

FINAL PLANS

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

STATE OF TEXAS
 DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
 STATE HIGHWAY IMPROVEMENT

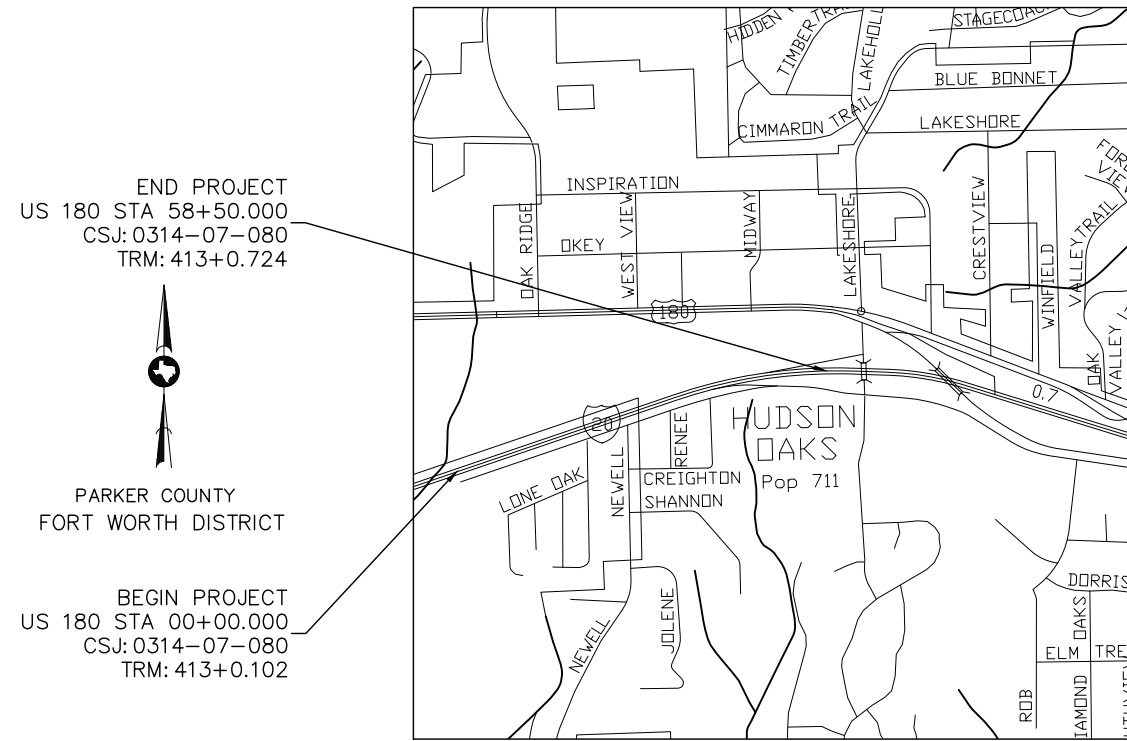
FEDERAL AID PROJECT NO.: F2022 848

IH-20
 PARKER COUNTY

LIMITS: FROM: EXIT 411 TO EXIT 413
 LENGTH OF PROJECT = 5,850FT = 1.11 MI
 FOR THE CONSTRUCTION OF WORK
 CONSISTING OF PLANTING AND IRRIGATION IMPROVEMENTS;
 LANDSCAPE & SCENIC ENHANCEMENT WORK ON IH-20
 PLANT REPLACEMENT ON US 180

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
GRAPHICS	6	F2022 848		IH-20
CHECK	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	FTW	PARKER	
CHECK	CONTROL	SECTION	JOB	001
	0314	07	080	

DESIGN SPEED = 70 MPH



END PROJECT
 US 180 STA 58+50.000
 CSJ: 0314-07-080
 TRM: 413+0.724

PARKER COUNTY
 FORT WORTH DISTRICT

BEGIN PROJECT
 US 180 STA 00+00.000
 CSJ: 0314-07-080
 TRM: 413+0.102

EXCEPTIONS: NONE
 EQUATIONS: NONE
 RAILROADS: NONE



SUBMITTED FOR LETTING: 05/03/2022
 Submitted by: *Abraham J. Wilmer*, R.L.A.
 CONSULTANT DESIGN ENGINEER OR PROJECT MANAGER

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, MAY 1, 2012)



WORK WAS COMPLETED ACCORDING TO THE PLANS AND CONTRACT.

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



CONCURRENCE FOR LETTING: 05/03/2022
 RECOMMENDED FOR LETTING: 5/10/2022
 Submitted by: *[Signature]*
 CITY OF HUDSON OAKS
 DIRECTOR OF TP&D

SUBMITTED FOR LETTING: 5/5/2022
 APPROVED FOR LETTING: 5/27/2022
 Submitted by: *[Signature]*, P.E.
 AREA ENGINEER
 Approved by: *[Signature]*, P.E.
 DISTRICT ENGINEER

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SHEET NO. DESCRIPTION

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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 05/05/2022
 MARK C. SCHLUTER, P.E. DATE

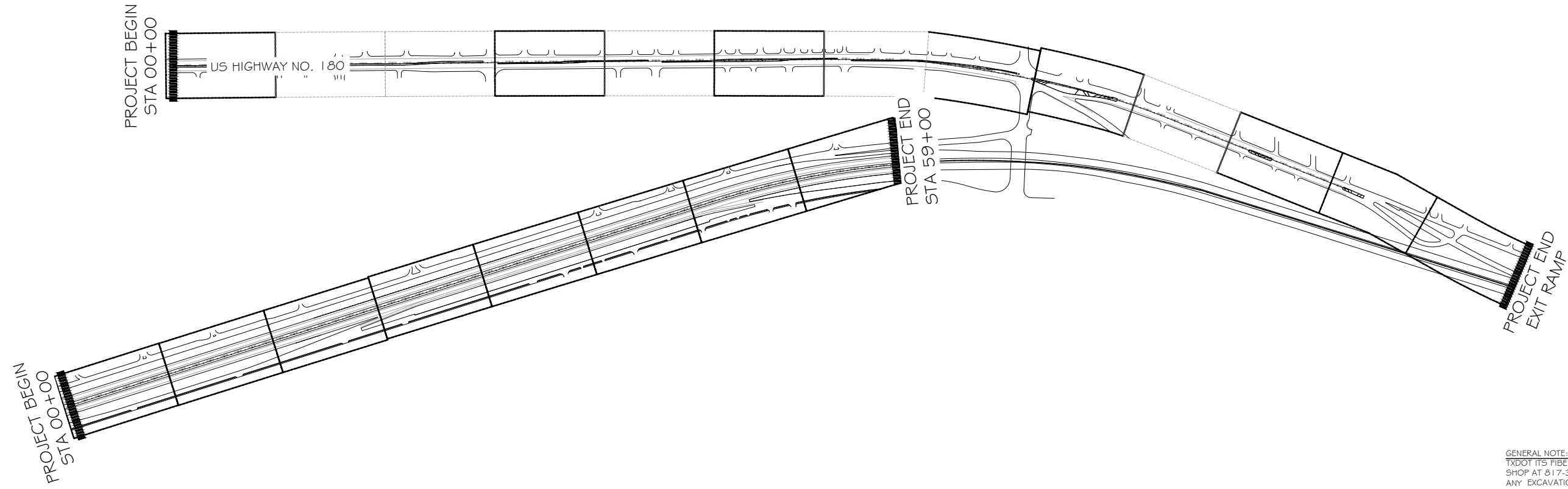
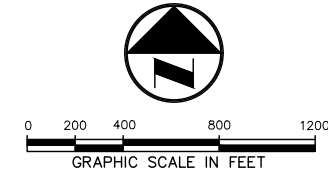
Pacheco Koch 4060 BRYANT IRVIN ROAD
 FORT WORTH, TX 76109 817.412.7155
 TX REG. ENGINEERING FIRM F-14439
 TX REG. SURVEYING FIRM LS-10193824

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INDEX OF SHEETS

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	F 2022(848)	002
STATE	DISTRICT	COUNTY
TEXAS	FTW	PARKER
CONTROL	SECTION	JOB
0314	07	080
		HIGHWAY NO
		IH-20 & US 180





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.

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GENERAL LAYOUT OVERVIEW

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	F 2022(848)		003
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY NO.
0314	07	080	IH-20 & US 180



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APRIL 2022 - 100% PLAN SUBMITTAL

Project Number: F 2022(848)

County: PARKER

Control: 0314-07-080

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: Klinton.Kuntz@txdot.gov
- Assistant Area Engineer's Email: Gary.Beek@txdot.gov
- Assistant Area Engineer's Email: Chadwick.Dabbs@txdot.gov

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

All contractor questions will be reviewed by the Engineer. Once a response is developed, it will be posted to TxDOT's Public FTP at the following Address: [https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting%20 Responses/](https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting%20Responses/)

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

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

Project Number: F 2022(848)

County: PARKER

Control: 0314-07-080

Highway: IH 20

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.

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

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.

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 2. Instructions to Bidders

Proposals with a bid of more than 85 working days for the substantial completion of the project will be considered non-responsive.

Item 4 – Scope of Work

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

Project Number: F 2022(848)

County: PARKER

Control: 0314-07-080

Highway: IH 20

Item 5. Control of the Work

When supplementary 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.

Standard Operating Procedure for Alternate Precast Proposal Submission" found online at https://www.txdot.gov/inside-txdot/forms-publications/consultants-contractors_publications/bridge.html#design. Acceptance or denial of an alternate is at the sole discretion of the Engineer. Impacts to the project schedule and any additional costs resulting from the use of alternates are the sole responsibility of the Contractor.

Item 7. Legal Relations and Responsibilities

The total area disturbed for this project is .40 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.

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.

No extension of time or compensation payment will be granted for a delay or suspension of work caused by nesting swallows. This work is subsidiary to the various bid items.

The following Holiday/Event lane closure restriction requirements apply to this project:

Project Number: F 2022(848)

County: PARKER

Control: 0314-07-080

Highway: IH 20

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.

Item 8. Prosecution and Progress

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

Prepare the progress schedule as a bar chart, include all planned work activities and sequences, and show Contract completion within the number of working days specified. Submit an updated hardcopy when changes to the schedule occur or when requested.

Item 100. Preparing Right of Way

Work under this item to include, weed removal and continued maintenance in all existing medians work area and the following:

Removal of all dead shrubs within the locations shown on the plans to receive new shrub plantings.

Item 170. Irrigation System

Project Number: F 2022(848)

County: PARKER

Control: 0314-07-080

Highway: IH 20

Contact Ricky King @ 817-565-4169 for installation of the water meters for the project. The Contractor is to pay for the installation & fees. Irrigation system under this pay item is defined as the total system from the outlet of the water meter.

The contractor is to pay for the installation of the water meters & associated fees. Required electrical connections by a licensed electrician is subsidiary to this item.

Payment for the adjustment of irrigation in existing shrub areas shall be paid for under Item number 170 6005 IRRIGATION SYSTEM (TY IV).

Item 192. Landscape Planting

No planting shall occur between June 1st and September 15th without written approval from the Landscape Architect. Per special provision 192.001 plant material requiring replacement will be at the cost of the contractor.

The placement of compost per item 161 Compost shall be subsidiary to this item and includes:

Placing approximately 2" of compost manufactured topsoil (CMT) in areas indicated, then till into a minimum of 6" existing soil to create a 8" minimum profile.

All plant material to be full and matching per species.

Temporary irrigation for plantings until irrigation system is complete is 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.

General Notes

Project Number: F 2022(848)

County: PARKER

Control: 0314-07-080

Highway: IH 20

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".

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.

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.

(1) 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.

General Notes

Sheet 4B

Project Number: F 2022(848)

County: PARKER

Control: 0314-07-080

Highway: IH 20

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



CONTROLLING PROJECT ID 0314-07-080

DISTRICT Fort Worth
HIGHWAY IH 20

COUNTY Parker

Estimate & Quantity Sheet

CONTROL SECTION JOB				0314-07-080		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00184760			
COUNTY				Parker			
HIGHWAY				IH 20			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	100-6001	PREPARING ROW	AC	0.400		0.400	
	170-6002	IRRIGATION SYSTEM (TY I)	LS	1.000		1.000	
	170-6003	IRRIGATION SYSTEM (TY II)	LS	1.000		1.000	
	170-6004	IRRIGATION SYSTEM (TY III)	LS	1.000		1.000	
	170-6005	IRRIGATION SYSTEM (TY IV)	LS	1.000		1.000	
	192-6002	PLANT MATERIAL (1-GAL)	EA	1,132.000		1,132.000	
	192-6013	MULCH	SY	1,804.000		1,804.000	
	192-6025	PLANT MATERIAL (45 GAL) (TREE)	EA	242.000		242.000	
	193-6001	PLANT MAINTENANCE	MO	12.000		12.000	
	193-6014	IRRIG SYS OPER AND MAINT (SCH A)	MO	12.000		12.000	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	4.000		4.000	
	506-6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	120.000		120.000	
	506-6024	CONSTRUCTION EXITS (REMOVE)	SY	120.000		120.000	
	506-6040	BIODEG EROSN CONT LOGS (IN STL) (8")	LF	290.000		290.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	290.000		290.000	
	618-6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	120.000		120.000	
	618-6034	CONDT (PVC) (SCH 40) (4") (BORE)	LF	120.000		120.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	99.000		99.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	

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	0.4	1	4	99

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 (REMOVE1)
	LF	LF	SY	SY
EROSION CONTROL PLAN (1 OF 4)	50	50	80	80
EROSION CONTROL PLAN (2 OF 4)			40	40
EROSION CONTROL PLAN (3 OF 4)	55	55		
EROSION CONTROL PLAN (4 OF 4)	185	185		
TOTAL	290	290	120	120

SUMMARY OF ITEMS					
LOCATION	192-6002	192-6013	192-6025	192-6025	193-6001
	LANDSCAPE PLANTING (1 GAL)	LANDSCAPE PLANTING (MULCH) (BARK)	PLANT MATERIAL (45 GAL) (TREE)(ORNAMENTAL)	PLANT MATERIAL (45 GAL) (TREE)	PLANT MAINTENANCE
	EA	SY	EA	EA	MO
PLANTING (1 OF 16)			16	22	
PLANTING (2 OF 16)			19	32	
PLANTING (3 OF 16)			7	14	
PLANTING (4 OF 16)			10	22	
PLANTING (5 OF 16)			16	28	
PLANTING (6 OF 16)			11	27	
PLANTING (7 OF 16)			2	2	
PLANTING (8 OF 16)			5	9	
PLANTING (9 OF 16)	131	218			
PLANTING (10 OF 16)	27	39			
PLANTING (11 OF 16)	144	231			
PLANTING (12 OF 16)	39	52			
PLANTING (13 OF 16)	170	263			
PLANTING (14 OF 16)	60	100			
PLANTING (15 OF 16)	55	75			
PLANTING (16 OF 16)	506	826			
TOTAL	1,132	1,804	86	156	12

SUMMARY OF ITEMS							
LOCATION	170-6002	170-6003	170-6004	170-6005	193-6007	618-6024	618-6034
	IRRIGATION SYSTEM (TY I)	IRRIGATION SYSTEM (TY II)	IRRIGATION SYSTEM (TY III)	IRRIGATION SYSTEM (TY IV)	IRRIG SYS OPER AND MAINT	CONDT (PVC) (SCH 40) (2") (BORE)	CONDT (PVC) (SCH 40) (4") (BORE)
	LS	LS	LS	LS	MO	LF	LF
IRRIGATION (1 OF 9)							
IRRIGATION (2 OF 9)							
IRRIGATION (3 OF 9)						32	32
IRRIGATION (4 OF 9)							
IRRIGATION (5 OF 9)							
IRRIGATION (6 OF 9)	1	1				88	88
IRRIGATION (7 OF 9)							
IRRIGATION (8 OF 9)			1				
IRRIGATION (9 OF 9)							
TOTAL	1	1	1	1	12	120	120

Pacheco Koch 4060 BRYANT IRVIN ROAD
 FORT WORTH, TX 76109 817.412.7155
 TX REG. ENGINEERING FIRM F-14439
 TX REG. SURVEYING FIRM LS-10193824



QUANTITY SUMMARY

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	F 2022(848)	006	
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY NO
0314	07	080	IH-20 & US 180



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APRIL 2022 - 100% PLAN SUBMITTAL

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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).

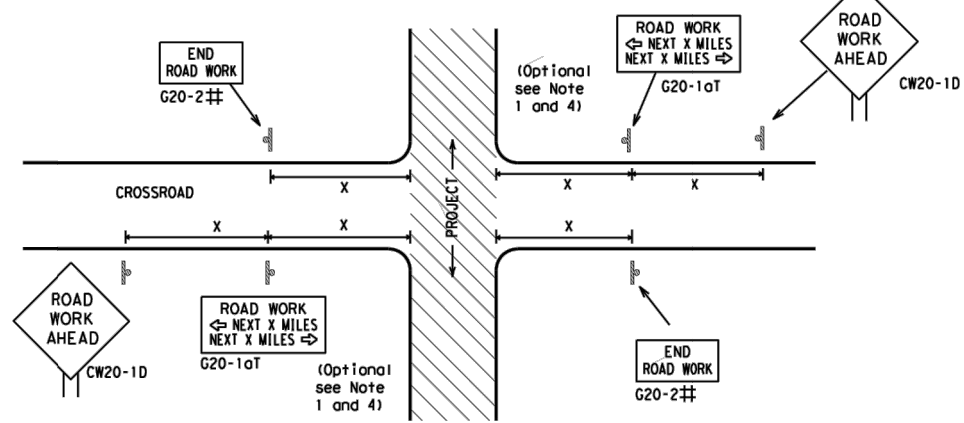
THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT http://www.txdot.gov
COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
MATERIAL PRODUCER LIST (MPL)
ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS)"
STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)
TEXAS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

SHEET 1 OF 12

		<i>Traffic Safety Division Standard</i>	
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS			
BC(1)-21			
FILE: bc-21.dgn	DW: TxDOT	CK: TxDOT	DW: TxDOT
© TxDOT November 2002	CONT SECT	JOB	HIGHWAY
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9-07 8-14	DIST	COUNTY	SHEET NO.
5-10 5-21	F:TW	PARKER	007

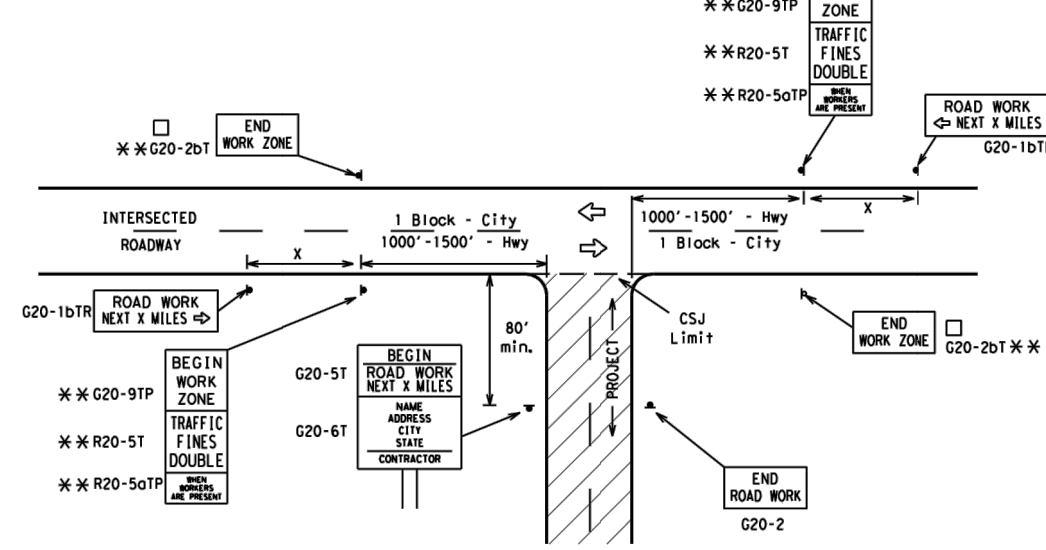
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TYPICAL LOCATION OF CROSSROAD SIGNS



- ## 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

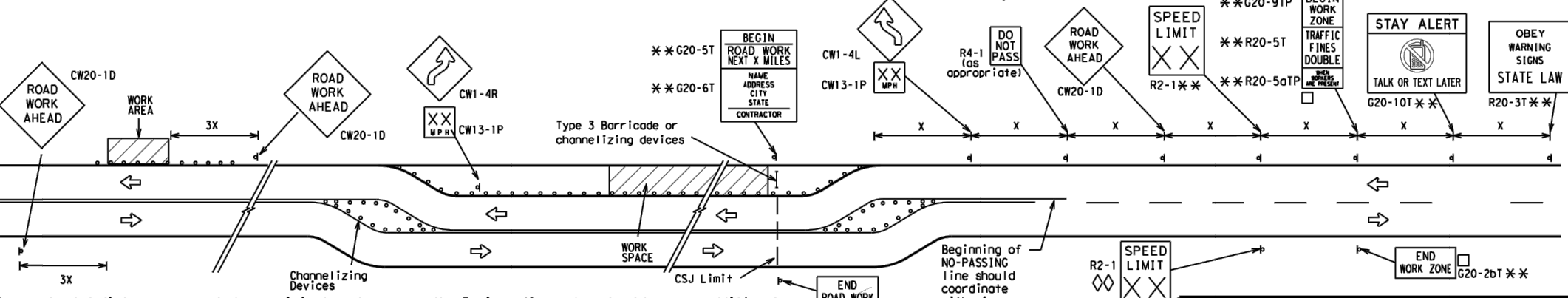
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

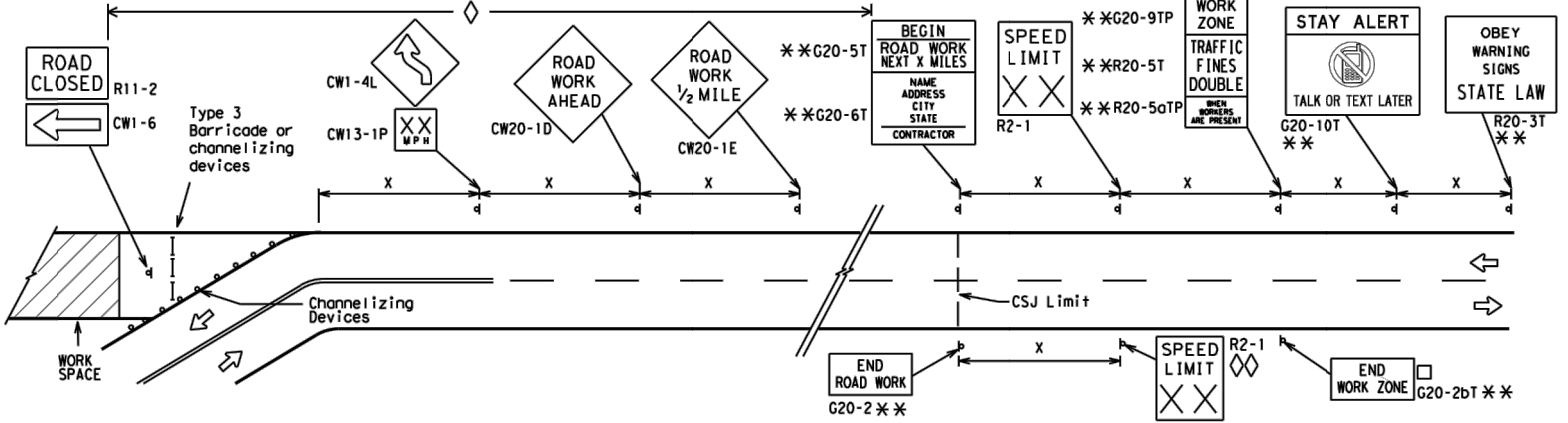
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be 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#	1	DATE	November 2002	REV#	2	DATE	080	REV#	3
REV#	3	DATE	8-14	REV#	4	DATE	5-21	REV#	5
REV#	4	DATE	7-13	REV#	5	DATE	5-21	REV#	6
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DIST#	9-07	COUNTY#	8-14	SHEET NO.	008				

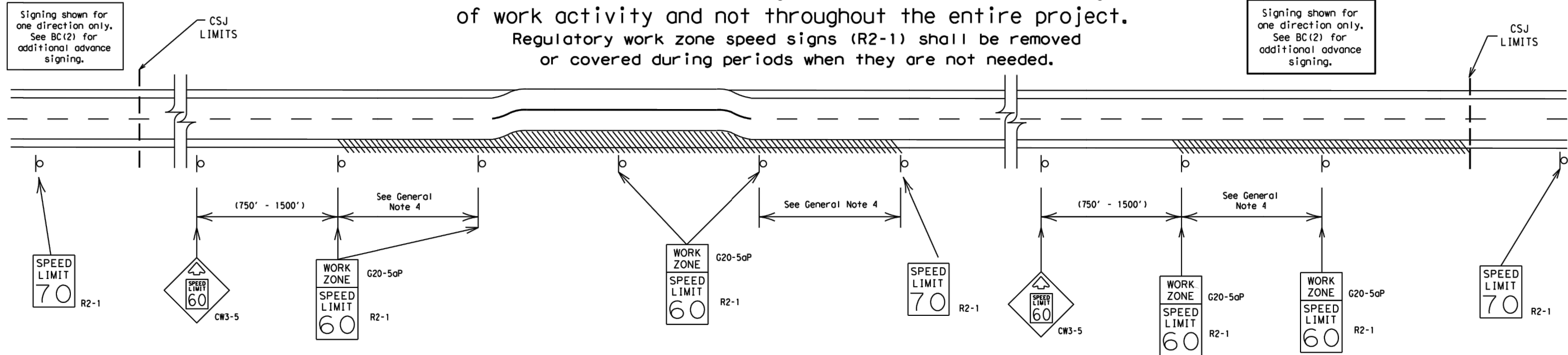
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TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

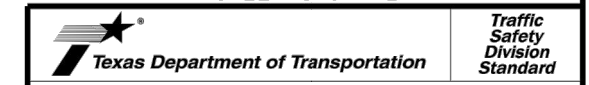
This type of work zone speed limit may be included on the design of the traffic control plans when workers or equipment are not behind concrete barrier, when work activity is within 10 feet of the traveled way or actually in the traveled way.

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:



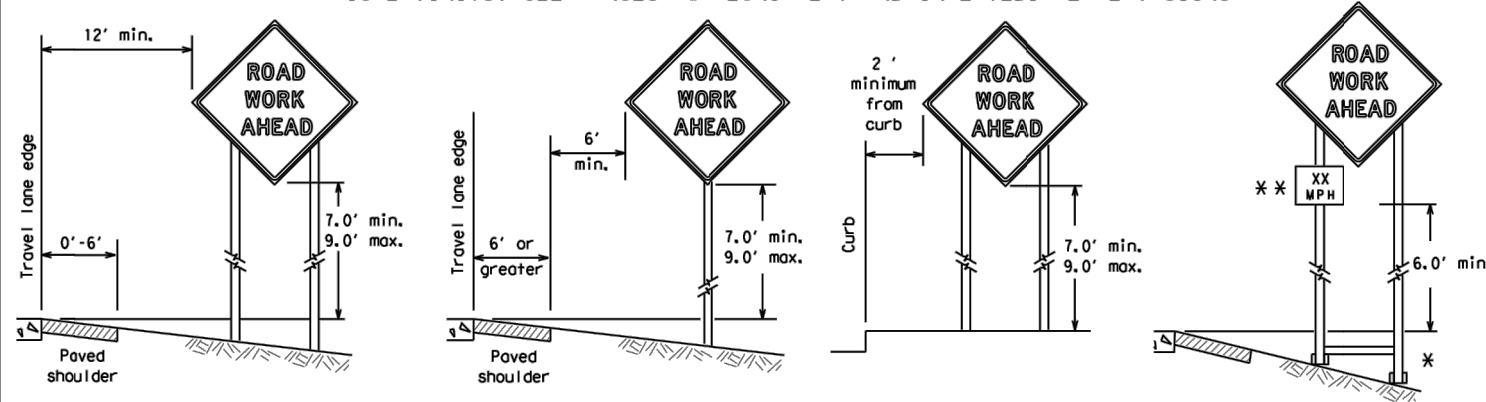
BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

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	080	IH-20
9-07	8-14	DIST	COUNTY	SHEET NO.	
7-13	5-21	FTW	PARKER	009	

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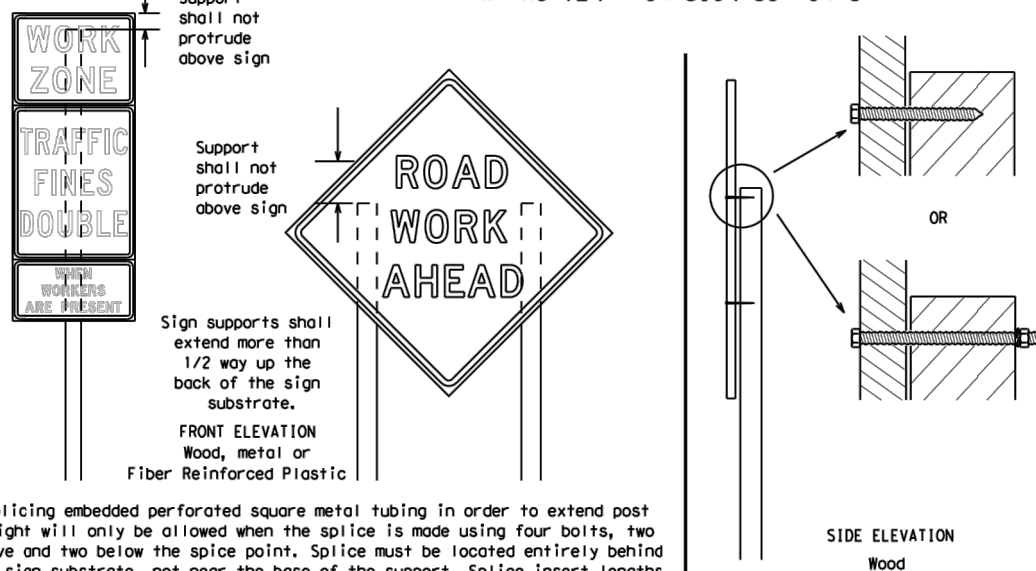
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



* 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



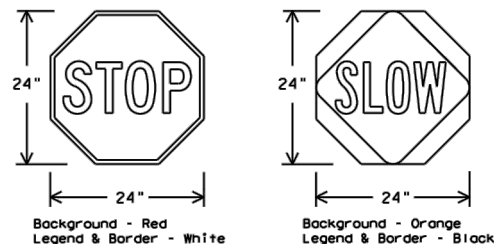
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

1. Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign support weights.
4. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs.
5. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall NOT be used.
6. Rubber ballasts designed for channelizing devices should not be used for ballast on portable sign supports. Sign supports designed and manufactured with rubber bases may be used when shown on the CWZTCD list.
7. Sandbags shall only be placed along or laid over the base supports of the traffic control device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners. Sandbags shall be placed along the length of the skids to weigh down the sign support.
8. Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

FLAGS ON SIGNS

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



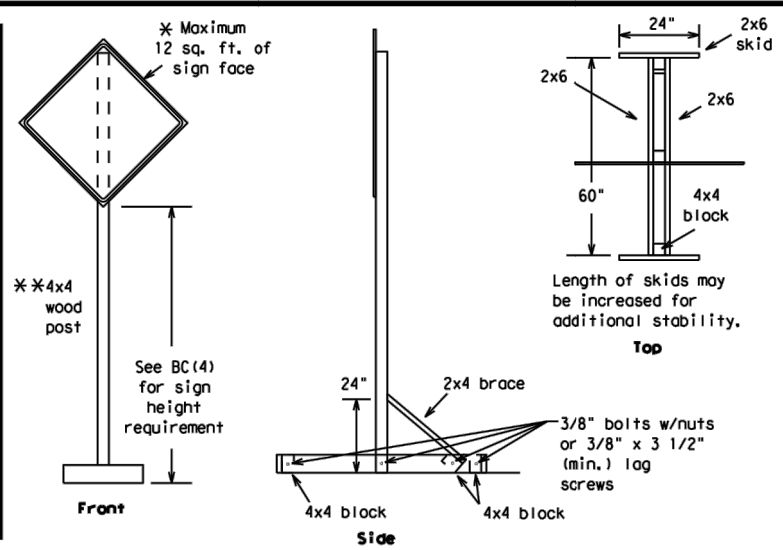
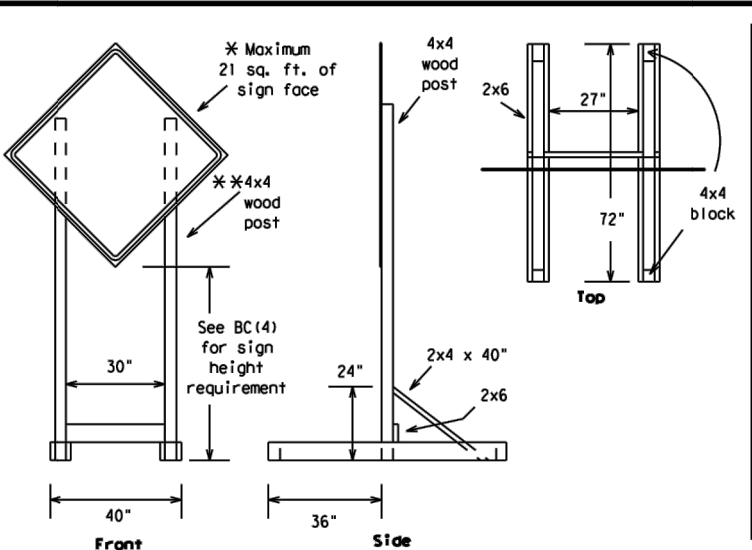
BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC (4) - 21

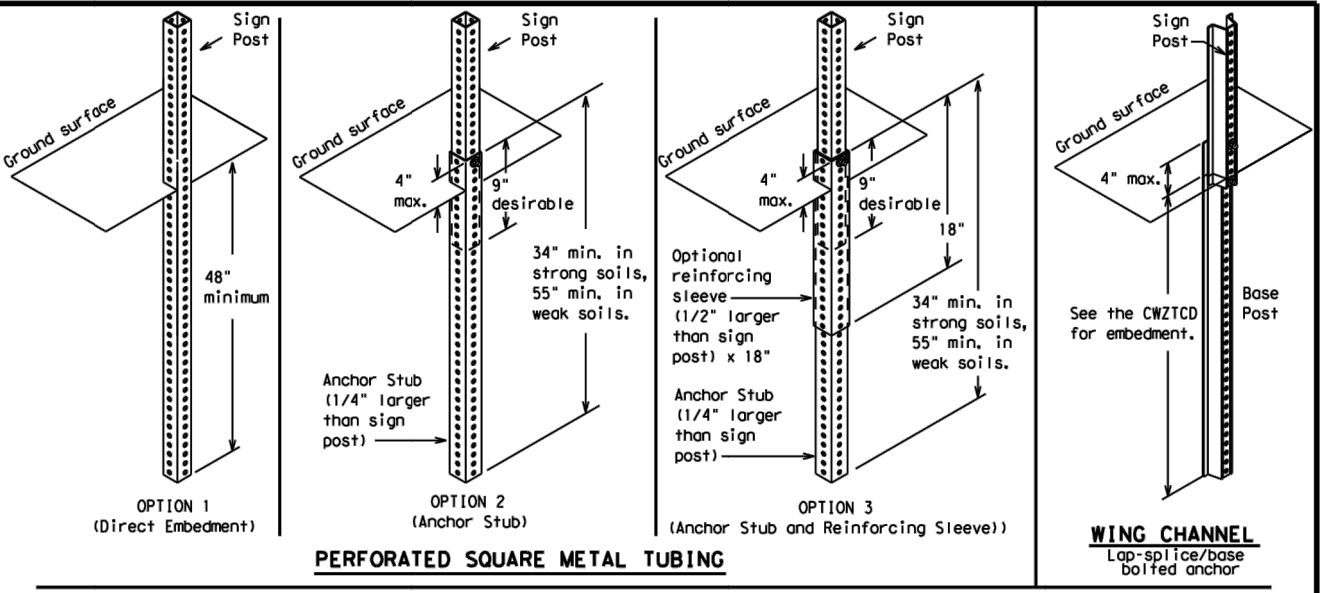
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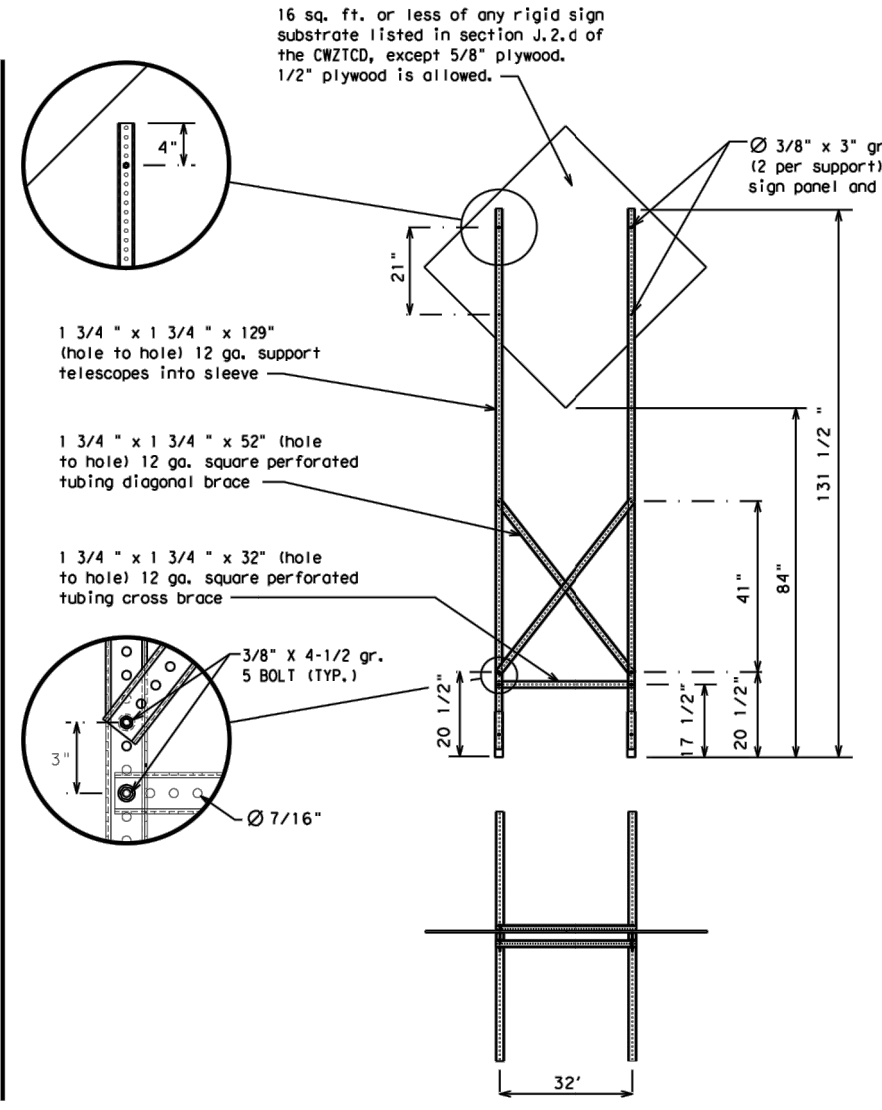
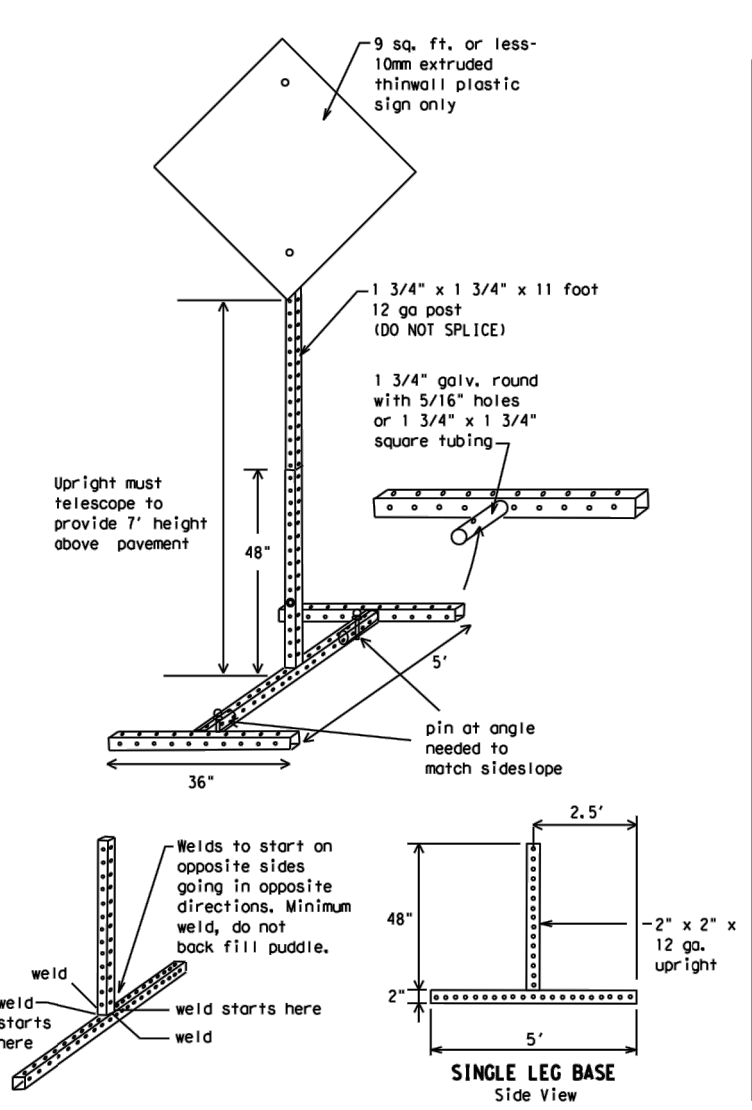
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SKID MOUNTED WOOD SIGN SUPPORTS
 * LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS



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**
- Nails may be used in the assembly of wooden sign supports, but 3/8" bolts with nuts or 3/8" x 3 1/2" lag screws must be used on every joint for final connection.
 - No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
 - When project is completed, all sign supports and foundations shall be removed from the project site. This will be considered subsidiary to Item 502.
- * See BC(4) for definition of "Work Duration."
 - ** Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.
 - See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

SHEET 5 OF 12

 Texas Department of Transportation
 Traffic Safety Division Standard

**BARRICADE AND CONSTRUCTION
 TYPICAL SIGN SUPPORT**

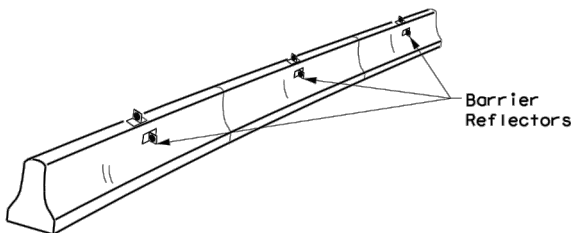
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© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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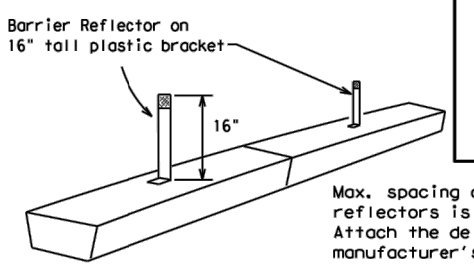
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- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 512.



CONCRETE TRAFFIC BARRIER (CTB)

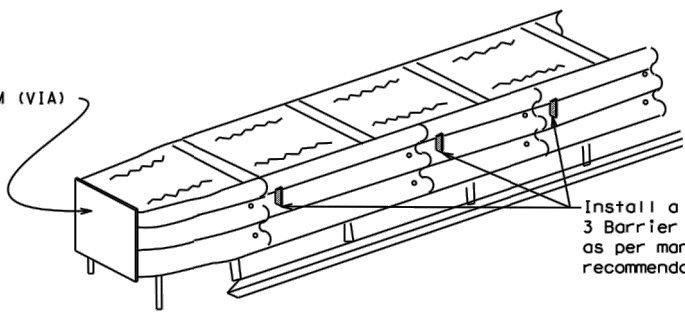


LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES
 LPCB is approved for use in work zone locations, where the posted speed is 45mph, or less. See Roadway Standard Sheet LPCB.

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

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.



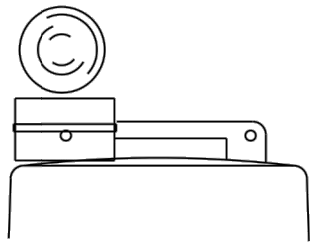
DELINEATION OF END TREATMENTS

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

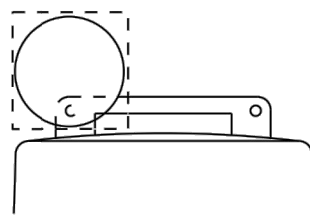
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet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



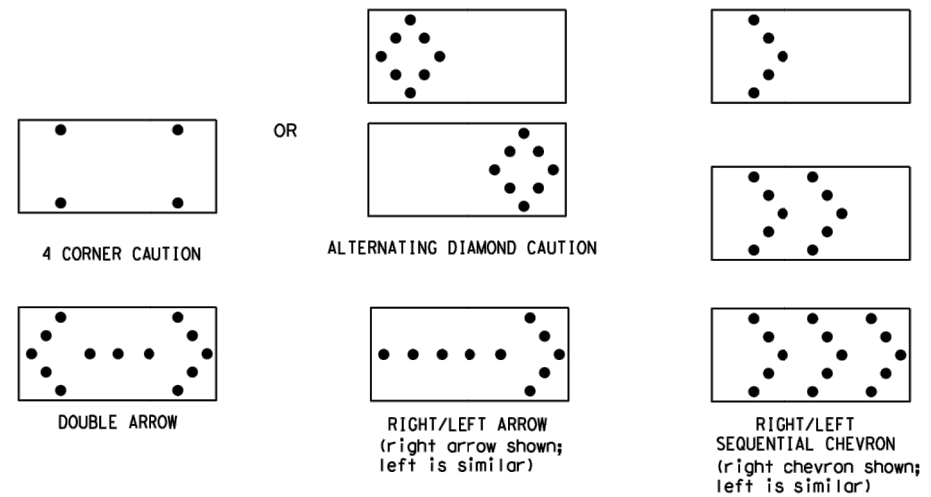
Warning reflector may be round or square. Must have a yellow reflective surface area of at least 30 square inches

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.

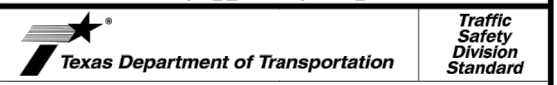
WHEN NOT IN USE, REMOVE THE ARROW BOARD FROM THE RIGHT-OF-WAY OR PLACE THE ARROW BOARD BEHIND CONCRETE TRAFFIC BARRIER OR GUARDRAIL.

FLASHING ARROW BOARDS

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

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



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

BC (7) - 21

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© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS		0314	07	080	IH-20				
9-07	8-14	DIST	COUNTY	SHEET NO.					
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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:

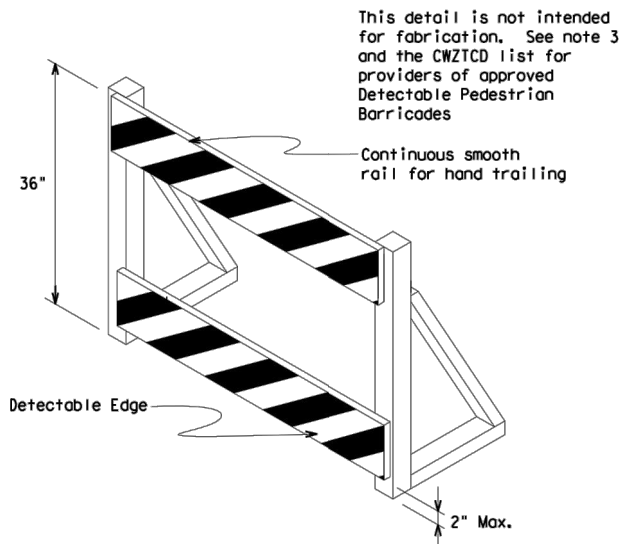
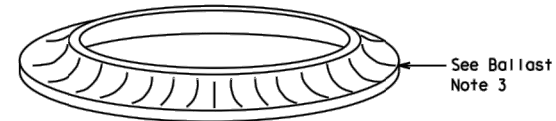
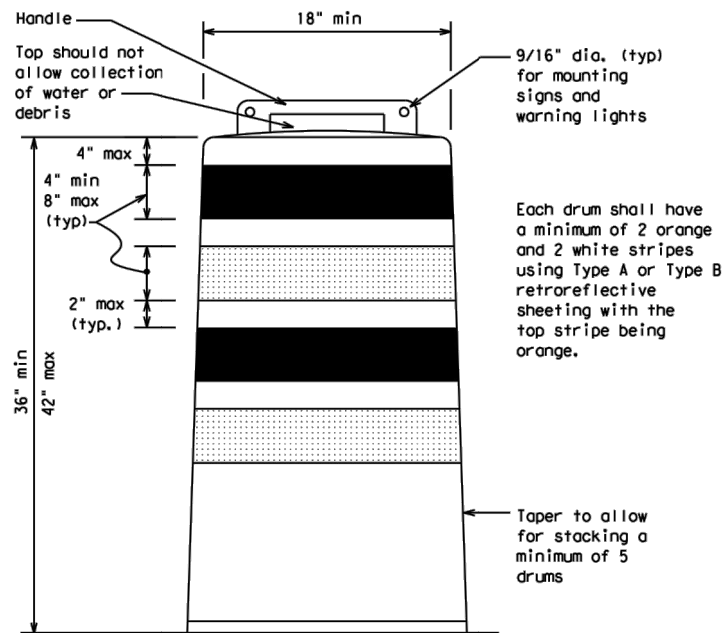
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
- The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

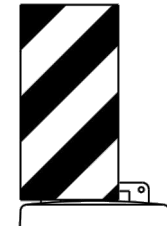


DETECTABLE PEDESTRIAN BARRICADES

- 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

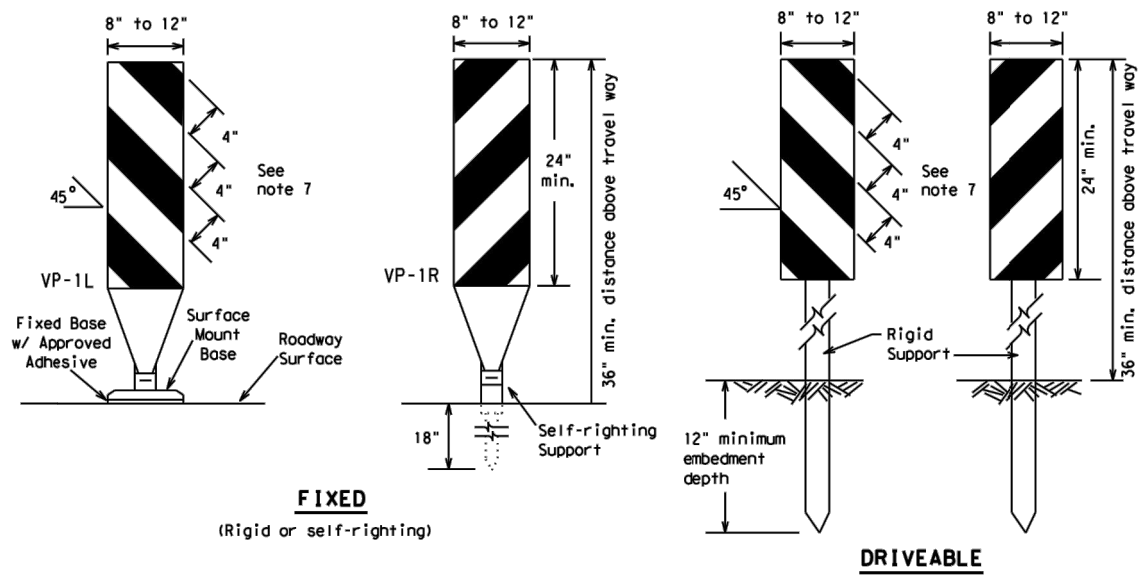
SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

- 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

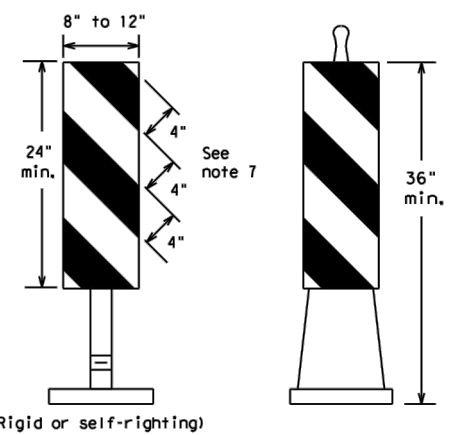
		Traffic Safety Division Standard	
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES			
BC (8) - 21			
FILE#	bc-21.dgn	DATE	TxDOT
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REVISONS	0314	07	080
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7-13			
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		SHEET NO.	013

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FIXED
(Rigid or self-righting)

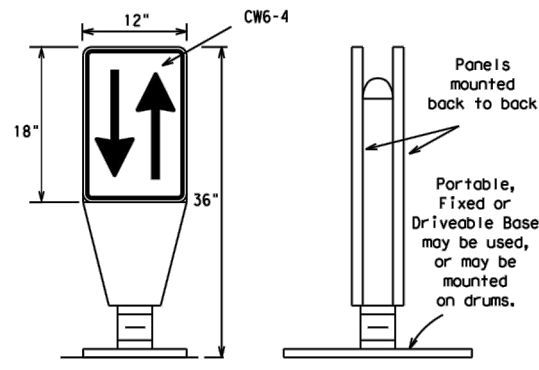
DRIVEABLE



PORTABLE

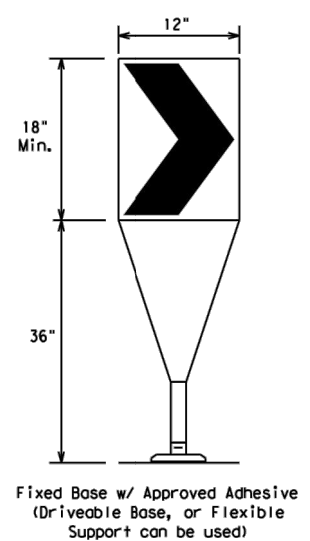
VERTICAL PANELS (VPs)

- 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.



OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

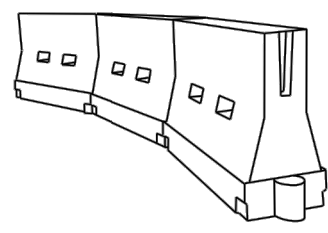
- Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base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



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

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

CHEVRONS



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

GENERAL NOTES

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (9) - 21

FILE#	bc-21.dgn	DN#	TxDOT	CK#	TxDOT	DW#	TxDOT	CK#	TxDOT
©	TxDOT	November	2002	COM#	SECT#	JOB#	HIGHWAY#		
REVISIONS				0314	07	080	IH-20		
9-07	8-14			DIST	COUNTY		SHEET NO.		
7-13	5-21			FTW	PARKER		014		

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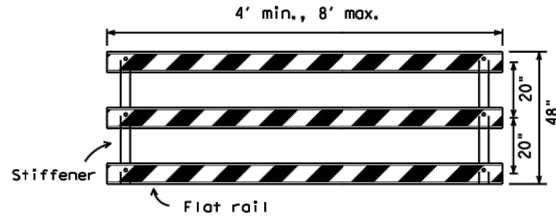
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



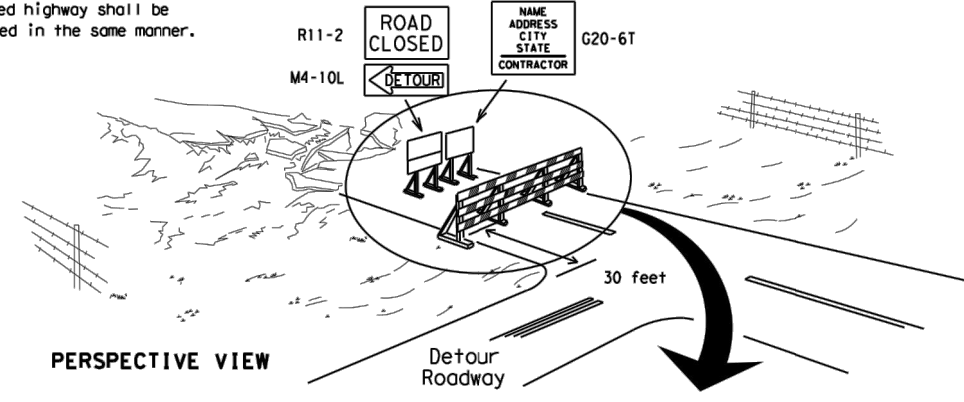
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

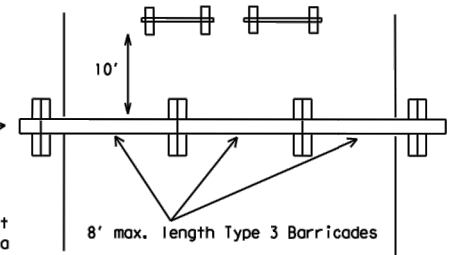
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

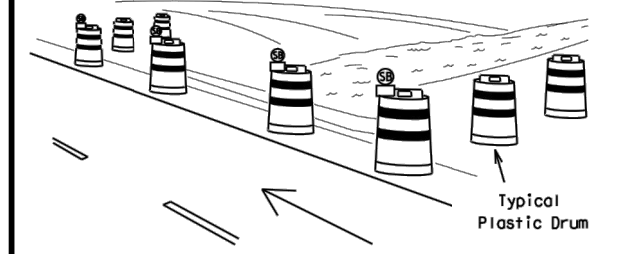
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.



PLAN VIEW

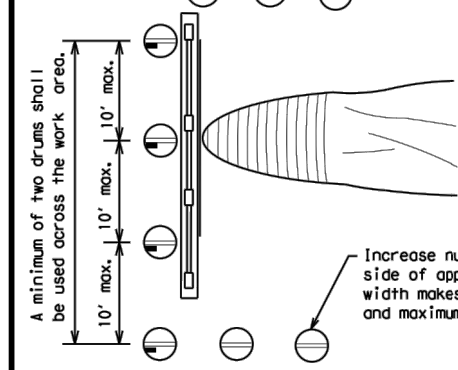
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

These drums are not required on one-way roadway

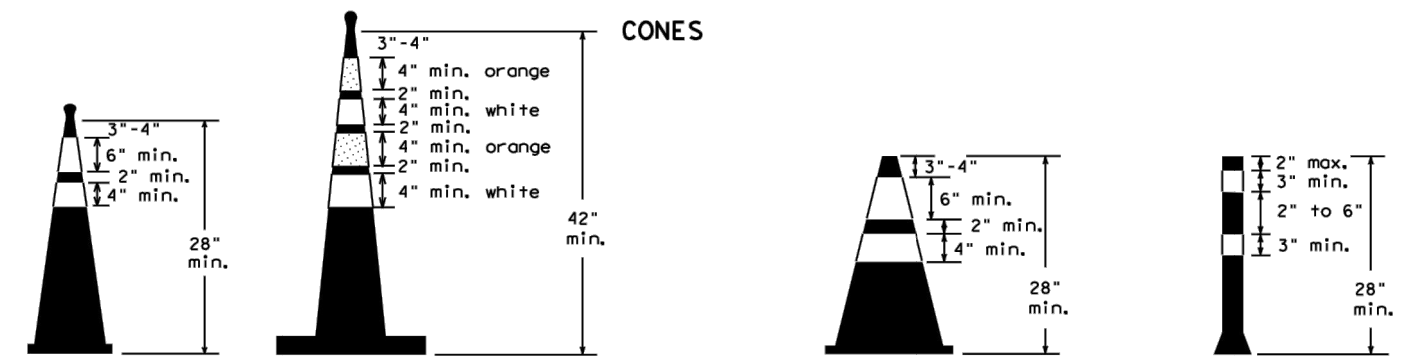


PLAN VIEW

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

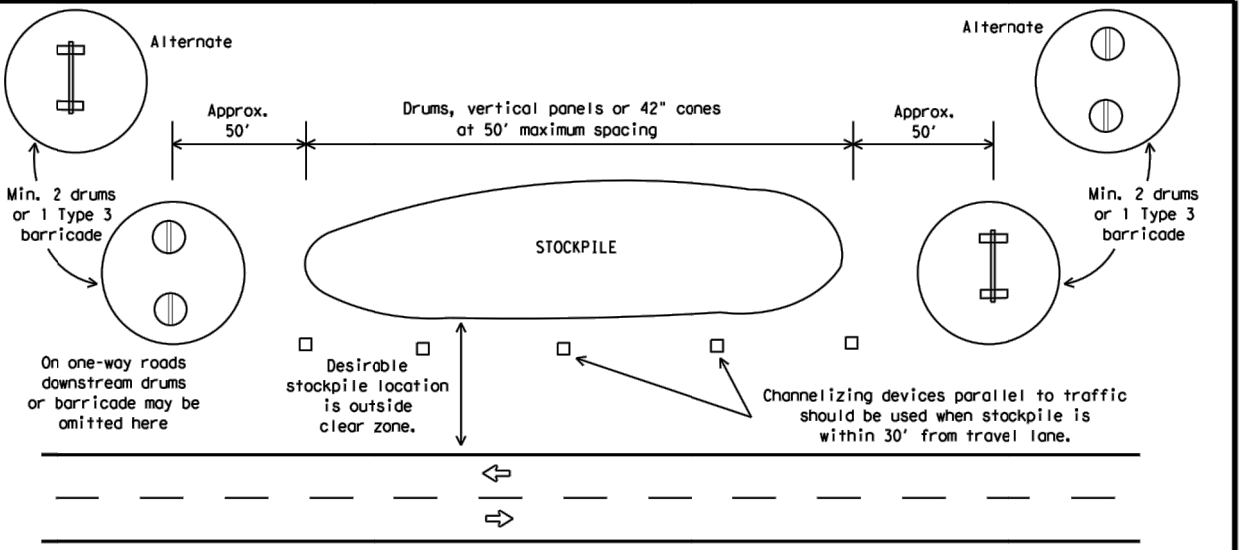


Two-Piece cones

One-Piece cones

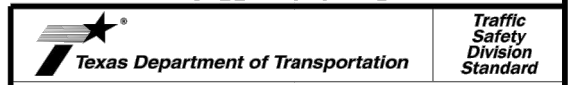
Tubular Marker

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				
REVISIONS		0314	07	080	IH-20				
9-07	8-14	DIST	COUNTY	SHEET NO.					
7-13	5-21	FTW	PARKER	015					

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DATE:
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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.

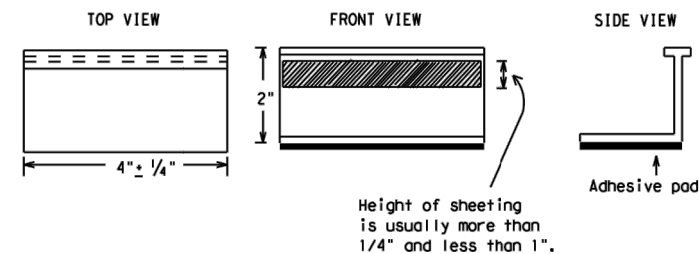
MAINTAINING WORK ZONE PAVEMENT MARKINGS

- 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

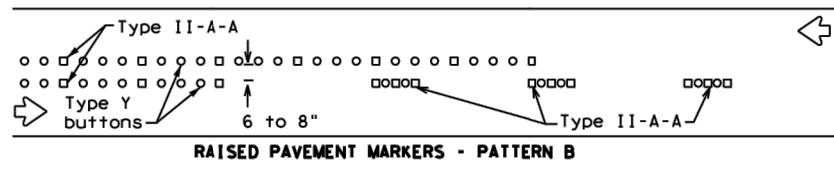
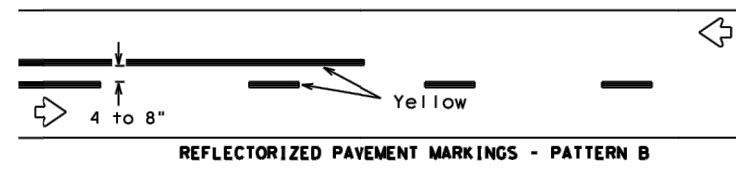
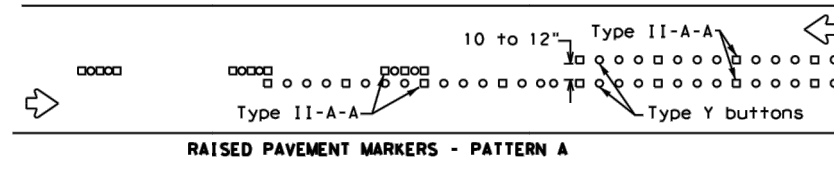
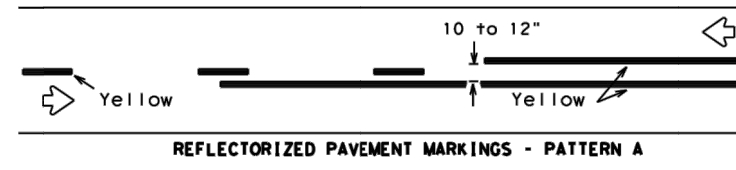
A list of prequalified reflective raised pavement markers, non-reflective traffic buttons, roadway marker tabs and other pavement markings can be found at the Material Producer List web address shown on BC(1).

SHEET 11 OF 12

 Texas Department of Transportation	<i>Traffic Safety Division Standard</i>
<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 JOB: 080 HIGHWAY: IH-20 REVISIONS: 2-98 9-07 5-21 DIST: 1-02 7-13 COUNTY: FTW SHEET NO.: 016

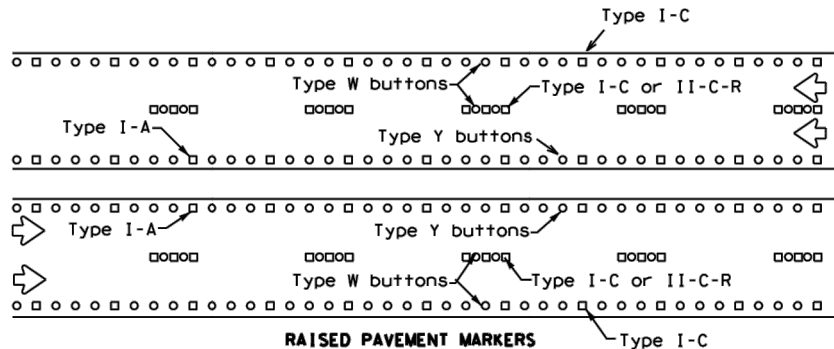
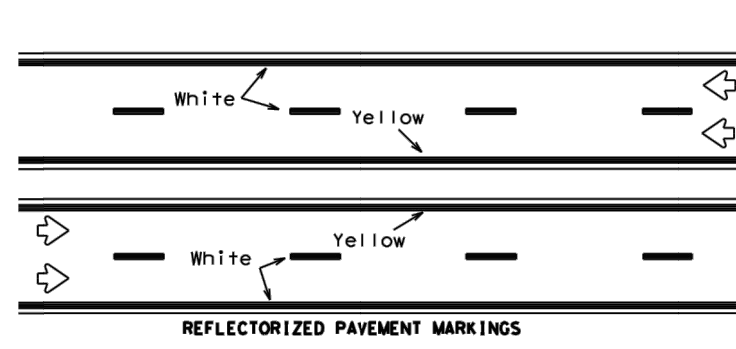
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PAVEMENT MARKING PATTERNS



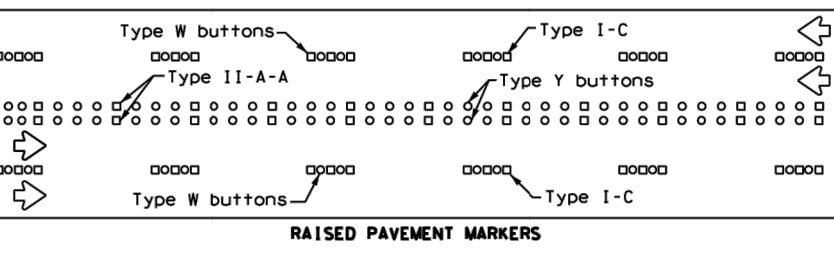
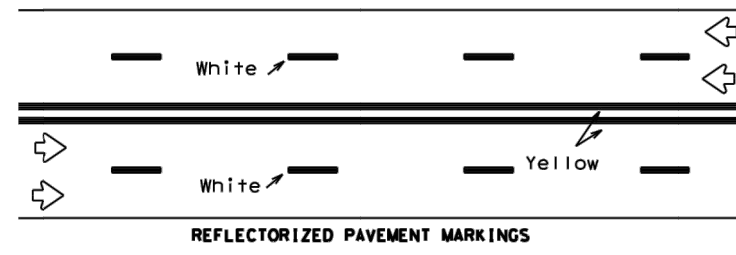
Pattern A is the TxDOT Standard, however Pattern B may be used if approved by the Engineer. Prefabricated markings may be substituted for reflectorized pavement markings.

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



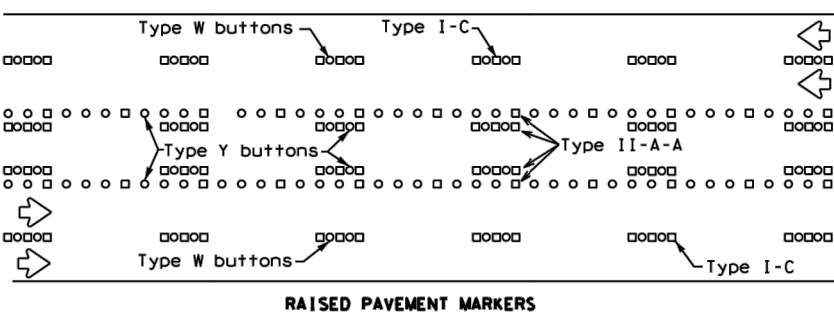
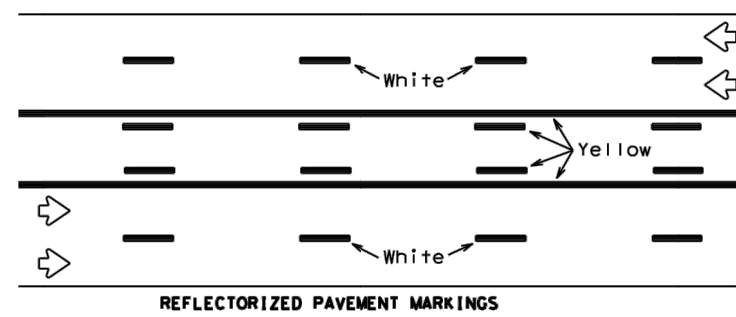
Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



Prefabricated markings may be substituted for reflectorized pavement markings.

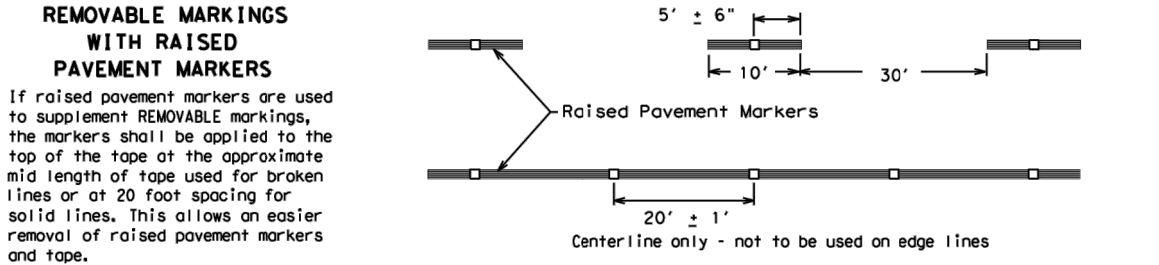
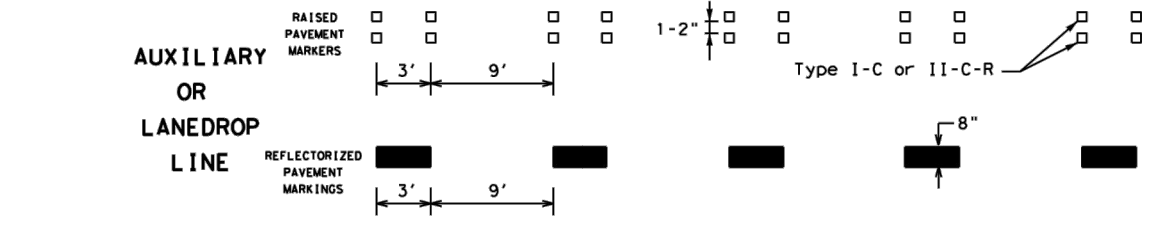
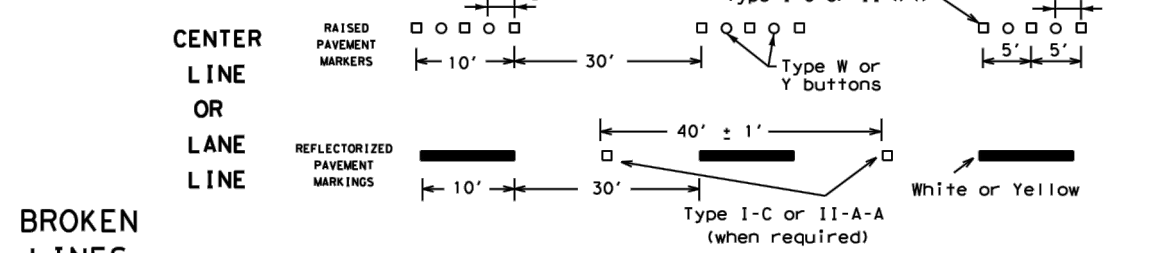
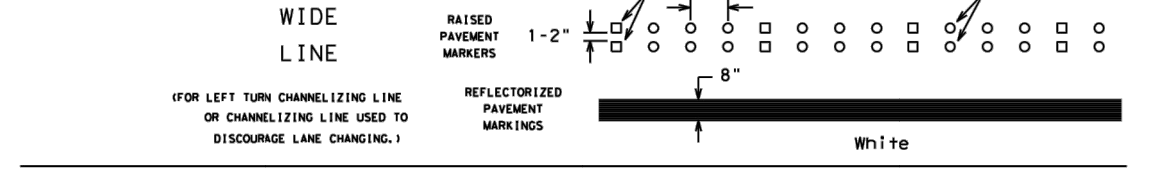
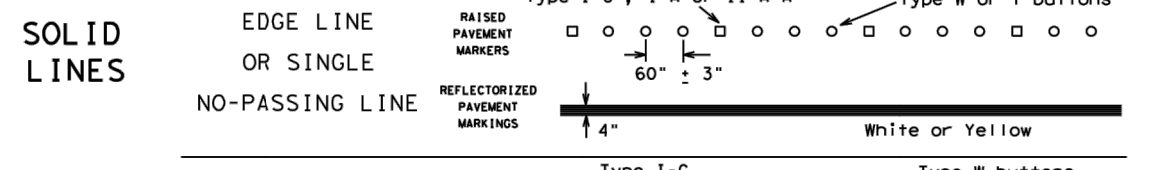
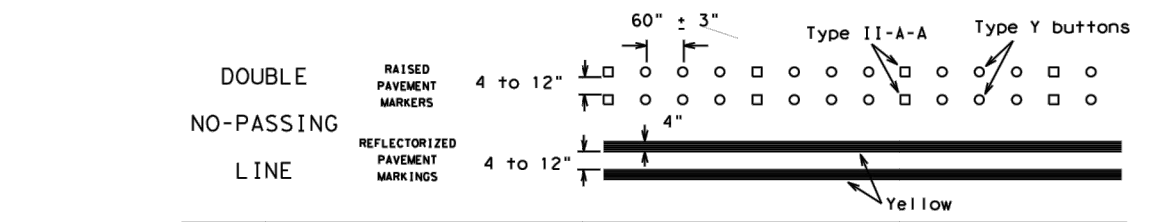
LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



SHEET 12 OF 12

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC (12) - 21

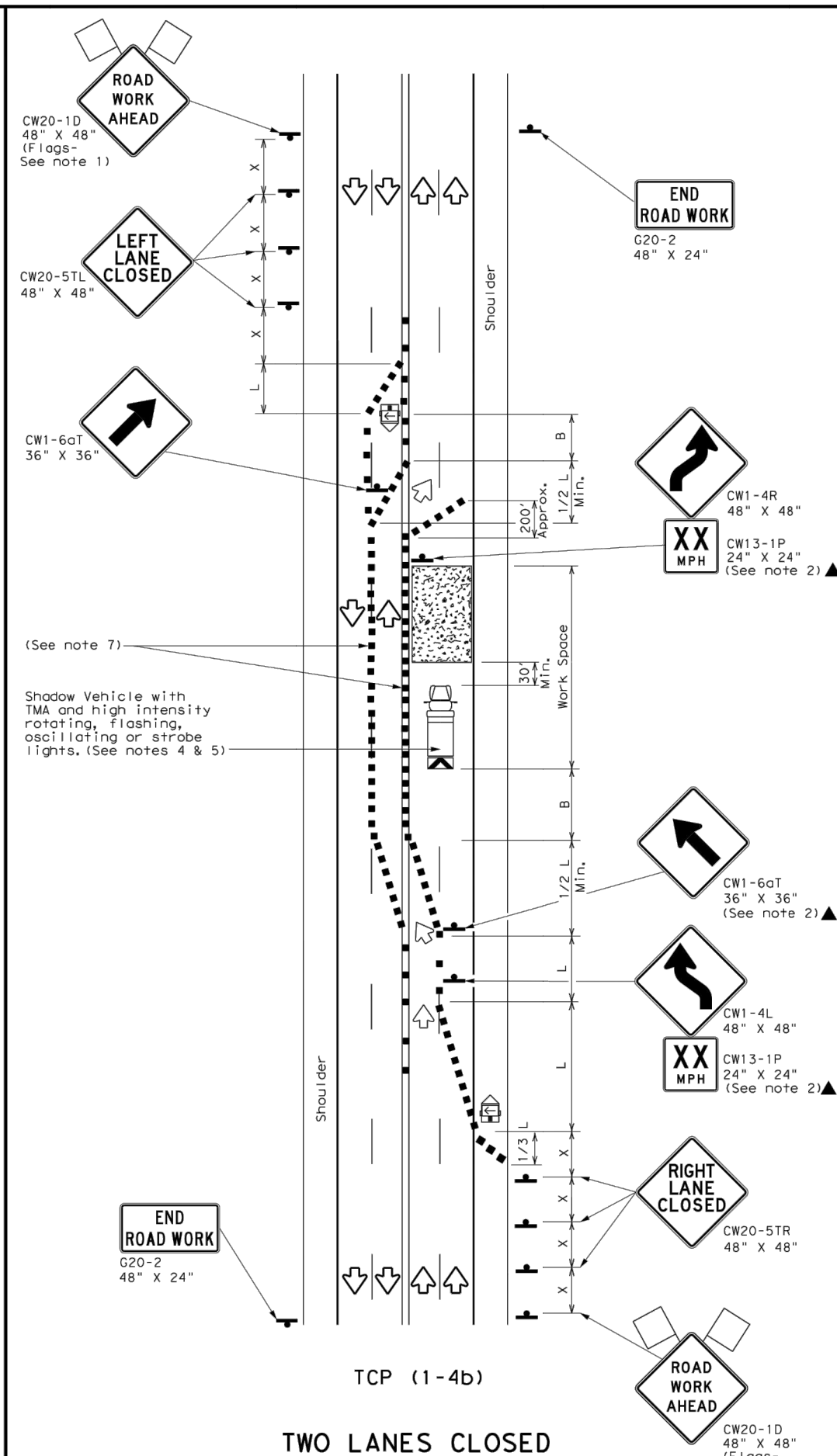
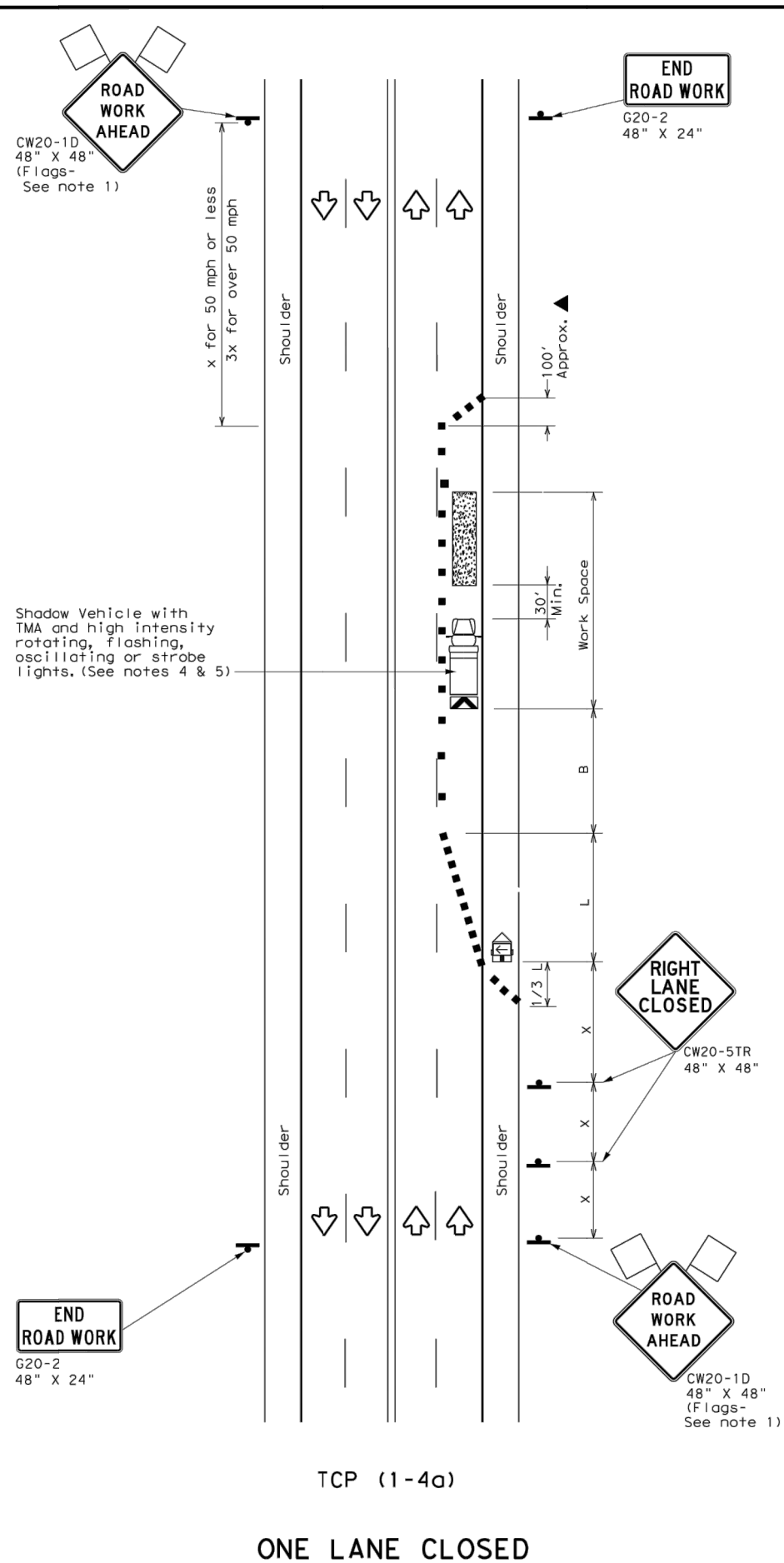
Raised pavement markers used as standard pavement markings shall be from the approved products list and meet the requirements of Item 672 "RAISED PAVEMENT MARKERS."

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0314	07	080	IH-20
1-97 9-07 5-21	DIST	COUNTY	SHEET NO.	
2-98 7-13	FTW	PARKER	017	
11-02 8-14				

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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

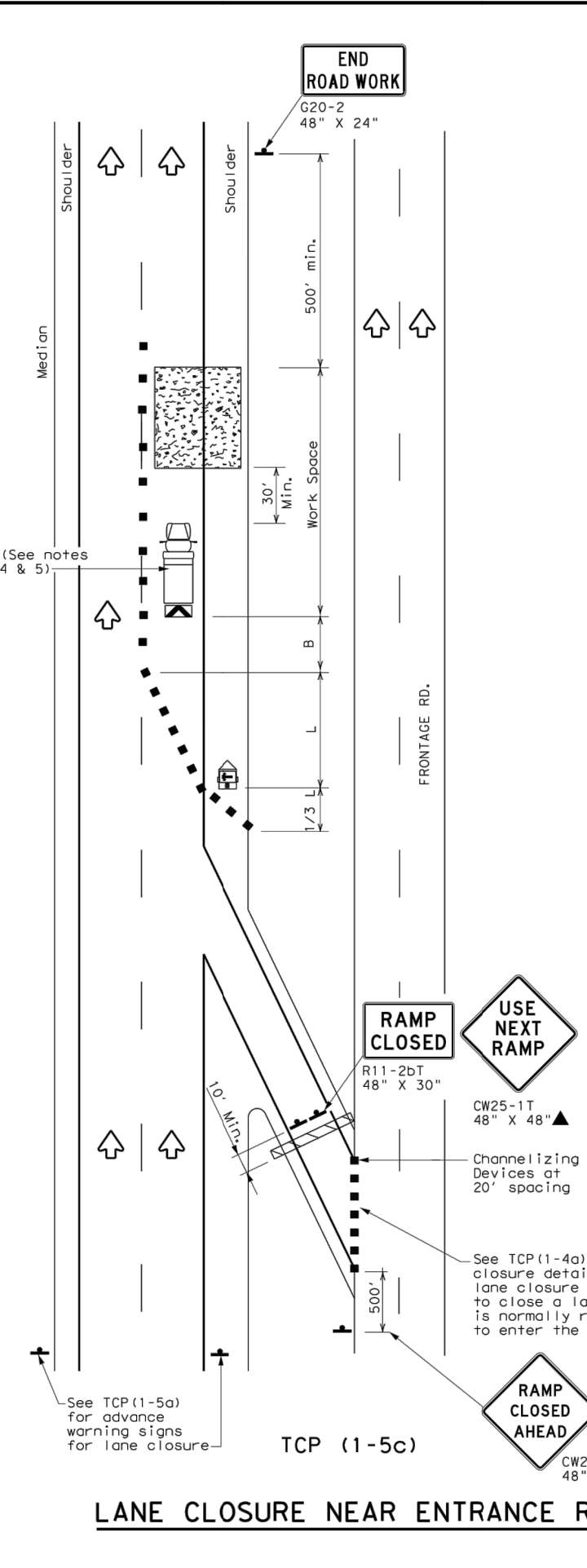
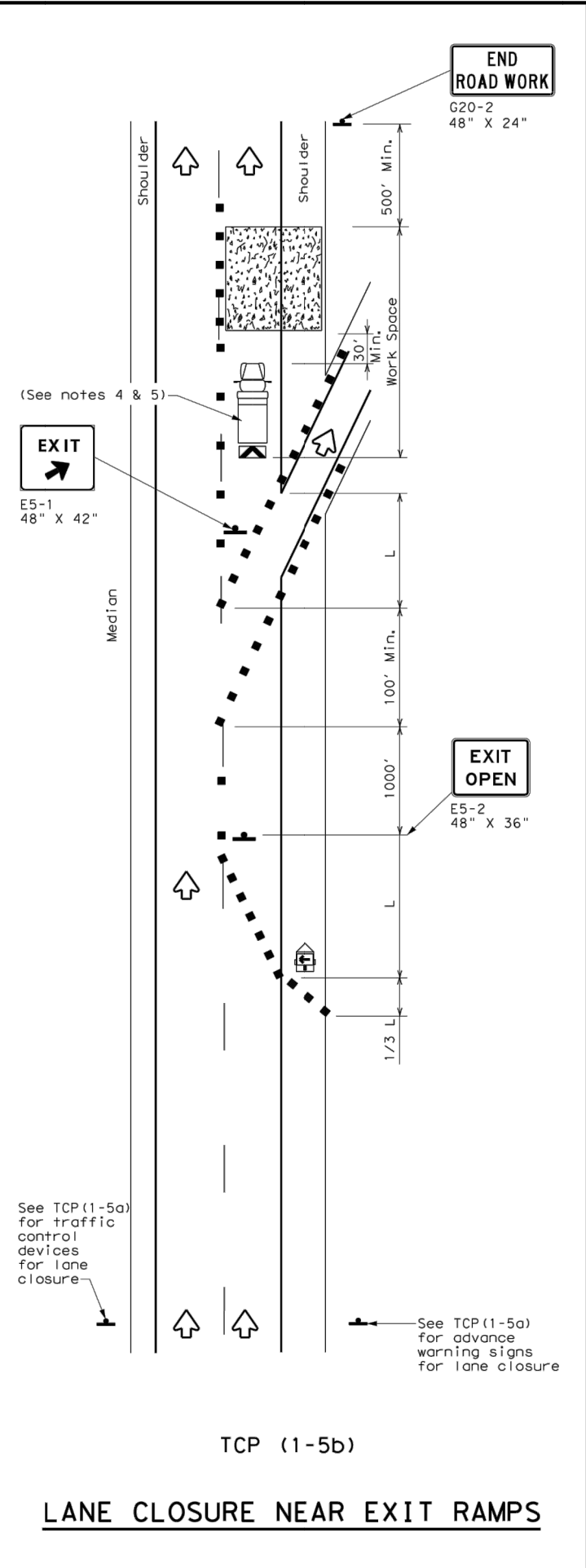
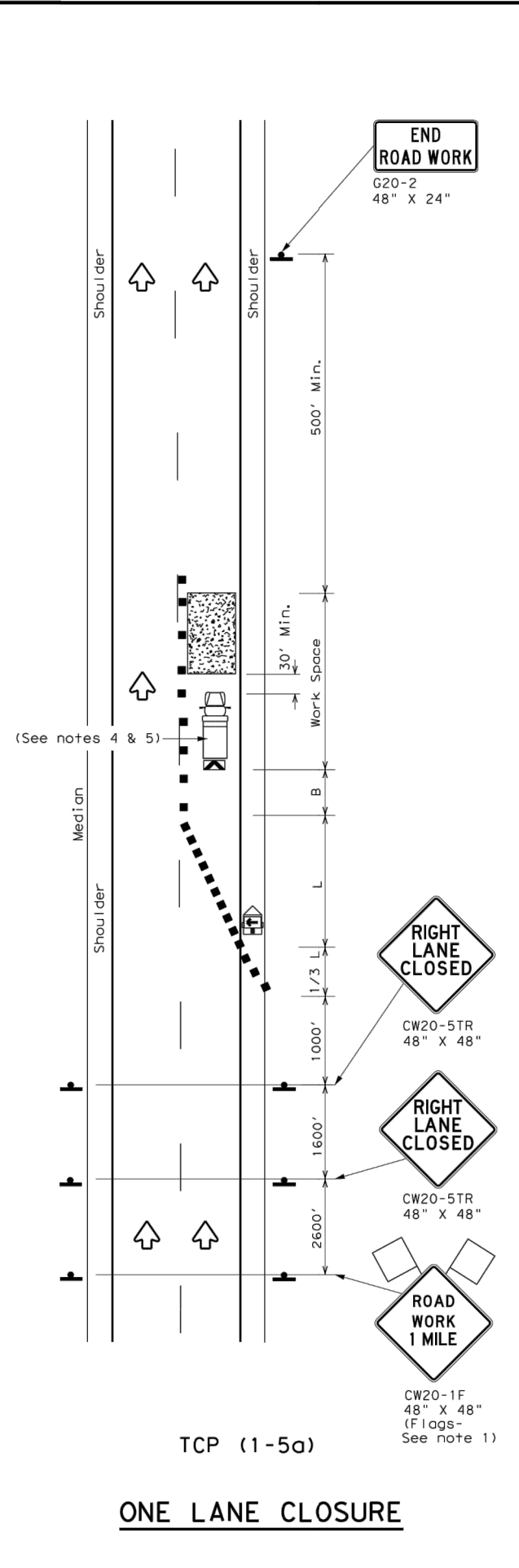
TRAFFIC CONTROL PLAN
LANE CLOSURES ON MULTILANE
CONVENTIONAL ROADS

TCP (1-4) - 18

FILE#	tcp1-4-18.dgn	DN#		CK#		DW#		CK#	
© TxDOT	December 1985	COM#	SECT	JOB	HIGHWAY				
REVISIONS		0314	07	080	IH-20				
2-94	4-98	DIST	COUNTY	SHEET NO.					
8-95	2-12	FTW	PARKER	018					
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.

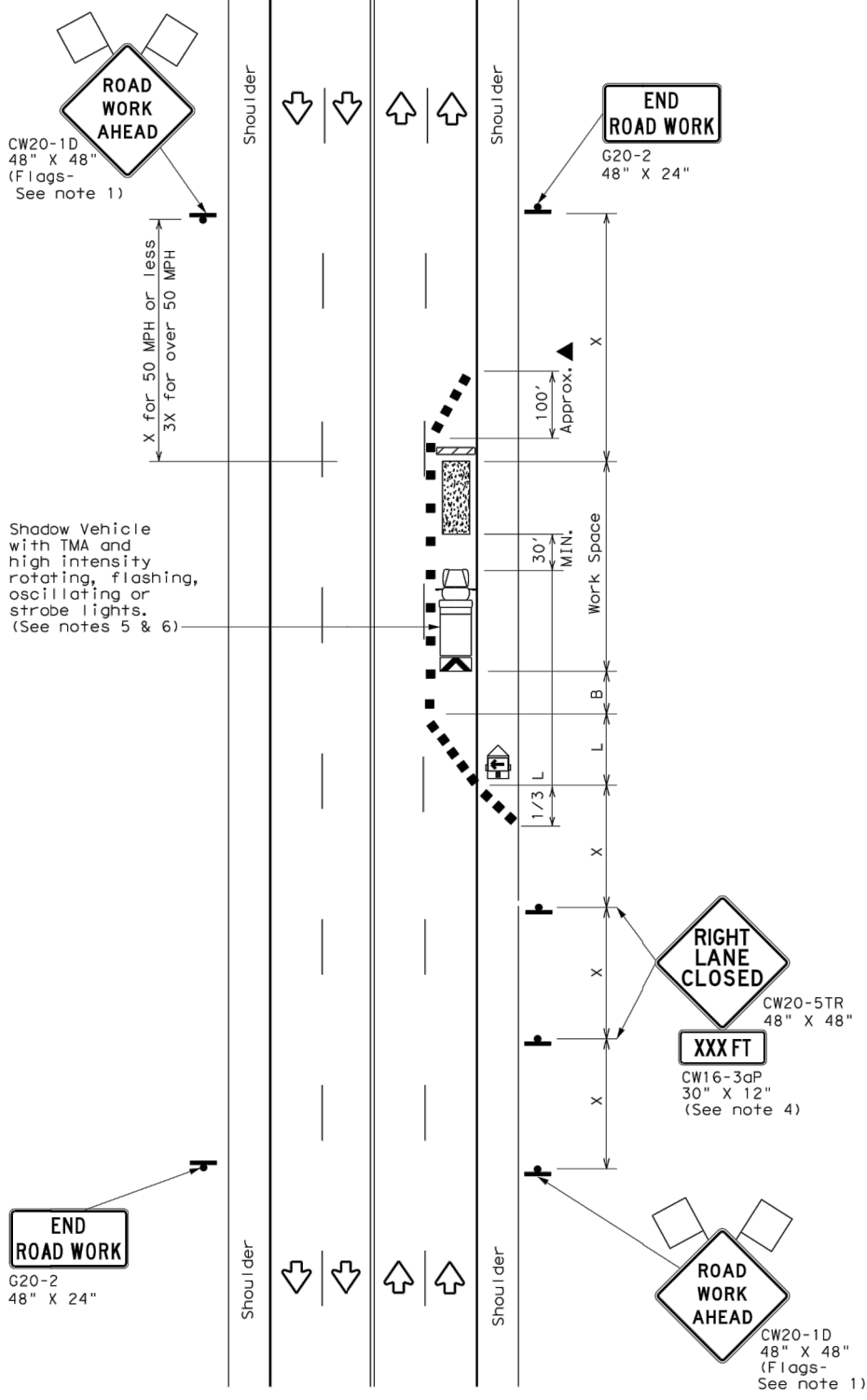
Texas Department of Transportation
 Traffic Operations Division Standard

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

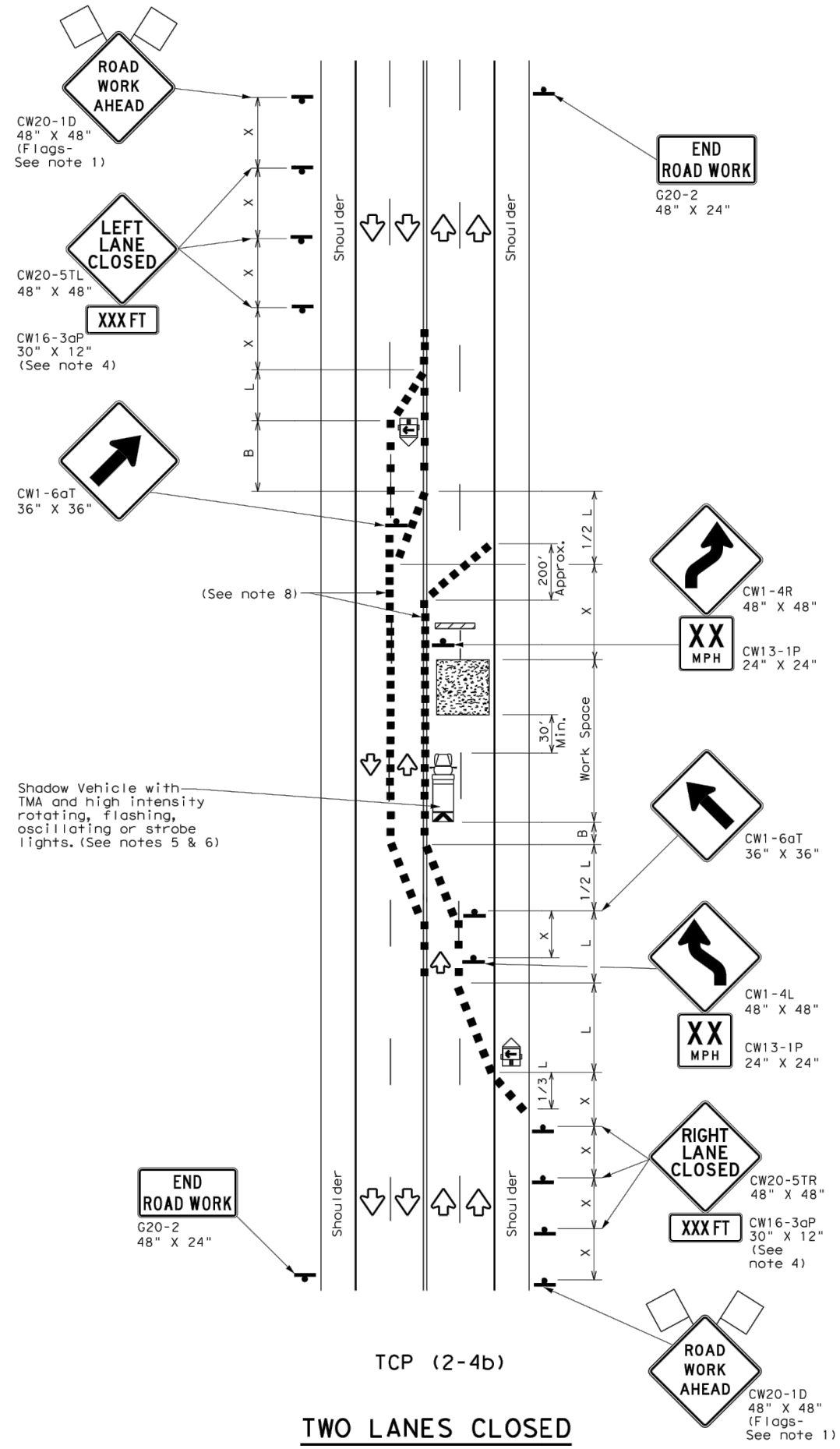
TCP (1-5) - 18

FILE: tcp1-5-18.dgn	DATE: February 2012	CONTRACT: 0314 07	JOB: 080	HIGHWAY: IH-20
REVISIONS:				
2-18		DIST: FTW	COUNTY: PARKER	SHEET NO.: 019

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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**

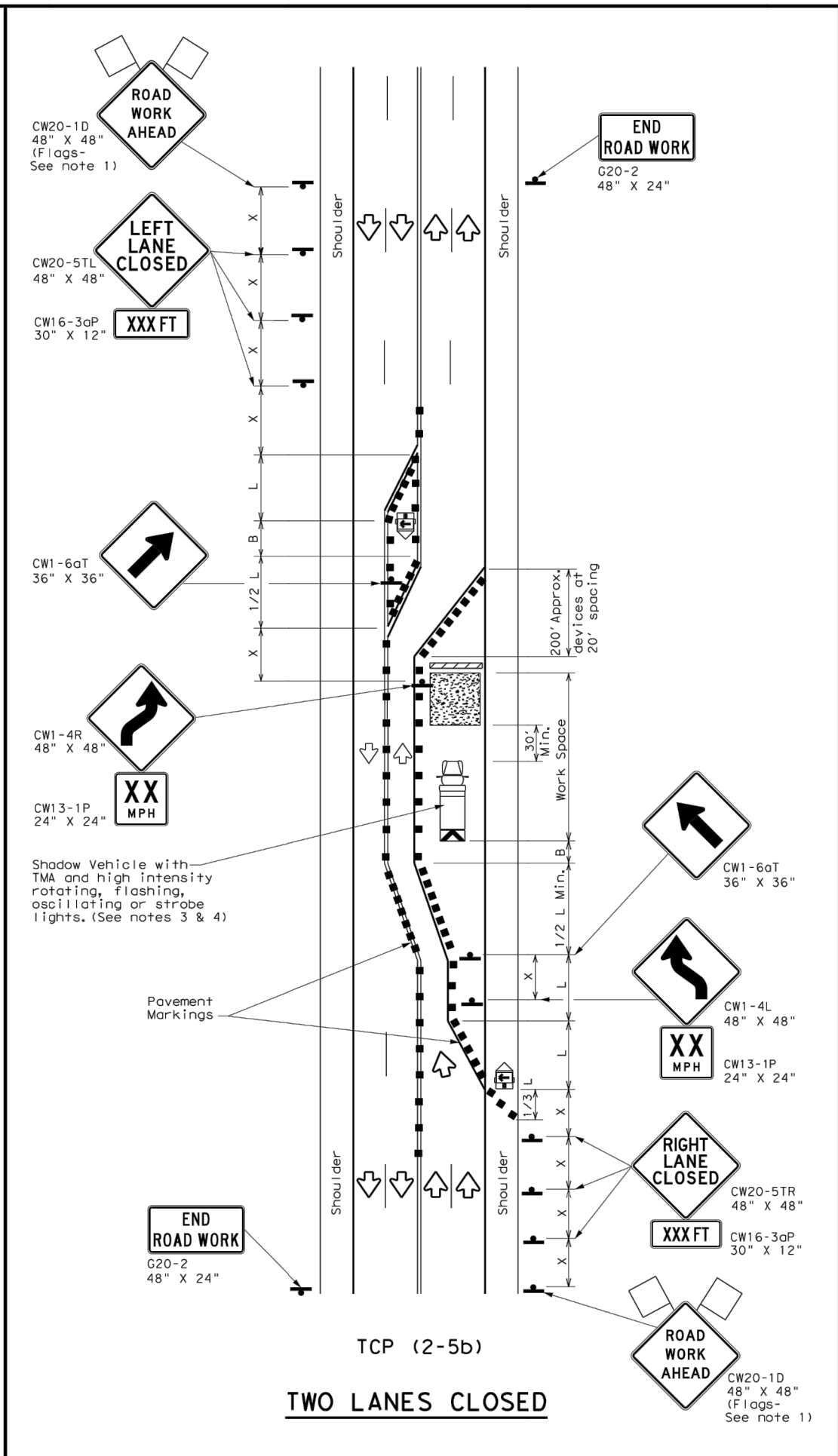
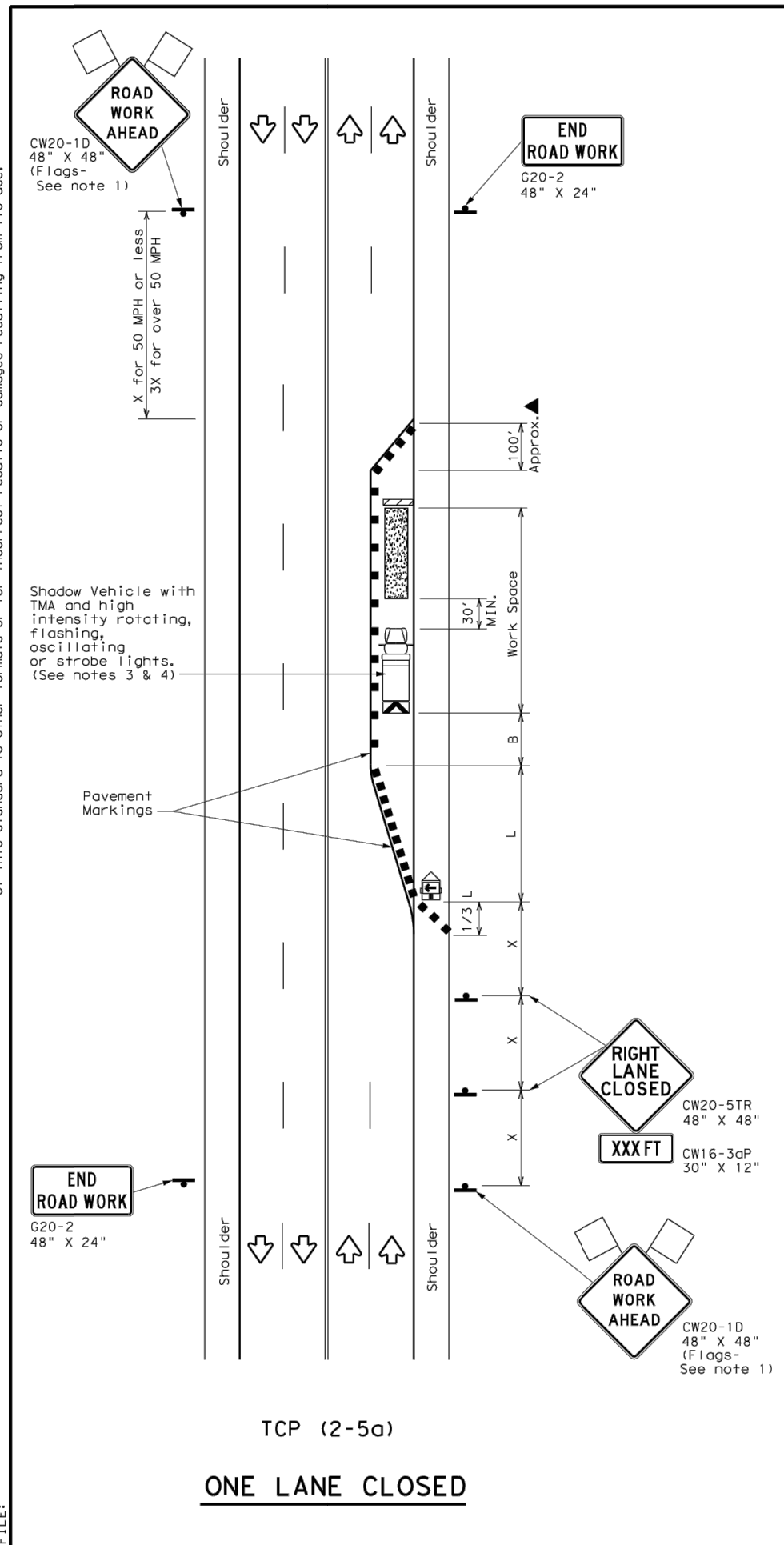
TCP (2-4) - 18

FILE#	tcp2-4-18.dgn	DW#	CK#	DW#	CK#
© TxDOT	December 1985	CONT	SECT	JOB	HIGHWAY
8-95	3-03	0314	07	080	IH-20
1-97	2-12	DIST	COUNTY	SHEET NO.	
4-98	2-18	FTW	PARKER	020	

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

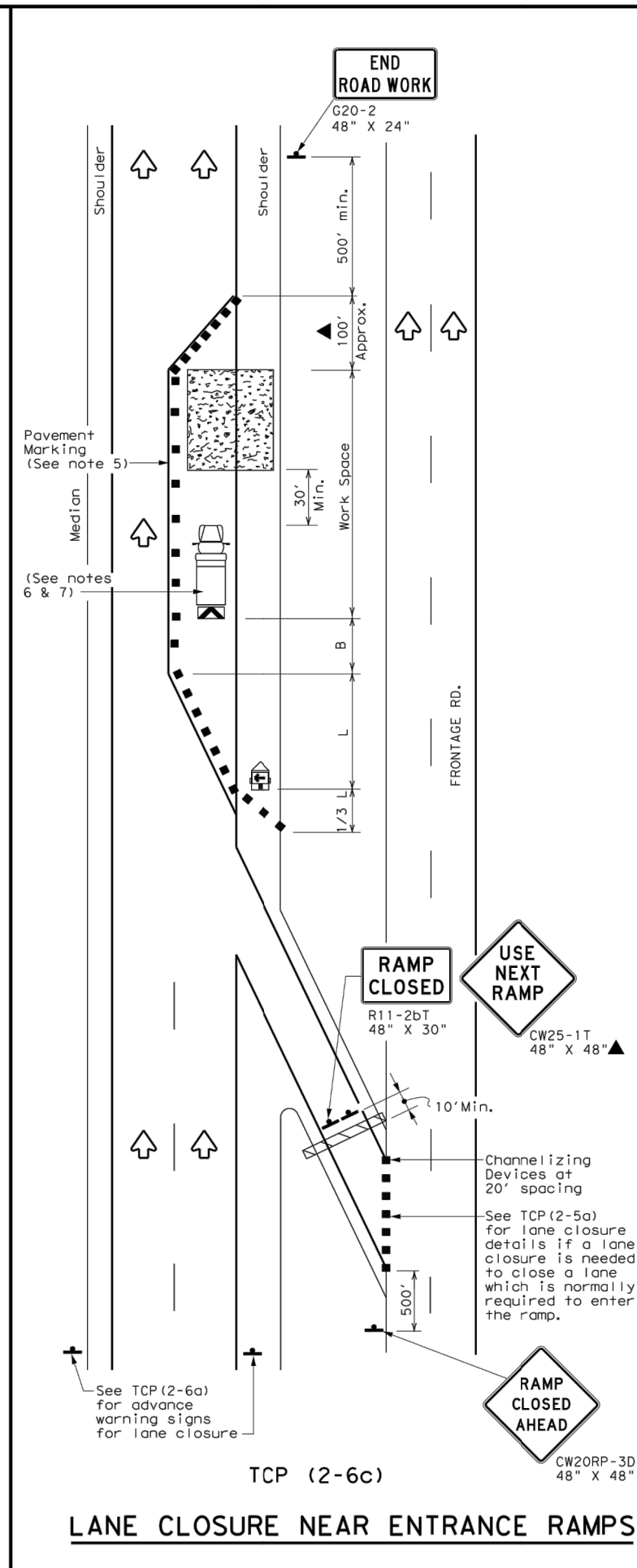
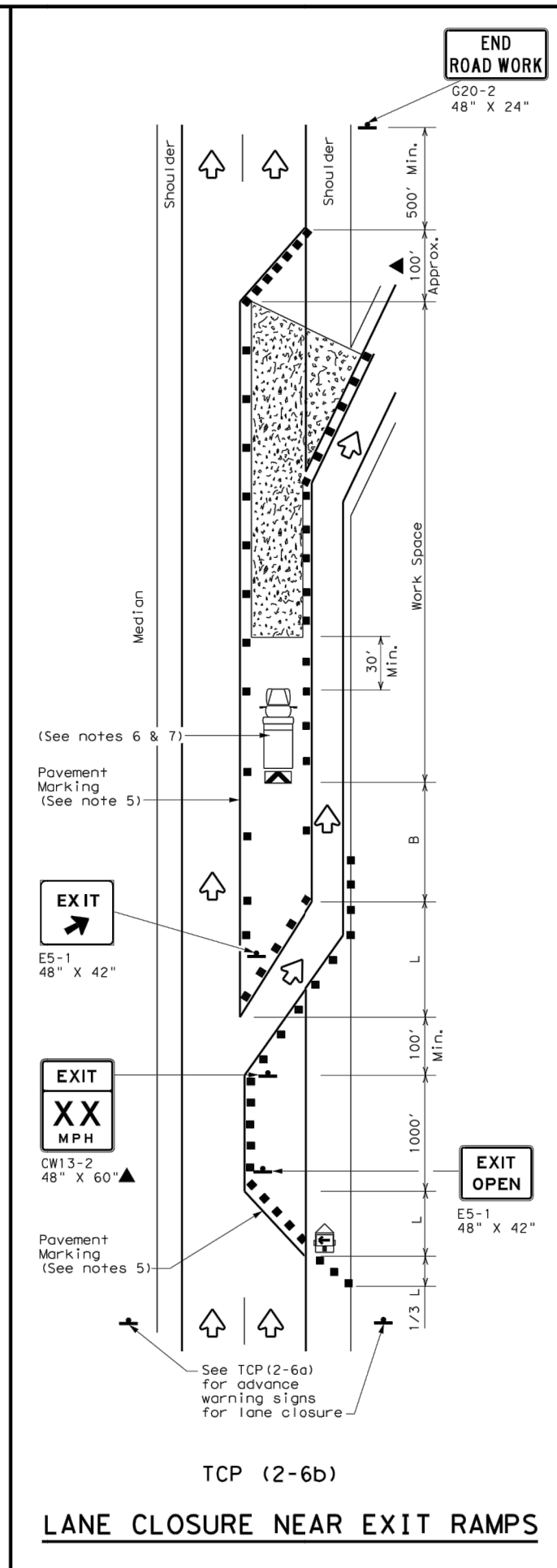
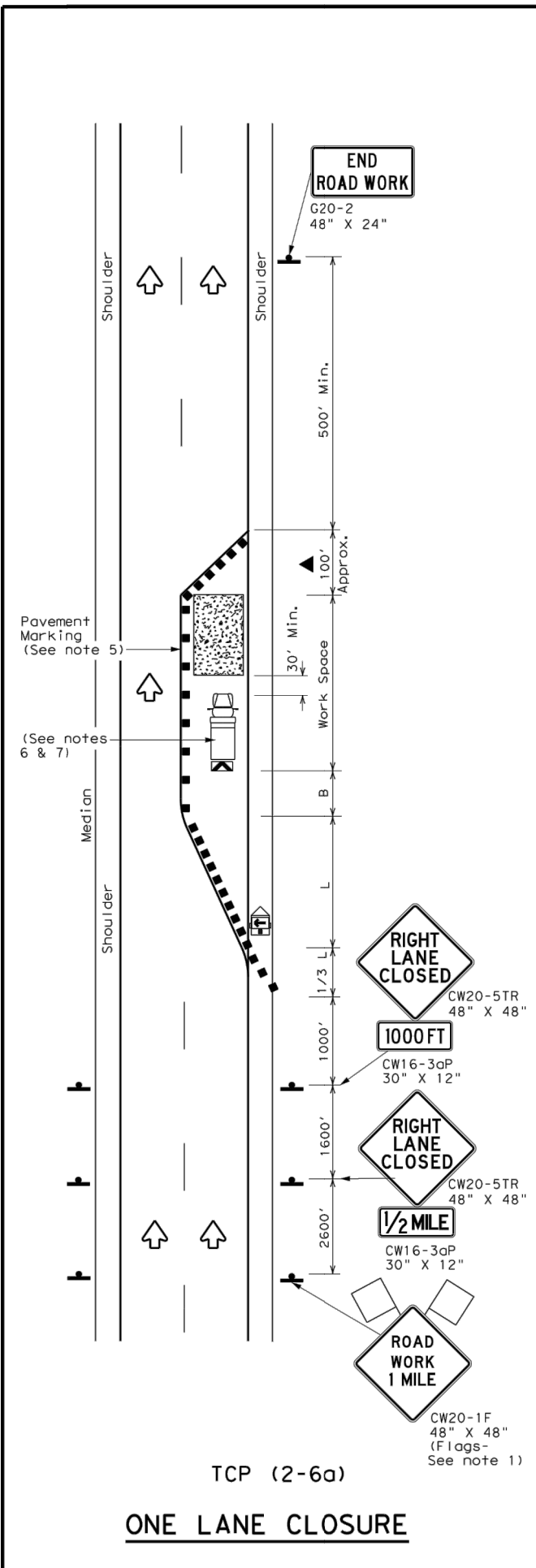
TRAFFIC CONTROL PLAN
LONG TERM LANE CLOSURES
MULTILANE CONVENTIONAL RDS.

TCP (2-5) - 18

FILE# tcp2-5-18.dgn	DN#	CK#	DW#	CK#
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
8-95 2-12 REVISIONS	0314	07	080	IH-20
1-97 3-03	DIST	COUNTY	SHEET NO.	
4-98 2-18	FTW	PARKER	021	

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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.
 - 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	080	IH-20
2-94 4-98	DIST	COUNTY	SHEET NO.	
8-95 2-12	FTW	PARKER	022	
1-97 2-18				

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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	080	IH-20
		DIST	COUNTY		SHEET NO.
		FTW	PARKER		023

ELECTRICAL CONDUCTORS

A. MATERIAL INFORMATION

- 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.
- 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.
- 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.
- 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

- 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.
- 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.
- 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.
- Size and install gel-filled insulating splice covers according to manufacturer's specifications when used in place of heat shrink tubing.
- 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.
- Support conductors in illumination poles with a J-hook at the top of the pole.
- 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.
- Replace conductors and cables that are damaged beyond repair or that fail an insulation resistance test at no additional cost to the department.
- Do not repair damaged conductors with duct tape, electrical tape, or wire nuts. Use only approved splicing methods.
- 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.
- 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.

- 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

- Install temporary conductors and electrical equipment in accordance with the NEC article "Temporary Installations" and Department standard sheets.
- 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.
- Use listed wire nuts with factory applied sealant for temporary wiring where approved.
- 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.
- Protect and when necessary repair any existing electrical conduits uncovered during the construction process in a timely manner and in conformance with the NEC.

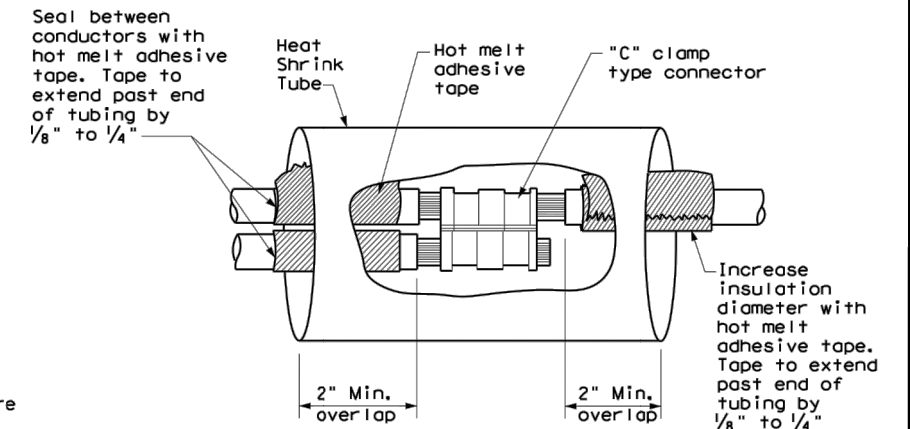
GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

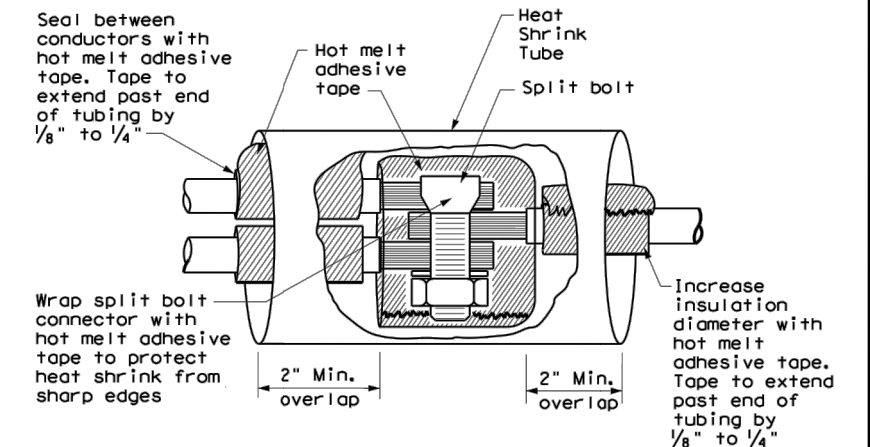
- Provide and install a grounding electrode at electrical services. Provide ground rods according to DMS 11040 and the plans. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets. Concrete encased grounding electrodes may be called for in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

B. CONSTRUCTION METHODS

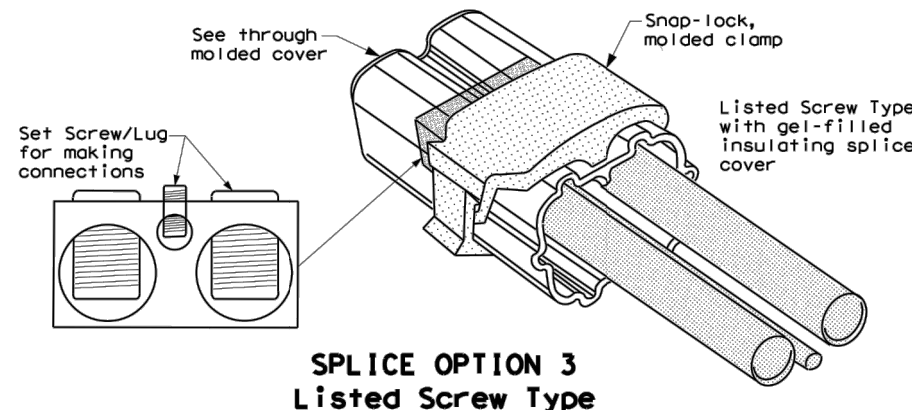
- Furnish auxiliary ground rods for lightning protection and install in soil, concrete, or both, as called for in the plans. For ground rods installed in concrete, ensure the connection of the conductor to the ground rod is readily accessible for inspection or repairs. For ground rods installed in soil, ensure that the upper end is between 2 to 4 in. below finished grade.
- Do not place ground rods in the same drilled hole as a timber pole.
- Install ground rods so the imprinted part number is at the upper end of the rod.
- Remove all non-conductive coatings such as concrete splatter from the rod at the clamp location.
- 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.
- 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.
- 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
©	TxDOT	COMT	October 2014	SECT	JOB
REVISIONS		0314	07	080	IH-20
DIST	COUNTY	SHEET NO.			
FTW	PARKER	024			

ELECTRICAL SERVICES NOTES

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- 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.
- 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.
- Provide all work, materials, services, and any incidentals needed to install a complete electrical service as specified in the plans.
- 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.
- 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.
- 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.
- When galvanized is specified for nuts, screws, bolts or miscellaneous hardware, stainless steel may be used.
- 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.
- 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.
- 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 in the layout for that particular branch circuit. Install a grounding bushing on the RMC where it terminates in the service enclosure.
- 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.
- Ensure all mounting hardware and installation details of services conform to utility company specifications.
- 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.
- 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.
- 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

- Provide threaded hub for all conduit entries into the top of enclosure.
- 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.
- 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.
- 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

- Field drill flange-mounted remote operator handle if needed, to ensure handle is lockable in both the "On" and "Off" positions.
- 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.

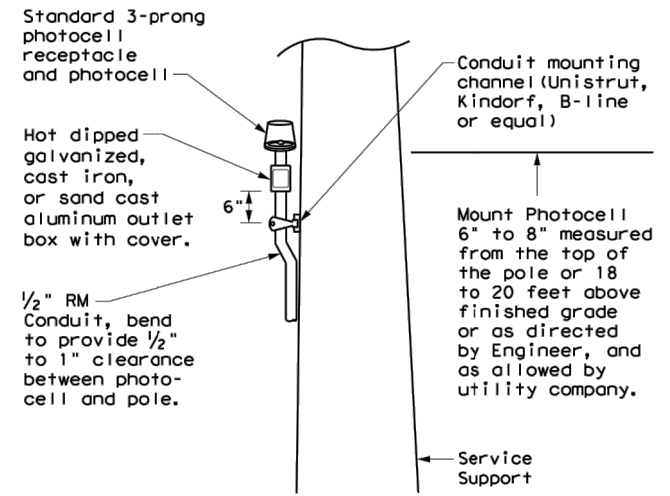
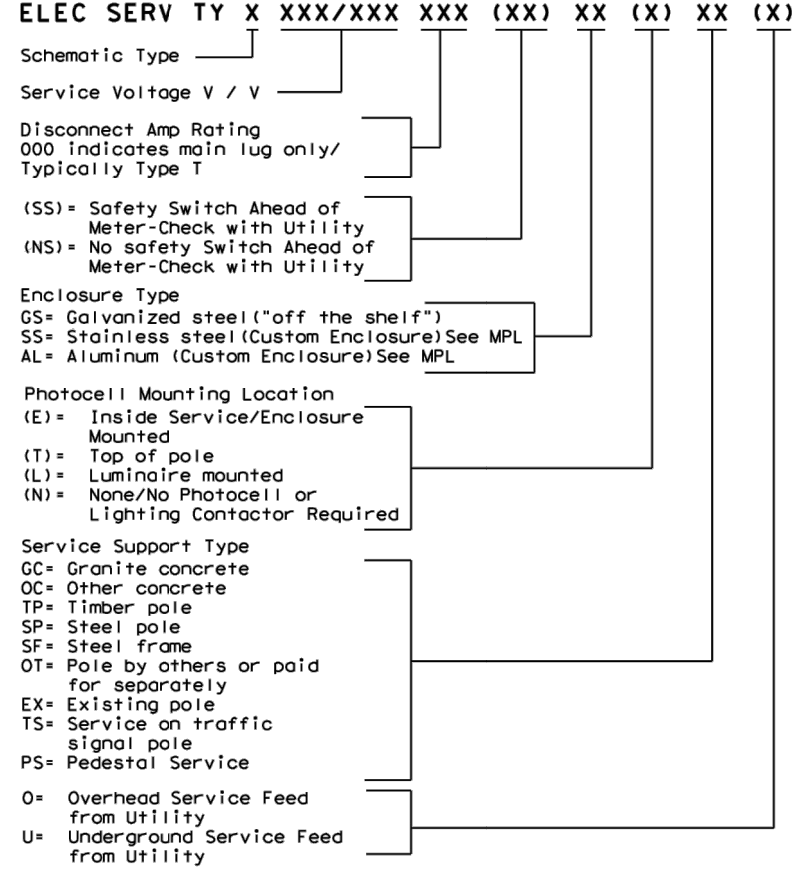
PHOTOELECTRIC CONTROL

- 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

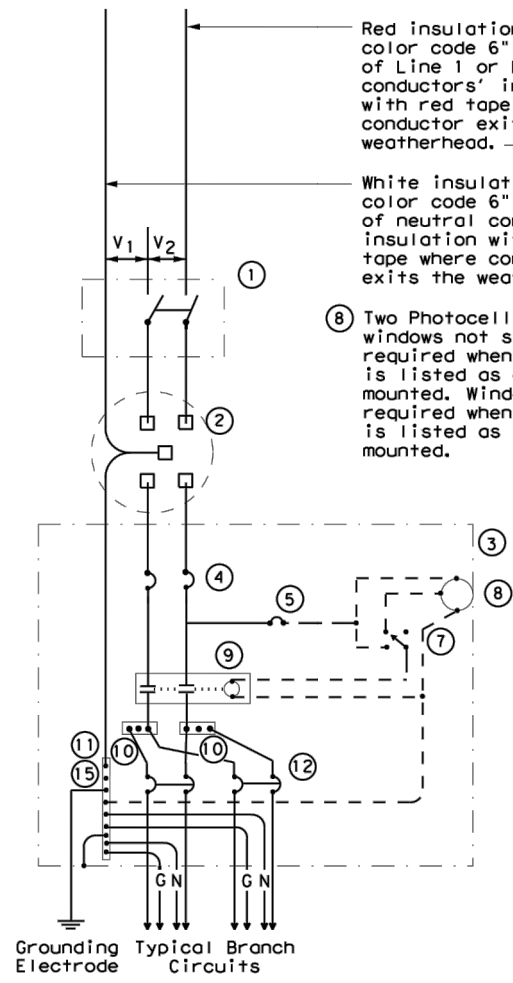


TOP MOUNTED PHOTOCELL

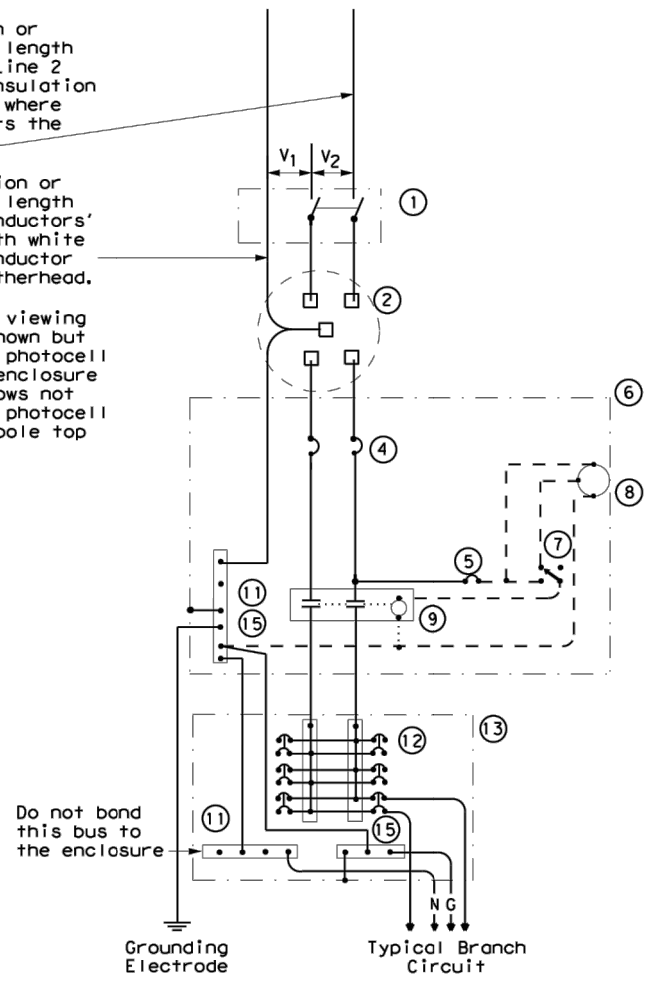
Install conduit strap maximum 3 feet from box. 5 foot maximum spacing between straps supporting conduit.

		Traffic Operations Division Standard	
<h2>ELECTRICAL DETAILS SERVICE NOTES & DATA</h2>			
<h3>ED(5)-14</h3>			
FILE#	ed5-14.dgn	DWG#	TxDOT
CONT	October 2014	SECT	JOB
REVISIONS		0314	07
		080	IH-20
DIST	COUNTY	SHEET NO.	
FTW	PARKER	025	

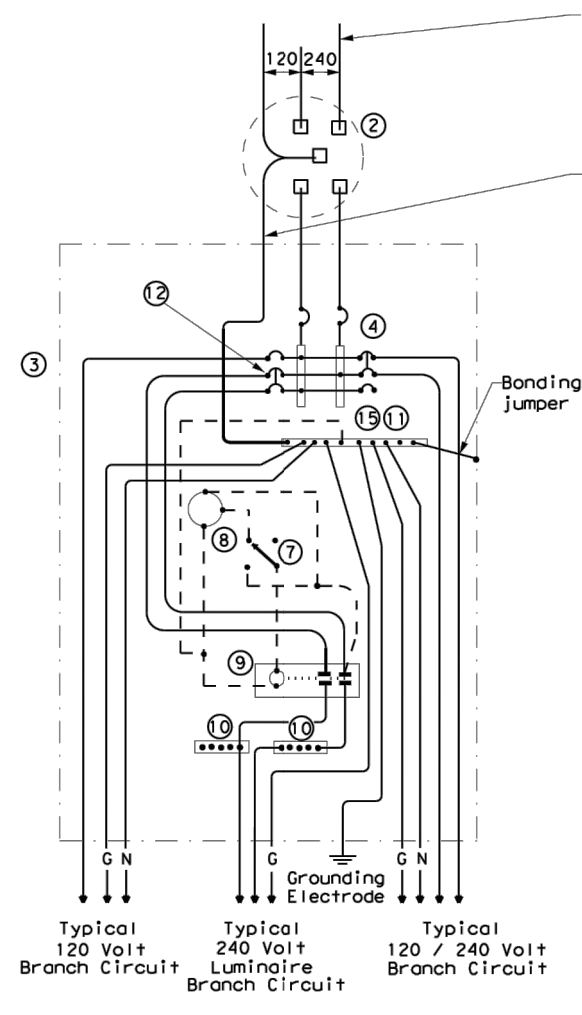
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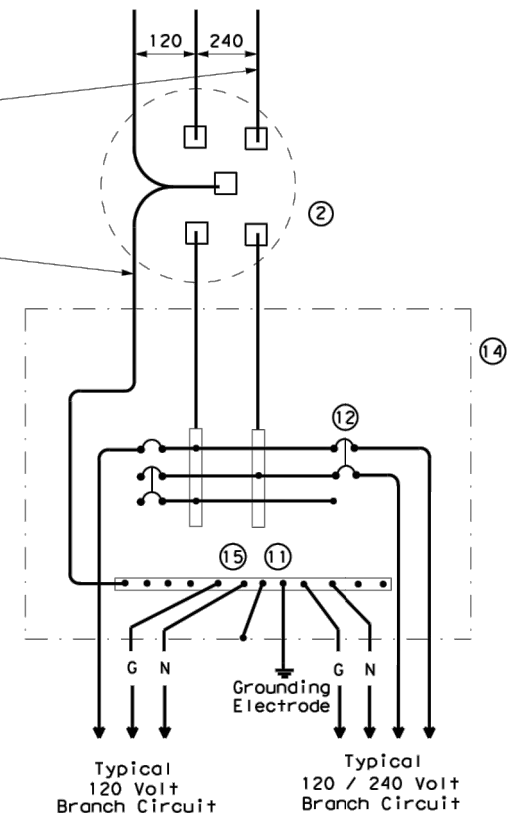
**SCHEMATIC TYPE A
THREE WIRE**



**SCHEMATIC TYPE C
THREE WIRE**



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



**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

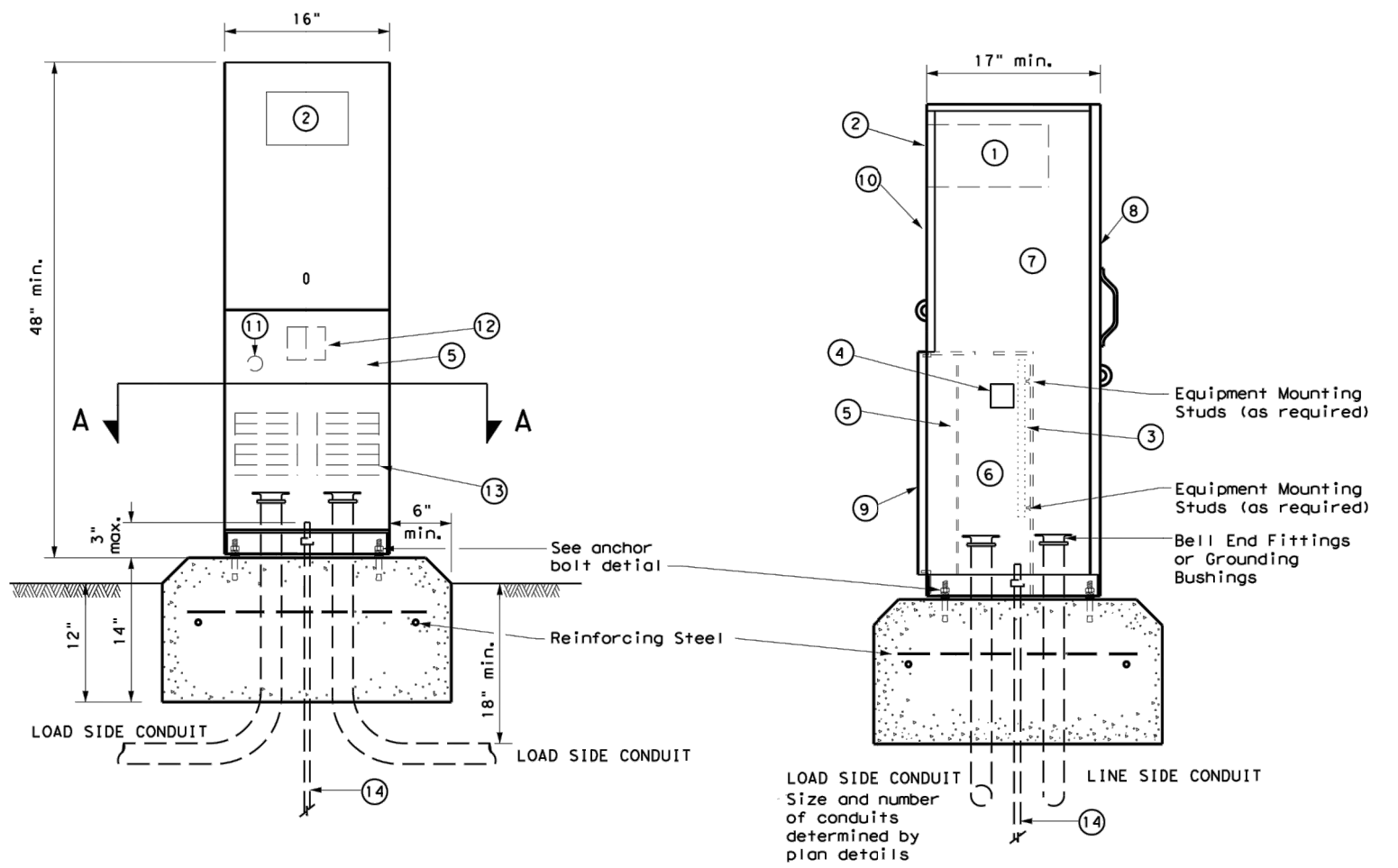
		Texas Department of Transportation		<i>Traffic Operations Division Standard</i>	
ELECTRICAL DETAILS SERVICE ENCLOSURE AND NOTES					
ED(6) - 14					
FILE#	ed6-14.dgn	DN#	TxDOT	CK#	TxDOT
©	TxDOT	October 2014	CONT	SECT	JOB
REVISIONS		0314	07	080	IH-20
DIST	COUNTY	SHEET NO.			
FTW	PARKER	026			

DATE:
FILE:

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PEDESTAL SERVICE NOTES

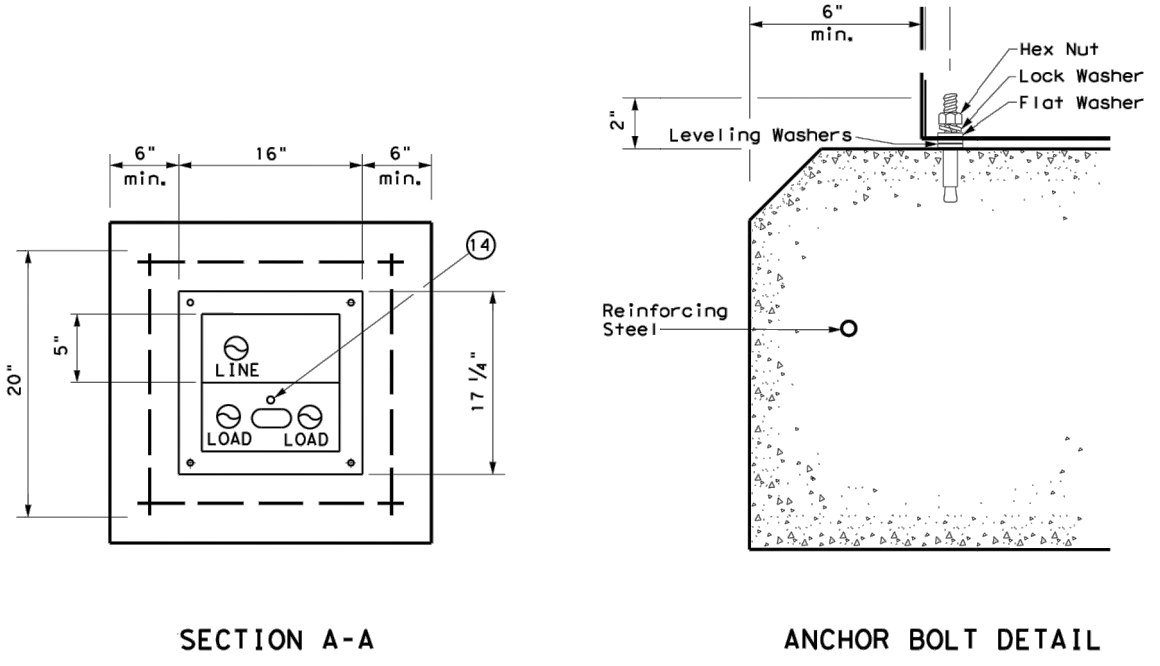
1. Manufacture pedestal electrical services in accordance with Departmental Material Specifications (DMS) 11080 "Electrical Services", 11085 "Electrical Services-Pedestal (PS)" and Item 628 "Electrical Services." Provide pedestal electrical services as listed on the Material Producers list (MPL) on the 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

FILES: ed9-14.dgn	DWG: TxDOT	CHK: TxDOT	DWG: TxDOT	CHK: TxDOT
© TxDOT October 2014	CONT: 0314	SECT: 07	JOB: 080	HIGHWAY: IH-20
REVISIONS		DIST: FTW	COUNTY: PARKER	SHEET NO.: 027

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

- Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
- Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
- Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
- 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

- Temporary Vegetation
- Blankets/Matting
- Mulch
- Sodding
- Interceptor Swale
- Diversion Dike
- Erosion Control Compost
- Mulch Filter Berm and Socks
- Compost Filter Berm and Socks

Sedimentation

- Silt Fence
- Rock Berm
- Triangular Filter Dike
- Sand Bag Berm
- Straw Bale Dike
- Brush Berms
- Erosion Control Compost
- Mulch Filter Berm and Socks
- Compost Filter Berm and Socks
- Stone Outlet Sediment Traps
- Sediment Basins

Post-Construction TSS

- Vegetative Filter Strips
- Retention/Irrigation Systems
- Extended Detention Basin
- Constructed Wetlands
- Wet Basin
- Erosion Control Compost
- Mulch Filter Berm and Socks
- Compost Filter Berm and Socks
- Vegetation Lined Ditches
- Sand Filter Systems
- 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

- 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
 CGP: Construction General Permit
 DSHS: Texas Department of State Health Services
 FHWA: Federal Highway Administration
 MOA: Memorandum of Agreement
 MS4: Municipal Separate Stormwater Sewer System
 MBTA: Migratory Bird Treaty Act
 NOI: Notice of Intent
 SPOC: Spill Prevention Control and Countermeasure
 SW3P: Storm Water Pollution Prevention Plan
 PCN: Pre-Construction Notification
 TCEQ: Texas Commission on Environmental Quality
 TPDES: Texas Pollutant Discharge Elimination System
 TPWD: Texas Parks and Wildlife Department
 T&E: Texas Department of Transportation
 Threatened and Endangered Species
 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.

-
-
-

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	080
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	028

A. GENERAL SITE DATA

- PROJECT LIMITS:** Highway: IH 20 & US 180
From: EXIT 412
To: EXIT 414
IH20 32°45'02.24"N 97°43'11.14"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
- PROJECT SITE MAPS:**
 - Project Location Map: Title Sheet (Sheets ###)
 - Drainage Patterns; Drainage Area Maps (Sheets 035-038)
 - Approx. Slopes Anticipated After Major Gradings and Areas of Soil Disturbance: Typical Sections (N/A)
 - Major Controls and Locations of Stabilization Practices: (Sheets 035-038) 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)
- PROJECT DESCRIPTION:** IH 20 & US 190 LANDSCAPE ENHANCEMENTS
- TREE AND SHRUB PLANTING AND TRENCHING FOR LOW FLOW IRRIGATION
- EXISTING CONDITION OF SOIL & VEGETATIVE COVER AND % OF EXISTING VEGETATIVE COVER:** Existing condition is established forbs and grasses in unmaintained state @ +/- 90% coverage.
- TOTAL PROJECT AREA:** .40 ACRES
- TOTAL AREA TO BE DISTURBED:** .40 ACRES
- WEIGHTED RUNOFF COEFFICIENT**

BEFORE CONSTRUCTION:	.30
AFTER CONSTRUCTION:	.30
- NAME OF RECEIVING WATERS:** N/A

10. ENDANGERED SPECIES, DESIGNATED CRITICAL HABITAT AND HISTORIC PROPERTY:
A. No Endangered Species, Designated Critical Habitat or Historic Property has been found on this project site.

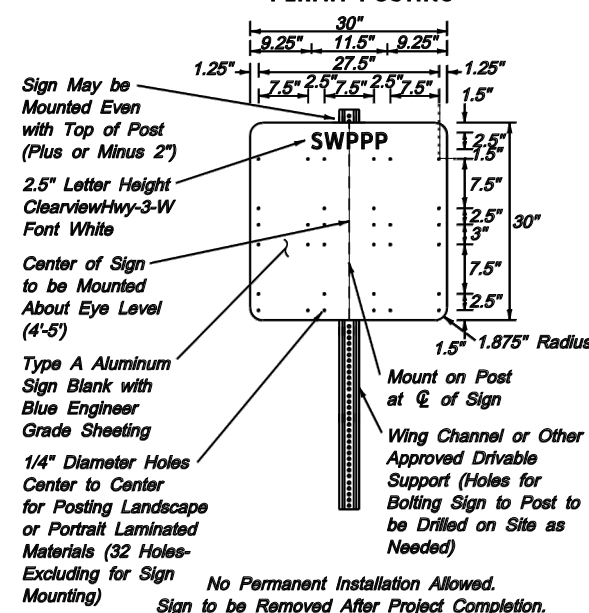
B. EROSION AND SEDIMENT CONTROLS

- 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 type="checkbox"/> SEEDING	<input checked="" type="checkbox"/> COMPOST MANUFACTURED TOPSOIL
<input type="checkbox"/> SODDING	<input type="checkbox"/> OTHER: (Specify Practice)
- 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 checked="" type="checkbox"/> OTHER: (Specify Practice)	
<input checked="" type="checkbox"/> EROSION CONTROL LOGS	
- STORM WATER MANAGEMENT:** (Example Below - May be used as applicable, revised or expanded)
 - 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.
 - 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.
- STORM WATER MANAGEMENT ACTIVITIES:** (Sequence of Construction)
(Describe Storm Water Management Activities by Phases)

STORM WATER POLLUTION PREVENTION PLAN PERMIT POSTING



- 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.

C. OTHER REQUIREMENTS & PRACTICES

- MAINTENANCE:** All erosion and sediment controls shall be maintained in good working order. If a repair is necessary, it shall be performed at the earliest date possible but no later than 7 calendar days after the surrounding exposed ground has dried sufficiently to prevent further damage from heavy equipment. Disturbed areas on which construction activities have ceased, temporarily or permanently, shall be stabilized within 14 calendar days unless they are scheduled to and do resume within 21 calendar days. The areas adjacent to creeks and drainageways shall have priority followed by devices protecting storm sewer inlets.
- INSPECTION:** An inspection shall be performed by a TxDOT Inspector every 14 calendar days as well as within 24 hours after any rainfall of one-half inch or more is recorded on a non-freezing rain gauge to be located at the project site, or every 7 calendar days. An Inspection and Maintenance Report shall be filed for each inspection. Based on the inspection results, the controls shall be revised in accordance with the inspection report.
- WASTE MATERIALS:** Except as noted below, all waste materials shall be collected in a metal dumpster having a secure cover. The dumpster shall meet all state and local solid waste management regulations. All trash and debris from construction shall be deposited in the dumpster. The dumpster shall be emptied, as necessary or as required by local regulation, and hauled to a local approved land fill site. The burying of construction waste on the project site shall not be permitted.

Concrete washout areas shall be required and shall consist of a pit, lined with an impervious material, of sufficient size to contain, until evaporation, all water used and washout material produced during concrete washout operations. The concrete washout locations shall be as directed by the engineer.

Lime slaking tanks shall be surrounded by an earthen berm, capable of containing any overflow.
- HAZARDOUS WASTE (INCLUDING SPILL REPORTING):** As a minimum, any products in the following categories are considered to be hazardous: paints, acids, solvents, asphalt products, chemical additives for soil stabilization and concrete curing compounds or additives. In the event of a spill which may be hazardous, the spill coordinator shall be contacted immediately.
- SANITARY WASTE:** All sanitary waste shall be collected from the portable units, as necessary or as required by local regulation, by a licensed sanitary waste management contractor.
- OFFSITE VEHICLE TRACKING:** The Contractor shall be required, on a regular basis or as may be directed by the Engineer, to dampen haul roads for dust control, stabilize construction entrances and to remove excess dirt from the roadway.
- MANAGEMENT PRACTICES:** (Example Below - May be used as applicable, revised or expanded)
 - Disposal areas, stockpiles and haul roads shall be constructed in a manner that will minimize and control the amount of sediment that may enter receiving waters. Disposal areas shall not be located in any wetland, waterbody or streambed.
 - Construction staging areas and vehicle maintenance areas shall be constructed by the Contractor in a manner to minimize the runoff of pollutants.
 - All temporary fills placed in waterways shall be built of erosion resistant material. (INWP 14)
 - All waterways shall be cleared as soon as practicable of temporary embankment, temporary bridges, matting, falsework, piling, debris or other obstructions placed during construction operations that are not a part of the finished work.
- OTHER:**
 - Listing of construction materials stored on site to be provided by Project Field Office.
 - The Project SW3P File located at the project field office shall contain the N.O.I., CGP Coverage Notice, TCEQ TPDES Form, Signature Authorization, Certification/Qualification Statements, Inspection Reports, Required Maps, and a copy of the TPDES General Permit No. TXR150000.



Design Consultant Logo here - delete block if not applicable

Texas Department of Transportation
Fort Worth District

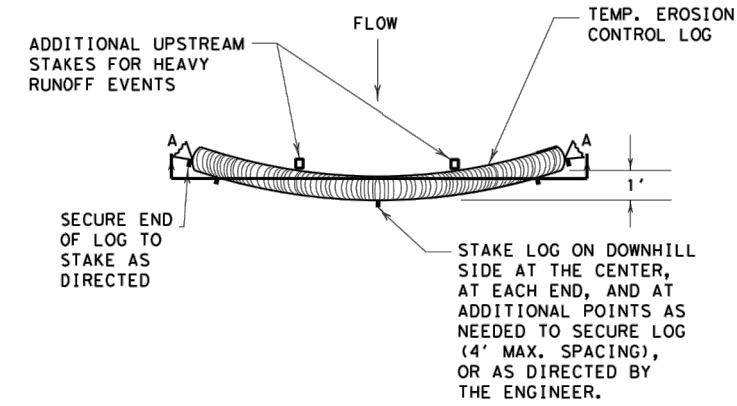
STORM WATER POLLUTION PREVENTION PLAN (SW3P)

FTW NEW 9/02	FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. F2022 848	HIGHWAY NO. IH-20
REVISIONS 8/2008	STATE TEXAS	DISTRICT FTW	COUNTY PARKER
1/2012	CONTROL	SECTION 07	JOB 080
Added sign 8/2015			SHEET NO. 029

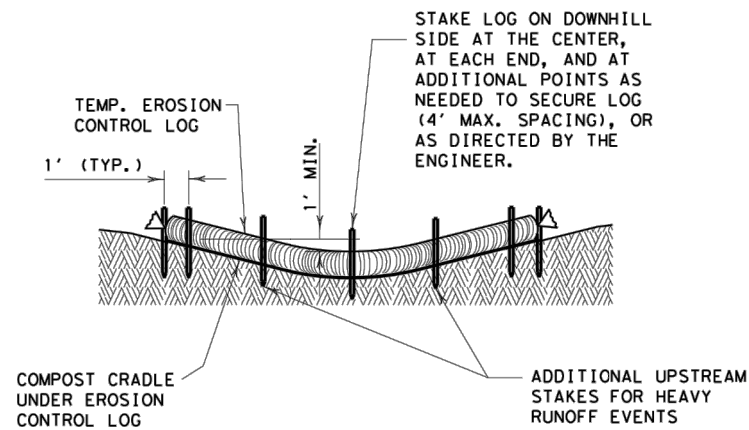
PUBLIC\STANDARD\SW3P\FW.DGN

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DATE:
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PLAN VIEW



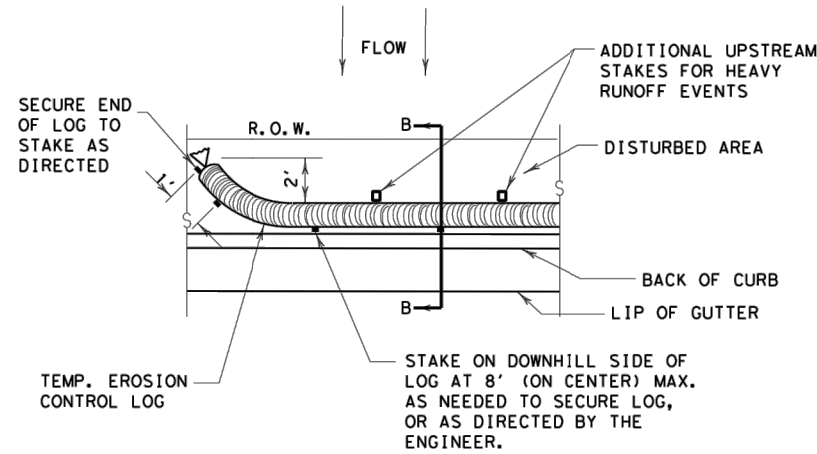
SECTION A-A

EROSION CONTROL LOG DAM

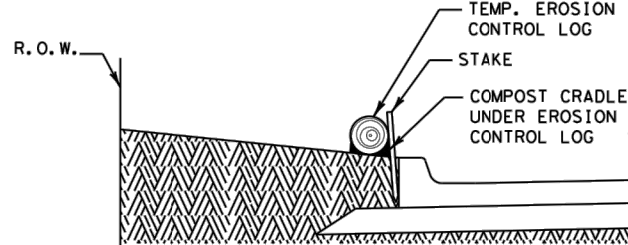
CL-D

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



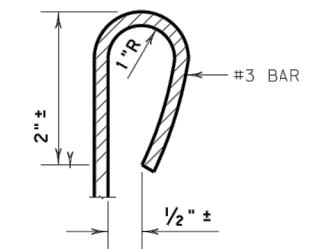
PLAN VIEW



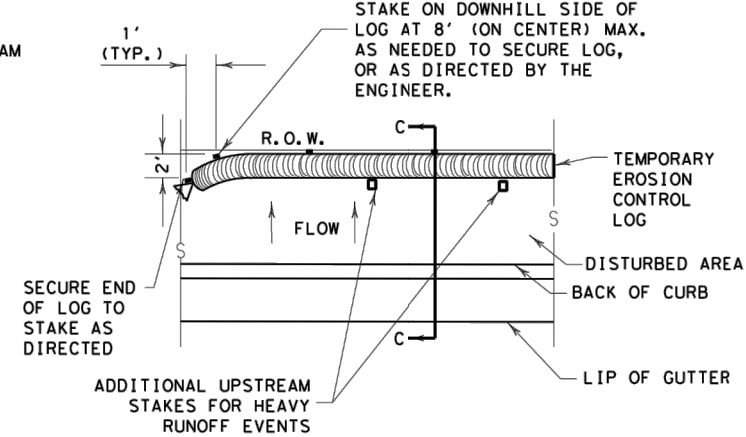
SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

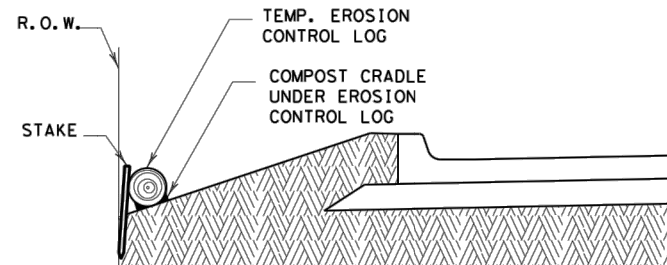
CL-BOC



REBAR STAKE DETAIL



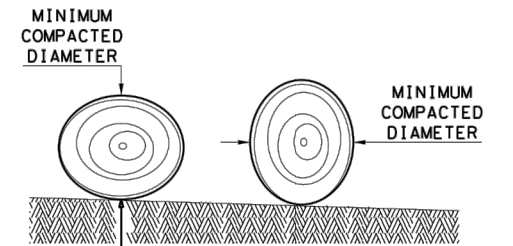
PLAN VIEW



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.

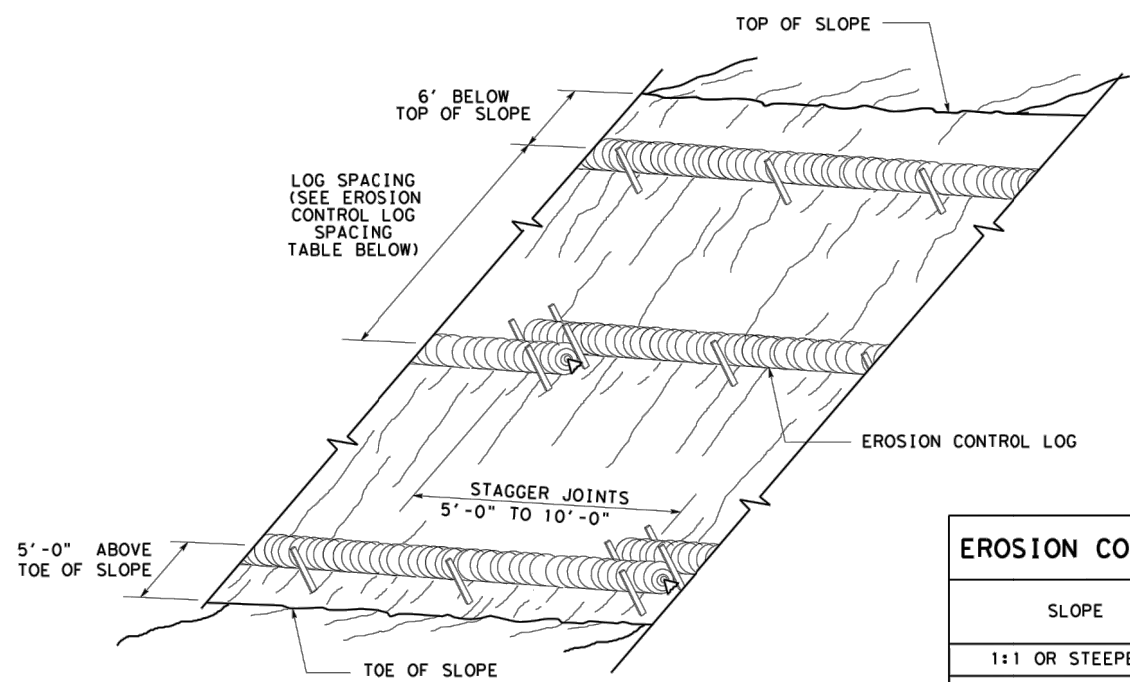
Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.

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: 080
REVISIONS		HIGHWAY: IH-20	
DIST: FTW	COUNTY: PARKER	SHEET NO.: 031	

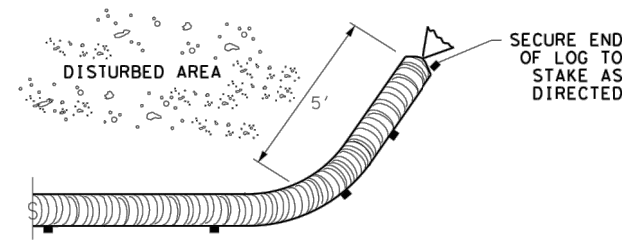
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FILE:



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

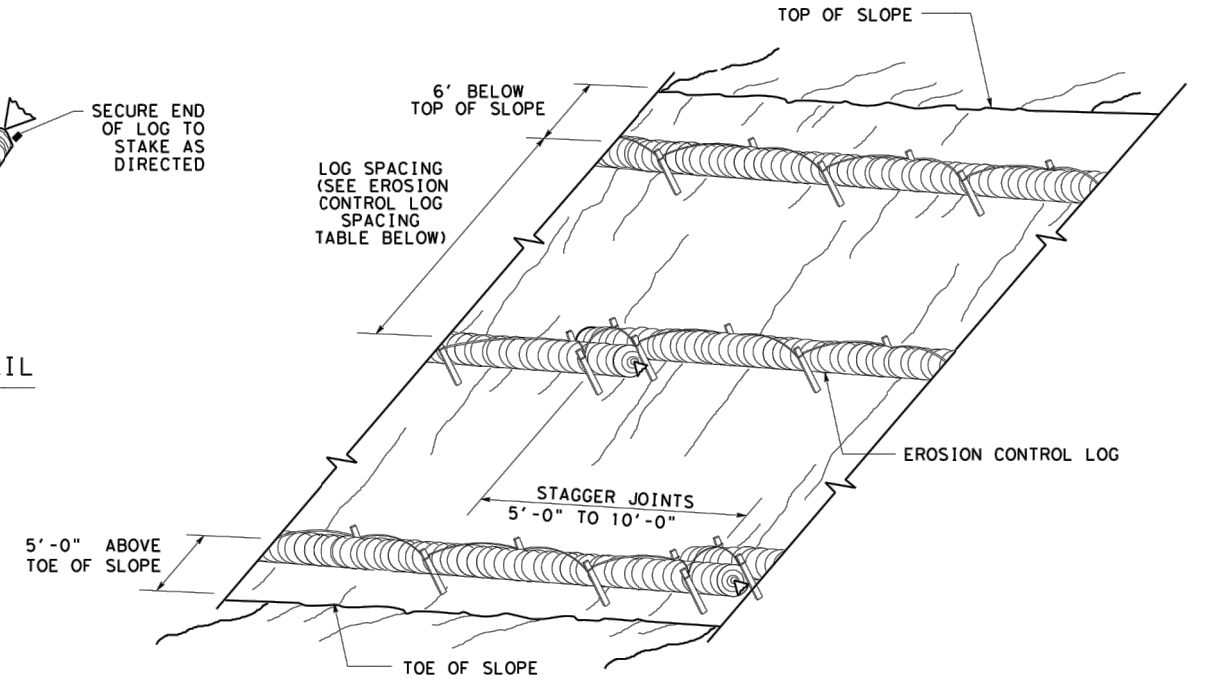
CL-SST



END SECTION RAP DETAIL

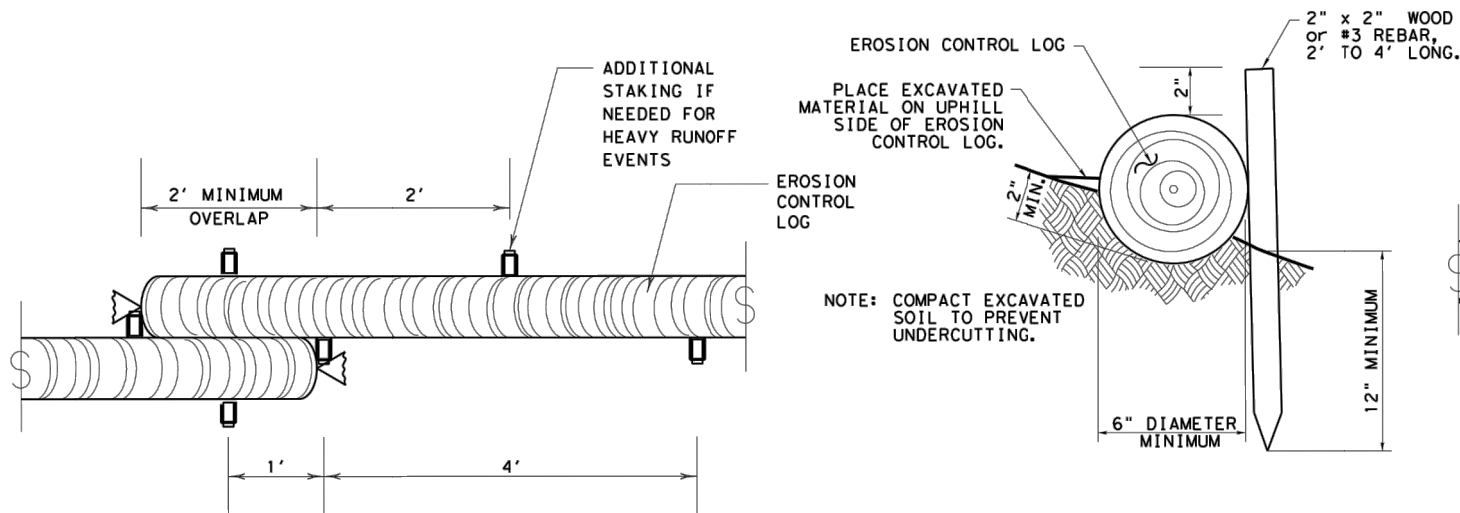
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

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



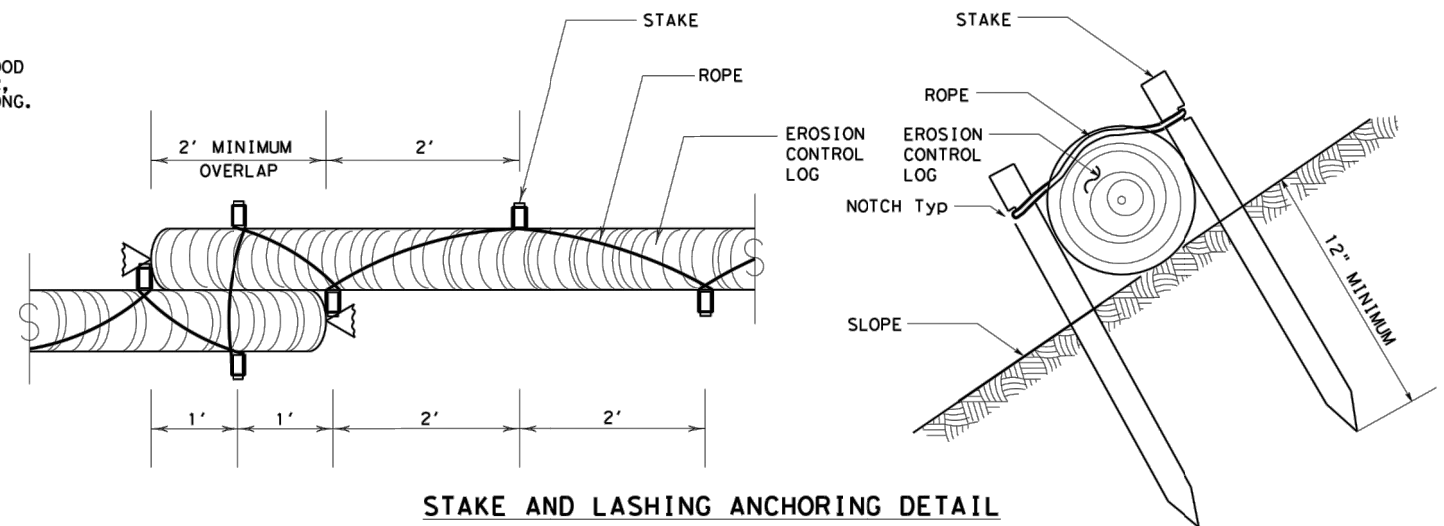
**EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING**

CL-SSL



STAKE AND TRENCHING ANCHORING DETAIL

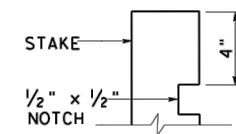
CL-SST



STAKE AND LASHING ANCHORING DETAIL

CL-SSL

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



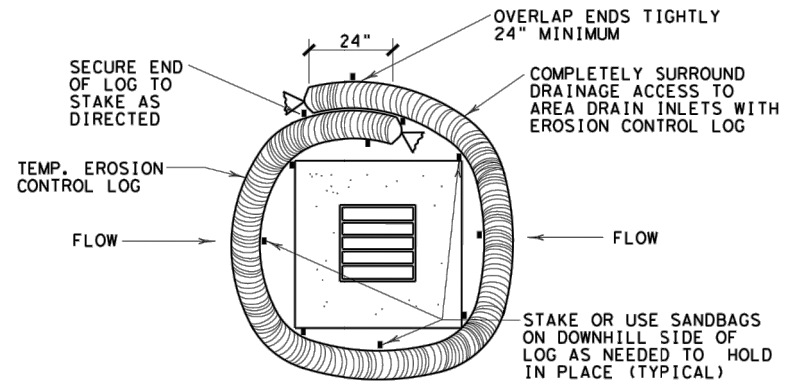
STAKE NOTCH DETAIL

SHEET 2 OF 3

		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES EROSION CONTROL LOG EC(9)-16			
FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT
© TxDOT: JULY 2016	CONT SECT	JOB	HIGHWAY
REVISIONS	0314 07	080	IH-20
DIST	COUNTY	SHEET NO.	
FTW	PARKER	032	

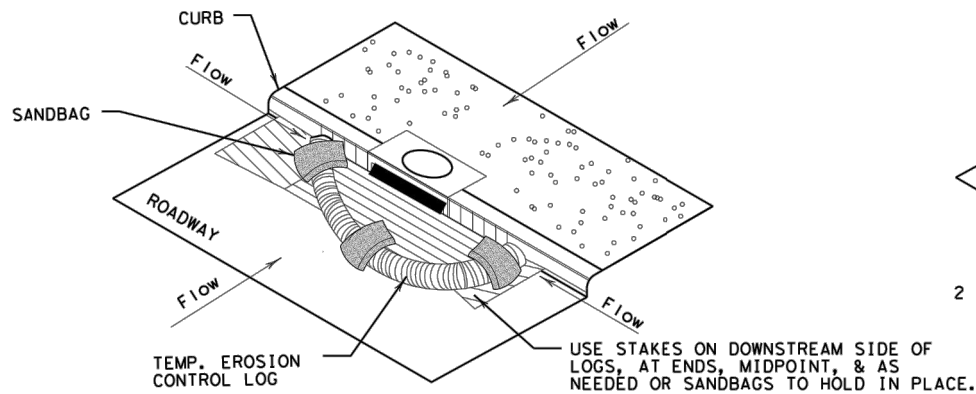
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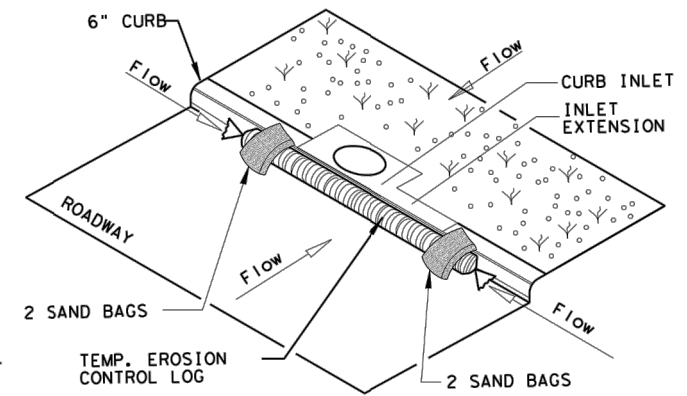
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

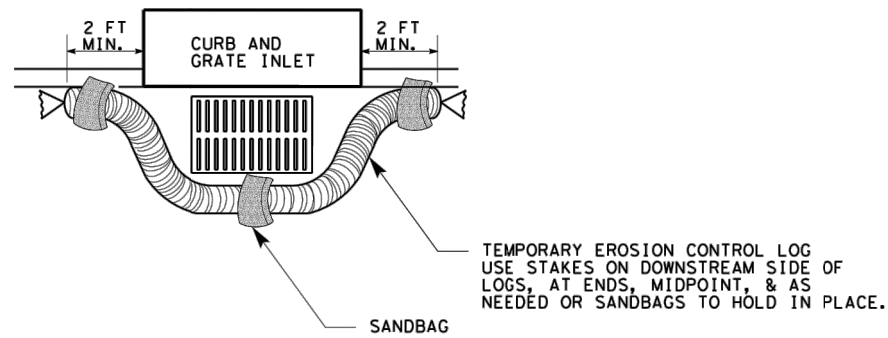
CL-CI



EROSION CONTROL LOG AT CURB INLET

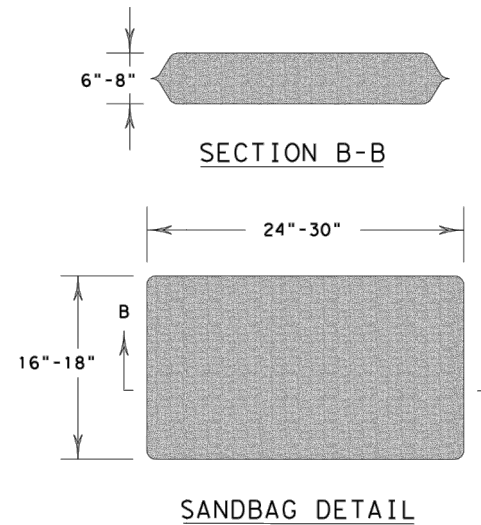
CL-CI

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

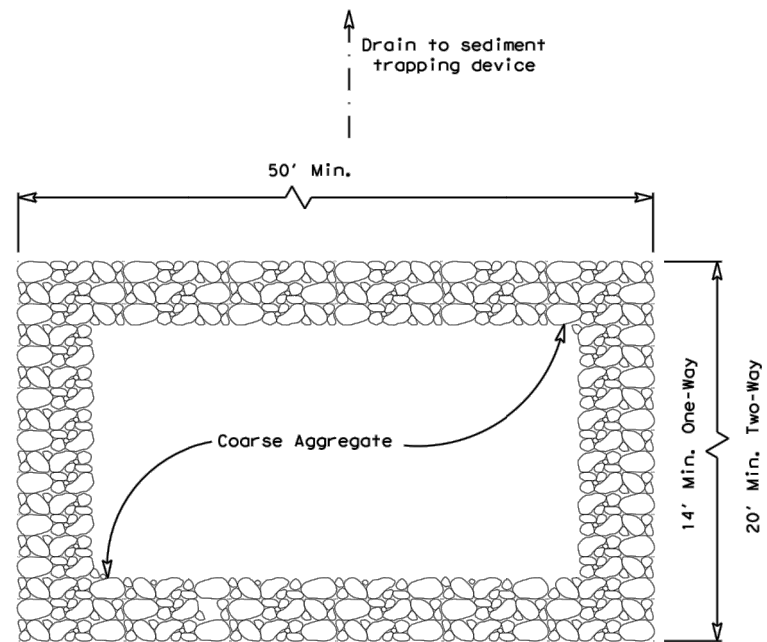


SHEET 3 OF 3

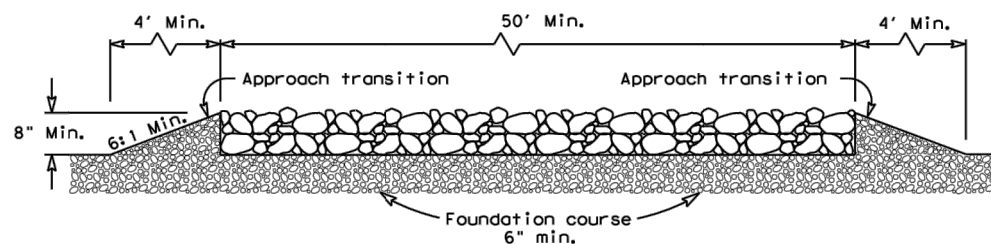
		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES EROSION CONTROL LOG EC (9) - 16			
FILE: ec916	DW: TxDOT	CK: KM	DW: LS/PT
© TxDOT: JULY 2016	CONT: 0314	SECT: 07	JOB: 080
REVISIONS		HIGHWAY: IH-20	
DIST: FTW	COUNTY: PARKER	SHEET NO.: 033	

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DATE:
FILE:



PLAN VIEW

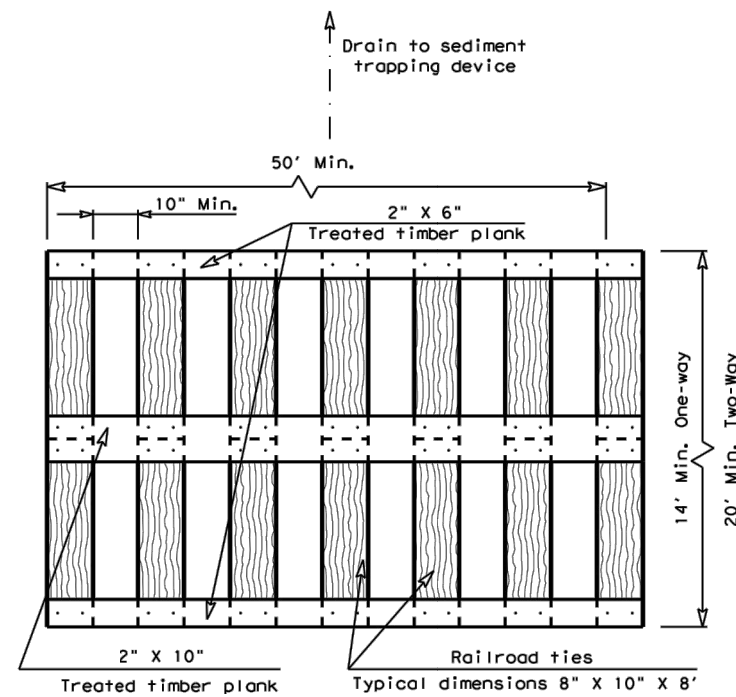


ELEVATION VIEW

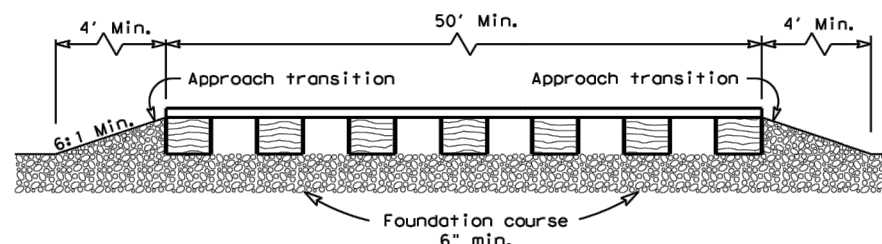
CONSTRUCTION EXIT (TYPE 1)
ROCK CONSTRUCTION (LONG TERM)

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

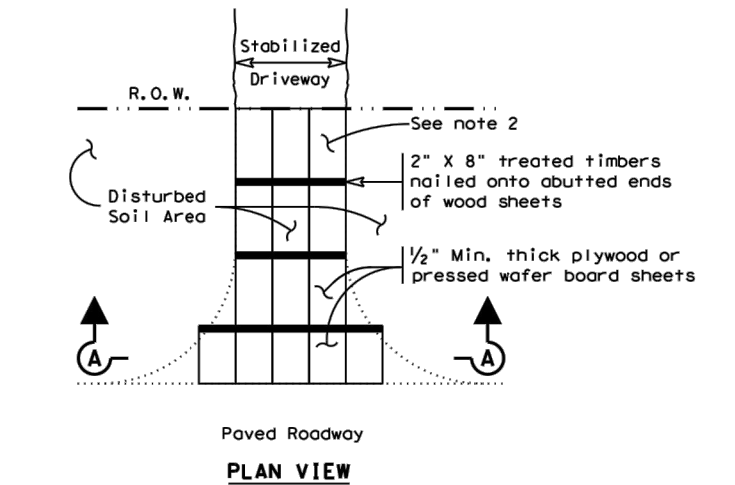


ELEVATION VIEW

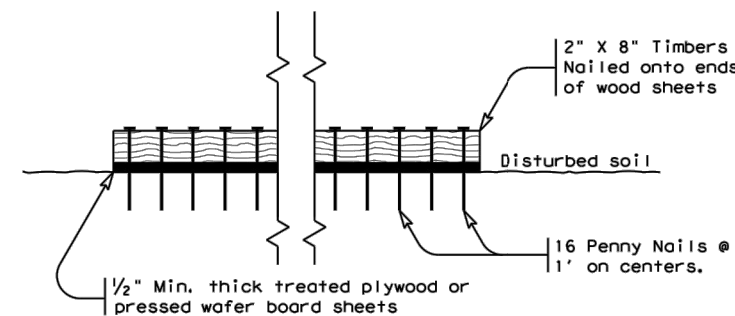
CONSTRUCTION EXIT (TYPE 2)
TIMBER CONSTRUCTION (LONG TERM)

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



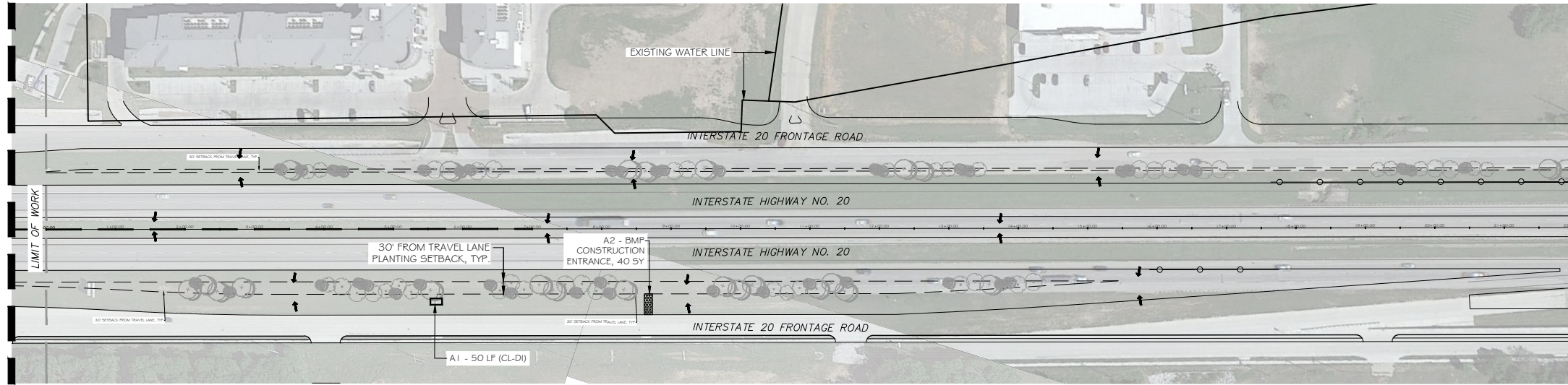
SECTION A-A

CONSTRUCTION EXIT (TYPE 3)
SHORT TERM

GENERAL NOTES (TYPE 3)

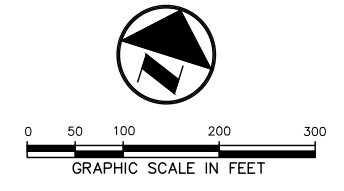
1. The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
2. The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
3. The treated 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	080	IH-20
DIST	COUNTY	SHEET NO.	
FTW	PARKER	034	



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

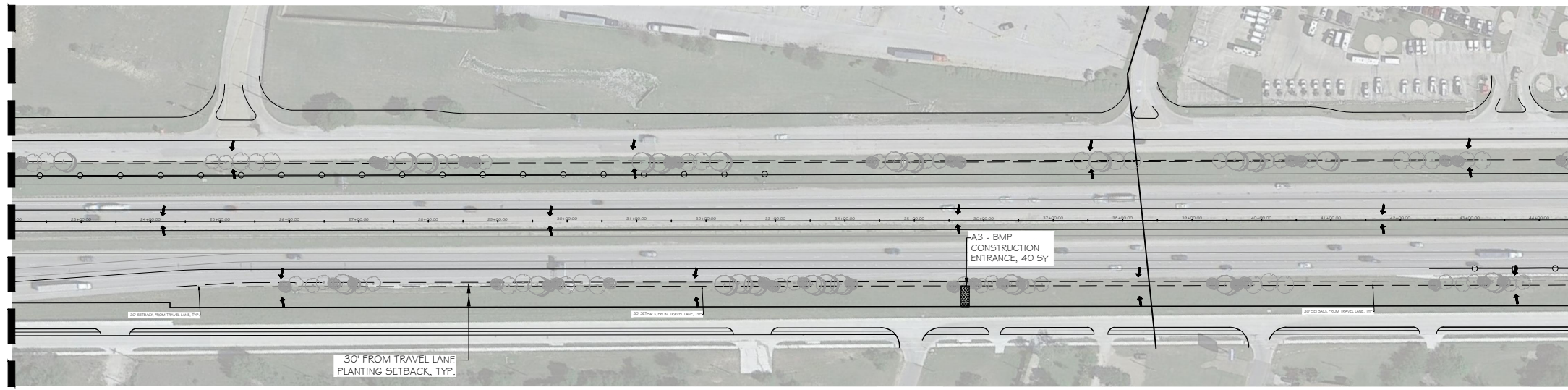
MATCHLINE SEE THIS SHEET



GENERAL NOTES

1. THE ENTIRE LIMITS OF IMPROVEMENTS WERE NOT SURVEYED. ALL LINWORK 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.

MATCHLINE SEE THIS SHEET



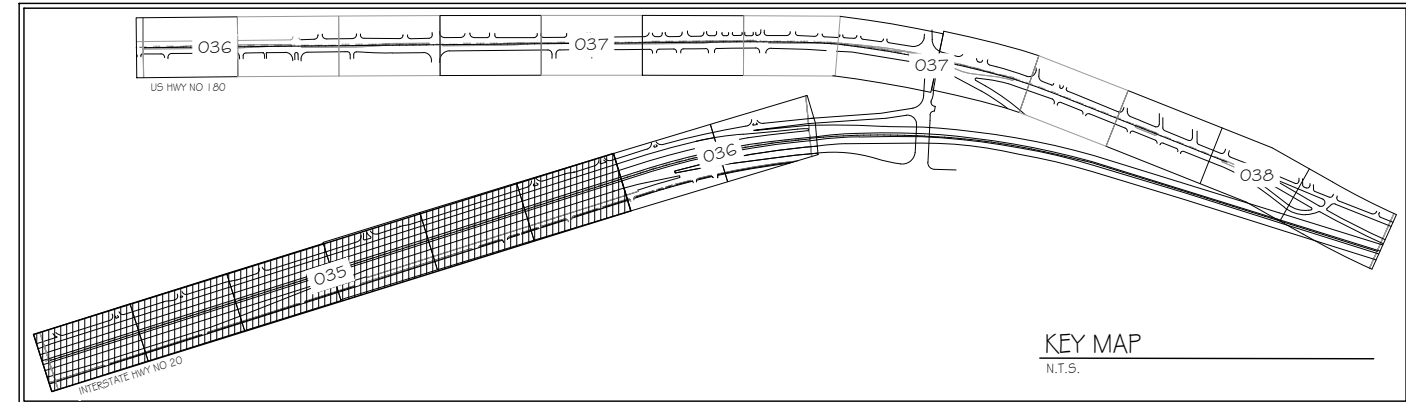
2 IH 20 STA 22+00.00 - STA 44+50.00

MATCHLINE SEE SHEET 036

ESTIMATE OF EROSION CONTROL QUANTITIES - BY SHEET				
ITEM NO.	DESC.	DESCRIPTION	UNIT	TOTAL
506	6020	CONSTRUCTION EXITS (INSTL) (TYP 1)	SY	80
506	6024	CONSTRUCTION EXITS (REMOVE)	SY	80
506	6040	BIODEG EROSION CONT LOGS (CL-CI) (8") (INSTALL)	LF	50
506	6043	BIODEG EROSION CONT LOGS (CL-CI) (8") (REMOVE)	LF	50

BMP NUMBER:	BMP DATE INSTALLED:	BMP DATE REMOVED:
BMP-A1		
BMP-A2		
BMP-A3		

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



GRADING AND DRAINAGE LEGEND

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

Pacheco Koch 4060 BRYANT IRVIN ROAD
FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10193824

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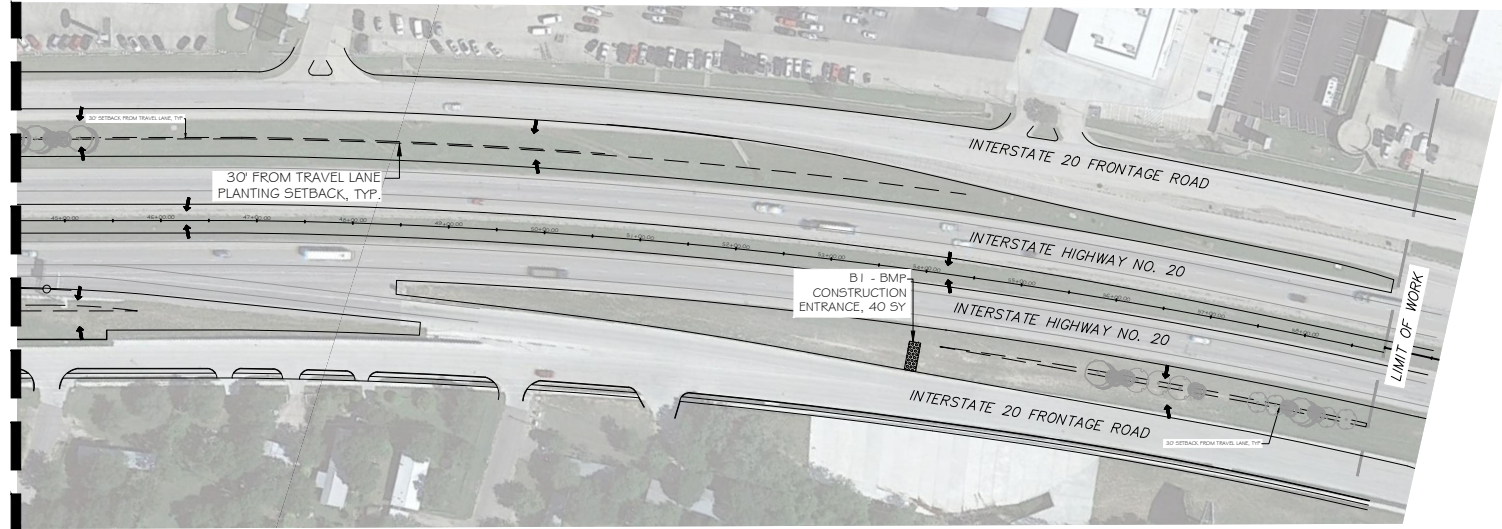
EROSION CONTROL PLAN
IH 20
STA 0+00 - STA 44+50

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. F 2022(848)	SHEET NO. 035
STATE TEXAS	DISTRICT FTW	COUNTY PARKER
CONTROL 0314	SECTION 07	JOB 080
		HIGHWAY NO IH-20 & US 180

DWITMEYER 05/02/2022 12:15PM N:\DWG-47\4747-22-043\DWG\LANDSCAPE\FX\2018\SHEETS\EROSION CONTROL_PLANDWG

APRIL 2022 - 100% PLAN SUBMITTAL

MATCHLINE SEE SHEET 035

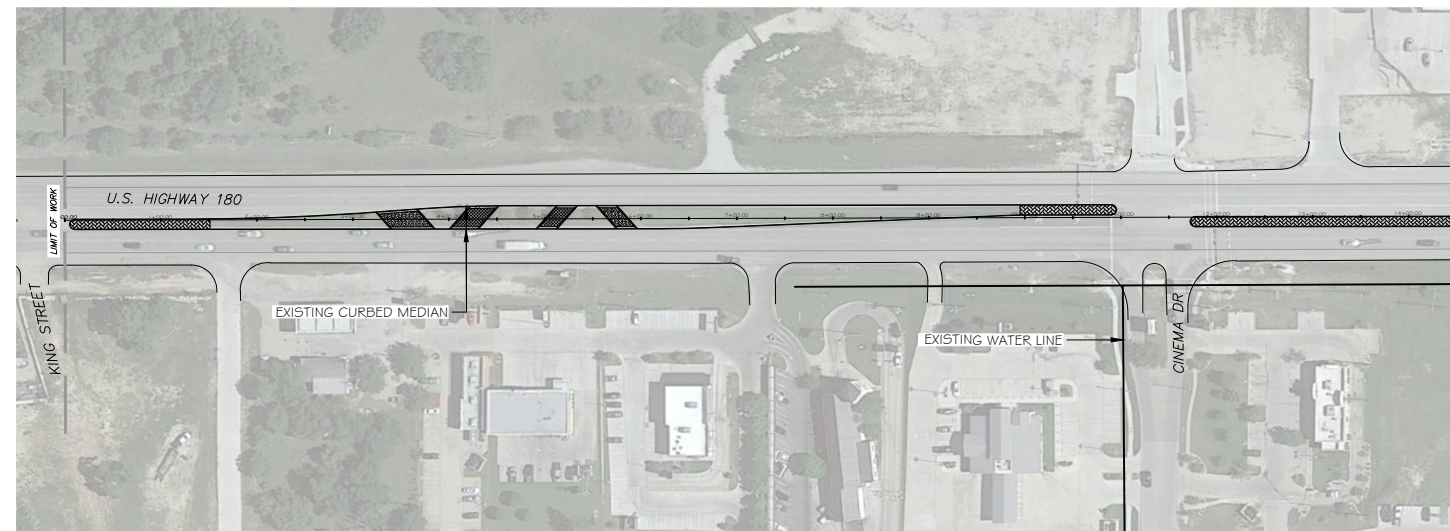


1 IH 20 STA 44+50 - STA 59+00



GENERAL NOTES

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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 T&DOT ROW.

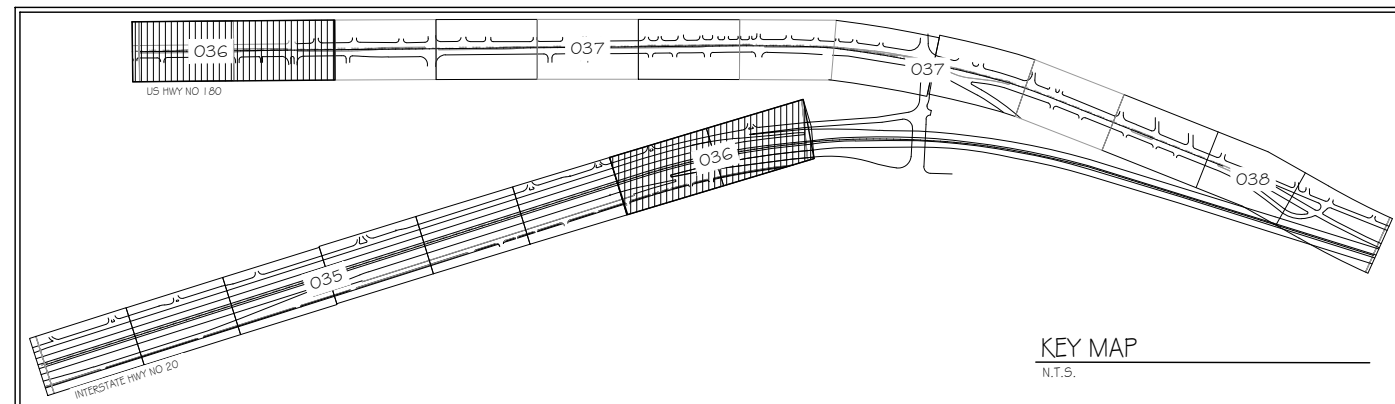


2 US 180 STA 00+00 - STA 14+50



ESTIMATE OF EROSION CONTROL QUANTITIES - BY SHEET				
ITEM NO.	DESC.	DESCRIPTION	UNIT	TOTAL
506	6020	CONSTRUCTION EXITS (INSTR) (TYP 1)	SY	40
506	6024	CONSTRUCTION EXITS (REMOVE)	SY	40

BMP NUMBER:	BMP DATE INSTALLED:	BMP DATE REMOVED:
BMP-B1		



KEY MAP
N.T.S.

GRADING AND DRAINAGE LEGEND

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

Pacheco Koch 4060 BRYANT IRVIN ROAD
FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10193824

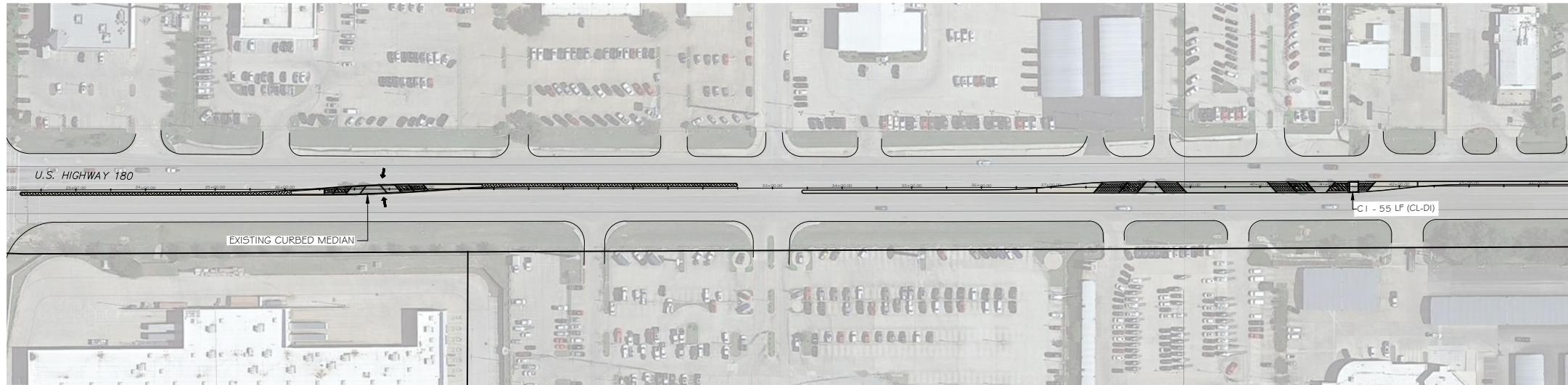
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EROSION CONTROL PLAN
IH 20
STA 44+50 - STA 59+00
US 180
STA 0+00 - STA 14+50

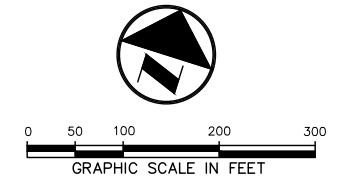
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. F 2022(848)	SHEET NO. 036
STATE TEXAS	DISTRICT FTW	COUNTY PARKER
CONTROL 0314	SECTION 07	JOB 080
		HIGHWAY NO IH-20 & US 180



APRIL 2022 - 100% PLAN SUBMITTAL

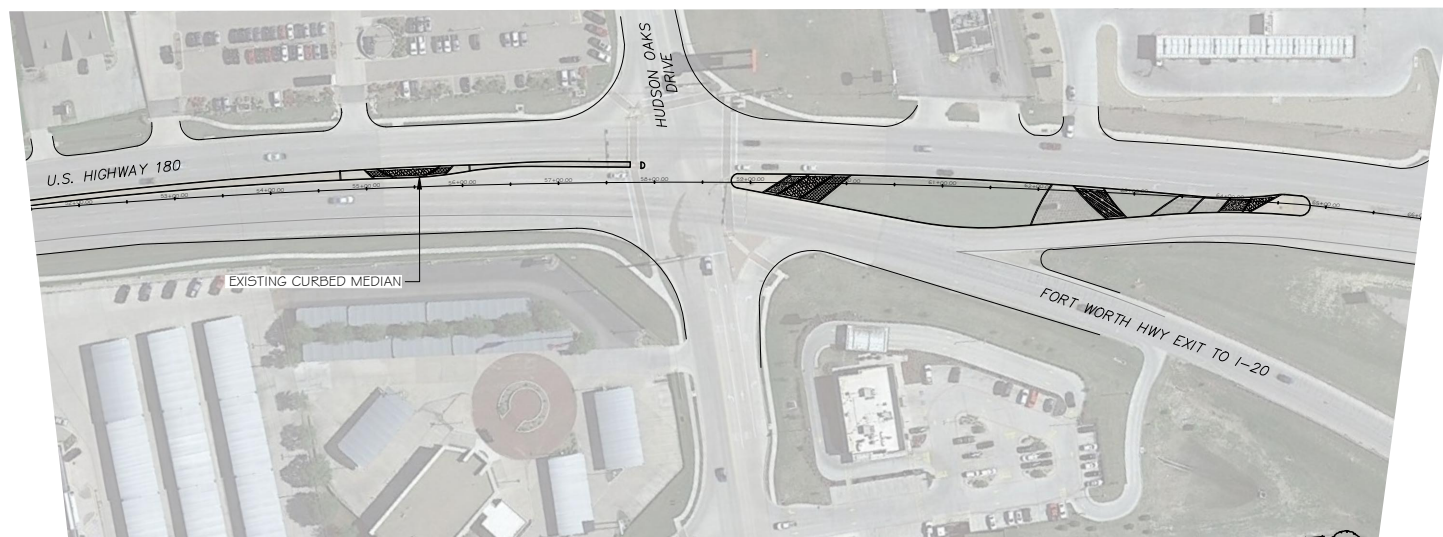


1 US 180 STA 22+00 - STA 44+50



GENERAL NOTES

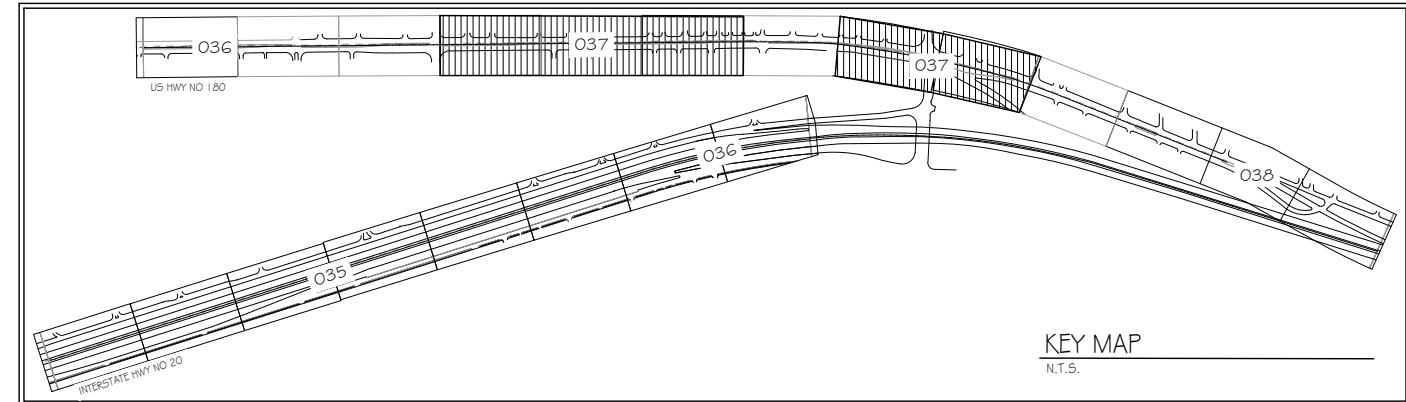
1. THE ENTIRE LIMITS OF IMPROVEMENTS WERE NOT SURVEYED. ALL LINEWORK IS APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
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4. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.
5. SEE PLANTING PLAN SHEETS FOR LOCATION AND TYPE(S) OF PLANNED FINAL STABILIZATION FOR THE PROJECT'S DISTURBED SOILS.
6. NO WORK OR EQUIPMENT SHALL OCCUR OUTSIDE OF T&DOT ROW.



2 US 180 STA 51+50 - STA 66+00

ESTIMATE OF EROSION CONTROL QUANTITIES - BY SHEET				
ITEM NO.	DESC.	DESCRIPTION	UNIT	TOTAL
506	6040	BIODEG EROSN CONT LOGS (INSTL) (8')	LF	55
506	6043	BIODEG EROSN CONT LOGS (REMOVE) (8')	LF	55

BMP NUMBER:	BMP DATE INSTALLED:	BMP DATE REMOVED:
BMP-C1		



GRADING AND DRAINAGE LEGEND

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

Pacheco Koch 4060 BRYANT IRVIN ROAD
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TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10193824

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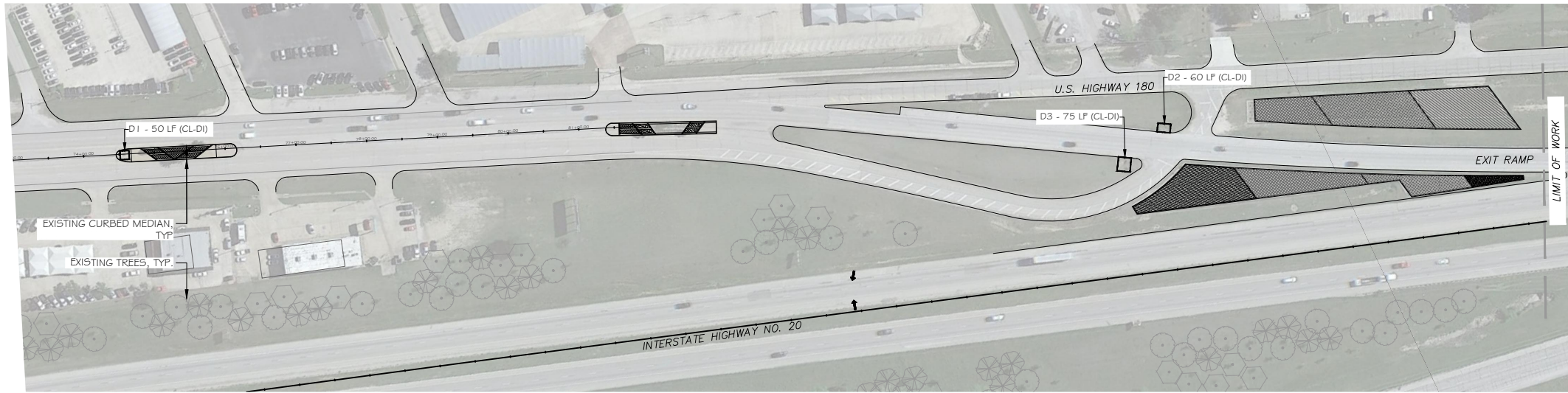
EROSION CONTROL PLAN
US 180
STA 22+00 - STA 66+00

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. F 2022(848)	SHEET NO. 037
STATE TEXAS	DISTRICT FTW	COUNTY PARKER
CONTROL 0314	SECTION 07	JOB 080
		HIGHWAY NO IH-20 & US 180

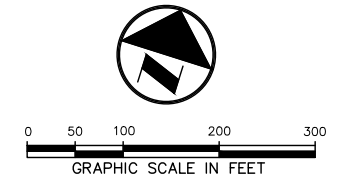


DWTMEYER 05/02/2022 12:15PM N: DWG-47\4747-22.043\DWG\LANDSCAPE.FX 2018\SHEETS\EROSION CONTROL.PLAN.DWG

APRIL 2022 - 100% PLAN SUBMITTAL



1 US 180 STA 73+00 - EXIT RAMP

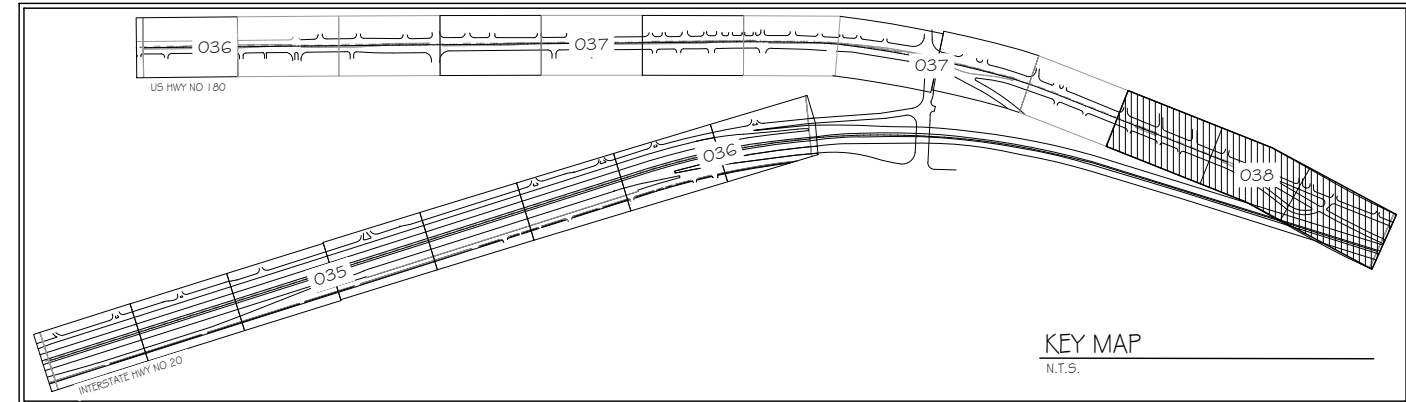


GENERAL NOTES

1. THE ENTIRE LIMITS OF IMPROVEMENTS WERE NOT SURVEYED. ALL LINEWORK IS APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
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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 TDDOT ROW.

ESTIMATE OF EROSION CONTROL QUANTITIES - BY SHEET				
ITEM NO.	DESC.	DESCRIPTION	UNIT	TOTAL
506	6040	BIODEG EROSN CONT LOGS (INSTL) (B)	LF	185
506	6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	185

BMP NUMBER:	BMP DATE INSTALLED:	BMP DATE REMOVED:
BMP-D1		
BMP-D2		
BMP-D3		



GRADING AND DRAINAGE LEGEND

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

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FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10193824

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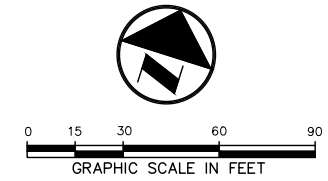
EROSION CONTROL PLAN
US 180
STA 73 +00 - EXIT RAMP

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. F 2022(848)	SHEET NO. 038
STATE TEXAS	DISTRICT FTW	COUNTY PARKER
CONTROL 0314	SECTION 07	JOB 080
		HIGHWAY NO IH-20 & US 180



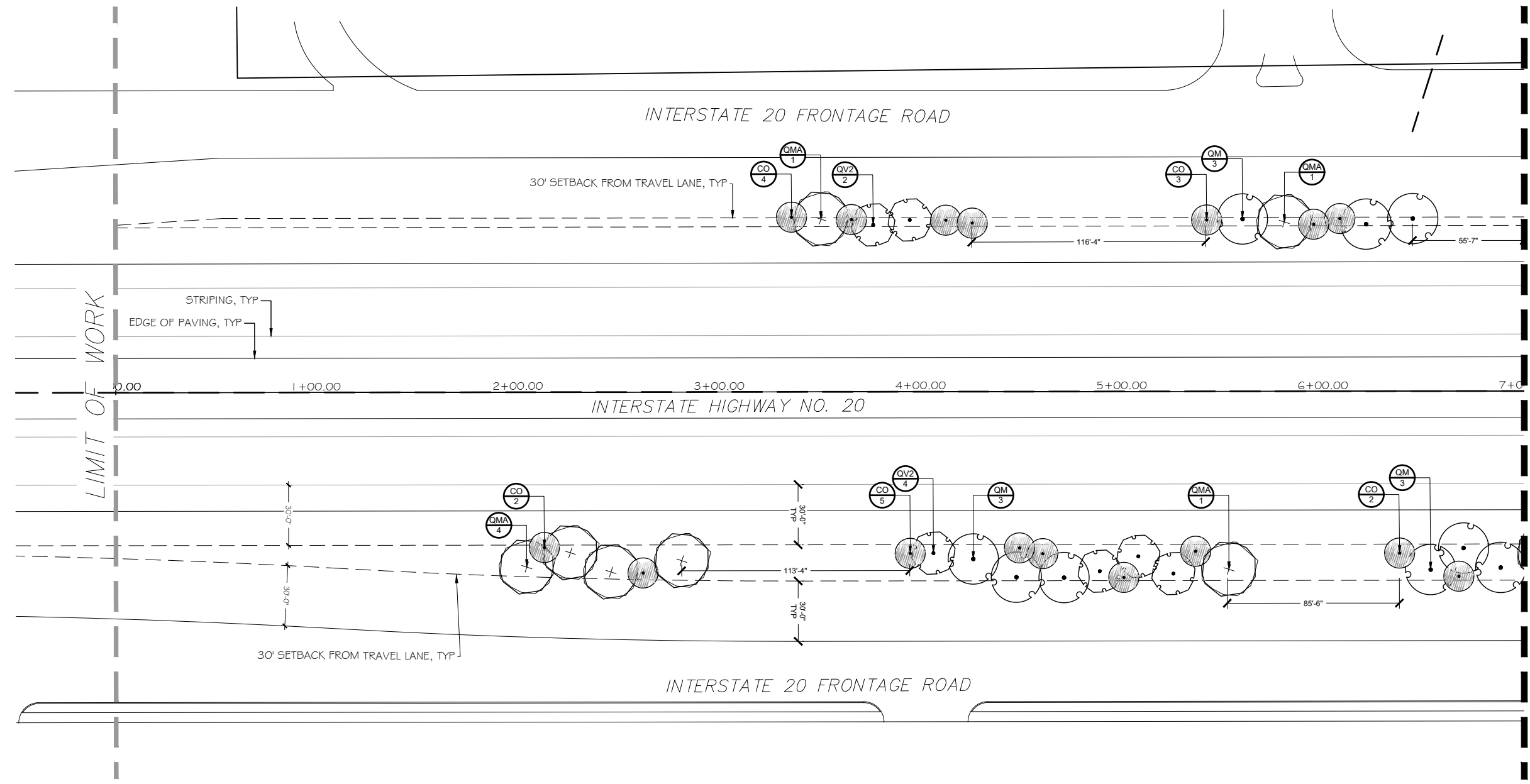
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APRIL 2022 - 100% PLAN SUBMITTAL



GENERAL NOTES

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3. PLANT SCHEDULE PROVIDED FOR CONTRACTORS CONVENIENCE ONLY; REF TO QUANTITY SUMMARY FOR FINAL QUANTITIES.



LIMIT OF WORK

MATCHLINE SEE SHEET 040

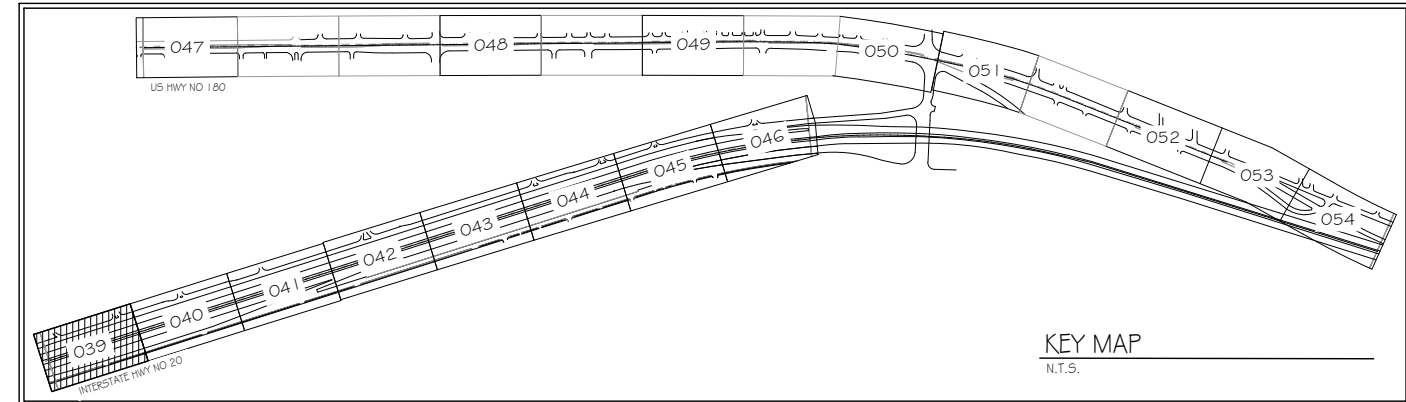
1 IH 20 STA 0+00 - STA 7+00

ESTIMATE OF QUANTITIES - BY SHEET				
ITEM NO	DESC	DESCRIPTION	UNIT	TOTAL
192	6025	PLANT MATERIAL (45 GAL) (TREE) (ORNAMENTAL)	EA	16
192	6025	PLANT MATERIAL (45 GAL) (TREE)	EA	22

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PLANT SCHEDULE 1			
TREES	BOTANICAL / COMMON NAME	QTY	REMARKS
CO	CERCIS CANADENSIS 'OKLAHOMA' OKLAHOMA REDBUD	16	192 6025 PLANT MATERIAL (45 GAL)(TREE)
QMA	QUERCUS MACROCARPA BURR OAK	7	192 6025 PLANT MATERIAL (45 GAL)(TREE)
QM	QUERCUS MUEHLENBERGII CHINKAPIN OAK	9	192 6025 PLANT MATERIAL (45 GAL)(TREE)
QV2	QUERCUS VIRGINIANA SOUTHERN LIVE OAK	6	192 6025 PLANT MATERIAL (45 GAL)(TREE)

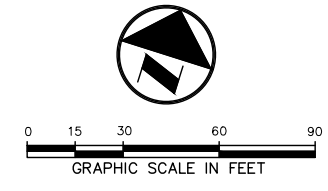


PLANTING PLAN
IH 20
STA 0+00 - STA 7+00

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	F 2022(848)	039
STATE	DISTRICT	COUNTY
TEXAS	FTW	PARKER
CONTROL	SECTION	JOB
0314	07	080
		HIGHWAY NO
		IH-20 & US 180

DWITMEYER 05/02/2022 12:15PM N: DWG-47\4747-22.043\DWG\LANDSCAPE FX 2018\SHEETS\PLANTING PLAN.DWG

APRIL 2022 - 100% PLAN SUBMITTAL

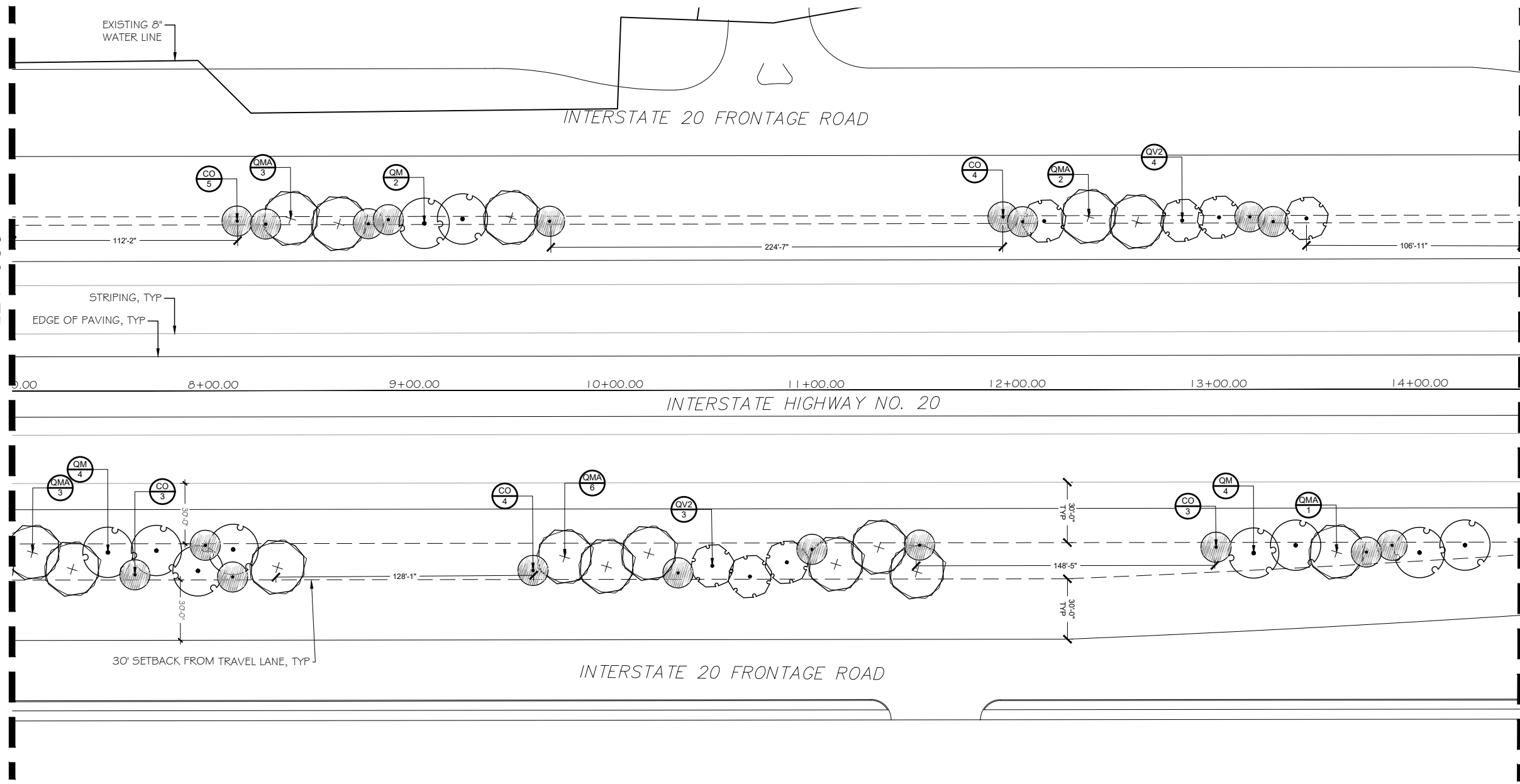


GENERAL NOTES

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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.
3. PLANT SCHEDULE PROVIDED FOR CONTRACTORS CONVENIENCE ONLY; REF TO QUANTITY SUMMARY FOR FINAL QUANTITIES.

MATCHLINE SEE SHEET 039

MATCHLINE SEE SHEET 041



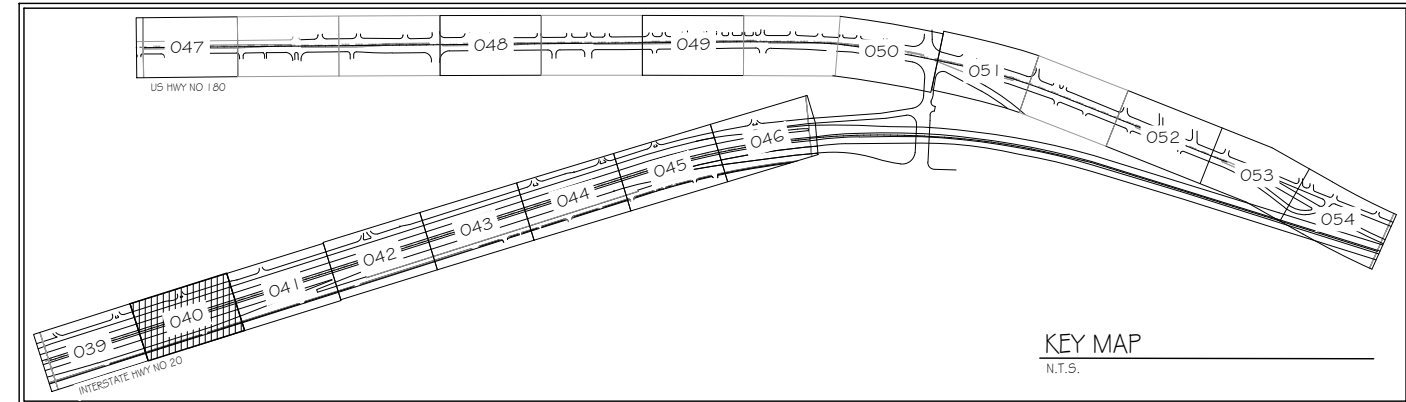
1 IH 20 STA 7+00 - STA 14+50

ESTIMATE OF QUANTITIES - BY SHEET 2				
ITEM NO	DESC	DESCRIPTION	UNIT	TOTAL
192	6025	PLANT MATERIAL (45 GAL) (TREE) (ORNAMENTAL)	EA	19
192	6025	PLANT MATERIAL (45 GAL) (TREE)	EA	32

Pacheco Koch 4060 BRYANT IRVIN ROAD
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PLANT SCHEDULE 2			
TREES	BOTANICAL / COMMON NAME	QTY	REMARKS
CO	CERCIS CANADENSIS 'OKLAHOMA' OKLAHOMA REDBUD	19	192 6025 PLANT MATERIAL (45 GAL)(TREE)
QMA	QUERCUS MACROCARPA BURR OAK	15	192 6025 PLANT MATERIAL (45 GAL)(TREE)
QM	QUERCUS MUEHLENBERGII CHINKAPIN OAK	10	192 6025 PLANT MATERIAL (45 GAL)(TREE)
QV2	QUERCUS VIRGINIANA SOUTHERN LIVE OAK	7	192 6025 PLANT MATERIAL (45 GAL)(TREE)

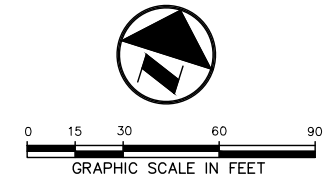


PLANTING PLAN
IH 20
STA 7+00 - STA 14+50

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. F 2022(848)	SHEET NO. 040
STATE TEXAS	DISTRICT FTW	COUNTY PARKER
CONTROL 0314	SECTION 07	JOB 080
		HIGHWAY NO IH-20 & US 180

DWTMEYER 05/02/2022 12:15PM N:\DWG-47\4747-22-043\DWG\LANDSCAPE\FX 2018\SHEETS\PLANTING PLAN.DWG

APRIL 2022 - 100% PLAN SUBMITTAL

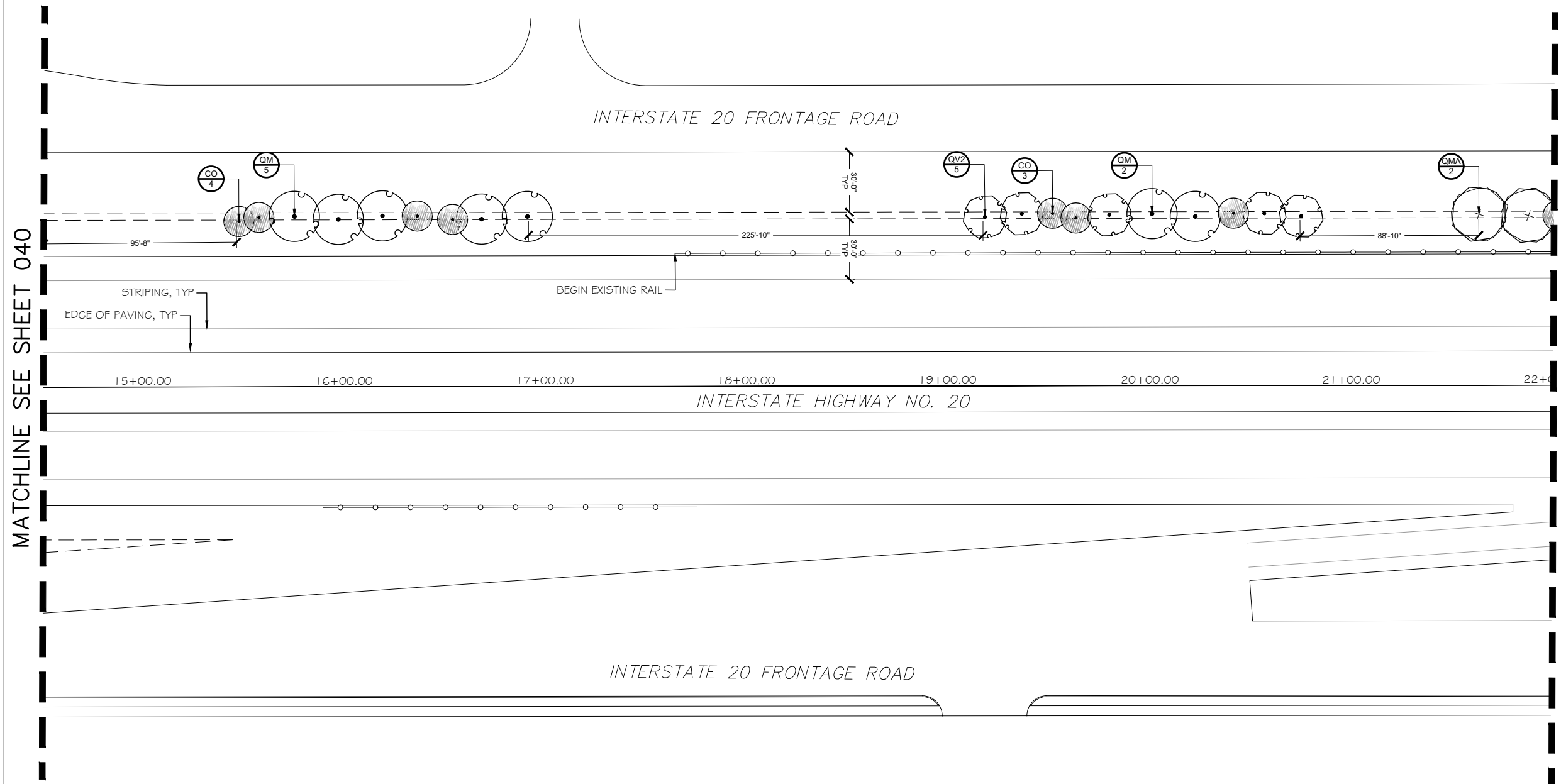


GENERAL NOTES

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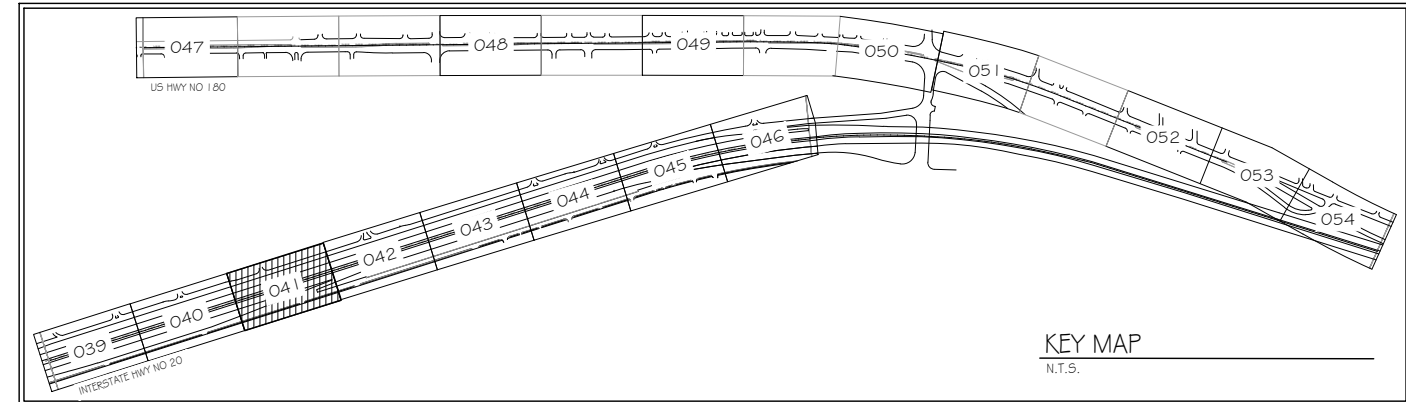
MATCHLINE SEE SHEET 040

MATCHLINE SEE SHEET 042



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

ESTIMATE OF QUANTITIES - BY SHEET 3				
ITEM NO	DESC	DESCRIPTION	UNIT	TOTAL
192	6025	PLANT MATERIAL (45 GAL) (TREE) (ORNAMENTAL)	EA	7
192	6025	PLANT MATERIAL (45 GAL) (TREE)	EA	14



PLANT SCHEDULE 3			
TREES	BOTANICAL / COMMON NAME	QTY	REMARKS
CO	CERCIS CANADENSIS 'OKLAHOMA' OKLAHOMA REDBUD	7	192 6025 PLANT MATERIAL (45 GAL)(TREE)
QMA	QUERCUS MACROCARPA BURR OAK	2	192 6025 PLANT MATERIAL (45 GAL)(TREE)
QM	QUERCUS MUEHLENBERGII CHINKAPIN OAK	7	192 6025 PLANT MATERIAL (45 GAL)(TREE)
QV2	QUERCUS VIRGINIANA SOUTHERN LIVE OAK	5	192 6025 PLANT MATERIAL (45 GAL)(TREE)

Pacheco Koch 4060 BRYANT IRVIN ROAD
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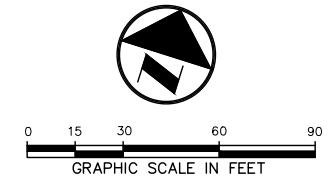


PLANTING PLAN
IH 20
STA 14+50 - STA 22+00

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. F 2022(848)	SHEET NO. 041
STATE CONTROL 0314	DISTRICT FTW SECTION 07	COUNTY PARKER JOB 080 HIGHWAY NO IH-20 & US 180

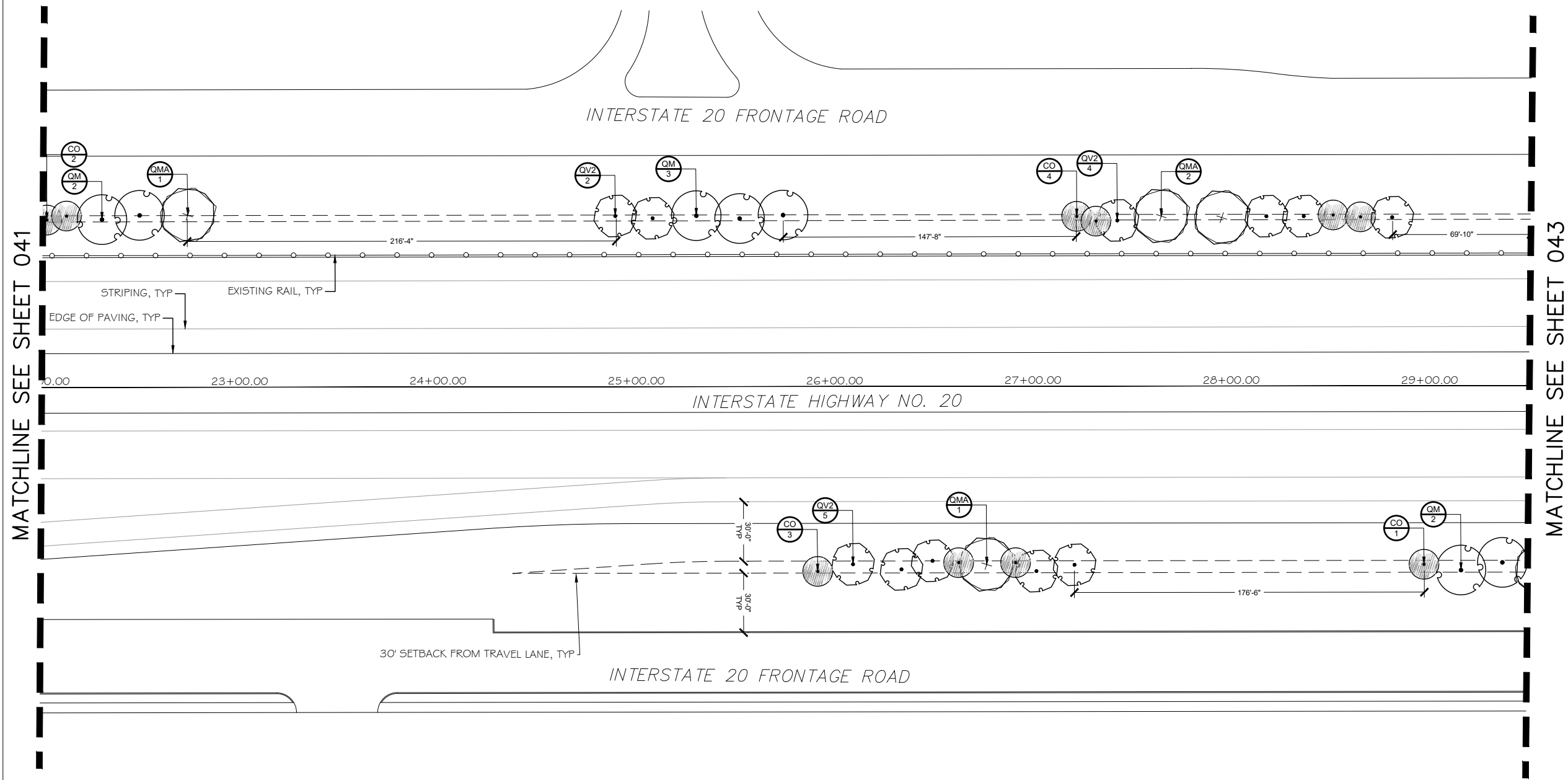
DWTMEYER 05/02/2022 12:18PM N: DWG-47\4747-22.043\DWG\LANDSCAPE FX 2018\SHEETS\PLANTING PLAN.DWG

APRIL 2022 - 100% PLAN SUBMITTAL



GENERAL NOTES

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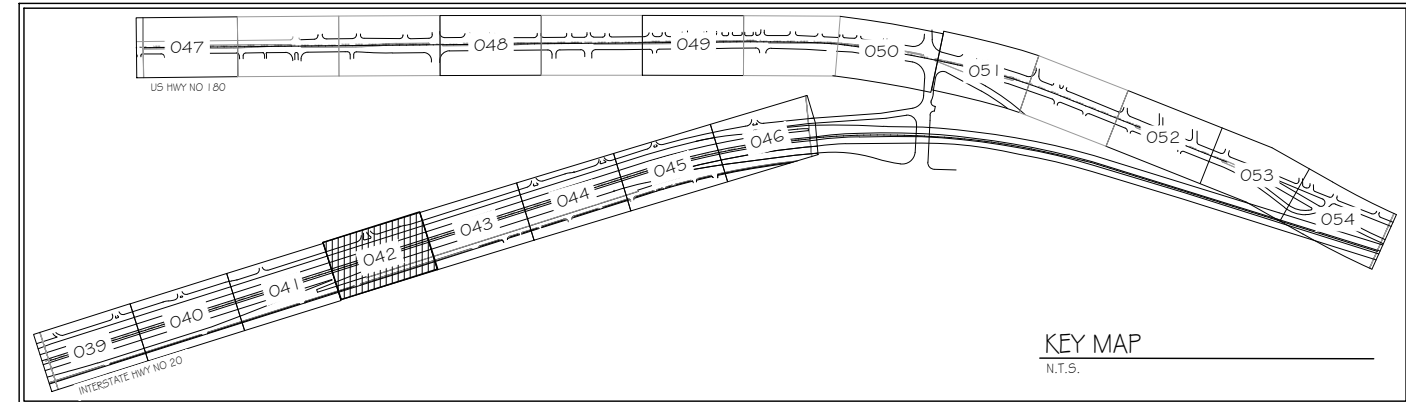
1 IH 20 STA 22+00 - STA 29+50

ESTIMATE OF QUANTITIES - BY SHEET 4				
ITEM NO	DESC	DESCRIPTION	UNIT	TOTAL
192	6025	PLANT MATERIAL (45 GAL) (TREE) (ORNAMENTAL)	EA	10
192	6025	PLANT MATERIAL (45 GAL) (TREE)	EA	22

PLANT SCHEDULE 4			
TREES	BOTANICAL / COMMON NAME	QTY	REMARKS
CO	CERCIS CANADENSIS 'OKLAHOMA' OKLAHOMA REDBUD	10	192 6025 PLANT MATERIAL (45 GAL)(TREE)
QMA	QUERCUS MACROCARPA BURR OAK	4	192 6025 PLANT MATERIAL (45 GAL)(TREE)
QM	QUERCUS MUEHLENBERGII CHINKAPIN OAK	7	192 6025 PLANT MATERIAL (45 GAL)(TREE)
QV2	QUERCUS VIRGINIANA SOUTHERN LIVE OAK	11	192 6025 PLANT MATERIAL (45 GAL)(TREE)

Pacheco Koch 4060 BRYANT IRVIN ROAD
FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10193824

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KEY MAP
N.T.S.

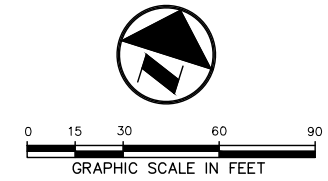


PLANTING PLAN
IH 20
STA 22+00 - STA 29+50

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. F 2022(848)	SHEET NO. 042
STATE TEXAS	DISTRICT FTW	COUNTY PARKER
CONTROL 0314	SECTION 07	JOB 080
		HIGHWAY NO IH-20 & US 180

DWTMEYER 05/02/2022 - 12:18PM N: DWG-47\4747-22.043\DWG\LANDSCAPE FX 2018\SHEETS\PLANTING PLAN.DWG

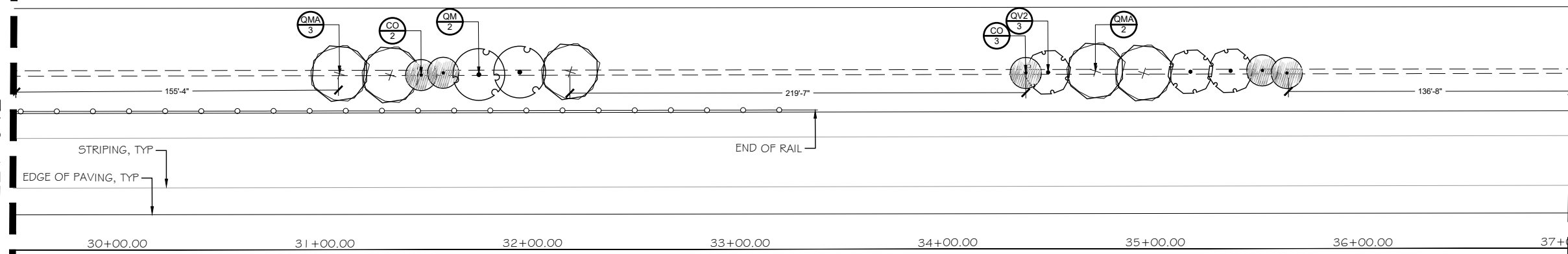
APRIL 2022 - 100% PLAN SUBMITTAL



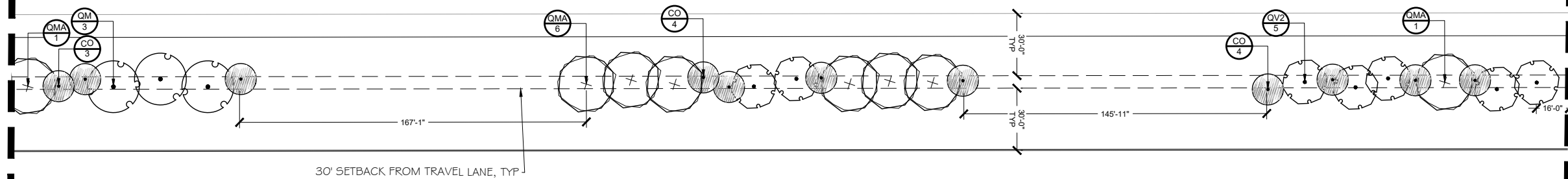
INTERSTATE 20 FRONTAGE ROAD

MATCHLINE SEE SHEET 042

MATCHLINE SEE SHEET 044



INTERSTATE HIGHWAY NO. 20



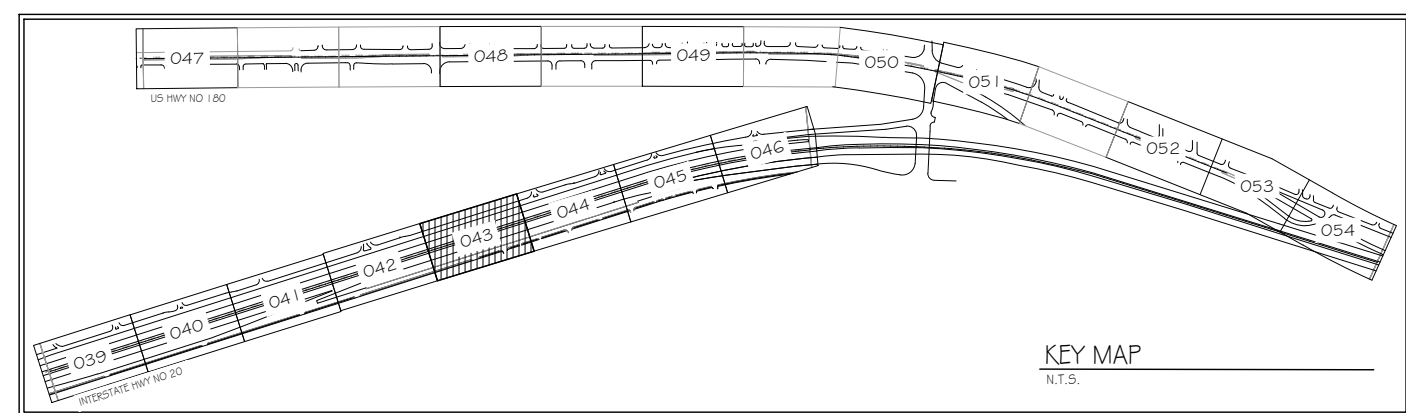
INTERSTATE 20 FRONTAGE ROAD

1 IH 20 STA 29+50 - STA 37+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. PLANT SCHEDULE PROVIDED FOR CONTRACTORS CONVENIENCE ONLY; REF TO QUANTITY SUMMARY FOR FINAL QUANTITIES.

ESTIMATE OF QUANTITIES - BY SHEET 5				
ITEM NO	DESC	DESCRIPTION	UNIT	TOTAL
192	6025	PLANT MATERIAL (45 GAL) (TREE) (ORNAMENTAL)	EA	16
192	6025	PLANT MATERIAL (45 GAL) (TREE)	EA	28



PLANT SCHEDULE 5			
TREES	BOTANICAL / COMMON NAME	QTY	REMARKS
CO	CERCIS CANADENSIS 'OKLAHOMA' OKLAHOMA REDBUD	16	192 6025 PLANT MATERIAL (45 GAL)(TREE)
QMA	QUERCUS MACROCARPA BURR OAK	13	192 6025 PLANT MATERIAL (45 GAL)(TREE)
QM	QUERCUS MUEHLENBERGII CHINKAPIN OAK	5	192 6025 PLANT MATERIAL (45 GAL)(TREE)
QV2	QUERCUS VIRGINIANA SOUTHERN LIVE OAK	10	192 6025 PLANT MATERIAL (45 GAL)(TREE)

Pacheco Koch 4060 BRYANT IRVIN ROAD
FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10193824

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PLANTING PLAN
IH 20
STA 29+50 - STA 37+00

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. F 2022(848)	SHEET NO. 043
STATE TEXAS	DISTRICT FTW	COUNTY PARKER
CONTROL 0314	SECTION 07	JOB 080
		HIGHWAY NO IH-20 & US 180

DWTMEYER 05/02/2022 - 12:18PM N: \\DWG-47\4747-22-043\DWG\LANDSCAPE\FX_2018\SHEETS\PLANTING_PLAN.DWG

APRIL 2022 - 100% PLAN SUBMITTAL

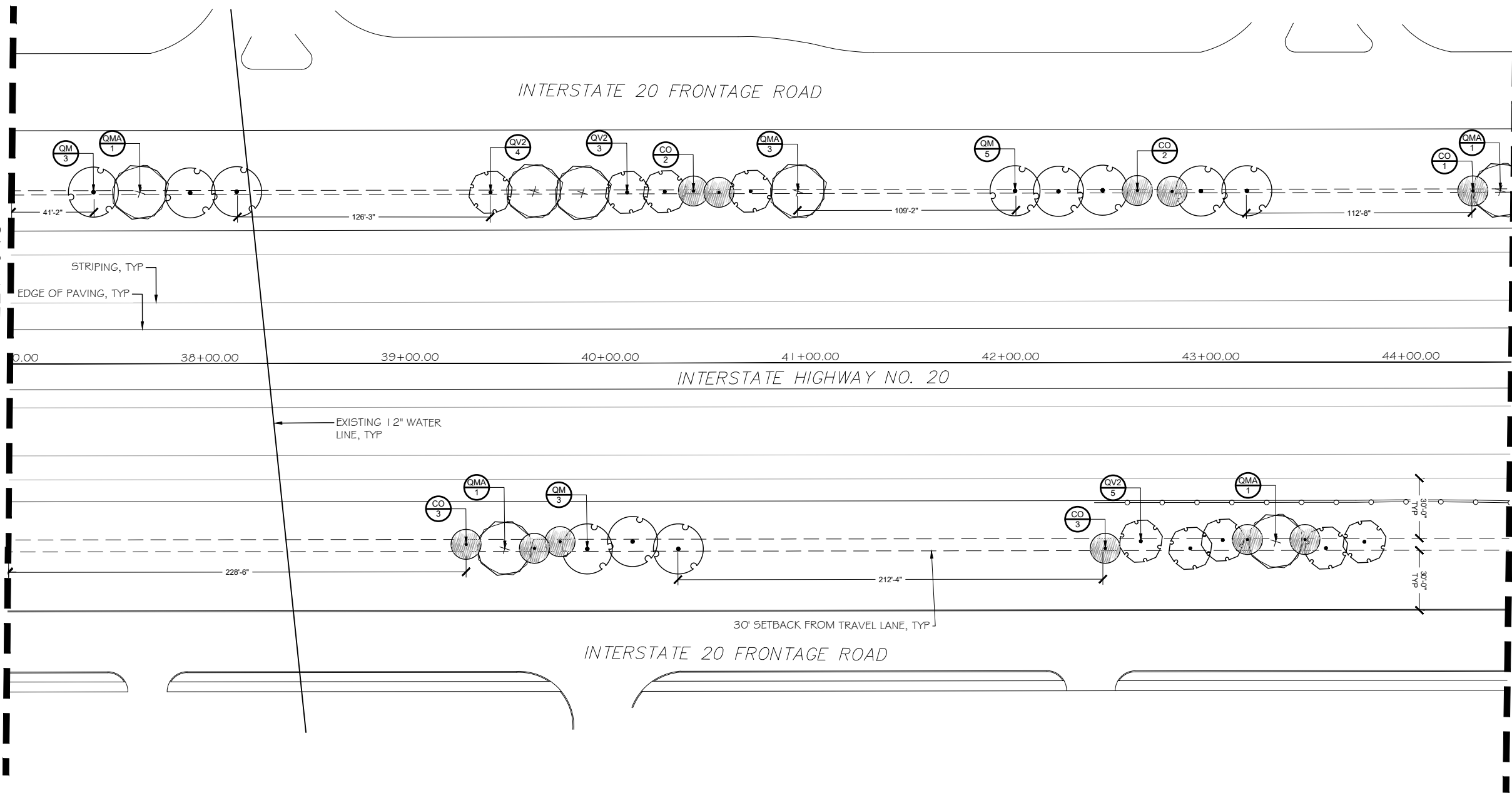


GENERAL NOTES

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.

MATCHLINE SEE SHEET 043

MATCHLINE SEE SHEET 045



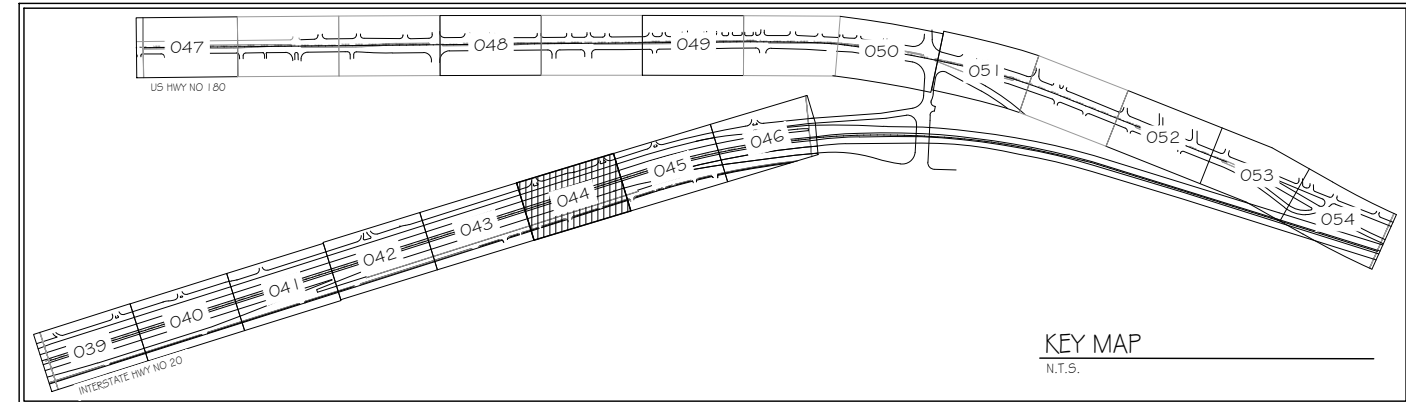
1 IH 20 STA 37+00 - STA 44+50

ESTIMATE OF QUANTITIES - BY SHEET 6				
ITEM NO	DESC	DESCRIPTION	UNIT	TOTAL
192	6025	PLANT MATERIAL (45 GAL) (TREE) (ORNAMENTAL)	EA	11
192	6025	PLANT MATERIAL (45 GAL) (TREE)	EA	27

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TX REG. SURVEYING FIRM LS-10193824

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PLANT SCHEDULE 6			
TREES	BOTANICAL / COMMON NAME	QTY	REMARKS
CO	CERCIS CANADENSIS 'OKLAHOMA' OKLAHOMA REDBUD	11	192 6025 PLANT MATERIAL (45 GAL)(TREE)
QMA	QUERCUS MACROCARPA BURR OAK	7	192 6025 PLANT MATERIAL (45 GAL)(TREE)
QM	QUERCUS MUEHLENBERGII CHINKAPIN OAK	11	192 6025 PLANT MATERIAL (45 GAL)(TREE)
QV2	QUERCUS VIRGINIANA SOUTHERN LIVE OAK	9	192 6025 PLANT MATERIAL (45 GAL)(TREE)



PLANTING PLAN
IH 20
STA 37+00 - STA 44+50

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. F 2022(848)	SHEET NO. 044
STATE TEXAS	DISTRICT FTW	COUNTY PARKER
CONTROL 0314	SECTION 07	JOB 080
		HIGHWAY NO IH-20 & US 180

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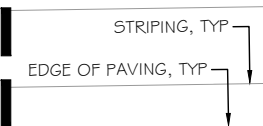
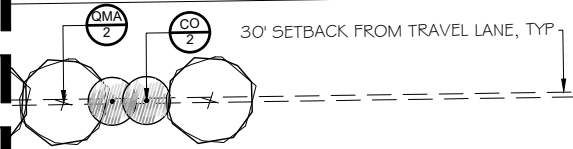
APRIL 2022 - 100% PLAN SUBMITTAL



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.

INTERSTATE 20 FRONTAGE ROAD



45+00.00 46+00.00 47+00.00 48+00.00 49+00.00 50+00.00 51+00.00 52+00.00

INTERSTATE HIGHWAY NO. 20

INTERSTATE 20 FRONTAGE ROAD

MATCHLINE SEE SHEET 044

MATCHLINE SEE SHEET 046

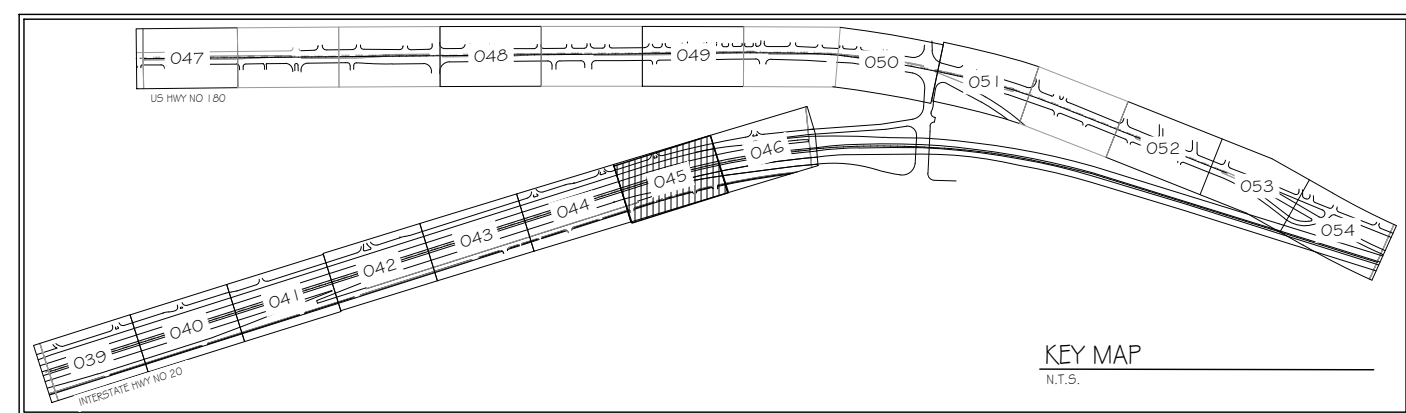
I IH 20 STA 44+50 - STA 52+00

ESTIMATE OF QUANTITIES - BY SHEET 7				
ITEM NO	DESC	DESCRIPTION	UNIT	TOTAL
192	6025	PLANT MATERIAL (45 GAL) (TREE) (ORNAMENTAL)	EA	2
192	6025	PLANT MATERIAL (45 GAL) (TREE)	EA	2

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TX REG. SURVEYING FIRM LS-10193824

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PLANT SCHEDULE 7			
TREES	BOTANICAL / COMMON NAME	QTY	REMARKS
CO	CERCIS CANADENSIS 'OKLAHOMA' OKLAHOMA REDBUD	2	192 6025 PLANT MATERIAL (45 GAL)(TREE)
QMA	QUERCUS MACROCARPA BURR OAK	2	192 6025 PLANT MATERIAL (45 GAL)(TREE)

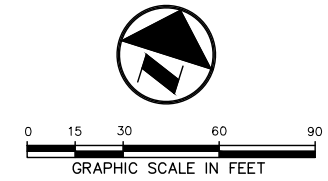


PLANTING PLAN
IH 20
STA 44+50 - STA 52+00

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. F 2022(848)	SHEET NO. 045
STATE TEXAS	DISTRICT FTW	COUNTY PARKER
CONTROL 0314	SECTION 07	JOB 080 HIGHWAY NO IH-20 & US 180

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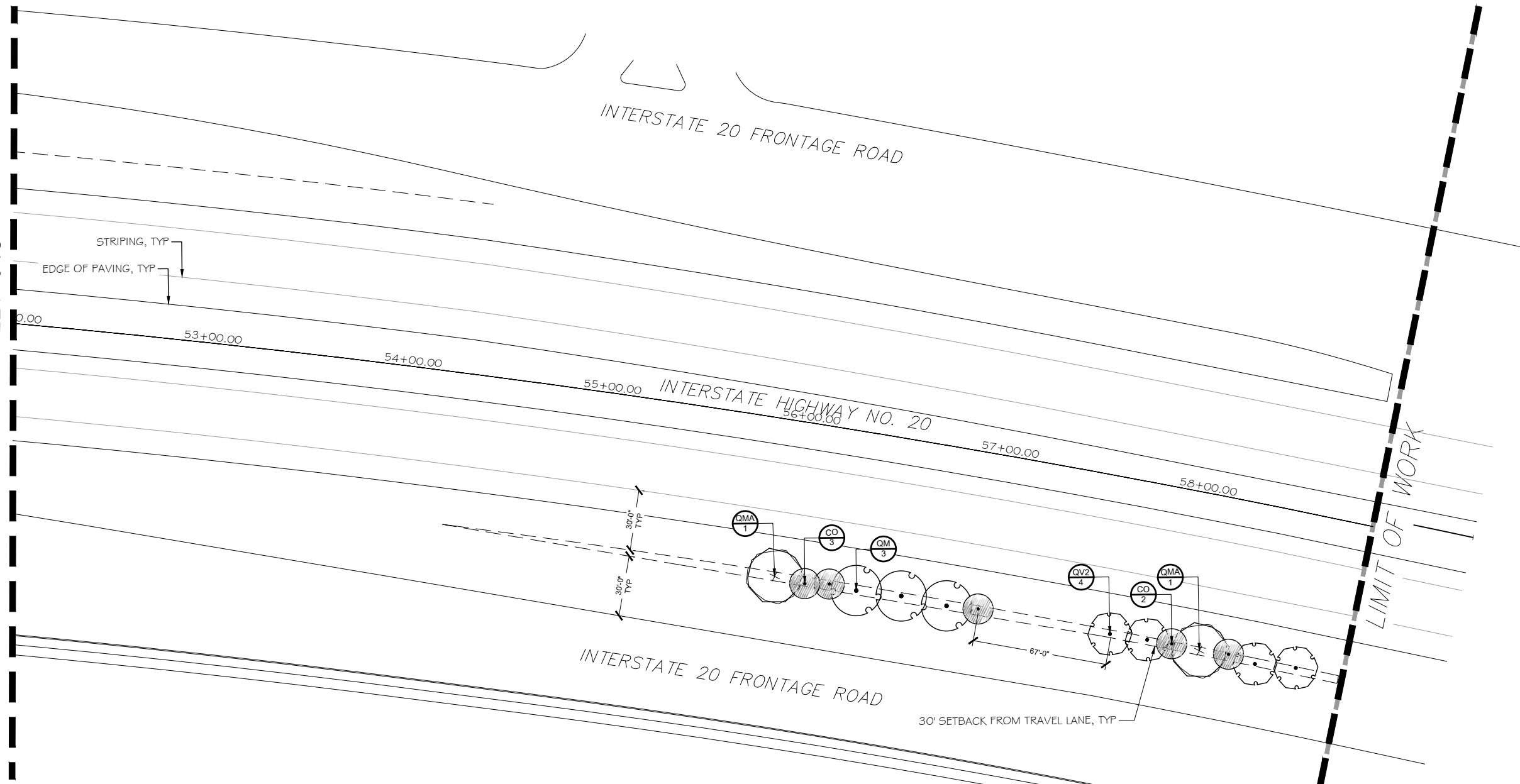
APRIL 2022 - 100% PLAN SUBMITTAL



GENERAL NOTES

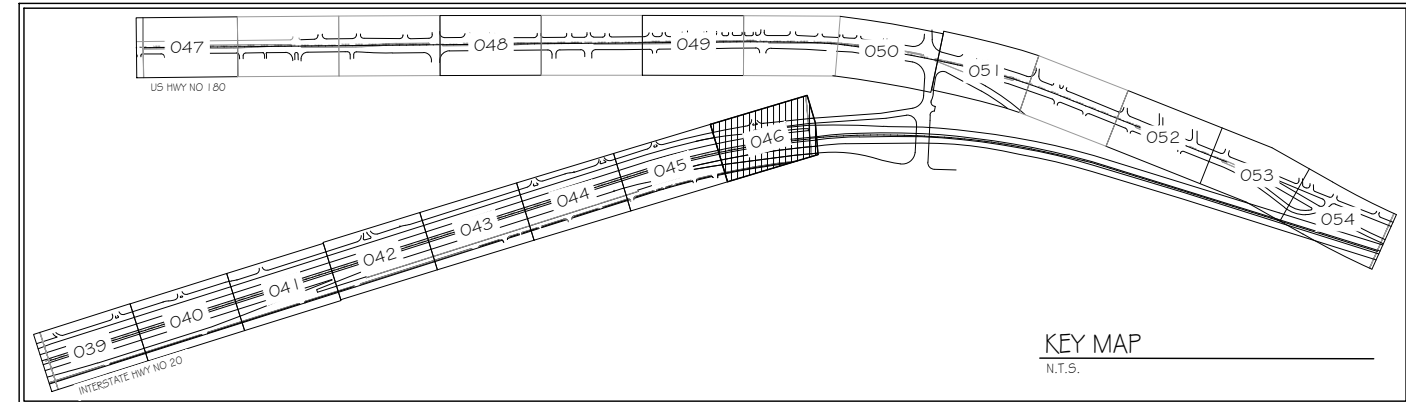
1. THE ENTIRE LIMITS OF IMPROVEMENTS WERE NOT SURVEYED. ALL LINEWORK IS APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
2. ALL UTILITIES SHOWN ON PLANS ARE APPROXIMATE IN NATURE AND DO NOT RELIEVE THE CONTRACTOR FROM ANY RESPONSIBILITY TO COORDINATE WITH APPROPRIATE AUTHORITIES.
3. PLANT SCHEDULE PROVIDED FOR CONTRACTORS CONVENIENCE ONLY; REF TO QUANTITY SUMMARY FOR FINAL QUANTITIES.

MATCHLINE SEE SHEET 045



1 IH 20 STA 52+00 STA 58+50

ESTIMATE OF QUANTITIES - BY SHEET 7				
ITEM NO	DESC	DESCRIPTION	UNIT	TOTAL
192	6025	PLANT MATERIAL (45 GAL) (TREE) (ORNAMENTAL)	EA	5
192	6025	PLANT MATERIAL (45 GAL) (TREE)	EA	9



KEY MAP
N.T.S.

PLANT SCHEDULE 8			
TREES	BOTANICAL / COMMON NAME	QTY	REMARKS
CO	CERCIS CANADENSIS 'OKLAHOMA' OKLAHOMA REDBUD	5	192 6025 PLANT MATERIAL (45 GAL)(TREE)
QMA	QUERCUS MACROCARPA BURR OAK	2	192 6025 PLANT MATERIAL (45 GAL)(TREE)
QM	QUERCUS MUEHLENBERGII CHINKAPIN OAK	3	192 6025 PLANT MATERIAL (45 GAL)(TREE)
QV2	QUERCUS VIRGINIANA SOUTHERN LIVE OAK	4	192 6025 PLANT MATERIAL (45 GAL)(TREE)

Pacheco Koch 4060 BRYANT IRVIN ROAD
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TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10193824

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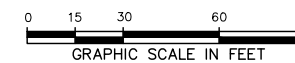


PLANTING PLAN
IH 20
STA 52+00 STA 58+50

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	F 2022(848)	046
STATE	DISTRICT	COUNTY
TEXAS	FTW	PARKER
CONTROL	SECTION	JOB
0314	07	080
		HIGHWAY NO
		IH-20 & US 180

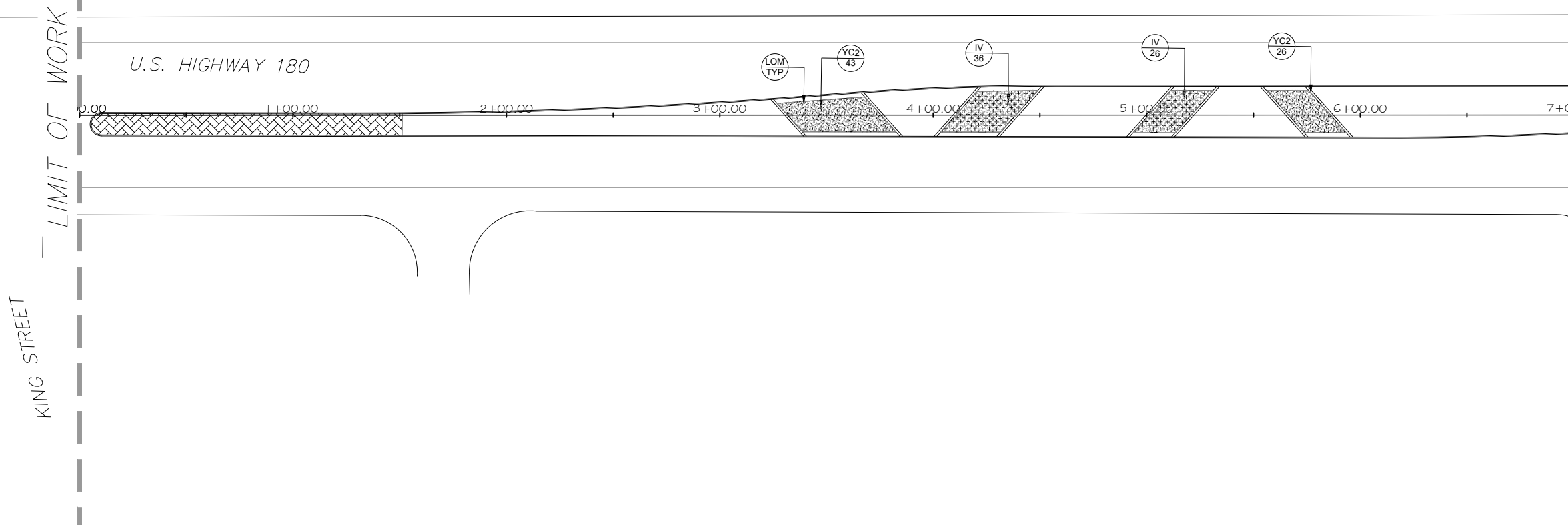
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APRIL 2022 - 100% PLAN SUBMITTAL



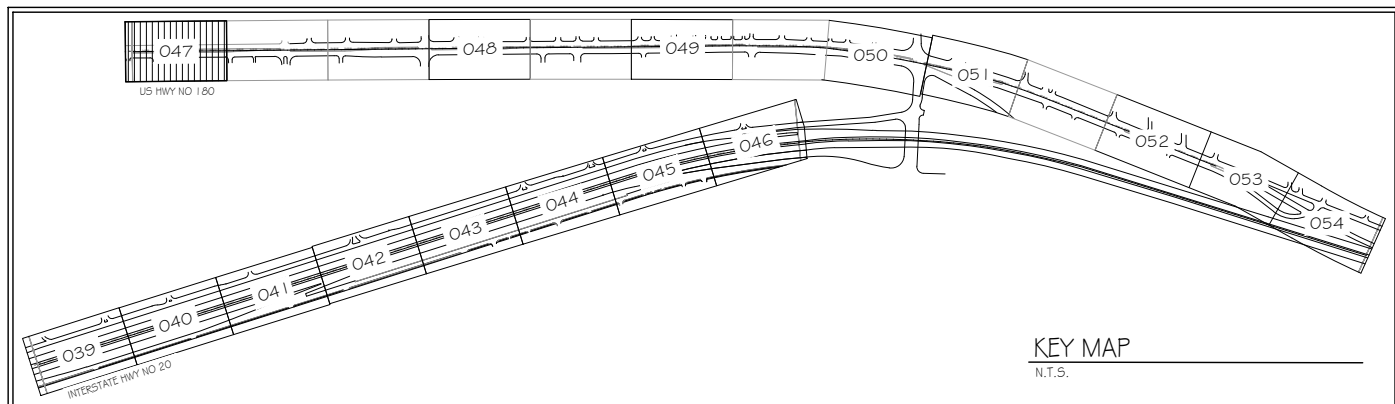
GENERAL NOTES

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 US 180 - STA 0+00.00 - STA 7+00.00

ESTIMATE OF QUANTITIES - BY SHEET 9				
ITEM NO	DESC	DESCRIPTION	UNIT	TOTAL
192	6013	LANDSCAPE PLANTING (MULCH)	SY	218
192	6002	LANDSCAPE PLANTING (1 GAL)	EA	131



PLANT SCHEDULE 9			
SHRUB AREAS	BOTANICAL / COMMON NAME	QTY	REMARKS
IV	ILEX VOMITORIA YAUPON HOLLY	62	192 6002 PLANT MATERIAL (1 GAL)(SHRUB)
YC2	YUCCA FILAMENTOSA 'COLOR GUARD' COLOR GUARD ADAM'S NEEDLE	69	192 6002 PLANT MATERIAL (1 GAL)(SHRUB)
SOD/SEED	BOTANICAL / COMMON NAME	QTY	REMARKS
LOM	SHREDDED BARK MULCH MULCH	1,963 SF	192 6013 LANDSCAPE PLANTING (MULCH) (BARK)

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FORT WORTH, TX 76109 817.412.7155
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PLANTING PLAN

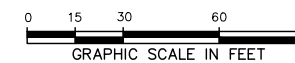
US 180
STA 0+00 - STA 7+00

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	F 2022(848)	047	
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY NO
0314	07	080	IH-20 & US 180



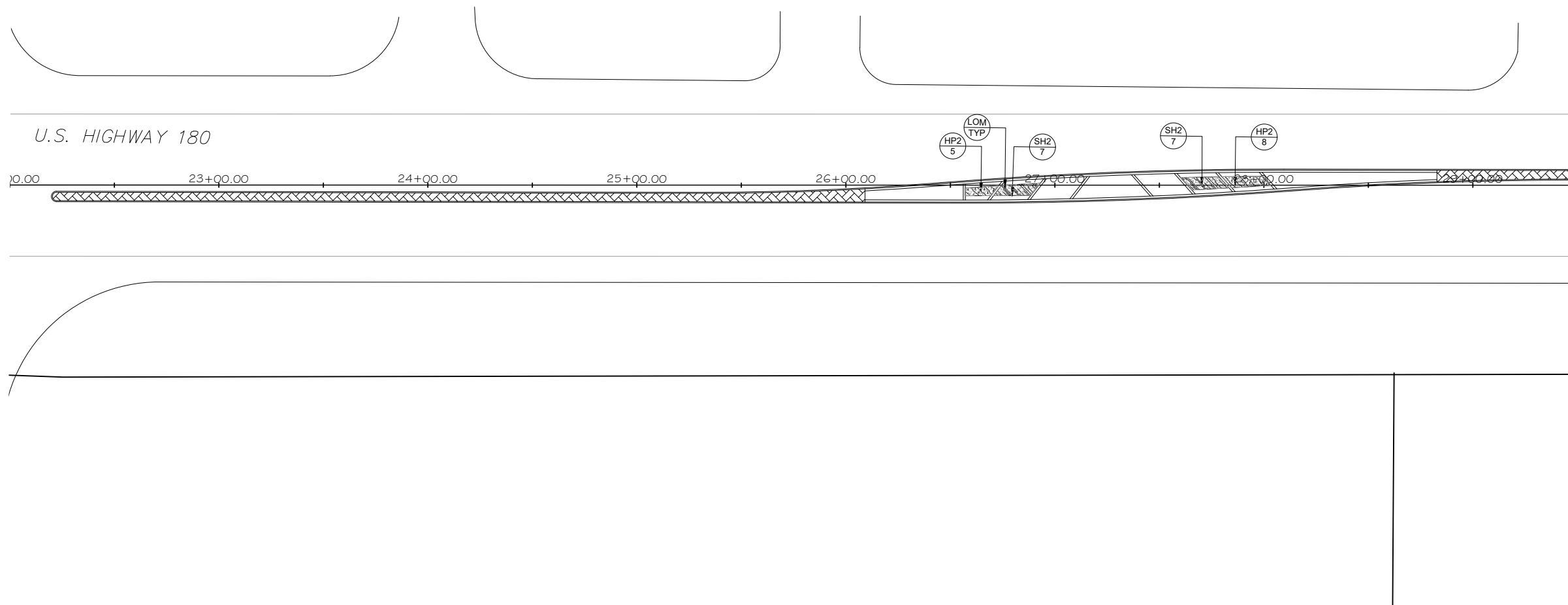
APRIL 2022 - 100% PLAN SUBMITTAL

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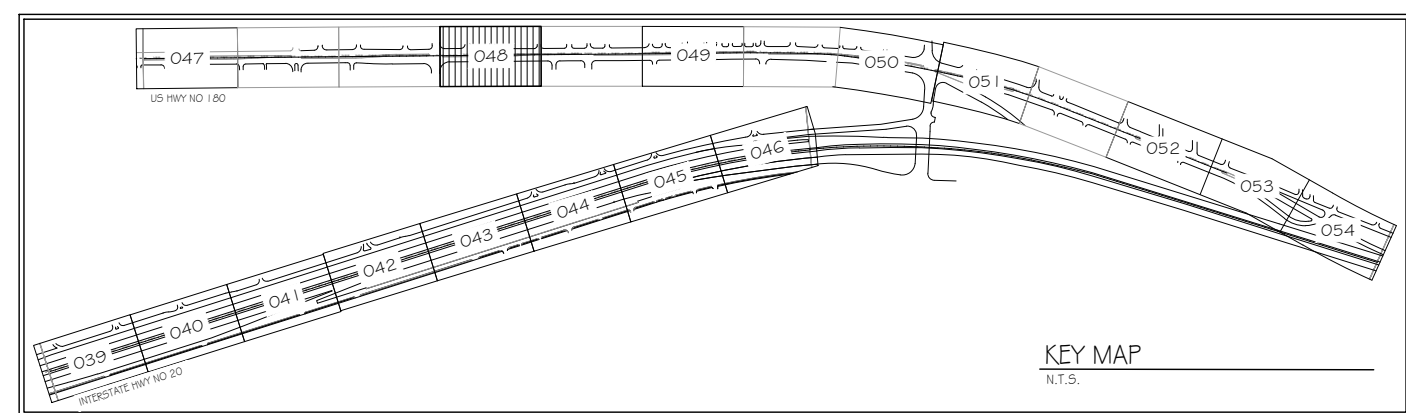
GENERAL NOTES

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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.



1 US 180 STA 22+00 - STA 29+50

ESTIMATE OF QUANTITIES - BY SHEET 10				
ITEM NO	DESC	DESCRIPTION	UNIT	TOTAL
192	6002	LANDSCAPE PLANTING (1 GAL)	EA	27
192	6013	LANDSCAPE PLANTING (MULCH)	SY	39



PLANT SCHEDULE 10			
SHRUB AREAS	BOTANICAL / COMMON NAME	QTY	REMARKS
HP2	HESPERALOE PARVIFLORA RED YUCCA	13	192 6002 PLANT MATERIAL (1 GAL)(SHRUB)
SH2	SALVIA FARINACEA 'HENRY DUELBERG' HENRY DUELBERG MEALY SAGE	14	192 6002 PLANT MATERIAL (1 GAL)(SHRUB)
SOD/SEED	BOTANICAL / COMMON NAME	QTY	REMARKS
LOM	SHREDDED BARK MULCH MULCH	352 SF	192 6013 LANDSCAPE PLANTING (MULCH) (BARK)

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TX REG. SURVEYING FIRM LS-10193824

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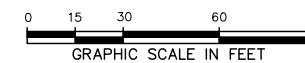


PLANTING PLAN
US 180
STA 22+00 - STA 29+50

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	F 2022(848)	048	
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY NO
0314	07	080	IH-20 & US 180

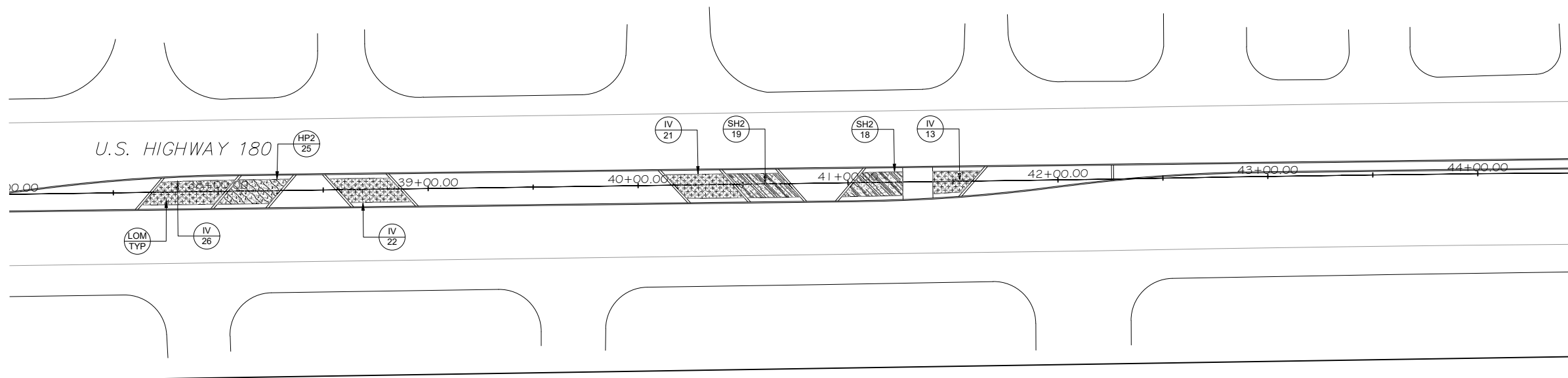
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APRIL 2022 - 100% PLAN SUBMITTAL



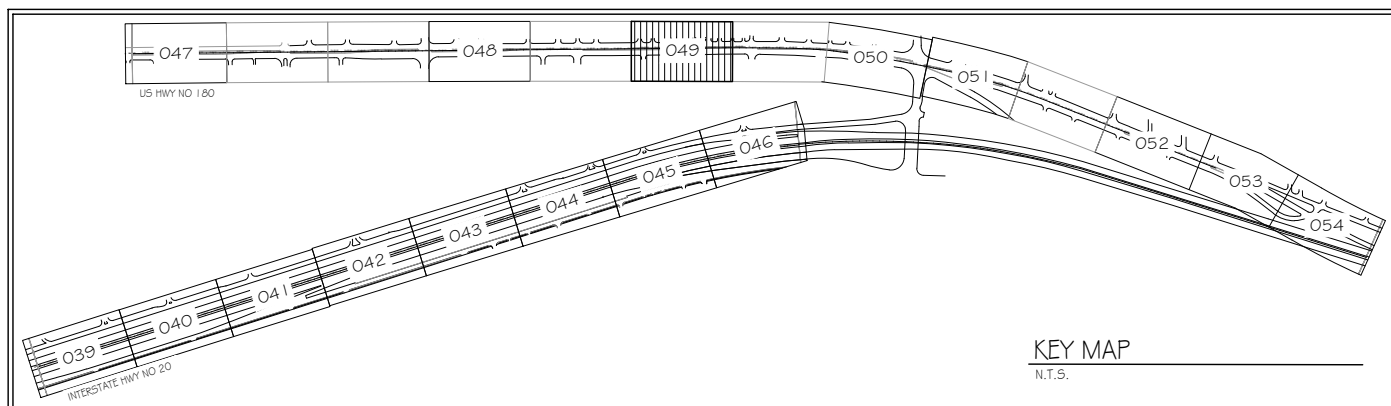
GENERAL NOTES

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 US 180 STA 37+00 - STA 44+50

ESTIMATE OF QUANTITIES - BY SHEET 11				
ITEM NO	DESC	DESCRIPTION	UNIT	TOTAL
192	6002	LANDSCAPE PLANTING (1 GAL)	EA	144
192	6013	LANDSCAPE PLANTING (MULCH)	SY	231



PLANT SCHEDULE 11			
SHRUB AREAS	BOTANICAL / COMMON NAME	QTY	REMARKS
HP2	HESPERALOE PARVIFLORA RED YUCCA	25	192 6002 PLANT MATERIAL (1 GAL)(SHRUB)
IV	ILEX VOMITORIA YAUPON HOLLY	82	192 6002 PLANT MATERIAL (1 GAL)(SHRUB)
SH2	SALVIA FARINACEA 'HENRY DUELBERG' HENRY DUELBERG MEALY SAGE	37	192 6002 PLANT MATERIAL (1 GAL)(SHRUB)
SOD/SEED	BOTANICAL / COMMON NAME	QTY	REMARKS
LOM	SHREDDED BARK MULCH MULCH	2,076 SF	192 6013 LANDSCAPE PLANTING (MULCH) (BARK)

Pacheco Koch 4060 BRYANT IRVIN ROAD
FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10193824



PLANTING PLAN

US 180
STA 37+00 - STA 44+50

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	F 2022(848)	049
STATE	DISTRICT	COUNTY
TEXAS	FTW	PARKER
CONTROL	SECTION	JOB
0314	07	080
		HIGHWAY NO
		IH-20 & US 180



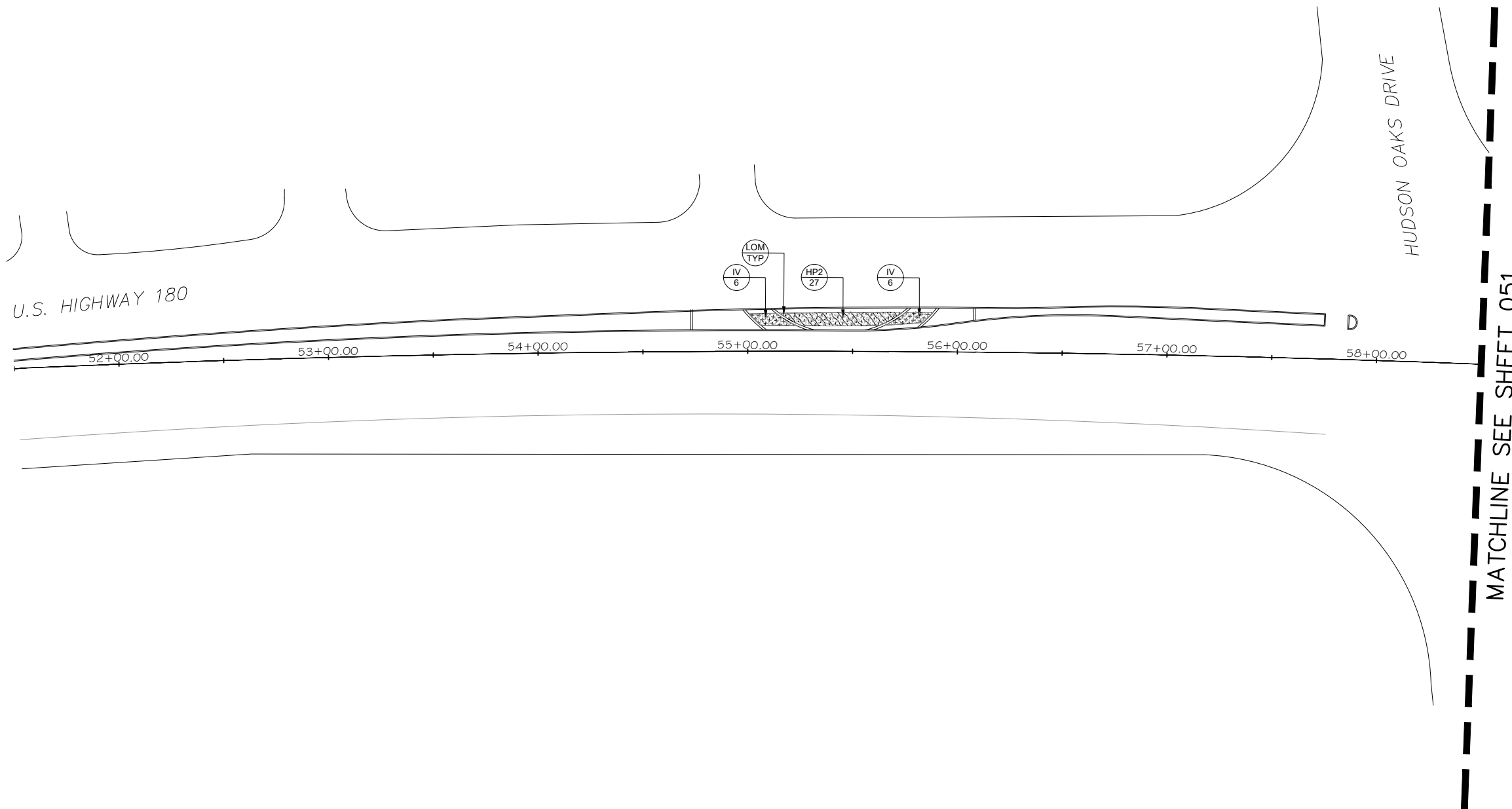
APRIL 2022 - 100% PLAN SUBMITTAL

DWITMEYER 05/02/2022 - 12:17PM N: DWG-47\4747-22-043\DWG\LANDSCAPE.FX 2018\SHEETS\PLANTING PLAN - US180.DWG



GENERAL NOTES

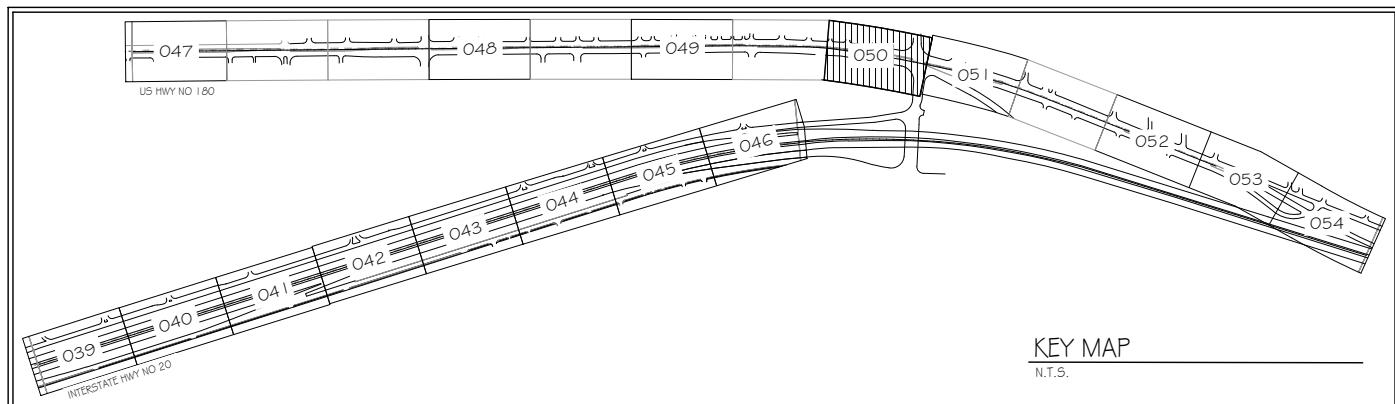
1. THE ENTIRE LIMITS OF IMPROVEMENTS WERE NOT SURVEYED. ALL LINEWORK IS APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
2. ALL UTILITIES SHOWN ON PLANS ARE APPROXIMATE IN NATURE AND DO NOT RELIEVE THE CONTRACTOR FROM ANY RESPONSIBILITY TO COORDINATE WITH APPROPRIATE AUTHORITIES.
3. CALL TXDOT TRAFFIC MANAGEMENT CENTER (817-370-3661) FOR TXDOT LOCATES WHEN WORKING NEAR EXISTING TXDOT MAINTAINED TRAFFIC SIGNAL AND ITS SYSTEMS.



MATCHLINE SEE SHEET 051

1 US 180 STA 51+50 - STA 58+50

ESTIMATE OF QUANTITIES - BY SHEET 12				
ITEM NO	DESC	DESCRIPTION	UNIT	TOTAL
192	6002	LANDSCAPE PLANTING (1 GAL)	EA	39
192	6013	LANDSCAPE PLANTING (MULCH)	SY	52



KEY MAP
N.T.S.

PLANT SCHEDULE 12			
SHRUB AREAS	BOTANICAL / COMMON NAME	QTY	REMARKS
HP2	HESPERALOE PARVIFLORA RED YUCCA	27	192 6002 PLANT MATERIAL (1 GAL)(SHRUB)
IV	ILEX VOMITORIA YAUPON HOLLY	12	192 6002 PLANT MATERIAL (1 GAL)(SHRUB)
SOD/SEED	BOTANICAL / COMMON NAME	QTY	REMARKS
LOM	SHREDDED BARK MULCH MULCH	472 SF	192 6013 LANDSCAPE PLANTING (MULCH)(BARK)

Pacheco Koch 4060 BRYANT IRVIN ROAD
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TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10193824

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PLANTING PLAN
US 180
STA 51+50 - STA 58+50

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. F 2022(848)	SHEET NO. 050
STATE TEXAS	DISTRICT FTW	COUNTY PARKER
CONTROL 0314	SECTION 07	JOB 080
		HIGHWAY NO IH-20 & US 180

DWITMEYER 05/02/2022 - 12:17PM N: DWG-47\4747-22.043\DWG\LANDSCAPE.FX 2018\SHEETS\PLANTING PLAN - US180.DWG

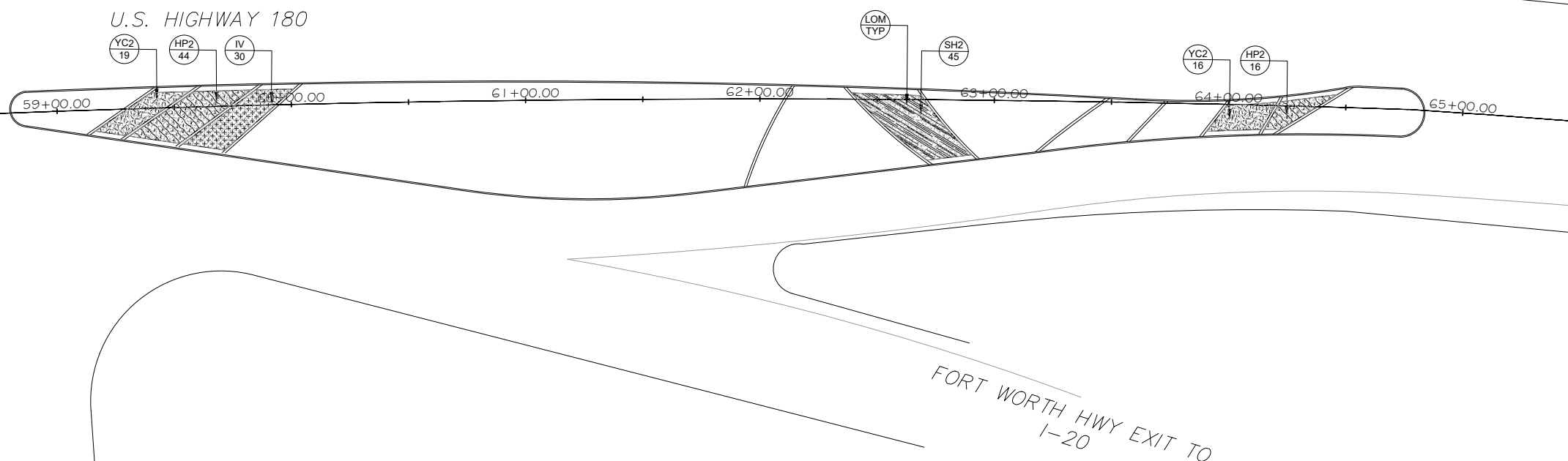
APRIL 2022 - 100% PLAN SUBMITTAL



GENERAL NOTES

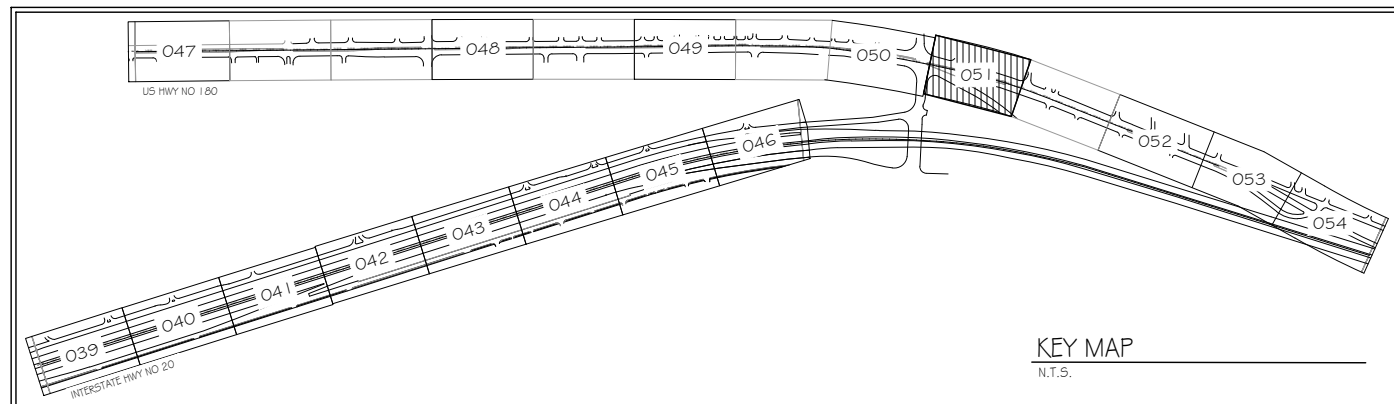
1. THE ENTIRE LIMITS OF IMPROVEMENTS WERE NOT SURVEYED. ALL LINEWORK IS APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
2. ALL UTILITIES SHOWN ON PLANS ARE APPROXIMATE IN NATURE AND DO NOT RELIEVE THE CONTRACTOR FROM ANY RESPONSIBILITY TO COORDINATE WITH APPROPRIATE AUTHORITIES.
3. CALL TxDOT TRAFFIC MANAGEMENT CENTER (817-370-3661) FOR TxDOT LOCATES WHEN WORKING NEAR EXISTING TxDOT MAINTAINED TRAFFIC SIGNAL AND ITS SYSTEMS.

MATCHLINE SEE SHEET 050



1 US 180 STA 58+50 - STA 65+50

ESTIMATE OF QUANTITIES - BY SHEET 13				
ITEM NO	DESC	DESCRIPTION	UNIT	TOTAL
192	6002	LANDSCAPE PLANTING (1 GAL)	EA	170
192	6013	LANDSCAPE PLANTING (MULCH)	SY	263



KEY MAP
N.T.S.

PLANT SCHEDULE 13			
SHRUB AREAS	BOTANICAL / COMMON NAME	QTY	REMARKS
HP2	HESPERALOE PARVIFLORA RED YUCCA	60	192 6002 PLANT MATERIAL (1 GAL)(SHRUB)
IV	ILEX VOMITORIA YAUPON HOLLY	30	192 6002 PLANT MATERIAL (1 GAL)(SHRUB)
SH2	SALVIA FARINACEA 'HENRY DUELBERG' HENRY DUELBERG MEALY SAGE	45	192 6002 PLANT MATERIAL (1 GAL)(SHRUB)
YC2	YUCCA FILAMENTOSA 'COLOR GUARD' COLOR GUARD ADAM'S NEEDLE	35	192 6002 PLANT MATERIAL (1 GAL)(SHRUB)
SOD/SEED	BOTANICAL / COMMON NAME	QTY	REMARKS
LOM	SHREDDED BARK MULCH MULCH	2,367 SF	192 6013 LANDSCAPE PLANTING (MULCH) (BARK)

Pacheco Koch 4060 BRYANT IRVIN ROAD
FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10193824



PLANTING PLAN

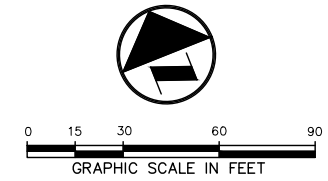
US 180
STA 58+50 - STA 65+50

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. F 2022(848)	SHEET NO. 051
STATE TEXAS	DISTRICT FTW	COUNTY PARKER
CONTROL 0314	SECTION 07	JOB 080
		HIGHWAY NO IH-20 & US 180



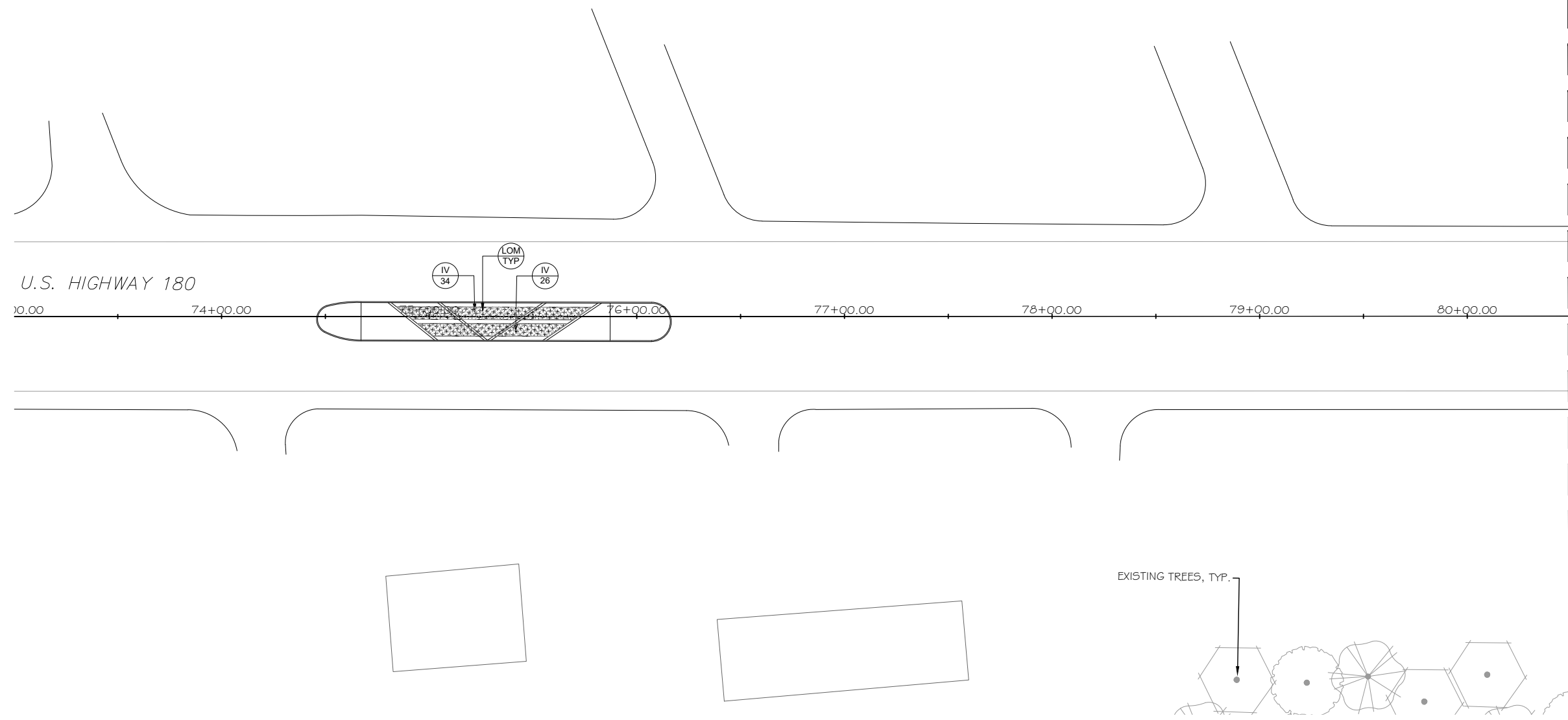
APRIL 2022 - 100% PLAN SUBMITTAL

DWITMEYER 05/02/2022 - 12:17PM N: DWG-47\4747-22.04\DWG\LANDSCAPE.FX 2018\SHEETS\PLANTING PLAN - US180.DWG



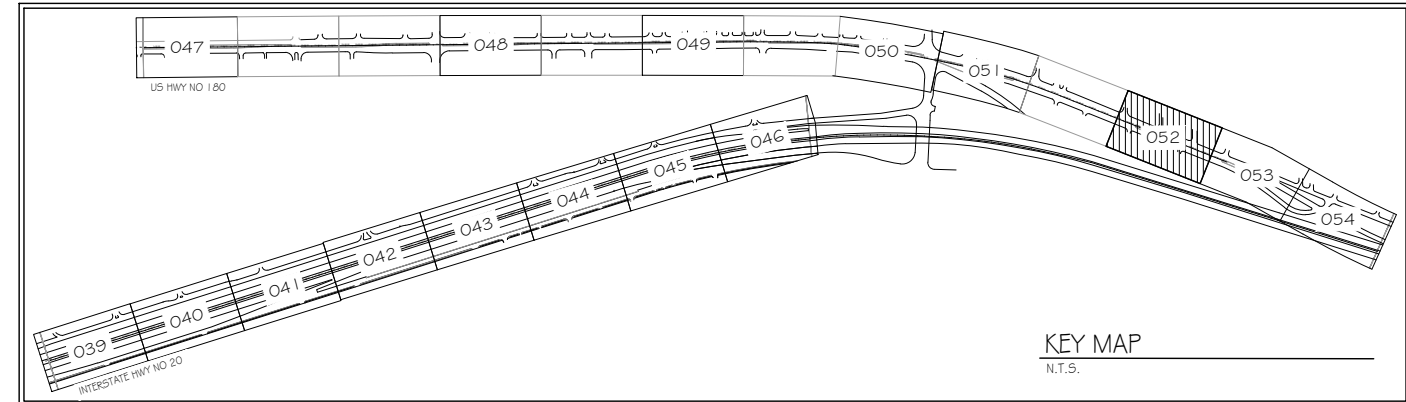
GENERAL NOTES

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 US 180 STA 73+00 - STA 80+50

ESTIMATE OF QUANTITIES - BY SHEET 14				
ITEM NO	DESC	DESCRIPTION	UNIT	TOTAL
192	6002	LANDSCAPE PLANTING (1 GAL)	EA	60
192	6013	LANDSCAPE PLANTING (MULCH)	SY	100



PLANT SCHEDULE 14			
SHRUB AREAS	BOTANICAL / COMMON NAME	QTY	REMARKS
IV	ILEX VOMITORIA YAUPON HOLLY	60	192 6002 PLANT MATERIAL (1 GAL)(SHRUB)
SOD/SEED	BOTANICAL / COMMON NAME	QTY	REMARKS
LOM	SHREDDED BARK MULCH MULCH	900 SF	192 6013 LANDSCAPE PLANTING (MULCH) (BARK)

Pacheco Koch 4060 BRYANT IRVIN ROAD
FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10193824

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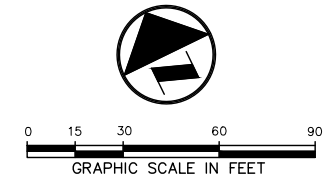


PLANTING PLAN
US 180
STA 73+00 - STA 80+50

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	F 2022(848)	052
STATE	DISTRICT	COUNTY
TEXAS	FTW	PARKER
CONTROL	SECTION	JOB
0314	07	080
		HIGHWAY NO
		IH-20 & US 180

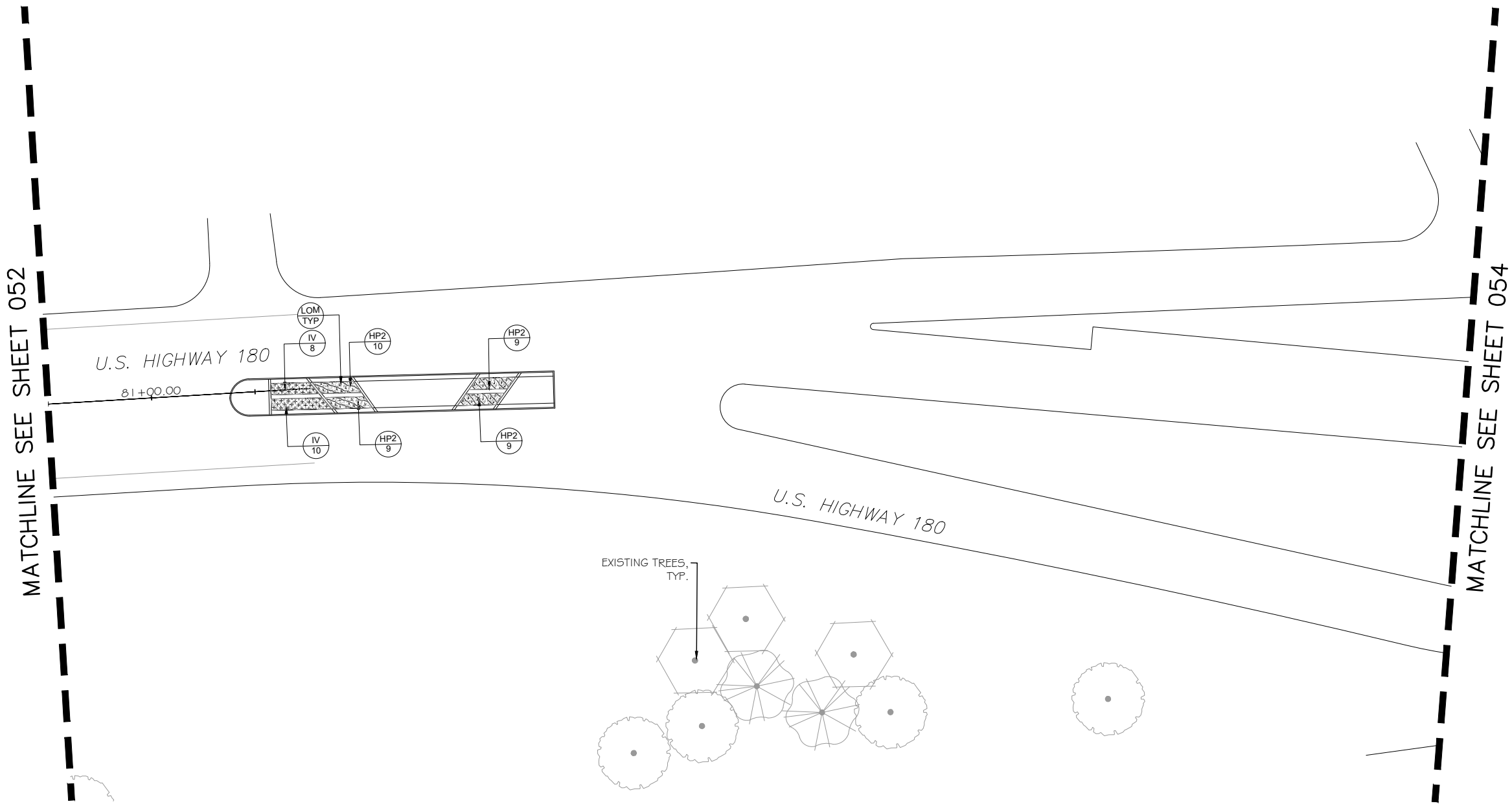
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APRIL 2022 - 100% PLAN SUBMITTAL



GENERAL NOTES

1. THE ENTIRE LIMITS OF IMPROVEMENTS WERE NOT SURVEYED. ALL LINWORK 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 SHEET 052

MATCHLINE SEE SHEET 054

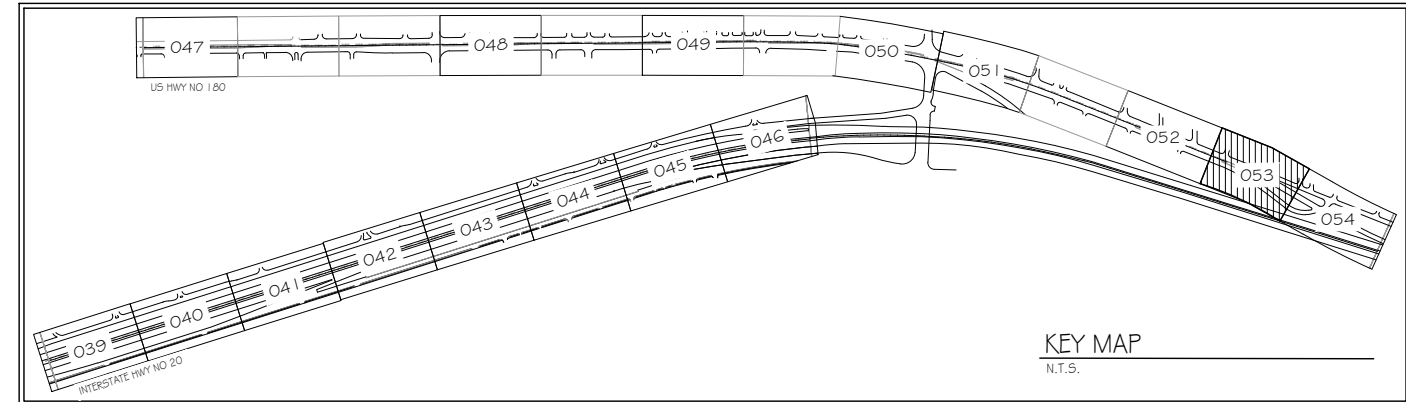
1 US 180 STA 80+50 - EXIT RAMP

ESTIMATE OF QUANTITIES - BY SHEET 15				
ITEM NO	DESC	DESCRIPTION	UNIT	TOTAL
192	6002	LANDSCAPE PLANTING (1 GAL)	EA	55
192	6013	LANDSCAPE PLANTING (MULCH)	SY	75

PLANT SCHEDULE 15			
SHRUB AREAS	BOTANICAL / COMMON NAME	QTY	REMARKS
HP2	HESPERALOE PARVIFLORA RED YUCCA	37	192 6002 PLANT MATERIAL (1 GAL)(SHRUB)
IV	ILEX VOMITORIA YAUPON HOLLY	18	192 6002 PLANT MATERIAL (1 GAL)(SHRUB)
SOD/SEED	BOTANICAL / COMMON NAME	QTY	REMARKS
LOM	SHREDDED BARK MULCH MULCH	681 SF	192 6013 LANDSCAPE PLANTING (MULCH) (BARK)

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TX REG. SURVEYING FIRM LS-10193824

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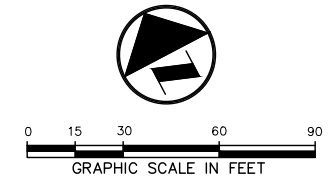


PLANTING PLAN
US 180
STA 80+50 - EXIT RAMP

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. F 2022(848)	SHEET NO. 053
STATE TEXAS	DISTRICT FTW	COUNTY PARKER
CONTROL 0314	SECTION 07	JOB 080
HIGHWAY NO IH-20 & US 180		

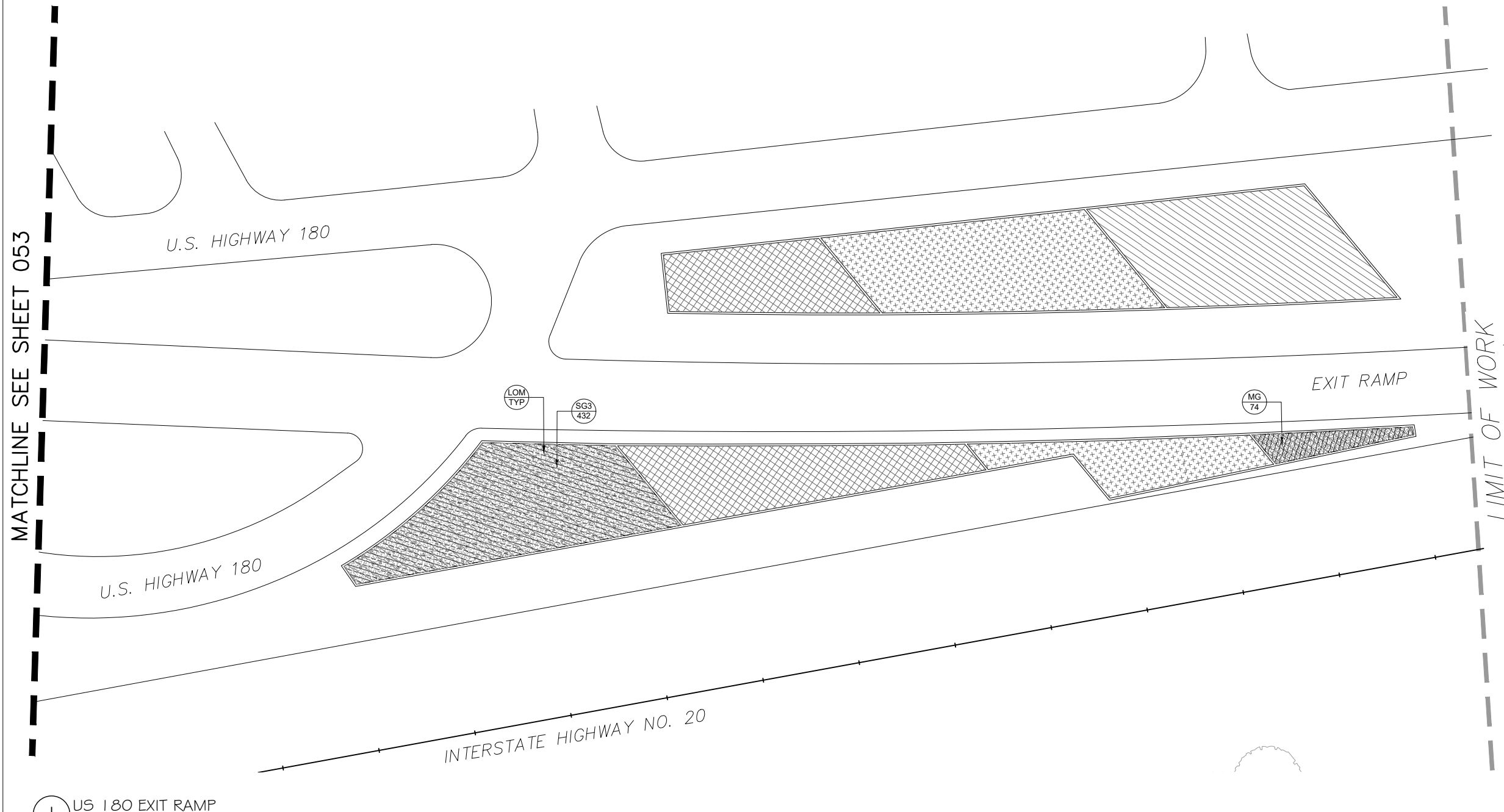
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APRIL 2022 - 100% PLAN SUBMITTAL



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.



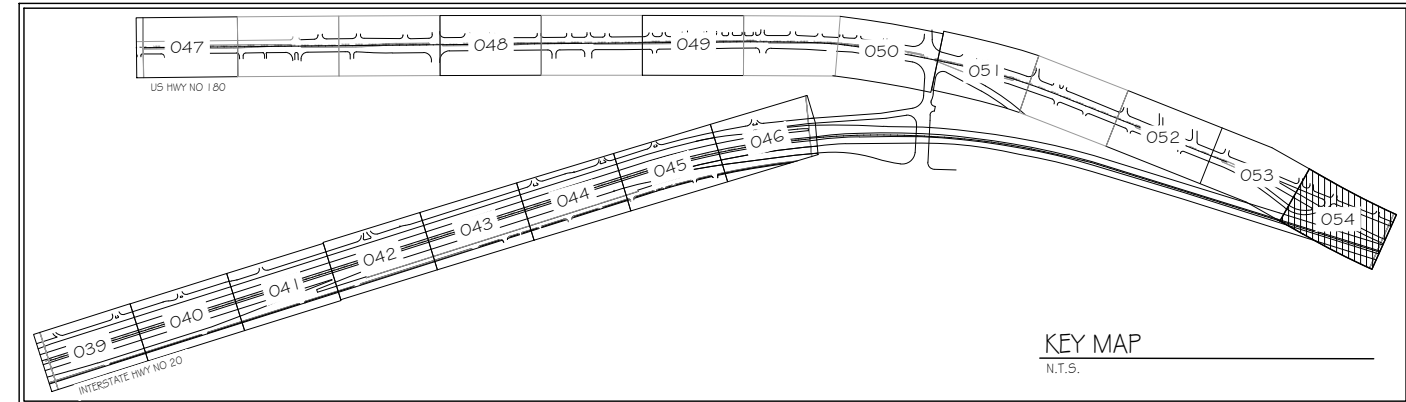
MATCHLINE SEE SHEET 053

LIMIT OF WORK

1 US 180 EXIT RAMP

ESTIMATE OF QUANTITIES - BY SHEET 16				
ITEM NO	DESC	DESCRIPTION	UNIT	TOTAL
192	6002	LANDSCAPE PLANTING (1 GAL)	EA	506
192	6013	LANDSCAPE PLANTING (MULCH)	SY	826

PLANT SCHEDULE 16			
SHRUB AREAS	BOTANICAL / COMMON NAME	QTY	REMARKS
MG	MISCANTHUS SINENSIS 'GRACILLIMUS' MAIDENHAIR GRASS	74	192 6002 PLANT MATERIAL (1 GAL)(SHRUB)
SG3	SALVIA GREGGII AUTUMN SAGE	432	192 6002 PLANT MATERIAL (1 GAL)(SHRUB)
SOD/SEED	BOTANICAL / COMMON NAME	QTY	REMARKS
LOM	SHREDDED BARK MULCH	7,423 SF	192 6013 LANDSCAPE PLANTING (MULCH) (BARK)



Pacheco Koch 4060 BRYANT IRVIN ROAD
FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10193824

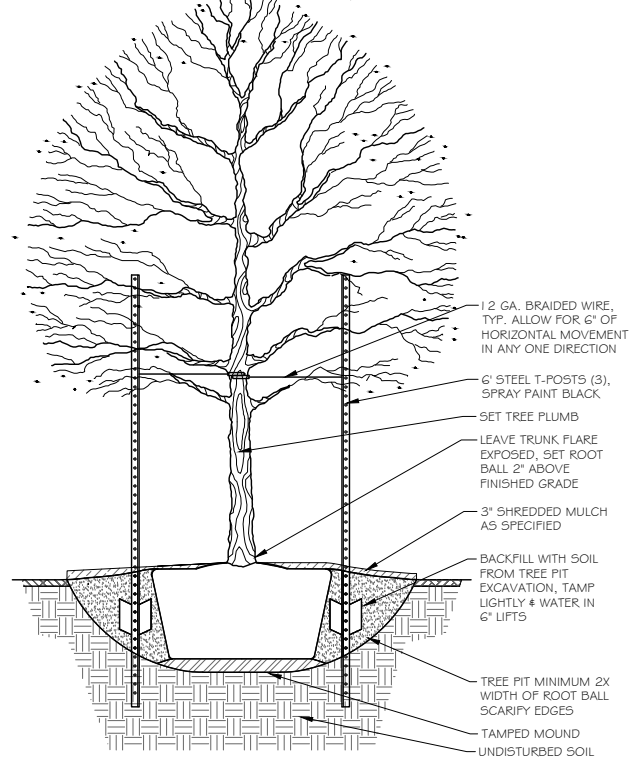
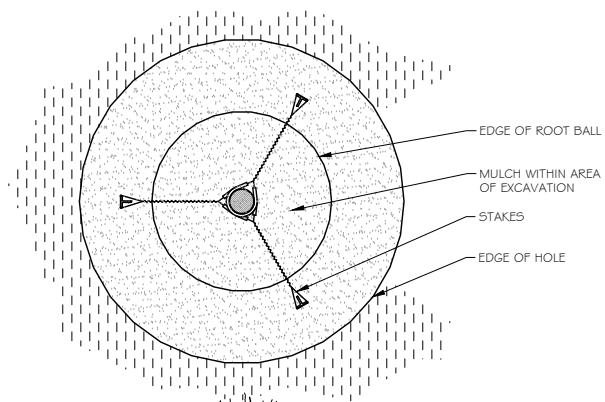
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PLANTING PLAN US 180 EXIT RAMP			
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. F 2022(848)	SHEET NO. 054	
STATE TEXAS	DISTRICT FTW	COUNTY PARKER	
CONTROL 0314	SECTION 07	JOB 080	HIGHWAY NO IH-20 & US 180

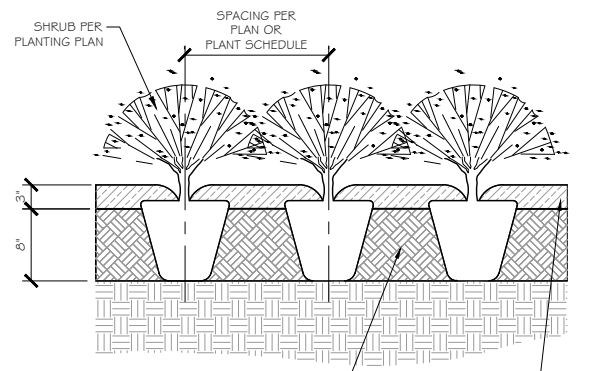


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APRIL 2022 - 100% PLAN SUBMITTAL



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 US180 - WHOLE SITE			
SHRUB AREAS	BOTANICAL / COMMON NAME	SPACING	REMARKS
HP2	HESPERALOE PARVIFLORA RED YUCCA	42" o.c.	192 6002 PLANT MATERIAL (1 GAL)(SHRUB)
IV	ILEX VOMITORIA YAUPON HOLLY	48" o.c.	192 6002 PLANT MATERIAL (1 GAL)(SHRUB)
MG	MISCANTHUS SINENSIS 'GRACILLIMUS' MAIDENHAIR GRASS	40" o.c.	192 6002 PLANT MATERIAL (1 GAL)(SHRUB)
SH2	SALVIA FARINACEA 'HENRY DUELBERG' HENRY DUELBERG MEALY SAGE	48" o.c.	192 6002 PLANT MATERIAL (1 GAL)(SHRUB)
SG3	SALVIA GREGGII AUTUMN SAGE	48" o.c.	192 6002 PLANT MATERIAL (1 GAL)(SHRUB)
YC2	YUCCA FILAMENTOSA 'COLOR GUARD' COLOR GUARD ADAM'S NEEDLE	48" o.c.	192 6002 PLANT MATERIAL (1 GAL)(SHRUB)
SOD/SEED	BOTANICAL / COMMON NAME	SPACING	REMARKS
LOM	SHREDDED BARK MULCH MULCH		192 6013 LANDSCAPE PLANTING (MULCH) (BARK)

DWTMEYER 05/02/2022 - 12:17PM M:\DWG-47\4747-22\043\DWG\LANDSCAPE.FX.2018\SHEETS\IRRIGATION_DETAILS.DWG



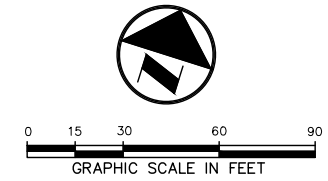
Pacheco Koch 4060 BRYANT IRVIN ROAD
FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10193824

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PLANTING DETAILS

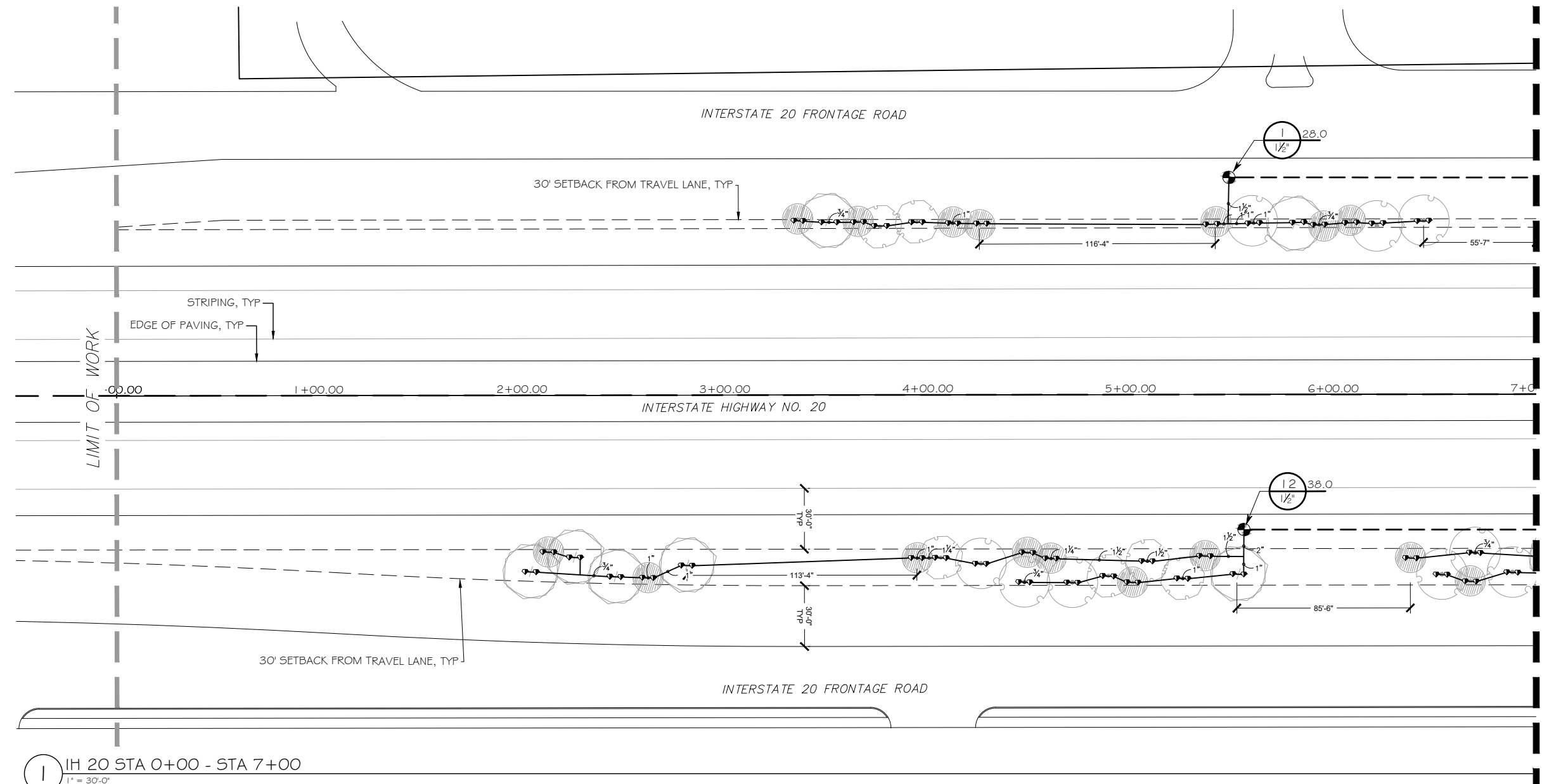
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	F 2022(848)	055	
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY NO.
0314	07	080	IH-20 & US 180

APRIL 2022 - 100% 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.

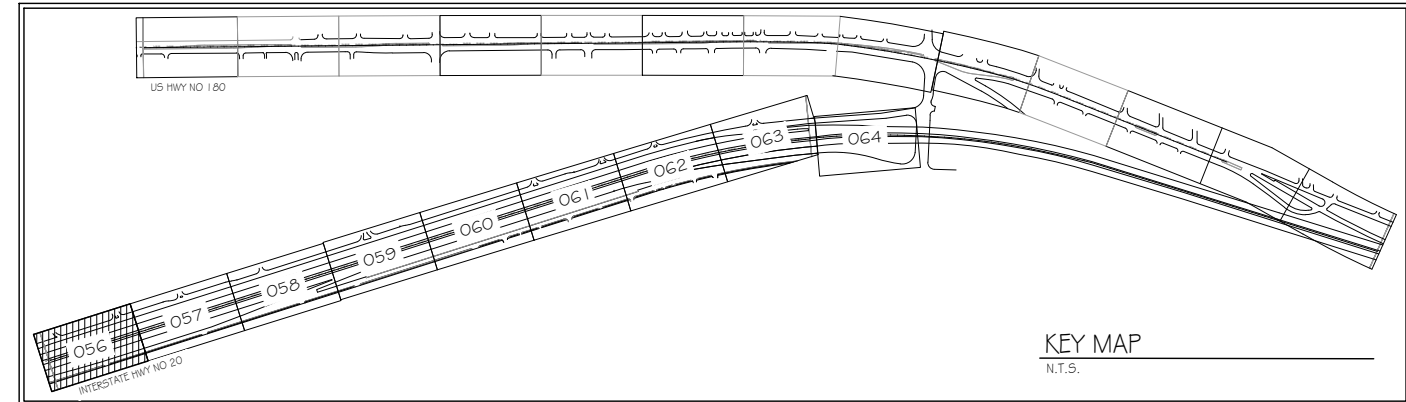


MATCHLINE SEE SHEET 057

1 IH 20 STA 0+00 - STA 7+00
1" = 30'-0"

IRRIGATION SCHEDULE 1

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	HUNTER PROS-PRS30-04-CV-PCN 10 FLOOD BUBBLER, 4" POP-UP, FACTORY INSTALLED DRAIN CHECK VALVE.
	HUNTER ICV-G 1", 1-1/2", 2", AND 3" PLASTIC ELECTRIC REMOTE CONTROL VALVES, GLOBE CONFIGURATION, WITH NPT THREADED INLET/OUTLET, FOR COMMERCIAL/MUNICIPAL USE.
	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.
	IRRIGATION MAINLINE: PVC CLASS 200 SDR 21
	Valve Callout # # — Valve Number # # — Valve Flow # # — Valve Size



Pacheco Koch 4060 BRYANT IRVIN ROAD
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TX REG. SURVEYING FIRM LS-10193824

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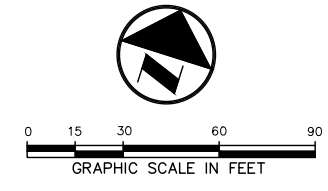
IRRIGATION PLAN
IH 20
STA 0+00 - STA 7+00

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. F 2022(848)	SHEET NO. 056
STATE TEXAS	DISTRICT FTW	COUNTY PARKER
CONTROL 0314	SECTION 07	JOB 080
		HIGHWAY NO IH-20 & US 180



DWTMEYER 05/02/2022 - 12:18PM N: \\DWG-47\4747-22-043\DWG\LANDSCAPE\FX_2018\SHEETS\IRRIGATION_PLAN.DWG

APRIL 2022 - 100% PLAN SUBMITTAL

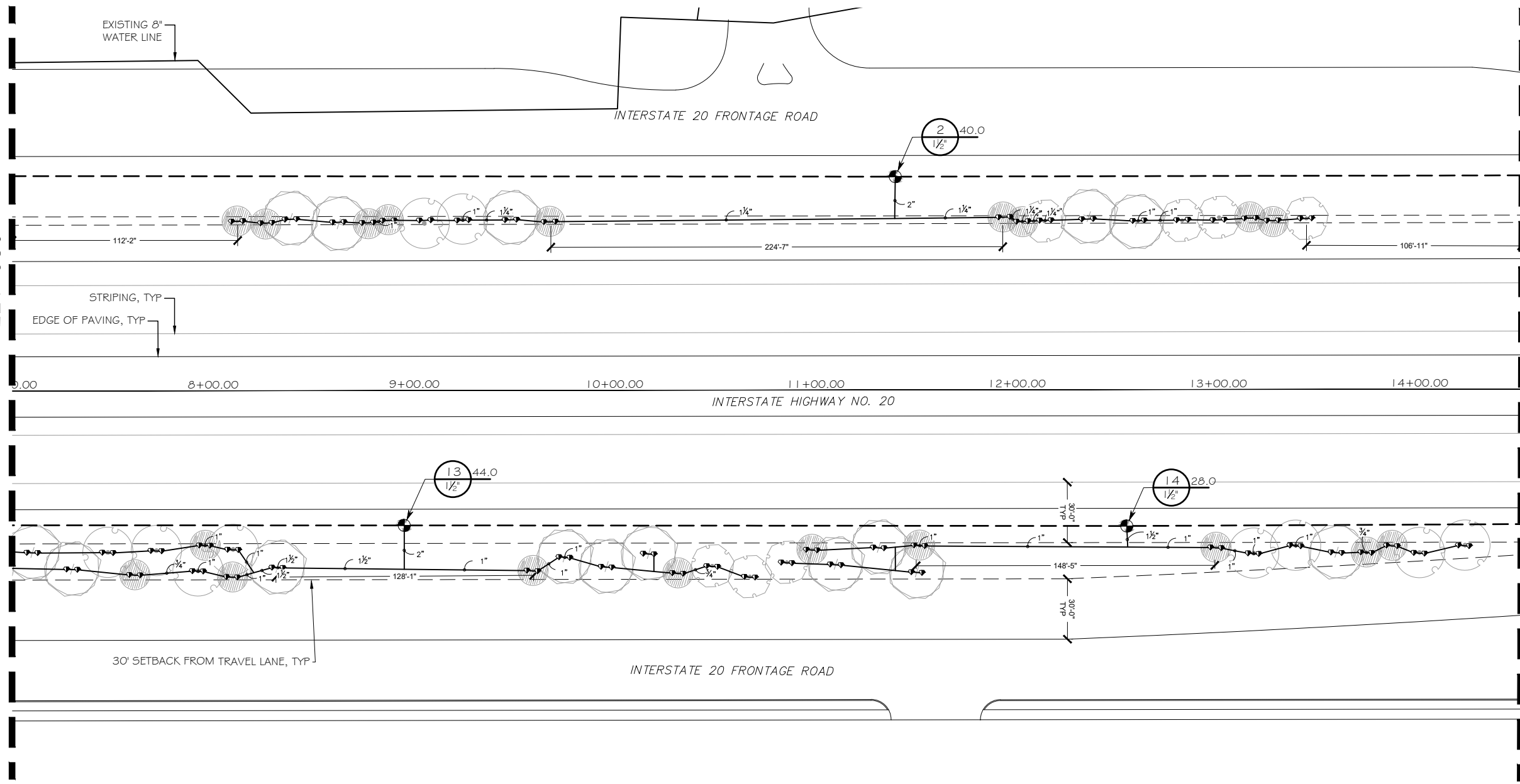


GENERAL NOTES

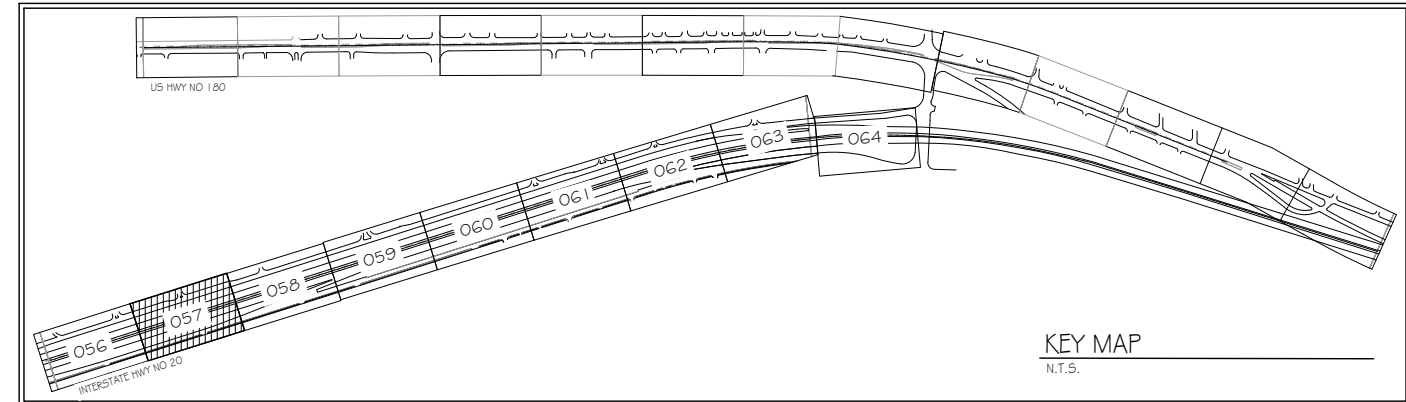
1. THE ENTIRE LIMITS OF IMPROVEMENTS WERE NOT SURVEYED. ALL LINEWORK IS APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
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MATCHLINE SEE SHEET 056

MATCHLINE SEE SHEET 058



1 IH 20 STA 7+00 - STA 14+50
1" = 30'-0"



IRRIGATION SCHEDULE 2

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	HUNTER PROS-PRS30-04-CV-PCN 10 FLOOD BUBBLER, 4" POP-UP, FACTORY INSTALLED DRAIN CHECK VALVE.
	HUNTER ICV-G 1", 1-1/2", 2", AND 3" PLASTIC ELECTRIC REMOTE CONTROL VALVES, GLOBE CONFIGURATION, WITH NPT THREADED INLET/OUTLET, FOR COMMERCIAL/MUNICIPAL USE.
	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.
	IRRIGATION MAINLINE: PVC CLASS 200 SDR 21

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	Valve Callout
	Valve Number
	Valve Flow
	Valve Size

Pacheco Koch 4060 BRYANT IRVIN ROAD
FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10193824

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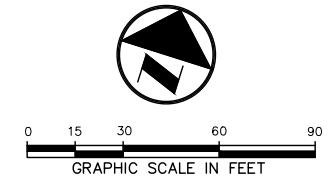
IRRIGATION PLAN
IH 20
STA 7+00 - STA 14+50

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. F 2022(848)	SHEET NO. 057
STATE CONTROL TEXAS 0314	DISTRICT SECTION FTW 07	COUNTY JOB PARKER 080
		HIGHWAY NO. IH-20 & US 180

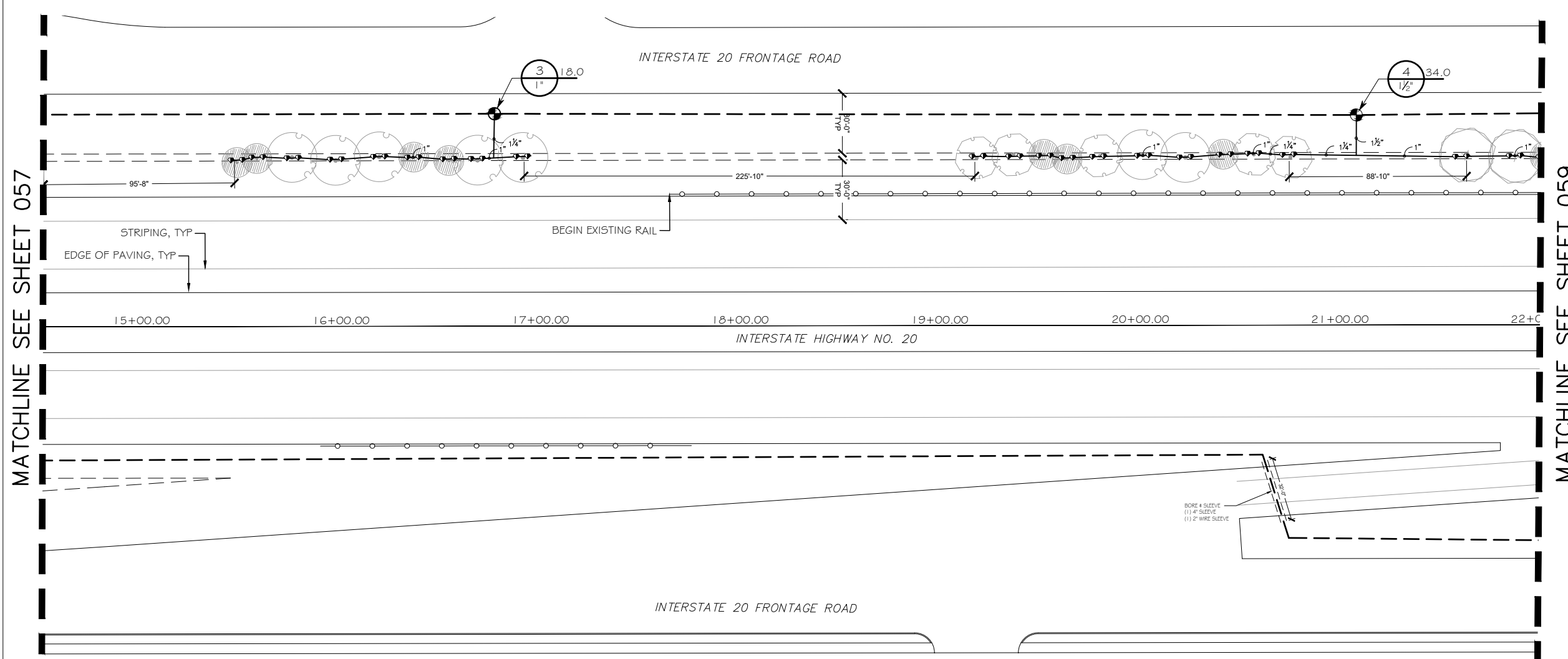


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APRIL 2022 - 100% PLAN SUBMITTAL



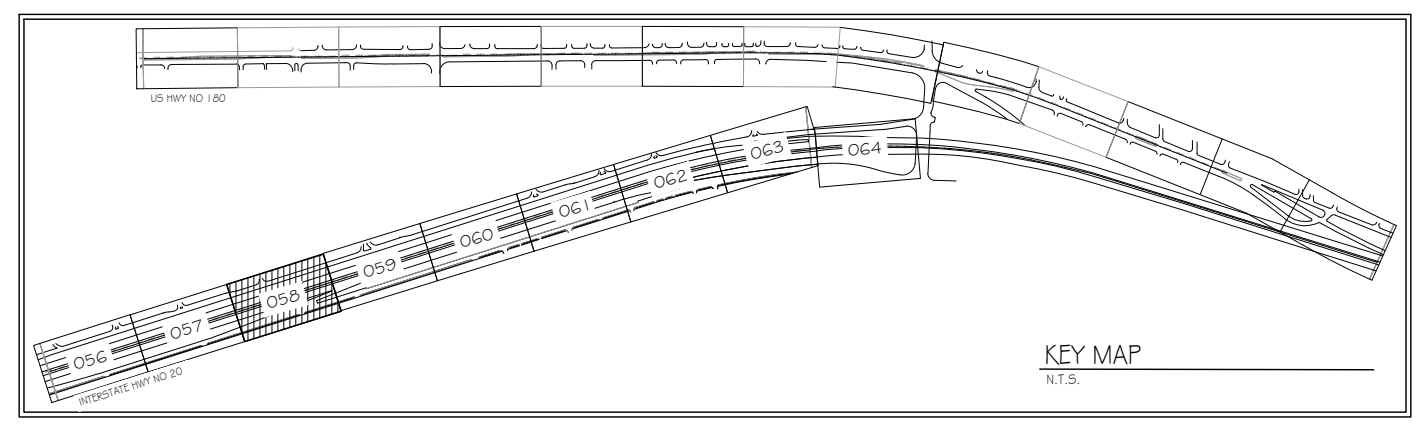
- GENERAL NOTES**
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 2. ALL UTILITIES SHOWN ON PLANS ARE APPROXIMATE IN NATURE AND DO NOT RELIEVE THE CONTRACTOR FROM ANY RESPONSIBILITY TO COORDINATE WITH APPROPRIATE AUTHORITIES.



I IH 20 STA 14+50 - STA 22+00
1" = 30'-0"

IRRIGATION SCHEDULE 3

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	HUNTER PROS-PRS30-04-CV-PCN 10 FLOOD BUBBLER, 4" POP-UP, FACTORY INSTALLED DRAIN CHECK VALVE.
	HUNTER ICV-G 1", 1-1/2", 2", AND 3" PLASTIC ELECTRIC REMOTE CONTROL VALVES, GLOBE CONFIGURATION, WITH NPT THREADED INLET/OUTLET, FOR COMMERCIAL/MUNICIPAL USE.
	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.
	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



Pacheco Koch 4060 BRYANT IRVIN ROAD
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TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10193824

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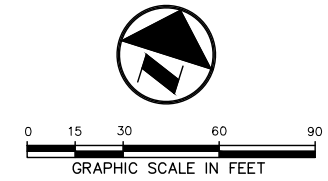


IRRIGATION PLAN
IH 20
STA 14+50 - STA 22+00

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. F 2022(848)	SHEET NO. 058
STATE TEXAS	DISTRICT FTW	COUNTY PARKER
CONTROL 0314	SECTION 07	JOB 080
		HIGHWAY NO IH-20 & US 180

DWTMEYER 05/02/2022 - 12:19PM N: DWG-47\4747-22.04\DWG\LANDSCAPE.FX.2018\SHEETS\IRRIGATION.PLAN.DWG

APRIL 2022 - 100% PLAN SUBMITTAL

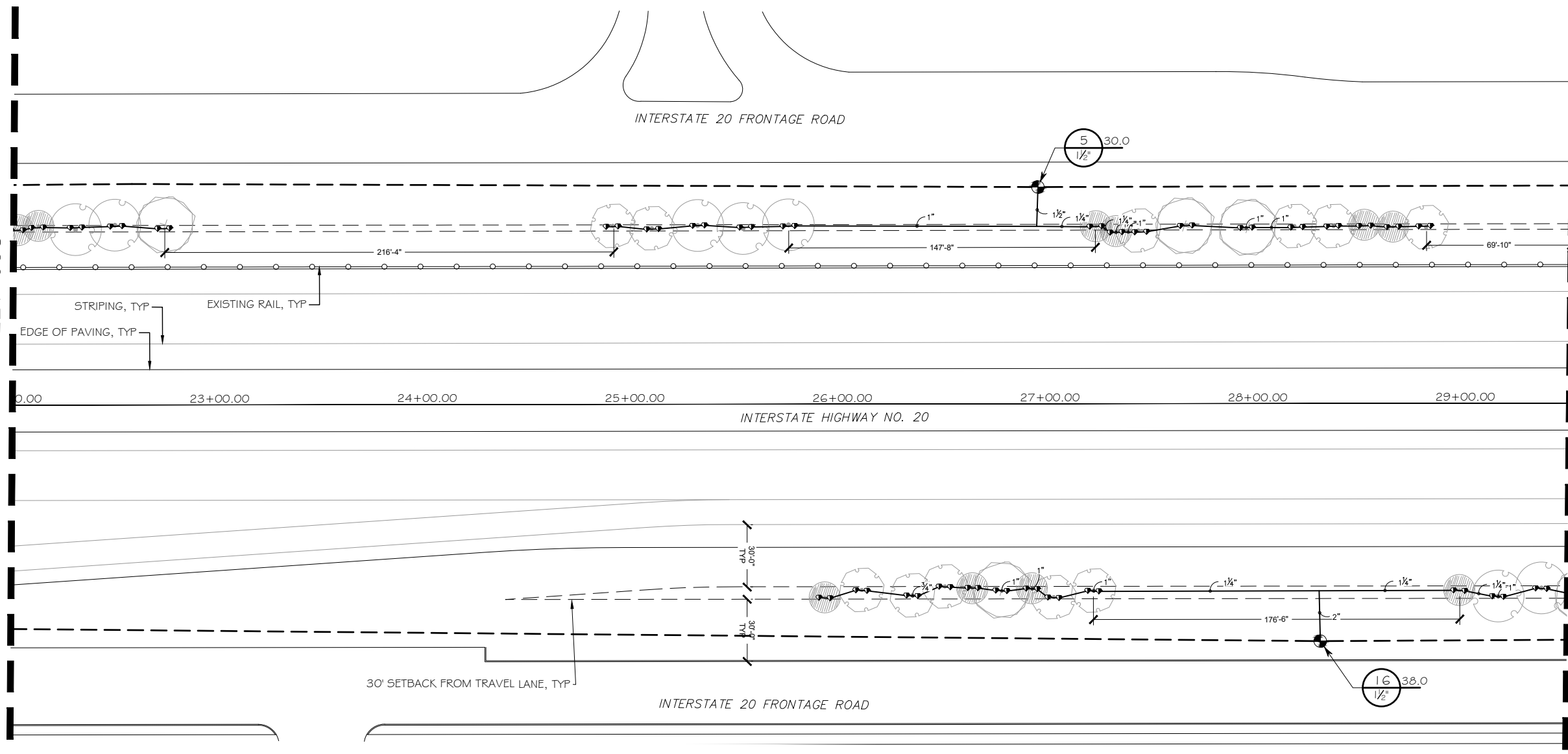


GENERAL NOTES

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 SHEET 058

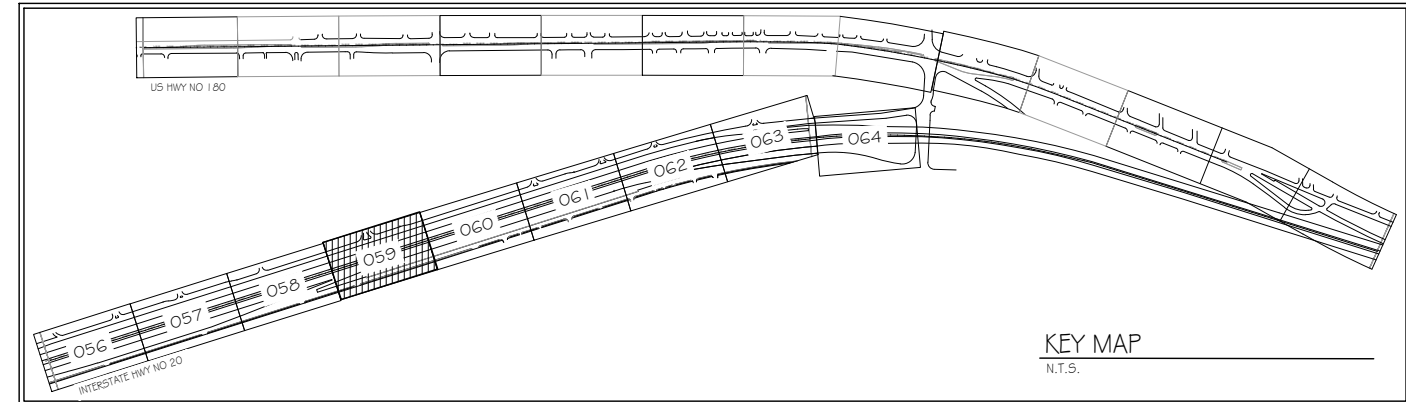
MATCHLINE SEE SHEET 060



1 IH 20 STA 22+00 - STA 29+50
1" = 30'-0"

IRRIGATION SCHEDULE 4

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	HUNTER PROS-PRS30-04-CV-PCN 10 FLOOD BUBBLER, 4" POP-UP, FACTORY INSTALLED DRAIN CHECK VALVE.
SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	HUNTER ICV-G 1", 1-1/2", 2", AND 3" PLASTIC ELECTRIC REMOTE CONTROL VALVES, GLOBE CONFIGURATION, WITH NPT THREADED INLET/OUTLET, FOR COMMERCIAL/MUNICIPAL USE.
	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.
	IRRIGATION MAINLINE: PVC CLASS 200 SDR 21
	Valve Callout # # Value Number # # Value Flow # # Value Size



Pacheco Koch 4060 BRYANT IRVIN ROAD
FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10193824

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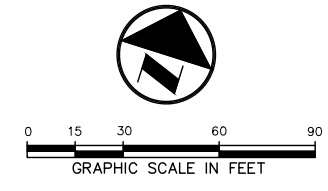
IRRIGATION PLAN
IH 20
STA 22+00 - STA 29+50

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. F 2022(848)	SHEET NO. 059
STATE TEXAS	DISTRICT FTW	COUNTY PARKER
CONTROL 0314	SECTION 07	JOB 080
		HIGHWAY NO IH-20 & US 180



DWITMEYER 05/02/2022 - 12:19PM M: \\DWG-47\4747-22.04\DWG\LANDSCAPE\FX_2018\SHEETS\IRRIGATION_PLAN.DWG

APRIL 2022 - 100% 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.

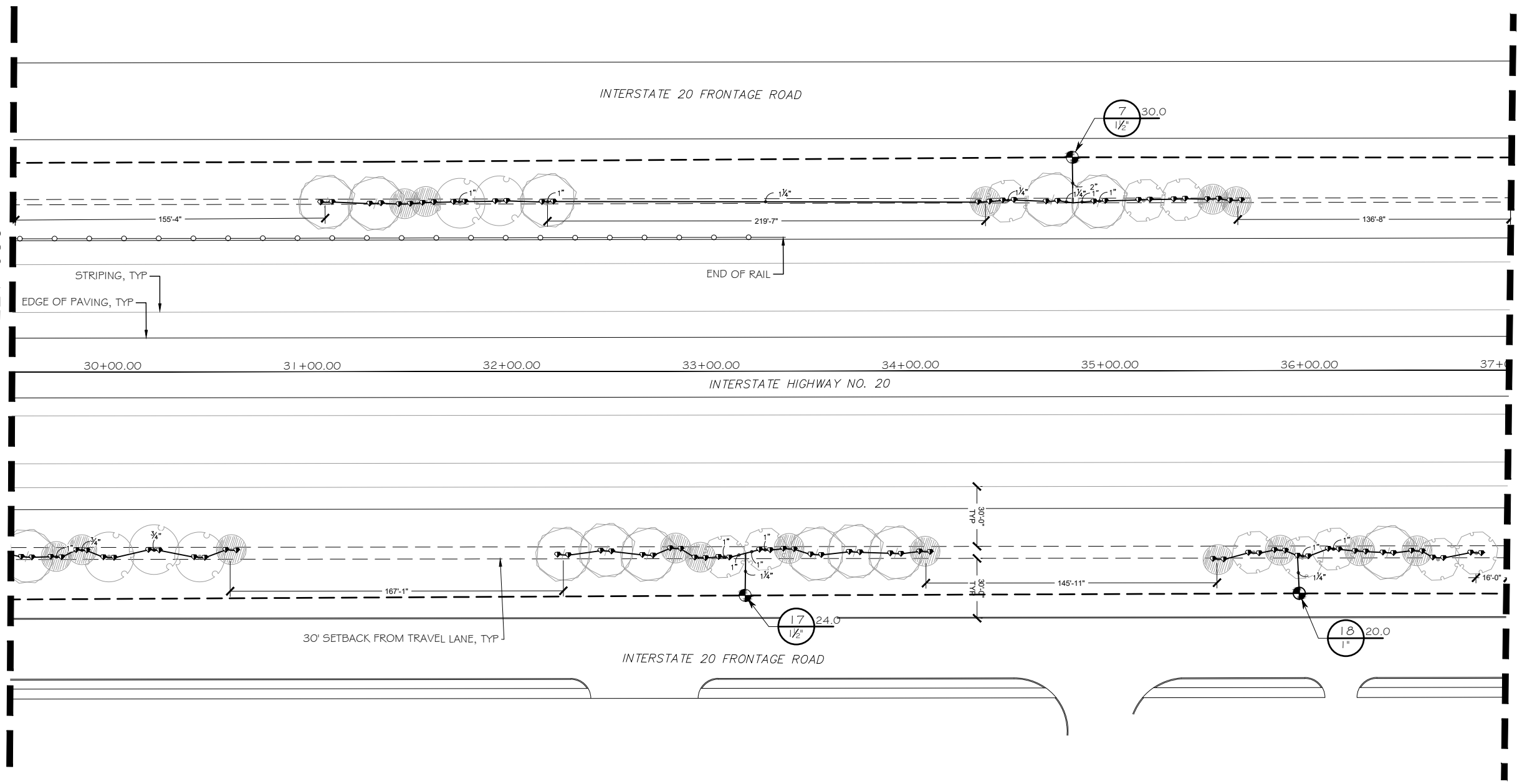
MATCHLINE SEE SHEET 059

MATCHLINE SEE SHEET 061

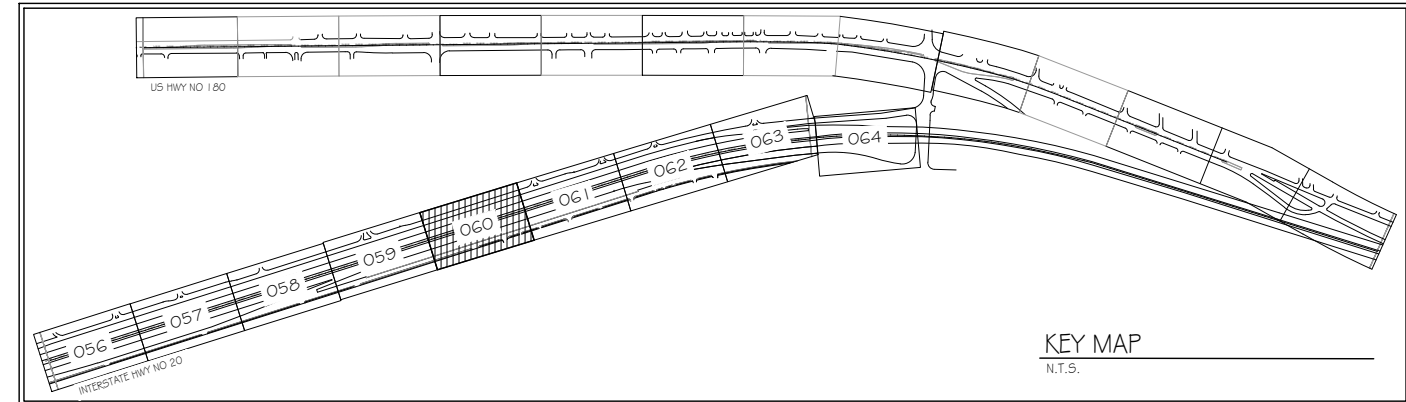
INTERSTATE 20 FRONTAGE ROAD

INTERSTATE HIGHWAY NO. 20

INTERSTATE 20 FRONTAGE ROAD



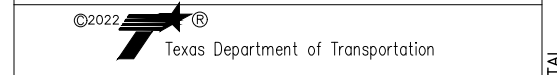
1 IH 20 STA 29+50 - STA 37+00
1" = 30'-0"



IRRIGATION SCHEDULE 5

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	HUNTER PRO-PRS30-04-CV-PCN 10 FLOOD BUBBLER, 4" POP-UP, FACTORY INSTALLED DRAIN CHECK VALVE.
	HUNTER ICV-G 1", 1-1/2", 2", AND 3" PLASTIC ELECTRIC REMOTE CONTROL VALVES, GLOBE CONFIGURATION, WITH NPT THREADED INLET/OUTLET, FOR COMMERCIAL/MUNICIPAL USE.
	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.
	IRRIGATION MAINLINE: PVC CLASS 200 SDR 21

Pacheco Koch 4060 BRYANT IRVIN ROAD
FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10193824



IRRIGATION PLAN
IH 20
STA 29+50 - STA 37+00

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. F 2022(848)	SHEET NO. 060
STATE TEXAS	DISTRICT FTW	COUNTY PARKER
CONTROL 0314	SECTION 07	JOB 080
		HIGHWAY NO IH-20 & US 180



DWTMEYER 05/02/2022 - 12:19PM N: \\DWG-47\4747-22-04\DWG\LANDSCAPE\FX_2018\SHEETS\IRRIGATION_PLAN.DWG

APRIL 2022 - 100% PLAN SUBMITTAL

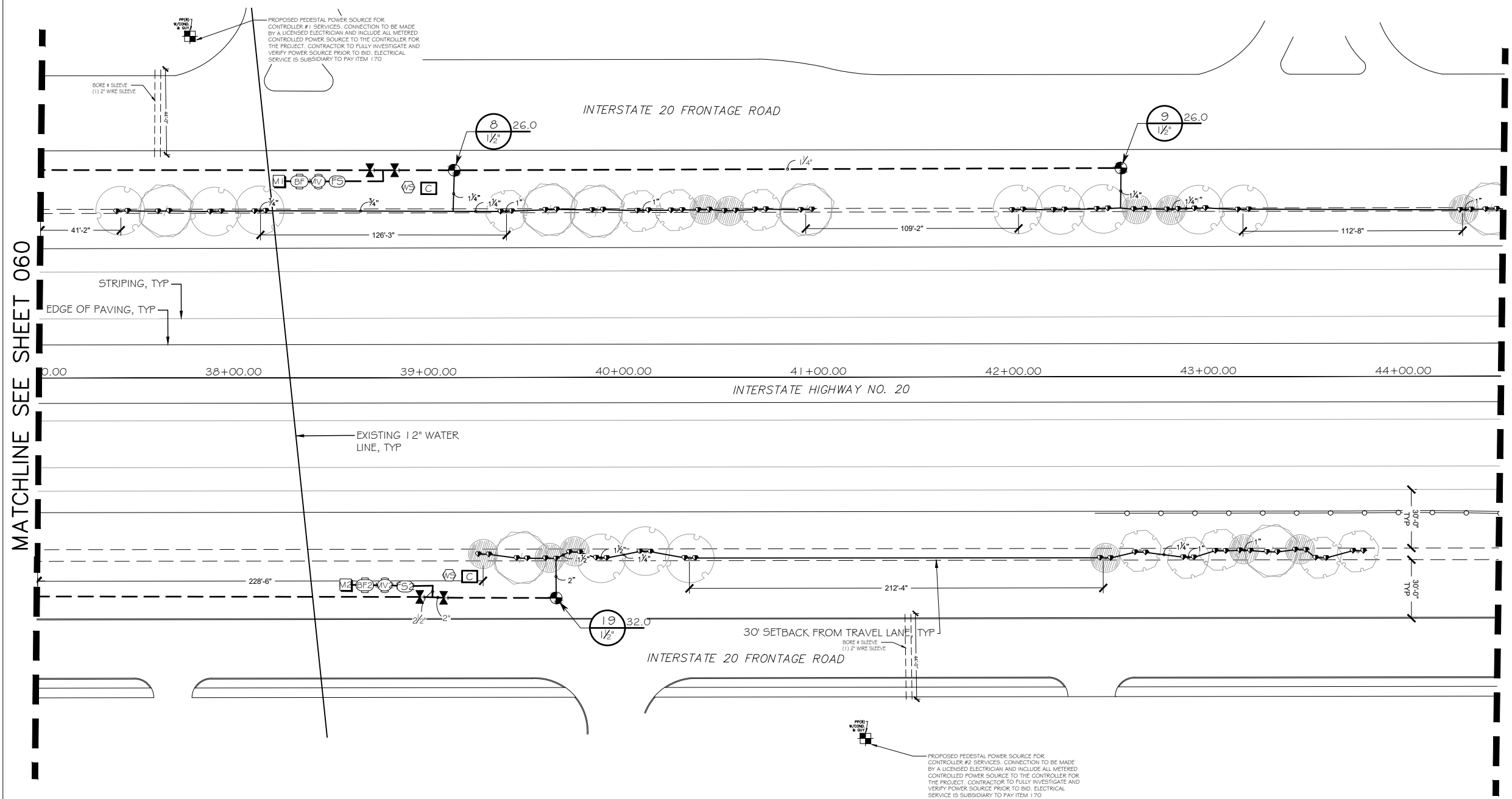


GENERAL NOTES

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 SHEET 060

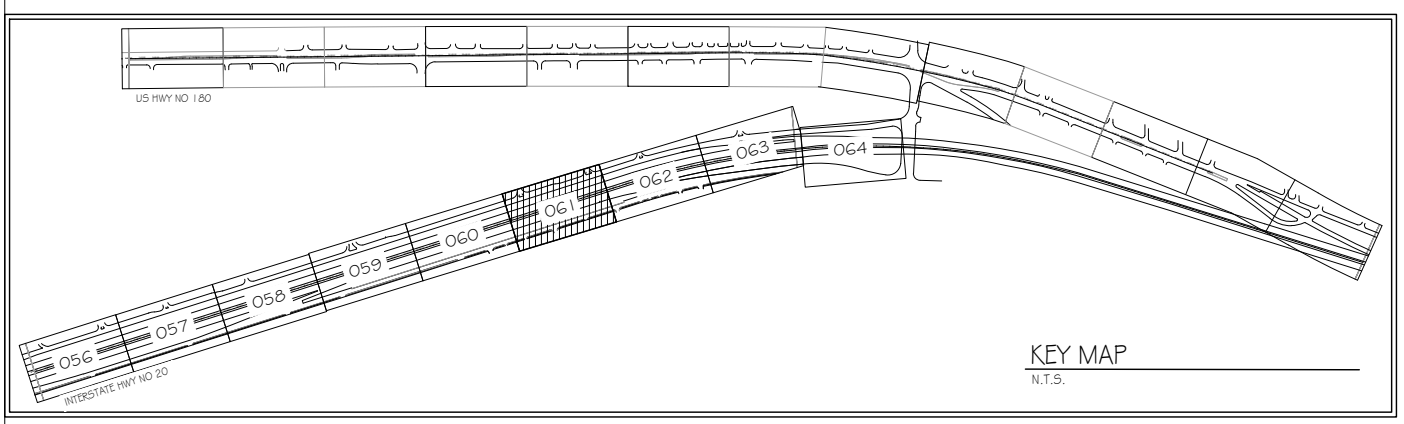
MATCHLINE SEE SHEET 062



1 IH 20 STA 37+00 - STA 44+50
 1" = 30'-0"

IRRIGATION SCHEDULE 6

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	HUNTER PROS-PRS30-04-CV-PCN 10 FLOOD BUBBLER, 4" POP-UP, FACTORY INSTALLED DRAIN CHECK VALVE.
	HUNTER ICV-G 1-1/2" 1", 1-1/2", 2", AND 3" PLASTIC ELECTRIC REMOTE CONTROL VALVES, GLOBE CONFIGURATION, WITH NPT THREADED INLET/OUTLET, FOR COMMERCIAL/MUNICIPAL USE.
	HUNTER ICV-G 1-1/2" 1", 1-1/2", 2", AND 3" PLASTIC ELECTRIC REMOTE CONTROL VALVES, GLOBE CONFIGURATION, WITH NPT THREADED INLET/OUTLET, FOR COMMERCIAL/MUNICIPAL USE.
	HUNTER ICV-G 1-1/2" 1", 1-1/2", 2", AND 3" PLASTIC ELECTRIC REMOTE CONTROL VALVES, GLOBE CONFIGURATION, WITH NPT THREADED INLET/OUTLET, FOR COMMERCIAL/MUNICIPAL USE.
	HUNTER ICV-G 1-1/2" 1", 1-1/2", 2", AND 3" PLASTIC ELECTRIC REMOTE CONTROL VALVES, GLOBE CONFIGURATION, WITH NPT THREADED INLET/OUTLET, FOR COMMERCIAL/MUNICIPAL USE.
	FBCO 825Y 1" REDUCED PRESSURE BACKFLOW PREVENTER
	FBCO 825Y 1" REDUCED PRESSURE BACKFLOW PREVENTER
	HUNTER IC-3000-PP MODULAR CONTROLLER, 30 STATIONS, OUTDOOR MODEL, PLASTIC PEDESTAL, COMMERCIAL USE. WITH FOUR ICM-600 MODULES INCLUDED.
	HUNTER WSS WIRELESS SOLAR, RAIN FREEZE SENSOR WITH OUTDOOR INTERFACE, CONNECTS TO HUNTER PCC, PRO-C, AND I-CORE CONTROLLERS, INSTALL AS NOTED. INCLUDES 10 YEAR LITHIUM BATTERY AND RUBBER MODULE COVER, AND GUTTER MOUNT BRACKET.
	HUNTER HFS-100 FLOW SENSOR FOR USE WITH ACC CONTROLLER, 1" SCHEDULE 40 SENSOR BODY, 24 VAC, 2 AMP.
	HUNTER HFS-100 FLOW SENSOR FOR USE WITH ACC CONTROLLER, 1" SCHEDULE 40 SENSOR BODY, 24 VAC, 2 AMP.
	WATER METER 1-1/2"
	WATER METER 1-1/2"
	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.
	IRRIGATION MAINLINE:
	PIPE SLEEVE:
	Valve Callout Valve Number Valve Flow Valve Size



KEY MAP
N.T.S.

Pacheco Koch 4060 BRYANT IRVIN ROAD
 FORT WORTH, TX 76109 817.412.7155
 TX REG. ENGINEERING FIRM F-14439
 TX REG. SURVEYING FIRM LS-10193824

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IRRIGATION PLAN
 IH 20
 STA 37+00 - STA 44+50

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. F 2022(848)	SHEET NO. 061
STATE TEXAS	DISTRICT FTW	COUNTY PARKER
CONTROL 0314	SECTION 07	JOB 080
		HIGHWAY NO IH-20 & US 180



DWITMEYER
 05/02/2022 - 12:19PM
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APRIL 2022 - 100% PLAN SUBMITTAL

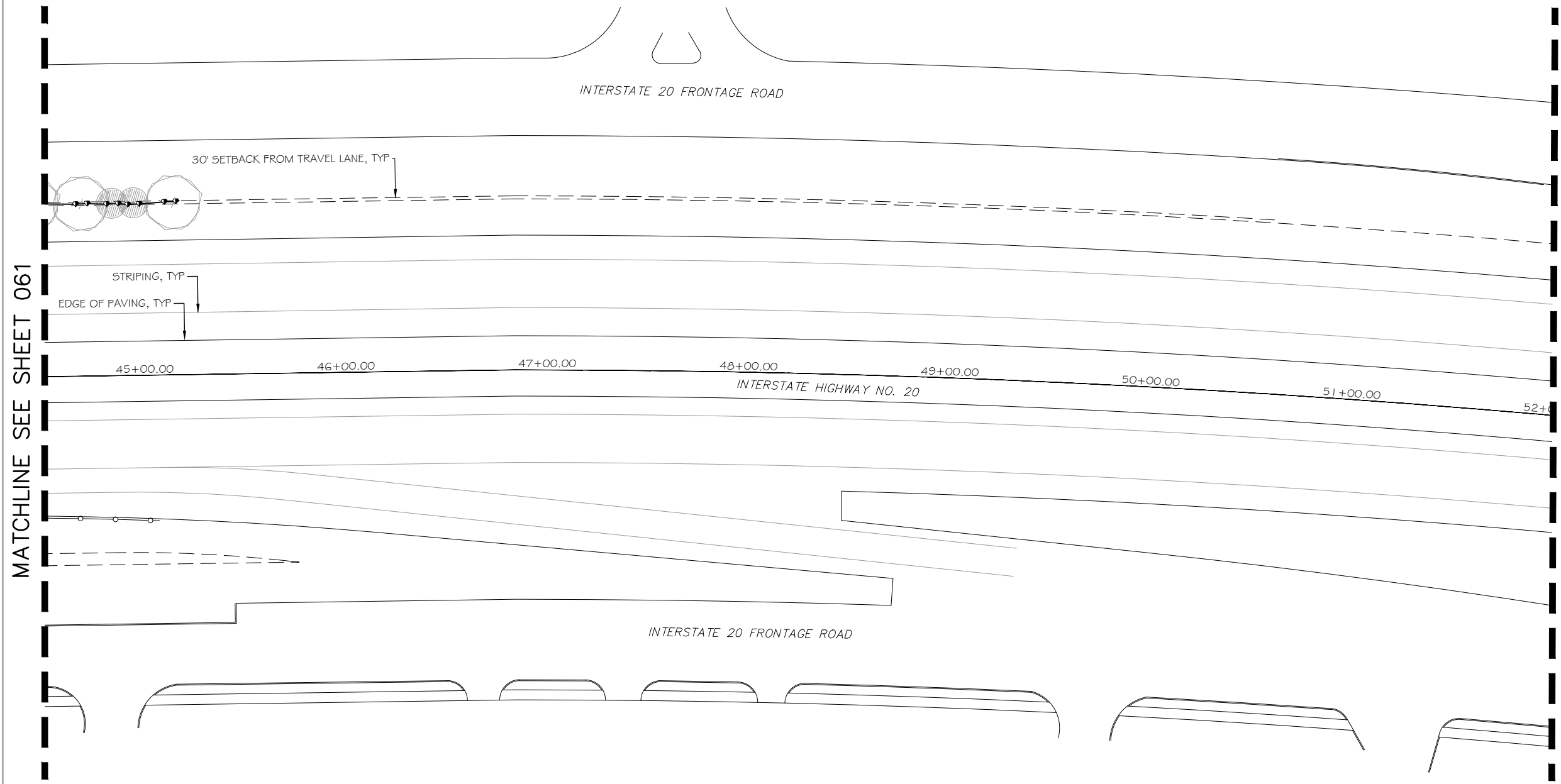


GENERAL NOTES

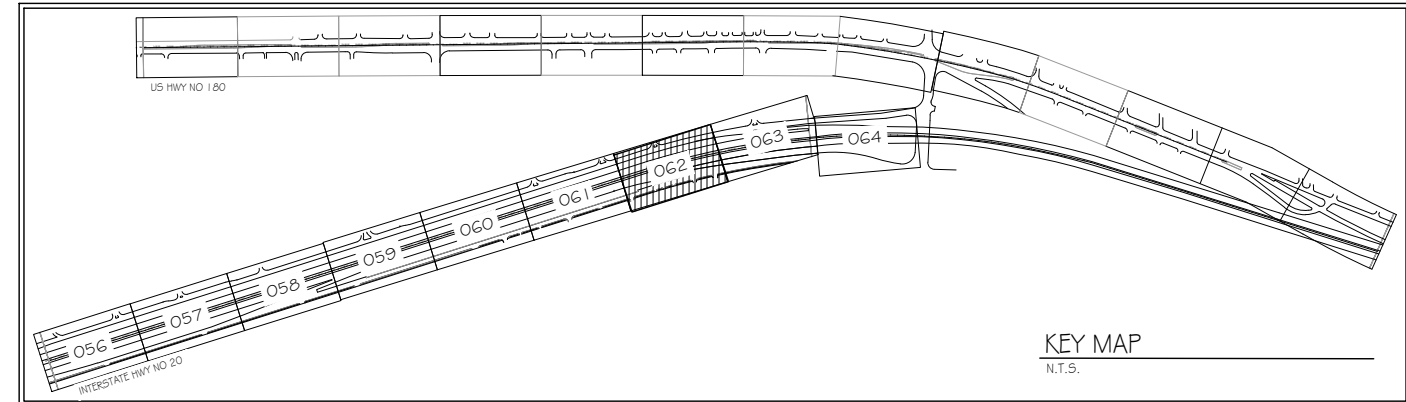
1. THE ENTIRE LIMITS OF IMPROVEMENTS WERE NOT SURVEYED. ALL LINEWORK IS APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
2. ALL UTILITIES SHOWN ON PLANS ARE APPROXIMATE IN NATURE AND DO NOT RELIEVE THE CONTRACTOR FROM ANY RESPONSIBILITY TO COORDINATE WITH APPROPRIATE AUTHORITIES.

MATCHLINE SEE SHEET 061

MATCHLINE SEE SHEET 063



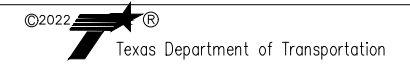
I IH 20 STA 44+50 - STA 52+00
1" = 30'-0"



IRRIGATION SCHEDULE 7

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	HUNTER PROS-PRS30-04-CV-PCN 10 FLOOD BUBBLER, 4" POP-UP, FACTORY INSTALLED DRAIN CHECK VALVE.
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.
	Valve Callout
	Valve Number
	Valve Flow
	Valve Size

Pacheco Koch 4060 BRYANT IRVIN ROAD
FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10193824



IRRIGATION PLAN

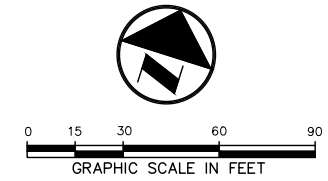
IH 20
STA 44+50 - STA 52+00

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. F 2022(848)	SHEET NO. 062
STATE TEXAS	DISTRICT FTW	COUNTY PARKER
CONTROL 0314	SECTION 07	JOB 080
		HIGHWAY NO IH-20 & US 180



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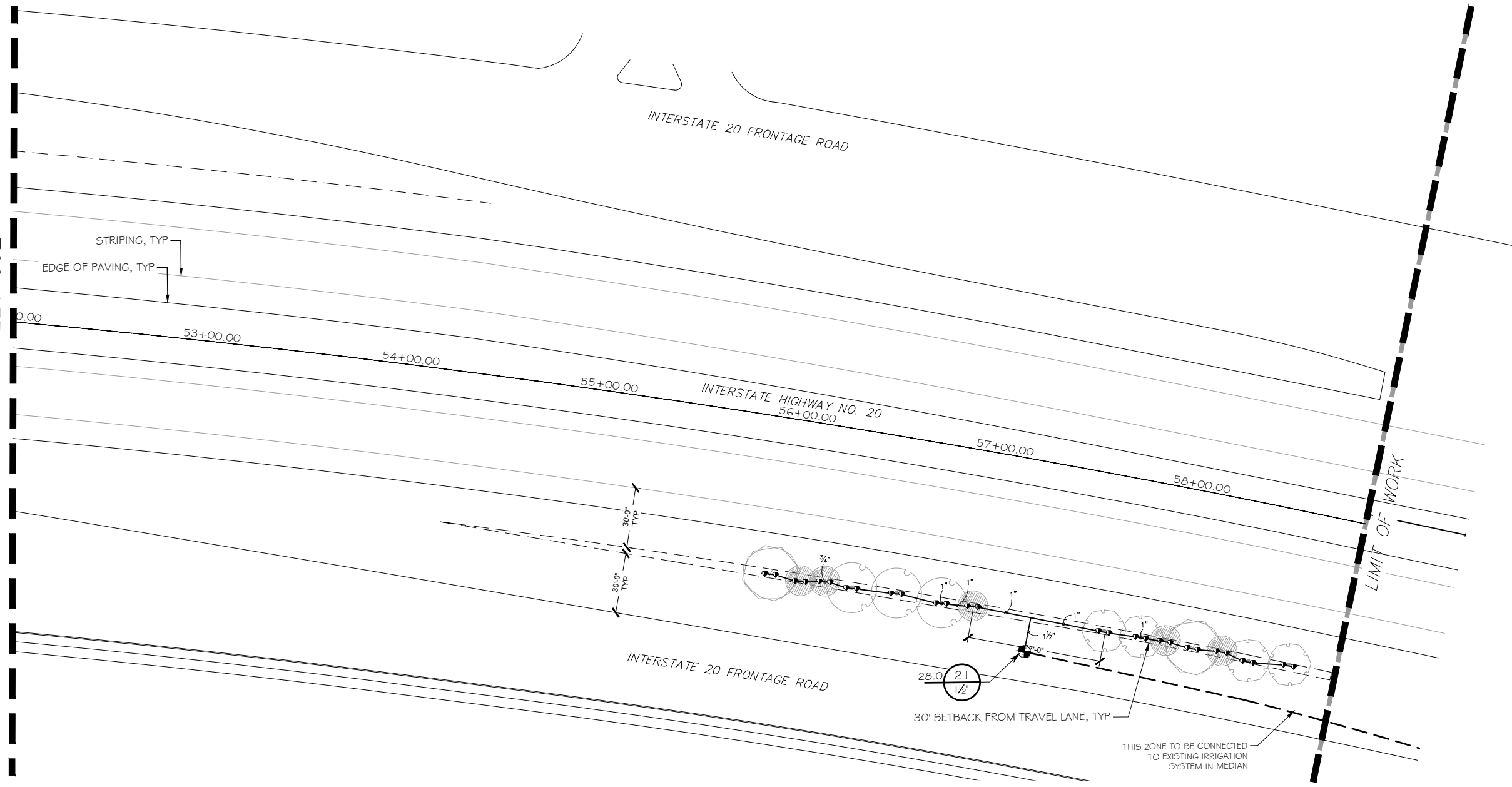
APRIL 2022 - 100% PLAN SUBMITTAL



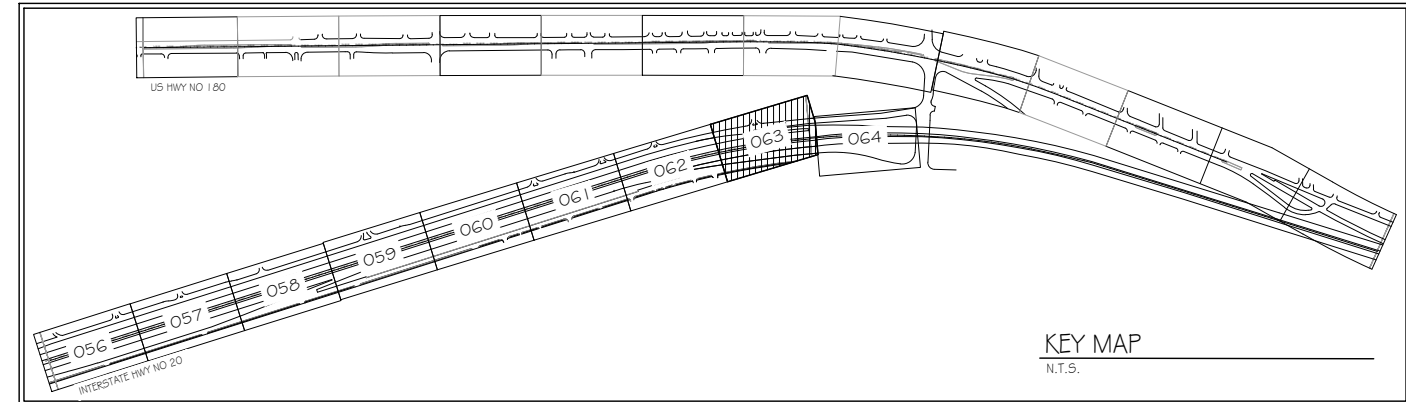
GENERAL NOTES

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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 SHEET 062



1 IH 20 STA 52+00 STA 58+50
1" = 30'-0"



IRRIGATION SCHEDULE 8

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	HUNTER PROS-PRS30-04-CV-PCN 10 FLOOD BUBBLER, 4" POP-UP, FACTORY INSTALLED DRAIN CHECK VALVE.
	HUNTER ICV-G 1", 1-1/2", 2", AND 3" PLASTIC ELECTRIC REMOTE CONTROL VALVES, GLOBE CONFIGURATION, WITH NPT THREADED INLET/OUTLET, FOR COMMERCIAL/MUNICIPAL USE.
—	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.
- - -	IRRIGATION MAINLINE: PVC CLASS 200 SDR 21

	Valve Callout
	Valve Number
	Valve Flow
	Valve Size

Pacheco Koch 4060 BRYANT IRVIN ROAD
FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10193824

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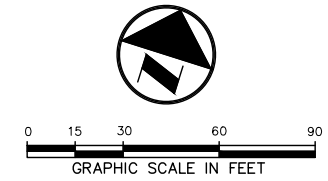
IRRIGATION PLAN
IH 20
STA 52+00 STA 58+50

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. F 2022(848)	SHEET NO. 063
STATE TEXAS	DISTRICT FTW	COUNTY PARKER
CONTROL 0314	SECTION 07	JOB 080
		HIGHWAY NO IH-20 & US 180



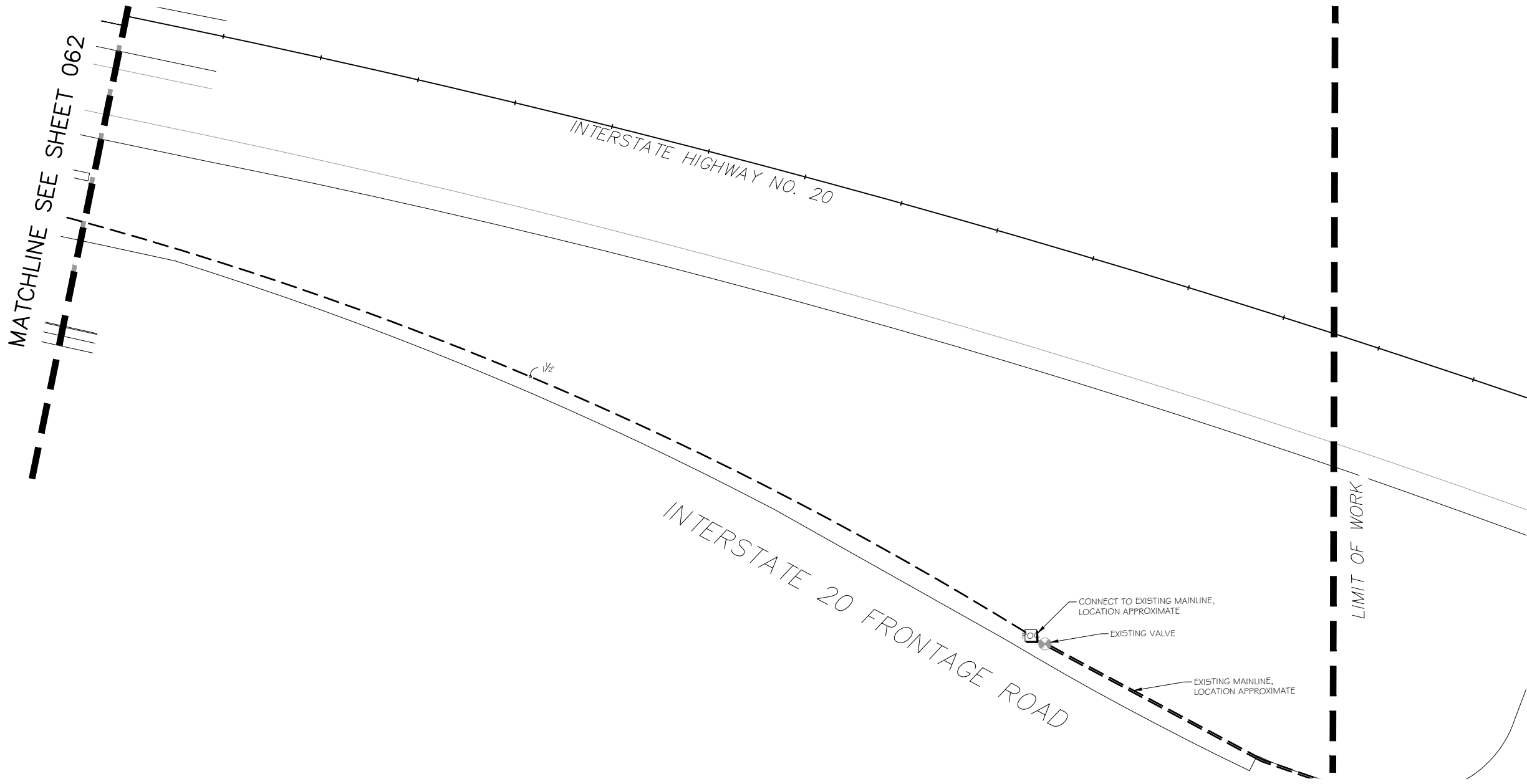
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APRIL 2022 - 100% PLAN SUBMITTAL

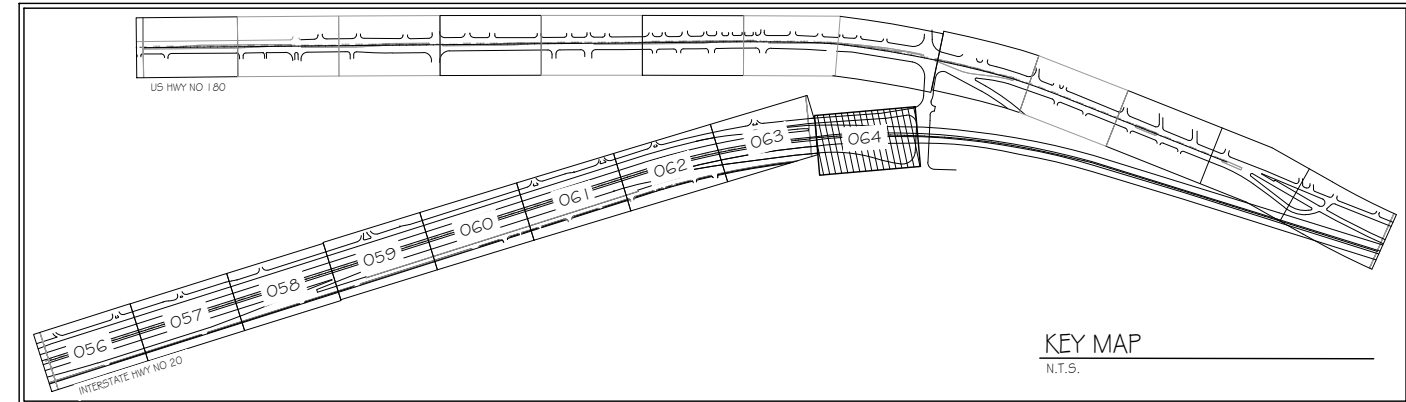


GENERAL NOTES

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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.

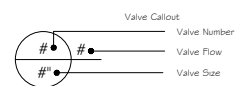


1 IH 20 STA 58+50 STA 70+00
1" = 30'-0"



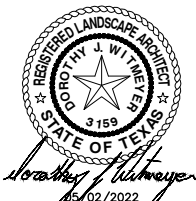
IRRIGATION SCHEDULE 8

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	HUNTER PROS-PRS30-04-CV-PCN 10 FLOOD BUBBLER, 4" POP-UP, FACTORY INSTALLED DRAIN CHECK VALVE.
SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
	HUNTER ICV-G 1", 1-1/2", 2", AND 3" PLASTIC ELECTRIC REMOTE CONTROL VALVES, GLOBE CONFIGURATION, WITH NPT THREADED INLET/OUTLET, FOR COMMERCIAL/MUNICIPAL USE.
	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.
	IRRIGATION MAINLINE: PVC CLASS 200 SDR 21



Pacheco Koch 4060 BRYANT IRVIN ROAD
FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-14439
TX REG. SURVEYING FIRM LS-10193824

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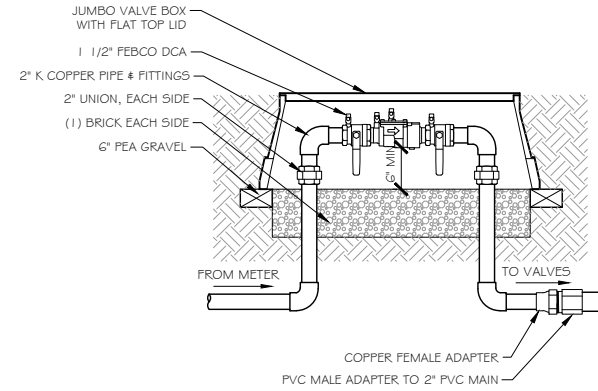
IRRIGATION PLAN
IH 20
STA 58+50 STA 70+00

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. F 2022(848)	SHEET NO. 064
STATE TEXAS	DISTRICT FTW	COUNTY PARKER
CONTROL 0314	SECTION 07	JOB 080
		HIGHWAY NO IH-20 & US 180

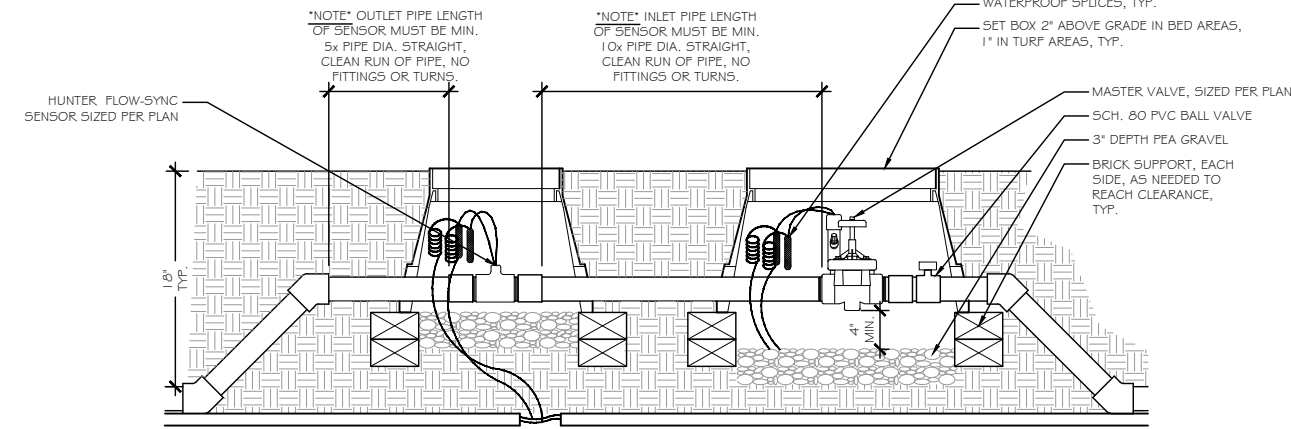
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APRIL 2022 - 100% PLAN SUBMITTAL

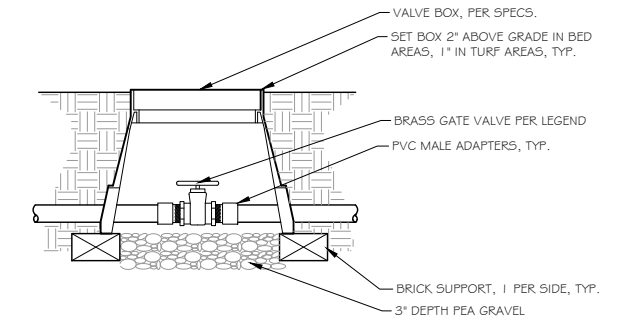
NOTE:
CONTRACTOR SHALL INSTALL Y STRAINER PER TCEQ REQUIREMENTS WITH DCA



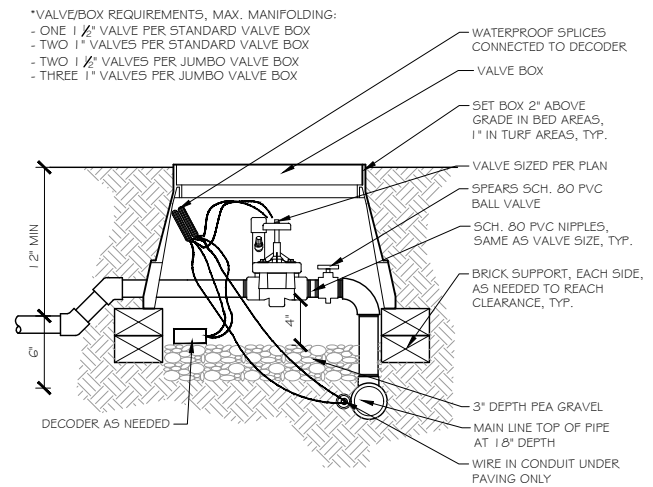
1 DOUBLE CHECK ASSEMBLY
1" = 1'-0"



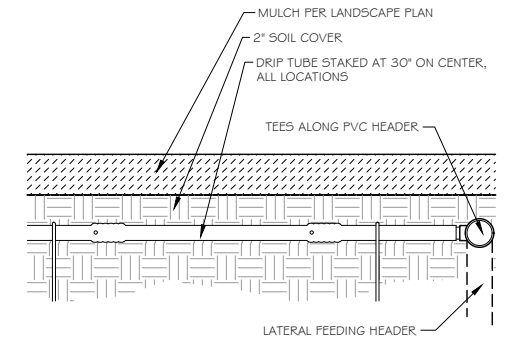
2 MASTER VALVE AND FLOW METER
1 1/2" = 1'-0"



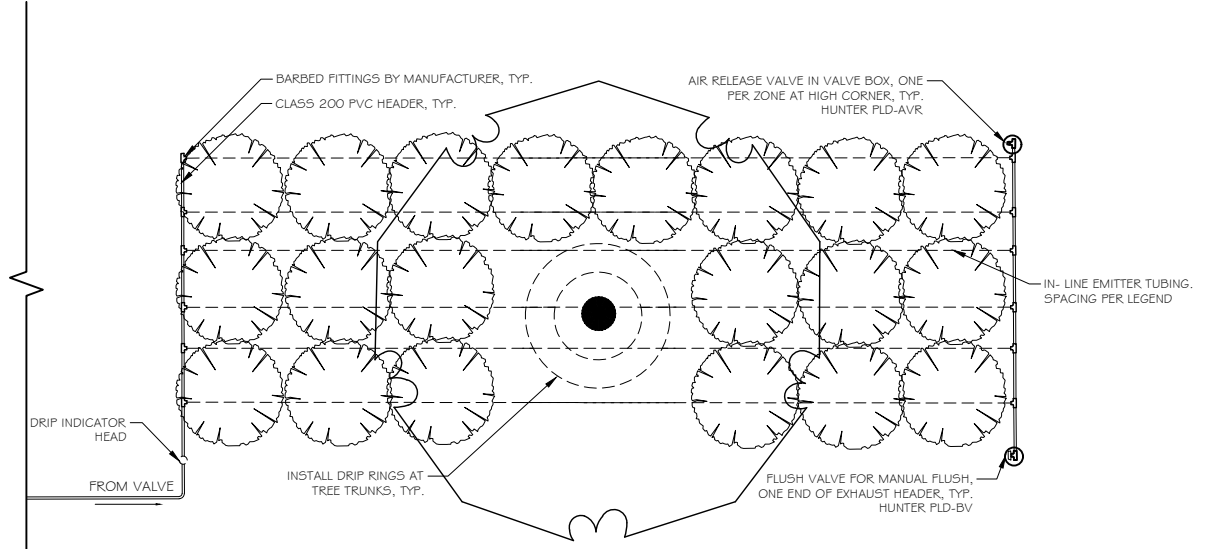
3 BRASS ISOLATION VALVE
1 1/2" = 1'-0"



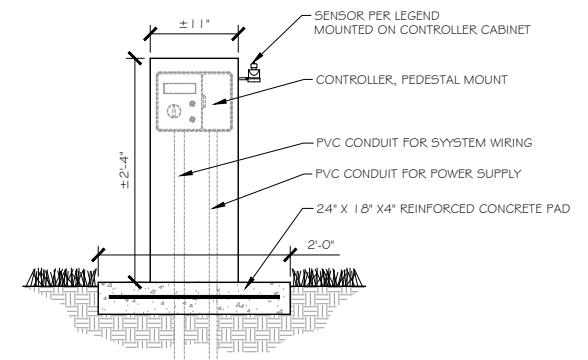
4 AUTOMATIC SYSTEM VALVE WITH DECODER
1 1/2" = 1'-0"



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



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



7 IRRIGATION CONTROLLER & SENSOR
1" = 1'-0"

DWTMEYER 05/02/2022 - 12:19PM M:\DWG-47\4747-22\043\DWG\LANDSCAPE.FX.2018\SHEETS\IRRIGATION DETAILS.DWG



			4060 BRYANT IRVIN ROAD FORT WORTH, TX 76109 817.412.7155 TX REG. ENGINEERING FIRM F-14439 TX REG. SURVEYING FIRM LS-10193824
IRRIGATION DETAILS			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	F 2022(848)	065	
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY NO.
0314	07	080	IH-20 & US 180

APRIL 2022 - 100% PLAN SUBMITTAL