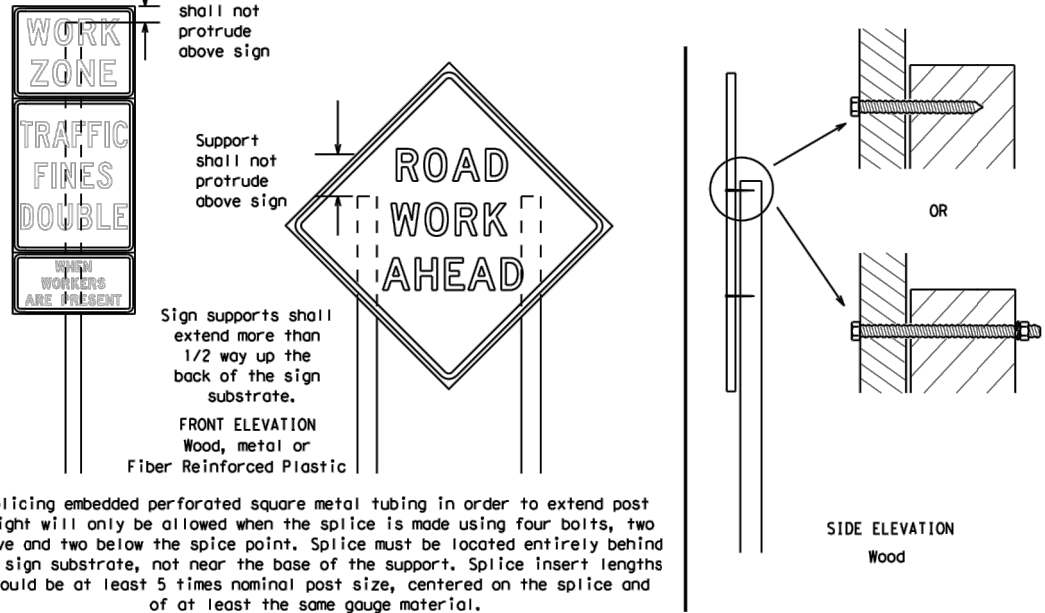
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



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

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

ATTACHMENT FOR SIGN SUPPORTS



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

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 TMUTCD but may have been omitted from the plans. Any variation in the plans shall be documented by written agreement between the Engineer and the Contractor's Responsible Person. All changes must be documented in writing before being implemented. This can include documenting the changes in the Inspector's TxDOT diary and having both the Inspector and Contractor initial and date the agreed upon changes.
- 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.

SIZE OF SIGNS

- 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 CWZTCD 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 B_{FL} or Type C_{FL}, 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 stubs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT WEIGHTS

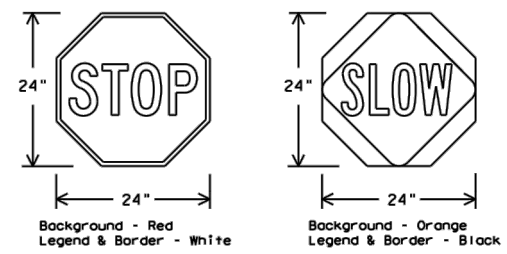
- Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
- The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects shall not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

STOP/SLOW PADDLES

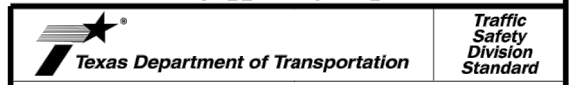
- STOP/SLOW paddles are the primary method to control traffic by flaggers. The STOP/SLOW paddle size should be 24" x 24".
- STOP/SLOW paddles shall be retroreflectized when used at night.
- STOP/SLOW paddles may be attached to a staff with a minimum length of 6' to the bottom of the sign.
- Any lights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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

- Permanent signs are used to give notice of traffic laws or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, specific service (LOGO), or cultural information. Drivers proceeding through a work zone need the same, if not better route guidance as normally installed on a roadway without construction.
- 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 CWZTCD list. The signs shall meet the required mounting heights shown on the BC, or the SMD standard sheets during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
- 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.



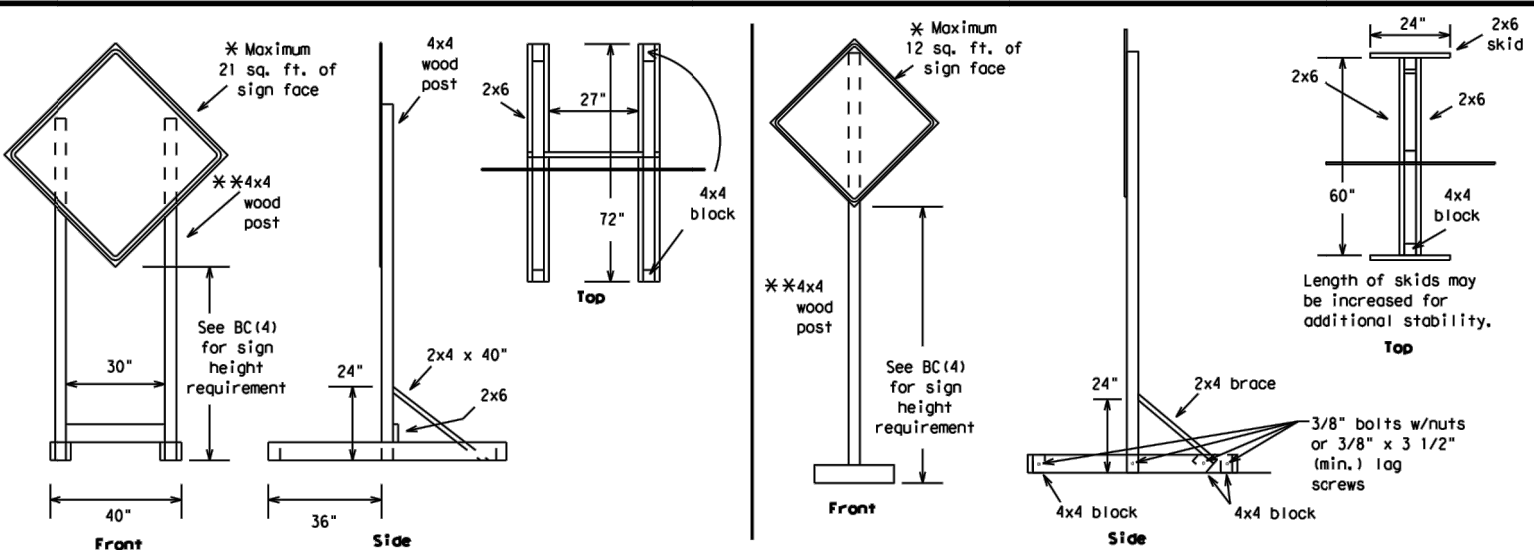
BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC (4) - 21

FILE#	bc-21.dgn	DWG#	TxDOT	CHK#	TxDOT	DWG#	TxDOT	CHK#	TxDOT
© TxDOT	November 2002	COM#	SECT#	JOB#	HIGHWAY#				
REVISIONS		0314	07	081	IH-20				
9-07	8-14	DIST	COUNTY	SHEET NO.					
7-13	5-21	FTW	PARKER	010					

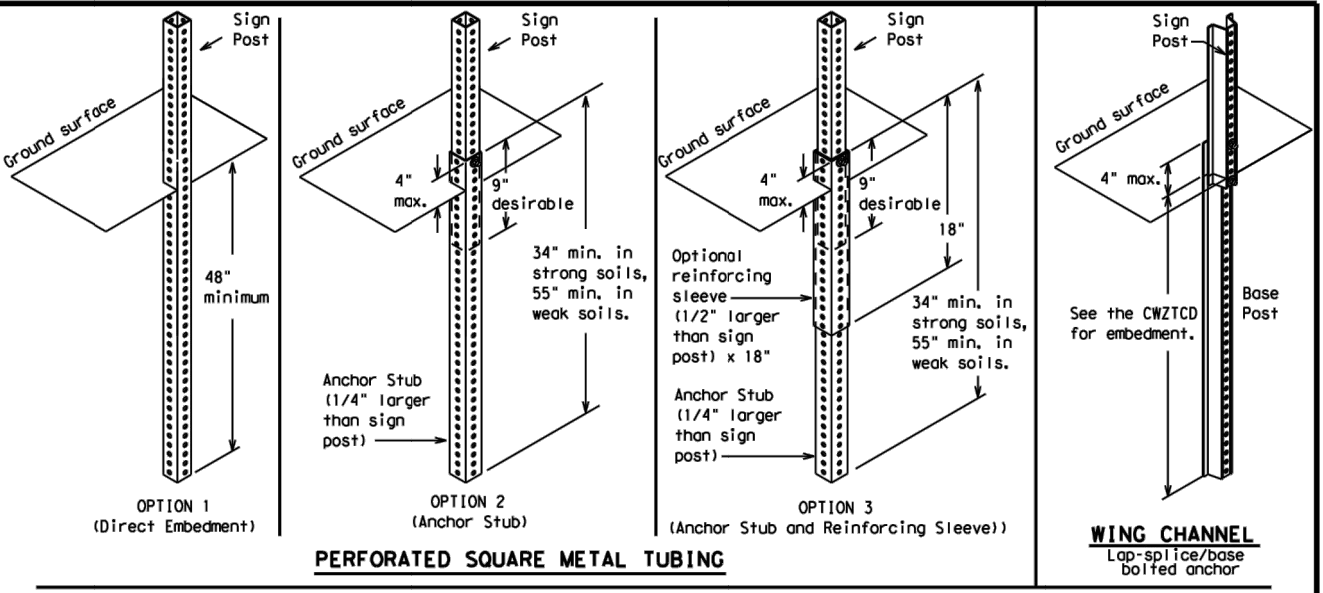
DATE: FILE:

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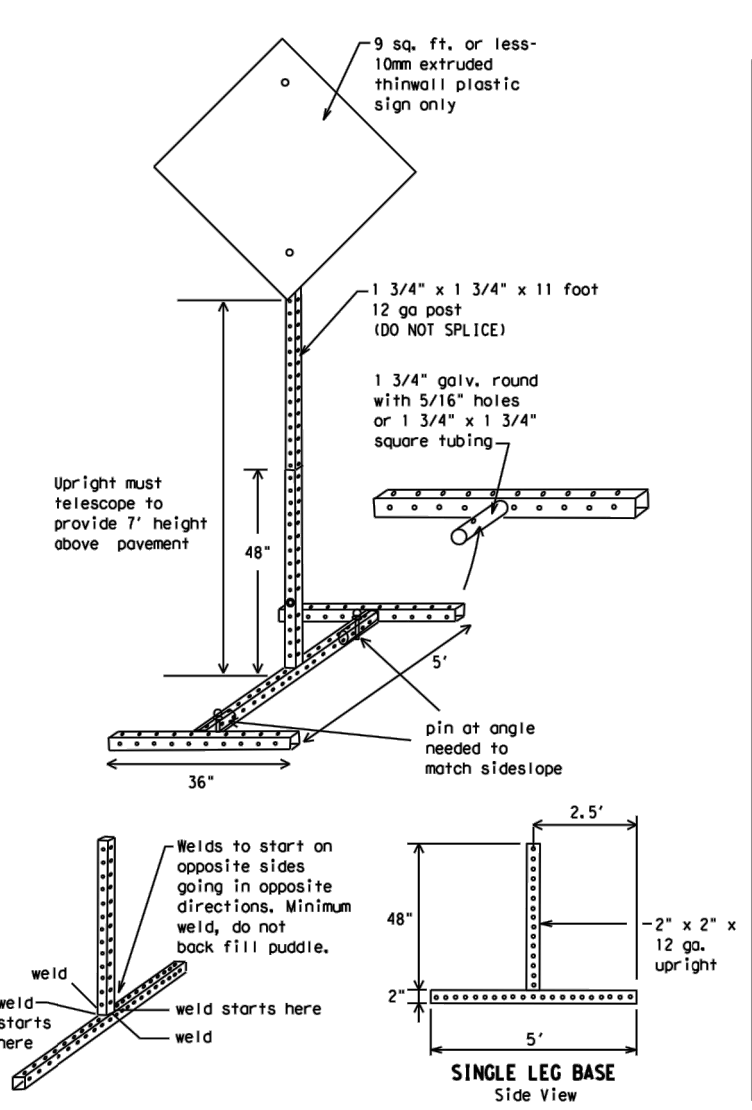
SKID MOUNTED WOOD SIGN SUPPORTS

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



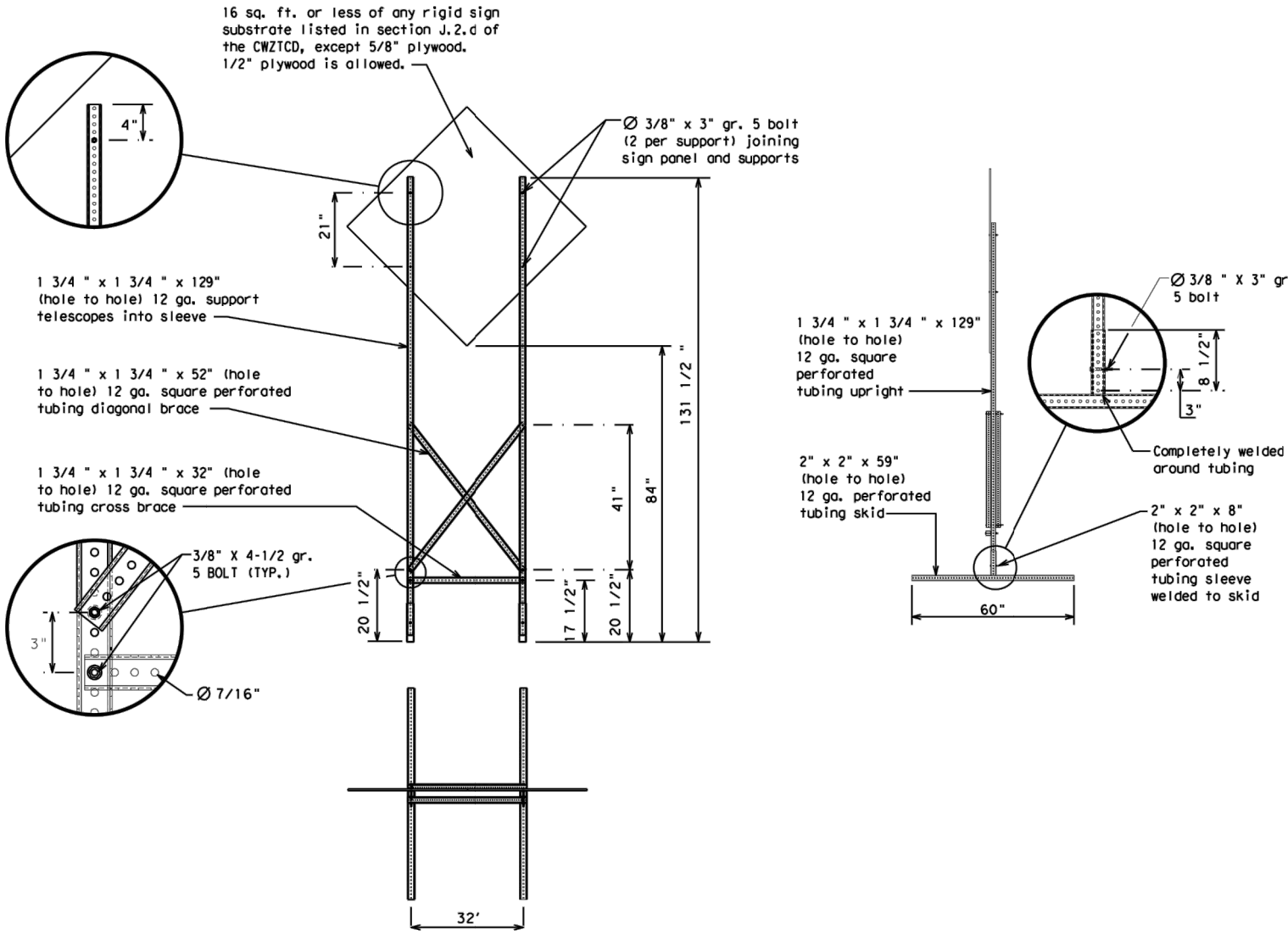
GROUND MOUNTED SIGN SUPPORTS

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



SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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



WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

SHEET 5 OF 12



BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

FILE#	bc-21.dgn	DATE	TxDOT	CHK	TxDOT	DWG	TxDOT	CHK	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS		0314	07	081	IH-20				
9-07	8-14	DIST	COUNTY	SHEET NO.					
7-13	5-21	FTW	PARKER	011					

DATE:
FILE:

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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 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 XXXXXXXX
US XXX TO FM XXXX

Warning List

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

**** Advance Notice List**

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

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

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

DATE: FILE:

Texas Department of Transportation Traffic Safety Division Standard

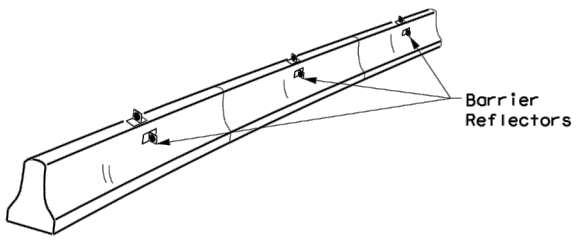
BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC (6) - 21

FILE#	bc-21.dgn	DWG	TxDOT	CHK	TxDOT	DWG	TxDOT	CHK	TxDOT
CONT	SECT	JOB	HIGHWAY						
0314	07	081	IH-20						
9-07	8-14	DIST	COUNTY	SHEET NO.					
7-13	5-21	FTW	PARKER	012					

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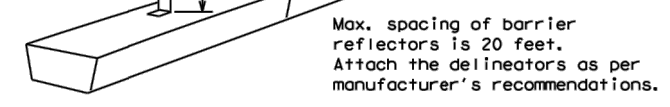
- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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



CONCRETE TRAFFIC BARRIER (CTB)

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

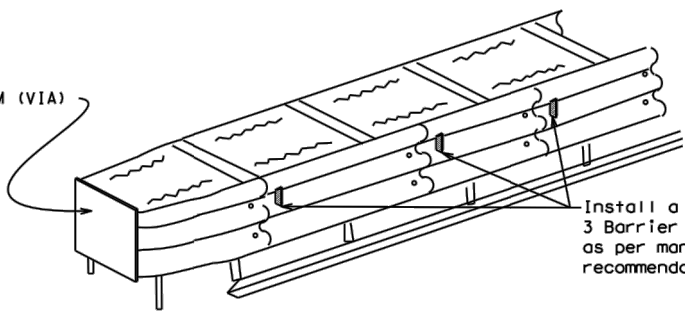
LPCB is approved for use in work zone locations, where the posted speed is 45mph, or less. See Roadway Standard Sheet LPCB.



LOW PROFILE CONCRETE BARRIER (LPCB)

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

See D & OM (VIA)



DELINEATION OF END TREATMENTS

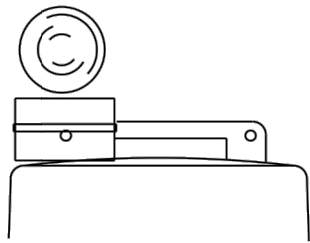
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

WARNING LIGHTS

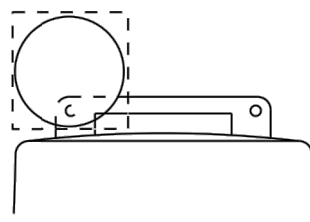
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet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



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

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.



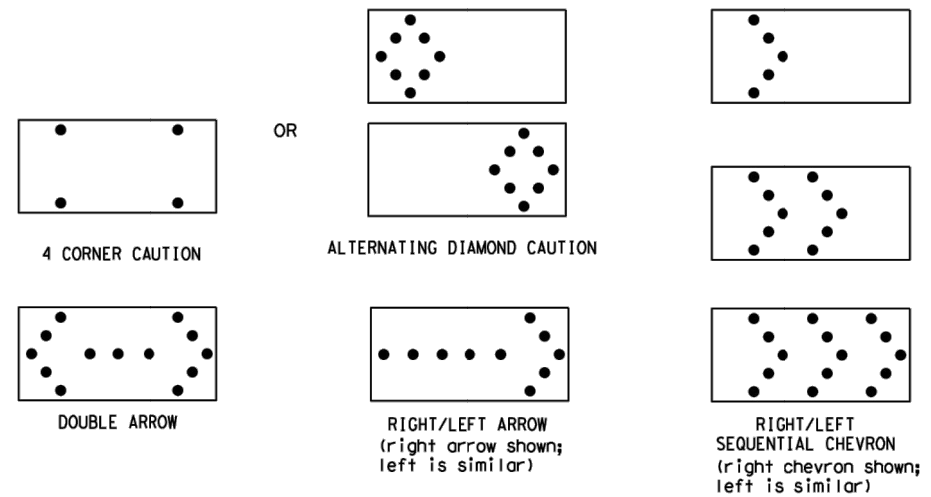
Warning reflector may be round or square. Must have a yellow reflective surface area of at least 30 square inches

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

- A warning reflector or approved substitute may be mounted on a plastic drum as a substitute for a Type C, steady burn warning light at the discretion of the Contractor unless otherwise noted in the plans.
- The warning reflector shall be yellow in color and shall be manufactured using a sign substrate approved for use with plastic drums listed on the CWZTCD.
- The warning reflector shall have a minimum retroreflective surface area (one-side) of 30 square inches.
- Round reflectors shall be fully reflectorized, including the area where attached to the drum.
- Square substrates must have a minimum of 30 square inches of reflectorized sheeting. They do not have to be reflectorized where it attaches to the drum.
- The side of the warning reflector facing approaching traffic shall have sheeting meeting the color and retroreflectivity requirements for DMS 8300-Type B or Type C.
- When used near two-way traffic, both sides of the warning reflector shall be reflectorized.
- The warning reflector should be mounted on the side of the handle nearest approaching traffic.
- The maximum spacing for warning reflectors should be identical to the channelizing device spacing requirements.

Arrow Boards may be located behind channelizing devices in place for a shoulder taper or merging taper, otherwise they shall be delineated with four (4) channelizing devices placed perpendicular to traffic on the upstream side of traffic.

- The Flashing Arrow Board should be used for all lane closures on multi-lane roadways, or slow moving maintenance or construction activities on the travel lanes.
- Flashing Arrow Boards should not be used on two-lane, two-way roadways, detours, diversions or work on shoulders unless the "CAUTION" display (see detail below) is used.
- The Engineer/Inspector shall choose all appropriate signs, barricades and/or other traffic control devices that should be used in conjunction with the Flashing Arrow Board.
- The Flashing Arrow Board should be able to display the following symbols:



- The "CAUTION" display consists of four corner lamps flashing simultaneously, or the Alternating Diamond Caution mode as shown.
- The straight line caution display is NOT ALLOWED.
- The Flashing Arrow Board shall be capable of minimum 50 percent dimming from rated lamp voltage. The flashing rate of the lamps shall not be less than 25 nor more than 40 flashes per minute.
- Minimum lamp "on time" shall be approximately 50 percent for the flashing arrow and equal intervals of 25 percent for each sequential phase of the flashing chevron.
- The sequential arrow display is NOT ALLOWED.
- The flashing arrow display is the TxDOT standard; however, the sequential chevron display may be used during daylight operations.
- The Flashing Arrow Board shall be mounted on a vehicle, trailer or other suitable support.
- A Flashing Arrow Board SHALL NOT BE USED to laterally shift traffic.
- A full matrix PCMS may be used to simulate a Flashing Arrow Board provided it meets visibility, flash rate and dimming requirements on this sheet for the same size arrow.
- Minimum mounting height of trailer mounted Arrow Boards should be 7 feet from roadway to bottom of panel.

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

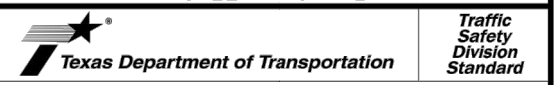
ATTENTION
 Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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



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

BC (7) -21

FILE#	bc-21.dgn	DATE	TxDOT	CHK	TxDOT	DATE	TxDOT	CHK	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS		0314	07	081	IH-20				
9-07	8-14	DIST	COUNTY	SHEET NO.					
7-13	5-21	FTW	PARKER	013					

DATE:
FILE:

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GENERAL NOTES

- For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
- For intermediate term stationary work zones on freeways, drums should be used as the primary channelizing device but may be replaced in tangent sections by vertical panels, or 42" two-piece cones. In tangent sections, one-piece cones may be used with the approval of the Engineer but only if personnel are present on the project at all times to maintain the cones in proper position and location.
- For short term stationary work zones on freeways, drums are the preferred channelizing device but may be replaced in tapers, transitions and tangent sections by vertical panels, two-piece cones or one-piece cones as approved by the Engineer.
- Drums and all related items shall comply with the requirements of the current version of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
- Drums, bases, and related materials shall exhibit good workmanship and shall be free from objectionable marks or defects that would adversely affect their appearance or serviceability.
- The Contractor shall have a maximum of 24 hours to replace any plastic drums identified for replacement by the Engineer/Inspector. The replacement device must be an approved device.

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

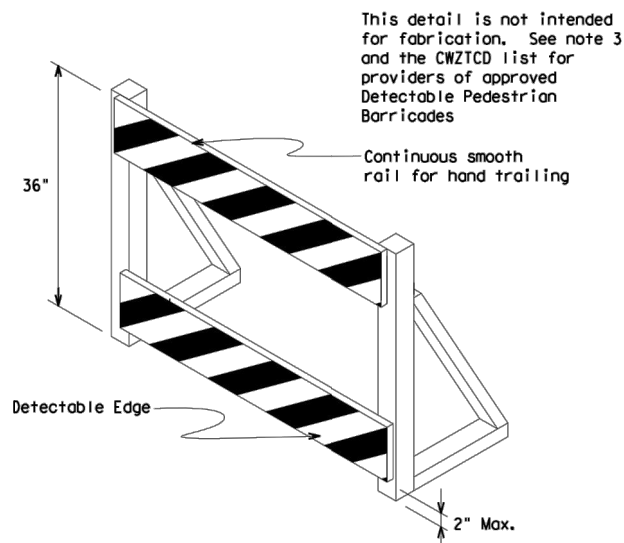
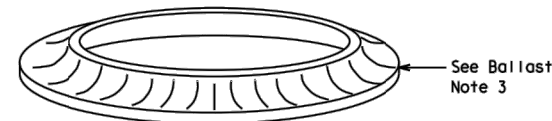
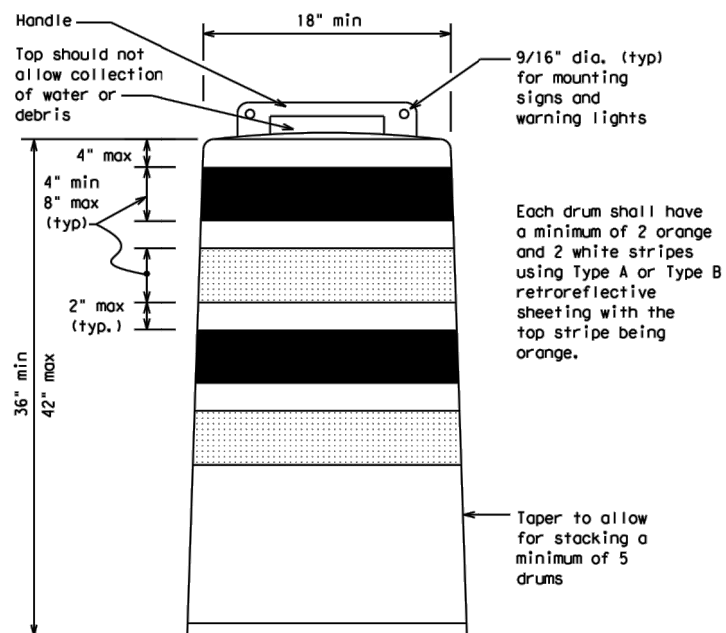
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
- The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents accidental separation due to normal handling and/or air turbulence created by passing vehicles.
- Plastic drums shall be constructed of lightweight flexible, and deformable materials. The Contractor shall NOT use metal drums or single piece plastic drums as channelization devices or sign supports.
- Drums shall present a profile that is a minimum of 18 inches in width at the 36 inch height when viewed from any direction. The height of drum unit (body installed on base) shall be a minimum of 36 inches and a maximum of 42 inches.
- The top of the drum shall have a built-in handle for easy pickup and shall be designed to drain water and not collect debris. The handle shall have a minimum of two widely spaced 9/16 inch diameter holes to allow attachment of a warning light, warning reflector unit or approved compliant sign.
- The exterior of the drum body shall have a minimum of four alternating orange and white retroreflective circumferential stripes not less than 4 inches nor greater than 8 inches in width. Any non-reflectorized space between any two adjacent stripes shall not exceed 2 inches in width.
- Bases shall have a maximum width of 36 inches, a maximum height of 4 inches, and a minimum of two footholds of sufficient size to allow base to be held down while separating the drum body from the base.
- Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
- Drum body shall have a maximum unballasted weight of 11 lbs.
- Drum and base shall be marked with manufacturer's name and model number.

RETROREFLECTIVE SHEETING

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

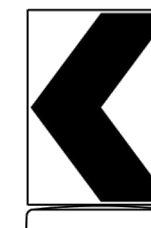
BALLAST

- Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other ballasting devices as approved by the Engineer. Stacking of sandbags will be allowed, however height of sandbags above pavement surface may not exceed 12 inches.
- Bases with built-in ballast shall weigh between 40 lbs. and 50 lbs. Built-in ballast can be constructed of an integral crumb rubber base or a solid rubber base.
- Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWZTCD list.
- The ballast shall not be heavy objects, water, or any material that would become hazardous to motorists, pedestrians, or workers when the drum is struck by a vehicle.
- When used in regions susceptible to freezing, drums shall have drainage holes in the bottoms so that water will not collect and freeze becoming a hazard when struck by a vehicle.
- Ballast shall not be placed on top of drums.
- Adhesives may be used to secure base of drums to pavement.

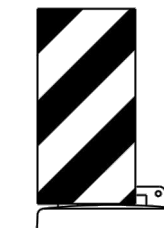


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

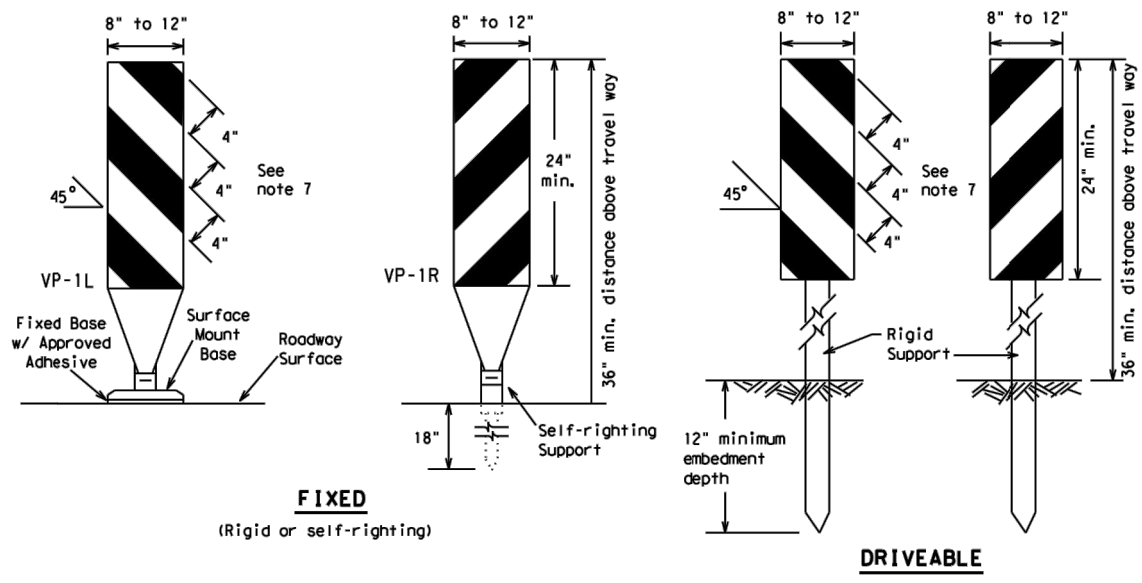
- Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
- Chevrons and other work zone signs with an orange background shall be manufactured with Type B_{FL} or Type C_{FL} Orange sheeting meeting the color and retroreflectivity requirements of DMS-8300, "Sign Face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

SHEET 8 OF 12

		Traffic Safety Division Standard	
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES			
BC (8) - 21			
FILE#	bc-21.dgn	DATE	TxDOT
REV#	November 2002	JOB	081
REV#	4-03 8-14	DIST	FTW
REV#	9-07 5-21	COUNTY	PARKER
REV#	7-13	SHEET NO.	014

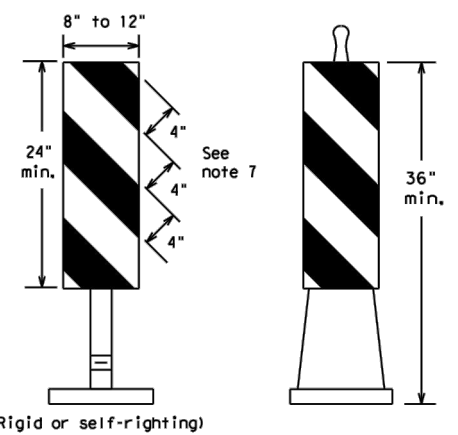
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FIXED
(Rigid or self-righting)

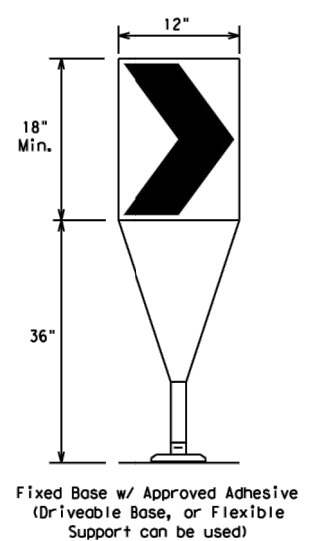
DRIVEABLE



PORTABLE

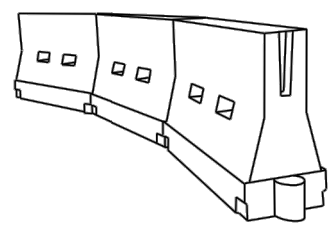
VERTICAL PANELS (VPs)

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



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

CHEVRONS



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

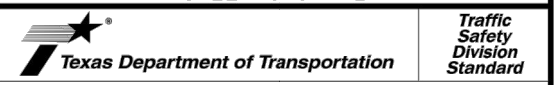
GENERAL NOTES

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS



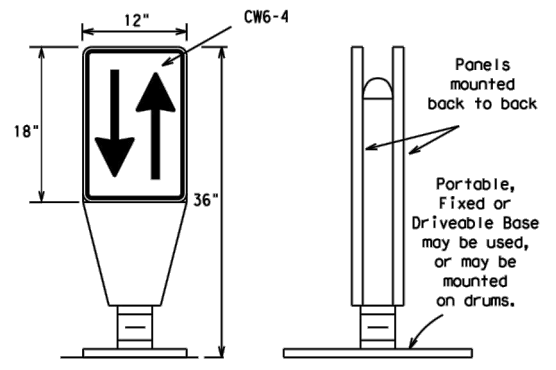
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (9) - 21

FILE#	bc-21.dgn	DN#	TxDOT	CK#	TxDOT	DW#	TxDOT	CK#	TxDOT
©	TxDOT	DATE	November 2002	COM#	SECT#	JOB#	HIGHWAY#		
		REVISIONS	0314	07	081		IH-20		
	9-07	8-14							
	7-13	5-21							
		DIST	FTW	COUNTY	PARKER	SHEET NO.	015		

DATE: FILE:

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



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

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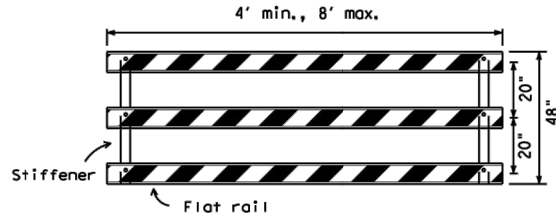
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.

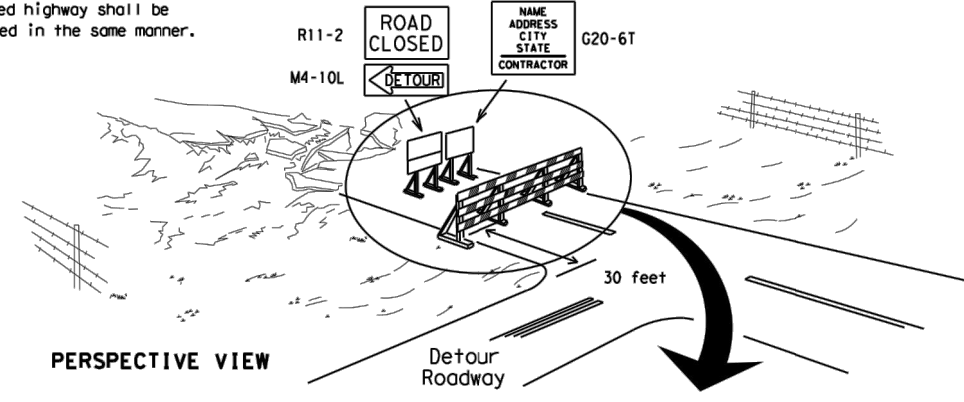


TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



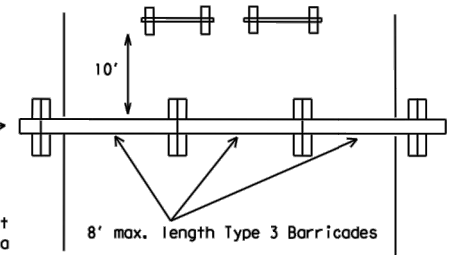
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

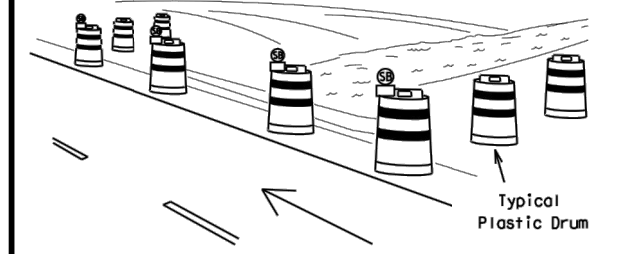
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.



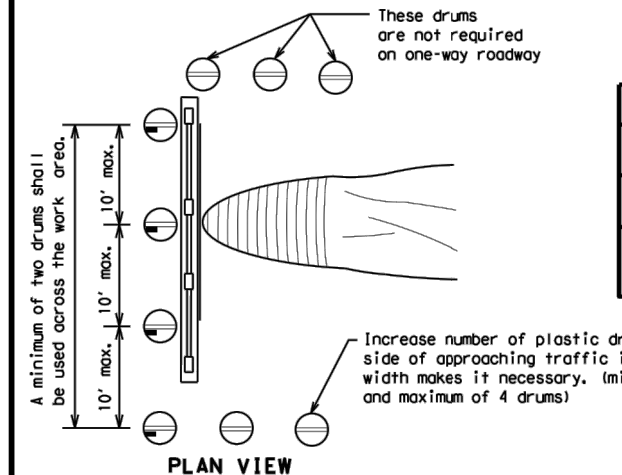
PLAN VIEW

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

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

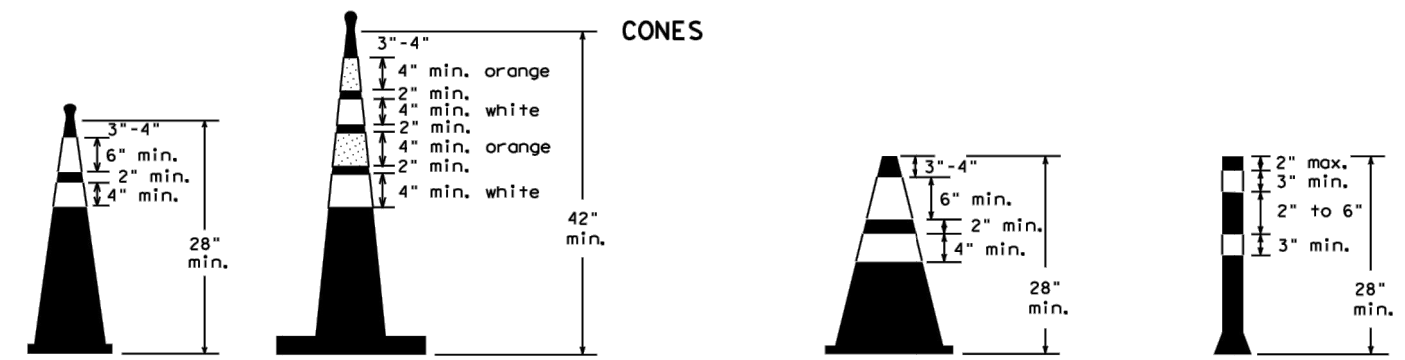


PLAN VIEW

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS

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

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

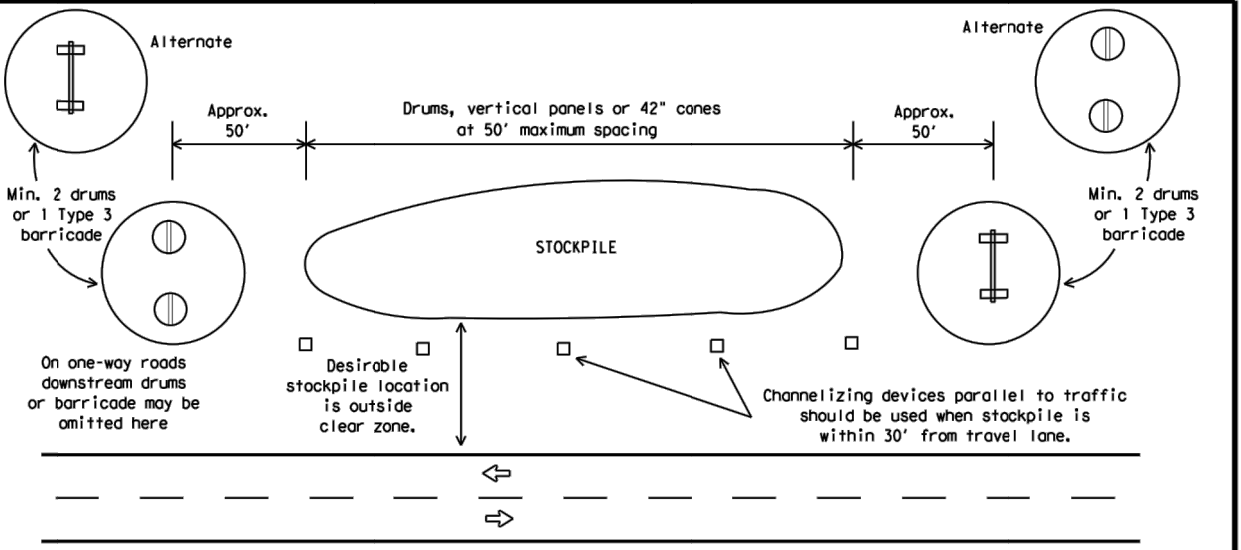


Two-Piece cones

One-Piece cones

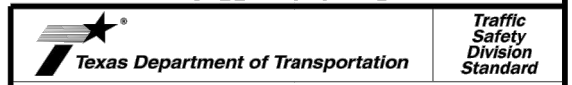
Tubular Marker

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (10) -21

FILE#	bc-21.dgn	DW:	TxDOT	CK:	TxDOT	DW:	TxDOT	CK:	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
		0314	07	081	IH-20				
9-07	8-14	DIST	COUNTY	SHEET NO.					
7-13	5-21	FTW	PARKER	016					

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

- Raised pavement markers are to be placed according to the patterns on BC(12).
- All raised pavement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAVEMENT MARKERS" and Departmental Material Specification DMS-4200 or DMS-4300.

PREFABRICATED PAVEMENT MARKINGS

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

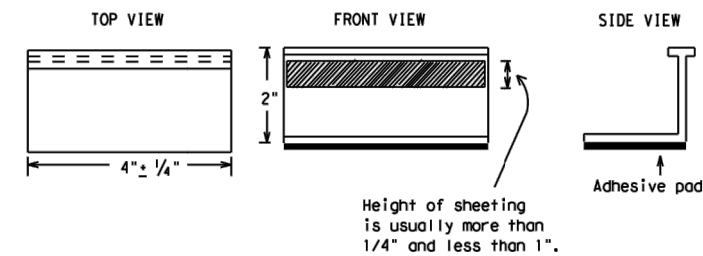
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

- Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
- Tabs detailed on this sheet are to be inspected and accepted by the Engineer or designated representative. Sampling and testing is not normally required, however at the option of the Engineer, either "A" or "B" below may be imposed to assure quality before placement on the roadway.
 - Select five (5) or more tabs at random from each lot or shipment and submit to the Construction Division, Materials and Pavement Section to determine specification compliance.
 - Select five (5) tabs and perform the following test. Affix five (5) tabs at 24 inch intervals on an asphaltic pavement in a straight line. Using a medium size passenger vehicle or pickup, run over the markers with the front and rear tires at a speed of 35 to 40 miles per hour, four (4) times in each direction. No more than one (1) out of the five (5) reflective surfaces shall be lost or displaced as a result of this test.
- Small design variances may be noted between tab manufacturers.
- See Standard Sheet WZ(STPM) for tab placement on new pavements. See Standard Sheet TCP(7-1) for tab placement on seal coat work.

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

Guidemarks shall be designated as:
 YELLOW - (two amber reflective surfaces with yellow body).
 WHITE - (one silver reflective surface with white body).

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

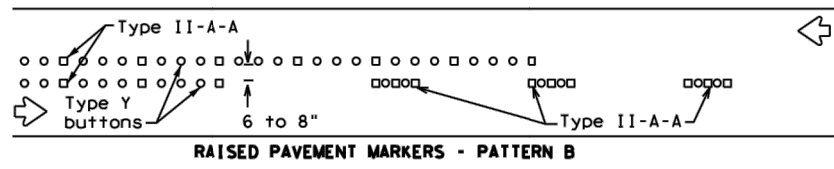
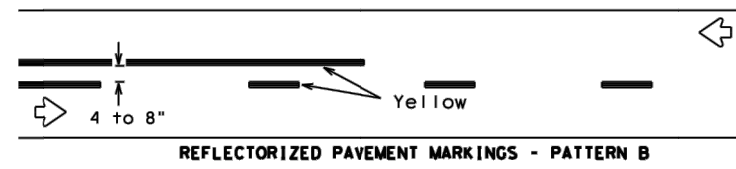
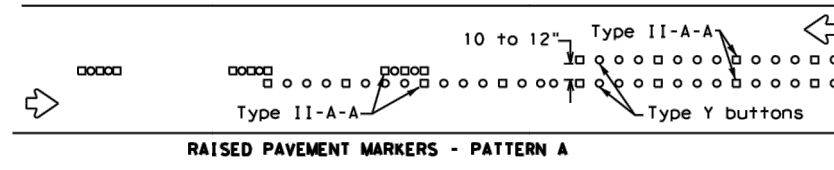
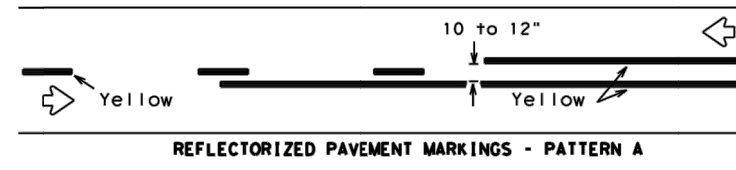
A list of prequalified reflective raised pavement markers, non-reflective traffic buttons, roadway marker tabs and other pavement markings can be found at the Material Producer List web address shown on BC(1).

SHEET 11 OF 12

Texas Department of Transportation		Traffic Safety Division Standard
<h1 style="margin: 0;">BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS</h1> <h2 style="margin: 0;">BC(11) - 21</h2>		
FILE: bc-21.dgn © TxDOT February 1998	DN: TxDOT CONT SECT: 0314 07 DIST: FTW	CK: TxDOT JOB: 081 COUNTY: PARKER SHEET NO.: 017
REVISIONS 2-98 9-07 5-21 1-02 7-13 11-02 8-14		

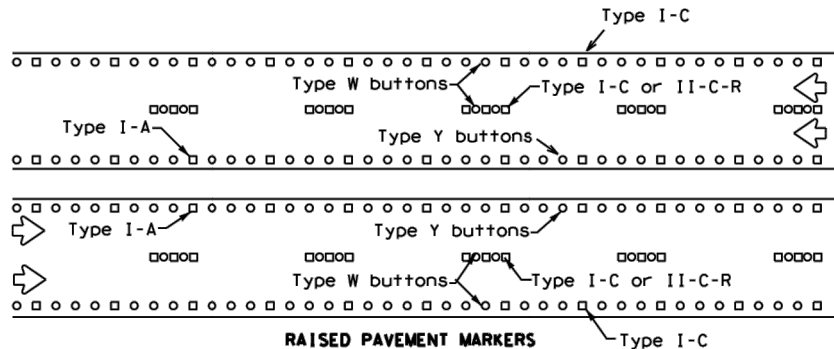
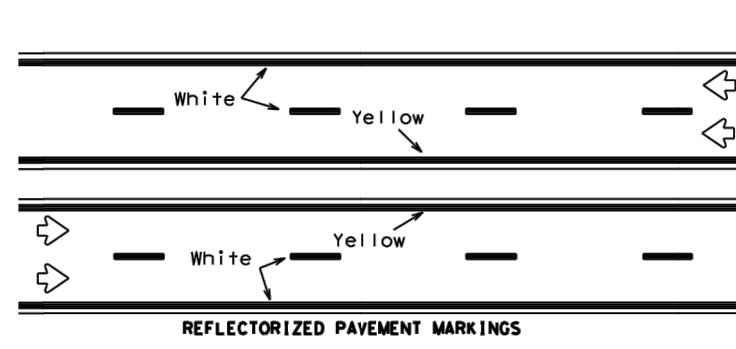
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

PAVEMENT MARKING PATTERNS



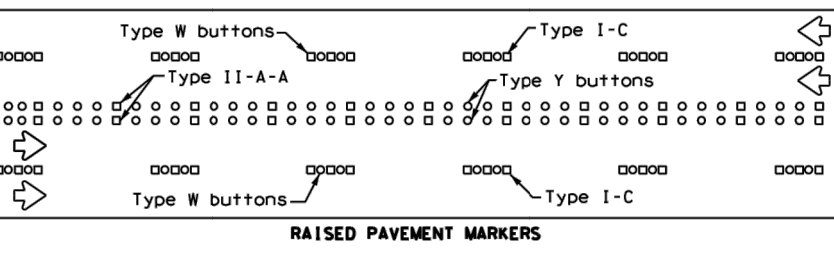
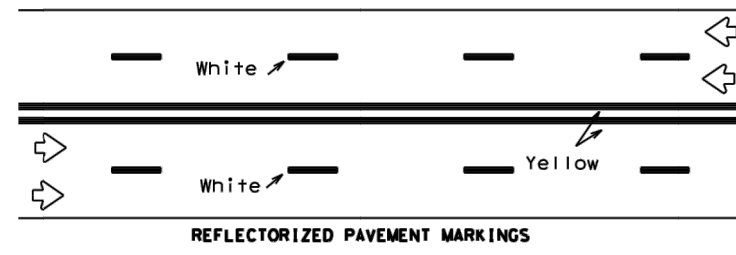
Pattern A is the TxDOT Standard, however Pattern B may be used if approved by the Engineer. Prefabricated markings may be substituted for reflectorized pavement markings.

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



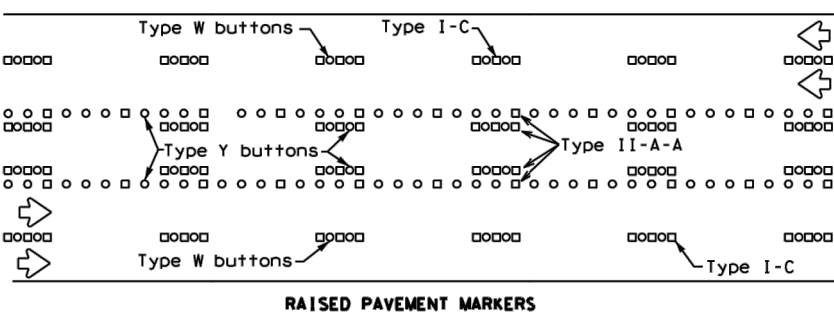
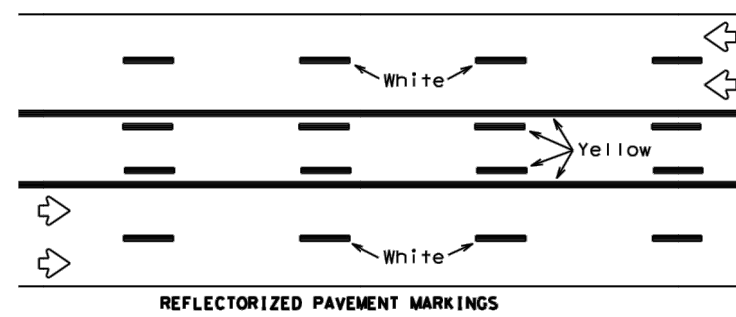
Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



Prefabricated markings may be substituted for reflectorized pavement markings.

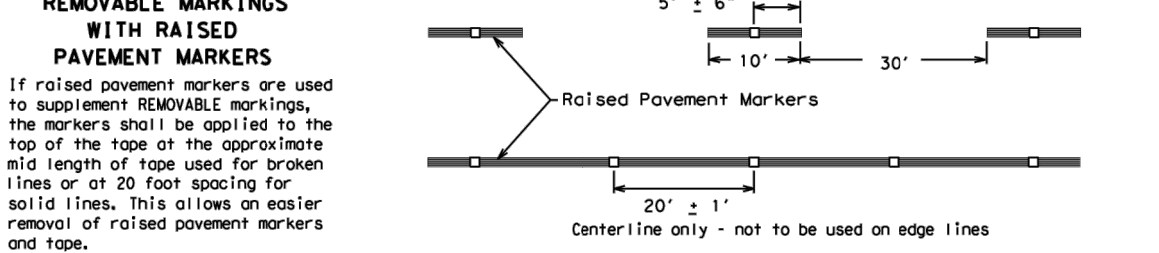
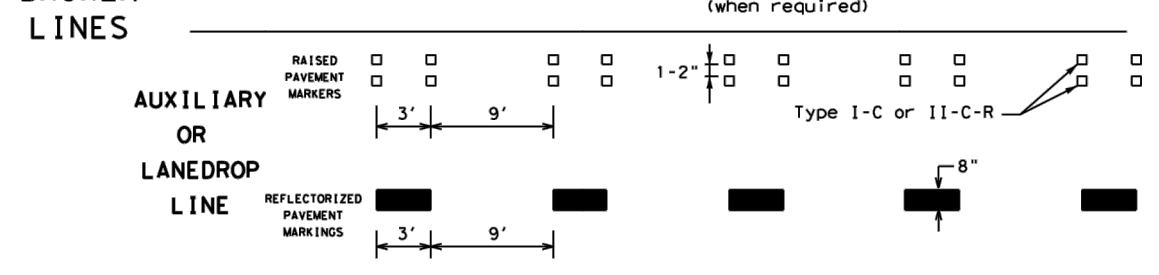
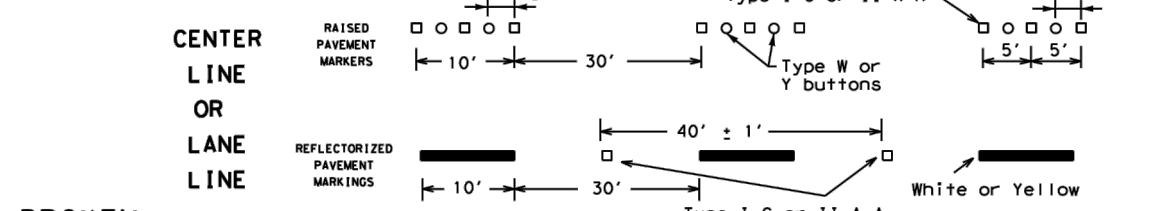
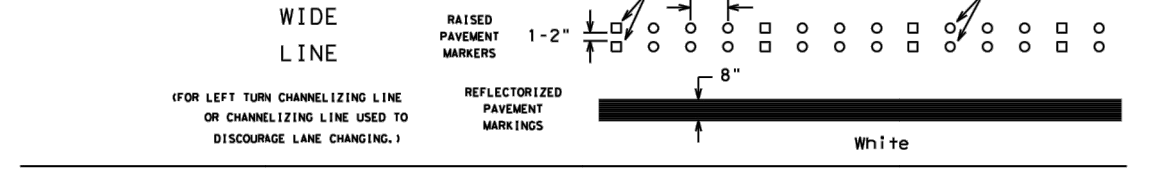
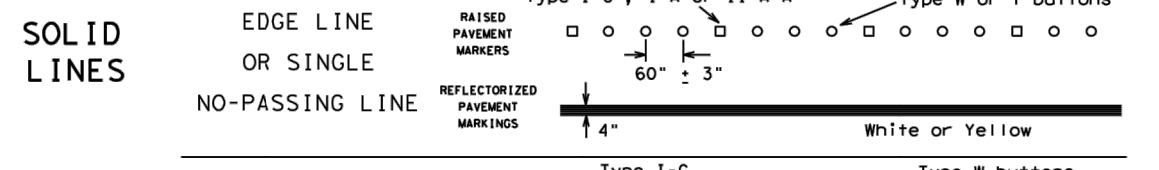
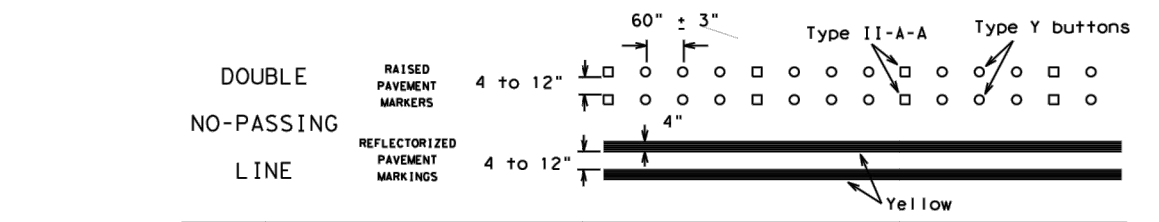
LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



Raised pavement markers used as standard pavement markings shall be from the approved products list and meet the requirements of Item 672 "RAISED PAVEMENT MARKERS."

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

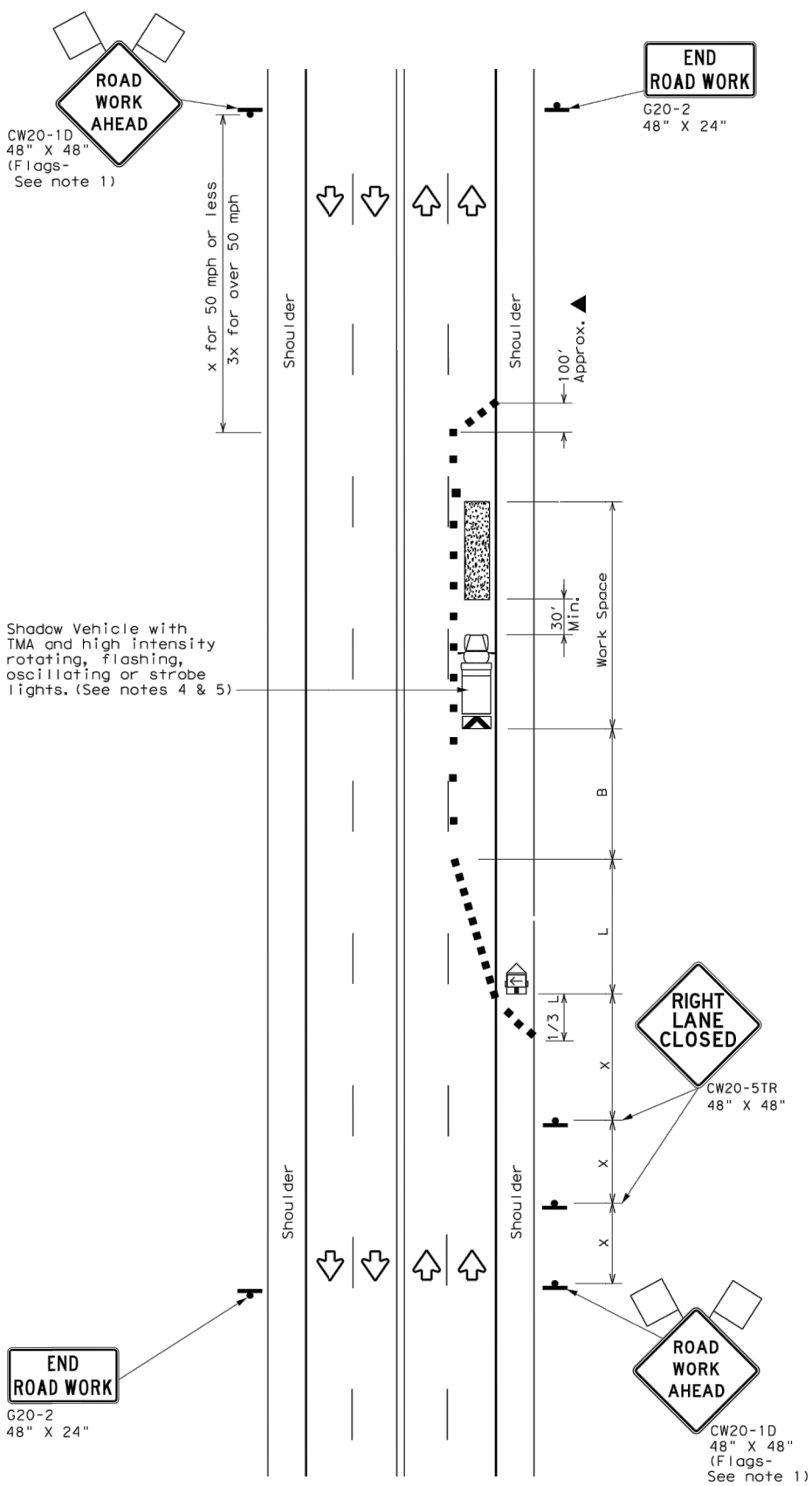
BC (12) - 21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0314	07	081	IH-20
1-97 9-07 5-21	DIST	COUNTY	SHEET NO.	
2-98 7-13	FTW	PARKER	018	
11-02 8-14				

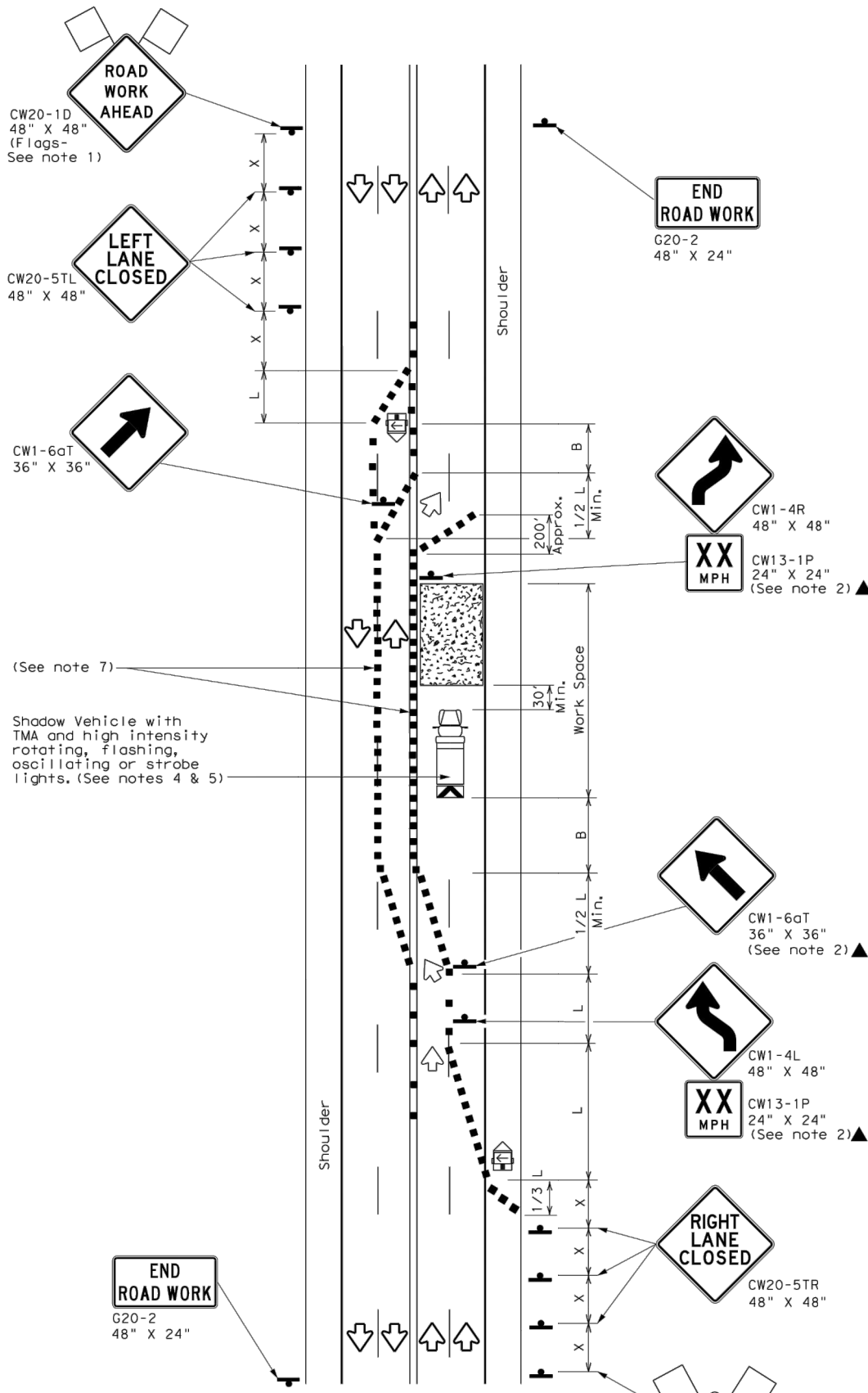
DATE: FILE:

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DATE: FILE:



TCP (1-4a)
ONE LANE CLOSED



TCP (1-4b)
TWO LANES CLOSED

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

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

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

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

- GENERAL NOTES**
- Flags attached to signs where shown are REQUIRED.
 - All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
 - 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.

Texas Department of Transportation
 Traffic Operations Division Standard

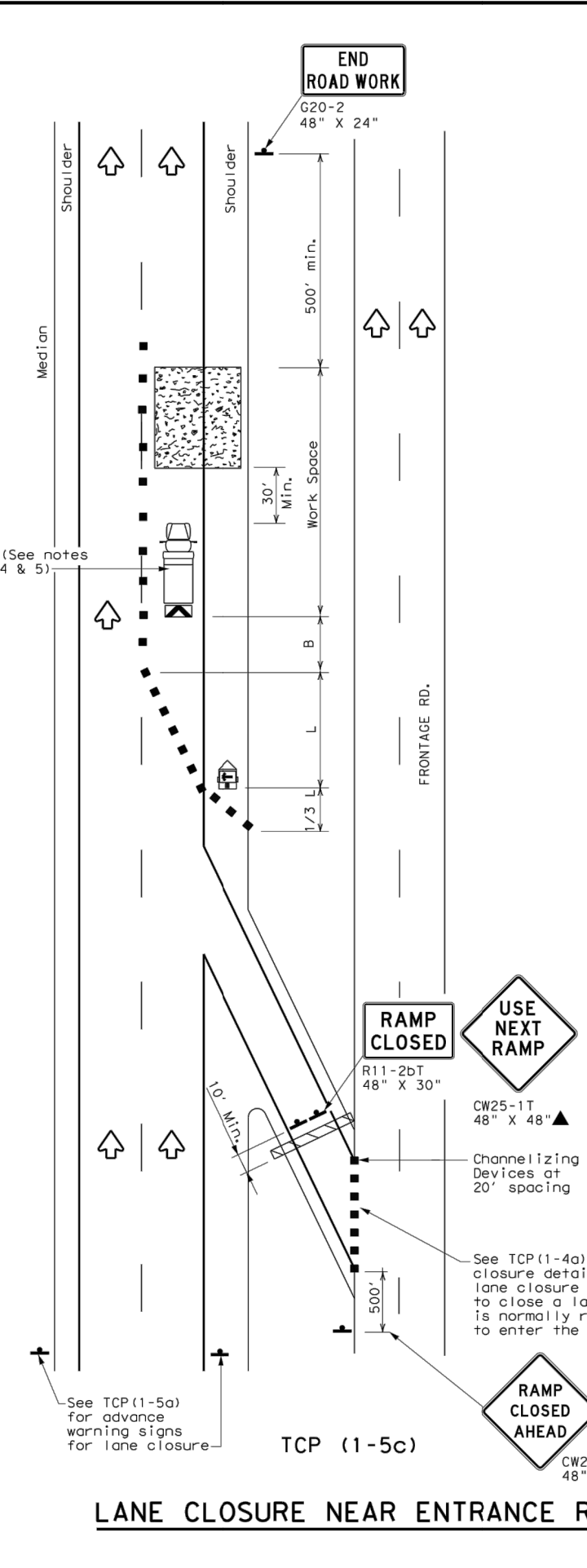
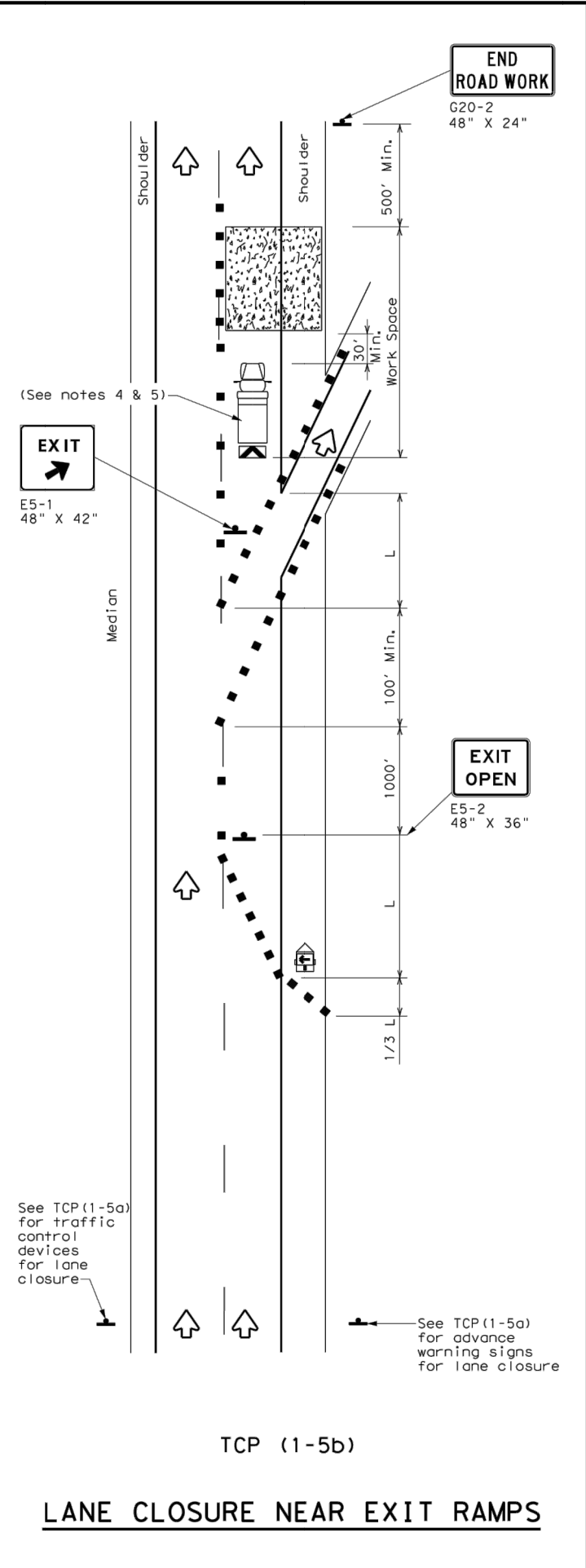
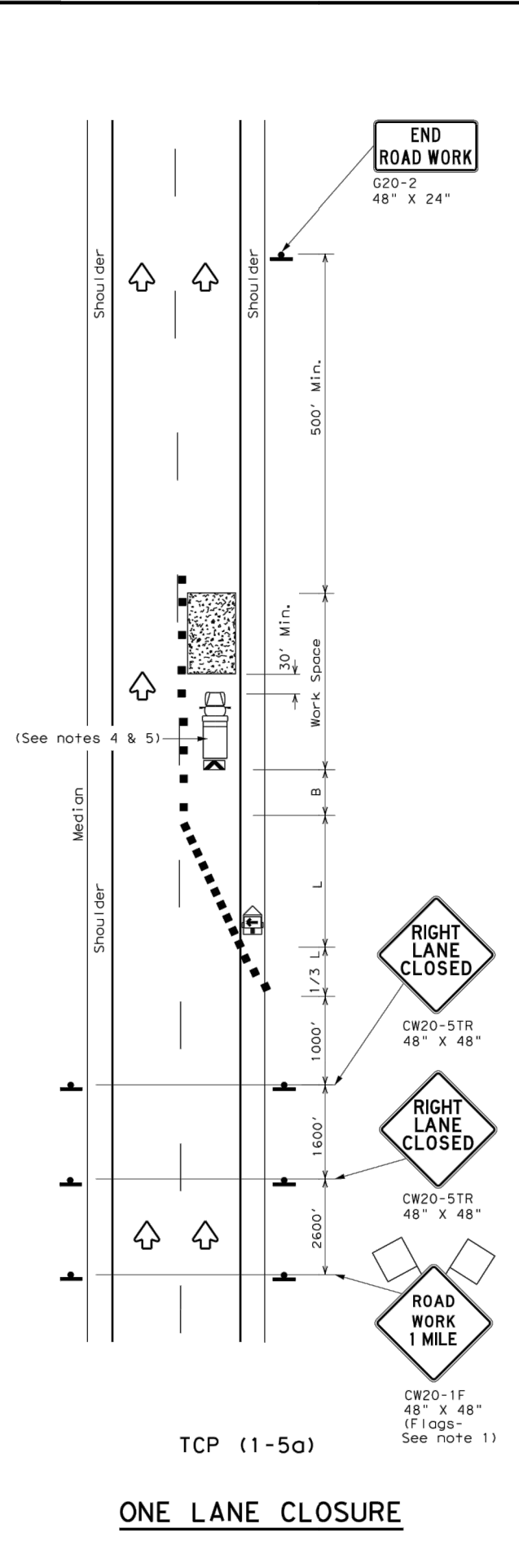
**TRAFFIC CONTROL PLAN
 LANE CLOSURES ON MULTILANE
 CONVENTIONAL ROADS**

TCP (1-4) - 18

FILE#	tcp1-4-18.dgn	DN#		CK#		DW#		CK#	
© TxDOT	December 1985	COM#	SECT	JOB	HIGHWAY				
REVISIONS		0314	07	081	IH-20				
2-94	4-98	DIST	COUNTY	SHEET NO.					
8-95	2-12	FTW	PARKER	019					
1-97	2-18								

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DATE: FILE:



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

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

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

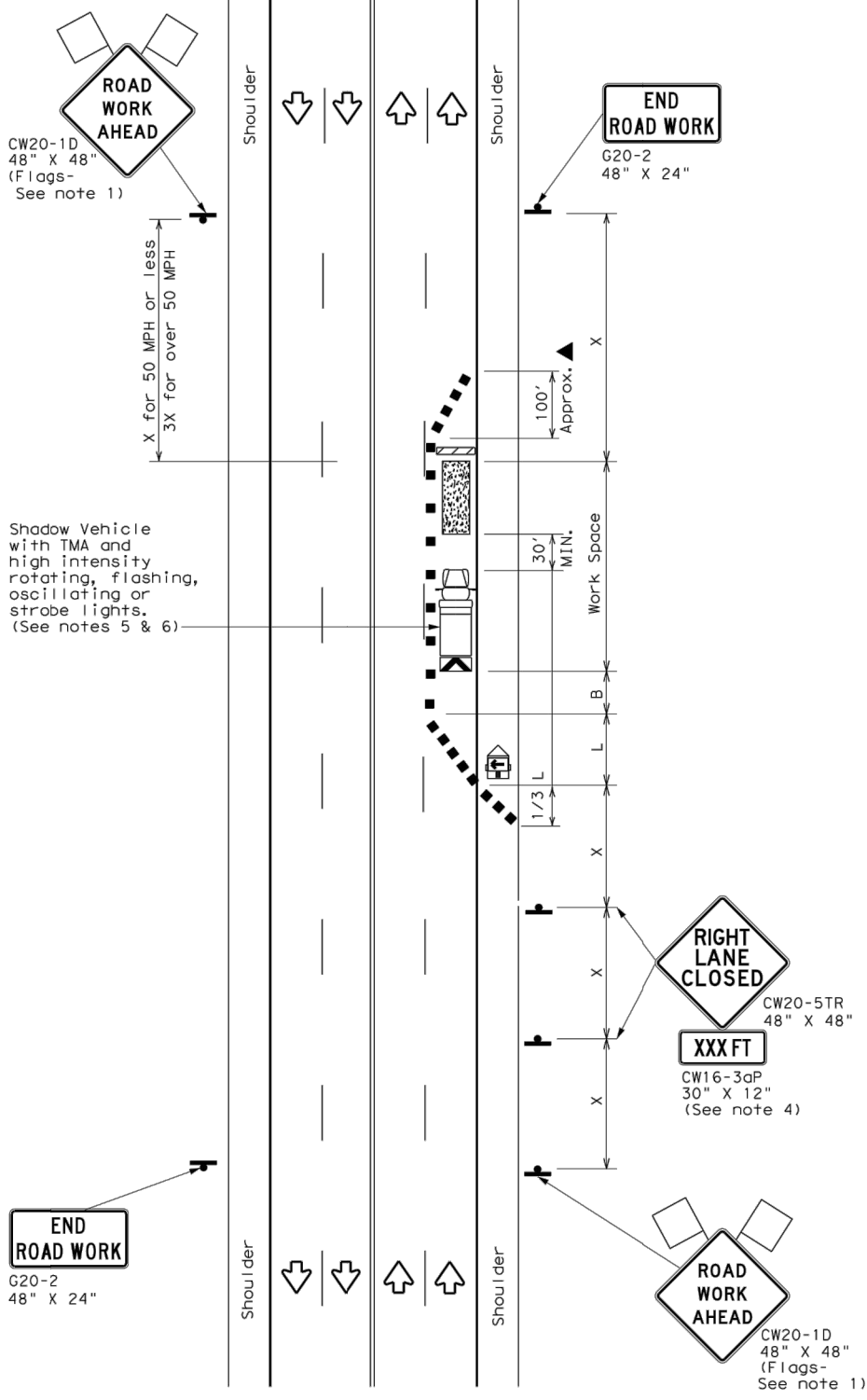
TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
		✓		

- GENERAL NOTES**
- Flags attached to signs where shown, are REQUIRED.
 - All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
 - Channelizing devices used to close lanes may be supplemented with the Chevron Alignment Sign placed on every other channelizing device. Chevrons may be attached to plastic drums as per BC Standards.
 - Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
 - Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

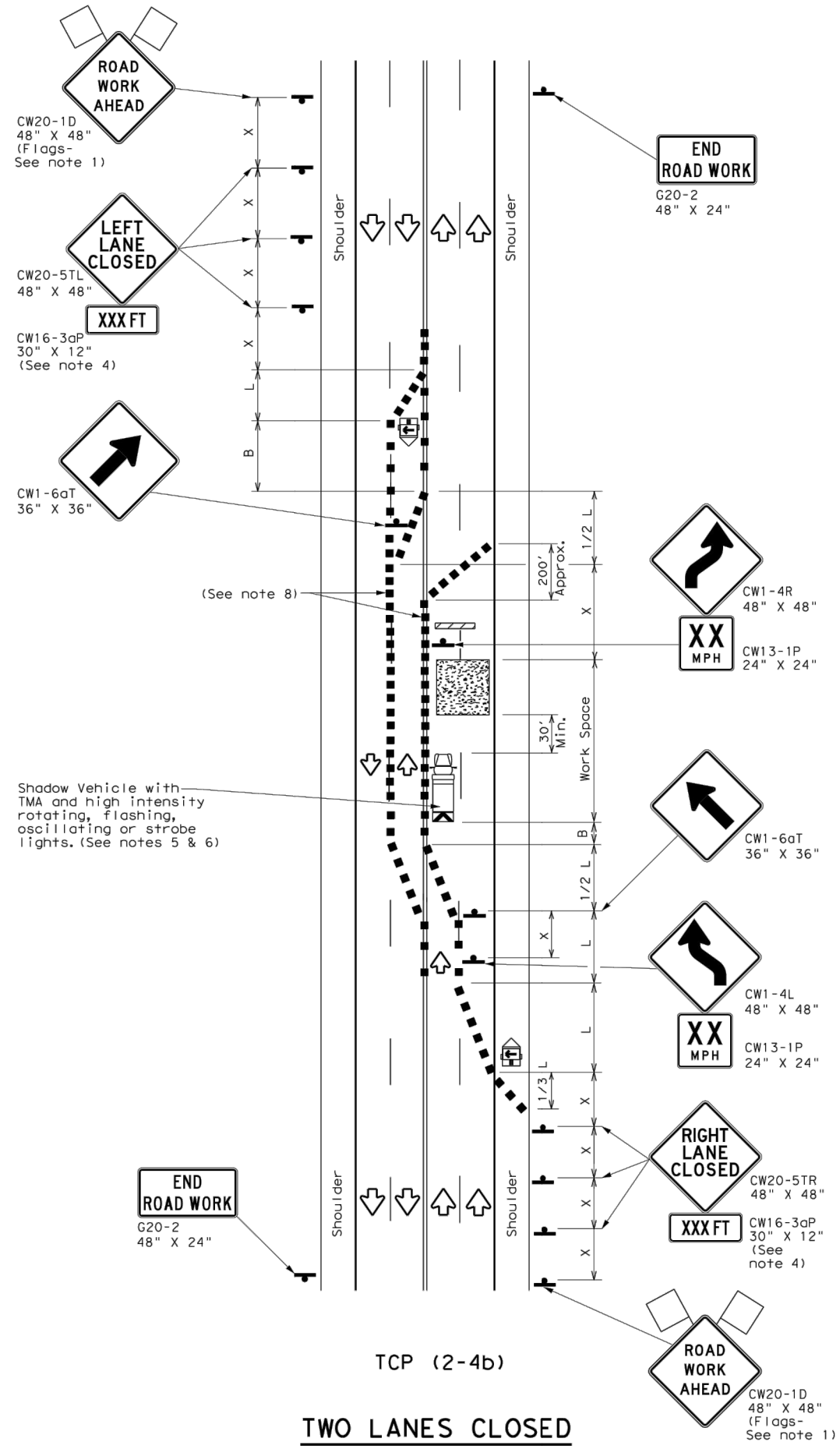
TRAFFIC CONTROL PLAN
LANE CLOSURES FOR
DIVIDED HIGHWAYS
TCP (1-5) - 18

FILE: tcp1-5-18.dgn	DATE: February 2012	CON: 0314	SECT: 07	JOB: 081	HIGHWAY: IH-20
© TxDOT	REVISIONS:	DIST: FTW	COUNTY: PARKER	SHEET NO.: 020	

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TCP (2-4a)
ONE LANE CLOSED



TCP (2-4b)
TWO LANES CLOSED

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40	L = WS	265'	295'	320'	40'	80'	240'	155'
45		450'	495'	540'	45'	90'	320'	195'
50	L = WS	500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60	L = WS	600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70	L = WS	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.
 - The downstream taper is optional. When used, it should be 100 feet minimum length per lane.
 - For short term applications, when post mounted signs are not used, the distance legend may be shown on the sign face rather than on a CW16-3aP supplemental plaque.
 - A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
 - Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.
- TCP (2-4a)**
- 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 to protect the work space from opposing traffic with the arrow board placed in the closed lane near the end of the merging taper.
- TCP (2-4b)**
- For shorter durations where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2(S) where S is the speed in mph. This tighter devices spacing is intended for the area of conflicting markings, not the entire work zone.



**TRAFFIC CONTROL PLAN
 LANE CLOSURES ON MULTILANE
 CONVENTIONAL ROADS**

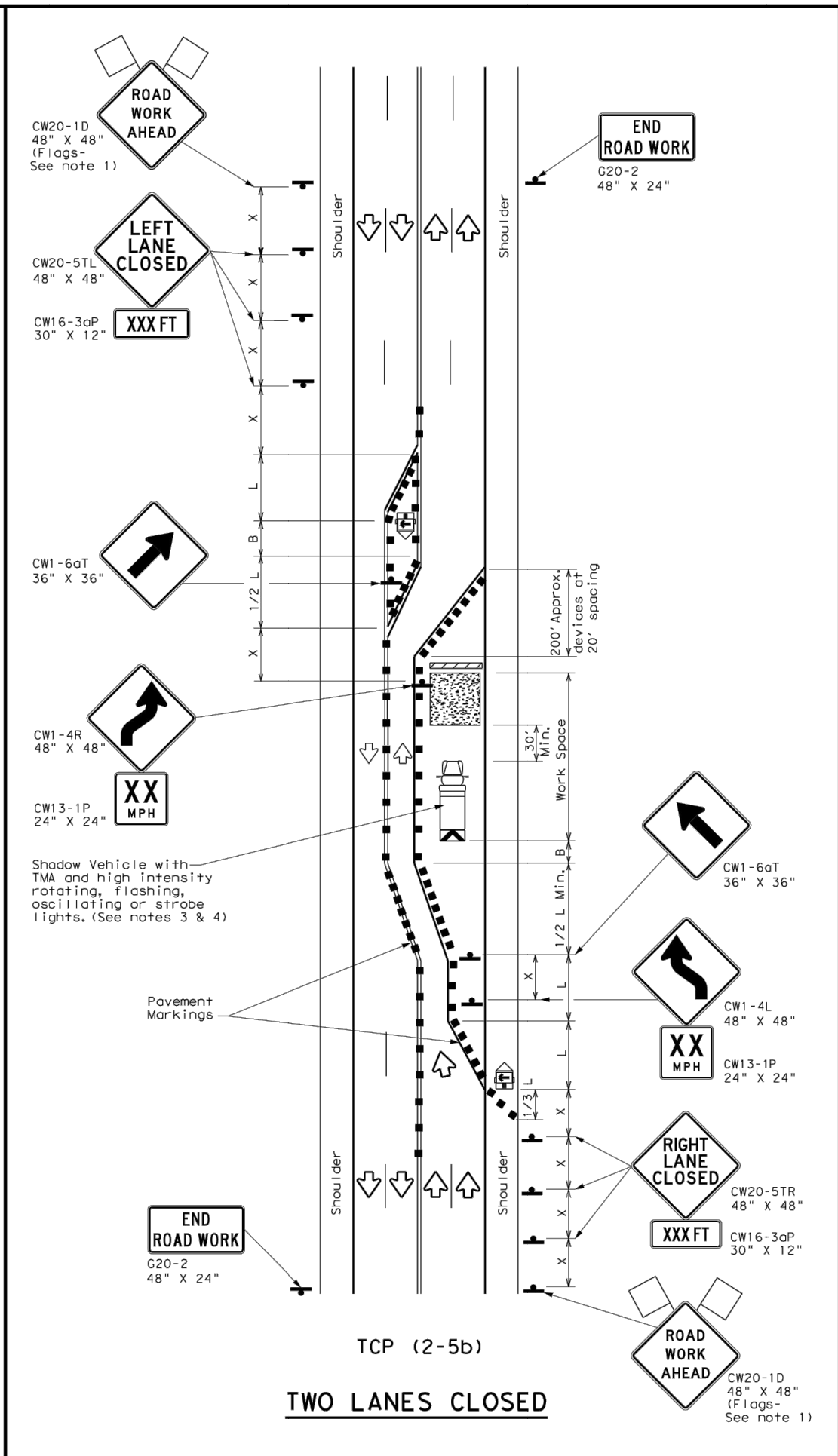
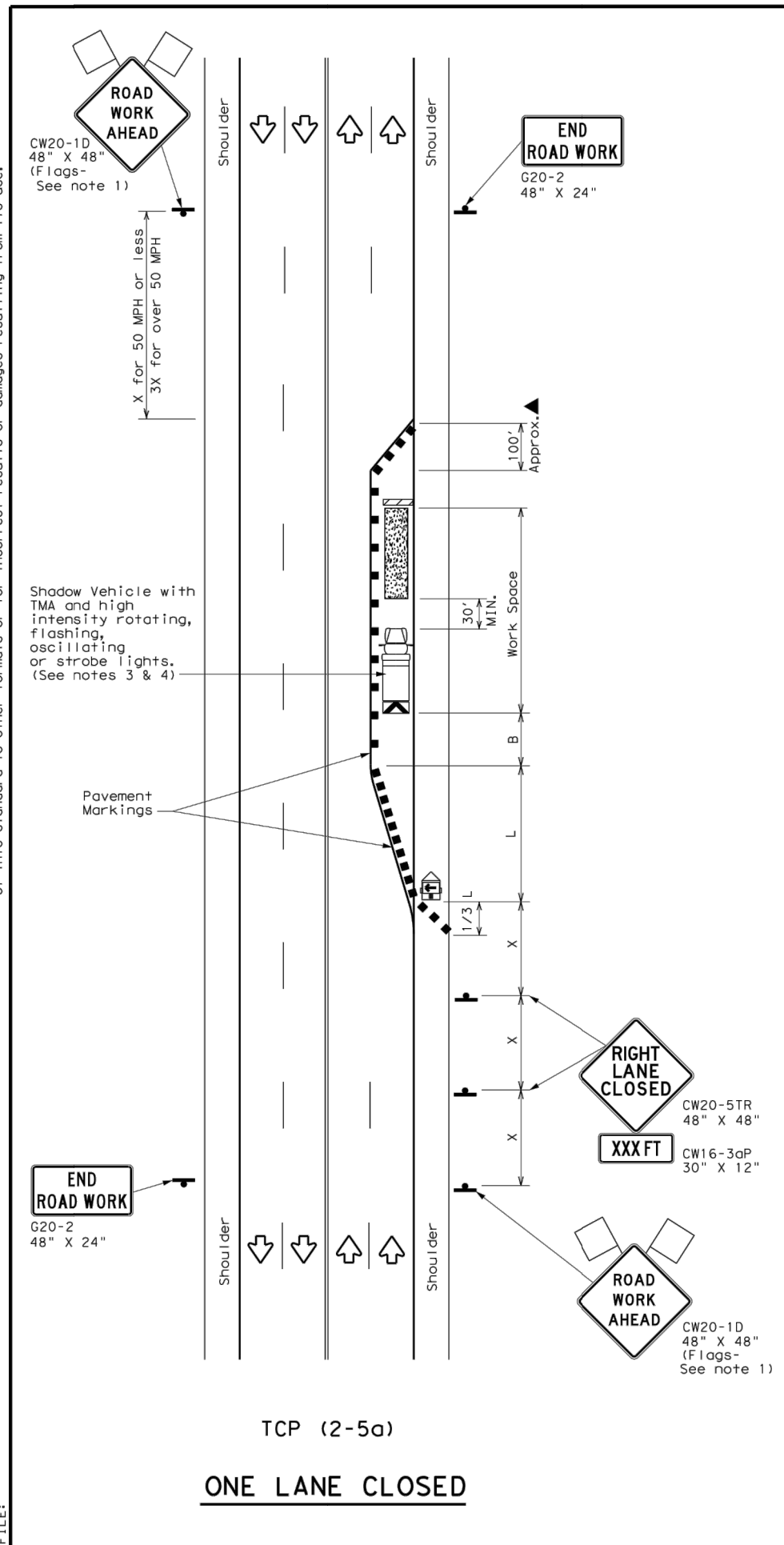
TCP (2-4) - 18

FILE: tcp2-4-18.dgn	DN: 1	CK: 1	DW: 1	CK: 1
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
8-95 3-03	0314	07	081	IH-20
1-97 2-12	DIST	COUNTY	SHEET NO.	
4-98 2-18	FTW	PARKER	021	

DATE:
FILE:

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DATE: FILE:



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

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

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

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

- GENERAL NOTES**
- Flags attached to signs where shown, are REQUIRED.
 - All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
 - A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
 - Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.
 - The downstream taper is optional. When used, it should be 100 feet approximately per lane, with channelizing devices spaced at 20 feet.

- TCP (2-5a)**
- If this TCP is used for a left lane closure, CW20-5TL "LEFT LANE CLOSED" signs shall be used and channelizing devices shall be placed on the centerline to protect the work space from opposing traffic, with the arrow board placed in the closed lane near the end of the merging taper.
- TCP (2-5b)**
- Conflicting pavement markings shall be removed for long-term projects.

Texas Department of Transportation
 Traffic Operations Division Standard

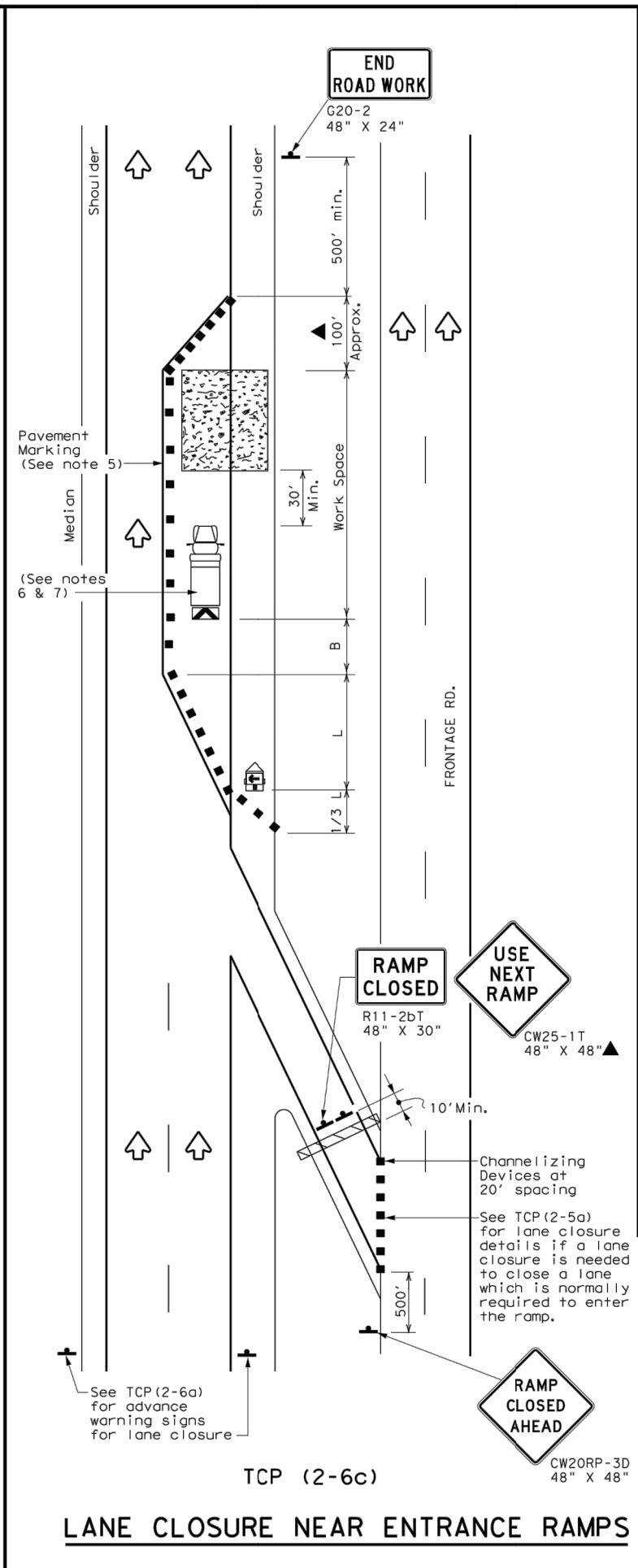
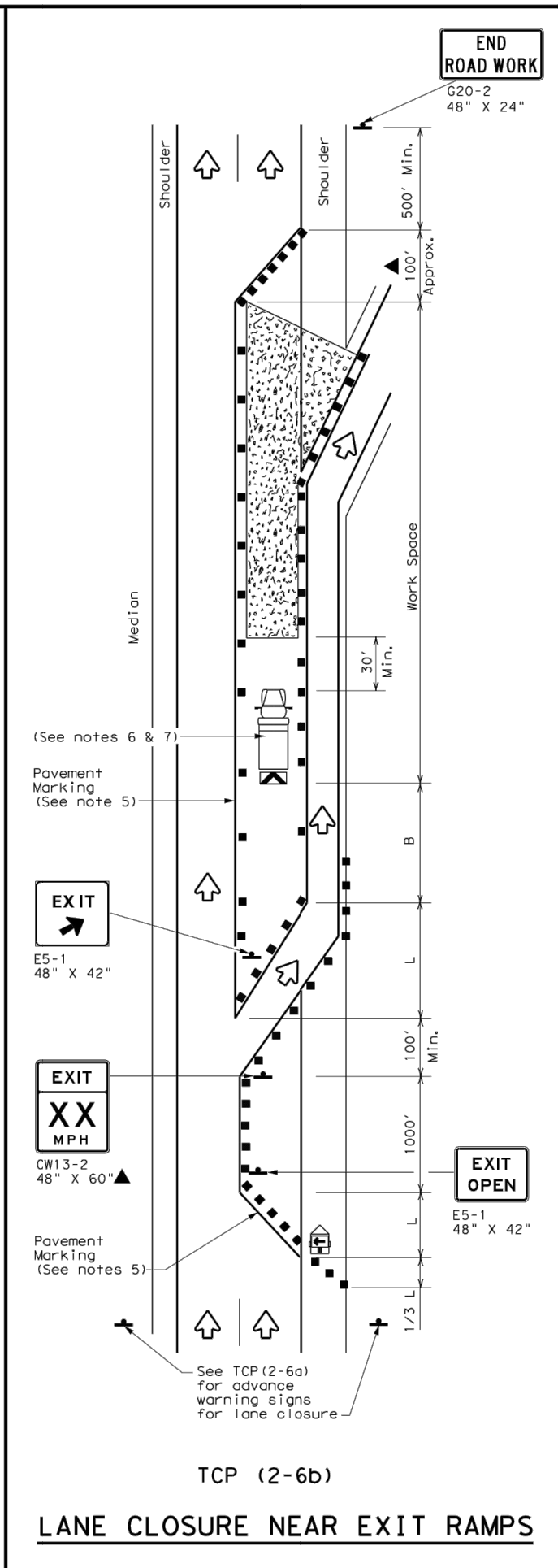
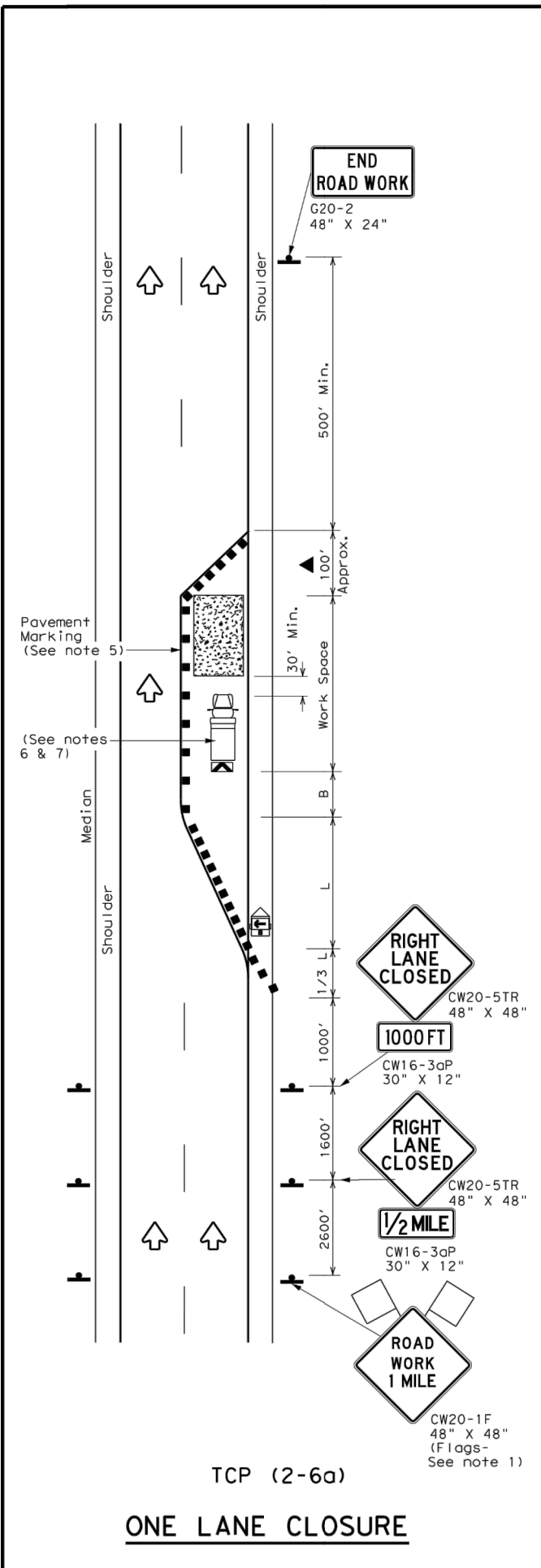
**TRAFFIC CONTROL PLAN
 LONG TERM LANE CLOSURES
 MULTILANE CONVENTIONAL RDS.**

TCP (2-5) - 18

FILE# tcp2-5-18.dgn	DATE December 1985	CK#	DW#	CK#
8-95 2-12	REVISIONS	0314 07	081	IH-20
1-97 3-03		DIST	COUNTY	SHEET NO.
4-98 2-18		FTW	PARKER	022

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DATE: FILE:



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

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

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

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

- GENERAL NOTES**
- Flags attached to signs where shown, are REQUIRED.
 - All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
 - Channelizing devices used to close lanes may be supplemented with the Chevron Alignment Sign placed on every other channelizing device. Chevrons may be attached to plastic drums as per BC Standards.
 - Channelizing devices used along the work space or along tangent sections may be supplemented with vertical panels (VP) placed on every other channelizing device. If night time conditions make it difficult to see at least two VPs, the VPs may be placed on each channelizing device.
 - The placement of pavement markings may be omitted on Intermediate-term stationary work zones with the approval of the Engineer.
 - Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
 - Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

Texas Department of Transportation
 Traffic Operations Division Standard

**TRAFFIC CONTROL PLAN
 LANE CLOSURES ON
 DIVIDED HIGHWAYS**

TCP (2-6) - 18

FILE# tcp2-6-18.dgn	DWG#	CK#	DWG#	CK#
© TxDOT December 1985	CON#	SECT#	JOB#	HIGHWAY#
REVISIONS	0314	07	081	IH-20
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	FTW	PARKER		023
1-97 2-18				

166

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DATE: FILE:

GENERAL NOTES FOR ALL ELECTRICAL WORK

- The location of all conduits, junction boxes, ground boxes, and electrical services is diagrammatic and may be shifted to accommodate field conditions.
- Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC), TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA), and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association (CSA), Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Where reference is made to NEMA listed devices, International Electrotechnical Commission (IEC) listed devices will not be considered an acceptable equal to a NEMA listed device. Acceptable devices may have both a NEMA and IEC listing. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection. Replace or reinstall rejected material or equipment at no additional cost to the Department.
- Miscellaneous nuts, bolts and hardware, except for high strength bolts, may be stainless steel when plans specify galvanized, provided the bolt size is 1/2 in. or less in diameter.
- Provide the following test equipment as required by the Engineer to confirm compliance with the contract and the NEC: voltmeter, ammeter, megohm meter (1000 volt DC), ground resistance tester, torque wrenches, and torque screwdrivers. Ensure all equipment has been properly calibrated within the last year. Provide calibration certification to the Engineer upon request. Operate test equipment during inspection as requested by the Engineer.
- Install grounding as shown on the plans and in accordance with the NEC. Ensure all metallic conduits; metal poles; luminaires; and metal enclosures are bonded to the equipment grounding conductor. Provide stranded bare copper or green insulated grounding conductors. Ground rods, connectors, and bonding jumpers are subsidiary to the various bid items.
- When required by the Engineer, notify the Department in writing of materials from the Material Producers List (MPL) intended for use on each project. Prequalified materials are listed on the MPL on TxDOT's website under "Roadway Illumination and Electrical Supplies." No substitutions will be allowed for materials on this list.

CONDUIT

A. MATERIALS

- Provide conduit, junction boxes, fittings, and hardware as per TxDOT Departmental Material Specification (DMS) 11030 "Conduit" and Item 618 "Conduit" of TxDOT's "Standard Specifications For Construction And Maintenance Of Highways, Streets, And Bridges," latest edition. Provide conduits listed under Item 618 on the MPL under "Roadway Illumination and Electrical Supplies." Provide conduit types according to the descriptive code or as shown on the plans. Do not substitute other types of conduits for those shown. Provide liquidtight flexible metal conduit (LFMC) when flexible conduit is called for on galvanized steel rigid metallic conduit (RMC) systems. Provide liquidtight flexible nonmetallic conduit (LFNC) when flexible conduit is called for on polyvinyl chloride (PVC) systems.
- Provide galvanized steel RMC for all exposed conduits, unless otherwise shown on the plans. Properly bond all metal conduits.
- Unless otherwise shown on the plans, provide junction boxes with a minimum size as shown in the following table, which applies to the greatest number of conductors entering the box through one conduit with no more than four conduits per box. When a mixture of conductor sizes is present, count the conductors as if all are of the larger size. For situations not applicable to the table, size junction boxes in accordance with NEC.


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

- Junction boxes with an internal volume of less than 100 cu. in. and supported by entering raceways must have threaded entries or hubs identified for the intended purpose and supported by connection of two or more rigid metal conduits. Secure conduit within 3 ft. of the enclosure or within 18 in. of the enclosure if all conduit entries are on the same side. Mechanically secure all junction boxes with an internal volume greater than 100 cu. inches.
- Provide hot dipped galvanized cast iron or sand cast aluminum outlet boxes for junction boxes containing only 10 AWG or 12 AWG conductors. Do not use die cast aluminum boxes. Size outlet boxes according to the NEC.
- Do not use intermediate metal conduit (IMC) or electrical metallic tubing (EMT) unless specifically required by the plan sheets. When EMT is called for, provide junction boxes made from galvanized steel sheeting, listed and approved for outdoor use, unless otherwise noted on the plans. Size all galvanized steel junction boxes in accordance with the NEC. Provide junction boxes for IMC conduit systems that meet the same requirements for junction boxes used with RMC systems.
- Provide PVC junction boxes intended for outdoor use on PVC conduit systems, unless otherwise noted on the plans.

- Provide PVC elbows in PVC conduit systems, unless otherwise shown on the plans. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the PVC conduit system. When galvanized steel RMC elbows are specifically called for in the plans and any portion of the RMC elbow is buried less than 18 in., ground the RMC elbow by means of a grounding bushing on a rigid metal extension. Grounding of the rigid metal elbow is not required if the entire RMC elbow is encased in a minimum of 2 in. of concrete. PVC extensions are allowed on these concrete encased rigid metal elbows. RMC or PVC elbows are subsidiary to various bid items.
- When required, provide High-Density Polyethylene (HDPE) conduit with factory installed internal conductors according to Item 622 "Duct Cable." At the Contractor's request and with approval by the Engineer, substitute HDPE conduit with no conductors for bored schedule 40 or schedule 80 PVC conduit bid under Item 618. Ensure bored HDPE substituted for PVC is schedule 40 and of the same size PVC called for in the plans. Ensure the substituted HDPE meets the requirements of Item 622, except that the conduit is supplied without factory-installed conductors. Make the transition of the HDPE conduit to PVC (or RMC elbow when required) at the bore pit. Provide conduit of the size and schedule as shown on the plans. Do not extend substituted conduit into ground boxes or foundations. Provide PVC or galvanized steel RMC elbows as called for at all ground boxes and foundations.
- Use two-hole straps when supporting 2 in. and larger conduits. On electrical service poles, properly sized stainless steel or hot dipped galvanized one-hole standoff straps are allowed on the service riser conduit.

B. CONSTRUCTION METHODS

- Provide and install expansion joint conduit fittings on all structure-mounted conduits at the structure's expansion joints to allow for movement of the conduit. In addition, provide and install expansion joint fittings on all continuous runs of galvanized steel RMC conduit externally exposed on structures such as bridges at maximum intervals of 150 ft. When requested by the project Engineer, supply manufacturer's specification sheet for expansion joint conduit fittings. Repair or replace expansion joint fittings that do not allow for movement at no additional cost to the Department. Provide the method of determining the amount of expansion to the Engineer upon request. Do not use LFMC or LFNC as a substitute for the required expansion conduit fittings.
- Space all conduit supports at maximum intervals of 5 ft. Install conduit spacers when attaching metal conduit to surface of concrete structures. See "Conduit Mounting Options" on ED(2). Install conduit support within 3 ft. of all enclosures and conduit terminations.
- Do not attach conduit supports directly to pre-stressed concrete beams except as shown specifically in the plans or as approved by the Engineer.
- Unless otherwise shown on the plans, jack or bore conduit placed beneath existing roadways, driveways, sidewalks, or after the base or surfacing operation has begun. Backfill and compact the bore pits below the conduit per Item 476 "Jacking, Boring, or Tunneling Pipe or Box" prior to installing conduit or duct cable to prevent bending of the connections.
- When placing conduit in the sub-grade of new roadways, backfill all trenches with excavated material unless otherwise noted on the plans. When placing conduit in the sub-base of new roadways, backfill all trenches with cement-stabilized base as per requirements of Items 110 "Excavation", 400 "Excavation and Backfill for Structures", 401 "Flowable Backfill", 402 "Trench Excavation Protection", and 403 "Temporary Special Shoring."
- Provide and place warning tape approximately 10 in. above all trenched conduit as per Item 618.
- During construction, temporarily cap or plug open ends of all conduit and raceways immediately after installation to prevent entry of dirt, debris and animals. Temporary caps constructed of durable duct tape are allowed. Tightly fix the tape to the conduit opening. Clean out the conduit and prove it clear in accordance with Item 618 prior to installing any conductors.
- Ensure conduit entry into the top of any enclosure is waterproof by installing conduit sealing hubs or using boxes with threaded bosses. This includes surface mounted safety switches, meter cans, service enclosures, auxiliary enclosures and junction boxes. Grounding bushings on water tight sealing hubs are not required.
- Fit the ends of all PVC conduit terminations with bushings or bell end fittings. Provide and install a grounding type bushing on all metal conduit terminations.
- Install a bonding jumper from each grounding bushing to the nearest ground rod, grounding lug, or equipment grounding conductor. Ensure all bonding jumpers are the same size as the equipment grounding conductor. Bonding of conduit used as a casing under roadways for duct cable is not required, if the duct extends the full length through the casing.
- At all electrical services, install a 6 AWG solid copper grounding electrode conductor.
- Place conduits entering ground boxes so that the conduit openings are between 3 in. and 6 in. from the bottom of the box. See the ground box detail on sheet ED(4).
- Seal ends of all conduits with duct seal, expandable foam, or by other methods approved by the Engineer. Seal conduit immediately after completion of conductor installation and pull tests. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a conduit sealant.
- File smooth the cut ends of all mounting strut and conduit. Before installing, paint the field cut ends of all mounting strut and RMC (threaded or non-threaded) with zinc rich paint (94% or more zinc content) to alleviate overspray. Use zinc rich paint to touch up galvanized material as allowed under Item 445 "Galvanizing." Do not paint non-galvanized material with a zinc rich paint as an alternative for materials required to be galvanized.

		Texas Department of Transportation		Traffic Operations Division Standard	
<h2>ELECTRICAL DETAILS CONDUITS & NOTES</h2>					
<h3>ED(1)-14</h3>					
FILE:	ed1-14.dgn	DN:	CK:	DW:	CK:
© TxDOT	October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS		0314	07	081	IH-20
		DIST	COUNTY		SHEET NO.
		FTW	PARKER		024

ELECTRICAL CONDUCTORS

A. MATERIAL INFORMATION

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

B. CONSTRUCTION METHODS

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

12. Provide and install a separate stranded equipment grounding conductor (EGC) in all conduits that contain circuit wiring of 50 volts or more. Unless shown elsewhere, size the EGC to be the same size as the largest current carrying conductor contained in the conduit. Ensure all EGCs are bonded together at every accessible location. For traffic signal installations, provide a minimum size 8 AWG EGC. The EGC is paid for under Item 620.

C. TEMPORARY WIRING

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

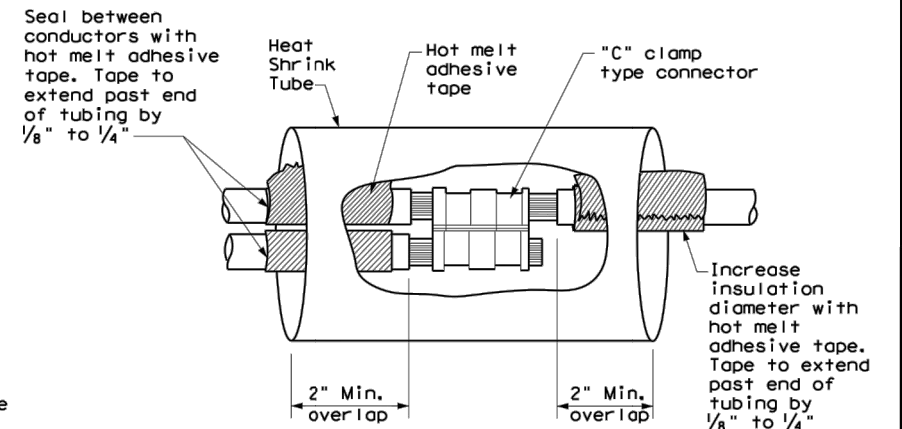
GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

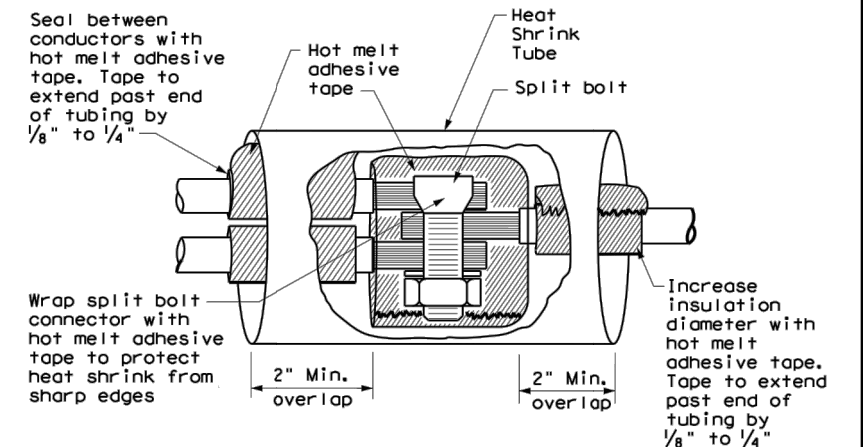
1. Provide and install a grounding electrode at electrical services. Provide ground rods according to DMS 11040 and the plans. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets. Concrete encased grounding electrodes may be called for in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

B. CONSTRUCTION METHODS

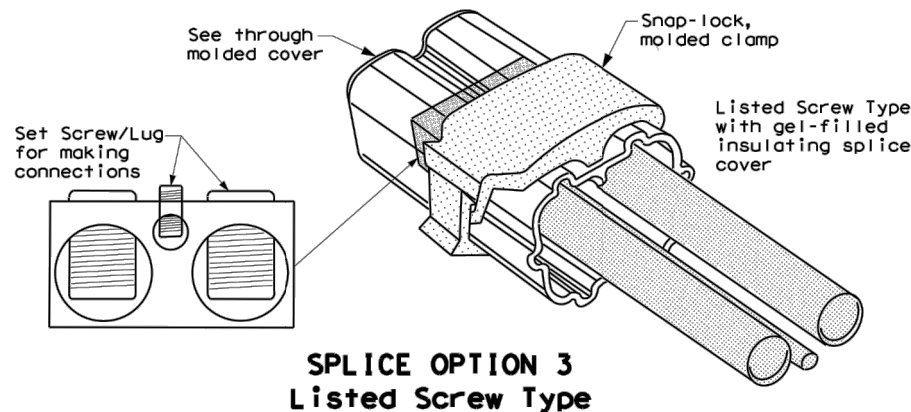
1. Furnish auxiliary ground rods for lightning protection and install in soil, concrete, or both, as called for in the plans. For ground rods installed in concrete, ensure the connection of the conductor to the ground rod is readily accessible for inspection or repairs. For ground rods installed in soil,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



**SPLICE OPTION 1
Compression Type**



**SPLICE OPTION 2
Split Bolt Type**



**SPLICE OPTION 3
Listed Screw Type**

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DATE: FILE:

		Texas Department of Transportation		Traffic Operations Division Standard	
<h2>ELECTRICAL DETAILS CONDUCTORS</h2>					
<h3>ED(3)-14</h3>					
FILE#	ed3-14.dgn	DN#	TxDOT	CK#	TxDOT
REV#	01	DATE	October 2014	JOB	HIGHWAY
REV#	0314	REV#	07	REV#	081
DIST	FTW	COUNTY	PARKER	SHEET NO.	025

ELECTRICAL SERVICES NOTES

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1. Provide new materials. Ensure installation and materials comply with the applicable provisions of the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards. Ensure material is Underwriters Laboratories (UL) listed. Provide and install electrical service conduits, conductors, disconnects, contactors, circuit breaker panels, and branch circuit breakers as shown on the Electrical Service Data chart in the plans. Faulty fabrication or poor workmanship in material, equipment, or installation is justification for rejection. Where manufacturers provide warranties and guarantees as a customary trade practice, furnish these to the State.
2. Provide electrical services in accordance with Electrical Details standard sheets, Departmental Material Specification (DMS) 11080 "Electrical Services," DMS 11081 "Electrical Services-Type A," DMS 11082 "Electrical Services-Type C," DMS 11083 "Electrical Services-Type D," DMS 11084 "Electrical Services-Type T," DMS 11085 "Electrical Services-Pedestal (PS)", and Item 628 "Electrical Services" of the Standard Specifications. Provide electrical service types A, C, and D, as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 628. Provide other service types as detailed on the plans.
3. Provide all work, materials, services, and any incidentals needed to install a complete electrical service as specified in the plans.
4. Coordinate with the Engineer and the utility provider for metering and compliance with utility requirements. Primary line extensions, connection charges, meter charges, and other charges by the utility company to provide power to the location are paid for in accordance with Item 628. Get approval for the costs associated with these charges prior to engaging the utility company to do the work. Consult with the utility provider to determine costs and requirements, and coordinate the work as approved.
5. The enclosure manufacturer will provide Master Lock Type 2 with brass tumblers keyed #2195 for all custom electrical enclosures. Installing Contractor is to provide Master Lock #2195 Type 2 with brass tumblers for "off the shelf" enclosures. Master Lock #2195 keys and locks become property of the State. Unless otherwise approved, do not energize electrical service equipment until locks are installed.
6. Enclosures with external disconnects that de-energize all equipment inside the enclosure do not need a dead front trim. Protect incoming line terminations from incidental contact as required by the NEC.
7. When galvanized is specified for nuts, screws, bolts or miscellaneous hardware, stainless steel may be used.
8. Provide wiring and electrical components rated for 75°C. Provide red, black, and white colored XHHW service entrance conductors of minimum size 6 American Wire Gauge (AWG). Identify size 6 AWG conductors by continuous color jacket. Identify electrical conductors sized 4 AWG and larger by continuous color jacket or by colored tape. Mark at least 6 inches of the conductor's insulation with half laps of colored tape, when identifying conductors. Ensure each service entrance conductor exits through a separately bushed non-metallic opening in the weatherhead. The lengths of the conductors outside the weatherhead are to be 12 inches minimum, 18 inches maximum, or as required by utility.
9. All electrical service conduit and conductors attached to the electrical service including the riser or the elbow below ground are subsidiary to the electrical service. For an underground utility feed, all service conduit and conductors after the elbow, including service conduit and conductors for the utility pole riser when furnished by the Contractor, will be paid for separately.
10. Provide rigid metal conduit (RMC) for all conduits on service, except for the 1/2 in. PVC conduit containing the electrical service grounding electrode conductor. Size the service entrance conduit as shown in the plans. Ensure conduit for branch circuit entry to enclosure is the same size as that shown on the layout sheets for branch circuit conduit. Extend all rigid metal conduits a minimum of 6 inches underground and then couple to the type and schedule of the conduit shown on the layout for that particular branch circuit. Install a grounding bushing on the RMC where it terminates in the service enclosure.
11. Use of liquidtight flexible metal conduit (LFMC) is allowed between the meter and service enclosure when they are mounted 90 to 180 degrees to each other. Size the LFMC the same size as service entrance conduit. LFMC must not exceed 3 feet in length. Strap LFMC within 1 foot of each end. LFMC less than 12 inches in length need not be strapped. Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting. The LFMC must contain a grounded (neutral) conductor. Ensure any bend in LFMC never exceeds 180 degrees. A pull test is required on all installed conductors, with at least six inches of free conductor movement demonstrated to the satisfaction of the Engineer.
12. Ensure all mounting hardware and installation details of services conform to utility company specifications.
13. For all electrical service enclosures listed under Item 628 on the MPL, the UL 508 enclosure manufacturers will prepare and submit a schematic drawing unique to each service. Before shipment to the job site, place the applicable laminated schematic drawings and the laminated plan sheet showing the electrical service data chart used to build the enclosure in the enclosure's data pocket. The installing contractor will copy and laminate the actual project plan sheets detailing all equipment and branch circuits supplied by that service. The laminated plan sheets are to be placed in the service enclosure's document pocket. Reduce 11 in. x 17 in. plan sheets to 8 1/2 in. x 11 in. before laminating. If the installation differs from the plan sheets, the installing contractor is to redline plan sheets before laminating.
14. When providing an "Off The Shelf" Type D or Type T service, provide laminated plan sheets detailing equipment and branch circuits supplied by that service. Reduce 11 in. x 17 in. plan sheets to 8 1/2 in. x 11 in before laminating. Deliver these drawings before completion of the work to the Engineer, instead of placing in enclosure that has no door pocket.
15. Do not install conduit in the back wall of a service enclosure where it would penetrate the equipment mounting panel inside the enclosure. Provide grounding bushings on all metal conduits, and terminate bonding jumpers to grounding bus. Grounding bushings are not required when the end of the metal conduit is fitted with a conduit sealing hub or threaded boss, such as a meter base hub.

SERVICE ASSEMBLY ENCLOSURE

1. Provide threaded hub for all conduit entries into the top of enclosure.
2. Type galvanized steel (GS) enclosures may be used for Type C panelboards and for Type D and T services that do not use an enclosure mounted photocell or lighting contactor. Provide GS enclosures in accordance with DMS 11080, 11082, 11083, and 11084.
3. Provide aluminum (AL) and stainless steel (SS) enclosures for Types A, C, and D in accordance with DMS 11080, 11081, 11082, 11083, and 11084. Do not paint stainless steel.
4. Provide pedestal service (PS) enclosures in accordance with ED(9) and DMS 11080 and 11085. Do not provide GS pedestal services. If GS is shown in the PS descriptive code, provide an AL enclosure.

MAIN DISCONNECT & BRANCH CIRCUIT BREAKERS

1. Field drill flange-mounted remote operator handle if needed, to ensure handle is lockable in both the "On" and "Off" positions.
2. When the utility company provides a transformer larger than 50 KVA, verify that the available fault current is less than the circuit breaker's ampere interrupting capacity (AIC) rating and provide documentation from the electric utility provider to the Engineer.

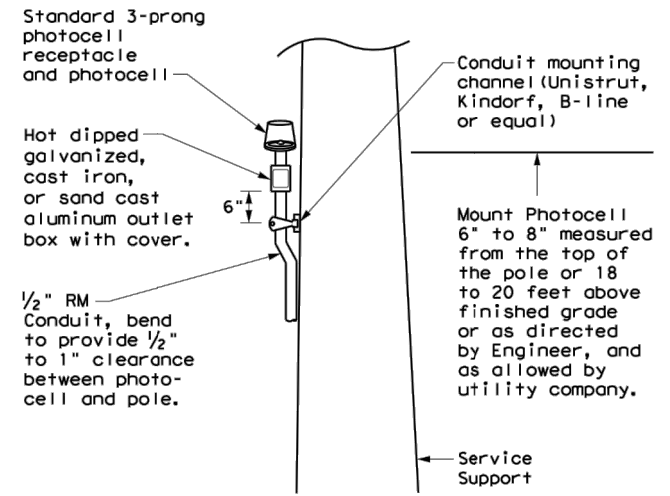
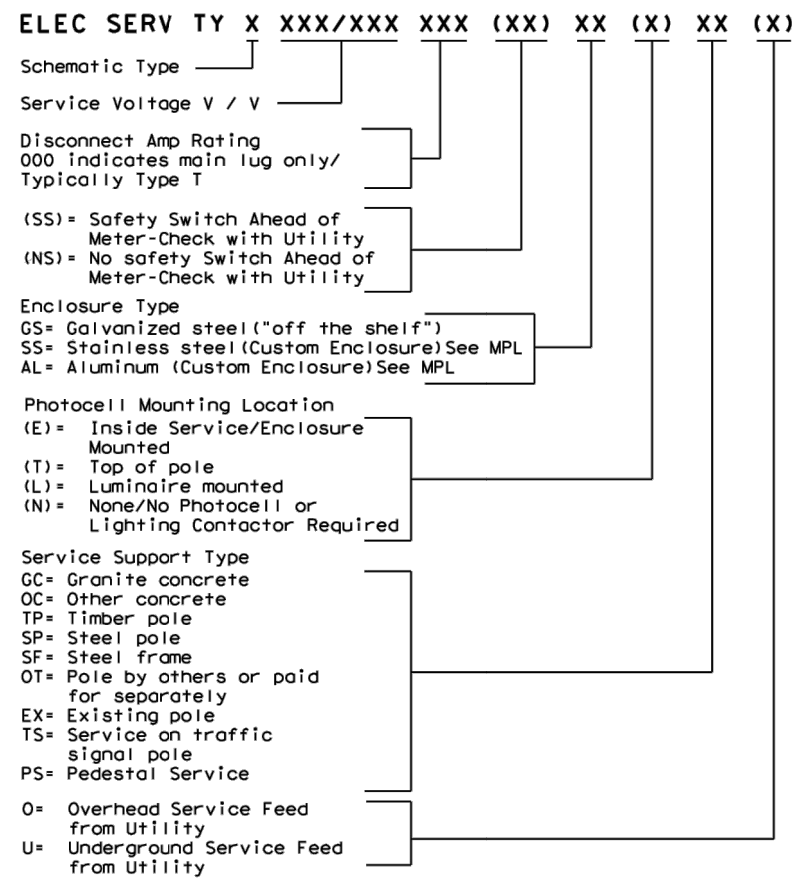
PHOTOELECTRIC CONTROL

1. Provide photocell as listed on the MPL. Move, adjust, or shield the photocell from stray or ambient night time light to ensure proper operation. Mount photocell facing north when practical. Mount top of pole photocells as shown on Top Mounted Photocell Detail.

* ELECTRICAL SERVICE DATA													
Elec. Service ID	Plan Sheet Number	Electrical Service Description	Service Conduit **Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amps	Two-Pole Contractor Amps	Panelbd/ Loadcenter Amp Rating	Branch Circuit ID	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load	
SB 183	289	ELC SRV TY A 240/480 100(SS)AL(E)SF(U)	2"	3/#2	100	2P/100	100	N/A	Lighting NB	2P/40	26	28.1	
									Lighting SB	2P/40	25		
									Underpass	1P/20	15		
NB Access	30	ELC SRV TY D 120/240 060(NS)SS(E)TS(O)	1 1/4"	3/#6	N/A	2P/60		100	Sig. Controller	1P/30	23	5.3	
							30		Luminaire	2P/20	9		
									CCTV	1P/20	3		
2nd & Main	58	ELC SRV TY T 120/240 000(NS)GS(N)SP(O)	1 1/4"	3/#6	N/A	N/A	N/A	70	Flashing Beacon 1	1P/20	4	1.0	
									Flashing Beacon 2	1P/20	4		

* Example only, not for construction. All new electrical services must have electrical service data chart specific to that service as shown in the plans.
 ** Verify service conduit size with utility. Size may change due to utility meter requirements. Ensure conduit size meets the National Electrical Code.

EXPLANATION OF ELECTRICAL SERVICE DESCRIPTIVE CODE



TOP MOUNTED PHOTOCELL

Install conduit strap maximum 3 feet from box. 5 foot maximum spacing between straps supporting conduit.

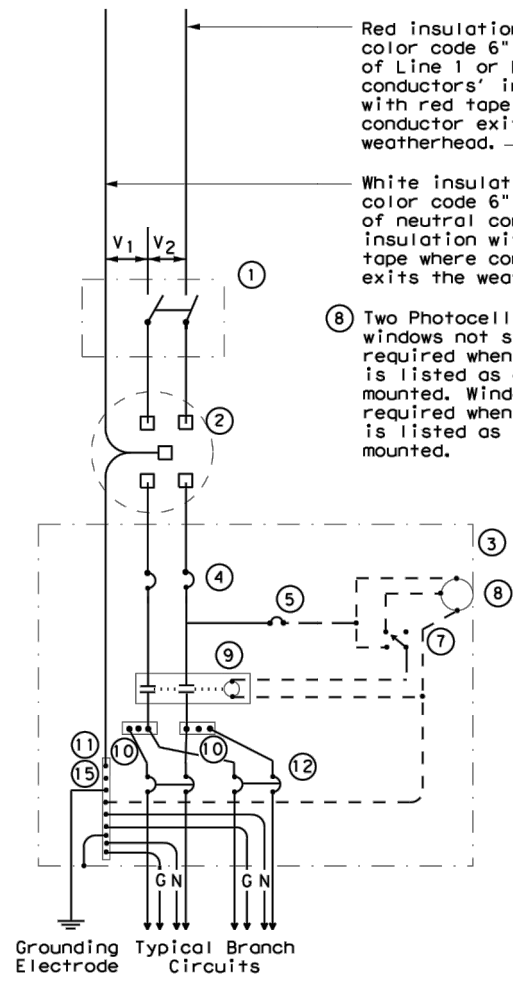
Texas Department of Transportation Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE NOTES & DATA

ED(5) - 14

FILE#	ed5-14.dgn	DWG	TxDOT	CHK	TxDOT	DWG	TxDOT	CHK	TxDOT
© TxDOT	October 2014	CONT	SECT	JOB	HIGHWAY				
REVISIONS		0314	07	081	IH-20				
DIST	COUNTY	SHEET NO.							
FTW	PARKER	026							

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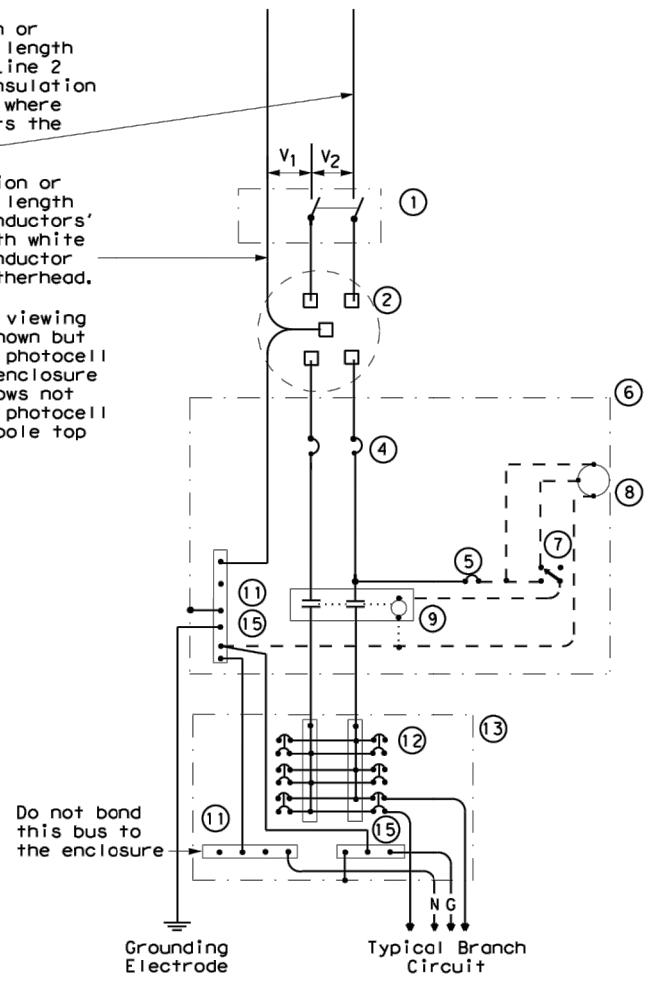


**SCHEMATIC TYPE A
THREE WIRE**

Red insulation or color code 6" length of Line 1 or Line 2 conductors' insulation with red tape where conductor exits the weatherhead.

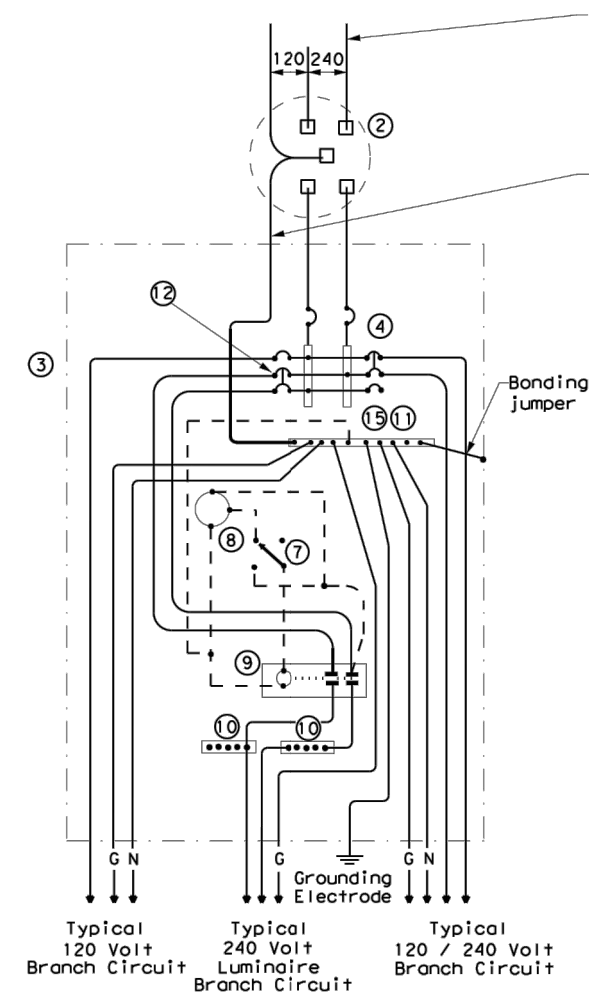
White insulation or color code 6" length of neutral conductors' insulation with white tape where conductor exits the weatherhead.

⑧ Two Photocell viewing windows not shown but required when photocell is listed as enclosure mounted. Windows not required when photocell is listed as pole top mounted.



**SCHEMATIC TYPE C
THREE WIRE**

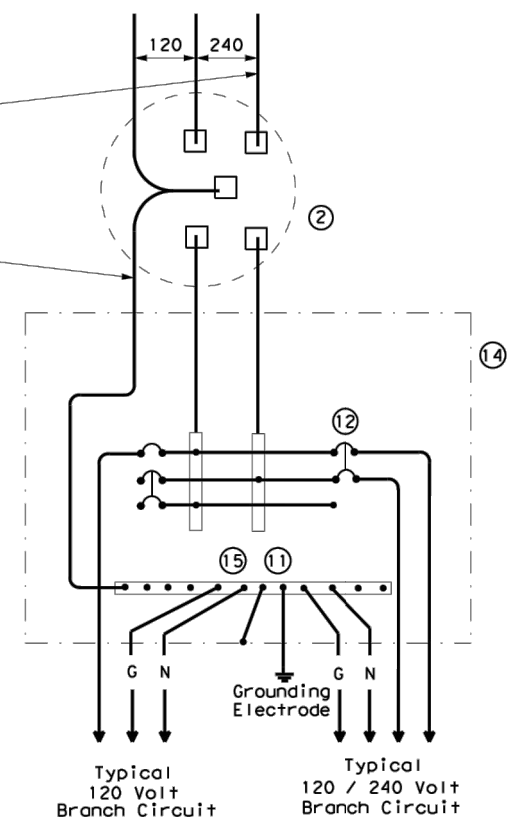
Do not bond this bus to the enclosure



**SCHEMATIC TYPE D - CUSTOM
120/240 VOLTS - THREE WIRE**

Red insulation or color code 6" length of Line 1 or Line 2 conductors' insulation with red tape where conductor exits the weatherhead.

White insulation or color code 6" length of neutral conductors' insulation with white tape where conductor exits the weatherhead.



**SCHEMATIC TYPE T
120/240 VOLTS - THREE WIRE**
Galvanized steel-"Buy Off The Shelf" only. When required install photocell top of the pole or on luminaire only, no lighting contractor will be installed.

WIRING LEGEND	
————	Power Wiring
-----	Control Wiring
—N—	Neutral Conductor
—G—	Equipment grounding conductor-always required

SCHEMATIC LEGEND	
1	Safety Switch (when required)
2	Meter (when required-verify with electric utility provider)
3	Service Assembly Enclosure
4	Main Disconnect Breaker (See Electrical Service Data)
5	Circuit Breaker, 15 Amp (Control Circuit)
6	Auxiliary Enclosure
7	Control Station ("H-O-A" Switch)
8	Photo Electric Control (enclosure-mounted shown)
9	Lighting Contactor
10	Power Distribution Terminal Blocks
11	Neutral Bus
12	Branch Circuit Breaker (See Electrical Service Data)
13	Separate Circuit Breaker Panelboard
14	Load Center
15	Ground Bus

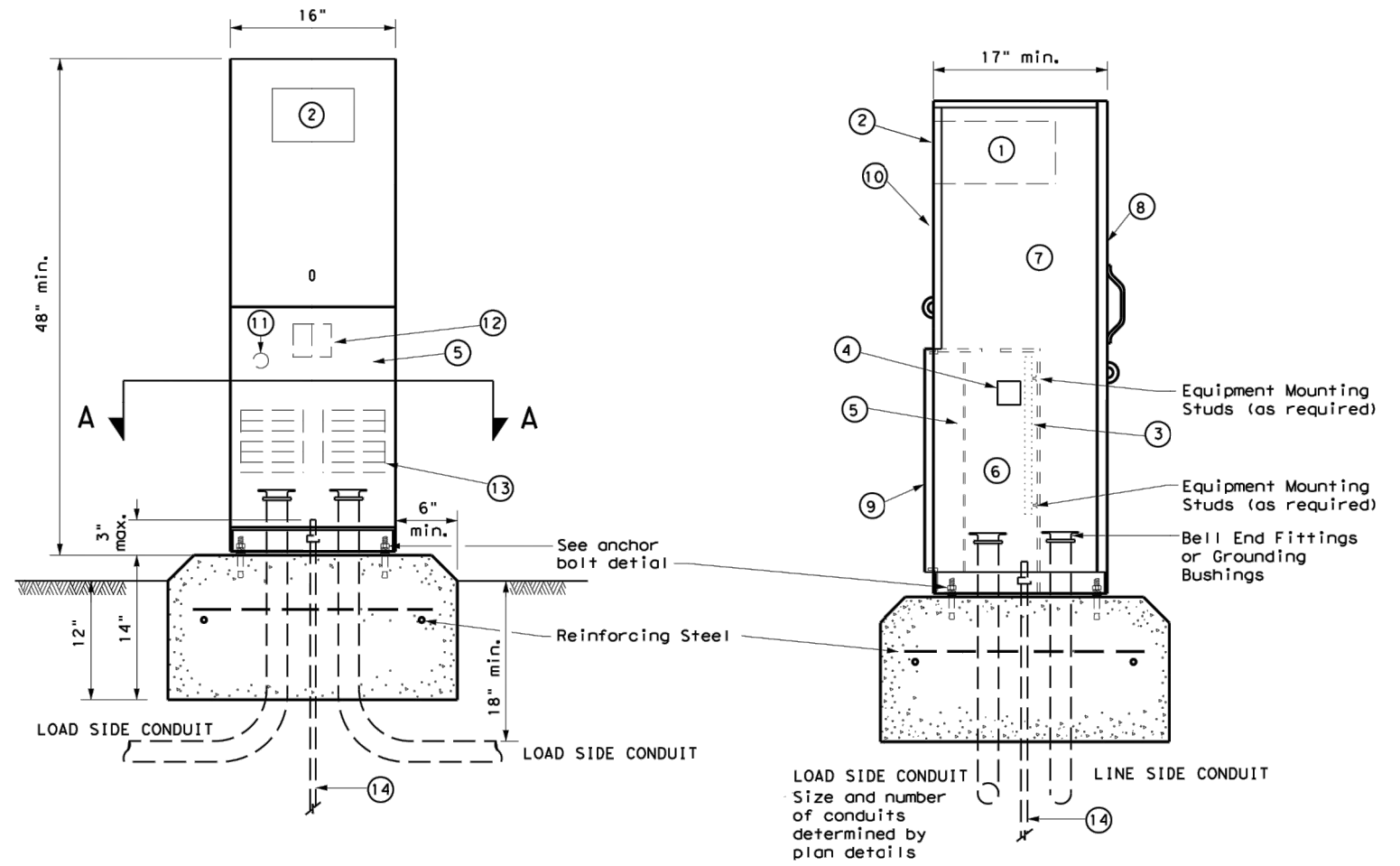
		Traffic Operations Division Standard	
ELECTRICAL DETAILS SERVICE ENCLOSURE AND NOTES			
ED(6) - 14			
FILE: ed6-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
© TxDOT October 2014	CONT: 0314	SECT: 07	JOB: 081
REVISIONS		HIGHWAY: IH-20	
DIST: FTW	COUNTY: PARKER	SHEET NO.: 027	

DATE:
FILE:

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PEDESTAL SERVICE NOTES

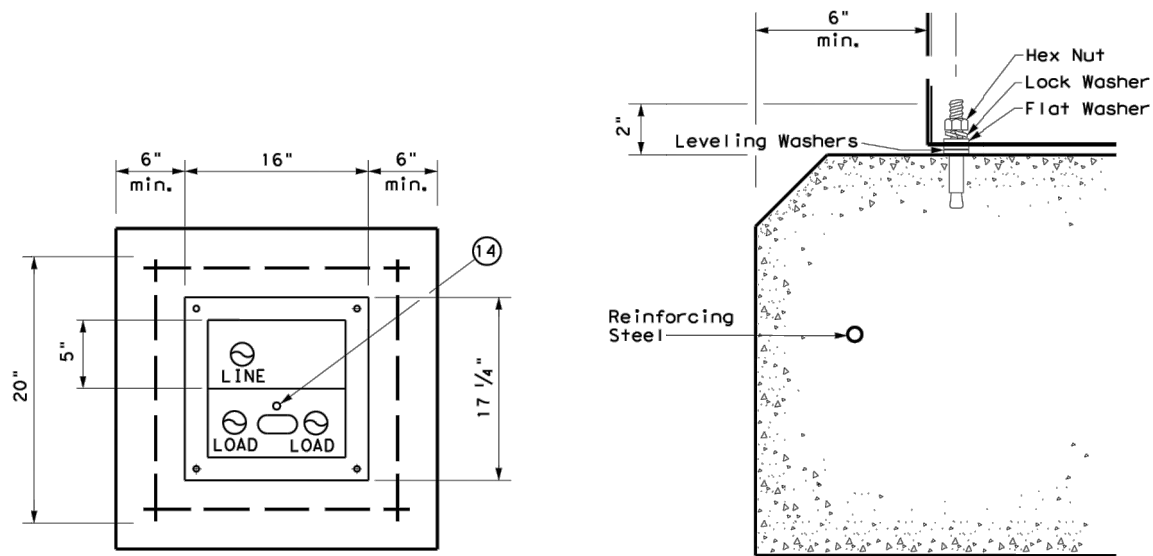
1. Manufacture pedestal electrical services in accordance with Departmental Material Specifications (DMS) 11080 "Electrical Services", 11085 "Electrical Services-Pedestal (PS)" and Item 628 "Electrical Services." Provide pedestal electrical services as listed on the Material Producers list (MPL) on the Department's web site under "Roadway Illumination and Electrical Supplies," Item 628. Ensure all mounting hardware and installation details of services meet utility company specifications. Contact the local utility company for approval of pedestal details prior to installing the electrical pedestal service. Submit any changes required by the utility company prior to manufacturing the pedestal enclosure.
2. When a meter socket is required, provide a socket with a minimum 100 amp rating that complies with local utility requirements.
3. Provide Class A or C concrete for pedestal service foundations in accordance with Item 420, "Concrete Substructures," except that concrete will not be paid for directly but is considered subsidiary to Item 628.
4. Provide #4 reinforcing steel for foundations in accordance with Item 440, "Reinforcement for Concrete."
5. Install 1/2 in. X 2 1/8 in. minimum length concrete single expansion type anchors for mounting pedestal enclosure to foundation. Anchor location to match mounting holes in each corner of enclosure. Secure each of the four corners of the pedestal enclosure to the anchors in the foundation with a 1/2 in. galvanized or stainless steel machine thread bolt, a properly sized locknut and a flat washer.
6. Finish top of concrete foundation in a neat and workmanlike manner. If leveling washers are used, ensure no more than 1/8 in. gap at any corner. Do not exceed a maximum dip or rise in the foundation of 1/8 in. per foot. When properly installed, ensure the top of the service enclosure is level front to back and side to side within 1/4 in. Repair rocking or movement of the service enclosure at no additional cost to the department.
7. Do not use liquidtight flexible metal conduit (LFMC) on pedestal type services.
8. Ensure all elbows in the foundation are sized as per utility provider's conduit requirements for underground conduit and feeders. PVC extensions may be installed provided the ends of the rigid metal conduits are more than 2 in. below the top of the concrete foundation. Where extension conduits are metal, grounding bushings must be installed with a bonding jumper properly terminated.



FRONT VIEW

SIDE VIEW

TYPE C shown, TYPE A similar except that TYPE A shall have individual circuit breakers (CB) mounted on an equipment mounting panel. CB Handles shall protrude through hinged deadfront trim.



SECTION A-A

ANCHOR BOLT DETAIL

LEGEND

1	Meter Socket, (when required)
2	Meter Socket Window, (when required)
3	Equipment Mounting Panel
4	Photo Electric Control Window, (When required)
5	Hinged Deadfront Trim
6	Load Side Conduit Trim
7	Line Side Conduit Area
8	Utility Access Door, with handle
9	Pedestal Door
10	Hinged Meter Access
11	Control Station (H-O-A Switch)
12	Main Disconnect
13	Branch Circuit Breakers
14	Copper Clad Ground Rod - 5/8" X 10'

		Traffic Operations Division Standard	
ELECTRICAL DETAILS ELECTRICAL SERVICE SUPPORT PEDESTAL SERVICE TYPE PS			
ED(9) - 14			
FILE: ed9-14.dgn	DWG: TxDOT	CHK: TxDOT	DWG: TxDOT
© TxDOT October 2014	CONT: 0314	SECT: 07	JOB: 081
REVISIONS		HIGHWAY: IH-20	
DIST: FTW	COUNTY: PARKER	SHEET NO.: 028	

DATE: FILE:

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DATE: FILE:

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 in accordance with Item 506.
List MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction activities.

1. City of Hudson Oaks

No Action Required Required Action

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

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

USACE Permit required for filling, dredging, excavating or other work in any water bodies, rivers, creeks, streams, wetlands or wet areas.

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

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

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

1.

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

Best Management Practices:

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

III. CULTURAL RESOURCES

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

No Action Required Required Action

IV. VEGETATION RESOURCES

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

No Action Required Required Action

1. Areas within the existing ROW, but outside the limits of construction, will not be disturbed. Every effort will be made to preserve trees where they would neither compromise safety nor substantially interfere with the proposed projects.

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

No Action Required Required Action

1. Between October 1 and February 15, the contractor will remove all old migratory bird nests from any structure that would be affected by the proposed project, and complete any bridge work/demolition and /or vegetation clearing. In addition, the contractor will be prepared to prevent migratory birds from building nests by utilizing nest prevention methods, such as bird-deterrent netting and bird-repelling sprays and/or gels, between February 15 and October 1. In the event that migratory birds are encountered on-site during project construction, adverse impacts on protected birds, active nests, eggs, and/or young will be avoided.

2. The Eagle Protection Act prohibits the taking or possession of and commerce in eagles, parts, feathers, nests, or eggs with limited exceptions. The definition of take includes pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb. Eagles may not be taken for any purpose unless a permit is issued prior to the taking.

If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately. The work may not remove active nests from bridges and other structures during nesting season of the birds associated with the nests. If caves or sinkholes are discovered, cease work in the immediate area, and contact the Engineer immediately.

LIST OF ABBREVIATIONS

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.

Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:

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

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

Yes No

If "No", then no further action is required.
If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

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

Yes No

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

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

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

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

No Action Required Required Action

VII. OTHER ENVIRONMENTAL ISSUES

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


No Action Required Required Action

Action No.

- 1.
- 2.
- 3.

GENERAL NOTE:

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

		<i>Design Division Standard</i>	
ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS			
EPIC			
FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP
©TxDOT: February 2015	CONT	SECT	JOB
12-12-2011 REVISIONS (DS)	0314	07	081
05-07-14 ADDED NOTE SECTION IV.	DIST	COUNTY	SHEET NO.
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	FTW	PARKER	029

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<https://www.dot.state.tx.us/ftw/specinfo/standard.htm>
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A. GENERAL SITE DATA

1. **PROJECT LIMITS:** Highway: IH 20 & US 180
 From: EXIT 411
 To: EXIT 414
 IH20 32°45'18.7"N 97°42'05.3"W IH20 32°45'18.51"N 97°41'58.01"W
 LATITUDE: US180 32°45'25.10"N 97°42'59.99"W LONGITUDE: US180 32°45'22.24"N 97°41'48.96"W
2. **PROJECT SITE MAPS:**
 - Project Location Map: Title Sheet (Sheets ###)
 - Drainage Patterns: Drainage Area Maps (Sheets 036)
 - Approx. Slopes Anticipated After Major Graddings and Areas of Soil Disturbance: Typical Sections (N/A)
 - Major Controls and Locations of Stabilization Practices: (Sheets 036)
Erosion and Sediment Control Plans
 - Project Specific Locations:
To be specified by Project Field Office and located in the Project SW3P File
 - Surface Waters and Discharge Locations: Drainage and Culvert Layout Sheets (N/A)
3. **PROJECT DESCRIPTION:**
IH 20 & US 180
LANDSCAPE ENHANCEMENTS
4. TREE AND SHRUB PLANTING AND TRENCHING FOR LOW FLOW IRRIGATION
5. **EXISTING CONDITION OF SOIL & VEGETATIVE COVER AND % OF EXISTING VEGETATIVE COVER:**
Existing condition is established forbs and grasses in unmaintained state @ +/- 90% coverage.
6. **TOTAL PROJECT AREA:** .91 ACRES
7. **TOTAL AREA TO BE DISTURBED:** .48 ACRES
8. **WEIGHTED RUNOFF COEFFICIENT**

BEFORE CONSTRUCTION:	.30
AFTER CONSTRUCTION:	.30
9. **NAME OF RECEIVING WATERS:**

N/A
10. **ENDANGERED SPECIES, DESIGNATED CRITICAL HABITAT AND HISTORIC PROPERTY:**

No Endangered Species, Designated Critical Habitat or Historic Property has been found on this project site.

or

(Statement of What) has been found on this project site.

Note: Designer shall supply applicable statement.

The documentation satisfying TPDES Construction General Permit eligibility pertaining to the existence of or any protective action taken with regards to endangered species or designated critical habitat or historical property in this project area is contained in the project's Environmental document (EA or EIS) and can be viewed under the State Open Records Act at the address shown below:

TEXAS DEPARTMENT OF TRANSPORTATION
 FORT WORTH DISTRICT HEADQUARTERS
 DISTRICT DESIGN SECTION
 2501 SW LOOP
 FORT WORTH, TX 76133
 PHONE: 817-370-6500


B. EROSION AND SEDIMENT CONTROLS

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

<input type="checkbox"/> TEMPORARY SEEDING	<input type="checkbox"/> PRESERVATION OF NATURAL RESOURCES
<input type="checkbox"/> MULCHING (Hay or Straw)	<input type="checkbox"/> FLEXIBLE CHANNEL LINER
<input type="checkbox"/> BUFFER ZONES	<input type="checkbox"/> RIGID CHANNEL LINER
<input checked="" type="checkbox"/> PLANTING	<input type="checkbox"/> SOIL RETENTION BLANKET
<input checked="" type="checkbox"/> SEEDING	<input checked="" type="checkbox"/> COMPOST MANUFACTURED TOPSOIL
<input type="checkbox"/> SODDING	<input type="checkbox"/> OTHER: (Specify Practice)
2. **STRUCTURAL PRACTICES:**
(Select T = Temporary or P = Permanent, as applicable)


<input type="checkbox"/> SILT FENCES	<input type="checkbox"/> DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
<input type="checkbox"/> HAY BALES	<input type="checkbox"/> DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
<input type="checkbox"/> ROCK FILTER DAMS	<input type="checkbox"/> DIVERSION DIKE AND SWALE COMBINATIONS
<input type="checkbox"/> PIPE SLOPE DRAINS	<input checked="" type="checkbox"/> ROCK BEDDING AT CONSTRUCTION EXIT
<input type="checkbox"/> PAVED FLUMES	<input type="checkbox"/> TIMBER MATTING AT CONSTRUCTION EXIT
<input type="checkbox"/> CHANNEL LINERS	<input type="checkbox"/> STONE OUTLET STRUCTURES
<input type="checkbox"/> SEDIMENT TRAPS	<input type="checkbox"/> VELOCITY CONTROL DEVICES
<input type="checkbox"/> SEDIMENT BASINS	<input type="checkbox"/> CURBS AND GUTTERS
<input type="checkbox"/> STORM SEWERS	<input type="checkbox"/> STORM INLET SEDIMENT TRAP
<input type="checkbox"/> OTHER: (Specify Practice)	
<input checked="" type="checkbox"/> EROSION CONTROL LOGS	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
3. **STORM WATER MANAGEMENT:** (Example Below - May be used as applicable, revised or expanded)
 1. Storm water drainage will be provided by the ditches, inlets and storm water systems that will carry drainage within the R.O.W. to the low points within the roadway and project site which drain to natural facilities.
 2. Other permanent erosion controls include hydraulic design to limit structure outlet velocities and grading design generally consisting of 4:1 or flatter slopes with permanent vegetative cover.
4. **STORM WATER MANAGEMENT ACTIVITIES:** (Sequence of Construction)
(Describe Storm Water Management Activities by Phases)
5. **NON-STORM WATER DISCHARGES:**
Non-storm water discharges should be filtered, or held in retention basins, before being allowed to mix with storm water. These discharges consist of non-polluted ground water, spring water, foundation and/or footing drain water, and water used for dust control, pavement washing and vehicle washwater containing no detergents.


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Timothy J. Witmeyer
08/22/2023

TX REG. ENGINEERING FIRM F-469
TX REG. SURVEYING FIRM LS-10008001


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a Westwood company


Fort Worth District Standard

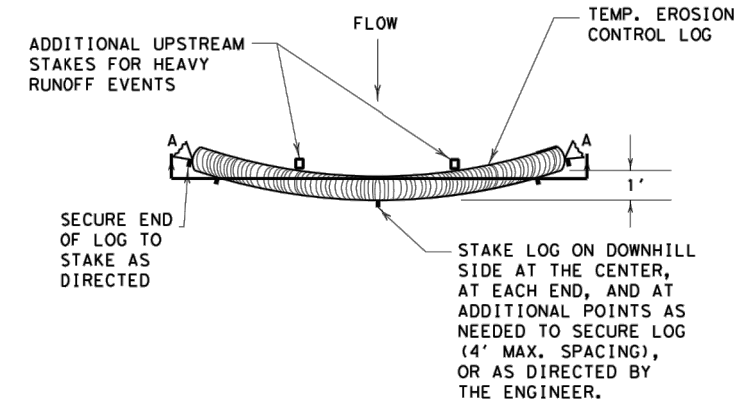
STORM WATER POLLUTION PREVENTION PLAN (SW3P)

SHEET 1 OF 2 SHEETS

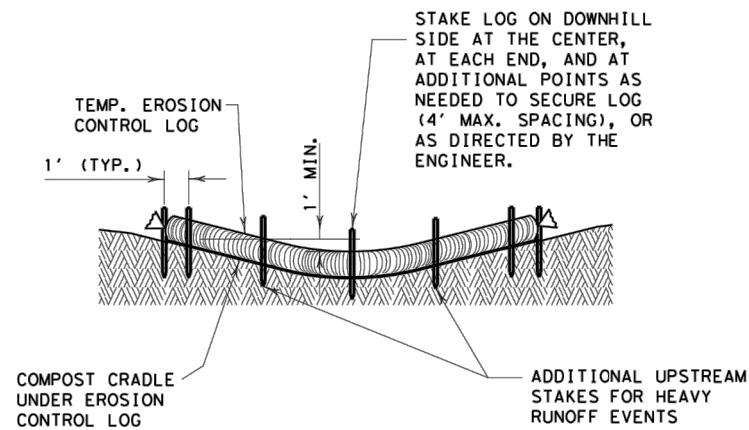
ORIGINAL DRAWING: 09/2002 sw3p-ftw.dgn		FED. REG. DIV. NO. 6	PROJECT NO. F2024 054	SHEET NO. 030
DATE	REVISIONS	STATE	STATE DIST. NO.	COUNTY
09/2008	NPDES TO TPDES	TEXAS	FTW	PARKER
01/2012	CLARIFY NOTE C. 2.	CONT.	SECT.	JOB
08/2013	ADDED SIGN	0314	081	07
05/2019	2-SHEET FORMAT			HIWAY NO. IH-20

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DATE:
FILE:



PLAN VIEW



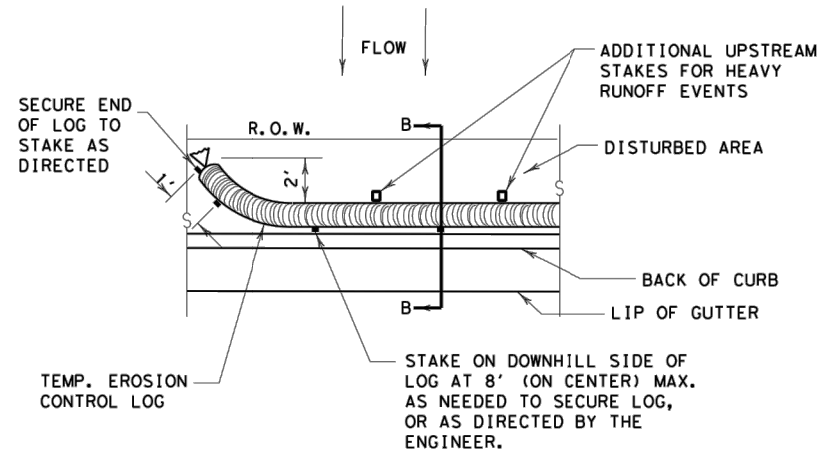
SECTION A-A

EROSION CONTROL LOG DAM

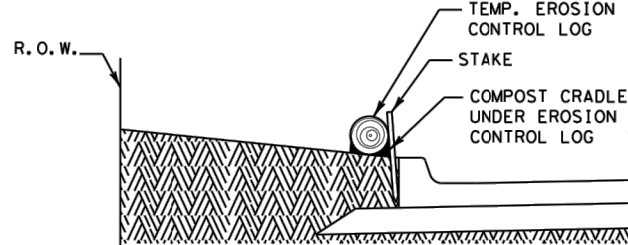
CL-D

LEGEND

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



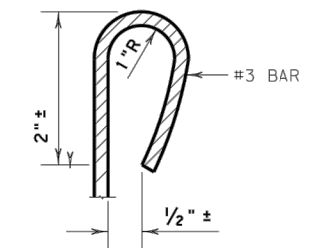
PLAN VIEW



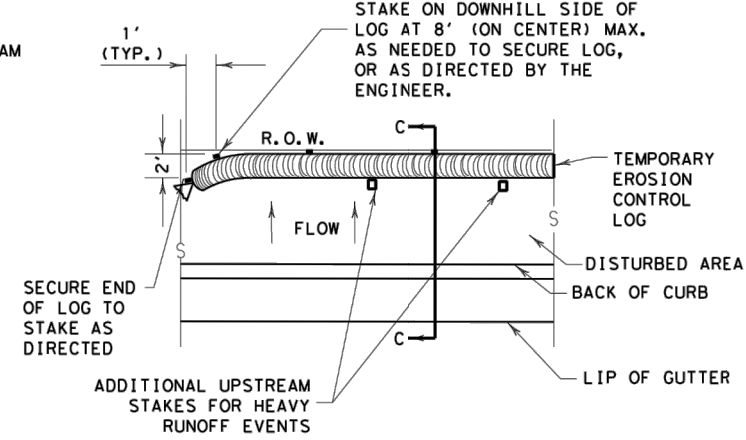
SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

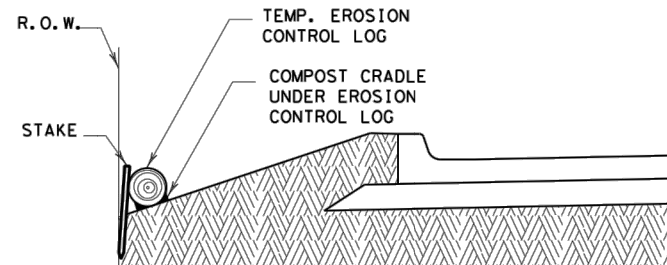
CL-BOC



REBAR STAKE DETAIL



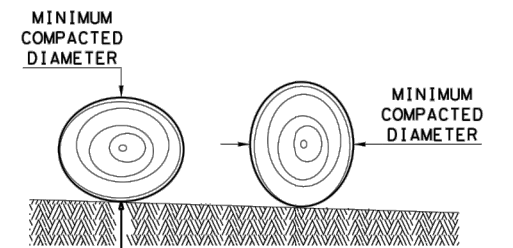
PLAN VIEW



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

GENERAL NOTES:

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

SEDIMENT BASIN & TRAP USAGE GUIDELINES

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

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

Control logs should be placed in the following locations:

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

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

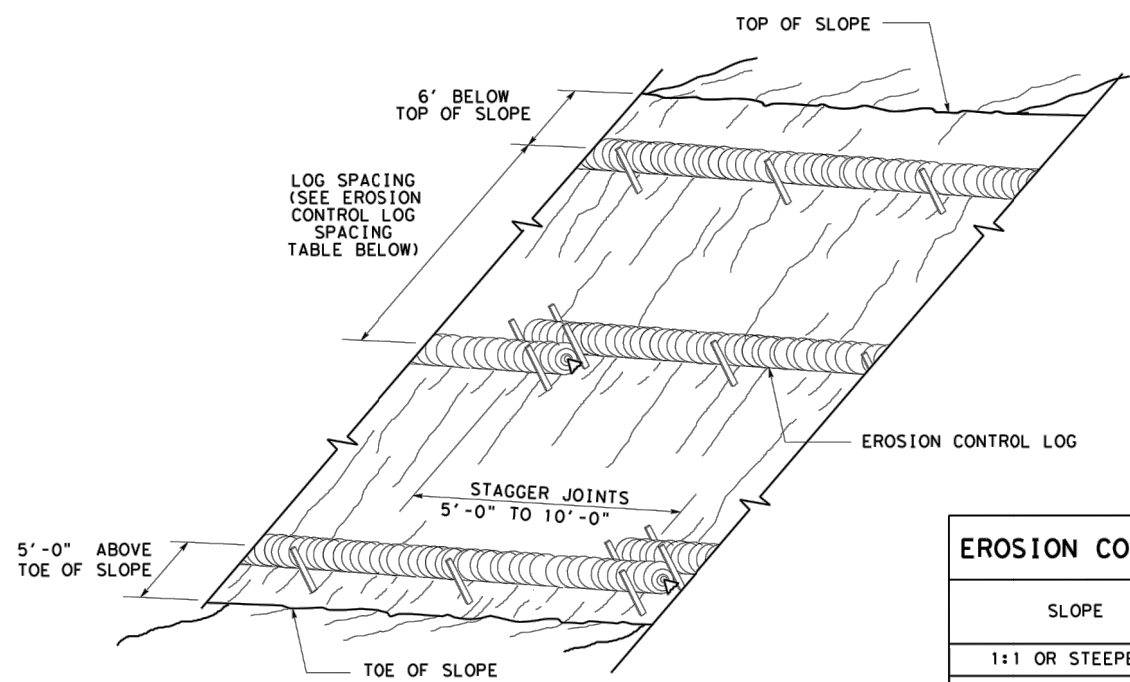
Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.

SHEET 1 OF 3

		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES EROSION CONTROL LOG EC (9) - 16			
FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT
© TxDOT: JULY 2016	CONT: 0314	SECT: 07	JOB: 081
REVISIONS		HIGHWAY: IH-20	
DIST: FTW	COUNTY: PARKER	SHEET NO.: 032	

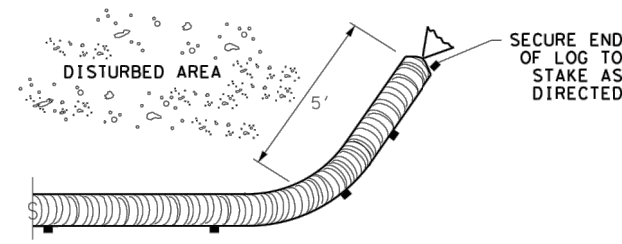
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:



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

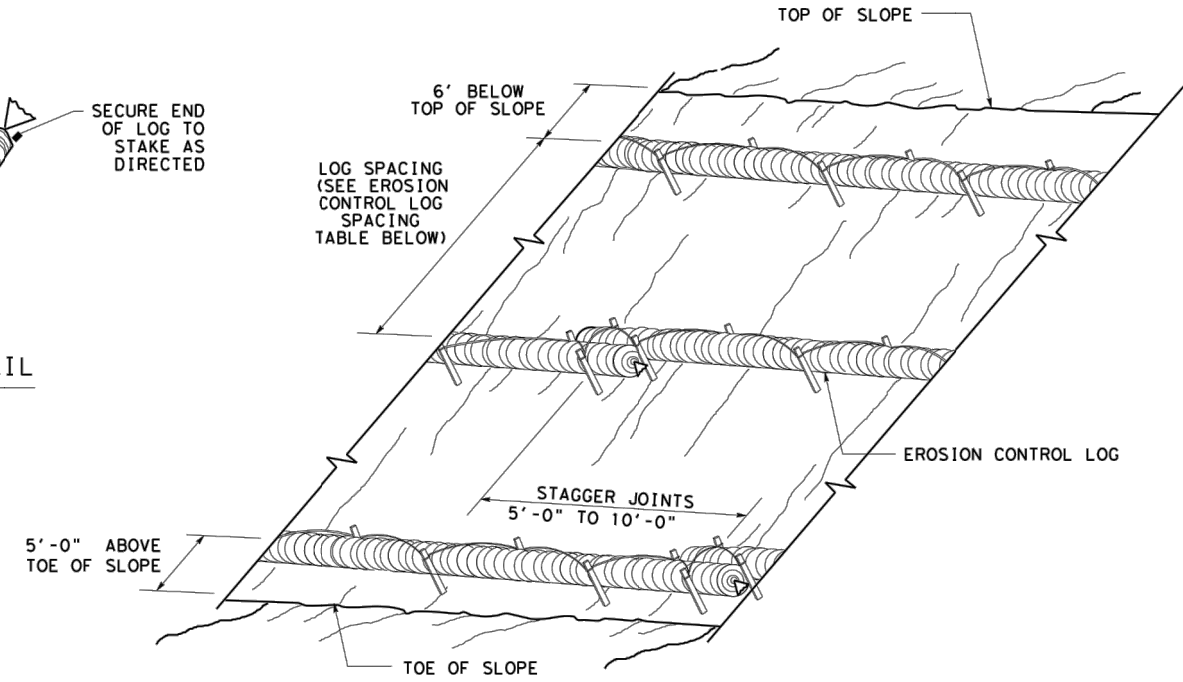
CL-SST



END SECTION RAP DETAIL

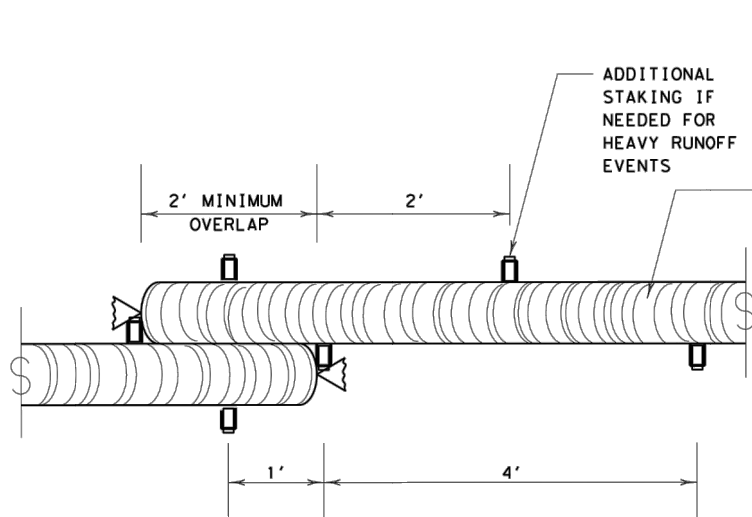
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

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



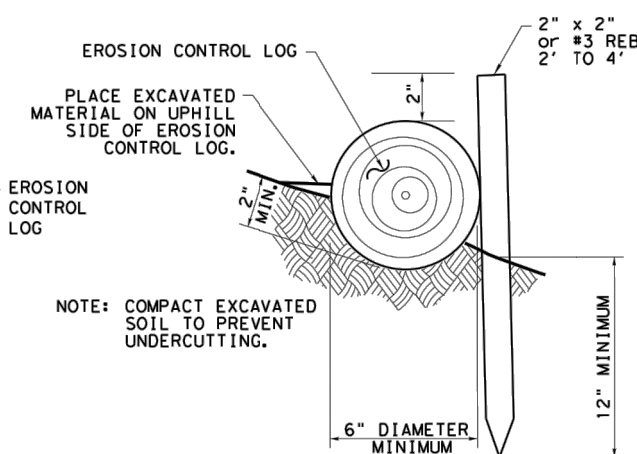
**EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING**

CL-SSL



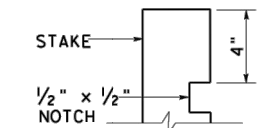
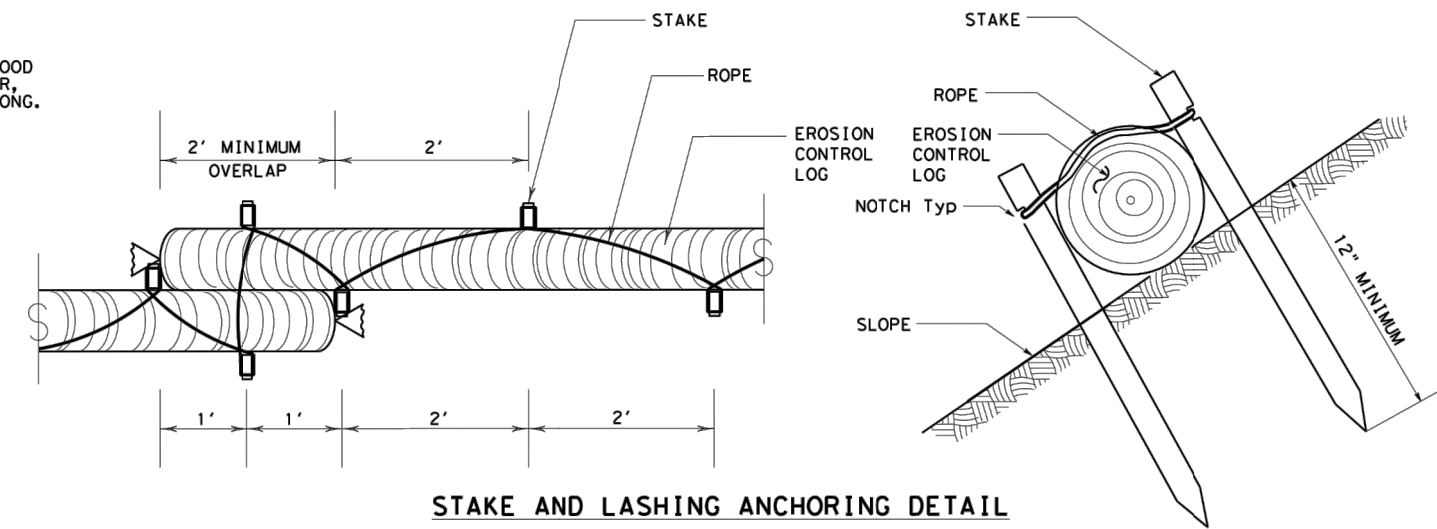
STAKE AND TRENCHING ANCHORING DETAIL

CL-SST



STAKE AND LASHING ANCHORING DETAIL

CL-SSL



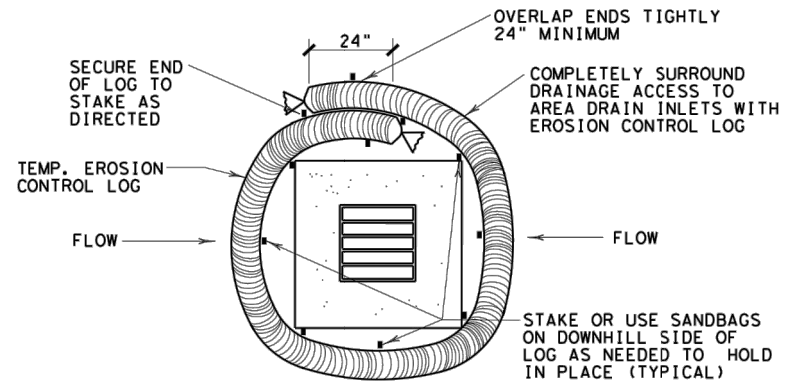
STAKE NOTCH DETAIL

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

SHEET 2 OF 3

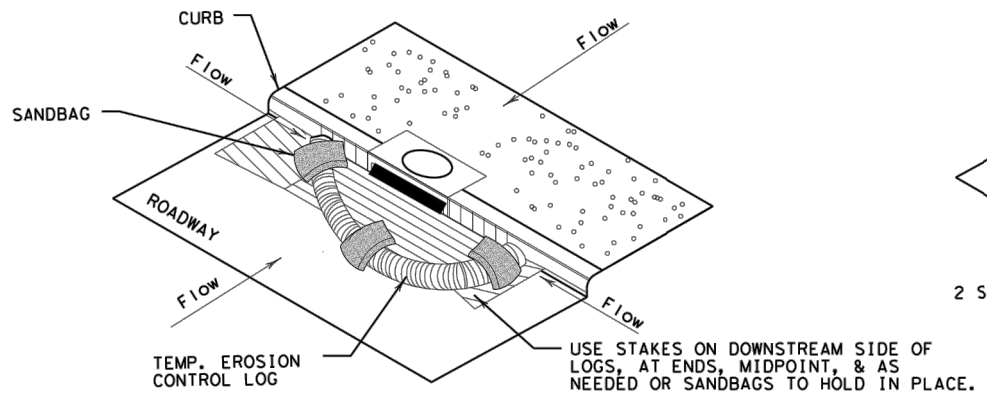
		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES EROSION CONTROL LOG EC(9)-16			
FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT
© TxDOT: JULY 2016	CONT SECT	JOB	HIGHWAY
REVISIONS	0314 07	081	IH-20
	DIST	COUNTY	SHEET NO.
	FTW	PARKER	033

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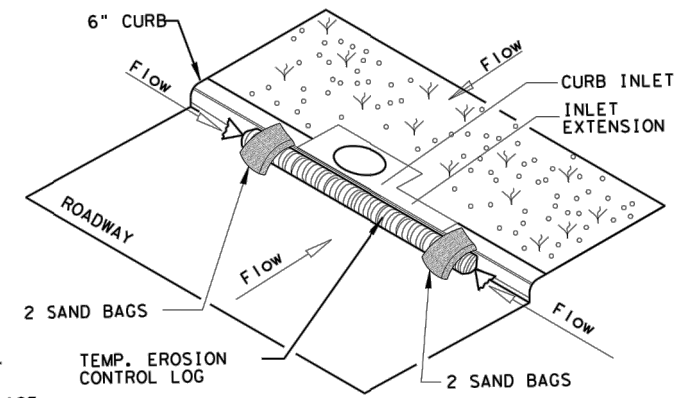
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

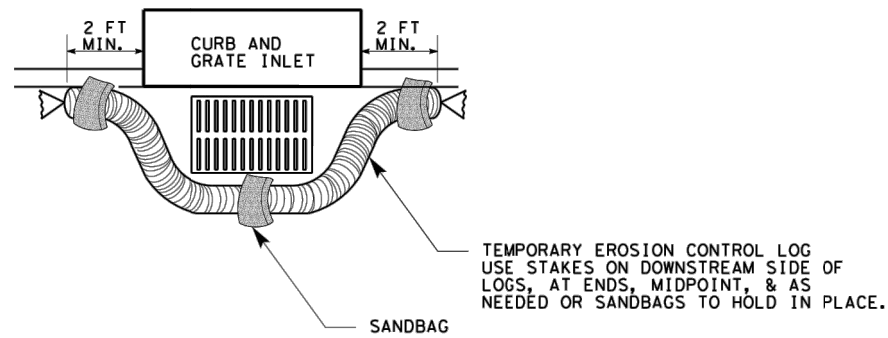
CL-CI



EROSION CONTROL LOG AT CURB INLET

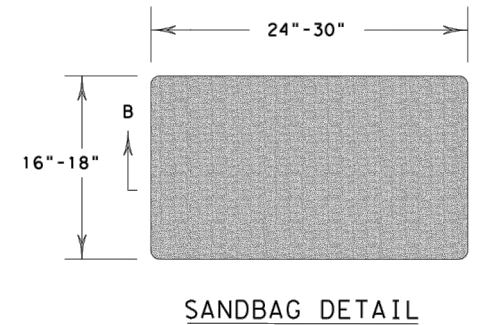
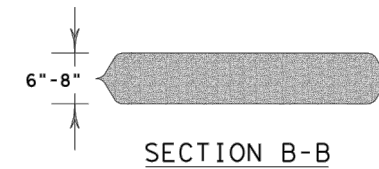
CL-CI

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



EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI



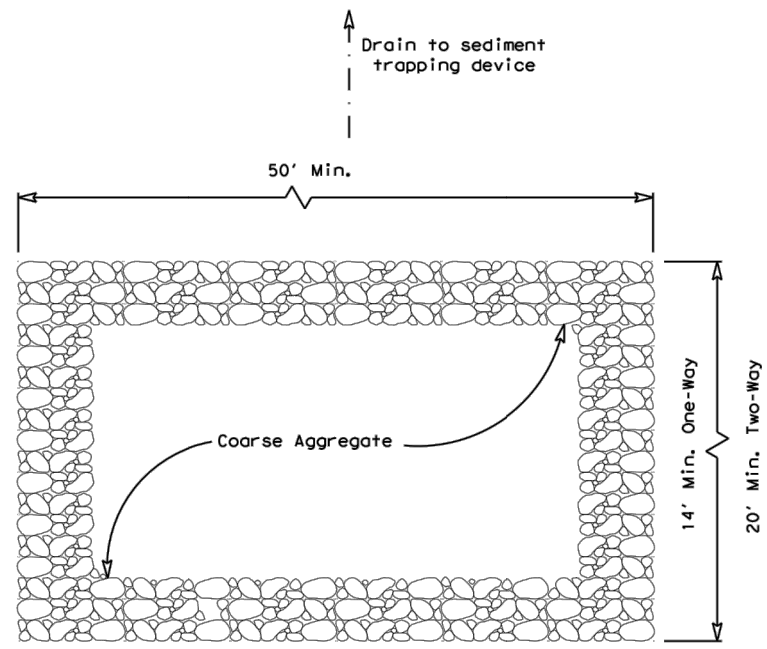
SHEET 3 OF 3

		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: 0314	SECT: 07	JOB: 081
REVISIONS		HIGHWAY: IH-20	
DIST: FTW	COUNTY: PARKER	SHEET NO.: 034	

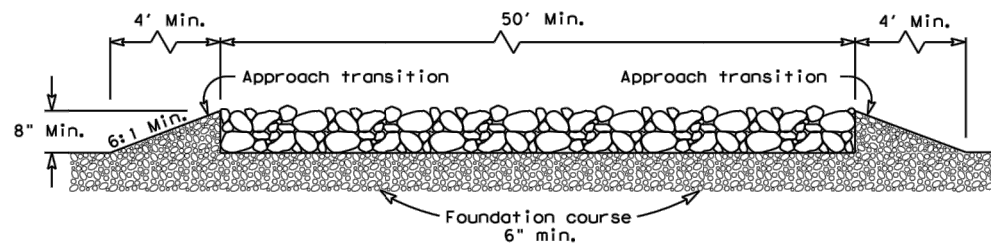
DATE:
FILE:

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DATE:
FILE:



PLAN VIEW

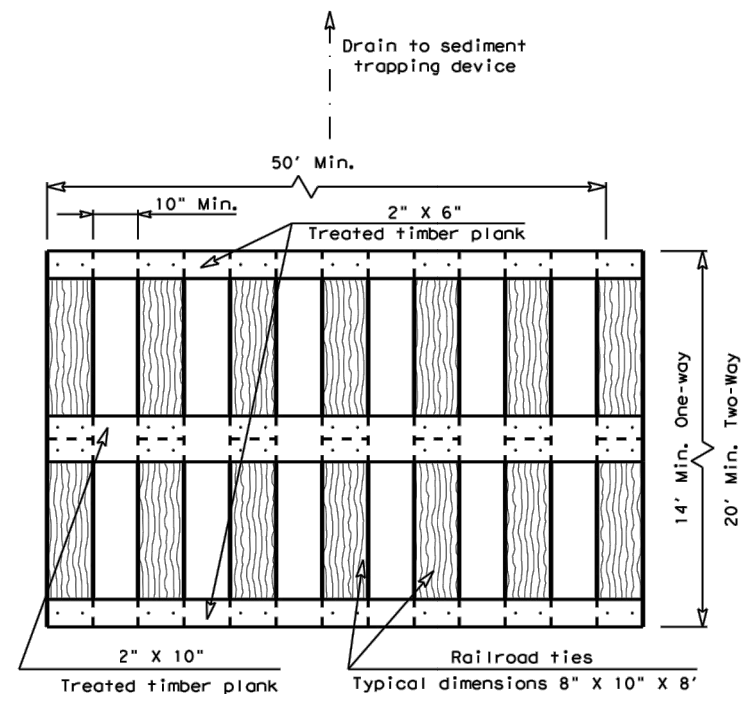


ELEVATION VIEW

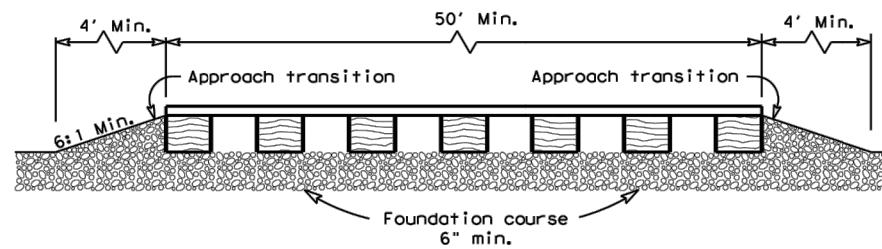
CONSTRUCTION EXIT (TYPE 1)
ROCK CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 1)

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



PLAN VIEW

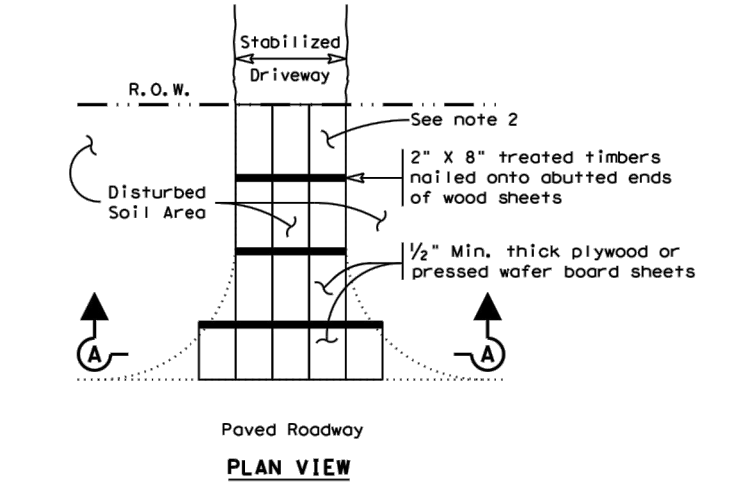


ELEVATION VIEW

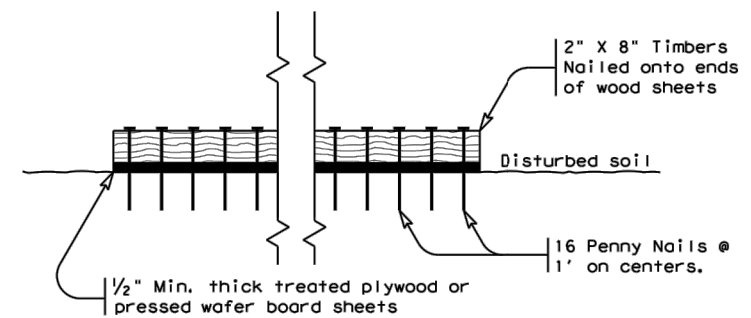
CONSTRUCTION EXIT (TYPE 2)
TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 2)

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



PLAN VIEW



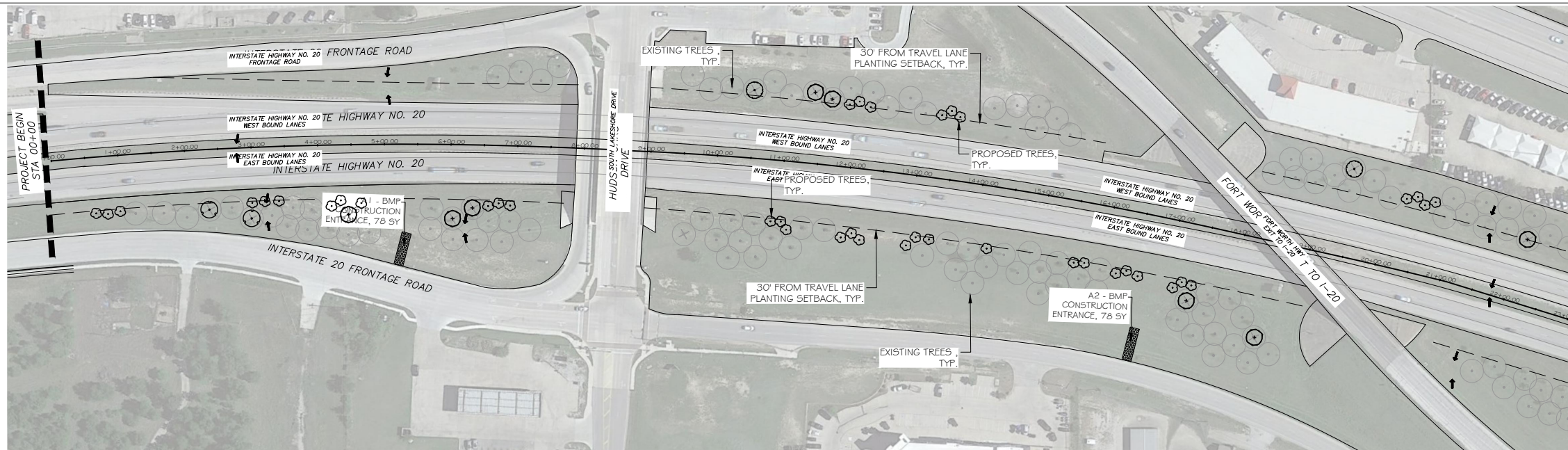
SECTION A-A

CONSTRUCTION EXIT (TYPE 3)
SHORT TERM

GENERAL NOTES (TYPE 3)

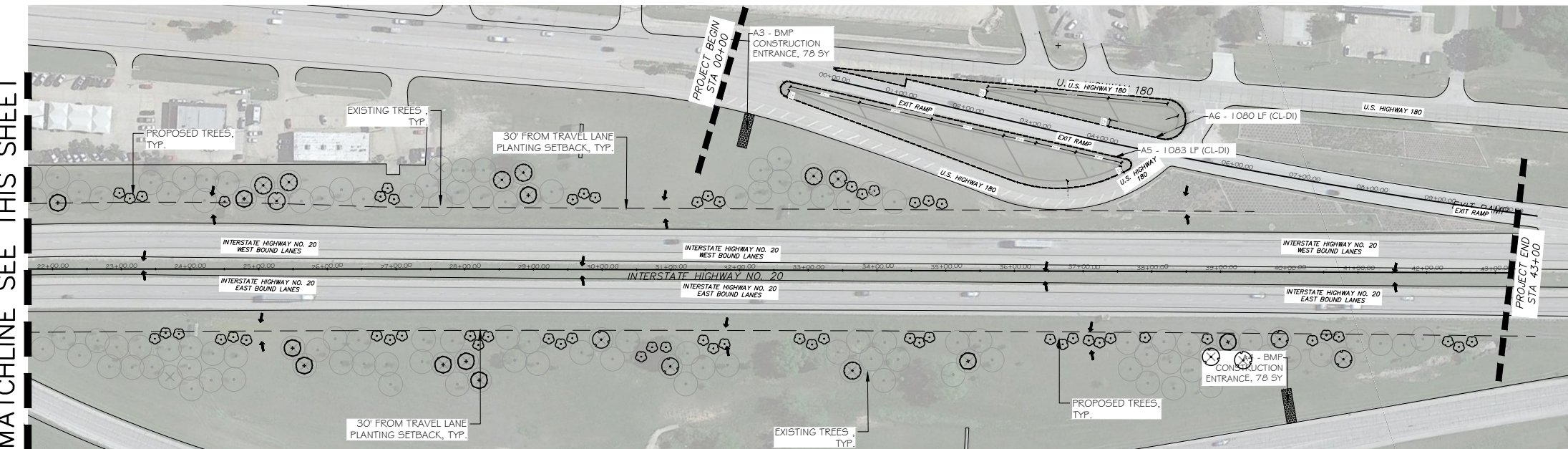
1. The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
2. The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
3. The treated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

		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES CONSTRUCTION EXITS EC(3)-16			
FILE: ec316	DN: TxDOT	CR: KM	DR: VP
© TxDOT: JULY 2016	CONT SECT	JOB	HIGHWAY
REVISIONS	0314 07	081	IH-20
DIST	COUNTY	SHEET NO.	
FTW	PARKER	035	



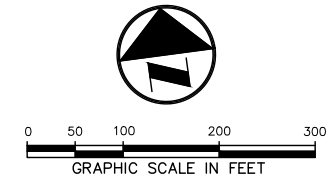
MATCHLINE SEE THIS SHEET

1 IH 20 STA 0+00.00 - STA 22+00.00



MATCHLINE SEE THIS SHEET

2 IH 20 STA 22+00.00 - STA 43+00.00



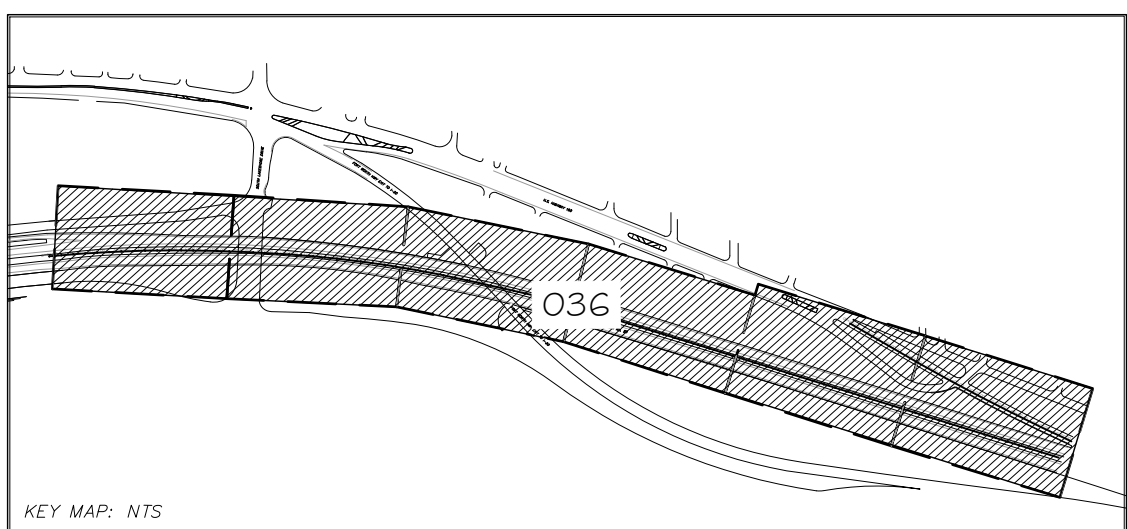
GENERAL NOTES

1. THE ENTIRE LIMITS OF IMPROVEMENTS WERE NOT SURVEYED. ALL LINEWORK IS APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
2. ALL UTILITIES SHOWN ON PLANS ARE APPROXIMATE IN NATURE AND DO NOT RELIEVE THE CONTRACTOR FROM ANY RESPONSIBILITY TO COORDINATE WITH APPROPRIATE AUTHORITIES.
3. BMPs SHALL BE INSTALLED NO SOONER THAN TWO WEEKS PRIOR TO SOIL DISTURBING OR POLLUTANT-GENERATING ACTIVITIES IN THEIR CONTROL AREA.
4. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.
5. SEE PLANTING PLAN SHEETS FOR LOCATION AND TYPE(S) OF PLANNED FINAL STABILIZATION FOR THE PROJECT'S DISTURBED SOILS.
6. NO WORK OR EQUIPMENT SHALL OCCUR OUTSIDE OF TxDOT ROW.

ESTIMATE OF EROSION CONTROL QUANTITIES - BY SHEET				
ITEM NO.	DESC.	DESCRIPTION	UNIT	TOTAL
506	6020	CONSTRUCTION EXITS (INSTR) (TYP 1)	SY	312
506	6024	CONSTRUCTION EXITS (REMOVE)	SY	312
506	6040	BIODEG EROSION CONT LOGS (CL-CI) (8") (INSTALL)	LF	2163
506	6043	BIODEG EROSION CONT LOGS (CL-CI) (8") (REMOVE)	LF	2163

BMP NUMBER:	BMP DATE INSTALLED:	BMP DATE REMOVED:
BMP-A1		
BMP-A2		
BMP-A3		
BMP-A4		
BMP-A5		
BMP-A6		

GENERAL NOTE:
CALL TxDOT TRAFFIC MANAGEMENT CENTER (817-370-3661) FOR TxDOT LOCATES WHEN WORKING NEAR EXISTING TxDOT MAINTAINED TRAFFIC SIGNAL AND ITS SYSTEMS.



KEY MAP: NTS

GRADING AND DRAINAGE LEGEND

- PROPOSED CONSTRUCTION ENTRANCE/EXIT
- INLET PROTECTION - BIODEGRADABLE EROSION CONTROL LOGS (8")
- DIRECTION OF FLOW & SLOPE



TX REG. ENGINEERING FIRM F-469
TX REG. SURVEYING FIRM LS-10008001

Pacheco Koch 4060 BRYANT IRVIN ROAD
 a Westwood company FORT WORTH, TX 76109
 817.412.7155
 ©2023 Texas Department of Transportation

EROSION CONTROL PLAN
 IH 20 & US 180
 STA 0+00 - STA 43+00

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	SEE SHEET 1	036
STATE	DISTRICT	COUNTY
TEXAS	FTW	PARKER
CONTROL	SECTION	JOB
0314	07	081
		HIGHWAY NO
		IH-20

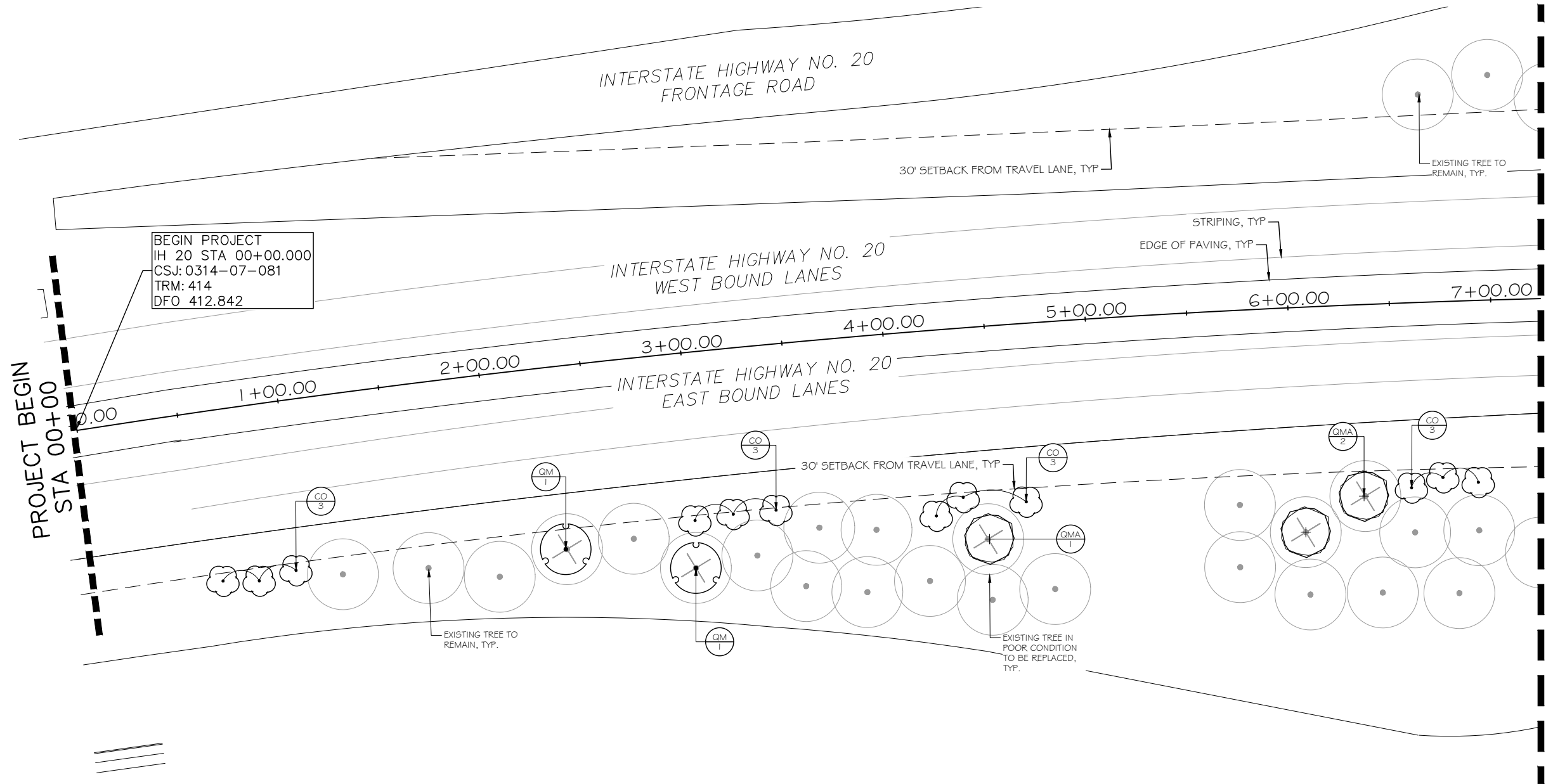
D:\JTM\MEYER - 9.25PM 06/22/2023 - 9.25PM M: \DWG-53\5356-23.02\DWG\LANDSCAPE - EROSION CONTROL PLAN.DWG

JUNE 2023 95% PLAN SUBMITTAL



GENERAL NOTES

1. THE ENTIRE LIMITS OF IMPROVEMENTS WERE NOT SURVEYED. ALL LINEWORK IS APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
2. ALL UTILITIES SHOWN ON PLANS ARE APPROXIMATE IN NATURE AND DO NOT RELIEVE THE CONTRACTOR FROM ANY RESPONSIBILITY TO COORDINATE WITH APPROPRIATE AUTHORITIES.
3. PLANT SCHEDULE PROVIDED FOR CONTRACTORS CONVENIENCE ONLY; REF TO QUANTITY SUMMARY FOR FINAL QUANTITIES.
4. REPLACEMENT TREES SHALL BE PLANTED A MINIMUM OF 6 FEET FROM THE TRUNK OF THE DEAD OR DECLINING TREE TO BE REMOVED.



BEGIN PROJECT
 IH 20 STA 00+00.000
 CSJ: 0314-07-081
 TRM: 414
 DFO 412.842

PROJECT BEGIN
 STA 00+00

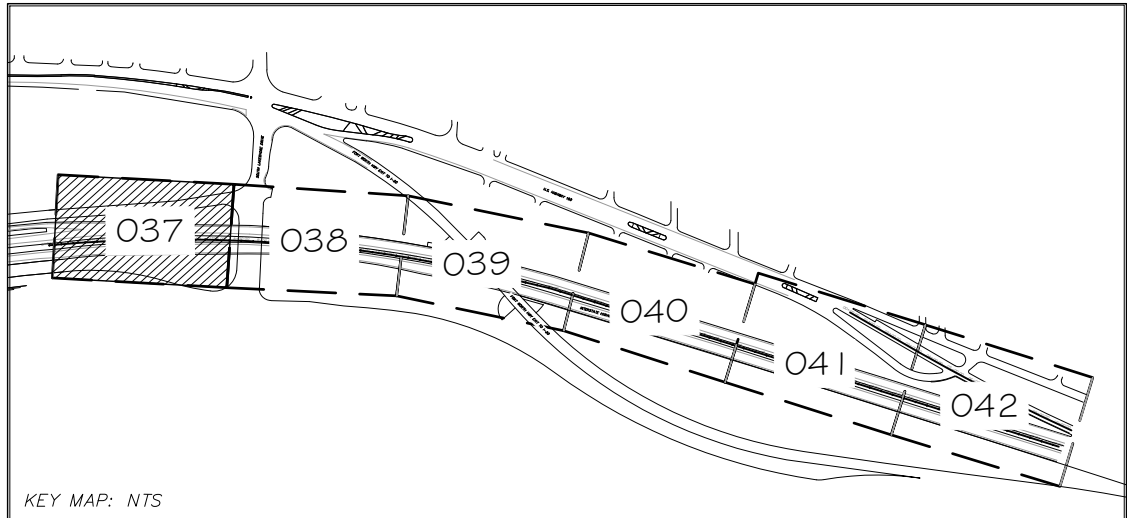
MATCHLINE SEE STA 7+25

1 IH 20 STA 0+00 - STA 7+25

ESTIMATE OF QUANTITIES - BY SHEET 1

ITEM NO	DESC	DESCRIPTION	UNIT	TOTAL
100	6013	PREP ROW (TREE) (2" TO 12" DIA)	EA	5*
192	6025	PLANT MATERIAL (45 GAL) (TREE) (ORNAMENTAL)	EA	12
192	6026	PLANT MATERIAL (65 GAL) (TREE)	EA	5

*CONTRACTOR TO FLAG EXISTING DECEASED TREES PRIOR TO REMOVAL FOR OWNERS APPROVAL SUBSIDIARY TO LINE ITEM 100 6013.



PLANT SCHEDULE 1

TREES	BOTANICAL / COMMON NAME	QTY	REMARKS
QMA	QUERCUS MACROCARPA BURR OAK	3	192-6026 PLANT MATERIAL (65 GAL) (TREE)
QM	QUERCUS MUEHLENBERGII CHINKAPIN OAK	2	192-6025 PLANT MATERIAL (65 GAL) (TREE)
ORNAMENTAL TREES	BOTANICAL / COMMON NAME	QTY	REMARKS
CO	CERCIS CANADENSIS 'OKLAHOMA' OKLAHOMA REDBUD	12	192-6025 PLANT MATERIAL (45 GAL) (ORNAMENTAL TREE)

Pacheco Koch 4060 BRYANT IRVIN ROAD
 FORT WORTH, TX 76109
 817.412.7155
 Westwood company

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 Texas Department of Transportation



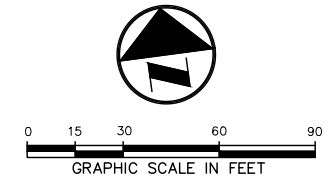
TX REG. ENGINEERING FIRM F-469
 TX REG. SURVEYING FIRM LS-10008001

PLANTING PLAN
 IH 20
 STA 0+00 - STA 7+25

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	SEE SHEET 1	037
STATE	DISTRICT	COUNTY
TEXAS	FTW	PARKER
CONTROL	SECTION	JOB
0314	07	081
		HIGHWAY NO
		IH-20

DJM/TMEYER
 06/22/2023 9:26PM
 N: \\DWG-53\5356-23\02\DWG\LANDSCAPE.FX 2018\SHEETS\PLANTING PLAN.DWG

JUNE 2023 1 - 95% PLAN SUBMITTAL



MATCHLINE SEE STA 7+25

MATCHLINE SEE STA 14+50

SOUTH LAKESHORE DRIVE

8+00.00 9+00.00 10+00.00 11+00.00 12+00.00 13+00.00 14+00.00

INTERSTATE HIGHWAY NO. 20
WEST BOUND LANES

INTERSTATE HIGHWAY NO. 20
EAST BOUND LANES

EXISTING TREE IN POOR CONDITION TO BE REPLACED, TYP.

EXISTING TREE TO REMAIN, TYP.

DEAD TREE TO BE REMOVED BUT NOT REPLACED

EXISTING TREE TO REMAIN, TYP.

30' SETBACK FROM TRAVEL LANE, TYP.

30' SETBACK FROM TRAVEL LANE, TYP.

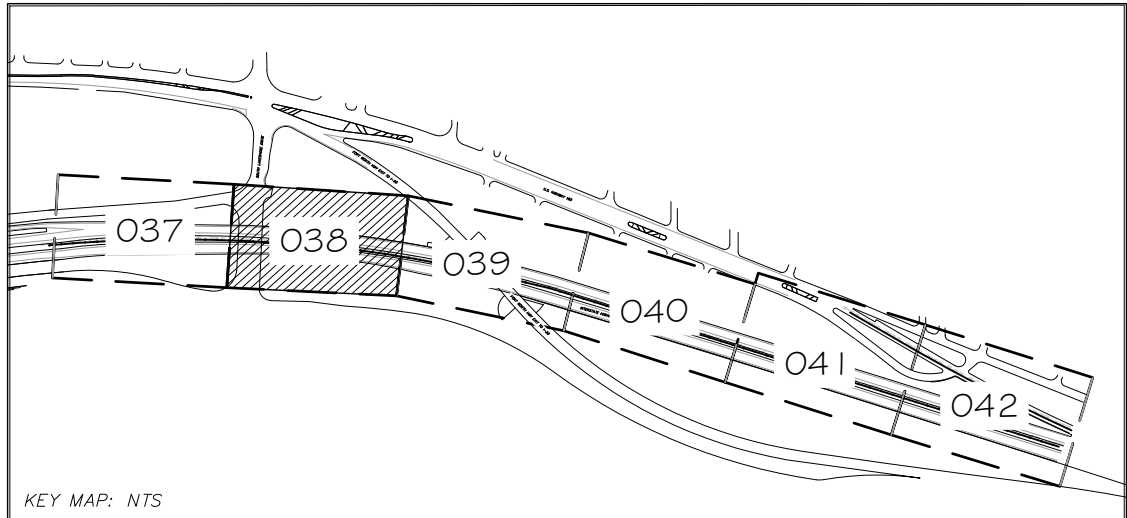
STRIPING, TYP.

EDGE OF PAVING, TYP.

1 IH 20 STA 7+25 - STA 14+50

ESTIMATE OF QUANTITIES - BY SHEET 2				
ITEM NO	DESC	DESCRIPTION	UNIT	TOTAL
100	6013	PREP ROW (TREE) (2" TO 12" DIA)	EA	4*
192	6025	PLANT MATERIAL (45 GAL) (TREE) (ORNAMENTAL)	EA	16
192	6026	PLANT MATERIAL (65 GAL) (TREE)	EA	3

*CONTRACTOR TO FLAG EXISTING DECEASED TREES PRIOR TO REMOVAL FOR OWNERS APPROVAL SUBSIDIARY TO LINE ITEM 100 6013.



PLANT SCHEDULE 2			
TREES	BOTANICAL / COMMON NAME	QTY	REMARKS
QMA	QUERCUS MACROCARPA BURR OAK	2	192-6026 PLANT MATERIAL (65 GAL) (TREE)
QV	QUERCUS VIRGINIANA SOUTHERN LIVE OAK	1	192-6026 PLANT MATERIAL (65 GAL) (TREE)
ORNAMENTAL TREES	BOTANICAL / COMMON NAME	QTY	REMARKS
CO	CERCIS CANADENSIS 'OKLAHOMA' OKLAHOMA REDBUD	16	192-6025 PLANT MATERIAL (45 GAL) (ORNAMENTAL TREE)

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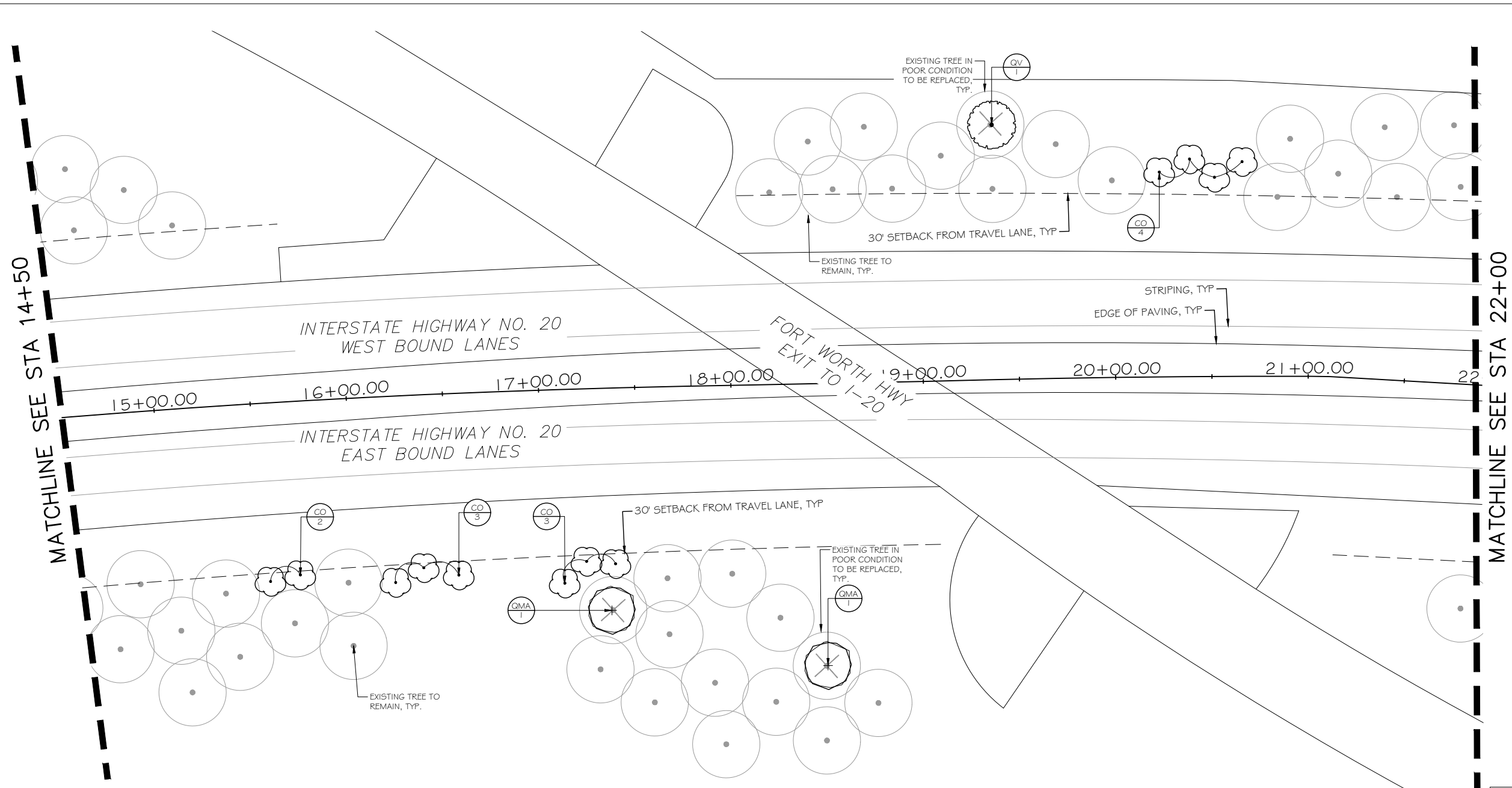
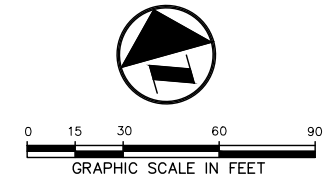
TX REG. ENGINEERING FIRM F-469
TX REG. SURVEYING FIRM LS-10008001

PLANTING PLAN
IH 20
STA 7+25 - STA 14+50

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	SEE SHEET 1	038	
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY NO.
0314	07	081	IH-20

DJM/TMEYER 06/22/2023 9:28PM N: DWG-53,5356-23.021\DWG\LANDSCAPE.FX 2018\SHEETS\PLANTING PLAN.DWG

JUNE 2023 95% PLAN SUBMITTAL



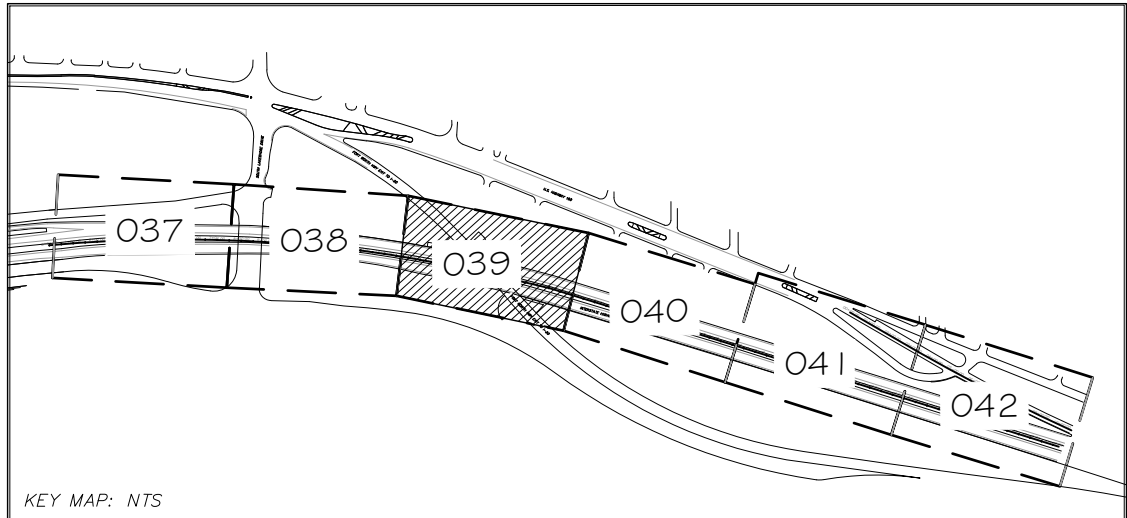
MATCHLINE SEE STA 14+50

MATCHLINE SEE STA 22+00

1 IH 20 STA 14+50 - STA 22+00

ESTIMATE OF QUANTITIES - BY SHEET 3				
ITEM NO	DESC	DESCRIPTION	UNIT	TOTAL
100	6013	PREP ROW (TREE) (2" TO 12" DIA)	EA	3*
192	6025	PLANT MATERIAL (45 GAL) (TREE) (ORNAMENTAL)	EA	12
192	6026	PLANT MATERIAL (65 GAL) (TREE)	EA	3

*CONTRACTOR TO FLAG EXISTING DECEASED TREES PRIOR TO REMOVAL FOR OWNERS APPROVAL SUBSIDIARY TO LINE ITEM 100 6013.



PLANT SCHEDULE 3			
TREES	BOTANICAL / COMMON NAME	QTY	REMARKS
QMA	QUERCUS MACROCARPA BURR OAK	2	192-G026 PLANT MATERIAL (65 GAL) (TREE)
QV	QUERCUS VIRGINIANA SOUTHERN LIVE OAK	1	192-G026 PLANT MATERIAL (65 GAL) (TREE)
ORNAMENTAL TREES	BOTANICAL / COMMON NAME	QTY	REMARKS
CO	CERCIS CANADENSIS 'OKLAHOMA' OKLAHOMA REDBUD	12	192-G025 PLANT MATERIAL (45 GAL) (ORNAMENTAL TREE)



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TX REG. SURVEYING FIRM LS-10008001

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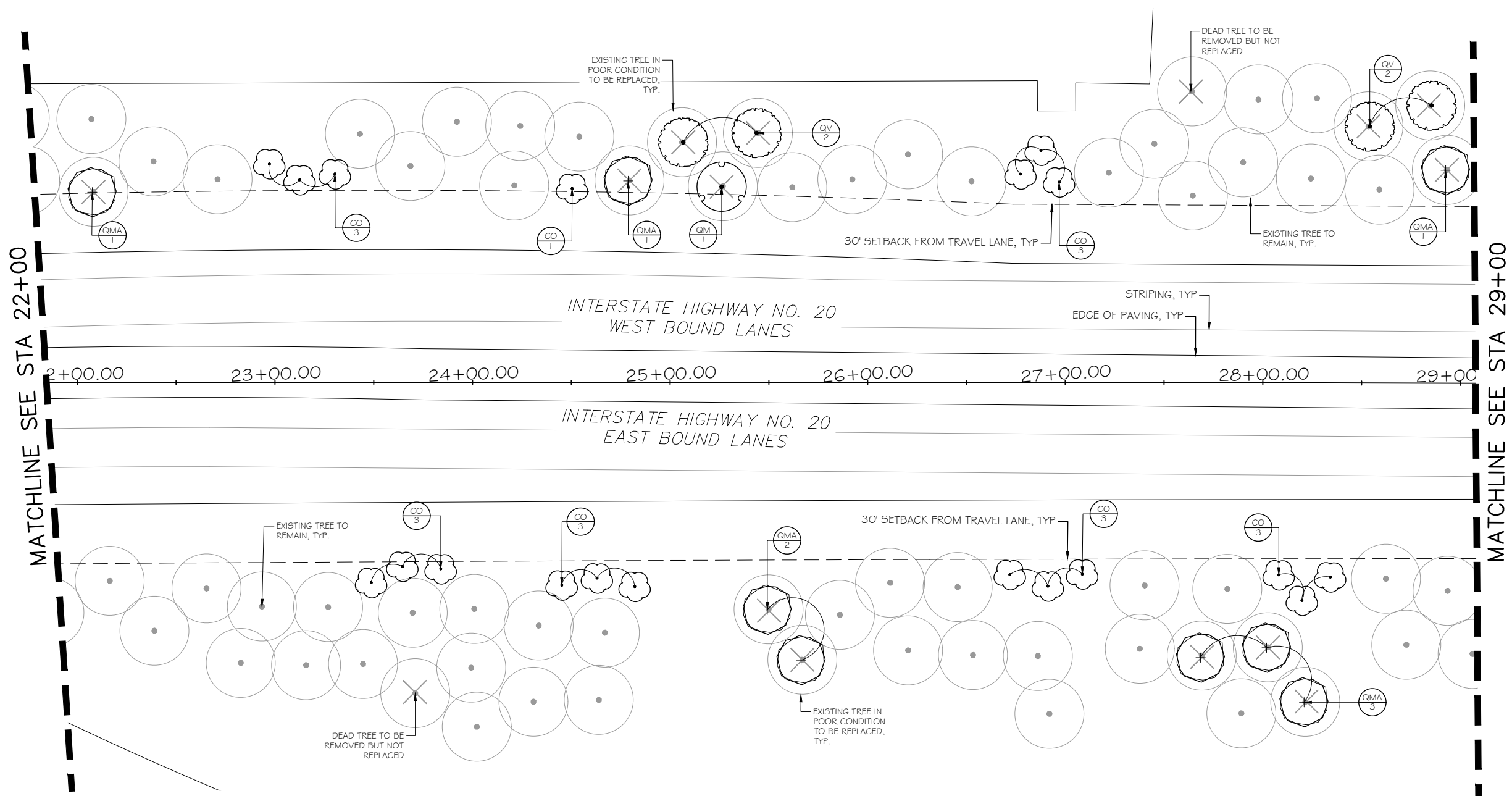
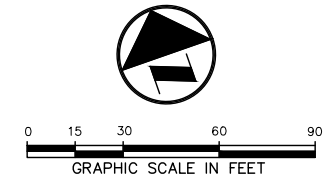
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PLANTING PLAN
IH 20
STA 14+50 - STA 22+00

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE SHEET 1	SHEET NO. 039
STATE TEXAS	DISTRICT FTW	COUNTY PARKER
CONTROL 0314	SECTION 07	JOB 081
		HIGHWAY NO IH-20

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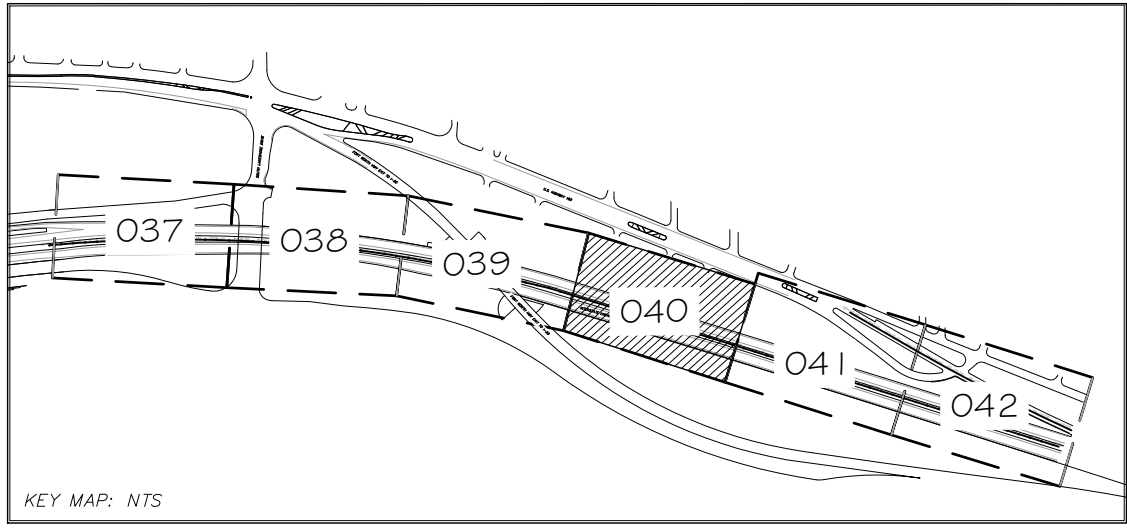
JUNE 2023 1 95% PLAN SUBMITTAL



1 IH 20 STA 22+00 - STA 29+00

ESTIMATE OF QUANTITIES - BY SHEET 4				
ITEM NO	DESC	DESCRIPTION	UNIT	TOTAL
100	6013	PREP ROW (TREE) (2" TO 12" DIA)	EA	15*
192	6025	PLANT MATERIAL (45 GAL) (TREE) (ORNAMENTAL)	EA	19
192	6026	PLANT MATERIAL (65 GAL) (TREE)	EA	13

*CONTRACTOR TO FLAG EXISTING DECEASED TREES PRIOR TO REMOVAL FOR OWNERS APPROVAL SUBSIDIARY TO LINE ITEM 100 6013.



PLANT SCHEDULE 4			
TREES	BOTANICAL / COMMON NAME	QTY	REMARKS
QMA	QUERCUS MACROCARPA BURR OAK	8	192-6026 PLANT MATERIAL (65 GAL) (TREE)
QM	QUERCUS MUEHLENBERGII CHINKAPIN OAK	1	192-6026 PLANT MATERIAL (65 GAL) (TREE)
QV	QUERCUS VIRGINIANA SOUTHERN LIVE OAK	4	192-6026 PLANT MATERIAL (65 GAL) (TREE)
ORNAMENTAL TREES	BOTANICAL / COMMON NAME	QTY	REMARKS
CO	CERCIS CANADENSIS "OKLAHOMA" OKLAHOMA REDBUD	19	192-6025 PLANT MATERIAL (45 GAL) (ORNAMENTAL TREE)

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PLANTING PLAN			
IH 20			
STA 22+00 - STA 29+00			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	SEE SHEET 1	040	
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY NO.
0314	07	081	IH-20

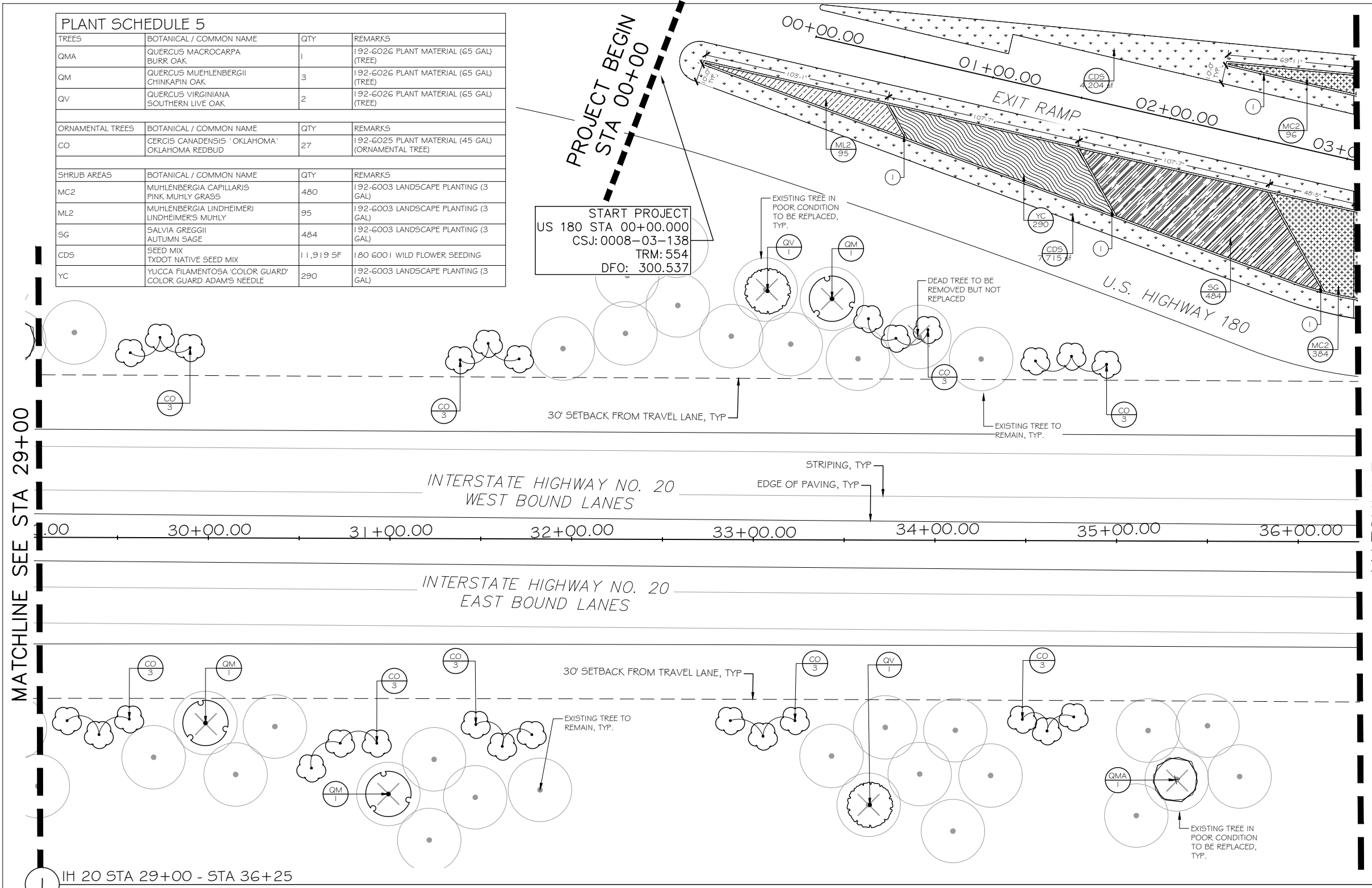
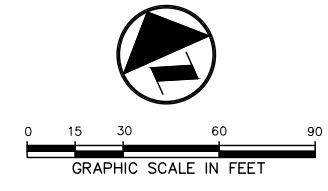
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JUNE 2023 1 95% PLAN SUBMITTAL

PLANT SCHEDULE 5			
TREES	BOTANICAL / COMMON NAME	QTY	REMARKS
QMA	QUERCUS MACROCARPA BURR OAK	1	192-6026 PLANT MATERIAL (65 GAL) (TREE)
QM	QUERCUS MUEHLENBERGII CHINKAPIN OAK	3	192-6026 PLANT MATERIAL (65 GAL) (TREE)
QV	QUERCUS VIRGINIANA SOUTHERN LIVE OAK	2	192-6026 PLANT MATERIAL (65 GAL) (TREE)
ORNAMENTAL TREES	BOTANICAL / COMMON NAME	QTY	REMARKS
CO	CERCIS CANADENSIS 'OKLAHOMA' OKLAHOMA REDBUD	27	192-6025 PLANT MATERIAL (45 GAL) (ORNAMENTAL TREE)
SHRUB AREAS	BOTANICAL / COMMON NAME	QTY	REMARKS
MC2	MUHLBERGIA CAPILLARIS PINK MUHLY GRASS	480	192-6003 LANDSCAPE PLANTING (3 GAL)
ML2	MUHLBERGIA LINDHEIMERI LINDHEIMER'S MUHLY	95	192-6003 LANDSCAPE PLANTING (3 GAL)
9G	SALVIA GREGGII AUTUMN SAGE	484	192-6003 LANDSCAPE PLANTING (3 GAL)
CDS	SEED MIX TXDOT NATIVE SEED MIX	11,919 SF	180 6001 WILD FLOWER SEEDING
YC	YUCCA FILAMENTOSA 'COLOR GUARD' COLOR GUARD ADAM'S NEEDLE	290	192-6003 LANDSCAPE PLANTING (3 GAL)

PROJECT BEGIN
STA 00+00

START PROJECT
US 180 STA 00+00.000
CSJ: 0008-03-138
TRM: 554
DFO: 300.537



MATCHLINE SEE STA 36+25

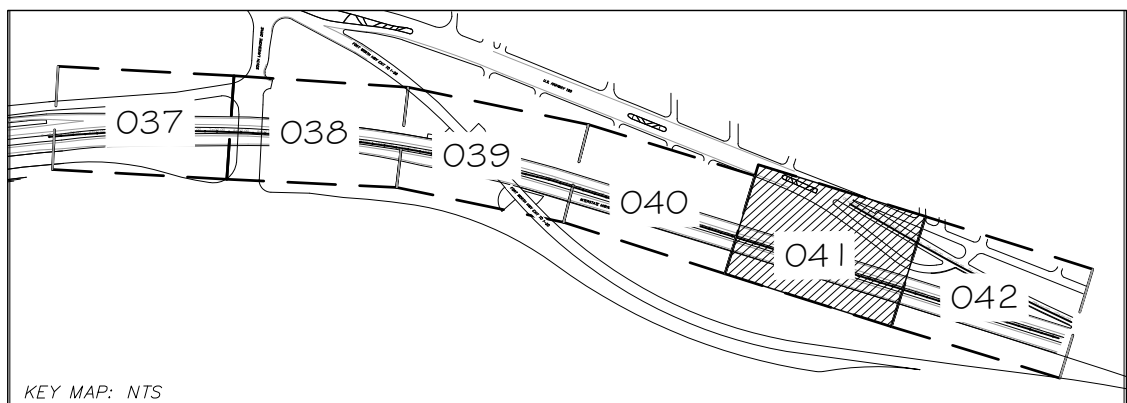
MATCHLINE SEE STA 29+00

REFERENCE NOTES SCHEDULE 5		
CODE	DESCRIPTION	QTY
1	192-6097 CONC LNDSCP EDG (12 IN WIDTH)	1,018 LF

ESTIMATE OF QUANTITIES - BY SHEET 5				
ITEM NO	DESC	DESCRIPTION	UNIT	TOTAL
100	6013	PREP ROW (TREE) (2" TO 12" DIA)	EA	6"
180	6001	WILD FLOWER MIX (TEXAS NATIVE SEED MIX)	AC	0.27
161	6024	GENERAL USE COMPOST (2")	SY	1,040
192	6003	LANDSCAPE PLANTING (3 GAL)	EA	1,349
192	6013	LANDSCAPE PLANTING (MULCH)	SY	1,040
192	6025	PLANT MATERIAL (45 GAL) (TREE) (ORNAMENTAL)	EA	27
192	6026	PLANT MATERIAL (65 GAL) (TREE)	EA	6
192	6097	CONC LNDSCP EDG (12 IN WIDTH) (CONCRETE)	LF	1,017

*CONTRACTOR TO FLAG EXISTING DECEASED TREES PRIOR TO REMOVAL FOR OWNERS APPROVAL SUBSIDIARY TO LINE ITEM 100 6013.

IH 20 STA 29+00 - STA 36+25



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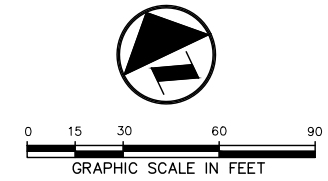


TX REG. ENGINEERING FIRM F-469
TX REG. SURVEYING FIRM LS-10008001

PLANTING PLAN			
IH 20			
STA 29+00 - STA 36+25			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	SEE SHEET 1	041	
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY NO.
0314	07	081	IH-20

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JUNE 2023 95% PLAN SUBMITTAL

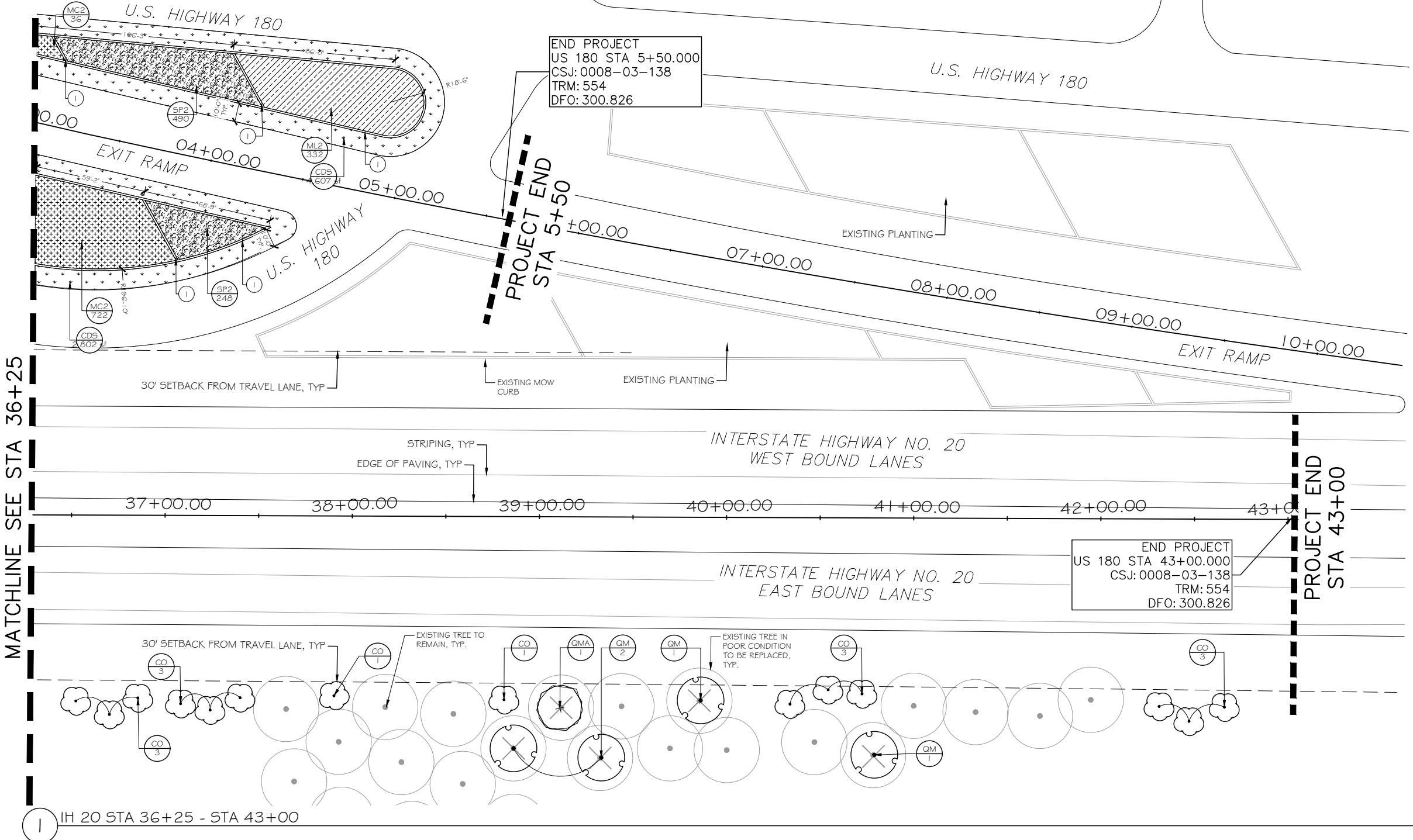


END PROJECT
US 180 STA 5+50.000
CSJ: 0008-03-138
TRM: 554
DFO: 300.826

END PROJECT
US 180 STA 43+00.000
CSJ: 0008-03-138
TRM: 554
DFO: 300.826

MATCHLINE SEE STA 36+25

PROJECT END
STA 43+00



REFERENCE NOTES SCHEDULE 6

CODE	DESCRIPTION	QTY
I	192-6097 CONC LANDSCP EDG (12 IN WIDTH)	528 LF

ESTIMATE OF QUANTITIES - BY SHEET 6

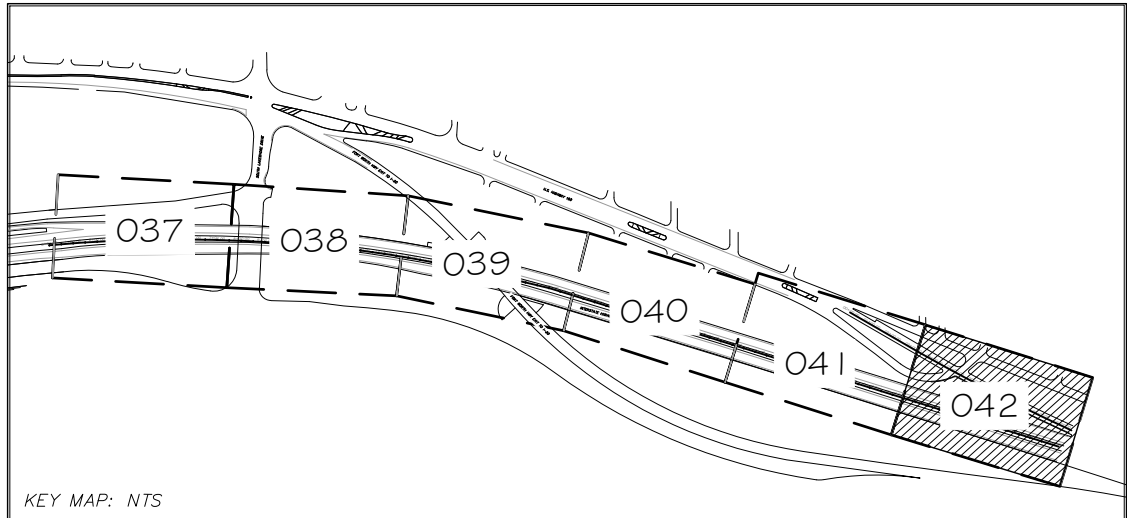
ITEM NO	DESC	DESCRIPTION	UNIT	TOTAL
100	6013	PREP ROW (TREE) (2" TO 12" DIA)	EA	5*
180	6001	WILDFLOWER SEED MIX (TXDOT NATIVE SEED MIX)	AC	0.11
161	6024	GENERAL USE COMPOST (2")	SY	958
192	6003	LANDSCAPE PLANTING (3 GAL)	EA	1,828
192	6013	LANDSCAPE PLANTING (MULCH)	SY	958
192	6025	PLANT MATERIAL (45 GAL) (TREE) (ORNAMENTAL)	EA	14
192	6026	PLANT MATERIAL (65 GAL) (TREE)	EA	5
192	6097	CONC LANDSCP EDG (12 IN WIDTH)	LF	927

*CONTRACTOR TO FLAG EXISTING DECEASED TREES PRIOR TO REMOVAL FOR OWNERS APPROVAL SUBSIDIARY TO LINE ITEM 100 6013.

1 IH 20 STA 36+25 - STA 43+00

PLANT SCHEDULE 6

TREES	BOTANICAL / COMMON NAME	QTY	REMARKS
QMA	QUERCUS MACROCARPA BURR OAK	1	192-6026 PLANT MATERIAL (65 GAL) (TREE)
QM	QUERCUS MUEHLENBERGII CHINKAPIN OAK	4	192-6026 PLANT MATERIAL (65 GAL) (TREE)
ORNAMENTAL TREES	BOTANICAL / COMMON NAME	QTY	REMARKS
CO	CERCIS CANADENSIS "OKLAHOMA" OKLAHOMA REDBUD	14	192-6025 PLANT MATERIAL (45 GAL) (ORNAMENTAL TREE)
SHRUB AREAS	BOTANICAL / COMMON NAME	QTY	REMARKS
MC2	MUHLENBERGIA CAPILLARIS PINK MUHLY GRASS	758	192-6003 LANDSCAPE PLANTING (3 GAL)
ML2	MUHLENBERGIA LINDHEIMERI LINDHEIMER'S MUHLY	332	192-6003 LANDSCAPE PLANTING (3 GAL)
SP2	SALVIA NEMOROSA BLUE QUEEN SAGE	738	192-6003 LANDSCAPE PLANTING (3 GAL)
CDS	SEED MIX TXDOT NATIVE SEED MIX	4,607 SF	180 6001 WILD FLOWER SEEDING



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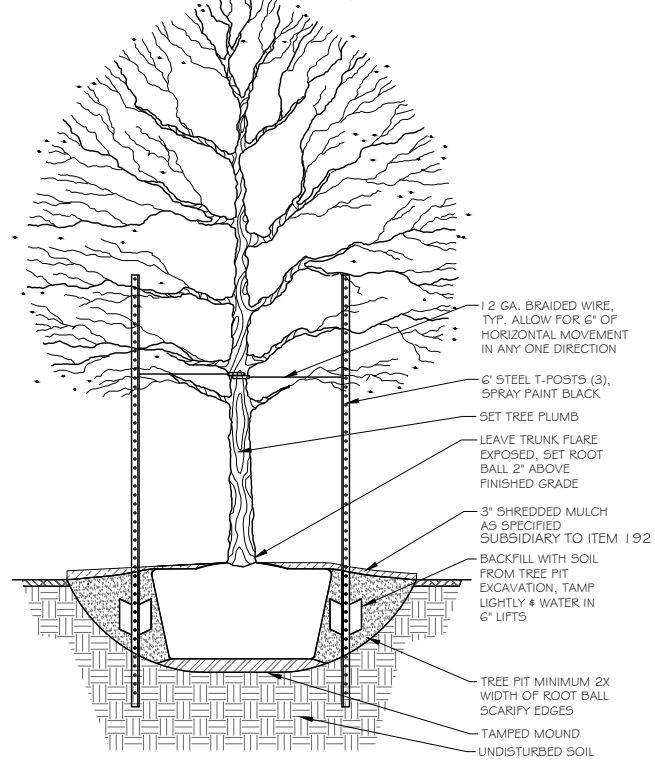
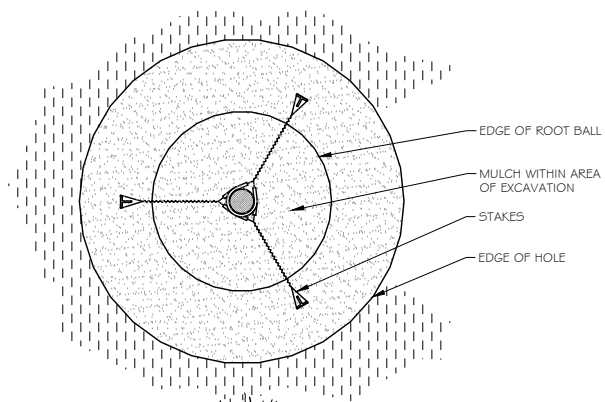
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PLANTING PLAN
IH 20
STA 36+25 - STA 43+00

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE SHEET 1	SHEET NO. 042
STATE TEXAS	DISTRICT FTW	COUNTY PARKER
CONTROL 0314	SECTION 07	JOB 081
		HIGHWAY NO. IH-20

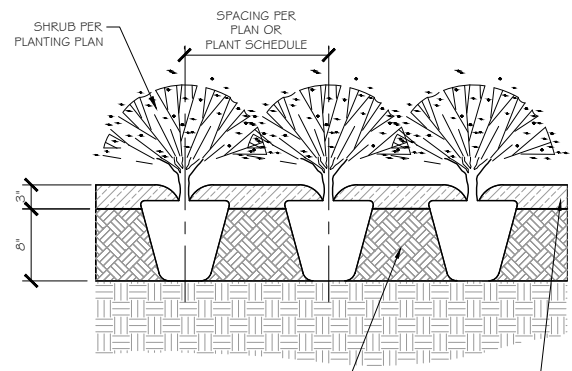
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JUNE 2023 95% PLAN SUBMITTAL



MULCH, TREE STAKING, AND ALL WORK SHOWN IN DETAIL SHALL BE SUBSIDIARY TO ITEMS 192 6025 & 192 6026

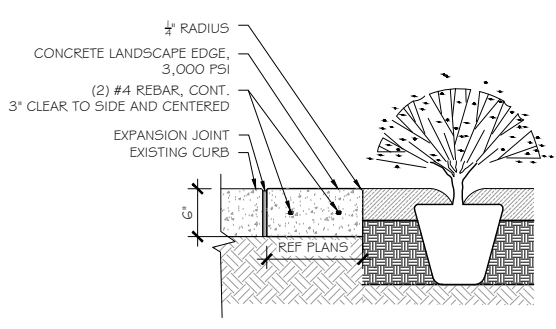
1 CANOPY TREE PLANTING
3/4" = 1'-0"



PLANTING SOIL IN SHRUB BEDS:
1. ADD 2" COMPOST & TILL INTO 6" EXISTING SOILS, CREATING 8" PLANTING SOIL
2. ADD 3" MULCH AFTER PLANTING
SUBSIDIARY TO ITEM 192

2 TYP. SHRUB PLANTING
1" = 1'-0"

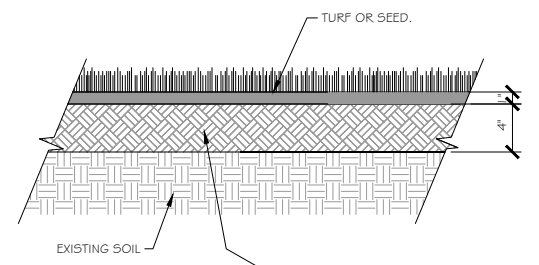
PLANT SCHEDULE			
TREES	BOTANICAL / COMMON NAME	QTY	REMARKS
QMA	QUERCUS MACROCARPA BURR OAK	17	192-6026 PLANT MATERIAL (65 GAL) (TREE)
QM	QUERCUS MUEHLENBERGII CHINKAPIN OAK	10	192-6026 PLANT MATERIAL (65 GAL) (TREE)
QV	QUERCUS VIRGINIANA SOUTHERN LIVE OAK	8	192-6026 PLANT MATERIAL (65 GAL) (TREE)
ORNAMENTAL TREES	BOTANICAL / COMMON NAME	QTY	REMARKS
CO	CERCIS CANADENSIS 'OKLAHOMA' OKLAHOMA REDBUD	100	192-6025 PLANT MATERIAL (45 GAL) (ORNAMENTAL TREE)
SHRUB AREAS	BOTANICAL / COMMON NAME	QTY	REMARKS
MC2	MUHLBERGIA CAPILLARIS PINK MUHLY GRASS	1,238	192-6003 LANDSCAPE PLANTING (3 GAL)
ML2	MUHLBERGIA LINDHEIMERI LINDHEIMER'S MUHLY	427	192-6003 LANDSCAPE PLANTING (3 GAL)
SG	SALVIA GREGGII AUTUMN SAGE	484	192-6003 LANDSCAPE PLANTING (3 GAL)
SP2	SALVIA NEMOROSA BLUE QUEEN SAGE	738	192-6003 LANDSCAPE PLANTING (3 GAL)
CDS	SEED MIX TXDOT NATIVE SEED MIX	19,329 SF	180 6001 WILD FLOWER SEEDING
YC	YUCCA FILAMENTOSA 'COLOR GUARD' COLOR GUARD ADAM'S NEEDLE	290	192-6003 LANDSCAPE PLANTING (3 GAL)



NOTE: CONTROL JOINTS @ 10' O.C. SEALED EXPANSION JOINTS @ 30' O.C. MEDIUM BROOM FINISH
SLEEVE AND DOWELS FOR EXPANSION JOINTS, SUBSIDIARY TO ASSOCIATED ITEM UNDER 192

3 CONCRETE LANDSCAPE EDGE - 1 1/2"
1" = 1'-0"

NOTES:
1. CONTRACTOR TO PROVIDE SEED MIX PER THE PERMANENT EROSION CONTROL SEED MIX AS APPROPRIATE FOR THE TIME OF YEAR INSTALLED. SOIL PREP AND COMPOST SHALL BE SUBSIDIARY TO THIS ITEM.
2. CONTRACTOR TO PROVIDE TEMPORARY IRRIGATION UNTIL ESTABLISHMENT, SUBSIDIARY TO ITEM 193



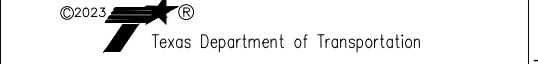
TOPSOIL PREP:
1. FINISH GRADE TOPSOIL BY REMOVING STONES LARGER THAN 1" IN ANY DIMENSION AND STICKS, ROOTS, RUBBISH, AND OTHER EXTRANEOUS MATTER TO LEGALLY DISPOSE OF THEM OFF OWNER'S PROPERTY.
2. ADD 1" COMPOST ON THE SURFACE, THEN TILL TO 4" DEPTH
3. INSTALL SEED AS SHOWN AND NOTED.

4 SOIL PROFILE FOR SOD & SEED
1 1/2" = 1'-0"



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PLANTING DETAILS			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	SEE SHEET 1	043	
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY NO.
0314	07	081	IH-20

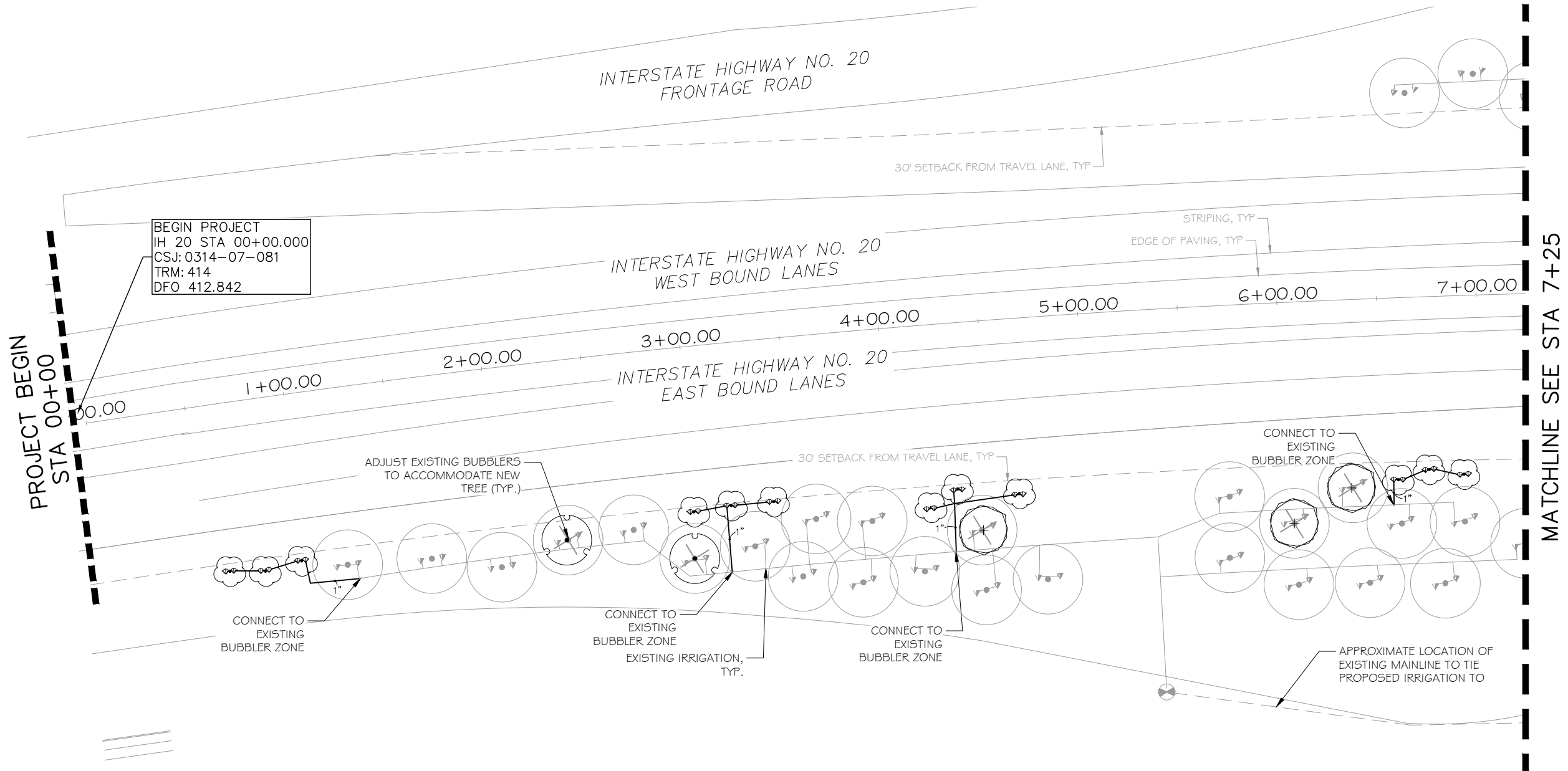
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JUNE 2023 - 95% PLAN SUBMITTAL



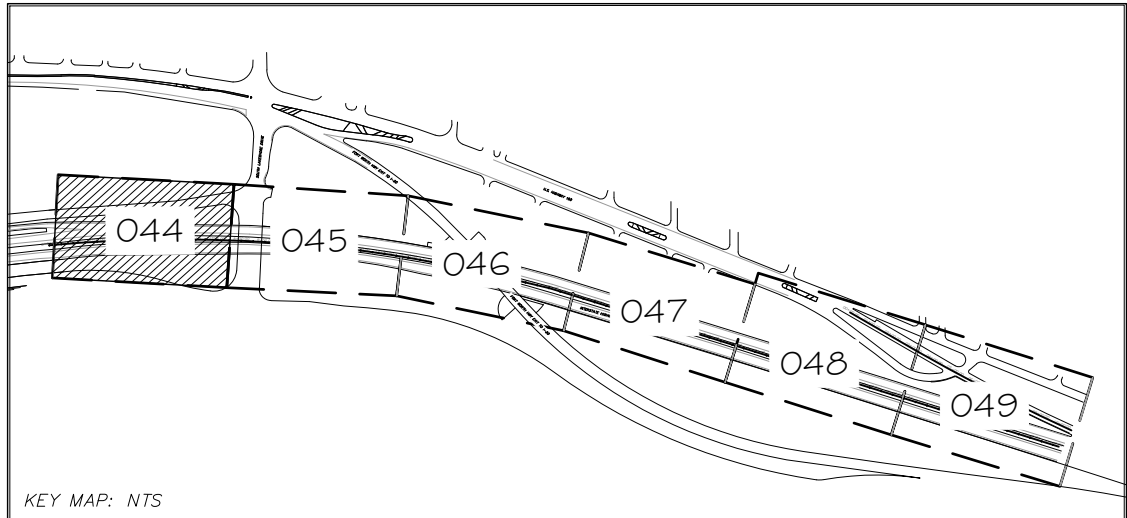
GENERAL NOTES

1. THE ENTIRE LIMITS OF IMPROVEMENTS WERE NOT SURVEYED. ALL LINEWORK IS APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
2. ALL UTILITIES SHOWN ON PLANS ARE APPROXIMATE IN NATURE AND DO NOT RELIEVE THE CONTRACTOR FROM ANY RESPONSIBILITY TO COORDINATE WITH APPROPRIATE AUTHORITIES.



1 IH 20 STA 0+00 - STA 7+25

ESTIMATE OF QUANTITIES - BY SHEET 1				
ITEM NO	DESC	DESCRIPTION	UNIT	TOTAL
193	6007	IRRIG SYS OPER AND MAINT	MO	12



KEY MAP: NTS

IRRIGATION SCHEDULE

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	HUNTER PRO5-PR530-04-PCN FLOOD BUBBLER, 4IN. POP-UP.		HUNTER ICV-G 1 IN., 1-1/2 IN., 2 IN., AND 3 IN. PLASTIC ELECTRIC REMOTE CONTROL VALVES, GLOBE CONFIGURATION, WITH NPT THREADED INLET/OUTLET, FOR COMMERCIAL/MUNICIPAL USE.
SYMBOL	MANUFACTURER/MODEL/DESCRIPTION		IRRIGATION LATERAL LINE: PVC CLASS 200 SDR 21 ONLY LATERAL TRANSITION PIPE SIZES 1" AND ABOVE ARE INDICATED ON THE PLAN, WITH ALL OTHERS BEING 3/4" IN SIZE.
	HUNTER ICZ-101-40 DRIP CONTROL ZONE KIT. 1 IN. ICV GLOBE VALVE WITH 1 IN. HY100 FILTER SYSTEM. PRESSURE REGULATION: 40PSI. FLOW RANGE: 2 GPM TO 20 GPM. 150 MESH STAINLESS STEEL SCREEN.		IRRIGATION MAINLINE: PVC CLASS 200 SDR 21
	AREA TO RECEIVE DRIPLINE NETAFIM TLHCVXR-CS-033-12 TECHLINE HCVXR-CS PRESSURE COMPENSATING LANDSCAPE DRIPLINE WITH COPPER STRIPE, CHECK VALVE AND ANTI-SIPHON FEATURE. 0.33 GPH EMITTERS AT 12" O.C. DRIPLINE LATERALS SPACED AT 12" APART, WITH EMITTERS OFFSET FOR TRIANGULAR PATTERN. 17MM.		PIPE SLEEVE: PVC CLASS 200 SDR 21 2 SIZES LARGER THAN PIPE WITHIN.
			Valve Callout # - Valve Number # - Valve Flow # - Valve Size

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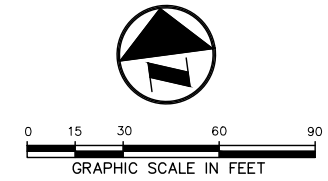
IRRIGATION PLAN

IH 20
 STA 0+00 - STA 7+25

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE SHEET 1	SHEET NO. 044
STATE TEXAS	DISTRICT FTW	COUNTY PARKER
CONTROL SECTION 0314	JOB 07	HIGHWAY NO. 081 IH-20

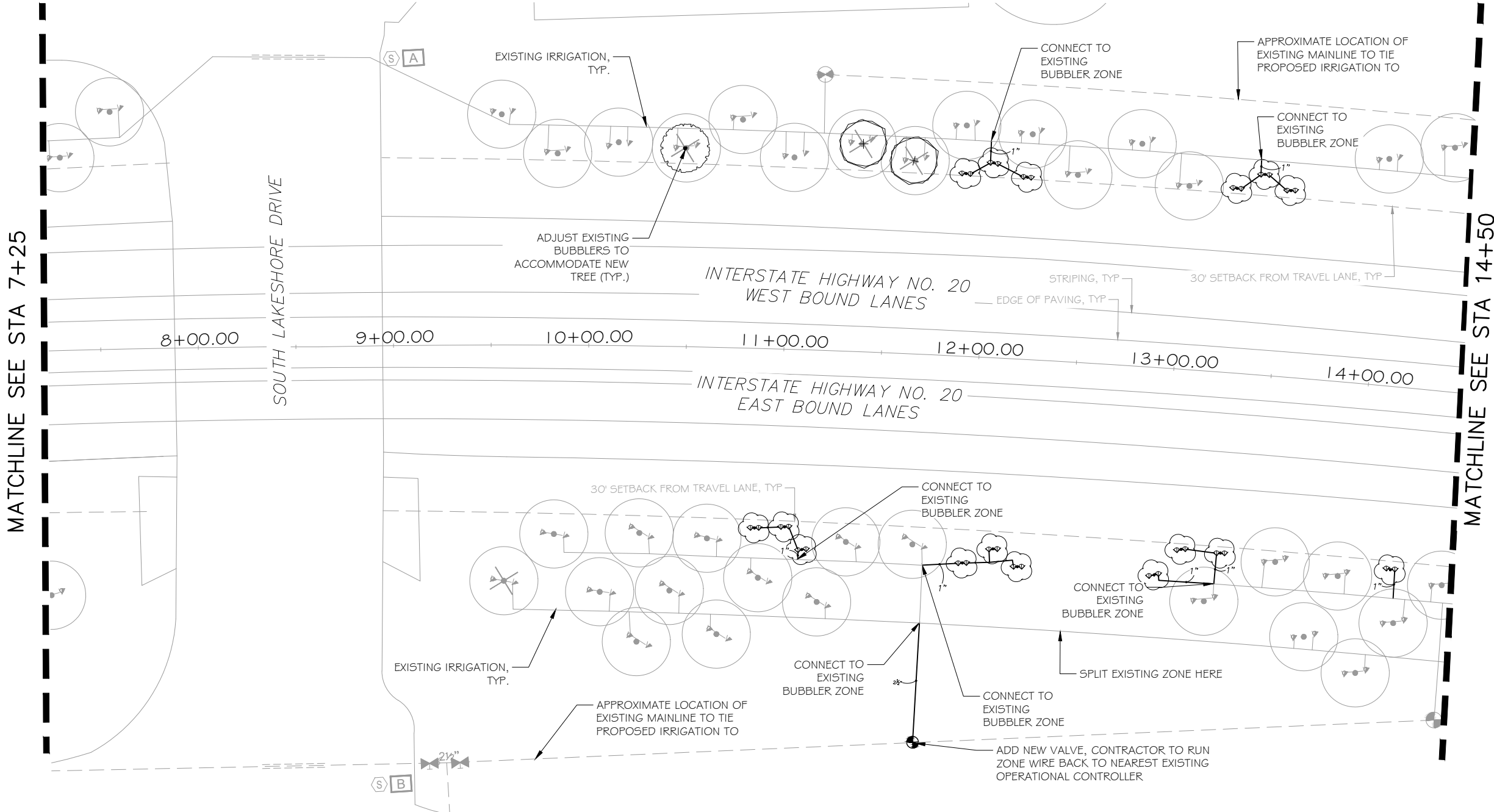
JUNE 2023 1 - 95% PLAN SUBMITTAL

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GENERAL NOTES

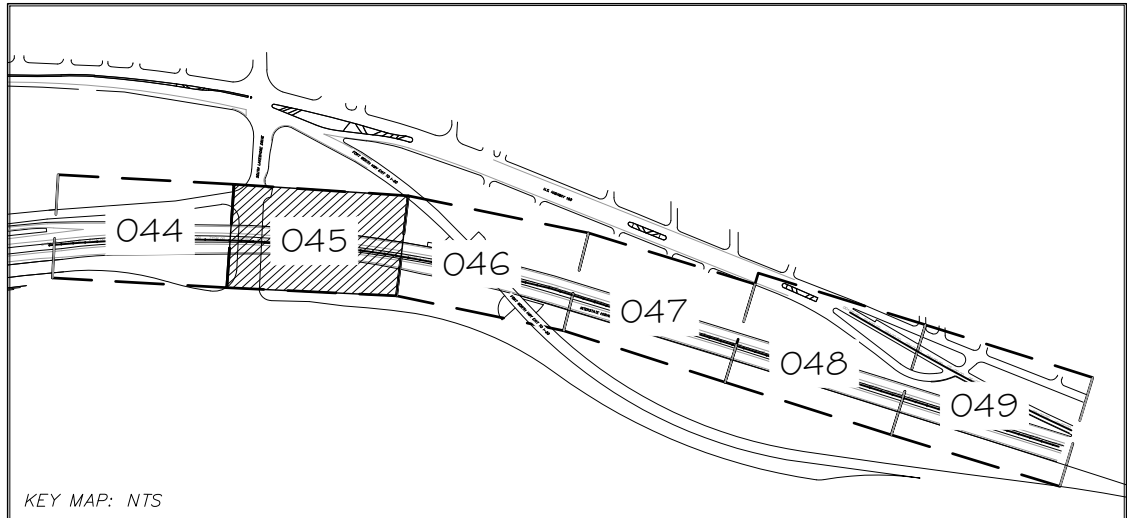
1. THE ENTIRE LIMITS OF IMPROVEMENTS WERE NOT SURVEYED. ALL LINEWORK IS APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
2. ALL UTILITIES SHOWN ON PLANS ARE APPROXIMATE IN NATURE AND DO NOT RELIEVE THE CONTRACTOR FROM ANY RESPONSIBILITY TO COORDINATE WITH APPROPRIATE AUTHORITIES.



MATCHLINE SEE STA 7+25

MATCHLINE SEE STA 14+50

1 IH 20 STA 7+25 - STA 14+50



KEY MAP: NTS

IRRIGATION SCHEDULE

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	HUNTER PRO5-PRS30-04-PCN FLOOD BUBBLER, 4IN. POP-UP.		HUNTER ICV-G 1IN., 1-1/2IN., 2IN., AND 3IN. PLASTIC ELECTRIC REMOTE CONTROL VALVES, GLOBE CONFIGURATION, WITH NPT THREADED INLET/OUTLET, FOR COMMERCIAL/MUNICIPAL USE.
	HUNTER ICZ-101-40 Drip Control Zone Kit. 1IN. ICV GLOBE VALVE WITH 1IN. HY 100 FILTER SYSTEM. PRESSURE REGULATION: 40PSI. FLOW RANGE: 2 GPM TO 20 GPM. 150 MESH STAINLESS STEEL SCREEN.		IRRIGATION LATERAL LINE: PVC CLASS 200 SDR 21 ONLY LATERAL TRANSITION PIPE SIZES 1" AND ABOVE ARE INDICATED ON THE PLAN, WITH ALL OTHERS BEING 3/4" IN SIZE.
	AREA TO RECEIVE DRILINE NETAFIM TLHCVXR-CS-033-12 TECHLINE HCVXR-CS PRESSURE COMPENSATING LANDSCAPE DRILINE WITH COPPER STRIPE, CHECK VALVE AND ANTI-SIPHON FEATURE. 0.33 GPH EMITTERS AT 12" O.C. DRILINE LATERALS SPACED AT 12" APART, WITH EMITTERS OFFSET FOR TRIANGULAR PATTERN. 17MM.		IRRIGATION MAINLINE: PVC CLASS 200 SDR 21
	PIPE SLEEVE: PVC CLASS 200 SDR 21 2 SIZES LARGER THAN PIPE WITHIN.		Valve Callout # - Valve Number # - Valve Flow # - Valve Size

ESTIMATE OF QUANTITIES - BY SHEET 2				
ITEM NO	DESC	DESCRIPTION	UNIT	TOTAL
193	6007	IRRIG SYS OPER AND MAINT	MO	12

Pacheco Koch 4060 BRYANT IRVIN ROAD FORT WORTH, TX 76109 817.412.7155
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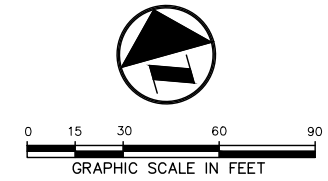


TX REG. ENGINEERING FIRM F-469
 TX REG. SURVEYING FIRM LS-10008001

IRRIGATION PLAN			
IH 20 STA 7+25 - STA 14+50			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	SEE SHEET 1	045	
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL SECTION	JOB	HIGHWAY NO	
0314	07	081 IH-20	

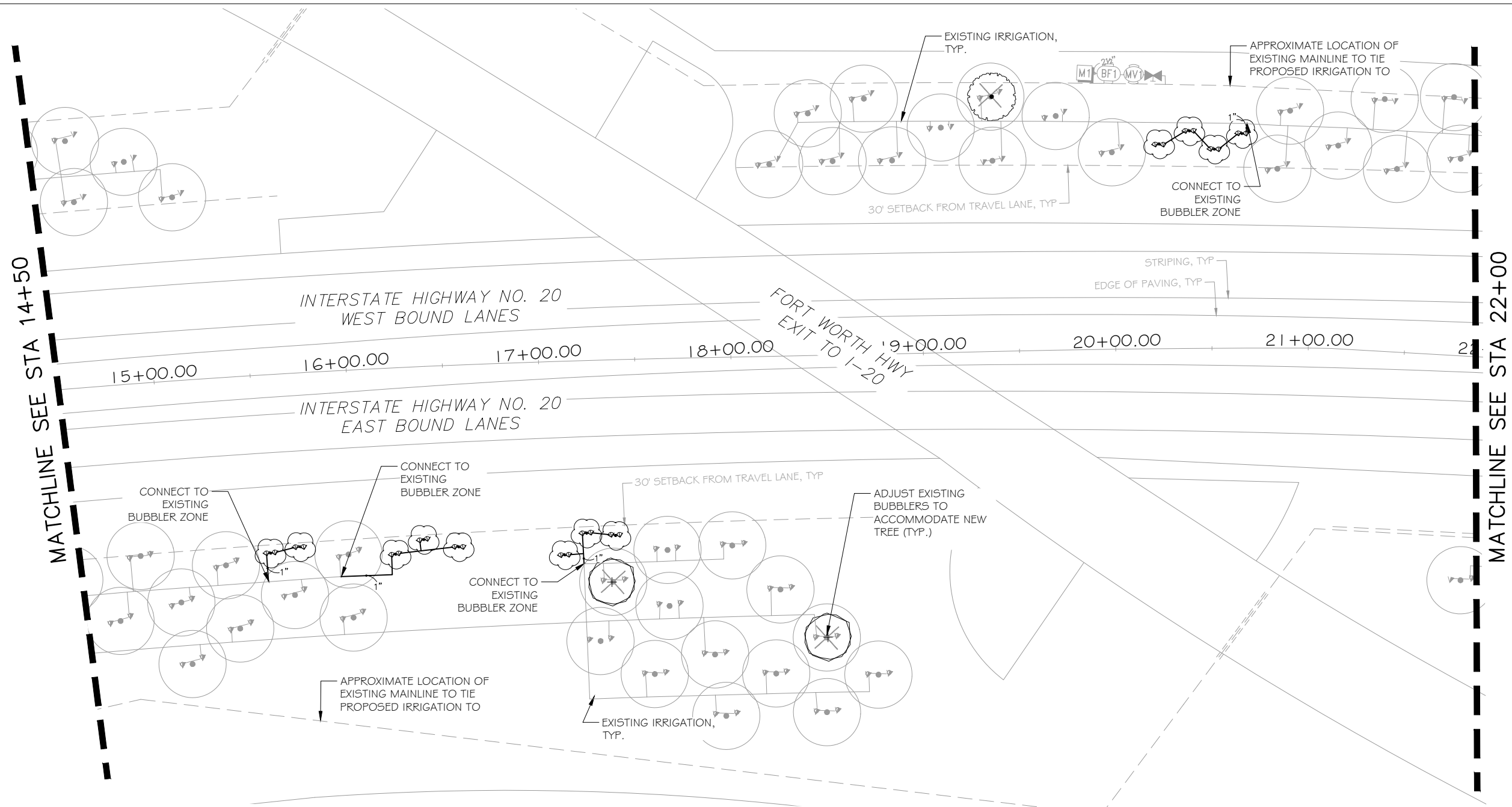
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JUNE 2023 1 95% PLAN SUBMITTAL



GENERAL NOTES

1. THE ENTIRE LIMITS OF IMPROVEMENTS WERE NOT SURVEYED. ALL LINEWORK IS APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
2. ALL UTILITIES SHOWN ON PLANS ARE APPROXIMATE IN NATURE AND DO NOT RELIEVE THE CONTRACTOR FROM ANY RESPONSIBILITY TO COORDINATE WITH APPROPRIATE AUTHORITIES.

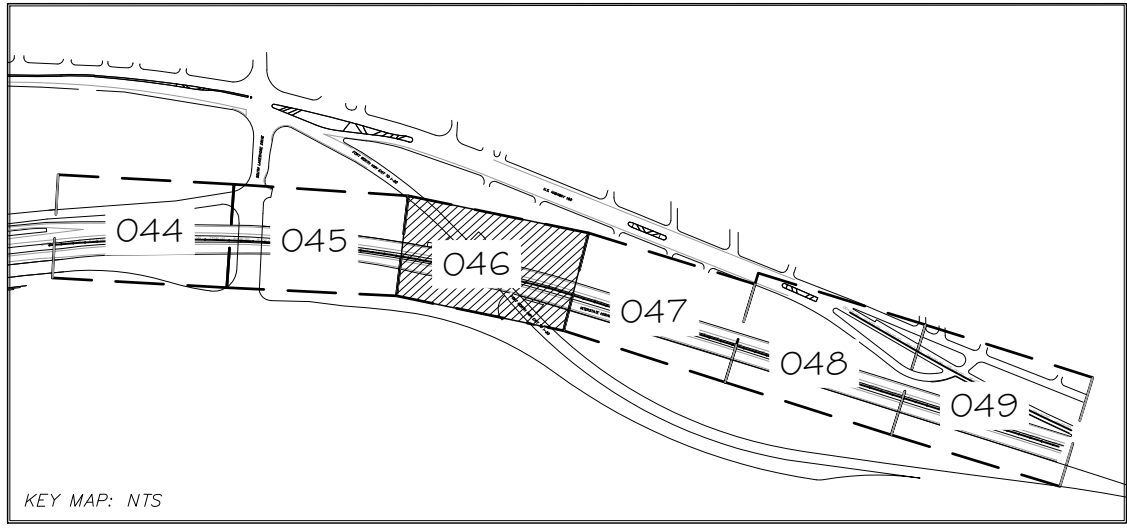


MATCHLINE SEE STA 14+50

MATCHLINE SEE STA 22+00

1 IH 20 STA 14+50 - STA 22+00

ESTIMATE OF QUANTITIES - BY SHEET 3				
ITEM NO	DESC	DESCRIPTION	UNIT	TOTAL
193	6007	IRRIG SYS OPER AND MAINT	MO	12



IRRIGATION SCHEDULE

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	HUNTER PRO5-FRS30-04-PCN FLOOD BUBBLER, 4IN. POP-UP.		HUNTER ICV-G 1IN., 1-1/2IN., 2IN., AND 3IN. PLASTIC ELECTRIC REMOTE CONTROL VALVES, GLOBE CONFIGURATION, WITH NPT THREADED INLET/OUTLET, FOR COMMERCIAL/MUNICIPAL USE.
	HUNTER ICZ-101-40 DRIP CONTROL ZONE KIT. 1IN. ICV GLOBE VALVE WITH 1IN. HY100 FILTER SYSTEM. PRESSURE REGULATION: 40PSI. FLOW RANGE: 2 GPM TO 20 GPM. 150 MESH STAINLESS STEEL SCREEN.		IRRIGATION LATERAL LINE: PVC CLASS 200 SDR 21 ONLY LATERAL TRANSITION PIPE SIZES 1" AND ABOVE ARE INDICATED ON THE PLAN, WITH ALL OTHERS BEING 3/4" IN SIZE.
	AREA TO RECEIVE DRIPLINE NETAFIM TLHCVXR-CS-033-12 TECHLINE HCVXR-CS PRESSURE COMPENSATING LANDSCAPE DRIPLINE WITH COPPER STRIPE, CHECK VALVE AND ANTI-SIPHON FEATURE. 0.33 GPH EMITTERS AT 12" O.C. DRIPLINE LATERALS SPACED AT 12" APART, WITH EMITTERS OFFSET FOR TRIANGULAR PATTERN. 17MM.		IRRIGATION MAINLINE: PVC CLASS 200 SDR 21
			PIPE SLEEVE: PVC CLASS 200 SDR 21 2 SIZES LARGER THAN PIPE WITHIN.
			Valve Callout Value Number Value Flow Value Size

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 TX REG. SURVEYING FIRM LS-10008001

IRRIGATION PLAN			
IH 20			
STA 14+50 - STA 22+00			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	SEE SHEET 1	046	
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY NO.
0314	07	081	IH-20

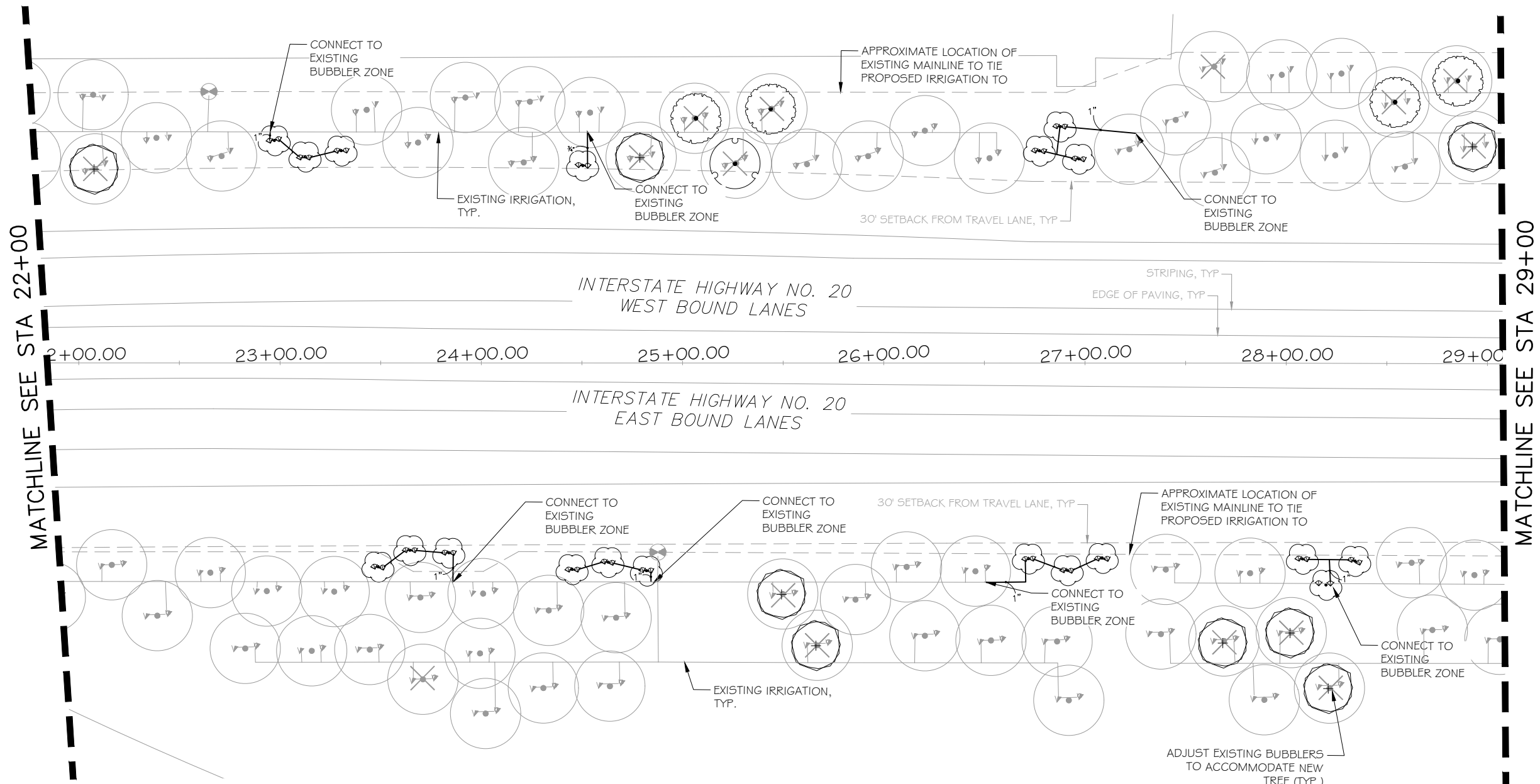
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JUNE 2023 95% PLAN SUBMITTAL



GENERAL NOTES

1. THE ENTIRE LIMITS OF IMPROVEMENTS WERE NOT SURVEYED. ALL LINEWORK IS APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
2. ALL UTILITIES SHOWN ON PLANS ARE APPROXIMATE IN NATURE AND DO NOT RELIEVE THE CONTRACTOR FROM ANY RESPONSIBILITY TO COORDINATE WITH APPROPRIATE AUTHORITIES.

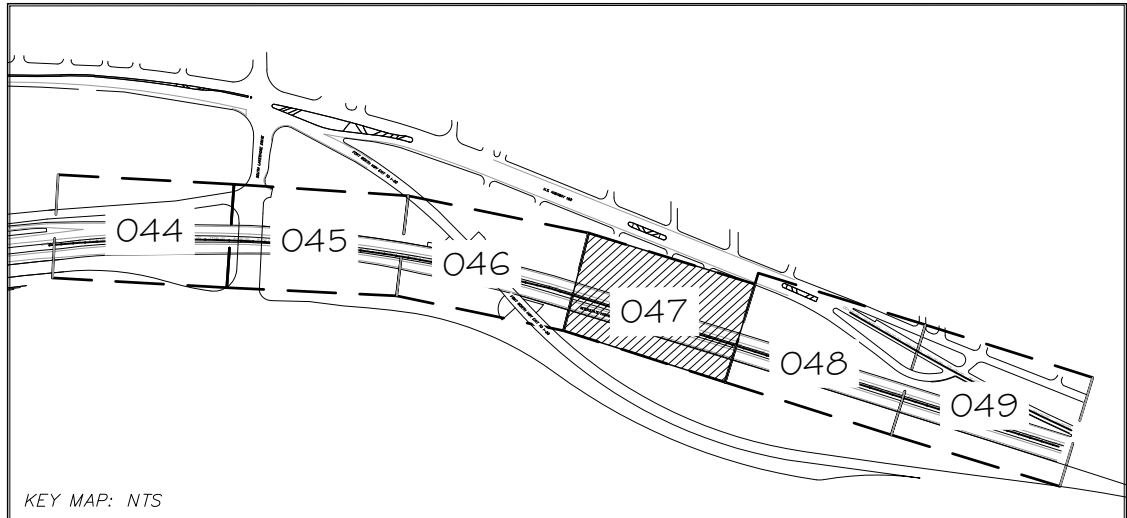


1 IH 20 STA 22+00 - STA 29+00

IRRIGATION SCHEDULE

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	HUNTER PROS-FR530-04-PCN FLOOD BUBBLER, 4IN. POP-UP.		HUNTER ICV-G 1IN., 1-1/2IN., 2IN., AND 3IN. PLASTIC ELECTRIC REMOTE CONTROL VALVES, GLOBE CONFIGURATION, WITH NPT THREADED INLET/OUTLET, FOR COMMERCIAL/MUNICIPAL USE.
	HUNTER ICZ-101-40 DRIP CONTROL ZONE KIT. 1 IN. ICV GLOBE VALVE WITH 1 IN. HY100 FILTER SYSTEM. PRESSURE REGULATION: 40PSI. FLOW RANGE: 2 GPM TO 20 GPM. 150 MESH STAINLESS STEEL SCREEN.		IRRIGATION LATERAL LINE: PVC CLASS 200 SDR 21 ONLY LATERAL TRANSITION PIPE SIZES 1" AND ABOVE ARE INDICATED ON THE PLAN, WITH ALL OTHERS BEING 3/4" IN SIZE.
	AREA TO RECEIVE DRIPLINE NETAFIM TLHCVXR-CS-033-12 TECHLINE HCVXR-CS PRESSURE COMPENSATING LANDSCAPE DRIPLINE WITH COPPER STRIPE, CHECK VALVE AND ANTI-SIPHON FEATURE. 0.33 GPH EMITTERS AT 12" O.C. DRIPLINE LATERALS SPACED AT 12" APART, WITH EMITTERS OFFSET FOR TRIANGULAR PATTERN. 1.7MM.		IRRIGATION MAINLINE: PVC CLASS 200 SDR 21
			PIPE SLEEVE: PVC CLASS 200 SDR 21 2 SIZES LARGER THAN PIPE WITHIN.
			Valve Callout: # Value Number # Value Flow # Value Size

ESTIMATE OF QUANTITIES - BY SHEET 4				
ITEM NO	DESC	DESCRIPTION	UNIT	TOTAL
193	6007	IRRIG SYS OPER AND MAINT	MO	12



KEY MAP: NTS



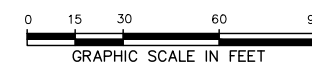
TX REG. ENGINEERING FIRM F-469
TX REG. SURVEYING FIRM LS-10008001

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IRRIGATION PLAN			
IH 20			
STA 22+00 - STA 29+00			
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE SHEET 1	SHEET NO. 047	
STATE TEXAS	DISTRICT FTW	COUNTY PARKER	
CONTROL 0314	SECTION 07	JOB 081	HIGHWAY NO. IH-20

DJM/TMEYER
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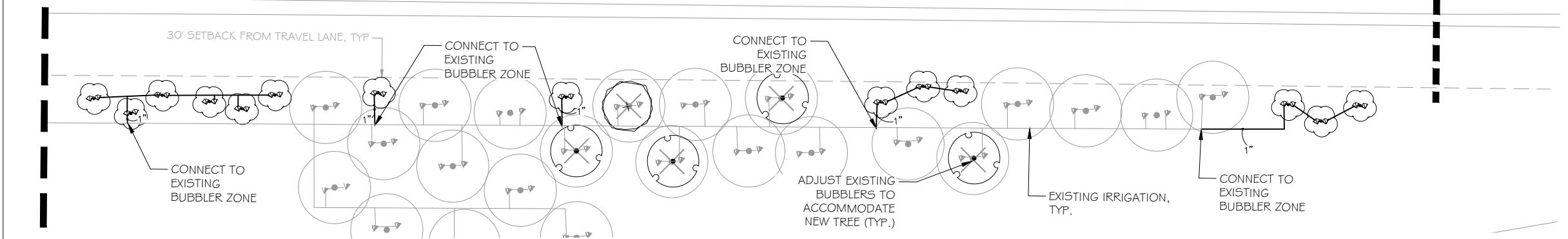
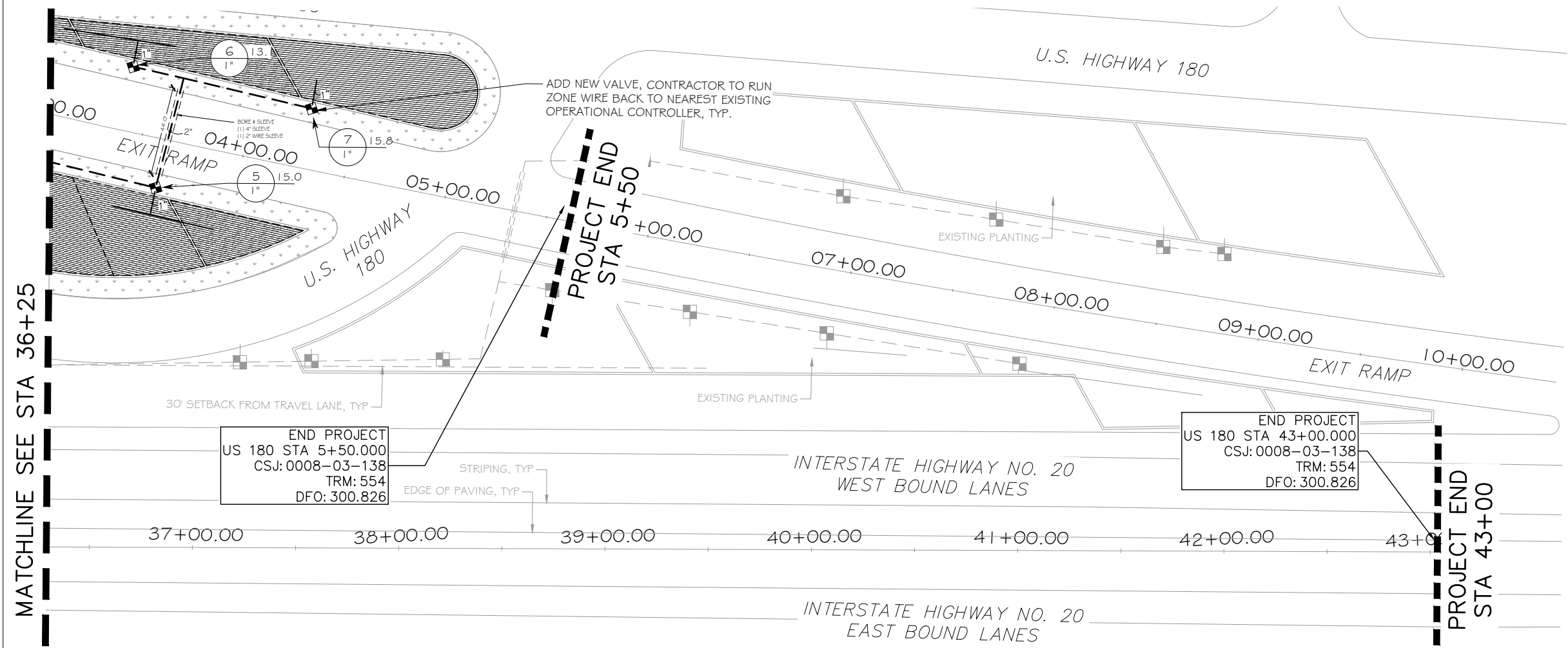
JUNE 2023 1 95% PLAN SUBMITTAL



GENERAL NOTES

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2. ALL UTILITIES SHOWN ON PLANS ARE APPROXIMATE IN NATURE AND DO NOT RELIEVE THE CONTRACTOR FROM ANY RESPONSIBILITY TO COORDINATE WITH APPROPRIATE AUTHORITIES.

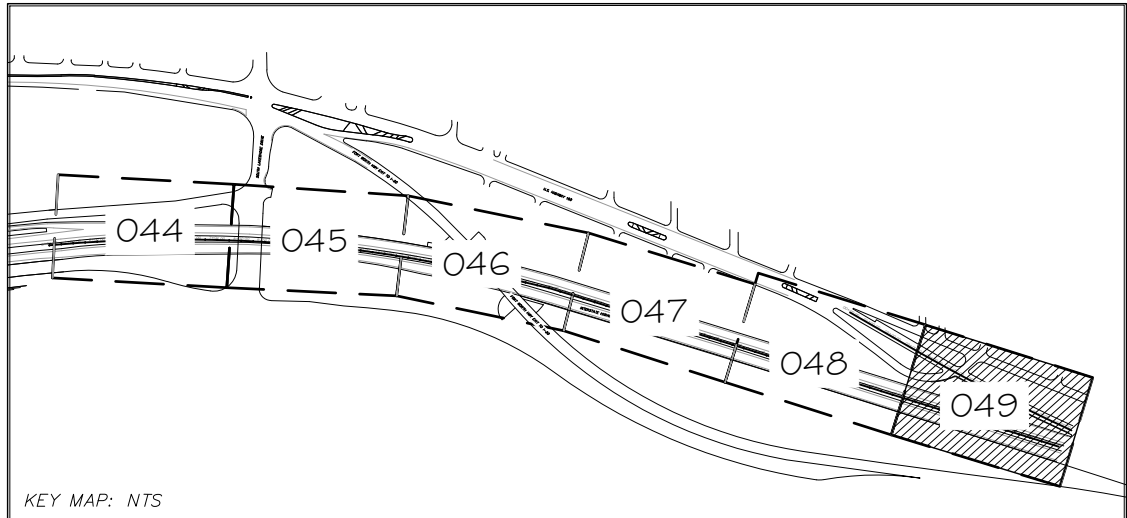
MATCHLINE SEE STA 36+25



1 IH 20 STA 36+25 - STA 43+00

IRRIGATION SCHEDULE

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	HUNTER PROS-PRS30-04-PCN FLOOD BUBBLER, 4IN. POP-UP.		HUNTER ICV-G 1IN., 1-1/2IN., 2IN., AND 3IN. PLASTIC ELECTRIC REMOTE CONTROL VALVES, GLOBE CONFIGURATION, WITH NPT THREADED INLET/OUTLET, FOR COMMERCIAL/MUNICIPAL USE.
	HUNTER ICZ-101-40 HY100 FILTER SYSTEM. PRESSURE REGULATION: 40PSI. FLOW RANGE: 2 GPM TO 20 GPM. 150 MESH STAINLESS STEEL SCREEN.		IRRIGATION LATERAL LINE: PVC CLASS 200 SDR 21 ONLY LATERAL TRANSITION PIPE SIZES 1" AND ABOVE ARE INDICATED ON THE PLAN, WITH ALL OTHERS BEING 3/4" IN SIZE.
	AREA TO RECEIVE DRIPLINE NETAFIM TLHCVXR-CS-033-12 TECHLINE HICVXR-CS PRESSURE COMPENSATING LANDSCAPE DRIPLINE WITH COPPER STRIPE, CHECK VALVE AND ANTI-SIPHON FEATURE. 0.33 GPH EMITTERS AT 12" O.C. DRIPLINE LATERALS SPACED AT 12" APART, WITH EMITTERS OFFSET FOR TRIANGULAR PATTERN. 17MM.		IRRIGATION MAINLINE: PVC CLASS 200 SDR 21
			PIPE SLEEVE: PVC CLASS 200 SDR 21 2 SIZES LARGER THAN PIPE WITHIN.
		Valve Callout: Valve Number Valve Flow Valve Size	



ESTIMATE OF QUANTITIES - BY SHEET 6				
ITEM NO	DESC	DESCRIPTION	UNIT	TOTAL
193	6007	IRRIG SYS OPER AND MAINT	MO	12
618	6034	CONDT (PVC) (SCH 40) (4") (BORE)	LF	43

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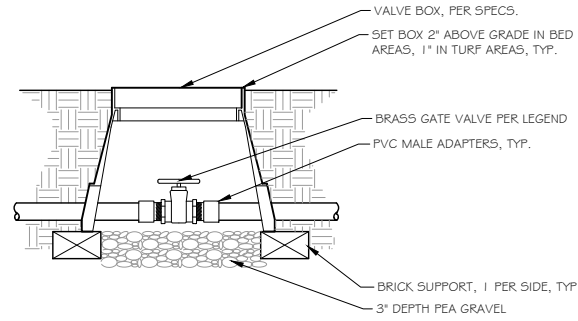


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 TX REG. SURVEYING FIRM LS-10008001

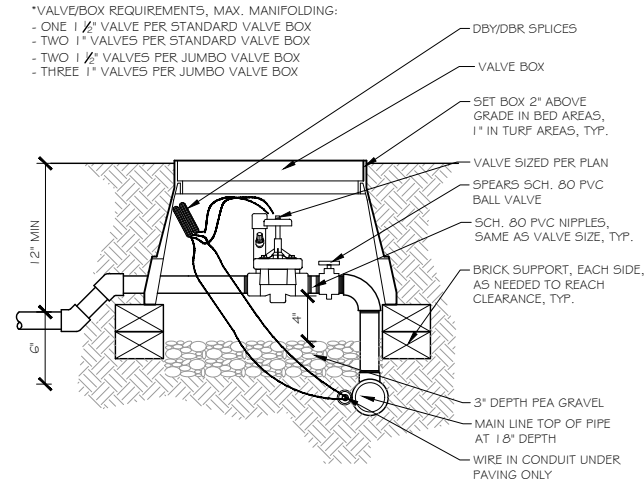
IRRIGATION PLAN			
IH 20			
STA 36+25 - STA 43+00			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	SEE SHEET 1	049	
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL SECTION	JOB	HIGHWAY NO	
0314	07	081 IH-20	

DJM/TMEYER 06/22/2023 9:27PM
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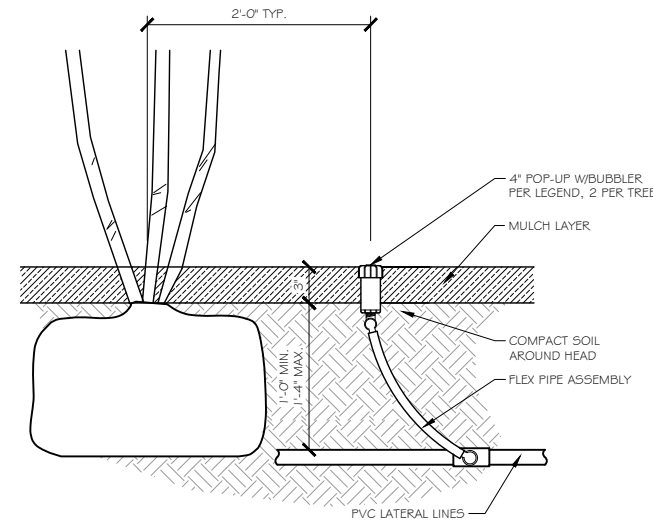
JUNE 2023 1 95% PLAN SUBMITTAL



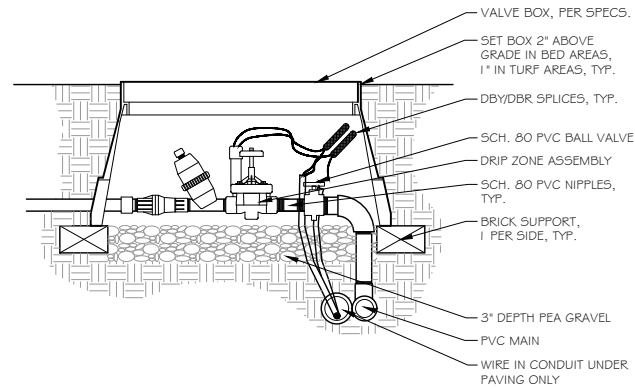
1 BRASS ISOLATION VALVE
1 1/2" = 1'-0"



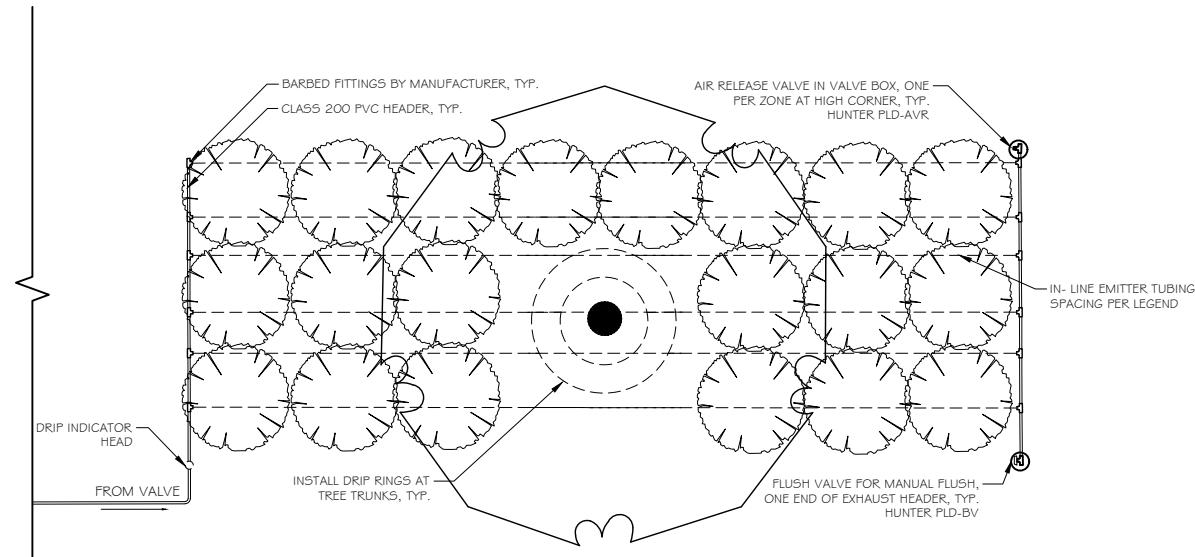
2 AUTOMATIC SYSTEM VALVE
1 1/2" = 1'-0"



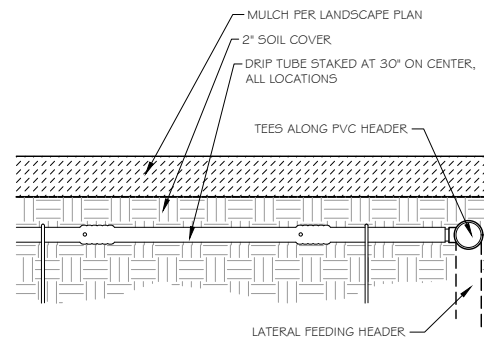
3 BUBBLER HEAD
1 1/2" = 1'-0"



4 DRIP ZONE VALVE ASSEMBLY-AT GRADE
1 1/2" = 1'-0"



5 DRIP ZONE TYPICAL ENLARGEMENT
3/8" = 1'-0"



6 DRIP TUBE INSTALLATION - AT GRADE
3" = 1'-0"

IRRIGATION MODIFICATION NOTES

THE CONTRACTOR SHALL VISIT THE SITE & DOCUMENT THE EXISTING IRRIGATION SYSTEM TO A LEVEL SUFFICIENT TO DETERMINE:

1. THAT THE BACKFLOW PREVENTION DEVICE ON THE EXISTING SYSTEM IS FUNCTIONAL. IF NOT, HE SHALL PROVIDE A NEW ONE.
2. THAT THE EXISTING CONTROLLER CAN ACCOMMODATE NEW ZONES OR EXISTING ZONES MODIFIED WITHIN TCEQ DESIGN CRITERIA TO ACCOMMODATE EXISTING ZONES. PROVIDE NEW CONTROLLER IS NECESSARY.
3. IF EXISTING RAIN/FREEZE SENSOR IS PRESENT & FUNCTIONAL. IF NOT, PROVIDE ONE COMPATIBLE WITH CONTROLLER.
4. WHAT MANUFACTURER IS CURRENTLY IN USE & PROVIDE SAME BRAND OF EQUIPMENT TO MODIFIED ZONES.

CONTRACTOR SHALL:

1. FOLLOW ALL TCEQ IRRIGATION REQUIREMENTS & STANDARDS.
2. PROVIDE LAMINATED 8 1/2" X 1 1/4" AS-BUILT OF THE FINISHED/MODIFIED SYSTEM.
3. DEMONSTRATE TO AN OWNER'S REPRESENTATIVE THAT THE IRRIGATION SYSTEM IS FULLY FUNCTIONAL AND RUNNING PROPERLY PRIOR TO FINAL ACCEPTANCE AND BEGINNING OF THE WARRANTY PERIOD
4. PROVIDE THAT ALL TRENCHING WITHIN DRIP LINE OF EXISTING TREES SHALL BE DONE WITH HAND TOOLS AND SHALL NOT CUT ANY ROOT OVER 3" DIAMETER.
5. EXAMINE THE PLANS IN THEIR ENTIRETY TO DETERMINE THE APPROXIMATE LOCATION OF EXISTING AND PROPOSED UTILITIES. HE SHALL ALSO CONTACT THE APPROPRIATE AUTHORITY TO MARK UTILITIES ON THE SITE. THE IRRIGATION CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO UTILITIES ON THE SITE CAUSED BY HIS WORK.

DWITMEYER
 06/22/2023 - 9:28PM
 M:\DWG-53\6356-23\021 DWG\LANDSCAPE FX 2018\ SHEETS\IRRIGATION DETAILS.DWG



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Pacheco Koch 4060 BRYANT IRVIN ROAD
 a Westwood company FORT WORTH, TX 76109
 817.412.7155

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IRRIGATION DETAILS

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	SEE SHEET 1	050	
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY NO.
0314	07	081	IH-20

JUNE 2023 - 95% PLAN SUBMITTAL