FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	STP 2023(388) HES		1
STATE	STATE DIST.	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONT.	SECT.	JOB	HIGHWAY NO.
0024	04	068, ETC.	US 90,ETC.

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

INDEX OF SHEETS

SEE SHEET 2 FOR INDEX OF SHEETS

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT

PROJECT NO. STP 2023 (388) HES

MEDINA, ETC.
US 90, ETC.

DESIGN SPEED = N/A
AREA OF DISTURBED SOIL = 3.34 ACRES

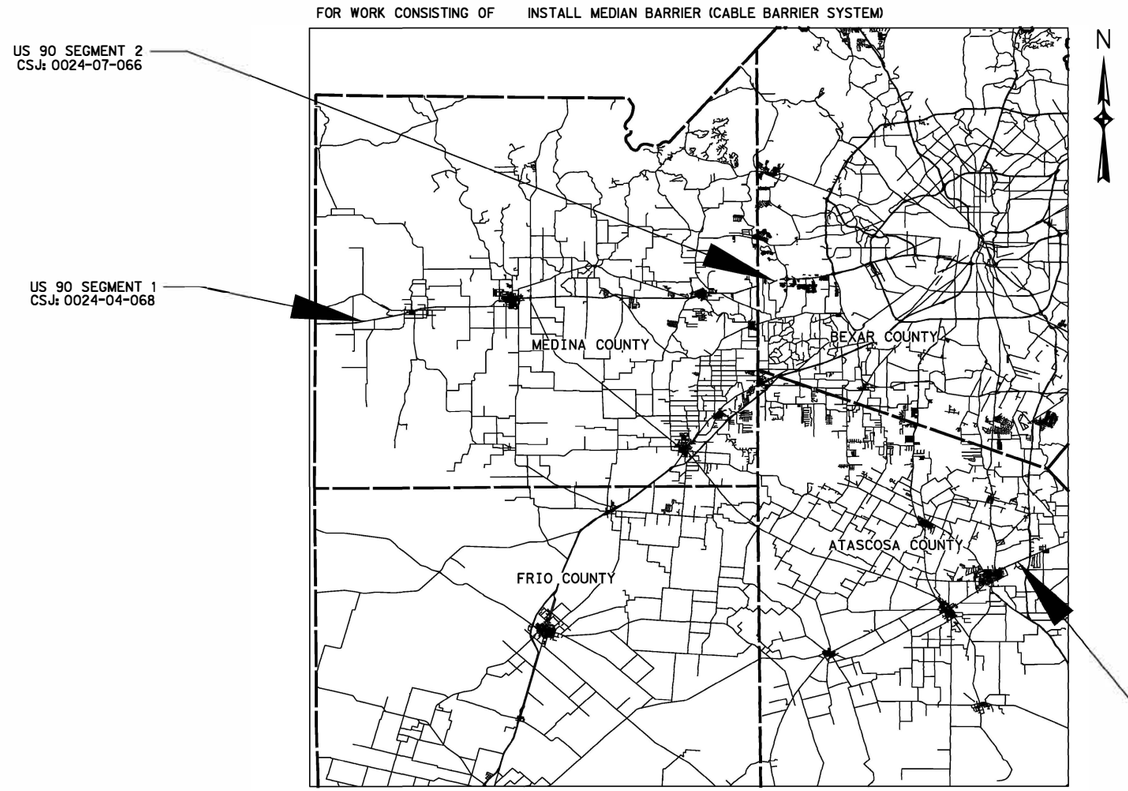
ADT: US 90 (MEDINA COUNTY) : 7813
US 90 (BEXAR COUNTY) : 23224
SH 97 (ATASCOSA COUNTY) : 9500

CSJ: 0024-04-068
LIMITS FROM: 3.45 MI EAST OF RM 187
TO: 0.10 MI EAST OF NESTER LN
NET LENGTH OF ROADWAY = 39,493.00 FT = 7.480 MI
NET LENGTH OF BRIDGE = 0.00 FT = 0.000 MI
NET LENGTH OF PROJECT = 39,493.00 FT = 7.480 MI

CSJ: 0024-07-066
LIMITS FROM: SH 211
TO: ZINSMEYER
NET LENGTH OF ROADWAY = 13,240.00 FT = 2.509 MI
NET LENGTH OF BRIDGE = 0.00 FT = 0.000 MI
NET LENGTH OF PROJECT = 13,240.00 FT = 2.509 MI

CSJ: 0328-03-037
LIMITS FROM: PARSONS RD
TO: IH 37
NET LENGTH OF ROADWAY = 12,000.00 FT = 2.273 MI
NET LENGTH OF BRIDGE = 0.00 FT = 0.000 MI
NET LENGTH OF PROJECT = 12,000.00 FT = 2.273 MI

FOR WORK CONSISTING OF INSTALL MEDIAN BARRIER (CABLE BARRIER SYSTEM)



N.T.S

EXCEPTIONS: NONE
EQUATIONS: NONE
R. R. CROSSINGS: NONE

LETTING DATE: _____

DATE CONTRACTOR BEGAN WORK: _____

DATE WORK WAS ACCEPTED: _____

FINAL CONTRACT COST: $ _____

CONTRACTOR: _____

FINAL PLANS STATEMENT:

THE CONSTRUCTION WORK WAS PERFORMED IN ACCORDANCE WITH THE PLANS.

_____ P.E. _____
AREA ENGINEER DATE

TEXAS DEPARTMENT OF TRANSPORTATION

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

RECOMMENDED FOR LETTING: 9/23/2022
DocuSigned by: Diana C. Rogerio
TRANSPORTATION ENGINEER SUPERVISOR

RECOMMENDED FOR LETTING: 9/23/2022
DocuSigned by: Clayton Ripps, P.E.
DIRECTOR OF TRANSPORTATION PLANNING & DEVELOPMENT

RECOMMENDED FOR LETTING: 9/26/2022
DocuSigned by: Lynette J. Colbert, P.E.
TRANSPORTATION ENGINEER SUPERVISOR

APPROVED FOR LETTING: 9/23/2022
DocuSigned by: Gina Gallegos
DISTRICT ENGINEER

FILE LOCATION
http://www.txdot.gov/inside-txdot/district/san-antonio/specInfo.html

LEVELS DISPLAYED

PROJ. NO. _____
LETTING DATE _____
COUNTY _____
HWY. NO. _____
DATE ACCEPTED _____

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

STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

9/22/2022

THE SEAL ORIGINALLY APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY JOHNNY L. CLAYTON, P.E. #107215 ON 9/22/2022 . ALTERATION OF A PREVIOUSLY SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT. THE RECORD COPY OF THIS DRAWING IS ON FILE AT THE OFFICES OF HALFF ASSOCIATES, INC., 100 NE INTERSTATE 410 LOOP, SUITE 200, SAN ANTONIO, TEXAS 78216, TBPE FIRM #F-312

NO.	REVISION	BY	DATE

HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

Texas Department of Transportation®

INDEX OF SHEETS

SCALE: NTS SHEET 1 OF 1

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		2
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.

US 90 SEGMENT 1
BEGIN PROJECT
CSJ: 0024-04-068
STA 15+00.00
3.45 MI EAST OF RM 187
INSTALL CABLE BARRIER IN MEDIAN (TL-3)

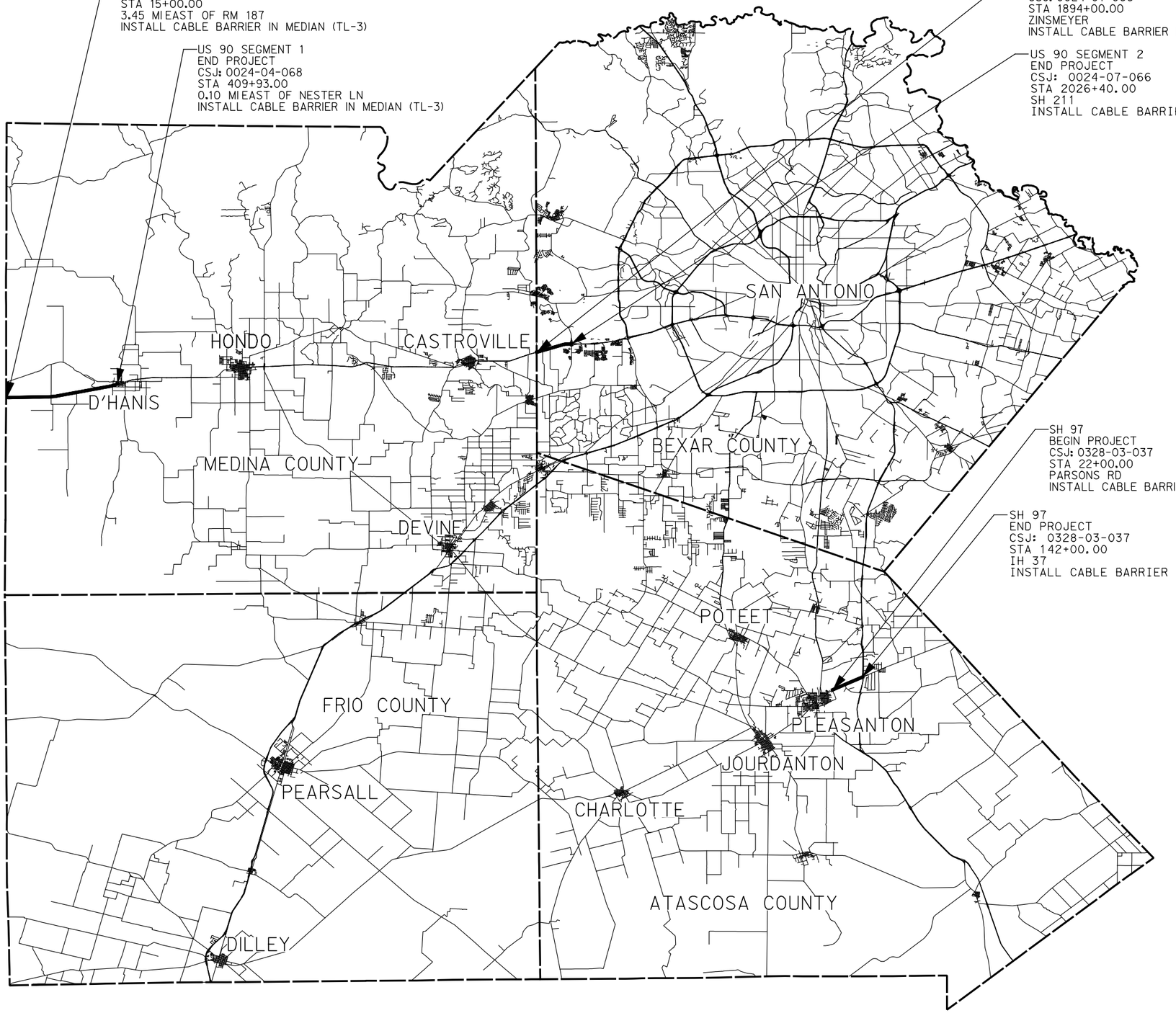
US 90 SEGMENT 1
END PROJECT
CSJ: 0024-04-068
STA 409+93.00
0.10 MI EAST OF NESTER LN
INSTALL CABLE BARRIER IN MEDIAN (TL-3)

US 90 SEGMENT 2
BEGIN PROJECT
CSJ: 0024-07-066
STA 1894+00.00
ZINSMEYER
INSTALL CABLE BARRIER IN MEDIAN (TL-3)

US 90 SEGMENT 2
END PROJECT
CSJ: 0024-07-066
STA 2026+40.00
SH 211
INSTALL CABLE BARRIER IN MEDIAN (TL-3)

SH 97
BEGIN PROJECT
CSJ: 0328-03-037
STA 22+00.00
PARSONS RD
INSTALL CABLE BARRIER IN MEDIAN (TL-3)

SH 97
END PROJECT
CSJ: 0328-03-037
STA 142+00.00
IH 37
INSTALL CABLE BARRIER IN MEDIAN (TL-3)



N

N.T.S.

STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

6/30/2022

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NO.	REVISION	BY	DATE

HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

Texas Department of Transportation®

LOCATION MAP

SCALE: NTS SHEET 1 OF 1

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		2A
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.

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**********GENERAL NOTES**********
2014 Specification Book

========== **Basis of Estimate** ==========

Item	Description	Rate/Area	Quant-Unit
168-6001	Vegetative Watering	16 MG/165,098 SY	2,654 MG

--General--
To better fit field conditions, the cross sections may be varied when approved.

If there are waste areas or material source areas, follow the Texas Aggregate Quarry and Pit Safety Act requirements.

Any materials removed and not reused and determined to be salvageable shall be stored within the project limits at an approved location or delivered undamaged to the storage yard as directed. Properly dispose unsalvageable materials in accordance with local, state, and federal regulations. Deface traffic signs so that they will not reappear in public as signs.

Any sign panels that are adjusted or removed and replaced, shall be done the same workday unless otherwise approved. This work shall be considered subsidiary to Item 502.

Notify the Engineer at least two weeks prior to a proposed traffic pattern change(s) that will require a revision to traffic signals.

Hurricane Evacuation

Hurricane Season is from June 1 thru November 30. As the closest metropolitan city inland from the Texas Coast, the City of San Antonio is a major shelter destination during mandatory hurricane evacuations. As such, planned work zone lane or road closures may be restricted and/or suspended during mandatory hurricane evacuation operations. The District will coordinate these restrictions at a minimum H-120 from any projected impact to the Texas Coast.

No time charges will be made if the Engineer determines that work on the project was impacted by the hurricane.

The Engineer may order changes in the Traffic Control Plan to accommodate evacuation traffic, and may suspend the work, all or in part, to ensure timely completion of this work. All work to implement changes in the Traffic Control Plan will be paid through existing bid prices or through Item 9.5, Force Account. However, the Department will not entertain any request for delay damages, loss of efficiency that may be attributed to the restriction or suspension of road or lane closures, or to changes in the Traffic Control Plan.

Contractor questions on this project are to be addressed to the following individual(s):
Area Engineer: Christen Longoria, christen.longoria@txdot.gov
Assistant Area Engineer: Frances Merecka, frances.merecka@txdot.gov

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

All contractor questions will be reviewed by the Engineer. Once a response is developed, it will be posted to TxDOT's Public FTP at the following Address:
https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting%20Responses/
All questions submitted that generate a response will be posted through this site. The site is organized by District, Project Type (Construction or Maintenance), Letting Date, CCSJ/Project Name.

--Item 5--
The earthwork information was not developed with computers; therefore, a CD cannot be provided. Prior to letting, earthwork cross-sections will be available at the Engineer's office for review by the bidder or for borrowing by copying companies to make copies at the bidder's expense.

When working near aerial electrical lines or utility poles, comply with Federal, State and local regulations. A horizontal boom or equivalent equipment is required for construction in the vicinity of the CPS Energy electric lines in order to provide vertical clearance of equipment during construction. Contact CPS Energy Utility Coordination Group sixteen (16) week in anticipation of pole bracing. The estimated duration for pole bracing is 6 to 10 weeks (or longer if temporary construction easements are required) after invoice is paid. For de-energizing or sleeving of the overhead electrical lines depicted on the plans, please contact CPS Energy Utility Coordination Group sixteen (16) week in anticipation of needed de-energization. The estimated duration for de-energizing is approximately 4 to 6 weeks (after invoice is paid) but could vary on system scenario and backfeed requirements. De-energizing may not be possible in all instances or may be restricted during specific periods of time due to load demand. Contractor will be reimbursed for the invoice cost for pole bracing and/or de-energizing or sleeving through force account.

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, nests containing migratory birds must be avoided and no work will be performed in the nesting areas until the young birds have fledged.

Structures

Bridge and culvert construction operations cannot begin until swallow nesting prevention is implemented, until after October 1 if it's determined that swallow nesting is actively occurring, or until it's determined swallow nests have been abandoned. If the State installed nesting deterrent on the bridges and culverts, maintain the existing nesting deterrent to prevent swallow nesting until October 1 or completion of the bridge and culvert work, whichever occurs earlier. If new nests are built and occupied after the beginning of the work, do not perform work that can interfere with or discourage swallows from returning to their nests. Prevention of swallow nesting can be performed by one of the following methods:

1. By February 15 begin the removal of any existing mud nests and all other mud placed by swallows for the construction of nests on any portion of the bridge and culverts. The Engineer will inspect the bridges and culverts for nest building activity. If swallows begin nest building, scrape or wash down all nest sites. Perform these activities daily unless the Engineer determines the need to do this work more frequently. Remove nests and mud through October 1 or until bridge and culvert construction operations are completed.

2. By February 15 place a nesting deterrent (which prevents access to the bridge and culvert by swallows) on the entire bridge (except deck and railing) and culverts.

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.

When a precast or cast-in-place concrete element is included in the plans, a precast concrete alternate may be submitted in accordance with "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 6--
Show the stockpile lot and/or sub lot numbers on all tickets for all materials.

Steel Wrapped or Asbestos Utility Lines:

Existing steel wrapped natural gas and/or asbestos cement (AC) water lines that will no longer be in service are usually abandoned in place (AIP). However, if any of these lines have to be removed for whatever reason (in the way of other construction, to make tie-ins, etc.), comply with Item 6.

If removal of AC water lines is included in the construction contract, then notify the Engineer of proposed dates of removal of the AC water lines in accordance to Item 6. Excavate to the top of

the AC water line to allow a separate contractor hired by the State to remove the AC water line. The excavation for the AC water line removal is subsidiary to the work that created the need for the removal (excavation for structures, roadway, a new line, tie-ins, etc.).

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

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

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

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

--Item 7--
The project's total disturbed area is 3.34 acres. The disturbed area in all project locations and Contractor project specific locations (PSL's), within 1/4 mile of the project limits, 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. Obtain any required authorization from the TCEQ for any PSL's on or off the ROW. When the total area disturbed on the project and PSL's within 1/4 mile of the project exceeds 5 acres, provide a copy of the Contractor NOI for PSL's to the Engineer (to the appropriate MS4 operator when the project is on an off-state system route).

Notify the Engineer of the disturbed acreage within one (1) mile of the project limits. Obtain authorization from the TCEQ for Contractor PSL's for construction support activities on or off ROW.

Roadway closures during the following key dates and/or special event are prohibited.
See the TCP Narrative for these dates.

--Item 8--
Working days will be computed and charged in accordance with Article 8.3.1.4: Standard work week.

A Special Provision to Item 8 for a delayed authorized date to begin work has been included in the contract. The reason for including the Special Provision is for material processing or contractor mobilization.

Create and maintain a Bar Chart schedule.

--Item 9--
When approved, provide uniformed, off-duty law enforcement officers with marked vehicles during work that requires a lane closure. The officer in marked vehicles shall be located as approved to monitor or direct traffic during the closure. The method used to direct traffic at signalized intersections shall be as approved. Additional officers and vehicles may be provided when approved or directed.

Complete the daily tracking form provided by the department and submit invoices that agree with the tracking form for payment at the end of each month approved services were provided.

Show proof of certification by the Texas Commission on Law Enforcement Standards. All law enforcement personnel used in Work Zone Traffic Control shall be trained for performing duties in work zones and are required to take “Safe and Effective Use of Law Enforcement Personnel in Work Zones” (Course #133119) which can be found online at the following site: www.nhi.fhwa.dot.gov

Certificates of completion should be available to all who finish the course. These should be kept by the officers in order to substantiate completion when reporting to the work site.

Minimums, scheduling fees, etc. will not be paid; TxDOT will consider paying cancellation fees on a case-by-case basis.

--Item 100--
Begin clearing operations after trees and other areas of vegetation to be protected have been identified and approved. Install fencing around features to be protected as shown in the plans or directed. Coordinate all right of way clearing operations with the SW3P.

Trim and remove brush and trees within the stations noted in the plans and as needed for construction operations. Unless shown otherwise in the plans or a designated non-mow area, perform trimming or removal for areas to the ROW limits. Trim or remove to provide minimum of 5 ft. of horizontal clearance and 7 ft. of vertical clearance for the following: sidewalks, paths, guard fence, rails, signs, object markers, and structures. Trim to provide a minimum of 12 ft. vertical clearance under all trees. This work is subsidiary.

Obtain approval for proposed method of tree and brush trimming and removal. Vertical flailing equipment is not allowed. Treat damaged or cut branches, roots and/or stumps of all oak trees with a commercial tree wound dressing. Disinfect all pruning tools with a solution of 70% alcohol before moving from one tree to another. Unless otherwise approved remove all resulting vegetative debris from the ROW within 24 hours. The Engineer can stop all construction operations if the dressing, cut and removal requirements are not followed.

--Item 164--
Drill seeding of permanent grasses requires the use of approved grass seeding equipment capable of properly storing and metering the release of small seeds (such as Bermuda grass) separately from fluffy type seeds (such as bluestems). Equipment manufactured for planting grain crops is acceptable for planting temporary cool season seeds, but not for planting the permanent seed mix.

If performing a permanent seeding in an area with established temporary grass cover and mowing is performed instead of tilling, seed and fertilizer may be distributed simultaneously during “Broadcast Seeding” operations, provided each component is applied at the specified rate.

--Item 166--
Use a fertilizer with an analysis of 13-13-13 (50% of the total N must be sulfur coated urea) to apply 60 lbs of actual N per acre. This requires 460 lbs of 13-13-13 per acre or .095 lbs per SY of area.

--Item 168--
Apply vegetative watering as needed to supplement natural rainfall during the vegetation establishment period. Plan quantity of irrigation water is based on the application of a total of 1.3 gal of water each week for each sq. yd. of area that is sodded or seeded. Establishment time is estimated to be 12 weeks for both sod and permanent seed mixes. Temporary seeding will require less time for establishment. Provide a schedule and coordinate watering cycles and rates per cycle with the Engineer. Obtain approval if the quantity of water to be applied is expected to exceed the plan quantity. Adjust the amount of water applied with each cycle and the number of cycles each wk. according to actual site conditions. Drought or other conditions, as determined by the Engineer, may require the application of supplemental irrigation during hours other than normal working hours.

--Item 432--
In all riprap slopes, provide 3-inch diameter weep holes at 10 foot maximum spacing and backed with loose graded gravel or crushed stone and galvanized hardware cloth.

In areas where guard fence posts are to be placed in riprap, the riprap shall have an 18 inch +/- blocked out area (round or square). After the posts are installed, the blocked-out area shall be topped off with 4 inches of low strength grout/mortar consisting of about 1 sack of cement per cubic yard of mix.

Match the slope of the Riprap (Mow Strip) to the slope of the adjacent roadway.

--Item 500--
"Materials on Hand" payments will not be considered in determining percentages for mobilization payments.

--Item 502--
Place standard markings no later than 14 days after surface treatment operations are completed.

When advanced warning flashing arrow panels and/or changeable message sign is specified, have one standby unit in good condition at the job site. Standby time shall be considered subsidiary to the bid item.

Treat the pavement drop-offs as shown in the TCP.

After written notification, the time frame is provided on the Form 599 to provide properly maintained signs and barricades before considered in non-compliance. Failure to make corrections as noted may result in payment for this item being withheld.

Moving an existing sign to a temporary location is subsidiary to this Item. Installations with permanent supports at permanent locations will be paid for under the applicable bid item (s).

Mount temporary mailboxes on plastic drum in accordance with Compliant Work Zone Traffic Control Devices, Section K. Mounting and moving the mailbox as needed for the various construction phases is subsidiary to this Item.

Notify the Engineer in writing 10 business days in advance of any temporary or permanent lane, ramp, connector, etc. closures/detours, restrictions to lane widths, alterations to vertical clearances, or modifications to radii. Any other modifications to the roadway that may adversely affect the mobility of oversized/overweight trucks also require 10 business days advance written notice to the Engineer. Unless shown in the TCP, no lane, ramp, connector, etc. closures are allowed during special events. At least one lane has to remain open at all times. Lane closures will not be allowed if this reporting requirement is not met.

Avoid placing stockpiles within the roadway's horizontal clear zone. If a stockpile is placed within the clear zone, address in accordance with the TMUTCD.

Do not place barricades, signs, or any other traffic control devices where they interfere with sight distance at driveways or side streets.

In addition to providing a Contractor's Responsible Person and a phone number for emergency contact, have an employee available to respond on the project for emergencies and for taking corrective measures within 2 hours or within a reasonable time frame as specified by the Engineer.

If Nighttime work is required and work is not behind positive barrier then full TY 3 reflective gear is required to be worn by all workers, hard hat halos are required to be worn by the flaggers at flagging stations, TY III barricades are required to be spaced at 500 ft, and a mandatory night work meeting is required.

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

--Item 506--
An Inspector will perform a regularly scheduled SWP3 inspection every 7 calendar days.

Failure to address items noted on the SW3P inspection report within two report cycles may result in the Department stopping all construction operations, exclusive of time charges, or withholding that month's estimate until the SW3P deficiencies are corrected unless the Engineer determines that the area is too wet to correct SW3P deficiencies.

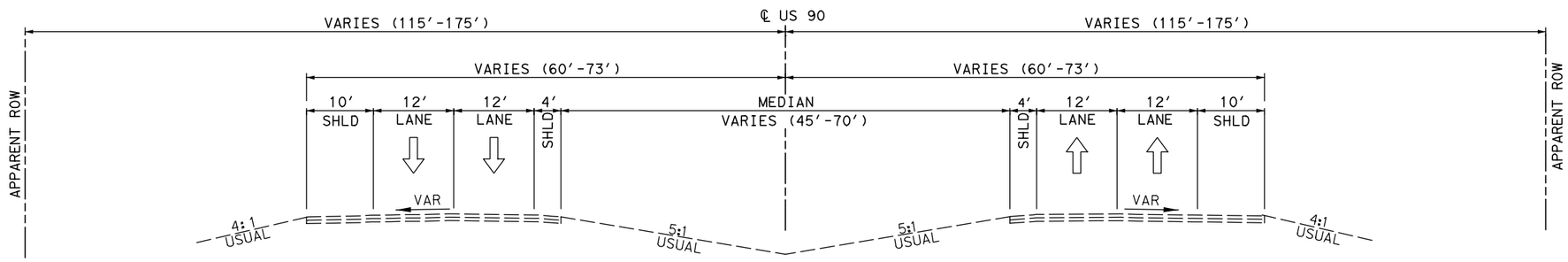
Failure to correctly maintain daily monitoring reports and submitting to TxDOT daily/weekly basis may result in the monthly estimate being withheld.

--Item 6185--
1 shadow vehicle with TMA will be required for this project. The TMA's will be measured and paid for by the DAY for each TMA/TA set up and operational on the worksite. The contractor will be responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMA's needed for the project. See TMA and TA Summary sheet in the plans.

Estimate & Quantity Sheet

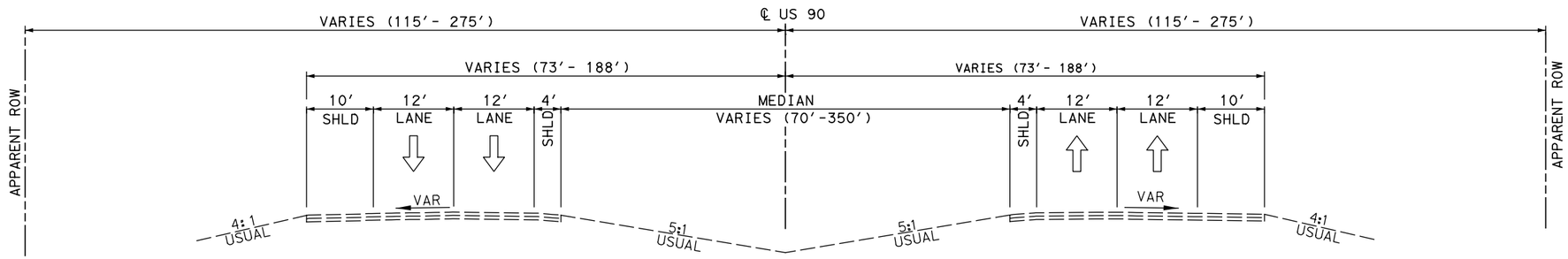
CONTROLLING PROJECT ID 0024-04-068 **DISTRICT** San Antonio **COUNTY** Atascosa, Bexar, Medina
HIGHWAY SH 97, US 90

			CONTROL SECTION JOB	**0024-04-068**		**0024-07-066**		**0328-03-037**		TOTAL EST.	TOTAL FINAL
			PROJECT ID	**A00177445**		**A00177454**		**A00177350**			
			COUNTY	**Medina**		**Bexar**		**Atascosa**			
			HIGHWAY	**US 90**		**US 90**		**SH 97**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	132-6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	CY	28,062.000		9,100.000		2,160.000		39,322.000	
	164-6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	88,216.000		37,728.000		39,154.000		165,098.000	
	164-6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	88,216.000		37,728.000		39,154.000		165,098.000	
	168-6001	VEGETATIVE WATERING	MG	1,419.000		607.000		628.000		2,654.000	
	169-6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	88,216.000		37,728.000		39,154.000		165,098.000	
	432-6066	RIPRAP (CL A) (MOW STRIP) (3 IN)	CY	825.000		363.000		288.000		1,476.000	
	500-6001	MOBILIZATION	LS	1.000						1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	3.000		1.000		1.000		5.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	1,075.000		525.000		210.000		1,810.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	1,075.000		525.000		210.000		1,810.000	
	543-6001	CABLE BARRIER SYSTEM (TL-3)	LF	25,270.000		11,709.000		8,734.000		45,713.000	
	543-6019	CABLE BARRIER TERMINAL SECTION (TL-3)	EA	68.000		20.000		26.000		114.000	
	6185-6002	TMA (STATIONARY)	DAY	29.000		15.000		15.000		59.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000						1.000	
		LAW ENFORCEMENT: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000						1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000						1.000	



US 90 EXISTING TYPICAL SECTION

℄ US 90-1 STA 18+00 TO STA 68+00
℄ US 90-1 STA 124+00 TO STA 410+00
℄ US 90-2 STA 1893+70 TO STA 2026+40



US 90 EXISTING TYPICAL SECTION

℄ US 90-1 STA 68+00 TO STA 124+00

STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

6/30/2022

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NO.	REVISION	BY	DATE

HALFF
100 NE INTERSTATE 410 LOOP
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SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

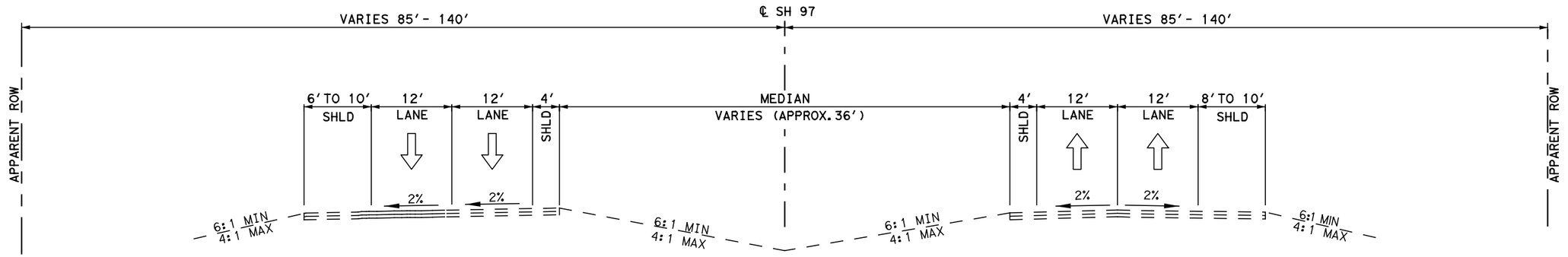
Texas Department of Transportation®

US 90

EXISTING
TYPICAL SECTIONS

SCALE: NTS SHEET 1 OF 1

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		5
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.



SH 97 EXISTING TYPICAL SECTION

℄ US SH 97 STA 24+00 TO STA 140+85

STATE OF TEXAS
ERIC DIETRICH
94970
LICENSED
PROFESSIONAL ENGINEER

NAME 6/27/2022 DATE

NO.	REVISION	BY	DATE

HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

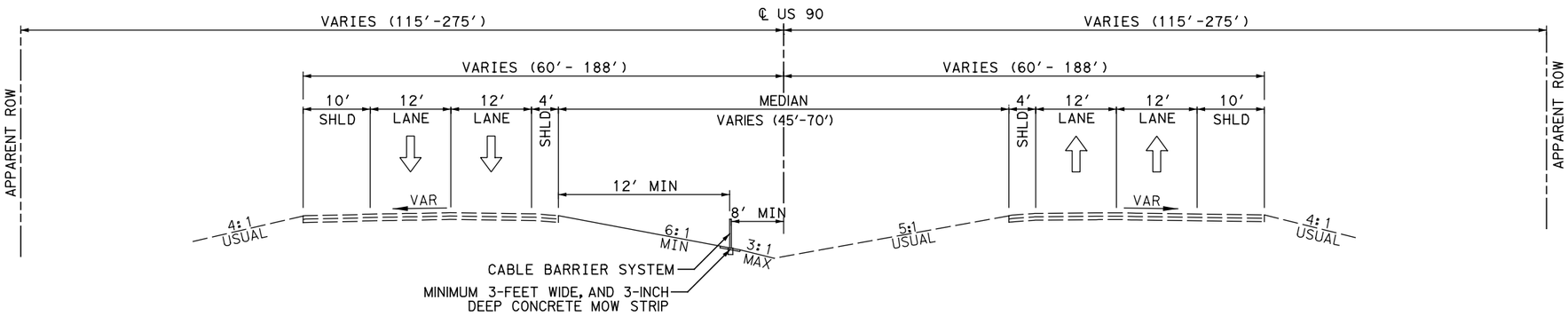
TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
1201 Interstate Highway 2
Mission, Texas 78572
(956) 424-7898
TEDSI
TBPE F-1640

SH 97

EXISTING
TYPICAL SECTION

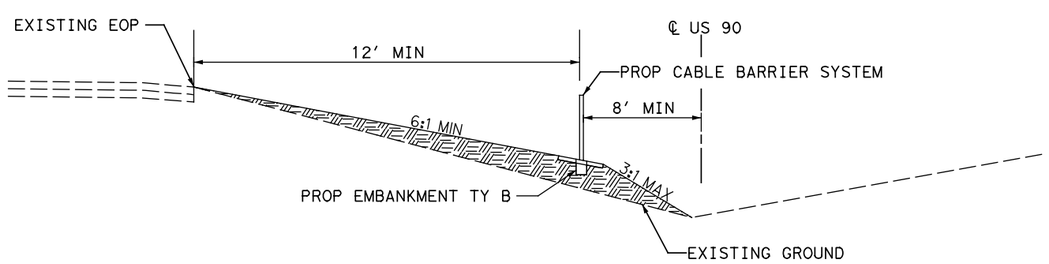
SCALE: N.T.S. SHEET 1 OF 1

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	See Title Sheet		5A
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068, ETC	US 90, ETC

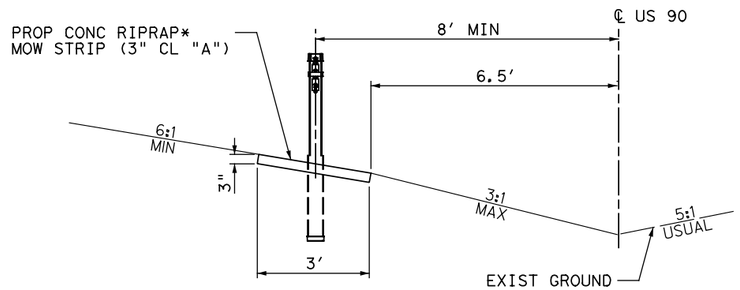


US 90 PROPOSED TYPICAL SECTION

℄ US 90-1 STA 18+00 TO STA 68+00
℄ US 90-1 STA 124+00 TO STA 410+00
℄ US 90-2 STA 1893+70 TO STA 2026+40



EMBANKMENT



MOW STRIP

*RIPRAP TO BE REINFORCED PER SPEC 432

STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

4/29/2022

THE SEAL ORIGINALLY APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY JOHNNY L. CLAYTON, P.E. #107215, ON 4/29/2022 . ALTERATION OF A PREVIOUSLY SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT. THE RECORD COPY OF THIS DRAWING IS ON FILE AT THE OFFICES OF HALFF ASSOCIATES, INC., 100 NE INTERSTATE 410 LOOP, SUITE 200, SAN ANTONIO, TEXAS 78216, TBPE FIRM #F-312

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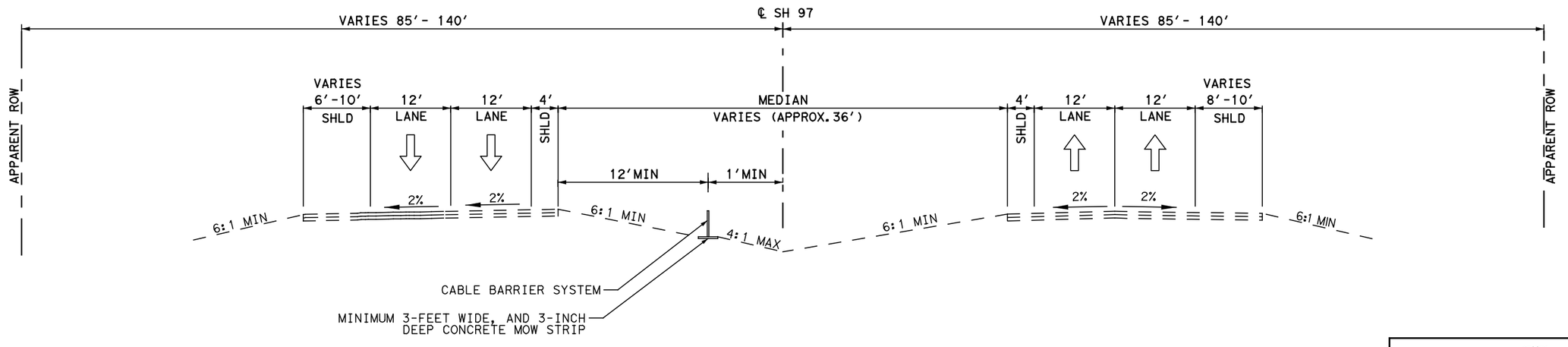
US 90

PROPOSED
TYPICAL SECTIONS

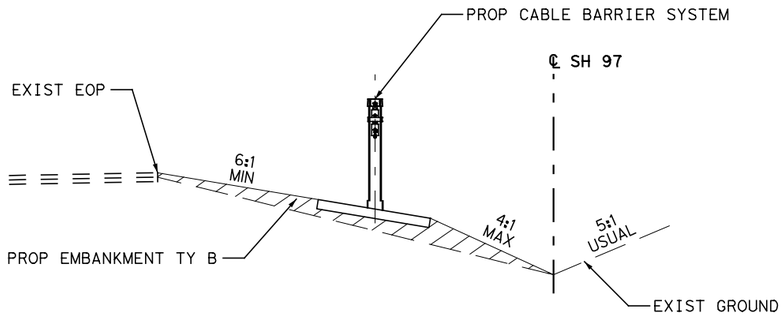
SCALE: NTS SHEET 1 OF 1

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		6
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.



SH 97 PROPOSED TYPICAL SECTION

℄ US SH 97 STA 24+00 TO STA 140+85



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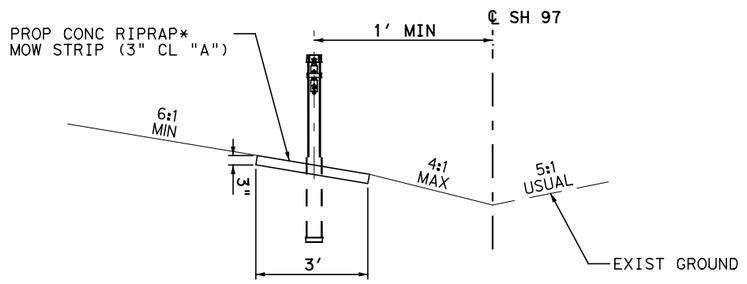

MOW STRIP

* RIPRAP TO BE REINFORCED PER SPEC 432

ERIC DIETRICH
94970
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

6/27/2022
NAME DATE

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SH 97

PROPOSED TYPICAL SECTION

SCALE: N.T.S. SHEET 1 OF 1

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	See Title Sheet		7
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068, ETC	US 90, ETC

US 90 CABLE BARRIER SUMMARY (SEGMENT 1) CSJ: 0024-04-068

SHEET	LOCATION	132 6019	164 6035	164 6051	168 6001	169 6001	432 6066	506 6038	506 6039	543 6001	543 6019
		EMBANKMENT (VEHICLE) (ORD COMP) (TY B)	DRILL SEEDING (PERM) (RURAL) (CLAY)	DRILL SEED (TEMP) (WARM OR COOL)	VEGETATIVE WATERING	SOIL RETENTION BLANKETS (CL 1) (TY A)	RIPRAP (MOW STRIP) (3 IN)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	CABLE BARRIER SYSTEM (TL-3)	CABLE BARRIER TERMINAL SECTION (TL-3)
		CY	SY	SY	MG	SY	CY	LF	LF	LF	EA
CABLE BARRIER SHEETS											
1 OF 17	CABLE BARRIER	1,841	4,197	4,197	68	4,197	38	80	80	1,209	3
2 OF 17	CABLE BARRIER	1,998	5,622	5,622	90	5,622	52	120	120	1,478	6
3 OF 17	CABLE BARRIER	920	3,836	3,836	62	3,836	33			1,132	1
4 OF 17	CABLE BARRIER										
5 OF 17	CABLE BARRIER	533	1,573	1,573	25	1,573	12			349	1
6 OF 17	CABLE BARRIER	1,720	6,204	6,204	100	6,204	62	60	60	1,961	4
7 OF 17	CABLE BARRIER	4,099	5,680	5,680	91	5,680	59	60	60	1,843	4
8 OF 17	CABLE BARRIER	1,895	6,378	6,378	103	6,378	56	90	90	1,740	4
9 OF 17	CABLE BARRIER	1,815	6,059	6,059	97	6,059	61	60	60	1,944	4
10 OF 17	CABLE BARRIER	1,406	6,610	6,610	106	6,610	62	60	60	1,966	4
11 OF 17	CABLE BARRIER	1,349	6,890	6,890	111	6,890	59	60	60	1,626	8
12 OF 17	CABLE BARRIER	1,930	7,253	7,253	117	7,253	62	90	90	1,873	6
13 OF 17	CABLE BARRIER	1,522	5,906	5,906	95	5,906	63	100	100	1,828	6
14 OF 17	CABLE BARRIER	241	7,134	7,134	115	7,134	63	115	115	1,824	6
15 OF 17	CABLE BARRIER	2,211	5,862	5,862	94	5,862	56	90	90	1,768	4
16 OF 17	CABLE BARRIER	2,178	4,543	4,543	73	4,543	39	30	30	1,227	3
17 OF 17	CABLE BARRIER	2,404	4,469	4,469	72	4,469	48	60	60	1,502	4
PROJECT TOTALS		28,062	88,216	88,216	1,419	88,216	825	1,075	1,075	25,270	68

US 90 CABLE BARRIER SUMMARY (SEGMENT 2) CSJ: 0024-07-066

SHEET	LOCATION	132 6019	164 6035	164 6051	168 6001	169 6001	432 6066	506 6038	506 6039	543 6001	543 6019
		EMBANKMENT (VEHICLE) (ORD COMP) (TY B)	DRILL SEEDING (PERM) (RURAL) (CLAY)	DRILL SEED (TEMP) (WARM OR COOL)	VEGETATIVE WATERING	SOIL RETENTION BLANKETS (CL 1) (TY A)	RIPRAP (MOW STRIP) (3 IN)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	CABLE BARRIER SYSTEM (TL-3)	CABLE BARRIER TERMINAL SECTION (TL-3)
		CY	SY	SY	MG	SY	CY	LF	LF	LF	EA
CABLE BARRIER SHEETS											
1 OF 6	CABLE BARRIER	850	5,588	5,588	90	5,588	51	85	85	1,607	3
2 OF 6	CABLE BARRIER	1,812	6,219	6,219	100	6,219	64	30	30	2,044	4
3 OF 6	CABLE BARRIER	1,740	6,462	6,462	104	6,462	64	125	125	2,079	4
4 OF 6	CABLE BARRIER	3,232	6,719	6,719	108	6,719	65	90	90	2,125	3
5 OF 6	CABLE BARRIER	1,466	7,273	7,273	117	7,273	67	100	100	2,204	3
6 OF 6	CABLE BARRIER		5,467	5,467	88	5,467	52	95	95	1,650	3
PROJECT TOTALS		9,100	37,728	37,728	607	37,728	363	525	525	11,709	20

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US 90

SUMMARY OF QUANTITIES

SCALE: NTS SHEET 1 OF 1

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		8
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.

SH 97 CABLE BARRIER SUMMARY CSJ:0328-03-037

SHEET NO.	STATIONING	0132 6019 EMBANKMENT (VEHICLE) (ORD COMP) (TY B)	0164 6035 DRILL SEEDING (PERM) (RURAL) (CLAY)	0164 6051 DRILL SEED (TEMP) (WARM OR COOL)	0168 6001 VEGETATIVE WATERING	0169 6001 SOIL RETENTION BLANKETS (CL1) (TY A)	0432 6066 RIPRAP (MOW STRIP) (3 IN)	0506 6038 TEMP SEDMT CONT FENCE (INSTALL)	0506 6039 TEMP SEDMT CONT FENCE (REMOVE)	0543 6001 CABLE BARRIER SYSTEM (TL-3)	0543 6019 CABLE BARRIER TERMINAL SECTION (TL-3)
		CY	SY	SY	MG	SY	CY	LF	LF	LF	EA
1 OF 7	22+00 TO 25+00	9	489	489	8	489	3			49	1
2 OF 7	25+00 TO 45+00	269	5432	5432	87	5432	43	50	50	1300	4
3 OF 7	45+00 TO 65+00	395	6843	6843	110	6843	50	40	40	1566	4
4 OF 7	65+00 TO 85+00	112	6270	6270	101	6270	48			1489	4
5 OF 7	85+00 TO 105+00	476	7245	7245	116	7245	53			1786	2
6 OF 7	105+00 TO 125+00	399	7189	7189	115	7189	51	40	40	1577	4
7 OF 7	125+00 TO 142+00	500	5686	5686	91	5686	40	80	80	967	7
TOTAL		2160	39154	39154	628	39154	288	210	210	8734	26

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SH 97

SUMMARY OF QUANTITIES

SHEET 1 OF 1

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	See Title Sheet		9
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068, ETC	US 90, ETC

DETOURS, BARRICADES, WARNING SIGNS, SEQUENCE OF WORK, ETC.

THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE REQUIREMENTS OF ITEM 7, "LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC", OF THE STANDARD SPECIFICATIONS. IN ADDITION TO THESE REQUIREMENTS, THE FOLLOWING PROVISIONS SHALL ALSO GOVERN ON THIS CONTRACT:

1. GENERAL

(1) TRAFFIC MUST BE HANDLED THROUGHOUT THE PROJECT DURING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING A SAFE AND COMFORTABLE PASSAGE FOR VEHICULAR AND PEDESTRIAN TRAFFIC WITH MINIMAL INCONVENIENCE TO THE PUBLIC, AS SHOWN IN THE PLANS OR AS DIRECTED/APPROVED BY THE ENGINEER.
(2) THE CONTRACTOR MAY PROPOSE/RECOMMEND MODIFICATIONS TO THE SEQUENCE OF WORK FOR CONSIDERATION BY THE ENGINEER. ANY MAJOR RECOMMENDED MODIFICATION BY THE CONTRACTOR SHALL INCLUDE ANY CHANGES TO THE VARIOUS BID ITEMS, IMPACT TO TRAFFIC, EFFECT OF OVERALL PROJECT IN TIME AND COST, ETC. IF THIS PROPOSAL IS IMPLEMENTED, THE CONTRACTOR WILL BE RESPONSIBLE FOR DEVELOPING DETAILED PLAN SHEETS TO BE SEALED BY A LICENSED PROFESSIONAL ENGINEER FOR INCLUSION WITH THE CHANGE ORDER. THE CONTRACTOR CANNOT PROCEED WITH ANY CONSTRUCTION OPERATIONS BASED ON A REVISED PHASE/SEQUENCE UNTIL WRITTEN APPROVAL IS OBTAINED FROM THE ENGINEER. IF AT ANY TIME DURING CONSTRUCTION THE CONTRACTOR'S PROPOSED PLAN OF OPERATION FOR HANDLING TRAFFIC DOES NOT PROVIDE FOR SAFE AND COMFORTABLE MOVEMENT, THE CONTRACTOR WILL IMMEDIATELY CHANGE THEIR OPERATION TO CORRECT THE UNSATISFACTORY CONDITION.
(3) DO NOT STORE ANY CONSTRUCTION MATERIAL OR EQUIPMENT AT ANY LOCATION THAT WILL CONSTITUTE A HAZARD AND WILL ENDANGER TRAFFIC.
(4) THE CONTRACTOR WILL PROVIDE ADVANCE NOTIFICATION TO THE ENGINEER OF IMPENDING / UPCOMING LANE CLOSURES FOR ALL TEMPORARY AND / OR PERMANENT LANE, RAMP, CONNECTOR, FRONTAGE, SHOULDER, ETC. CLOSURES OR DETOURS. SEE GENERAL NOTES FOR NOTIFICATION REQUIREMENTS.
(5) ACCESS TO ADJOINING PROPERTY MUST BE MAINTAINED AT ALL TIMES.
(6) TEMPORARY DRAINAGE IS THE RESPONSIBILITY OF THE CONTRACTOR.
(7) AT NO TIME SHALL TWO CONSECUTIVE INTERSECTING ROADWAYS BE CLOSED AT ONE TIME DURING CONSTRUCTION.
(8) AT NO TIME SHALL TWO CONSECUTIVE RAMPS BE CLOSED AT ONE TIME DURING CONSTRUCTION OR OVERLAY OPERATIONS.
(9) UNLESS OTHERWISE NOTED IN THE PLANS AND/OR AS DIRECTED BY THE ENGINEER NO LANE CLOSURES WILL BE PERMITTED FOR THE FOLLOWING DATES AND/OR SPECIAL EVENTS:
- BETWEEN DECEMBER 15 AND JANUARY 1.
- WEDNESDAY BEFORE THANKSGIVING THRU THE SUNDAY AFTER THANKSGIVING.
- SATURDAY AND SUNDAY BEFORE MEMORIAL DAY AND LABOR DAY.
- SATURDAY OR SUNDAY WHEN JULY 4 FALLS ON A FRIDAY OR MONDAY.
- FRIDAY, SATURDAY, AND SUNDAY OF EASTER WEEKEND.

(10) REMOVAL AND DISPOSAL OF EXISTING ABANDONED UTILITIES (EITHER PREVIOUSLY ABANDONED OR ABANDONED DURING THIS PROJECT) REQUIRED TO SUPPORT THIS PROJECT'S CONSTRUCTION SHALL BE PERFORMED UNDER THE OVERALL PREPARE RIGHT-OF-WAY ITEM (ITEM 100).
(11) COORDINATE WITH ADJACENT PROJECTS.
(12) COVER PERMANENT SIGNS IF NOT USED. THIS IS SUBSIDIARY TO ITEM 502.
(13) EXCAVATION WITHIN 5 FEET OF AN EXISTING CPS ENERGY POLE WILL REQUIRE POLE BRACING. CONTACT CPS ENERGY UTILTY COORDINATION TO REQUEST POLE BRACING (JOHN OFFER, JEOFFER@CPSENERGY.COM. THE ESTIMATED DURATION FOR THE POLE BRACING PROCESS IS APPROXIMATELY 6 TO 8 WEEKS.

2. SEQUENCE OF WORK

(1) THIS PROJECT WILL BE CONSTRUCTED IN 2 PHASES. BEFORE THE COMMENCEMENT OF EACH PHASE, INSTALL ADVANCE WARNING SIGNS, TEMPORARY SIGNS AND BARRICADES AS SHOWN ON THE PLANS AND/OR AS DIRECTED/APPROVED BY THE ENGINEER. DAILY LANE CLOSURES WILL BE USED IN ACCORDANCE WITH STATE TCP STANDARDS. DROP OFF CONDITIONS OF GREATER THAN 2" MUST HAVE A 3:1 SLOPE AT THE END OF EACH DAY, AS WELL AS THROUGHOUT THE PROJECT WHERE ACCESS TO ADJACENT PROPERTIES IS ALLOWED TO DRIVEWAYS AND SIDE STREETS.
(2) PREPARING ROW / REMOVAL OF EXISTING ITEMS TO BE DONE ONLY IN AREAS WHERE WORK IS OCCURING, AS PER THE PHASES NOTED BELOW.
(3) A BRIEF DESCRIPTION OF THESE PHASES ARE AS FOLLOWS:

US 90 CABLE BARRIER
PHASE 1 STEP 1:
1. INSTALL ADVANCE WARNING SIGNS, TEMPORARY SIGNS, CONSTRUCTION SIGNS, BARRICADES, CHANNELIZING DEVICES, AND EROSION CONTROL DEVICES.
2. ON THE SIDE OF THE CABLE BARRIER, CLOSE INSIDE LANE UTILIZING TCP(2-6)-18 AND THE SHOULDER ON MIRRORING SIDE UTILIZING TCP(5-1)-18 .
3. RE-GRADE SIDE SLOPE
4. INSTALL MOW STRIP AND CABLE BARRIER POST FOUNDATIONS.
5. ALL LANES TO REMAIN OPEN DURING NON-WORKING HOURS.

PHASE 1 STEP 2:
1. INSTALL ADVANCE WARNING SIGNS, TEMPORARY SIGNS, CONSTRUCTION SIGNS, BARRICADES, CHANNELIZING DEVICES AS SHOWN ON THE TYPICAL TRAFFIC CONTROL PLAN.
2. ON THE SIDE OF THE CABLE BARRIER, CLOSE INSIDE SHOULDER UTILIZING TCP(5-1)-18 AND THE SHOULDER ON MIRRORING SIDE UTILIZING TCP(5-1)-18 .
3. INSTALL CABLE BARRIER POSTS AND CABLES.
4. INSTALL DRILL SEED, AND SOIL RETENTION BLANKETS.
5. PERFORM FINAL CLEAN UP.
6. ALL LANES TO REMAIN OPEN DURING NON-WORKING HOURS.

SH 97 CABLE BARRIER
PHASE 1 STEP 1:
1. INSTALL ADVANCE WARNING SIGNS, TEMPORARY SIGNS, CONSTRUCTION SIGNS, BARRICADES, CHANNELIZING DEVICES, AND EROSION CONTROL DEVICES.
2. ON THE SIDE OF THE CABLE BARRIER, CLOSE INSIDE LANE UTILIZING TCP(2-6)-18 AND THE SHOULDER ON MIRRORING SIDE UTILIZING TCP(5-1)-18 .
3. RE-GRADE SIDE SLOPES.
4. INSTALL MOW STRIP AND CABLE BARRIER POST FOUNDATIONS.
5. ALL LANES TO REMAIN OPEN DURING NON-WORKING HOURS.

PHASE 1 STEP 2:
1. INSTALL ADVANCE WARNING SIGNS, TEMPORARY SIGNS, CONSTRUCTION SIGNS, BARRICADES, CHANNELIZING DEVICES AS SHOWN ON THE TYPICAL TRAFFIC CONTROL PLAN.
2. ON THE SIDE OF THE CABLE BARRIER, CLOSE INSIDE SHOULDER UTILIZING TCP(5-1)-18 AND THE SHOULDER ON MIRRORING SIDE UTILIZING TCP(5-1)-18 .
3. INSTALL DRILL SEED, AND SOIL RETENTION BLANKETS.
4. INSTALL CABLE BARRIER POSTS AND CABLES.
5. PERFORM FINAL CLEAN UP.
6. ALL LANES TO REMAIN OPEN DURING NON-WORKING HOURS.

3. SAFETY

(1) THE CONTRACTOR WILL PROVIDE, CONSTRUCT AND MAINTAIN BARRICADES AND SIGNS IN ACCORDANCE WITH STATE STANDARDS. ANY SIGNS REQUIRED THAT ARE NOT DETAILED IN THE STANDARD SHEETS SHALL BE IN CONFORMANCE WITH THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" AND THE "STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS."

(2) BARRICADES AND WARNING SIGNS SHALL BE PLACED AS INDICATED ON THE PLANS. THIS SHALL BE CONSIDERED THE MINIMUM REQUIRED TO PROVIDE FOR THE SAFETY OF TRAFFIC DURING CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN OTHER SUCH BARRICADES AND SIGNS DEEMED NECESSARY BY THE ENGINEER OR AS DIRECTED BY FIELD CONDITIONS, TO PROVIDE FOR THE PASSAGE OF TRAFFIC IN SAFETY AT ALL TIMES.

(3) THE CONTRACTOR SHALL PROVIDE AND MAINTAIN FLAGGERS AS DIRECTED/APPROVED BY THE ENGINEER, AT SUCH POINTS, AND FOR SUCH PERIODS OF TIME AS MAY BE REQUIRED, TO PROVIDE FOR THE SAFETY OF THE TRAVELING PUBLIC AND THE CONTRACTOR'S PERSONNEL.

(4) THE CONTRACTOR SHALL KEEP THE ROADWAY CLEAN AND FREE OF DIRT OR OTHER MATERIALS DURING HAULING OPERATIONS. IF THE CONTRACTOR DOES NOT MAINTAIN A CLEAN ROADWAY, THEY SHALL CEASE ALL CONSTRUCTION OPERATIONS, WHEN DIRECTED BY THE ENGINEER, TO CLEAN THE ROADWAY TO THE SATISFACTION OF THE ENGINEER.

4. HAULING EQUIPMENT

(1) THE USE OF RUBBER-TIRED EQUIPMENT WILL BE REQUIRED FOR MOVING DIRT OR OTHER MATERIALS ALONG OR ACROSS PAVEMENTED SURFACES. WHERE THE CONTRACTOR DESIRES TO MOVE ANY EQUIPMENT NOT LICENSE FOR OPERATION ON PUBLIC HIGHWAYS, ON OR ACROSS PAVEMENT. THEY SHALL PROTECT THE PAVEMENT FROM DAMAGE AS DIRECTED / APPROVED BY THE ENGINEER.

(2) THROUGHOUT CONSTRUCTION OPERATIONS, THE CONTRACTOR WILL BE REQUIRED TO CONDUCT THEIR HAULING OPERATIONS IN A MANNER SUCH THAT VEHICLES WILL NOT HAUL OVER PREVIOUSLY RECOMPACTED SUBGRADE OR COMPACTED BASE MATERIAL, EXCEPT IN SHORT SECTIONS FOR DUMPING MANIPULATIONS.

5. FINAL CLEAN UP

UPON COMPLETION OF THE WORK AND BEFORE FINAL ACCEPTANCE AND FINAL PAYMENT IS MADE, THE CONTRACTOR SHALL CLEAR AND REMOVE FROM THE SITE ALL SURPLUS AND DISCARDED MATERIALS AND DEBRIS OF EVERY KIND AND LEAVE THE ENTIRE PROJECT IN A SMOOTH, NEAT AND SIGHTLY CONDITION.

6. PAYMENT

ALL BARRICADES, SIGNS, AND FLAGGERS SHALL BE SUBSIDIARY TO ITEM 502 BARRICADES, SIGNS AND TRAFFIC HANDLING. ALL EROSION AND SEDIMENT CONTROL DEVICES WILL BE PAID FOR UNDER ITEM 506 TEMPORARY EROSION, SEDIMENTATION, AND ENVIRONMENTAL CONTROLS. ALL WORK ZONE PAVEMENT MARKINGS WILL BE PAID FOR UNDER ITEM 662 WORK ZONE PAVEMENT MARKINGS. ALL OTHER WORK AND MATERIALS SHALL BE SUBSIDIARY TO THE VARIOUS BID ITEMS UNLESS OTHERWISE INDICATED IN THE PLANS.

STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

4/29/2022

THE SEAL ORIGINALLY APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY JOHNNY L. CLAYTON, P.E. #107215 ON 4/29/2022 . ALTERATION OF A PREVIOUSLY SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT. THE RECORD COPY OF THIS DRAWING IS ON FILE AT THE OFFICES OF HALFF ASSOCIATES, INC. 100 NE INTERSTATE 410 LOOP, SUITE 200, SAN ANTONIO, TEXAS 78216, TBPE FIRM #F-312

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Texas Department of Transportation®

TRAFFIC CONTROL PLAN NARRATIVE

SCALE: NTS SHEET 1 OF 1

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		10
STATE	DISTRICT	COUNTY	
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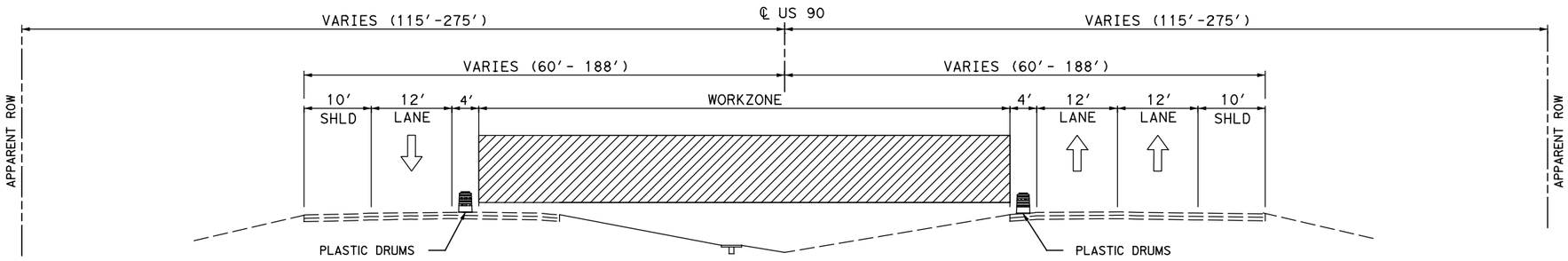
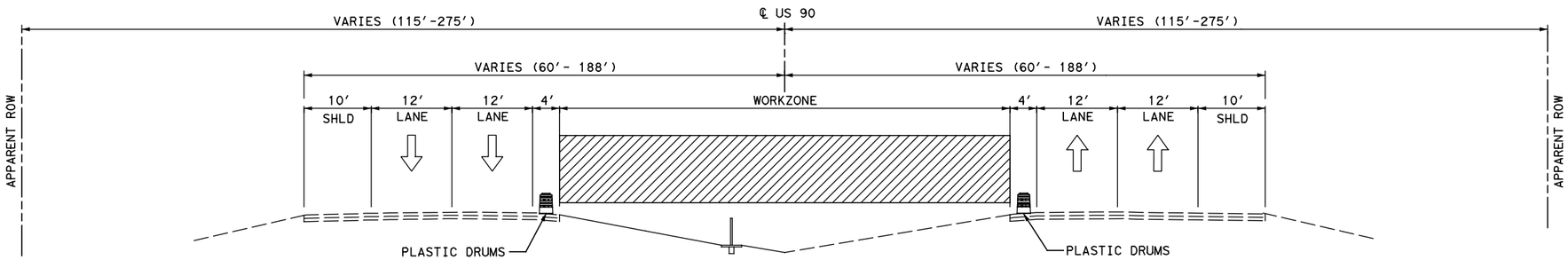
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.



US 90 TCP TYPICAL SECTION PHASE 1 STEP 1



US 90 TCP TYPICAL SECTION PHASE 1 STEP 2

STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

4/29/2022

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100 NE INTERSTATE 410 LOOP
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Texas Department of Transportation®

US 90

TCP TYPICAL SECTIONS

SCALE: NTS SHEET 1 OF 1

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.	SHEET
6	SEE TITLE SHEET	11

STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.

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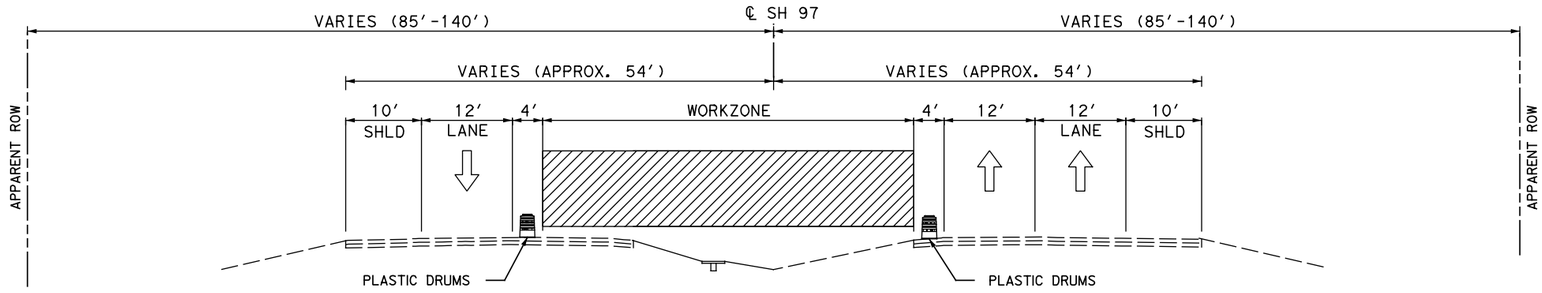
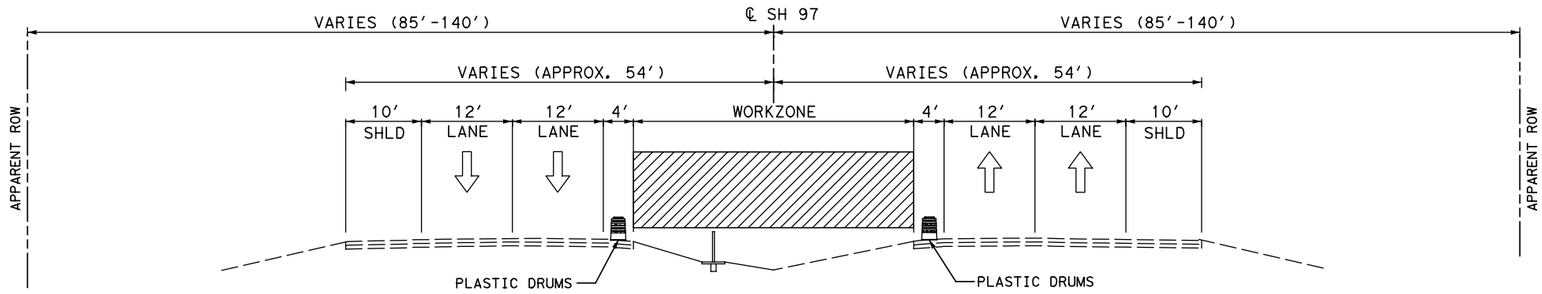


SH 97 TCP TYPICAL SECTION PHASE 1 STEP 1



SH 97 TCP TYPICAL SECTION PHASE 1 STEP 2

NO.	REVISION	BY	DATE

HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

SH 97

TCP TYPICAL SECTIONS

SCALE: NTS SHEET 1 OF 1

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		12
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.

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LOC NO.	TCP PHASE	SPECIFIC TCP PLAN SHEET OR TCP STANDARD SHEET					6185 6002	6185 6005
			FURNISH TMA/TA	RELOCATE/REUSE TMA/TA	TOTAL TMA/TA PER SET UP	DURATION OF TMA/TA SET UP	TMA (STATIONARY)	TMA (MOBILE OPERATION)
		SHEET NUMBER	EA	EA	EA	DAYS PER TMA/TA USE	DAY	DAY
1	US 90-P1S1	TCP (2-6)-18	1		1	19	19	
2	US 90-P1S2	TCP (5-1)-18		1	1	16	16	
3	SH 97-P1S1	TCP (2-6)-18		1	1	3	3	
4	SH 97-P1S1	TCP (5-1)-18		1	1	5	5	
		TOTALS	1			43	43	

NOTE.
FURNISH TMA/TA - THE NUMBER OF ATTENUATORS BEING FURNISHED FOR THE SPECIFIC TCP.
RELOCATE/REUSE TMA/TA - THE NUMBER OF ATTENUATORS BEING REUSED FROM A PREVIOUS TCP FOR THE SPECIFIC TCP.
TOTAL TMA/TA PER SET UP = (FURNISH TMA/TA) + (RELOCATE/REUSE TMA/TA)
DURATION OF TMA/TA SET UP - THE NUMBER OF DAYS THE ATTENTUATORS WILL BE USED FOR THE SPECIFIC TCP.
TMA/TA (STATIONARY) = (TOTAL TMA/TA PER SET UP) X (THE DURATION OF TMA/TA SET UP)
TMA/TA (MOBILE OPERATION) = (TOTAL TMA/TA PER SET UP) X (THE DURATION OF TMA/TA SET UP)

TRUCK MOUNTED ATTENUATOR (TMA) AND TRAILER ATTENUATOR (TA) SUMMARY SHEET

FILE: tma.dgn	DN: TxDOT	CK:	CK:
© TxDOT	CONT	SECT JOB	HIGHWAY
REVISIONS 3/2018	0024	04 068,ETC	US 90,ETC
	DIST	COUNTY	
	SAT	MEDINA,ETC	
	FEDERAL AID PROJECT		SHEET NO.
			13

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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

1. The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction pavement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).

2. The development and design of the Traffic Control Plan (TCP)is the responsibility of the Engineer.

3. The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.

4. The Contractor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move or change the approximate location of any device without the approval of the Engineer.

5. Geometric design of lane shifts and detours should, when possible, meet the applicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials (AASHTO), "A Policy on Geometric Design of Highways and Streets," the TxDOT "Roadway Design Manual" or engineering judgment.

6. When projects abut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the adjacent project is completed first, the Contractor shall erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.

7. The Engineer may require duplicate warning signs on the median side of divided highways where median width will permit and traffic volumes justify the signing.

8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.

9. The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.

10. Where highway construction or maintenance work is being undertaken, other than mobile operations as defined by the Texas Manual on Uniform Traffic Control Devices, CSJ limit signs are required. CSJ limit signs are shown on BC(2). The OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits. For mobile operations, CSJ limit signs are not required.

11. Traffic control devices should be in place only while work is actually in progress or a definite need exists.

12. The Engineer has the final decision on the location of all traffic control devices.

13. Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

WORKER SAFETY NOTES:

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

2. Except in emergency situations, flagger stations shall be illuminated when flagging is used at night.

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

1. Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources.

2. Work zone traffic control devices shall be compliant with the Manual for Assessing safety Hardware (MASH).

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-03 7-13 9-07 8-14 5-10 5-21	0024	04	068,ETC	US 90,ETC
	DIST	COUNTY		SHEET NO.
	SAT	MEDINA,ETC		14

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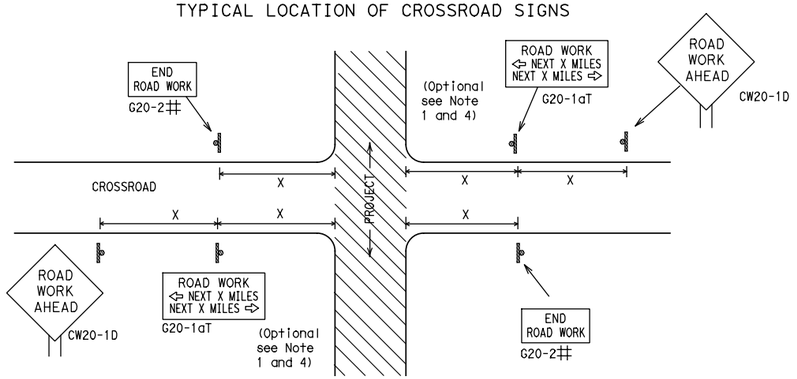
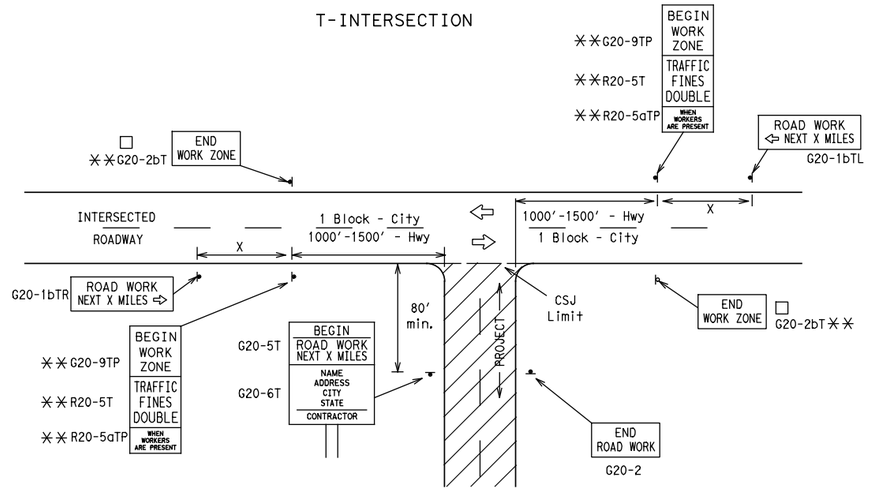
TYPICAL LOCATION OF CROSSROAD SIGNS



May be mounted on back of "ROAD WORK AHEAD"(CW20-1D) sign with approval of Engineer. (See note 2 below)

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

1. 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.
2. If construction closes the road at a T-intersection, the Contractor shall place the "CONTRACTOR NAME"(G20-6T) sign behind the Type 3 Barricades for the road closure (see BC(10) also). The "ROAD WORK NEXT X MILES" left arrow(G20-1bTL) and "ROAD WORK NEXT X MILES" right arrow (G20-1bTR)" signs shall be replaced by the detour signing called for in the plans.

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING[1,5,6]

SIZE

Sign Number or Series	Conventional Road	Expressway/ Freeway
CW20[4] CW21 CW22 CW23 CW25	48" x 48"	48" x 48"
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"

SPACING

Posted Speed	Sign △ Spacing "X"
MPH	Feet (Apprx.)
30	120
35	160
40	240
45	320
50	400
55	500[2]
60	600[2]
65	700[2]
70	800[2]
75	900[2]
80	1000[2]
✳	✳[3]

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

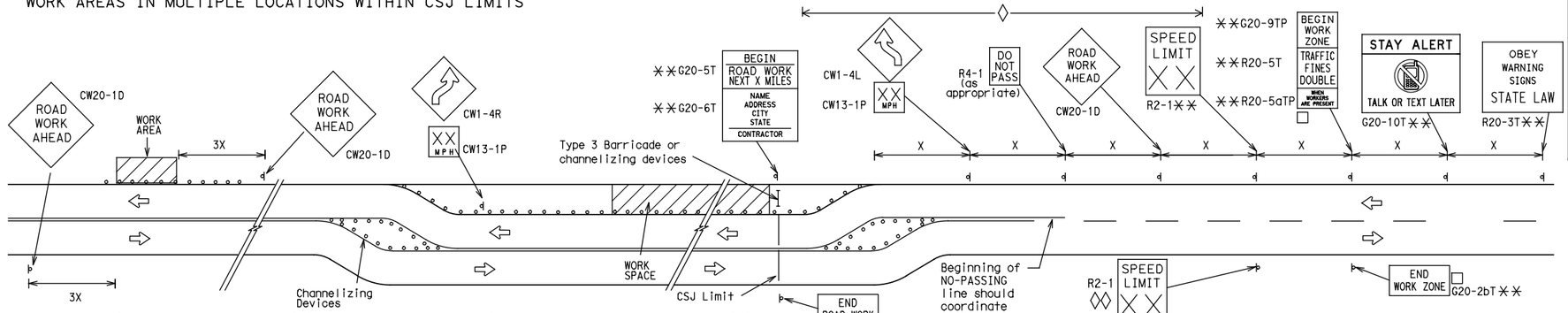
△ Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

GENERAL NOTES

1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (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".
5. Only diamond shaped warning sign sizes are indicated.
6. 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.

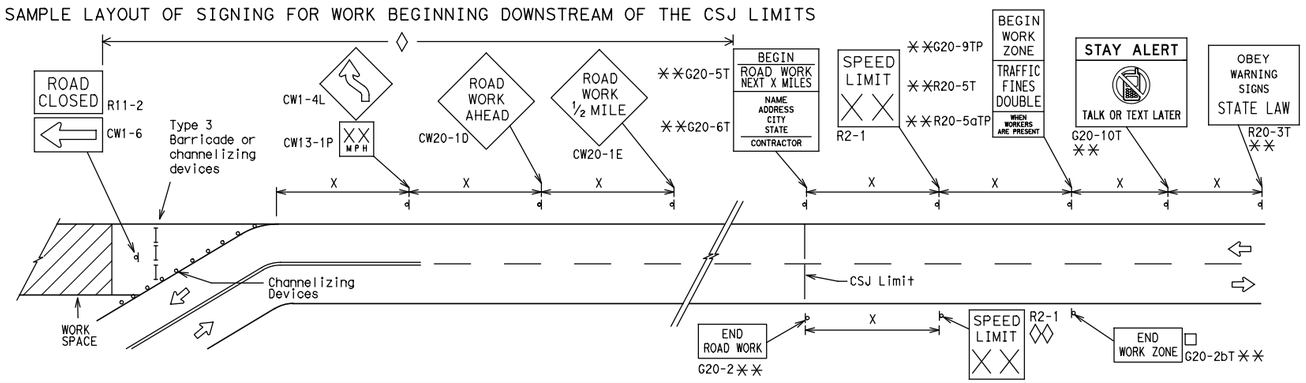
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE 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.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	04	068,ETC	US 90,ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SAT	MEDINA,ETC		15

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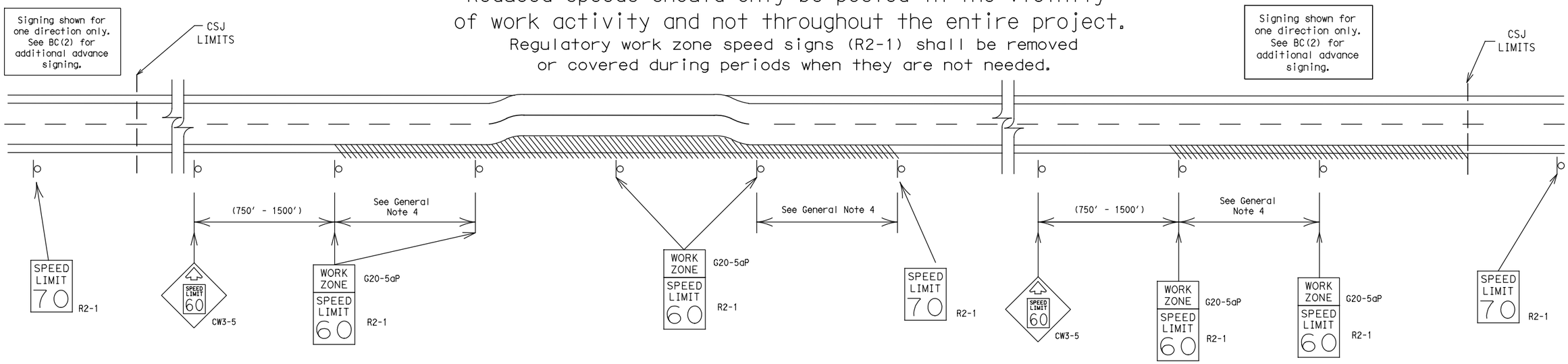
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13 5-21	0024	04	068,ETC	US 90,ETC
	DIST	COUNTY		SHEET NO.
	SAT	MEDINA,ETC		16

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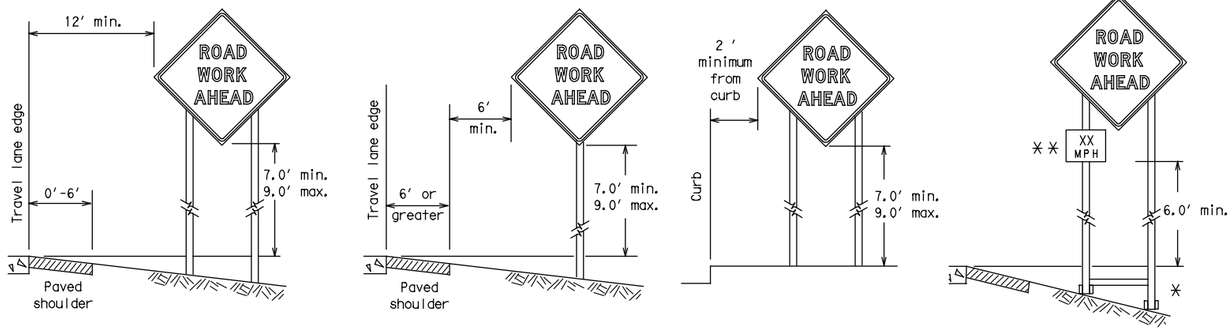
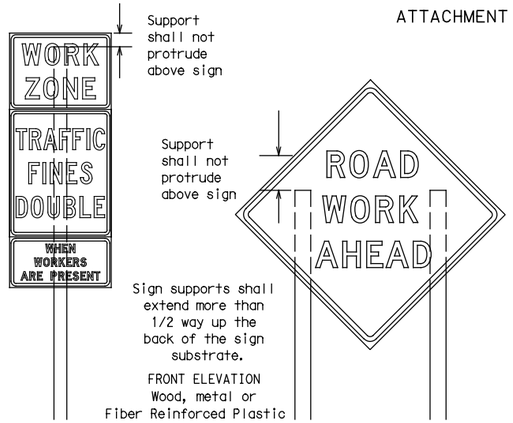
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

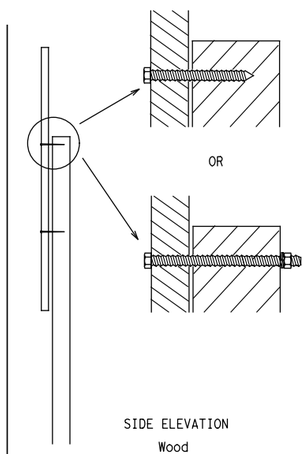


⚹ When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

⚹⚹ 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





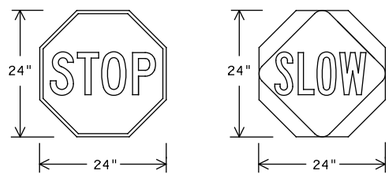
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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 spice point. Splice must be located entirely behind the sign substrate, not near the base of the support. Splice insert lengths should be at least 5 times nominal post size, centered on the splice and of at least the same gauge material.

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SAT	MEDINA,ETC		17

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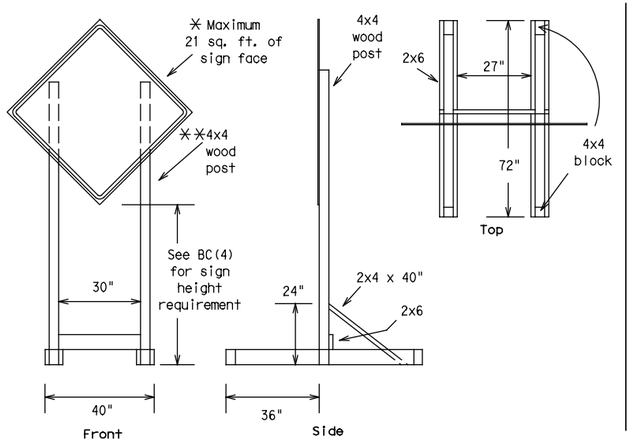
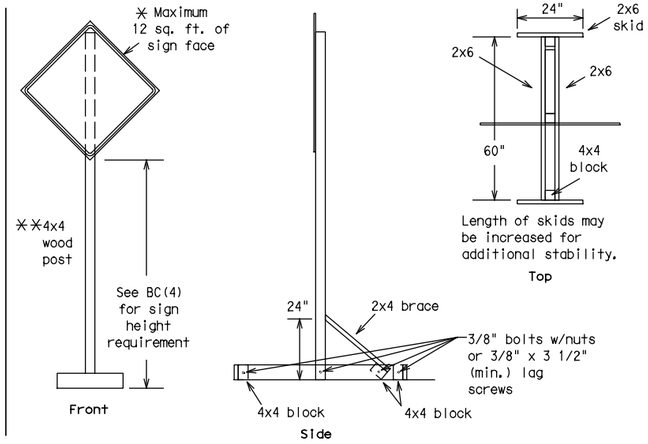
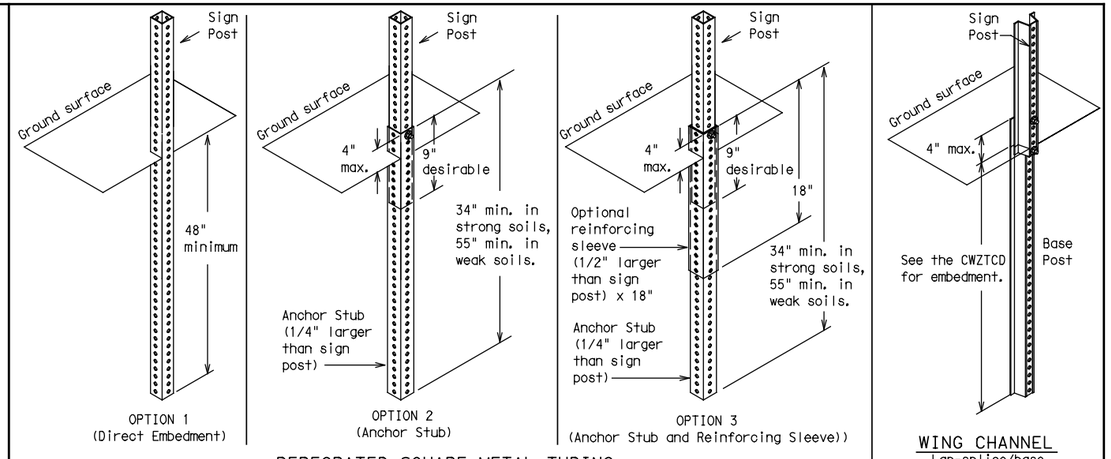




SKID MOUNTED WOOD SIGN SUPPORTS

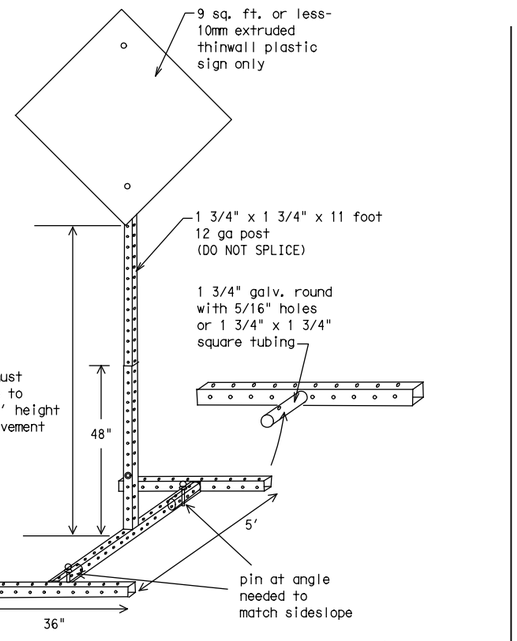
✳ LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

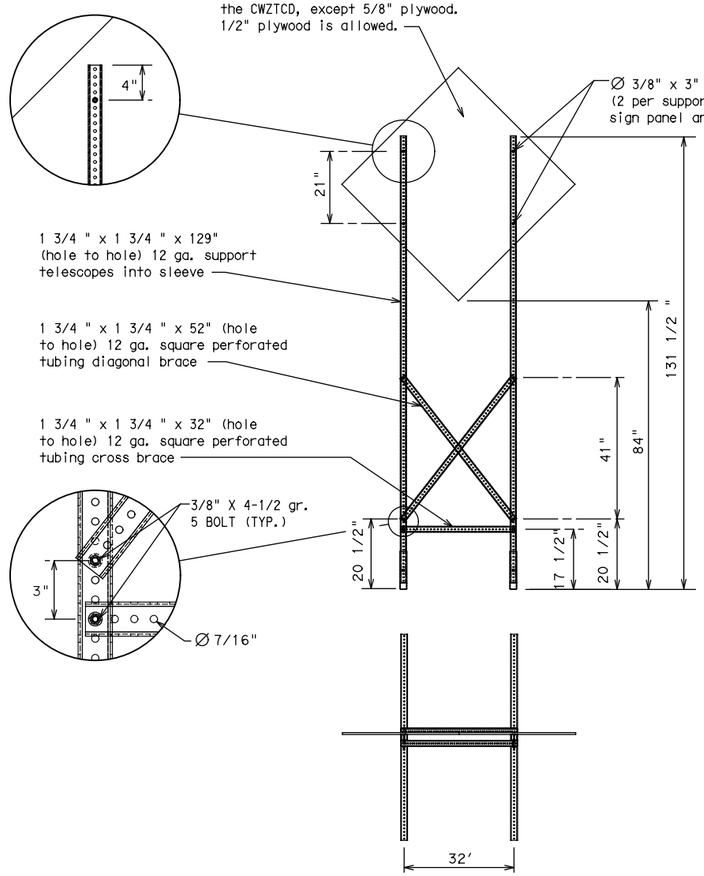


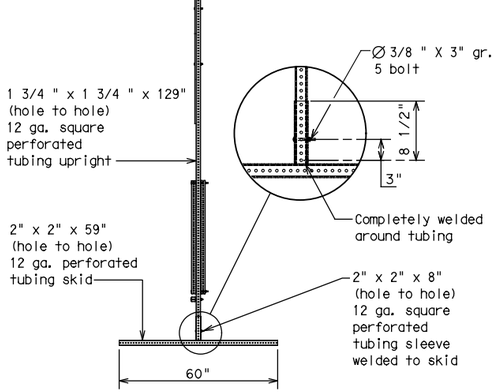
PERFORATED SQUARE METAL TUBING

GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

✳ See BC(4) for definition of "Work Duration."

✳✳ Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.

☐ See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SAT	MEDINA,ETC		18

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD
Alternate	ALT
Avenue	AVE
Best Route	BEST RTE
Boulevard	BLVD
Bridge	BRDG
Cannot	CANT
Center	CTR
Construction Ahead	CONST AHD
CROSSING	XING
Detour Route	DETOUR RTE
Do Not	DONT
East	E
Eastbound	(route) E
Emergency	EMER
Emergency Vehicle	EMER VEH
Entrance, Enter	ENT
Express Lane	EXP LN
Expressway	EXPWY
XXXX Feet	XXXX FT
Fog Ahead	FOG AHD
Freeway	FRWY, FWY
Freeway Blocked	FWY BLKD
Friday	FRI
Hazardous Driving	HAZ DRIVING
Hazardous Material	HAZMAT
High-Occupancy	HOV
Vehicle Highway	HWY
Hour(s)	HR, HRS
Information	INFO
It Is	ITS
Junction	JCT
Left	LFT
Left Lane	LFT LN
Lane Closed	LN CLOSED
Lower Level	LWR LEVEL
Maintenance	MAINT

WORD OR PHRASE	ABBREVIATION
Major	MAJ
Miles	MI
Miles Per Hour	MPH
Minor	MNR
Monday	MON
Normal	NORM
North	N
Northbound	(route) N
Parking	PKING
Road	RD
Right Lane	RT LN
Saturday	SAT
Service Road	SERV RD
Shoulder	SHLDR
Slippery	SLIP
South	S
Southbound	(route) S
Speed	SPD
Street	ST
Sunday	SUN
Telephone	PHONE
Temporary	TEMP
Thursday	THURS
To Downtown	TO DWNTN
Traffic	TRAF
Travelers	TRVLRS
Tuesday	TUES
Time Minutes	TIME MIN
Upper Level	UPR LEVEL
Vehicles (s)	VEH, VEHS
Warning	WARN
Wednesday	WED
Weight Limit	WT LIMIT
West	W
Westbound	(route) W
Wet Pavement	WET PVMT
Will Not	WONT

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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7-13 5-21	SAT	MEDINA,ETC		19

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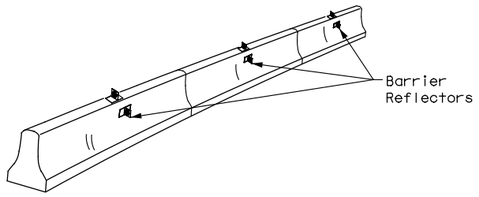
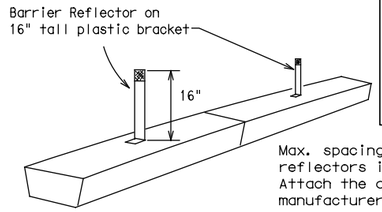
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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



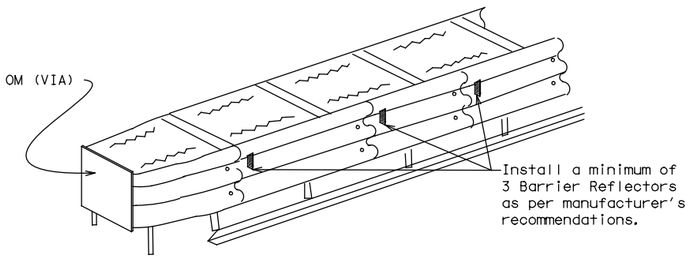
CONCRETE TRAFFIC BARRIER (CTB)

3. 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.
4. 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.
5. When CTB separates traffic traveling in the same direction, no barrier reflectors will be required on top of the CTB.
6. Barrier Reflector units shall be yellow or white in color to match the edgeline being supplemented.
7. Maximum spacing of Barrier Reflectors is forty (40) feet.
8. Pavement markers or temporary flexible-reflective roadway marker tabs shall NOT be used as CTB delineation.
9. Attachment of Barrier Reflectors to CTB shall be per manufacturer's recommendations.
10. Missing or damaged Barrier Reflectors shall be replaced as directed by the Engineer.
11. Single slope barriers shall be delineated as shown on the above detail.



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

LOW PROFILE CONCRETE BARRIER (LPCB)



DELINEATION OF END TREATMENTS

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

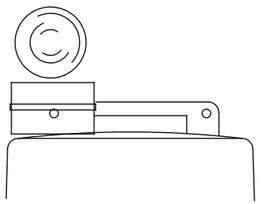
LPCB is approved for use in work zone locations, where the posted speed is 45mph, or less. See Roadway Standard Sheet LPCB.

END TREATMENTS FOR CTB'S USED IN WORK ZONES

End treatments used on CTB's in work zones shall meet the apppropriate 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

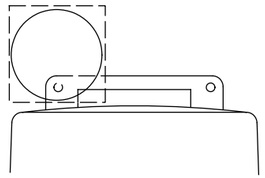


Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.

1. Warning lights shall meet the requirements of the TMUTCD.
2. Warning lights shall NOT be installed on barricades.
3. 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.
4. 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".
5. The Engineer/Inspector or the plans shall specify the location and type of warning lights to be installed on the traffic control devices.
6. 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.
7. 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.
8. The location of warning lights and warning reflectors on drums shall be as shown elsewhere in the plans.

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. 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.
4. 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.
5. Type A, Type C and Type D warning lights shall be installed at locations as detailed on other sheets in the plans.
6. Warning lights shall not be installed on a drum that has a sign, chevron or vertical panel.
7. The maximum spacing for warning lights on drums should be identical to the channelizing device spacing.



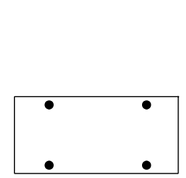
Warning reflector may be round or square.Must have a yellow reflective surface area of at least 30 square inches

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

1. 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.
2. 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.
3. The warning reflector shall have a minimum retroreflective surface area (one-side) of 30 square inches.
4. Round reflectors shall be fully reflectorized, including the area where attached to the drum.
5. 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.
6. 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.
7. When used near two-way traffic, both sides of the warning reflector shall be reflectorized.
8. The warning reflector should be mounted on the side of the handle nearest approaching traffic.
9. The maximum spacing for warning reflectors should be identical to the channelizing device spacing requirements.

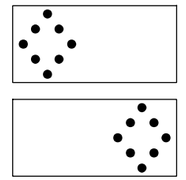
Arrow Boards may be located behind channelizing devices in place for a shoulder taper or merging taper, otherwise they shall be delineated with four (4) channelizing devices placed perpendicular to traffic on the upstream side of traffic.

1. 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.
2. 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.
3. 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.
4. The Flashing Arrow Board should be able to display the following symbols:

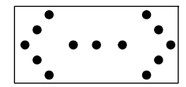


4 CORNER CAUTION

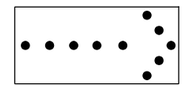
OR



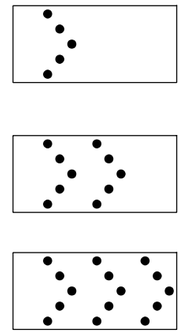
ALTERNATING DIAMOND CAUTION



DOUBLE ARROW



RIGHT/LEFT ARROW
(right arrow shown; left is similar)



RIGHT/LEFT SEQUENTIAL CHEVRON
(right chevron shown; left is similar)

5. The "CAUTION" display consists of four corner lamps flashing simultaneously, or the Alternating Diamond Caution mode as shown.
6. The straight line caution display is NOT ALLOWED.
7. 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.
8. 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.
9. The sequential arrow display is NOT ALLOWED.
10. The flashing arrow display is the TxDOT standard; however, the sequential chevron display may be used during daylight operations.
11. The Flashing Arrow Board shall be mounted on a vehicle, trailer or other suitable support.
12. A Flashing Arrow Board SHALL NOT BE USED to laterally shift traffic.
13. 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.
14. Minimum mounting height of trailer mounted Arrow Boards should be 7 feet from roadway to bottom of panel.

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

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

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

1. Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the Manual for Assessing Safety Hardware (MASH).
2. Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
3. Refer to the CWZTCD for a list of approved TMAs.
4. TMAs are required on freeways unless otherwise noted in the plans.
5. 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.
6. 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.

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	04	068,ETC	US 90,ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SAT	MEDINA,ETC		20

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GENERAL NOTES

1. For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
2. 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.
3. 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.
4. 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).
5. 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.
6. 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:

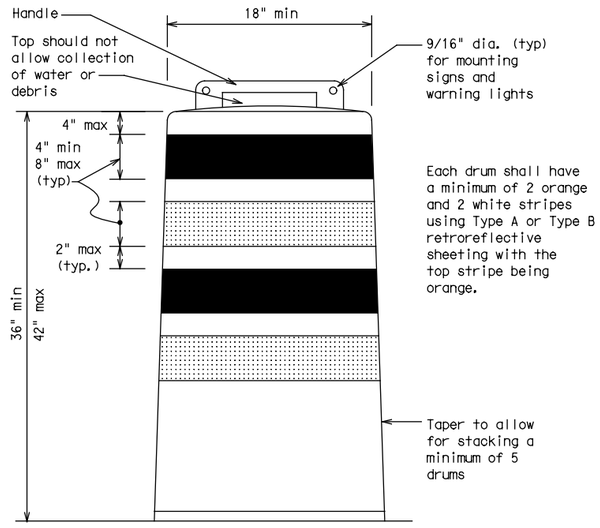
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents accidental separation due to normal handling and/or air turbulence created by passing vehicles.
3. 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.
4. 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.
5. 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.
6. 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.
7. 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.
8. Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
9. Drum body shall have a maximum unballasted weight of 11 lbs.
10. Drum and base shall be marked with manufacturer's name and model number.

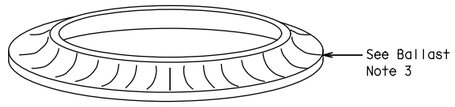
RETROREFLECTIVE SHEETING

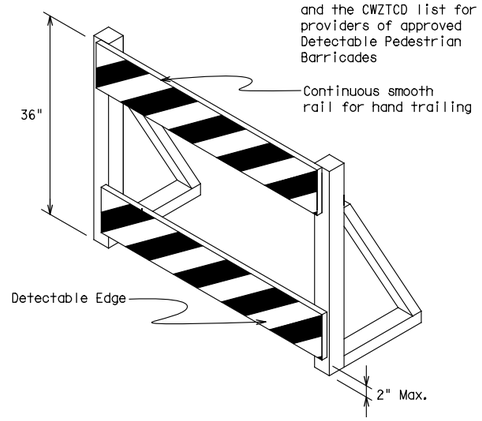
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall 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

1. 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.
2. 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.
3. Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWZTCD list.
4. 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.
5. 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.
6. Ballast shall not be placed on top of drums.
7. Adhesives may be used to secure base of drums to pavement.

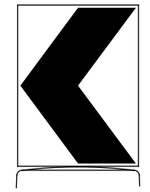




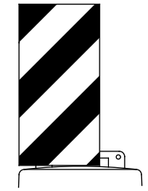


DETECTABLE PEDESTRIAN BARRICADES

1. 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.
2. 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.
3. 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.
4. 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.
5. Warning lights shall not be attached to detectable pedestrian barricades.
6. 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

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1. Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
2. 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.
3. 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.
4. 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.
5. Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one locking washer for each connection.
6. Mounting bolts and nuts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2 inch beyond nuts.
7. 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.
8. 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.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	SAT	MEDINA,ETC		21
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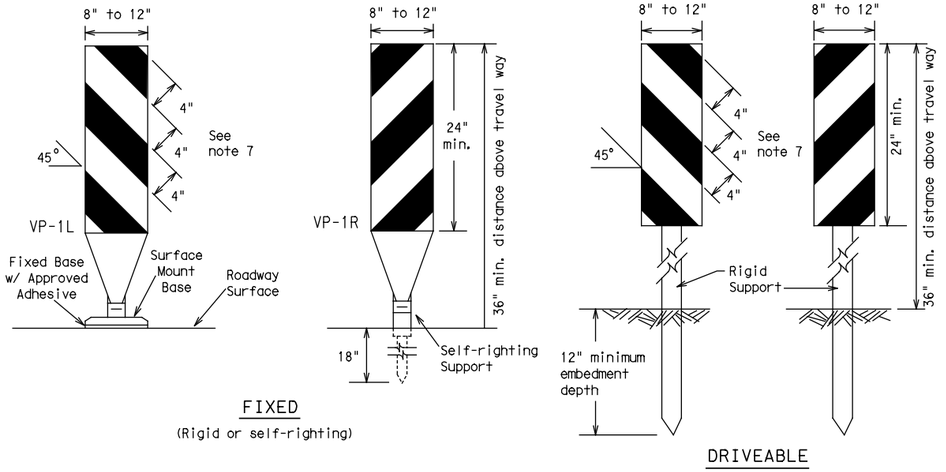
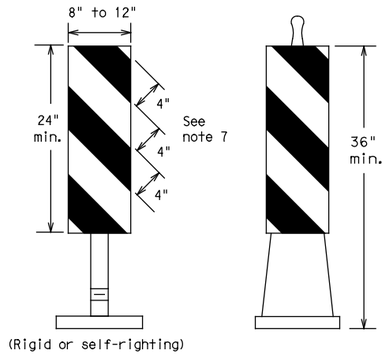


FIXED
(Rigid or self-righting)

DRIVEABLE

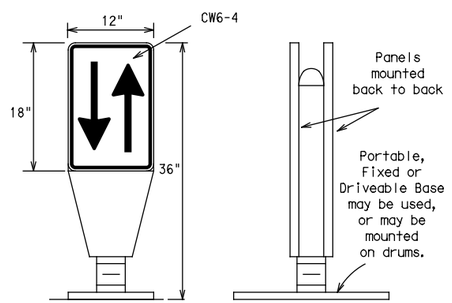


(Rigid or self-righting)

PORTABLE

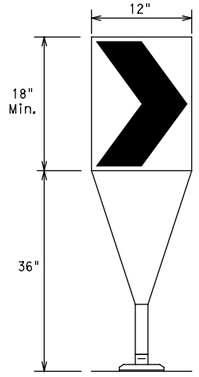
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



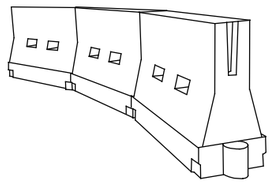
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

If used to channelize pedestrians, longitudinal channelizing devices or water ballasted systems must have a continuous detectable bottom for users of long 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

Posted Speed	Formula	Minimum Desirable Taper Lengths ** 10′ Offset	11′ Offset	12′ Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent
30	$L=\frac{WS^2}{60}$	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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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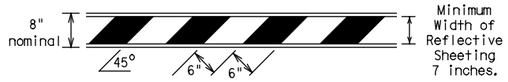
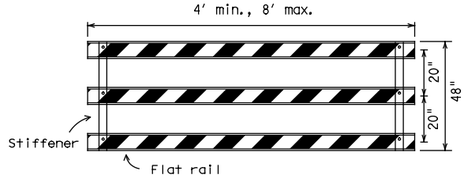
TYPE 3 BARRICADES

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.



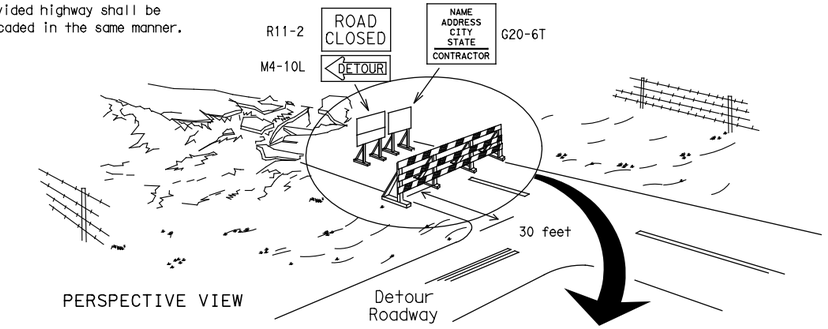
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

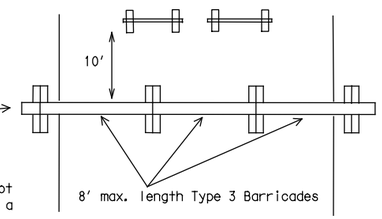
TYPICAL PANEL DETAIL
FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

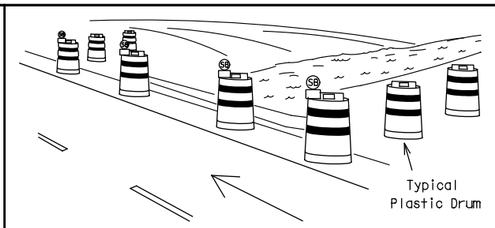
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

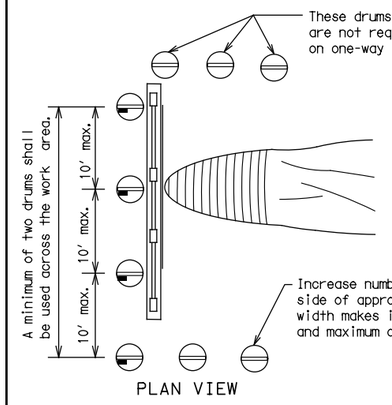
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

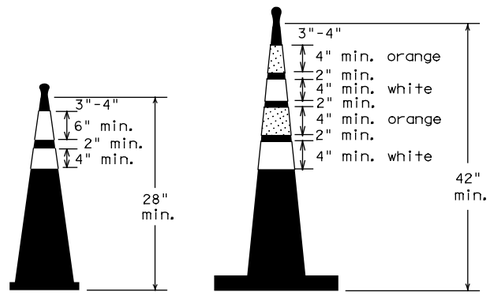
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder 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.



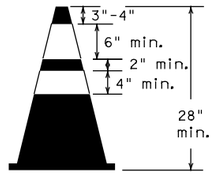
PLAN VIEW

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

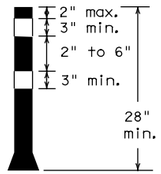
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

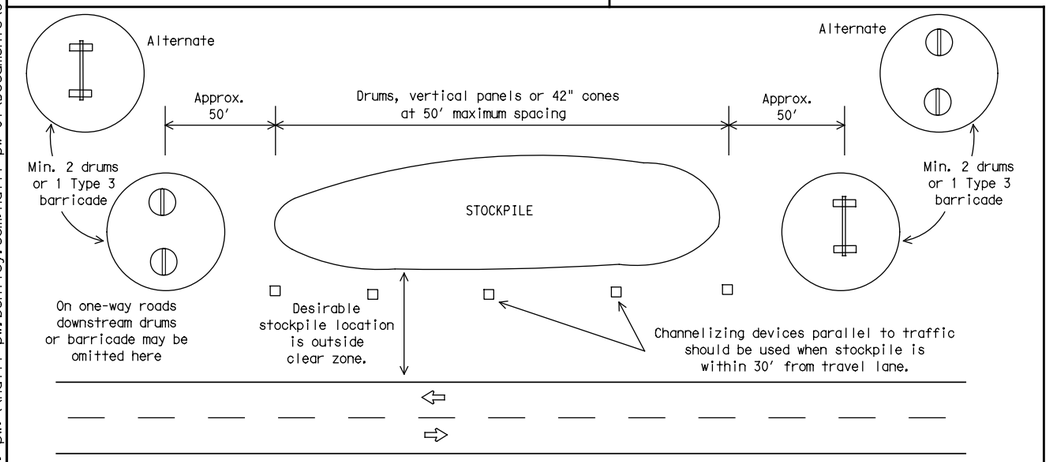


Tubular Marker

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

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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

SHEET 10 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

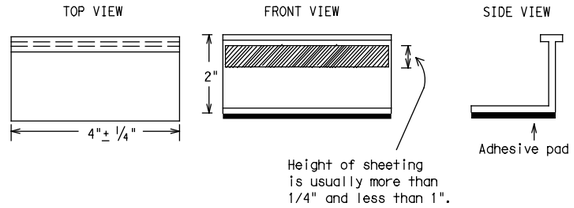
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

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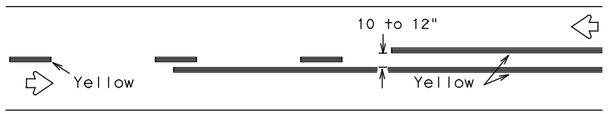
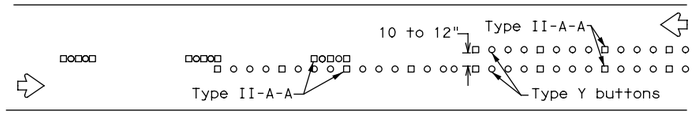
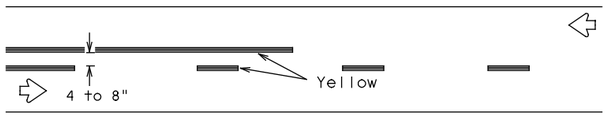
PAVEMENT MARKING PATTERNS



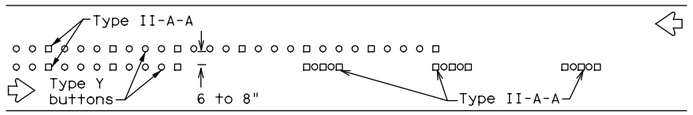
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



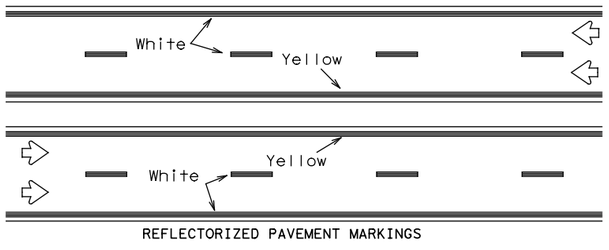
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



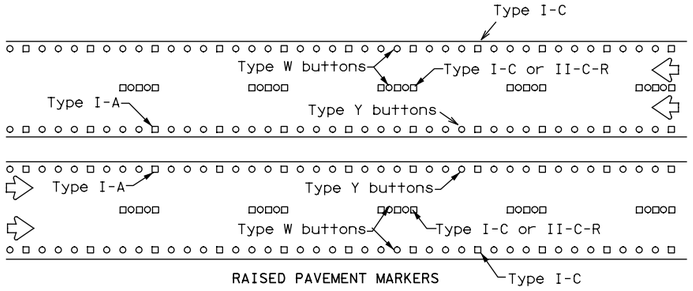
RAISED PAVEMENT MARKERS - PATTERN B

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

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



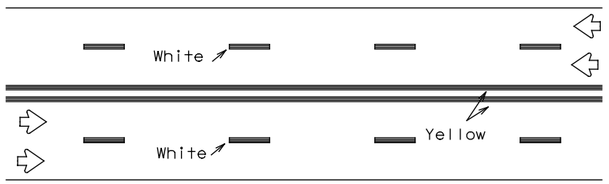
REFLECTORIZED PAVEMENT MARKINGS



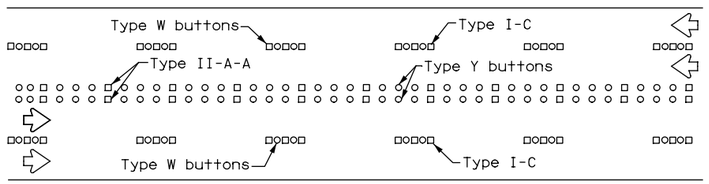
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



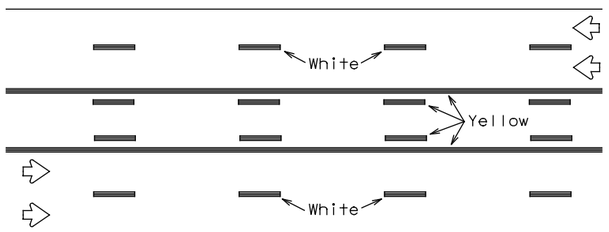
REFLECTORIZED PAVEMENT MARKINGS



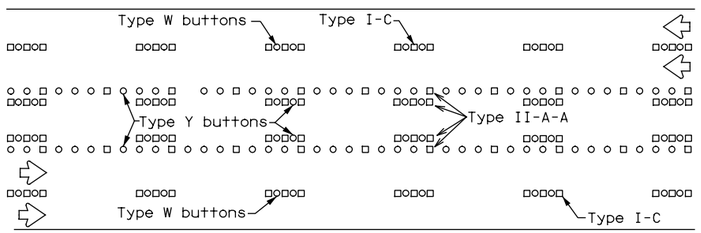
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



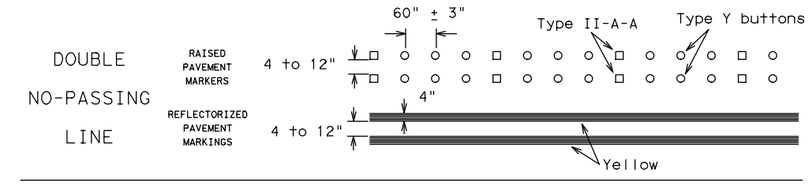
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

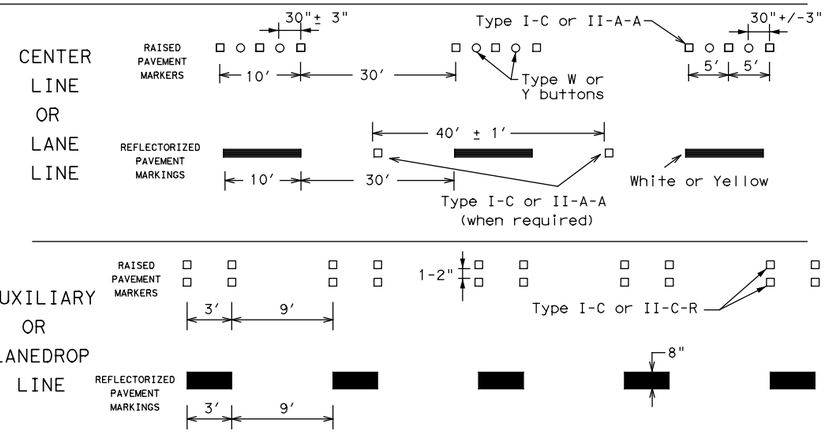
TWO-WAY LEFT TURN LANE

STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

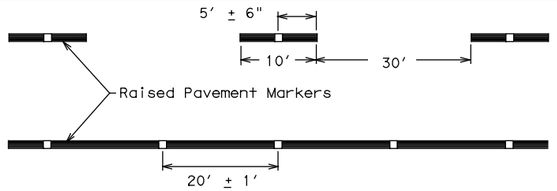


BROKEN LINES



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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."

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

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106

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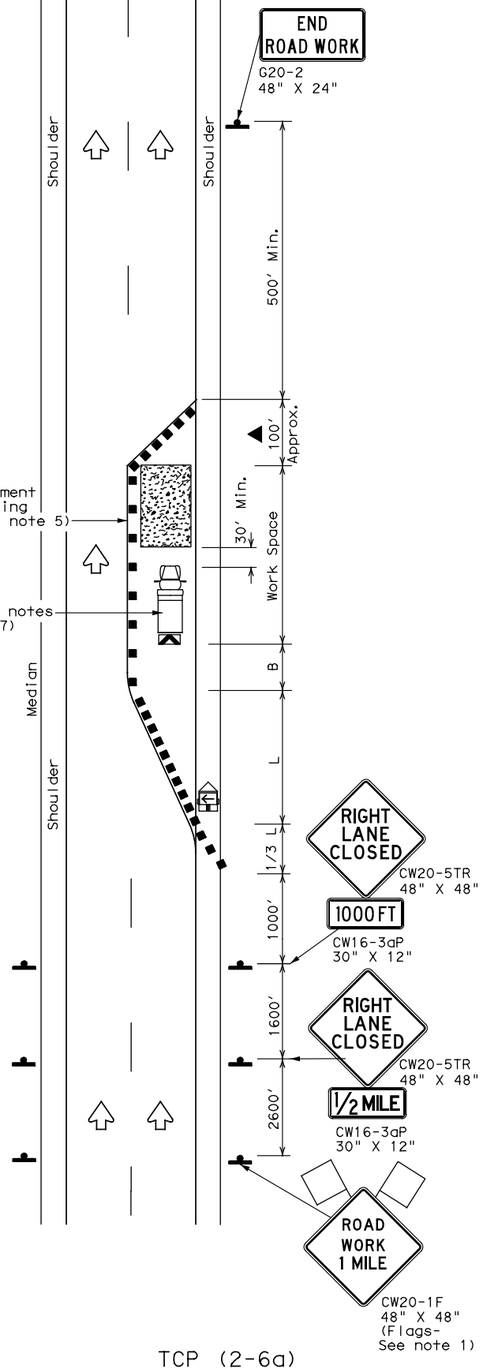
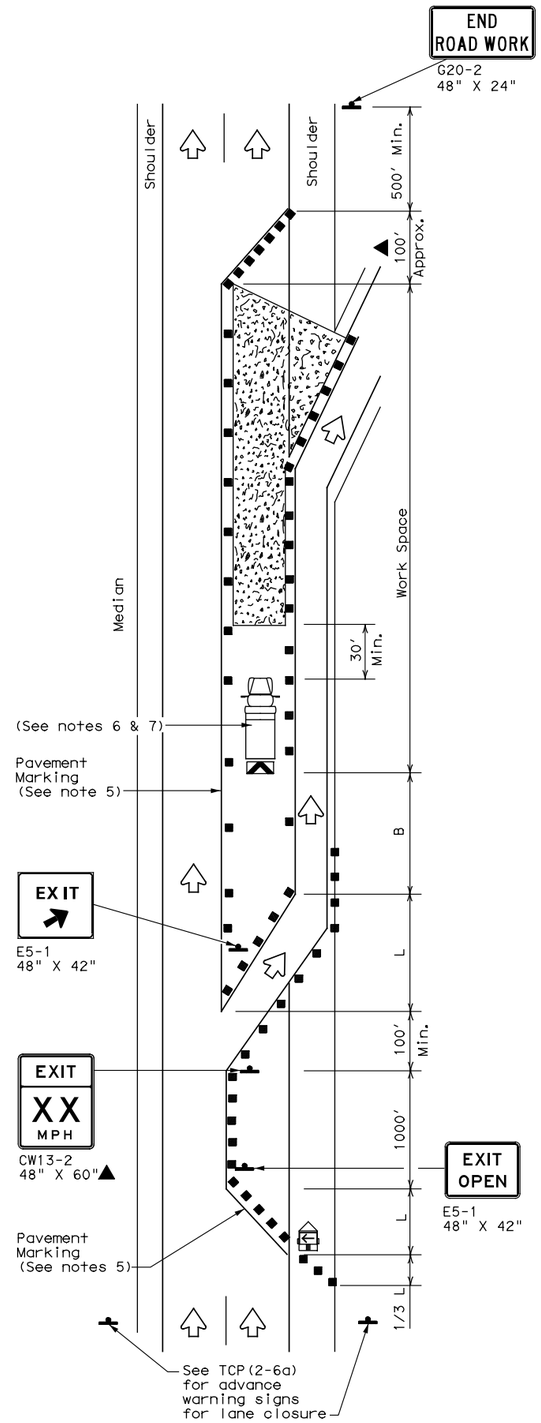


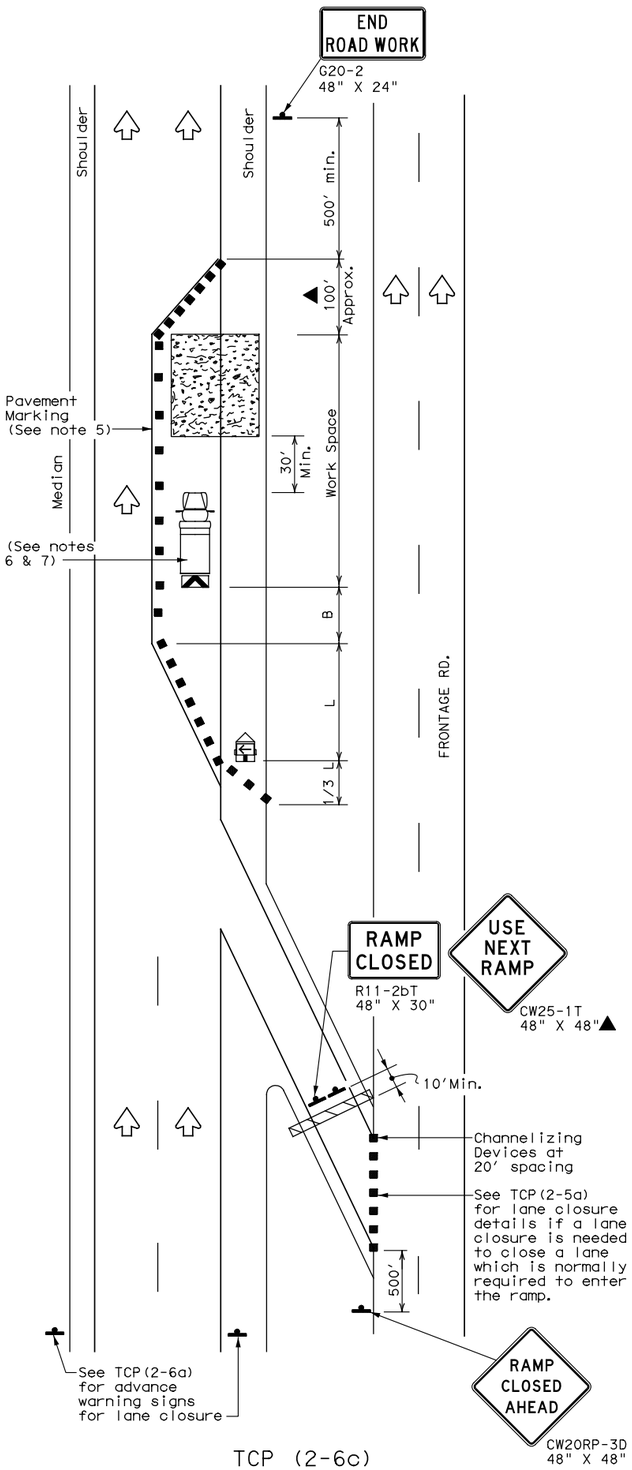
TCP (2-6a)

ONE LANE CLOSURE



TCP (2-6b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (2-6c)

LANE CLOSURE NEAR ENTRANCE RAMPS

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

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

1. Flags attached to signs where shown, are REQUIRED.
2. 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.
3. 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.
4. Channelizing devices used along the work space or along tangent sections may be supplemented with vertical panels (VP) placed on everyother channelizing device. If night time conditions make it difficult to see at least two VPs, the VPs may be placed on each channelizing device.
5. The placement of pavement markings may be omitted on Intermediate-term stationary work zones with the approval of the Engineer.
6. 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.
7. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

Texas Department of Transportation

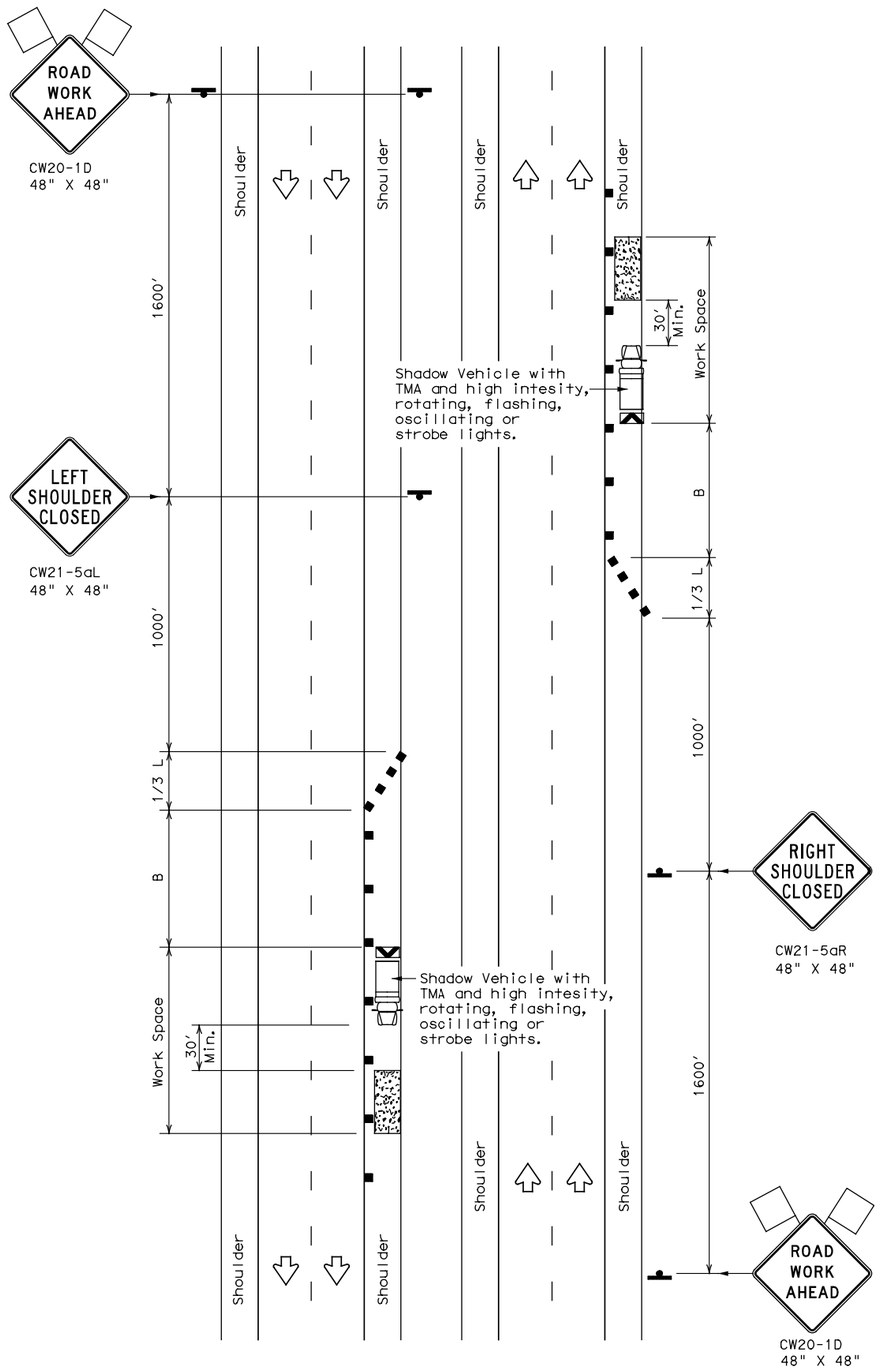
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON DIVIDED HIGHWAYS

TCP(2-6)-18

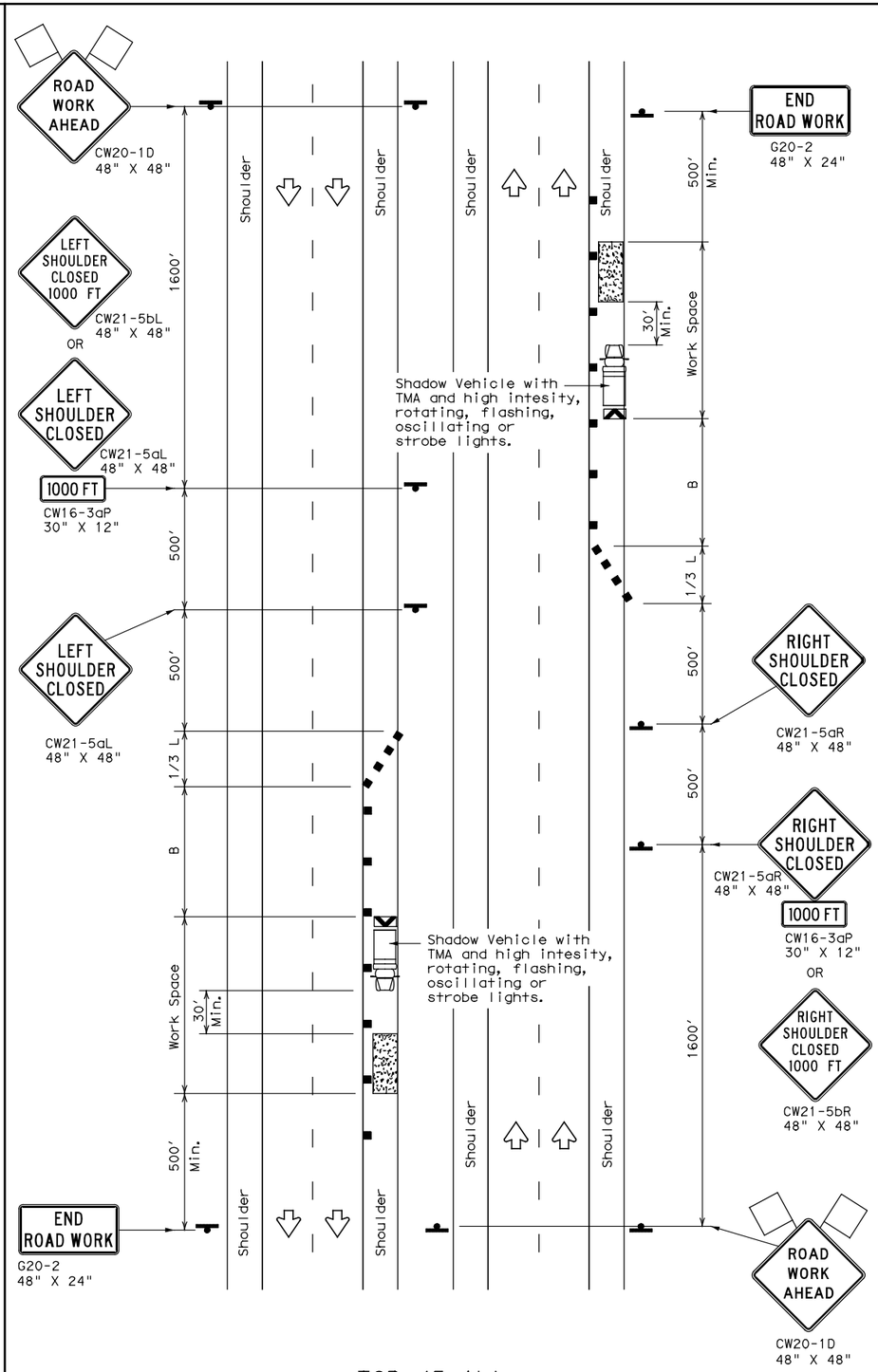
FILE: tcp2-6-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18	0024	04	068,ETC	US 90,ETC
	DIST	COUNTY		SHEET NO.
	SAT	MEDINA,ETC		26

DATE: 4/29/2022 2:07:37 PM
FILE: pw:\\halff-pw.bentley.com:halff-pw-01\Documents\34832.F00 US90_SH97\500 TRAFFIC\Sheets\tcp5-1-18.dgn



TCP (5-1a)

WORK AREA ON SHOULDER



TCP (5-1b)

WORK AREA ON SHOULDER

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	90'
35		205'	225'	245'	35'	70'	120'
40		265'	295'	320'	40'	80'	155'
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN SHOULDER WORK FOR FREEWAYS / EXPRESSWAYS

TCP(5-1)-18

FILE: tcp5-1-18.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	04	068,ETC	US 90,ETC
2-18	DIST	COUNTY		SHEET NO.
	SAT	MEDINA,ETC		27

Chain US90-1 contains:
 US903 CUR US90-11 CUR US90-12 CUR US90-13 CUR US90-14 CUR US90-15 CUR US90-16 - US904

Beginning chain US90-1 description

Point US903 N 13,663,567.485 E 1,837,457.559 Sta 10+00.00

Course from US903 to PC US90-11 N 89° 20′ 54.37" E Dist 359.320

Curve Data			
Curve US90-11			
P.I. Station	14+71.34	N 13,663,572.845	E 1,837,928.865
Delta =	8° 32′ 29.99"	(RT)	
Degree =	3° 49′ 10.99"		
Tangent =	112.018		
Length =	223.620		
Radius =	1,500.000		
External =	4.177		
Long Chord =	223.413		
Mid. Ord. =	4.165		
P.C. Station	13+59.32	N 13,663,571.571	E 1,837,816.855
P.T. Station	15+82.94	N 13,663,557.468	E 1,838,039.822
C.C.		N 13,662,071.668	E 1,837,833.912
Back = N	89° 20′ 54.37" E		
Ahead = S	82° 06′ 35.63" E		
Chord Bear = S	86° 22′ 50.63" E		

Curve Data			
Curve US90-12			
P.I. Station	16+98.76	N 13,663,541.568	E 1,838,154.547
Delta =	8° 49′ 53.48"	(LT)	
Degree =	3° 49′ 12.46"		
Tangent =	115.821		
Length =	231.184		
Radius =	1,499.839		
External =	4.465		
Long Chord =	230.955		
Mid. Ord. =	4.452		
P.C. Station	15+82.94	N 13,663,557.468	E 1,838,039.822
P.T. Station	18+14.12	N 13,663,543.471	E 1,838,270.353
C.C.		N 13,665,043.108	E 1,838,245.711
Back = S	82° 06′ 35.63" E		
Ahead = N	89° 03′ 30.89" E		
Chord Bear = S	86° 31′ 32.37" E		

Course from PT US90-12 to PC US90-13 N 89° 03′ 30.89" E Dist 14,397.793

Curve Data			
Curve US90-13			
P.I. Station	164+05.89	N 13,663,783.216	E 1,852,860.148
Delta =	4° 37′ 41.56"	(LT)	
Degree =	1° 11′ 37.18"		
Tangent =	193.972		
Length =	387.732		
Radius =	4,800.000		
External =	3.918		
Long Chord =	387.627		
Mid. Ord. =	3.914		
P.C. Station	162+11.92	N 13,663,780.029	E 1,852,666.202
P.T. Station	165+99.65	N 13,663,802.042	E 1,853,053.204
C.C.		N 13,668,579.381	E 1,852,587.338
Back = N	89° 03′ 30.89" E		
Ahead = N	84° 25′ 49.33" E		
Chord Bear = N	86° 44′ 40.11" E		

Course from PT US90-13 to PC US90-14 N 84° 25′ 49.33" E Dist 1,914.238

Curve Data			
Curve US90-14			
P.I. Station	189+09.79	N 13,664,026.254	E 1,855,352.442
Delta =	6° 09′ 59.39"	(LT)	
Degree =	0° 46′ 46.32"		
Tangent =	395.907		
Length =	791.049		
Radius =	7,350.000		
External =	10.655		
Long Chord =	790.667		
Mid. Ord. =	10.640		
P.C. Station	185+13.89	N 13,663,987.829	E 1,854,958.404
P.T. Station	193+04.94	N 13,664,106.783	E 1,855,740.072
C.C.		N 13,671,303.130	E 1,854,245.047
Back = N	84° 25′ 49.33" E		
Ahead = N	78° 15′ 49.93" E		
Chord Bear = N	81° 20′ 49.63" E		

Course from PT US90-14 to PC US90-15 N 78° 15′ 49.93" E Dist 19,952.244

Curve Data			
Curve US90-15			
P.I. Station	396+59.37	N 13,668,246.972	E 1,875,668.994
Delta =	6° 52′ 14.01"	(LT)	
Degree =	0° 51′ 18.58"		
Tangent =	402.194		
Length =	803.423		
Radius =	6,700.000		
External =	12.061		
Long Chord =	802.942		
Mid. Ord. =	12.039		
P.C. Station	392+57.18	N 13,668,165.164	E 1,875,275.209
P.T. Station	400+60.60	N 13,668,375.300	E 1,876,050.166
C.C.		N 13,674,725.099	E 1,873,912.397
Back = N	78° 15′ 49.93" E		
Ahead = N	71° 23′ 35.92" E		
Chord Bear = N	74° 49′ 42.93" E		

Course from PT US90-15 to PC US90-16 N 71° 23′ 35.92" E Dist 557.928

Curve Data			
Curve US90-16			
P.I. Station	412+74.06	N 13,668,762.477	E 1,877,200.193
Delta =	3° 15′ 29.15"	(LT)	
Degree =	0° 14′ 54.88"		
Tangent =	655.525		
Length =	1,310.696		
Radius =	23,049.454		
External =	9.320		
Long Chord =	1,310.520		
Mid. Ord. =	9.316		
P.C. Station	406+18.53	N 13,668,553.318	E 1,876,578.932
P.T. Station	419+29.23	N 13,669,006.605	E 1,877,808.563
C.C.		N 13,690,398.004	E 1,869,224.543
Back = N	71° 23′ 35.92" E		
Ahead = N	68° 08′ 06.77" E		
Chord Bear = N	69° 45′ 51.34" E		

Course from PT US90-16 to US904 N 68° 08′ 06.77" E Dist 235.274

Point US904 N 13,669,094.226 E 1,878,026.913 Sta 421+64.50

Ending chain US90-1 description
Chain US90-2 contains:
 US907 CUR US90-21 US908

Beginning chain US90-2 description

Point US907 N 13,682,141.259 E 2,030,529.190 Sta 1890+65.00

Course from US907 to PC US90-21 N 71° 41′ 19.15" E Dist 10,657.592

Curve Data			
Curve US90-21			
P.I. Station	2003+22.53	N 13,685,678.155	E 2,041,216.673
Delta =	17° 56′ 36.06"	(RT)	
Degree =	1° 30′ 28.02"		
Tangent =	599.935		
Length =	1,190.048		
Radius =	3,800.000		
External =	47.067		
Long Chord =	1,185.191		
Mid. Ord. =	46.491		
P.C. Station	1997+22.59	N 13,685,489.667	E 2,040,647.116
P.T. Station	2009+12.64	N 13,685,682.008	E 2,041,816.595
C.C.		N 13,681,882.086	E 2,041,841.002
Back = N	71° 41′ 19.15" E		
Ahead = N	89° 37′ 55.21" E		
Chord Bear = N	80° 39′ 37.18" E		

Course from PT US90-21 to US908 N 89° 37′ 55.21" E Dist 1,881.158

Point US908 N 13,685,694.090 E 2,043,697.715 Sta 2027+93.80

Ending chain US90-2 description

NOTE:
ALIGNMENT WAS CREATED USING AERIAL PHOTOGRAPHY WITH ADJUSTMENT FACTOR OF 1.00013.

STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

4/29/2022

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NO.	REVISION	BY	DATE

HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

HORIZONTAL ALIGNMENT DATA

SCALE: NTS SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		28
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.

Chain SH97-NEW contains:
 CUR SH97-NEW-1 1001

Beginning chain SH97-NEW description

			Curve Data		

Curve SH97-NEW-1					
P.I. Station		18+64.52	N 13,540,052.538	E	2,138,790.245
Delta	=	17° 52′ 05.88" (RT)			
Degree	=	1° 02′ 30.76"			
Tangent	=	864.524			
Length	=	1,715.011			
Radius	=	5,499.285			
External	=	67.540			
Long Chord	=	1,708.069			
Mid. Ord.	=	66.720			
P.C. Station		10+00.00	N 13,539,449.633	E	2,138,170.643
P.T. Station		27+15.01	N 13,540,436.249	E	2,139,564.950
C.C.			N 13,535,508.308	E	2,142,005.756
Back	= N 45° 46′ 57.02" E				
Ahead	= N 63° 39′ 02.90" E				
Chord Bear	= N 54° 42′ 59.96" E				

Course from PT SH97-NEW-1 to 1001 N 63° 39′ 02.90" E Dist 11,495.704

Point 1001 N 13,545,538.511 E 2,149,866.316 Sta 142+10.72

Ending chain SH97-NEW description

NOTE:
ALIGNMENT WAS CREATED USING AERIAL PHOTOGRAPHY WITH ADJUSTMENT FACTOR OF 1.00013.

STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

4/29/2022

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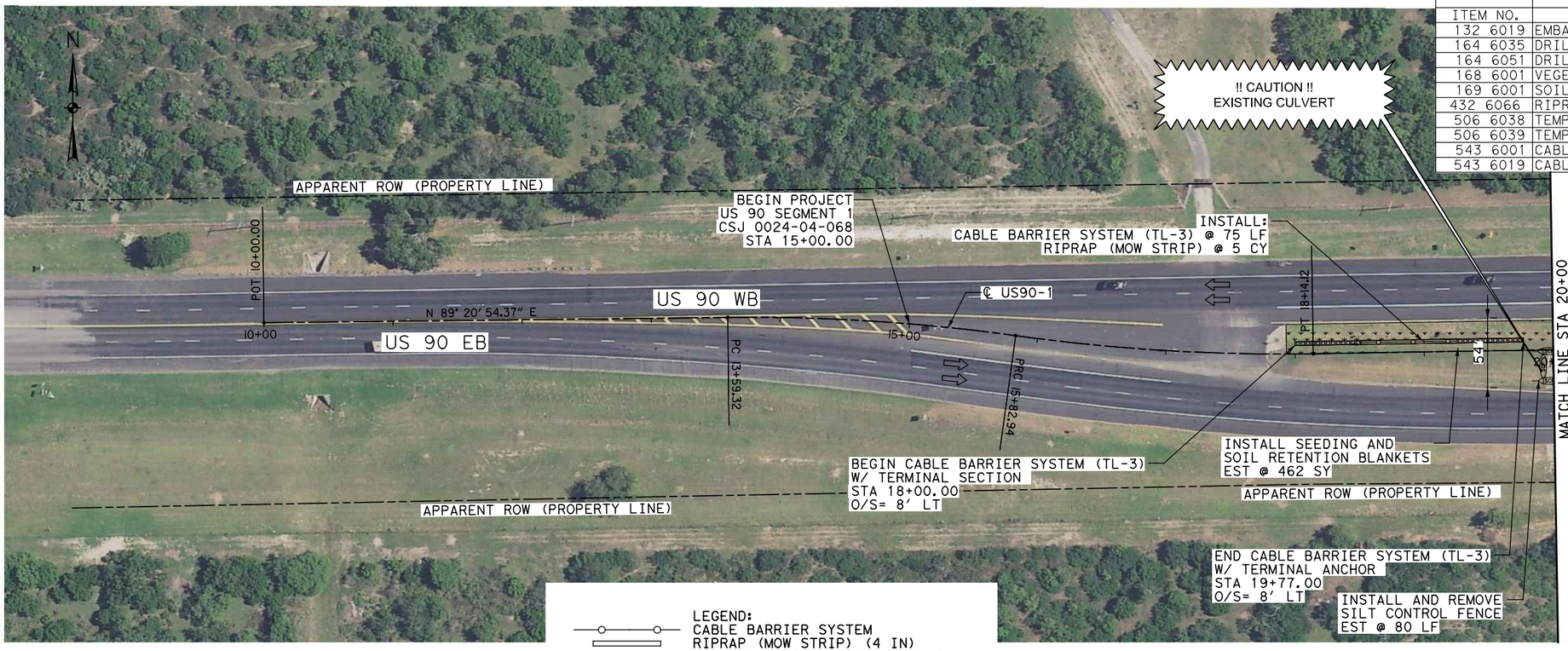
NO.	REVISION	BY	DATE

HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

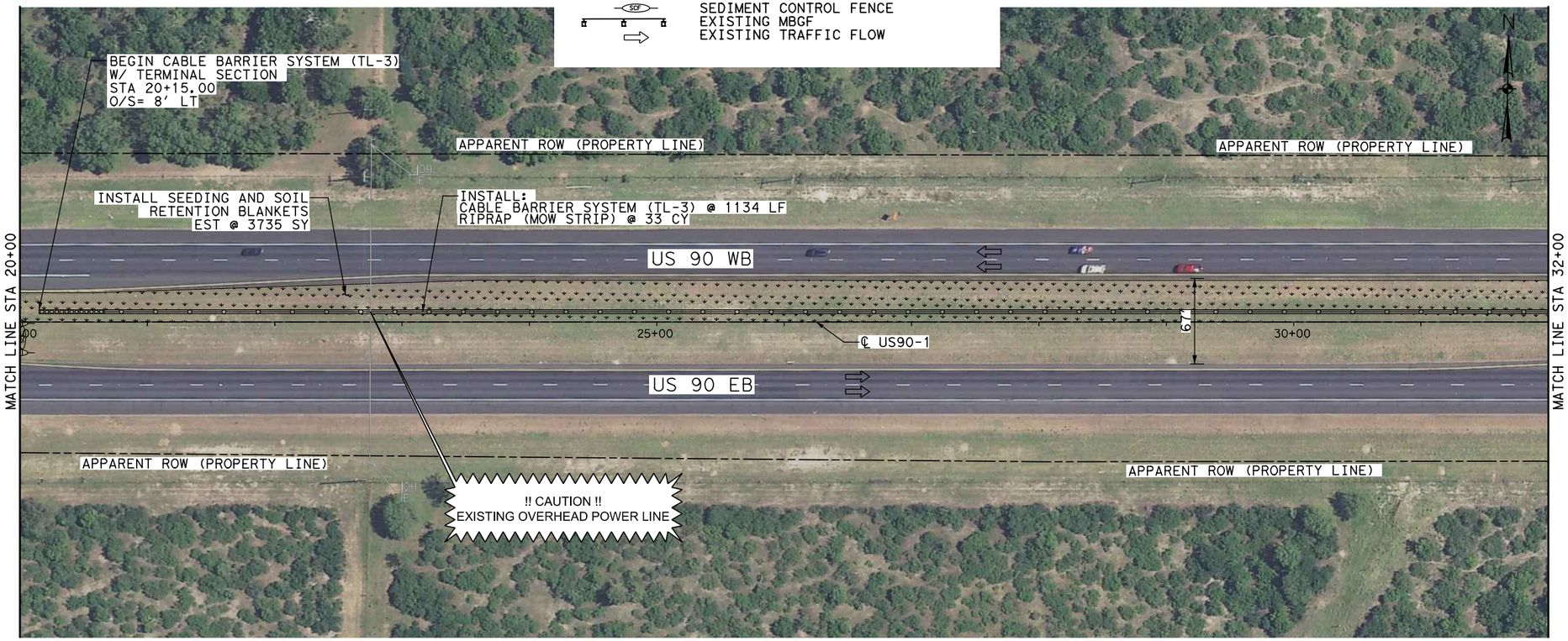
HORIZONTAL ALIGNMENT DATA

SCALE: NTS SHEET 2 OF 2

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		29
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.



LEGEND:
- CABLE BARRIER SYSTEM
- RIPRAP (MOW STRIP) (4 IN)
- CABLE BARRIER TERMINAL SECTION
- CENTERLINE
- SEDIMENT CONTROL FENCE
- EXISTING MBGF
- EXISTING TRAFFIC FLOW



	ESTIMATED QUANTITIES		
ITEM NO.	DESCRIPTION	UNIT	QTY
132 6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	CY	1841
164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	4197
164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	4197
168 6001	VEGETATIVE WATERING	MG	68
169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	4197
432 6066	RIPRAP (MOW STRIP)(3 IN)	CY	38
506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	80
506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	80
543 6001	CABLE BARRIER SYSTEM (TL-3)	LF	1209
543 6019	CABLE BARRIER TERMINAL SECTION (TL-3)	EA	3

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR CENTERLINE GEOMETRY OF US 90.
2. CABLE BARRIERS ARE DESIGNED TO BE PLACED ON 6:1 OR FLATTER SIDE SLOPES. TOPOGRAPHICAL SURVEYING WAS NOT PERFORMED ON THIS PROJECT. BASELINE COINCIDES WITH THE FLOW LINE OF DITCH. CABLE BARRIER LOCATIONS MAY BE ADJUSTED AS NEEDED TO FIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.
3. CABLE BARRIERS SHALL BE PLACED WITH AT LEAST 12-FEET OFFSET FROM THE EDGE OF THE ROADWAY PAVEMENT. CABLE BARRIERS SHALL BE PLACED AT LEAST 8-FEET FROM THE BOTTOM OF THE DITCH LINE. OFFSET OF AT LEAST 5-FEET FROM THE EDGE OF ILLUMINATION POLE IS RECOMMENDED.
4. CONTRACTOR SHALL INSTALL TEMPORARY SEDIMENT CONTROL FENCE AS NEEDED.
5. ALL UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR MUST VERIFY ALL EXISTING OVERHEAD AND UNDERGROUND UTILITIES FOR ELEVATION AND CLEARANCES.
6. CONTRACTOR SHALL WINDROW TOWARDS CENTERLINE AND SHALL NOT WINDROW ALONG EDGE OF PAVEMENT.
7. SEEDING AND BLANKETS TO BE INSTALLED AS NEEDED TO REESTABLISH VEGETATION IN DISTURBED AREAS.

0 25 50 75 100 150
SCALE IN FEET
SCALE: HOR: 1" = 100'

STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED
PROFESSIONAL ENGINEER

6/27/2022

THE SEAL ORIGINALLY APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY JOHNNY L. CLAYTON, P.E. #107215 ON 6/27/2022 . ALTERATION OF A PREVIOUSLY SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT. THE RECORD COPY OF THIS DRAWING IS ON FILE AT THE OFFICES OF HALFF ASSOCIATES, INC., 100 NE INTERSTATE 410 LOOP, SUITE 200, SAN ANTONIO, TEXAS 78216, TBPE FIRM #F-312

NO.	REVISION	BY	DATE

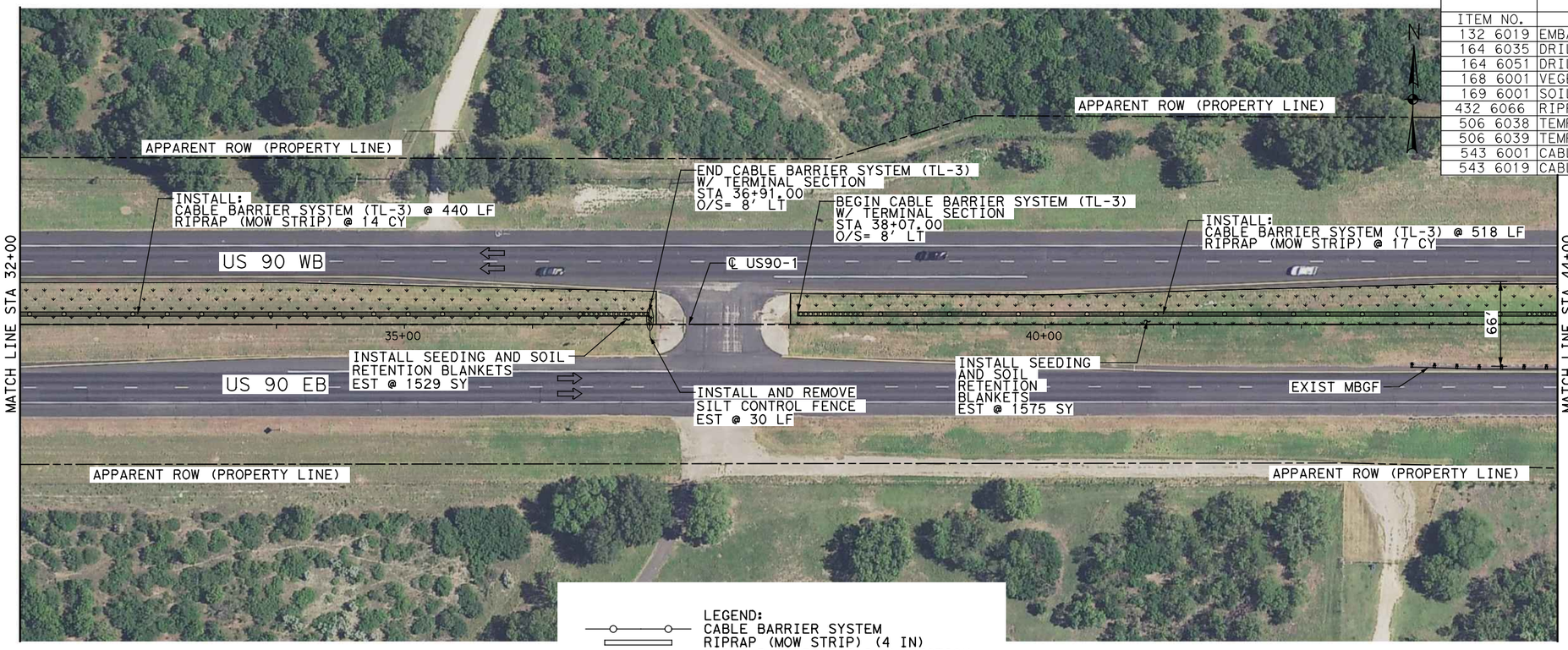
HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

Texas Department of Transportation®

US 90 SEGMENT 1
CABLE BARRIER PLAN
BEGIN TO STA 32+00

SCALE: 1"=100' SHEET 1 OF 17

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		30
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.

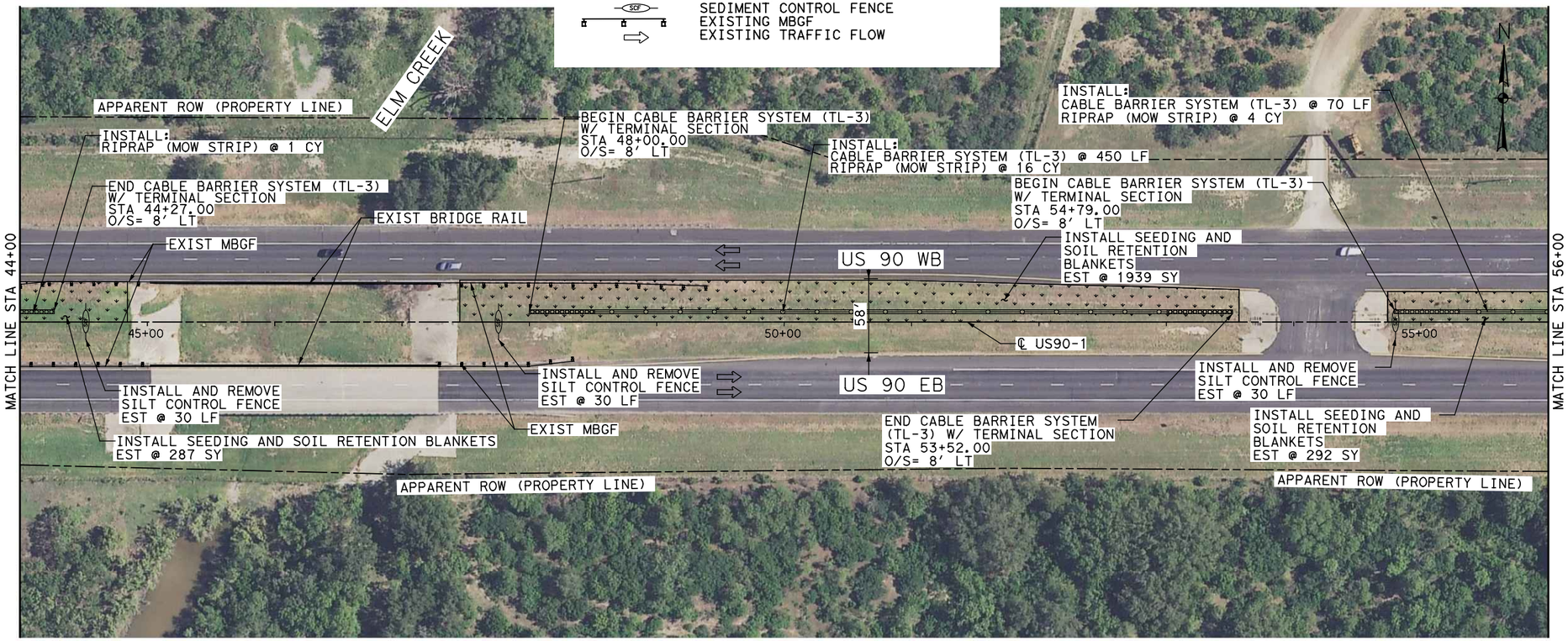


	ESTIMATED QUANTITIES		
ITEM NO.	DESCRIPTION	UNIT	QTY
132 6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	CY	1998
164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	5622
164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	5622
168 6001	VEGETATIVE WATERING	MG	90
169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	5622
432 6066	RIPRAP (MOW STRIP)(3 IN)	CY	52
506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	120
506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	120
543 6001	CABLE BARRIER SYSTEM (TL-3)	LF	1478
543 6019	CABLE BARRIER TERMINAL SECTION (TL-3)	EA	6

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR CENTERLINE GEOMETRY OF US 90.
2. CABLE BARRIERS ARE DESIGNED TO BE PLACED ON 6:1 OR FLATTER SIDE SLOPES. TOPOGRAPHICAL SURVEYING WAS NOT PERFORMED ON THIS PROJECT. BASELINE COINCIDES WITH THE FLOW LINE OF DITCH. CABLE BARRIER LOCATIONS MAY BE ADJUSTED AS NEEDED TO FIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.
3. CABLE BARRIERS SHALL BE PLACED WITH AT LEAST 12-FEET OFFSET FROM THE EDGE OF THE ROADWAY PAVEMENT. CABLE BARRIERS SHALL BE PLACED AT LEAST 8-FEET FROM THE BOTTOM OF THE DITCH LINE. OFFSET OF AT LEAST 5-FEET FROM THE EDGE OF ILLUMINATION POLE IS RECOMMENDED.
4. CONTRACTOR SHALL INSTALL TEMPORARY SEDIMENT CONTROL FENCE AS NEEDED.
5. ALL UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR MUST VERIFY ALL EXISTING OVERHEAD AND UNDERGROUND UTILITIES FOR ELEVATION AND CLEARANCES.
6. CONTRACTOR SHALL WINDROW TOWARDS CENTERLINE AND SHALL NOT WINDROW ALONG EDGE OF PAVEMENT.
7. SEEDING AND BLANKETS TO BE INSTALLED AS NEEDED TO REESTABLISH VEGETATION IN DISTURBED AREAS.

LEGEND:
CABLE BARRIER SYSTEM
RIPRAP (MOW STRIP) (4 IN)
CABLE BARRIER TERMINAL SECTION
CENTERLINE
SEDIMENT CONTROL FENCE
EXISTING MBGF
EXISTING TRAFFIC FLOW



STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED
PROFESSIONAL ENGINEER

6/27/2022

THE SEAL ORIGINALLY APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY JOHNNY L. CLAYTON, P.E. #107215 ON 6/27/2022 . ALTERATION OF A PREVIOUSLY SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT. THE RECORD COPY OF THIS DRAWING IS ON FILE AT THE OFFICES OF HALFF ASSOCIATES, INC., 100 NE INTERSTATE 410 LOOP, SUITE 200, SAN ANTONIO, TEXAS 78216, TBPE FIRM #F-312

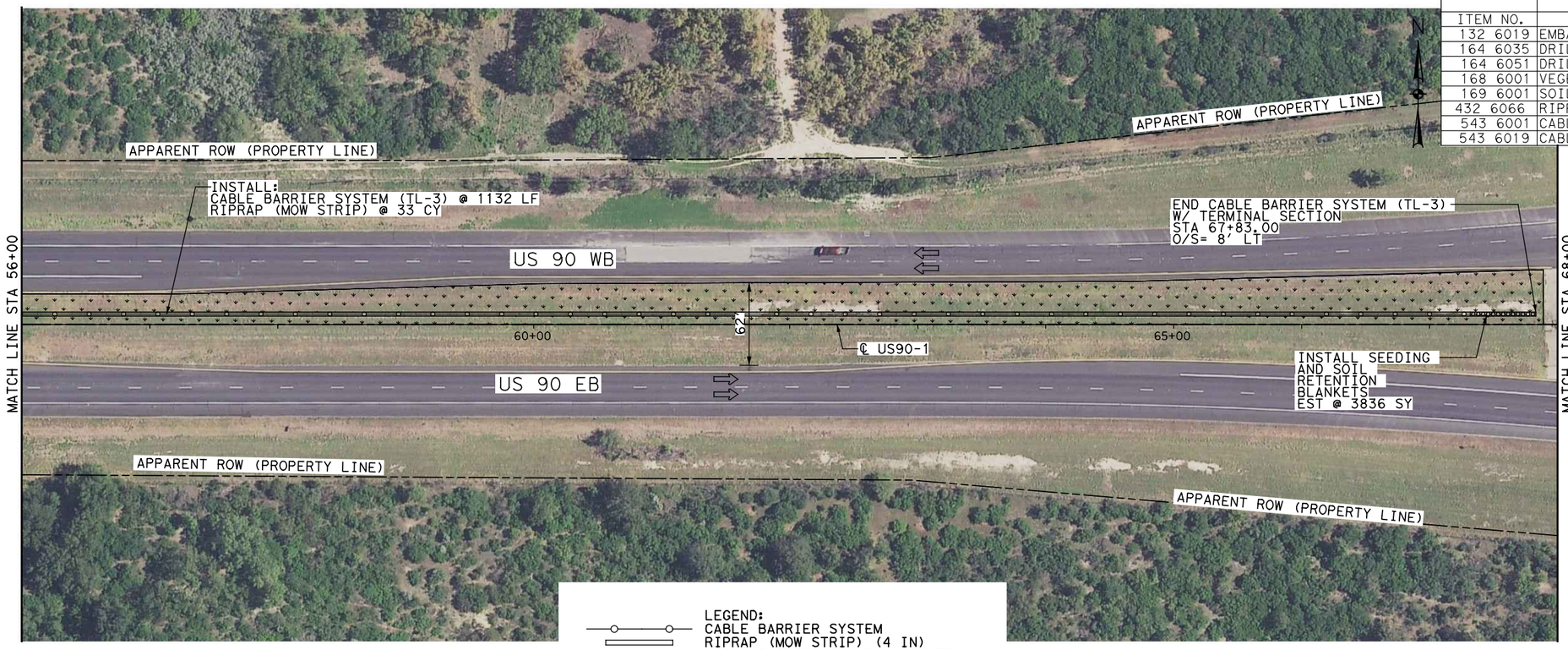
NO.	REVISION	BY	DATE

HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

US 90 SEGMENT 1
CABLE BARRIER PLAN
STA 32+00 TO STA 56+00

SCALE:1"=100' SHEET 2 OF 17

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		31
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.

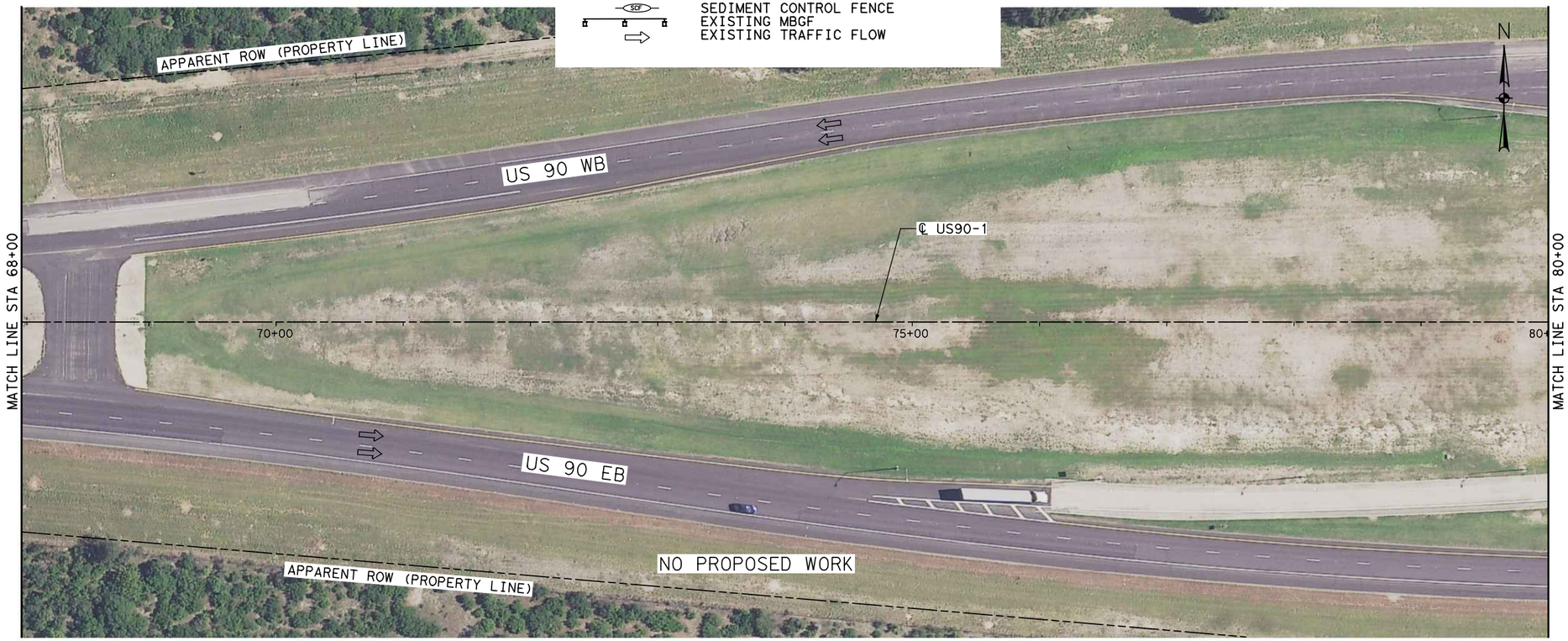


	ESTIMATED QUANTITIES		
ITEM NO.	DESCRIPTION	UNIT	QTY
132 6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	CY	920
164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	3836
164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	3836
168 6001	VEGETATIVE WATERING	MG	62
169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	3836
432 6066	RIPRAP (MOW STRIP)(3 IN)	CY	33
543 6001	CABLE BARRIER SYSTEM (TL-3)	LF	1132
543 6019	CABLE BARRIER TERMINAL SECTION (TL-3)	EA	1

LEGEND:
- CABLE BARRIER SYSTEM
- RIPRAP (MOW STRIP) (4 IN)
- CABLE BARRIER TERMINAL SECTION
- CENTERLINE
- SEDIMENT CONTROL FENCE
- EXISTING MBGF
- EXISTING TRAFFIC FLOW

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR CENTERLINE GEOMETRY OF US 90.
2. CABLE BARRIERS ARE DESIGNED TO BE PLACED ON 6:1 OR FLATTER SIDE SLOPES. TOPOGRAPHICAL SURVEYING WAS NOT PERFORMED ON THIS PROJECT. BASELINE COINCIDES WITH THE FLOW LINE OF DITCH. CABLE BARRIER LOCATIONS MAY BE ADJUSTED AS NEEDED TO FIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.
3. CABLE BARRIERS SHALL BE PLACED WITH AT LEAST 12-FEET OFFSET FROM THE EDGE OF THE ROADWAY PAVEMENT. CABLE BARRIERS SHALL BE PLACED AT LEAST 8-FEET FROM THE BOTTOM OF THE DITCH LINE. OFFSET OF AT LEAST 5-FEET FROM THE EDGE OF ILLUMINATION POLE IS RECOMMENDED.
4. CONTRACTOR SHALL INSTALL TEMPORARY SEDIMENT CONTROL FENCE AS NEEDED.
5. ALL UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR MUST VERIFY ALL EXISTING OVERHEAD AND UNDERGROUND UTILITIES FOR ELEVATION AND CLEARANCES.
6. CONTRACTOR SHALL WINDROW TOWARDS CENTERLINE AND SHALL NOT WINDROW ALONG EDGE OF PAVEMENT.
7. SEEDING AND BLANKETS TO BE INSTALLED AS NEEDED TO REESTABLISH VEGETATION IN DISTURBED AREAS.



0 25 50 75 100 150

SCALE IN FEET
SCALE: HOR: 1" = 100'

STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

6/27/2022

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NO.	REVISION	BY	DATE

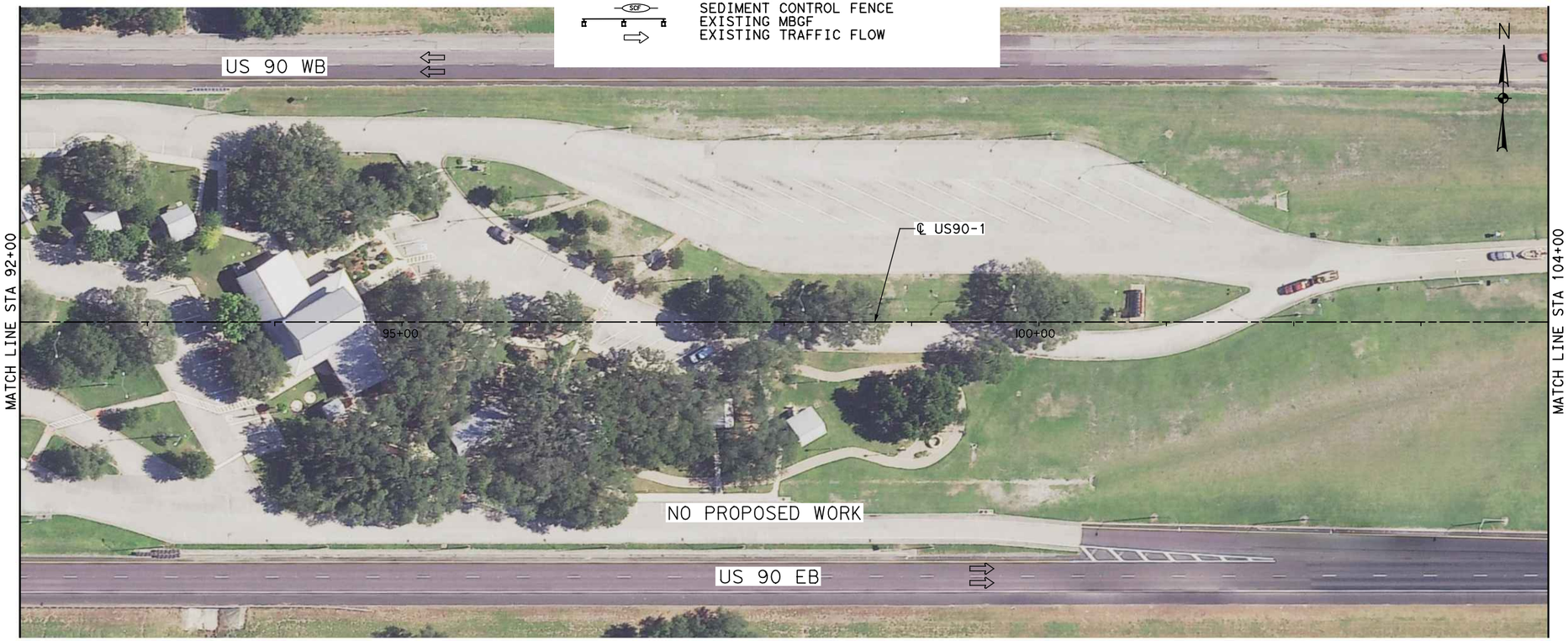
HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

US 90 SEGMENT 1
CABLE BARRIER PLAN
STA 56+00 TO STA 80+00

SCALE:1"=100' SHEET 3 OF 17

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		32
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.

LEGEND:
- CABLE BARRIER SYSTEM
- RIPRAP (MOW STRIP) (4 IN)
- CABLE BARRIER TERMINAL SECTION
- CENTERLINE
- SEDIMENT CONTROL FENCE
- EXISTING MBGF
- EXISTING TRAFFIC FLOW



NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR CENTERLINE GEOMETRY OF US 90.
2. CABLE BARRIERS ARE DESIGNED TO BE PLACED ON 6:1 OR FLATTER SIDE SLOPES. TOPOGRAPHICAL SURVEYING WAS NOT PERFORMED ON THIS PROJECT. BASELINE COINCIDES WITH THE FLOW LINE OF DITCH. CABLE BARRIER LOCATIONS MAY BE ADJUSTED AS NEEDED TO FIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.
3. CABLE BARRIERS SHALL BE PLACED WITH AT LEAST 12-FEET OFFSET FROM THE EDGE OF THE ROADWAY PAVEMENT. CABLE BARRIERS SHALL BE PLACED AT LEAST 8-FEET FROM THE BOTTOM OF THE DITCH LINE. OFFSET OF AT LEAST 5-FEET FROM THE EDGE OF ILLUMINATION POLE IS RECOMMENDED.
4. CONTRACTOR SHALL INSTALL TEMPORARY SEDIMENT CONTROL FENCE AS NEEDED.
5. ALL UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR MUST VERIFY ALL EXISTING OVERHEAD AND UNDERGROUND UTILITIES FOR ELEVATION AND CLEARANCES.
6. CONTRACTOR SHALL WINDROW TOWARDS CENTERLINE AND SHALL NOT WINDROW ALONG EDGE OF PAVEMENT.
7. SEEDING AND BLANKETS TO BE INSTALLED AS NEEDED TO REESTABLISH VEGETATION IN DISTURBED AREAS.

0 25 50 75 100 150
SCALE IN FEET
SCALE: HOR: 1" = 100'

STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

6/27/2022

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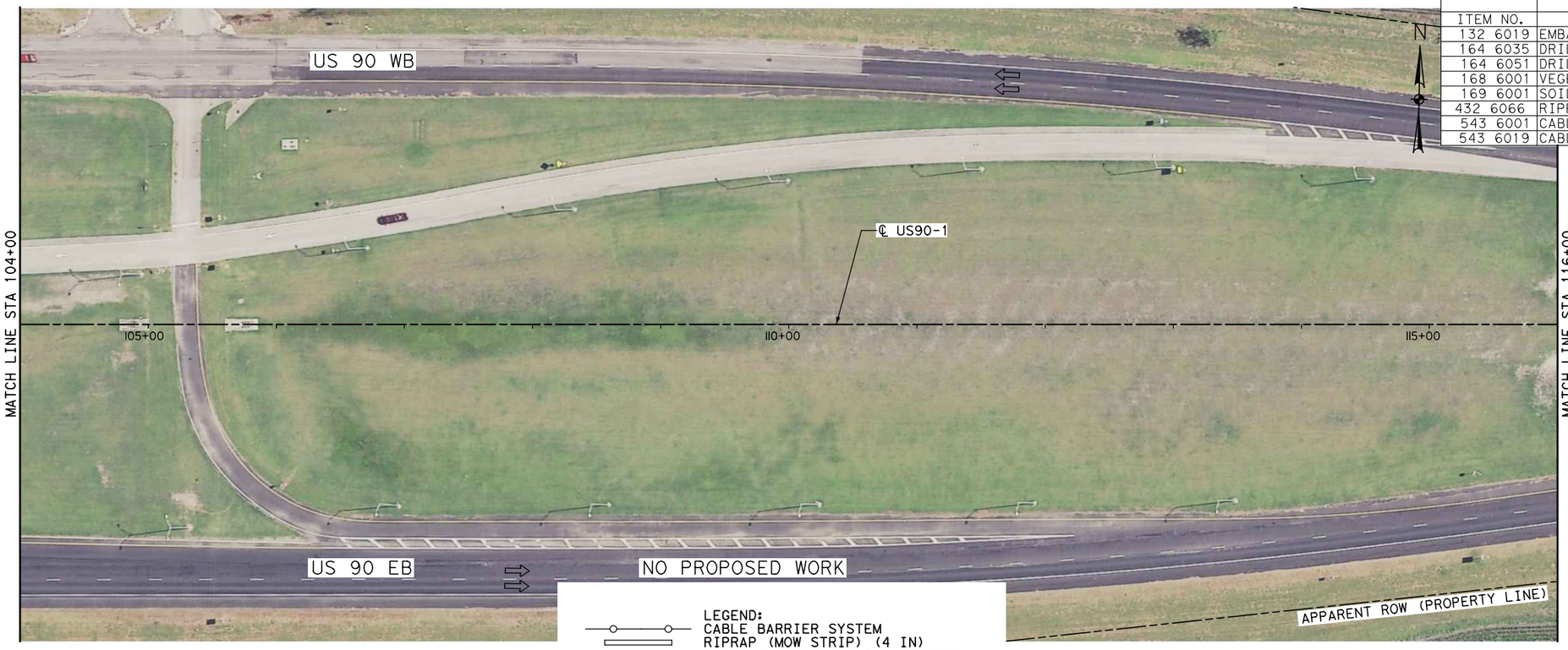
NO.	REVISION	BY	DATE

HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

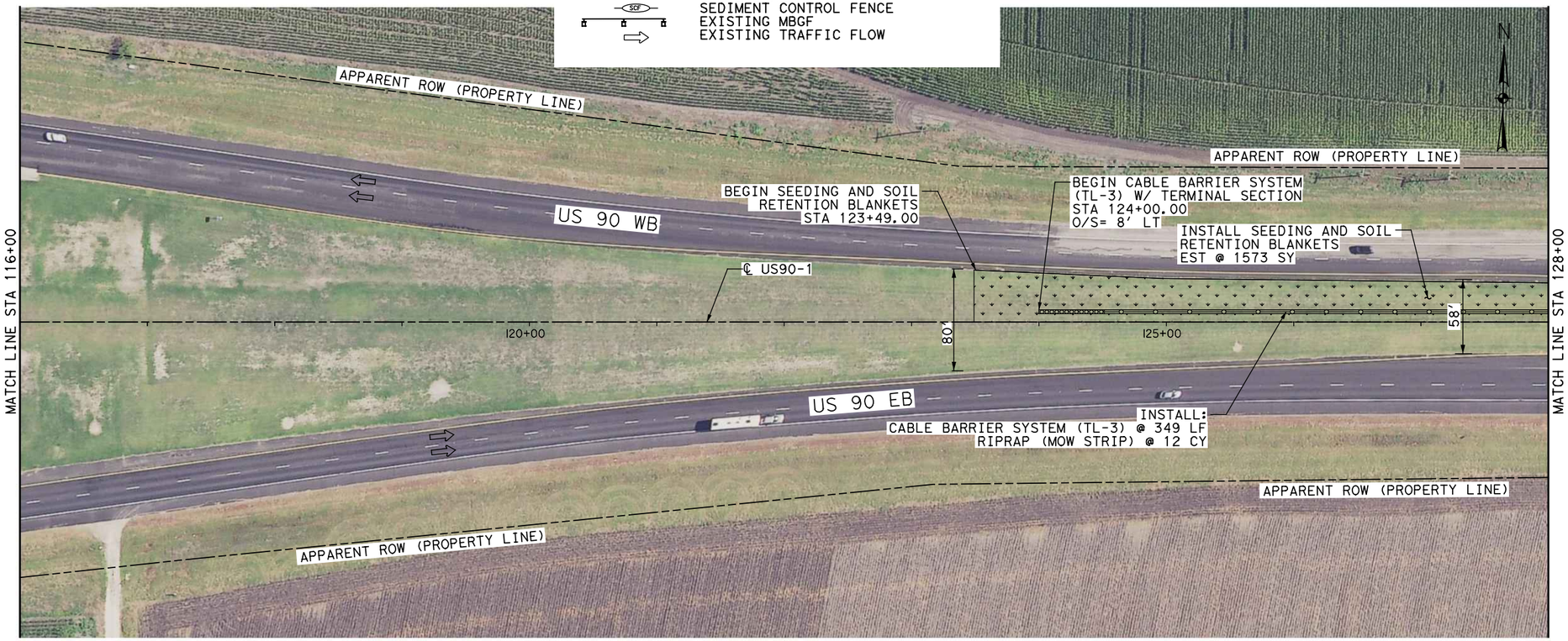
US 90 SEGMENT 1
CABLE BARRIER PLAN
STA 80+00 TO STA 104+00

SCALE:1"=100' SHEET 4 OF 17

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		33
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.



LEGEND:
- CABLE BARRIER SYSTEM
- RIPRAP (MOW STRIP) (4 IN)
- CABLE BARRIER TERMINAL SECTION
- CENTERLINE
- SEDIMENT CONTROL FENCE
- EXISTING MBGF
- EXISTING TRAFFIC FLOW



	ESTIMATED QUANTITIES		
ITEM NO.	DESCRIPTION	UNIT	QTY
132 6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	CY	533
164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	1573
164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	1573
168 6001	VEGETATIVE WATERING	MG	25
169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	1573
432 6066	RIPRAP (MOW STRIP)(3 IN)	CY	12
543 6001	CABLE BARRIER SYSTEM (TL-3)	LF	349
543 6019	CABLE BARRIER TERMINAL SECTION (TL-3)	EA	1

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR CENTERLINE GEOMETRY OF US 90.
2. CABLE BARRIERS ARE DESIGNED TO BE PLACED ON 6:1 OR FLATTER SIDE SLOPES. TOPOGRAPHICAL SURVEYING WAS NOT PERFORMED ON THIS PROJECT. BASELINE COINCIDES WITH THE FLOW LINE OF DITCH. CABLE BARRIER LOCATIONS MAY BE ADJUSTED AS NEEDED TO FIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.
3. CABLE BARRIERS SHALL BE PLACED WITH AT LEAST 12-FEET OFFSET FROM THE EDGE OF THE ROADWAY PAVEMENT. CABLE BARRIERS SHALL BE PLACED AT LEAST 8-FEET FROM THE BOTTOM OF THE DITCH LINE. OFFSET OF AT LEAST 5-FEET FROM THE EDGE OF ILLUMINATION POLE IS RECOMMENDED.
4. CONTRACTOR SHALL INSTALL TEMPORARY SEDIMENT CONTROL FENCE AS NEEDED.
5. ALL UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR MUST VERIFY ALL EXISTING OVERHEAD AND UNDERGROUND UTILITIES FOR ELEVATION AND CLEARANCES.
6. CONTRACTOR SHALL WINDROW TOWARDS CENTERLINE AND SHALL NOT WINDROW ALONG EDGE OF PAVEMENT.
7. SEEDING AND BLANKETS TO BE INSTALLED AS NEEDED TO REESTABLISH VEGETATION IN DISTURBED AREAS.

0 25 50 75 100 150
SCALE IN FEET
SCALE: HOR: 1" = 100'

STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

6/27/2022

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NO.	REVISION	BY	DATE

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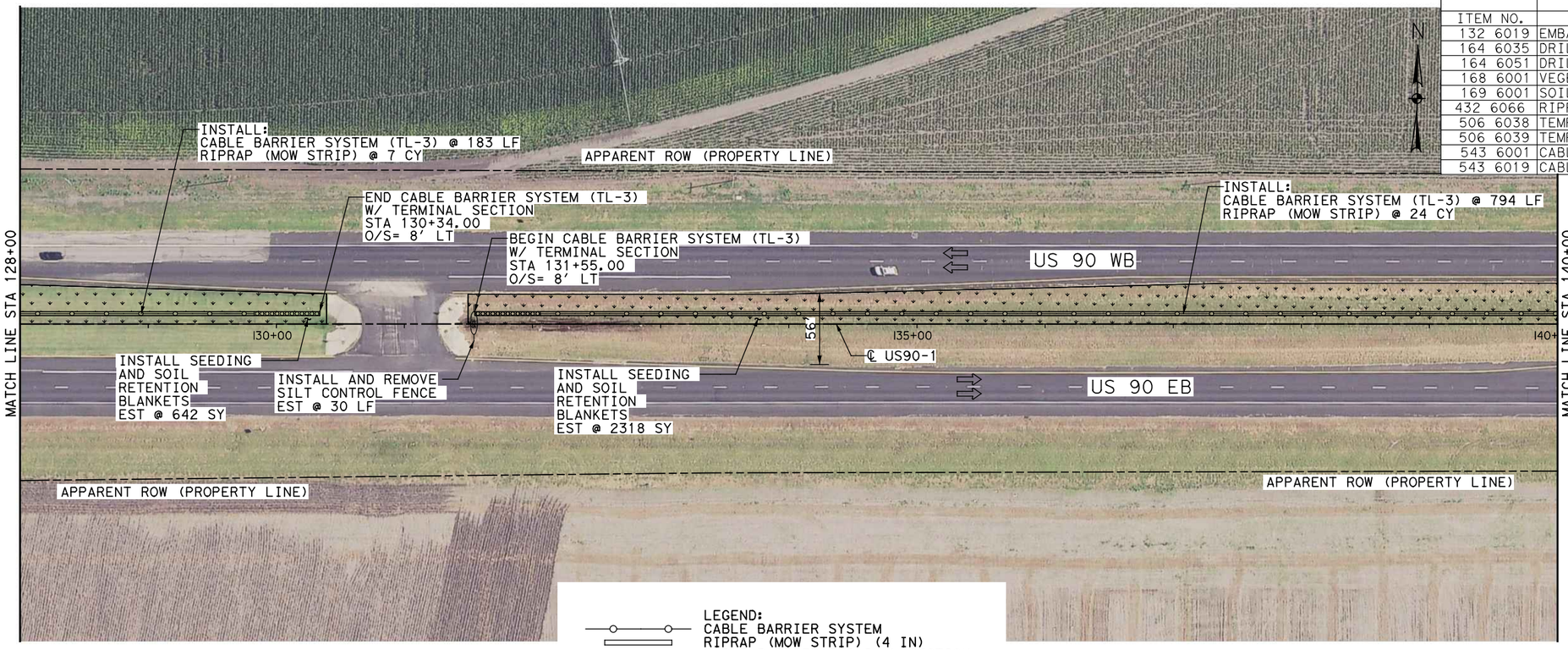
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

US 90 SEGMENT 1
CABLE BARRIER PLAN
STA 104+00 TO STA 128+00

SCALE:1"=100' SHEET 5 OF 17

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		34
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.



	ESTIMATED QUANTITIES		
ITEM NO.	DESCRIPTION	UNIT	QTY
132 6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	CY	1720
164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	6204
164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	6204
168 6001	VEGETATIVE WATERING	MG	100
169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	6204
432 6066	RIPRAP (MOW STRIP)(3 IN)	CY	62
506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	60
506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	60
543 6001	CABLE BARRIER SYSTEM (TL-3)	LF	1961
543 6019	CABLE BARRIER TERMINAL SECTION (TL-3)	EA	4

NOTES:

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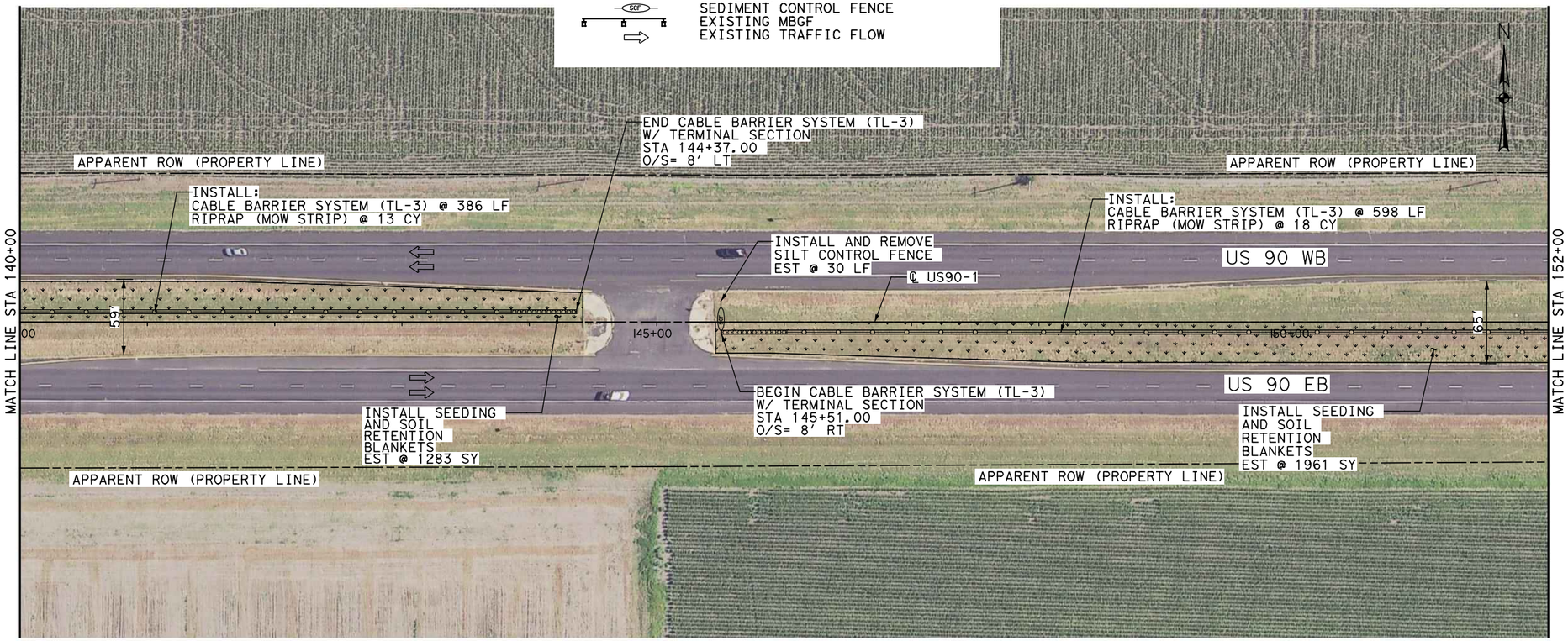
7. SEEDING AND BLANKETS TO BE INSTALLED AS NEEDED TO REESTABLISH VEGETATION IN DISTURBED AREAS.

LEGEND:
CABLE BARRIER SYSTEM
RIPRAP (MOW STRIP) (4 IN)
CABLE BARRIER TERMINAL SECTION
CENTERLINE
SEDIMENT CONTROL FENCE
EXISTING MBGF
EXISTING TRAFFIC FLOW



0 25 50 75 100 150

SCALE IN FEET
SCALE: HOR: 1" = 100'

STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED
PROFESSIONAL ENGINEER

6/27/2022

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NO.	REVISION	BY	DATE

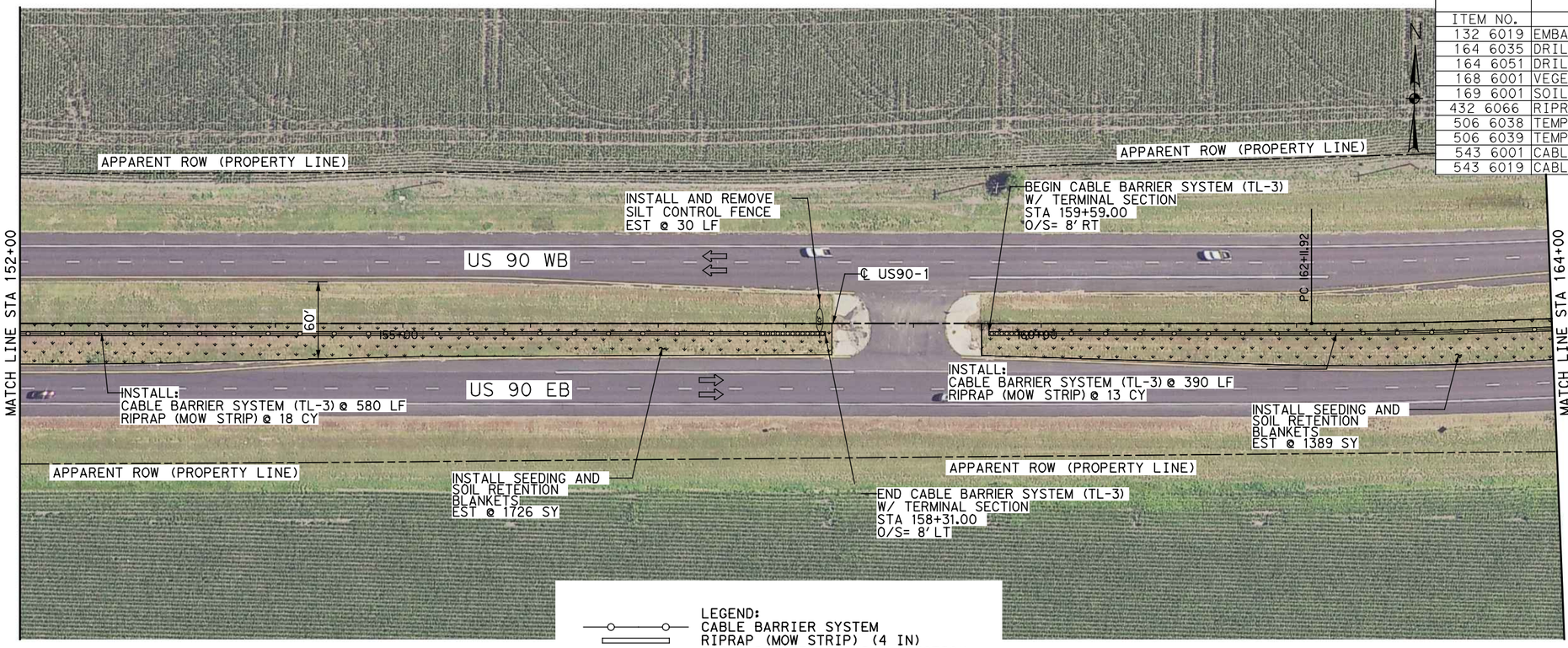
HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

US 90 SEGMENT 1
CABLE BARRIER PLAN
STA 128+00 TO STA 152+00

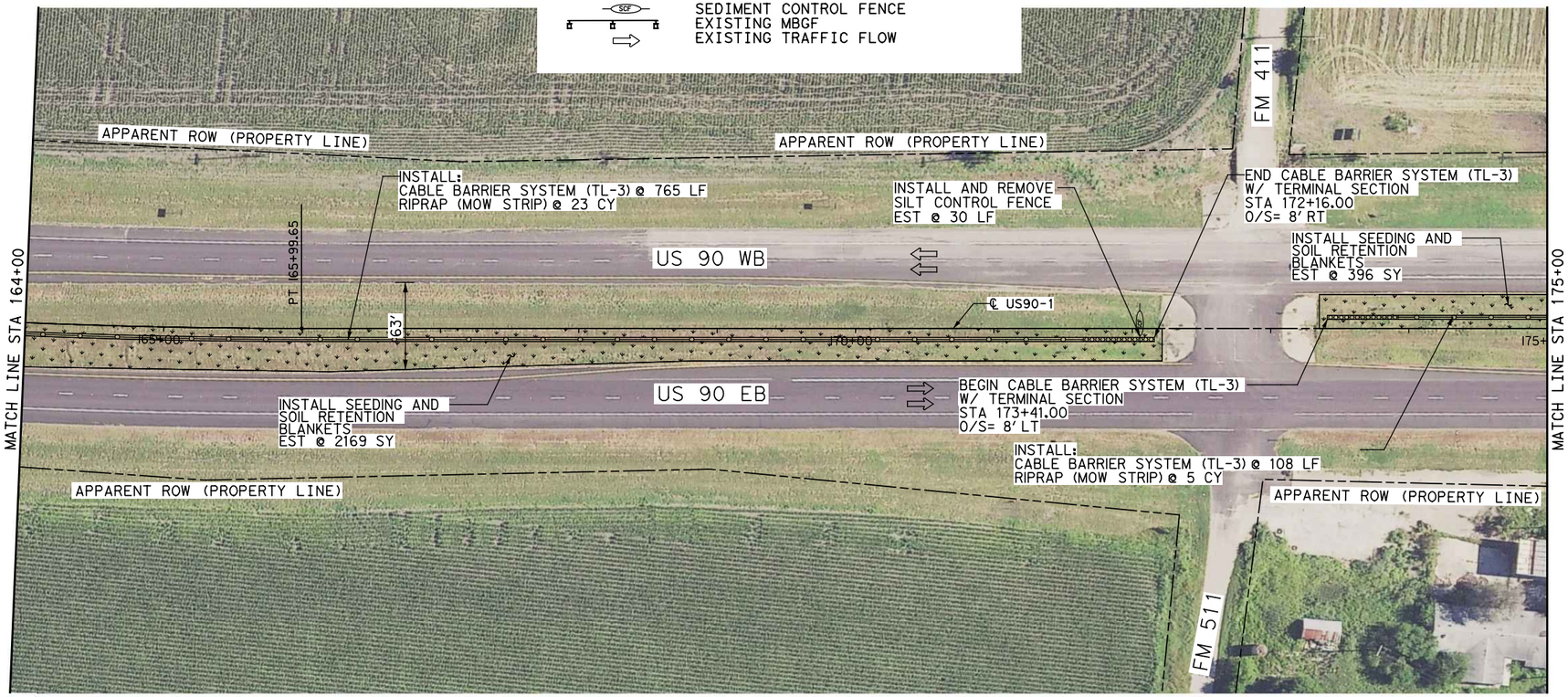
SCALE:1"=100' SHEET 6 OF 17

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		35
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.

	ESTIMATED QUANTITIES		
ITEM NO.	DESCRIPTION	UNIT	QTY
132 6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	CY	4099
164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	5680
164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	5680
168 6001	VEGETATIVE WATERING	MG	91
169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	5680
432 6066	RIPRAP (MOW STRIP)(3 IN)	CY	59
506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	60
506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	60
543 6001	CABLE BARRIER SYSTEM (TL-3)	LF	1843
543 6019	CABLE BARRIER TERMINAL SECTION (TL-3)	EA	4



LEGEND:
- CABLE BARRIER SYSTEM
- RIPRAP (MOW STRIP) (4 IN)
- CABLE BARRIER TERMINAL SECTION
- CENTERLINE
- SEDIMENT CONTROL FENCE
- EXISTING MBGF
- EXISTING TRAFFIC FLOW



NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR CENTERLINE GEOMETRY OF US 90.
2. CABLE BARRIERS ARE DESIGNED TO BE PLACED ON 6:1 OR FLATTER SIDE SLOPES. TOPOGRAPHICAL SURVEYING WAS NOT PERFORMED ON THIS PROJECT. BASELINE COINCIDES WITH THE FLOW LINE OF DITCH. CABLE BARRIER LOCATIONS MAY BE ADJUSTED AS NEEDED TO FIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.
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7. SEEDING AND BLANKETS TO BE INSTALLED AS NEEDED TO REESTABLISH VEGETATION IN DISTURBED AREAS.

0 25 50 75 100 150
SCALE IN FEET
SCALE: HOR: 1" = 100'

STATE OF TEXAS
JOHNNY L. CLAYTON
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LICENSED PROFESSIONAL ENGINEER
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100 NE INTERSTATE 410 LOOP
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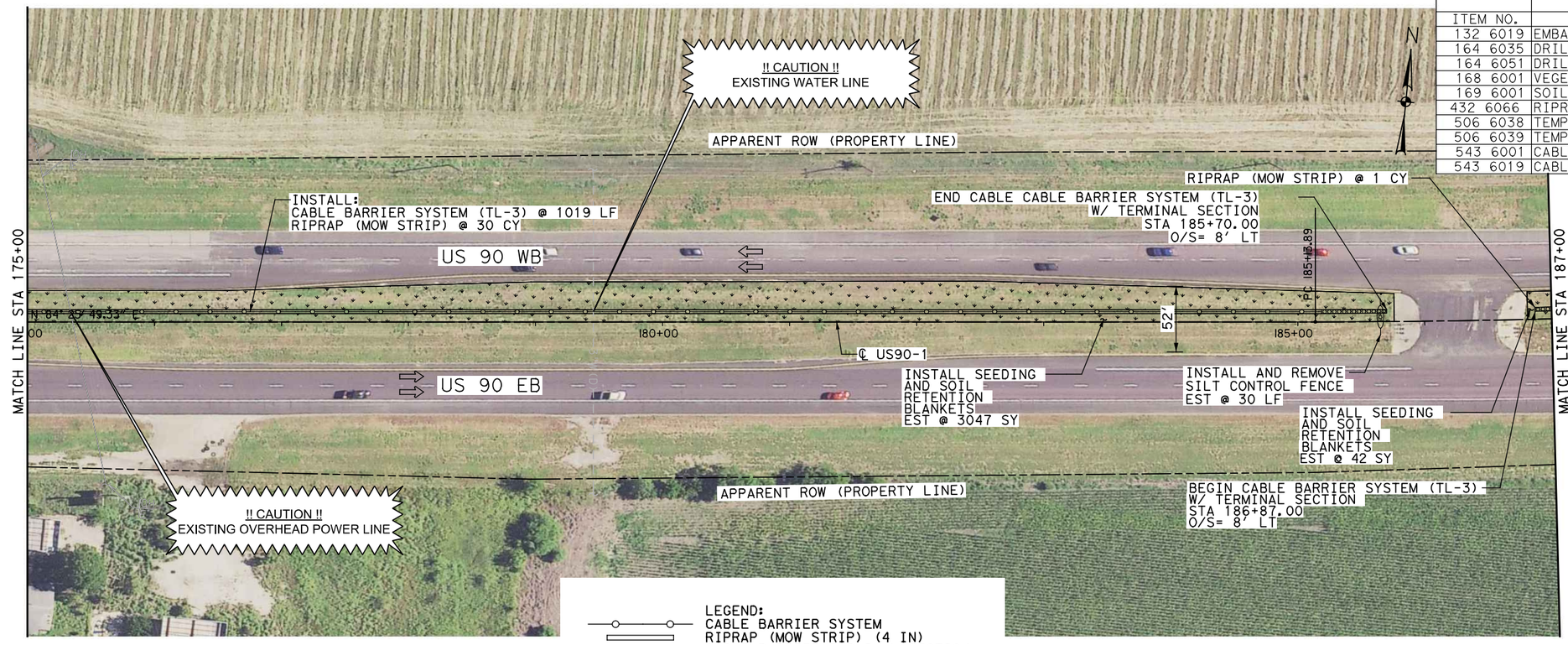
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

US 90 SEGMENT 1
CABLE BARRIER PLAN
STA 152+00 TO STA 175+00

SCALE:1"=100' SHEET 7 OF 17

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		36
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.



	ESTIMATED QUANTITIES		
ITEM NO.	DESCRIPTION	UNIT	QTY
132 6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	CY	1895
164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	6378
164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	6378
168 6001	VEGETATIVE WATERING	MG	103
169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	6378
432 6066	RIPRAP (MOW STRIP)(3 IN)	CY	56
506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	90
506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	90
543 6001	CABLE BARRIER SYSTEM (TL-3)	LF	1740
543 6019	CABLE BARRIER TERMINAL SECTION (TL-3)	EA	4

NOTES:

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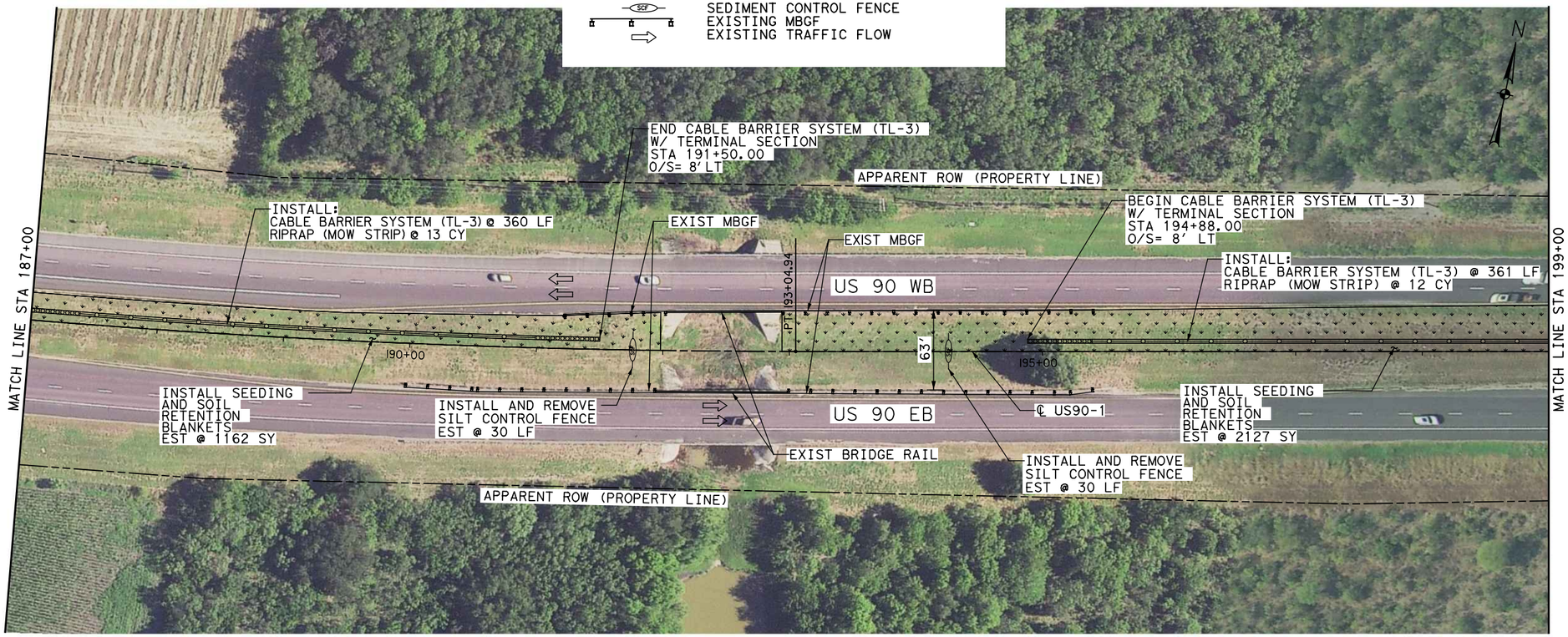
LEGEND:
- CABLE BARRIER SYSTEM
- RIPRAP (MOW STRIP) (4 IN)
- CABLE BARRIER TERMINAL SECTION
- CENTERLINE
- SEDIMENT CONTROL FENCE
- EXISTING MBGF
- EXISTING TRAFFIC FLOW



0 25 50 75 100 150

SCALE IN FEET
SCALE: HOR: 1" = 100'

STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

6/27/2022

THE SEAL ORIGINALLY APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY JOHNNY L. CLAYTON, P.E. #107215 ON 6/27/2022 . ALTERATION OF A PREVIOUSLY SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT. THE RECORD COPY OF THIS DRAWING IS ON FILE AT THE OFFICES OF HALFF ASSOCIATES, INC. 100 NE INTERSTATE 410 LOOP, SUITE 200, SAN ANTONIO, TEXAS 78216, TBPE FIRM #F-312

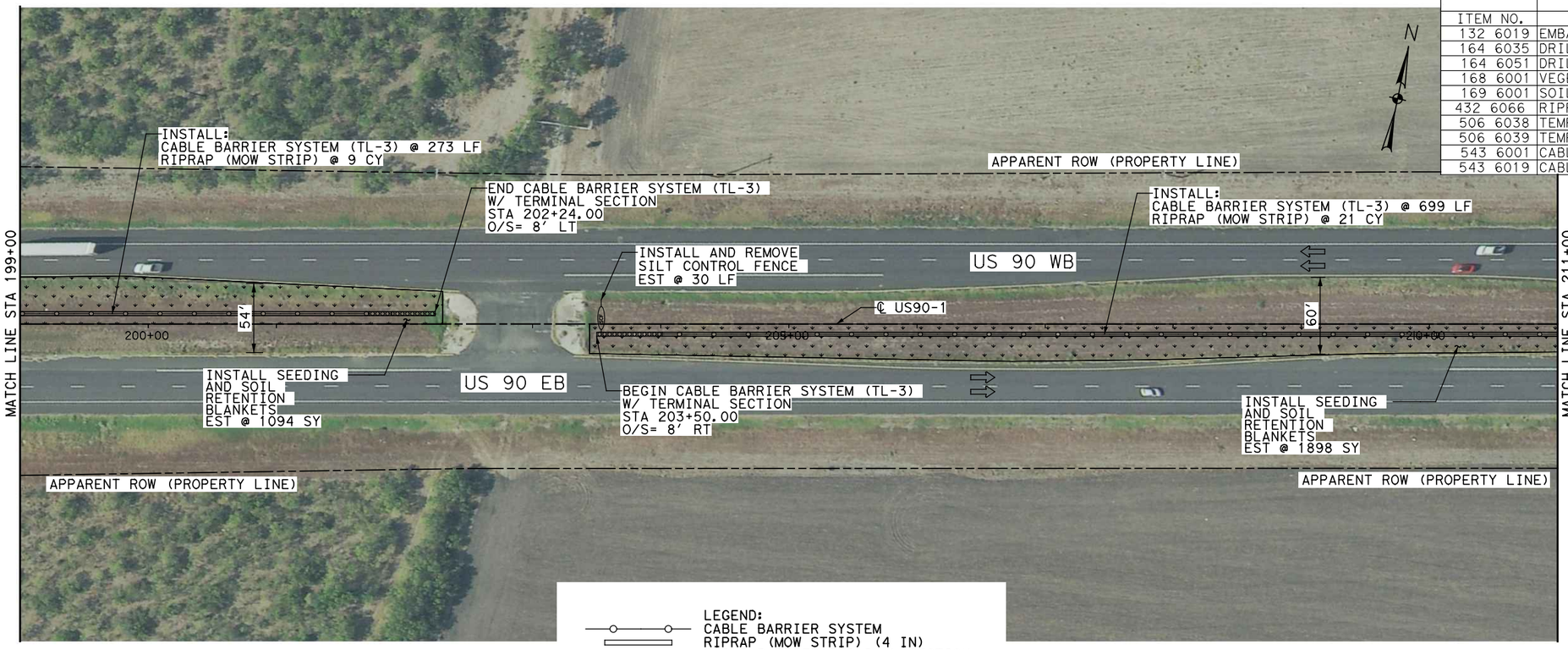
NO.	REVISION	BY	DATE

HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

US 90 SEGMENT 1
CABLE BARRIER PLAN
STA 175+00 TO STA 199+00

SCALE:1"=100' SHEET 8 OF 17

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		37
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.

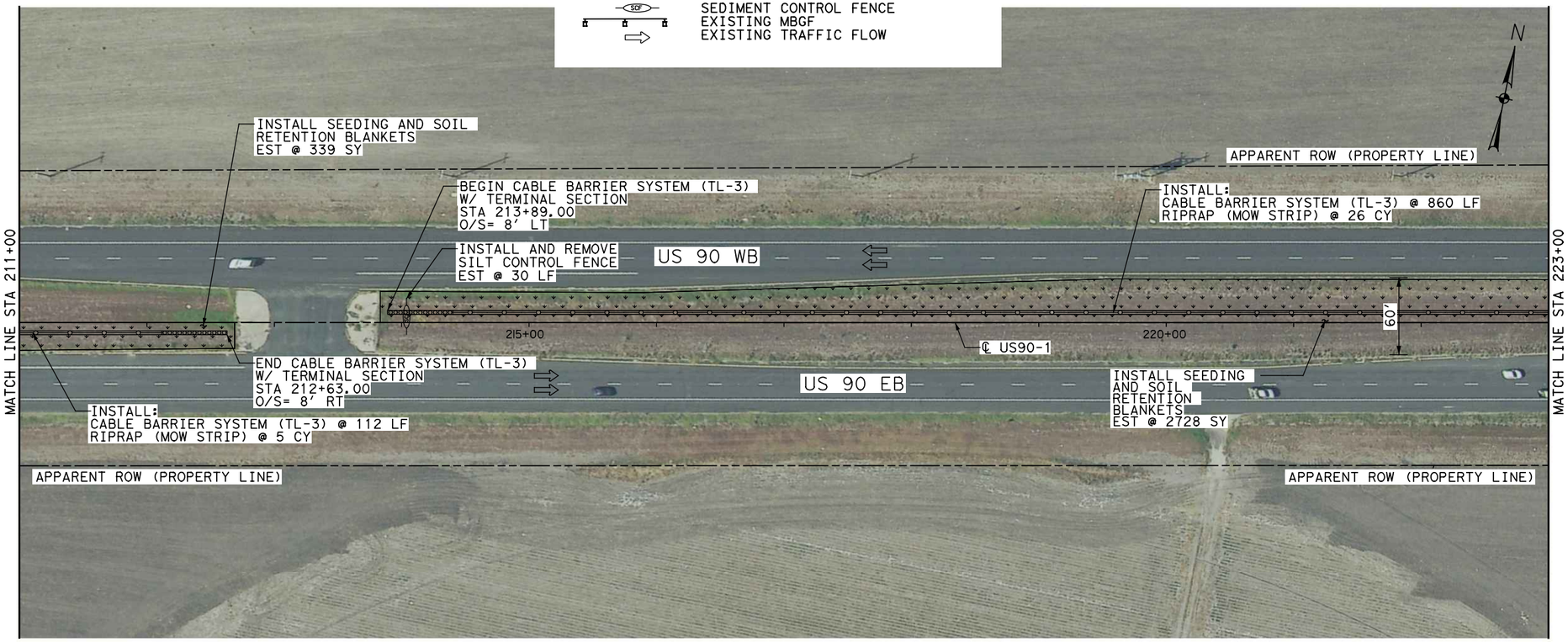


	ESTIMATED QUANTITIES		
ITEM NO.	DESCRIPTION	UNIT	QTY
132 6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	CY	1815
164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	6059
164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	6059
168 6001	VEGETATIVE WATERING	MG	97
169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	6059
432 6066	RIPRAP (MOW STRIP)(3 IN)	CY	61
506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	60
506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	60
543 6001	CABLE BARRIER SYSTEM (TL-3)	LF	1944
543 6019	CABLE BARRIER TERMINAL SECTION (TL-3)	EA	4

LEGEND:
- CABLE BARRIER SYSTEM
- RIPRAP (MOW STRIP) (4 IN)
- CABLE BARRIER TERMINAL SECTION
- CENTERLINE
- SEDIMENT CONTROL FENCE
- EXISTING MBGF
- EXISTING TRAFFIC FLOW

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR CENTERLINE GEOMETRY OF US 90.
2. CABLE BARRIERS ARE DESIGNED TO BE PLACED ON 6:1 OR FLATTER SIDE SLOPES. TOPOGRAPHICAL SURVEYING WAS NOT PERFORMED ON THIS PROJECT. BASELINE COINCIDES WITH THE FLOW LINE OF DITCH. CABLE BARRIER LOCATIONS MAY BE ADJUSTED AS NEEDED TO FIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.
3. CABLE BARRIERS SHALL BE PLACED WITH AT LEAST 12-FEET OFFSET FROM THE EDGE OF THE ROADWAY PAVEMENT. CABLE BARRIERS SHALL BE PLACED AT LEAST 8-FEET FROM THE BOTTOM OF THE DITCH LINE. OFFSET OF AT LEAST 5-FEET FROM THE EDGE OF ILLUMINATION POLE IS RECOMMENDED.
4. CONTRACTOR SHALL INSTALL TEMPORARY SEDIMENT CONTROL FENCE AS NEEDED.
5. ALL UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR MUST VERIFY ALL EXISTING OVERHEAD AND UNDERGROUND UTILITIES FOR ELEVATION AND CLEARANCES.
6. CONTRACTOR SHALL WINDROW TOWARDS CENTERLINE AND SHALL NOT WINDROW ALONG EDGE OF PAVEMENT.
7. SEEDING AND BLANKETS TO BE INSTALLED AS NEEDED TO REESTABLISH VEGETATION IN DISTURBED AREAS.



0 25 50 75 100 150

SCALE IN FEET
SCALE: HOR: 1" = 100'

STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED
PROFESSIONAL ENGINEER

6/27/2022

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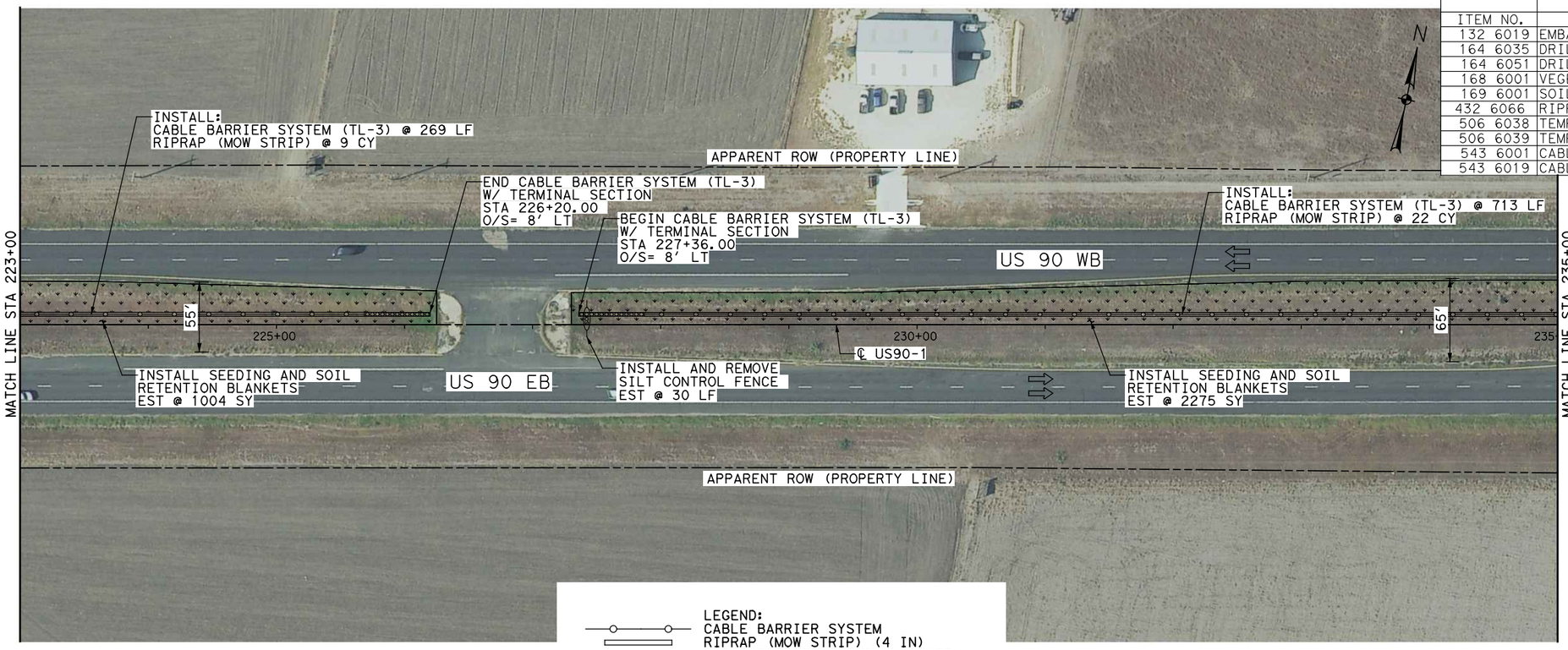
NO.	REVISION	BY	DATE

HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

US 90 SEGMENT 1
CABLE BARRIER PLAN
STA 199+00 TO STA 223+00

SCALE:1"=100' SHEET 9 OF 17

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		38
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.



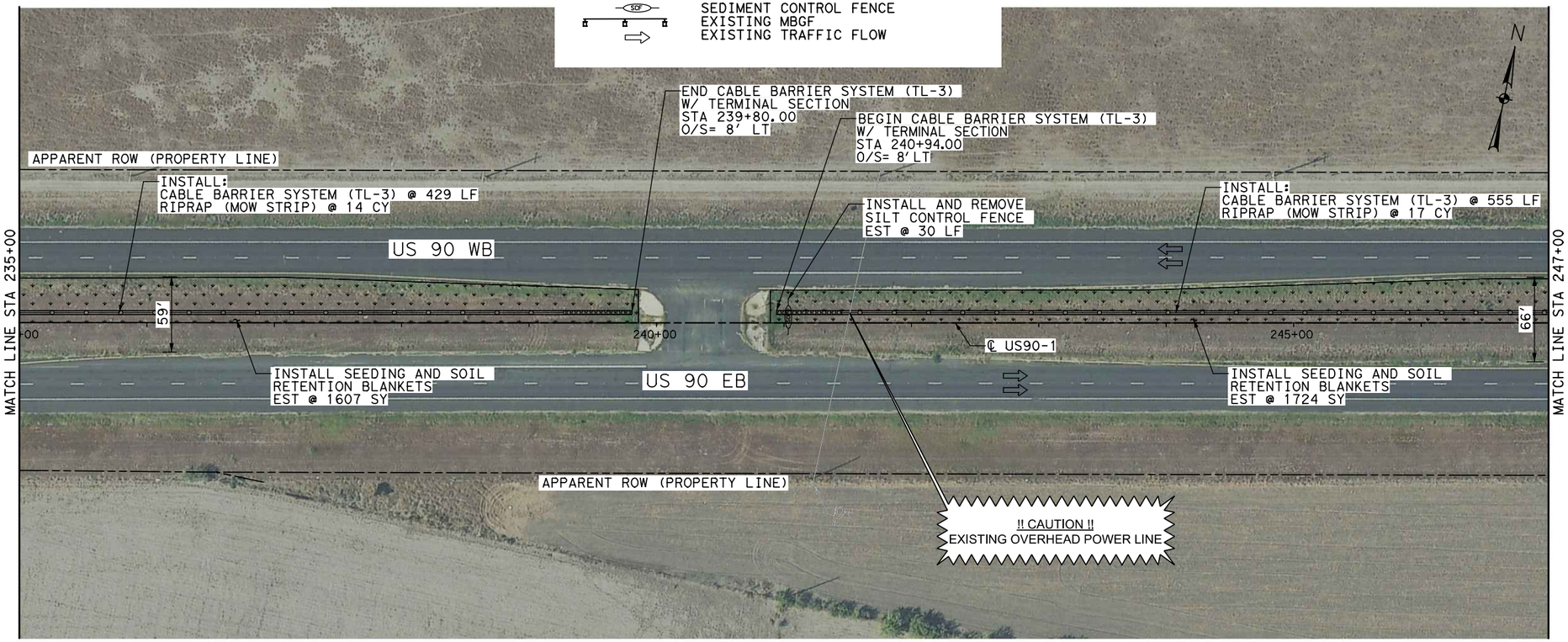
	ESTIMATED QUANTITIES		
ITEM NO.	DESCRIPTION	UNIT	QTY
132 6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	CY	1406
164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	6610
164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	6610
168 6001	VEGETATIVE WATERING	MG	106
169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	6610
432 6066	RIPRAP (MOW STRIP)(3 IN)	CY	62
506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	60
506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	60
543 6001	CABLE BARRIER SYSTEM (TL-3)	LF	1966
543 6019	CABLE BARRIER TERMINAL SECTION (TL-3)	EA	4

LEGEND:
- CABLE BARRIER SYSTEM
- RIPRAP (MOW STRIP) (4 IN)
- CABLE BARRIER TERMINAL SECTION
- CENTERLINE
- SEDIMENT CONTROL FENCE
- EXISTING MBGF
- EXISTING TRAFFIC FLOW

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR CENTERLINE GEOMETRY OF US 90.
2. CABLE BARRIERS ARE DESIGNED TO BE PLACED ON 6:1 OR FLATTER SIDE SLOPES. TOPOGRAPHICAL SURVEYING WAS NOT PERFORMED ON THIS PROJECT. BASELINE COINCIDES WITH THE FLOW LINE OF DITCH. CABLE BARRIER LOCATIONS MAY BE ADJUSTED AS NEEDED TO FIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.
3. CABLE BARRIERS SHALL BE PLACED WITH AT LEAST 12-FEET OFFSET FROM THE EDGE OF THE ROADWAY PAVEMENT. CABLE BARRIERS SHALL BE PLACED AT LEAST 8-FEET FROM THE BOTTOM OF THE DITCH LINE. OFFSET OF AT LEAST 5-FEET FROM THE EDGE OF ILLUMINATION POLE IS RECOMMENDED.
4. CONTRACTOR SHALL INSTALL TEMPORARY SEDIMENT CONTROL FENCE AS NEEDED.
5. ALL UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR MUST VERIFY ALL EXISTING OVERHEAD AND UNDERGROUND UTILITIES FOR ELEVATION AND CLEARANCES.
6. CONTRACTOR SHALL WINDROW TOWARDS CENTERLINE AND SHALL NOT WINDROW ALONG EDGE OF PAVEMENT.
7. SEEDING AND BLANKETS TO BE INSTALLED AS NEEDED TO REESTABLISH VEGETATION IN DISTURBED AREAS.

0 25 50 75 100 150
SCALE IN FEET
SCALE: HOR: 1" = 100'



STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

6/27/2022

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NO.	REVISION	BY	DATE

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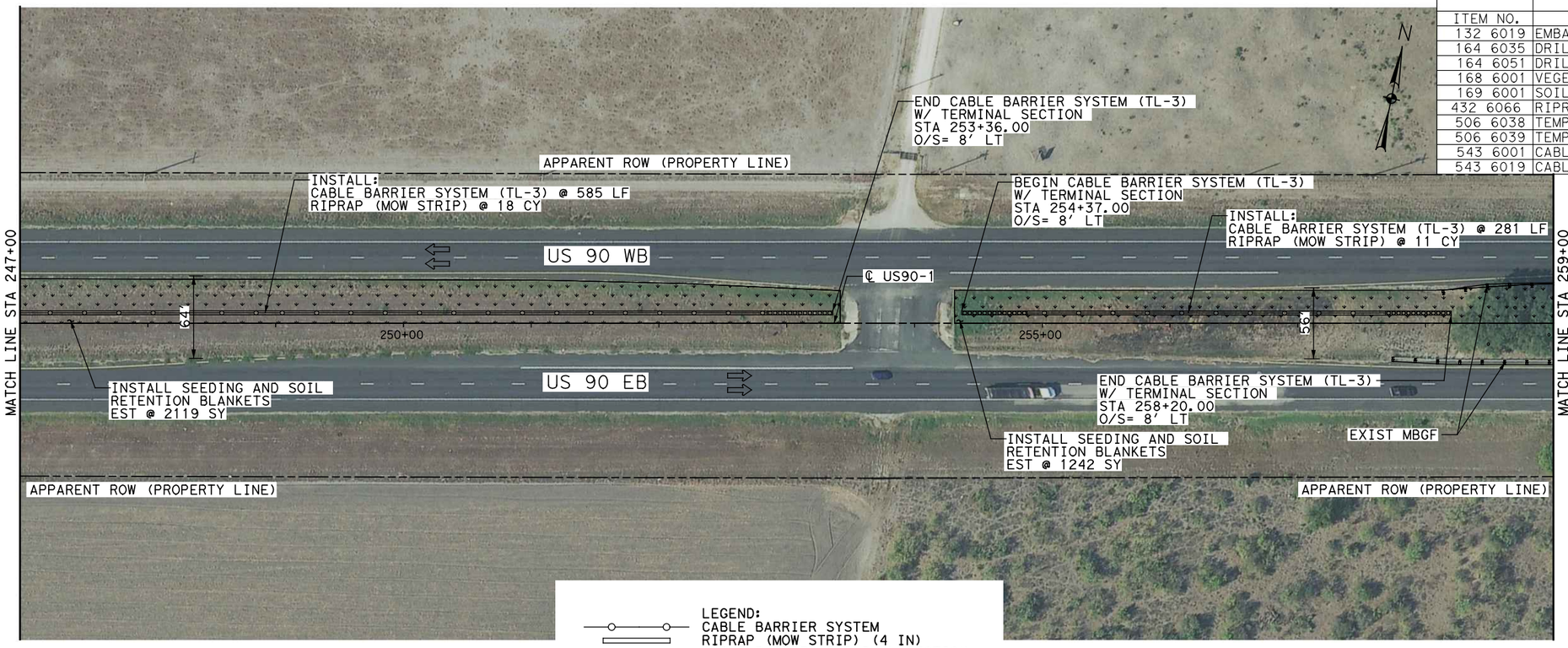
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

US 90 SEGMENT 1
CABLE BARRIER PLAN
STA 223+00 TO STA 247+00

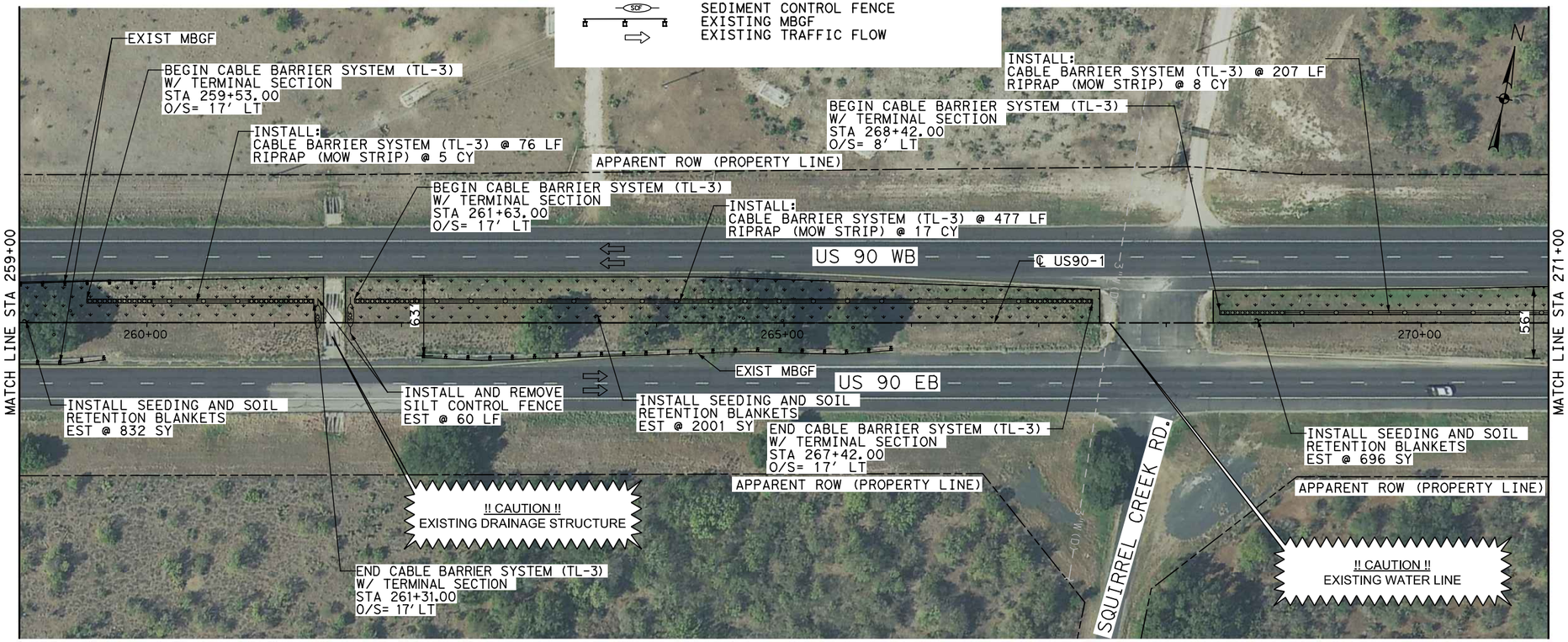
SCALE: 1"=100' SHEET 10 OF 17

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		39
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.

	ESTIMATED QUANTITIES		
ITEM NO.	DESCRIPTION	UNIT	QTY
132 6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	CY	1349
164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	6890
164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	6890
168 6001	VEGETATIVE WATERING	MG	111
169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	6890
432 6066	RIPRAP (MOW STRIP)(3 IN)	CY	59
506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	60
506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	60
543 6001	CABLE BARRIER SYSTEM (TL-3)	LF	1626
543 6019	CABLE BARRIER TERMINAL SECTION (TL-3)	EA	8



LEGEND:
- CABLE BARRIER SYSTEM
- RIPRAP (MOW STRIP) (4 IN)
- CABLE BARRIER TERMINAL SECTION
- CENTERLINE
- SEDIMENT CONTROL FENCE
- EXISTING MBGF
- EXISTING TRAFFIC FLOW



NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR CENTERLINE GEOMETRY OF US 90.
2. CABLE BARRIERS ARE DESIGNED TO BE PLACED ON 6:1 OR FLATTER SIDE SLOPES. TOPOGRAPHICAL SURVEYING WAS NOT PERFORMED ON THIS PROJECT. BASELINE COINCIDES WITH THE FLOW LINE OF DITCH. CABLE BARRIER LOCATIONS MAY BE ADJUSTED AS NEEDED TO FIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.
3. CABLE BARRIERS SHALL BE PLACED WITH AT LEAST 12-FEET OFFSET FROM THE EDGE OF THE ROADWAY PAVEMENT. CABLE BARRIERS SHALL BE PLACED AT LEAST 8-FEET FROM THE BOTTOM OF THE DITCH LINE. OFFSET OF AT LEAST 5-FEET FROM THE EDGE OF ILLUMINATION POLE IS RECOMMENDED.
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6. CONTRACTOR SHALL WINDROW TOWARDS CENTERLINE AND SHALL NOT WINDROW ALONG EDGE OF PAVEMENT.
7. SEEDING AND BLANKETS TO BE INSTALLED AS NEEDED TO REESTABLISH VEGETATION IN DISTURBED AREAS.

0 25 50 75 100 150

SCALE IN FEET
SCALE: HOR: 1" = 100'

STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED
PROFESSIONAL ENGINEER

6/27/2022

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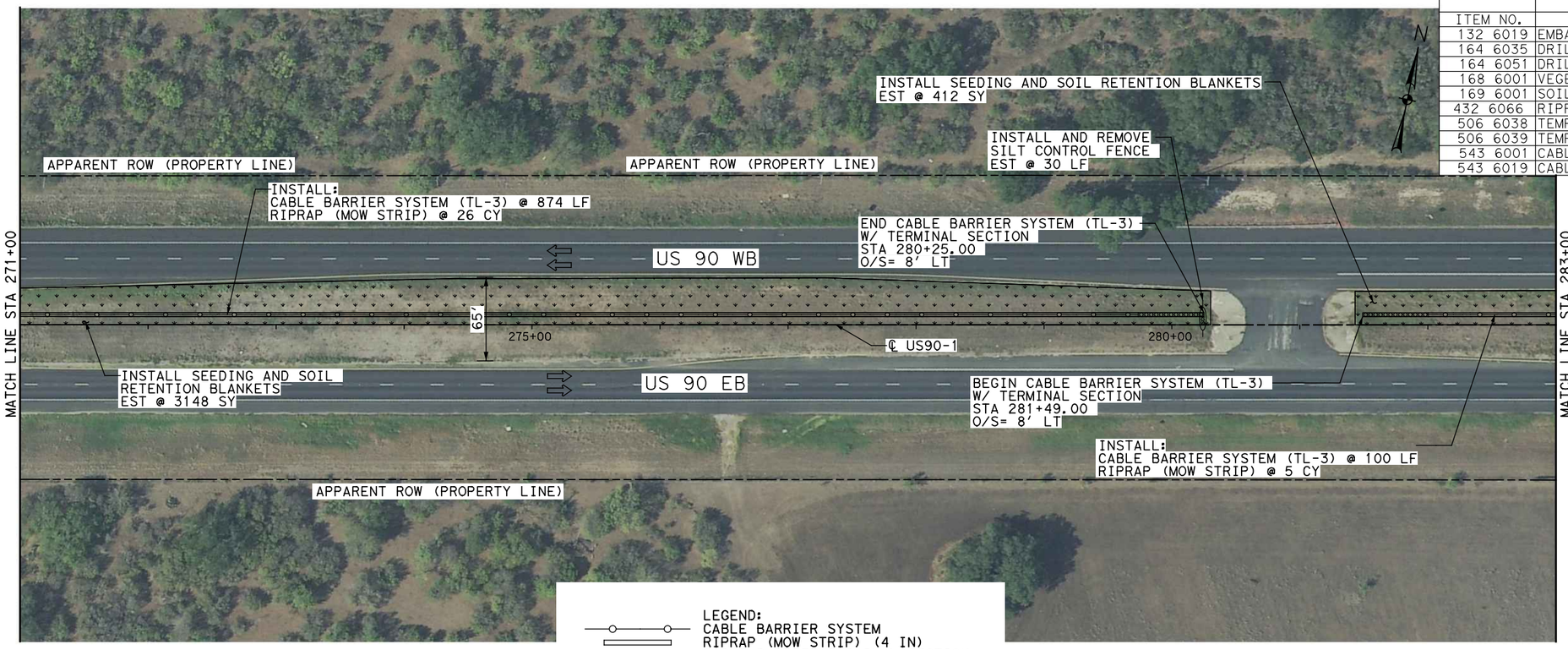
NO.	REVISION	BY	DATE

HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

US 90 SEGMENT 1
CABLE BARRIER PLAN
STA 247+00 TO STA 271+00

SCALE: 1"=100' SHEET 11 OF 17

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		40
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.



	ESTIMATED QUANTITIES		
ITEM NO.	DESCRIPTION	UNIT	QTY
132 6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	CY	1930
164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	7253
164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	7253
168 6001	VEGETATIVE WATERING	MG	117
169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	7253
432 6066	RIPRAP (MOW STRIP)(3 IN)	CY	62
506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	90
506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	90
543 6001	CABLE BARRIER SYSTEM (TL-3)	LF	1873
543 6019	CABLE BARRIER TERMINAL SECTION (TL-3)	EA	6

LEGEND:
- CABLE BARRIER SYSTEM
- RIPRAP (MOW STRIP) (4 IN)
- CABLE BARRIER TERMINAL SECTION
- CENTERLINE
- SEDIMENT CONTROL FENCE
- EXISTING MBGF
- EXISTING TRAFFIC FLOW

NOTES:

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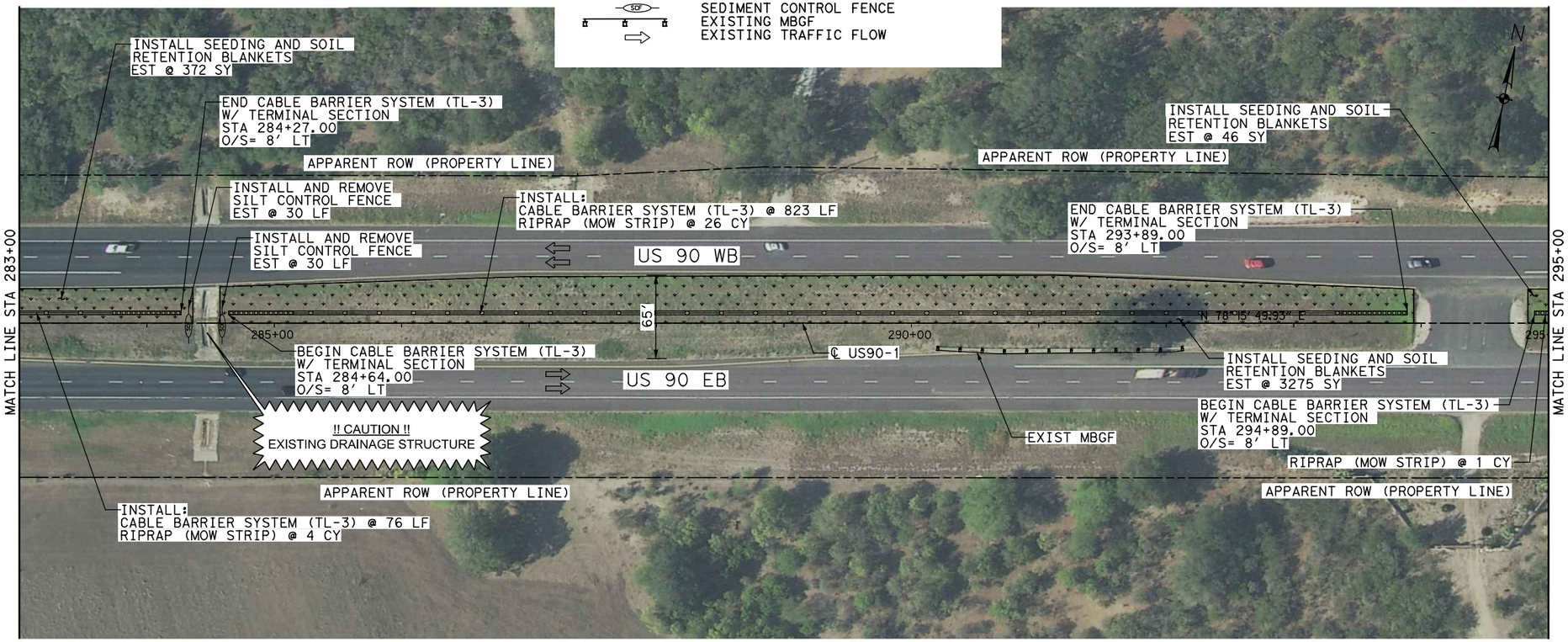
7. SEEDING AND BLANKETS TO BE INSTALLED AS NEEDED TO REESTABLISH VEGETATION IN DISTURBED AREAS.

0 25 50 75 100 150

SCALE IN FEET
SCALE: HOR: 1" = 100'



STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED
PROFESSIONAL ENGINEER

6/27/2022

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NO.	REVISION	BY	DATE

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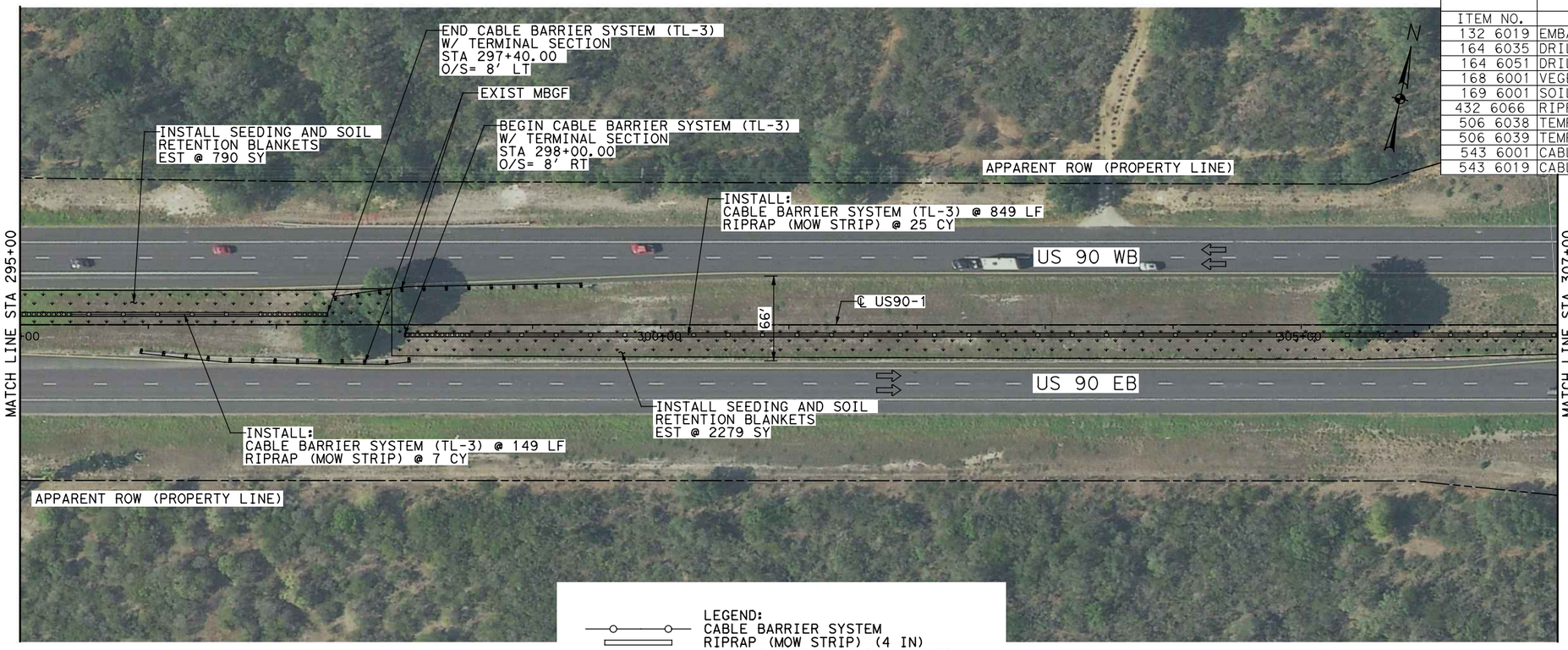
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

US 90 SEGMENT 1
CABLE BARRIER PLAN
STA 271+00 TO STA 295+00

SCALE:1"=100' SHEET 12 OF 17

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		41
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.



	ESTIMATED QUANTITIES		
ITEM NO.	DESCRIPTION	UNIT	QTY
132 6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	CY	1522
164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	5906
164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	5906
168 6001	VEGETATIVE WATERING	MG	95
169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	5906
432 6066	RIPRAP (MOW STRIP)(3 IN)	CY	63
506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	100
506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	100
543 6001	CABLE BARRIER SYSTEM (TL-3)	LF	1828
543 6019	CABLE BARRIER TERMINAL SECTION (TL-3)	EA	6

NOTES:

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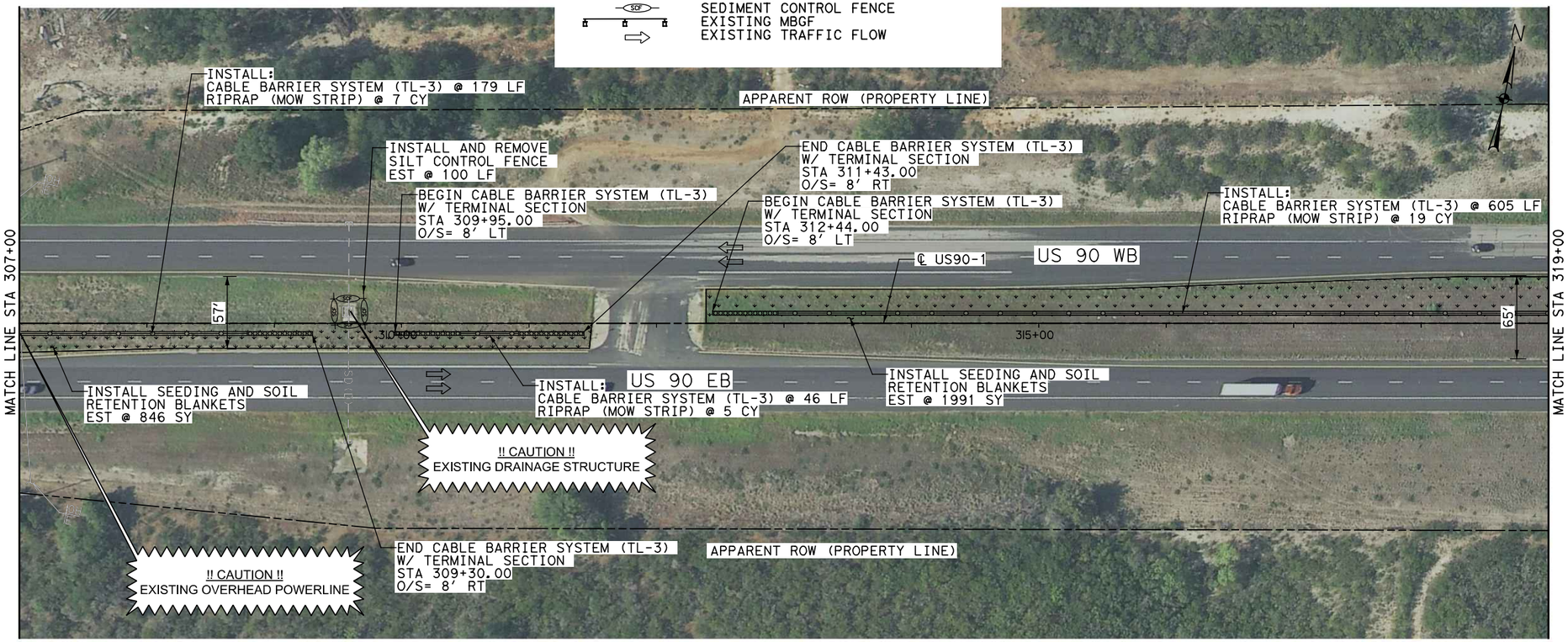
5. ALL UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR MUST VERIFY ALL EXISTING OVERHEAD AND UNDERGROUND UTILITIES FOR ELEVATION AND CLEARANCES.
6. CONTRACTOR SHALL WINDROW TOWARDS CENTERLINE AND SHALL NOT WINDROW ALONG EDGE OF PAVEMENT.
7. SEEDING AND BLANKETS TO BE INSTALLED AS NEEDED TO REESTABLISH VEGETATION IN DISTURBED AREAS.

LEGEND:
- CABLE BARRIER SYSTEM
- RIPRAP (MOW STRIP) (4 IN)
- CABLE BARRIER TERMINAL SECTION
- CENTERLINE
- SEDIMENT CONTROL FENCE
- EXISTING MBGF
- EXISTING TRAFFIC FLOW



0 25 50 75 100 150

SCALE IN FEET
SCALE: HOR: 1" = 100'

STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED
PROFESSIONAL ENGINEER

6/27/2022

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SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

US 90 SEGMENT 1
CABLE BARRIER PLAN
STA 295+00 TO STA 319+00

SCALE: 1"=100' SHEET 13 OF 17

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.	SHEET
6	SEE TITLE SHEET	42

STATE	DISTRICT	COUNTY
TEXAS	SAT	MEDINA, ETC.

CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.

US90_PENTABLE.tbl
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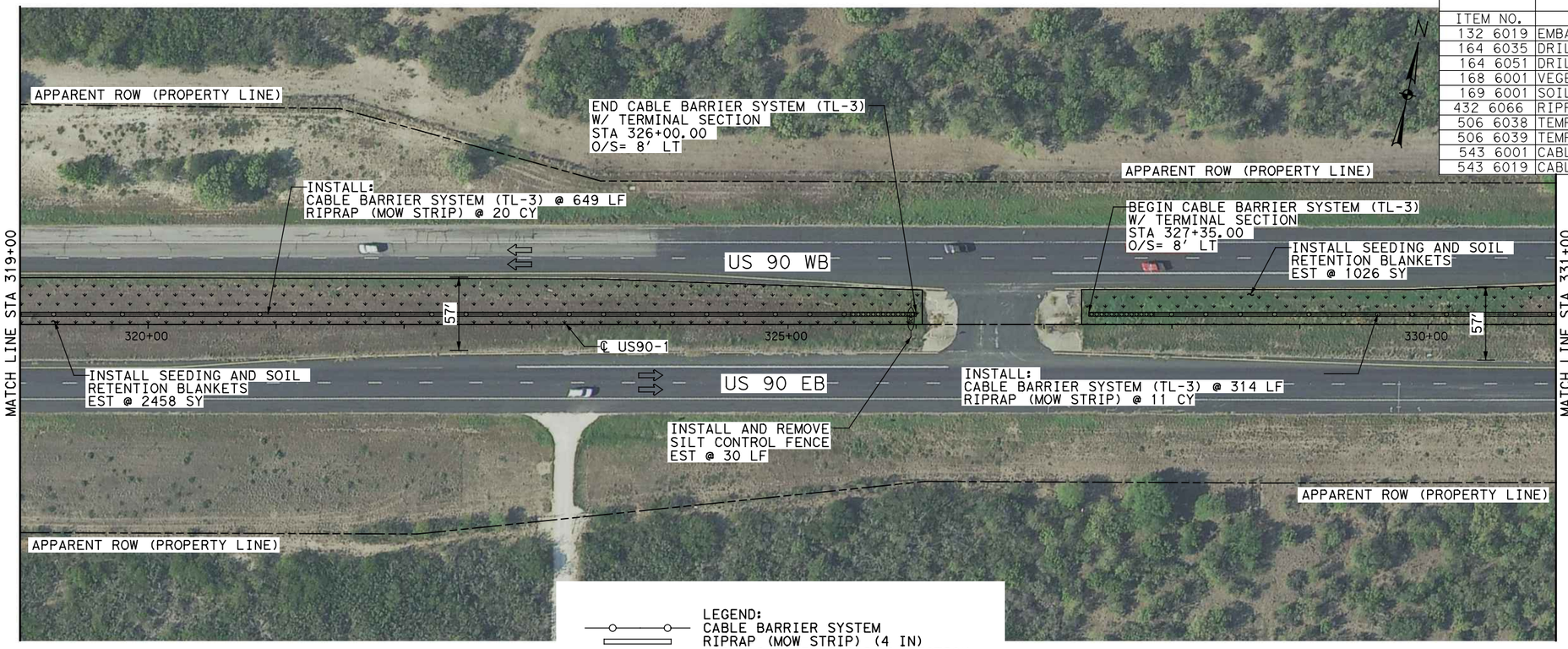

	ESTIMATED QUANTITIES		
ITEM NO.	DESCRIPTION	UNIT	QTY
132 6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	CY	241
164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	7134
164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	7134
168 6001	VEGETATIVE WATERING	MG	115
169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	7134
432 6066	RIPRAP (MOW STRIP)(3 IN)	CY	63
506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	115
506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	115
543 6001	CABLE BARRIER SYSTEM (TL-3)	LF	1824
543 6019	CABLE BARRIER TERMINAL SECTION (TL-3)	EA	6

NOTES:

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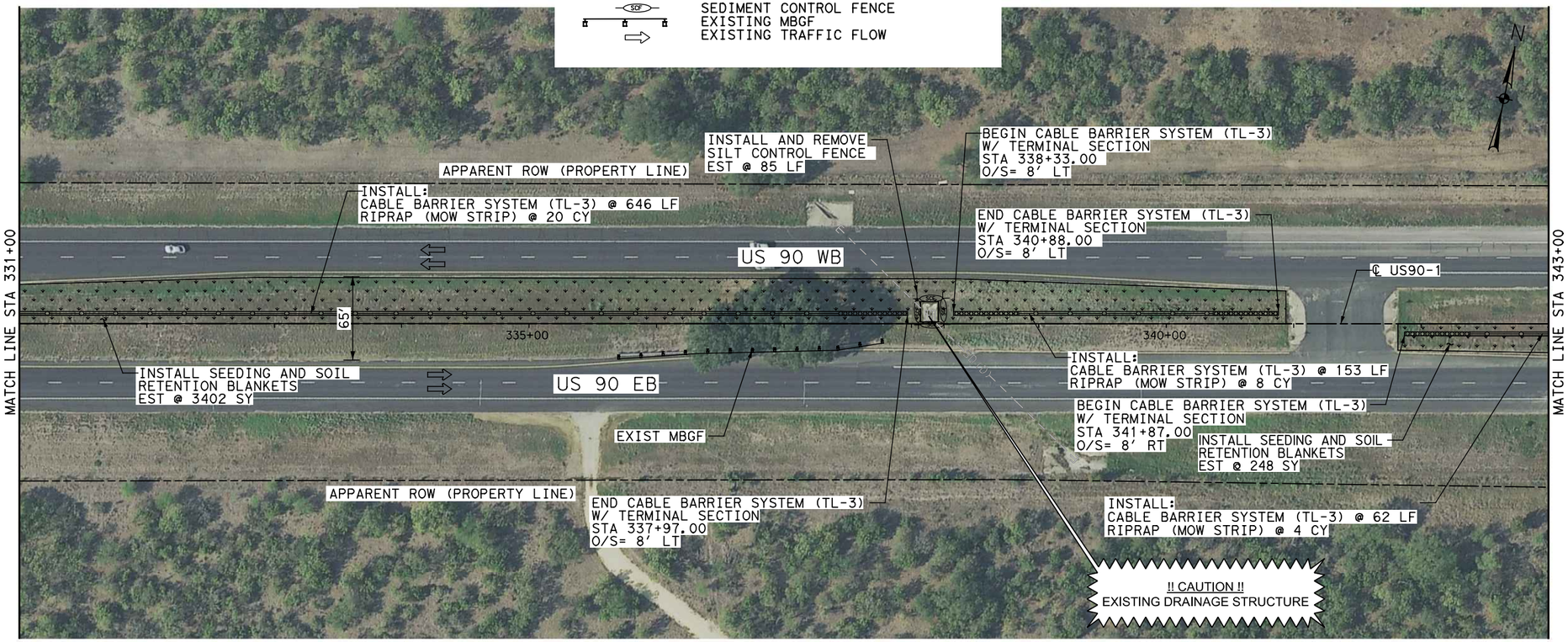
LEGEND:
- CABLE BARRIER SYSTEM
- RIPRAP (MOW STRIP) (4 IN)
- CABLE BARRIER TERMINAL SECTION
- CENTERLINE
- SEDIMENT CONTROL FENCE
- EXISTING MBGF
- EXISTING TRAFFIC FLOW



0 25 50 75 100 150

SCALE IN FEET
SCALE: HOR: 1" = 100'

STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED
PROFESSIONAL ENGINEER

6/27/2022

THE SEAL ORIGINALLY APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY JOHNNY L. CLAYTON, P.E. #107215 ON 6/27/2022 . ALTERATION OF A PREVIOUSLY SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT. THE RECORD COPY OF THIS DRAWING IS ON FILE AT THE OFFICES OF HALFF ASSOCIATES, INC., 100 NE INTERSTATE 410 LOOP, SUITE 200, SAN ANTONIO, TEXAS 78216, TBPE FIRM #F-312

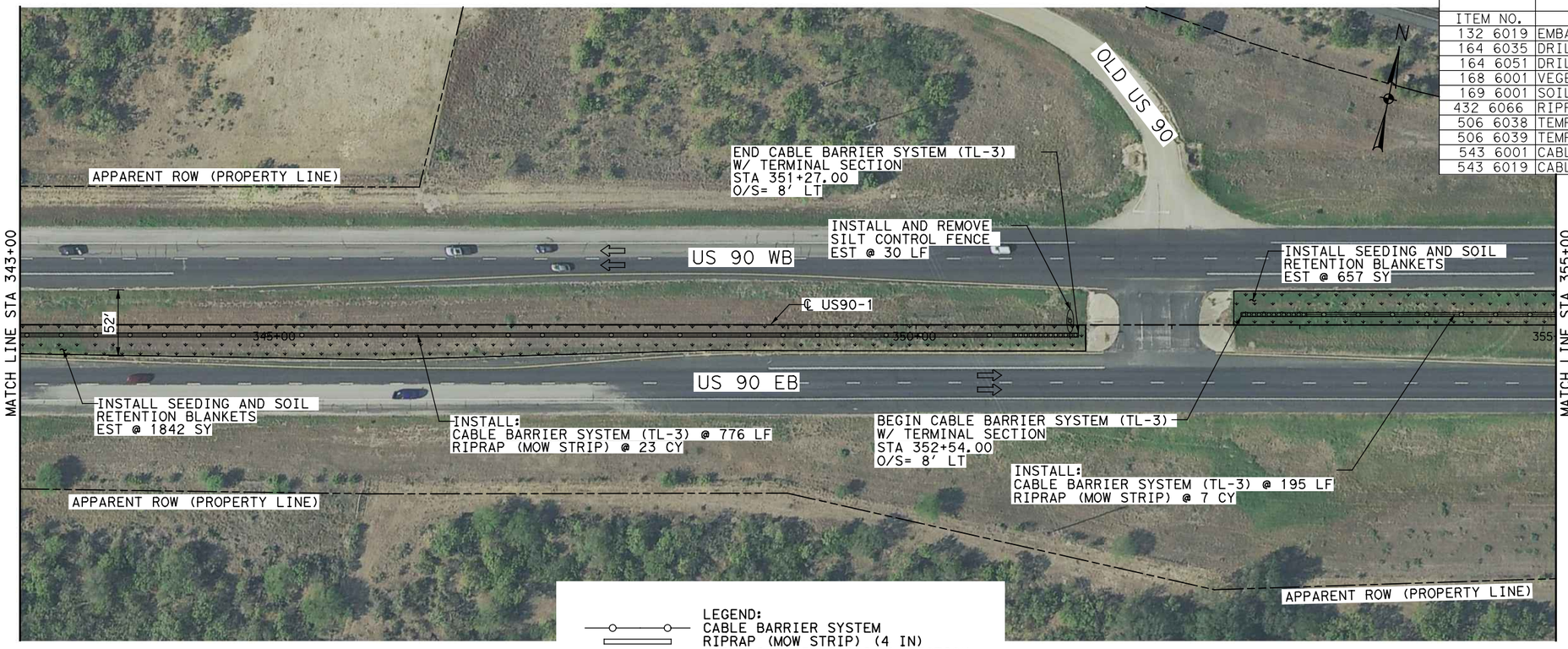
NO.	REVISION	BY	DATE

HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

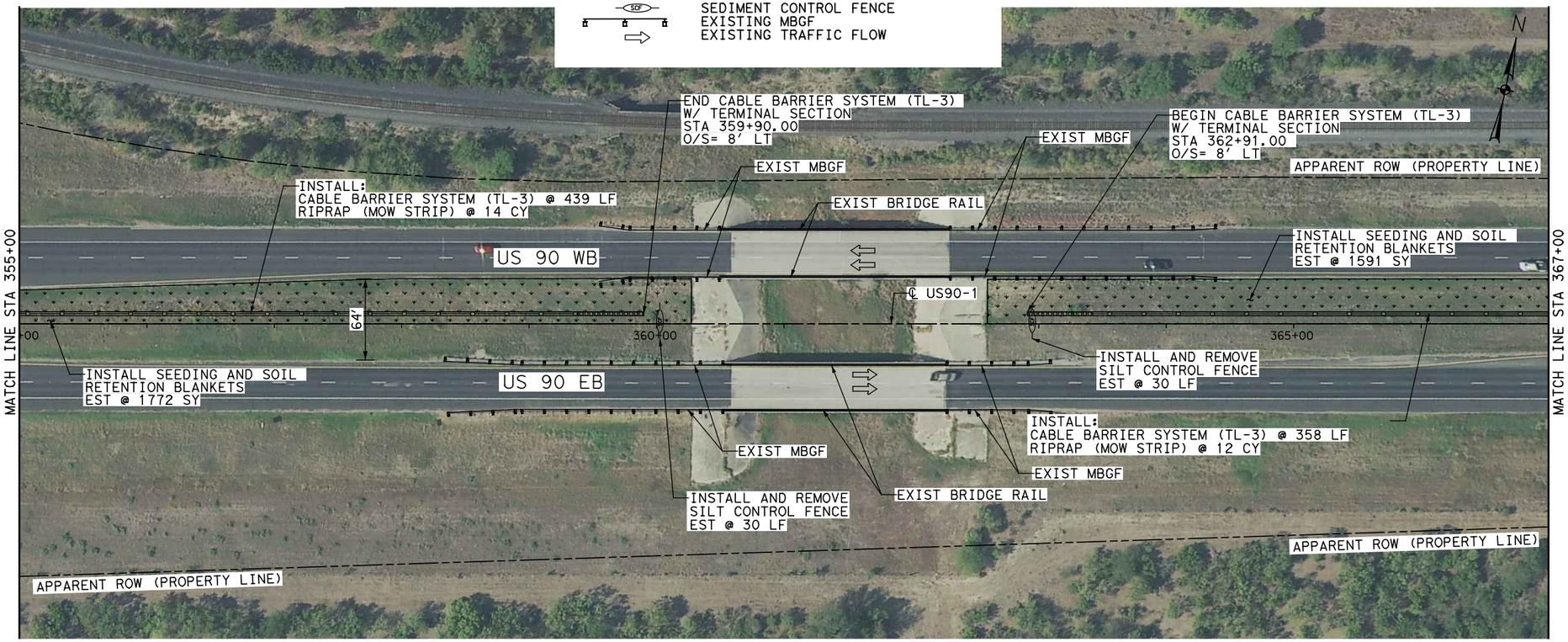
US 90 SEGMENT 1
CABLE BARRIER PLAN
STA 319+00 TO STA 343+00

SCALE:1"=100' SHEET 14 OF 17

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		43
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.



LEGEND:
- CABLE BARRIER SYSTEM
- RIPRAP (MOW STRIP) (4 IN)
- CABLE BARRIER TERMINAL SECTION
- CENTERLINE
- SEDIMENT CONTROL FENCE
- EXISTING MBGF
- EXISTING TRAFFIC FLOW



	ESTIMATED QUANTITIES		
ITEM NO.	DESCRIPTION	UNIT	QTY
132 6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	CY	2211
164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	5862
164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	5862
168 6001	VEGETATIVE WATERING	MG	94
169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	5862
432 6066	RIPRAP (MOW STRIP)(3 IN)	CY	56
506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	90
506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	90
543 6001	CABLE BARRIER SYSTEM (TL-3)	LF	1768
543 6019	CABLE BARRIER TERMINAL SECTION (TL-3)	EA	4

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR CENTERLINE GEOMETRY OF US 90.
2. CABLE BARRIERS ARE DESIGNED TO BE PLACED ON 6:1 OR FLATTER SIDE SLOPES. TOPOGRAPHICAL SURVEYING WAS NOT PERFORMED ON THIS PROJECT. BASELINE COINCIDES WITH THE FLOW LINE OF DITCH. CABLE BARRIER LOCATIONS MAY BE ADJUSTED AS NEEDED TO FIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.
3. CABLE BARRIERS SHALL BE PLACED WITH AT LEAST 12-FEET OFFSET FROM THE EDGE OF THE ROADWAY PAVEMENT. CABLE BARRIERS SHALL BE PLACED AT LEAST 8-FEET FROM THE BOTTOM OF THE DITCH LINE. OFFSET OF AT LEAST 5-FEET FROM THE EDGE OF ILLUMINATION POLE IS RECOMMENDED.
4. CONTRACTOR SHALL INSTALL TEMPORARY SEDIMENT CONTROL FENCE AS NEEDED.
5. ALL UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR MUST VERIFY ALL EXISTING OVERHEAD AND UNDERGROUND UTILITIES FOR ELEVATION AND CLEARANCES.
6. CONTRACTOR SHALL WINDROW TOWARDS CENTERLINE AND SHALL NOT WINDROW ALONG EDGE OF PAVEMENT.
7. SEEDING AND BLANKETS TO BE INSTALLED AS NEEDED TO REESTABLISH VEGETATION IN DISTURBED AREAS.

0 25 50 75 100 150
SCALE IN FEET
SCALE: HOR: 1" = 100'

STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED
PROFESSIONAL ENGINEER

6/27/2022

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NO.	REVISION	BY	DATE

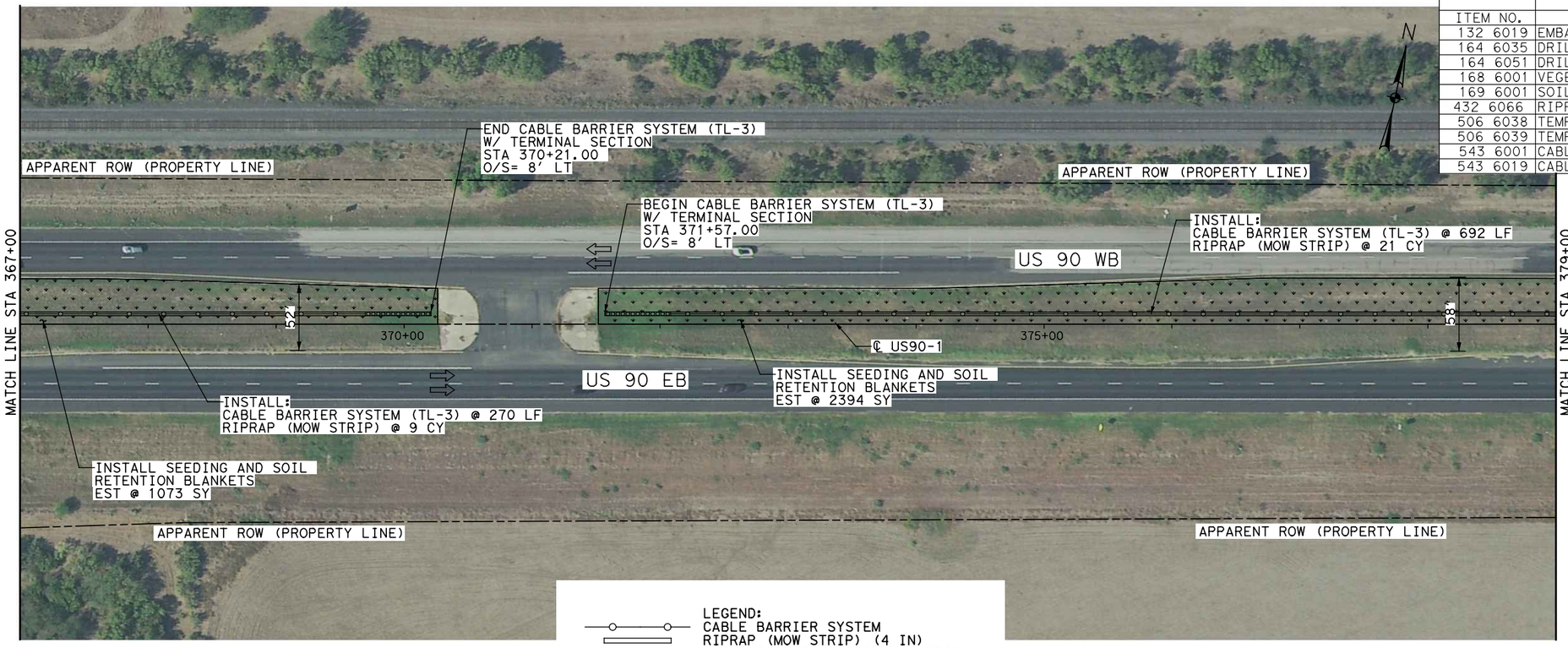
HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

US 90 SEGMENT 1
CABLE BARRIER PLAN
STA 343+00 TO STA 367+00

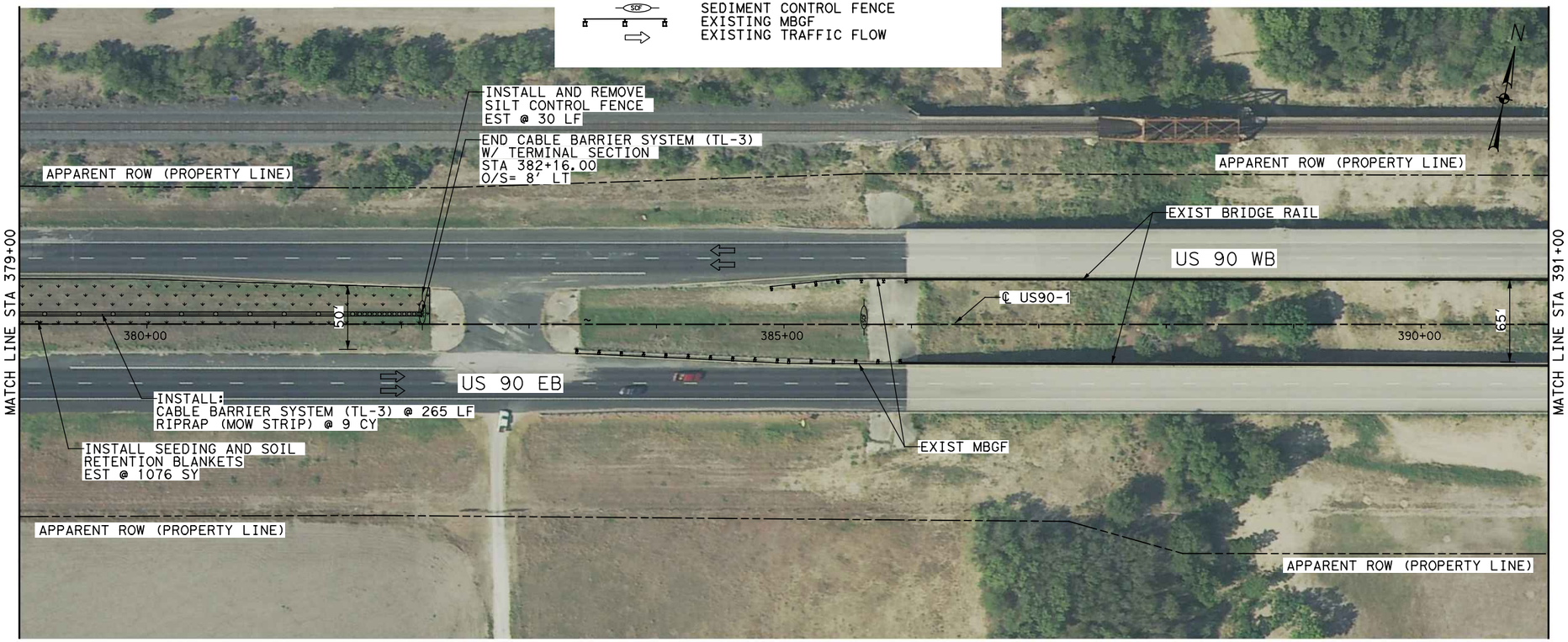
SCALE:1"=100' SHEET 15 OF 17

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		44
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.

	ESTIMATED QUANTITIES		
ITEM NO.	DESCRIPTION	UNIT	QTY
132 6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	CY	2178
164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	4543
164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	4543
168 6001	VEGETATIVE WATERING	MG	73
169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	4543
432 6066	RIPRAP (MOW STRIP)(3 IN)	CY	39
506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	30
506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	30
543 6001	CABLE BARRIER SYSTEM (TL-3)	LF	1227
543 6019	CABLE BARRIER TERMINAL SECTION (TL-3)	EA	3



LEGEND:
- CABLE BARRIER SYSTEM
- RIPRAP (MOW STRIP) (4 IN)
- CABLE BARRIER TERMINAL SECTION
- CENTERLINE
- SEDIMENT CONTROL FENCE
- EXISTING MBGF
- EXISTING TRAFFIC FLOW



NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR CENTERLINE GEOMETRY OF US 90.
2. CABLE BARRIERS ARE DESIGNED TO BE PLACED ON 6:1 OR FLATTER SIDE SLOPES. TOPOGRAPHICAL SURVEYING WAS NOT PERFORMED ON THIS PROJECT. BASELINE COINCIDES WITH THE FLOW LINE OF DITCH. CABLE BARRIER LOCATIONS MAY BE ADJUSTED AS NEEDED TO FIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.
3. CABLE BARRIERS SHALL BE PLACED WITH AT LEAST 12-FEET OFFSET FROM THE EDGE OF THE ROADWAY PAVEMENT. CABLE BARRIERS SHALL BE PLACED AT LEAST 8-FEET FROM THE BOTTOM OF THE DITCH LINE. OFFSET OF AT LEAST 5-FEET FROM THE EDGE OF ILLUMINATION POLE IS RECOMMENDED.
4. CONTRACTOR SHALL INSTALL TEMPORARY SEDIMENT CONTROL FENCE AS NEEDED.
5. ALL UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR MUST VERIFY ALL EXISTING OVERHEAD AND UNDERGROUND UTILITIES FOR ELEVATION AND CLEARANCES.
6. CONTRACTOR SHALL WINDROW TOWARDS CENTERLINE AND SHALL NOT WINDROW ALONG EDGE OF PAVEMENT.
7. SEEDING AND BLANKETS TO BE INSTALLED AS NEEDED TO REESTABLISH VEGETATION IN DISTURBED AREAS.

0 25 50 75 100 150

SCALE IN FEET
SCALE: HOR: 1" = 100'

STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

6/27/2022

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NO.	REVISION	BY	DATE

HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

US 90 SEGMENT 1
CABLE BARRIER PLAN
STA 367+00 TO STA 391+00

SCALE:1"=100' SHEET 16 OF 17

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		45
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.

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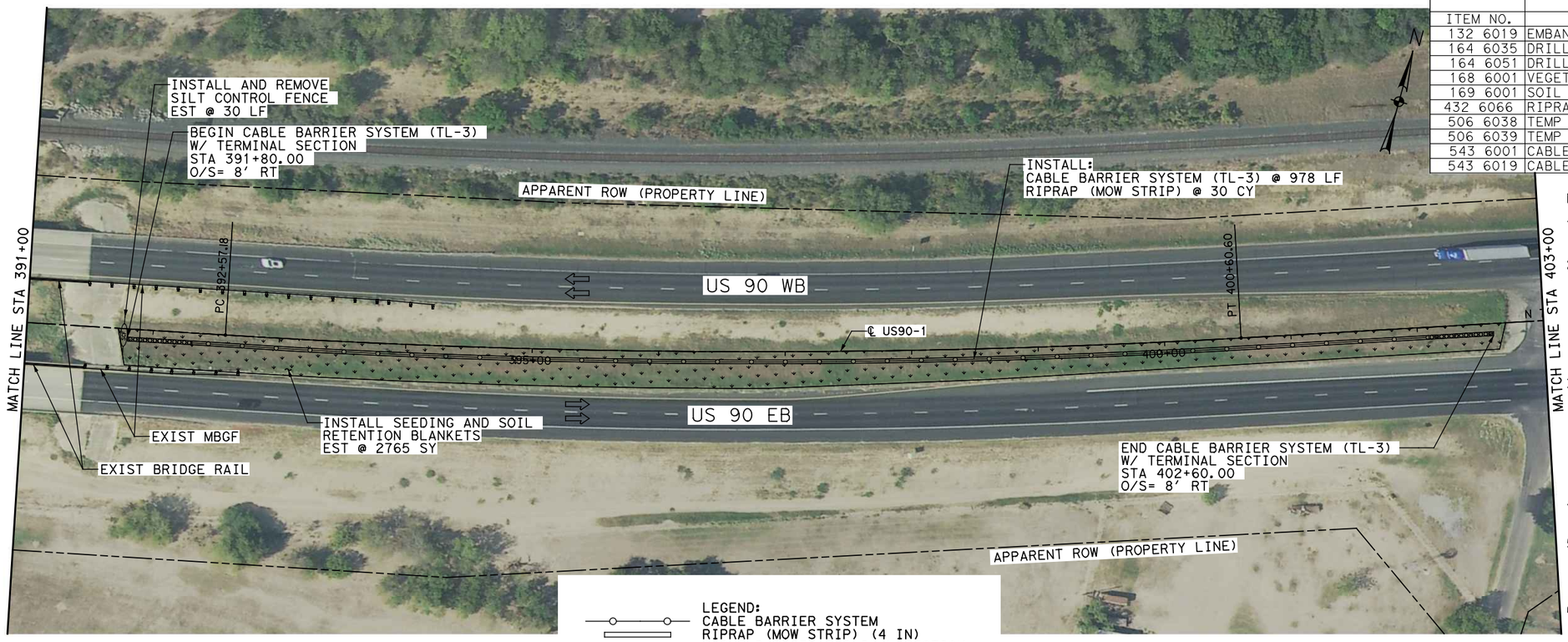
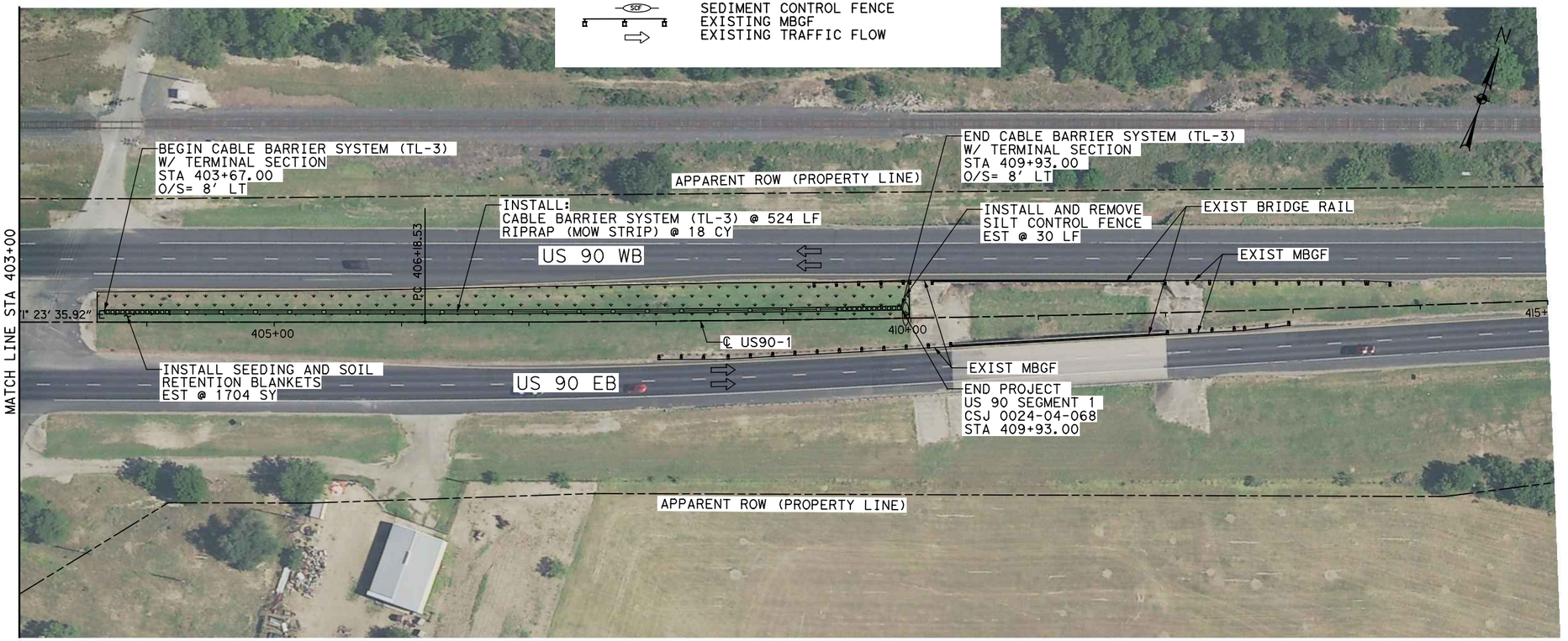


LEGEND:
- CABLE BARRIER SYSTEM
- RIPRAP (MOW STRIP) (4 IN)
- CABLE BARRIER TERMINAL SECTION
- CENTERLINE
- SEDIMENT CONTROL FENCE
- EXISTING MBGF
- EXISTING TRAFFIC FLOW



	ESTIMATED QUANTITIES		
ITEM NO.	DESCRIPTION	UNIT	QTY
132 6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	CY	2404
164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	4469
164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	4469
168 6001	VEGETATIVE WATERING	MG	72
169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	4469
432 6066	RIPRAP (MOW STRIP)(3 IN)	CY	48
506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	60
506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	60
543 6001	CABLE BARRIER SYSTEM (TL-3)	LF	1502
543 6019	CABLE BARRIER TERMINAL SECTION (TL-3)	EA	4

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR CENTERLINE GEOMETRY OF US 90.
2. CABLE BARRIERS ARE DESIGNED TO BE PLACED ON 6:1 OR FLATTER SIDE SLOPES. TOPOGRAPHICAL SURVEYING WAS NOT PERFORMED ON THIS PROJECT. BASELINE COINCIDES WITH THE FLOW LINE OF DITCH. CABLE BARRIER LOCATIONS MAY BE ADJUSTED AS NEEDED TO FIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.
3. CABLE BARRIERS SHALL BE PLACED WITH AT LEAST 12-FEET OFFSET FROM THE EDGE OF THE ROADWAY PAVEMENT. CABLE BARRIERS SHALL BE PLACED AT LEAST 8-FEET FROM THE BOTTOM OF THE DITCH LINE. OFFSET OF AT LEAST 5-FEET FROM THE EDGE OF ILLUMINATION POLE IS RECOMMENDED.
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6. CONTRACTOR SHALL WINDROW TOWARDS CENTERLINE AND SHALL NOT WINDROW ALONG EDGE OF PAVEMENT.
7. SEEDING AND BLANKETS TO BE INSTALLED AS NEEDED TO REESTABLISH VEGETATION IN DISTURBED AREAS.

0 25 50 75 100 150

SCALE IN FEET
SCALE: HOR: 1" = 100'

STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED
PROFESSIONAL ENGINEER

6/27/2022

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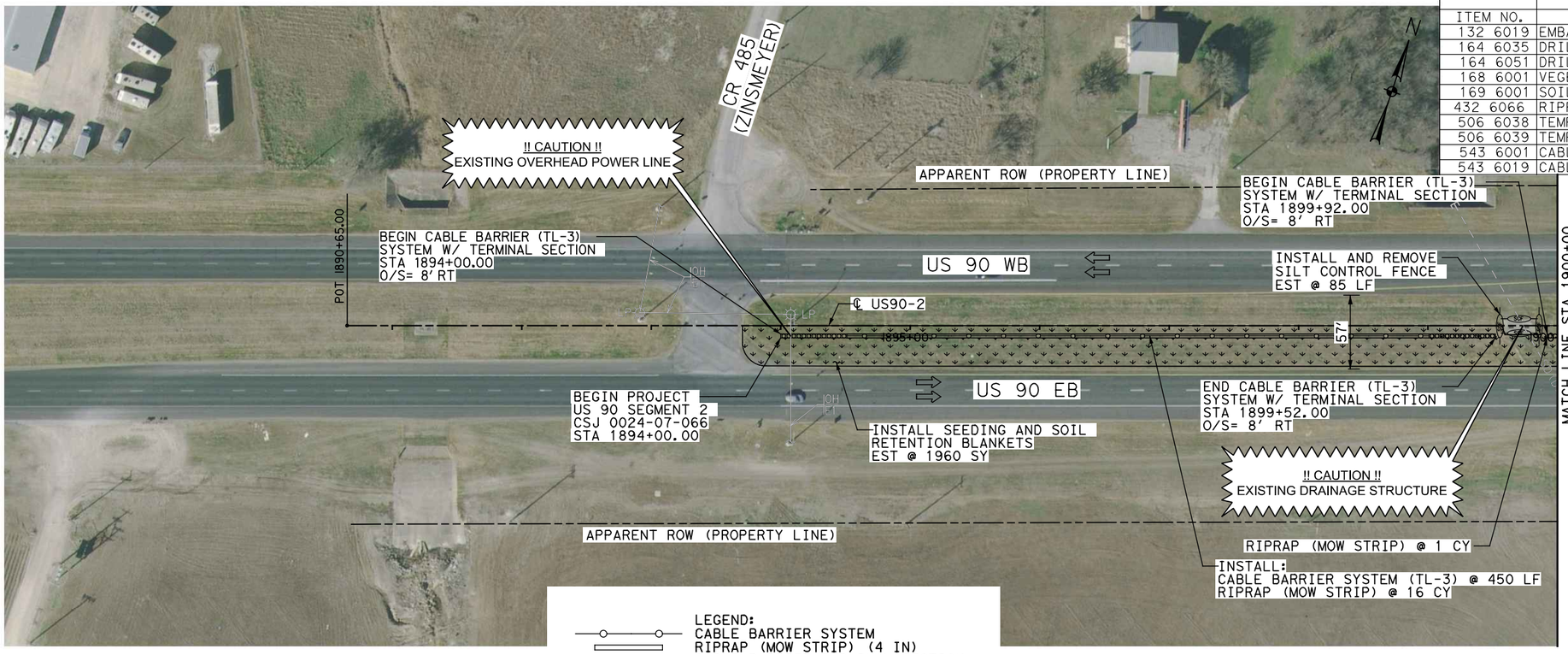
NO.	REVISION	BY	DATE

HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

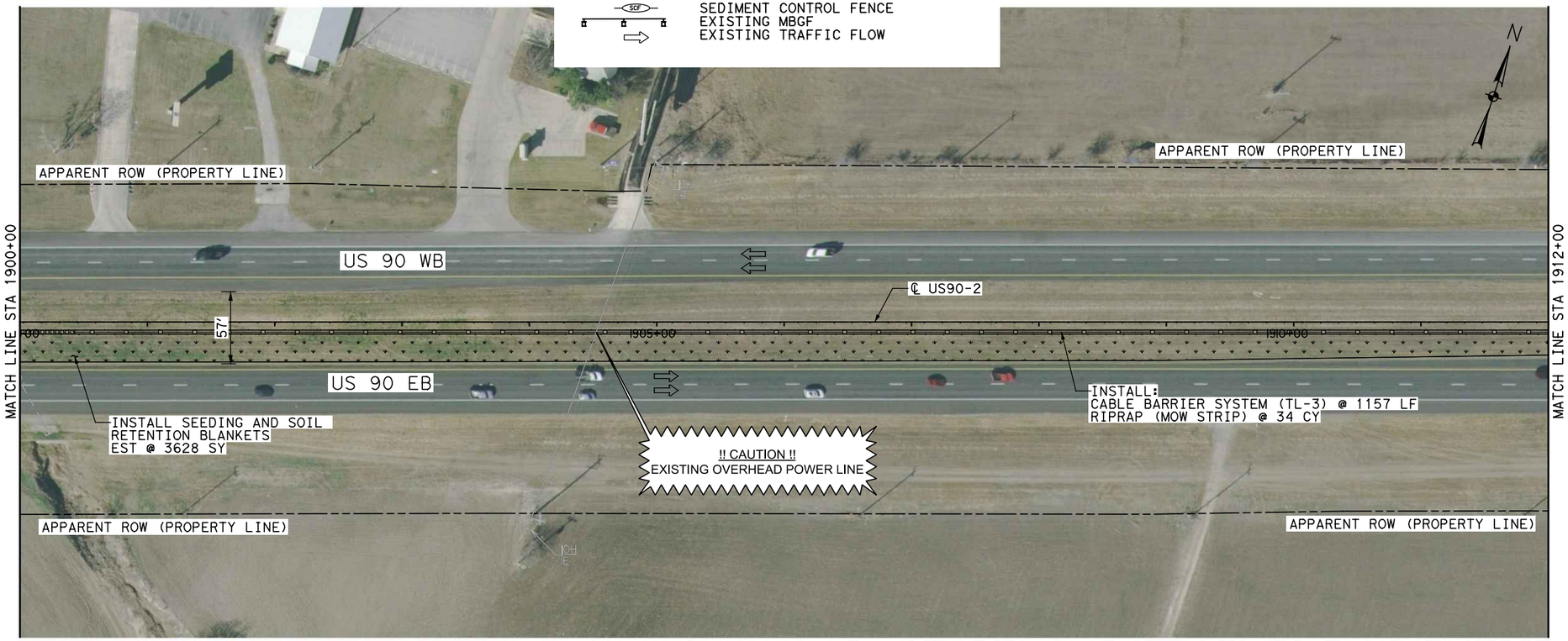
US 90 SEGMENT 1
CABLE BARRIER PLAN
STA 391+00 TO STA END PROJECT

SCALE:1"=100' SHEET 17 OF 17

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		46
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.



LEGEND:
- CABLE BARRIER SYSTEM
- RIPRAP (MOW STRIP) (4 IN)
- CABLE BARRIER TERMINAL SECTION
- CENTERLINE
- SEDIMENT CONTROL FENCE
- EXISTING MBGF
- EXISTING TRAFFIC FLOW



ESTIMATED QUANTITIES			
ITEM NO.	DESCRIPTION	UNIT	QTY
132 6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	CY	850
164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	5588
164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	5588
168 6001	VEGETATIVE WATERING	MG	90
169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	5588
432 6066	RIPRAP (MOW STRIP)(3 IN)	CY	51
506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	85
506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	85
543 6001	CABLE BARRIER SYSTEM (TL-3)	LF	1607
543 6019	CABLE BARRIER TERMINAL SECTION (TL-3)	EA	3

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR CENTERLINE GEOMETRY OF US 90.
2. CABLE BARRIERS ARE DESIGNED TO BE PLACED ON 6:1 OR FLATTER SIDE SLOPES. TOPOGRAPHICAL SURVEYING WAS NOT PERFORMED ON THIS PROJECT. BASELINE COINCIDES WITH THE FLOW LINE OF DITCH. CABLE BARRIER LOCATIONS MAY BE ADJUSTED AS NEEDED TO FIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.
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6. CONTRACTOR SHALL WINDROW TOWARDS CENTERLINE AND SHALL NOT WINDROW ALONG EDGE OF PAVEMENT.
7. SEEDING AND BLANKETS TO BE INSTALLED AS NEEDED TO REESTABLISH VEGETATION IN DISTURBED AREAS.

0 25 50 75 100 150

SCALE IN FEET
SCALE: HOR: 1" = 100'

STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

6/27/2022

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NO.	REVISION	BY	DATE

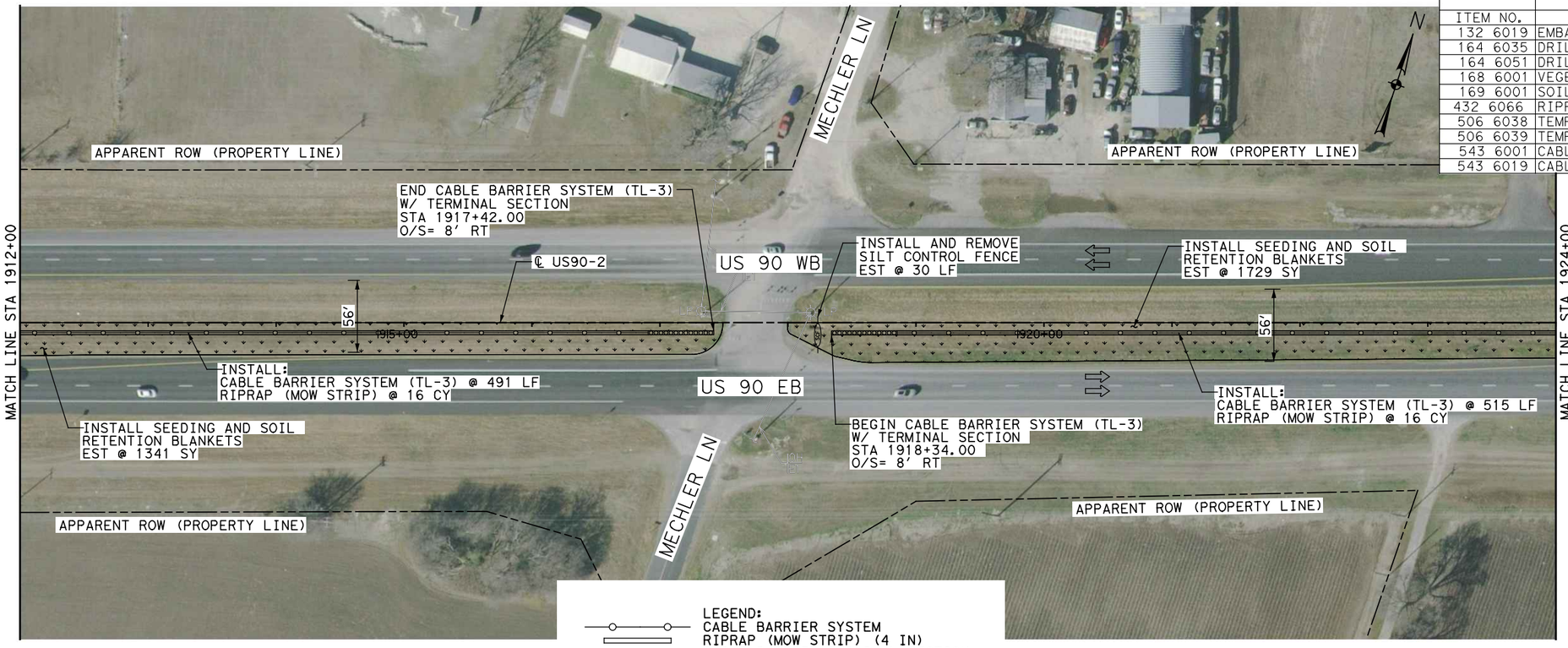
HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

US 90 SEGMENT 2
CABLE BARRIER PLAN
BEGIN TO STA 1912+00

SCALE:1"=100' SHEET 1 OF 6

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		47
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.

	ESTIMATED QUANTITIES		
ITEM NO.	DESCRIPTION	UNIT	QTY
132 6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	CY	1812
164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	6219
164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	6219
168 6001	VEGETATIVE WATERING	MG	100
169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	6219
432 6066	RIPRAP (MOW STRIP)(3 IN)	CY	64
506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	30
506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	30
543 6001	CABLE BARRIER SYSTEM (TL-3)	LF	2044
543 6019	CABLE BARRIER TERMINAL SECTION (TL-3)	EA	4



LEGEND:
- CABLE BARRIER SYSTEM
- RIPRAP (MOW STRIP) (4 IN)
- CABLE BARRIER TERMINAL SECTION
- CENTERLINE
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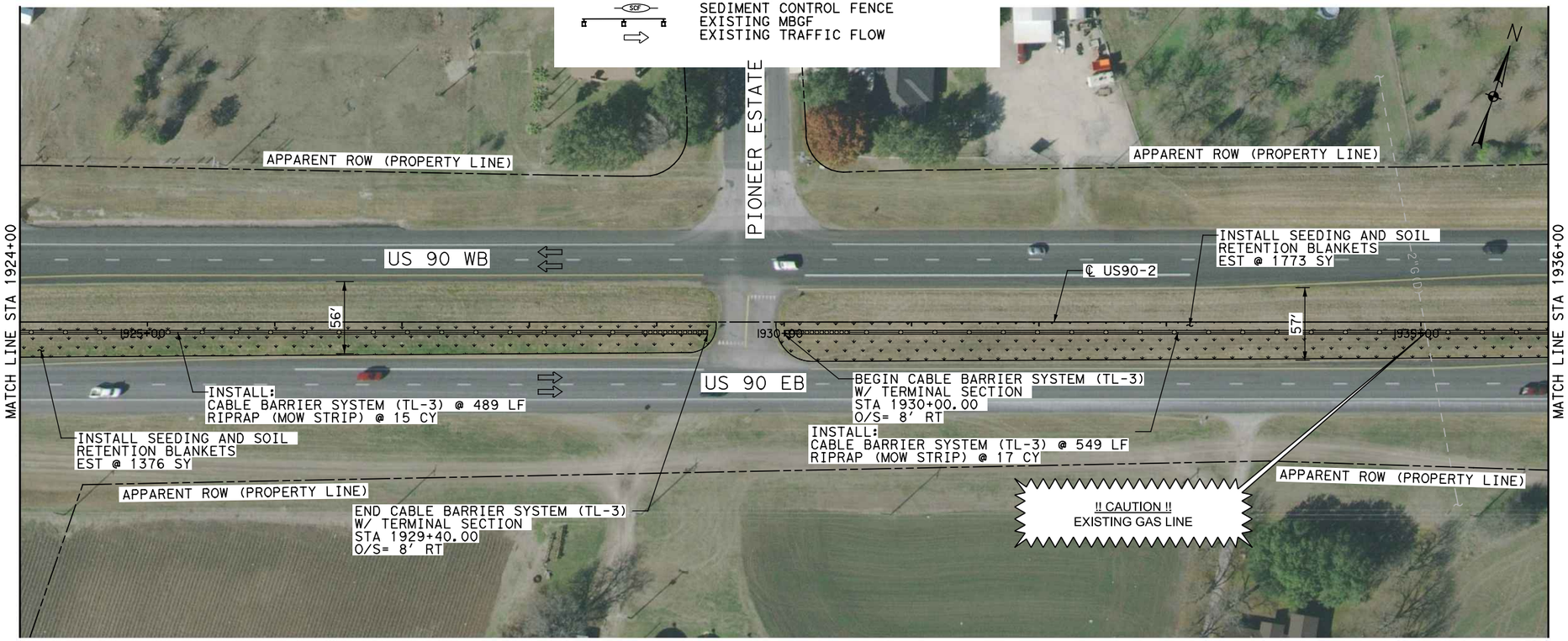
- EXISTING MBGF
- EXISTING TRAFFIC FLOW



NOTES:

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0 25 50 75 100 150

SCALE IN FEET
SCALE: HOR: 1" = 100'

STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

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NO.	REVISION	BY	DATE

HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

US 90 SEGMENT 2
CABLE BARRIER PLAN
STA 1912+00 TO STA 1936+00

SCALE:1"=100' SHEET 2 OF 6

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		48
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.

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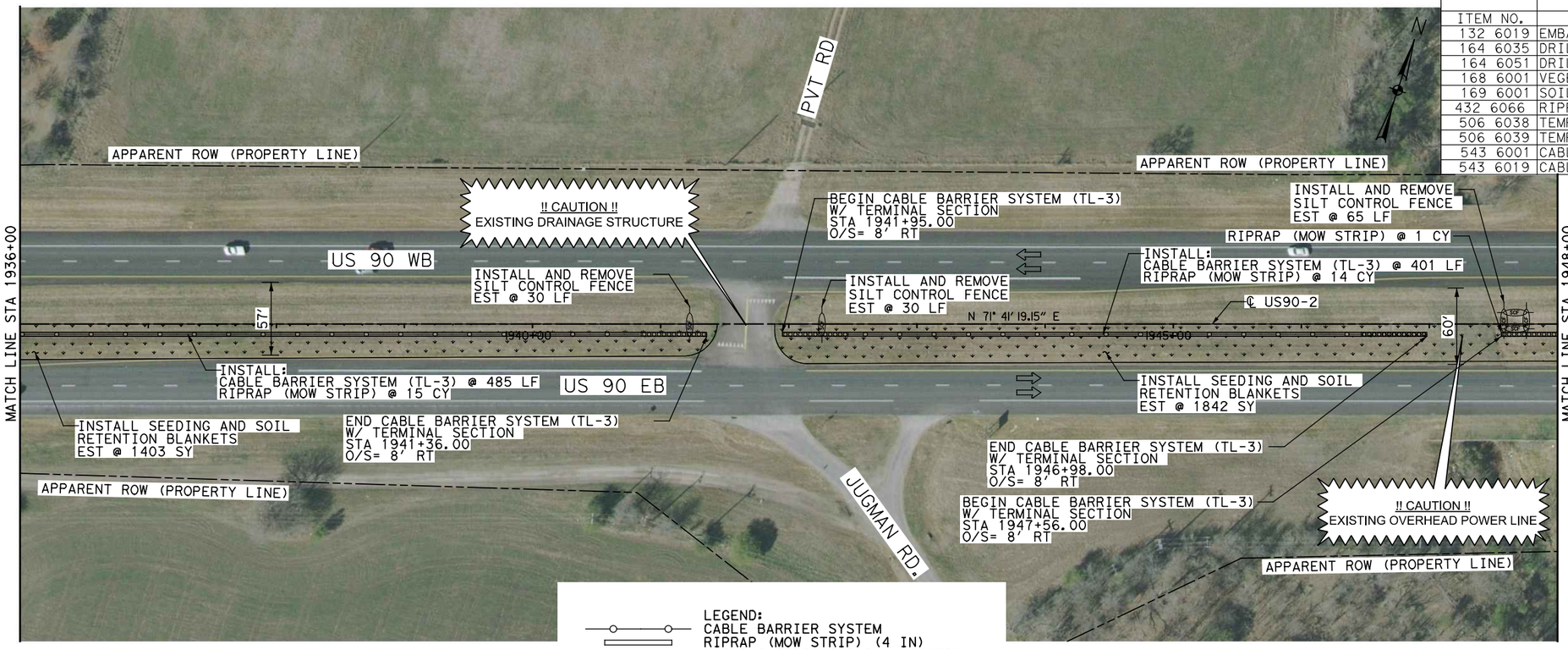


	ESTIMATED QUANTITIES		
ITEM NO.	DESCRIPTION	UNIT	QTY
132 6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	CY	1740
164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	6462
164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	6462
168 6001	VEGETATIVE WATERING	MG	104
169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	6462
432 6066	RIPRAP (MOW STRIP)(3 IN)	CY	64
506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	125
506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	125
543 6001	CABLE BARRIER SYSTEM (TL-3)	LF	2079
543 6019	CABLE BARRIER TERMINAL SECTION (TL-3)	EA	4

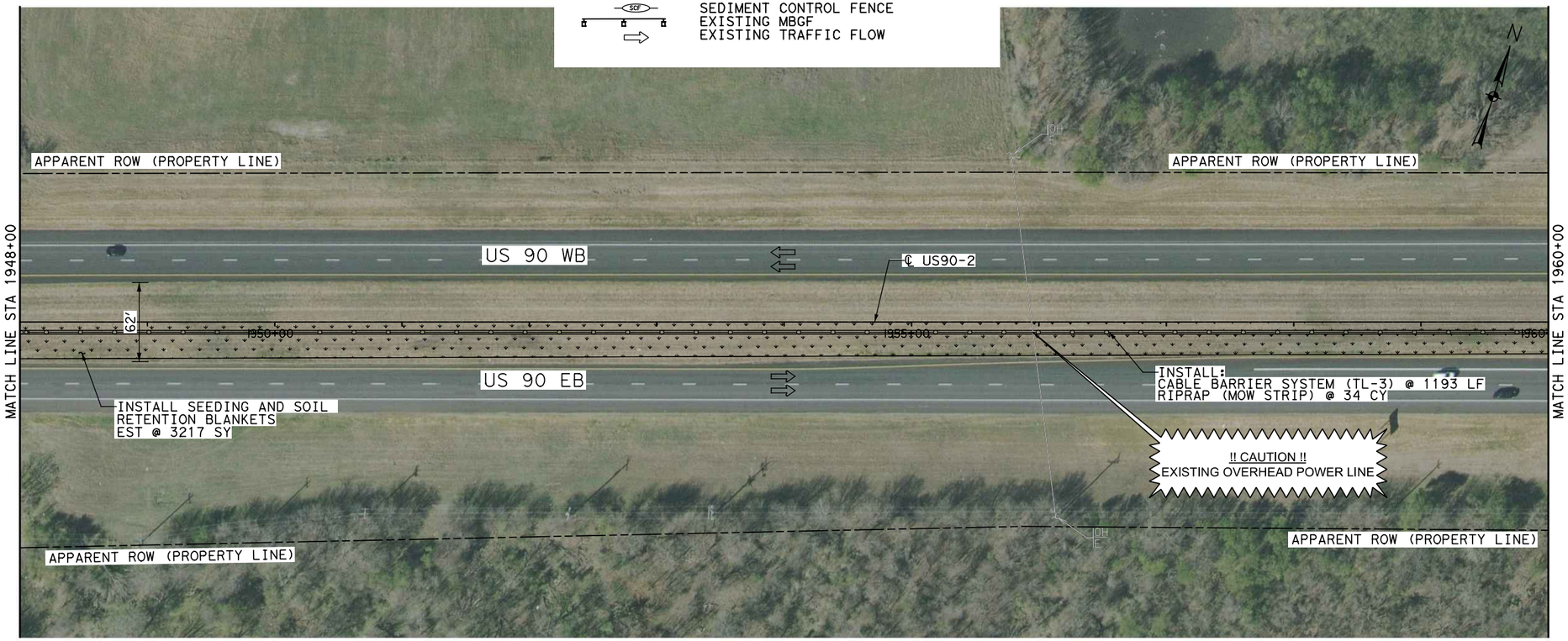
LEGEND:
- CABLE BARRIER SYSTEM
- RIPRAP (MOW STRIP) (4 IN)
- CABLE BARRIER TERMINAL SECTION
- CENTERLINE
- SEDIMENT CONTROL FENCE
- EXISTING MBGF
- EXISTING TRAFFIC FLOW

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR CENTERLINE GEOMETRY OF US 90.
2. CABLE BARRIERS ARE DESIGNED TO BE PLACED ON 6:1 OR FLATTER SIDE SLOPES. TOPOGRAPHICAL SURVEYING WAS NOT PERFORMED ON THIS PROJECT. BASELINE COINCIDES WITH THE FLOW LINE OF DITCH. CABLE BARRIER LOCATIONS MAY BE ADJUSTED AS NEEDED TO FIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.
3. CABLE BARRIERS SHALL BE PLACED WITH AT LEAST 12-FEET OFFSET FROM THE EDGE OF THE ROADWAY PAVEMENT. CABLE BARRIERS SHALL BE PLACED AT LEAST 8-FEET FROM THE BOTTOM OF THE DITCH LINE. OFFSET OF AT LEAST 5-FEET FROM THE EDGE OF ILLUMINATION POLE IS RECOMMENDED.
4. CONTRACTOR SHALL INSTALL TEMPORARY SEDIMENT CONTROL FENCE AS NEEDED.
5. ALL UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR MUST VERIFY ALL EXISTING OVERHEAD AND UNDERGROUND UTILITIES FOR ELEVATION AND CLEARANCES.
6. CONTRACTOR SHALL WINDROW TOWARDS CENTERLINE AND SHALL NOT WINDROW ALONG EDGE OF PAVEMENT.
7. SEEDING AND BLANKETS TO BE INSTALLED AS NEEDED TO REESTABLISH VEGETATION IN DISTURBED AREAS.

0 25 50 75 100 150

SCALE IN FEET
SCALE: HOR: 1" = 100'



STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

6/27/2022

THE SEAL ORIGINALLY APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY JOHNNY L. CLAYTON, P.E. #107215 ON 6/27/2022 . ALTERATION OF A PREVIOUSLY SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT. THE RECORD COPY OF THIS DRAWING IS ON FILE AT THE OFFICES OF HALFF ASSOCIATES, INC., 100 NE INTERSTATE 410 LOOP, SUITE 200, SAN ANTONIO, TEXAS 78216, TBPE FIRM #F-312

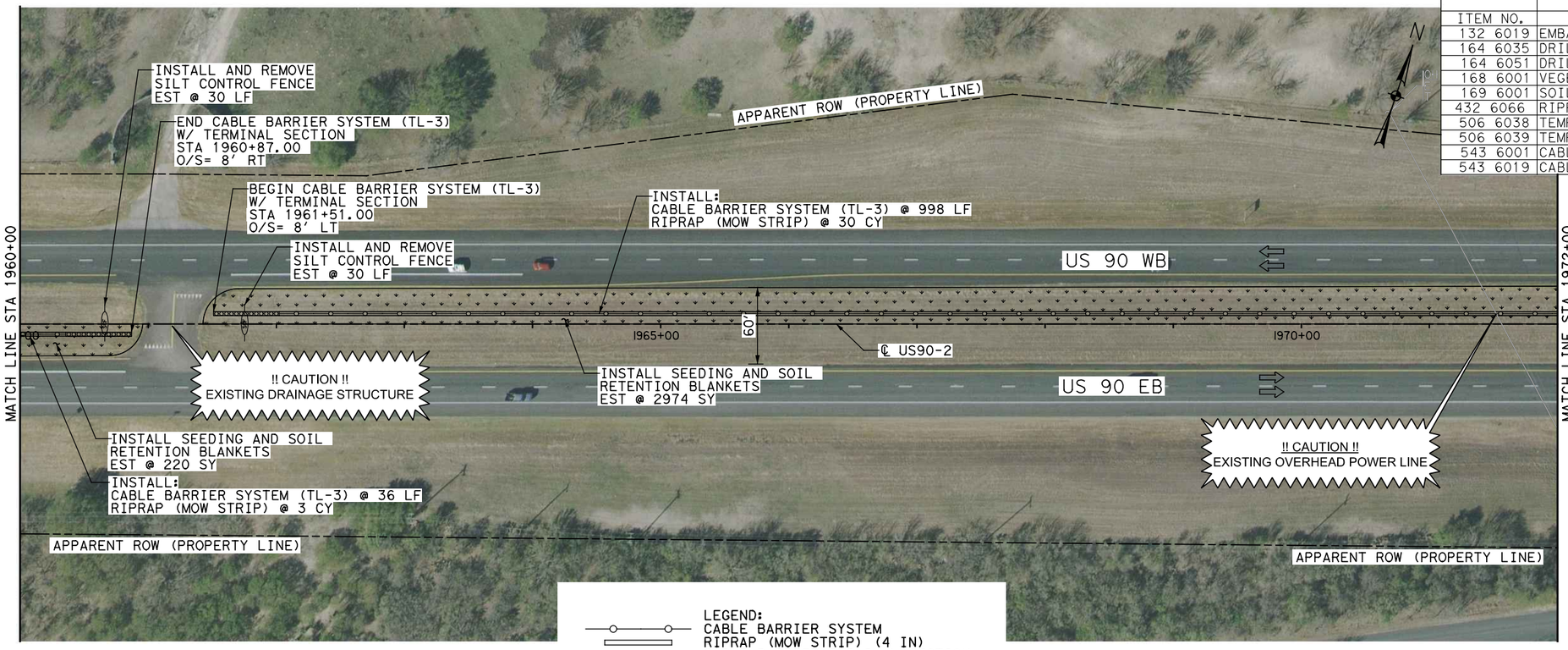
NO.	REVISION	BY	DATE

HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

US 90 SEGMENT 2
CABLE BARRIER PLAN
STA 1936+00 TO STA 1960+00

SCALE:1"=100' SHEET 3 OF 6

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		49
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.



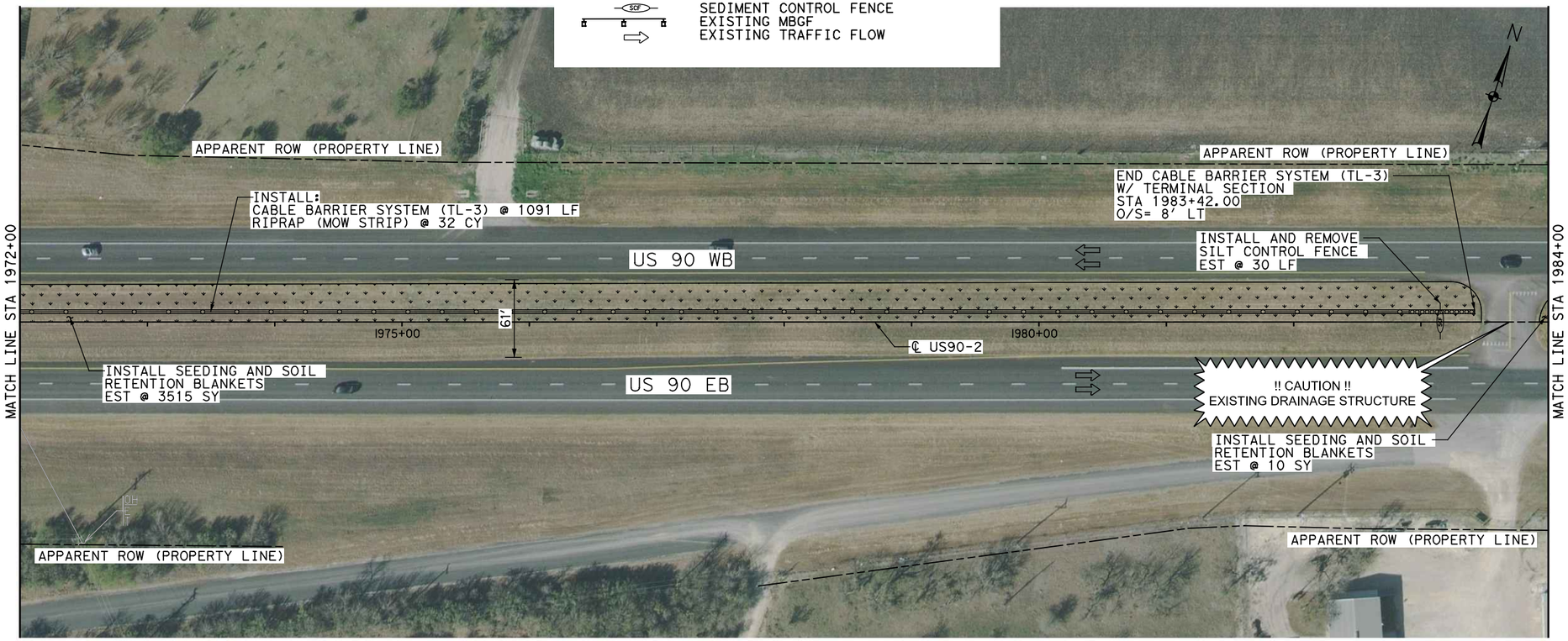
	ESTIMATED QUANTITIES		
ITEM NO.	DESCRIPTION	UNIT	QTY
132 6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	CY	3232
164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	6719
164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	6719
168 6001	VEGETATIVE WATERING	MG	108
169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	6719
432 6066	RIPRAP (MOW STRIP)(3 IN)	CY	65
506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	90
506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	90
543 6001	CABLE BARRIER SYSTEM (TL-3)	LF	2125
543 6019	CABLE BARRIER TERMINAL SECTION (TL-3)	EA	3

LEGEND:
- CABLE BARRIER SYSTEM
- RIPRAP (MOW STRIP) (4 IN)
- CABLE BARRIER TERMINAL SECTION
- CENTERLINE
- SEDIMENT CONTROL FENCE
- EXISTING MBGF
- EXISTING TRAFFIC FLOW

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR CENTERLINE GEOMETRY OF US 90.
2. CABLE BARRIERS ARE DESIGNED TO BE PLACED ON 6:1 OR FLATTER SIDE SLOPES. TOPOGRAPHICAL SURVEYING WAS NOT PERFORMED ON THIS PROJECT. BASELINE COINCIDES WITH THE FLOW LINE OF DITCH. CABLE BARRIER LOCATIONS MAY BE ADJUSTED AS NEEDED TO FIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.
3. CABLE BARRIERS SHALL BE PLACED WITH AT LEAST 12-FEET OFFSET FROM THE EDGE OF THE ROADWAY PAVEMENT. CABLE BARRIERS SHALL BE PLACED AT LEAST 8-FEET FROM THE BOTTOM OF THE DITCH LINE. OFFSET OF AT LEAST 5-FEET FROM THE EDGE OF ILLUMINATION POLE IS RECOMMENDED.
4. CONTRACTOR SHALL INSTALL TEMPORARY SEDIMENT CONTROL FENCE AS NEEDED.
5. ALL UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR MUST VERIFY ALL EXISTING OVERHEAD AND UNDERGROUND UTILITIES FOR ELEVATION AND CLEARANCES.
6. CONTRACTOR SHALL WINDROW TOWARDS CENTERLINE AND SHALL NOT WINDROW ALONG EDGE OF PAVEMENT.
7. SEEDING AND BLANKETS TO BE INSTALLED AS NEEDED TO REESTABLISH VEGETATION IN DISTURBED AREAS.

0 25 50 75 100 150
SCALE IN FEET
SCALE: HOR: 1" = 100'



STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

6/27/2022

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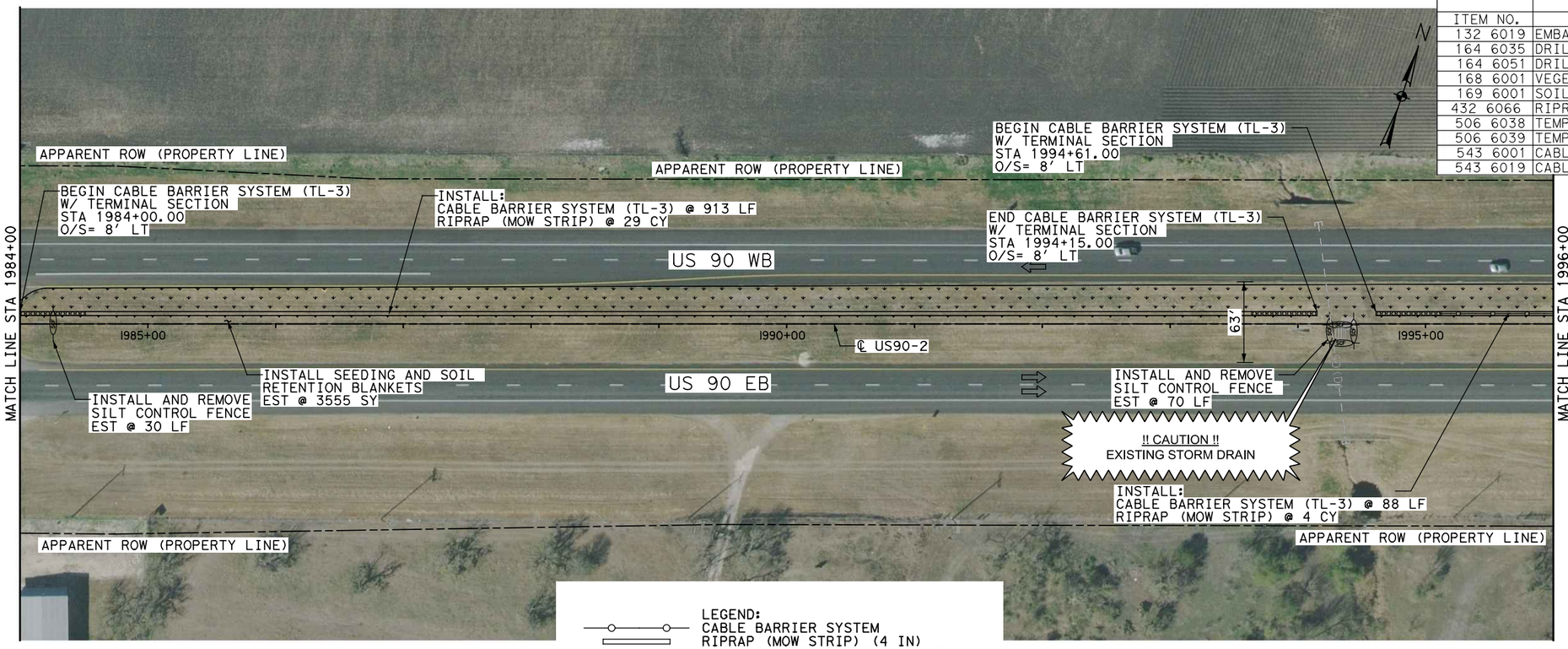
NO.	REVISION	BY	DATE

HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

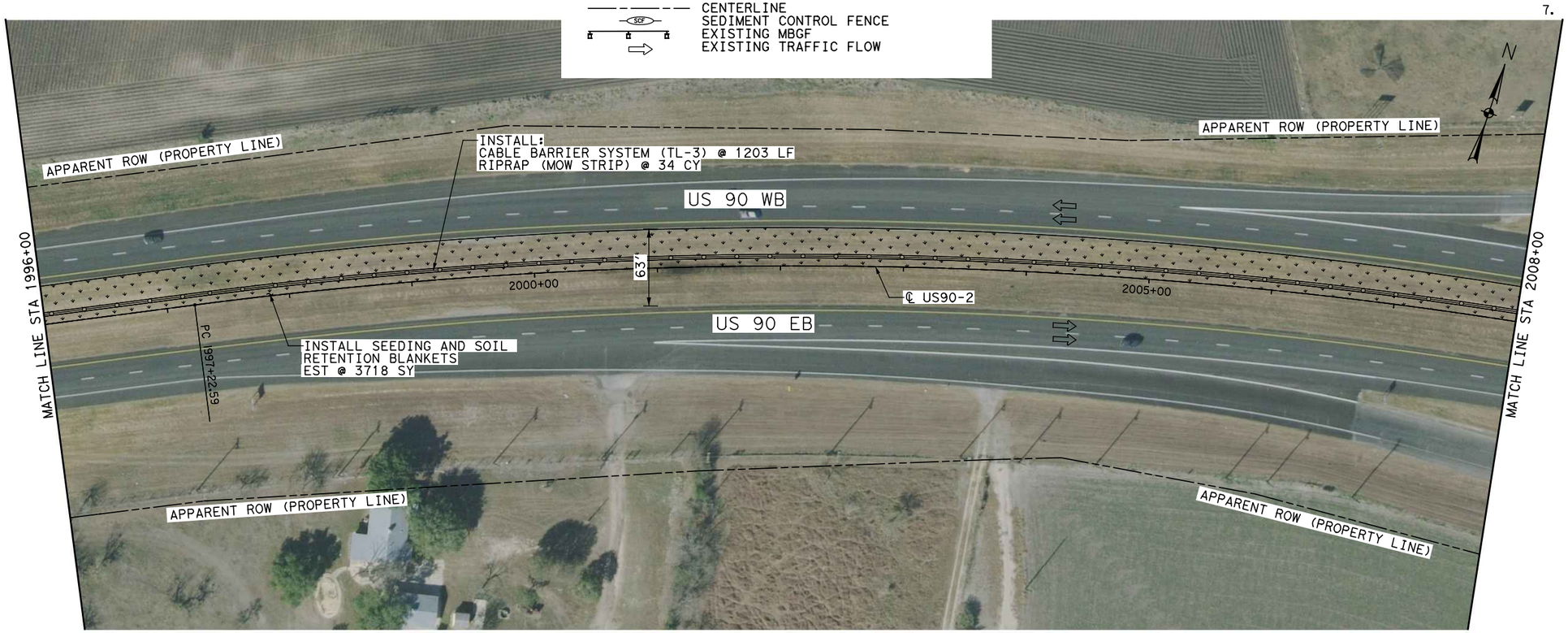
US 90 SEGMENT 2
CABLE BARRIER PLAN
STA 1960+00 TO STA 1984+00

SCALE:1"=100' SHEET 4 OF 6

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		50
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.



LEGEND:
- CABLE BARRIER SYSTEM
- RIPRAP (MOW STRIP) (4 IN)
- CABLE BARRIER TERMINAL SECTION
- CENTERLINE
- SEDIMENT CONTROL FENCE
- EXISTING MBGF
- EXISTING TRAFFIC FLOW



	ESTIMATED QUANTITIES		
ITEM NO.	DESCRIPTION	UNIT	QTY
132 6019	EMBANKMENT (VEHICLE)(ORD COMP)(TY B)	CY	1466
164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	7273
164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	7273
168 6001	VEGETATIVE WATERING	MG	117
169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	7273
432 6066	RIPRAP (MOW STRIP)(3 IN)	CY	67
506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	100
506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	100
543 6001	CABLE BARRIER SYSTEM (TL-3)	LF	2204
543 6019	CABLE BARRIER TERMINAL SECTION (TL-3)	EA	3

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR CENTERLINE GEOMETRY OF US 90.
2. CABLE BARRIERS ARE DESIGNED TO BE PLACED ON 6:1 OR FLATTER SIDE SLOPES. TOPOGRAPHICAL SURVEYING WAS NOT PERFORMED ON THIS PROJECT. BASELINE COINCIDES WITH THE FLOW LINE OF DITCH. CABLE BARRIER LOCATIONS MAY BE ADJUSTED AS NEEDED TO FIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.
3. CABLE BARRIERS SHALL BE PLACED WITH AT LEAST 12-FEET OFFSET FROM THE EDGE OF THE ROADWAY PAVEMENT. CABLE BARRIERS SHALL BE PLACED AT LEAST 8-FEET FROM THE BOTTOM OF THE DITCH LINE. OFFSET OF AT LEAST 5-FEET FROM THE EDGE OF ILLUMINATION POLE IS RECOMMENDED.
4. CONTRACTOR SHALL INSTALL TEMPORARY SEDIMENT CONTROL FENCE AS NEEDED.
5. ALL UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR MUST VERIFY ALL EXISTING OVERHEAD AND UNDERGROUND UTILITIES FOR ELEVATION AND CLEARANCES.
6. CONTRACTOR SHALL WINDROW TOWARDS CENTERLINE AND SHALL NOT WINDROW ALONG EDGE OF PAVEMENT.
7. SEEDING AND BLANKETS TO BE INSTALLED AS NEEDED TO REESTABLISH VEGETATION IN DISTURBED AREAS.

0 25 50 75 100 150

SCALE IN FEET
SCALE: HOR: 1" = 100'

STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

6/27/2022

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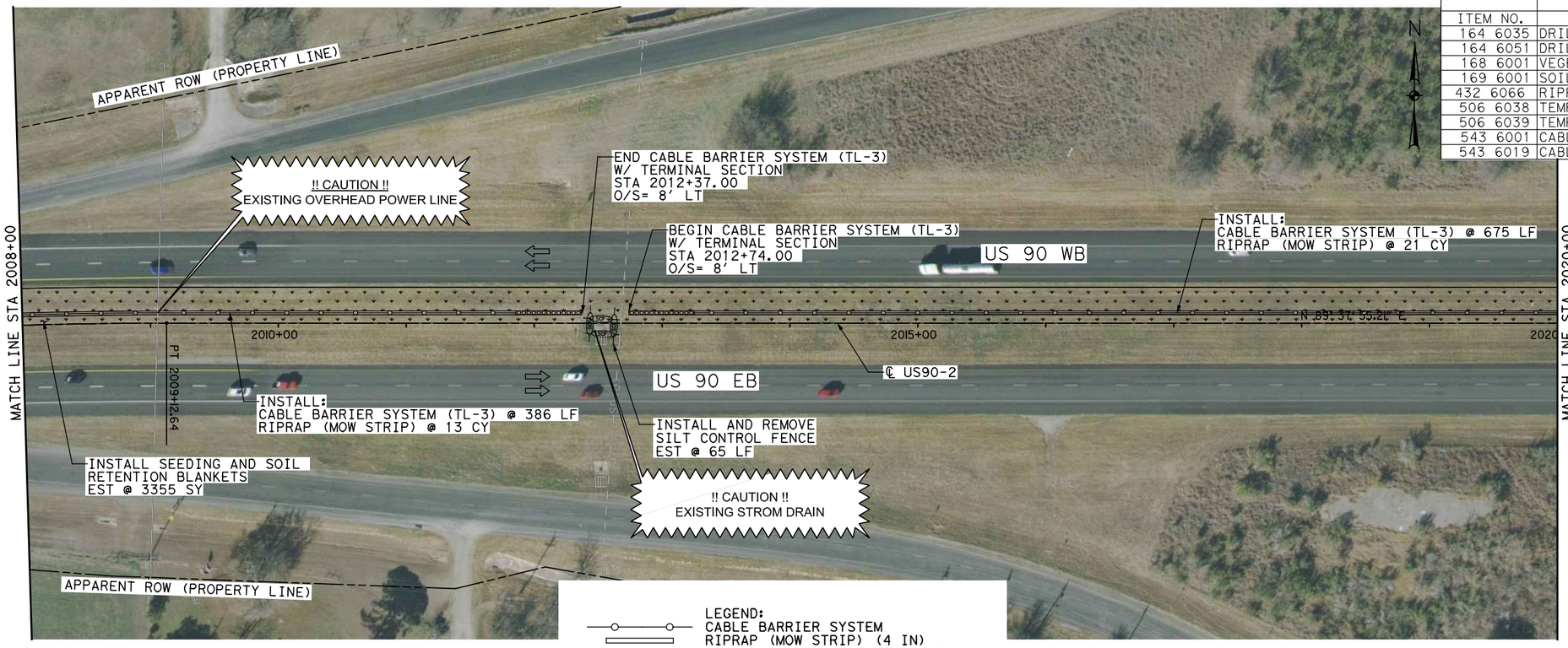
NO.	REVISION	BY	DATE

HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

US 90 SEGMENT 2
CABLE BARRIER PLAN
STA 1984+00 TO STA 2008+00

SCALE:1"=100' SHEET 5 OF 6

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		51
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.



	ESTIMATED QUANTITIES		
ITEM NO.	DESCRIPTION	UNIT	QTY
164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	5467
164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	5467
168 6001	VEGETATIVE WATERING	MG	88
169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	5467
432 6066	RIPRAP (MOW STRIP)(3 IN)	CY	52
506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	95
506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	95
543 6001	CABLE BARRIER SYSTEM (TL-3)	LF	1650
543 6019	CABLE BARRIER TERMINAL SECTION (TL-3)	EA	3

LEGEND:
- CABLE BARRIER SYSTEM
- RIPRAP (MOW STRIP) (4 IN)
- CABLE BARRIER TERMINAL SECTION
- CENTERLINE
- SEDIMENT CONTROL FENCE
- EXISTING MBGF
- EXISTING TRAFFIC FLOW

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR CENTERLINE GEOMETRY OF US 90.
2. CABLE BARRIERS ARE DESIGNED TO BE PLACED ON 6:1 OR FLATTER SIDE SLOPES. TOPOGRAPHICAL SURVEYING WAS NOT PERFORMED ON THIS PROJECT. BASELINE COINCIDES WITH THE FLOW LINE OF DITCH. CABLE BARRIER LOCATIONS MAY BE ADJUSTED AS NEEDED TO FIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.
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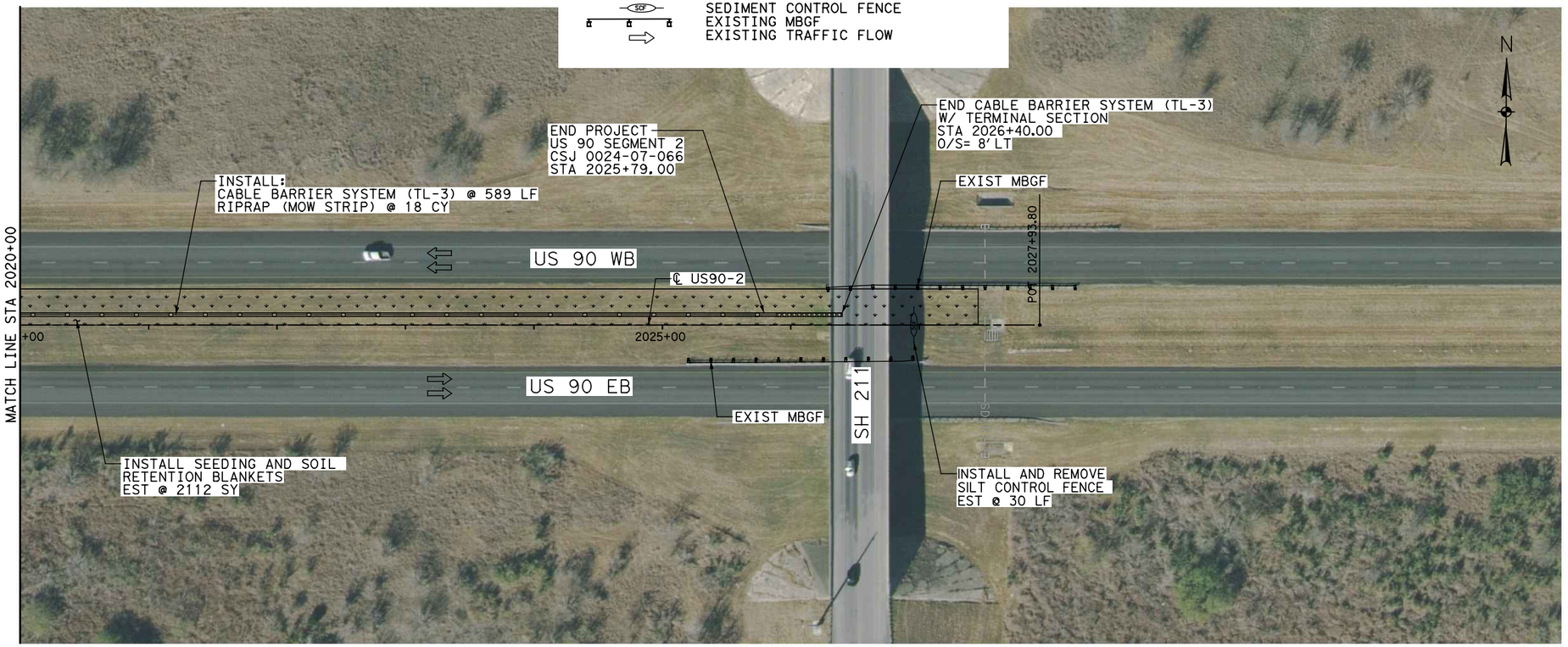
7. SEEDING AND BLANKETS TO BE INSTALLED AS NEEDED TO REESTABLISH VEGETATION IN DISTURBED AREAS.

0 25 50 75 100 150
SCALE IN FEET
SCALE: HOR: 1" = 100'



STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

6/27/2022

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NO.	REVISION	BY	DATE

HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

Texas Department of Transportation®

US 90 SEGMENT 2
CABLE BARRIER PLAN
STA 2008+00 TO END PROJECT

SCALE: 1"=100' SHEET 6 OF 6

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		52
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.

ESTIMATED QTY CB 1			
ITEM#	DESCRIPTION	UNIT	QTY
0132 6019	EMBANKMENT (VEHICLE) (ORD COMP) (TY B)	CY	9
0164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	489
0164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	489
0168 6001	VEGETATIVE WATERING	MG	8
0169 6001	SOIL RETENTION BLANKETS(CL1)(TY A)	SY	489
0432 6066	RIPRAP (MOW STRIP)(3 IN)	CY	3
0543 6001	CABLE BARRIER SYSTEM (TL-3)	LF	49
0543 6019	CABLE BARRIER TERMINAL SECTION (TL-3)	EA	1

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR CENTERLINE GEOMETRY OF SH 97.
2. CABLE BARRIERS ARE DESIGNED TO BE PLACED ON 6:1 OR FLATTER SIDE SLOPES. TOPOGRAPHICAL SURVEYING WAS NOT PERFORMED ON THIS PROJECT. BASELINE COINCIDES WITH THE FLOW LINE OF DITCH. CABLE BARRIER LOCATIONS MAY BE ADJUSTED AS NEEDED TO FIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.
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5. ALL UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR MUST VERIFY ALL EXISTING OVERHEAD AND UNDERGROUND UTILITIES FOR ELEVATION AND CLEARANCES.
6. CONTRACTOR SHALL WINDROW TOWARDS CENTERLINE AND SHALL NOT WINDROW ALONG EDGE OF PAVEMENT.
7. SEED & BLANKETS TO BE INSTALLED AS NEEDED TO REESTABLISH VEGETATION IN DISTURBED AREAS.

0 25 50 75 100 150

SCALE IN FEET
SCALE: 1" = 100'

STATE OF TEXAS
ERIC DIETRICH
94970
LICENSED
PROFESSIONAL ENGINEER

6/27/2022
NAME DATE

NO.	REVISION	BY	DATE

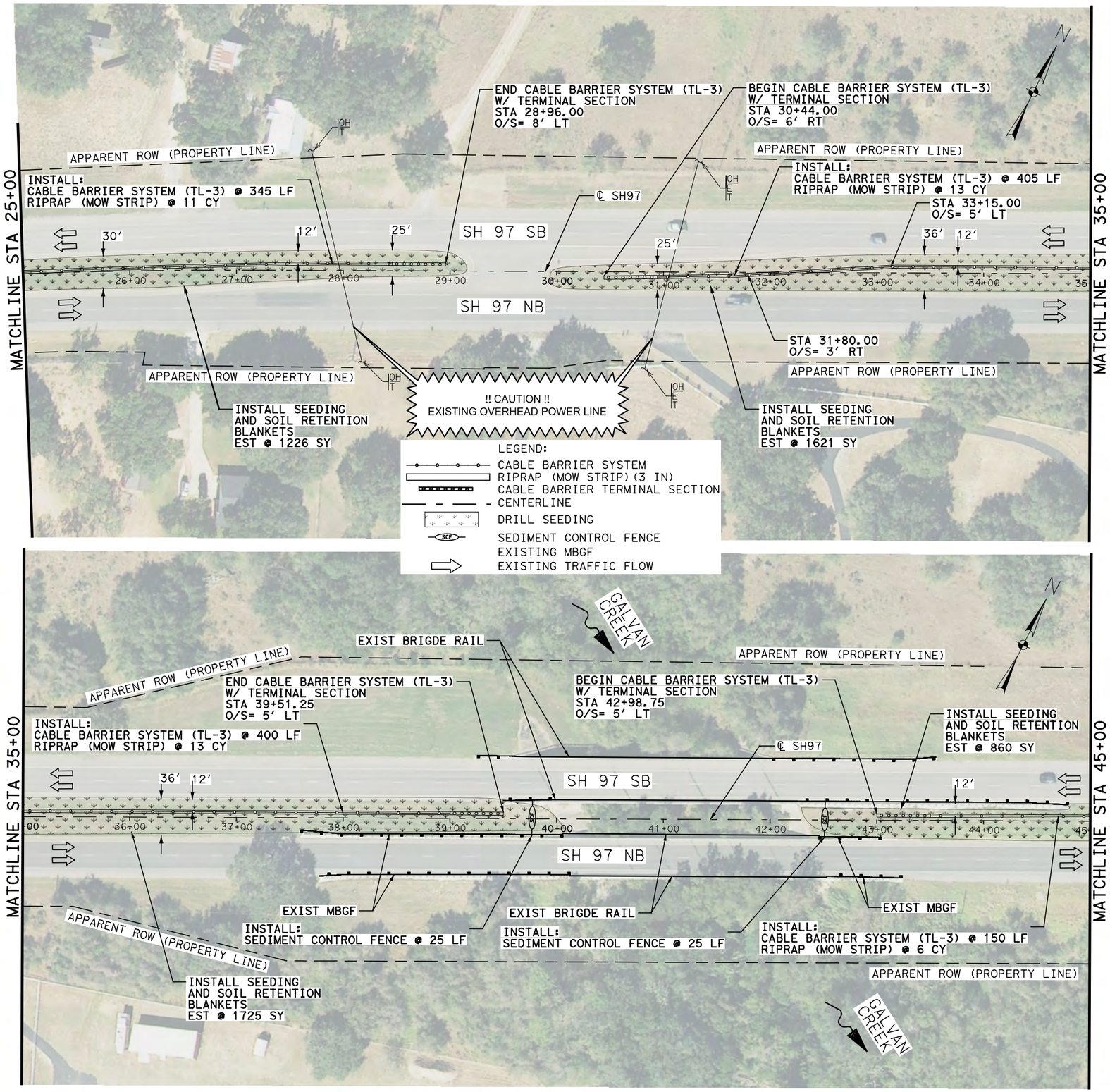
HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
1201 Interstate Highway 2
Mission, Texas 78572
(956) 424-7898
TBPE F-1640

SH 97
CABLE BARRIER PLAN
STA 22+00 TO STA 25+00

SCALE: 1"=100' SHEET 1 OF 7

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	See Title Sheet		53
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068, ETC	US 90, ETC



ESTIMATED QTY CB 2

ITEM#	DESCRIPTION	UNIT	QTY
0132 6019	EMBANKMENT (VEHICLE) (ORD COMP) (TY B)	CY	269
0164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	5432
0164 6051	DRILL SEED (TEMP) (WARM OR COOL)	SY	5432
0168 6001	VEGETATIVE WATERING	MG	87
0169 6001	SOIL RETENTION BLANKETS(CL1)(TY A)	SY	5432
0432 6066	RIPRAP (MOW STRIP)(3 IN)	CY	43
0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	50
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	50
0543 6001	CABLE BARRIER SYSTEM (TL-3)	LF	1300
0543 6019	CABLE BARRIER TERMINAL SECTION (TL-3)	EA	4

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR CENTERLINE GEOMETRY OF SH 97.
2. CABLE BARRIERS ARE DESIGNED TO BE PLACED ON 6:1 OR FLATTER SIDE SLOPES. TOPOGRAPHICAL SURVEYING WAS NOT PERFORMED ON THIS PROJECT. BASELINE COINCIDES WITH THE FLOW LINE OF DITCH. CABLE BARRIER LOCATIONS MAY BE ADJUSTED AS NEEDED TO FIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.
3. CABLE BARRIERS SHALL BE PLACED WITH AT LEAST 12-FEET OFFSET FROM THE EDGE OF THE ROADWAY PAVEMENT. CABLE BARRIERS SHALL BE PLACED AT LEAST 1-FEET FROM THE BOTTOM OF THE DITCH LINE.
4. CONTRACTOR SHALL INSTALL TEMPORARY SEDIMENT CONTROL FENCE AS NEEDED.
5. ALL UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR MUST VERIFY ALL EXISTING OVERHEAD AND UNDERGROUND UTILITIES FOR ELEVATION AND CLEARANCES.
6. CONTRACTOR SHALL WINDROW TOWARDS CENTERLINE AND SHALL NOT WINDROW ALONG EDGE OF PAVEMENT.
7. SEED & BLANKETS TO BE INSTALLED AS NEEDED TO REESTABLISH VEGETATION IN DISTURBED AREAS.

0 25 50 75 100 150

SCALE IN FEET
SCALE: 1" = 100'

STATE OF TEXAS
ERIC DIETRICH
94970
LICENSED
PROFESSIONAL ENGINEER

6/27/2022
NAME DATE

NO.	REVISION	BY	DATE

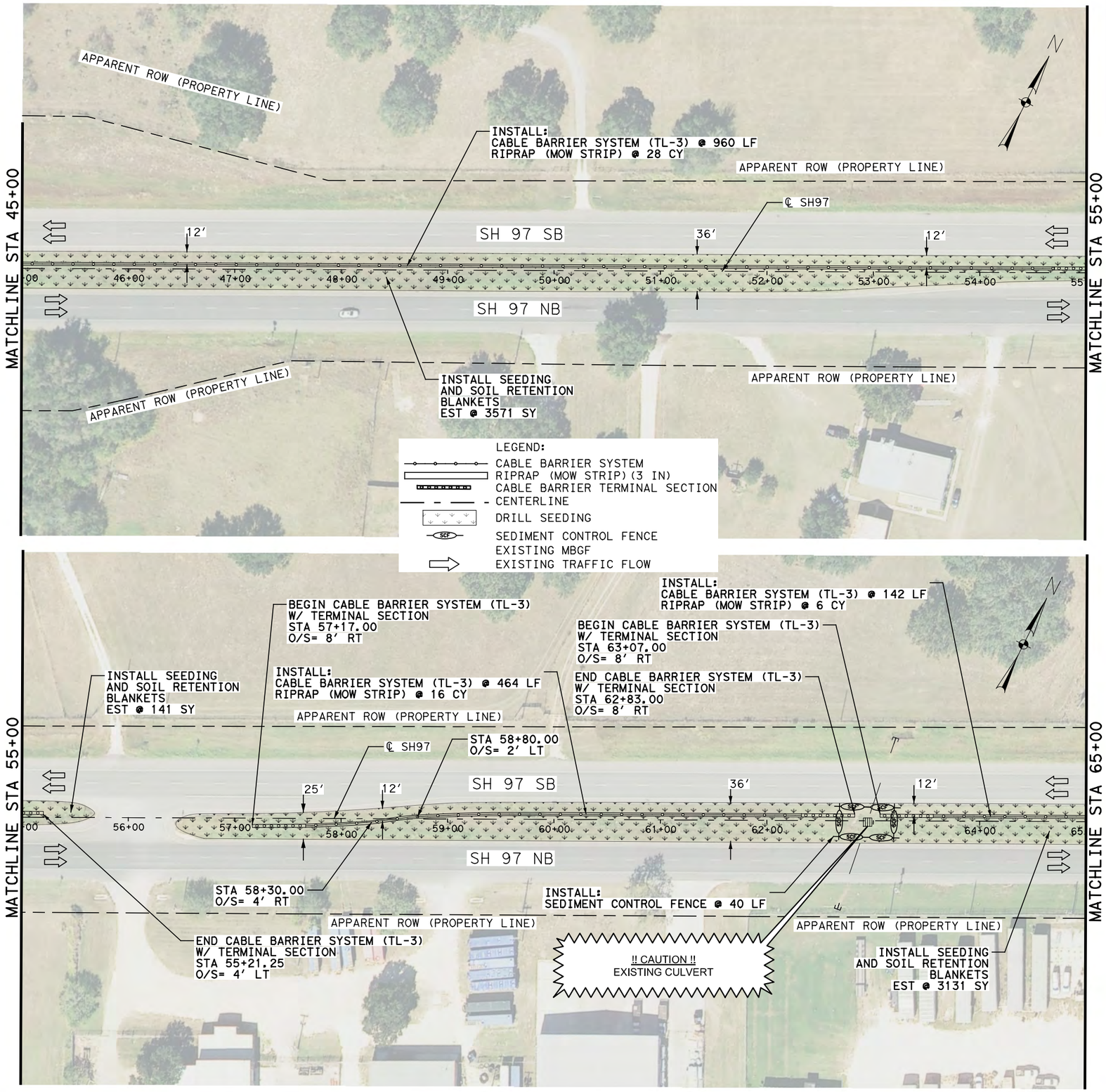
HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
1201 Interstate Highway 2
Mission, Texas 78572
(956) 424-7898
TBPE F-1640

SH 97
CABLE BARRIER PLAN
STA 25+00 TO STA 45+00

SCALE: 1"=100' SHEET 2 OF 7

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	See Title Sheet		54
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068, ETC	US 90, ETC



ESTIMATED QTY CB 3

ITEM#	DESCRIPTION	UNIT	QTY
0132 6019	EMBANKMENT (VEHICLE) (ORD COMP) (TY B)	CY	395
0164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	6843
0164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	6843
0168 6001	VEGETATIVE WATERING	MG	110
0169 6001	SOIL RETENTION BLANKETS(CL1)(TY A)	SY	6843
0432 6066	RIPRAP (MOW STRIP)(3 IN)	CY	50
0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	40
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	40
0543 6001	CABLE BARRIER SYSTEM (TL-3)	LF	1566
0543 6019	CABLE BARRIER TERMINAL SECTION (TL-3)	EA	4

NOTES:

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5. ALL UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR MUST VERIFY ALL EXISTING OVERHEAD AND UNDERGROUND UTILITIES FOR ELEVATION AND CLEARANCES.
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0 25 50 75 100 150

SCALE IN FEET
SCALE: 1" = 100′

STATE OF TEXAS
ERIC DIETRICH
94970
LICENSED
PROFESSIONAL ENGINEER

NAME | DATE: 6/27/2022

NO.	REVISION	BY	DATE

HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

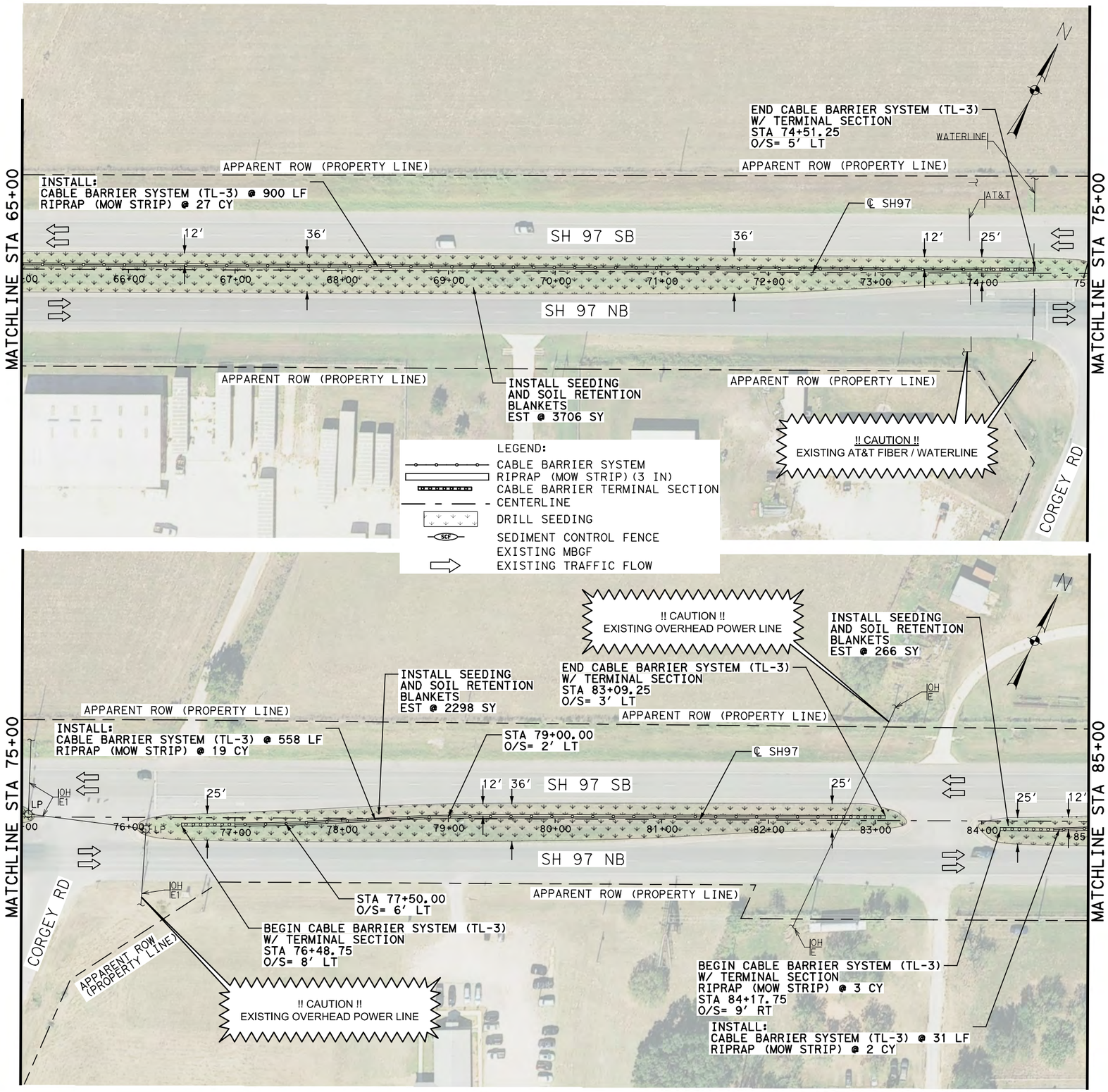
TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
1201 Interstate Highway 2
Mission, Texas 78572
(956) 424-7898
TEDSI TBPE F-1640

SH 97
CABLE BARRIER PLAN
STA 45+00 TO STA 65+00

SCALE: 1"=100′ SHEET 3 OF 7

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.	SHEET
6	See Title Sheet	55

STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068, ETC	US 90, ETC



ESTIMATED QTY CB 4			
ITEM#	DESCRIPTION	UNIT	QTY
0132 6019	EMBANKMENT (VEHICLE) (ORD COMP) (TY B)	CY	112
0164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	6270
0164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	6270
0168 6001	VEGETATIVE WATERING	MG	101
0169 6001	SOIL RETENTION BLANKETS(CL1)(TY A)	SY	6270
0432 6066	RIPRAP (MOW STRIP)(3 IN)	CY	48
0543 6001	CABLE BARRIER SYSTEM (TL-3)	LF	1489
0543 6019	CABLE BARRIER TERMINAL SECTION (TL-3)	EA	4

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR CENTERLINE GEOMETRY OF SH 97.
2. CABLE BARRIERS ARE DESIGNED TO BE PLACED ON 6:1 OR FLATTER SIDE SLOPES. TOPOGRAPHICAL SURVEYING WAS NOT PERFORMED ON THIS PROJECT. BASELINE COINCIDES WITH THE FLOW LINE OF DITCH. CABLE BARRIER LOCATIONS MAY BE ADJUSTED AS NEEDED TO FIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.
3. CABLE BARRIERS SHALL BE PLACED WITH AT LEAST 12-FEET OFFSET FROM THE EDGE OF THE ROADWAY PAVEMENT. CABLE BARRIERS SHALL BE PLACED AT LEAST 1-FEET FROM THE BOTTOM OF THE DITCH LINE.
4. CONTRACTOR SHALL INSTALL TEMPORARY SEDIMENT CONTROL FENCE AS NEEDED.
5. ALL UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR MUST VERIFY ALL EXISTING OVERHEAD AND UNDERGROUND UTILITIES FOR ELEVATION AND CLEARANCES.
6. CONTRACTOR SHALL WINDROW TOWARDS CENTERLINE AND SHALL NOT WINDROW ALONG EDGE OF PAVEMENT.
7. SEED & BLANKETS TO BE INSTALLED AS NEEDED TO REESTABLISH VEGETATION IN DISTURBED AREAS.

0 25 50 75 100 150

SCALE IN FEET
SCALE: 1" = 100'

STATE OF TEXAS
ERIC DIETRICH
94970
LICENSED
PROFESSIONAL ENGINEER

6/27/2022
NAME DATE

NO.	REVISION	BY	DATE

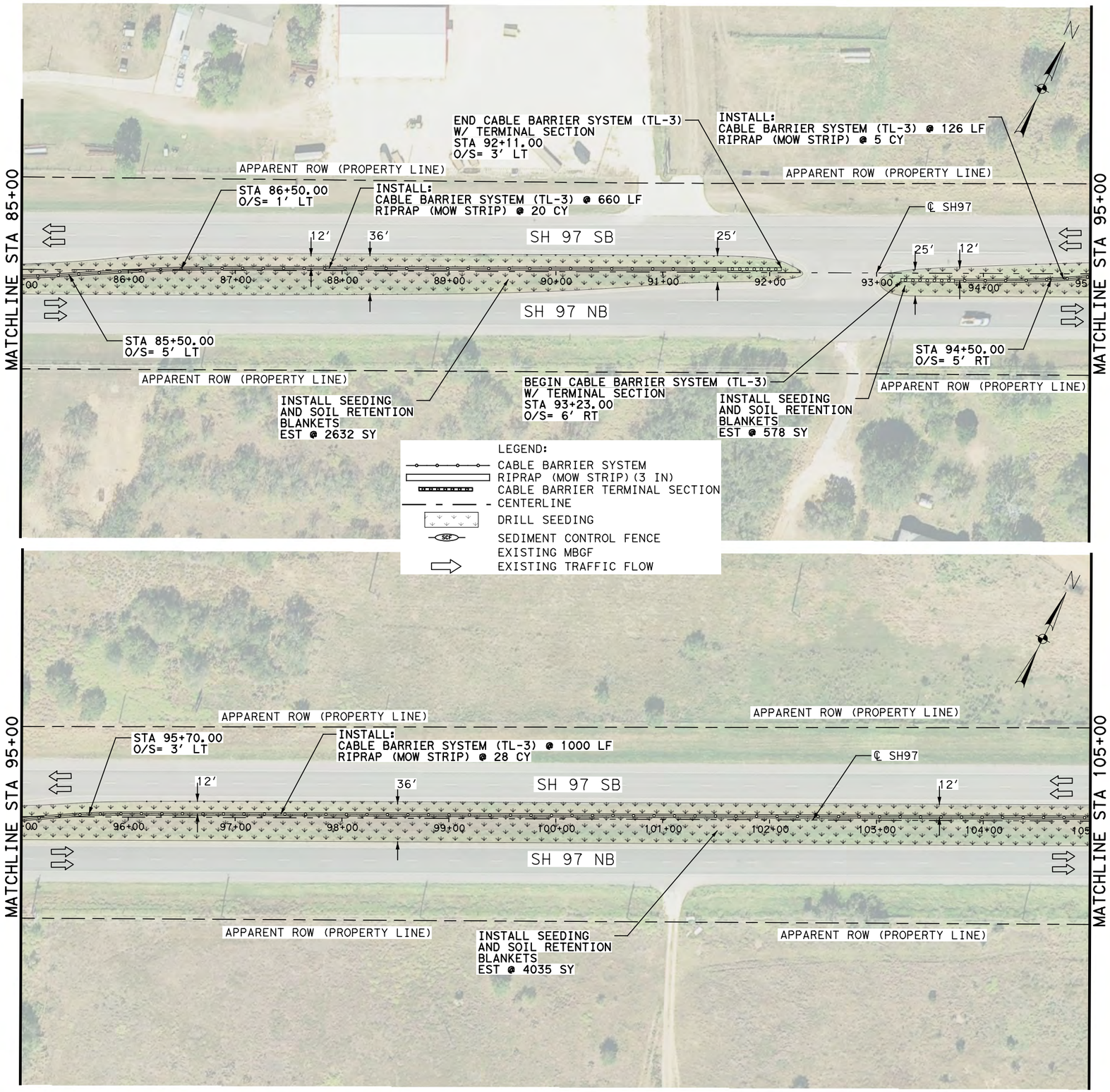
HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
1201 Interstate Highway 2
Mission, Texas 78572
(956) 424-7898
TEDSI TBPE F-1640

SH 97
CABLE BARRIER PLAN
STA 65+00 TO STA 85+00

SCALE: 1"=100' SHEET 4 OF 7

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	See Title Sheet		56
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068, ETC	US 90, ETC



ESTIMATED QTY CB 5

ITEM#	DESCRIPTION	UNIT	QTY
0132 6019	EMBANKMENT (VEHICLE) (ORD COMP) (TY B)	CY	476
0164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	7245
0164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	7245
0168 6001	VEGETATIVE WATERING	MG	116
0169 6001	SOIL RETENTION BLANKETS(CL1)(TY A)	SY	7245
0432 6066	RIPRAP (MOW STRIP)(3 IN)	CY	53
0543 6001	CABLE BARRIER SYSTEM (TL-3)	LF	1786
0543 6019	CABLE BARRIER TERMINAL SECTION (TL-3)	EA	2

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR CENTERLINE GEOMETRY OF SH 97.
2. CABLE BARRIERS ARE DESIGNED TO BE PLACED ON 6:1 OR FLATTER SIDE SLOPES. TOPOGRAPHICAL SURVEYING WAS NOT PERFORMED ON THIS PROJECT. BASELINE COINCIDES WITH THE FLOW LINE OF DITCH. CABLE BARRIER LOCATIONS MAY BE ADJUSTED AS NEEDED TO FIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.
3. CABLE BARRIERS SHALL BE PLACED WITH AT LEAST 12-FEET OFFSET FROM THE EDGE OF THE ROADWAY PAVEMENT. CABLE BARRIERS SHALL BE PLACED AT LEAST 1-FEET FROM THE BOTTOM OF THE DITCH LINE.
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7. SEED & BLANKETS TO BE INSTALLED AS NEEDED TO REESTABLISH VEGETATION IN DISTURBED AREAS.

0 25 50 75 100 150

SCALE IN FEET
SCALE: 1" = 100'

STATE OF TEXAS
ERIC DIETRICH
94970
LICENSED
PROFESSIONAL ENGINEER

6/27/2022

NAME DATE

NO.	REVISION	BY	DATE

HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
1201 Interstate Highway 2
Mission, Texas 78572
(956) 424-7898
TEDSI
TBPE F-1640

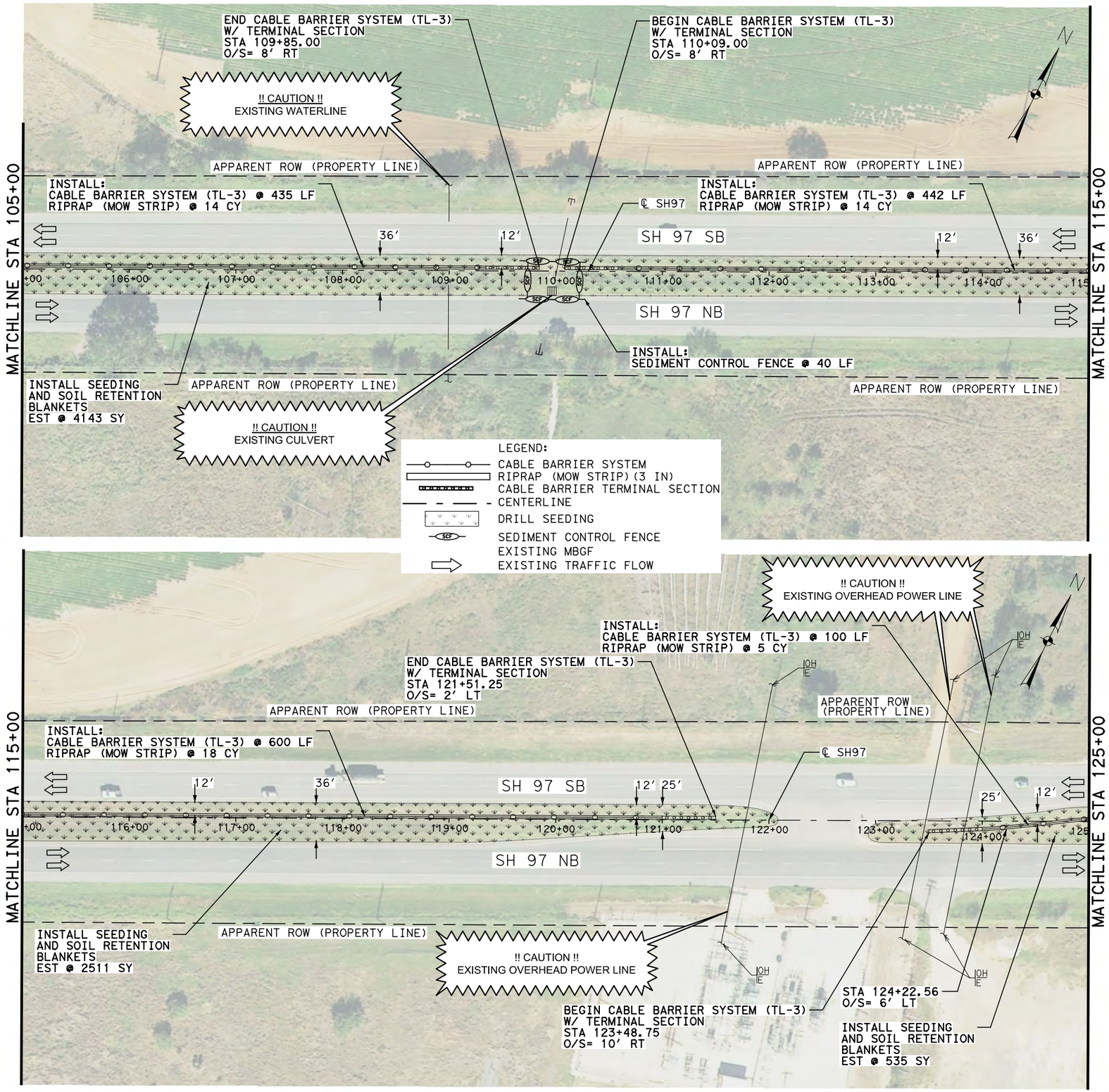
SH 97
CABLE BARRIER PLAN
STA 85+00 TO STA 105+00

SCALE: 1"=100' SHEET 5 OF 7

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.	SHEET
6	See Title Sheet	57

STATE	DISTRICT	COUNTY
TEXAS	SAT	MEDINA, ETC

CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068, ETC	US 90, ETC



ESTIMATED QTY CB 6

ITEM#	DESCRIPTION	UNIT	QTY
0132 6019	EMBANKMENT (VEHICLE) (ORD COMP) (TY B)	CY	399
0164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	7189
0164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	7189
0168 6001	VEGETATIVE WATERING	MG	115
0169 6001	SOIL RETENTION BLANKETS(CL1)(TY A)	SY	7189
0432 6066	RIPRAP (MOW STRIP)(3 IN)	CY	51
0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	40
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	40
0543 6001	CABLE BARRIER SYSTEM (TL-3)	LF	1577
0543 6019	CABLE BARRIER TERMINAL SECTION (TL-3)	EA	4

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR CENTERLINE GEOMETRY OF SH 97.
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7. SEED & BLANKETS TO BE INSTALLED AS NEEDED TO REESTABLISH VEGETATION IN DISTURBED AREAS.

0 25 50 75 100 150

SCALE IN FEET
SCALE: 1" = 100'

STATE OF TEXAS
ERIC DIETRICH
94970
LICENSED
PROFESSIONAL ENGINEER

6/27/2022
NAME DATE

NO.	REVISION	BY	DATE

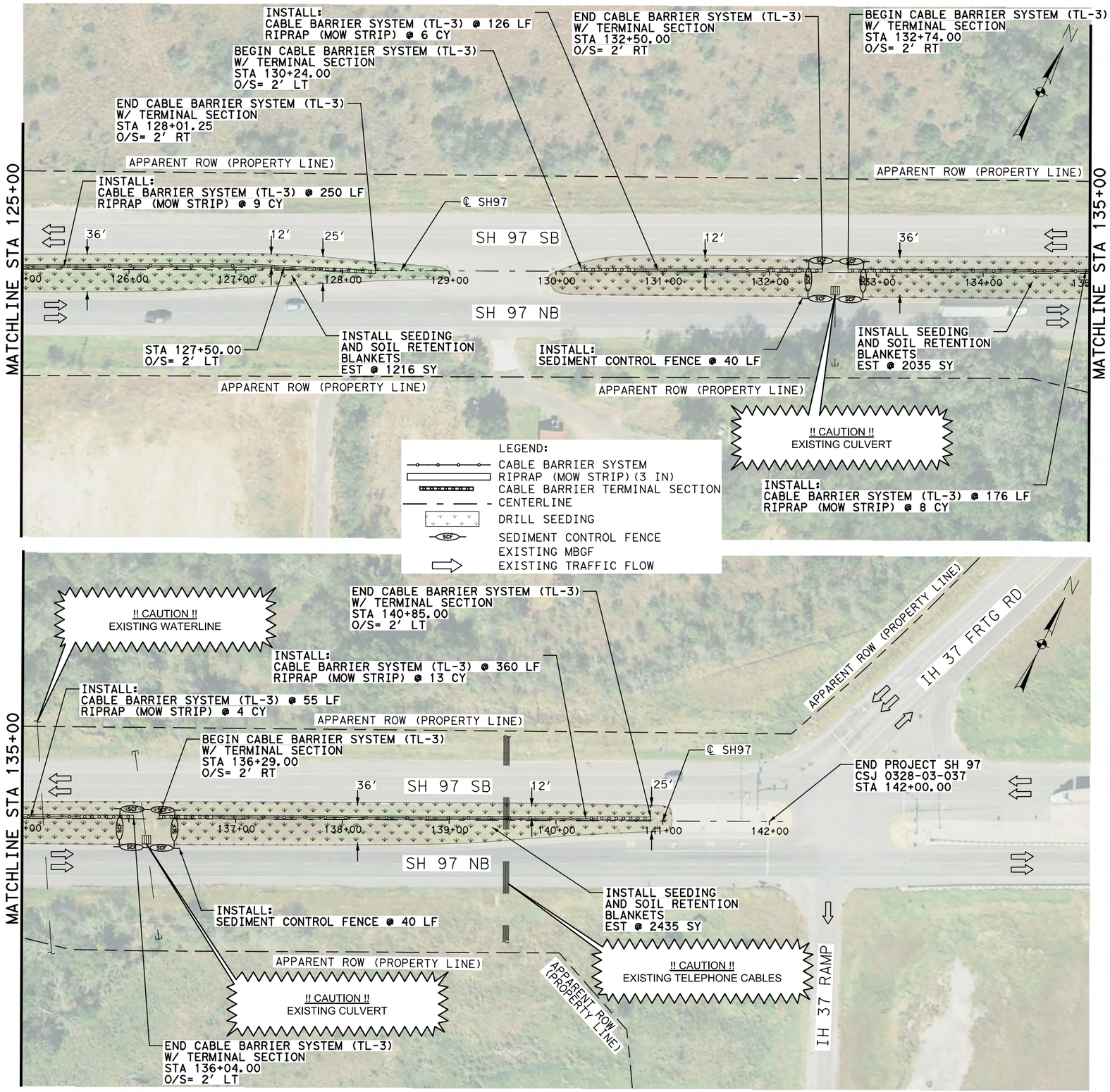
HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

TEDSI INFRASTRUCTURE GROUP
Consulting Engineers
1201 Interstate Highway 2
Mission, Texas 78572
(956) 424-7898
TEDSI TBPE F-1640

SH 97
CABLE BARRIER PLAN
STA 105+00 TO STA 125+00

SCALE: 1"=100' SHEET 6 OF 7

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	See Title Sheet		58
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068, ETC	US 90, ETC



ESTIMATED QTY CB 7			
ITEM#	DESCRIPTION	UNIT	QTY
0132 6019	EMBANKMENT (VEHICLE) (ORD COMP) (TY B)	CY	500
0164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	5686
0164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	5686
0168 6001	VEGETATIVE WATERING	MG	91
0169 6001	SOIL RETENTION BLANKETS(CL1)(TY A)	SY	5686
0432 6066	RIPRAP (MOW STRIP)(3 IN)	CY	40
0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	80
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	80
0543 6001	CABLE BARRIER SYSTEM (TL-3)	LF	967
0543 6019	CABLE BARRIER TERMINAL SECTION (TL-3)	EA	7

NOTES:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR CENTERLINE GEOMETRY OF SH 97.
2. CABLE BARRIERS ARE DESIGNED TO BE PLACED ON 6:1 OR FLATTER SIDE SLOPES. TOPOGRAPHICAL SURVEYING WAS NOT PERFORMED ON THIS PROJECT. BASELINE COINCIDES WITH THE FLOW LINE OF DITCH. CABLE BARRIER LOCATIONS MAY BE ADJUSTED AS NEEDED TO FIT FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.
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7. SEED & BLANKETS TO BE INSTALLED AS NEEDED TO REESTABLISH VEGETATION IN DISTURBED AREAS.

0 25 50 75 100 150

SCALE IN FEET
SCALE: 1" = 100'

STATE OF TEXAS
ERIC DIETRICH
94970
LICENSED
PROFESSIONAL ENGINEER

6/27/2022
NAME DATE

NO.	REVISION	BY	DATE

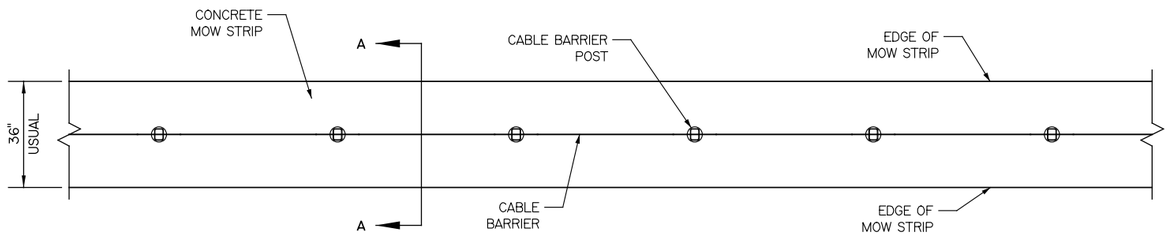
HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

TEDSI INFRASTRUCTURE GROUP
TEDSI
TBPE F-1640
Consulting Engineers
1201 Interstate Highway 2
Mission, Texas 78572
(956) 424-7898

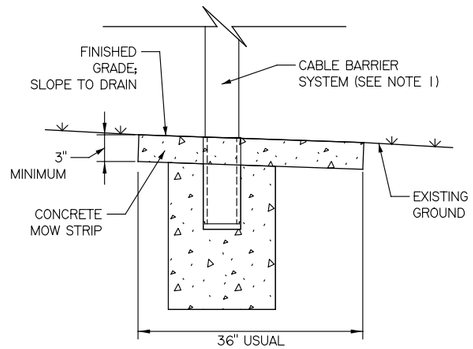
SH 97
CABLE BARRIER PLAN
STA 125+00 TO END

SCALE: 1"=100' SHEET 7 OF 7

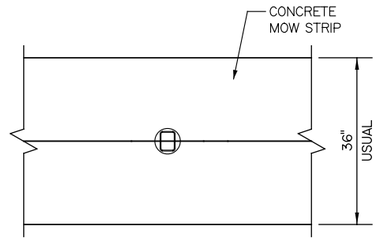
FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	See Title Sheet		59
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068, ETC	US 90, ETC



CABLE BARRIER MOW STRIP PLAN VIEW



CABLE BARRIER MOW STRIP - SECTION A-A



CABLE BARRIER MOW STRIP PLAN VIEW - DETAIL

NOTES:

1. FOR ADDITIONAL INFORMATION ON CABLE BARRIER AND FOUNDATION DETAILS, SEE APPLICABLE STANDARDS.
2. MOW STRIPS SHALL BE REINFORCED CONCRETE WITH (WIRE MESH OR SYNTHETIC FIBER), AS SHOWN ON THE PLANS AND WILL BE PAID FOR UNDER THE PERTINENT BID ITEM. REINFORCED CONCRETE SHALL BE PLACED IN ACCORDANCE WITH ITEM 432, "RIPRAP". THE USE OF SYNTHETIC FIBER IN LIEU OF STEEL REINFORCING IS ACCEPTABLE, PROVIDED THE FIBER PRODUCER IS ON THE DEPARTMENT MATERIAL PRODUCER LIST (MPL), MAINTAINED BY TxDOT, CONSTRUCTION DIVISION.
3. THE CABLE BARRIER SYSTEM(S) SELECTED FOR EACH PROJECT SHALL BE INSTALLED BASED ON THE STANDARDS, GUIDELINES, AND RECOMMENDATIONS PROVIDED BY THE SELECTED MANUFACTURER(S) OF EACH INDIVIDUAL SYSTEM.
4. USE CLASS "A" CONCRETE IN ACCORDANCE WITH ITEM 421.

STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER

9/22/2022

THE SEAL ORIGINALLY APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY JOHNNY L.CLAYTON, P.E. #107215 ON 9/22/2022 . ALTERATION OF A PREVIOUSLY SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT. THE RECORD COPY OF THIS DRAWING IS ON FILE AT THE OFFICES OF HALFF ASSOCIATES, INC., 100 NE INTERSTATE 410 LOOP, SUITE 200, SAN ANTONIO, TEXAS 78216, TBPE FIRM #F-312

NO.	REVISION	BY	DATE

HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

Texas Department of Transportation®

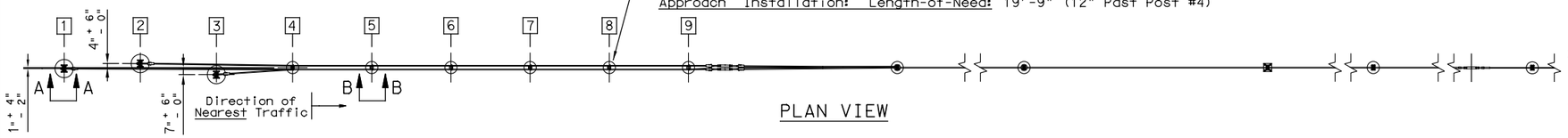
MISCELLANEOUS DETAILS

SCALE: NTS SHEET 1 OF 1

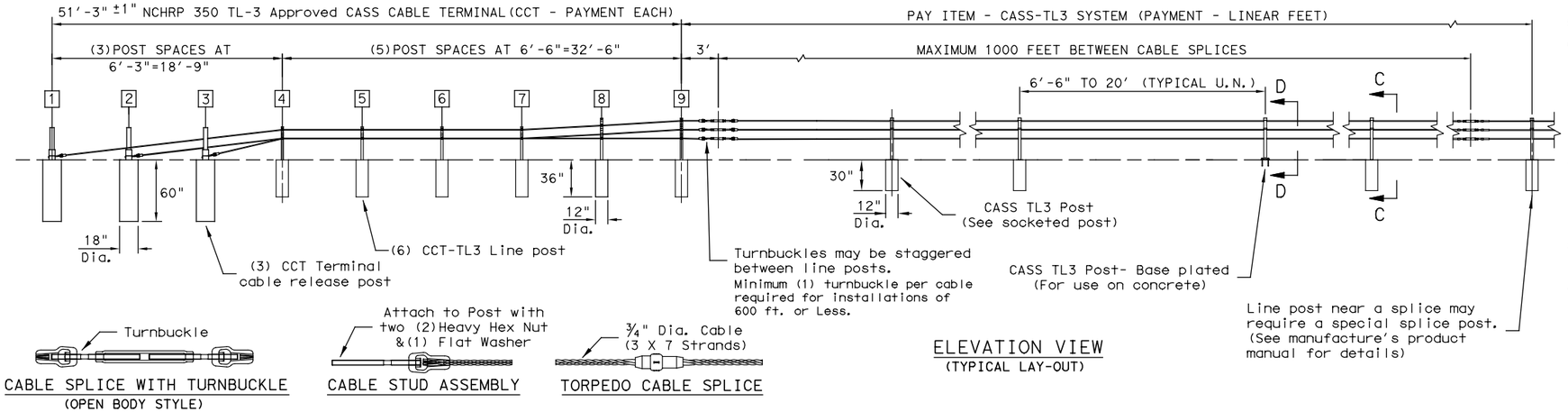
FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET
6	SEE TITLE SHEET		59A
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0024	04	068,ETC.	US 90, ETC.

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

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



PLAN VIEW

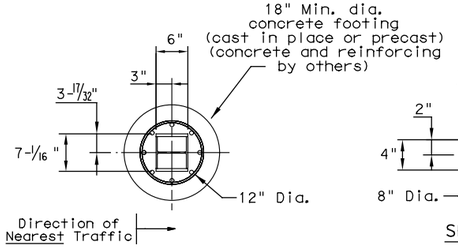


ELEVATION VIEW
(TYPICAL LAY-OUT)

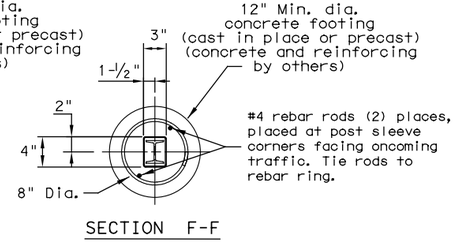
CABLE SPLICE WITH TURNBUCKLE
(OPEN BODY STYLE)

CABLE STUD ASSEMBLY

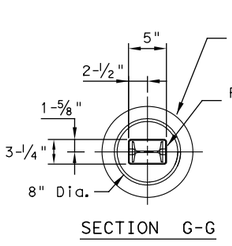
TORPEDO CABLE SPLICE



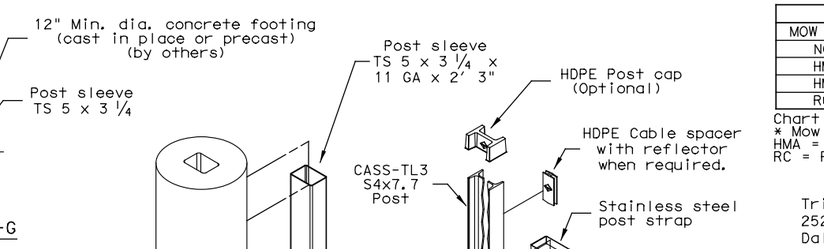
SECTION E-E



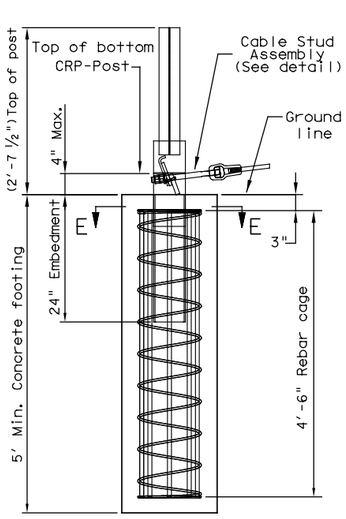
SECTION F-F



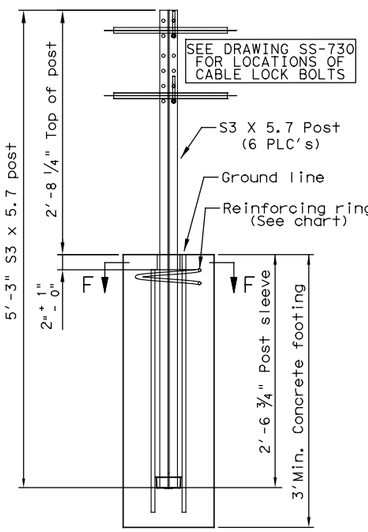
SECTION G-G



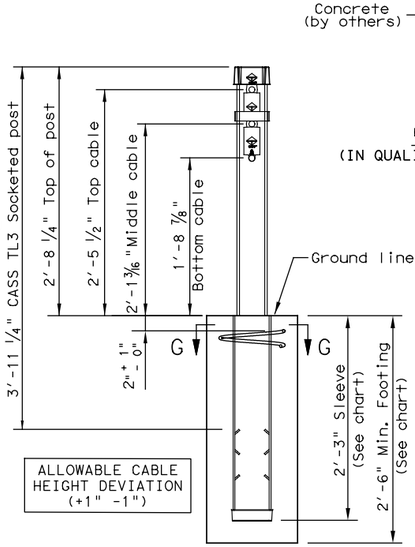
CONCRETE FOOTING
(IN QUALIFYING MOW STRIP SEE CHART)



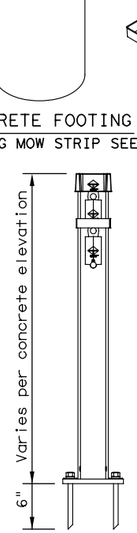
VIEW A-A
(CABLE RELEASE POST 1-3)



VIEW B-B
(TERMINAL LINE POST 4-7)



SECTION C-C
(SOCKETED POST)



SECTION D-D
(BASE PLATED POST)

STANDARD POST & CONCRETE FOOTING
(SOCKETED POST)

GENERAL NOTES

1. This drawing is a general overview of CASS TL-3 Barrier System. See SS-730 (latest version) for specific details of CASS cable terminal (CCT) and cable safety system (CASS) requirements, proper installation, options and specification.
2. CASS is designed for bi-directional traffic flows and can be installed on either side of the median. Contact Trinity (800-527-6050) or consult the design, installation, or repair manual(s) for additional information.
3. All concrete for CASS footings shall be TxDOT class A. If class A or stronger concrete is utilized for the mowstrip, please see chart below for allowable footing depth and sleeve deviations.
4. All posts shall be socketed unless otherwise specified. All cables shall be pre-stretched unless otherwise specified.
5. For payment see Special Specification "Cable Barrier System".
6. CASS TL-3 shall be installed on shoulders or medians with slopes of 6:1 or flatter without obstructions, depressions, etc. That may significantly affect the stability of an errant vehicle. Grading of site and/or appropriate fill materials may be required. The designer/installer shall "Flatten" or "Round" various topographical inconsistencies that could interfere with the ability of the installer to consistently maintain the design height (in relation to the terrain) of the cables. Please consult manual(s) and / or TxDOT Memo(s) for installations in "Ditch Sections".
7. CASS TL-3 post spacing may be modified to avoid obstacles that conflict with the installation of CASS TL-3 line posts or to reduce deflection on radiuses. No post space can exceed the maximum post TxDOT space limit of 20'. Reducing or increasing post spacing affects deflection. CASS TL-3 may be laterally transferred at a rate not to exceed 30:1.
8. Post foundations may be drilled through existing pavement. Please see line post foundation chart for minimum footing requirements in various applications.
9. For aesthetic purposes Trinity recommends all sleeves, driven posts, and lower cable release posts to be installed reasonably plumb (approximately ⅛" per foot).
10. CASS TL-3 shall be installed in well-drained, compacted, NCHRP Report 350 Standard soil. If soil does not meet this classification, if solid rock/concrete is encountered below grade or if soil is susceptable to severe freeze/thaw cycles, please contact Trinity about alternate footing design(s). Trinity suggests the use of "Mow strips" for erosion prevention and ease of maintenance / installation.
11. See the Texas MUTCD for proper "Barrier" Delineation.

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

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

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

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

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

Product.INFO@TRIN.NET

Texas Department of Transportation — Design Division Standard

TRINITY CABLE SAFETY SYSTEM (TL-3)

CASS(TL3)-14

FILE: casst1314.dgn	DN: TxDOT	CK: RM	DW: VP	CK:
©TxDOT: MARCH 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	04	068,ETC	US 90,ETC
	DIST	COUNTY		SHEET NO.
	SAT	MEDINA,ETC		60

DATE: 4/29/2022 2:15:28 PM
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DATE: 4/29/2022
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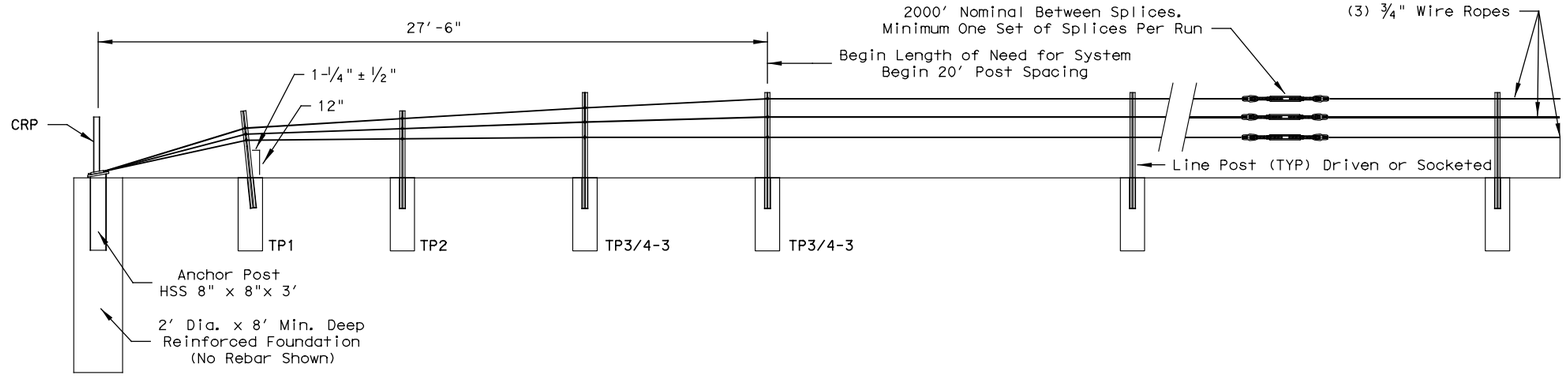
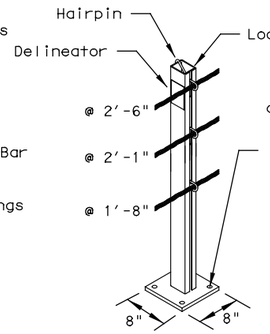
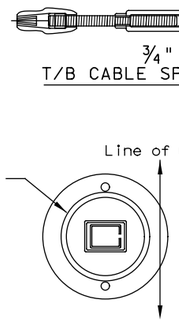
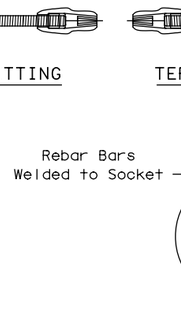




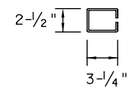
LINE POST
(BASE-PLATED OPTION)
Low-Fill Box Culvert Less than 15" Fill



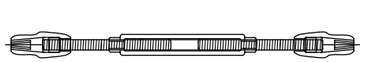
SECTION A



SECTION B



C-SECTION POST



¾" MIN
T/B CABLE SPLICE FITTING

¾" MIN
TERMINAL FITTING

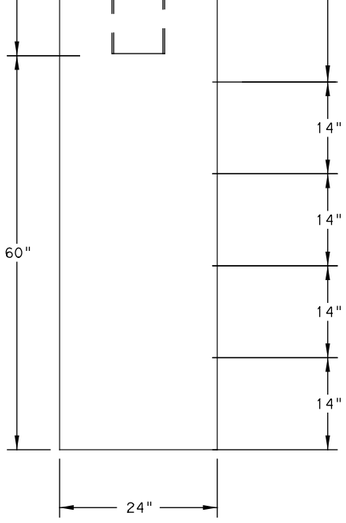
GENERAL NOTES

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

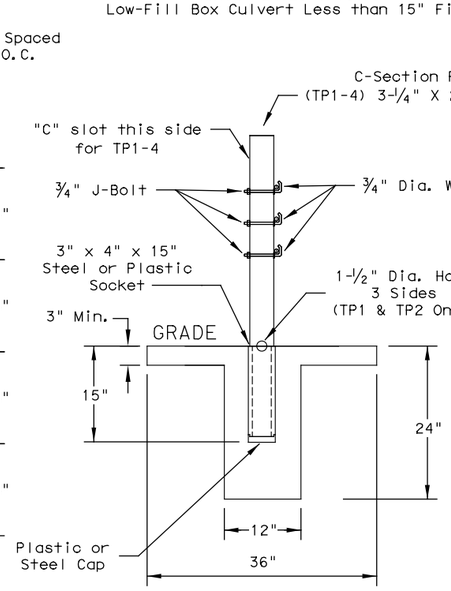
CABLE TENSION CHART*	
-10 °F	8000
0 °F	7600
10 °F	7200
20 °F	6800
30 °F	6400
40 °F	6000
50 °F	5600
60 °F	5200
70 °F	4800
80 °F	4400
90 °F	4000
100 °F	3600
110 °F	3200

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

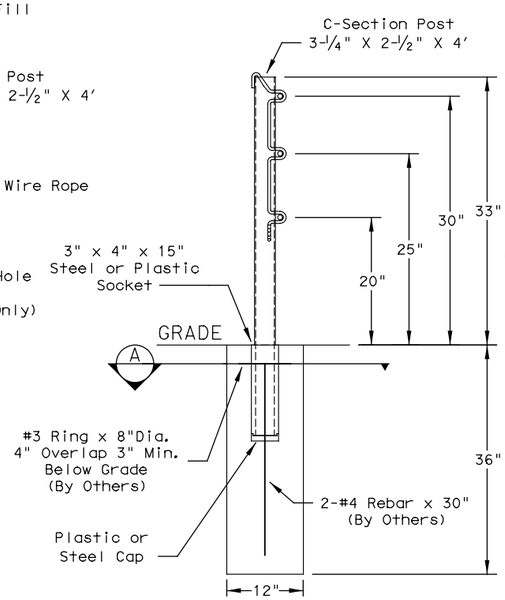
* Allowable Deviation from Chart +/- 10%



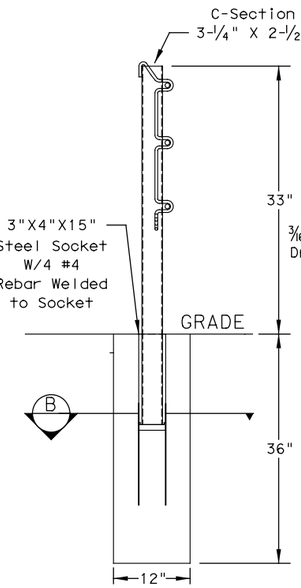
CABLE RELEASE AND ANCHOR POST



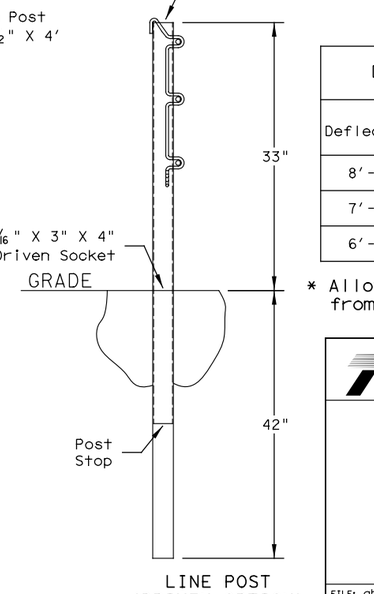
TERMINAL POST
(SHOWN WITH CONCRETE MOWSTRIP)
(Shown with Tube Plate Option)
(See Note 9)



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



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



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

Texas Department of Transportation

Design Division Standard

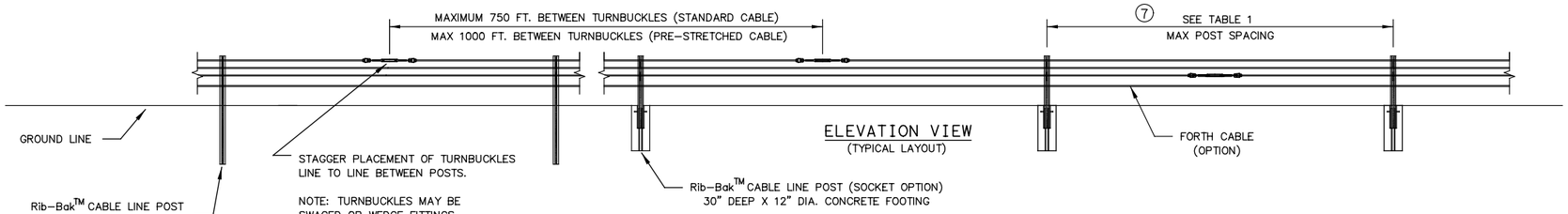
GIBRALTAR
CABLE BARRIER SYSTEM
(TL-3)

GBRLTR(TL3)-14

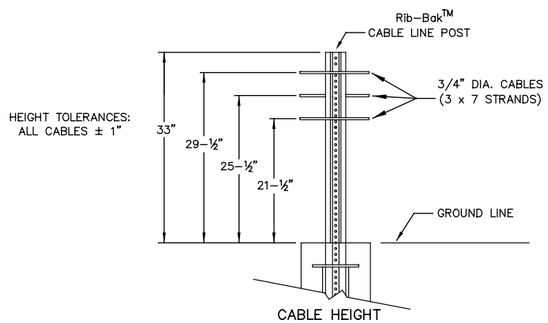
FILE: gbrltrtl314.dgn	DN: TxDOT	CK: RM	DW: VP	CK:
©TxDOT: March 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	002404		068,ETC	US 90,ETC
	DIST	COUNTY		SHEET NO.
	SAT	MEDINA,ETC		61

DATE: 4/29/2022
FILE: pw:\\halff-pw.bentley.com:halff-pw-01\Documents\34832.F00 US90_SH97\500 CADD\Sheets\Standards\nucable1t1314.dgn

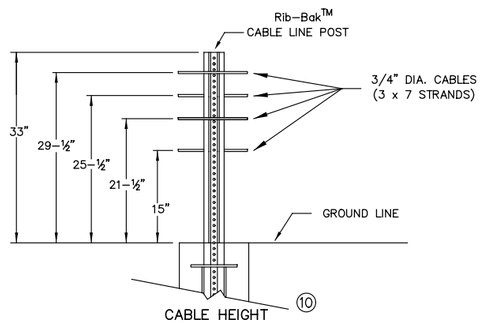
PLAN VIEW



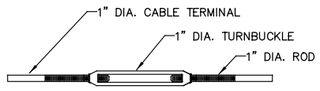
ELEVATION VIEW
(TYPICAL LAYOUT)



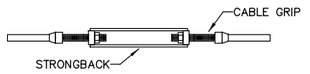
CABLE HEIGHT
(3 CABLE SYSTEM FOR 6:1 SLOPES)



CABLE HEIGHT
(OPTIONAL 4 CABLE SYSTEM FOR 6:1 SLOPES)



WEDGED FITTING
TURNBUCKLE DETAIL
(TYPICAL)



STRONGBACK (SELF-SWAGING)
TURNBUCKLE DETAIL
(OPTIONAL)

GENERAL NOTES

1. FOR ADDITIONAL INFORMATION CONTACT YOUR DISTRIBUTOR OR NUCOR STEEL MARION, INC. AT (603) 430-9350.
2. FOR PAYMENT SEE SPECIAL SPECIFICATION "CABLE BARRIER SYSTEM".
3. FOR ADDITIONAL INFORMATION SEE THE MANUFACTURER'S PRODUCT MANUAL.
4. THE NU-CABLE SYSTEM IS DESIGNED FOR BI-DIRECTIONAL TRAFFIC FLOWS. SEE THE MANUFACTURER'S PRODUCT MANUAL FOR PLACEMENT ADJACENT TO GUARDRAIL END TREATMENTS.
5. THE NU-CABLE SYSTEM SHALL BE INSTALLED ON SHOULDERS OR MEDIANS WITH SLOPES OF 6:1 OR FLATTER WITHOUT OBSTRUCTIONS, DEPRESSIONS, ETC. THAT MAY SIGNIFICANTLY AFFECT THE STABILITY OF AN ERRANT VEHICLE.
6. THE NU-CABLE SYSTEM MAY BE INSTALLED ON EITHER SIDE OF THE ROADWAY. Rib-Bak™ CABLE LINE POSTS MAY BE SOCKETED OR DRIVEN DESIGN.
7. THE TL-3 THREE-CABLE AND FOUR-CABLE FOR 6:1 SLOPES CAN USE EITHER A 4# /LF OR 5# /LF POST. SEE TABLE # 1 FOR POST SIZE PER SPACING.
8. SEE (TABLE 2) FOR TENSION AMOUNT AT SPECIFIC CABLE TEMPERATURE FOR INITIAL INSTALLATION.
9. SEE (TABLE 3) FOR TENSION AMOUNT AT SPECIFIC CABLE TEMPERATURE FOR MAINTENANCE.
10. FOURTH (LOWEST) CABLE IS OPTIONAL. SEE PROJECT SPECIFICATIONS FOR REQUIRMENT OF FOURTH CABLE.
11. CONSULT YOUR PROJECT PLAN SHEET AND CABLE BARRIER SPECIFICATIONS FOR DESIRED SOCKET MATERIAL.
12. ALL FOUNDATION DESIGNS ARE BASED ON NCHRP 350 STRONG (S1) SOIL. CONSULT THE MANUFACTURER FOR SPECIFIC FOUNDATION DESIGN IF SOIL TYPES DIFFER.

⑦ TABLE 1

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

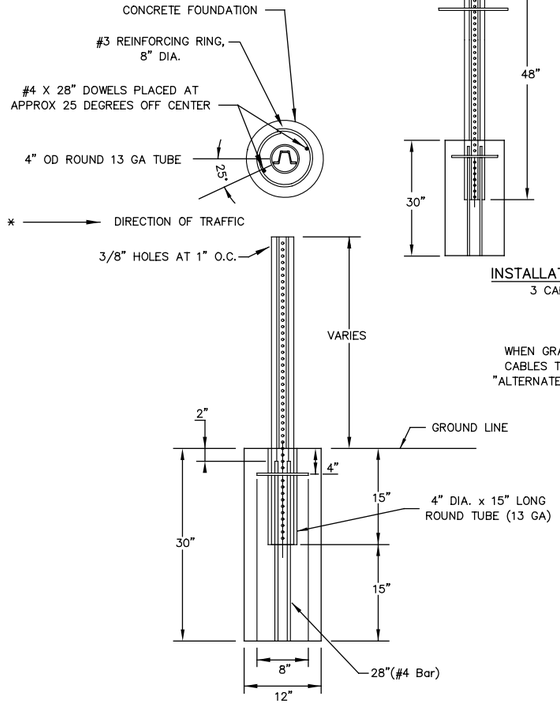
POST SPACING IS PER 8 FOOT DEFLECTION REQUIRMENTS.
CONSULT PRODUCT MANUAL IF GREATER DEFLECTION IS PERMISSIBLE.

⑧ TABLE 2

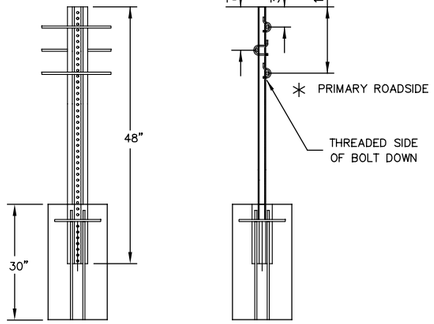
CABLE TENSION CHART	
INITIAL INSTALL	
F	LBF
120	4624
110	4986
100	5350
90	5713
80	6077
70	6440
60	7167
50	7894
40	8619
30	9346
20	10073
10	10800
0	11525
-10	12252
-20	12979
-30	13706

⑨ TABLE 3

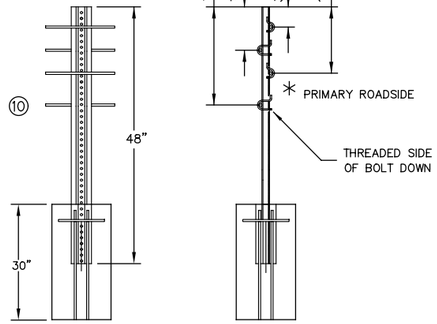
CABLE TENSION CHART	
MAINTENANCE	
F	LBF
120	4021
110	4336
100	4652
90	4968
80	5284
70	5600
60	6232
50	6864
40	7495
30	8127
20	8759
10	9391
0	10022
-10	10654
-20	11286
-30	11918



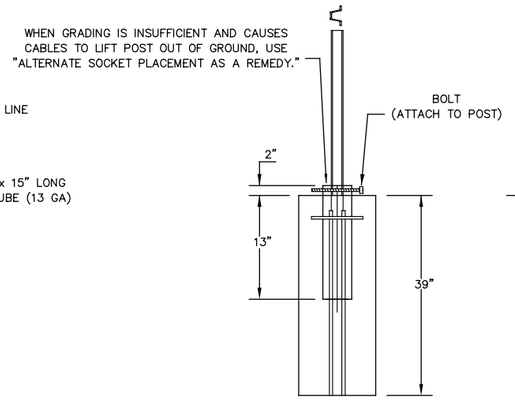
SOCKETED POST OPTION ⑪
(TYPE S POST)



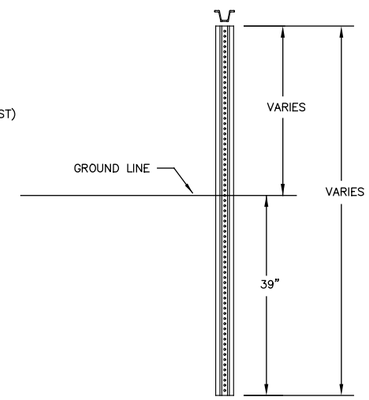
INSTALLATION DETAIL
3 CABLE 6:1



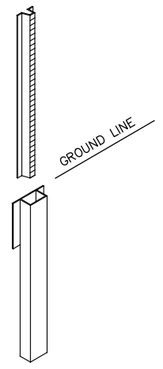
INSTALLATION DETAIL
4 CABLE 6:1



ALTERNATE SOCKET PLACEMENT
(TYPE S POST)



DRIVEN POST OPTION
(TYPE D POST)



DRIVEN SOCKET OPTION
(TYPE S POST)

SHEET 1 OF 2

Texas Department of Transportation

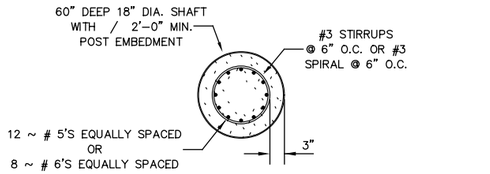
Design Division Standard

NU-CABLE BARRIER SYSTEM (TL-3) (3 OR 4 CABLE)

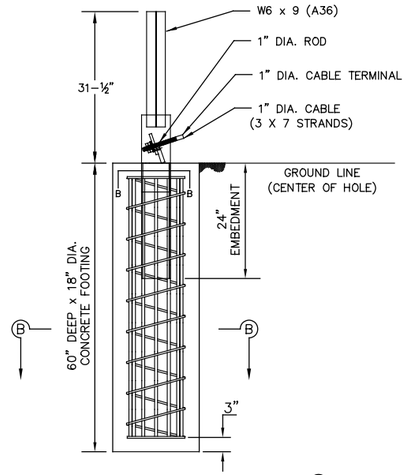
NU-CABLE(TL3)-14

FILE:	DN:	CK:	DW:	CK:
©TxDOT:	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	04	068,ETC	US 90,ETC
	DIST	COUNTY		SHEET NO.
	SAT	MEDINA,ETC		62

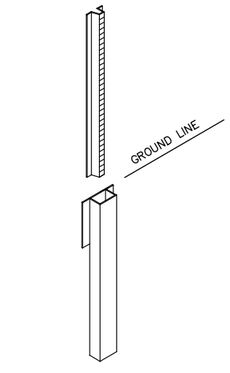
DATE: 4/29/2022
FILE: pw:\\halff-pw.bentley.com:halff-pw-01\Documents\34832.F00 US90_SH97\500 CADD\Sheets\Standards\nucable(tl3)14.dgn



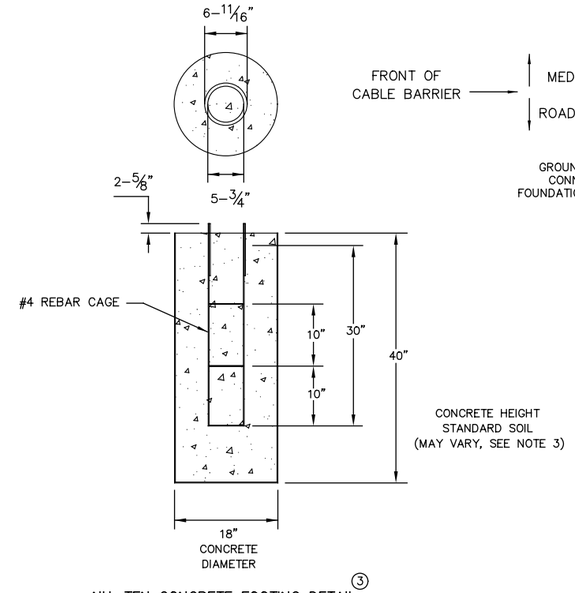
SECTION B–B
(CABLE RELEASE POST)



DETAIL A – CRP IN CONCRETE FOOTING ③
(3000 PSI MIN CONCRETE)



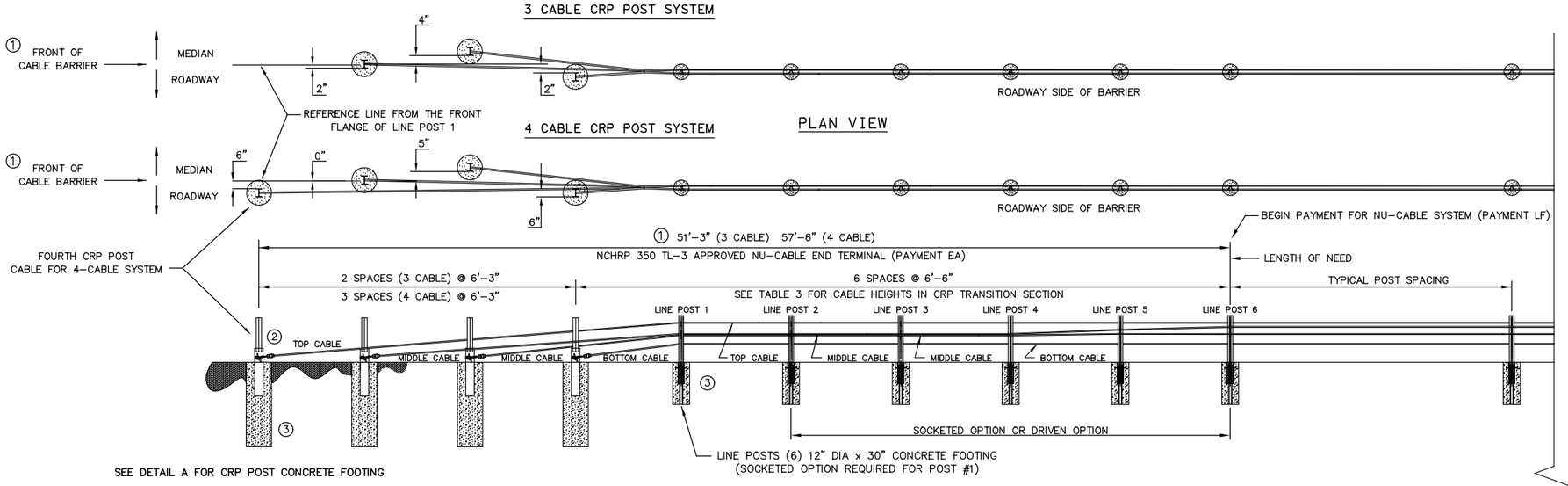
DRIVEN SOCKET OPTION



NU–TEN CONCRETE FOOTING DETAIL ③

3 CABLE CRP POST SYSTEM

4 CABLE CRP POST SYSTEM

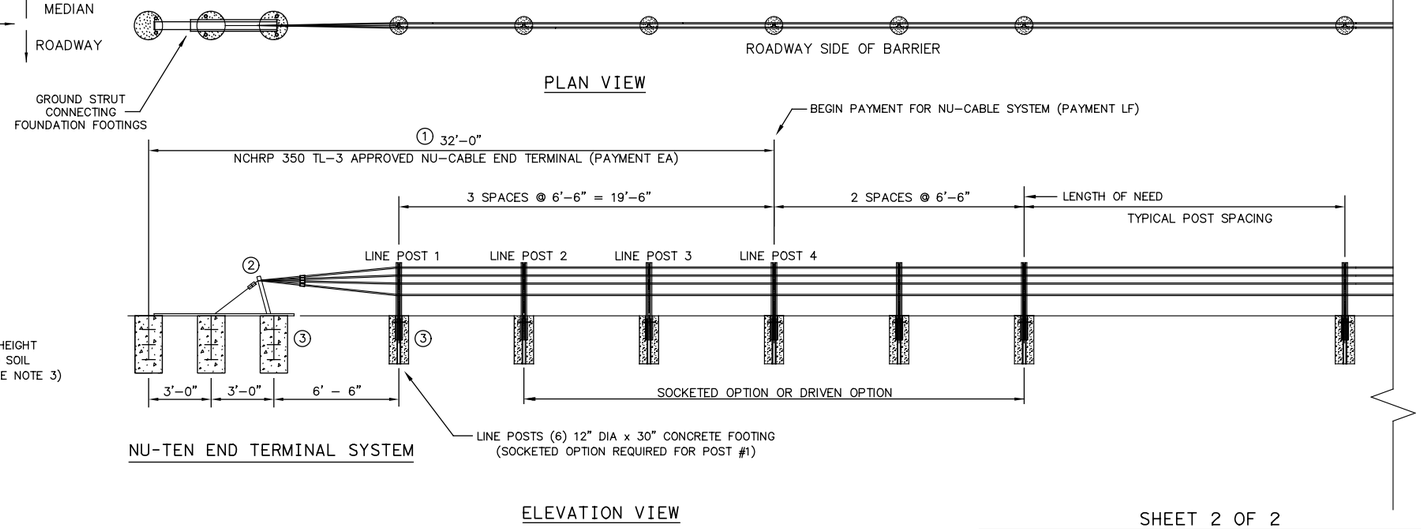


SEE DETAIL A FOR CRP POST CONCRETE FOOTING

PLAN VIEW

ELEVATION VIEW

CRP POST END TERMINAL SYSTEMS (3 AND 4 CABLE)



PLAN VIEW

NU–TEN END TERMINAL SYSTEM

ELEVATION VIEW

④ TABLE 4

CRP END TERMINAL CABLE HEIGHTS - TL-3- THREE CABLE						
	LP 1	LP 2	LP 3	LP 4	LP 5	LP 6
TOP CABLE	28"	28"	28"	28"	30"	30"
MIDDLE CABLE	22"	22"	22"	23"	25"	25"
BOTTOM CABLE	19"	19"	19"	20"	20"	21"
CRP END TERMINAL CABLE HEIGHTS - TL-3- FOUR CABLE 6:1						
	LP 1	LP 2	LP 3	LP 4	LP 5	LP 6
TOP CABLE	28"	28"	28"	28"	30"	30"
UPPER-MIDDLE CABLE	22"	22"	22"	23"	25"	25"
BOTTOM-MIDDLE CABLE	19"	19"	19"	20"	20"	21"
BOTTOM CABLE	15"	15"	15"	15"	15"	15"

REFER TO SHEET 1 OF 2 FOR LENGTH OF NEED CABLE HEIGHTS.

NOTES:

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

Texas Department of Transportation

Design Division Standard

NU-CABLE BARRIER SYSTEM (TL-3) (3 OR 4 CABLE)

NU-CABLE(TL3)-14

FILE:	DN:	CK:	DW:	CK:
©TxDOT:	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	04	068,ETC	US 90,ETC
	DIST	COUNTY		SHEET NO.
	SAT	MEDINA,ETC		63

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

Texas Pollutant Discharge Elimination System (TPDES) TXR 150000: Stormwater Discharge Permit or Construction General Permit (CGP) required for projects with 1 or more acres distrubed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

☐ No Action Required ☒ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000.
2. Comply with the Storm Water Pollution Prevention Plan (SW3P) and revise when necessary to control pollution or required by the Engineer.
3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and Texas Commission on Environmental Quality (TCEQ), Environmental Protection Agency (EPA) or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, Contractor shall submit Notice of Intent (NOI) to TCEQ and the Engineer.
5. NOI required: ☐Yes ☒No

Note: If amount of soil disturbance changes, permit requirements may change.

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

US Army Corps of Engineers (USACE) Permit required for filling, dredging, excavating or other work in any potential USACE jurisdictional water, such as, rivers, creeks, streams, or wetlands.

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

☒ No Permit Required
☐ Nationwide Permit (NWP) 14 - Pre-construction Notice (PCN) not Required
☐ Nationwide Permit 14 - PCN Required
☐ 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 (BMPs) planned to control erosion, sedimentation and post-project total suspended solids (TSS).

1.

2.

3.

4.

401 Best Management Practices: (Not applicable if no USACE permit)

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

III. CULTURAL RESOURCES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

IV. VEGETATION RESOURCES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

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

☐ No Action Required ☒ Required Action

Action No.

1. MIGRATORY BIRD NESTS: Schedule construction activities as needed to meet the following requirements:

   A. Do not remove or destroy any active migratory bird nests (nests containing eggs and/or flightless birds) at any time of year. If there are any active nests, they shall not be removed until the nests become inactive.

   B. On/in structures, if there are any active nests, they shall not be removed until all nests become inactive. After inactive nests are removed and/or before nest activity begins, deterrent materials may be applied to the structures to prevent future nest building.

2. See Item 5 in General Notes.
3.
4.

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

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 appropiate 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 follwing 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

Hazardous Materials or Contamination Issues Specific to this Project:

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

Does the project involve the demolition of a span bridge?

☐ Yes ☒ No (No further action required)

If "Yes", a pre- demolition notification must be submitted to the Texas Department of State Health Services. The contractor shall contact TxDOT's Project Engineer 25 calendar days prior to the demolition of the bridges(s) on the project to assist with the notification.

VII. OTHER ENVIRONMENTAL ISSUES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

Texas Department of Transportation
San Antonio District Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic_2015-10-09_SAT.dgn	DN: TxDOT	CK: TxDOT	DW: BW	CK: GAG
©TxDOT OCTOBER 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	04	068, ETC	US 90/SH 97
	DIST	COUNTY		SHEET NO.
	SAT	MEDINA, ETC		64

Note To Designer:
1. Do not alter Sheet Design or Font style, size or weight - match text attributes.
2. If additional space is needed for a numbered section, fence and adjust sections up or down as needed for proportioning and readability but do not relocate from it's relative position.

A. GENERAL SITE DATA

1. PROJECT LIMITS: *US 90 FROM 3.45 MI EAST OF RM 187 TO 0.10 MI EAST OF NESTER LN*
US 90 FROM SH 211 TO ZINSMEYER
SH 97 FROM PARSONS RD TO IH37

2. PROJECT SITE MAPS:
- * *Project Latitude _____ Project Longitude_____*
- * *Project Location Map: Shown on Title Sheet*
- * *Drainage Patterns: Shown on Drainage Area Maps N/A*
- * *Approx. Slopes Anticipated After Major Gradings and Areas of Soil Disturbance: Shown on Typical Sections (Sheets 6-7)*
- * *Major Controls and Locations of Stabilization Practices: Shown on Plan Sheets (Sheets 29-58)*
- * *Project Specific Locations: Off-site waste, borrow, or storage areas are not part of this SW3P.*
- * *Surface Waters and Discharge Locations: Shown on Drainage and Culvert Layout Sheets N/A*

3. PROJECT DESCRIPTION: *FOR WORK CONSISTING OF INSTALL MEDIAN BARRIER (CABLE BARRIER SYSTEM)*

* *Joint-bid utilities are covered by this SW3P (N/A)*
Non-Joint Bid Utilities are not part of this SW3P.

4. FOR MAJOR SOIL DISTURBING ACTIVITIES SEQUENCE OF EVENTS:

1. *Install controls down-slope of work area and initiate inspection and maintenance activities.*
2. *Begin phased construction with interim stabilization practices. Adjust erosion and sedimentation controls during construction to meet requirements and changing conditions and as directed/approved by the Engineer.*
3. *Major soil disturbing activities may include but are not limited to: right-of-way preparation, cut and/or fill to improve roadway profile, final grading and placement of topsoil and the following (if marked):*

___ *Placement of road base*
___ *Exstensive ditch grading*
___ *Upgrading or replacing culverts or bridges*
___ *Temporary detour road(s)*
_X_ *Other: Installing Cable Barrier*

5. EXISTING AND PROPOSED CONDITIONS:

Description of existing vegetative cover: Native Grass and Weeds
Percentage of existing vegetative cover: 90%
Existing vegetative cover: (mark one) _X_ *Thick or uniformly established*
___ *Thin and Patchy*
___ *None or minimal cover*
Description of soils: (Provide classification and description of soils)
Site Acreage: 63.36 acres *Acreage disturbed: 3.34 acres*
Site runoff coefficient (pre-construction): 0.35 *Site runoff coefficient (post-construction):* 0.35

6. RECEIVING WATERS: *(Mark all that apply)*

_X_ *A classified stream does not pass through project.*
___ *A classified stream passes through project. Name _____ Segment Number _____*
Name of receiving waters that will receive discharges from disturbed areas of the project: East Elm Creek, West Squirrel Creek, Galvan Creek

Site is in a Municipal Separate Storm Sewer System (MS4).
MS4 Operator (name): _____

B. BEST MANAGEMENT PRACTICES

General timing or sequence for implementation of BMPs shall be as required and/or as directed/approved by the Engineer to provide adequate controls. BMPs shown on plan sheets are to be considered "proposed" unless/until Install date is shown. BMPs are to reduce sediments from road construction activities.

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

_P_ SEEDING	___ PRESERVATION OF NATURAL RESOURCES
___ MULCHING (Hay or Straw)	___ FLEXIBLE CHANNEL LINER
___ BUFFER ZONES	___ RIGID CHANNEL LINER
___ PLANTING	_P_ SOIL RETENTION BLANKET
___ COMPOST/MULCH FILTER BERM	___ COMPOST MANUFACTURED TOPSOIL
___ SODDING	___ OTHER: (Specify Practice)

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

_T_ SILT FENCES
___ HAY BALES
___ ROCK FILTER DAMS
___ DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
___ DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
___ DIVERSION DIKE AND SWALE COMBINATIONS
___ PIPE SLOPE DRAINS
___ PAVED FLUMES
___ ROCK BEDDING AT CONSTRUCTION EXIT
___ TIMBER MATTING AT CONSTRUCTION EXIT
___ CHANNEL LINERS
___ SEDIMENT TRAPS
___ SEDIMENT BASINS
___ STORM INLET SEDIMENT TRAP
___ STONE OUTLET STRUCTURES
___ CURBS AND GUTTERS
___ STORM SEWERS
___ VELOCITY CONTROL DEVICES
___ OTHER: *(Specify Practice)*

3. STORM WATER MANAGEMENT:

The proposed facility was designed in consideration of hydraulic design standards to convey stormwater in a manner that is protective of public safety and property. The control of erosion from the facility is inherent to the design. Additional factors affecting post-construction stormwater at the project location include: (mark all that apply)

___ *Existing or new vegetation provides natural filtration.*
___ *The design includes provisions for permanent erosion controls provided by strategically placed pervious and impervious surfaces.*
___ *Project includes permanent sedimentation controls (other than grass).*
___ *Velocities do not require dissipation devices.*
___ *Velocity-dissipation devices included in the design.*
___ *Other : N/A*

4. NON-STORM WATER DISCHARGES:

Off-site discharges are prohibited except as follows:

1. *Discharges from fire fighting activities and/or fire hydrant flushings.*
2. *Vehicle, external building, and pavement wash water where detergents and soaps are not used and where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed).*
3. *Plain water used to control dust.*
4. *Plain water originating from potable water sources.*
5. *Uncontaminated groundwater, spring water or accumulated stormwater.*
6. *Foundation or footing drains where flows are not contaminated with process materials such as solvents.*
7. *Other: _____*

Concrete truck wash water discharges on the site should be prohibited or minimized. If allowed by the Engineer, they must be managed in a manner so as not to contaminate surface water. They must not be located in areas of concentrated flow. Concrete truck wash-out locations must be shown on the SW3P Layout and included in the inspections.

Hazardous material spill/leak shall be prevented or minimized. At a minimum, this includes asphalt products, fuels, oils, lubricants, solvents, paints, acids, concrete curing compounds and chemical additives for soil stabilization. BMPs shall be implemented to the storage areas of these products. All spills must be cleaned and disposed properly and reported to the Engineer. Report any release at or above the reportable quantity during a 24 hour period to the National Response Center at 1-800-424-8802.

C. OTHER REQUIREMENTS & PRACTICES

1. MAINTENANCE:

All erosion and sediment controls shall be maintained in good working order. If a repair is necessary, it shall be performed before the next anticipated storm event but no later than 7 calendar days after the surrounding exposed ground has dried sufficiently to prevent further damage from equipment. If maintenance prior to the next anticipated storm event is impracticable, maintenance must be scheduled and accomplished as soon as practicable. 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 protecting storm sewer inlets.

2. INSPECTION:

For areas of the construction site that have not been finally stabilized, areas used for storage of materials, structural control measures, and locations where vehicles enter or exit the site, personnel provided by the permittee and familiar with the SW3P must inspect disturbed areas at least once every seven (7) calendar days. An Inspection and Maintenance Report shall be prepared for each inspection and the controls shall be revised on the SW3P within seven (7) calendar days following the inspection.

3. WASTE MATERIALS:

All non-hazardous municipal waste materials such as litter, rubbish, trash and garbage located on or originating from the project shall be collected and stored in a securely lidded metal dumpster, provided by the Contractor. The dumpster shall be emptied as necessary or as required by local regulation and the trash shall be hauled to a permitted disposal facility. The burying of non-hazardous municipal waste on the project shall not be permitted. Construction material waste sites, stockpiles and haul roads shall be constructed to minimize and control the amount of sediment that may enter receiving waters. Construction material waste sites shall not be located in any wetland, water body or stream bed. Construction staging areas and vehicle maintenance areas shall be constructed in a manner to minimize the runoff of pollutants.

4. OFFSITE VEHICLE TRACKING:

Off-site vehicle tracking of sediments and the generation of dust must be minimized. Excess sediments on road shall be removed on a regular basis as directed/approved by the Engineer.

5. OTHER:

See the EPIC sheet for additional environmental information.

HALFF
100 NE INTERSTATE 410 LOOP
SUITE 200
SAN ANTONIO, TEXAS 78216
TEL (210) 798-1895 FIRM #F-312

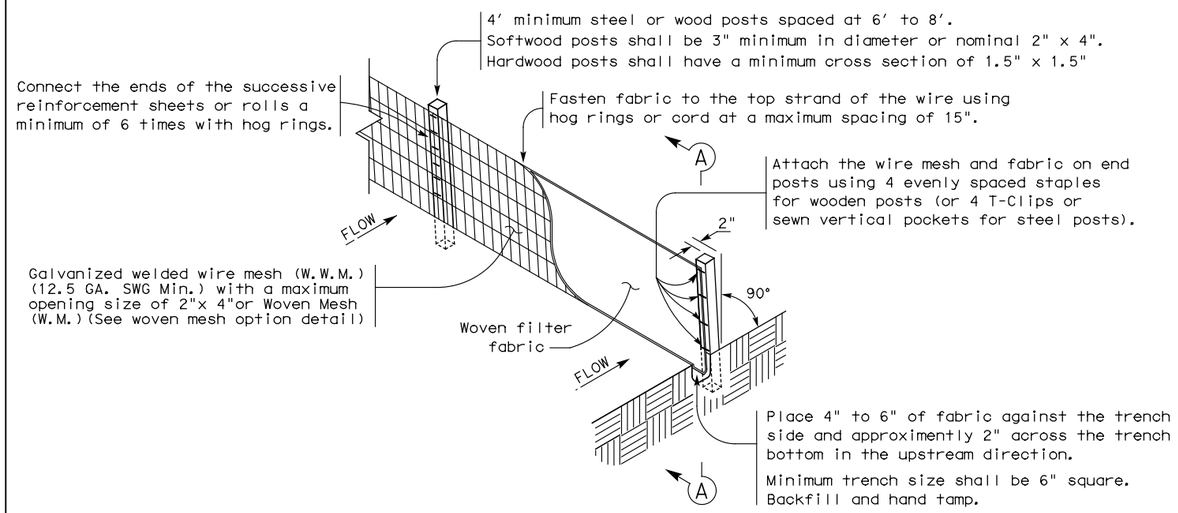
STATE OF TEXAS
JOHNNY L. CLAYTON
107215
LICENSED PROFESSIONAL ENGINEER
5/2/2022

THE SEAL ORIGINALLY APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY JOHNNY L. CLAYTON, P.E. #107215 ON 5/2/2022 . ALTERATION OF A PREVIOUSLY SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT. THE RECORD COPY OF THIS DRAWING IS ON FILE AT THE OFFICES OF HALFF ASSOCIATES, INC., 100 NE INTERSTATE 410 LOOP, SUITE 200, SAN ANTONIO, TEXAS 78216. TBPE FIRM #F-312

REVISION DATE: 10/12

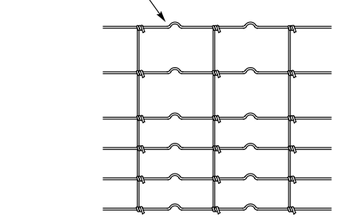
STORM WATER POLLUTION PREVENTION PLAN (SW3P)

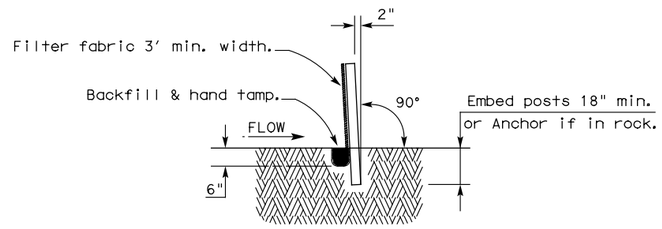
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		US 90 SH 97
STATE	DISTRICT	COUNTY	
TEXAS	SAT	MEDINA, ETC	
CONTROL	SECTION	JOB	SHEET NO.
0024	04	068, ETC	65



TEMPORARY SEDIMENT CONTROL FENCE

SCF





SECTION A-A

HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

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

SEDIMENT CONTROL FENCE USAGE GUIDELINES

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

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

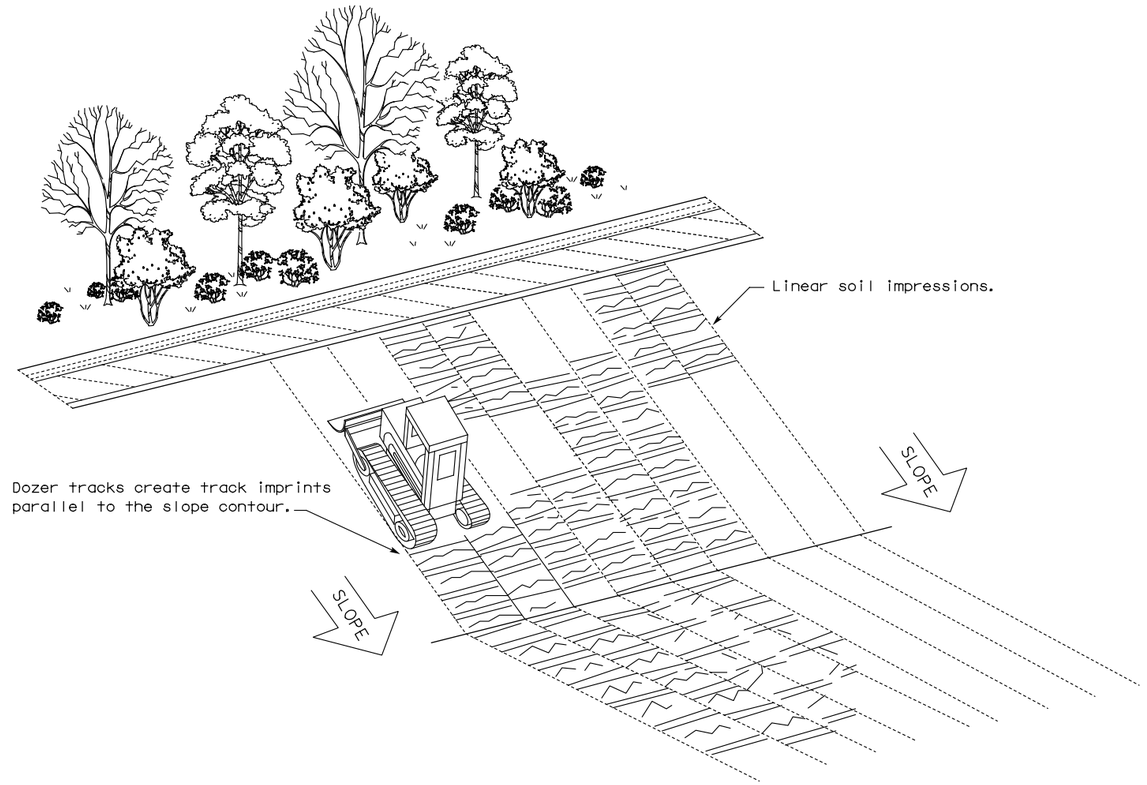
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

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



VERTICAL TRACKING

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & VERTICAL TRACKING

EC(1)-16

FILE: ec116	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	04	068,ETC	US 90,ETC
	DIST	COUNTY		SHEET NO.
	SAT	MEDINA,ETC		66

DATE: 9/24/2021 3:21:47 PM
FILE: pw:\\halff-pw.bentley.com:halff-pw-01\Documents\34832.F00 US90*SH97\500 CAD\Sheets\RR Scope of Work.dgn
PDF*Mono*MidWT.plt

dh3008

I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

DOT #: 742757G
Crossing Type: ** At Grade
RR Company Owning Track at Crossing: UPRR
Operating RR Company at Track: UPRR
RR MP: 267.600
RR Subdivision: Del Rio
City: D'Hanis
County: Medina
CSJ at this Crossing: 0024-04-068
Highway/Roadway name crossing the railroad: CR 521
# of regularly scheduled trains per day at this crossing: 20
# of switching movements per day at this crossing: 0
% of estimated contract cost of work within railroad ROW: <1%

Scope of Work at this Crossing to Be Performed by State Contractor:
No work to be performed in Railroad Right-of-Way. Workers will be installing cable median barrier in center median of US 90 main lanes which runs parallel to UPRR. Location of adjacent work will be from RRMP 267.6 to approximately RRMP 268.58.

Scope of Work at this Crossing to Be Performed by Railroad Company:
N/A

** Choose: Highway Overpass, Highway Underpass, At Grade, Pedestrian, or Closed/Abandoned

II. OTHER PROJECT WORK WITHIN RAILROAD RIGHTS-OF-WAY (ROW)

III. FLAGGING & INSPECTION

of Days of Railroad Flagging Expected: 0

On this project, night or weekend flagging is:

- [ ] Expected
- [X] Not Expected

Flagging services will be provided by:

- [X] Railroad Company: TxDOT will pay flagging invoices
- [ ] Outside Party: Contractor will pay flagging invoices, to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30 day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

- [X] UPRR - UP.info@railpros.com
  Call Center 877-315-0513, Select #1 for flagging
  - UP.request@nrssinc.net
  Call Center 877-984-6777
- [ ] BNSF - BNSF.info@railpros.com
  Call Center 877-315-0513, Select #1 for flagging
- [ ] KCS - KCS.info@railpros.com
  Call Center 877-315-0513, Select #1 for flagging
  - Bottom Line On-Track Safety Services
  bottomline076@aol.com, 903-767-7630
- [ ] OTHERS

Contractor must incorporate Construction Inspection into anticipated construction schedule.

- [X] Not Required
- [ ] Required: Contact Information for Construction Inspection:

IV. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

On this project, construction work to be performed by a railroad company is:

- [ ] Required
- [X] Not Required

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

V. RAILROAD INSURANCE REQUIREMENTS

Railroad reference number shall be provided by TxDOT CST or DO.

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies must be issued for and on behalf of the Railroad. Where more than one Railroad Company is operating on the same right of way or where several Railroad Companies are involved and operate on their own separate rights of way, provide separate insurance policies in the name of each Railroad Company.

No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000 combined single limit

Railroad Protective Liability		
[X]	Not Required	
[ ]	Non - Bridge Projects	$2,000,000 / $6,000,000
[ ]	Bridge Projects	$5,000,000 / $10,000,000
[ ]	Other	

VI. CONTRACTOR'S RIGHT OF ENTRY (ROE) AGREEMENT

On this project, an ROE agreement is:

- [X] Not Required
- [ ] Required: TxDOT CST to assist in obtaining with the UPRR (see Item 5, Article 8.3)
- [ ] Required: UPRR Maintenance Consent Letter. TxDOT CST to assist.
- [ ] Required: Contractor to obtain (see Item 5, Article 8.4)
  With the following railroad companies:

To view previously approved ROE Agreement templates agreed upon between the State and Railroad, see:

http://www.txdot.gov/inside-txdot/division/rail/samples.html

Approved ROE Agreement templates are not to be modified by the Contractor.

Contractor shall not operate within Railroad Right of Way without an executed Construction & Maintenance Agreement between the State and the Railroad and an executed ROE agreement between the Contractor and the Railroad if required on project.

VII. RAILROAD COORDINATION MEETING

On this project, a Railroad Coordination Meeting is:

- [X] Not Required
- [ ] Required

See Item 5, Article 8.1 for more details.

VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are required to maintain the same insurance coverage as required of the Contractor.

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency
Call Union Pacific Railroad
Railroad Emergency Line at 888-877-7267
Location: DOT 742757G
RR Milepost 267.600
Subdivision Del Rio

Texas Department of Transportation | Rail Division

RAILROAD SCOPE OF WORK

PROJECT SPECIFIC DETAILS

FILE: RR Scope of Work.dgn	DN: TxDOT	CK:	DW:	CK:
©TxDOT June 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0024	04	068	US 90
9/2021	DIST	COUNTY		SHEET NO.
	SAT	MEDINA		67