SEE SHEET 2 FOR
INDEX OF SHEETS

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

DESIGN SPEED = 30 MPH
A.D.T. (2021)= 3,358
A.D.T. (2041)= 4,701

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		1

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

STATE AID PROJECT NO. C 104-11-8

BU 67A
PRESIDIO COUNTY

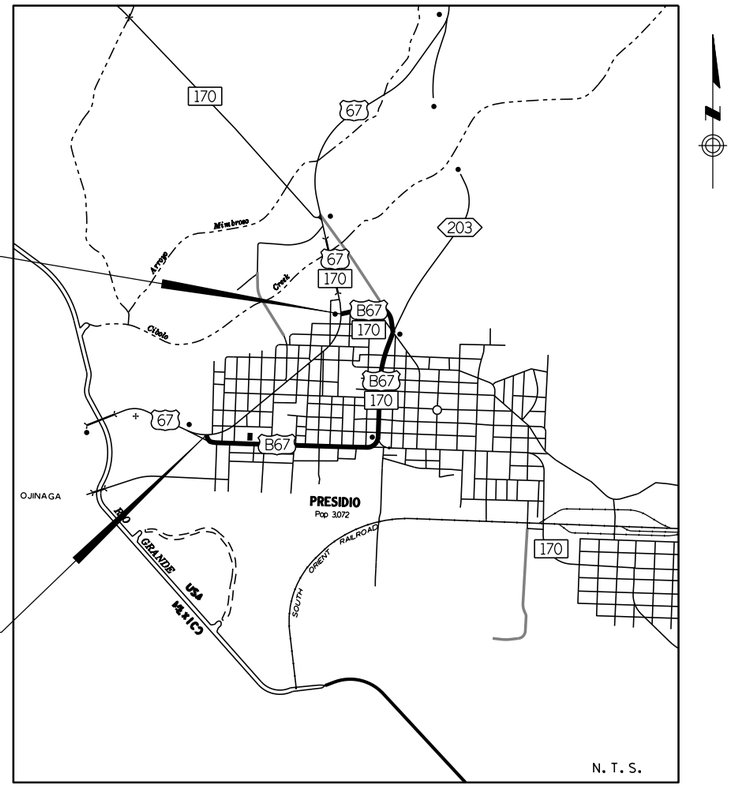
NET LENGTH OF ROADWAY=	9,467.04 FT. =	1.793 MI.
NET LENGTH OF BRIDGE =	0.00 FT. =	0.00 MI.
NET LENGTH OF PROJECT=	9,467.04 FT. =	1.793 MI.

LIMITS: FROM US 67 NORTH TO US 67 SOUTH

FOR THE CONSTRUCTION OF REHABILITATION OF EXISTING ROADWAY CONSISTING OF BASE REPAIR, MILL AND INLAY, PAVEMENT MARKINGS, AND CURB RAMPS

BEGIN PROJECT
CSJ: 0104-11-008
STA: 3115+05.00
RM : 134-0.061
LAT: 29.5703214
LONG: -104.3751574

END PROJECT
CSJ: 0104-11-008
STA: 3209+74.04
RM : 136+0.474
LAT: 29.5614340
LONG: -104.3861113



EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROAD CROSSINGS: NONE

REGISTERED ACCESSIBILITY SPECIALIST (RAS) INSPECTION REQUIRED
TDLR No. TABS2023013242

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: REQUIRED SPECIAL LABOR PROVISIONS FOR ALL STATE CONSTRUCTION PROJECTS. (SP000---008)

REQUIRED SIGNS SHALL BE IN ACCORDANCE WITH BC (1)- 21 THRU BC (12)- 21 AND THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".

STATE OF TEXAS
JAMSHID JAHANGIRI
56390
LICENSED
PROFESSIONAL ENGINEER

Jamshid Jahangiri, P.E. 5/30/2023

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FINAL PLANS

CONTRACTOR: _____
LETTING DATE: _____
TIME CHARGES BEGAN: _____
DATE CONTRACTOR BEGAN WORK: _____
DATE WORK WAS COMPLETED: _____
DATE WORK WAS ACCEPTED: _____
TOTAL DAYS CHARGED: _____
ORIGINAL CONTRACT AMOUNT: $ _____
AMOUNT OF CONTRACT AMENDMENTS: $ _____
FINAL CONTRACT COST: $ _____

_____ 20 _____

_____
AREA ENGINEER

KEY TO COUNTIES

Texas Department of Transportation

5/31/2023
RECOMMENDED FOR LETTING:
DocuSigned by:
Eduardo Perales, P.E.
2778C60AB5F742E...
SAFETY REVIEW COMMITTEE CHAIRMAN

5/31/2023
RECOMMENDED FOR LETTING:
DocuSigned by:
L. Raul Ortega Jr., P.E.
0E1750B98760474...
DISTRICT DIRECTOR OF TRANSPORTATION
PLANNING AND DEVELOPMENT

5/31/2023
APPROVED FOR LETTING:
DocuSigned by:
7A68C5EA0D94496...
DISTRICT ENGINEER

INDEX OF SHEETS

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ON THIS SHEET WITH A "A#" HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

M. N. MOZAFFAR, P.E. , P.E. & *5/24/2023* Date

STATE OF TEXAS
WEIYIH TEE
98478
LICENSED
PROFESSIONAL ENGINEER

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ON THIS SHEET WITH A "B#" HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

WEIYIH TEE, P.E. , P.E. & *5/24/2023* Date

Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

Texas Department of Transportation

BU 67A

INDEX OF SHEETS

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		2

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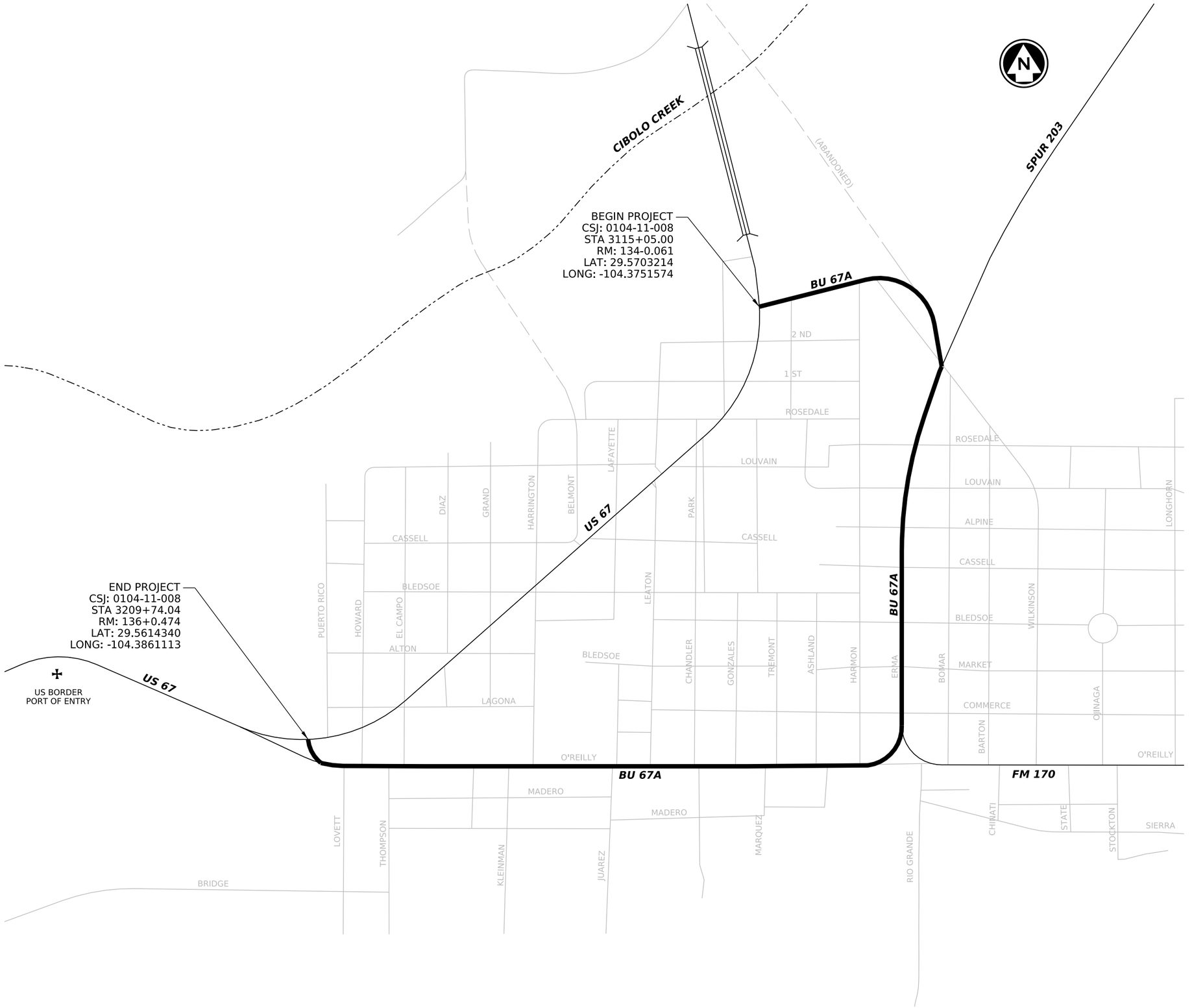

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DATE	BY	REV	REVISION

STATE OF TEXAS
WEIYIH TEE
98478
LICENSED
PROFESSIONAL ENGINEER
5/20/2023

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Texas Department of Transportation

BU 67A

PROJECT LAYOUT

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		3

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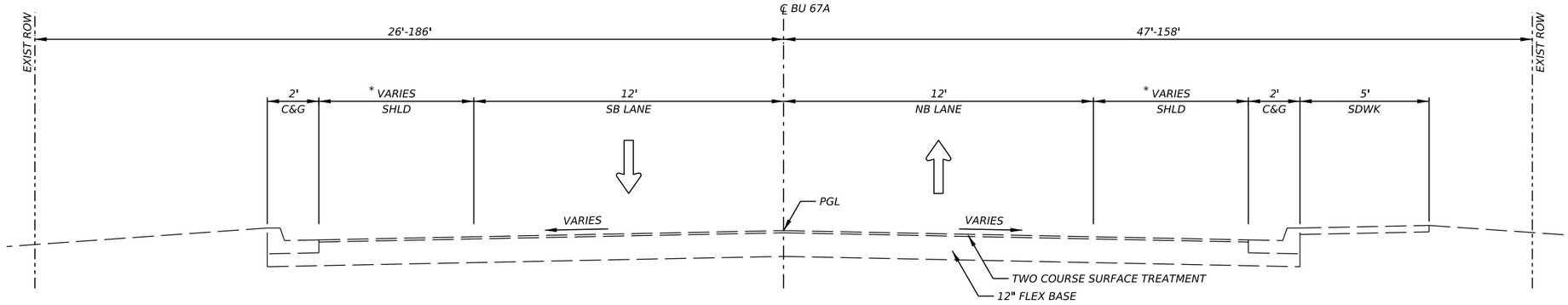
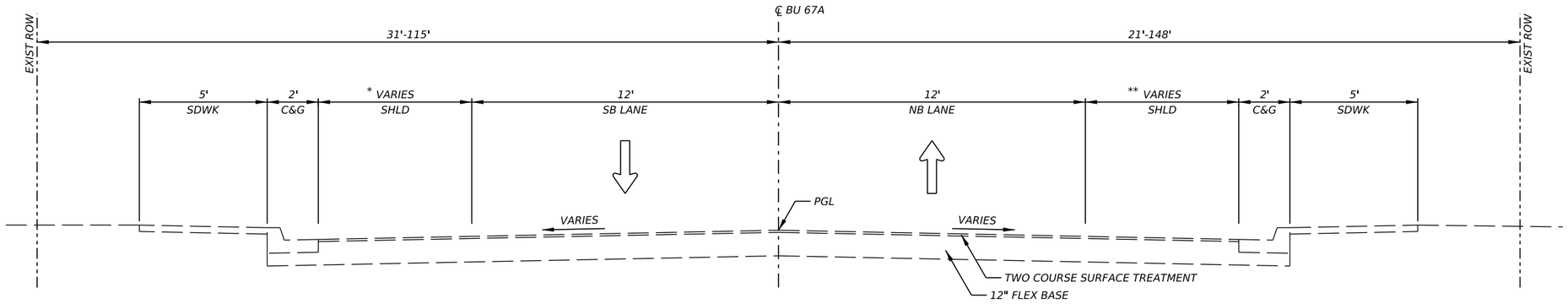


BU 67A EXISTING TYPICAL SECTION

STA 3115+30 TO STA 3132+40	6' *
STA 3162+05 TO STA 3163+77	10' *
STA 3207+75 TO STA 3209+63	4' *



BU 67A EXISTING TYPICAL SECTION

STA 3132+40 TO STA 3162+05	10' *	10' **
STA 3163+77 TO STA 3180+98	1'-13' *	6'-12' **
STA 3186+42 TO STA 3192+32	4' *	4' **
STA 3205+14 TO STA 3207+75	4' *	4' **

NOT TO SCALE

DATE	BY	REV	REVISION

STATE OF TEXAS
WEIYIH TEE
98478
LICENSED
PROFESSIONAL ENGINEER
5/20/2023

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Texas Department of Transportation

BU 67A

EXISTING
TYPICAL SECTIONS

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		4

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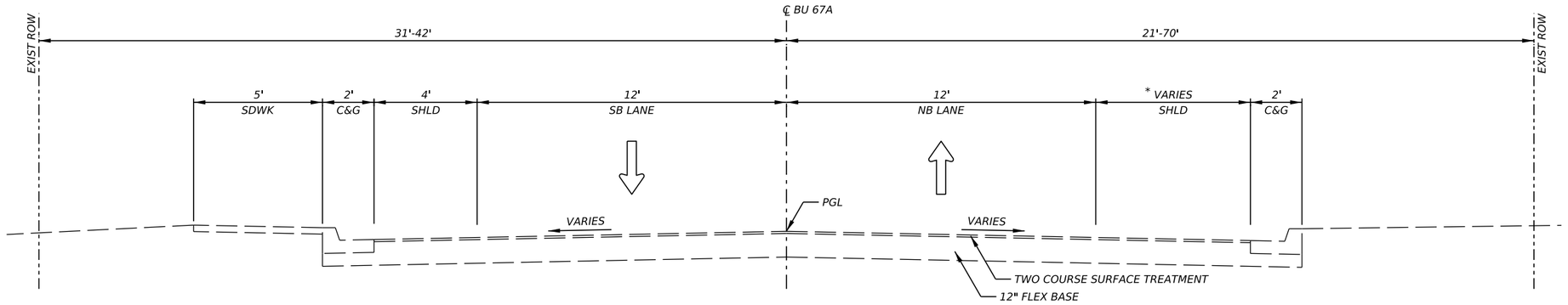

BU 67A EXISTING TYPICAL SECTION

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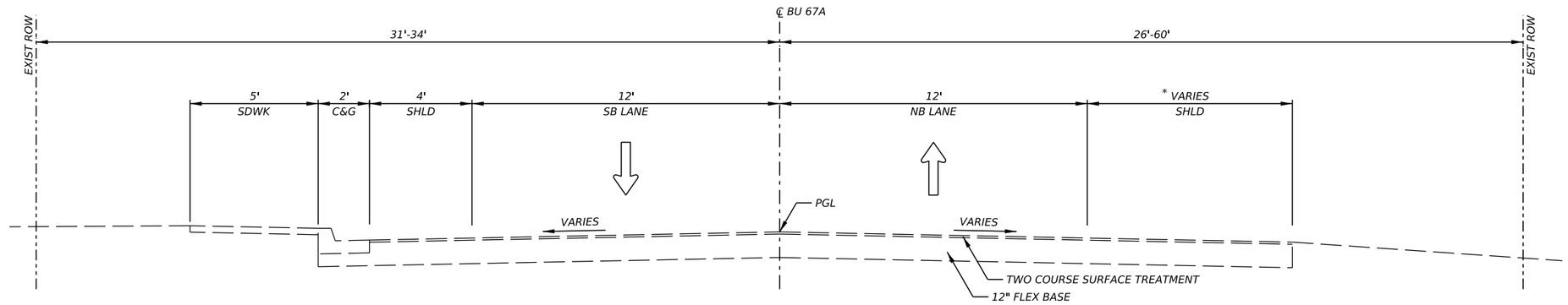
STA 3203+70 TO STA 3205+14 4" *



BU 67A EXISTING TYPICAL SECTION

STA 3192+32 TO STA 3203+70 6'-14" *

NOT TO SCALE

DATE	BY	REV	REVISION

STATE OF TEXAS
WEIYIH TEE
98478
LICENSED
PROFESSIONAL ENGINEER
5/20/2023

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Texas Department of Transportation

BU 67A

EXISTING
TYPICAL SECTIONS

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		5

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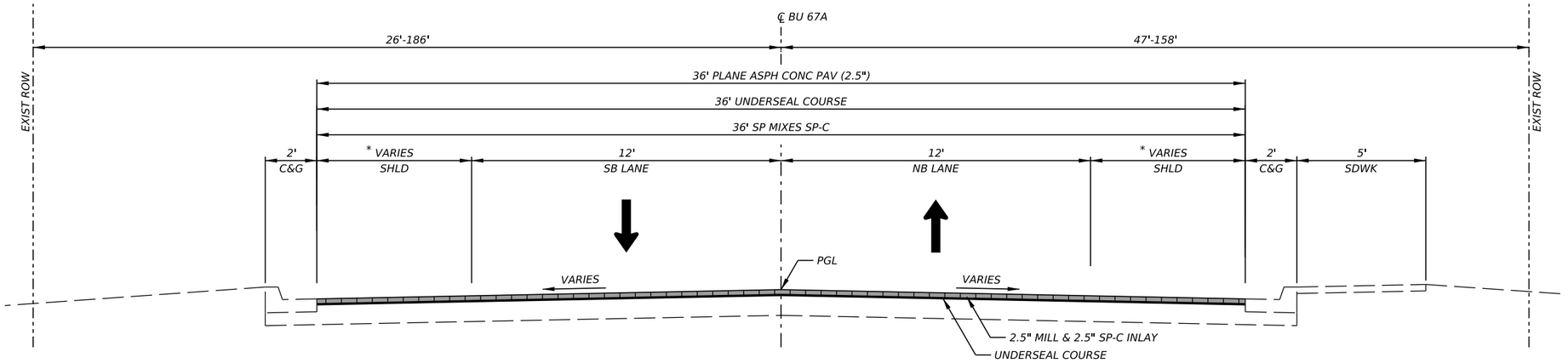
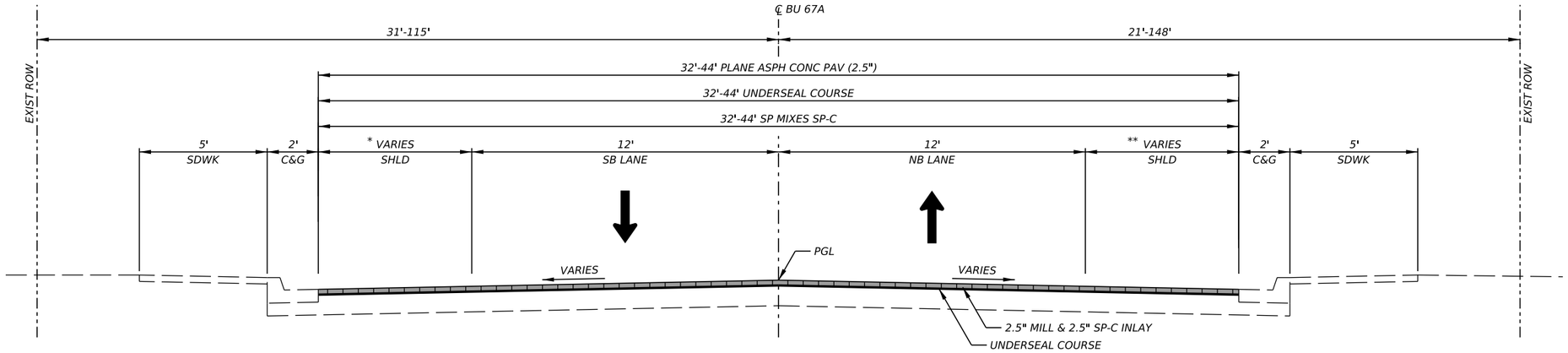


BU 67A PROPOSED TYPICAL SECTION

STA 3115+30 TO STA 3132+40	6' *
STA 3162+05 TO STA 3163+77	10' *
STA 3207+75 TO STA 3209+63	4' *



BU 67A PROPOSED TYPICAL SECTION

STA 3132+40 TO STA 3162+05	10' *	10' **
STA 3163+77 TO STA 3180+98	1'-13' *	6'-12' **
STA 3186+42 TO STA 3192+32	4' *	4' **
STA 3205+14 TO STA 3207+75	4' *	4' **

LEGEND:

- TRAFFIC FLOW DIRECTION
- EXISTING ROW
- PLANE ASPH CONC PAV (2.5")
- SP MIXES SP-C SAC-A PG70-22
- UNDERSEAL COURSE

NOTES:

1. TYPICAL SECTIONS ARE FOR GENERAL INFORMATION ONLY AND SHALL NOT BE USED FOR QUANTITY CALCULATIONS.
2. CONTRACTOR SHALL MATCH EXISTING ROADWAY CROSS SLOPE UNLESS OTHERWISE SHOWN IN THE PLAN OR DIRECTED BY THE ENGINEER.
3. FIELD VERIFY ACTUAL LOCATIONS OF PAVEMENT DIMENSIONS.

NOT TO SCALE

DATE	BY	REV	REVISION

STATE OF TEXAS
WEIYIH TEE
98478
REGISTERED
PROFESSIONAL ENGINEER
5/20/2023

Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

Texas Department of Transportation

BU 67A

PROPOSED
TYPICAL SECTIONS

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		6

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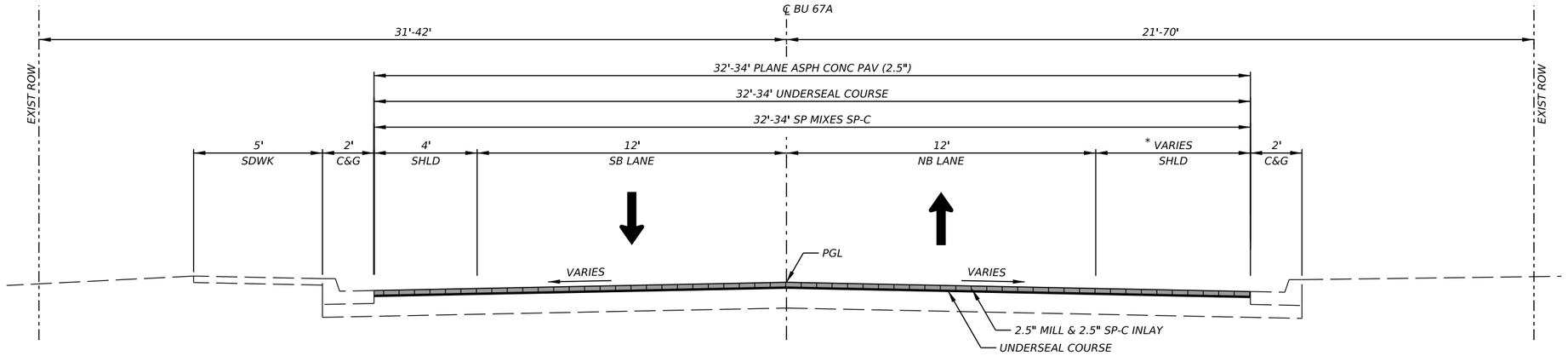
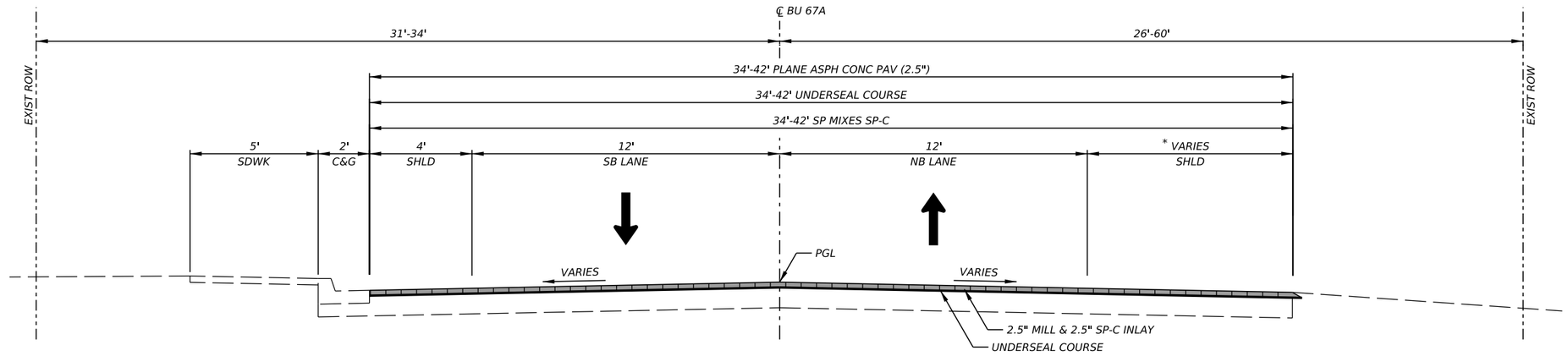


BU 67A PROPOSED TYPICAL SECTION

STA 3180+98 TO STA 3186+42 4'-6' *
STA 3203+70 TO STA 3205+14 4' *



BU 67A PROPOSED TYPICAL SECTION

STA 3192+32 TO STA 3203+70 6'-14' *

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LEGEND:

- TRAFFIC FLOW DIRECTION
- EXISTING ROW
- PLANE ASPH CONC PAV (2.5")
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DATE	BY	REV	REVISION

STATE OF TEXAS
WEIYIH TEE
98478
LICENSED
PROFESSIONAL ENGINEER
5/20/2023

Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

Texas Department of Transportation

BU 67A

PROPOSED
TYPICAL SECTIONS

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		7

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************ General Notes ************

2014 Specification Book

Specification Data

Table 1

Basis of Estimate

Item	Description	Rate
351	Flexible Pavement Structure Repair[3]	
3077	Superpave Mixtures Tack Coat (TRAIL)[2]	2.5 in. = 275 lb./sq.yd. 0.15 gal./sq.yd.
3085	Underseal Course: See Item 3085 general note for material information	See Item 3085 general note for rates

1. **Deviation from the rates shown will require approval.**
2. **Tack Coat to be applied to each layer as directed by the Engineer. Rate shown is based on the desired residual application of 0.10 gal./sq.yd.**
3. **Provide 6" of Item 3077-6024 SP MIXES SP-C SAC-A PG 70-22 (Exempt) for all repairs. SP-C SAC-A PG 70-22 (EXEMPT), 1" = 110 lb/sy, will not be measured but will be subsidiary to Item 351, "Flexible Pavement Structure Repair."**

General Requirements

Maintain the entire project area in a neat and orderly manner throughout the duration of the work. Remove all construction litter and undesirable vegetation within the right of way inside the project limits. This work will be subsidiary to the various bid items.

General Project Description – This project consists of Roadway Rehabilitation on BU 67A in Presidio County, TX.

Traffic

Contact the Engineer or the City when construction operations are within 400 feet of a signalized intersection to determine/verify the location of loop detectors, conduit, ground-boxes, etc. Repair or replace any signal equipment damaged by construction operations. The method of repair or replacement shall be pre-approved and inspected. This work shall be completed at the Contractor's expense.

Inform the Engineer and the respective utility companies, when it becomes apparent that the utility lines will interfere with the work in progress.

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

Alpine Area Office:

Armando Ramirez, P.E.
Alpine Area Engineer
Armando.Ramirez2@txdot.gov

Aldo Madrid, P.E.
Director of Construction
Aldo.Madrid@txdot.gov

Monica Ruiz, P.E
District Construction Engineer
Monica.Ruiz@txdot.gov

Questions may be submitted via the Letting Pre-Bid Q&A web page. This webpage can be accessed from the Notice to Contractors dashboard located at the following Address:

https://tableau.txdot.gov/views/ProjectInformationDashboard/NoticetoContractors.

All contractor questions will be reviewed by the Engineer. All questions and any corresponding responses that are generated will be posted through the same Letting Pre-Bid Q&A web page.

The Letting Pre-Bid Q&A web page for each project can be accessed by using the dashboard to navigate to the project you are interested in by scrolling or filtering the dashboard using the controls on the left. Hover over the blue hyperlink for the project you want to view the Q&A for and click on the link in the window that pops up.

Traffic

Contact the Department's El Paso District Signal Shop at txdotelplocates@txdot.gov to request all Department utility line locates within the project limits. The Signal Shop will locate one time only. Record locates for the purpose of refreshing and maintaining all markings throughout the duration of the project.

Item 4 – Scope of Work

Schedule and perform all work to ensure proper drainage during the course of construction. All labor, tools, equipment, and supervision required, to ensure drainage, removal, and handling of water shall be considered incidental work.

Item 5 – Control of Work

The Department will furnish horizontal and vertical reference points. Contractor must verify horizontal and vertical reference points with conventional survey methods before proceeding with construction activities. Verification must be submitted for review and approval to the Department's R.P.L.S. prior to start of construction. Any discrepancies not reported will be at no additional cost to the Department.

Plan datum for this project is NAD 83 for horizontal and NAVD 88 for elevation based.

Keep traveled surfaces used in hauling operations clear and free of dirt or other material.

Existing pavement, utilities, structures, etc. damaged as a result of construction operations will be repaired at no additional cost to the Department.

Protect from damage and destruction all areas of the right of way, which are not included in the actual limits of the proposed construction areas. Exercise care to prevent damage to trees, vegetation, irrigation system and other natural features. Protect trees, shrubs, and other landscape features from abuse, marring, or damage within the actual construction and/or fenced protection areas designated for preservation.

Restore any area disturbed or damaged to a condition “as good as” or “better than” prior to start of construction operation. This work will be at the Contractor’s expense.

Item 7 – Legal Relations and Responsibilities

Comply with all requirements of the Environmental Permits Issues and Commitments (EPIC) Sheet.

Do not discharge any liquid pollutant from vehicles onto the roadside. Immediately clean spills and dispose in compliance with local, state, and federal regulations to the satisfaction of the Engineer at no additional cost to the Department.

Occupational Safety & Health Administration (OSHA) regulations prohibit operations that bring people or equipment within 10 ft. of an energized electrical line. Where workers and/or equipment may be close to an energized electrical line, notify the electrical power company and make all necessary adjustments to ensure the safety of workers near the energized line.

No significant traffic generator events identified.

Law Enforcement Personnel

Submit charge summary and invoices using the Department forms.

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

No payment will be made for law enforcement personnel needed for moving equipment or payment for drive time to/from the event site.

Item 8 – Prosecution and Progress

Working days will be calculated in accordance with Section 8.3.1., “**Standard** Workweek.”

Create and maintain a Critical Path Method (CPM) schedule.

Submit baseline schedule and obtain approval prior to beginning construction. The monthly progress payment will be held if the monthly update is not submitted.

Item 9 – Measurement and Payment

Monthly progress payments will be made for items of work completed by the 27th day of each month. Any work completed after the 27th will be included for payment in the subsequent monthly progress payment.

Submit Material on Hand (MOH) payment requests at least **two (2)** working days before the end of the month for payment consideration on that month’s estimate.

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” WEB-BASED (Course #133119) which can be found online at the following site: **https://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 – Preparing Right of Way

Removal of existing loose aggregate, concrete, asphalt, and any other materials deleterious to plant growth encountered within the limits during initial grading is subsidiary to this Item.

Item 104 – Removing Concrete

All work items described under item 104.3 required to saw-cut, as shown on the plans, or as directed is considered subsidiary to this Item.

Item 316 – Seal Coat

Before applying the seal coat, protect all bridge armor and expansion joints, manhole and valve covers with paper or other suitable materials as directed by the Engineer.

Protect all existing bridges, curbs, and other exposed concrete surfaces within the limits of the project from asphalt materials by any method that is approved. Remove any excessive asphalt materials deposited on these surfaces at the Contractor's expense. During the application of the surface treatment, if existing conditions warrant, the lane widths, transitions, and intersection areas may be varied as directed.

The Engineer will approve asphalt and aggregate rates prior to application.

Prepare the roadway surface prior to placing asphalt to the satisfaction of the Engineer. Some areas may require more extensive cleaning than other areas. This work will not be paid for directly, but will be subsidiary to pertinent items.

Remove vegetation and blade pavement edges prior to surfacing operations. The work performed will not be measured or paid for directly, but will be subsidiary to pertinent Items.

Do not apply asphalt cement from September 16th to April 30th unless authorized in writing.

Surface treat existing intersections, curb widenings, and widened dipped sections plus any additional areas encountered during construction to conform to the existing surface. The limits are the right-of-way line or as directed.

Use AC-10 or PG 64-22 asphalt for pre-coating aggregate. The stripping characteristics of pre-coated aggregate must not exceed 10% when tested in accordance with Tex-530-C. Add asphalt antistripping agent (Liquid) only to the asphalt pre-coating the aggregate.

Item 351 – Flexible Pavement Structure Repair

Contractor shall perform 2.5" milling of existing pavement before the pavement repair work can be began.

Provide **SIX (6)** inches of **SP MIXES SP-C SAC-A PG 70-22 (EXEMPT)** for all repairs. **SP MIXES SP-C SAC-A PG 70-22 (EXEMPT)** will not be measured but will be subsidiary to Item 351, "Flexible Pavement Structure Repair".

Perform repairs on locations shown in plans and as directed by the Engineer.

Repair pavement edges to the line and grade of the original pavement. Sides of the repair area shall be made square by saw cutting or other approved methods. Any loose and foreign material shall be removed. Repair area to be clean and dry prior to application of prime coat. SS-1H to be applied as prime coat at 0.15 gal/sy to repaired area surfaces, unless otherwise directed. Waste material to be removed and disposed of as directed or approved.

Tack coat to be applied all surfaces that will be in contact with the subsequent SP-C placement at 0.15 GAL/SY unless otherwise directed.

Use of a motor grader will not be permitted unless otherwise directed by the Engineer.

Proof rolling or other approved compacting method as directed by the Engineer shall be required in the event that Flex Base or Subgrade is exposed. Payment is subsidiary to this item.

Item 354 – Planing and Texturing Pavement

A maximum milling speed of 50 feet per minute shall be applied unless directed otherwise by the Engineer.

Construct a taper with an asphaltic mixture at all uneven transverse joints left by planing operation. Transitions shall be at 10 feet for every 1 inch. Asphaltic material will be subsidiary to this item of work.

The Department will retain ownership of planed materials. The asphalt removed under this item shall be salvaged and stockpiled in separate stockpiles as directed by the Engineer at the following location:

Alpine Area Maintenance Office

16365 FM 170

Presidio, TX 79845

Contact the Alpine Area Maintenance Supervisor at (432) 837-7800 for coordination prior to delivery of materials. Stack in piles 12 to 13 feet maximum height. Place silt fence along the perimeter of stockpiled material. Silt fence will be paid under Item 506, "Temporary Erosion, Sedimentation, and Environmental Controls". Final quantity of silt fence to be approved by the engineer prior to stockpiling. Hauling of material and incidentals to complete this work is subsidiary to this Item.

Item 432 – Riprap

Wire mesh and fibers for concrete will not be allowed for concrete riprap in accordance with item 432.3.1, "Concrete Riprap" on this project for this Item. Reinforce all concrete riprap using bar reinforcement conforming to Item 440, "Reinforcement for Concrete," as shown on the plans, or as directed.

Item 502 – Barricades, Signs, and Traffic Handling

Prior to beginning construction, the Engineer will approve the routing of traffic and sequence of work.

Additional signs and barricades, placed as directed, will be considered subsidiary to this Item.

In accordance with Section 7.2.6.1, designate, in writing, a Contractor Responsible Person (CRP) and a CRP alternate to take full responsibility for the set-up, maintenance, and necessary corrective measures of the traffic control plan. The CRP or CRP alternate must be present at site and implement the initial set up of every traffic control phase/stage, at each location, and/or each call out, for the entire duration of the project.

At the written request of the Engineer, immediately remove the CRP or CRP alternate from the project if, in the opinion of the Engineer, is not competent, not present at initial TCP set-ups, or does not perform in a proper, skillful, or safe manner. These individuals shall not be reinstated without written consent of the Engineer.

CRP and CRP alternate must be trained using Department approved training. Provide a copy of the certificate of completion to the Engineer for project records. Refer to Table 2 for Department approved Training.

Table 2

Contractor Responsible Person and Alternate

Provider	Course Number	Course Title	Duration	Notes
American Traffic Safety Services Association	TCS	Traffic Control Supervisor	2 days	
National Highway Institute	133112 133113	Design and Operation of Work Zone Traffic Control Work Zone Traffic Control for Maintenance Operations	1 day 1 day	Both courses are required to meet minimum required training.
Texas Engineering Extension Services	133112A	Design and Operation of Work Zone Traffic Control	3 days	
University of Texas Arlington Division for Enterprise Development	WKZ421	Traffic Control Supervisor	16 hours	Contact UTA for training needs.

All contractor workers involved with the traffic control implementation and maintenance must participate and complete a Department approved training course. Provide a copy of the certificate of completion to the Engineer for project records. Refer to Table 3 for Department approved training.

Table 3

Other Work Zone Personnel

Provider	Course Number	Course Title	Duration	Notes
American Traffic Safety Services Association	TCT	Traffic Control Technician	1 day	
Texas Engineering Extension Services	HWS002	Work Zone Traffic Control	16 hours	Identical to HWS-410. Counts for 3 year CRP requirement.
National Highway Institute	133116	Maintenance of Traffic for Technicians	5 hours	Web based
National Highway Institute	134109-I	Maintenance Training Series: Basics of Work Zone Traffic Control	1 hour	Free, Web based
University of Texas at Arlington, Division for Enterprise Development	WKZ100	Work Zone Safety: Temporary Traffic Control	4 hours	Note name change. Free, Web based
TxDOT/AGC Joint Development	N/A	Safe Workers Awareness Highway Construction Work Zone Hazards	16 minutes 18 minutes	Videos available through AGC of Texas offices. English & Spanish
AGC America	N/A	Highway Work Zone Safety Training	1 day	
Texas Engineering Extension Service	HWS400	Temporary Traffic Control Worker	4 hours	Contact TEEX, if interested in course
TxDOT/AGC Joint Development	N/A	Work Zone Fundamentals	10 minutes	Videos available through ACT of Texas offices. English & Spanish

Contractor may choose to train workers involved with the traffic control implementation and maintenance with a contractor developed training in lieu of Department approved training. Contractor developed training must be equivalent to the Department approved training shown in Table 2. Provide the Engineer a copy of the course curriculum for pre-approval, prior to conducting the contractor developed training. Provide the Engineer a copy of the log of attendees after training completion for project records.

Existing regulatory signs, route marker auxiliaries, guide signs, and warning signs that must be removed due to widening shall be relocated temporarily and erected on approved supports at locations shown in the plans, or as directed. This work will not be paid for directly, but considered subsidiary to this Item.

Notify the Department officials when major traffic changes are to be made, such as detours. Coordinate with the Department on all traffic changes. Advance notification for the following week's work must be made by 5 P.M. on Wednesdays.

If Law Enforcement Personnel is required by the Engineer, coordinate with local law enforcement as directed or agreed. Complete the weekly tracking form provided by the Department and submit invoices with 5% allowance for Law Enforcement payments by Contractor that agree with the tracking form for payment at the end of each month where approved services were provided.

Provide access to intersecting side roads and driveways at all times, unless otherwise directed.

Any approved change to the sequence of work or TCP, must be signed and sealed by a Contractor's Licensed Professional Engineer assuming full responsibility for any additional barricade signs and devices needed.

Use striping operations to channelize traffic into the newly completed roadway, as directed. Maintain shoulders and median areas in a condition capable of serving as emergency paths, as approved. This work will be subsidiary to this Item.

Use portable changeable message signs (PCMS) to alert public of construction two weeks prior to construction.

Use flaggers when directed. Provide two-way radio communication for all flaggers.

Place and maintain sufficient additional warning signs, beacons, delineators, and barricades to warn and guide the public of all hazards through the construction zone at all times, and as directed.

Use flashing arrow boards on all tapers for each lane closure.

Some signs, barricades, and channelization devices may not be shown at the precise or measured position. Place the barricades, devices, or signs, with approval, in positions to meet field conditions.

Fill any holes left by barricade or sign supports and restore the area to its original condition.

Use Type A flashing warning lights or delineators to mark open excavation, footings, foundations, or other obstructions near lanes that may be open to traffic, as directed.

For additional information pertaining to channelization, signing, spacing details, and flagging procedures required to regulate, warn, and guide traffic through project, refer to the "Barricade and Construction Standards," BC(1)-21 and to the current *Texas Manual on Uniform Traffic Control Devices(TMUTCD).*

Remove or cover signs that do not apply to current conditions at the end of each day's work.

Repair and/or replace all signs damaged by the public or due to weather events.

Safety Contingency

The contractor Force Account "Safety Contingency" that has been established for this project is intended to be utilized for work zone enhancement, to improve the effectiveness of the TCP 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 – Temporary Erosion, Sedimentation, and Environmental Controls

Place Best Method Practices (BMP's) in locations as designated in the plans or as directed to meet field conditions.

Place rain gauge(s) at locations as designated.

The total disturbed area for this project is **0.23** acres. Establish the authorization requirements for Storm Water Discharges for soil disturbed area in this project, all project locations in the Contract, and Contractor Project Specific Locations (PSLs), within one mile of the project limits. Both the Department and the Contractor shall obtain an authorization to discharge storm water from TCEQ for the construction activities shown on the plans. Obtain required authorization from the TCEQ for any Contractor PSLs for construction support activities on or off right of way.

Best Method Practices (BMP's) may be adjusted to meet field conditions, or as directed. The Engineer will verify all locations prior to placement of BMPs. Maintain and properly place the erosion control measures to prevent storm water pollution to the Waters of the United States, as directed. Within the project limits, keep all inlets functional as long as possible to accept storm water as part of the Storm Water Pollution Prevention Plan (SWP3), as directed.

Grading operations will be limited to the catch point of the proposed cross-section.

Preserve any vegetation outside these limits.

Item 529 – Concrete Curb, Gutter and Combined Curb and Gutter

Use Class A concrete for these Items, unless otherwise shown on the plans. Wire mesh and fibers for concrete will not be allowed. Reinforce all concrete using reinforcement conforming to Item 440, "Reinforcement for concrete," as shown on the plans or as directed.

Construct the curb opening with metal plate configuration detailed in the plans, or as directed, to ensure roadway drainage to the earthen ditch. No direct payment will be made for these features. Payment will be made under this Item. All required manipulations or incidentals required to complete the work will be considered subsidiary to these items.

Perform all requiring grading for proposed concrete curb, gutter, and combined curb and gutter construction as shown on the plans. All grading, including excavation and fill/embankment will be subsidiary to this Item.

After construction, restore the adjacent surface to a condition approved by the Engineer. Consider this work subsidiary to this Item.

Item 531 – Sidewalk

The wheelchair ramp dimensions and locations shown in the plans may be adjusted, as directed, to match the field conditions. Any such modification will not be paid directly, but will be subsidiary to this Item.

Modify the sidewalk expansion joint spacing to 20 ft. spacing where waterlines may exist under the sidewalk. This work will not be paid for directly but will be subsidiary to this Item.

Provide textured finish for wheelchair ramps as directed.

Perform all work under this Item to conform to ADA and TDLR standards.

Perform all required grading for proposed sidewalks construction as shown on the plans. All grading, including excavation, fill, and embankment will be subsidiary to this Item.

Detectable warning surface for new ramps shall be made from a Department approved surface applied vitrified polymer composite tile, red in color.

Item 585 – Ride Quality for Pavement Surfaces

Use Surface Test Type A to govern ride quality.

Use diamond grinding or equivalent to correct areas of localized roughness. Use CSS-1H emulsion to fog seal the corrected areas.

The contractor shall take care to ensure satisfactory profile results in the intermediate paving layers (mixture) to eliminate corrective action for excessive deviations in the final surface layers.

Milling will not be allowed as a corrective action for excessive deviations in the surface layer of hot mix.

Use Surface Test Type B to govern ride quality for finished riding surfaces of travel lanes. Notify the District Laboratory 48 hours prior to conducting Surface Test Type B. Properly mark all starting/ending points, and leave-out sections prior to testing. Deliver test results within 24 hours of testing. Provide all profile measurements in electronic data to ELP-LAB@txdot.gov using the format specified in Tex-1001-S.

“Payment Adjustment, Schedule 3” will be used for the travel lanes.

An IRI > 95 will require corrective action.

Use diamond grinding or equivalent to correct areas of localized roughness. For flexible pavements, use CSS-1H emulsion to fog seal the corrected areas.

Milling will not be allowed as a corrective action for excessive deviations in the surface layer of hot mix.

Item 644 – Small Roadside Sign Assemblies

Stake all sign locations and receive approval prior to sign placement.

The 2-1/2 inch, Schedule 10 post will meet the following requirements:

- 0.120 in. nominal wall thickness
- Seamless or electric-resistance welded steel tubing or pipe
- Steel will be HSLAS Grade 55 per ASTM A1011 or ASTM A1008

Other steel may be used, if it meets the following:

- 55,000 psi minimum yield strength
- 70,000 psi minimum tensile strength
- 20% minimum elongation in 2 in.
- Wall thickness (uncoated) to be within the range of 0.108 in. to 0.132 in. galvanization per ASTM A123 or ASTM A653 G90

For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metalizing with zinc wire per ASTM B833.

Verify all post lengths to ensure the proper sign height. Remove and replace any sign installed incorrectly. This work will be done at no expense to the Department.

Provide Texas Universal Triangular Slip Base Bolt clamp type for all signs as shown on SMD (Slip-1)-08.

As directed, some regulatory and guide signs will be relocated before construction begins. Mark and locate each reference marker perpendicular to the road and along the right of way, or as directed, prior to removal. Re-erect reference markers at their original location upon completion of construction.

All signs removed will remain property of the Department or as directed by the Engineer.

Item 662 – Work Zone Pavement Markings

In those areas where existing pavement markings are to be covered or removed, field locate and record the existing pavement markings by survey or other approved method by the Engineer as directed. Place final striping on these locations.

Remove and properly dispose of tabs upon completion of the final striping. This work is considered subsidiary to various bid items.

Place tabs as per the Department’s Standard sheet TCP (7-1)-13. Place raised pavement markers in accordance with applicable standards and as directed.

Item 666 –Retroreflectorized Pavement Markings

Use a pilot line for final striping and remove pilot line after all striping is complete. Removal will be in accordance with the methods specified in Item 677, “Eliminating Existing Pavement Markings and Markers,” and will be subsidiary to this Item.

Air blasting is required as pavement surface preparation.

In those areas where existing pavement markings are to be covered or removed, field locate and record the existing pavement markings by survey or other approved method by the Engineer as directed. Place final striping on these locations.

Item 672 – Raised Pavement Markers

Use a pilot line for final pavement markers and remove pilot line after all striping is complete. Remove pilot line in accordance with the methods specified in Item 677, “Eliminating Existing Pavement Markings and Markers,” and will be subsidiary to this Item.

Air blasting is required for pavement surface preparation.

Do not place raised pavement markers when the pavement surface temperature is below 60°F.

Completely remove all existing raised pavement markers from pavement where raised pavement markers are proposed as shown in the plans. This will include all RPMs in the surrounding area of the proposed RPM. Removal of raised pavement markers is subsidiary to various bid items

Raised pavement marking spacing must be in compliance with the requirements as shown on the plans.

Item 677 – Eliminating Existing Pavement Marking and Markers

Use water blasting as the method for removal of existing pavement markings, unless otherwise approved by the Engineer.

Item 3077 – Superpave Mixtures

Use Surface Aggregate Classification “A” material for all surface mixes.

In place of typical tack materials shown in Table 18 under Item 300, use a tracking resistant asphalt interlayer (TRAIL) material as a tack coat. TRAIL shall only be required prior to the final riding surface layer of HMA. Approved TRAIL products are found on TxDOT’s Material Producer List under Asphalt Interlayer (Tracking Resistant) at:
https://www.txdot.gov/business/resources/materials.html

Supply Warm-Mix Asphalt (WMA) under this Item.

Use of Recycled Asphalt Shingles (RAS) is not allowed for any mixtures.

Substitute PG Binders (grade dumping) will not be allowed for any mixtures.

Obtain the current version of the templates at http://www.txdot.gov/inside-txdot/forms-publications/consultants-contractors/forms/site-manager.html Submit electronically to the Engineer.

Design the mixture at 50 gyrations (Ndesign).

Do not cover with asphaltic material, any existing survey monuments, manholes, or valve covers, etc. Adjustments will be done in coordination with the respective utility owners.

Place a string line or other suitable marking to ensure smooth, neat lines, or as directed. Provide smooth transitions to existing driveways and intersections.

Place longitudinal joints approximately 6 in. from the stripe, or as directed by the Engineer. Avoid placing joint under the wheel path. Avoid placing longitudinal joints on the outside travel lane on multi-lane roadway.

Operate the spreading and finishing machine at a uniform forward speed consistent with the plant production rate, hauling capability, and roller train capacity to result in a continuous operation. The speed will be slow enough, so that stopping between trucks is not ordinarily required. If the Engineer determines non-uniform delivery of material is affecting the HMA placement, the Engineer may require the paving operations to cease until acceptable methods are employed to minimize starting and stopping of the paver.

Item 3085 – Underseal Course

Prepare the roadway surface prior to placing Underseal Course to the satisfaction of the Engineer. Some areas may require more extensive cleaning than other areas. This work will not *be paid for directly but will be subsidiary to pertinent items.*

Use Spray Applied Underseal Membrane or seal coat as underseal course prior to the placement of SP MIX (SP-C SAC-A) along entire width of roadway.

The minimum application rates are listed in Table 4. The engineer may adjust the application rate taking in consideration the existing pavement surface conditions.

Table 4

Material	Minimum Application Rate	Conversion Factor
AGGR (TY-PB GR-4 SAC-B)	110 SY/CY	
SEAL COAT ASPHALT: ASPH (SPG 67-19)	0.35 GAL/SY	0.8 (see note 1)
OR		
Spray Applied Underseal Membrane	0.20 GAL/SY	1.0 (see note 2)

For estimating purposes, the Underseal Course is applied at a rate of 0.20 Gal/SY.

1. Aggregate is considered subsidiary to the asphalt. For estimating purposes 0.8 Gallons of Seal Coat Asphalt is equivalent to 1.0 Gallons of Underseal Course. Refer to Item 316 for more information on this option.

2. For estimating purposes 1.0 Gallon of Spray Applied Underseal Membrane is equivalent to 1.0 Gallon of Underseal Course. Refer to Special Specification SS3002 for information and specifications.

Example: If Seal Coat Option Is Selected for Use.

A conversation rate of 0.8 will be applied to every one gallon of oil that is used.

If the NET gallons determined after strapping the tank is 1,000 gallons, then the 1,000 gallons will be multiplied by the 0.8 Conversion Rate shown in the table above.

Example: 1,000-GAL x 0.8 CR = 800 gallons for payment.

Quantity based price adjustment factors are not applicable to compensate for over or under runs resulting from the method chosen.

Item 6001 – Portable Changeable Message Sign

Provide messages as directed.

Provide Portable Changeable Message Signs as shown on the plans or as directed by the Engineer.

Item 6185 – Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA)

All TMA Operators must participate in a TMA workshop to be conducted by the El Paso District Safety Office, on the proper use of TMAs, prior to working on Department Right of Way (ROW). A certificate of completion will be issued to TMA Operators that successfully complete the TMA workshop. The certificate of completion must be carried by TMA Operators at all times while working on Department right of way.

Acquire the TCP and TMA Operator's certificates of completion prior to the authorization to begin work. No time suspension will be granted and no traffic control work will be allowed without certificates of completion.

In addition to the shadow vehicles with Truck Mounted Attenuator (TMA) that are specified as being required on the traffic control plan for this project, provide 1 additional shadow vehicle(s) with TMA for TCP (2-1)-18 as detailed on General Note 5 of this standard sheet.

Therefore, 2 total shadow vehicles with TMA will be required for this type of work. The contractor will be responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMAs needed for the project.

The supporting vehicle for the TMA shall have a minimum gross (i.e., ballasted) vehicular weight of 19,000 pounds.

Basis of Estimate for Stationary TMAs				
		TMA(Stationary)		
Phase	Standard	Required	Additional	TOTAL
1	TCP(2-1)-18	1	1	2
2	TCP(1-2)-18	1		1

Basis of Estimate for Mobile TMAs			
	TMA(Mobile)		
Standard	Required	Additional	TOTAL
TCP(3-1)-13	2		2
TCP(3-3)-14	2		2

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0104-11-008 **DISTRICT** El Paso **COUNTY** Presidio
HIGHWAY BU 67A

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0104-11-008**			
		PROJECT ID		**A00130327**			
		COUNTY		**Presidio**			
		HIGHWAY		**BU 67A**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	100-6002	PREPARING ROW	STA	6.000		6.000	
	104-6017	REMOVING CONC (DRIVEWAYS)	SY	17.000		17.000	
	104-6022	REMOVING CONC (CURB AND GUTTER)	LF	1,792.000		1,792.000	
	104-6036	REMOVING CONC (SIDEWALK OR RAMP)	SY	1,001.000		1,001.000	
	104-6040	REMOVING CONC (PAVERS)	SY	41.000		41.000	
	351-6002	FLEXIBLE PAVEMENT STRUCTURE REPAIR(6")	SY	4,571.000		4,571.000	
	354-6064	PLANE ASPH CONC PAV (2 1/2")	SY	45,535.000		45,535.000	
	432-6001	RIPRAP (CONC)(4 IN)	CY	127.000		127.000	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	7.000		7.000	
	506-6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	40.000		40.000	
	506-6003	ROCK FILTER DAMS (INSTALL) (TY 3)	LF	205.000		205.000	
	506-6011	ROCK FILTER DAMS (REMOVE)	LF	245.000		245.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	1,790.000		1,790.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	1,790.000		1,790.000	
	510-6001	ONE-WAY TRAF CONT (FLAGGER CONT)	HR	144.000		144.000	
	529-6008	CONC CURB & GUTTER (TY II)	LF	390.000		390.000	
	531-6001	CONC SIDEWALKS (4")	SY	194.000		194.000	
	531-6005	CURB RAMPS (TY 2)	EA	66.000		66.000	
	531-6013	CURB RAMPS (TY 10)	EA	15.000		15.000	
	531-6041	CURB RAMPS (SPECIAL)	SY	19.000		19.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	33.000		33.000	
	644-6002	IN SM RD SN SUP&AM TY10BWG(1)SA(P-BM)	EA	4.000		4.000	
	644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	5.000		5.000	
	644-6007	IN SM RD SN SUP&AM TY10BWG(1)SA(U)	EA	5.000		5.000	
	644-6009	IN SM RD SN SUP&AM TY10BWG(1)SB(P)	EA	1.000		1.000	
	644-6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	2.000		2.000	
	644-6033	IN SM RD SN SUP&AM TYS80(1)SA(U)	EA	5.000		5.000	
	644-6036	IN SM RD SN SUP&AM TYS80(1)SA(U-BM)	EA	3.000		3.000	
	644-6037	IN SM RD SN SUP&AM TYS80(1)SA(U-WC)	EA	1.000		1.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	51.000		51.000	
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	965.000		965.000	
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	971.000		971.000	
	666-6047	REFL PAV MRK TY I (W)24"(SLD)(090MIL)	LF	484.000		484.000	
	666-6101	REF PAV MRK TY I(W)36"(YLD TRI)(090MIL)	EA	15.000		15.000	
	666-6308	RE PM W/RET REQ TY I (W)6"(SLD)(090MIL)	LF	17,455.000		17,455.000	
	666-6320	RE PM W/RET REQ TY I (Y)6"(SLD)(090MIL)	LF	17,270.000		17,270.000	

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SUMMARY OF ROADWAY ITEMS					
LOCATION	351 6002	432 6001	529 6008	3077 6022	3085 6001
	FLEXIBLE PAVEMENT STRUCTURE REPAIR(6")	RIPRAP (CONC)(4 IN)	CONC CURB & GUTTER (TY II)	SP MIXES SP-C SAC-A PG70-22	UNDERSEAL COURSE
	SY	CY	LF	TON	GAL
BEGIN OF PROJECT TO STA 3122+00 (SHEET 1 OF 12)				448	913
STA 3122+00 TO STA 3129+30 (SHEET 2 OF 12)				407	830
STA 3129+30 TO STA 3136+00 (SHEET 3 OF 12)			15	455	926
STA 3136+00 TO STA 3144+00 (SHEET 4 OF 12)			86	546	1,113
STA 3144+00 TO STA 3152+00 (SHEET 5 OF 12)		62	50	547	1,113
STA 3152+00 TO STA 3160+40 (SHEET 6 OF 12)		65	118	605	1,231
STA 3160+40 TO STA 3168+40 (SHEET 7 OF 12)			13	652	1,328
STA 3168+40 TO STA 3178+00 (SHEET 8 OF 12)			17	632	1,288
STA 3178+00 TO STA 3188+00 (SHEET 9 OF 12)			8	554	1,129
STA 3188+00 TO STA 3197+00 (SHEET 10 OF 12)			41	477	972
STA 3197+00 TO STA 3206+00 (SHEET 11 OF 12)			42	496	1,010
STA 3206+00 TO END OF PROJECT (SHEET 12 OF 12)				446	908
PROJECT TOTALS	4,571	127	390	6,265	12,761

SUMMARY OF PEDESTRIAN ITEMS				
LOCATION	531 6001	531 6005	531 6013	531 6041
	CONC SIDEWALKS (4")	CURB RAMPS (TY 2)	CURB RAMPS (TY 10)	CURB RAMPS (SPECIAL)
	SY	EA	EA	SY
BEGIN OF PROJECT TO STA 3122+00 (SHEET 1 OF 12)				
STA 3122+00 TO STA 3129+30 (SHEET 2 OF 12)			2	
STA 3129+30 TO STA 3136+00 (SHEET 3 OF 12)	6	2		
STA 3136+00 TO STA 3144+00 (SHEET 4 OF 12)	42	16		
STA 3144+00 TO STA 3152+00 (SHEET 5 OF 12)	24	14		
STA 3152+00 TO STA 3160+40 (SHEET 6 OF 12)	56	22		
STA 3160+40 TO STA 3168+40 (SHEET 7 OF 12)	7	2	2	
STA 3168+40 TO STA 3178+00 (SHEET 8 OF 12)	9	4	3	19
STA 3178+00 TO STA 3188+00 (SHEET 9 OF 12)	4		2	
STA 3188+00 TO STA 3197+00 (SHEET 10 OF 12)	23		6	
STA 3197+00 TO STA 3206+00 (SHEET 11 OF 12)	23	6		
STA 3206+00 TO END OF PROJECT (SHEET 12 OF 12)				
PROJECT TOTALS	194	66	15	19

SUMMARY OF SWP3 ITEMS					
LOCATION	506 6002	506 6003	506 6011	506 6038	506 6039
	ROCK FILTER DAMS (INSTALL) (TY 2)	ROCK FILTER DAMS (INSTALL) (TY 3)	ROCK FILTER DAMS (REMOVE)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)
	LF	LF	LF	LF	LF
BEGIN OF PROJECT TO STA 3129+40 (SHEET 1 OF 6)	20		20	170	170
STA 3129+40 TO STA 3144+00 (SHEET 2 OF 6)				800	800
STA 3144+00 TO STA 3160+00 (SHEET 3 OF 6)		175	175	360	360
STA 3160+00 TO STA 3178+00 (SHEET 4 OF 6)		30	30		
STA 3178+00 TO STA 3197+00 (SHEET 5 OF 6)				30	30
STA 3197+00 TO END OF PROJECT (SHEET 6 OF 6)	20		20	430	430
PROJECT TOTALS	40	205	245	1,790	1,790

SUMMARY OF REMOVAL ITEMS						
LOCATION	100 6002	104 6017	104 6022	104 6036	104 6040	354 6064
	PREPARING ROW	REMOVING CONC (DRIVEWAYS)	REMOVING CONC (CURB AND GUTTER)	REMOVING CONC (SIDEWALK OR RAMP)	REMOVING CONC (PAVERS)	PLANE ASPH CONC PAV (2 1/2")
	STA	SY	LF	SY	SY	SY
BEGIN OF PROJECT TO STA 3129+30 (SHEET 1 OF 6)			36	25		6,224
STA 3129+30 TO STA 3144+00 (SHEET 2 OF 6)			426	234		7,283
STA 3144+00 TO STA 3160+40 (SHEET 3 OF 6)	6		806	454		8,372
STA 3160+40 TO STA 3178+00 (SHEET 4 OF 6)			233	131	41	9,302
STA 3178+00 TO STA 3197+00 (SHEET 5 OF 6)		17	139	83		7,503
STA 3197+00 TO END OF PROJECT (SHEET 6 OF 6)			152	74		6,851
PROJECT TOTALS	6	17	1,792	1,001	41	45,535

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Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

Texas Department of Transportation

BU 67A

SUMMARY OF QUANTITIES

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		10

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS							
LOCATION	502 6001	510 6001	662 6109	662 6111	6001 6002	6185 6002	6185 6003
	BARRICADES, SIGNS AND TRAFFIC HANDLING	ONE-WAY TRAF CONT (FLAGGER CONT)	WK ZN PAV MRK SHT TERM (TAB)TY W	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	PORTABLE CHANGEABLE MESSAGE SIGN	TMA (STATIONARY)	TMA (MOBILE OPERATION)
	MO	HR	EA	EA	EA	DAY	HR
	7	144	965	971	4	105	24
PROJECT TOTALS	**7**	**144**	**965**	**971**	**4**	**105**	**24**

SUMMARY OF SMALL SIGNS ITEMS										
LOCATION	644 6001	644 6002	644 6004	644 6007	644 6009	644 6030	644 6033	644 6036	644 6037	644 6076
	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	IN SM RD SN SUP&AM TY10BWG(1)SA(P-BM)	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	IN SM RD SN SUP&AM TY10BWG(1)SA(U)	IN SM RD SN SUP&AM TY10BWG(1)SB(P)	IN SM RD SN SUP&AM TYS80(1)SA(T)	IN SM RD SN SUP&AM TYS80(1)SA(U)	IN SM RD SN SUP&AM TYS80(1)SA(U-BM)	IN SM RD SN SUP&AM TYS80(1)SA(U-WC)	REMOVE SM RD SN SUP&AM
	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
BEGIN OF PROJECT TO STA 3122+00.00 (SHEET 1 OF 12)	5	1	2					2		10
STA 3122+00.00 TO STA 3129+30.00 (SHEET 2 OF 12)	3					1				4
STA 3129+30.00 TO STA 3136+00.00 (SHEET 3 OF 12)	3					1	2	1		7
STA 3136+00.00 TO STA 3144+00.00 (SHEET 4 OF 12)	3		1	1						5
STA 3144+00.00 TO STA 3152+00.00 (SHEET 5 OF 12)	1									1
STA 3152+00.00 TO STA 3160+40.00 (SHEET 6 OF 12)	3			1					1	5
STA 3160+40.00 TO STA 3168+40.00 (SHEET 7 OF 12)	3	1		1			3			8
STA 3168+40.00 TO STA 3178+00.00 (SHEET 8 OF 12)	3				1					
STA 3178+40.00 TO STA 3188+00.00 (SHEET 9 OF 12)	1									1
STA 3188+00.00 TO STA 3197+00.00 (SHEET 10 OF 12)	2	1								
STA 3197+00.00 TO STA 3260+00.00 (SHEET 11 OF 12)	2	1								2
STA 3260+00.00 TO END OF PROJECT (SHEET 12 OF 12)	4		2	2						8
PROJECT TOTALS	**33**	**4**	**5**	**5**	**1**	**2**	**5**	**3**	**1**	**51**

SUMMARY OF PAVEMENT MARKING ITEMS								
LOCATION	666 6101	666 6308	666 6320	666 6047	672 6009	678 6002	678 6008	678 6023
	REF PAV MRK TY I(W)36"(YLD TRI)(090MIL)	RE PM W/RET REQ TY I (W)6"(SLD)(090MIL)	RE PM W/RET REQ TY I (Y)6"(SLD)(090MIL)	REFL PAV MRK TY I (W)24"(SLD)(090MIL)	REFL PAV MRKR TY II-A-A	PAV SURF PREP FOR MRK (6")	PAV SURF PREP FOR MRK (24")	PAV SURF PREP FOR MRK (36")(YLD TRI)
	EA	LF	LF	LF	EA	LF	LF	EA
BEGIN OF PROJECT TO STA 3122+00.00 (SHEET 1 OF 12)	10	1,360	1,340	20	17	2,700	20	10
STA 3122+00.00 TO STA 3129+30.00 (SHEET 2 OF 12)		1,200	1,350		17	2,550		
STA 3129+30.00 TO STA 3136+00.00 (SHEET 3 OF 12)		1,340	1,340		17	2,680		
STA 3136+00.00 TO STA 3144+00.00 (SHEET 4 OF 12)		1,280	1,280		17	2,560		
STA 3144+00.00 TO STA 3152+00.00 (SHEET 5 OF 12)		1,130	1,130		15	2,260		
STA 3152+00.00 TO STA 3160+40.00 (SHEET 6 OF 12)		1,240	1,400	228	20	2,640	228	
STA 3160+40.00 TO STA 3168+40.00 (SHEET 7 OF 12)		2,100	1,940		26	4,040		
STA 3168+40.00 TO STA 3178+00.00 (SHEET 8 OF 12)		1,660	1,650	150	22	3,310	150	
STA 3178+40.00 TO STA 3188+00.00 (SHEET 9 OF 12)		1,385	1,450		20	2,835		
STA 3188+00.00 TO STA 3197+00.00 (SHEET 10 OF 12)		1,680	1,740	66	23	3,420	66	
STA 3197+00.00 TO STA 3260+00.00 (SHEET 11 OF 12)		1,450	1,500		20	2,950		
STA 3260+00.00 TO END OF PROJECT (SHEET 12 OF 12)	5	1,630	1,150	20	20	2,780	20	5
PROJECT TOTALS	**15**	**17,455**	**17,270**	**484**	**234**	**34,725**	**484**	**15**

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TBPE REG. # F-11657

Texas Department of Transportation

BU 67A

SUMMARY OF QUANTITIES

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		11

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DATE:
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I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

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

1.

2.

☐ 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 SW3P and revise when necessary to control pollution or required by the Engineer.
3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

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

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

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

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

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

1.

2.

3.

4.

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

Best Management Practices:

Erosion	Sedimentation	Post-Construction TSS
☐ 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	☐ 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. Project staging areas, stockpiles, temporary construction easements, and other project related sites should be situated in previously disturbed areas to avoid or minimize impacts to sensitive or unique habitats including intact native vegetation, floodplains, riparian corridors, wetlands, playa lakes, and habitat for wildlife species.
2. Minimize the amount of vegetation cleared. Removal of native vegetation, particularly mature native trees and shrubs should be avoided. Impacted vegetation should be replaced with in-kind on-site replacement/restoration of native vegetation.

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. Contractors will be informed to avoid harming all wildlife species if encountered and allow them to safely leave the project site. Due diligence should be used to avoid killing or harming any wildlife species in the implementation of transportation projects.
2. Examine heavy equipment stored on site before use, particularly after rain events when reptile and amphibian movements occur more often, to ensure use will not harm individuals that might be seeking temporary refuge.

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

LIST OF ABBREVIATIONS

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

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

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

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

Contact the Engineer if any of the following are detected:
* Dead or distressed vegetation (not identified as normal)
* Trash piles, drums, canister, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

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

☐ Yes ☒ No

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

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

☐ Yes ☒ No

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

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

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

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

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

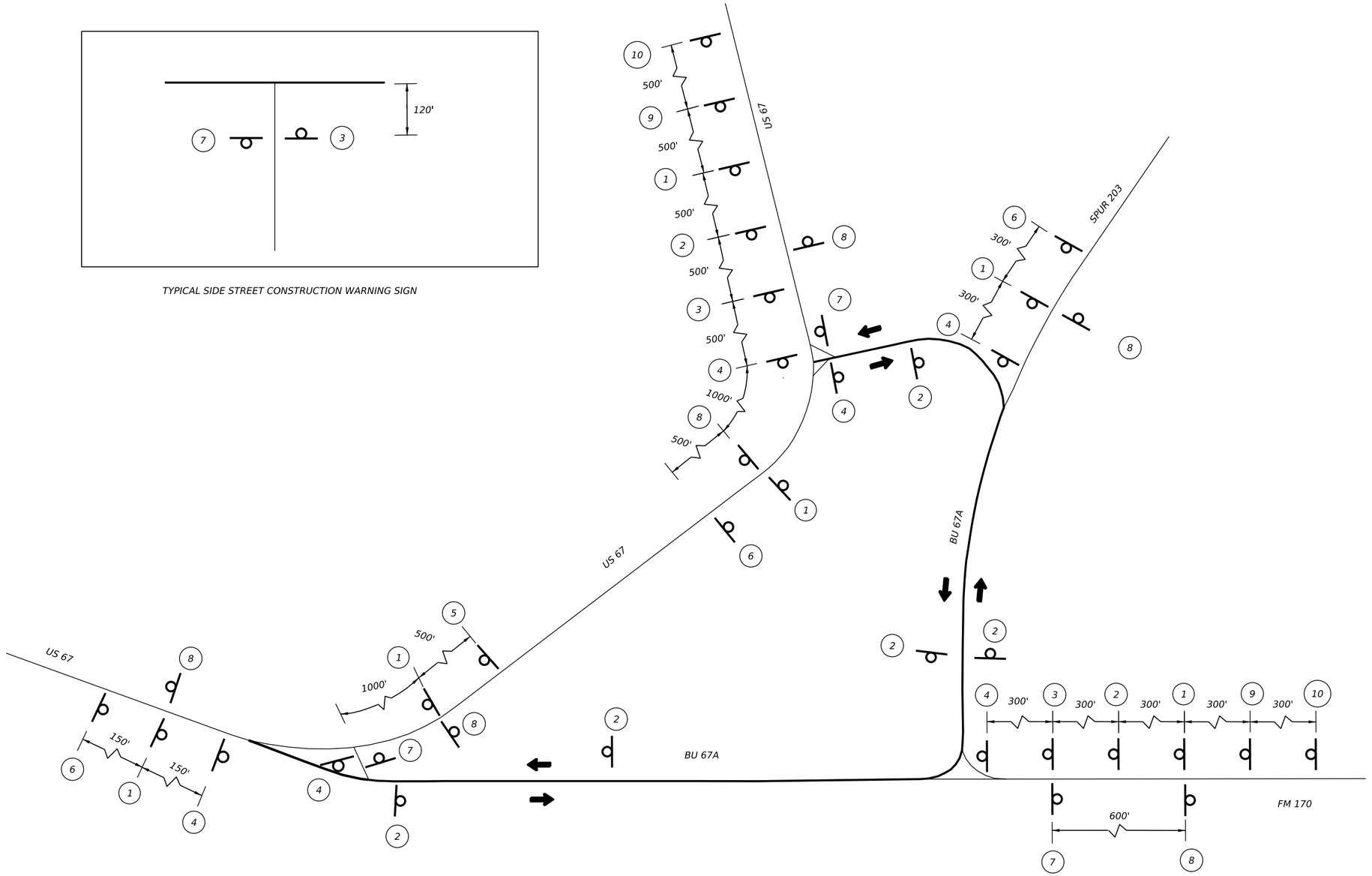
Design Division Standard

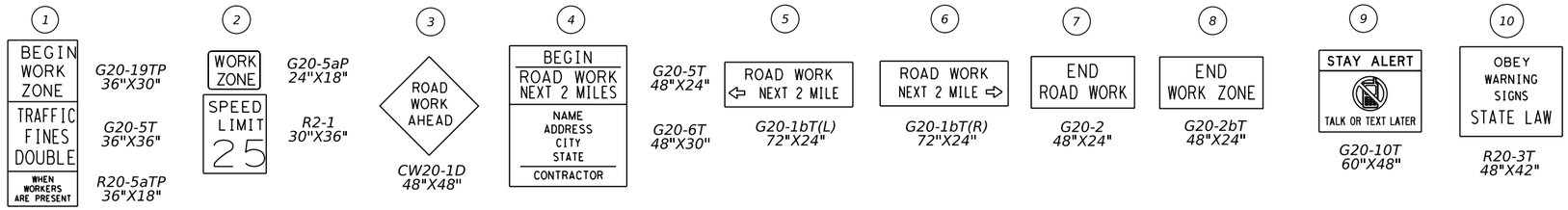
ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR	
©TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY	
REVISIONS 12-12-2011 (DS) 05-07-14 ADDED NOTE SECTION IV. 01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	0104	11	008	BU 67A	
	DIST	COUNTY		SHEET NO.	
	ELP	PRESIDIO		12	

TYPICAL SIDE STREET CONSTRUCTION WARNING SIGN





LEGEND:

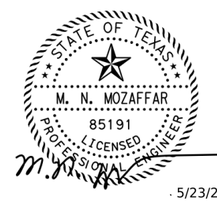
- WORK ZONE
- CONSTRUCTION WARNING SIGNS
- TRAFFIC FLOW

NOTES:

1. REFER TO BC(2)-21 AND WZ(BRK) STANDARDS TO VERIFY MINIMUM SPACING FOR CONSTRUCTION WARNING SIGNS DEPENDING ON HIGHWAY POSTED SPEED.
2. PLACE PROJECT LIMITS SIGNS AT LOCATION SHOWN AS FIELD CONDITIONS PERMIT. SIGNS TO REMAIN FOR THE DURATION OF THE PROJECT OR AS DIRECTED.
3. PROVIDE AND MAINTAIN ALL BARRICADES, WARNING SIGNS, AND TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH TXDOT BC AND TCP STANDARDS, AND PART VI OF THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".
4. CONTRACTOR SHALL COORDINATE WITH THE ENGINEER TO ADJUST SIGN PLACEMENT AND SPACING AS NEEDED.
5. CONTRACTOR SHALL COVER OR REMOVE THE EXISITING CONFLICTING SIGNS AS REQUIRED.
6. CONTRACTOR SHALL FOLLOW SIDE STREET CONSTRUCTION WARNING SIGN GUIDANCE TO PLACE CONSTRUCTION WARNING SIGNS AT SIDE STREETS. CONTRACTOR IS RESPONSIBLE FOR PLACING APPLICABLE SIDE STREET CONSTRUCTION WARNING SIGNS AS REQUIRED.

NOT TO SCALE

DATE	BY	REV	REVISION



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TBPE REG. # F-11657

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BU 67A

TRAFFIC CONTROL PLAN ADVANCE WARNING SIGNS

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		13

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GENERAL NOTES:

1. ALL TRAFFIC CONTROL DEVICES SHALL CONFORM WITH THE TEXAS "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" (TXMUTCD), AND SHALL BE MAINTAINED AS DIRECTED BY THE ENGINEER. WORK SITES SHOULD BE CAREFULLY MONITORED TO ENSURE THAT TRAFFIC CONTROL MEASURES ARE OPERATING EFFECTIVELY AND THAT ALL DEVICES USED ARE CLEARLY VISIBLE, CLEAN AND IN GOOD REPAIR.

2. ROADWAY DRAINAGE MUST BE MAINTAINED AT ALL TIMES.

3. THE CONTRACTOR MUST PROVIDE CONTINUOUS PEDESTRIAN ACCESS DURING ALL PHASES OF CONSTRUCTION. PEDESTRIAN DETOURS MAY NEED TO BE ESTABLISHED BEFORE THE CONTRACTOR BEGINS CONSTRUCTION, SO THAT ACCESS IS NOT DENIED TO PEDESTRIANS. CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE NECESSARY DETOUR PLAN FOR PEDESTRIANS ACCORDING TO THE SIDEWALK DETOUR AND CROSSWALK CLOSURES STANDARD.

4. CURB RAMPS SHALL BE CONSTRUCTED ON ONE SIDE OF THE ROADWAY BEFORE WORK CAN BE BEGUN ON THE OTHER SIDE OF THE ROADWAY.

5. ANY LOOSE MATERIAL AND DEBRIS RESULTING FROM CONSTRUCTION OPERATIONS MUST BE REMOVED AT THE END OF EACH WORK DAY.

6. MAINTAIN DRIVEWAY AND CROSS STREET ACCESS AT ALL TIMES.

SEQUENCE OF WORK

PHASE 1:

1. PLACE BARRICADES, ADVANCE WARNING SIGNS AND OTHER TRAFFIC CONTROL DEVICES AS SHOWN ON THE PLANS AND IN ACCORDANCE WITH BC, WZ, AND TCP STANDARDS.

2. PLACE SWP3 MEASURES.

3. CONSTRUCT SIDEWALK, CURB RAMPS AND SMALL SIGNS USING TCP(2-1)-18 AND TCP(1-2)-18 STANDARDS.

4. PERFROM GRADING AND PAVEMENT REPAIR AT THOMPSON/N EI CAMPO ST INTERSECTION BY DETOURING THE TRAFFIC AS SHOWN IN THE DETOUR LAYOUT.

PHASE 2:

1. MILLING SHALL BE PERFORMED IN TWO (2) STAGES. BEFORE THE COMMENCEMENT OF EACH STAGE, INSTALL ADVANCE WARNING SIGNS, TEMPORARY SIGNS, BARRICADES AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. CONTRACTOR SHALL LIMIT THE LENGTH OF THE WORK SPACE BASED ON WHAT CAN BE DONE DURING A WORKDAY PERIOD. AT THE END OF EACH WORKING DAY, THE ROADWAY MUST BE REOPENED TO TWO-WAY,TWO LANE TRAFFIC WITHIN THE PROJECT LIMITS.

2. DAILY LANE CLOSURES WILL BE USED IN ACCORDANCE WITH TXDOT TCP STANDARDS. LANE CLOSURES AND CONSTRUCTION WILL BE LIMITED TO DAY TIME OPERATIONS. ANY NIGHT WORK MUST BE APPROVED IN WRITING BY THE ENGINEER.

3. ANY LONGITUDINAL DIFFERENCE IN ELEVATION SHALL BE TAPERED TO MEET A MINIMUM 3:1 SLOPE PER STANDARD OF TREATMENT FOR VARIOUS EDGE CONDITIONS AND PROVIDE SIGNAGE PER STANDARD WZ(UL)-13 AT LOCATIONS WHERE THIS CONDITION EXISTS.

PHASE 2 STAGE 1:

1. CLOSE ONE LANE AND SHIFT TRAFFIC INTO NEW CONFIGURATION AS SHOWN ON TCP TYPICAL SECTIONS. INSTALL BARRICADES, BARRELS, AND SIGNS PER TCP(1-2)-18.

2. PERFORM 6" PAVEMENT REPAIR OPERATIONS AT LOCATIONS AS DIRECTED BY THE ENGINEER.

3. MILL 2.5" OF EXISTING PAVEMENT.

4. PERFORM UNDERSEAL COURSE.

5. PLACE PROPOSED 2.5" SP-C INLAY.

6. MAINTAIN DRIVEWAY AND CROSS STREET ACCESS AT ALL TIMES.

PHASE 2 STAGE 2:

1. REPEAT PHASE 2 STAGE 1 FOR OPPOSITE DIRECTION OF TRAFFIC.

PHASE 3:

1. PLACE FINAL PAVEMENT MARKINGS PER TCP(3-1)-13, TCP(3-3)-14 AND TCP(1-2)-18.

2. PERFORM FINAL CLEAN UP.

TCP SELECTION TABLE

PHASE	TYPE OF WORK	STANDARD SHEET	SHEET DESCRIPTION	SHEET DIAGRAM	SUGGESTED USE
1	SIDEWALK AND CURB RAMP CONSTRUCTION	TCP(2-1)-18	CONVENTIONAL ROAD SHOULDER WORK	TCP(2-1c)	WORK VEHICLES ON SHOULDER TCP. ONE-LANE TWO-WAY TRAFFIC CONTROL WITH FLAGGERS (TCP(1-2)-18) IS OPTIONAL
2	MILL AND INLAY: STA 3115+30 TO STA 3209+63	TCP(1-2)-18	ONE LANE TWO-WAY CONTROL	TCP(1-2b)	ONE LANE TWO-WAY TRAFFIC CONTROL WITH FLAGGERS
3	PAVEMENT MARKING	TCP(3-1)-13	MOBILE OPERATIONS- UNDIVIDED HIGHWAYS	TCP(3-1b)	MOBILE OPERATION
3	RPM INSTALLATION	TCP(3-3)-14	MOBILE OPERATIONS- RPM INSTALLATION /REMOVAL	TCP(3-3a)	MOBILE OPERATION

DATE	BY	REV	REVISION

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER

5/23/2023

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HOUSTON, TEXAS 77063
TBPE REG. # F-11657

Texas Department of Transportation

BU 67A

TRAFFIC CONTROL PLAN GENERAL NOTES AND SEQUENCE OF CONSTRUCTION

NOT TO SCALE

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A

DIST	COUNTY	SHEET NO.
ELP	PRESIDIO	14

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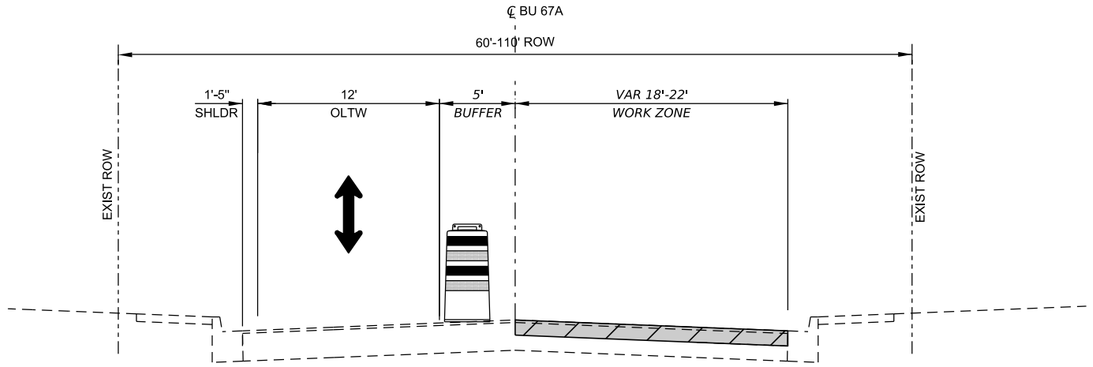
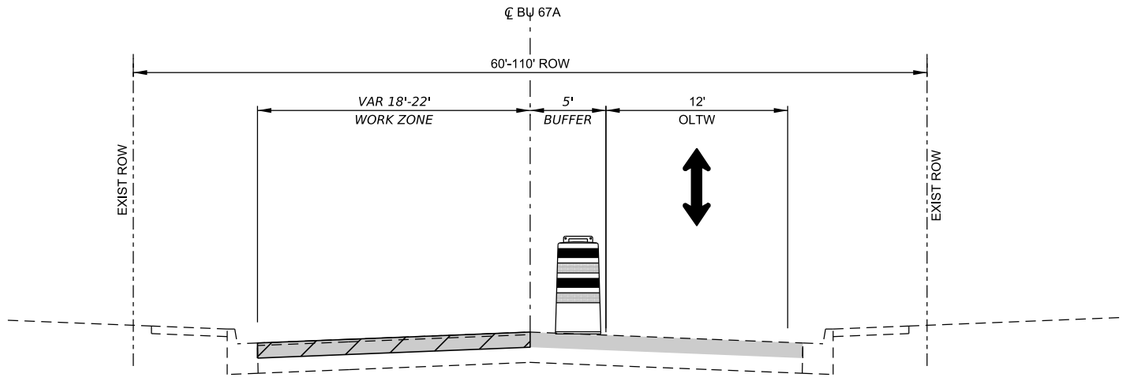


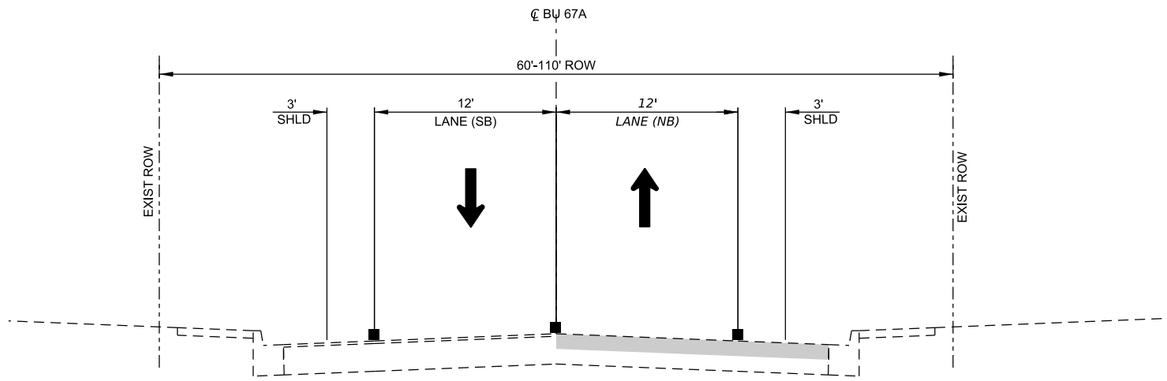
TCP PHASE 2 STAGE 1 TYPICAL SECTION

STA 3115+30 TO STA 3209+63



TCP PHASE 2 STAGE 2 TYPICAL SECTION

STA 3115+30 TO STA 3209+63



TCP PHASE 2 NON-WORK HOURS, OPEN BOTH LANES FOR TRAFFIC

STA 3115+30 TO STA 3209+63

LEGEND:

- MILLING
- INLAY
- CHANNELIZATION DEVICES
- WK ZN PAV MRK SHT TERM (TAB)

NOTES:

1. REFER TO TCP SEQUENCE OF WORK FOR WORK ZONE FOR MORE INFORMATION.
2. CONTRACTOR SHALL REFER TO TCP SELECTION TABLE FOR APPLICABLE STANDARDS DURING WORK HOURS.

NOT TO SCALE

DATE	BY	REV	REVISION

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HOUSTON, TEXAS 77063
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BU 67A

TRAFFIC CONTROL PLAN
TYPICAL SECTIONS

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		15

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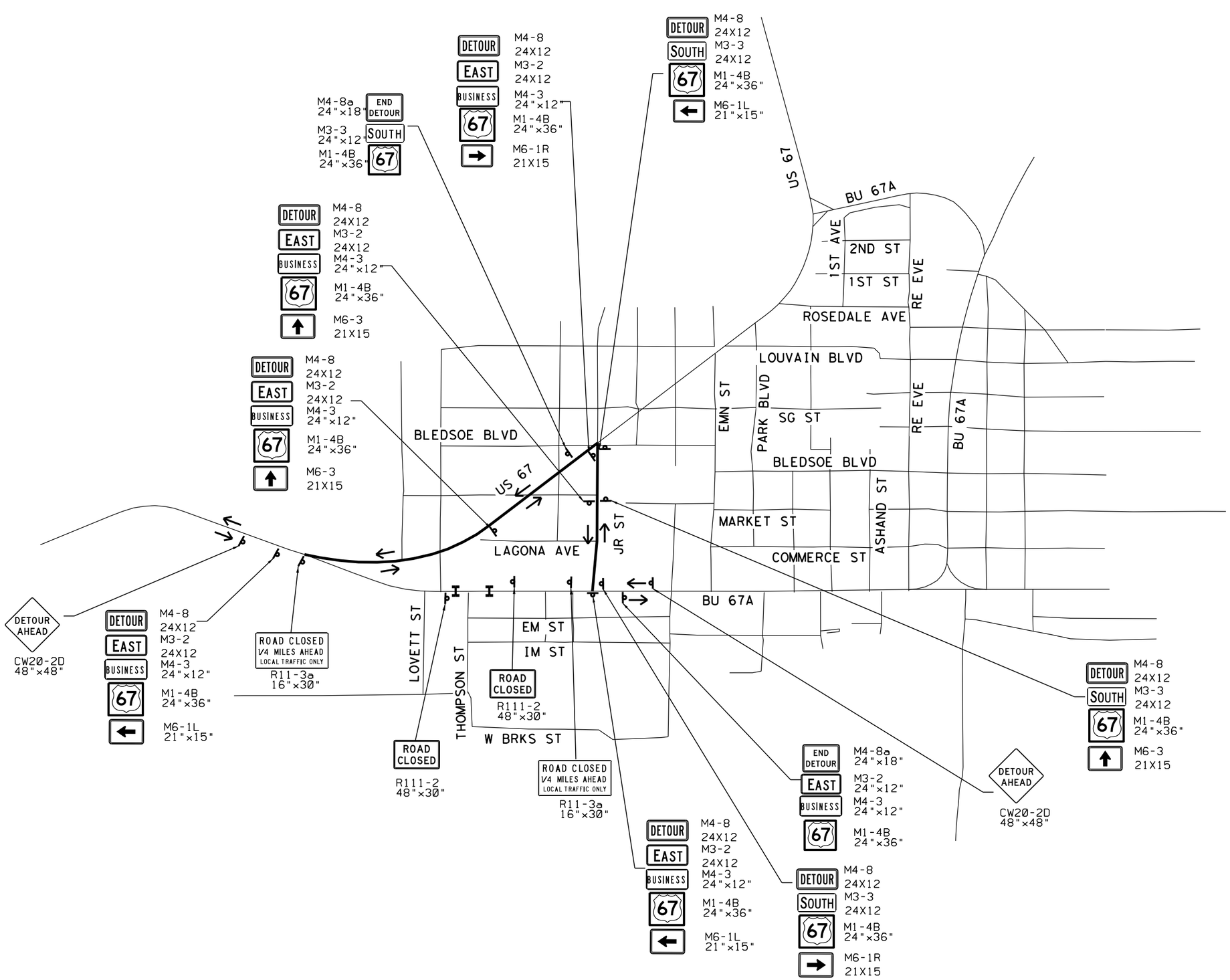

LEGEND:

I — TYPE III BARRICADE

NOT TO SCALE

DATE	BY	REV	REVISION

STATE OF TEXAS
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BU 67A

TRAFFIC CONTROL PLAN
DETOUR LAYOUT

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		16

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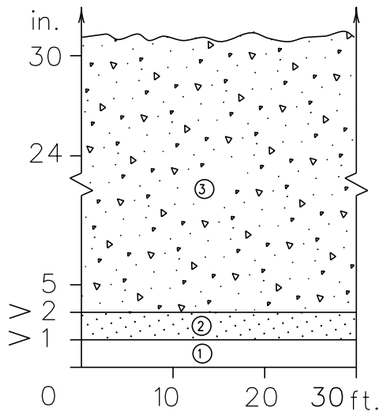
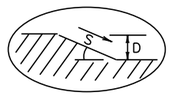
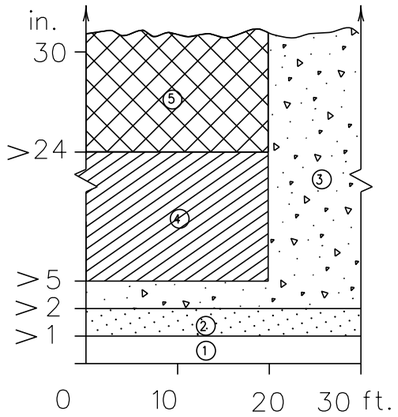
DEFINITION OF TREATMENT ZONES FOR VARIOUS EDGE CONDITIONS

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

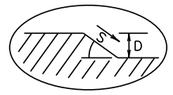


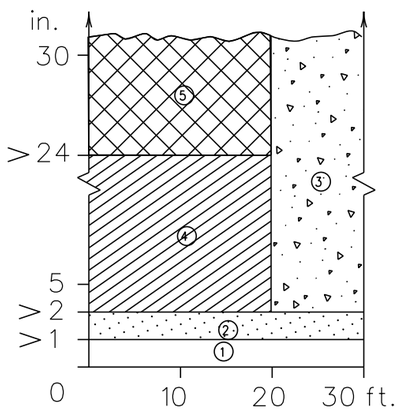
Edge Condition I
S = (3:1) (or flatter)



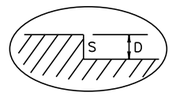


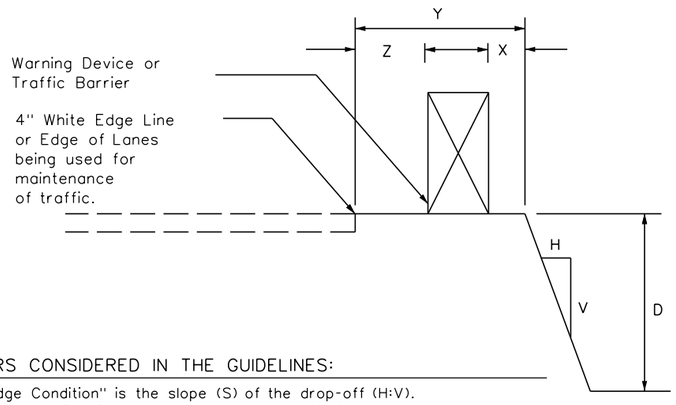
Edge Condition II
S = ((2.99):1) to (1:1)





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





FACTORS CONSIDERED IN THE GUIDELINES:

1. The "Edge Condition" is the slope (S) of the drop-off (H:V). The "Edge Height is the depth of the drop-off "D".

2. Distance "X" is to be the maximum practical under job conditions. Two feet minimum for high speed conditions. Distance "Y" is the lateral clearance from edge of travel lane to edge of dropoff. Distance "Z" does not have a minimum.

3. In addition to the factors considered in the guidelines, each construction zone drop-off situation should be analyzed individually, taking into account other variables, such as: traffic mix, posted speed in the construction zone, horizontal curvature, and the practicality of the treatment options.

4. The conditions for indicating the use of positive or protective barriers are given by Zone-5 and Figure-1. Traffic barriers are primarily applicable for high speed conditions. Urban areas with speeds of 30 mph or less may have a lesser need for signing, delineation, and barriers. Right-angled edges, however, with "D" greater than 2 inches and located within a lateral offset of 6 feet, may indicate a higher level of treatment.

5. If the distance "Y" must be less than 3 feet, the use of a positive barrier may not be feasible. In such a case, consider either: 1) narrowing the lanes to a desired 11 to 12 feet or 10 foot minimum (see CW20-8 sign), or 2) provide an edge slope such as Edge Condition I.

Zone	Treatment Types Guidelines:
①	No treatment
②	CW 8-11 "Uneven Lanes" signs.
③	CW 8-9a Shoulder Drop-Off" or CW 8-11 signs plus vertical panels.
④	CW8-9a or CW 8-11, signs plus drums. Where restricted space precludes the use of drums, use vertical panels. An edge slope to that of the profered Edge Condition I.
⑤	Check indications (Figure-1) for possitive barrier. Where positive barrier is not indicated, the treatment shown above for Zone-4 may be used after consideration of other applicable factors.

Edge Condition Notes:

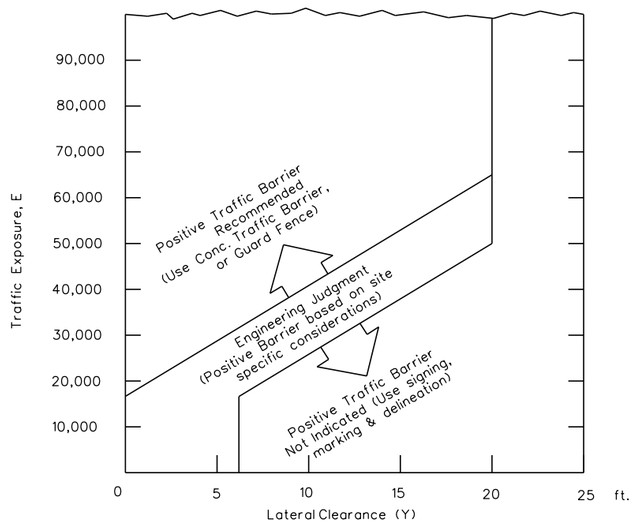
1. Edge Condition I: Most vehicles are able to traverse an edge condition with a slope rate of (3 to 1) or flatter. The slope must be constructed with a compacted material capable of supporting vehicles.

2. Edge Condition II: Most vehicles are able to traverse an edge condition with a slope between (2.99 to 1) and (1 to 1) so long as "D" does not exceed 5 inches. Under-carriage drag on most automobiles will occur when "D" exceeds 6 inches. As "D" exeeds 24 inches, the possibility for rollover is greater in most vehicles.

3. Edge Condition III: When slopes are greater than (1 to 1) and where "D" is greater than 2 inches, a more difficult control factor may exist for some vehicles, if not properly treated. For example, where "D" is greater than 2 inches and up to 24 inches different types of vehicles may experience different steering control at different edge heights. Automobiles might experience more steering control differential when "D" is greater than 2 inches and up to 5 inches. Trucks, particularly those with high loads, have more steering control differential when "D" is greater than 5 inches and up to 24 inches. When "D" exceeds 24 inches, the possibility of rollover is greater for most vehicles.

4. Milling or overlay operations that result in Edge Condition III should not be in place without appropriate warning treatments, and these conditions should not be left in place for extended periods of time.

FIGURE-1: CONDITIONS INDICATING USE OF POSITIVE BARRIER FOR ZONE 5 ( )



1. E = ADT x T
   Where ADT is that portion of the average daily traffic volume traveling within 20 feet (generally two adjacent lanes) of the edge dropoff condition; and, T is the duration time in years of the dropoff condition.

2. Figure-1 provides a practical approach to the use of positive barriers for the protection of vehicles from pavement drop-offs. Other factors, such as the presence of heavy machinery, construction workers, or the mix and volume of traffic may make the use of positive barriers appropriate, even when the edge condition alone may not justify the use of a barrier.

3. An approved end treatment should be provided for any positive barrier end located within the clear zone.

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

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER
5/23/2023

Texas Department of Transportation

Traffic Safety Division Standard

TREATMENT FOR VARIOUS EDGE CONDITIONS

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03-01 08-01 9-21	DIST	COUNTY		SHEET NO.
	ELP	PRESIDIO		17

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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

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Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0104	11	008	BU 67A
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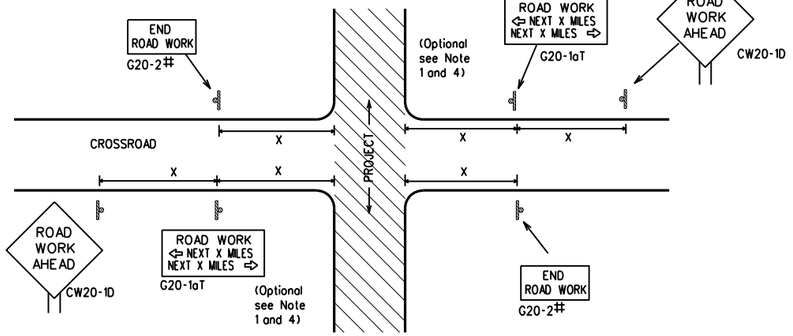
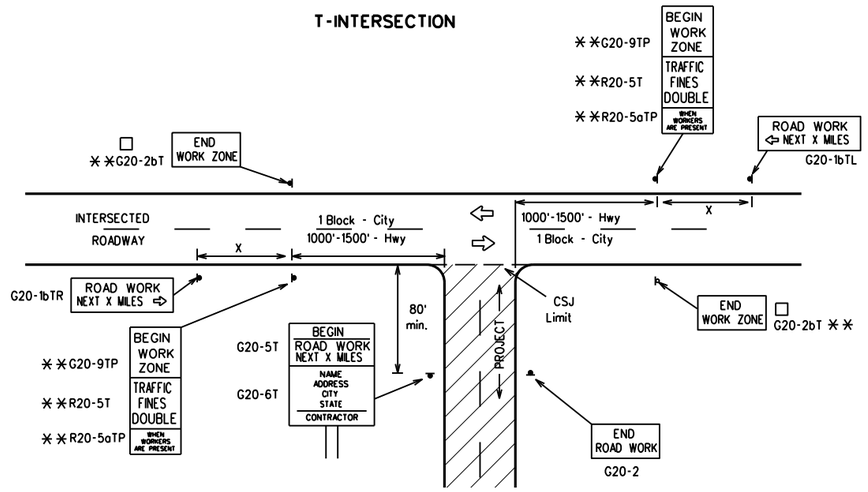
TYPICAL LOCATION OF CROSSROAD SIGNS



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]

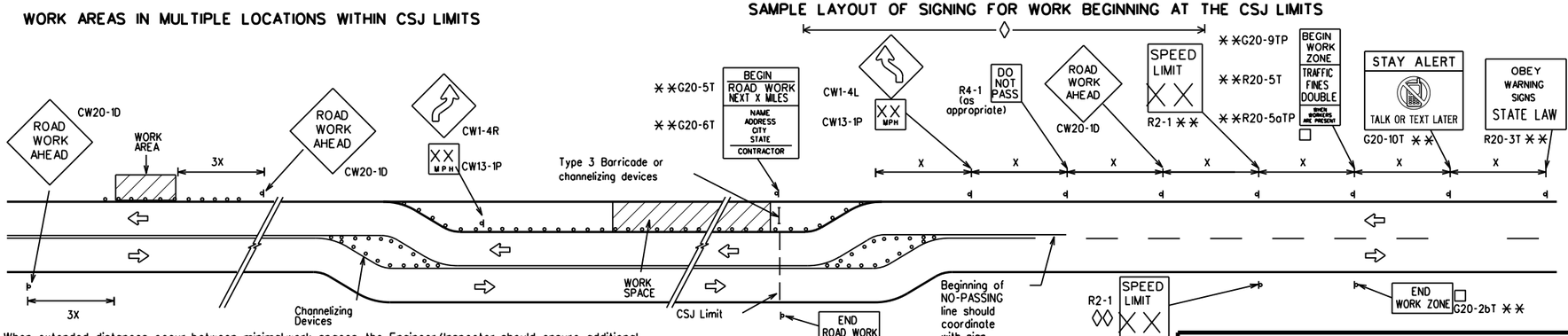
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

* 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.

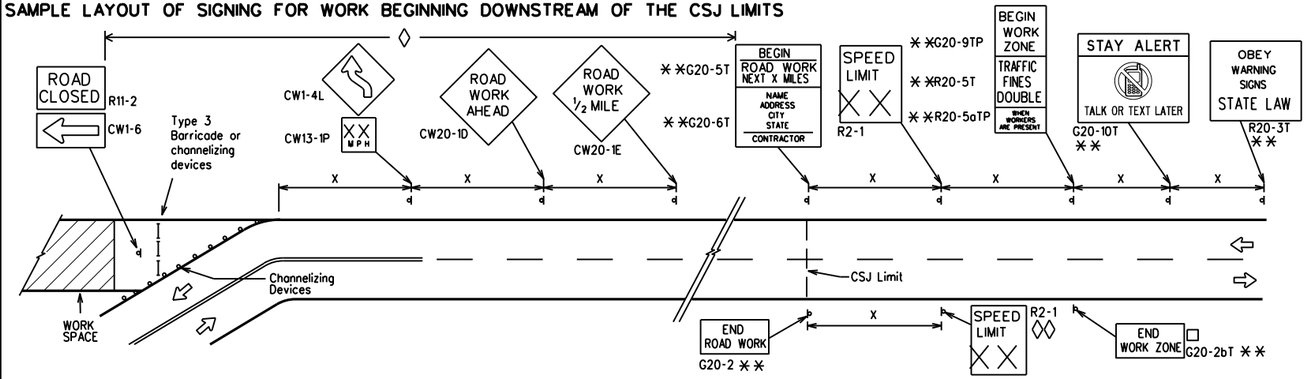
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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 AT THE CSJ LIMITS

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.

SHEET 2 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

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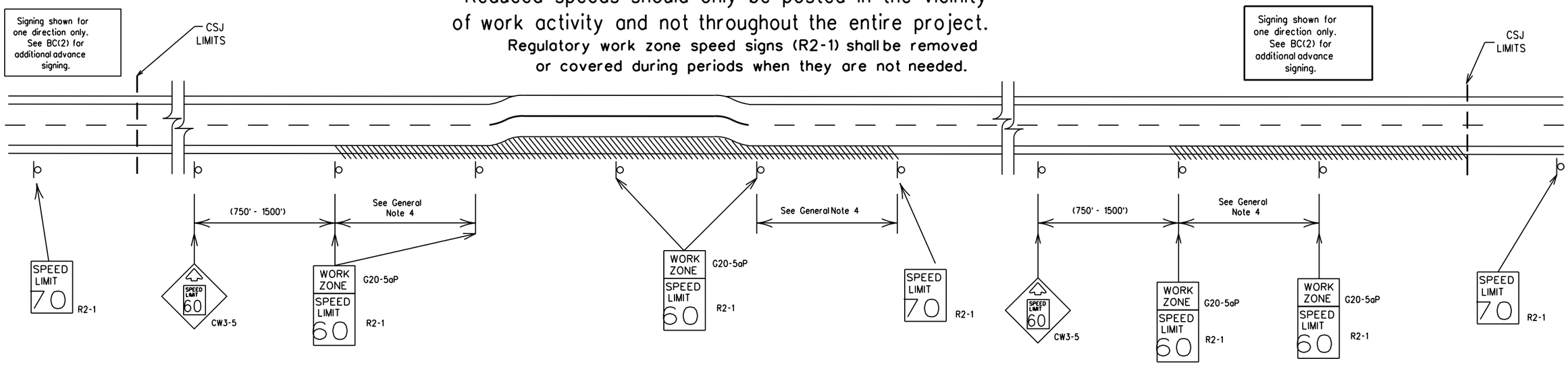
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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. Low 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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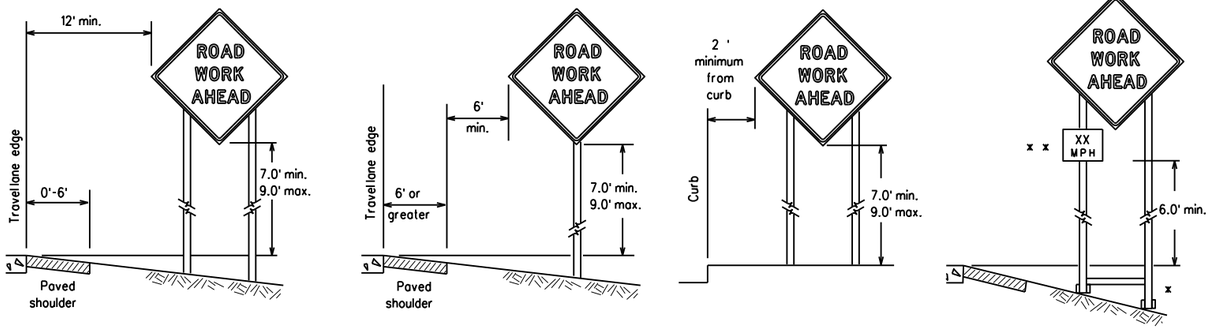
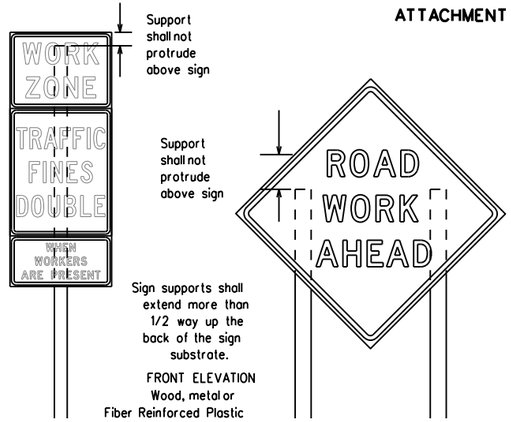
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



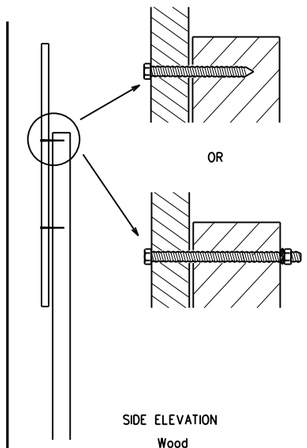
x When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS



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

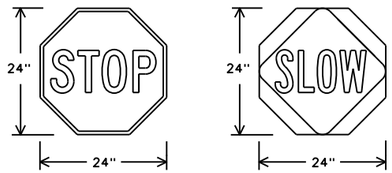


Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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.

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

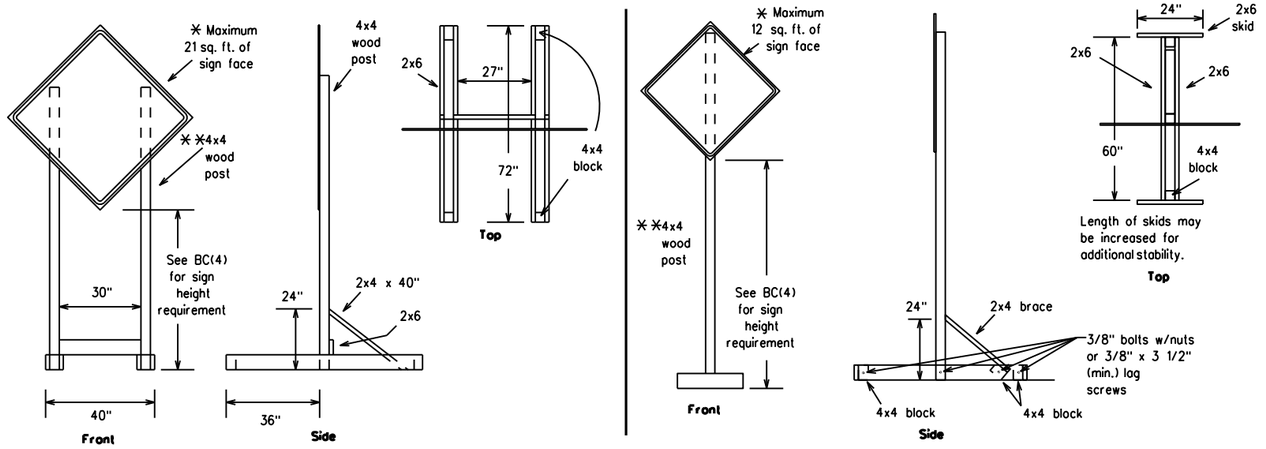
1. Flags may be used to draw attention to warning signs. When used, the flag shall be 16 inches square or larger and shall be orange or fluorescent red-orange in color. Flags shall not be allowed to cover any portion of the sign face.

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

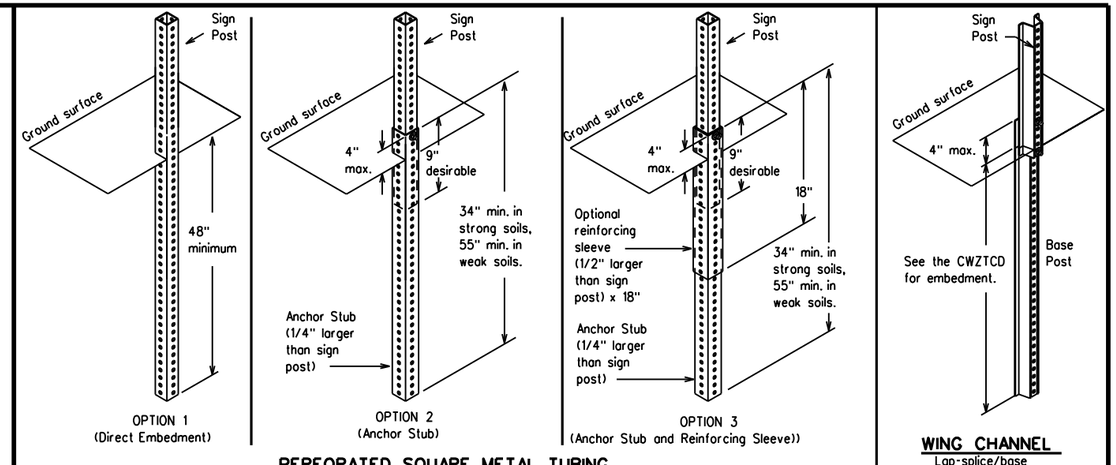
BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0104	11	008	BU 67A
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ELP	PRESIDIO		21



SKID MOUNTED WOOD SIGN SUPPORTS

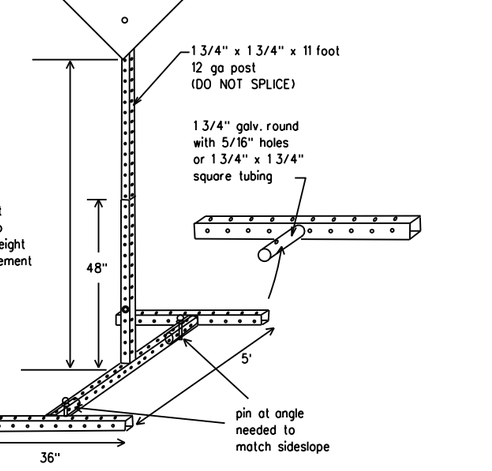
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

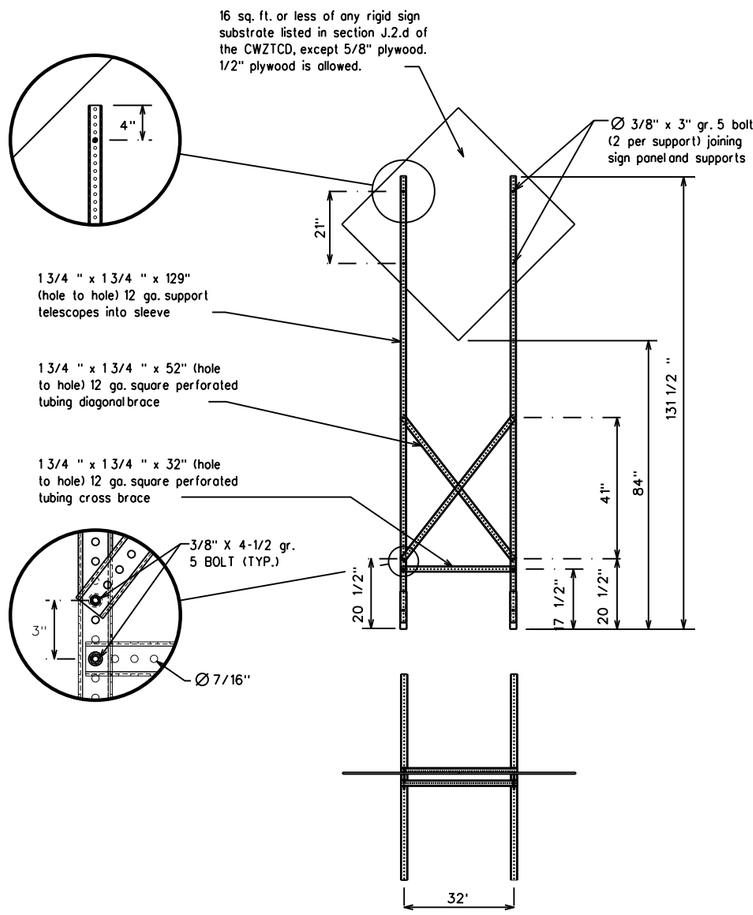


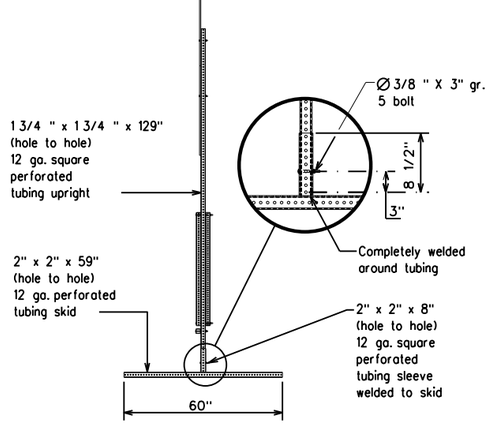
PERFORATED SQUARE METAL TUBING

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
REVISIONS	0104	11	008	BU 67A
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ELP	PRESIDIO		22

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DATE: 4/24/2023 12:42:34 AM
FILE: c:\pw_working\infra02\wtee\dms65536\bc-6-21.dgn

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 x

x 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 x	

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

x x 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

x x 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

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0104	11	008	BU 67A
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ELP	PRESIDIO		23

100

DATE: 4/24/2023 12:42:37 AM
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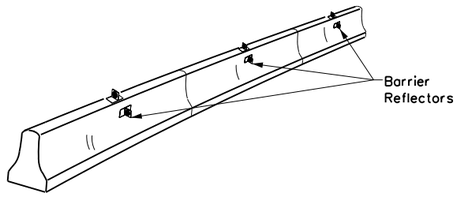
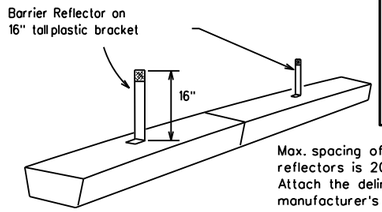
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost 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.

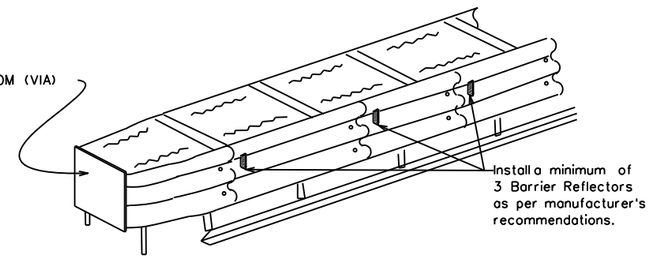


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

LOW PROFILE CONCRETE BARRIER (LPCB)

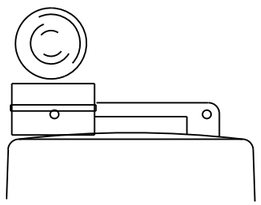


DELINEATION OF END TREATMENTS

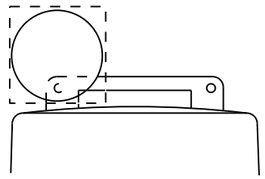
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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



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



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

WARNING LIGHTS

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 or C 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

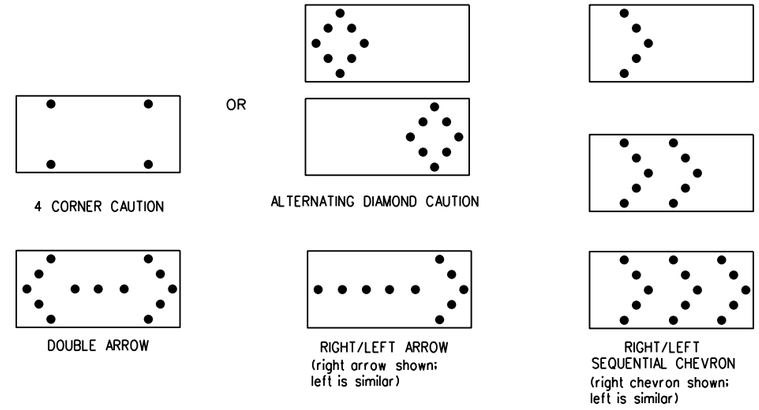
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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	0104	11	008	BU 67A
9-07 8-14	DIST	COUNTY		SHEET NO.
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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:

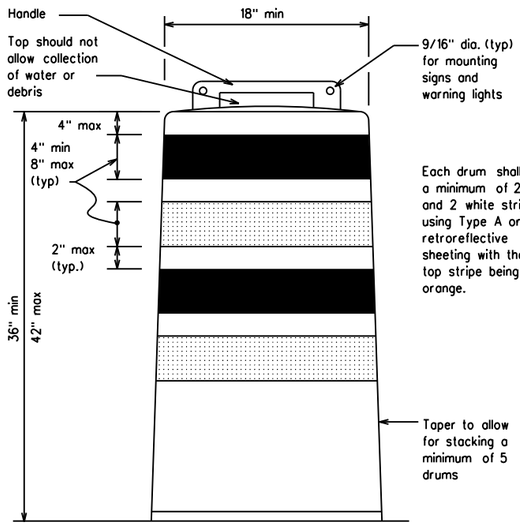
1. Plastic drums shall be a two-piece design: the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

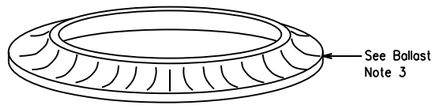
RETROREFLECTIVE SHEETING

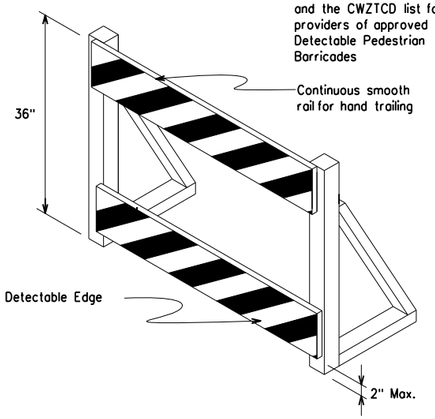
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

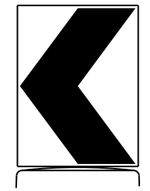




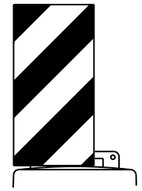


DETECTABLE PEDESTRIAN BARRICADES

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

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 or Type C Orange$_{FL}$ 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
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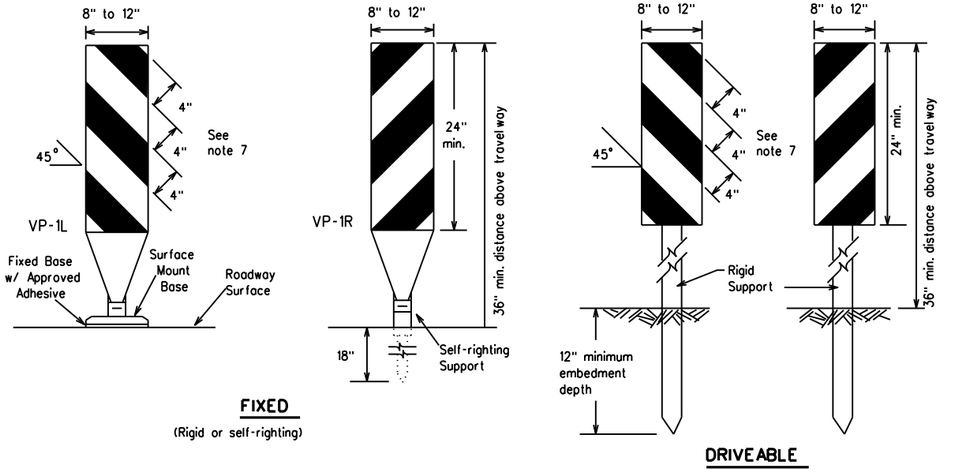
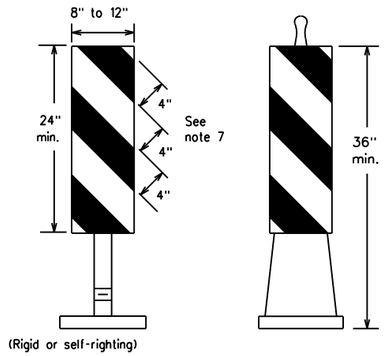
REVISIONS	0104	11	008	BU 67A
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	ELP	PRESIDIO		25
7-13				



FIXED

(Rigid or self-righting)

DRIVEABLE

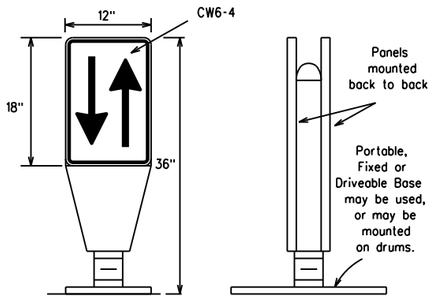


(Rigid or self-righting)

PORTABLE

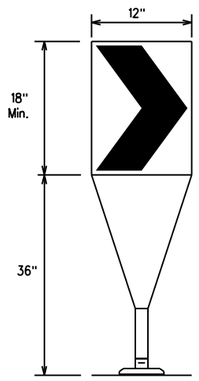
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is 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 or Type C conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



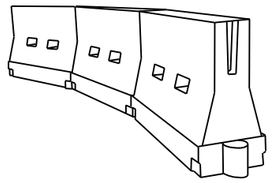
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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 or Type C 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

SHEET 9 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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7-13 5-21	ELP	PRESIDIO		26

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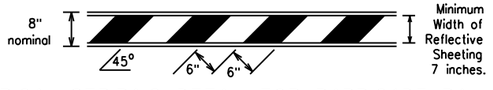
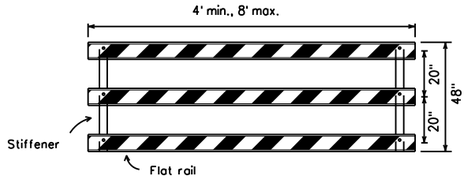
TYPE 3 BARRICADES

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.



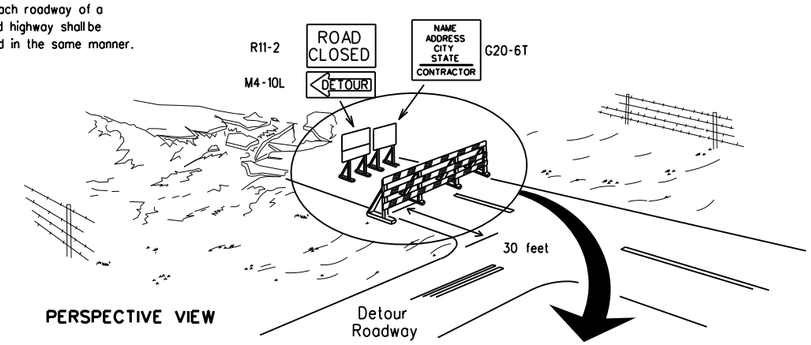
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

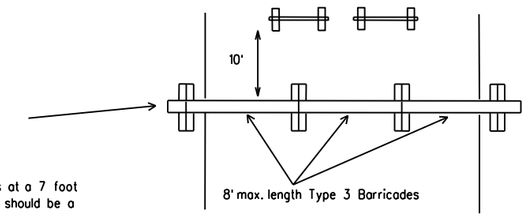
Each roadway of a divided highway shall be barricaded in the same manner.



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.

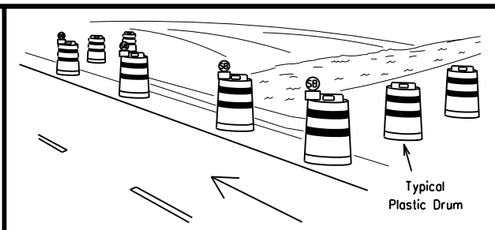
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

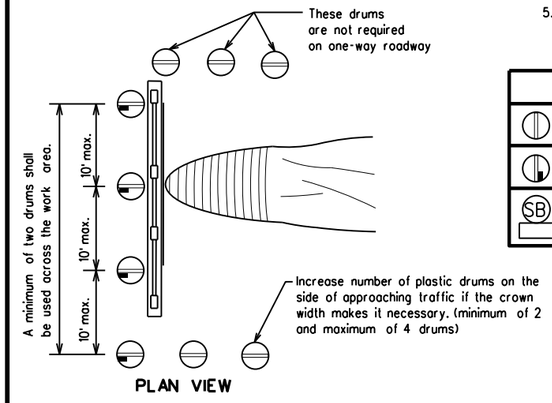
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

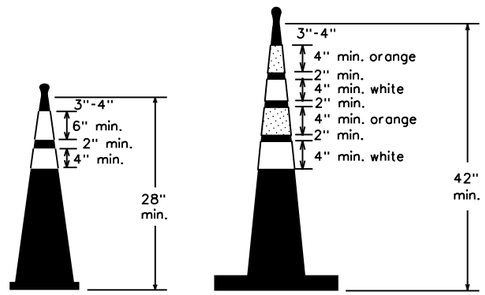
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



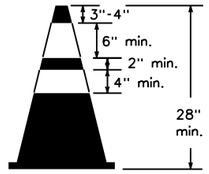
PLAN VIEW

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

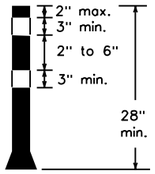
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

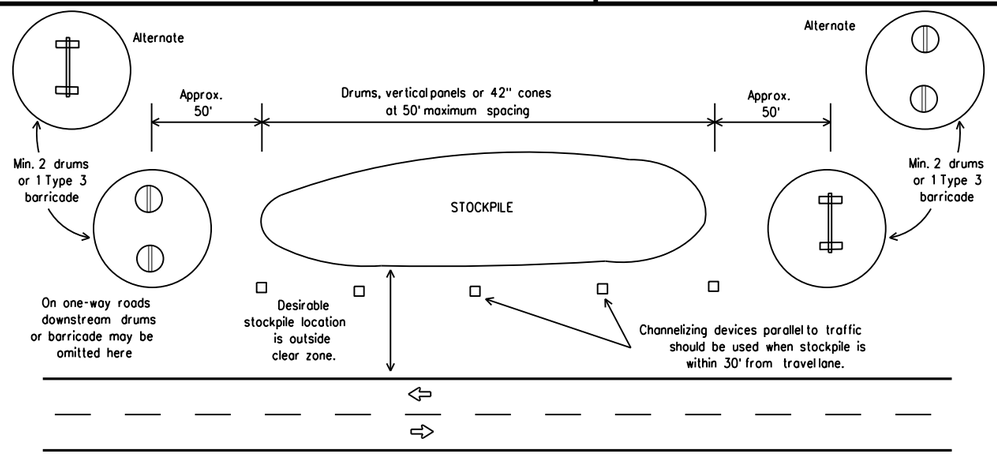


Tubular Marker

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

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0104	11	008	BU 67A
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ELP	PRESIDIO		27

104

DATE: 4/24/2023 12:42:46 AM
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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.

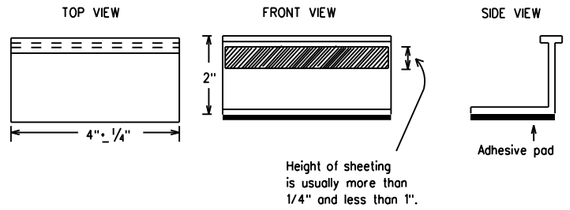
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0104	11	008	BU 67A
2-98 9-07 5-21	DIST	COUNTY		SHEET NO.
1-02 7-13	ELP	PRESIDIO		28
11-02 8-14				

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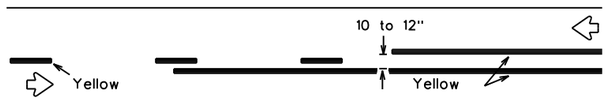
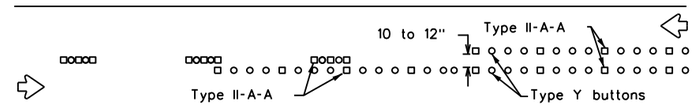
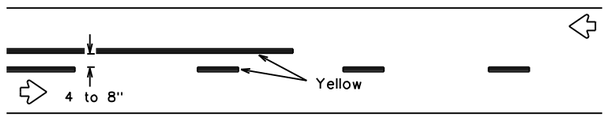
PAVEMENT MARKING PATTERNS



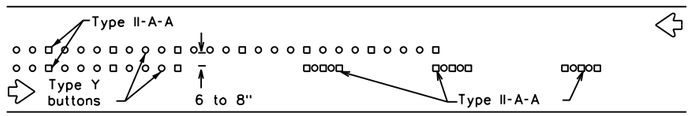
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



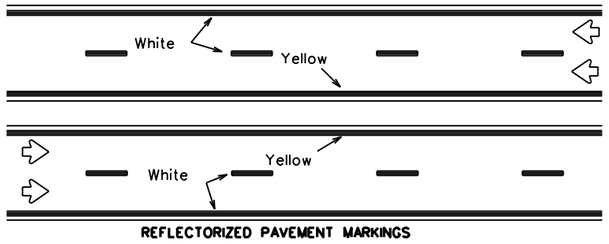
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



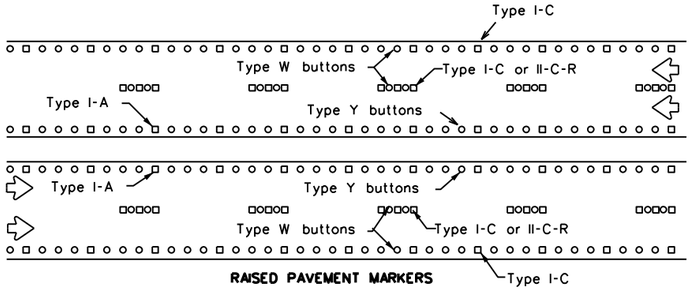
RAISED PAVEMENT MARKERS - PATTERN B

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



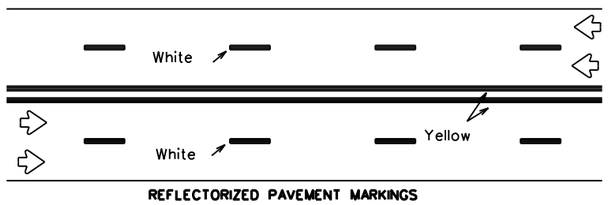
REFLECTORIZED PAVEMENT MARKINGS



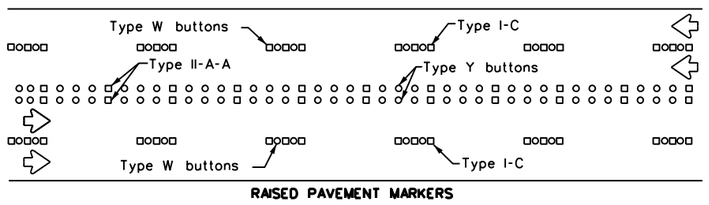
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



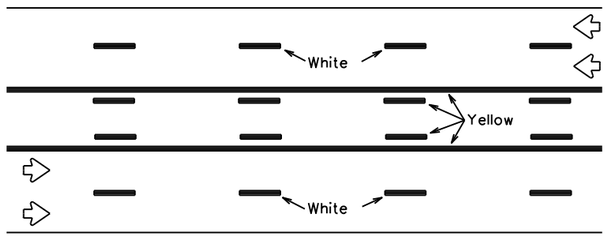
REFLECTORIZED PAVEMENT MARKINGS



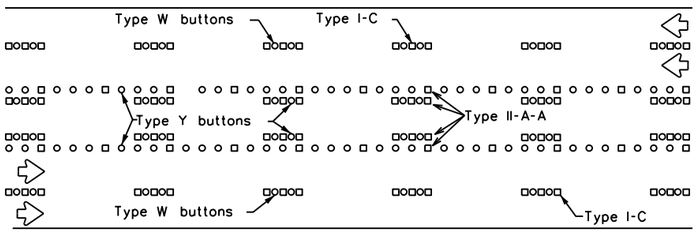
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

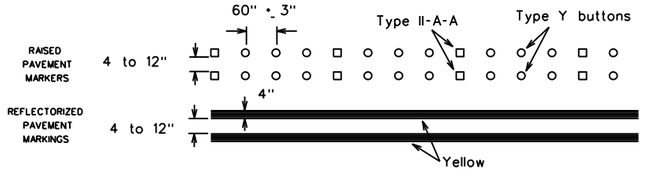
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

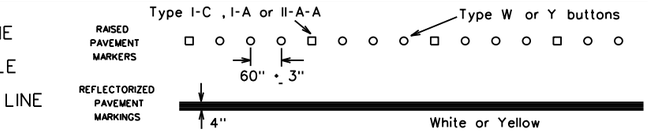
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

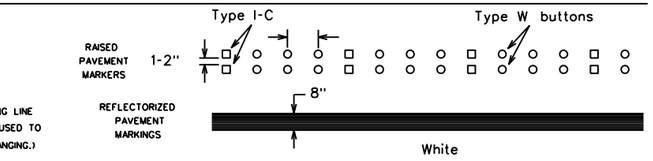


EDGE LINE OR SINGLE NO-PASSING LINE



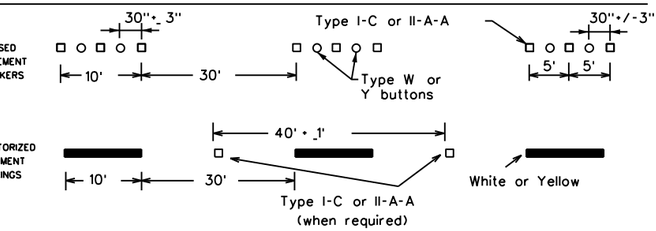
WIDE LINE

(FOR LEFT TURN CHANNELIZING LINE OR CHANNELIZING LINE USED TO DISCOURAGE LANE CHANGING.)

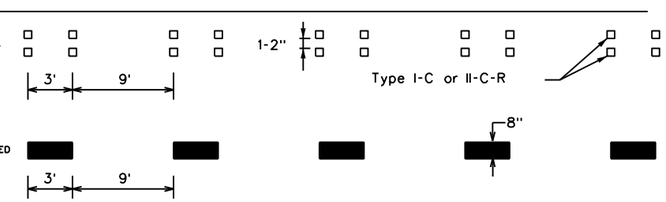


BROKEN LINES

CENTER LINE OR LANE LINE

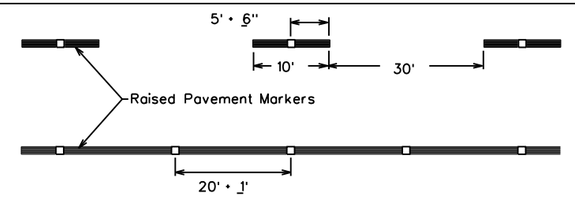


AUXILIARY OR LANEDROP LINE



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."

SHEET 12 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	0104	11	008	BU 67A
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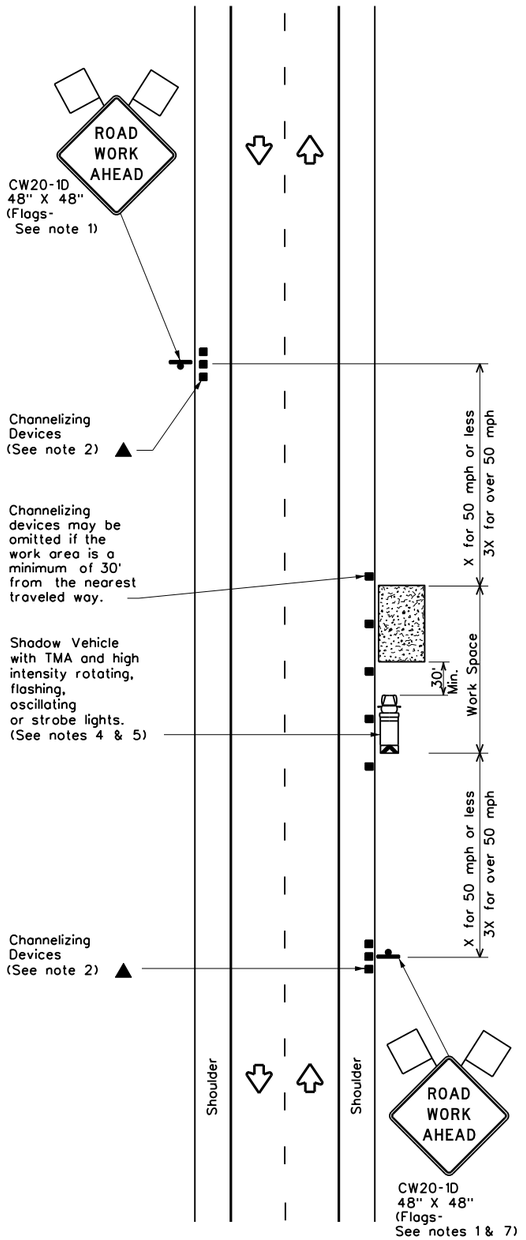
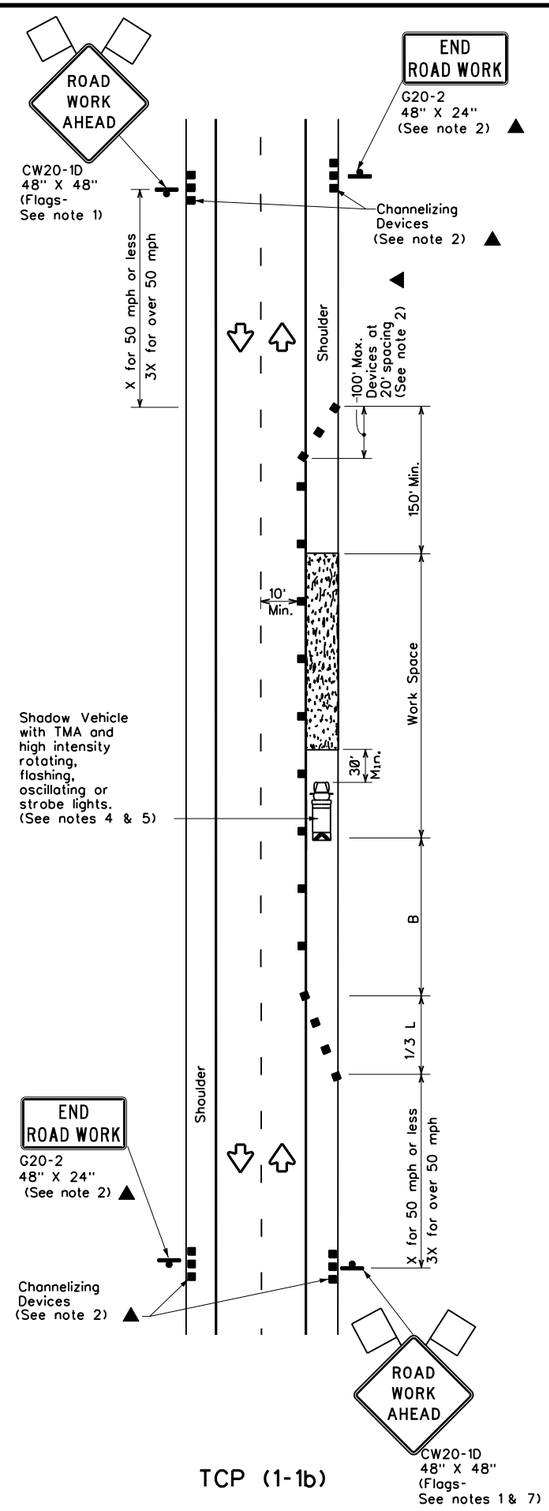


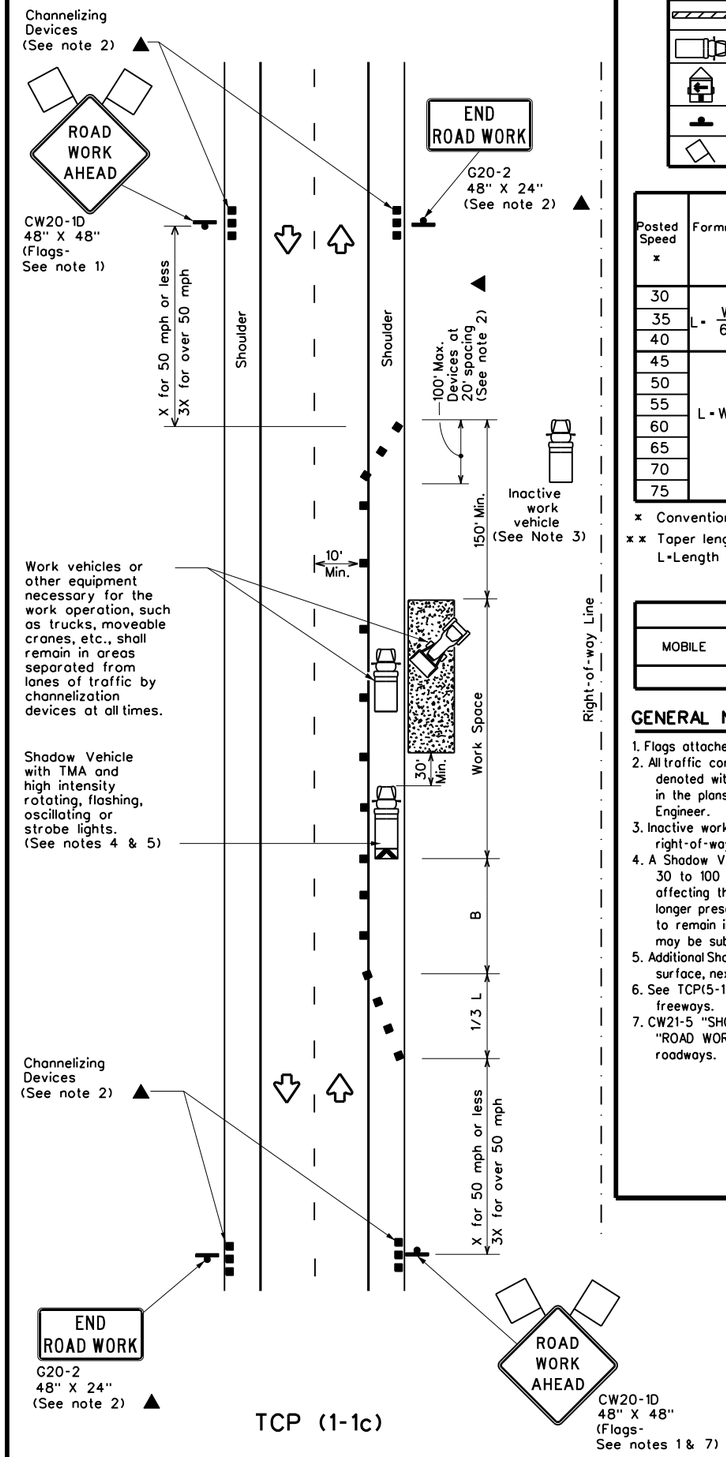
TCP (1-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (1-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (1-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	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. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
4. 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.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
6. See TCP(5-1)for shoulder work on divided highways, expressways and freeways.
7. CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(1-1)-18

FILE: tcp1-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0104	11	008	BU 67A
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	ELP	PRESIDIO		30
1-97 2-18				

151

DATE: 4/24/2023 12:42:55 AM
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DATE: 4/24/2023 12:42:58 AM
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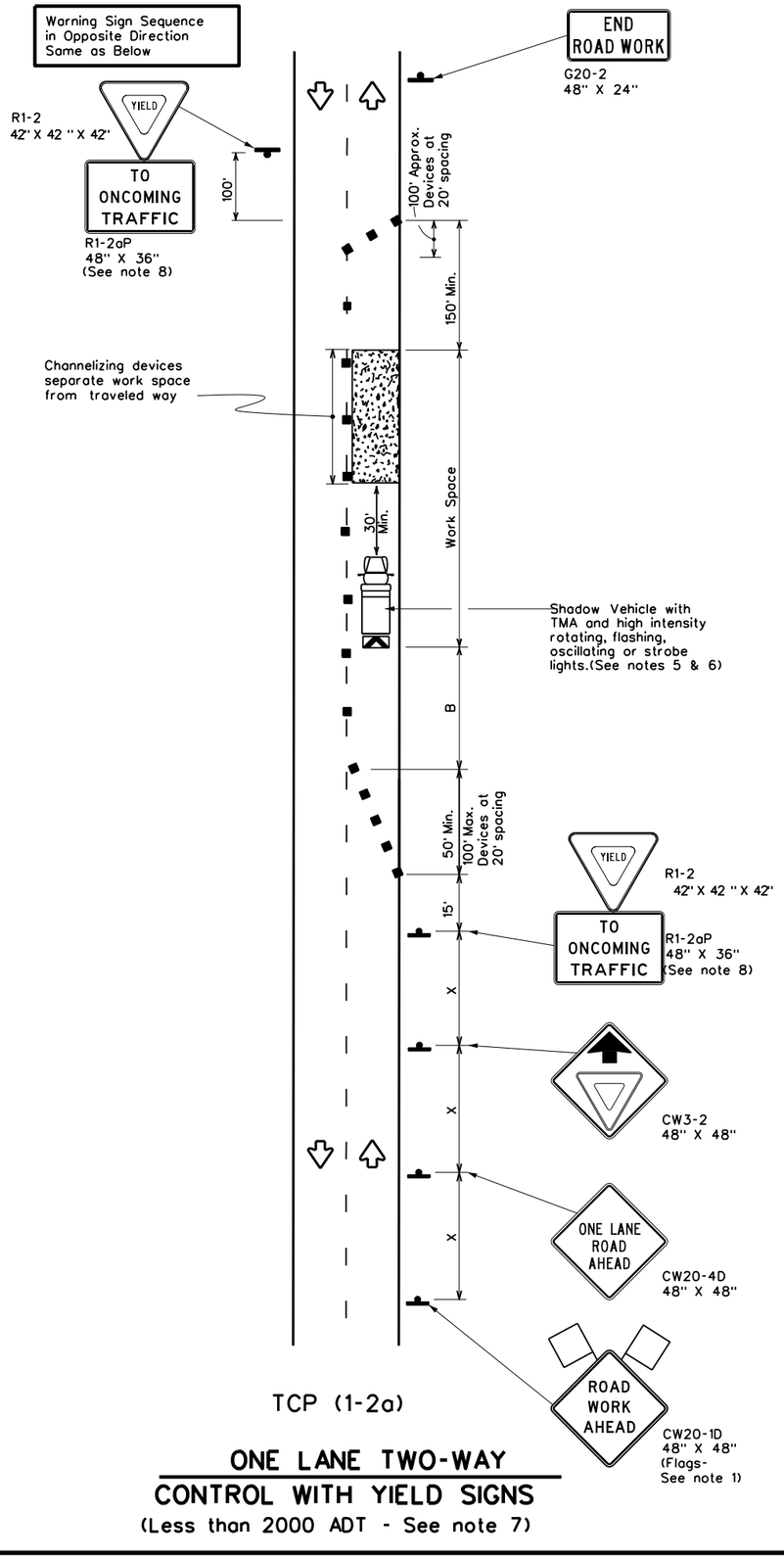
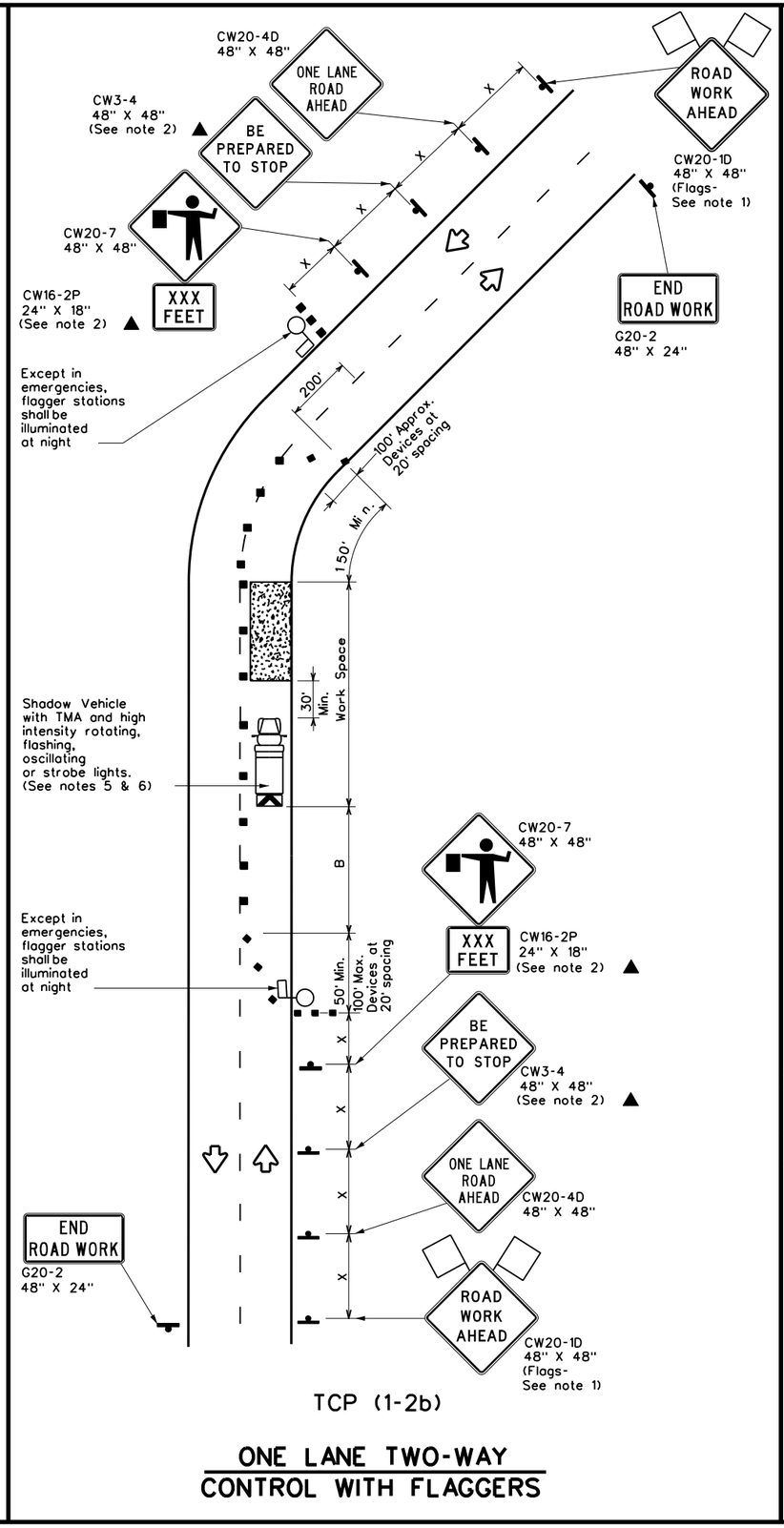


TCP (1-2a)

ONE LANE TWO-WAY CONTROL WITH YIELD SIGNS

(Less than 2000 ADT - See note 7)



TCP (1-2b)

ONE LANE TWO-WAY CONTROL WITH FLAGGERS

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"	Stopping Sight Distance
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L=WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

* 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. The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign, but proper sign spacing shall be maintained.
4. Sign spacing may be increased or an additional CW20-1D "ROAD WORK AHEAD" sign may be used if advance warning ahead of the flagger or R1-2 "YIELD" sign is less than 1500 feet.
5. 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.
6. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

TCP (1-2a)

7. R1-2 "YIELD" sign traffic control may be used on projects with approaches that have adequate sight distance. For projects in urban areas, work spaces should be no longer than one half city block. In rural areas on roadways with less than 2000 ADT, work spaces should be no longer than 400 feet.
8. R1-2 "YIELD" sign with R1-2aP "TO ONCOMING TRAFFIC" plaque shall be placed on a support at a 7 foot minimum mounting height.

TCP (1-2b)

9. Flaggers should use two-way radios or other methods of communication to control traffic.
10. Length of work space should be based on the ability of flaggers to communicate.
11. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain adequate stopping sight distance to the flagger and a queue of stopped vehicles (see table above).
12. Channelizing devices on the center-line may be omitted when a pilot car is leading traffic and approved by the Engineer.
13. Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(1-2)-18

FILE: tcp1-2-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-90 4-98 2-94 2-12 1-97 2-18	0104	11	008	BU 67A
	DIST	COUNTY		SHEET NO.
	ELP	PRESIDIO		31

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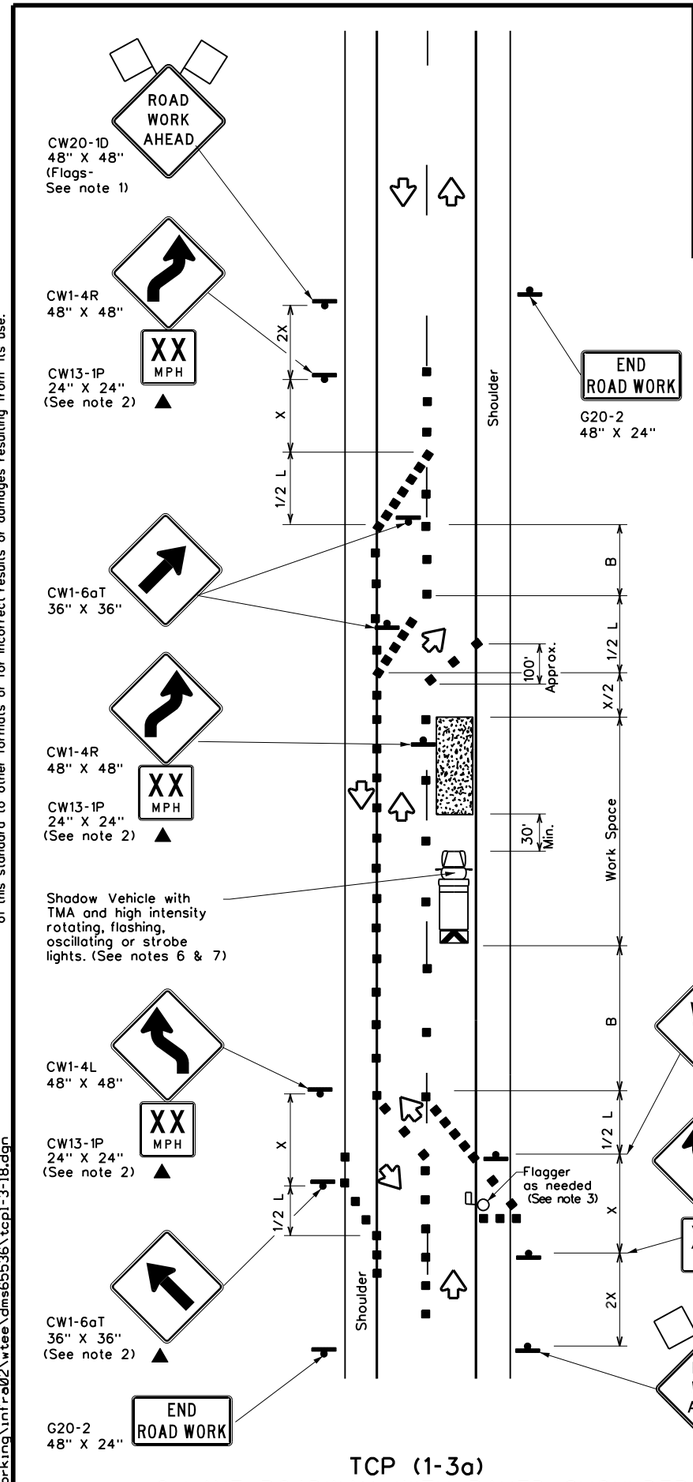


TCP (1-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

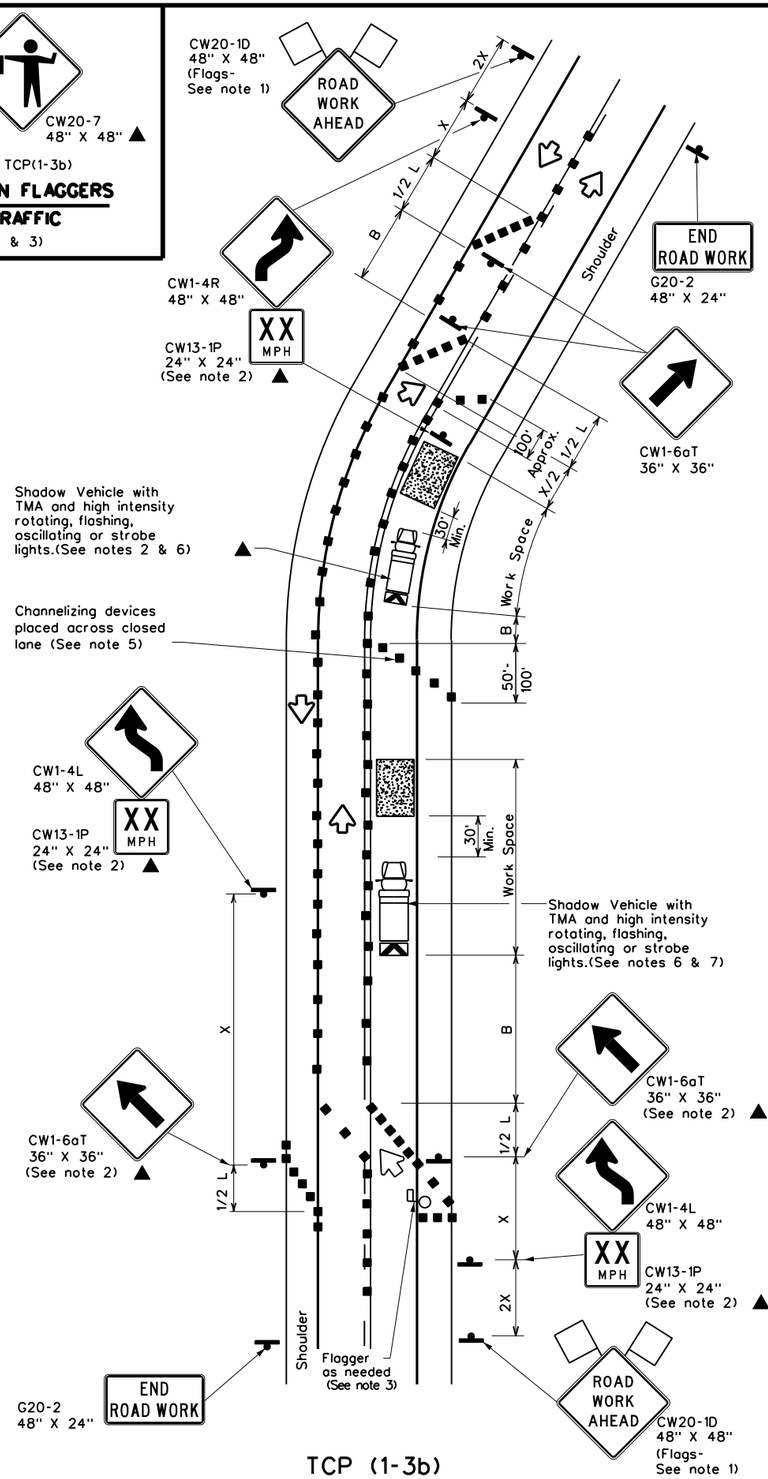
ONE LANE CLOSED
ADEQUATE FIELD OF VIEW

BE PREPARED TO STOP
CW3-4 48" X 48"
CW20-7 48" X 48"

For either TCP(1-3a) or TCP(1-3b)

USE ONLY WHEN FLAGGERS CONTROL TRAFFIC

(See Notes 2 & 3)



TCP (1-3b)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
INADEQUATE FIELD OF VIEW

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 x	Formula	Minimum Desirable Taper Lengths x x 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'

x Conventional Roads Only

x x 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. Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Additional flaggers may be positioned in advance of traffic queues to alert traffic to reduce speed.
4. DO NOT PASS, PASS WITH CARE and construction regulatory speed zone signs may be installed downstream of the ROAD WORK AHEAD signs.
5. When the work zone is made up of several work spaces, channelizing devices should be placed laterally across the closed lane to re-emphasize closure. Laterally placed channelizing devices should be repeated every 500 to 1000 feet in urban areas and every 1/4 to 1/2 mile in rural areas.
6. 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 off the paved surface, next to those shown in order to protect wider work spaces.
8. Where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20', or 15' if posted speed are 35 mph or slower, and for tangent sections, at 1/2S where S is the speed in mph. This tighter device spacing is intended for the area of conflicting markings not the entire work zone.

Texas Department of Transportation

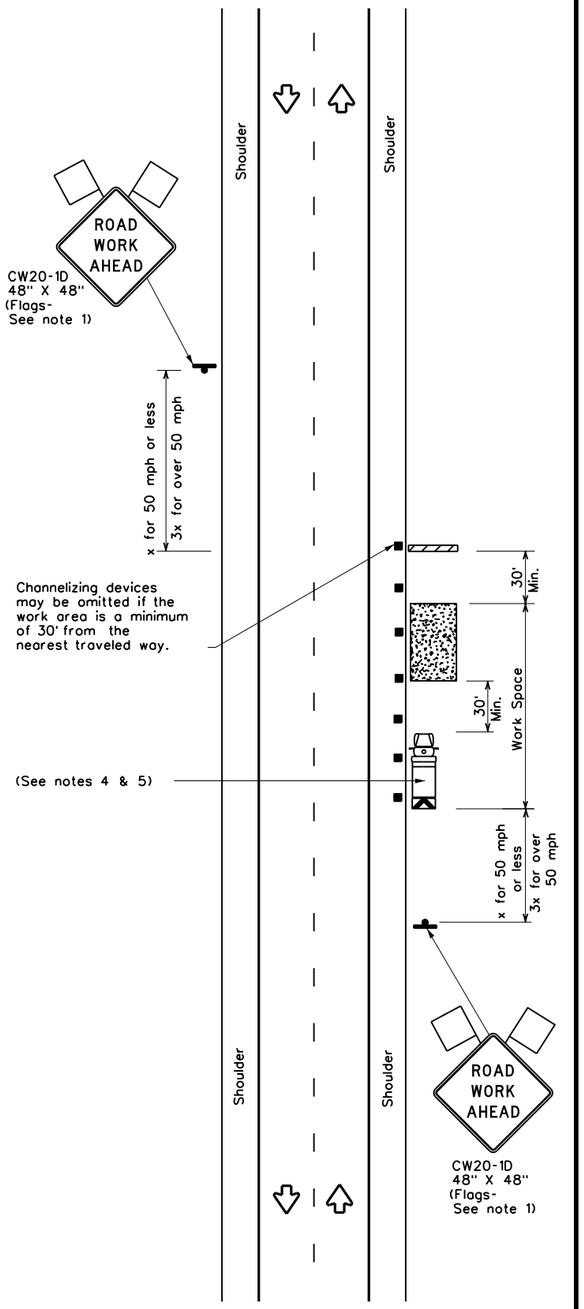
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN TRAFFIC SHIFTS ON TWO LANE ROADS

TCP(1-3)-18

FILE: tcp1-3-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0104	11	008	BU 67A
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	ELP	PRESIDIO		32
1-97 2-18				

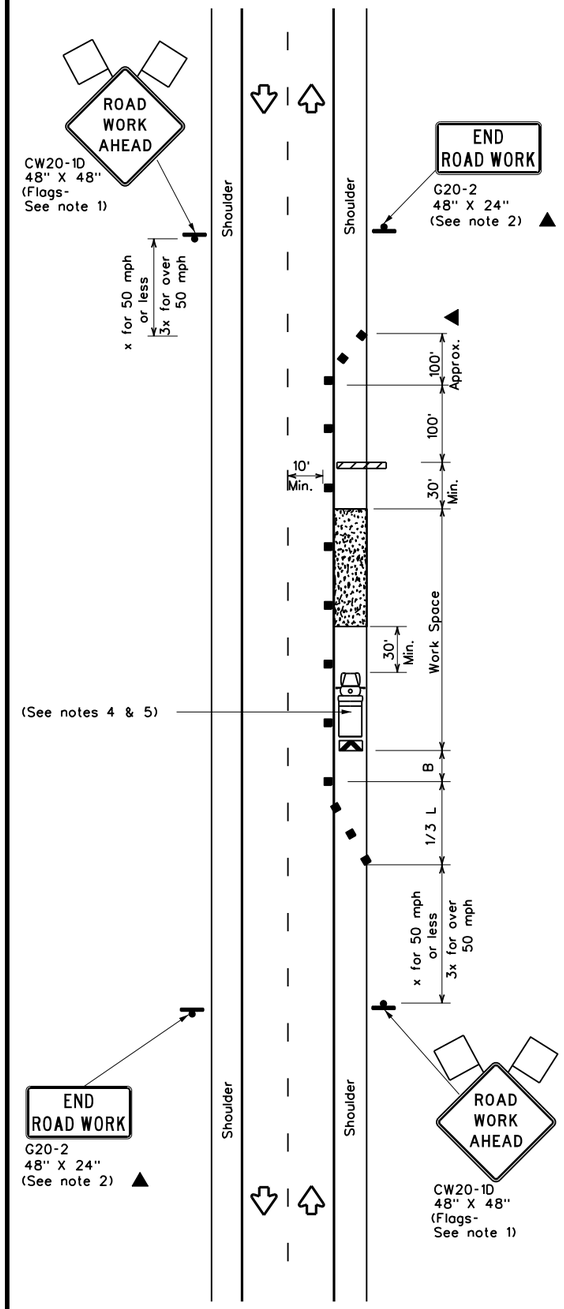
15.3



TCP (2-1a)

WORK SPACE NEAR SHOULDER

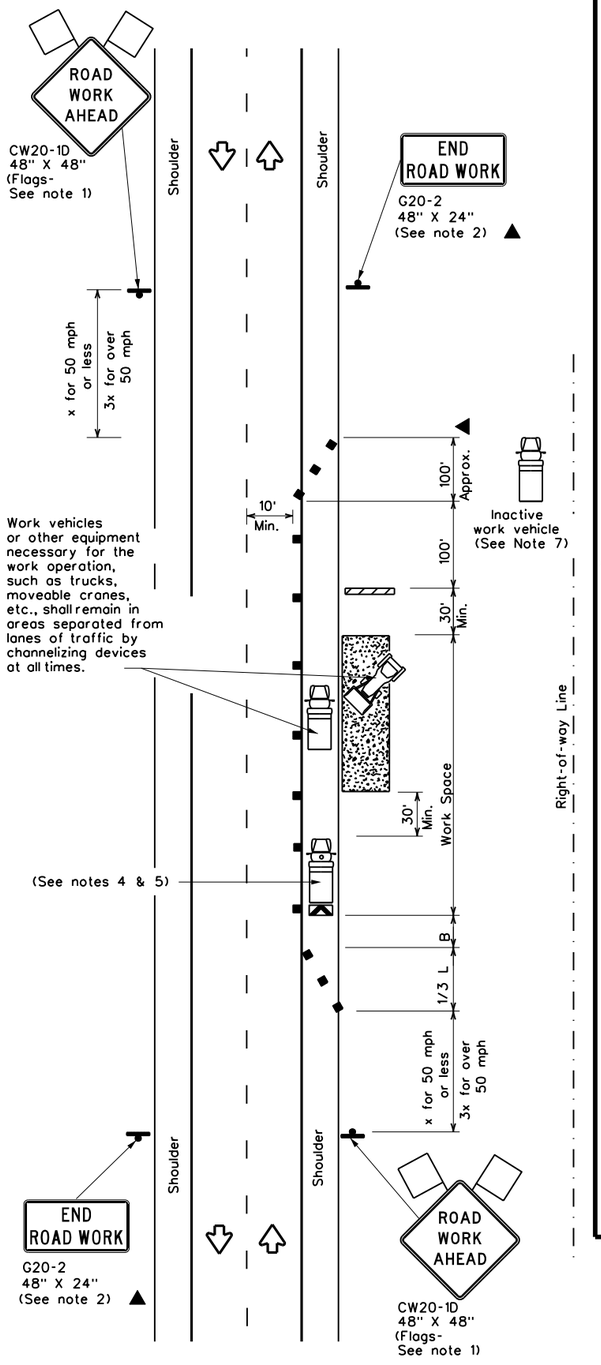
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER

Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER

Conventional Roads

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	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 in the plans, or for routine maintenance work, when approved by the Engineer.
3. Stockpiled material should be placed a minimum of 30 feet from nearest traveled way.
4. 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.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
6. See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
7. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
8. CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0104	11	008	BU 67A
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	ELP	PRESIDIO		33
1-97 2-18				

DATE: 4/24/2023 12:43:03 AM
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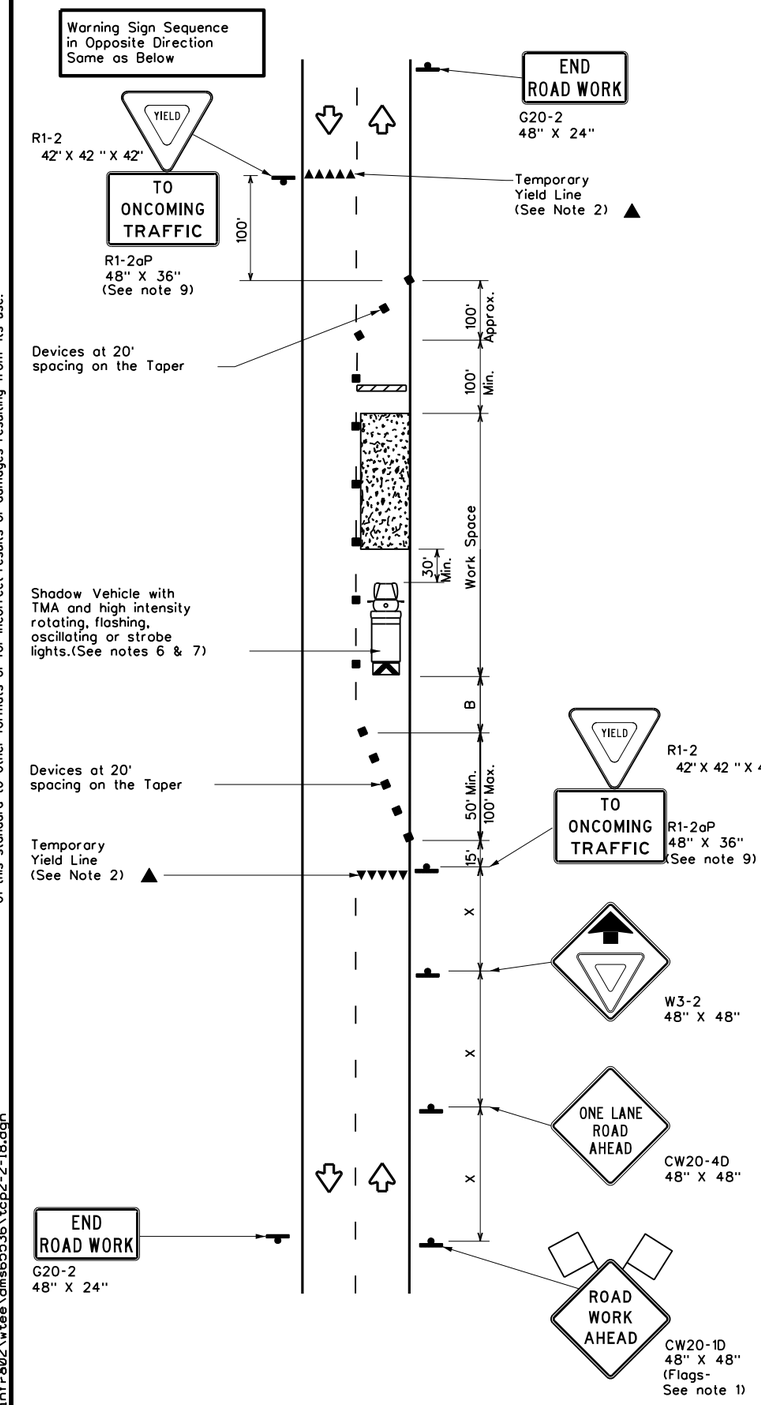
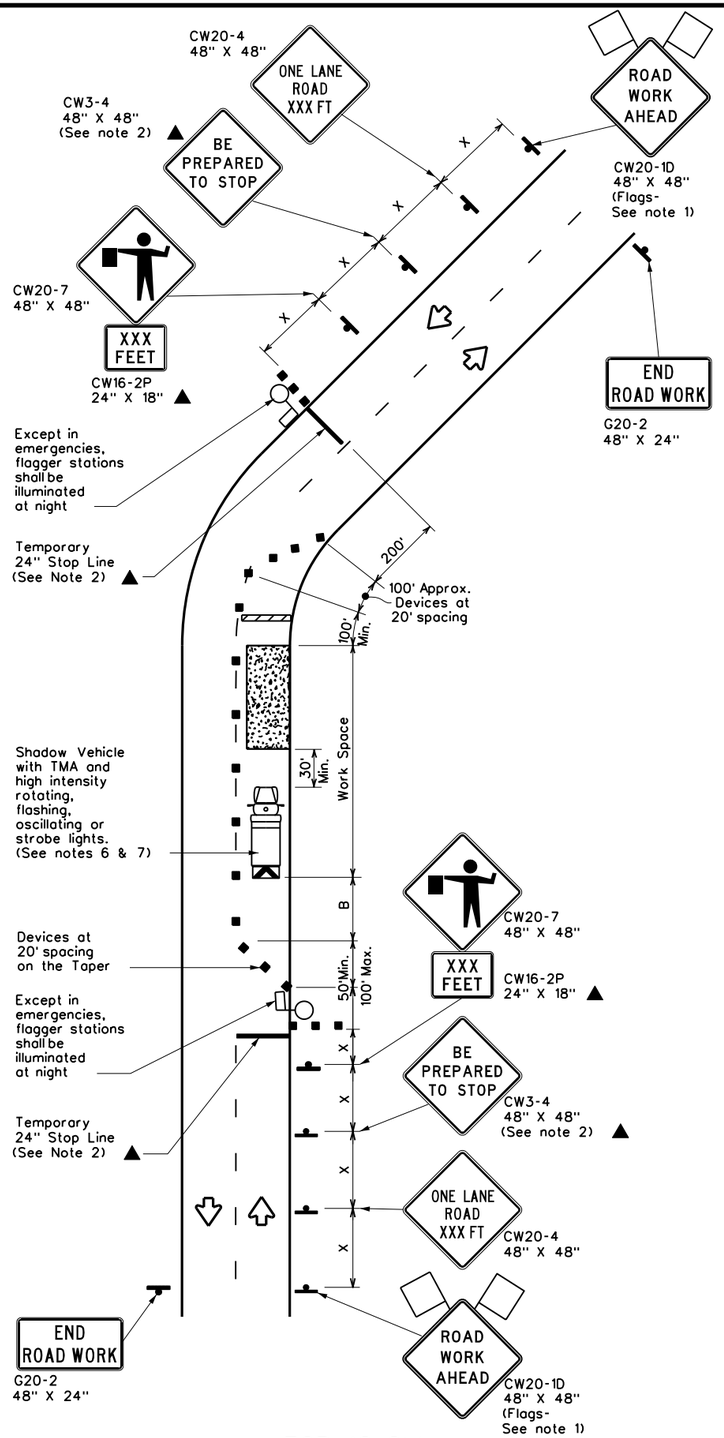


TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS

ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See Note 9)



TCP (2-2b)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS

ONE LANE TWO-WAY
CONTROL WITH FLAGGERS

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"	Stopping Sight Distance
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L=WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

* 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. The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4 "ONE LANE ROAD XXX FT" sign, but proper sign spacing shall be maintained.
4. Flaggers should use two-way radios or other methods of communication to control traffic.
5. Length of work space should be based on the ability of flaggers to communicate.
6. 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 off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-2a)

8. The R1-2 "YIELD" sign traffic control may be used on projects with approaches that have adequate sight distance. For projects in urban areas, work space should be no longer than one half city block. In rural areas, roadways with less than 2000 ADT, work space should be no longer than 400 feet.
9. The R1-2aP "YIELD TO ONCOMING TRAFFIC" sign shall be placed on a support at a 7 foot minimum mounting height.

TCP (2-2b)

10. Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
11. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain stopping sight distance to the flagger and a queue of stopped vehicles. (See table above).
12. Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situtations.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(2-2)-18

FILE: tcp2-2-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03 1-97 2-12 4-98 2-18	0104	11	008	BU 67A
	DIST	COUNTY		SHEET NO.
	ELP	PRESIDIO		34

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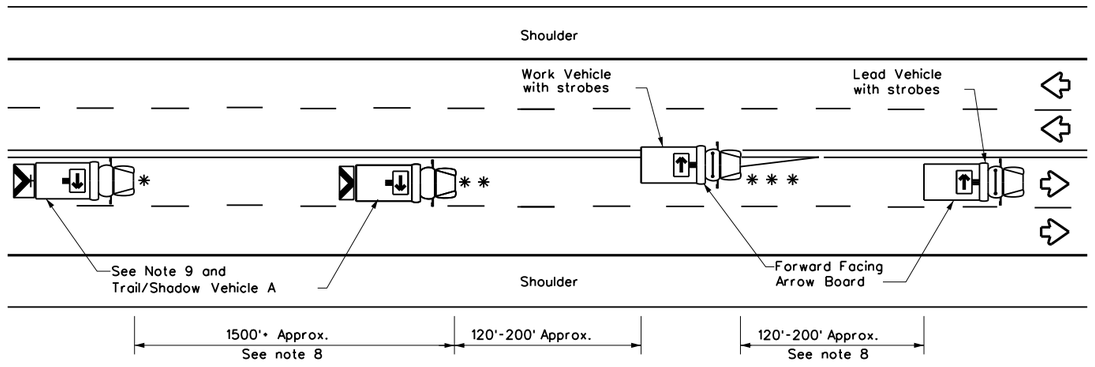
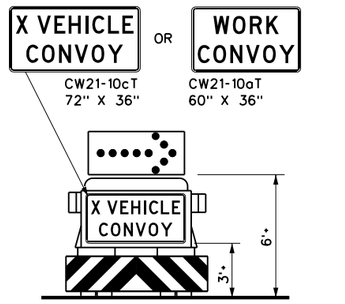


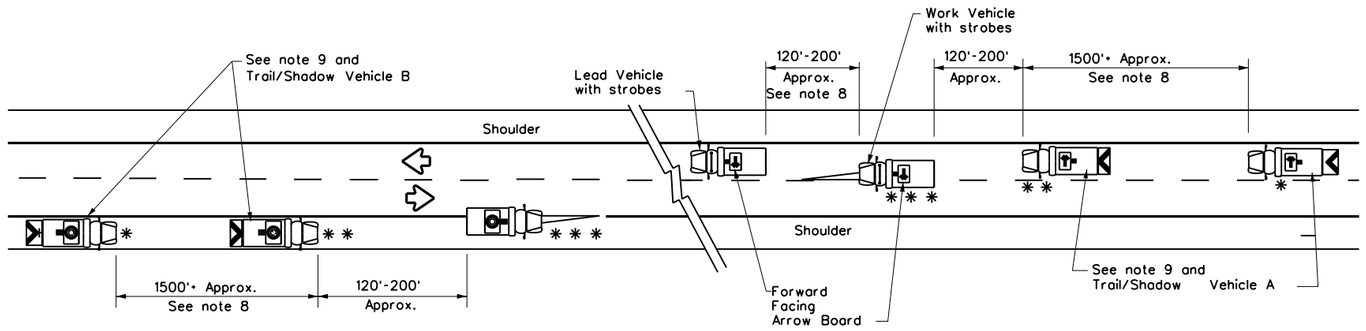
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

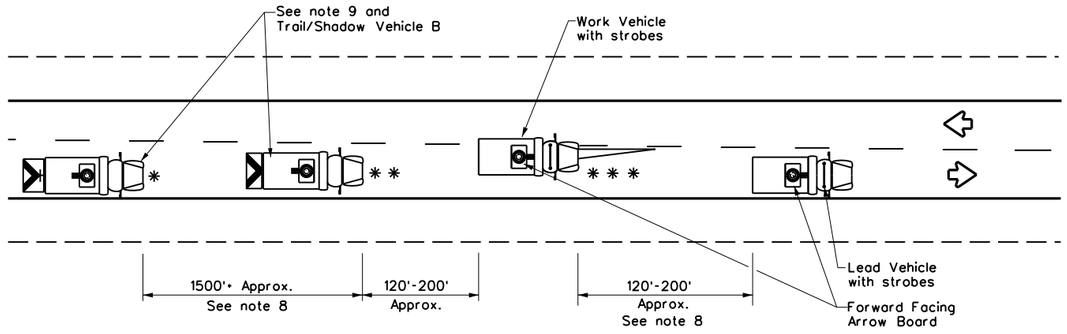


WORK ON SHOULDER

WORK ON TRAVEL LANE

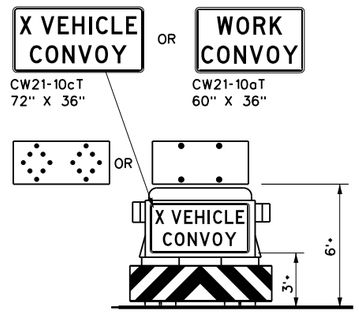
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

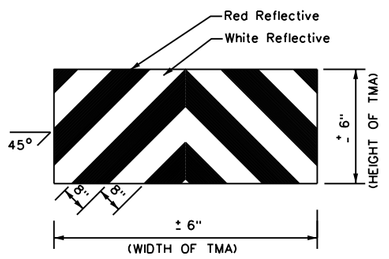
with Flashing Arrow Board in CAUTION display

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

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

GENERAL NOTES

1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used the WORK vehicle must be equipped with an arrow board. The Engineer will determine if the LEAD VEHICLE and/or TRAIL VEHICLE are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.
2. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
3. The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE and TRAIL VEHICLE are required.
4. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION DMS 8300, Type A.
5. Flashing arrow boards shall be Type B or Type C as per the Barricade and Construction (BC) standards. The board shall be controlled from inside the vehicle.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.
9. "X VEHICLE CONVOY" (CW21-10cT) or "WORK CONVOY" (CW21-10aT) signs shall be used on TRAIL VEHICLES and SHADOW VEHICLES as shown. As an option 48" X 48" diamond shaped "WORK CONVOY"(CW21-10T) or "X VEHICLE CONVOY" (CW21-10bT) signs may be used where adequate mounting space exists. When used, the X VEHICLE CONVOY sign shall have the number of the convoy vehicles displayed on the sign in the number designation "X" location. The "X VEHICLE CONVOY" sign shall not be used on the SHADOW VEHICLE if a TRAIL VEHICLE is used.
10. On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a "DO NOT PASS" (R4-1) sign should be placed on the back of the rearmost protection vehicle.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

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©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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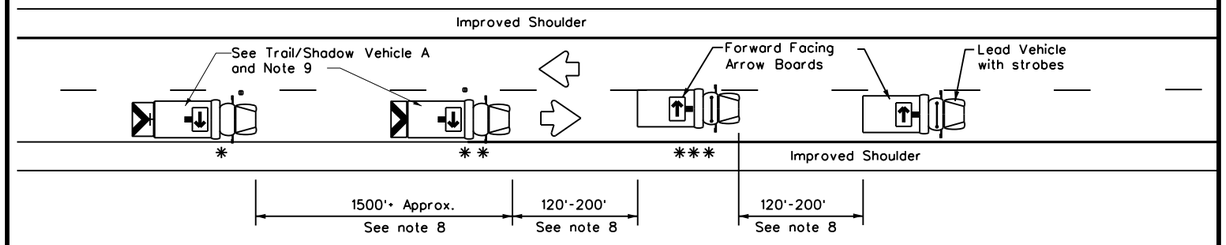
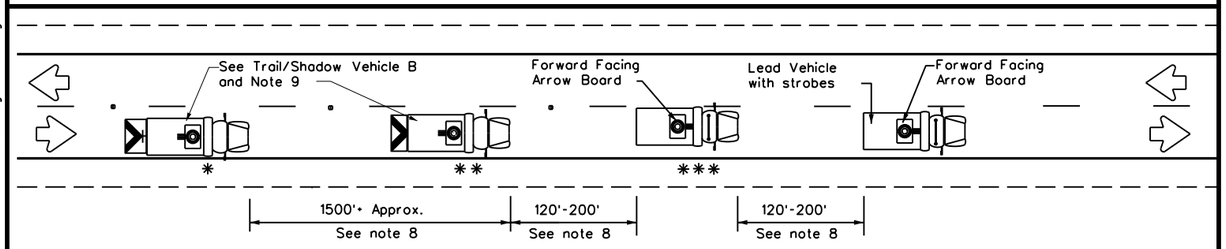


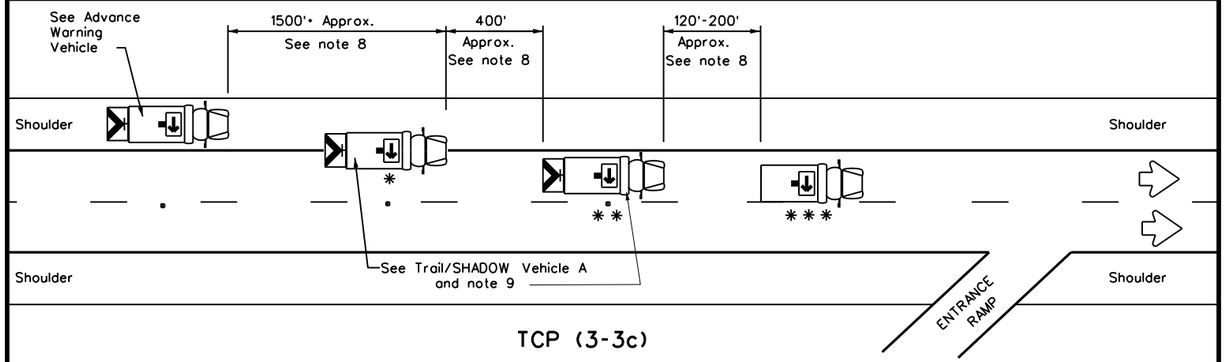
TCP (3-3a)

TWO LANE HIGHWAY WITH PAVED SHOULDERS (WORK ON TRAVEL LANE)



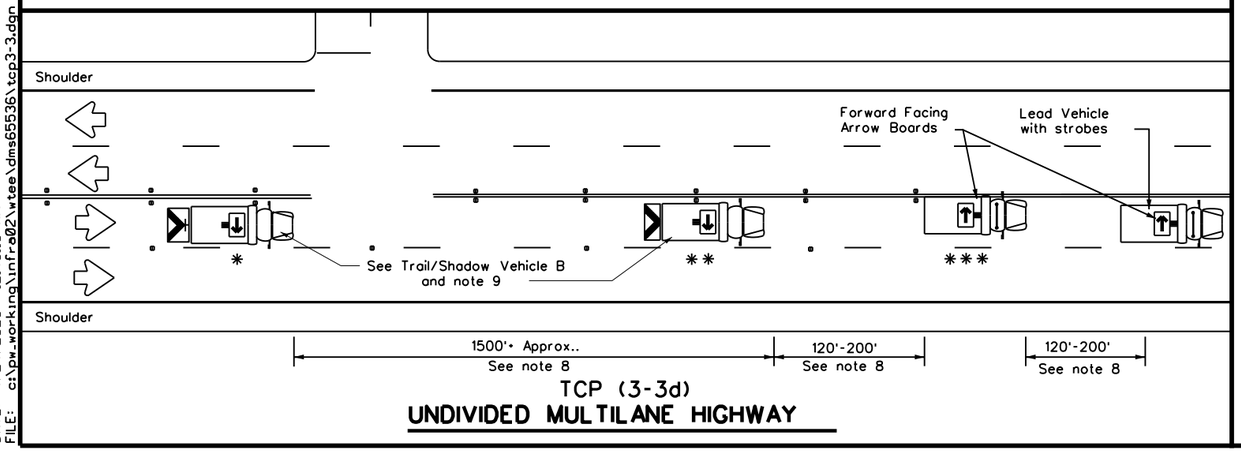
TCP (3-3b)

TWO LANE HIGHWAY WITHOUT PAVED SHOULDERS (WORK ON TRAVEL LANE)



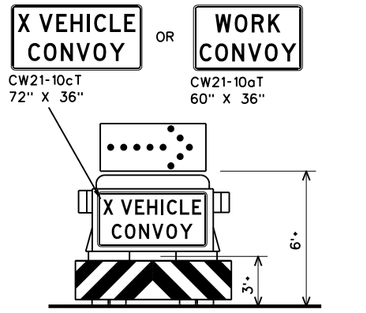
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



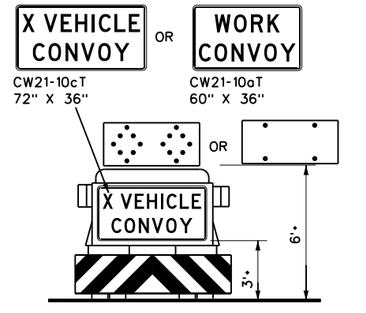
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



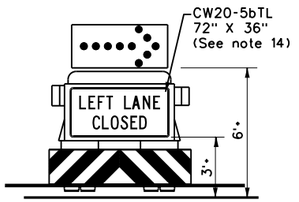
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

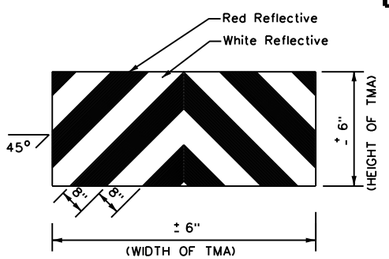


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

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

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

GENERAL NOTES

1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used on two way roads the WORK vehicle must have an arrow board. For divided roadways, the arrow board on the WORK vehicle is optional based on the type of work being performed. The Engineer will determine if the LEAD vehicle and/or TRAIL vehicle are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.
2. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating, or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
3. The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE, ADVANCE WARNING and TRAIL VEHICLE are required.
4. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION DMS 8300, Type A.
5. Flashing arrow boards shall be Type B or Type C as per the Barricade and Construction (BC) standards. The board shall be controlled from inside the vehicle.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.
9. X VEHICLE CONVOY (CW21-10cT) or WORK CONVOY (CW21-10aT) signs shall be used on TRAIL VEHICLES and SHADOW VEHICLES as shown. As an option 48" x 48" diamond shaped WORK CONVOY (CW21-10T) or X VEHICLE CONVOY (CW21-10bT) signs may be used where adequate mounting space exists. When used, the X VEHICLE CONVOY sign shall have the number of the convoy vehicles displayed on the sign in the number designation "X" location. The X VEHICLE CONVOY sign shall not be used on the SHADOW VEHICLE if a TRAIL VEHICLE is used.
10. For divided highways with two or three lanes in one direction, the appropriate LEFT LANE CLOSED (CW20-5bTL), RIGHT LANE CLOSED (CW20-5bTR), or CENTER LANE CLOSED (CW20-5dT) sign should be used on the Advance Warning Vehicle. As an option, a portable changeable message sign (PCMS) or truck mounted changeable message sign (TMCMS) with a minimum character height of 12", and displaying the same legend may be substituted for these signs. An appropriate directional arrow display, simulating the size and legibility of the flashing arrow board may be used in the second phase of the PCMS/TMCMS message. When this is done, the arrow board will not be required on the Advance Warning Vehicle.
11. A double arrow shall not be displayed on the arrow board on the Advance Warning Vehicle.
12. For divided highways with three or four lanes in each direction, use TCP(3-2).
13. Standard diamond shape versions of the CW20-5 series signs may be used as an option if the rectangular signs shown are not available.
14. The Advance Warning Vehicle may straddle the edgeline when Shoulder width makes it necessary.
15. On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a DO NOT PASS (R4-1) sign should be placed on the back of the rearmost protection vehicle.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS RAISED PAVEMENT MARKER INSTALLATION/ REMOVAL TCP(3-3)-14

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©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
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2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	ELP	PRESIDIO		36
1-97 7-14				

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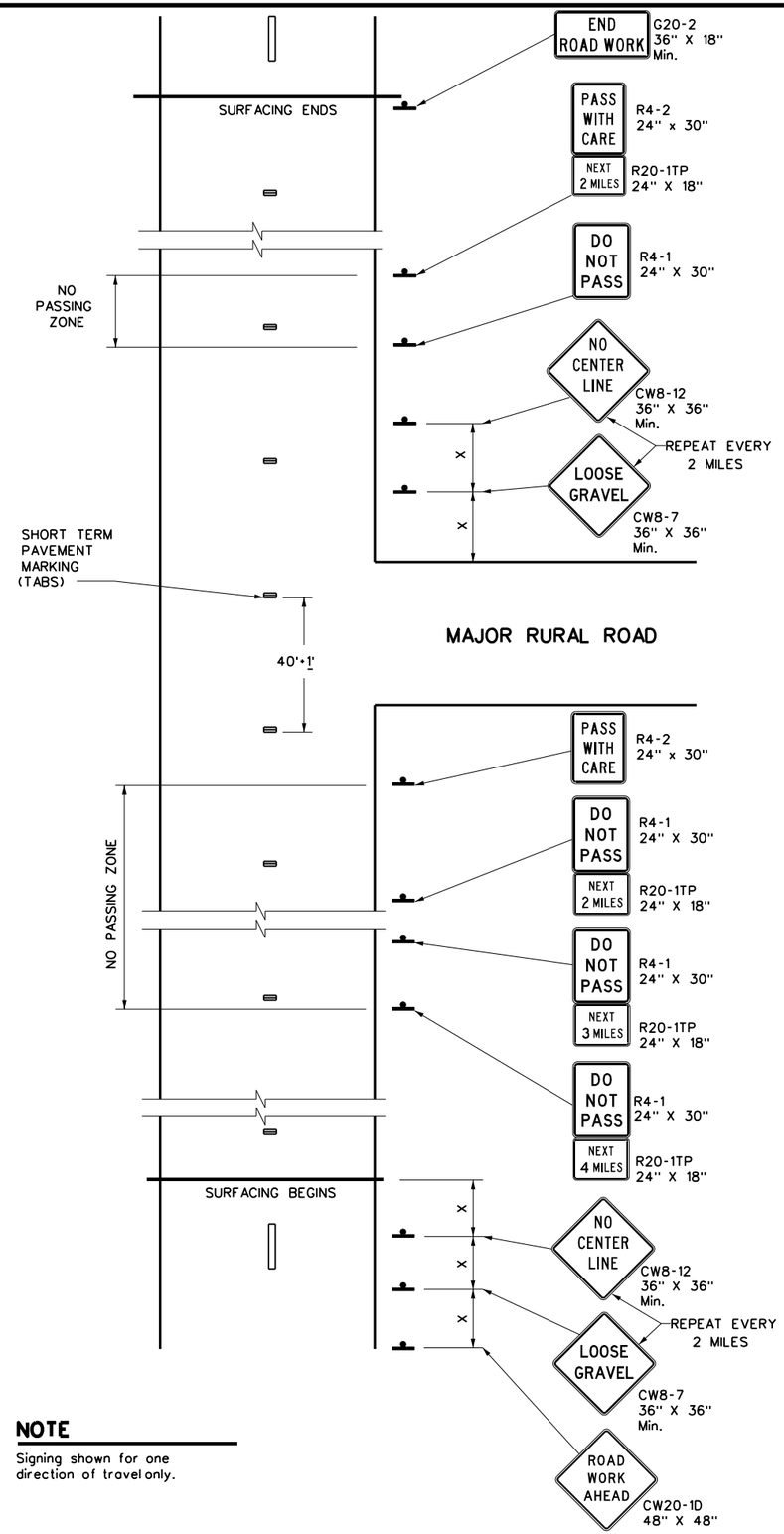
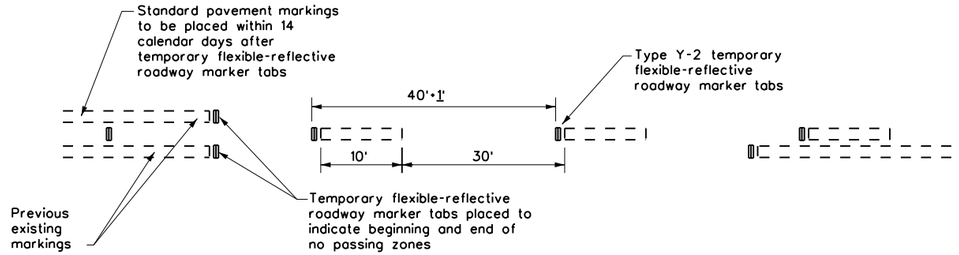


NOTE

Signing shown for one direction of travel only.

NO PASSING ZONES ON TWO-LANE TWO-WAY ROADS



TABS ON CENTERLINES OF TWO-LANE TWO-WAY ROADS

For seal coat, micro-surface or similar operations

"DO NOT PASS" SIGN (R4-1) and NO-PASSING ZONES

A. Prior to the beginning of construction, all currently striped no-passing zones shall be signed with the DO NOT PASS (R4-1) signs and PASS WITH CARE (R4-2) signs placed at the beginning and end of each zone for each direction of travel except as otherwise provided herein. Signs marking these individual no-passing zones need not be covered prior to construction if the signs supplement the existing pavement markings.

B. At the discretion of the Engineer, in areas of numerous no-passing zones, several zones may be combined as a single zone. If passing is to be prohibited over one or more lengthy sections, a DO NOT PASS sign and a NEXT XX MILES (R20-1TP) plaque may be used at the beginning of such zones. The DO NOT PASS sign and the NEXT XX MILES plaque should be repeated every mile to the end of the no-passing zone. In areas where there is considerable distance between no-passing zones, the end of the no-passing zone may be signed with a PASS WITH CARE sign and a NEXT XX MILES plaque.

C. Depending on traffic volumes and length of sections, it may be desirable to prohibit passing throughout the project to prevent damage to windshield and lights. The DO NOT PASS sign and NEXT XX MILES plaque should be used and repeated as often as necessary for this purpose. Where several existing zones are to be combined into one individual no-passing zone, the sign at the beginning of the zone should be covered until the surfacing operation has passed this location so as not to have the DO NOT PASS sign conflict with the existing pavement markings. Also, unless one days operation completes the entire length of such combined zones, appropriate DO NOT PASS and PASS WITH CARE signs should be placed at the beginning and end of the no-passing zones where the surfacing operation has stopped for the day.

D. R4-1 and R4-2 are to remain in place until standard pavement markings are installed.

"NO CENTER LINE" SIGN (CW8-12)

A. Center line markings are yellow pavement markings that delineate the separation of travel lanes that have opposite directions of travel on a roadway. Divided highways do not typically have center line markings.

B. At the time construction activity obliterates the existing center line markings(low volume roads may not have an existing centerline), a NO CENTER LINE (CW8-12) sign should be erected at the beginning of the work area, at approximately 2 mile intervals within the work area, beyond major intersections and other locations deemed necessary by the Engineer.

C. The NO CENTER LINE signs are to remain in place until standard pavement markings are installed.

"LOOSE GRAVEL" SIGN (CW8-7)

A. When construction begins, a LOOSE GRAVEL (CW8-7) sign should be erected at each end of the work area and repeated at intervals of approximately 2 miles in rural areas and closer in urban areas.

B. The LOOSE GRAVEL signs are to remain in place until the condition no longer exists.

PAVEMENT MARKINGS

A. Temporary markings for surfacing projects shall be Temporary Flexible-reflective Roadway Marker Tabs unless otherwise approved by the Engineer. Tabs are to be installed to provide true alignment for striping crews or as directed by the Engineer. Tabs will be placed at the spacing indicated. Tabs should be applied to the pavement no more than two (2) days before the surfacing is applied. After the surfacing is rolled and swept, the cover over the reflective strip shall be removed.

B. Tabs shall not be used to simulate edge lines.

C. Tab placement for overlay/inlay operations shall be as shown on the WZ(STPM) standard sheet.

COORDINATION OF SIGN LOCATIONS

A. The location of warning signs at the beginning and end of a work area are to be coordinated with other signing typically shown on the Barricade and Construction Standards for project limits to ensure adequate sign spacing.

B. Where possible the ROAD WORK AHEAD (CW20-1D), LOOSE GRAVEL (CW8-7), and NO CENTER LINE (CW8-12) signs should be placed in the sequence shown following the OBEY WARNING SIGNS STATE LAW (R20-3T) and the TRAFFIC FINES DOUBLE (R20-5T) sign, and one "X" sign spacing prior to the CONTRACTOR (G20-6T)sign typically located at or near the limits of surfacing. LOOSE GRAVEL and NO CENTER LINE signs will then be repeated as described above.

Posted Speed *	Minimum Sign Spacing "X" Distance
30	120'
35	160'
40	240'
45	320'
50	400'
55	500'
60	600'
65	700'
70	800'
75	900'

* Conventional Roads Only

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

GENERAL NOTES

1. The traffic control devices detailed on this sheet will be furnished and erected as directed by the Engineer on sections of roadway where tabs must be placed prior to the surfacing operation which will cover or obliterate the existing pavement markings.
2. The devices shown on this sheet are to be used to supplement those required by the BC Standards or others required elsewhere in the plans.
3. Signs shall be erected as detailed on the BC Standards or the Compliant Work Zone Traffic Control Devices List (CWZTCD) on supports approved for Long-Term / Intermediate-Term Work Zone Sign Supports.
4. When surfacing operations take place on divided highways, freeways or expressways, the size of diamond shaped construction warning signs shall be 48" x 48".
5. Signs on divided highways, freeways and expressways will be placed on both right and left sides of the roadway based on roadway conditions as directed by the Engineer.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL DETAILS FOR SURFACING OPERATIONS

TCP(7-1)-13

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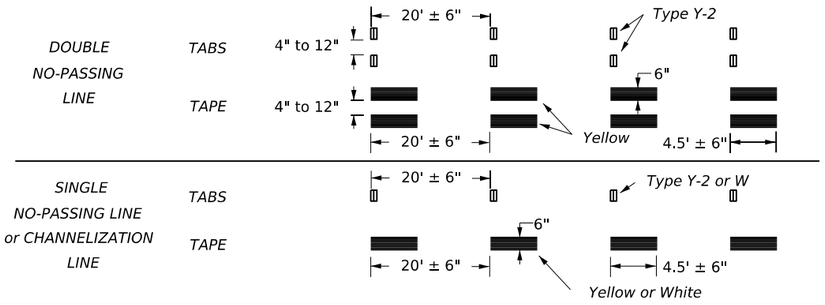
©TxDOT March 1991	CONT	SECT	JOB	HIGHWAY
REVISIONS	0104	11	008	BU 67A
4-92 4-98	DIST	COUNTY		SHEET NO.
1-97 7-13	ELP	PRESIDIO		37

WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



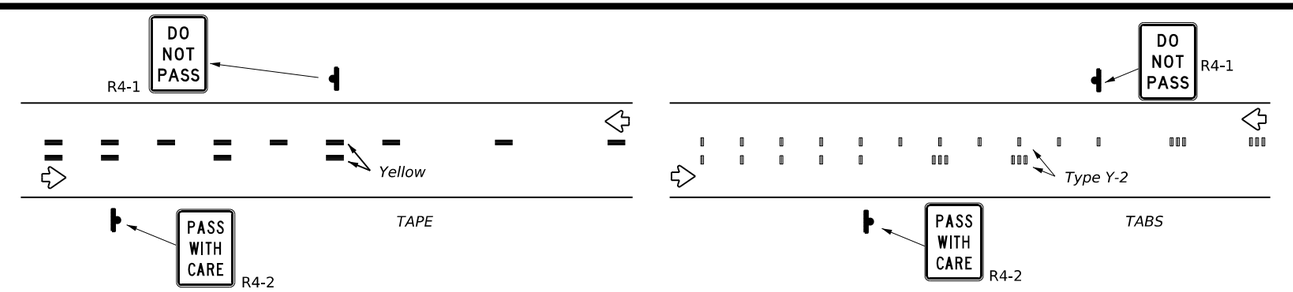
NOTES:

1. Short term pavement markings may be prefabricated markings (stick down tape) or temporary flexible reflective roadway marker tabs unless otherwise specified elsewhere in plans.
2. Short term pavement markings shall NOT be used to simulate edge lines.
3. Dimensions indicated on this sheet are typical and approximate. Variations in size and height may occur between markers or devices made by manufacturers, by as much as 1/4 inch, unless otherwise noted.
4. Temporary flexible-reflective roadway marker tabs will require normal maintenance replacement when used on roadways with an ADT per lane of up to 7500 vehicles with no more than 10% truck mix. When roadways exceed these values, additional maintenance replacement of devices should be planned.
5. No segment of roadway open to traffic shall remain without permanent pavement markings for a period greater than 14 calendar days. The Contractor will be responsible for maintaining short term pavement markings until permanent pavement markings are in place. When the Contractor is responsible for placement of permanent pavement markings, no segment of roadway shall remain without permanent pavement markings for a period greater than 14 calendar days unless weather conditions prohibit placement. Permanent pavement markings shall be placed as soon as weather permits.
6. For two lane, two-way roadways, DO NOT PASS signs shall be erected to mark the beginning of sections where passing is prohibited and PASS WITH CARE signs shall be erected to mark the beginning of sections where passing is permitted. Signs shall be in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and may be used to indicate the limits of no-passing zones for up to 14 calendar days. Permanent pavement markings should then be placed.
7. For low volume two lane, two-way roadways of 4000 ADT or less, no-passing lines may be omitted when approved by the Engineer. DO NOT PASS and PASS WITH CARE signs shall be erected (see note 6).
8. For exit gores where a lane is being dropped place wide gore markings or retroreflective channelizing devices to guide motorist through the exit. If channelizing devices are to be used it should be noted elsewhere in the plans. One piece cones are not allowed for this purpose.

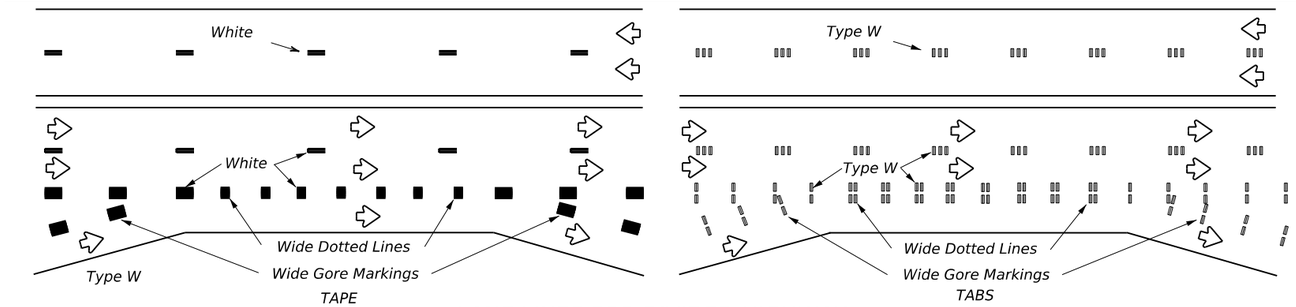
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

1. Temporary flexible-reflective roadway marker tabs detailed on this sheet will be designated Type Y-2 (two amber reflective surfaces with yellow body); Type Y (one amber reflective surface with yellow body); and Type W (one white or silver reflective surface with white body). Additional details may be found on BC(11).
2. Tabs shall meet requirements of Departmental Material Specification DMS-8242.
3. When dry, tabs shall be visible for a minimum distance of 200 feet during normal daylight hours and when illuminated by automobile low-beam head light at night, unless sight distance is restricted by roadway geometrics.
4. No two consecutive tabs nor four tabs per 1000 feet of line shall be missing or fail to meet the visual performance requirements of Note 3.

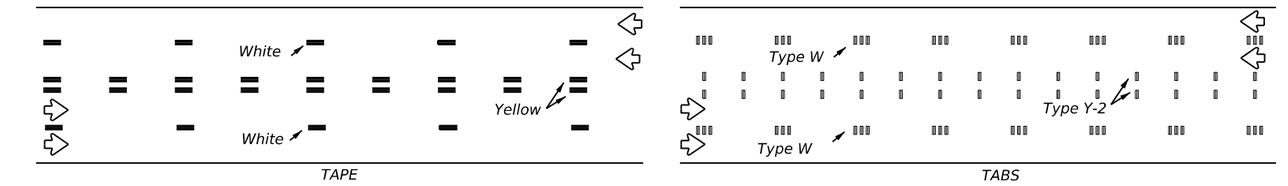
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



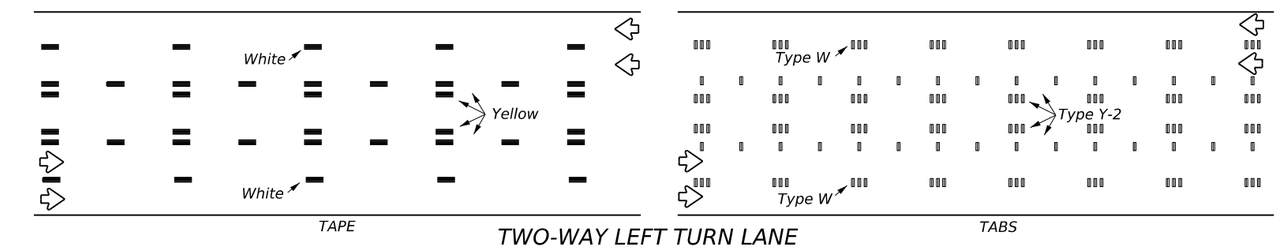
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



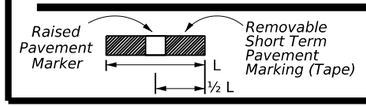
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



If raised pavement markers are used to supplement REMOVABLE short term markings, the markers shall be applied to the top of the tape at the approximate mid length of the tape. This allows an easier removal of raised markers and tape.

PREFABRICATED PAVEMENT MARKINGS

1. Temporary Removable Prefabricated Pavement Markings shall meet the requirements of DMS-8241.
2. Non-removable Prefabricated Pavement Markings shall meet the requirements of either DMS-8240 "Permanent Prefabricated Pavement Markings" or DMS-8243 "Temporary Costruction-Grade Prefabricated Pavement Markings."

RAISED PAVEMENT MARKERS

1. All raised pavement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAVEMENT MARKERS" and DMS-4200.

DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS) & MATERIAL PRODUCER LISTS (MPL)

1. DMSs referenced above can be found along with embedded links to their respective MPLs at the following website:

http://www.txdot.gov/business/contractors_consultants/material_specifications/default.htm

Texas Department of Transportation

Traffic Safety Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-23

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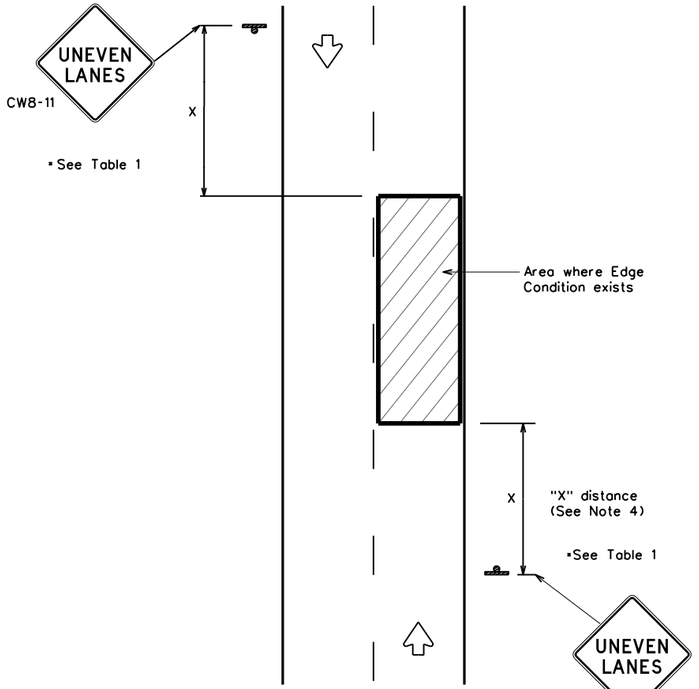
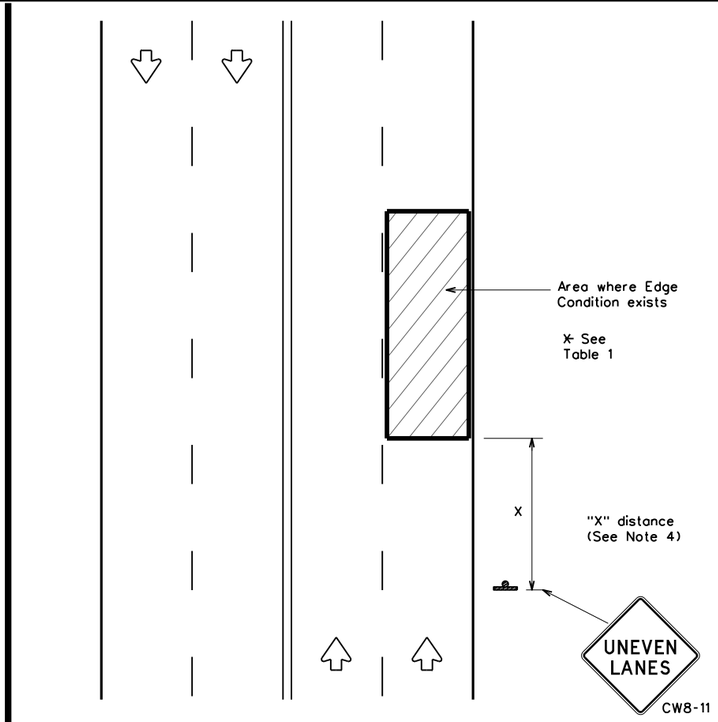
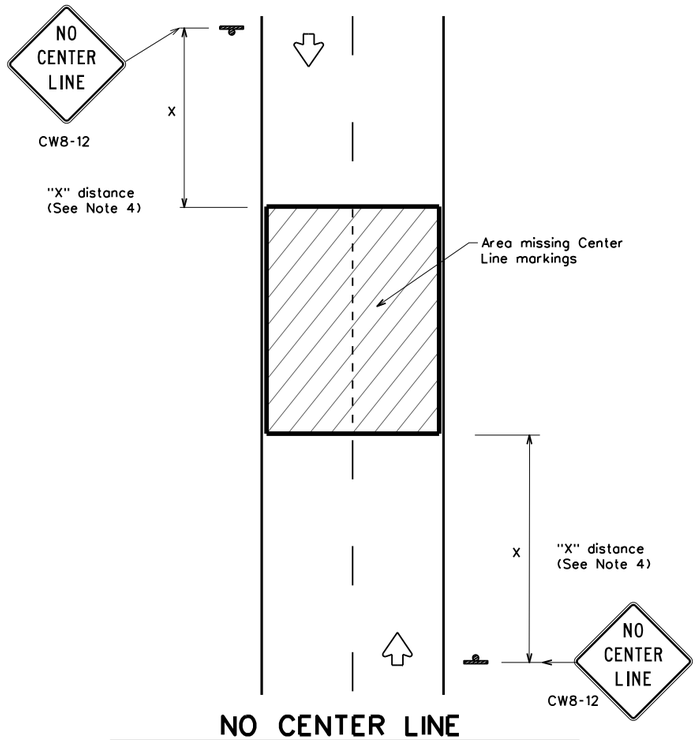


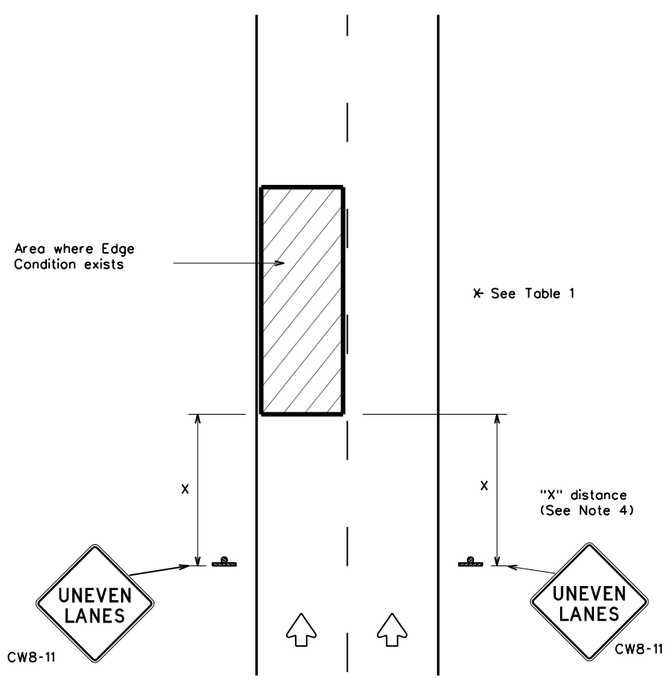
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

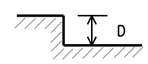
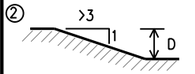
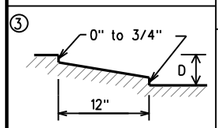
DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

COLOR	USAGE	SHEETING MATERIAL
ORANGE	BACKGROUND	TYPE B_{FL} OR TYPE C_{FL} SHEETING
BLACK	LEGEND & BORDERS	ACRYLIC NON-REFLECTIVE SHEETING

GENERAL NOTES

1. If spalling or holes occur, ROUGH ROAD (CW8-8) signs should be placed in advance of the condition and be repeated every two miles where the condition persists.
2. UNEVEN LANES (CW8-11) signs shall be installed in advance of the condition and repeated every mile. Signs installed along the uneven lane condition may be supplemented with the NEXT XX MILES (CW7-3aP) plaque or Advisory Speed (CW13-1P) plaque.
3. NO CENTER LINE (CW8-12) signs and temporary pavement markings as per the WZ(STPM) standard shall be installed if yellow centerlines separating two way traffic are obscured or obliterated. Repeat NO CENTER LINE signs every two miles where the center line markings are not in place. The signs and markings shall remain in place until permanent pavement markings are installed.
4. Signs shall be spaced at the distances recommended as per BC standards.
5. Additional signs may be required as directed by the Engineer. Signs shall remain in place until final surface is applied. Signs shall be considered subsidiary to Item 502 "BARRICADES, SIGNS AND TRAFFIC HANDLING."
6. Signs shall be fabricated and mounted on supports as shown on the BC standards and/or listed on the "Compliant Work Zone Traffic Control Devices" list.
7. Short term markings shall not be used to simulate edge lines.
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition.

TABLE 1

Edge Condition	Edge Height (D)	* Warning Devices
① 	Less than or equal to: 1¼" (maximum-planing) 1½" (typical-overlay)	Sign: CW8-11
	Distance "D" may be a maximum of 1 1/4 " for planing operations and 2" for overlay operations if uneven lanes with edge condition 1 are open to traffic after work operations cease.	
② 	Less than or equal to 3"	Sign: CW8-11
③  Notched Wedge Joint	Distance "D" may be a maximum of 3" if uneven lanes with edge condition 2 or 3 are open to traffic after work operations cease. Uneven lanes should not be open to traffic when "D" is greater than 3".	

TRAFFIC CONTROL DURING PLANING, OVERLAY AND LEVELING OPERATIONS ARE SHOWN ELSEWHERE IN THE PLANS.

MINIMUM WARNING SIGN SIZE	
Conventional roads	36" x 36"
Freeways/expressways, divided roadways	48" x 48"

Texas Department of Transportation

Traffic Operations Division Standard

SIGNING FOR UNEVEN LANES

WZ(UL)-13

FILE: wzul-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
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1-97 3-03	ELP	PRESIDIO		39

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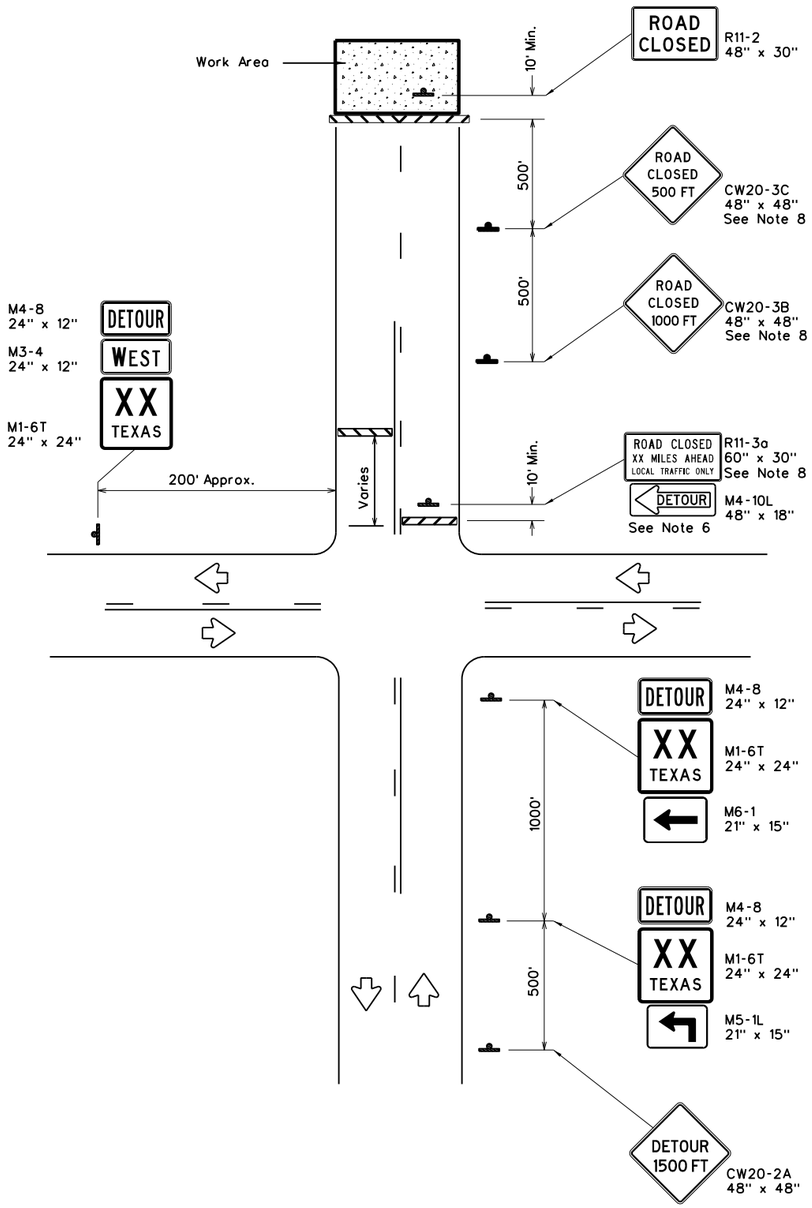
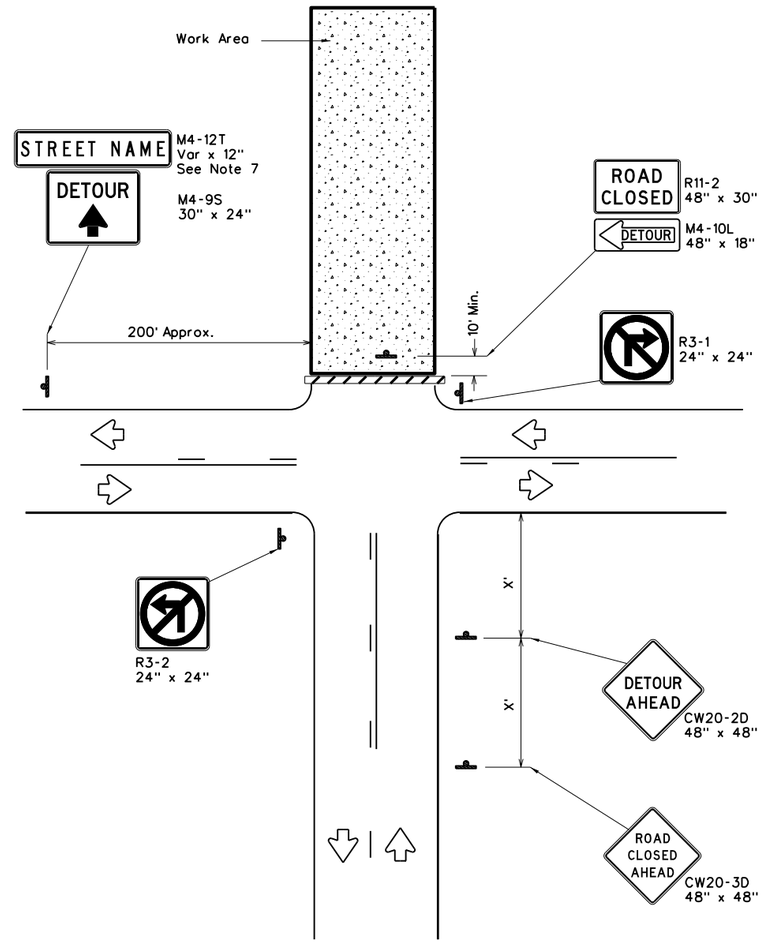


ROAD CLOSURE BEYOND THE INTERSECTION

Signing for a Numbered Route with an Off-Site Detour



ROAD CLOSURE AT THE INTERSECTION

Signing for an Un-numbered Route with an Off-Site Detour

LEGEND	
	Type 3 Barricade
	Sign

Posted Speed *	Minimum Sign Spacing "X" Distance
30	120'
35	160'
40	240'
45	320'
50	400'
55	500'
60	600'
65	700'
70	800'
75	900'

* Conventional Roads Only

GENERAL NOTES

1. This sheet is intended to provide details for temporary work zone road closures. For permanent road closure details see the D&OM standards.
2. Barricades used shall meet the requirements shown on Barricade and Construction Standard BC(10) and listed on the Compliant Work Zone Traffic Control Devices list (CWZTCD).
3. Stockpiled materials shall not be placed on the traffic side of barricades.
4. Barricades at the road closure should extend from pavement edge to pavement edge.
5. Detour signing shown is intended to illustrate the type of signing that is appropriate for numbered routes or un-numbered routes as labeled. It does not indicate the full extent of detour signing required. Detour routes should be signed as shown elsewhere in the plans.
6. If the road is open for a significant distance beyond the intersection or there are significant origin/destination points beyond the intersection, the signs and barricades at this location should be located at the edge of the traveled way.
7. The Street Name (M4-12T) sign is to be placed above the DETOUR (M4-9S) sign.
8. For urban areas where there is a shorter distance between the intersection and the actual closure location, the ROAD CLOSED XX MILES AHEAD (R11-3a) sign may be replaced with a ROAD CLOSED TO THRU TRAFFIC (R11-4) sign. If adequate space does not exist between the intersection and the closure a single ROAD CLOSED AHEAD (CW20-3D) sign spaced as per the table above may replace the ROAD CLOSED 1000 FT (CW20-3B) and ROAD CLOSED 500 FT (CW20-3C) signs.
9. Signs and barricades shown shall be subsidiary to Item 502. Locations where these details will be required shall be as shown elsewhere in the plans.

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE ROAD CLOSURE DETAILS

WZ(RCD)-13

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2-98 3-03	ELP	PRESIDIO		40

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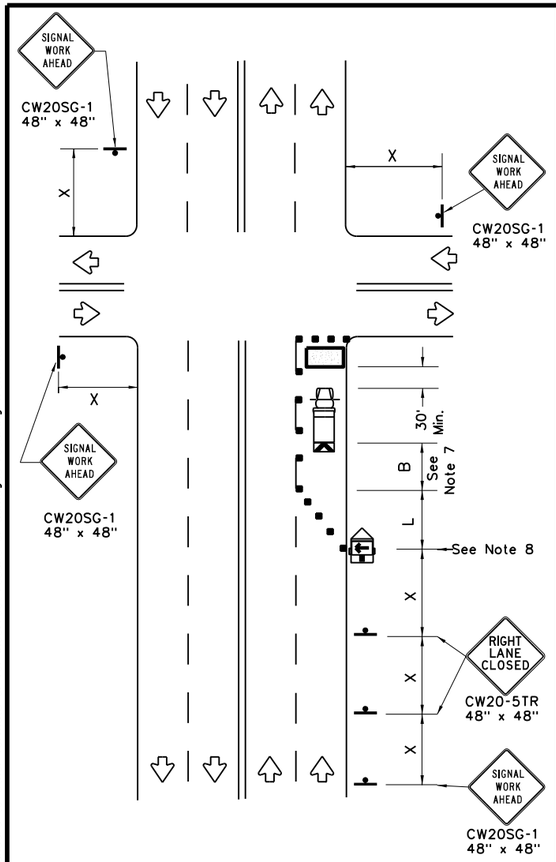
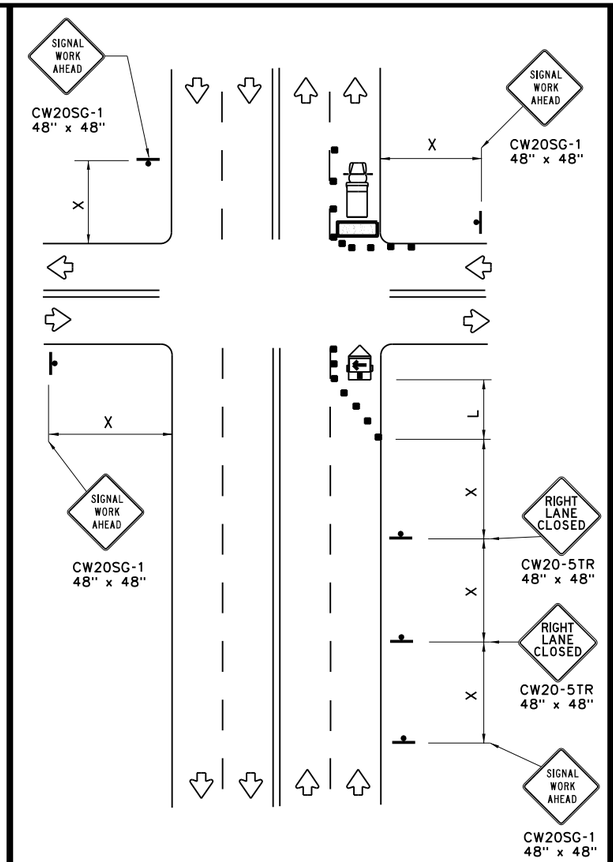


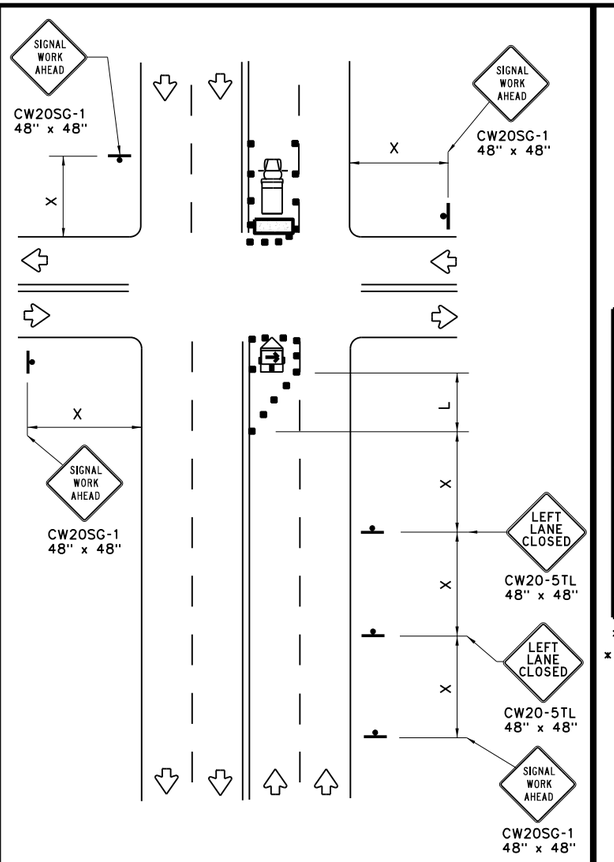
NEAR SIDE LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE RIGHT LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE LEFT LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY

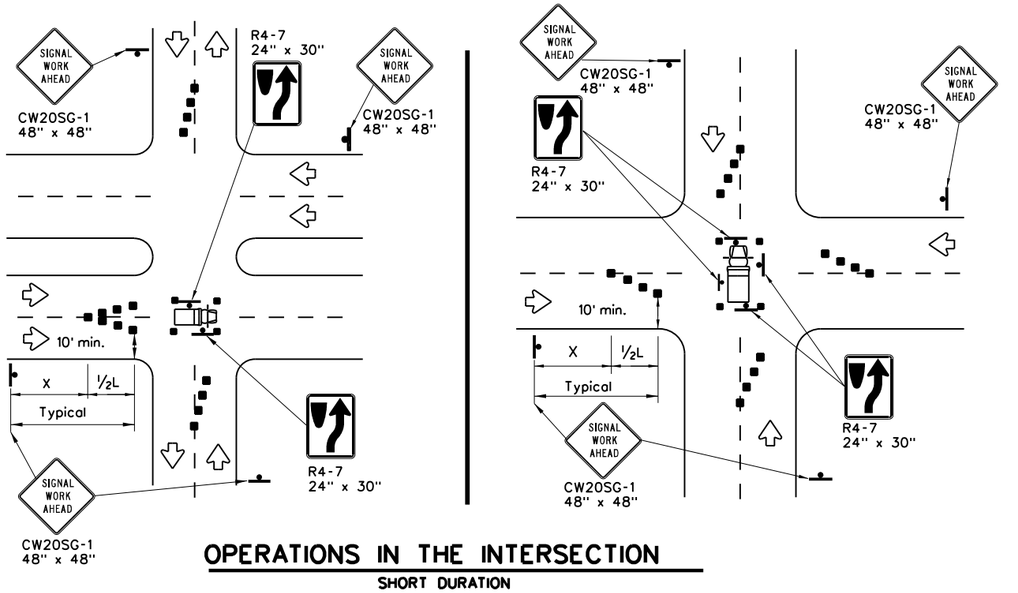
LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

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)

WORKERS IN BUCKET TRUCKS SHALL NOT WORK ABOVE OPEN LANES OF TRAFFIC.



OPERATIONS IN THE INTERSECTION

SHORT DURATION

GENERAL NOTES

1. The minimum size channelizing device is the 28" cone. 42" Two-piece cones, drums, vertical panels or barricades will be required when the device must be left unattended at night.
2. Obstructions or hazards at the work area shall be clearly marked and delineated at all times.
3. Flaggers and Flagger Symbol (CW20-7) signs may be required according to field conditions.
4. Vehicles parked in roadway shall be equipped with at least two high intensity rotating, flashing, oscillating or strobe type lights.
5. High level warning devices (flag trees) may be used at corners of the vehicle.
6. When work operations are performed on existing signals, the signals may be placed in flashing red mode when approved by the engineer. If existing signals do not have power, All-Way Stop (R1-1 and R1-3P) signs may be implemented when approved by the engineer.
7. For Short-Term Stationary work the buffer space "B" from the above table should be used if field conditions permit. For Short Duration (less than 1 hour) any buffer space provided will enhance the safety of the setup.
8. The arrow board at this location may be omitted for Short Duration work if the work vehicle has an arrow board in operation. As an option, the arrow board may be placed at the end of the taper in the closed lane if space is not available at the beginning of the taper.
9. Signs and devices for the NEAR SIDE LANE CLOSURE may be altered for a left lane closure by using a LEFT LANE CLOSED (CW20-5TL) and adding channelizing devices on the centerline to protect the work space from opposing traffic.

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC SIGNAL WORK TYPICAL DETAILS

WZ(BTS-1)-13

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2-98 10-99 7-13	DIST	COUNTY		SHEET NO.
4-98 3-03	ELP	PRESIDIO		41

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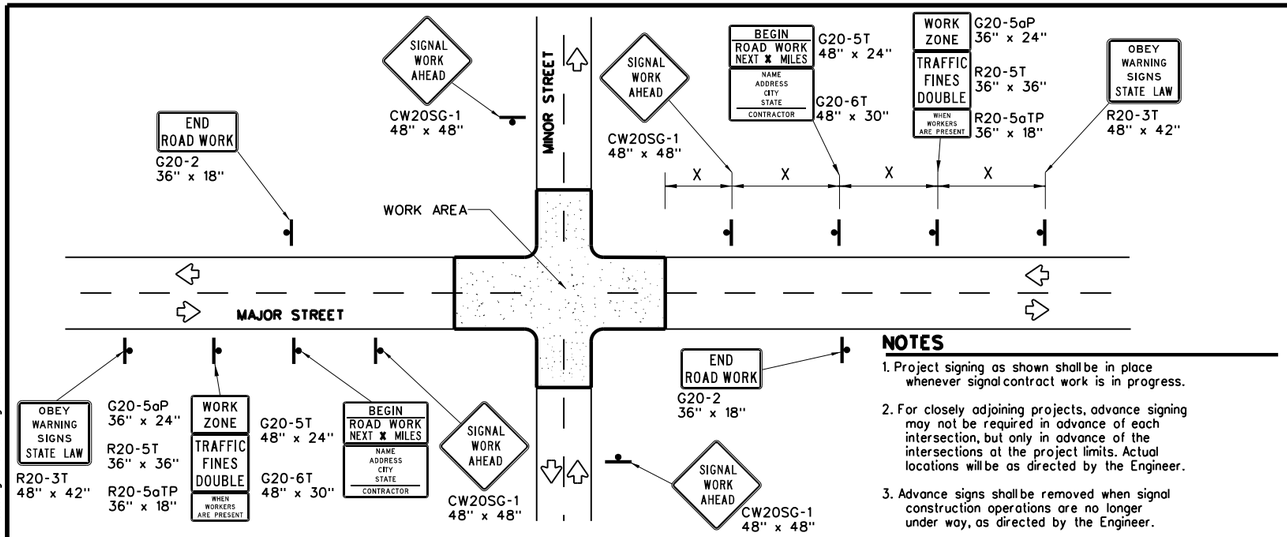


TYPICAL ADVANCE SIGNAL PROJECT SIGNING

FOR LONG TERM and INTERMEDIATE-TERM STATIONARY WORK OPERATIONS

NOTES

1. Project signing as shown shall be in place whenever signal contract work is in progress.
2. For closely adjoining projects, advance signing may not be required in advance of each intersection, but only in advance of the intersections at the project limits. Actual locations will be as directed by the Engineer.
3. Advance signs shall be removed when signal construction operations are no longer under way, as directed by the Engineer.
4. Warning sign spacing shown is typical for both directions.
5. See the Table on sheet 1 of 2 for Typical warning sign spacing.

GENERAL NOTES FOR WORK ZONE SIGNS

1. Signs shall be installed and maintained in a straight and plumb condition.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. Nails shall NOT be used to attach signs to any support.
5. All signs shall be installed in accordance with the plans or as directed by the Engineer.
6. The Contractor shall furnish the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD).
7. The Contractor shall furnish sign supports and substrates listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD), installed as per the manufacturer's recommendations.
8. Temporary signs that have damaged or cracked substrates and/or damaged or marred reflective sheeting shall be replaced as directed by the Engineer.
9. 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".
10. Damaged wood posts shall be replaced. Splicing wood posts will not be allowed.

DURATION OF WORK

1. Work zone durations are defined in Part 6, Section 6G.02 of the Texas Manual on Uniform Traffic Control Devices (TMUTCD).

SIGN MOUNTING HEIGHT

1. Sign height of Long-term/Intermediate-term warning signs shall be as shown on Figure 6F-1 of the TMUTCD.
2. Sign height of Short-term/Short Duration warning signs shall be as shown on Figure 6F-2 of the TMUTCD.
3. Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered, unless otherwise approved by the Engineer.
2. When signs are covered, the material used shall be opaque, such as heavy mil black plastic, or other materials which will cover the entire sign face and maintain their opaque properties under automobile headlights at night without damaging the sign sheeting. Burlap, or heavy materials such as plywood or aluminum shall not be used to cover signs.
3. Duct tape or other adhesive material shall NOT be affixed to a sign face.
4. Signs and anchor stubs shall be removed and holes back filled upon completion of the work.

REFLECTIVE SHEETING

1. All signs shall be retroreflective and constructed of sheeting meeting the requirements of the DMS and color usage table shown on this sheet.

SIGN SUPPORT WEIGHTS

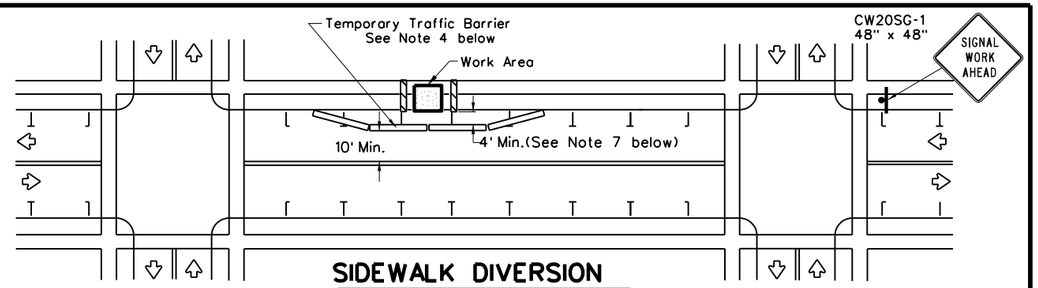
1. Weights used to keep signs from turning over should be sandbags filled with dry, cohesionless material.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects will not be permitted for use as sign support 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 fastners. 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.

LEGEND	
	Sign
	Channelizing Devices
	Type 3 Barricade

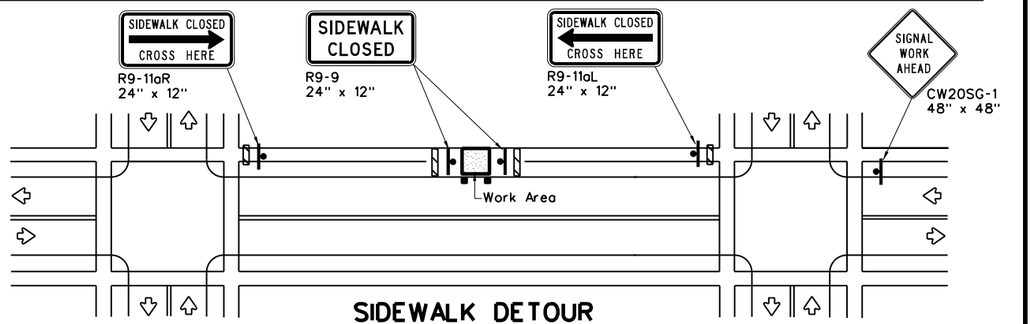
DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
FLEXIBLE ROLL-UP REFLECTIVE SIGNS	DMS-8310

COLOR	USAGE	SHEETING MATERIAL
ORANGE	BACKGROUND	TYPE B_{FL} OR TYPE C_{FL} SHEETING
WHITE	BACKGROUND	TYPE A SHEETING
BLACK	LEGEND & BORDERS	ACRYLIC NON-REFLECTIVE SHEETING

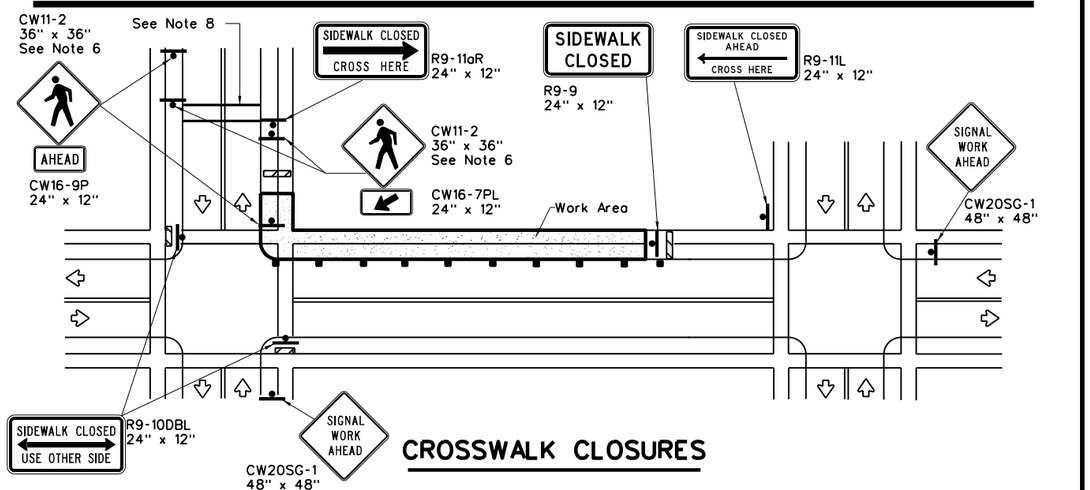
Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found at the following web address:
http://www.txdot.gov/txdot_library/publications/construction.htm



SIDEWALK DIVERSION



SIDEWALK DETOUR



CROSSWALK CLOSURES

PEDESTRIAN CONTROL

1. Holes, trenches or other hazards shall be adequately protected by covering, delineating or surrounding the hazard with orange plastic pedestrian fencing or longitudinal channelizing devices, or as directed by the Engineer.
2. "CROSSWALK CLOSURES" as detailed above will require the Engineer's approval prior to installation.
3. R9 series signs shown may be placed on supports detailed on the BC standards or CWZTCD list, or when fabricated from approved lightweight plastic substrates, they may be mounted on top of a plastic drum at or near the location shown.
4. For speeds less than 45 mph longitudinal channelizing devices may be used instead of traffic barriers when approved by the Engineer. Attenuation of blunt ends and installation of water filled devices shall be as per BC(9) and manufacturer's recommendations.
5. Location of devices are for general guidance. Actual device spacing and location must be field adjusted to meet actual conditions.
6. Where pedestrians with visual disabilities normally use the closed sidewalk Detectable Pedestrian Barricades should be used instead of the Type 3 Barricades shown.
7. The width of existing sidewalk should be maintained if practical.
8. Pavement markings for mid-block crosswalks shall be paid for under the appropriate bid items.
9. When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility.

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC SIGNAL WORK BARRICADES AND SIGNS

WZ(BTS-2)-13

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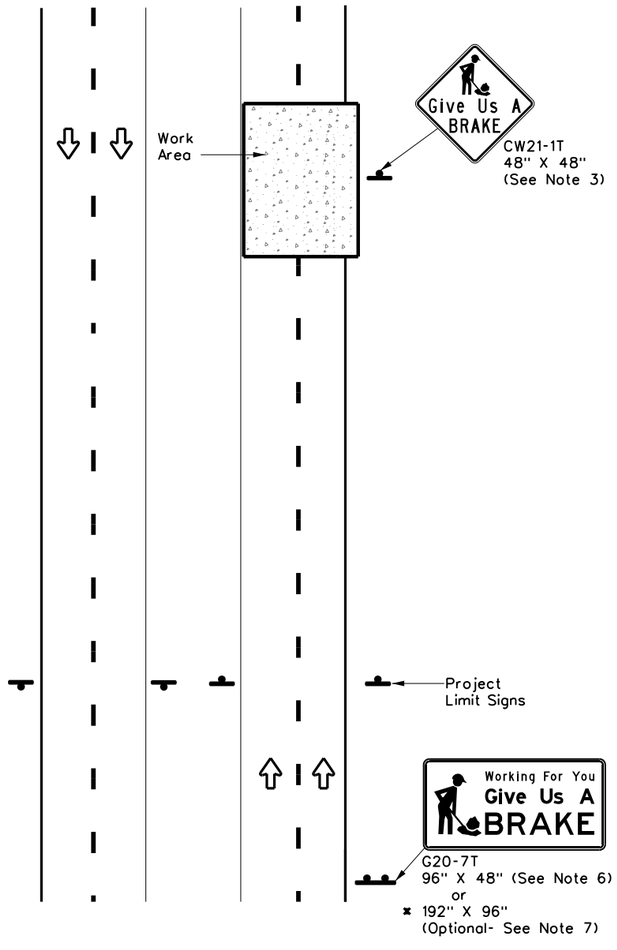
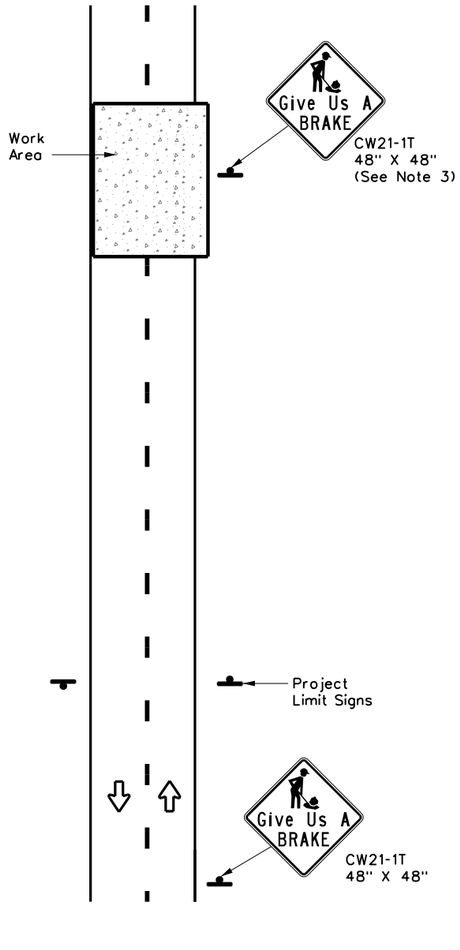


DIVIDED HIGHWAY



UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

* When the optional larger WORKING FOR YOU GIVE US A BRAKE (G20-7T) 192" x 96" sign is required, the locations shall be noted elsewhere in the plans.

SUMMARY OF LARGE SIGNS

BACKGROUND COLOR	SIGN DESIGNATION	SIGN	SIGN DIMENSIONS	REFLECTIVE SHEETING	SQ FT	GALVANIZED STRUCTURAL STEEL			DRILLED SHAFT 24" DIA. (LF)
						Size	(LF) ①	(LF) ②	
Orange	G20-7T	Working For You Give Us A BRAKE	96" X 48"	Type B_{FL} or C_{FL}	32	▲	▲	▲	▲
Orange	G20-7T	Working For You Give Us A BRAKE	192" X 96"	Type B_{FL} or C_{FL}	128	W8x18	16	17	12

▲ See Note 6 Below

LEGEND	
	Sign
	Large Sign
	Traffic Flow

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PLYWOOD SIGN BLANKS	DMS-7100
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

COLOR	USAGE	SHEETING MATERIAL
ORANGE	BACKGROUND	TYPE B_{FL} OR TYPE C_{FL}
BLACK	LEGEND & BORDERS	NON-REFLECTIVE ACRYLIC FILM

GENERAL NOTES

1. See BC and SMD sheets for additional sign support details.

2. Sign locations shall be approved by the Engineer.

3. For projects more than two miles in length, Give Us a BRAKE signs should be repeated halfway through the project. The Give Us a Brake (CW21-1T) may be used for this purpose.

4. Work zone speed limits are sometimes used in conjunction with GIVE US A BRAKE signing. See BC(3) for location and spacing of construction speed zone signing when required.

5. Give Us a Brake (CW21-1T) signs and supports shall be considered subsidiary to Item 502, "Barricades, Signs and Traffic Handling."

6. The 96" X 48" Working For You Give Us A BRAKE (G20-7T) may use a 1/2" or 5/8" plywood substrate or 0.125" aluminum sheeting substrate and may be supported by two 4" x 6" wood posts with drilled holes for breakaway as per BC(5) and will be subsidiary to Item 502.

7. The Working For You Give Us A BRAKE (G20-7T) 192" X 96" sign shall be paid for under the following specification items:
   Item 636 - Aluminum Signs
   Item 647 - Large Roadside Sign Supports and Assemblies.
   Item 416 - Drilled Shaft Foundations

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.

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE "GIVE US A BRAKE" SIGNS

WZ(BRK)-13

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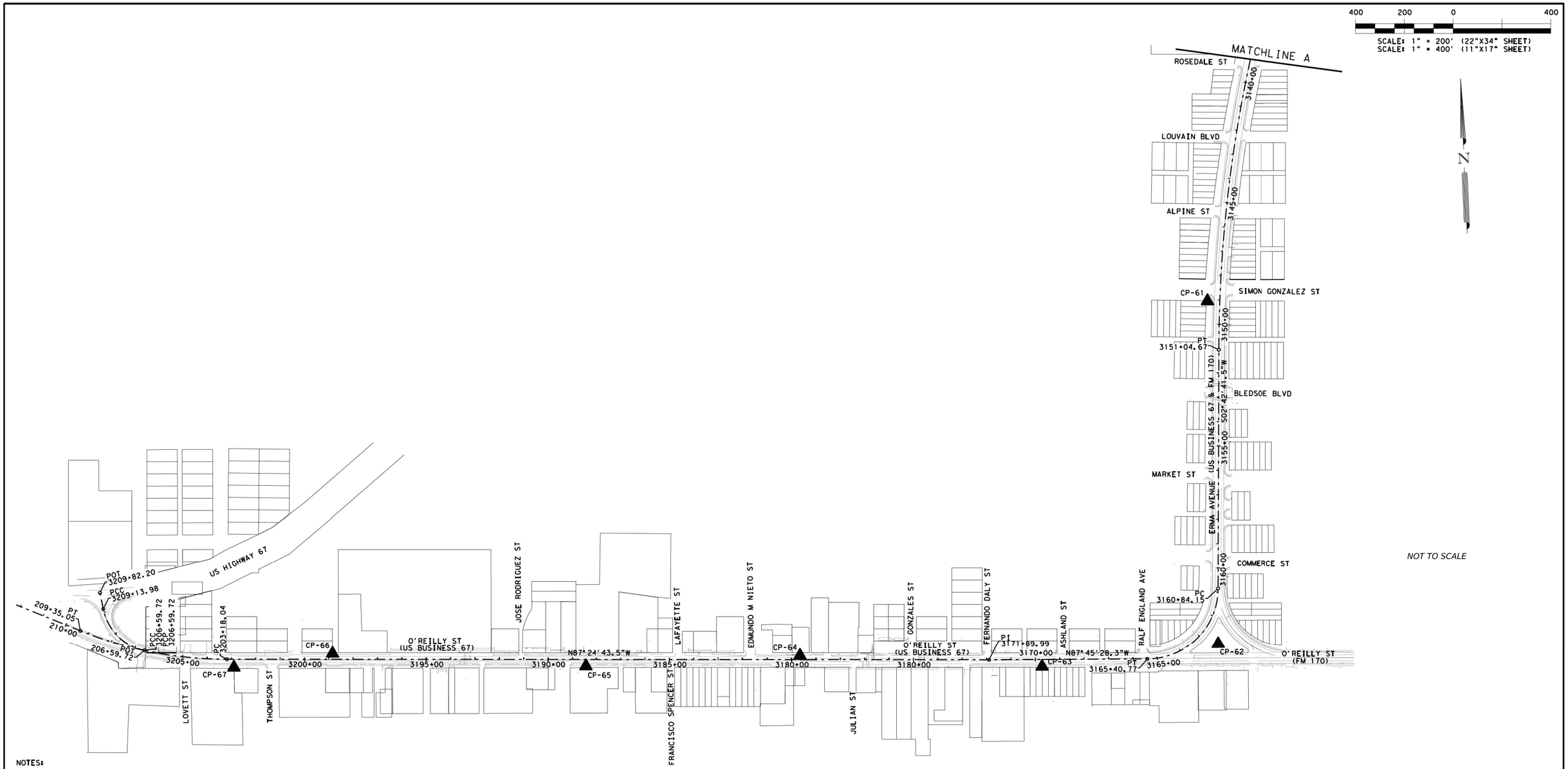


NOT TO SCALE

NOTES:

1. ALL BEARINGS AND COORDINATES SHOWN HEREON ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH ZONE (4204), NORTH AMERICAN DATUM OF 1983 (NAD 83), 2011 ADJ, EPOCH 2010.000

2. ALL ELEVATIONS SHOWN HEREON ARE ORTHOMETRIC VALUES REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988, (NAVD 88), REALIZED USING GEOID 12B.

3. COORDINATES AND DISTANCES ARE IN U.S. SURVEY FEET, DISPLAYED IN SURFACE VALUES, AND MAY BE CONVERTED TO GRID VALUES BY APPLYING THE TXDOT SURFACE ADJUSTMENT FACTOR (SAF), SAF = 1.00020, USING THE FORMULA: SURFACE / SAF = GRID

4. HORIZONTAL CONTROL VALUES REFERENCED HEREON ARE BASED ON STATIC GNSS OBSERVATIONS TIED TO NGS CONTINUALLY OPERATING REFERENCE STATIONS (CORS). TXPE, TXSN AND TXFS WERE HELD FIXED USING THEIR PUBLISHED HORIZONTAL VALUES.

5. VERICAL CONTROL VALUES REFERENCED HEREON ARE BASED ON STATIC GNSS OBSERVATIONS TIED TO NGS CONTINUALLY OPERATING REFERENCE STATIONS (CORS). TXPE, TXSN AND TXFS WERE HELD FIXED USING THEIR PUBLISHED VERTICAL VALUES.

SURVEY CONTROL TABLE

CONTROL POINT NUMBER	NORTHING	EASTING	ELEVATION	STATION	OFFSET	MONUMENT DESCRIPTION
CP-61	13,794,849.78	261,508.86	2,595.66	3149+05.80	50.87'RT.	SET 5/8" IRON ROD W/TXDOT ALUMINUM CAP
CP-62	13,793,440.96	261,490.60	2,581.69	3162+77.28	79.25'LT.	SET 5/8" IRON ROD W/TXDOT ALUMINUM CAP
CP-63	13,793,378.92	260,764.66	2,582.38	3169+72.36	28.59'LT.	SET 5/8" IRON ROD W/TXDOT ALUMINUM CAP
CP-64	13,793,468.33	259,774.29	2,580.79	3179+65.59	17.33'RT.	SET 5/8" IRON ROD W/TXDOT ALUMINUM CAP
CP-65	13,793,464.08	258,894.30	2,579.85	3188+44.49	26.65'LT.	SET 5/8" IRON ROD W/TXDOT ALUMINUM CAP
CP-66	13,793,562.06	257,857.09	2,574.94	3198+85.06	24.39'RT.	SET 5/8" IRON ROD W/TXDOT ALUMINUM CAP
CP-67	13,793,523.01	257,450.16	2,575.12	3202+89.81	32.99'LT.	SET 5/8" IRON ROD W/TXDOT ALUMINUM CAP

U.S. SURVEY FEET

SURVEYOR CERTIFICATION

THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION.

KYLE C. SUNDAY
REGISTERED PROFESSIONAL LAND SURVEYOR
TEXAS REGISTRATION NO. 5924
DATE: 21-Feb-2023

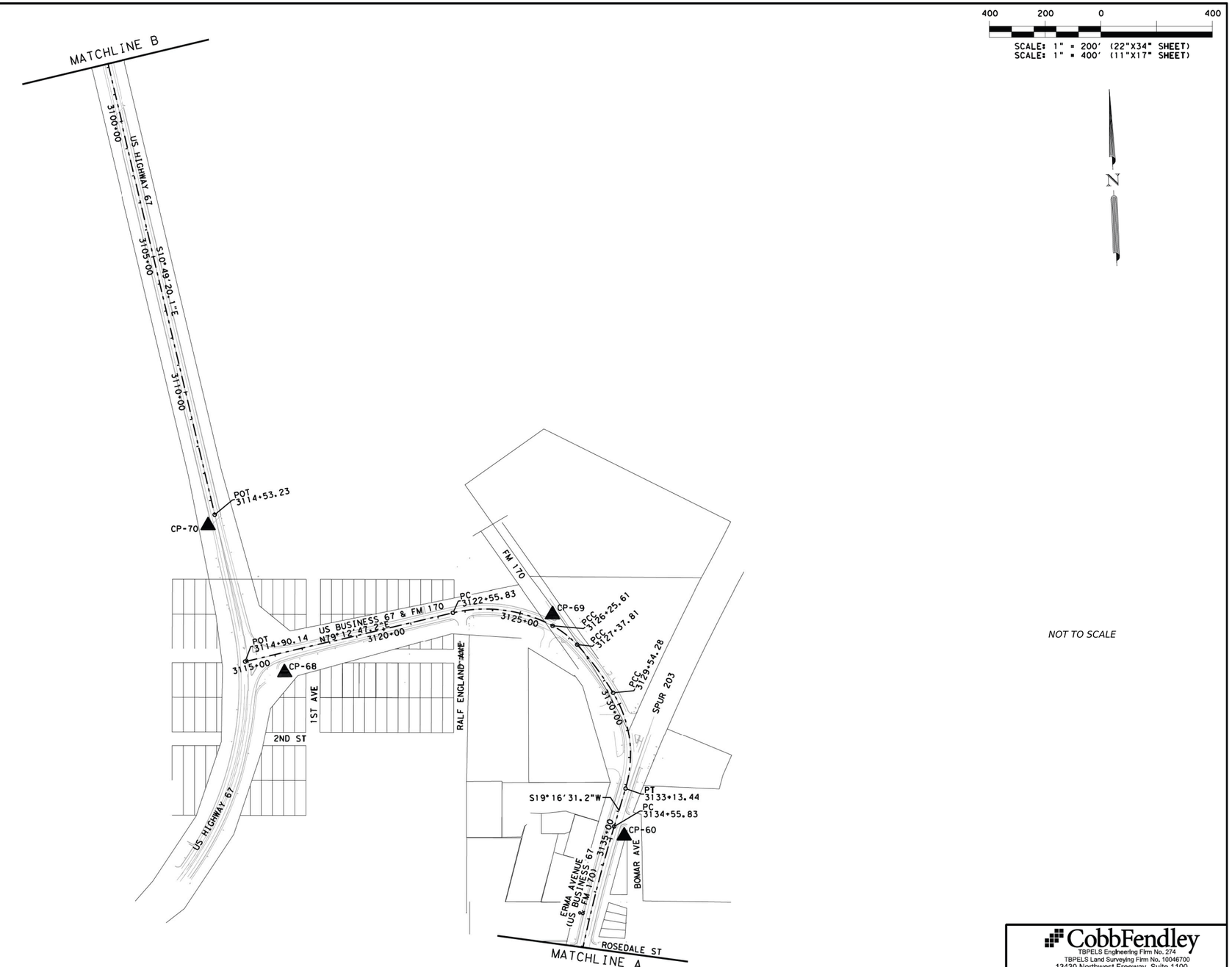
STATE OF TEXAS REGISTERED KYLE CARSON SUNDAY 5924 PROFESSIONAL LAND SURVEYOR

CobbFendley
TBPELS Engineering Firm No. 274
TBPELS Land Surveying Firm No. 10046700
13430 Northwest Freeway, Suite 1100
Houston, Texas 77040
713.462.3242 | fax 713.462.3262
www.cobbfendley.com

US BUSINESS 67A
SURVEY CONTROL LAYOUT SHEET
PRESIDIO COUNTY, TEXAS

SHEETS 1 OF 3

DSN: MH	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
CK: UO	6	TEXAS	C 104-11-8			US 67
DRN: BM	STATE DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
CK: UO	24	PRESIDIO	0104	11	008	44



NOT TO SCALE

NOTES:

1. ALL BEARINGS AND COORDINATES SHOWN HEREON ARE BASED ON THE TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH ZONE (4204), NORTH AMERICAN DATUM OF 1983 (NAD 83), 2011 ADJ, EPOCH 2010.000

2. ALL ELEVATIONS SHOWN HEREON ARE ORTHOMETRIC VALUES REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988, (NAVD 88), REALIZED USING GEOID 12B.

3. COORDINATES AND DISTANCES ARE IN U.S. SURVEY FEET, DISPLAYED IN SURFACE VALUES, AND MAY BE CONVERTED TO GRID VALUES BY APPLYING THE TXDOT SURFACE ADJUSTMENT FACTOR (SAF), SAF = 1.00020, USING THE FORMULA: SURFACE / SAF = GRID

4. HORIZONTAL CONTROL VALUES REFERENCED HEREON ARE BASED ON STATIC GNSS OBSERVATIONS TIED TO NGS CONTINUALLY OPERATING REFERENCE STATIONS (CORS). TXPE, TXSN AND TXFS WERE HELD FIXED USING THEIR PUBLISHED HORIZONTAL VALUES.

5. VERICAL CONTROL VALUES REFERENCED HEREON ARE BASED ON STATIC GNSS OBSERVATIONS TIED TO NGS CONTINUALLY OPERATING REFERENCE STATIONS (CORS). TXPE, TXSN AND TXFS WERE HELD FIXED USING THEIR PUBLISHED VERTICAL VALUES.

SURVEY CONTROL TABLE

CONTROL POINT NUMBER	NORTHING	EASTING	ELEVATION	STATION	OFFSET	MONUMENT DESCRIPTION
CP-60	13,796,226.32	261,895.37	2,610.91	3134+76.21	44.48' LT.	SET 5/8" IRON ROD W/TXDOT ALUMINUM CAP
CP-68	13,796,868.18	260,703.55	2,622.51	3116+19.52	70.10' RT.	SET 5/8" IRON ROD W/TXDOT ALUMINUM CAP
CP-69	13,797,034.68	261,673.23	2,618.19	3126+07.10	36.58' LT.	SET 5/8" IRON ROD W/TXDOT ALUMINUM CAP
CP-70	13,797,408.08	260,452.47	2,622.40	3114+84.75	31.54' RT.	SET 5/8" IRON ROD W/TXDOT ALUMINUM CAP

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Texas Department of Transportation

US BUSINESS 67A
SURVEY CONTROL
LAYOUT SHEET
PRESIDIO COUNTY, TEXAS

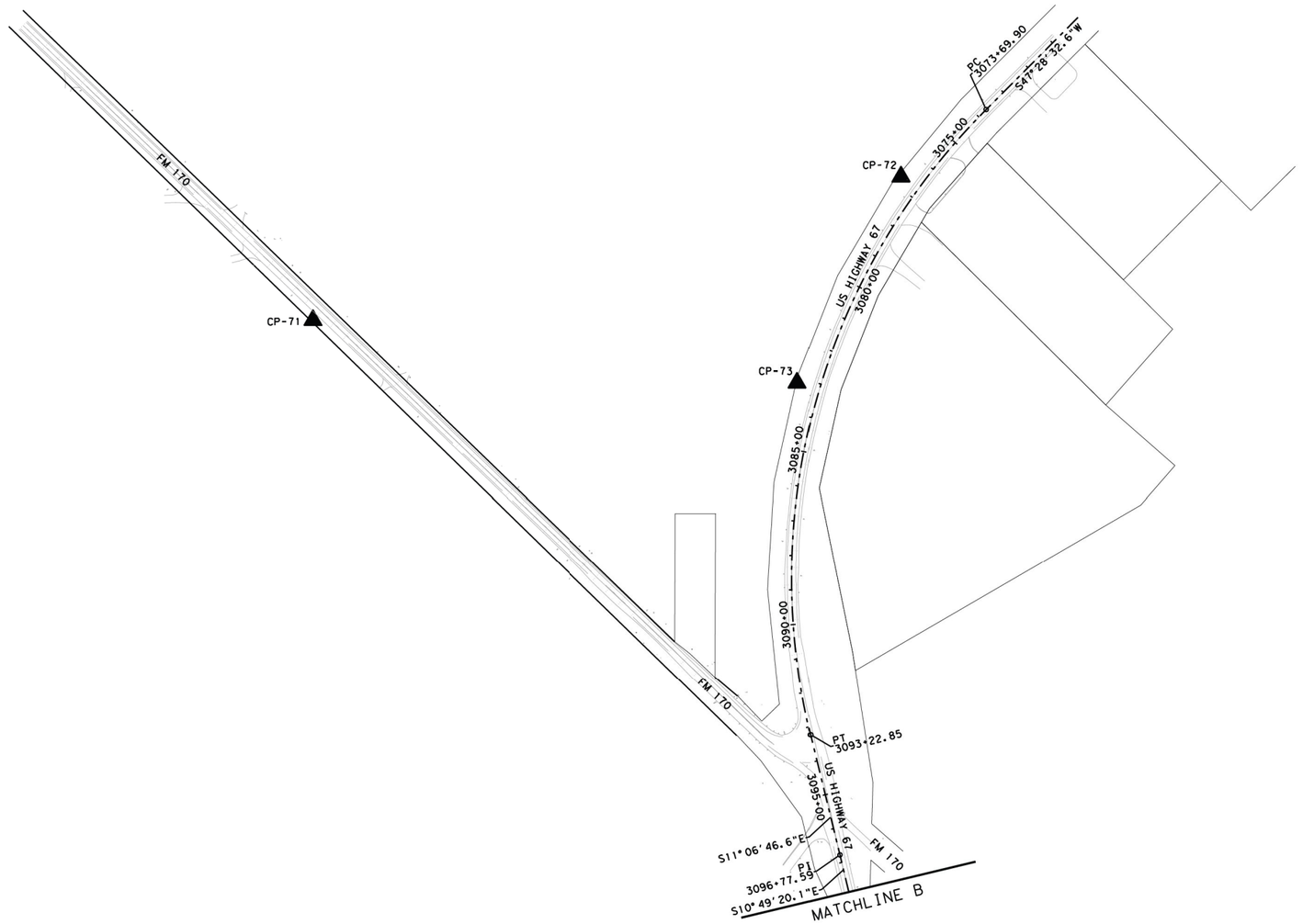
SHEETS 2 OF 3

DSN: MH	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
CK: UO	6	TEXAS	C 104-11-8				US 67
DRN: BM	STATE DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
CK: UO	24	PRESIDIO	0104	11	008		45

400 200 0 400

SCALE: 1" = 200' (22"X34" SHEET)
SCALE: 1" = 400' (11"X17" SHEET)

N



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SURVEY CONTROL TABLE

CONTROL POINT NUMBER	NORTHING	EASTING	ELEVATION	STATION	OFFSET	MONUMENT DESCRIPTION
CP-71	13,800,794.56	258,699.39	2,615.69	3084+42.35	1,460.04'RT.	SET 5/8" IRON ROD W/TXDOT ALUMINUM CAP
CP-72	13,801,131.55	260,406.18	2,642.38	3076+70.24	61.61'RT.	SET 5/8" IRON ROD W/TXDOT ALUMINUM CAP
CP-73	13,800,552.75	260,082.65	2,635.21	3083+14.87	66.40'RT.	SET 5/8" IRON ROD W/TXDOT ALUMINUM CAP

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Texas Department of Transportation

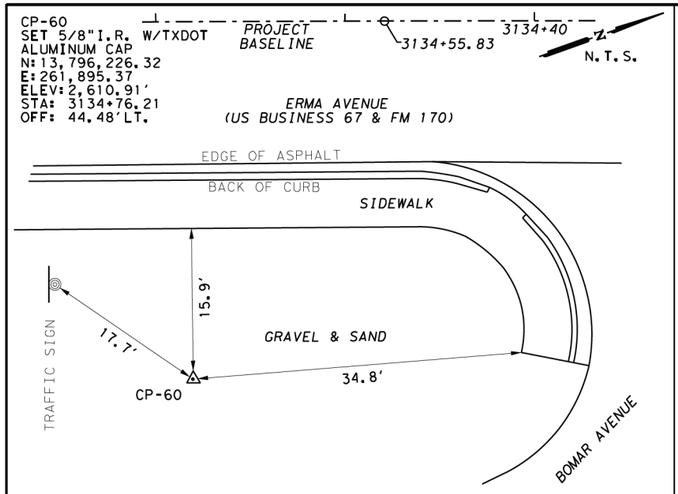
US BUSINESS 67A
SURVEY CONTROL LAYOUT SHEET

PRESIDIO COUNTY, TEXAS

SHEETS 3 OF 3

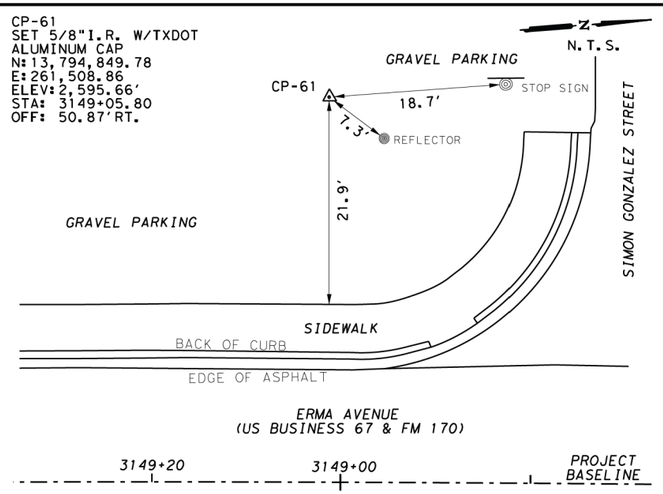
DSN: MH	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
CK: UO	6	TEXAS	C 104-11-8			US 67
DRN: BM	STATE DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
CK: UO	24	PRESIDIO	0104	11	008	46

CP-60
SET 5/8"I.R. W/TXDOT ALUMINUM CAP
N: 13,796,226.32
E: 261,895.37
ELEV: 2,610.91'
STA: 3134+76.21
OFF: 44.48'LT.



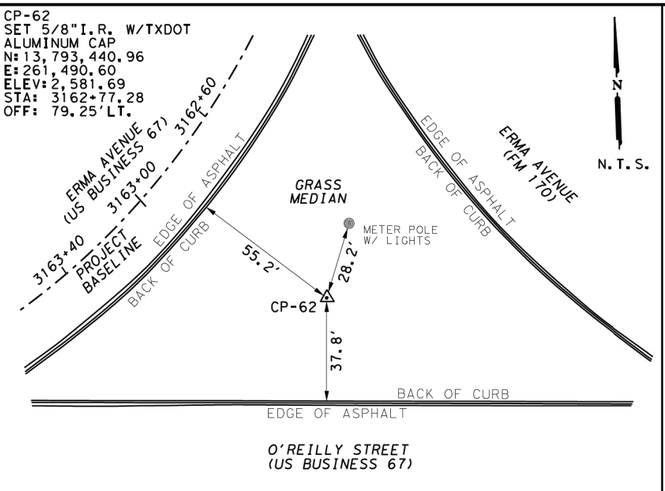
SET 5/8" IRON ROD W/ TXDOT ALUMINUM CAP LOCATED ON THE EAST SIDE OF ERMA AVE, SOUTHEAST OF THE INTERSECTION OF ERMA AVE & BOMAR AVE.

CP-61
SET 5/8"I.R. W/TXDOT ALUMINUM CAP
N: 13,794,849.78
E: 261,508.86
ELEV: 2,595.66'
STA: 3149+05.80
OFF: 50.87'RT.



SET 5/8" IRON ROD W/ TXDOT ALUMINUM CAP LOCATED ON THE WEST SIDE OF ERMA AVE, SOUTHWEST OF THE INTERSECTION OF ERMA AVE & SIMON GONZALEZ ST.

CP-62
SET 5/8"I.R. W/TXDOT ALUMINUM CAP
N: 13,793,440.96
E: 261,490.60
ELEV: 2,581.69
STA: 3162+77.28
OFF: 79.25'LT.



SET 5/8" IRON ROD W/ TXDOT ALUMINUM CAP LOCATED IN THE GRASS MEDIAN AT THE INTERSECTION OF ERMA AVE AND O'REILLY ST.

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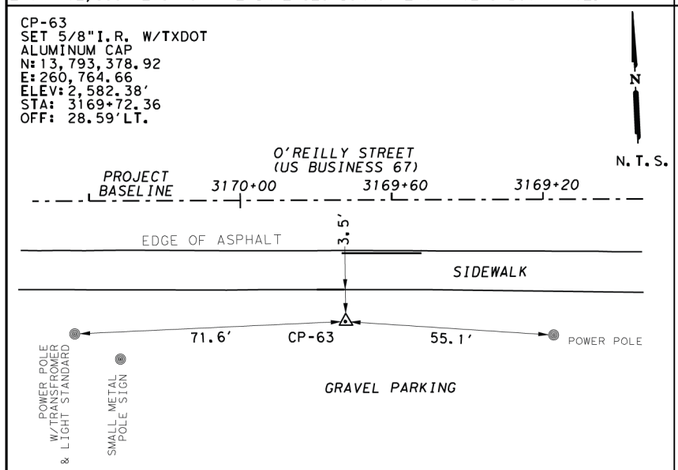
NOT TO SCALE

KYLE C. SUNDAY
REGISTERED PROFESSIONAL LAND SURVEYOR
TEXAS REGISTRATION NO. 5924

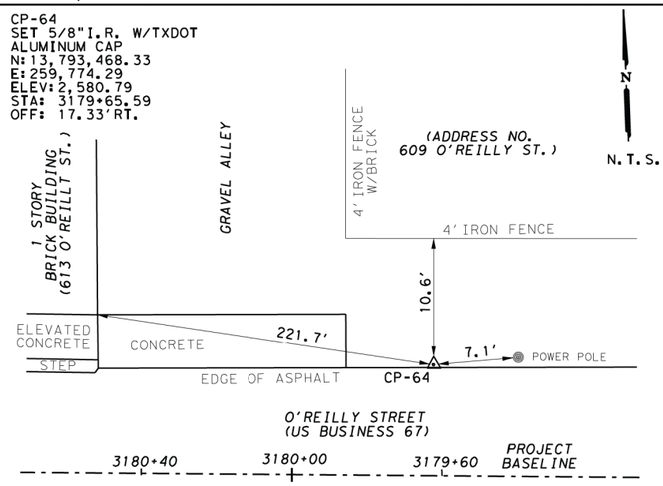
DATE: 21-Feb-2023

CP-63
SET 5/8"I.R. W/TXDOT ALUMINUM CAP
N: 13,793,378.92
E: 260,764.66
ELEV: 2,582.38'
STA: 3169+72.36
OFF: 28.59'LT.



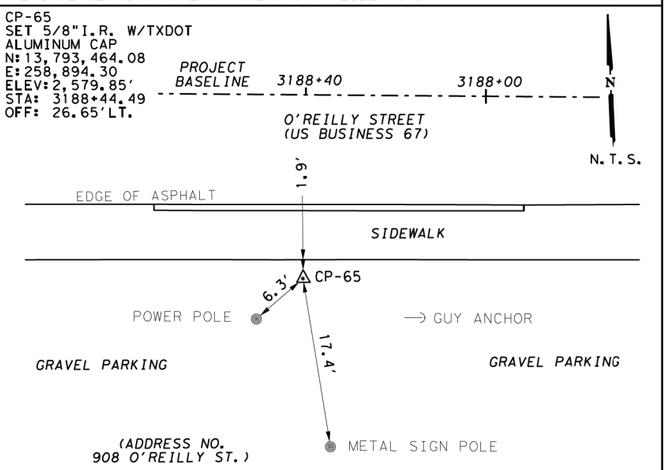
SET 5/8" IRON ROD W/ TXDOT ALUMINUM CAP LOCATED ON THE SOUTH SIDE OF O'REILLY ST, APPROX. 90' SOUTHWEST OF THE INTERSECTION OF O'REILLY ST. & ASHLAND ST.

CP-64
SET 5/8"I.R. W/TXDOT ALUMINUM CAP
N: 13,793,468.33
E: 259,774.29
ELEV: 2,580.79
STA: 3179+65.59
OFF: 17.33'RT.



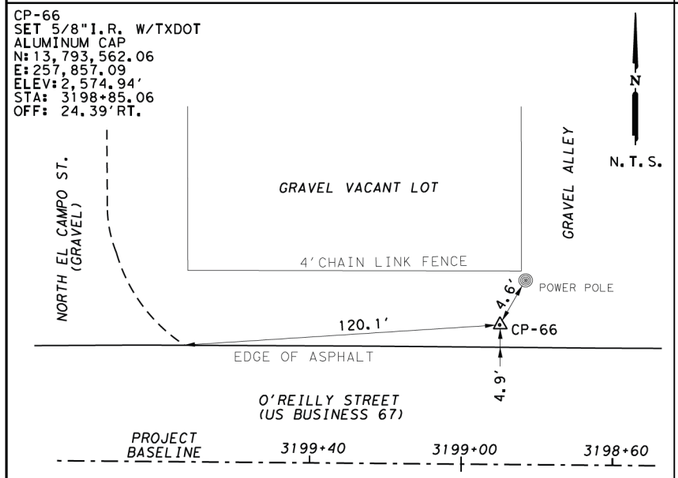
SET 5/8" IRON ROD W/ TXDOT ALUMINUM CAP LOCATED ON THE NORTH SIDE OF O'REILLY ST, APPROX. 205' EAST OF THE INTERSECTION OF O'REILLY ST. & EDMUNDO M NIETO ST.

CP-65
SET 5/8"I.R. W/TXDOT ALUMINUM CAP
N: 13,793,464.08
E: 258,894.30
ELEV: 2,579.85'
STA: 3188+44.49
OFF: 26.65'LT.



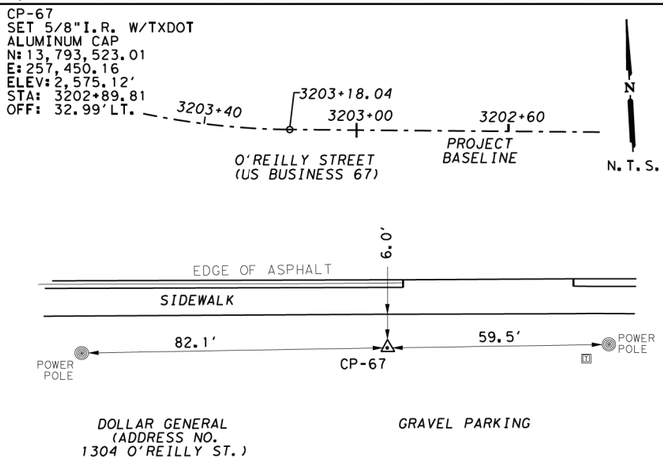
SET 5/8" IRON ROD W/ TXDOT ALUMINUM CAP LOCATED ON THE SOUTH SIDE OF O'REILLY ST, APPROX. 350' WEST OF THE INTERSECTION OF O'REILLY ST. & FRANCISCO SPENSER ST.

CP-66
SET 5/8"I.R. W/TXDOT ALUMINUM CAP
N: 13,793,562.06
E: 257,857.09
ELEV: 2,574.94'
STA: 3198+85.06
OFF: 24.39'RT.



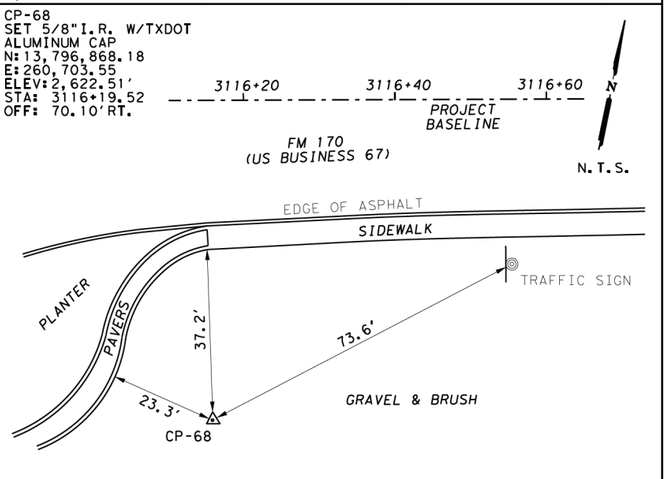
SET 5/8" IRON ROD W/ TXDOT ALUMINUM CAP LOCATED ON THE NORTH SIDE OF O'REILLY ST, APPROX. 147' EAST OF THE INTERSECTION OF O'REILLY ST. & NORTH EL CAMPO ST.

CP-67
SET 5/8"I.R. W/TXDOT ALUMINUM CAP
N: 13,793,523.01
E: 257,450.16
ELEV: 2,575.12'
STA: 3202+89.81
OFF: 32.99'LT.



SET 5/8" IRON ROD W/ TXDOT ALUMINUM CAP LOCATED ON THE SOUTH SIDE OF O'REILLY ST, APPROX. 156' WEST OF THE INTERSECTION OF O'REILLY ST. & THOMPSON ST.

CP-68
SET 5/8"I.R. W/TXDOT ALUMINUM CAP
N: 13,796,868.18
E: 260,703.55
ELEV: 2,622.51'
STA: 3116+19.52
OFF: 70.10'RT.



SET 5/8" IRON ROD W/ TXDOT ALUMINUM CAP LOCATED ON THE SOUTH SIDE OF FM 170, SOUTHEAST OF THE INTERSECTION OF FM 170 & US 67.

CobbFendley
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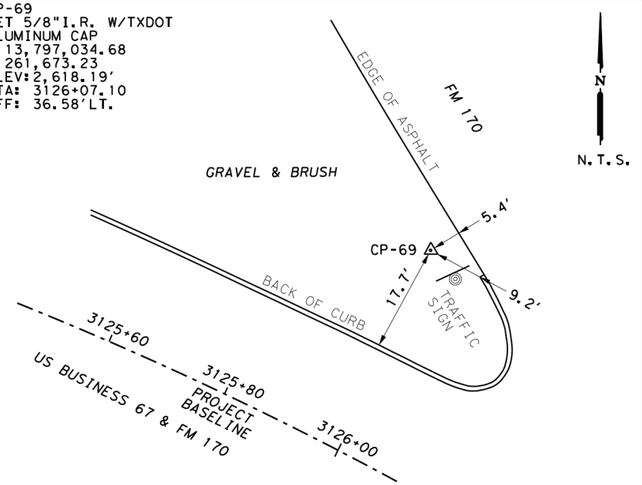
Texas Department of Transportation

US BUSINESS 67A
HORIZONTAL AND VERTICAL CONTROL SHEET

SHEET 1 OF 2

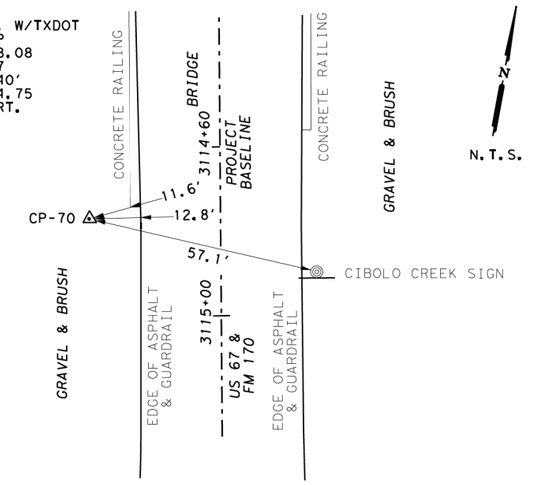
DSN: CW	FED. RD. DIV. NO.	STATE	PROJECT NO.		HIGHWAY NO.
CK: UO	6	TEXAS	C 104-11-8		US 67
DRN: BM	STATE DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
CK: UO	24	PRESIDIO	0104	11	008	47

CP-69
SET 5/8"I.R. W/TXDOT
ALUMINUM CAP
N: 13,797,034.68
E: 261,673.23
ELEV: 2,618.19'
STA: 3126+07.10
OFF: 36.58'LT.



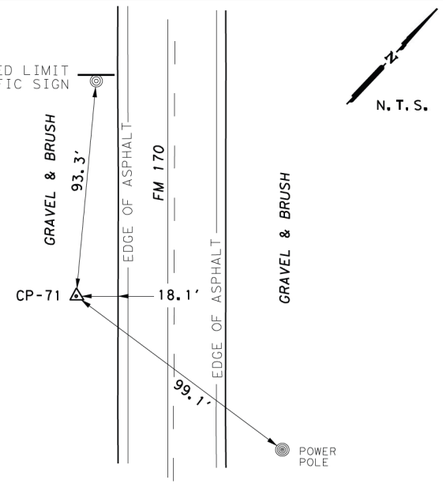
SET 5/8" IRON ROD W/ TXDOT ALUMINUM CAP LOCATED ON THE NORTH SIDE OF THE INTERSECTION OF FM 170 & US BUSINESS 67.

CP-70
SET 5/8"I.R. W/TXDOT
ALUMINUM CAP
N: 13,797,408.08
E: 260,452.47
ELEV: 2,622.40'
STA: 3114+84.75
OFF: 31.54'RT.



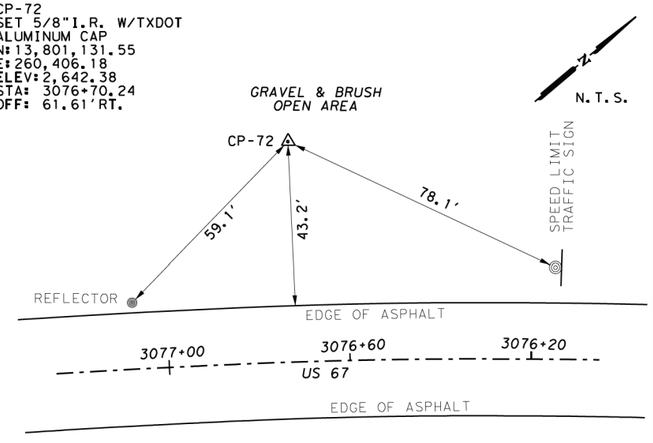
SET 5/8" IRON ROD W/ TXDOT ALUMINUM CAP LOCATED ON THE WEST SIDE OF FM 170, APPROX. 507' NORTH OF THE INTERSECTION OF FM 170 & US 67.

CP-71
SET 5/8"I.R. W/TXDOT
ALUMINUM CAP
N: 13,800,794.56
E: 258,699.39
ELEV: 2,615.69'
STA: 3084+42.35
OFF: 1,460.04'RT.



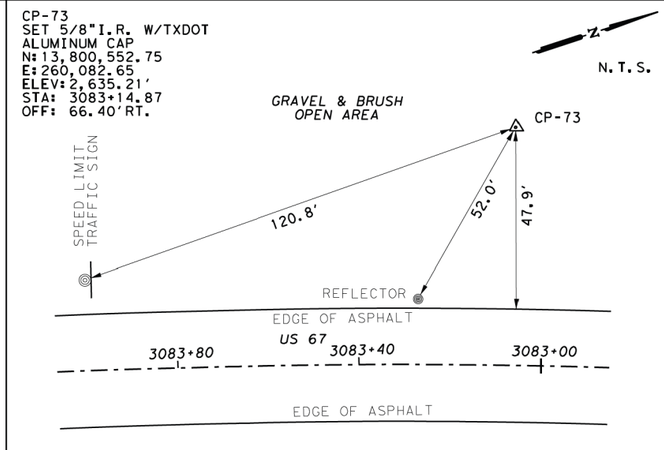
SET 5/8" IRON ROD W/ TXDOT ALUMINUM CAP LOCATED ON THE SOUTH SIDE OF FM 170, APPROX. 1,880' NORTHWEST OF THE INTERSECTION OF FM 170 & US 67.

CP-72
SET 5/8"I.R. W/TXDOT
ALUMINUM CAP
N: 13,801,131.55
E: 260,406.18
ELEV: 2,642.38
STA: 3076+70.24
OFF: 61.61'RT.



SET 5/8" IRON ROD W/ TXDOT ALUMINUM CAP LOCATED ON THE WEST SIDE OF US 67, APPROX. 1,670' NORTH OF THE INTERSECTION OF FM 170 & US 67.

CP-73
SET 5/8"I.R. W/TXDOT
ALUMINUM CAP
N: 13,800,552.75
E: 260,082.65
ELEV: 2,635.21'
STA: 3083+14.87
OFF: 66.40'RT.



SET 5/8" IRON ROD W/ TXDOT ALUMINUM CAP LOCATED ON THE WEST SIDE OF US 67, APPROX. 1,067' NORTH OF THE INTERSECTION OF FM 170 & US 67.

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US BUSINESS 67A
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SHEET 2 OF 2

DSN: UO	FED. RD. DIV. NO.	STATE	PROJECT NO.				HIGHWAY NO.
CK: UO	6	TEXAS	C 104-11-8				US 67
DRN: BM	STATE DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.		SHEET NO.
CK: UO	24	PRESIDIO	0104	11	008		48

ALIGNMENT NAME: BU67A

	STATION	X	Y
POT	3114+99.72 R1	260564.88	13796912.66
PC	3122+57.98 R1	261309.50	13797055.79
Tangential Direction:	N79.12'E		
Tangential Length:	758.26		
PC	3122+57.98 R1	261309.50	13797055.79
PI	3124+49.95 R1	261498.02	13797092.03
CC		261407.66	13796545.14
PCC	3126+25.78 R1	261664.87	13796997.08
Radius:	520.00		
Delta:	40.53° Right		
Degree of Curvature(Arc):	11.02°		
Length:	367.80		
Tangent:	191.97		
Chord:	360.18		
Middle Ordinate:	32.18		
External:	34.30		
Tangent Back Direction:	N79.12'E		
Radial Direction:	S10.88'E		
Chord Direction:	S80.62'E		
Radial Direction:	S29.64'W		
Tangent Ahead Direction:	S60.36'E		
PCC	3126+25.78 R1	261664.87	13796997.08
PI	3126+86.70 R1	261717.81	13796966.94
CC		261501.64	13796710.27
PCC	3127+46.26 R1	261756.51	13796919.90
Radius:	330.00		
Delta:	20.92° Right		
Degree of Curvature(Arc):	17.36°		
Length:	120.48		
Tangent:	60.92		
Chord:	119.81		
Middle Ordinate:	5.48		
External:	5.58		
Tangent Back Direction:	S60.36'E		
Radial Direction:	S29.64'W		
Chord Direction:	S49.90'E		
Radial Direction:	S50.56'W		
Tangent Ahead Direction:	S39.44'E		
PCC	3127+46.26 R1	261756.51	13796919.90
PI	3128+52.39 R1	261823.93	13796837.93
CC		260829.72	13796157.62
PCC	3129+57.98 R1	261875.91	13796745.40
Radius:	1200.00		
Delta:	10.11° Right		
Degree of Curvature(Arc):	4.77°		
Length:	211.71		
Tangent:	106.13		
Chord:	211.44		
Middle Ordinate:	4.67		
External:	4.68		
Tangent Back Direction:	S39.44'E		
Radial Direction:	S50.56'W		
Chord Direction:	S34.38'E		
Radial Direction:	S60.67'W		
Tangent Ahead Direction:	S29.33'E		
PCC	3129+57.98 R1	261875.91	13796745.40
PI	3131+57.56 R1	261973.67	13796571.39
CC		261501.03	13796534.78
PRC	3133+31.70 R1	261903.88	13796384.41
Radius:	430.00		
Delta:	49.80° Right		
Degree of Curvature(Arc):	13.32°		
Length:	373.72		
Tangent:	199.58		
Chord:	362.07		
Middle Ordinate:	39.97		
External:	44.06		
Tangent Back Direction:	S29.33'E		
Radial Direction:	S60.67'W		
Chord Direction:	S4.43'E		
Radial Direction:	N69.53'W		
Tangent Ahead Direction:	S20.47W		

ALIGNMENT NAME: BU67A (Continued)

	STATION	X	Y
PRC	3133+31.70 R1	261903.88	13796384.41
PI	3142+32.94 R1	261588.72	13795540.07
CC		267309.59	13794366.69
PT	3151+19.73 R1	261546.06	13794639.84
Radius:	5770.00		
Delta:	17.76° Left		
Degree of Curvature(Arc):	0.99°		
Length:	1788.04		
Tangent:	901.24		
Chord:	1780.89		
Middle Ordinate:	69.12		
External:	69.96		
Tangent Back Direction:	S20.47'W		
Radial Direction:	N69.53'W		
Chord Direction:	S11.59'W		
Radial Direction:	N87.29'W		
Tangent Ahead Direction:	S2.71'W		
PT	3151+19.73 R1	261546.06	13794639.84
PC	3160+94.81 R1	261499.90	13793665.86
Tangential Direction:	S2.71'W		
Tangential Length:	975.07		
PC	3160+94.81 R1	261499.90	13793665.86
PI	3163+74.19 R1	261486.67	13793386.78
CC		261213.22	13793679.44
PT	3165+37.91 R1	261207.34	13793392.50
Radius:	287.00		
Delta:	88.46° Right		
Degree of Curvature(Arc):	19.96°		
Length:	443.11		
Tangent:	279.39		
Chord:	400.39		
Middle Ordinate:	81.35		
External:	113.53		
Tangent Back Direction:	S2.71'W		
Radial Direction:	N87.29'W		
Chord Direction:	S46.94'W		
Radial Direction:	N1.17'E		
Tangent Ahead Direction:	N88.83'W		
PT	3165+37.91 R1	261207.34	13793392.50
PC	3167+49.12 R1	260996.17	13793396.83
Tangential Direction:	N88.83'W		
Tangential Length:	211.21		
PC	3167+49.12 R1	260996.17	13793396.83
PI	3167+97.50 R1	260947.80	13793397.82
CC		261078.10	13797395.99
PT	3168+45.88 R1	260899.47	13793399.98
Radius:	4000.00		
Delta:	1.39° Right		
Degree of Curvature(Arc):	1.43°		
Length:	96.75		
Tangent:	48.38		
Chord:	96.75		
Middle Ordinate:	0.29		
External:	0.29		
Tangent Back Direction:	N88.83'W		
Radial Direction:	N1.17'E		
Chord Direction:	N88.13'W		
Radial Direction:	N2.56'E		
Tangent Ahead Direction:	N87.44'W		
PT	3168+45.88 R1	260899.47	13793399.98
PI	3202+05.90 R1	257542.80	13793550.03
Tangential Direction:	N87.44'W		
Tangential Length:	3360.02		
PI	3202+05.90 R1	257542.80	13793550.03
PC	3203+84.63 R1	257364.36	13793560.24
Tangential Direction:	N86.73'W		
Tangential Length:	178.74		

ALIGNMENT NAME: BU67A (Continued)

	STATION	X	Y
PC	3203+84.63 R1	257364.36	13793560.24
PI	3205+19.63 R1	257229.59	13793567.95
CC		257444.34	13794957.96
PCC	3206+53.79 R1	257098.77	13793601.28
Radius:	1400.00		
Delta:	11.02° Right		
Degree of Curvature(Arc):	4.09°		
Length:	269.15		
Tangent:	134.99		
Chord:	268.74		
Middle Ordinate:	6.46		
External:	6.49		
Tangent Back Direction:	N86.73'W		
Radial Direction:	N3.27'E		
Chord Direction:	N81.22'W		
Radial Direction:	N14.29'E		
Tangent Ahead Direction:	N75.71'W		
PCC	3206+53.79 R1	257098.77	13793601.28
PI	3208+34.93 R1	256923.24	13793645.99
CC		257156.53	13793828.04
PT	3209+62.08 R1	256922.53	13793827.12
Radius:	234.00		
Delta:	75.49° Right		
Degree of Curvature(Arc):	24.49°		
Length:	308.29		
Tangent:	181.14		
Chord:	286.47		
Middle Ordinate:	48.96		
External:	61.92		
Tangent Back Direction:	N75.71'W		
Radial Direction:	N14.29'E		
Chord Direction:	N37.97'W		
Radial Direction:	N89.78'E		
Tangent Ahead Direction:	N0.22'W		
PT	3209+62.08 R1	256922.53	13793827.12
POT	3209+84.45 R1	256922.44	13793849.49
Tangential Direction:	N0.22'W		
Tangential Length:	22.37		

DATE	BY	REV	REVISION

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BU 67A

HORIZONTAL ALIGNMENT DATA

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		49

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DW
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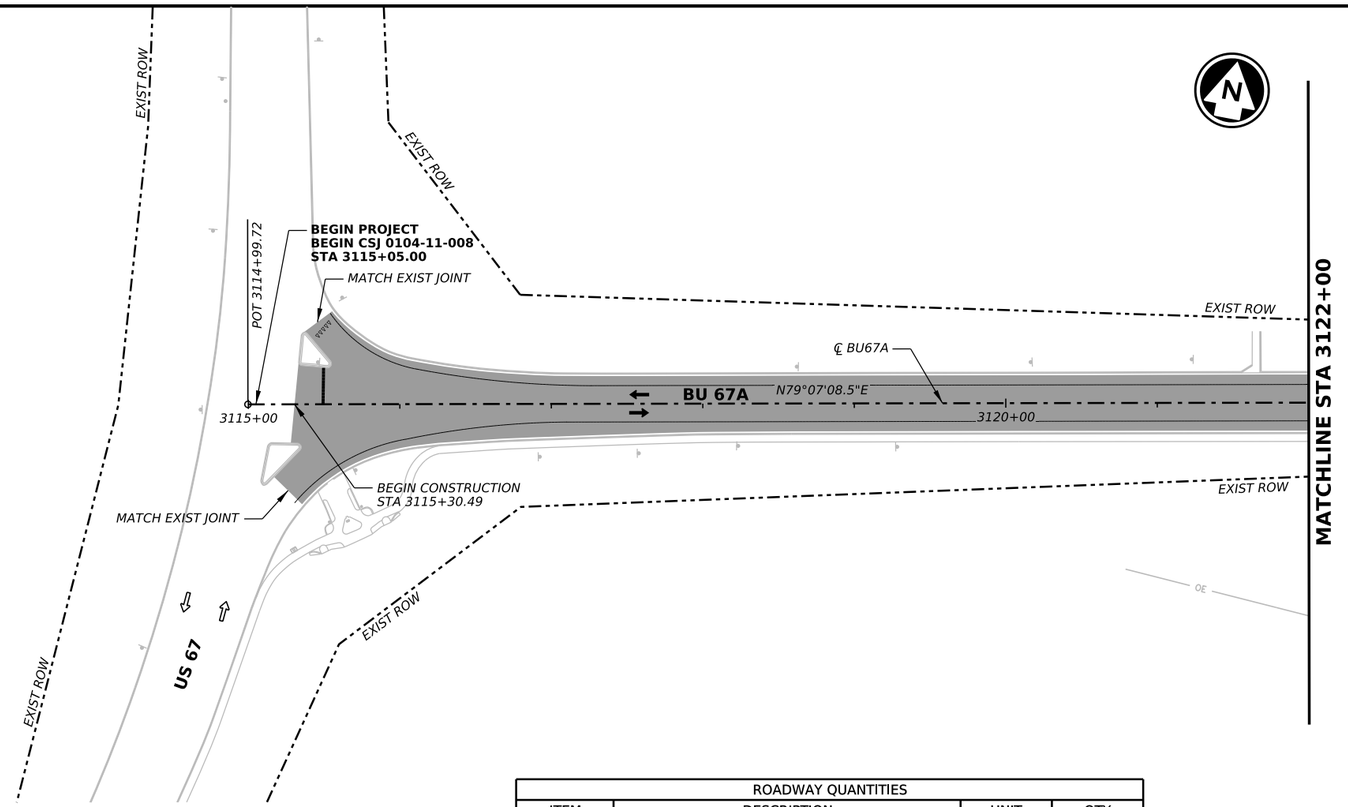

ROADWAY QUANTITIES			
ITEM	DESCRIPTION	UNIT	QTY
3077 6022	SP MIXES SP-C SAC-A PG70-22	TON	448
3085 6001	UNDERSEAL COURSE	GAL	913

LEGEND:

- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- CONCRETE RIPRAP (4")
- 6" PAVEMENT REPAIR
- 2.5" SP MIXES
- EXISTING ROW

NOTES:

1. REFER TO HORIZONTAL AND VERTIAL CONTROL SHEET FOR PROJECT CONTROL DATA, CONTROL POINT, AND BENCH MARK DATA.
2. REFER TO TYPICAL SECTIONS, GRADING PLAN, AND ROADWAY MISCELLANEOUS DETAILS SHEET FOR ADDITIONAL INFORMATION.
3. REFER TO PED-18 STANDARD FOR SIDEWALK TREATMENT AT DRIVEWAYS.

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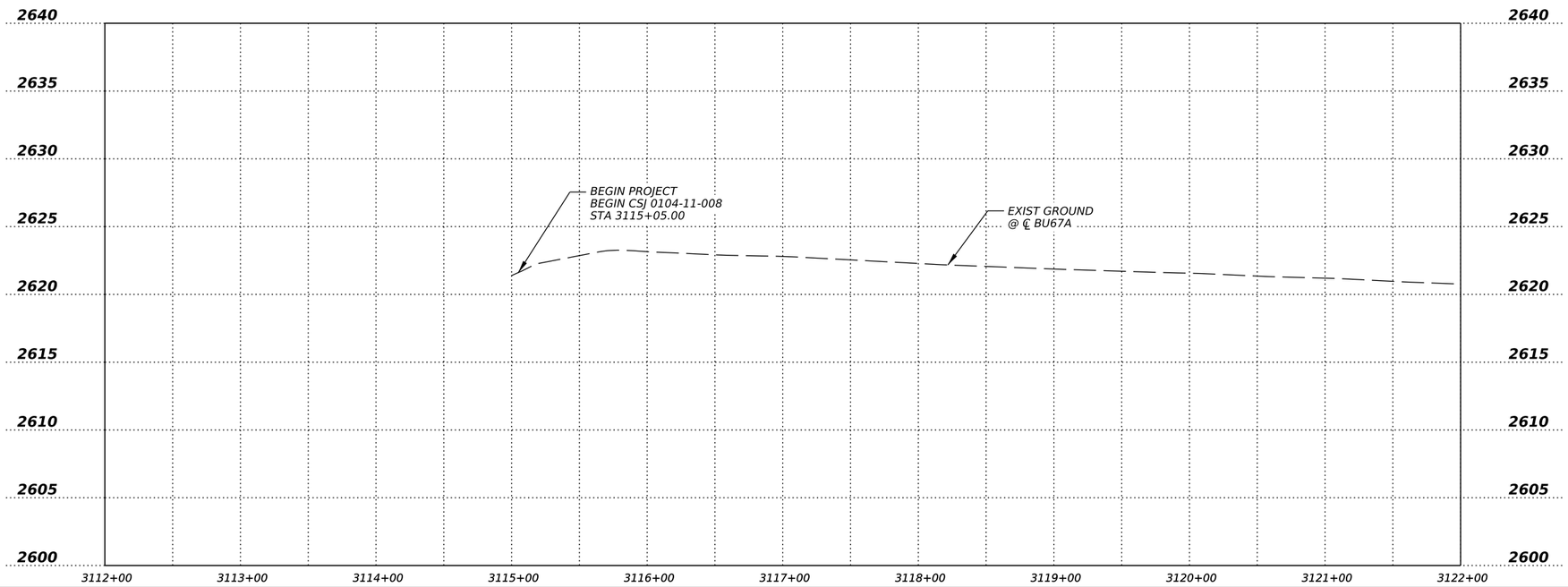
1"=10' Vert



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BU 67A

ROADWAY PLAN AND PROFILE

BEGIN OF PROJECT TO STA 3122+00

SHEET 1 OF 12

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		50

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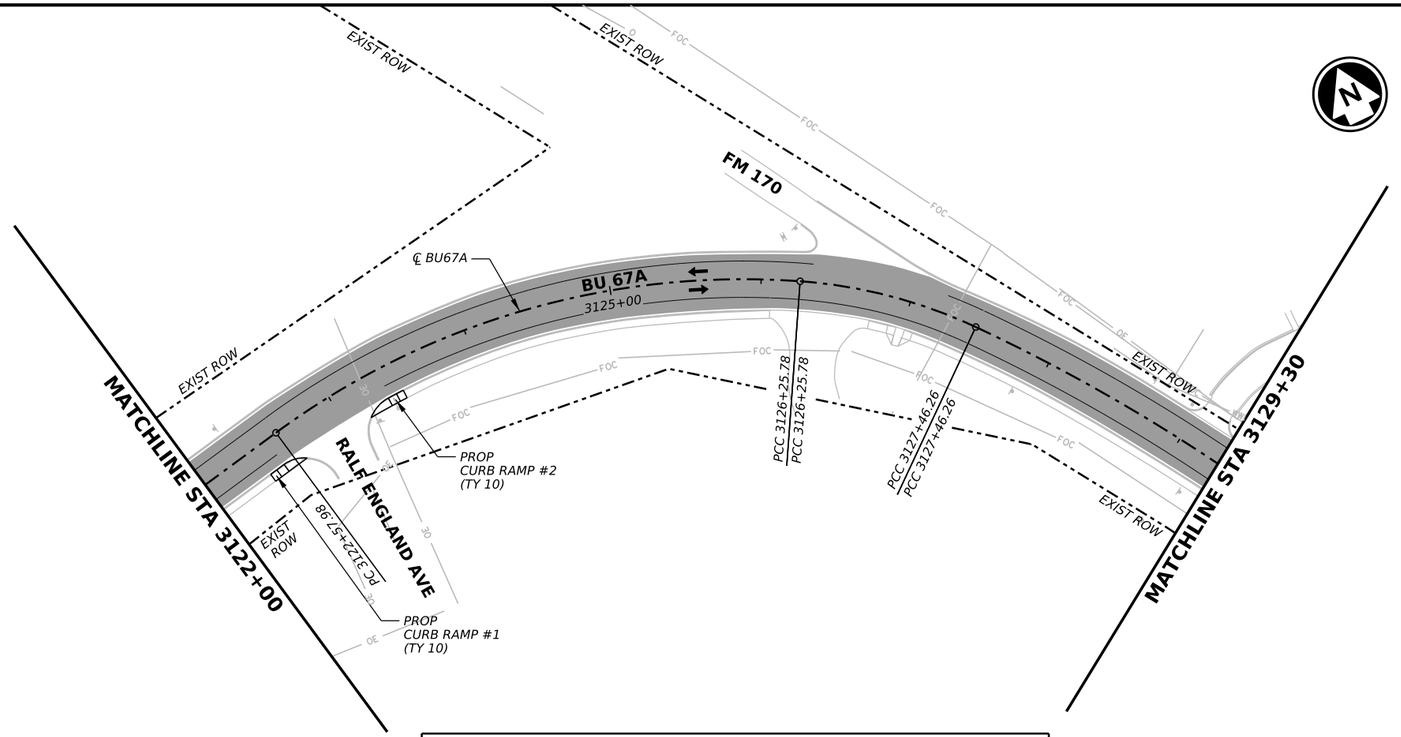
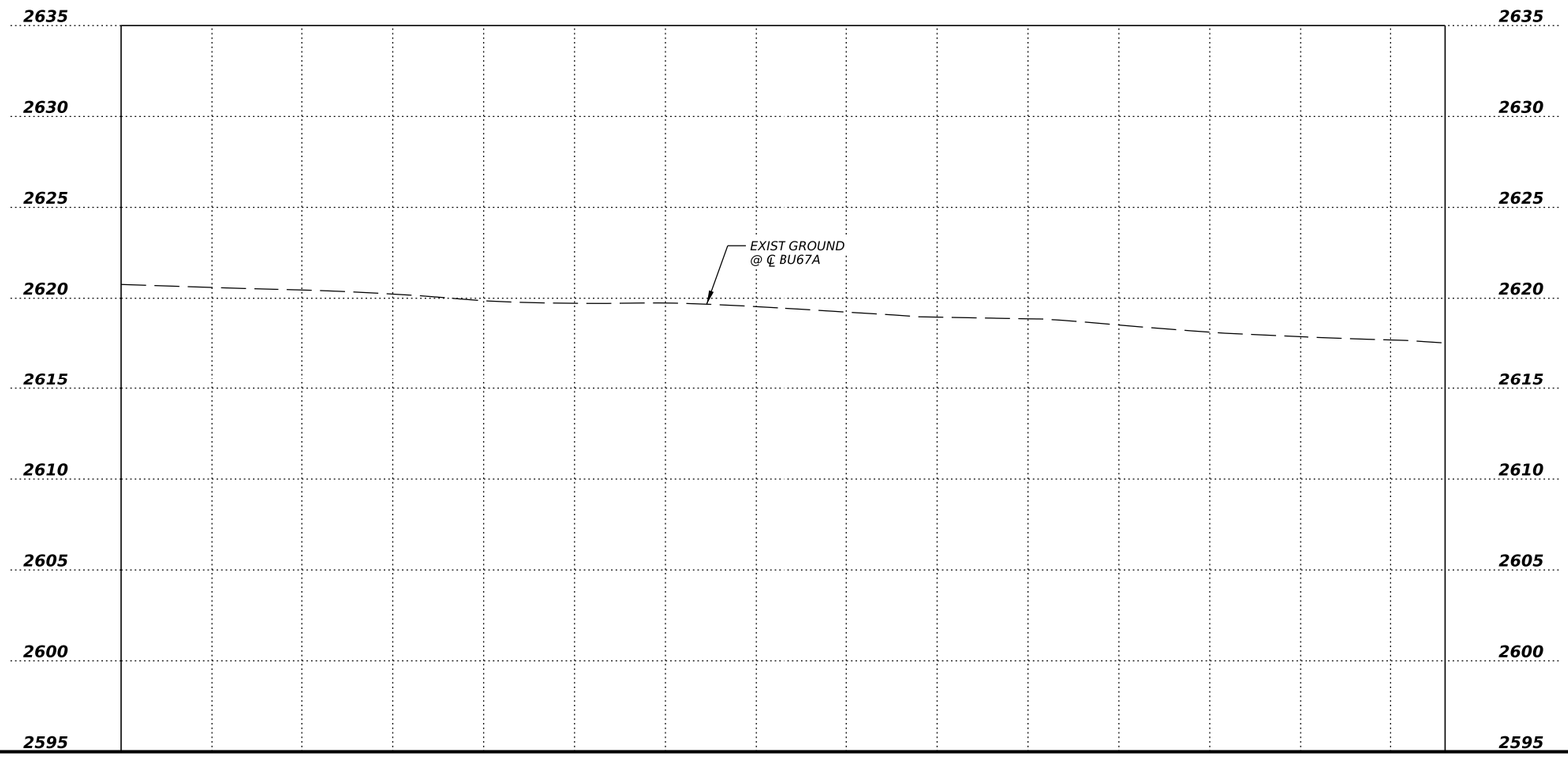


ROADWAY QUANTITIES			
ITEM	DESCRIPTION	UNIT	QTY
531 6013	CURB RAMPS (TY 10)	EA	2
3077 6022	SP MIXES SP-C SAC-A PG70-22	TON	407
3085 6001	UNDERSEAL COURSE	GAL	830



LEGEND:

- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- CONCRETE RIPRAP (4")
- 6" PAVEMENT REPAIR
- 2.5" SP MIXES
- EXISTING ROW

NOTES:

1. REFER TO HORIZONTAL AND VERTIAL CONTROL SHEET FOR PROJECT CONTROL DATA, CONTROL POINT, AND BENCH MARK DATA.
2. REFER TO TYPICAL SECTIONS, GRADING PLAN, AND ROADWAY MISCELLANEOUS DETAILS SHEET FOR ADDITIONAL INFORMATION.
3. REFER TO PED-18 STANDARD FOR SIDEWALK TREATMENT AT DRIVEWAYS.

0 50 100
SCALE: 1"=100' Horiz
1"=10' Vert

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BU 67A

ROADWAY PLAN AND PROFILE

STA 3122+00 TO STA 3129+30

SHEET 2 OF 12

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		51

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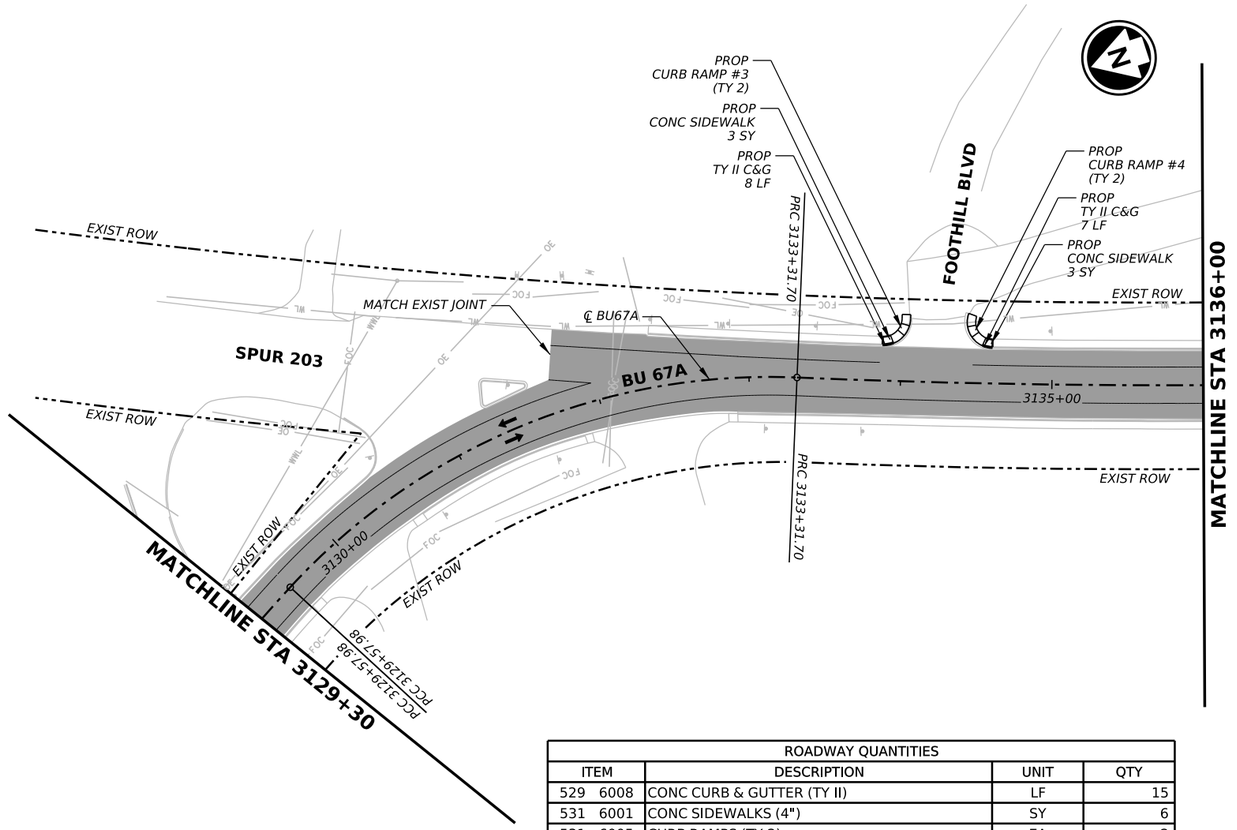
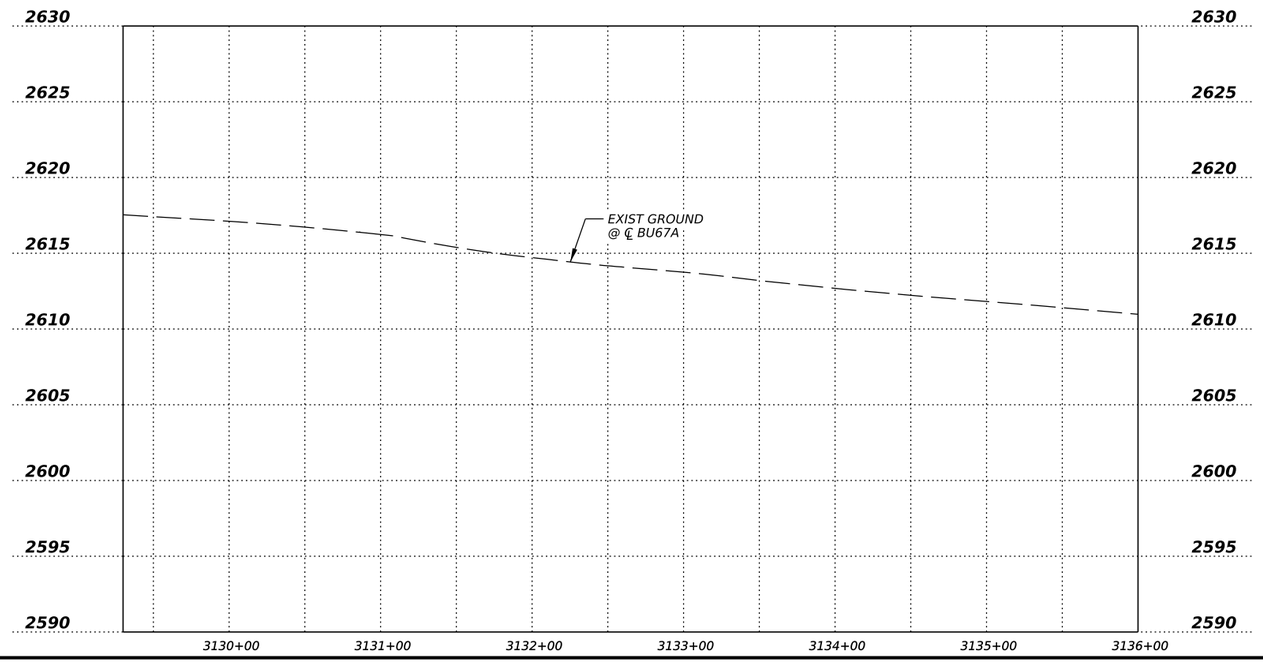


ROADWAY QUANTITIES				
ITEM		DESCRIPTION	UNIT	QTY
529	6008	CONC CURB & GUTTER (TY II)	LF	15
531	6001	CONC SIDEWALKS (4")	SY	6
531	6005	CURB RAMPS (TY 2)	EA	2
3077	6022	SP MIXES SP-C SAC-A PG70-22	TON	455
3085	6001	UNDERSEAL COURSE	GAL	926



LEGEND:

- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- CONCRETE RIPRAP (4")
- 6" PAVEMENT REPAIR
- 2.5" SP MIXES
- EXISTING ROW

NOTES:

1. REFER TO HORIZONTAL AND VERTIAL CONTROL SHEET FOR PROJECT CONTROL DATA, CONTROL POINT, AND BENCH MARK DATA.
2. REFER TO TYPICAL SECTIONS, GRADING PLAN, AND ROADWAY MISCELLANEOUS DETAILS SHEET FOR ADDITIONAL INFORMATION.
3. REFER TO PED-18 STANDARD FOR SIDEWALK TREATMENT AT DRIVEWAYS.

0 50 100
SCALE: 1"=100' Horiz
1"=10' Vert

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BU 67A

ROADWAY
PLAN AND PROFILE

STA 3129+30 TO STA 3136+00

SHEET 3 OF 12

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		52

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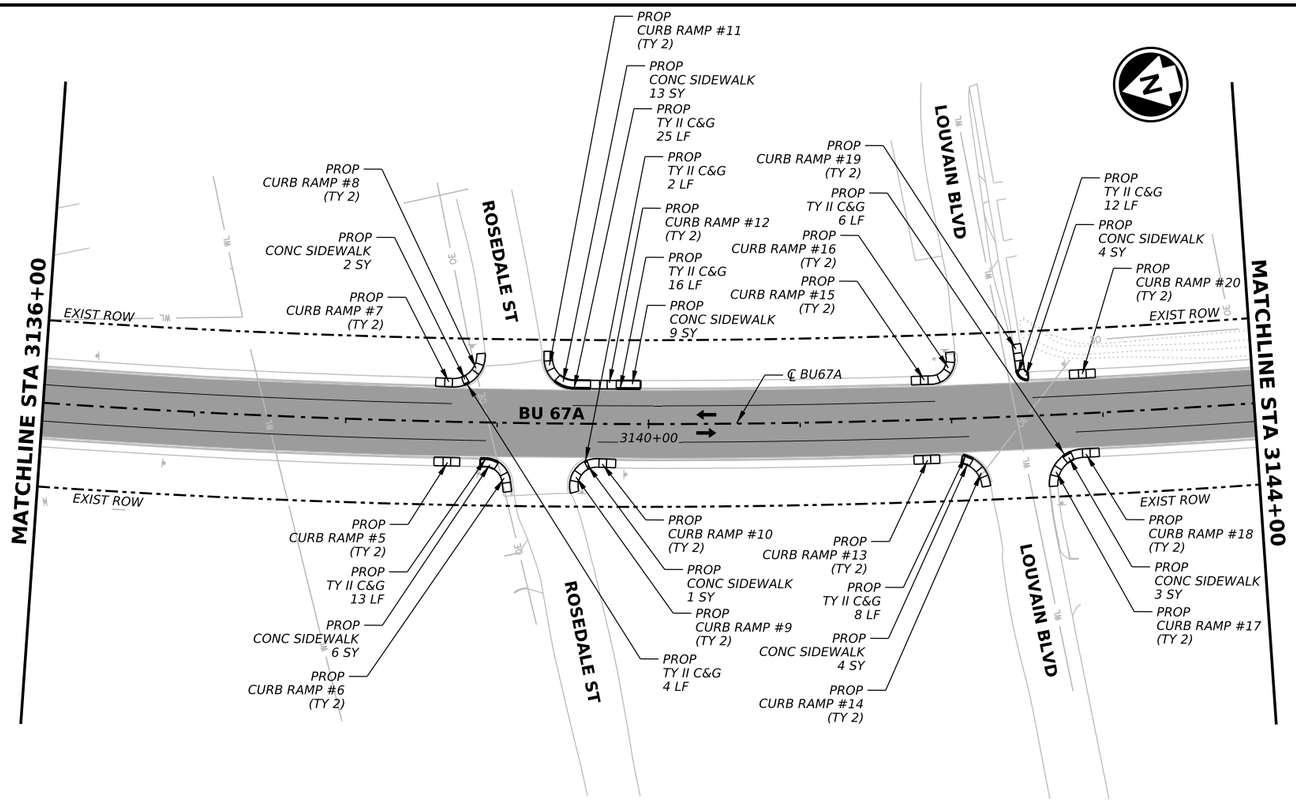


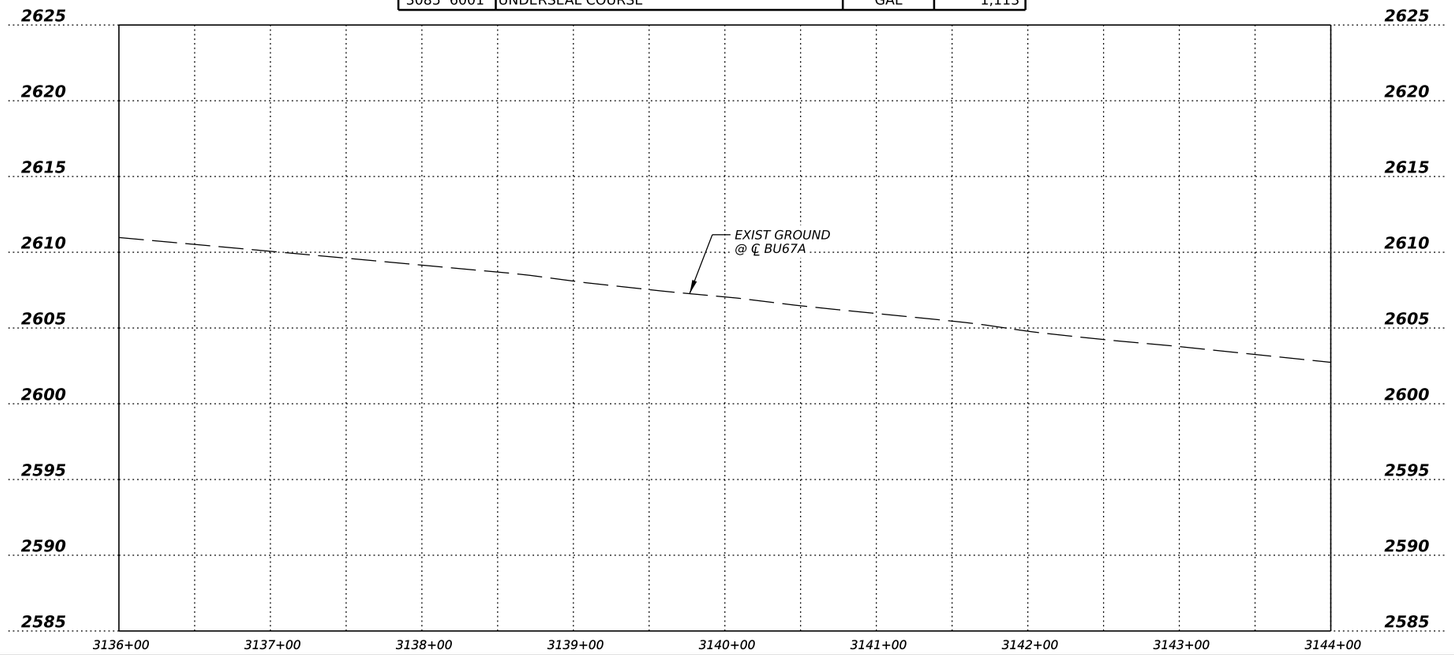
LEGEND:

- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- CONCRETE RIPRAP (4")
- 6" PAVEMENT REPAIR
- 2.5" SP MIXES
- EXISTING ROW

NOTES:

1. REFER TO HORIZONTAL AND VERTIAL CONTROL SHEET FOR PROJECT CONTROL DATA, CONTROL POINT, AND BENCH MARK DATA.
2. REFER TO TYPICAL SECTIONS, GRADING PLAN, AND ROADWAY MISCELLANEOUS DETAILS SHEET FOR ADDITIONAL INFORMATION.
3. REFER TO PED-18 STANDARD FOR SIDEWALK TREATMENT AT DRIVEWAYS.

ROADWAY QUANTITIES			
ITEM	DESCRIPTION	UNIT	QTY
529 6008	CONC CURB & GUTTER (TY II)	LF	86
531 6001	CONC SIDEWALKS (4")	SY	42
531 6005	CURB RAMPS (TY 2)	EA	16
3077 6022	SP MIXES SP-C SAC-A PG70-22	TON	546
3085 6001	UNDERSEAL COURSE	GAL	1,113



SCALE: 1"=100' Horiz
1"=10' Vert

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BU 67A

ROADWAY
PLAN AND PROFILE

STA 3136+00 TO STA 3144+00

SHEET 4 OF 12

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		53

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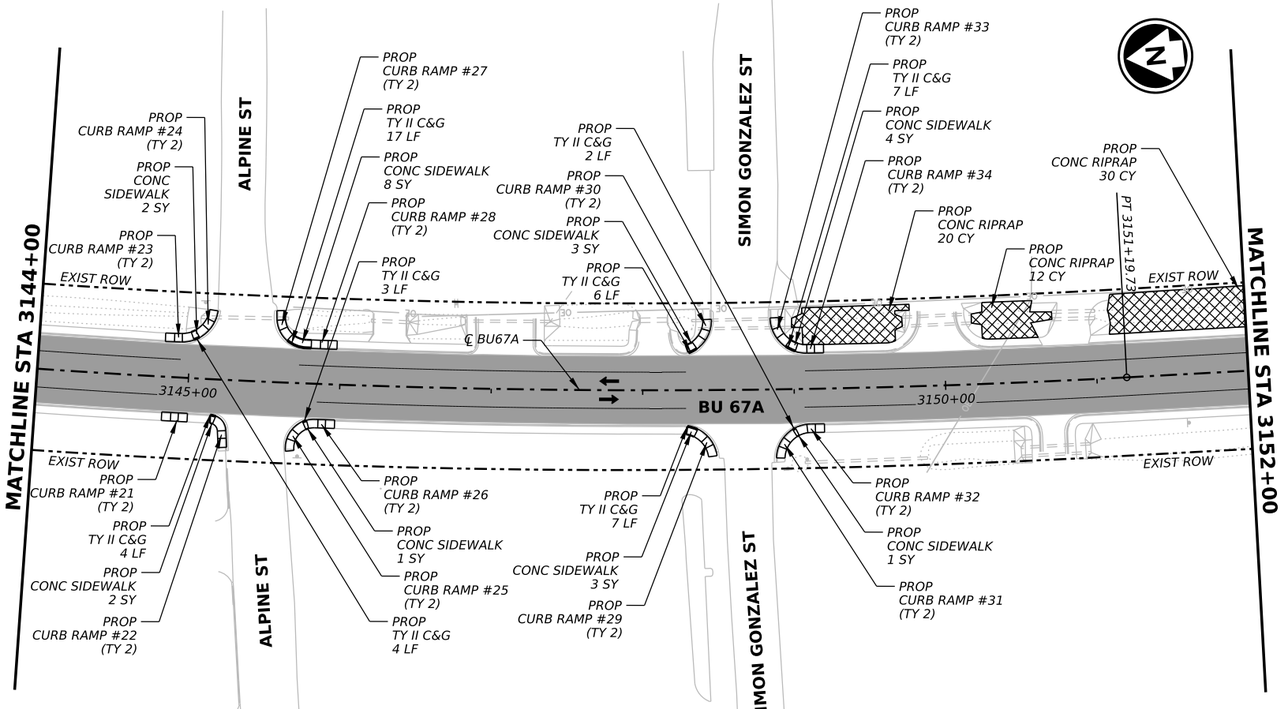


LEGEND:

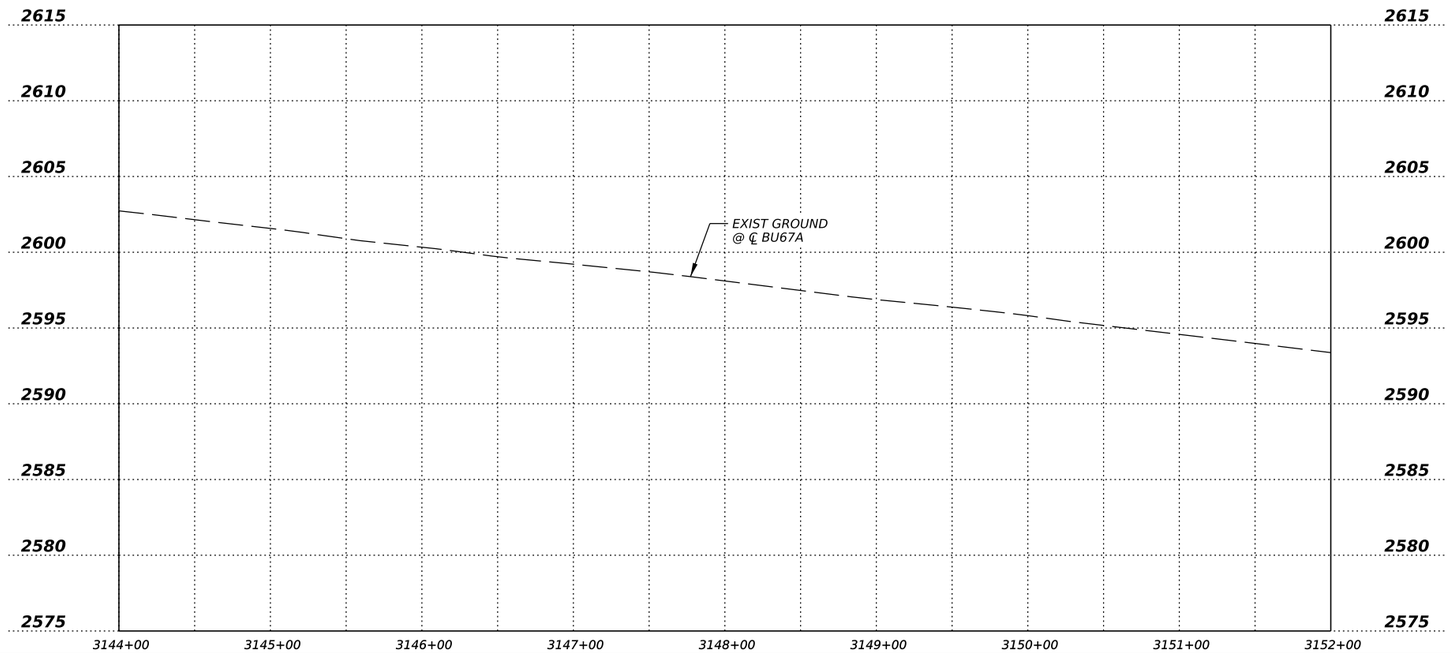
- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- CONCRETE RIPRAP (4")
- 6" PAVEMENT REPAIR
- 2.5" SP MIXES
- EXISTING ROW

NOTES:

1. REFER TO HORIZONTAL AND VERTIAL CONTROL SHEET FOR PROJECT CONTROL DATA, CONTROL POINT, AND BENCH MARK DATA.
2. REFER TO TYPICAL SECTIONS, GRADING PLAN, AND ROADWAY MISCELLANEOUS DETAILS SHEET FOR ADDITIONAL INFORMATION.
3. REFER TO PED-18 STANDARD FOR SIDEWALK TREATMENT AT DRIVEWAYS.

ROADWAY QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY
432 6001	RIPRAP (CONC)(4 IN)	CY	62
529 6008	CONC CURB & GUTTER (TY II)	LF	50
531 6001	CONC SIDEWALKS (4")	SY	24
531 6005	CURB RAMPS (TY 2)	EA	14
3077 6022	SP MIXES SP-C SAC-A PG70-22	TON	547
3085 6001	UNDERSEAL COURSE	GAL	1,113



SCALE: 1"=100' Horiz
1"=10' Vert

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BU 67A

ROADWAY
PLAN AND PROFILE

STA 3144+00 TO STA 3152+00

SHEET 5 OF 12

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		54

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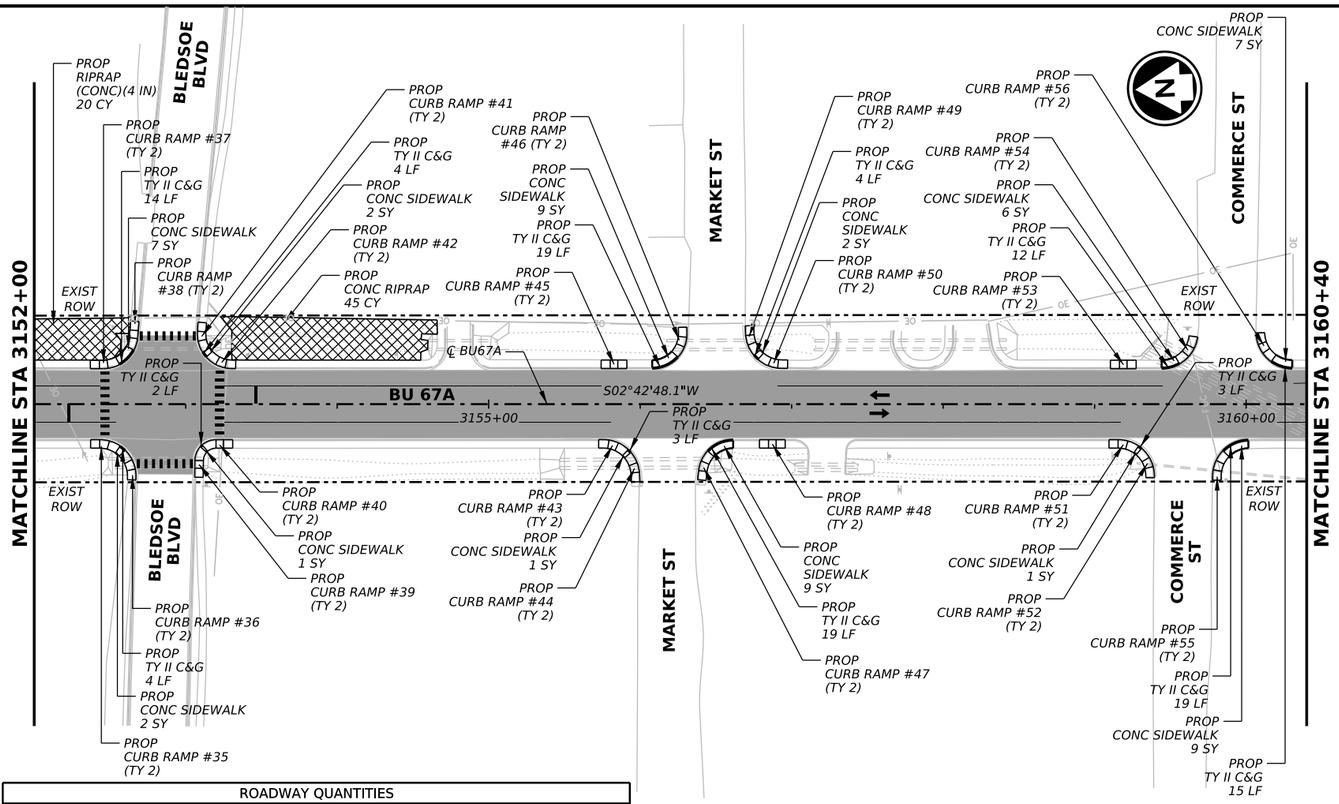
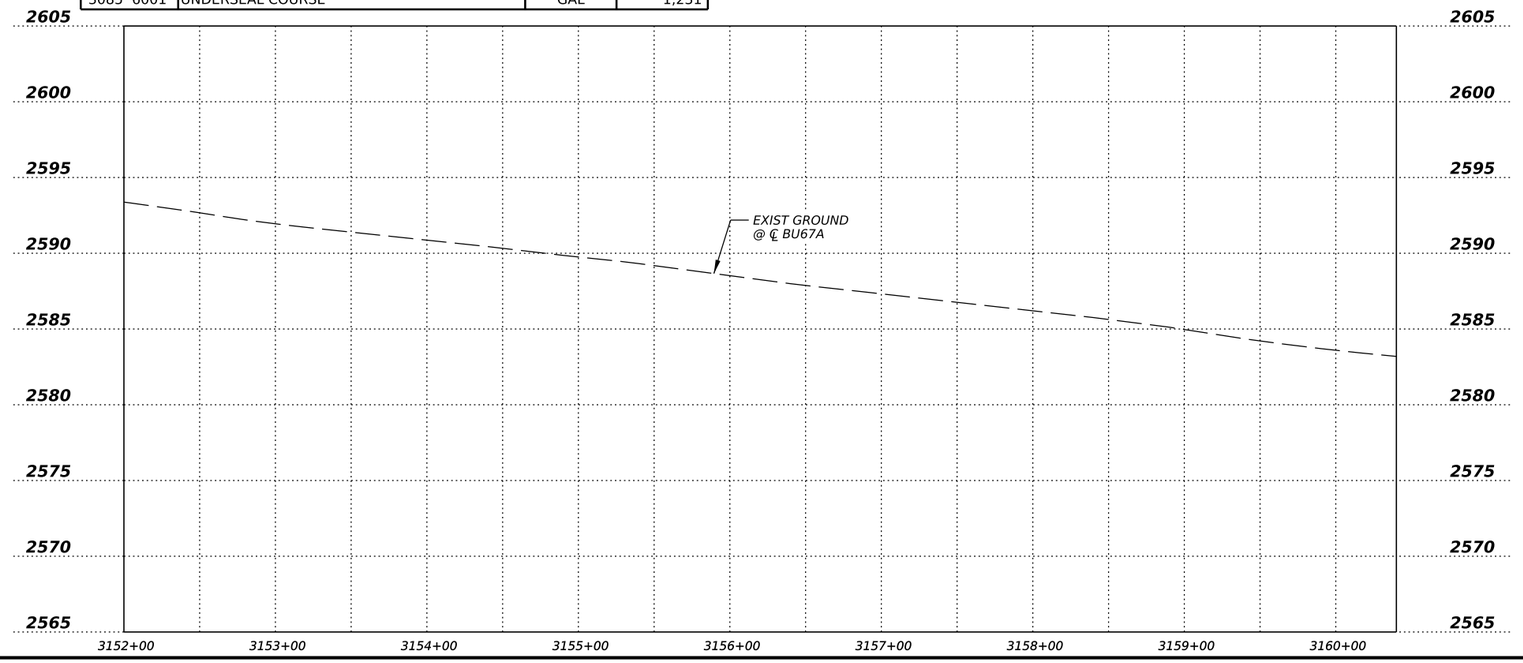


ROADWAY QUANTITIES			
ITEM	DESCRIPTION	UNIT	QTY
432 6001	RIPRAP (CONC)(4 IN)	CY	65
529 6008	CONC CURB & GUTTER (TY II)	LF	118
531 6001	CONC SIDEWALKS (4")	SY	56
531 6005	CURB RAMPS (TY 2)	EA	22
3077 6022	SP MIXES SP-C SAC-A PG70-22	TON	605
3085 6001	UNDERSEAL COURSE	GAL	1,231



LEGEND:

- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- CONCRETE RIPRAP (4")
- 6" PAVEMENT REPAIR
- 2.5" SP MIXES
- EXISTING ROW

NOTES:

1. REFER TO HORIZONTAL AND VERTIAL CONTROL SHEET FOR PROJECT CONTROL DATA, CONTROL POINT, AND BENCH MARK DATA.
2. REFER TO TYPICAL SECTIONS, GRADING PLAN, AND ROADWAY MISCELLANEOUS DETAILS SHEET FOR ADDITIONAL INFORMATION.
3. REFER TO PED-18 STANDARD FOR SIDEWALK TREATMENT AT DRIVEWAYS.

0 50 100

SCALE: 1"=100' Horiz
1"=10' Vert

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BU 67A

ROADWAY PLAN AND PROFILE

STA 3152+00 TO STA 3160+40

SHEET 6 OF 12

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		55

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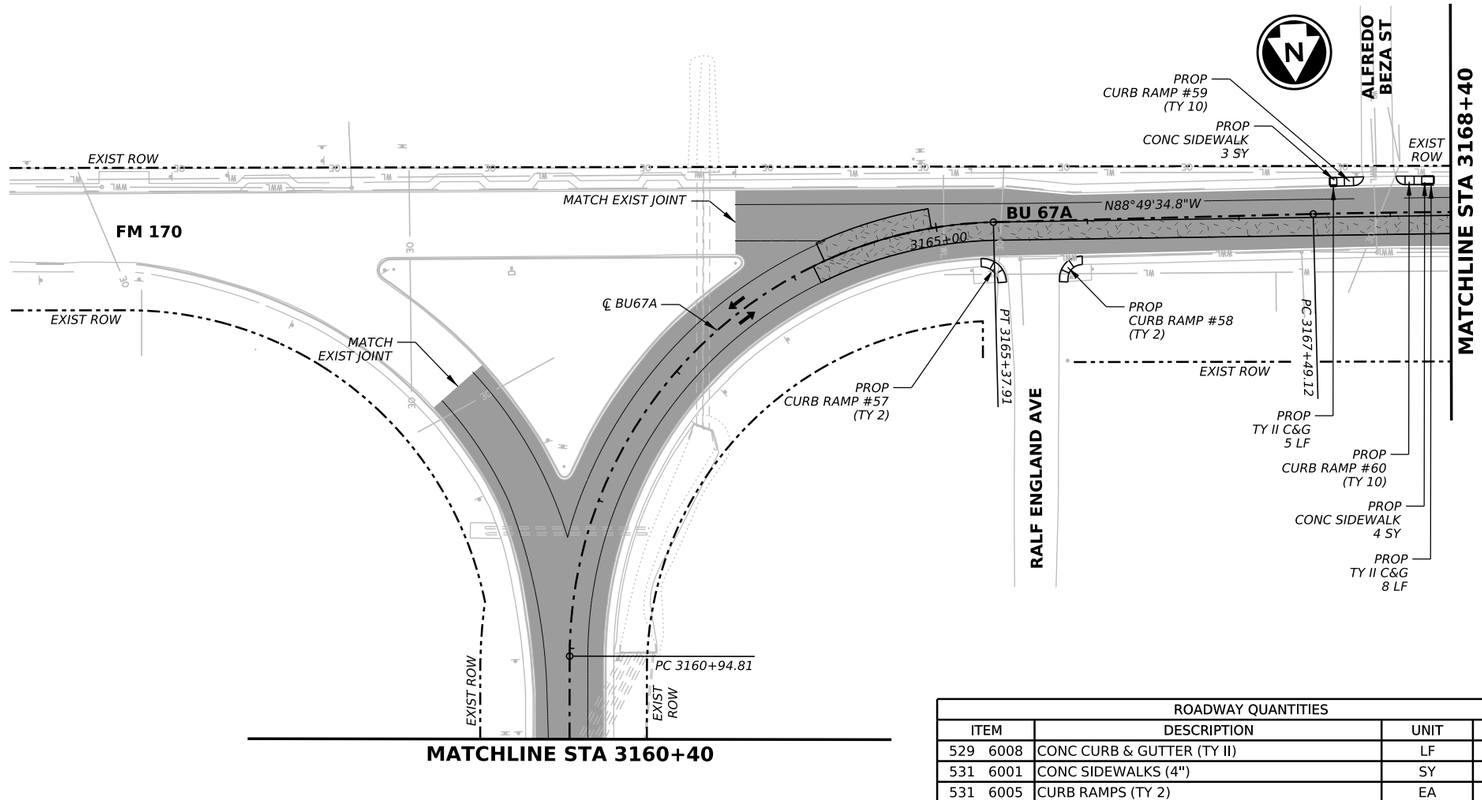


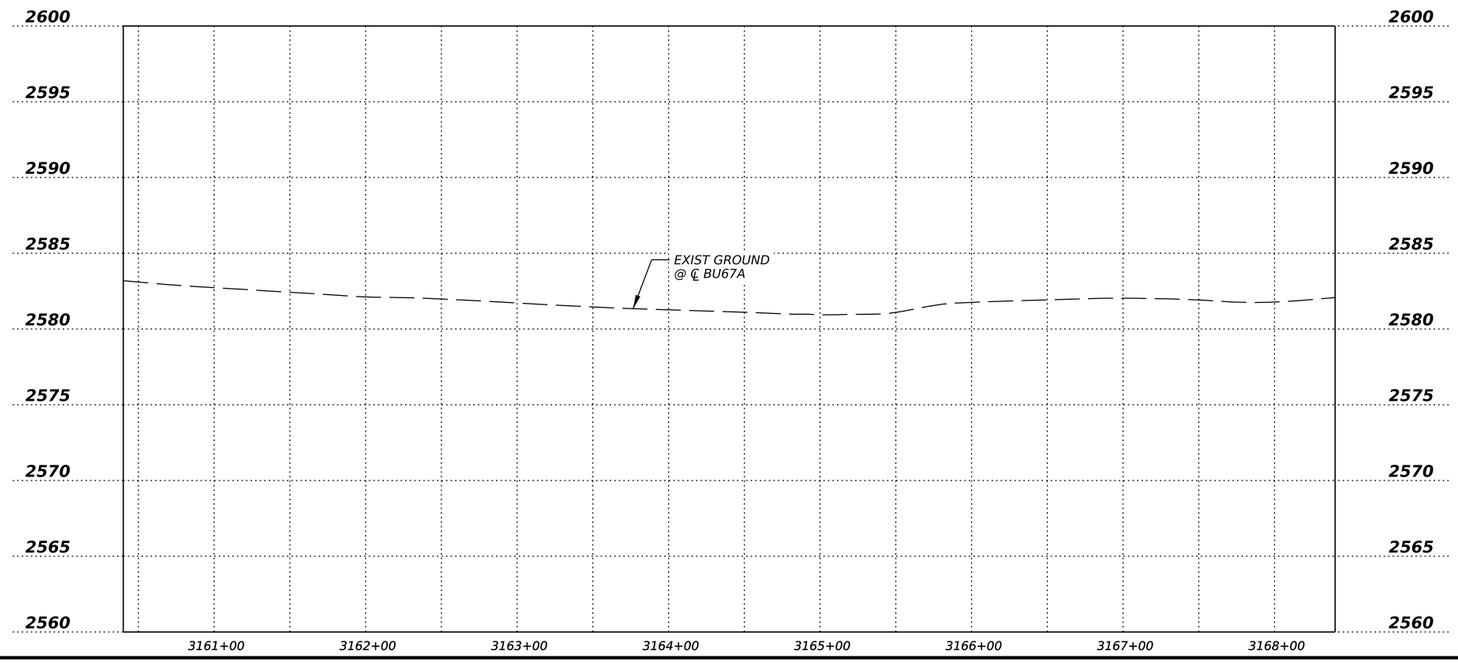
LEGEND:

- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- CONCRETE RIPRAP (4")
- 6" PAVEMENT REPAIR
- 2.5" SP MIXES
- EXISTING ROW

NOTES:

1. REFER TO HORIZONTAL AND VERTIAL CONTROL SHEET FOR PROJECT CONTROL DATA, CONTROL POINT, AND BENCH MARK DATA.
2. REFER TO TYPICAL SECTIONS, GRADING PLAN, AND ROADWAY MISCELLANEOUS DETAILS SHEET FOR ADDITIONAL INFORMATION.
3. REFER TO PED-18 STANDARD FOR SIDEWALK TREATMENT AT DRIVEWAYS.

ROADWAY QUANTITIES			
ITEM	DESCRIPTION	UNIT	QTY
529 6008	CONC CURB & GUTTER (TY II)	LF	13
531 6001	CONC SIDEWALKS (4")	SY	7
531 6005	CURB RAMPS (TY 2)	EA	2
531 6013	CURB RAMPS (TY 10)	EA	2
3077 6022	SP MIXES SP-C SAC-A PG70-22	TON	652
3085 6001	UNDERSEAL COURSE	GAL	1,328



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SCALE: 1"=100' Horiz
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DATE	BY	REV	REVISION

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5/26/2023

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BU 67A

ROADWAY
PLAN AND PROFILE

STA 3160+40 TO STA 3168+40

SHEET 7 OF 12

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		56

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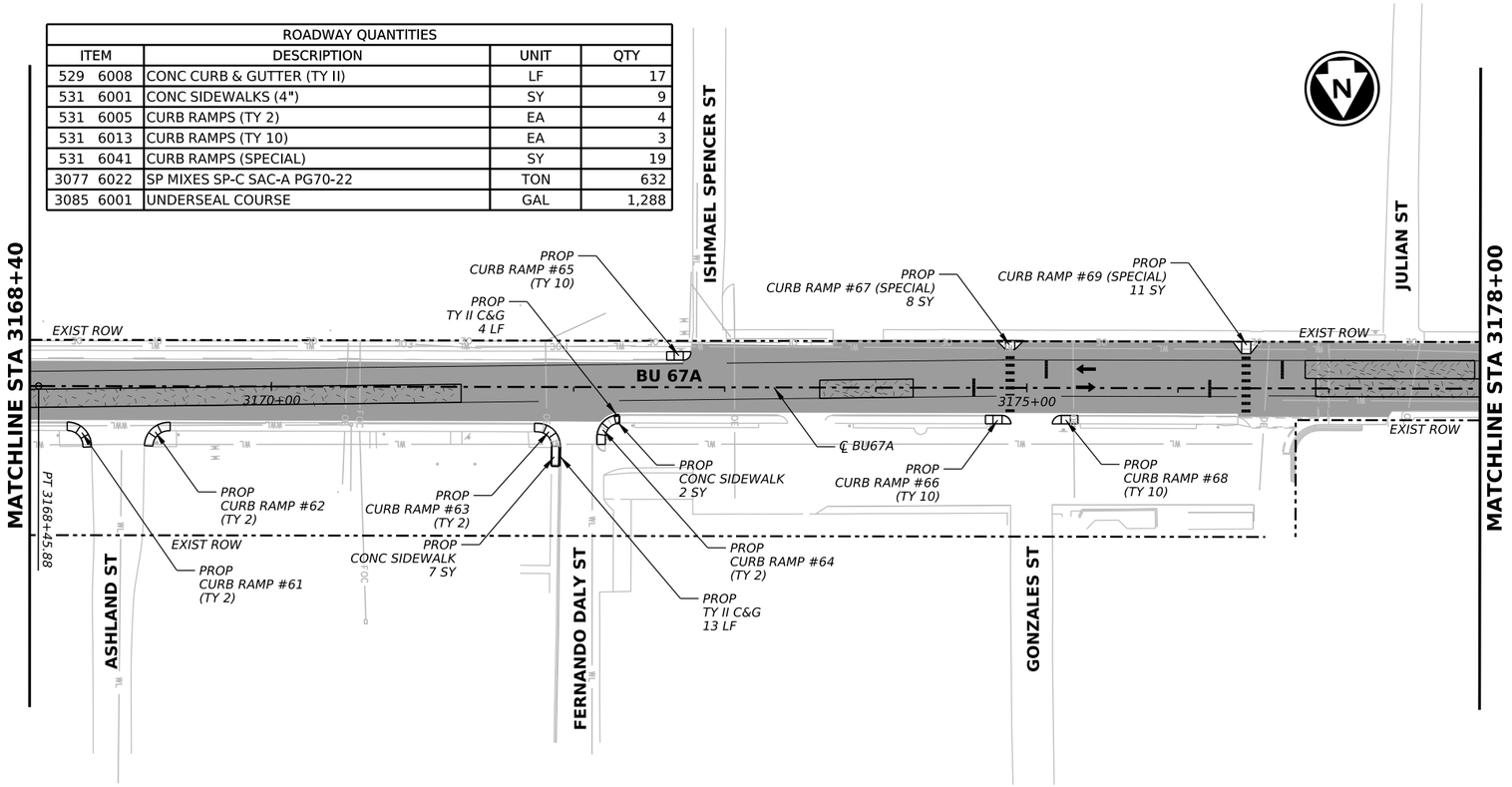
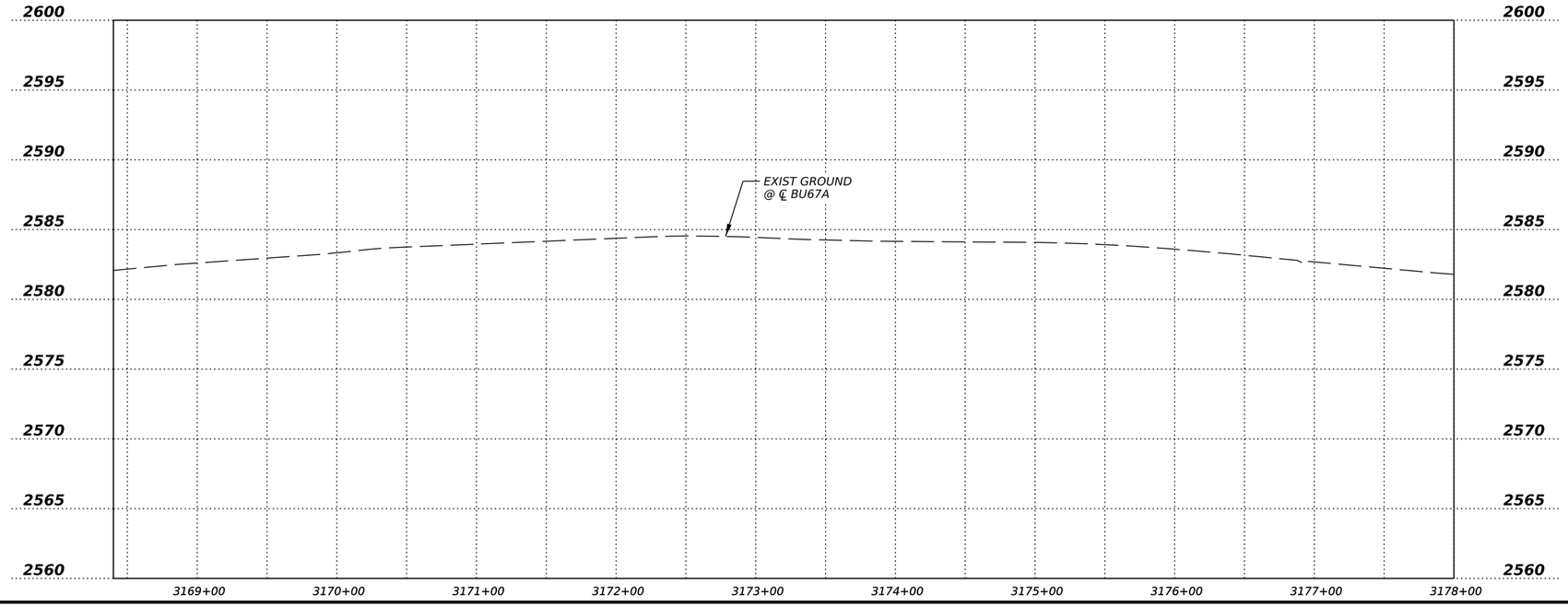
ROADWAY QUANTITIES			
ITEM	DESCRIPTION	UNIT	QTY
529 6008	CONC CURB & GUTTER (TY II)	LF	17
531 6001	CONC SIDEWALKS (4")	SY	9
531 6005	CURB RAMPS (TY 2)	EA	4
531 6013	CURB RAMPS (TY 10)	EA	3
531 6041	CURB RAMPS (SPECIAL)	SY	19
3077 6022	SP MIXES SP-C SAC-A PG70-22	TON	632
3085 6001	UNDERSEAL COURSE	GAL	1,288





LEGEND:

- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- CONCRETE RIPRAP (4")
- 6" PAVEMENT REPAIR
- 2.5" SP MIXES
- EXISTING ROW

NOTES:

1. REFER TO HORIZONTAL AND VERTIAL CONTROL SHEET FOR PROJECT CONTROL DATA, CONTROL POINT, AND BENCH MARK DATA.
2. REFER TO TYPICAL SECTIONS, GRADING PLAN, AND ROADWAY MISCELLANEOUS DETAILS SHEET FOR ADDITIONAL INFORMATION.
3. REFER TO PED-18 STANDARD FOR SIDEWALK TREATMENT AT DRIVEWAYS.

0 50 100

SCALE: 1"=100' Horiz
1"=10' Vert

DATE	BY	REV	REVISION

STATE OF TEXAS
WEIYIH TEE
98478
LICENSED
PROFESSIONAL ENGINEER
5/26/2023

Stantec
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Texas Department of Transportation

BU 67A

ROADWAY
PLAN AND PROFILE

STA 3168+40 TO STA 3178+00

SHEET 8 OF 12

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		57

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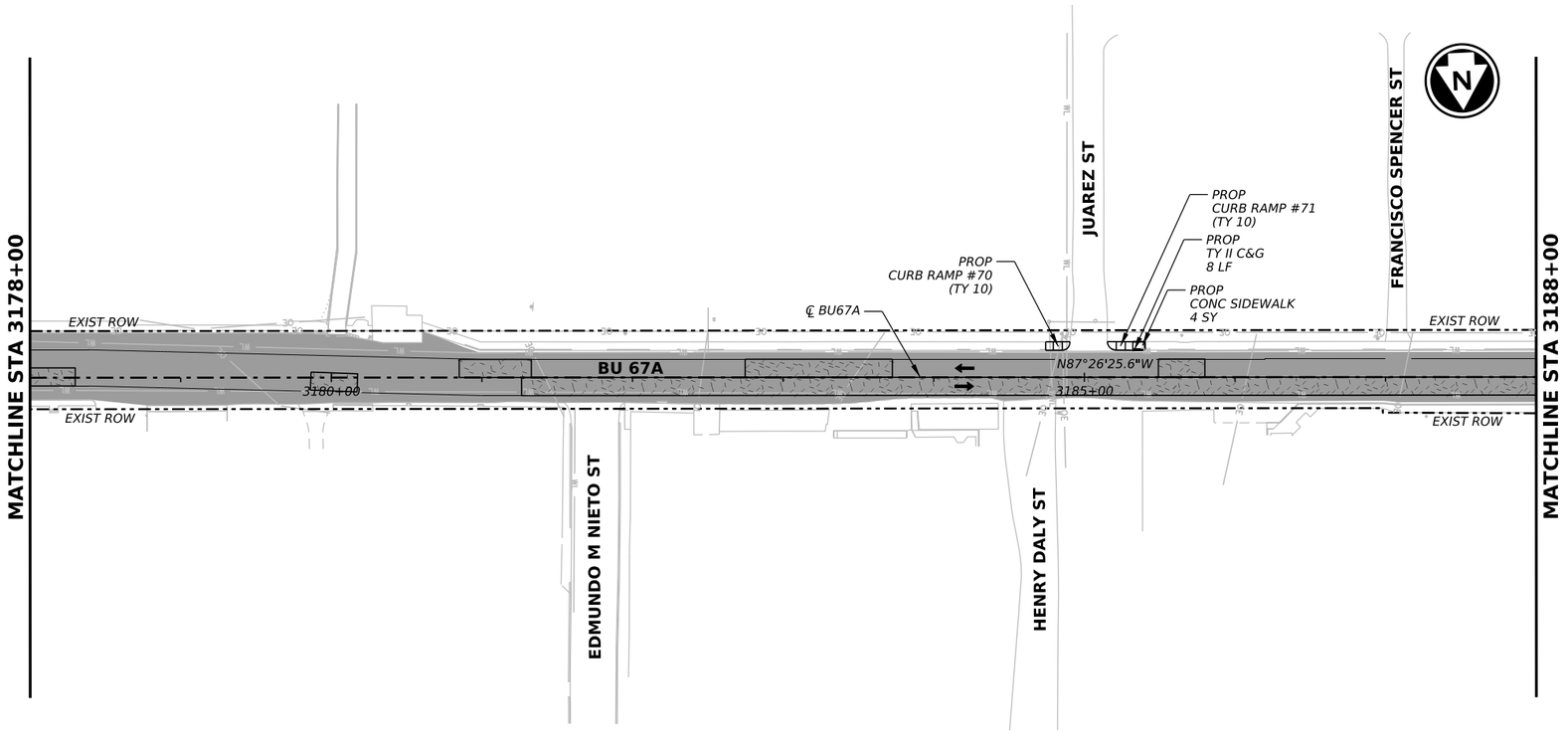


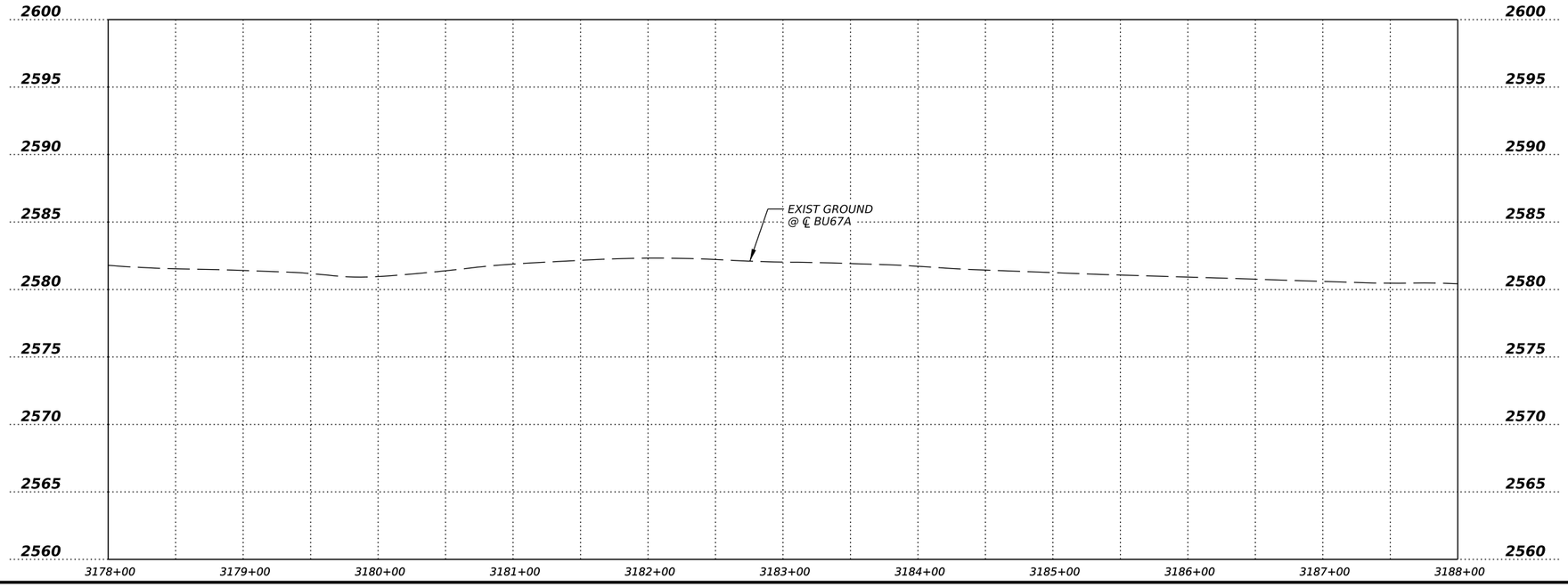
LEGEND:

- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- CONCRETE RIPRAP (4")
- 6" PAVEMENT REPAIR
- 2.5" SP MIXES
- EXISTING ROW

NOTES:

1. REFER TO HORIZONTAL AND VERTIAL CONTROL SHEET FOR PROJECT CONTROL DATA, CONTROL POINT, AND BENCH MARK DATA.
2. REFER TO TYPICAL SECTIONS, GRADING PLAN, AND ROADWAY MISCELLANEOUS DETAILS SHEET FOR ADDITIONAL INFORMATION.
3. REFER TO PED-18 STANDARD FOR SIDEWALK TREATMENT AT DRIVEWAYS.

ROADWAY QUANTITIES			
ITEM	DESCRIPTION	UNIT	QTY
529 6008	CONC CURB & GUTTER (TY II)	LF	8
531 6001	CONC SIDEWALKS (4")	SY	4
531 6013	CURB RAMPS (TY 10)	EA	2
3077 6022	SP MIXES SP-C SAC-A PG70-22	TON	554
3085 6001	UNDERSEAL COURSE	GAL	1,129



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SCALE: 1"=100' Horiz
1"=10' Vert

DATE	BY	REV	REVISION

STATE OF TEXAS
WEIYIH TEE
98478
LICENSED
PROFESSIONAL ENGINEER
5/26/2023

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BU 67A

ROADWAY
PLAN AND PROFILE

STA 3178+00 TO STA 3188+00

SHEET 9 OF 12

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		58

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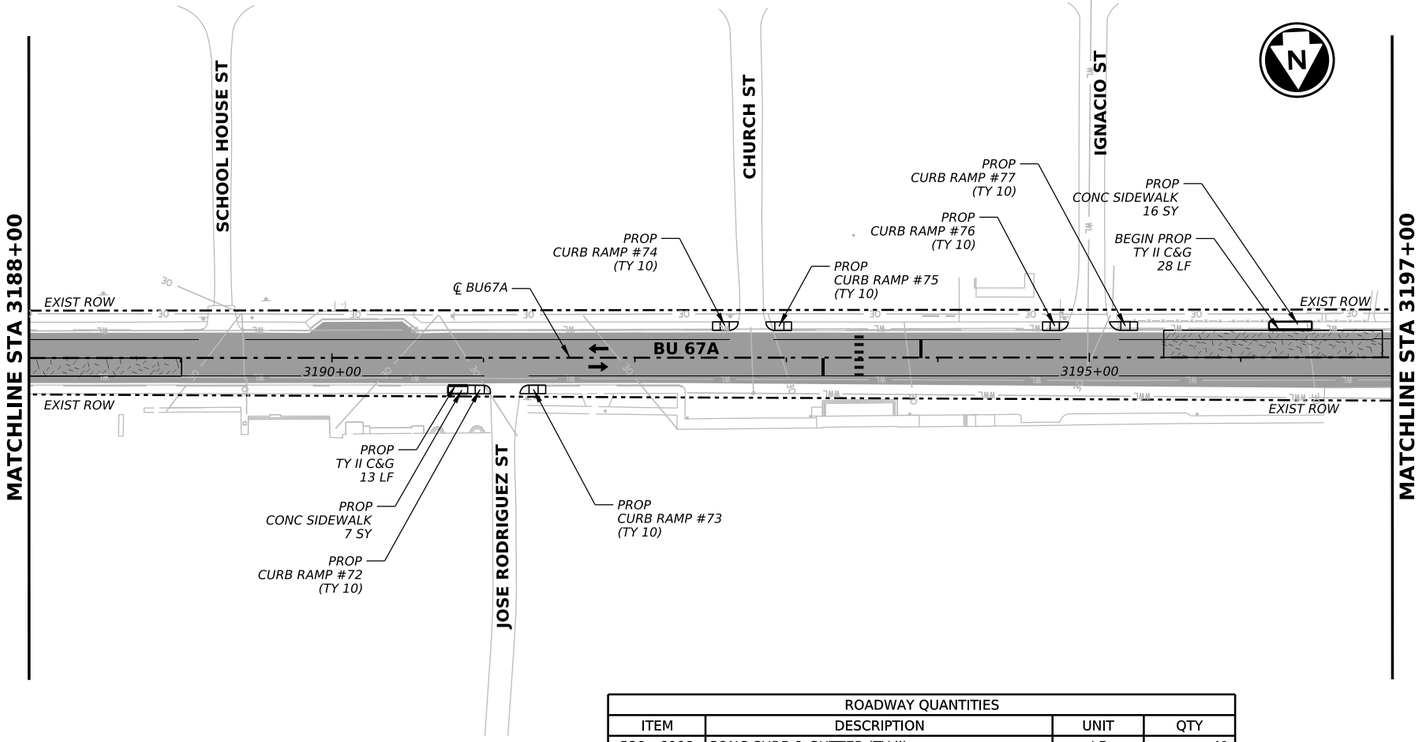
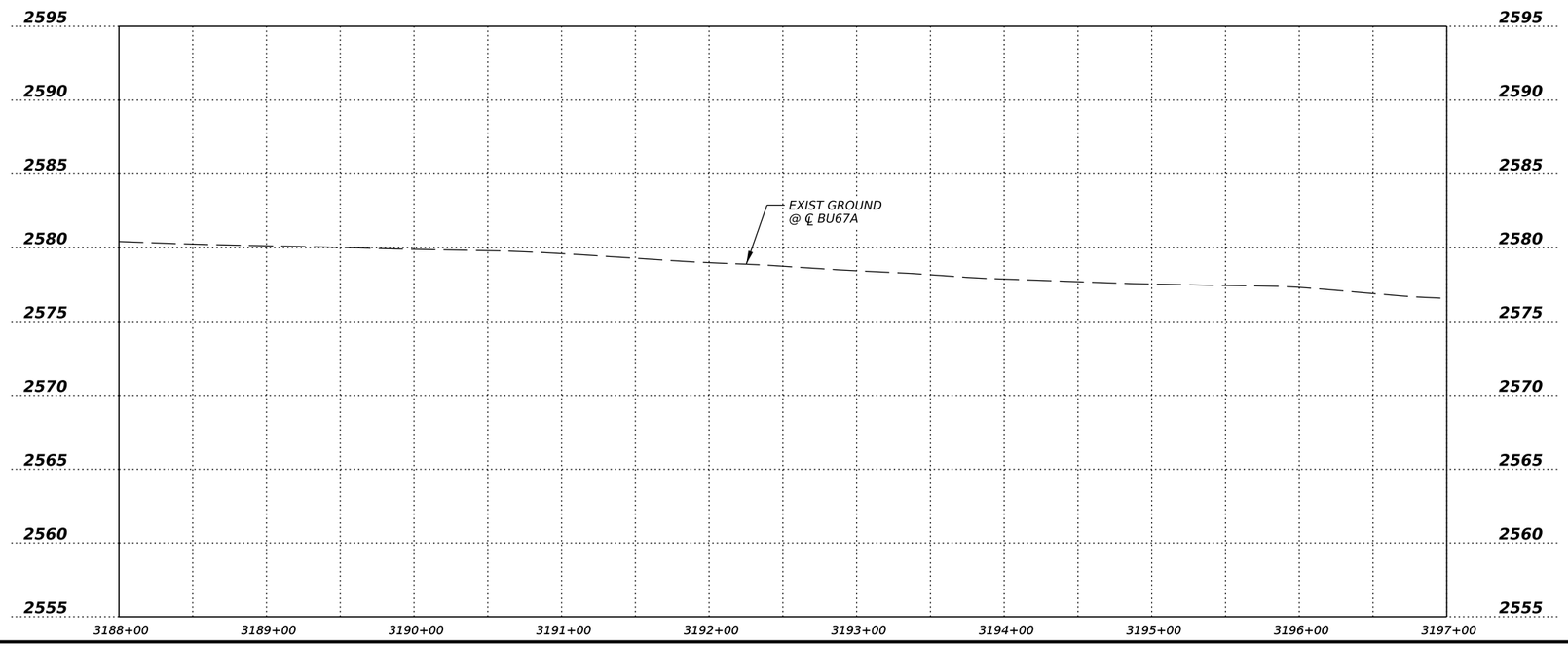


ROADWAY QUANTITIES			
ITEM	DESCRIPTION	UNIT	QTY
529 6008	CONC CURB & GUTTER (TY II)	LF	41
531 6001	CONC SIDEWALKS (4")	SY	23
531 6013	CURB RAMPS (TY 10)	EA	6
3077 6022	SP MIXES SP-C SAC-A PG70-22	TON	477
3085 6001	UNDERSEAL COURSE	GAL	972



LEGEND:

- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- CONCRETE RIPRAP (4")
- 6" PAVEMENT REPAIR
- 2.5" SP MIXES
- EXISTING ROW

NOTES:

1. REFER TO HORIZONTAL AND VERTIAL CONTROL SHEET FOR PROJECT CONTROL DATA, CONTROL POINT, AND BENCH MARK DATA.
2. REFER TO TYPICAL SECTIONS, GRADING PLAN, AND ROADWAY MISCELLANEOUS DETAILS SHEET FOR ADDITIONAL INFORMATION.
3. REFER TO PED-18 STANDARD FOR SIDEWALK TREATMENT AT DRIVEWAYS.

0 50 100

SCALE: 1"=100' Horiz
1"=10' Vert

DATE	BY	REV	REVISION

STATE OF TEXAS
WEIYIH TEE
98478
LICENSED
PROFESSIONAL ENGINEER

5/26/2023

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Texas Registered Engineering Firm F-0324

Texas Department of Transportation

BU 67A

ROADWAY
PLAN AND PROFILE

STA 3188+00 TO STA 3197+00

SHEET 10 OF 12

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		59

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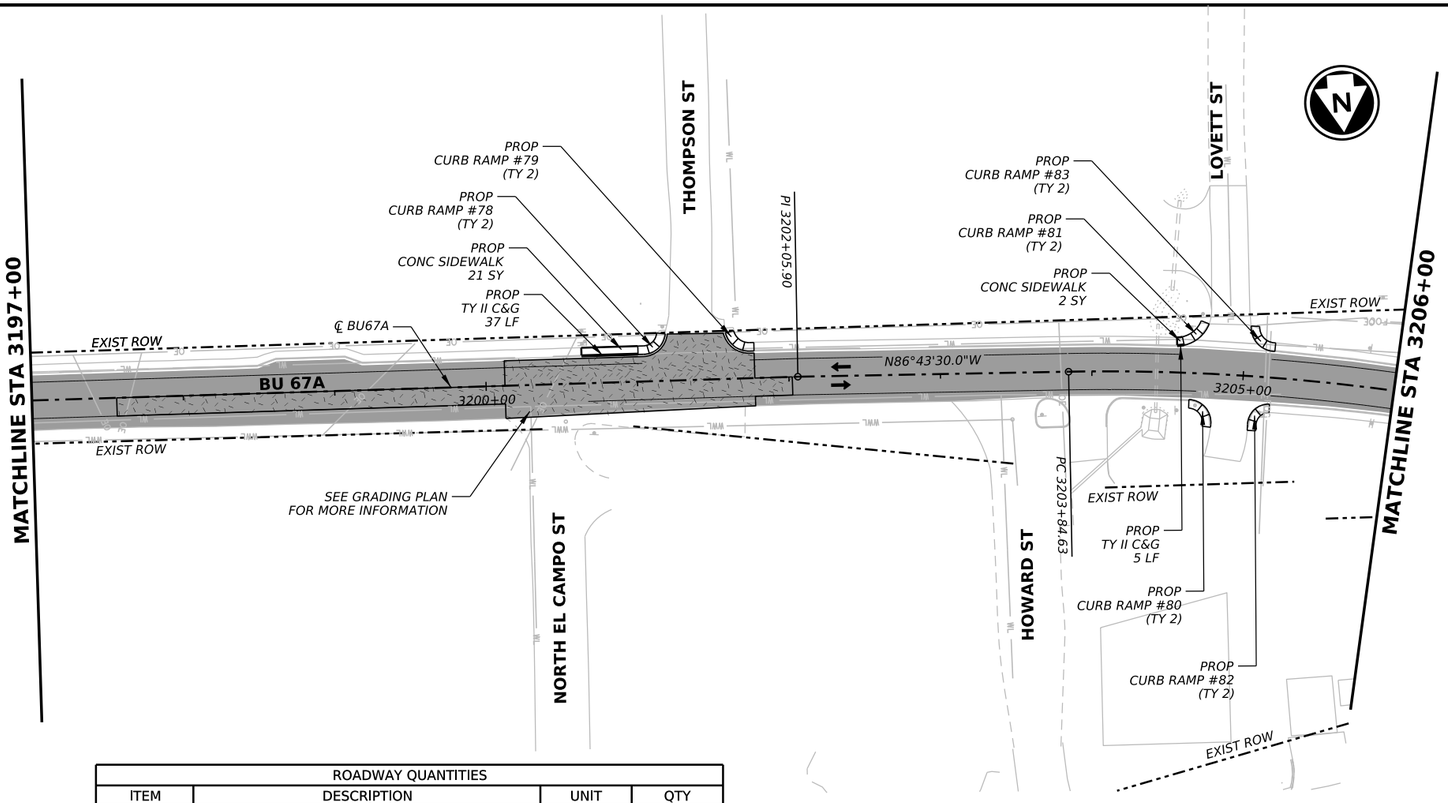


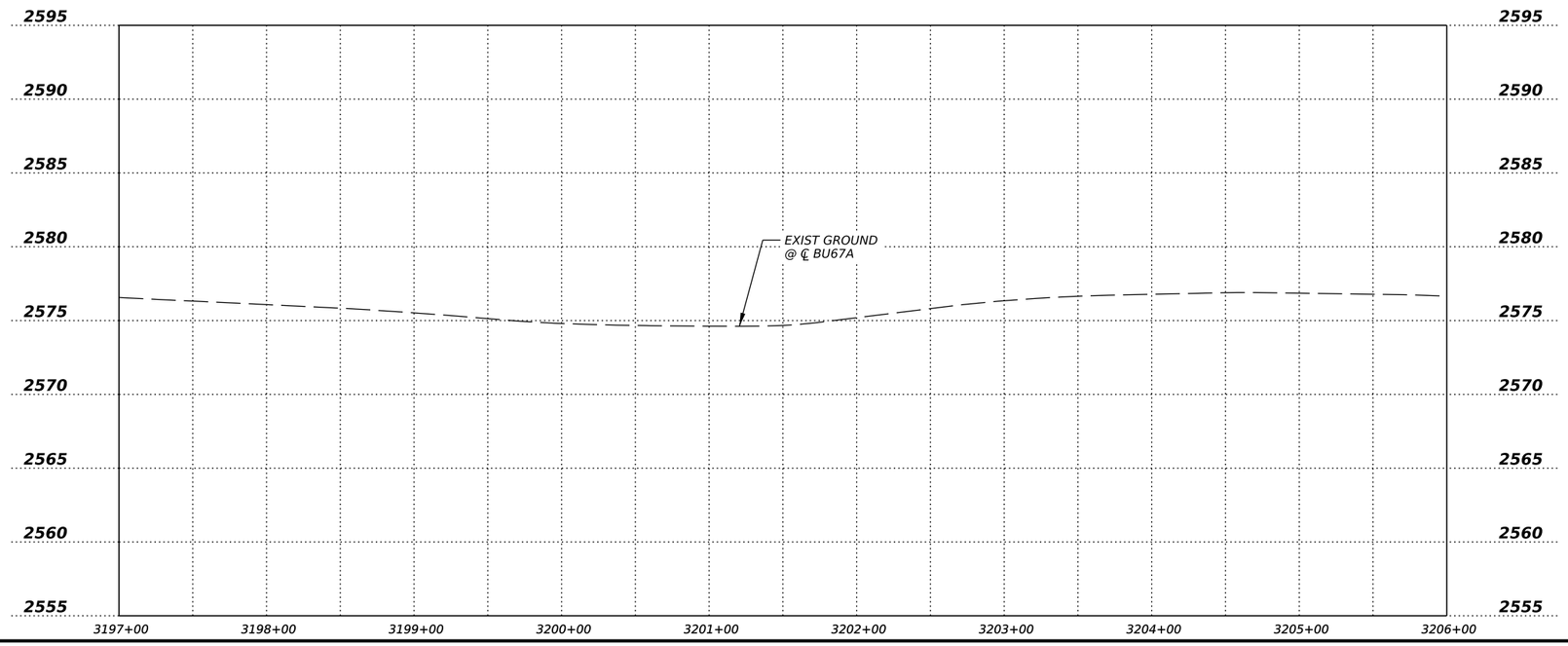
LEGEND:

- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- CONCRETE RIPRAP (4")
- 6" PAVEMENT REPAIR
- 2.5" SP MIXES
- EXISTING ROW

NOTES:

1. REFER TO HORIZONTAL AND VERTIAL CONTROL SHEET FOR PROJECT CONTROL DATA, CONTROL POINT, AND BENCH MARK DATA.
2. REFER TO TYPICAL SECTIONS, GRADING PLAN, AND ROADWAY MISCELLANEOUS DETAILS SHEET FOR ADDITIONAL INFORMATION.
3. REFER TO PED-18 STANDARD FOR SIDEWALK TREATMENT AT DRIVEWAYS.

ROADWAY QUANTITIES			
ITEM	DESCRIPTION	UNIT	QTY
529 6008	CONC CURB & GUTTER (TY II)	LF	42
531 6001	CONC SIDEWALKS (4")	SY	23
531 6005	CURB RAMPS (TY 2)	EA	6
3077 6022	SP MIXES SP-C SAC-A PG70-22	TON	496
3085 6001	UNDERSEAL COURSE	GAL	1,010



0 50 100

SCALE: 1"=100' Horiz
1"=10' Vert

DATE	BY	REV	REVISION

STATE OF TEXAS
WEIYIH TEE
98478
LICENSED PROFESSIONAL ENGINEER
5/26/2023

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BU 67A

ROADWAY
PLAN AND PROFILE

STA 3197+00 TO STA 3206+00

SHEET 11 OF 12

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		60

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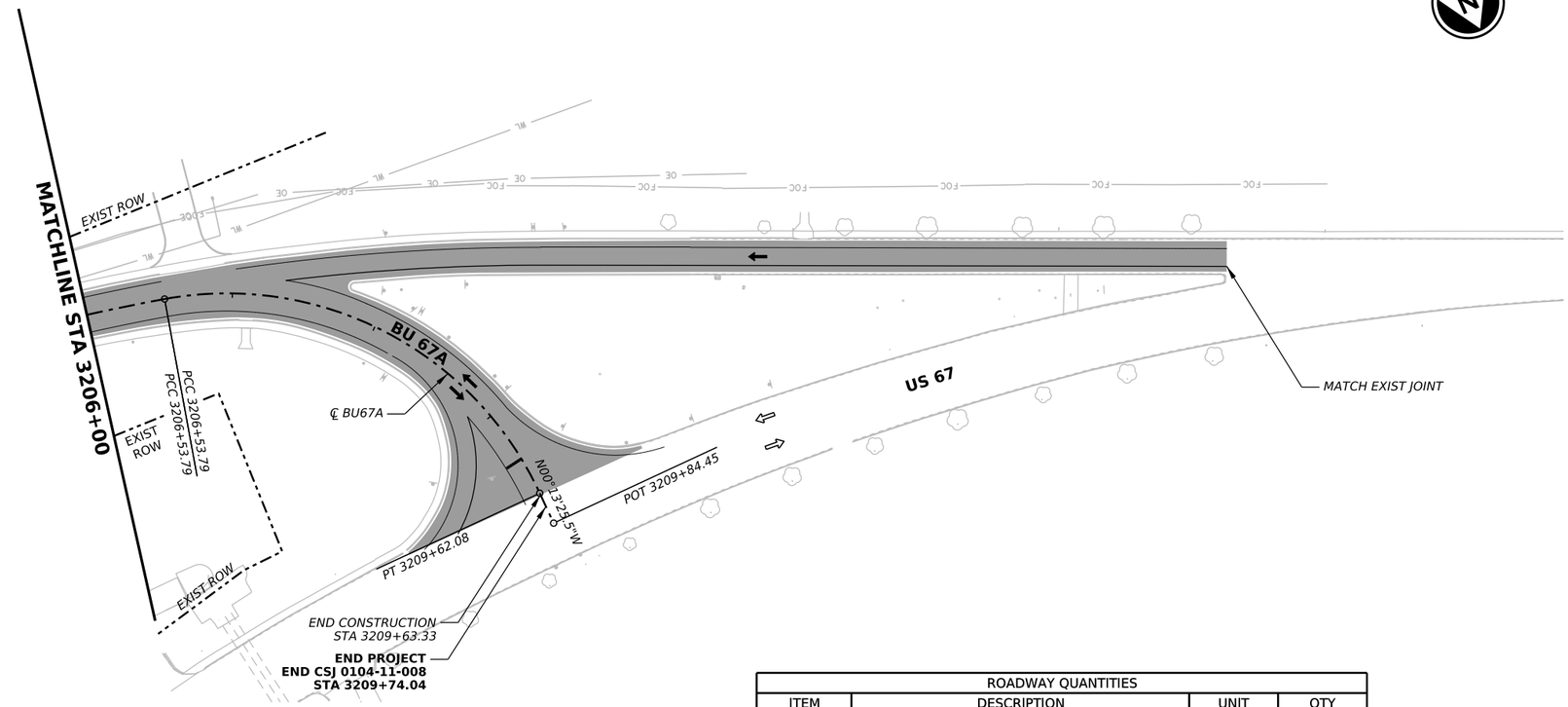


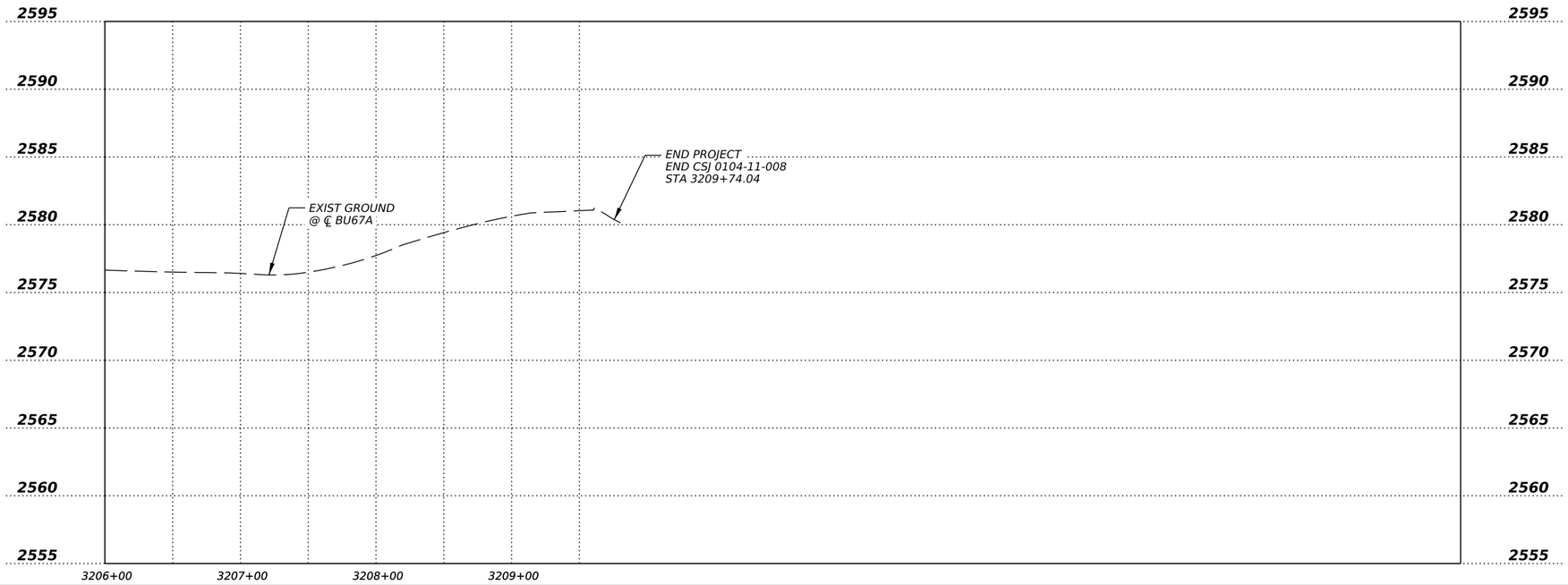
LEGEND:

- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- CONCRETE RIPRAP (4")
- 6" PAVEMENT REPAIR
- 2.5" SP MIXES
- EXISTING ROW

NOTES:

1. REFER TO HORIZONTAL AND VERTIAL CONTROL SHEET FOR PROJECT CONTROL DATA, CONTROL POINT, AND BENCH MARK DATA.
2. REFER TO TYPICAL SECTIONS, GRADING PLAN, AND ROADWAY MISCELLANEOUS DETAILS SHEET FOR ADDITIONAL INFORMATION.
3. REFER TO PED-18 STANDARD FOR SIDEWALK TREATMENT AT DRIVEWAYS.

ROADWAY QUANTITIES			
ITEM	DESCRIPTION	UNIT	QTY
3077 6022	SP MIXES SP-C SAC-A PG70-22	TON	446
3085 6001	UNDERSEAL COURSE	GAL	908



0 50 100

SCALE: 1"=100' Horiz
1"=10' Vert

DATE	BY	REV	REVISION

STATE OF TEXAS
WEIYIH TEE
98478
LICENSED PROFESSIONAL ENGINEER
5/20/2023

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Texas Registered Engineering Firm F-6324

Texas Department of Transportation

BU 67A

ROADWAY
PLAN AND PROFILE

STA 3206+00 TO END OF PROJECT

SHEET 12 OF 12

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		61

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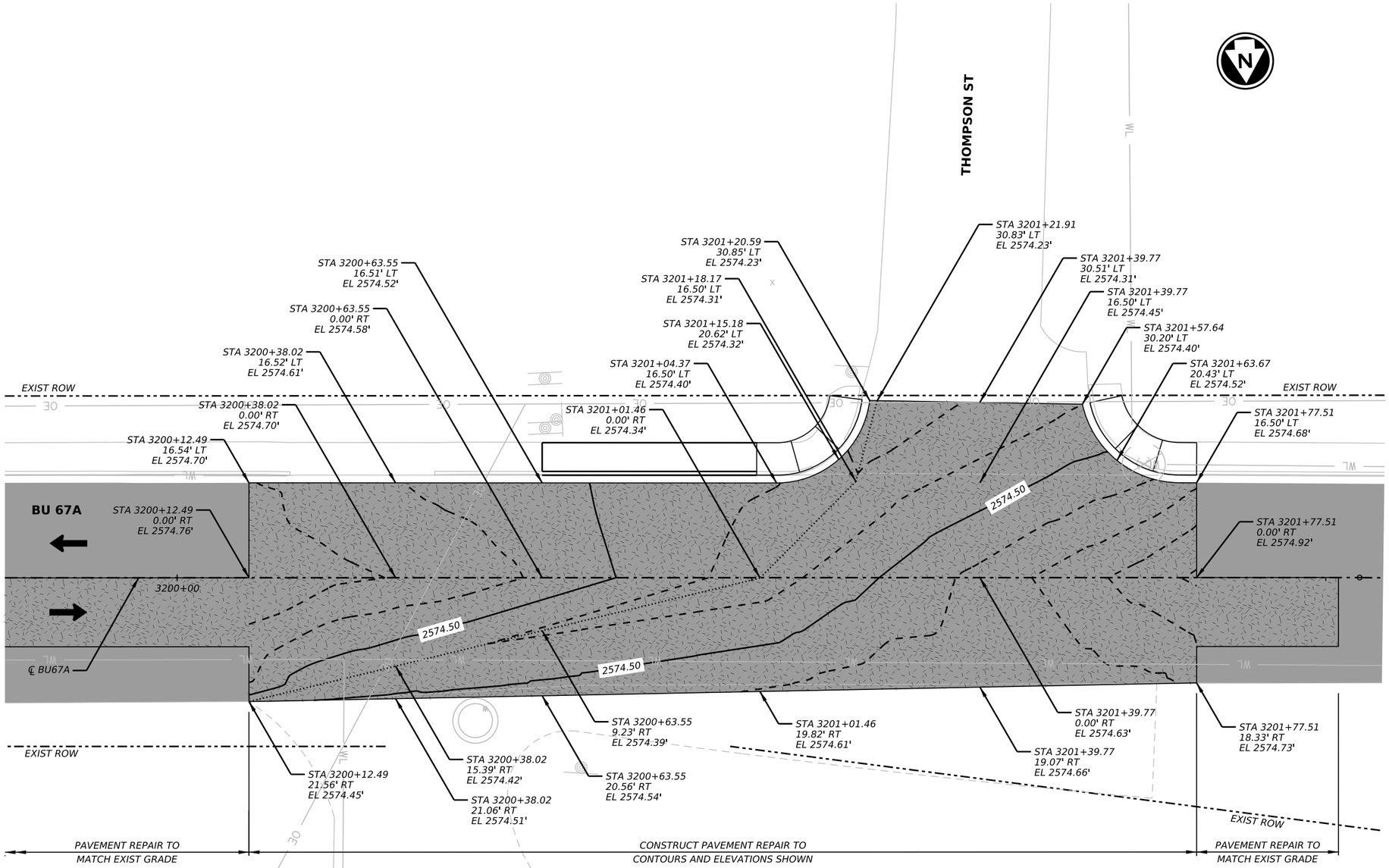

LEGEND:

- PROPOSED TRAFFIC
- EXISTING ROW
- XXXX MAJOR CONTOUR
- MINOR CONTOUR
- 6" PAVEMENT REPAIR
- 2.5" SP MIXES

0 10 20

SCALE IN FEET

DATE	BY	REV	REVISION

STATE OF TEXAS
BRIAN W. SCOTT
146261
LICENSED PROFESSIONAL ENGINEER
Brian W. Scott
5/26/2023

Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

Texas Department of Transportation

BU 67A

GRADING PLAN

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		62

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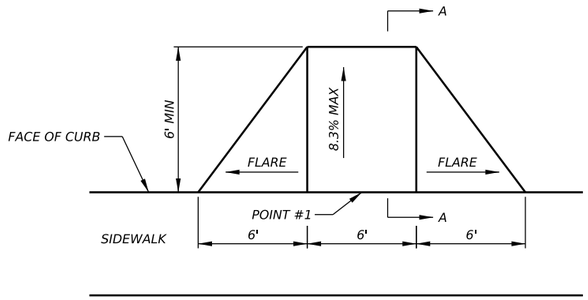
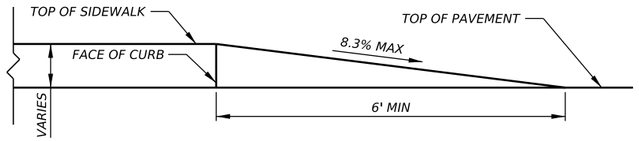
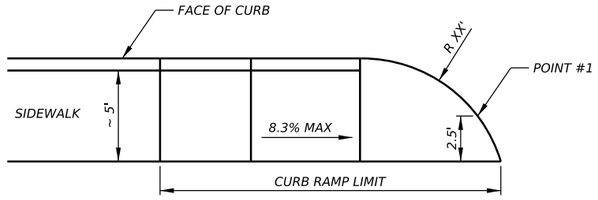


PLAN VIEW

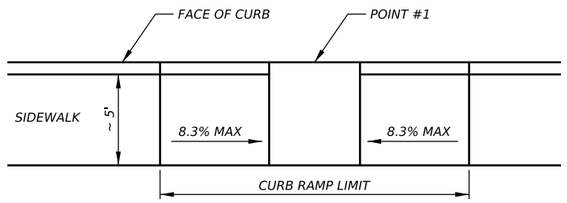


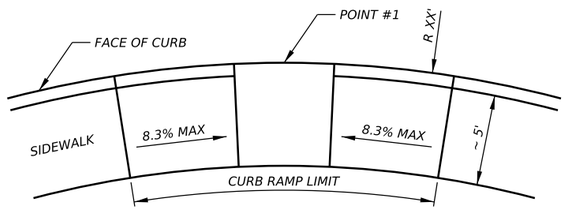
SECTION A-A

SPECIAL CURB RAMP DETAILS
NOT TO SCALE



TY 10 CURB RAMP
NOT TO SCALE





TY 2 CURB RAMP
NOT TO SCALE

CURB RAMP				
RAMP #	RAMP TYPE	RADIUS	POINT #1	
		FT	STA	OFFSET
1	10	22	3122+61.42	23.14' RT
2	10	25	3123+21.52	23.46' RT
3	2	18	3134+03.63	33.32' LT
4	2	17	3134+44.63	33.55' LT
5	2	N/A	3138+67.39	23.54' RT
6	2	17	3139+08.87	35.72' RT
7	2	N/A	3138+67.26	22.94' LT
8	2	21	3138+89.08	34.40' LT
9	2	18	3139+49.50	33.89' RT
10	2	N/A	3139+69.93	23.01' RT
11	2	20	3139+31.06	37.62' LT
12	2	N/A	3139+69.98	23.07' LT
13	2	N/A	3141+82.86	23.39' RT
14	2	23	3142+21.22	34.87' RT
15	2	N/A	3141+82.79	23.19' LT
16	2	16	3142+02.41	33.35' LT
17	2	23	3142+64.76	36.28' RT
18	2	N/A	3142+87.76	23.32' RT
19	2	N/A	3142+42.92	38.95' LT
20	2	N/A	3142+87.70	23.18' LT
21	2	N/A	3144+92.12	23.30' RT
22	2	N/A	3145+26.61	35.92' RT
23	2	N/A	3144+92.10	23.40' LT
24	2	24	3145+13.85	34.87' LT
25	2	19	3145+67.83	33.54' RT
26	2	N/A	3145+88.98	23.34' RT
27	2	20	3145+57.47	37.43' LT
28	2	N/A	3145+88.76	23.21' LT
29	2	23	3148+44.74	32.95' RT
30	2	23	3148+43.31	35.82' LT
31	2	23	3148+90.74	34.47' RT
32	2	N/A	3149+10.74	23.13' RT
33	2	24	3148+87.33	36.54' LT
34	2	N/A	3149+11.35	23.56' LT
35	2	24	3152+46.48	23.61' RT
36	2	24	3152+65.95	39.70' RT
37	2	23	3152+45.93	23.37' LT
38	2	N/A	3152+68.53	45.84' LT
39	2	N/A	3153+05.98	39.76' RT
40	2	N/A	3153+22.51	23.40' RT
41	2	23	3153+07.62	44.83' LT
42	2	23	3153+22.75	24.81' LT

CURB RAMP				
RAMP #	RAMP TYPE	RADIUS	POINT #1	
		FT	STA	OFFSET
43	2	24	3155+82.67	24.38' RT
44	2	24	3155+99.00	41.66' RT
45	2	N/A	3155+82.73	23.45' LT
46	2	23	3156+30.27	40.86' LT
47	2	23	3156+39.15	40.58' RT
48	2	N/A	3156+61.39	23.38' RT
49	2	24	3156+70.11	42.08' LT
50	2	24	3156+87.50	24.33' LT
51	2	24	3159+18.76	23.58' RT
52	2	24	3159+37.61	38.04' RT
53	2	N/A	3159+18.92	23.38' LT
54	2	24	3159+64.13	34.04' LT
55	2	24	3159+79.01	40.14' RT
56	2	24	3160+09.29	36.38' LT
57	2	16	3165+40.89	28.43' RT
58	2	15	3165+84.08	29.13' RT
59	10	7	3167+81.90	21.33' LT
60	10	6	3168+04.70	21.45' LT
61	2	16	3168+76.56	28.72' RT
62	2	16	3169+21.38	27.77' RT
63	2	15	3171+85.71	27.31' RT
64	2	15	3172+16.66	27.23' RT
65	10	5	3172+77.20	21.09' LT
66	10	6	3174+88.90	21.36' RT
67	SPECIAL	N/A	3174+88.90	31.34' LT
68	10	6	3175+17.54	21.29' RT
69	SPECIAL	N/A	3176+45.15	30.91' LT
70	10	5	3184+89.99	21.05' LT
71	10	6	3185+15.90	21.12' LT
72	10	4	3191+04.53	21.36' RT
73	10	6	3191+24.83	21.19' RT
74	10	6	3192+67.60	21.17' LT
75	10	6	3192+87.10	21.08' LT
76	10	6	3194+85.43	20.97' LT
77	10	8	3195+14.46	21.05' LT
78	2	15	3201+12.08	19.95' LT
79	2	16	3201+66.41	20.10' LT
80	2	15	3204+76.85	23.24' RT
81	2	23	3204+70.01	23.50' LT
82	2	14	3205+06.81	24.63' RT
83	2	16	3205+08.28	21.41' LT

NOTES:

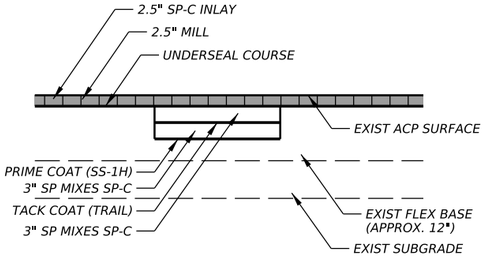
1. SEE ROADWAY PLAN AND PROFILE SHEETS FOR RAMP LOCATIONS.
2. CONTRACTOR SHALL REFER TO PED-18 STANDARD FOR ADDITIONAL INFORMATION AND DETAILS.

NORTHBOUND FULL DEPTH PAVEMENT REPAIR							
LENGTH (FT)	WIDTH (FT)	AREA (SY)	DESCRIPTION	COORDINATES			
				BEGIN		END	
				LATITUDE	LONGITUDE	LATITUDE	LONGITUDE
147	18	294	MAIN LANE & SHOULDER	29.56067894	-104.38252316	29.56067554	-104.38206925
33	12	44	MAIN LANE	29.56068031	-104.37902147	29.56068042	-104.37892432
84	12	112	MAIN LANE	29.56067936	-104.37836888	29.56067985	-104.37806156
81	12	108	MAIN LANE	29.56067752	-104.37761499	29.56067556	-104.37746444
98	12	131	MAIN LANE	29,56066217	-104,37655702	29,56066309	-104,37620415
93	13	134	MAIN LANE	29.56070315	-104.37246865	29.56075806	-104.37224131

SOUTHBOUND FULL DEPTH PAVEMENT REPAIR							
LENGTH (FT)	WIDTH (FT)	AREA (SY)	DESCRIPTION	COORDINATES			
				BEGIN		END	
				LATITUDE	LONGITUDE	LATITUDE	LONGITUDE
736	12	981	MAIN LANE	29,56081052	-104.37224166	29,56071101	-104.37444712
65	12	87	MAIN LANE	29,56070278	-104.37519361	29.56070296	-104.37538804
141	12	188	MAIN LANE	29.56069362	-104.37622596	29,56069445	-104.37666266
32	12	43	MAIN LANE	29.56069888	-104.37715382	29.56070199	-104.37725122
793	12	1,057	MAIN LANE	29.56070878	-104.37759481	29.56071200	-104.38003023
490	12	653	MAIN LANE	29.56070603	-104.38272001	29.56070588	-104.38412333

NOTES:

1. LOCATIONS AND AREAS ARE APPROXIMATED AND FOR INFORMATION ONLY. CONTRACTOR SHALL VERIFY AND CONTRUCT PAVEMENT REPAIR AS DIRECTED BY THE ENGINEER.



6" FLEXIBLE PAVEMENT REPAIR DETAILS
NOT TO SCALE

DATE	BY	REV	REVISION

STATE OF TEXAS
WEIYIH TEE
98478
PROFESSIONAL LICENSED ENGINEER
5/26/2023

Stantec
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Texas Department of Transportation

BU 67A

ROADWAY MISCELLANEOUS DETAILS

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		63

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DATE: 4/24/2023
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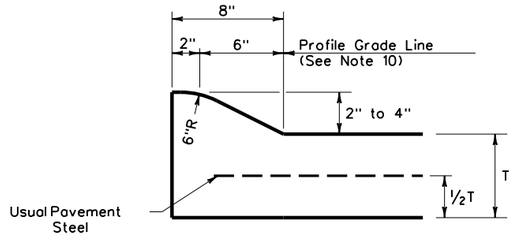
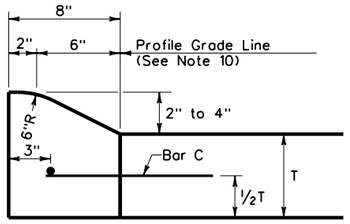


TYPE I CURB (MONOLITHIC)
2" - 4" HEIGHT



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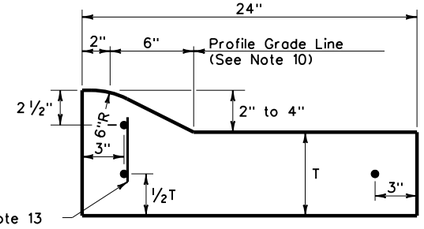
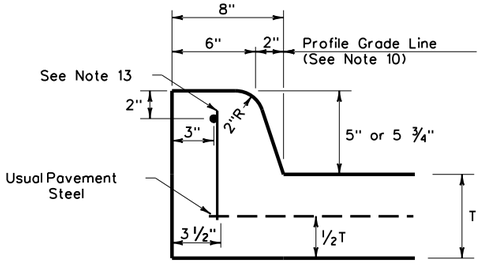
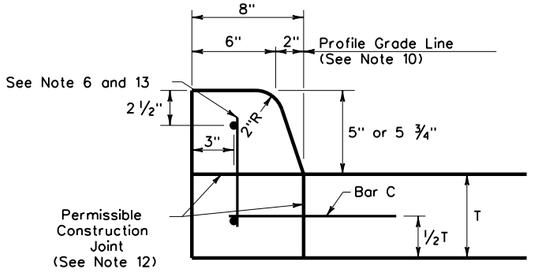


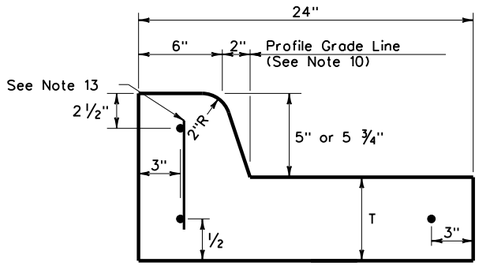
TYPE I CURB AND GUTTER
2" - 4" HEIGHT



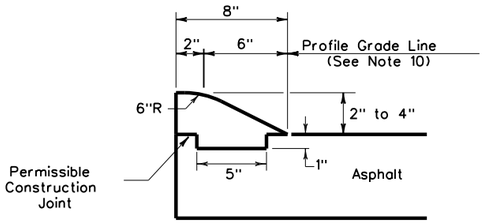
TYPE II CURB (MONOLITHIC)
5" - 5 ¾" HEIGHT



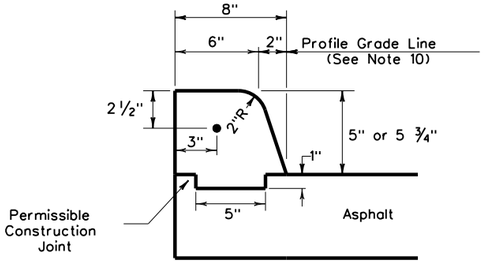
TYPE II CURB
5" - 5 ¾" HEIGHT



TYPE II CURB AND GUTTER
5" - 5 ¾" HEIGHT



TYPE III CURB (KEYED)
2" - 4" HEIGHT



TYPE IV CURB (KEYED)
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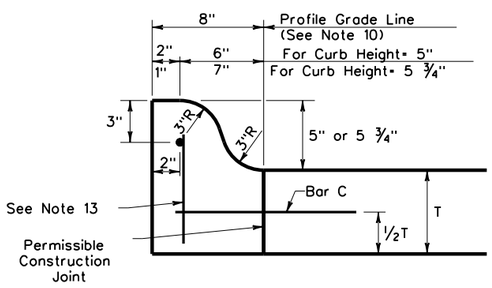
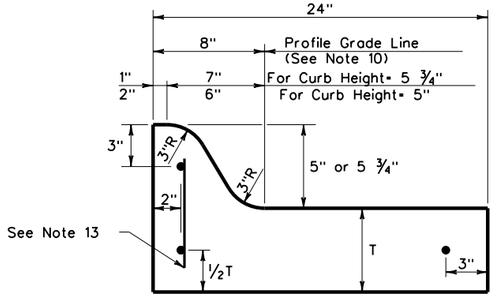
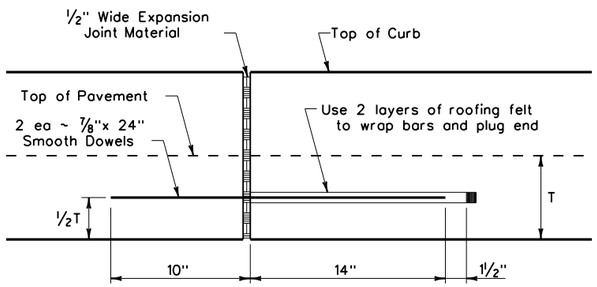


TYPE IIa CURB
5" - 5 ¾" HEIGHT

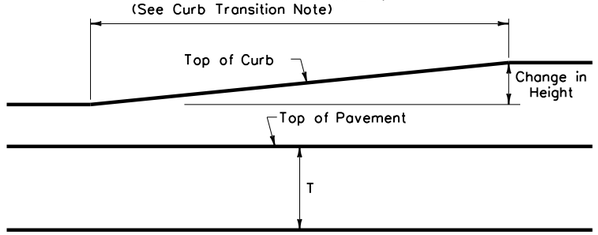


TYPE IIa CURB AND GUTTER
5" - 5 ¾" HEIGHT



EXPANSION JOINT DETAIL

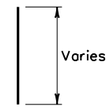
CURB TRANSITION NOTE:
Field conditions may require a longer or shorter transition, and shall be shown elsewhere in the plans,or as directed by the Engineer.



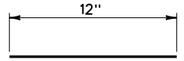
CURB TRANSITION
Note: To be paid for as Highest Curb

GENERAL NOTES

1. All materials and construction shall be in accordance with Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter."
2. Concrete shall be Class A.
3. When reinforcing bars are used, they shall be No.4 unless otherwise shown. The use of fiber reinforced concrete in lieu of reinforcing steel is acceptable. Use fibers meeting the requirements of DMS 4550, "Fibers for Concrete," and dose fibers in accordance with Material Producers List (MPL) "Fibers for Class A and B Concrete Applications."
4. Round exposed sharp edges with a rounding tool, to a minimum radius of ¼ inch.
5. All existing curbs and driveways to be removed shall be sawed or removed at existing joints.
6. Where concrete curb is to be placed on existing concrete pavement, Bar B may be drilled and grouted in place, or may be inserted into fresh concrete.
7. Expansion and contraction joints shall be constructed to match pavement joints in all curbs and curb and gutter adjacent to jointed concrete pavement. Where placement of curb or curb and gutter is not adjacent to concrete pavement, expansion joints shall be provided at structures, curb returns at streets, and at locations directed by The Engineer.
8. Vertical and horizontal dowel bars and transverse reinforcing bars shall be placed at four feet C~C.
9. Dimension 'T' shown is the thickness of concrete pavement. When curb is installed adjacent to flexible pavement dimension 'T' is 8" maximum.
10. Usual profile grade line. Refer to typical sections and plan-profile sheets for exact locations.
11. One-half inch expansion joint material shall be provided where curb or curb and gutter is adjacent to sidewalk or riprap.
12. When horizontal permissible construction joints are used, the longitudinal pavement steel shall be placed in accordance with pavement details shown elsewhere in the plans. Reinforcing steel for curb section shall then conform to that required for concrete curb.
13. Bar B placement as needed (typically at four ft. C-C) to support curb reinforcing steel during concrete placement.



BAR B



BAR C

Texas Department of Transportation

Design Division Standard

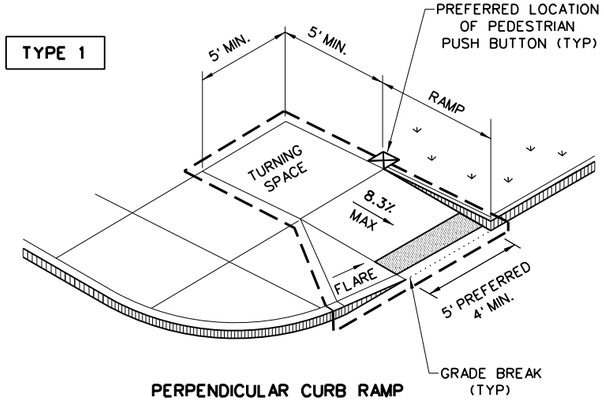
CONCRETE CURB AND CURB AND GUTTER

CCCG-22

FILE: cccg21.dgn	DN: TXDOT	CK: AN	DW: CS	CK: KM
© TxDOT: JUNE 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0104	11	008	BU 67A
	DIST	COUNTY		SHEET NO.
	ELP	PRESIDIO		64

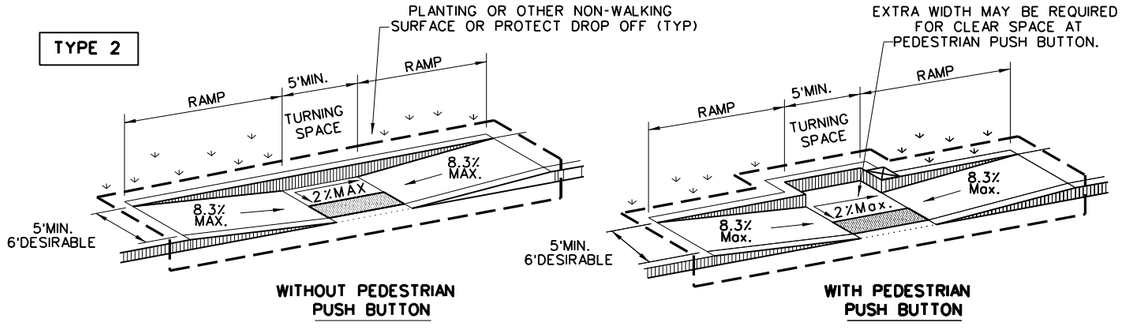
DATE: 4/24/2023
FILE: c:\pw_working\infra02\wtee\dms65562\ped18-1.dgn

TYPE 1



PERPENDICULAR CURB RAMP

TYPE 2

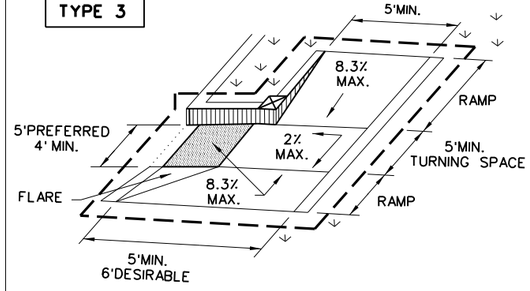


WITHOUT PEDESTRIAN PUSH BUTTON

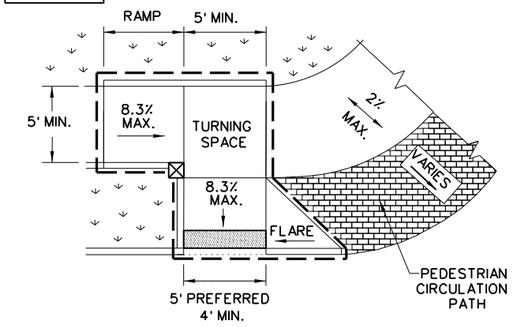
WITH PEDESTRIAN PUSH BUTTON

PARALLEL CURB RAMP

TYPE 3

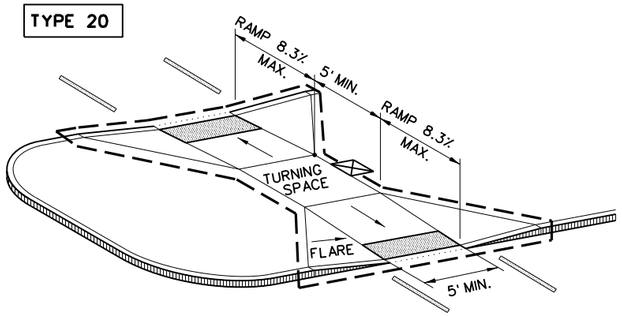


TYPE 6



COMBINATION CURB RAMPS

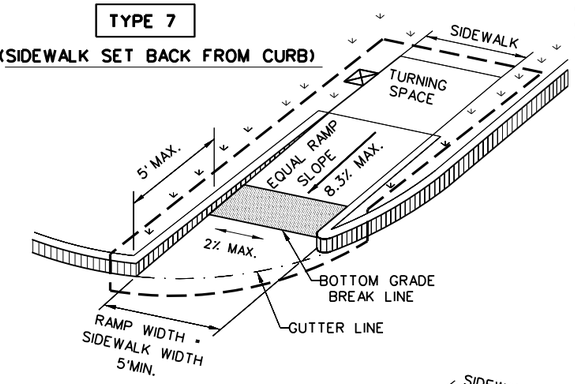
TYPE 20



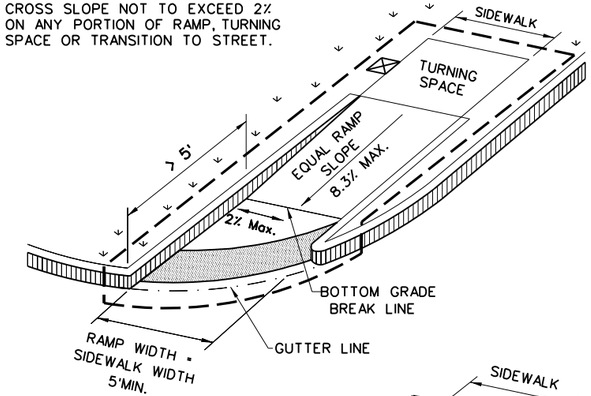
CURB RAMPS AT MEDIAN ISLANDS

TYPE 7

(SIDEWALK SET BACK FROM CURB)

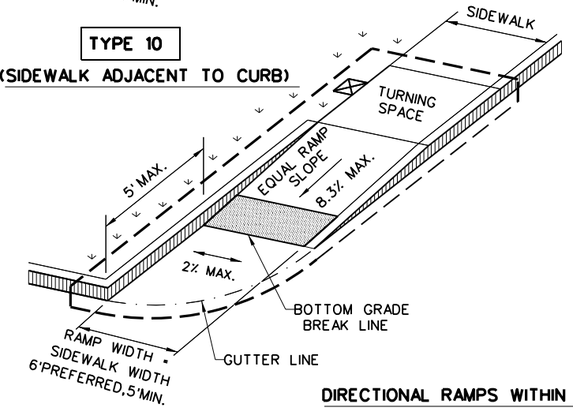


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.

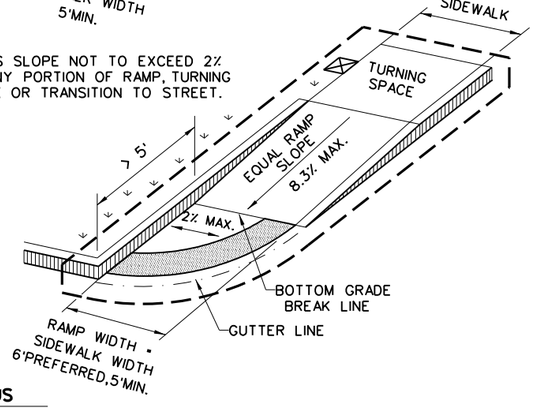


TYPE 10

(SIDEWALK ADJACENT TO CURB)

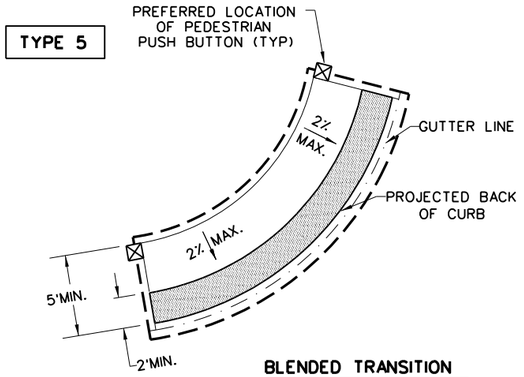


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.



DIRECTIONAL RAMPS WITHIN RADIUS

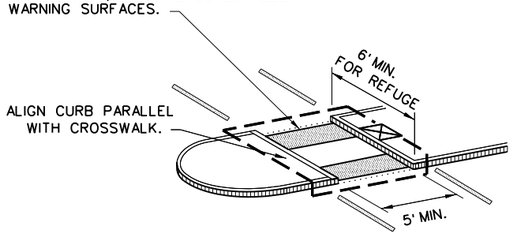
TYPE 5



BLENDED TRANSITION
(FLUSH LANDING)

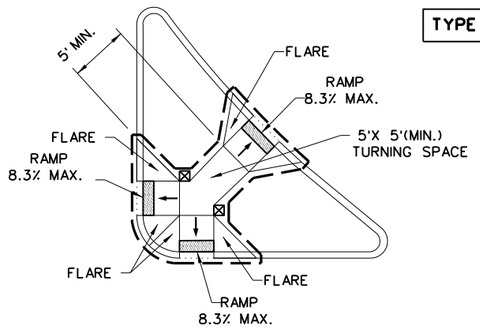
TYPE 21

INSTALL DETECTABLE WARNING SURFACE AT EACH END OF THE CUT-THROUGH RAMP WITH A MINIMUM 2' USUAL SIDEWALK SURFACE BETWEEN. IF MEDIAN IS LESS THAN 6' WIDE, ELIMINATE DETECTABLE WARNING SURFACES.



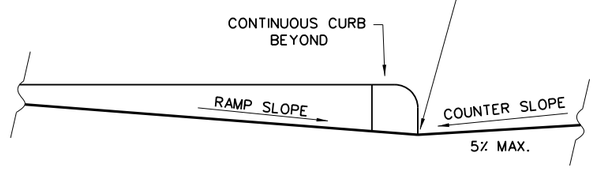
NOTE: CURB DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.

TYPE 22



COMBINATION ISLAND RAMPS

BOTTOM GRADE BREAK OF CURB RAMP WILL NORMALLY BE AT GUTTER LINE. SURFACE SLOPES AT GRADE BREAKS SHALL BE FLUSH.



TYPICAL SECTION OF PERPENDICULAR CURB RAMP AT CONNECTION TO ROADWAY

NOTES / LEGEND:

SEE GENERAL NOTES ON SHEET 2 OF 4 FOR MORE INFORMATION.

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH.

DETECTABLE WARNING SURFACE

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON IF APPLICABLE.

GUTTER LINE

GRADE BREAK

RAMP LIMITS OF PAYMENT

SHEET 1 OF 4

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0104	11	008	BU 67A	
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY		SHEET NO.	
	ELP	PRESIDIO		65	

DATE: 4/24/2023
FILE: c:\pw_working\infra02\wtee\dms65562\ped18-2.dgn

GENERAL NOTES

CURB RAMPS

1. Install a curb ramp or blended transition at each pedestrian street crossing.

2. All slopes shown are maximum allowable. Cross slopes of 1.5% and lesser running should be used. Adjust curb ramp length or grade of approach sidewalks as directed.

3. Maximum allowable cross slope on sidewalk and curb ramp surfaces is 2%.

4. The minimum sidewalk width is 5'. Where the sidewalk is adjacent to the back of curb, a 6' sidewalk width is desirable. Where a 5' sidewalk cannot be provided due to site constraints, sidewalk width may be reduced to 4' for short distances. 5'x 5' passing areas at intervals not to exceed 200' are required.

5. Turning Spaces shall be 5'x 5' minimum. Cross slope shall be maximum 2%.

6. Clear space at the bottom of curb ramps shall be a minimum of 4'x 4' wholly contained within the crosswalk and wholly outside the parallel vehicular travel path.

7. Provide flared sides where the pedestrian circulation path crosses the curb ramp. Flared sides shall be sloped at 10% maximum, measured parallel to the curb. Returned curbs may be used only where pedestrians would not normally walk across the ramp, either because the adjacent surface is planted, substantially obstructed, or otherwise protected.

8. Additional information on curb ramp location, design, light reflective value and texture may be found in the latest draft of the Proposed Guidelines for Pedestrian Facilities in the Public Right of Way (PROWAG) as published by the U.S. Architectural and Transportation Barriers Compliance Board (Access Board).

9. To serve as a pedestrian refuge area, the median should be a minimum of 6' wide, measured from back of curbs. Medians should be designed to provide accessible passage over or through them.

10. Small channelization islands, which do not provide a minimum 5'x 5' landing at the top of curb ramps, shall be cut through level with the surface of the street.

11. Crosswalk dimensions, crosswalk markings and stop bar locations shall be as shown elsewhere in the plans. At intersections where crosswalk markings are not required, curb ramps shall align with theoretical crosswalks unless otherwise directed.

12. Provide curb ramps to connect the pedestrian access route at each pedestrian street crossing. Handrails are not required on curb ramps.

13. Curb ramps and landings shall be constructed and paid for in accordance with Item 531 "Sidewalks".

14. Place concrete at a minimum depth of 5" for ramps, flares and landings, unless otherwise directed.

15. Furnish and install No. 3 reinforcing steel bars at 18" o.c. both ways, unless otherwise directed.

16. Provide a smooth transition where the curb ramps connect to the street.

17. Curbs shown on sheet 1 within the limits of payment are considered part of the curb ramp for payment, whether it is concrete curb, gutter, or combined curb and gutter.

18. Existing features that comply with applicalble standards may remain in place unless otherwise shown on the plans.

DETECTABLE WARNING MATERIAL

19. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with PROWAG. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material adjacent to uncolored concrete, unless specified elsewhere in the plans.

20. Detectable Warning Materials must meet TxDOT Departmental Materials Specification DMS 4350 and be listed on the Material Producer List. Install products in accordance with manufacturer's specifications.

21. Detectable warning surfaces must be firm, stable and slip resistant.

22. Detectable warning surfaces shall be a minimum of 24 inches in depth in the direction of pedestrian travel, and extend the full width of the curb ramp or landing where the pedestrian access route enters the street.

23. Detectable warning surfaces shall be located so that the edge nearest the curb line is at the back of curb and neither end of that edge is greater than 5 feet from the back of curb. Detectable warning surfaces may be curved along the corner radius.

24. Shaded areas on Sheet 1 of 4 indicate the approximate location for the detectable warning surface for each curb ramp type.

DETECTABLE WARNING PAVERS (IF USED)

25. Furnish detectable warning paver units meeting all requirements of ASTM C-936, C-33. Lay in a two by two unit basket weave pattern or as directed.

26. Lay full-size units first followed by closure units consisting of at least 25 percent (25%) of a full unit. Cut detectable warning paver units using a power saw.

SIDEWALKS

27. Provide clear ground space at operable parts, including pedestrian push buttons. Operable parts shall be placed within unobstructed reach range specified in PROWAG section R406.

28. Place traffic signal or illumination poles, ground boxes, controller boxes, signs, drainage facilities and other items so as not to obstruct the pedestrian access route or clear ground space.

29. Street grades and cross slopes shall be as shown elsewhere in the plans.

30. Changes in level greater than 1/4 inch are not permitted.

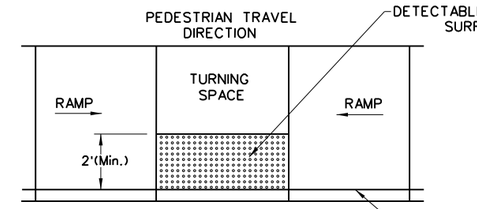
31. The least possible grade should be used to maximize accessibility. The running slope of sidewalks and crosswalks within the public right of way may follow the grade of the parallel roadway. Where a continuous grade greater than five percent (5%) must be provided, handrails may be desirable to improve accessibility. Handrails may also be needed to protect pedestrians from potentially hazardous conditions. If provided, handrails shall comply with PROWAG R409.

32. Handrail extensions shall not protrude into the usable landing area or into intersecting pedestrian routes.

33. Driveways and turnouts shall be constructed and paid for in accordance with Item "Intersections, Driveways and Turnouts". Sidewalks shall be constructed and paid for in accordance with Item, "Sidewalks".

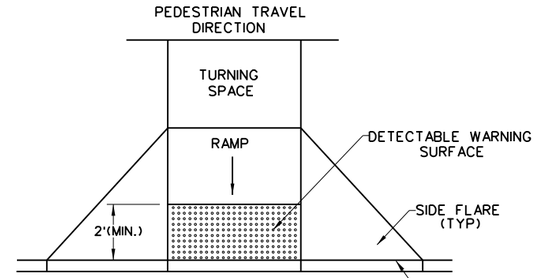
34. Sidewalk details are shown elsewhere in the plans.

DETECTABLE WARNING SURFACE DETAILS



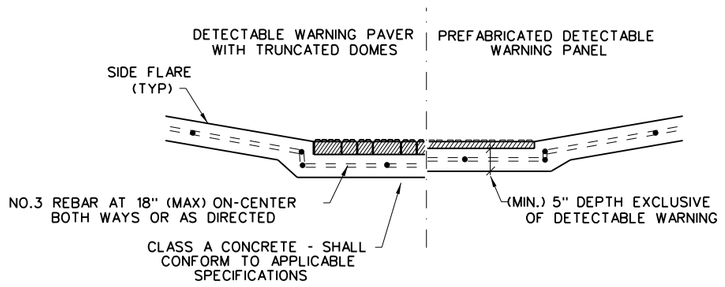
PARALLEL CURB RAMP

TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON LANDING AT STREET EDGE.

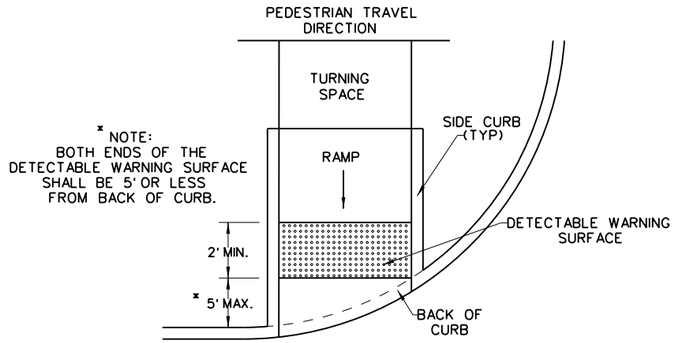


PERPENDICULAR CURB RAMP

TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.



SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS



DIRECTIONAL CURB RAMP

TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.

Texas Department of Transportation

Design Division Standard

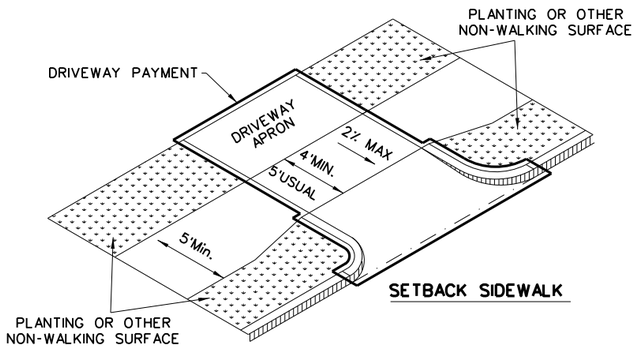
PEDESTRIAN FACILITIES CURB RAMPS

PED-18

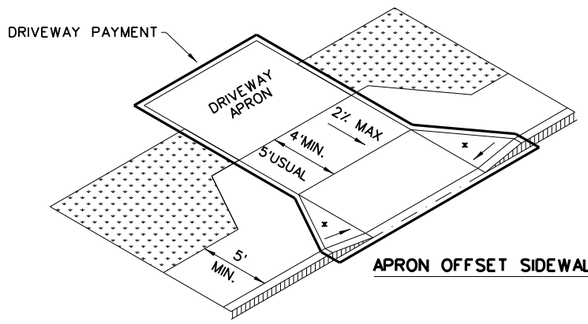
FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS	0104	11	008		BU 67A
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY			SHEET NO.
	ELP	PRESIDIO			66

DATE: 4/24/2023
FILE: c:\pw_working\infra02\wtee\dms65562\ped18-3.dgn

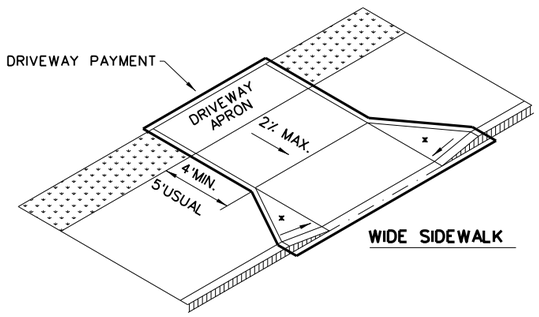
SIDEWALK TREATMENT AT DRIVEWAYS



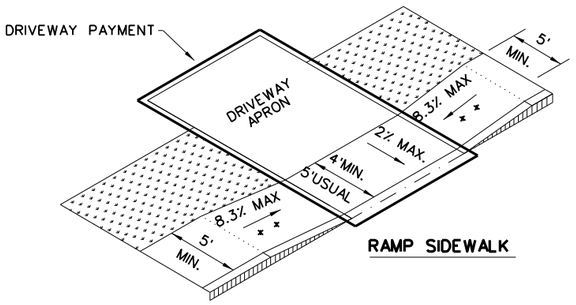
SETBACK SIDEWALK



APRON OFFSET SIDEWALK



WIDE SIDEWALK

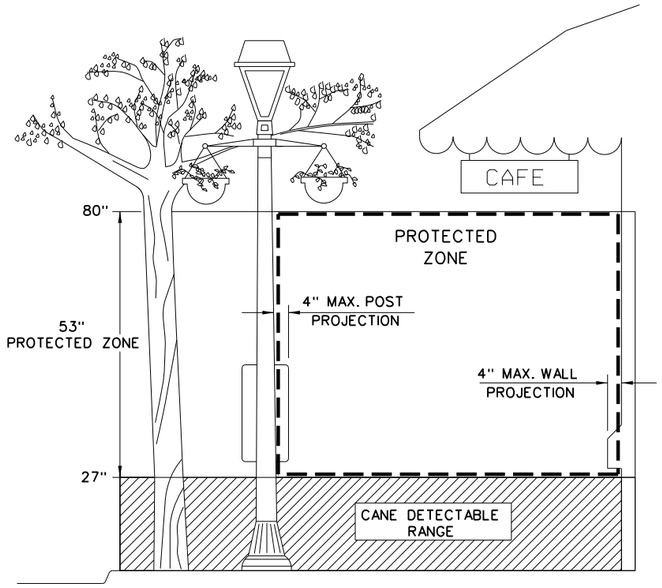


RAMP SIDEWALK

NOTES:

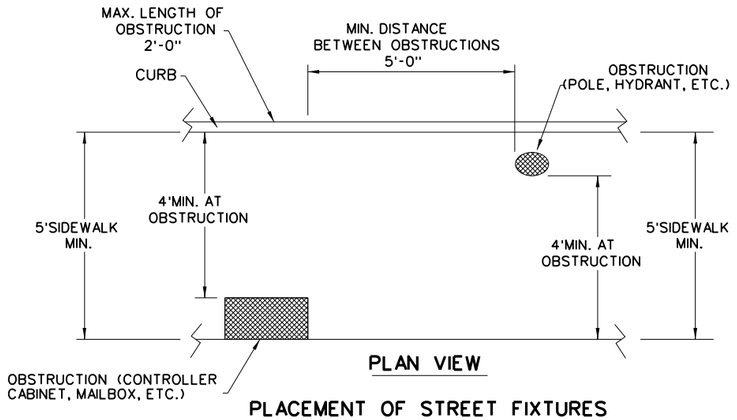
* WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.

* * IF CURB HEIGHT IS GREATER THAN 6 INCHES, USE GRADE LESS THAN OR EQUAL TO 5%. HANDRAIL AND DETECTABLE WARNING ARE NOT REQUIRED.



PROTECTED ZONE

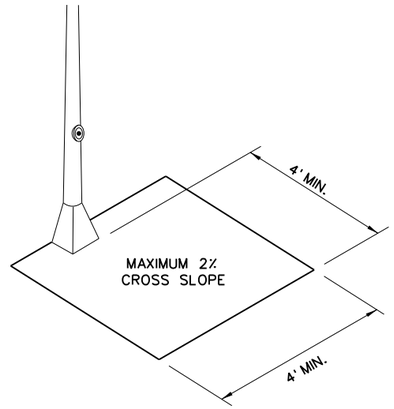
NOTE: IN PEDESTRIAN CIRCULATION AREA, MAXIMUM 4" PROJECTION FOR POST OR WALL MOUNTED OBJECTS BETWEEN 27" AND 80" ABOVE THE SURFACE.



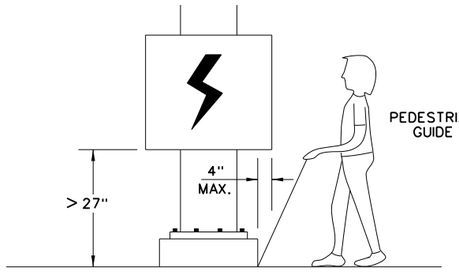
PLAN VIEW

PLACEMENT OF STREET FIXTURES

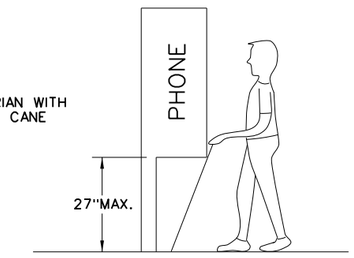
NOTE: ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' X 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.



CLEAR SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



WHEN AN OBSTRUCTION OF A HEIGHT GREATER THAN 27" FROM THE SURFACE WOULD CREATE A PROTRUSION OF MORE THAN 4" INTO THE PEDESTRIAN CIRCULATION AREA, CONSTRUCT ADDITIONAL CURB OR FOUNDATION AT THE BOTTOM TO PROVIDE A MAXIMUM 4" OVERHANG.



PROTRUDING OBJECTS OF A HEIGHT ≤27" ARE DETECTABLE BY CANE AND DO NOT REQUIRE ADDITIONAL TREATMENT.

DETECTION BARRIER FOR VERTICAL CLEARANCE <80"

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

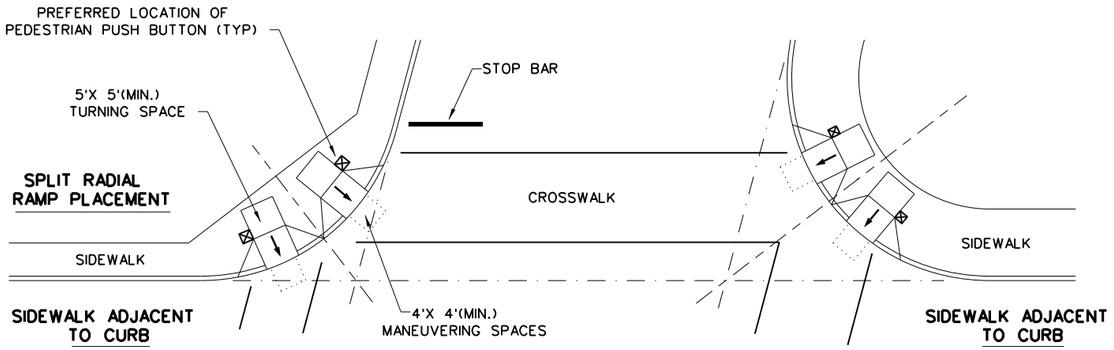
PED-18

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0104	11	008	BU 67A
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY		SHEET NO.
	ELP	PRESIDIO		67

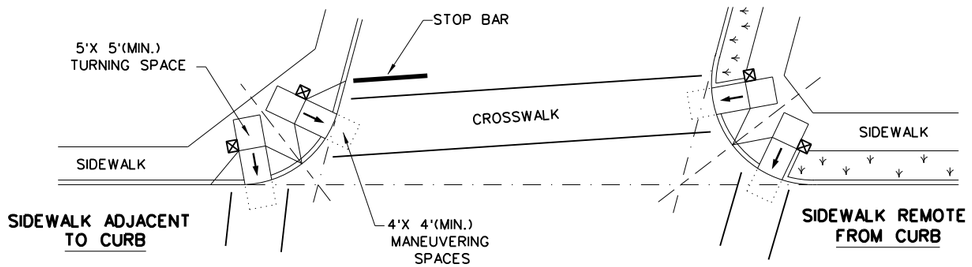
DATE: 4/24/2023
FILE: c:\pw_working\infra02\wtee\dms65562\ped18-4.dgn

TYPICAL CROSSING LAYOUTS

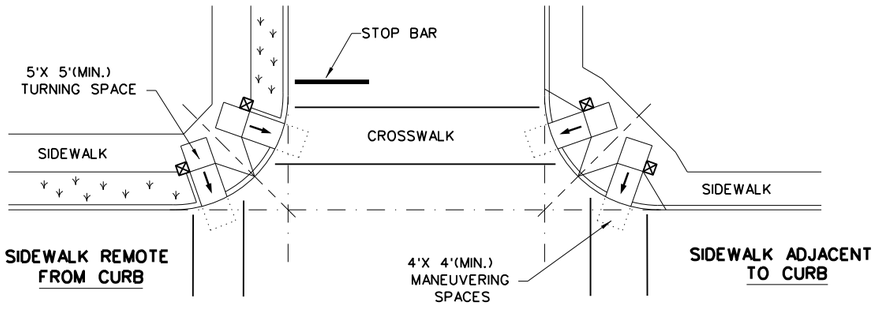
SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



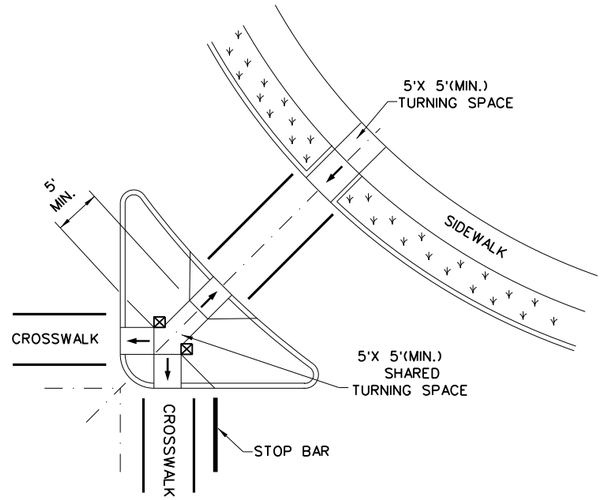
SKEWED INTERSECTION WITH "LARGE" RADIUS



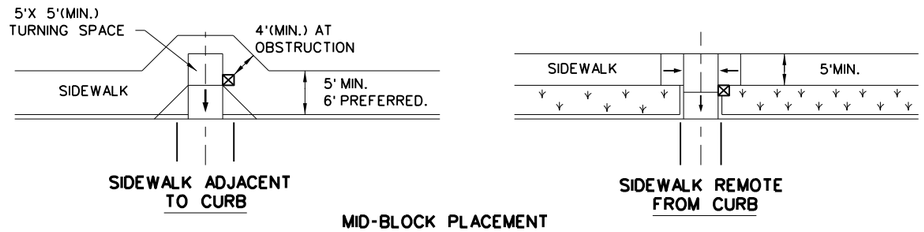
SKEWED INTERSECTION WITH "SMALL" RADIUS



NORMAL INTERSECTION WITH "SMALL" RADIUS



AT INTERSECTION
W/FREE RIGHT TURN & ISLAND



MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS

LEGEND:

SHOWS DOWNWARD SLOPE. →

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON (IF APPLICABLE). ⊠

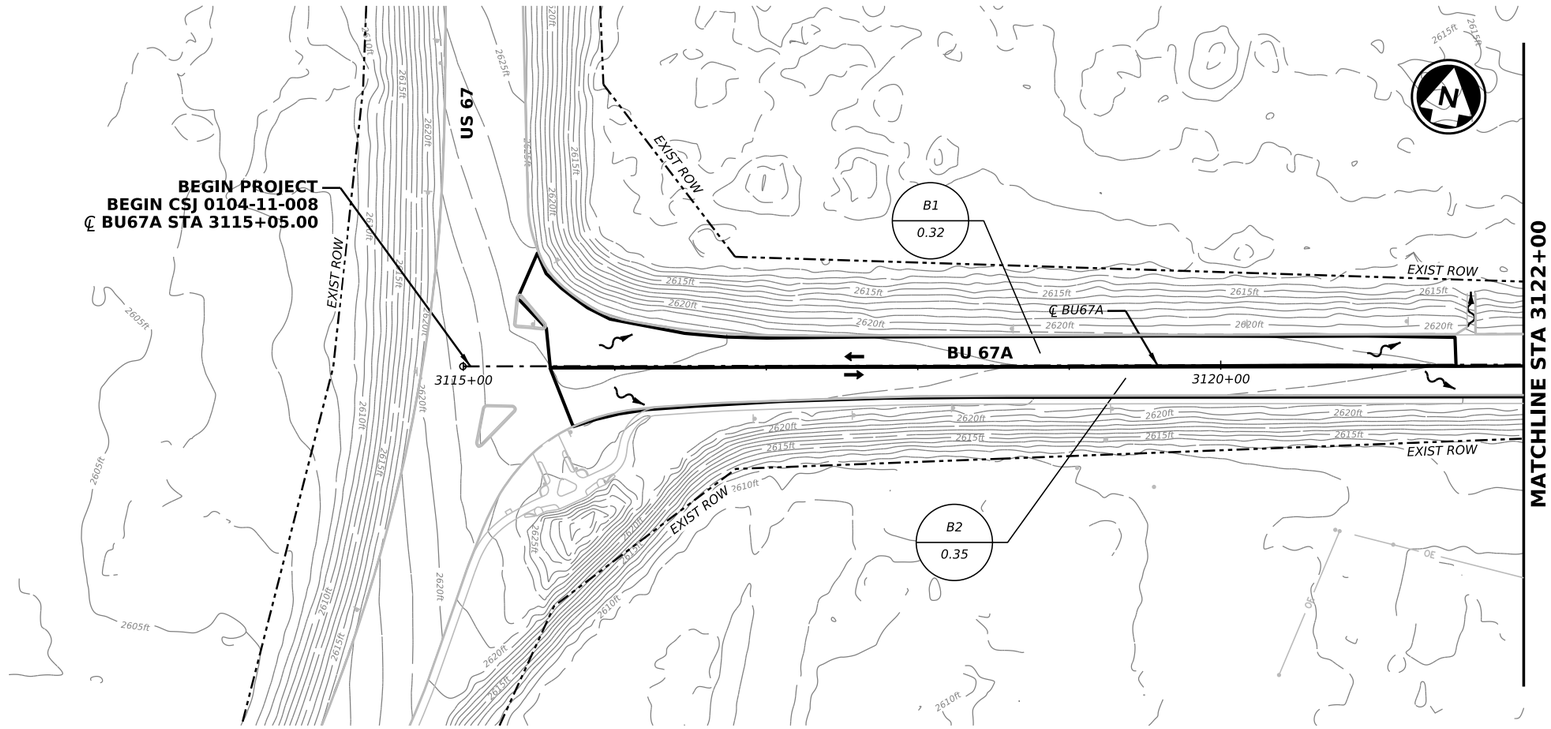
DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH.

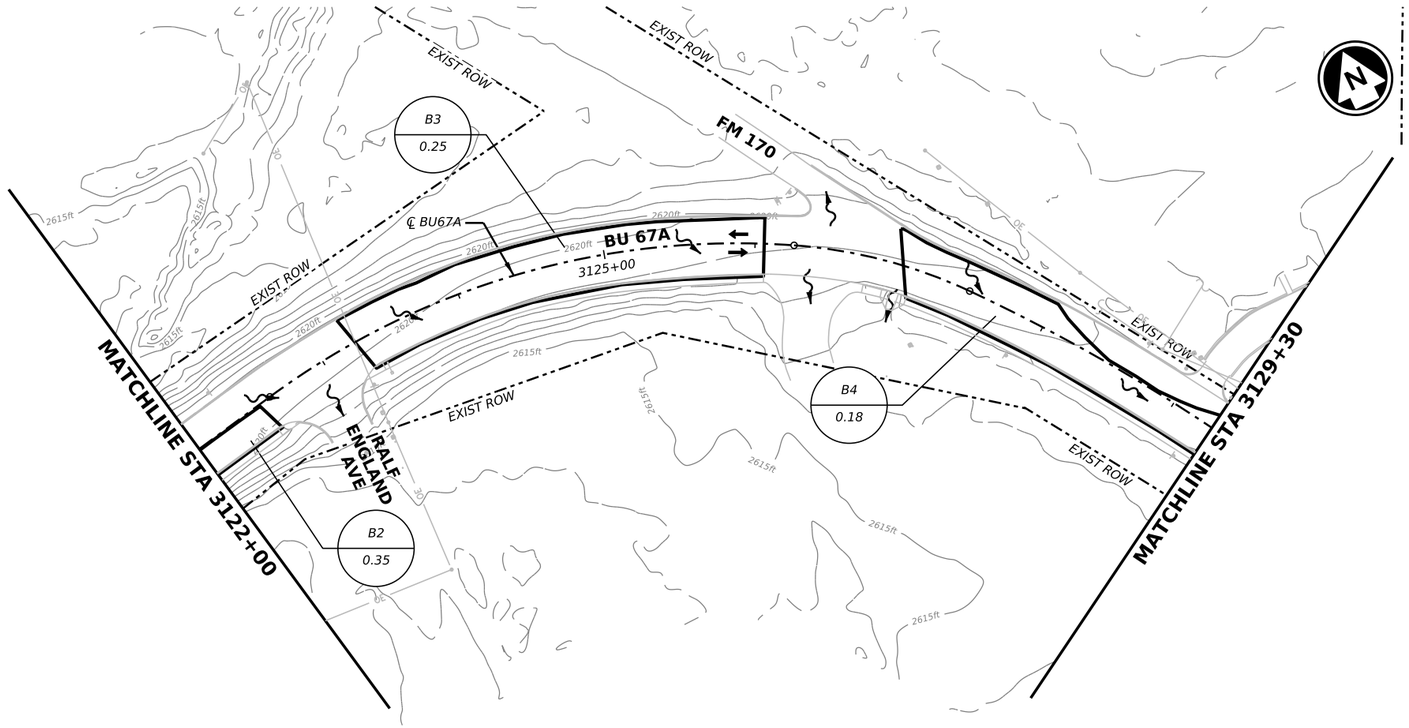
Texas Department of Transportation — Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS	0104	11	008		BU 67A
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY			SHEET NO.
	ELP	PRESIDIO			68





LEGEND:

- EXISTING ROW
- TRAFFIC FLOW DIRECTION
- DRAINAGE AREA BOUNDARY
- DIRECTION OF FLOW
- ID / 00.00 — DRAINAGE AREA ID / DRAINAGE AREA ACREAGE

NOTES:

1. WATER LEAVES THE PROJECT ROADWAY IN THE SAME PLACES AND PATHS AS THE EXISTING CONDITION. THIS PROJECT DOES NOT CHANGE DRAINAGE PATTERNS.

0 50 100

SCALE: 1"=100'

DATE	BY	REV	REVISION

STATE OF TEXAS
LISA M. LAUVER
115404
LICENSED PROFESSIONAL ENGINEER

5/20/2023

Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

Texas Department of Transportation

BU 67A

DRAINAGE MAP

BEGIN OF PROJECT TO STA 3129+30

SHEET 1 OF 6

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		69

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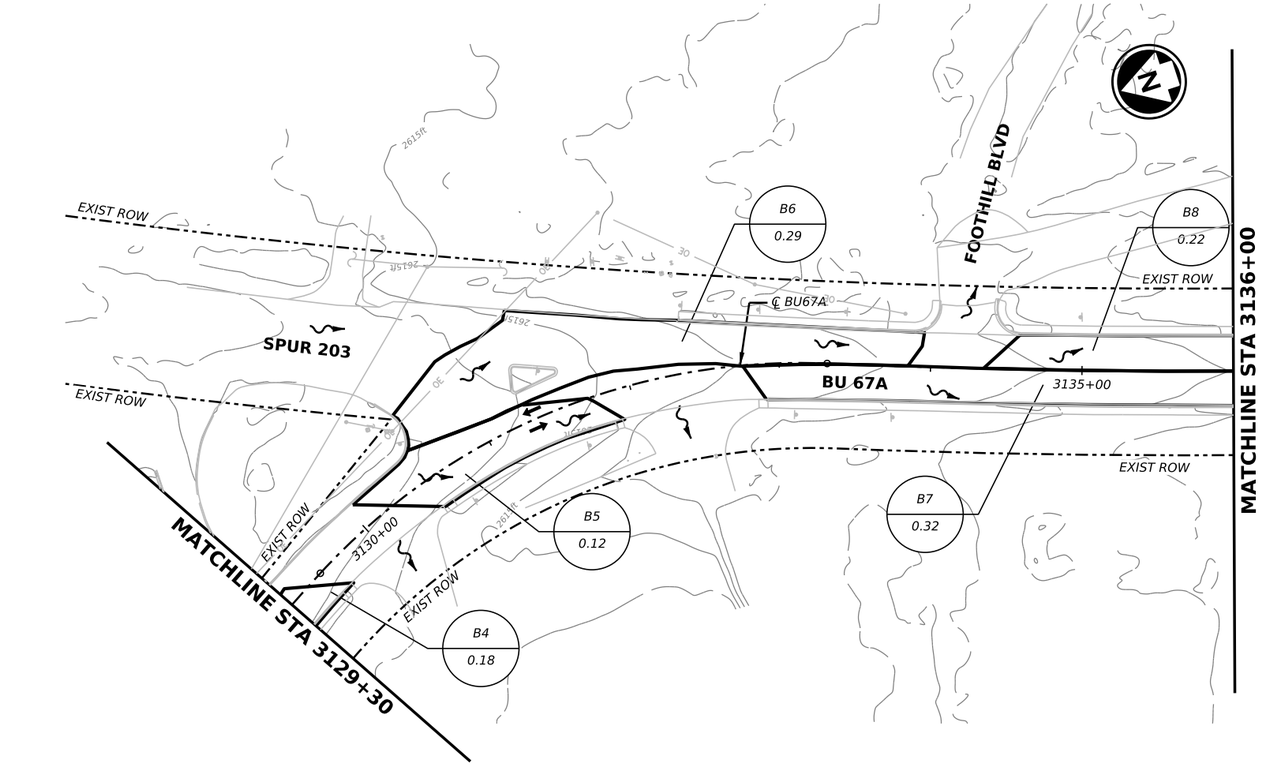

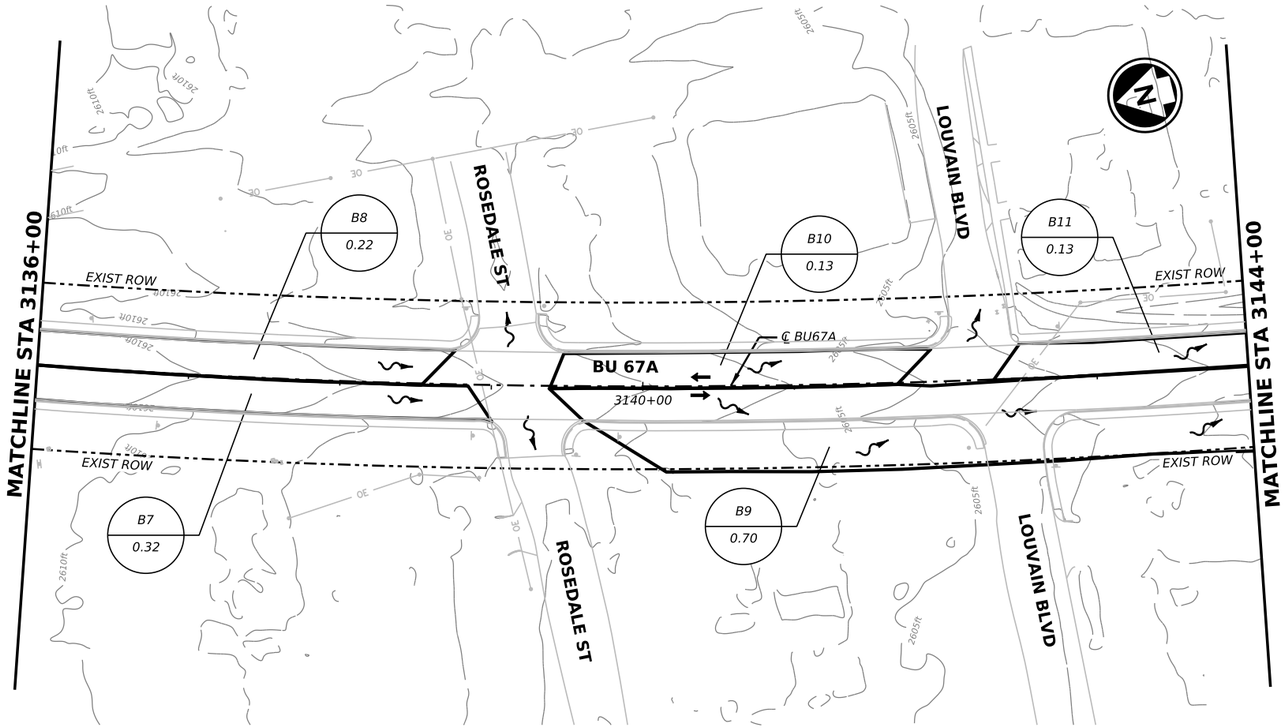

LEGEND:

- EXISTING ROW
- TRAFFIC FLOW DIRECTION
- DRAINAGE AREA BOUNDARY
- DIRECTION OF FLOW
- ID / 00.00 — DRAINAGE AREA ID / DRAINAGE AREA ACREAGE

NOTES:

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0 50 100

SCALE: 1"=100'

DATE	BY	REV	REVISION

STATE OF TEXAS
LISA M. LAUVER
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5/20/2023

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Texas Department of Transportation

BU 67A

DRAINAGE MAP

STA 3129+30 TO STA 3144+00

SHEET 2 OF 6

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		70

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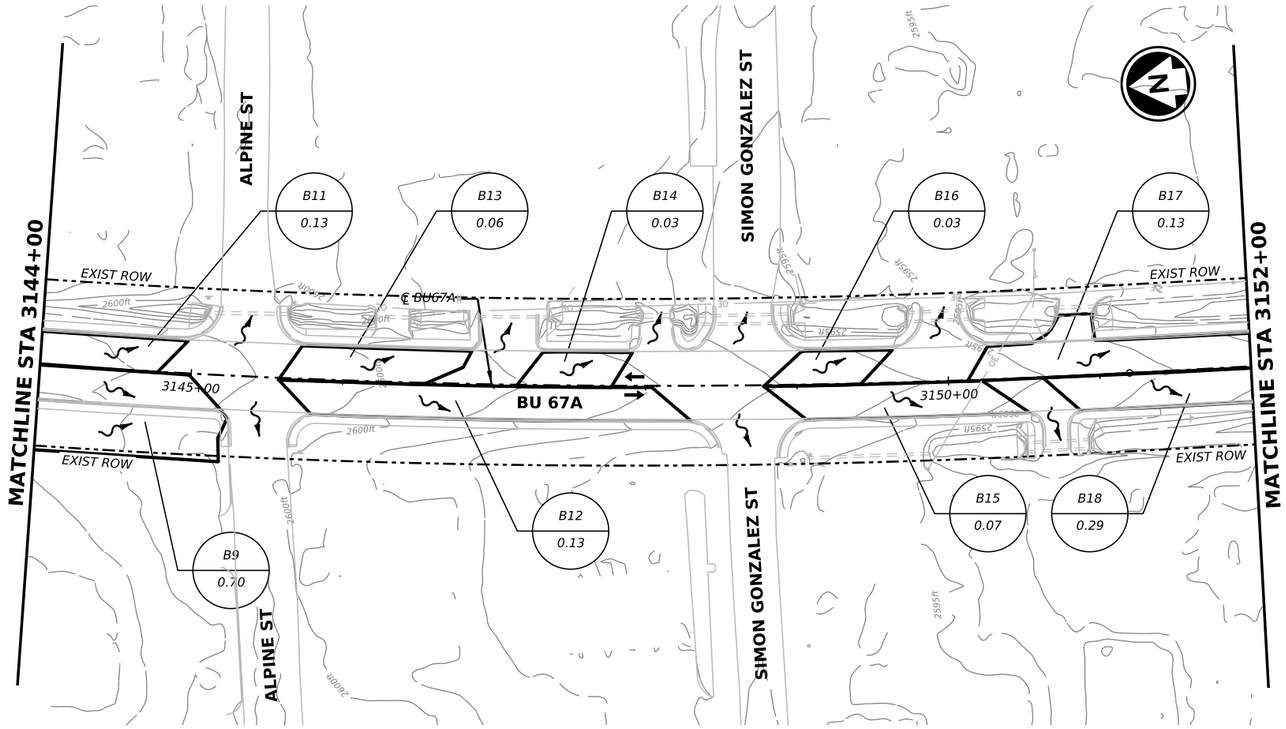

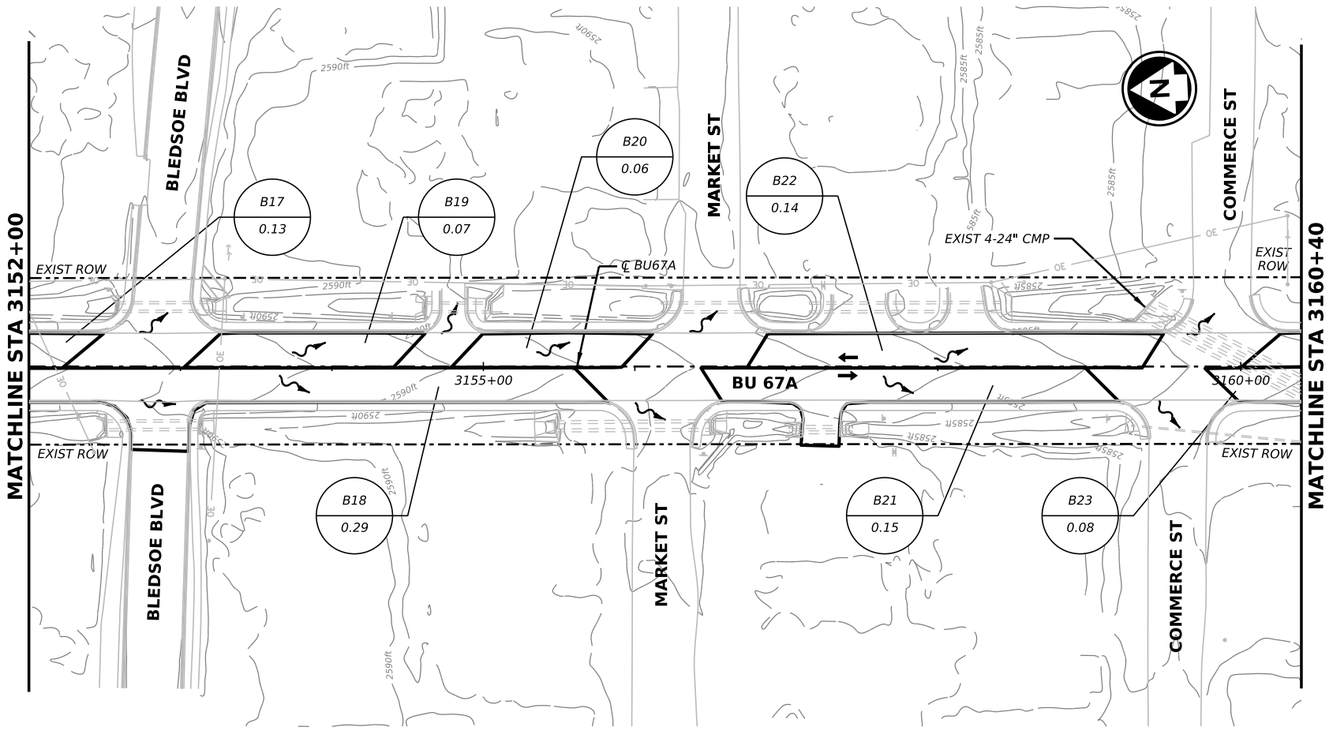

LEGEND:

- EXISTING ROW
- TRAFFIC FLOW DIRECTION
- DRAINAGE AREA BOUNDARY
- DIRECTION OF FLOW
- ID / 00.00 — DRAINAGE AREA ID / DRAINAGE AREA ACREAGE

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0 50 100

SCALE: 1"=100'

DATE	BY	REV	REVISION

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LICENSED PROFESSIONAL ENGINEER

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BU 67A

DRAINAGE MAP

STA 3144+00 TO STA 3160+40

SHEET 3 OF 6

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		71

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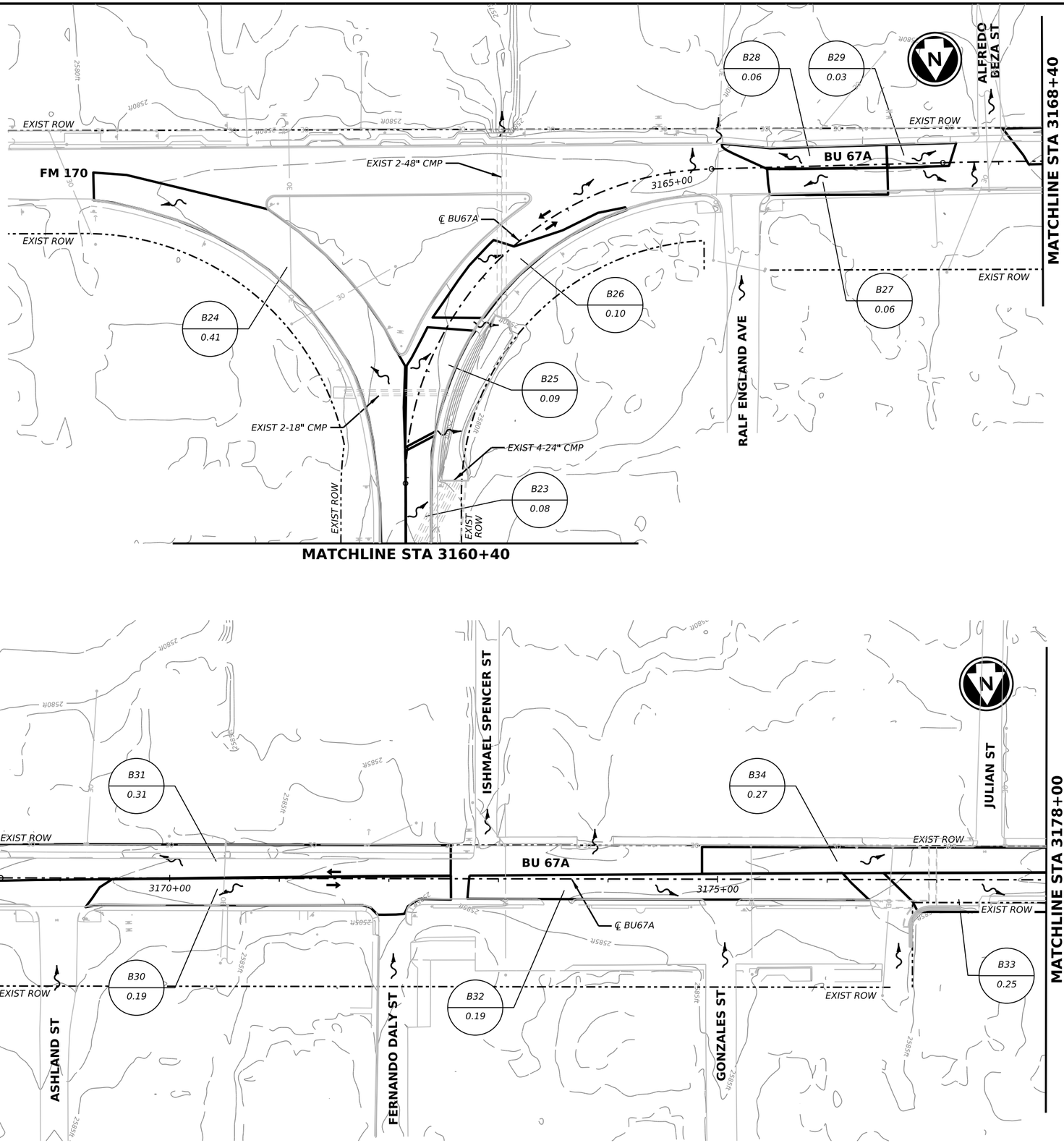

LEGEND:

- EXISTING ROW
- TRAFFIC FLOW DIRECTION
- DRAINAGE AREA BOUNDARY
- DIRECTION OF FLOW
- ID / 00.00 — DRAINAGE AREA ID / DRAINAGE AREA ACREAGE

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0 50 100

SCALE: 1"=100'

DATE	BY	REV	REVISION

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LISA M. LAUVER
115404
LICENSED PROFESSIONAL ENGINEER

5/20/2023

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BU 67A

DRAINAGE MAP

STA 3160+40 TO STA 3178+00

SHEET 4 OF 6

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		72

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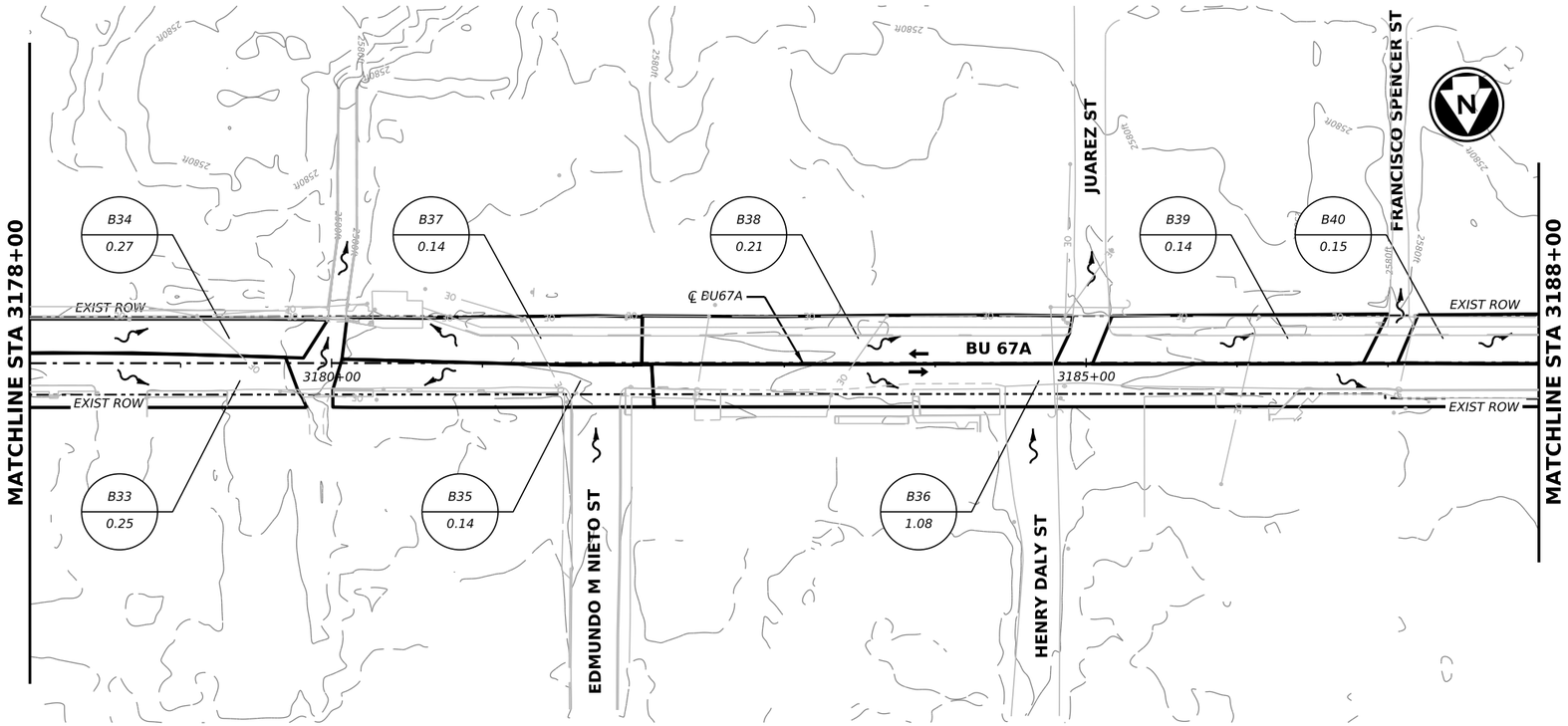

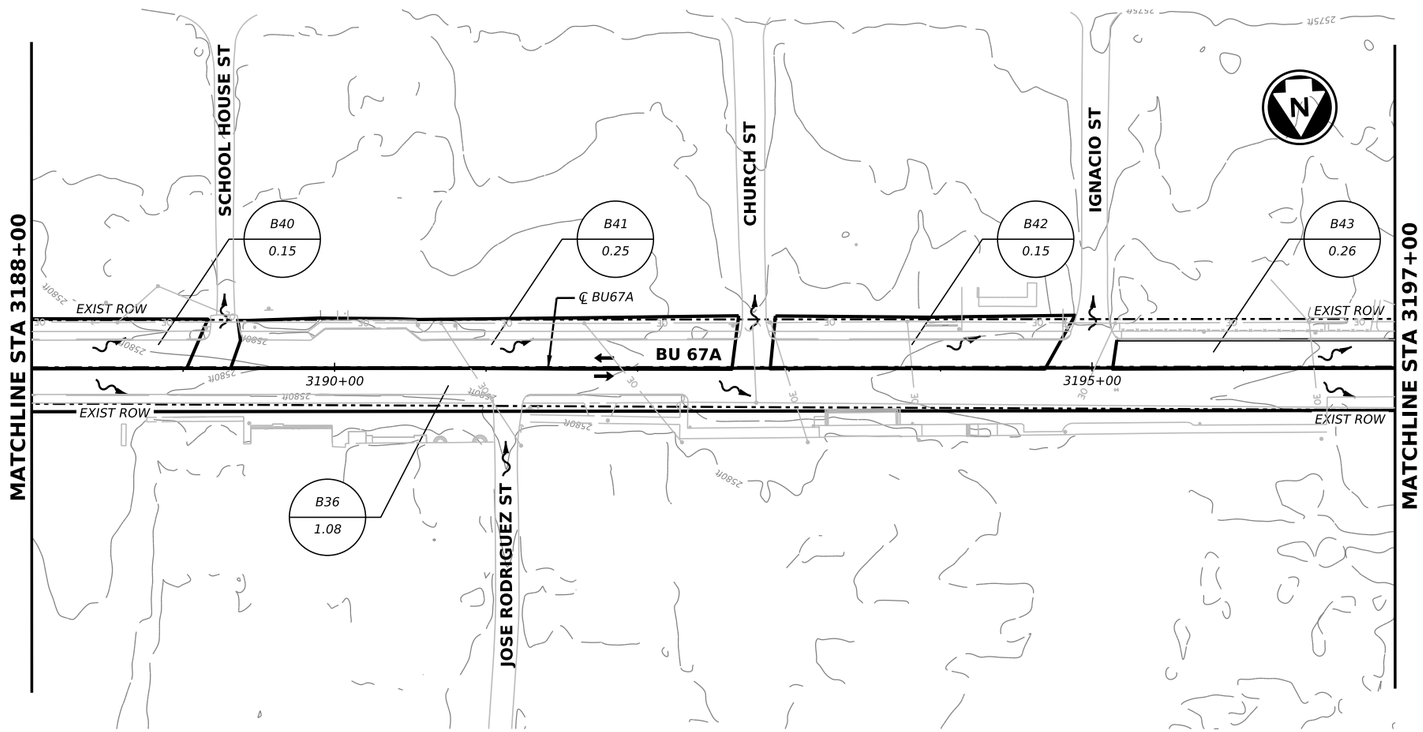

LEGEND:

- EXISTING ROW
- TRAFFIC FLOW DIRECTION
- DRAINAGE AREA BOUNDARY
- DIRECTION OF FLOW
- ID / 00.00 — DRAINAGE AREA ID / DRAINAGE AREA ACREAGE

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0 50 100

SCALE: 1"=100'

DATE	BY	REV	REVISION

STATE OF TEXAS
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5/20/2023

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BU 67A

DRAINAGE MAP

STA 3178+00 TO STA 3197+00

SHEET 5 OF 6

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		73

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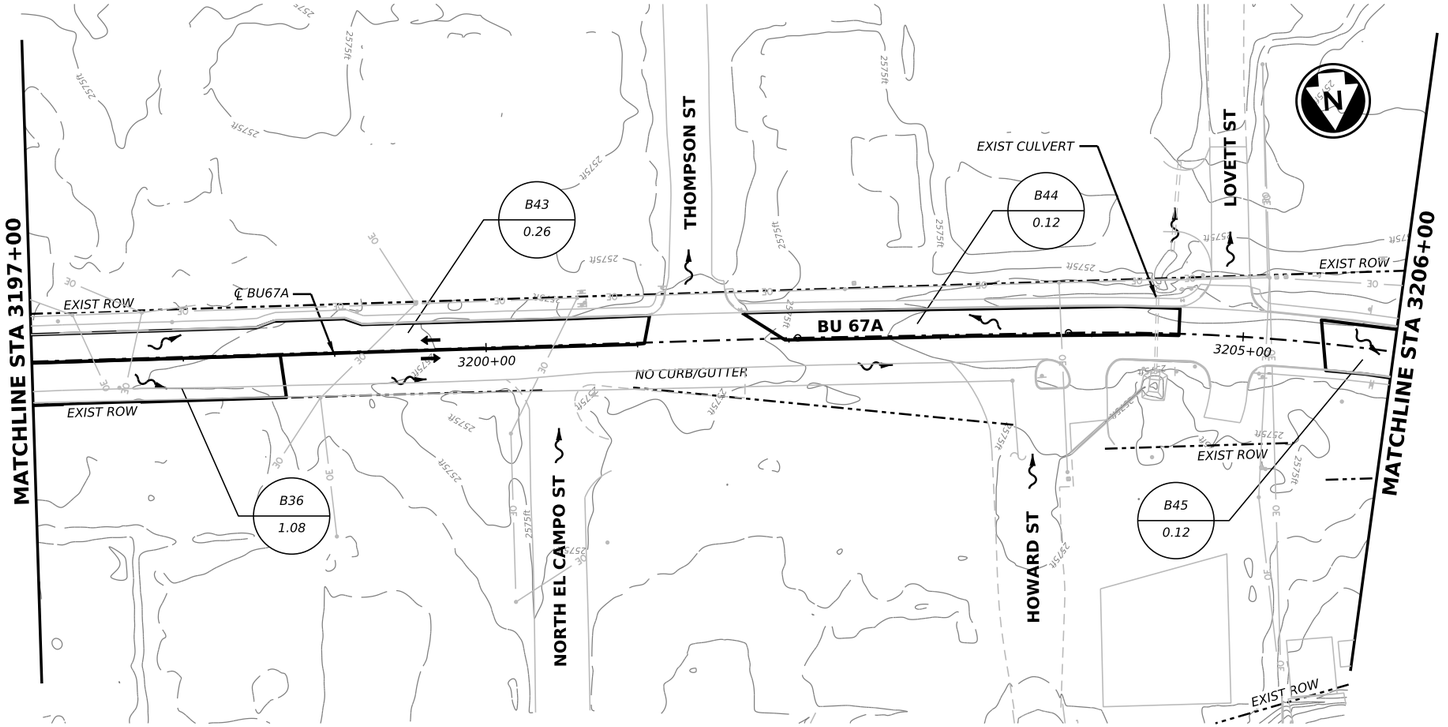

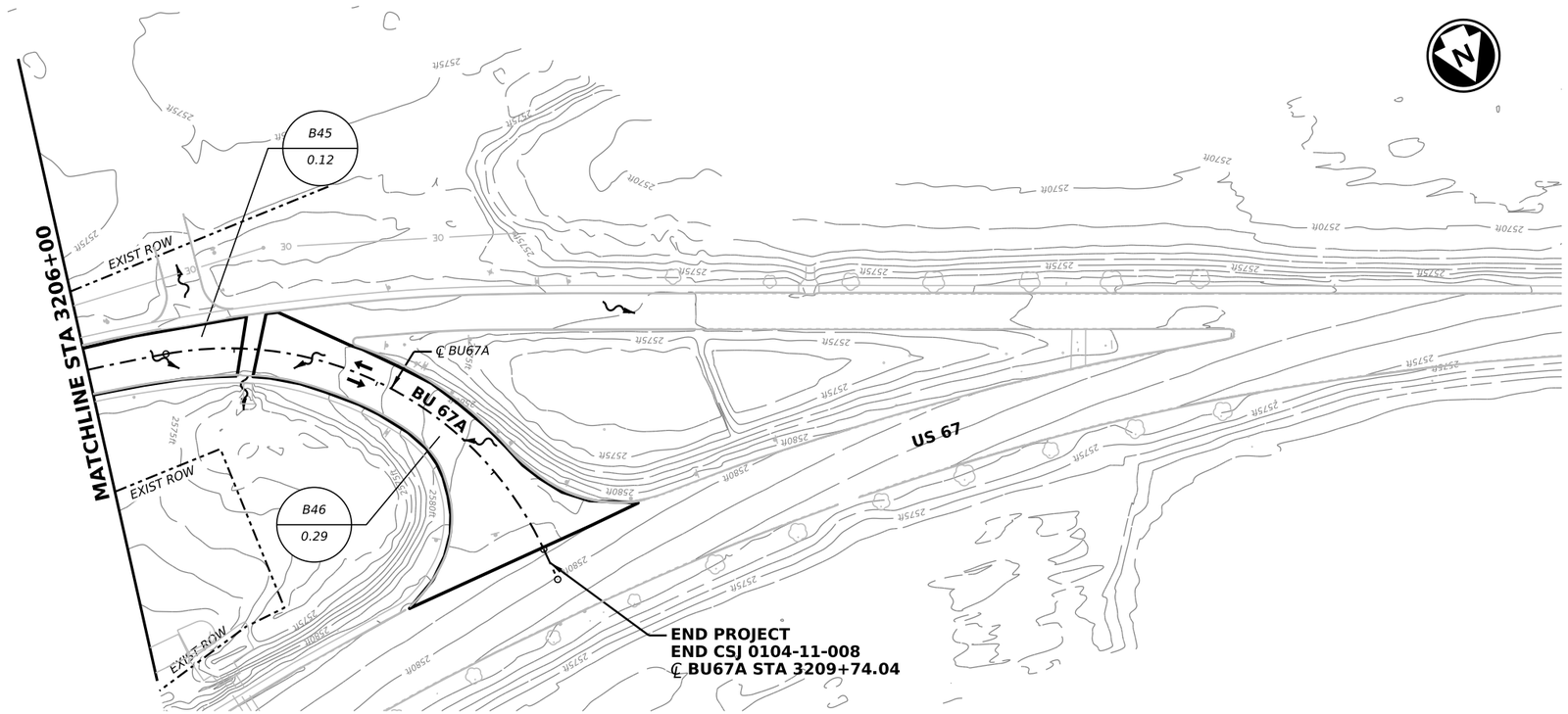

LEGEND:

- EXISTING ROW
- TRAFFIC FLOW DIRECTION
- DRAINAGE AREA BOUNDARY
- DIRECTION OF FLOW
- ID / 00.00 — DRAINAGE AREA ID / DRAINAGE AREA ACREAGE

NOTES:

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0 50 100

SCALE: 1"=100'

DATE	BY	REV	REVISION

STATE OF TEXAS
LISA M. LAUVER
115404
LICENSED PROFESSIONAL ENGINEER

5/20/2023

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BU 67A

DRAINAGE MAP

STA 3197+00 TO END OF PROJECT

SHEET 6 OF 6

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		74

DATE: 5/20/2023 6:48:03 PM
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STARTING ROADWAY STATION	ENDING ROADWAY STATION	LEFT/RIGHT SIDE OF ROAD	DRAINAGE BASIN ID	BASIN AREA [AC]	MANNINGS N-VALUE	PAVEMENT CROSS SLOPE (SX) [FT/FT]	ROADWAY SLOPE (SL) [FT/FT]	2-YEAR			5-YEAR			100-YEAR		
								2-YR FLOW (Q2) [CFS]	2-YR MAX WIDTH OF FLOW (T) [FT]	2-YR MAX DEPTH OF FLOW (D) [IN]	5-YR FLOW (Q5) [CFS]	5-YR MAX WIDTH OF FLOW (T) [FT]	5-YR MAX DEPTH OF FLOW (D) [IN]	100-YR FLOW (Q100) [CFS]	100-YR MAX WIDTH OF FLOW (T) [FT]	100-YR MAX DEPTH OF FLOW (D) [IN]
3115+48	3121+48	L	B1	0.32	0.013	0.003	0.003	1.0	27.3	1.0	1.2	29.7	1.1	2.1	36.7	1.3
3115+64	3122+45	R	B2	0.35	0.013	0.002	0.003	1.1	36.4	0.9	1.3	39.7	1.0	2.4	49.1	1.2
3123+16	3125+98	R	B3	0.25	0.013	0.042	0.004	0.8	4.6	2.3	1.0	5.0	2.5	1.7	6.1	3.1
3126+99	3129+61	R	B4	0.18	0.013	0.002	0.006	0.6	25.2	0.6	0.7	27.5	0.7	1.3	34.0	0.8
3130+44	3131+82	R	B5	0.12	0.013	0.016	0.011	0.4	5.2	1.0	0.5	5.6	1.1	0.8	7.0	1.3
3130+50	3133+87	L	B6	0.29	0.013	0.021	0.010	0.9	6.2	1.6	1.1	6.8	1.7	2.0	8.4	2.1
3132+83	3138+89	R	B7	0.32	0.013	0.022	0.009	1.0	6.4	1.7	1.2	7.0	1.8	2.2	8.6	2.3
3134+50	3138+68	L	B8	0.22	0.013	0.023	0.009	0.7	5.5	1.5	0.9	5.9	1.6	1.5	7.3	2.0
3139+52	3145+12	R	B9	0.70	0.013	0.024	0.011	2.1	7.8	2.3	2.7	8.5	2.5	4.7	10.5	3.0
3139+40	3141+83	L	B10	0.13	0.013	0.029	0.010	0.4	3.7	1.3	0.5	4.1	1.4	0.9	5.0	1.8
3142+42	3144+89	L	B11	0.13	0.013	0.020	0.011	0.4	4.6	1.1	0.5	5.0	1.2	0.9	6.2	1.5
3145+72	3148+22	R	B12	0.13	0.013	0.027	0.011	0.4	3.8	1.2	0.5	4.2	1.4	0.9	5.2	1.7
3145+64	3146+77	L	B13	0.06	0.013	0.015	0.011	0.2	4.1	0.7	0.2	4.5	0.8	0.4	5.5	1.0
3147+24	3147+84	L	B14	0.03	0.013	0.023	0.011	0.1	2.5	0.7	0.1	2.8	0.8	0.2	3.4	0.9
3148+98	3150+45	R	B15	0.07	0.013	0.024	0.011	0.2	3.4	1.0	0.3	3.7	1.1	0.5	4.6	1.3
3148+95	3149+56	L	B16	0.03	0.013	0.025	0.011	0.1	2.4	0.7	0.1	2.6	0.8	0.2	3.2	1.0
3150+19	3152+41	L	B17	0.13	0.013	0.027	0.012	0.4	3.8	1.2	0.5	4.1	1.3	0.9	5.1	1.6
3150+78	3155+75	R	B18	0.29	0.013	0.026	0.011	0.9	5.4	1.7	1.1	5.8	1.8	2.0	7.2	2.3
3153+18	3154+54	L	B19	0.07	0.013	0.024	0.011	0.2	3.3	1.0	0.3	3.6	1.0	0.5	4.5	1.3
3154+92	3156+04	L	B20	0.06	0.013	0.025	0.011	0.2	3.0	0.9	0.2	3.3	1.0	0.4	4.0	1.2
3156+50	3159+12	R	B21	0.15	0.013	0.028	0.012	0.5	3.9	1.3	0.6	4.3	1.4	1.0	5.3	1.8
3156+80	3159+41	L	B22	0.14	0.013	0.026	0.012	0.4	4.0	1.2	0.5	4.3	1.4	0.9	5.4	1.7
3159+91	3161+35	R	B23	0.08	0.013	0.026	0.008	0.2	3.5	1.1	0.3	3.8	1.2	0.5	4.7	1.5
3160+19	3162+00	L	B24	0.41	0.013	0.005	0.003	1.3	21.8	1.3	1.6	23.8	1.4	2.8	29.4	1.8
3161+39	3162+47	R	B25	0.09	0.013	0.015	0.004	0.3	5.8	1.1	0.3	6.4	1.1	0.6	7.9	1.4
3162+62	3164+42	R	B26	0.10	0.013	0.011	0.005	0.3	7.0	0.9	0.4	7.7	1.0	0.7	9.5	1.2
3165+84	3166+91	R	B27	0.06	0.013	0.013	0.003	0.2	5.9	0.9	0.2	6.4	1.0	0.4	7.9	1.2
3165+40	3166+91	L	B28	0.06	0.013	0.005	0.003	0.2	10.7	0.6	0.2	11.7	0.7	0.4	14.4	0.9
3166+91	3167+54	L	B29	0.03	0.013	0.014	0.002	0.1	4.6	0.8	0.1	5.0	0.8	0.2	6.2	1.0
3169+16	3172+49	R	B30	0.19	0.013	0.024	0.006	0.6	5.4	1.6	0.7	5.9	1.7	1.3	7.3	2.1
3167+96	3172+49	L	B31	0.31	0.013	0.013	0.006	1.0	9.5	1.5	1.2	10.4	1.6	2.1	12.8	2.0
3172+64	3176+31	R	B32	0.19	0.013	0.024	0.003	0.6	6.1	1.8	0.7	6.6	1.9	1.3	8.2	2.4
3176+69	3179+76	R	B33	0.25	0.013	0.008	0.007	0.8	11.5	1.1	1.0	12.6	1.2	1.7	15.5	1.5
3174+78	3179+90	L	B34	0.27	0.013	0.032	0.007	0.8	5.0	1.9	1.1	5.5	2.1	1.9	6.7	2.6
3179+93	3182+06	R	B35	0.14	0.013	0.010	0.007	0.4	8.1	1.0	0.6	8.9	1.1	1.0	10.9	1.3
3182+06	3198+60	R	B36	1.08	0.013	0.019	0.005	2.3	10.9	2.5	3.0	11.9	2.7	5.5	14.9	3.4
3180+03	3181+98	L	B37	0.14	0.013	0.006	0.007	0.4	11.1	0.8	0.5	12.0	0.9	0.9	14.9	1.1
3181+98	3184+80	L	B38	0.21	0.013	0.017	0.004	0.6	7.2	1.5	0.7	7.9	1.6	1.3	9.8	2.0
3185+04	3186+85	L	B39	0.14	0.013	0.014	0.003	0.4	7.6	1.3	0.5	8.2	1.4	0.9	10.2	1.7
3187+06	3189+02	L	B40	0.15	0.013	0.020	0.002	0.5	6.7	1.6	0.6	7.4	1.8	1.0	9.1	2.2
3189+30	3192+57	L	B41	0.25	0.013	0.004	0.006	0.8	18.4	0.9	1.0	20.0	1.0	1.7	24.7	1.2
3192+82	3194+72	L	B42	0.15	0.013	0.010	0.005	0.5	8.8	1.1	0.6	9.6	1.2	1.0	11.9	1.4
3195+09	3201+01	L	B43	0.26	0.013	0.004	0.005	0.8	19.2	0.9	1.0	20.9	1.0	1.8	25.9	1.2
3201+62	3204+50	L	B44	0.12	0.013	0.012	0.011	0.4	6.2	0.9	0.5	6.7	1.0	0.8	8.3	1.2
3205+49	3206+93	R	B45	0.12	0.013	0.023	0.003	0.4	5.3	1.5	0.5	5.7	1.6	0.8	7.1	2.0
3207+04	3209+53	R	B46	0.29	0.013	0.022	0.300	0.9	3.2	0.8	1.1	3.5	0.9	2.0	4.3	1.1

1. FLOW RATES WERE CALCULATED USING THE RATIONAL METHOD PER TXDOT HYDRAULIC DESIGN MANUAL, CHAPTER 4, SECTION 12.
2. ONLY RAINFALL WITHIN THE PROJECT ROW WAS CONSIDERED. OFF-SITE CONTRIBUTING FLOWS ARE NOT INCLUDED.
3. GUTTER FLOW CALCULATIONS ARE PER TXDOT HYDRAULIC DESIGN MANUAL, CHAPTER 10, SECTION 6.

DATE	BY	REV	REVISION

STATE OF TEXAS
LISA M. LAUVER
115404
LICENSED PROFESSIONAL ENGINEER

5/20/2023

Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-0324

Texas Department of Transportation

BU 67A

DRAINAGE CALCULATIONS

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		75

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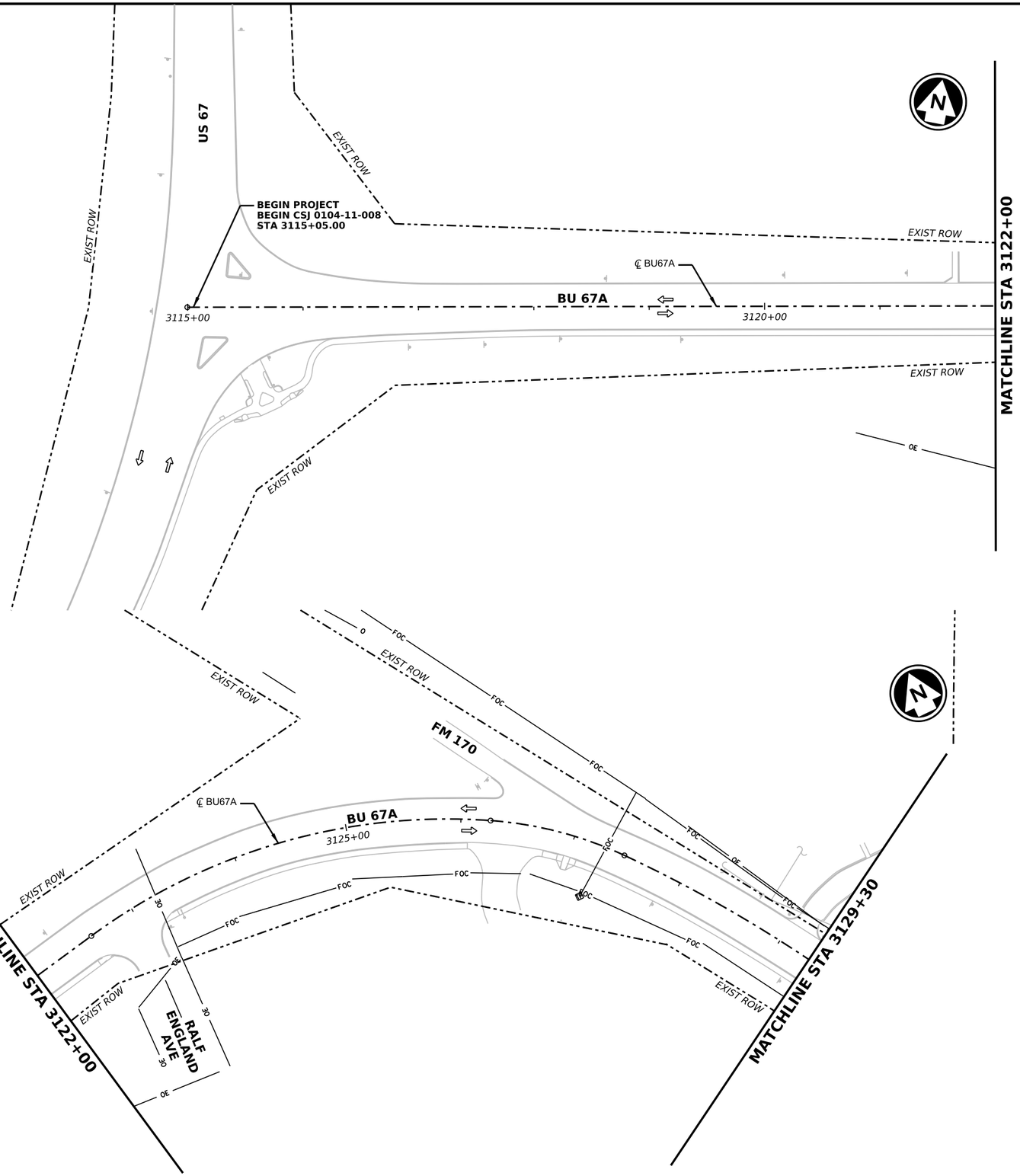

LEGEND:

- FOUND NGS VERTICAL MONUMENT
- LIGHT POLE
- POWER POLE
- GUY WIRE
- ELECTRICAL JUNCTION BOX
- ELECTRIC METER
- ELECTRICAL CONDUIT
- JUNCTION BOX
- FIRE HYDRANT
- WATER VALVE
- WATER METER
- WATER FAUCET
- WASTE WATER MANHOLE
- CLEAN OUT
- SIGN
- TELEPHONE MANHOLE
- TELEPHONE JUNCTION BOX
- TELEPHONE PEDESTAL
- WOOD POST
- IRRIGATION CONTROL VALVE
- IRRIGATION SPRINKLER HEAD
- VALVE
- GUARD POST
- RIGHT OF WAY LINE
- OVERHEAD ELECTRICAL LINE (OE)
- WATER LINE (WL)
- FIBER OPTIC LINE (FOC)
- STORM SEWER LINE (STM)
- SANITARY SEWER LINE (WWL)
- FORCE MAIN LINE (FM)

0 50 100

SCALE: 1"=100'

DATE	BY	REV	REVISION

STATE OF TEXAS
JAVIER A. ACOSTA
109225
LICENSED PROFESSIONAL ENGINEER
5/20/2023

FRANK X. SPENCER & ASSOCIATES, INC.
Consulting Civil Engineers & Surveyors
(TBPE# F-3584, TBPLS# 100490-00)
1130 MONTANA AVE, EL PASO, TX 79902
Ph: (915) 533-4800 Fax:(915)533-4673

Texas Department of Transportation

BU 67A

EXISTING UTILITIES LAYOUT

BEGIN OF PROJECT TO STA 3129+30

SHEET 1 OF 6

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		76

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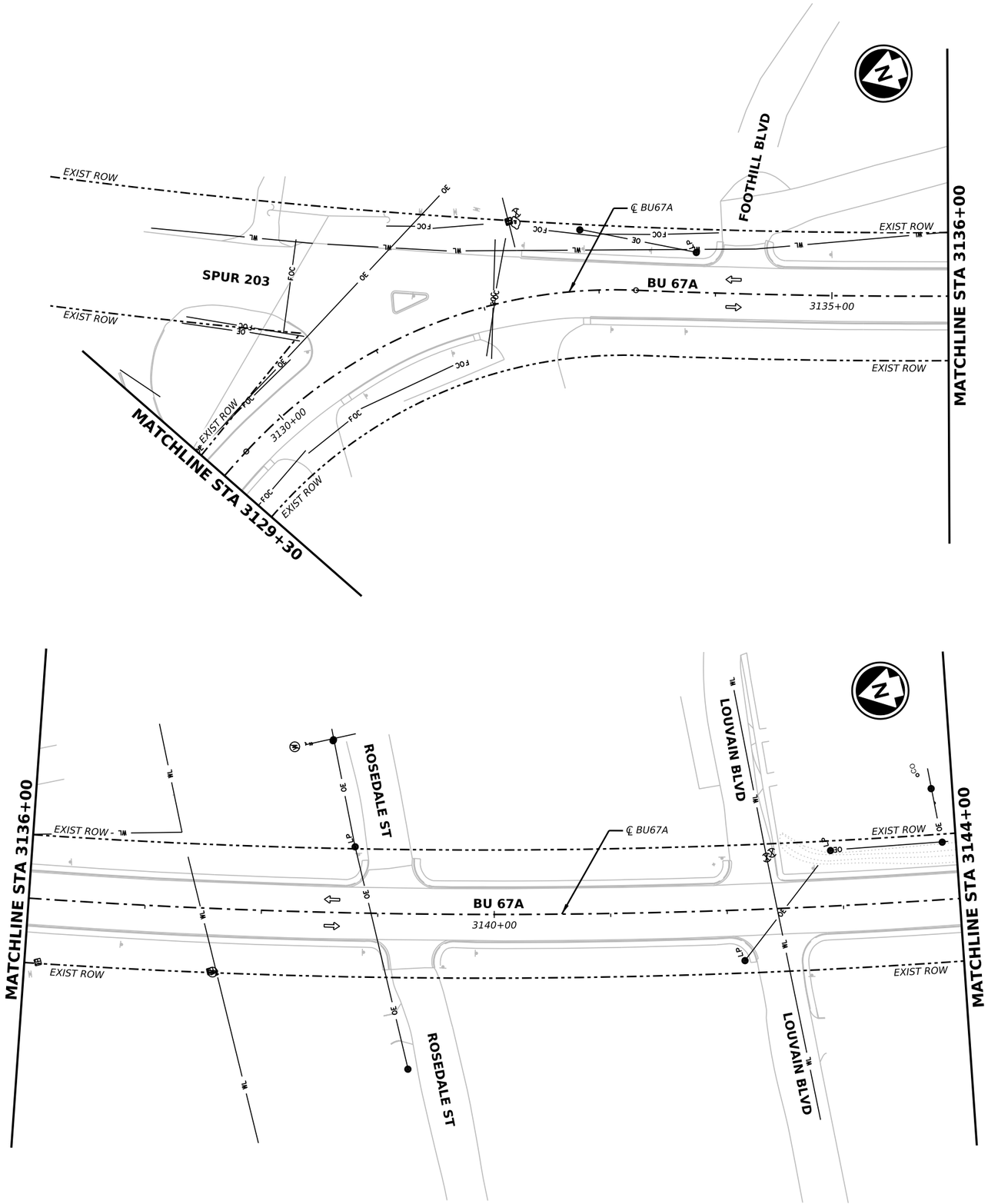

LEGEND:

- FOUND NGS VERTICAL MONUMENT
- LIGHT POLE
- POWER POLE
- GUY WIRE
- ELECTRICAL JUNCTION BOX
- ELECTRIC METER
- ELECTRICAL CONDUIT
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- IRRIGATION SPRINKLER HEAD
- VALVE
- GUARD POST
- RIGHT OF WAY LINE
- OE — OVERHEAD ELECTRICAL LINE
- WL — WATER LINE
- FOC — FIBER OPTIC LINE
- STM — STORM SEWER LINE
- WWL — SANITARY SEWER LINE
- FM — FORCE MAIN LINE

0 50 100

SCALE: 1"=100'

DATE	BY	REV	REVISION

STATE OF TEXAS
JAVIER A. ACOSTA
109225
LICENSED PROFESSIONAL ENGINEER
5/20/2023

FRANK X. SPENCER & ASSOCIATES, INC.
Consulting Civil Engineers & Surveyors
(TBPE# F-3584, TBPLS# 100490-00)
1130 MONTANA AVE, EL PASO, TX 79902
Ph: (915) 533-4800 Fax:(915)533-4673

Texas Department of Transportation

BU 67A

EXISTING UTILITIES LAYOUT

STA 3129+30 TO STA 3144+00

SHEET 2 OF 6

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		77

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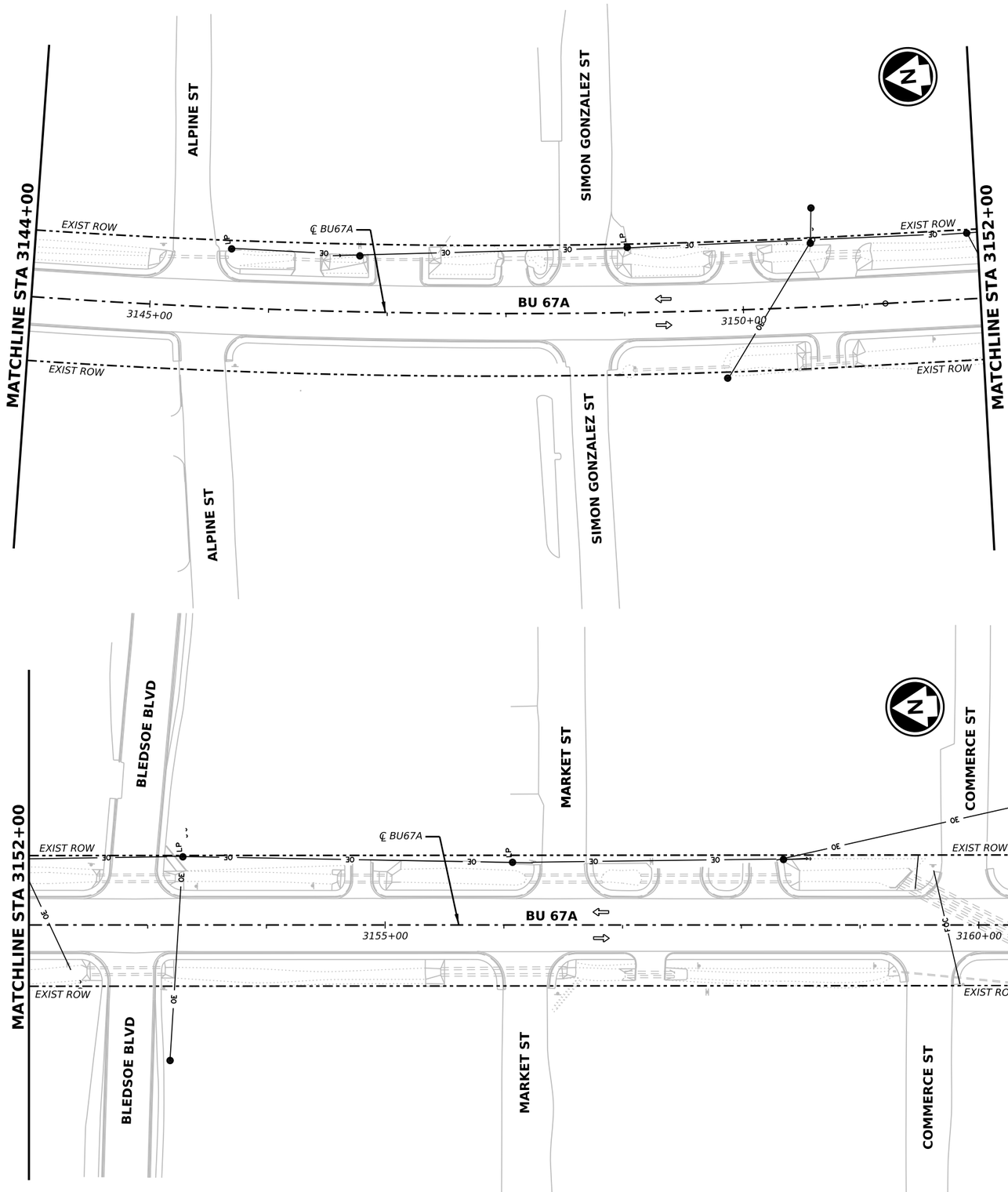

LEGEND:

- FOUND NGS VERTICAL MONUMENT
- LIGHT POLE
- POWER POLE
- GUY WIRE
- ELECTRICAL JUNCTION BOX
- ELECTRIC METER
- ELECTRICAL CONDUIT
- JUNCTION BOX
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- WATER VALVE
- WATER METER
- WATER FAUCET
- WASTE WATER MANHOLE
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- WL — WATER LINE
- FOC — FIBER OPTIC LINE
- STM — STORM SEWER LINE
- WWL — SANITARY SEWER LINE
- FM — FORCE MAIN LINE

0 50 100

SCALE: 1"=100'

DATE	BY	REV	REVISION

STATE OF TEXAS
JAVIER A. ACOSTA
109225
LICENSED
PROFESSIONAL ENGINEER
5/20/2023

FRANK X. SPENCER & ASSOCIATES, INC.
Consulting Civil Engineers & Surveyors
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1130 MONTANA AVE, EL PASO, TX 79902
Ph: (915) 533-4600 Fax:(915)533-4673

Texas Department of Transportation

BU 67A

EXISTING UTILITIES LAYOUT

STA 3144+00 TO STA 3160+40

SHEET 3 OF 6

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		78

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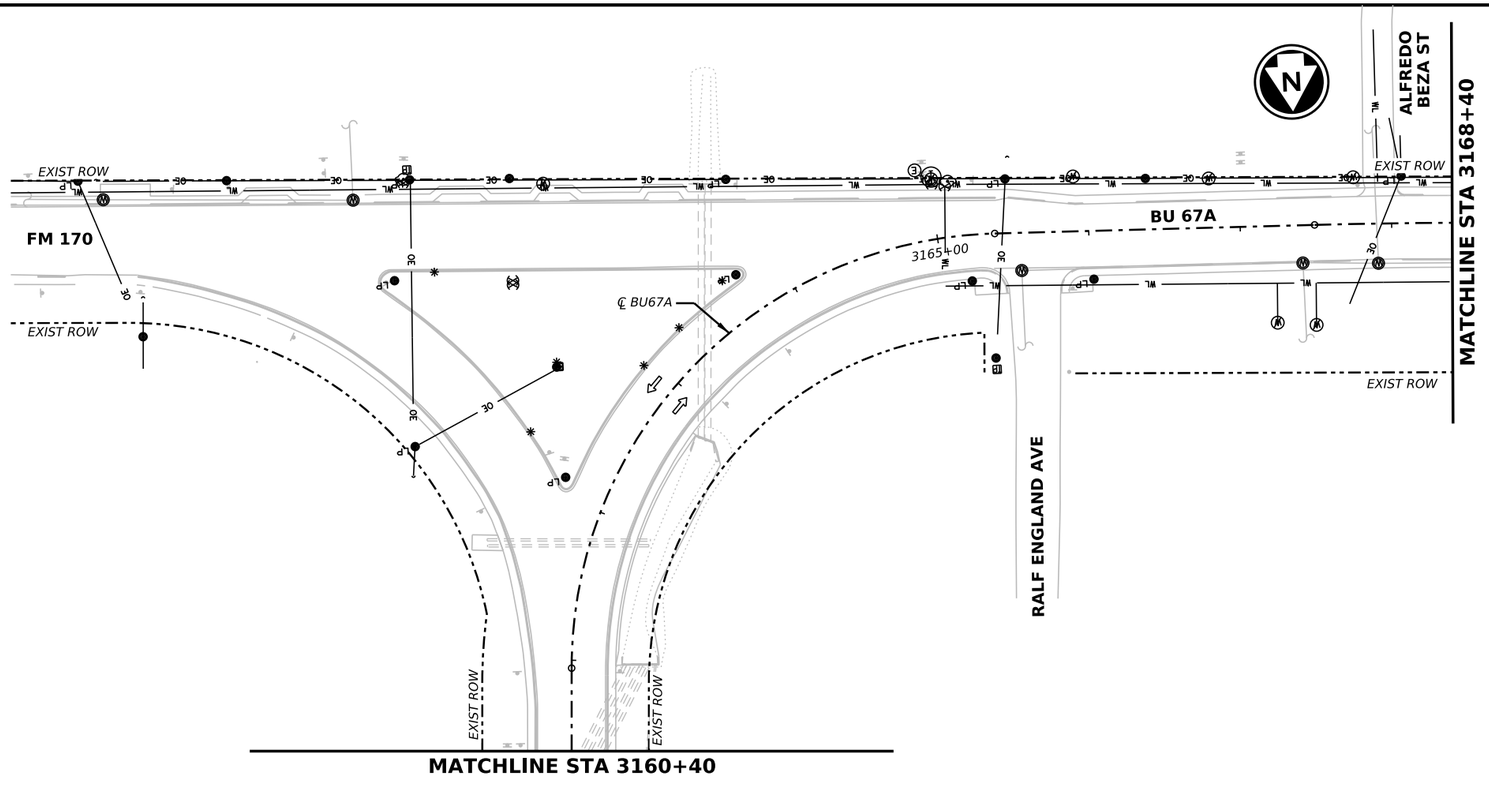

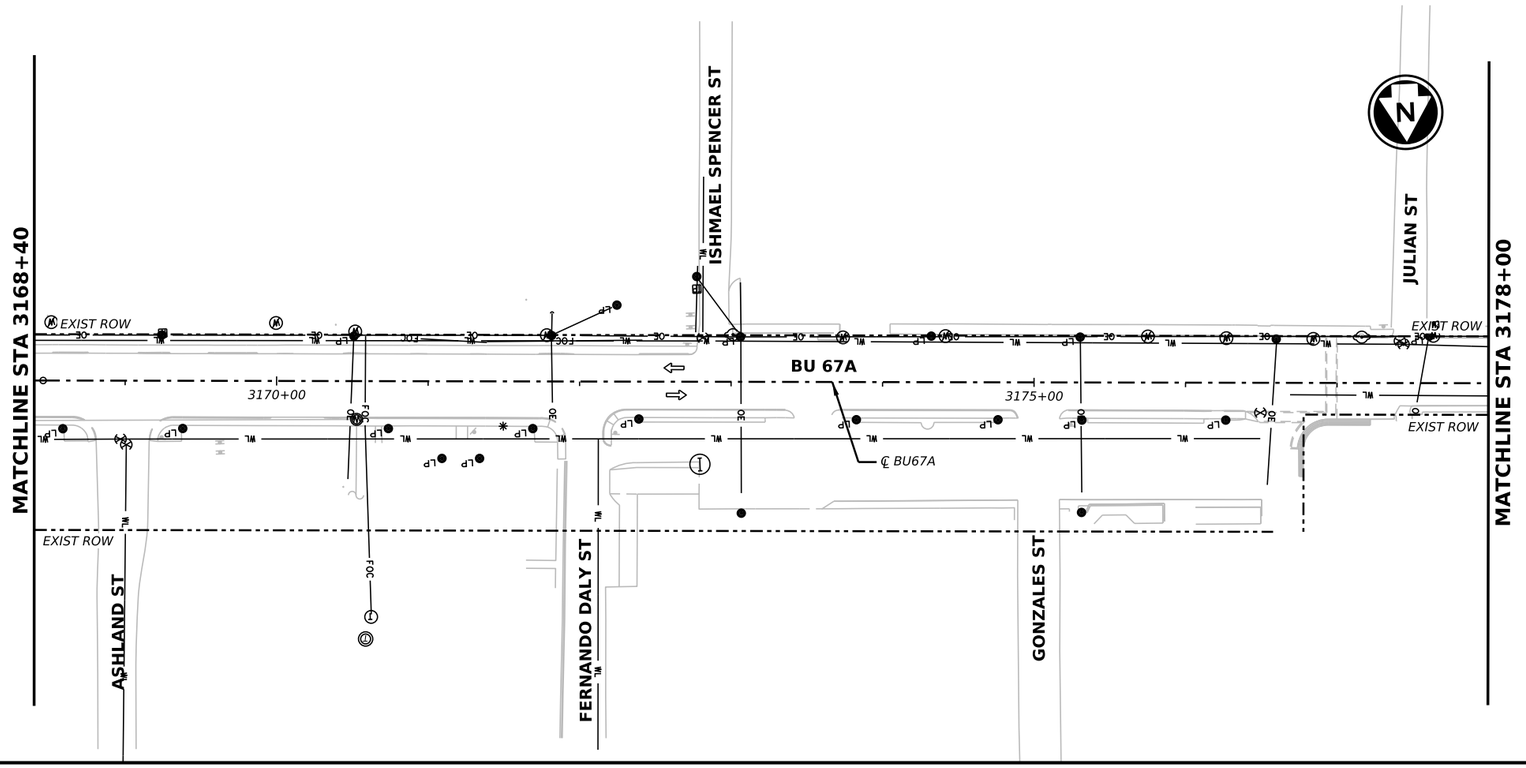

LEGEND:

- FOUND NGS VERTICAL MONUMENT
- LIGHT POLE
- POWER POLE
- GUY WIRE
- ELECTRICAL JUNCTION BOX
- ELECTRIC METER
- ELECTRICAL CONDUIT
- JUNCTION BOX
- FIRE HYDRANT
- WATER VALVE
- WATER METER
- WATER FAUCET
- WASTE WATER MANHOLE
- CLEAN OUT
- SIGN
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- TELEPHONE PEDESTAL
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- RIGHT OF WAY LINE
- OE — OVERHEAD ELECTRICAL LINE
- WL — WATER LINE
- FOC — FIBER OPTIC LINE
- STM — STORM SEWER LINE
- WWL — SANITARY SEWER LINE
- FM — FORCE MAIN LINE

0 50 100

SCALE: 1"=100'

DATE	BY	REV	REVISION

STATE OF TEXAS
JAVIER A. ACOSTA
109225
LICENSED PROFESSIONAL ENGINEER
5/20/2023

FRANK X. SPENCER & ASSOCIATES, INC.
Consulting Civil Engineers & Surveyors
(TBPE# F-3584, TBPLS# 100490-00)
1130 MONTANA AVE, EL PASO, TX 79902
Ph: (915) 533-4800 Fax:(915)533-4673

Texas Department of Transportation

BU 67A

EXISTING UTILITIES LAYOUT

STA 3160+40 TO STA 3178+00

SHEET 4 OF 6

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		79

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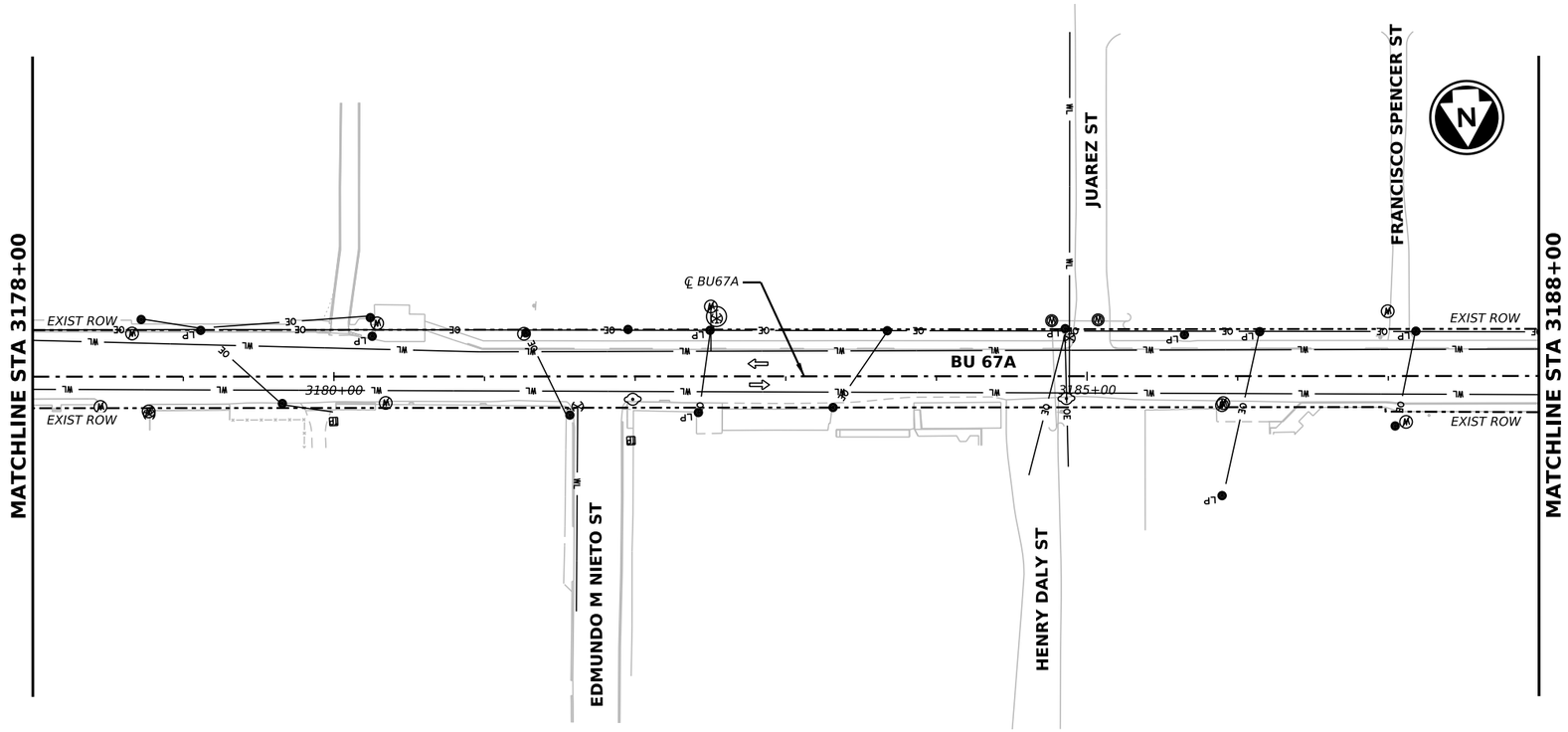

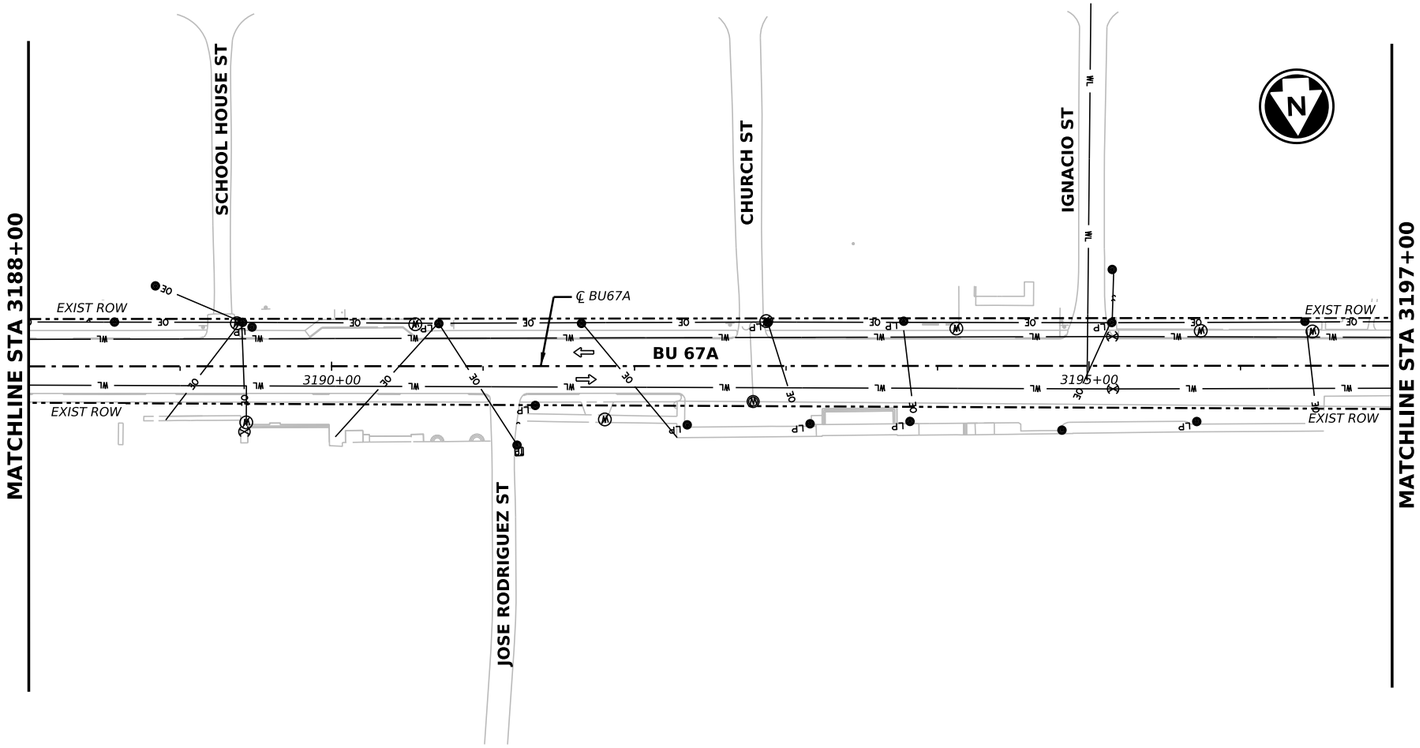

LEGEND:

- FOUND NGS VERTICAL MONUMENT
- LIGHT POLE
- POWER POLE
- GUY WIRE
- ELECTRICAL JUNCTION BOX
- ELECTRIC METER
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- WWL — SANITARY SEWER LINE
- FM — FORCE MAIN LINE

0 50 100

SCALE: 1"=100'

DATE	BY	REV	REVISION

STATE OF TEXAS
JAVIER A. ACOSTA
109225
LICENSED
PROFESSIONAL ENGINEER
5/20/2023

FRANK X. SPENCER & ASSOCIATES, INC.
Consulting Civil Engineers & Surveyors
(TBPE# F-3584, TBPLS# 100490-00)
1130 MONTANA AVE, EL PASO, TX 79902
Ph: (915) 533-4800 Fax:(915)533-4673

Texas Department of Transportation

BU 67A

EXISTING UTILITIES LAYOUT

STA 3178+00 TO STA 3197+00

SHEET 5 OF 6

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		80

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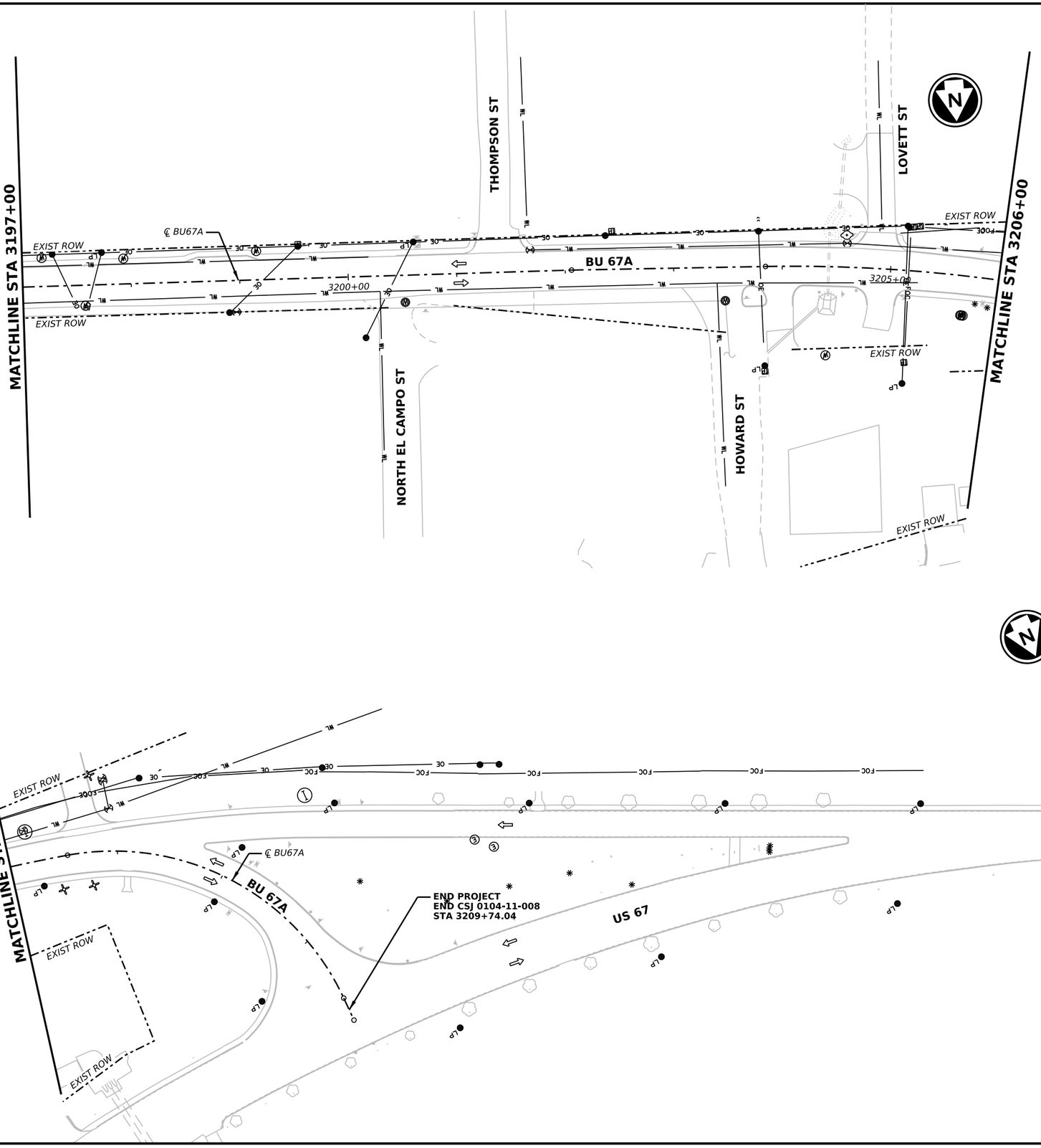

LEGEND:

- FOUND NGS VERTICAL MONUMENT
- LIGHT POLE
- POWER POLE
- GUY WIRE
- ELECTRICAL JUNCTION BOX
- ELECTRIC METER
- ELECTRICAL CONDUIT
- JUNCTION BOX
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- WATER FAUCET
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- STM — STORM SEWER LINE
- WWL — SANITARY SEWER LINE
- FM — FORCE MAIN LINE

0 50 100

SCALE: 1"=100'

DATE	BY	REV	REVISION

STATE OF TEXAS
JAVIER A. ACOSTA
109225
PROFESSIONAL LICENSED ENGINEER
5/20/2023

FRANK X. SPENCER & ASSOCIATES, INC.
Consulting Civil Engineers & Surveyors
(TBPE# F-3584, TBPLS# 100490-00)
1130 MONTANA AVE, EL PASO, TX 79902
Ph: (915) 533-4800 Fax:(915)533-4673

Texas Department of Transportation

BU 67A

EXISTING UTILITIES LAYOUT

STA 3197+00 TO END OF PROJECT

SHEET 6 OF 6

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		81

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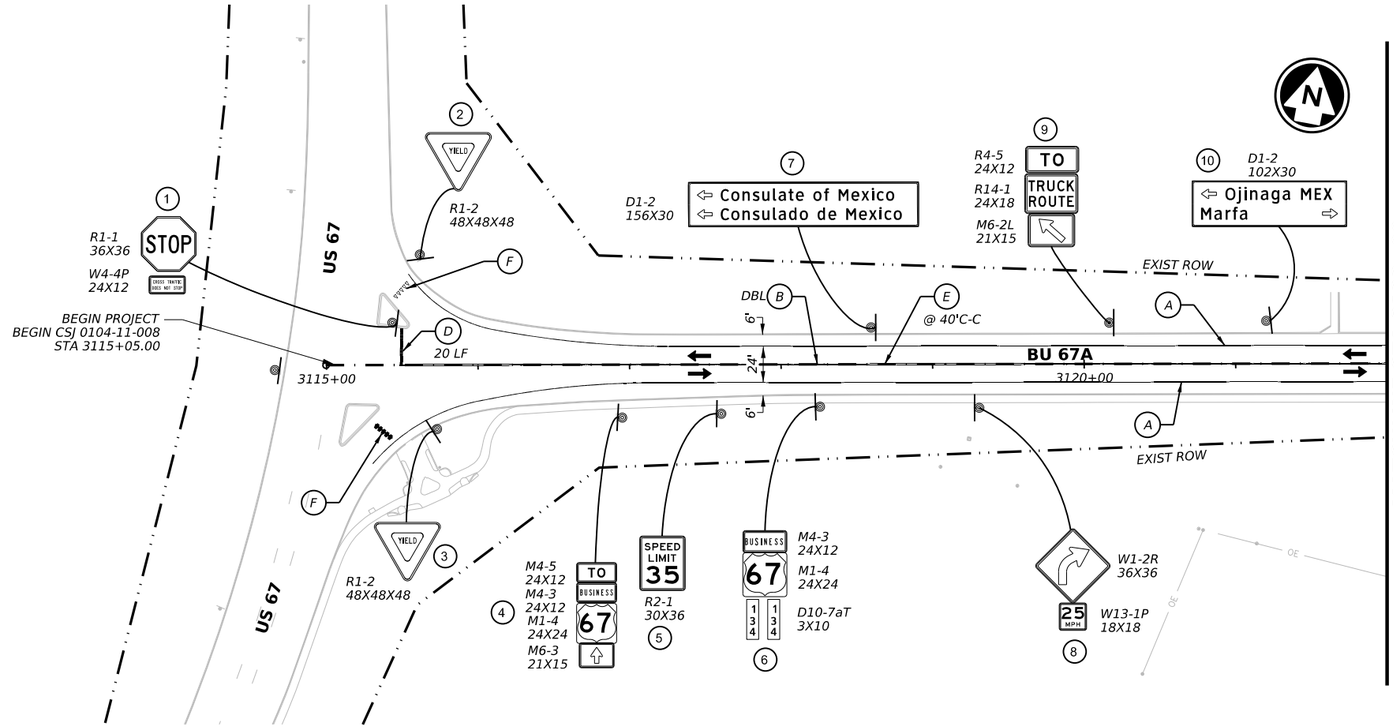

SIGNING AND PAVEMENT MARKING QUANTITIES			
ITEM	DESCRIPTION	UNIT	QTY
644 6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	5
644 6002	IN SM RD SN SUP&AM TY10BWG(1)SA(P-BM)	EA	1
644 6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	2
644 6036	IN SM RD SN SUP&AM TYS80(1)SA(U-BM)	EA	2
644 6076	REMOVE SM RD SN SUP&AM	EA	10
666 6101	REF PAV MRK TY I(W)36"(YLD TRI)(090MIL)	EA	10
666 6308	RE PM W/RET REQ TY I (W)6"(SLD)(090MIL)	LF	1360
666 6320	RE PM W/RET REQ TY I (Y)6"(SLD)(090MIL)	LF	1340
668 6047	REFL PAV MRK TY I (W)24"(SLD)(090MIL)	LF	20
672 6009	REFL PAV MRKR TY II-A-A	EA	17
678 6002	PAV SURF PREP FOR MRK (6")	LF	2700
678 6008	PAV SURF PREP FOR MRK (24")	LF	20
678 6023	PAV SURF PREP FOR MRK (36") (YLD TRI)	EA	10

LEGEND:

- (A) *RE PM W/RET REQ TY I (W)6"(SLD) (90MIL)*
- (B) *RE PM W/RET REQ TY I (Y)6"(SLD) (90MIL)*
- (C) *REFL PAV MRK TY I (W)8"(SLD) (90MIL)*
- (D) *REFL PAV MRK TY I (W)24"(SLD) (90MIL)*
- (E) *REFL PAV MRKR TY II-A-A*
- (F) *REF PAV MRK TY I(W)36"(YLD TRI)(90MIL)*
- ⬅ *TRAFFIC FLOW*
- (#) *SIGN TO BE REMOVED AND REINSTALLED*
- ⚠(#) *SIGN TO BE INSTALLED*

NOTES:

1. *ALL POSTED REGULATORY AND ADVISORY SPEED SIGNS SHALL BE ESTABLISHED ON THE BASIS OF AN ENGINEERING STUDY. CONTRACTOR TO COORDINATE WITH THE ENGINEER FOR APPROPRIATE SIGN LOCATION AND SPEED TO SHOW ON ALL R2-1 AND W13-1P PLAQUES UNLESS OTHERWISE DIRECTED BY THE ENGINEER.*
2. *ALL SIGNING AND PAVEMENT MARKINGS MUST COMPLY WITH TxDOT STANDARDS AND TMUTCD, UNLESS OTHERWISE APPROVED BY ENGINEER.*
3. *ALL SMALL SIGN LOCATIONS ARE APPROXIMATE UNLESS OTHERWISE NOTED. FIELD ADJUSTMENT MAY BE NECESSARY TO COMPLY WITH TxDOT STANDARDS.*
4. *REFER TO TYPICAL SECTIONS FOR LANE WIDTHS. PROPOSED DOUBLE YELLOW AND WHITE LANE LINE SHALL BE PLACED ACCORDING TO THE EXISITING CONFIGURATION.*
5. *REFER TO SIGNING DETAIL SHEETS FOR ADDITIONAL INFORMATION.*

0 50 100

SCALE: 1"=100'

DATE	BY	REV	REVISION

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER
5/23/2023

I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

Texas Department of Transportation

BU 67A

SIGNING AND PAVEMENT MARKING PLAN

BEGIN OF PROJECT TO STA 3122+00

SHEET 1 OF 12

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		82

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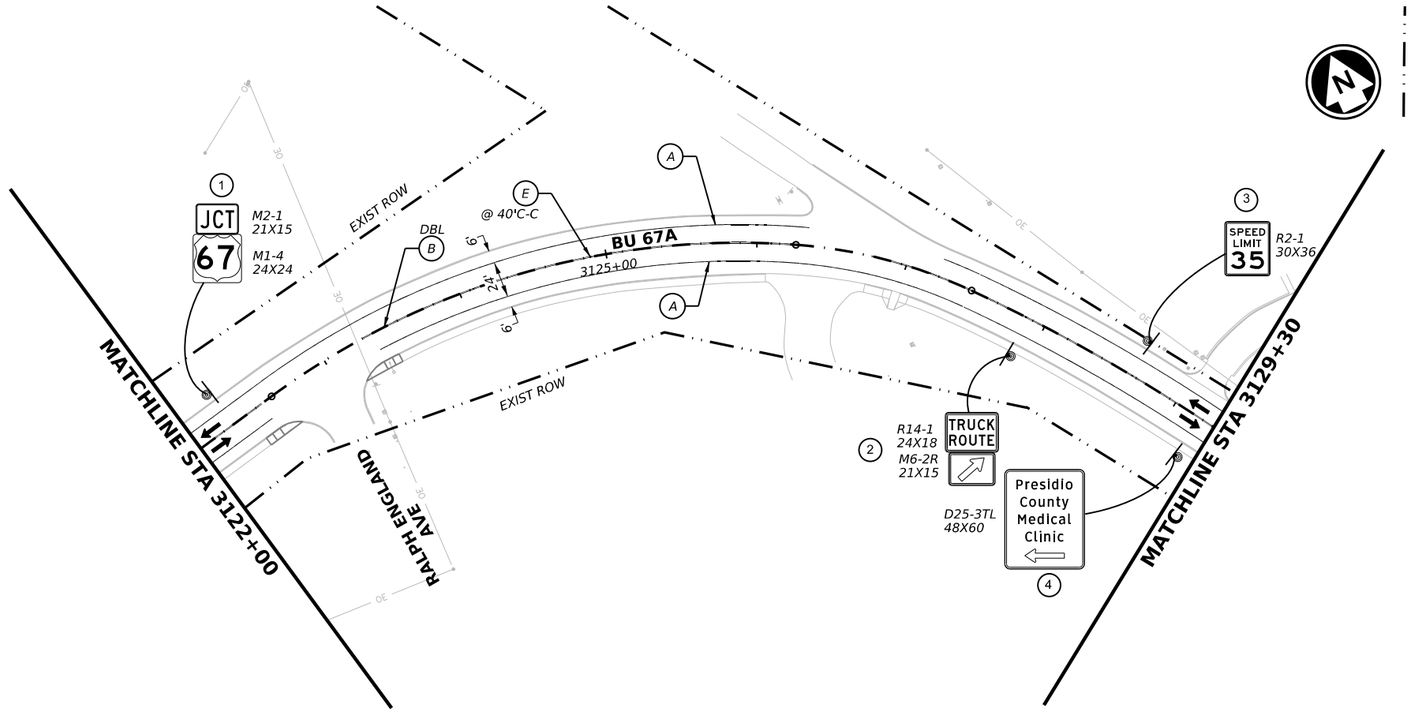

SIGNING AND PAVEMENT MARKING QUANTITIES			
ITEM	DESCRIPTION	UNIT	QTY
644 6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	3
644 6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	1
644 6076	REMOVE SM RD SN SUP&AM	EA	4
666 6308	RE PM W/RET REQ TY I (W)6"(SLD)(090MIL)	LF	1200
666 6320	RE PM W/RET REQ TY I (Y)6"(SLD)(090MIL)	LF	1350
672 6009	REFL PAV MRKR TY II-A-A	EA	17
678 6002	PAV SURF PREP FOR MRK (6")	LF	2550

LEGEND:

- (A) RE PM W/RET REQ TY I (W)6"(SLD) (90MIL)
- (B) RE PM W/RET REQ TY I (Y)6"(SLD) (90MIL)
- (C) REFL PAV MRK TY I (W)8"(SLD) (90MIL)
- (D) REFL PAV MRK TY I (W)24"(SLD) (90MIL)
- (E) REFL PAV MRKR TY II-A-A
- (F) REF PAV MRK TY I(W)36"(YLD TRI)(90MIL)
- TRAFFIC FLOW
- (#) SIGN TO BE REMOVED AND REINSTALLED
- (#) SIGN TO BE INSTALLED

NOTES:

1. ALL POSTED REGULATORY AND ADVISORY SPEED SIGNS SHALL BE ESTABLISHED ON THE BASIS OF AN ENGINEERING STUDY. CONTRACTOR TO COORDINATE WITH THE ENGINEER FOR APPROPRIATE SIGN LOCATION AND SPEED TO SHOW ON ALL R2-1 AND W13-1P PLAQUES UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
2. ALL SIGNING AND PAVEMENT MARKINGS MUST COMPLY WITH TxDOT STANDARDS AND TMUTCD, UNLESS OTHERWISE APPROVED BY ENGINEER.
3. ALL SMALL SIGN LOCATIONS ARE APPROXIMATE UNLESS OTHERWISE NOTED. FIELD ADJUSTMENT MAY BE NECESSARY TO COMPLY WITH TxDOT STANDARDS.
4. REFER TO TYPICAL SECTIONS FOR LANE WIDTHS. PROPOSED DOUBLE YELLOW AND WHITE LANE LINE SHALL BE PLACED ACCORDING TO THE EXISITING CONFIGURATION.
5. REFER TO SIGNING DETAIL SHEETS FOR ADDITIONAL INFORMATION.

0 50 100

SCALE: 1"=100'

DATE	BY	REV	REVISION

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER

5/23/2023

I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

Texas Department of Transportation

BU 67A

SIGNING AND PAVEMENT MARKING PLAN

STA 3122+00 TO STA 3129+30

SHEET 2 OF 12

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		83

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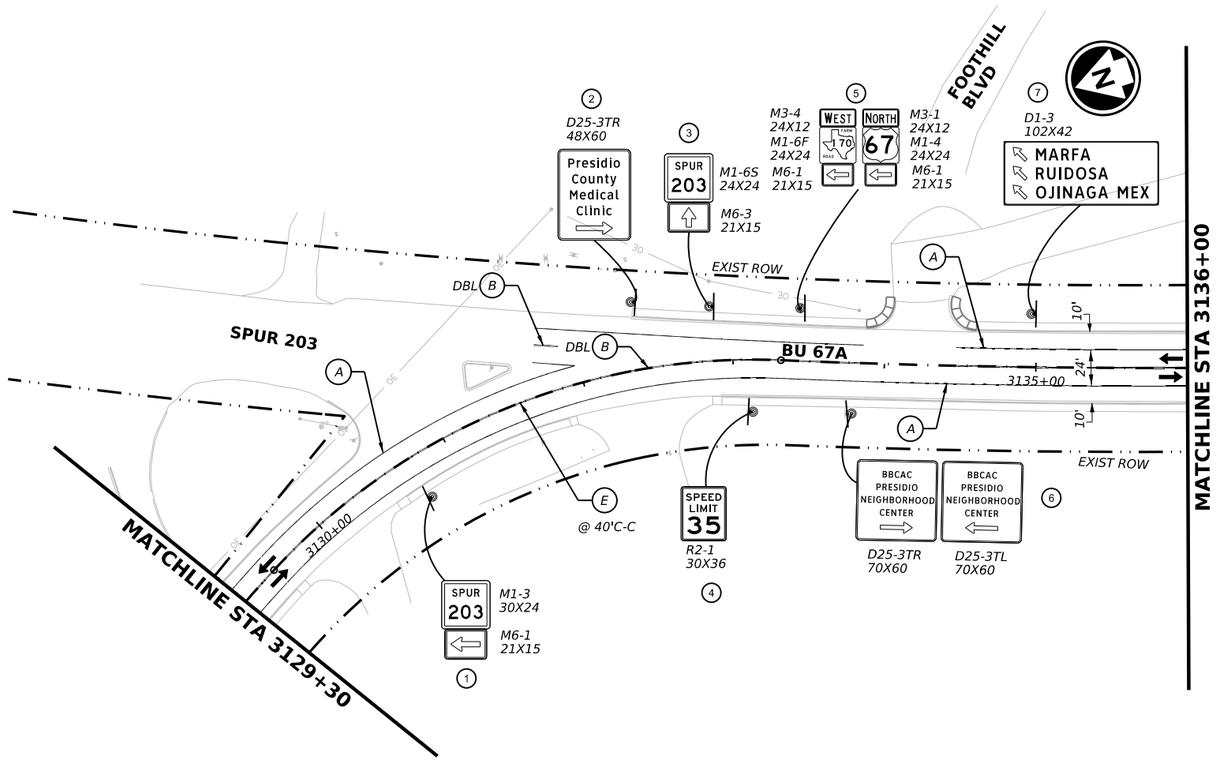

SIGNING AND PAVEMENT MARKING QUANTITIES			
ITEM	DESCRIPTION	UNIT	QTY
644 6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	3
644 6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	1
644 6033	IN SM RD SN SUP&AM TYS80(1)SA(U)	EA	2
644 6036	IN SM RD SN SUP&AM TYS80(1)SA(U-BM)	EA	1
644 6076	REMOVE SM RD SN SUP&AM	EA	7
666 6308	RE PM W/RET REQ TY I (W)6"(SLD)(090MIL)	LF	1340
666 6320	RE PM W/RET REQ TY I (Y)6"(SLD)(090MIL)	LF	1340
672 6009	REFL PAV MRKR TY II-A-A	EA	17
678 6002	PAV SURF PREP FOR MRK (6")	LF	2680

LEGEND:

- (A) *RE PM W/RET REQ TY I (W)6"(SLD) (90MIL)*
- (B) *RE PM W/RET REQ TY I (Y)6"(SLD) (90MIL)*
- (C) *REFL PAV MRK TY I (W)8"(SLD) (90MIL)*
- (D) *REFL PAV MRK TY I (W)24"(SLD) (90MIL)*
- (E) *REFL PAV MRKR TY II-A-A*
- (F) *REF PAV MRK TY I(W)36"(YLD TRI)(90MIL)*
- *TRAFFIC FLOW*
- (#) *SIGN TO BE REMOVED AND REINSTALLED*
- (#) *SIGN TO BE INSTALLED*

NOTES:

1. *ALL POSTED REGULATORY AND ADVISORY SPEED SIGNS SHALL BE ESTABLISHED ON THE BASIS OF AN ENGINEERING STUDY. CONTRACTOR TO COORDINATE WITH THE ENGINEER FOR APPROPRIATE SIGN LOCATION AND SPEED TO SHOW ON ALL R2-1 AND W13-1P PLAQUES UNLESS OTHERWISE DIRECTED BY THE ENGINEER.*
2. *ALL SIGNING AND PAVEMENT MARKINGS MUST COMPLY WITH TxDOT STANDARDS AND TMUTCD, UNLESS OTHERWISE APPROVED BY ENGINEER.*
3. *ALL SMALL SIGN LOCATIONS ARE APPROXIMATE UNLESS OTHERWISE NOTED. FIELD ADJUSTMENT MAY BE NECESSARY TO COMPLY WITH TxDOT STANDARDS.*
4. *REFER TO TYPICAL SECTIONS FOR LANE WIDTHS. PROPOSED DOUBLE YELLOW AND WHITE LANE LINE SHALL BE PLACED ACCORDING TO THE EXISITING CONFIGURATION.*
5. *REFER TO SIGNING DETAIL SHEETS FOR ADDITIONAL INFORMATION.*

0 50 100

SCALE: 1"=100'

DATE	BY	REV	REVISION

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER
5/23/2023

I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

Texas Department of Transportation

BU 67A

SIGNING AND PAVEMENT MARKING PLAN

STA 3129+30 TO STA 3136+00

SHEET 3 OF 12

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		84

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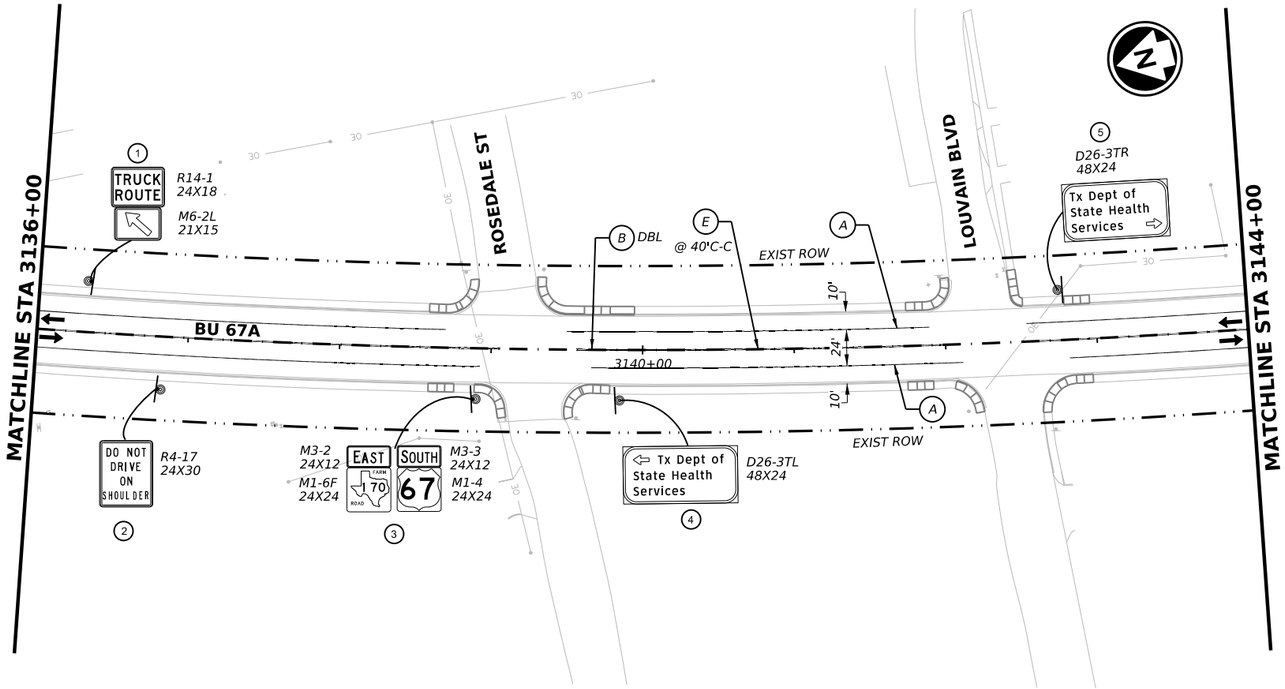

SIGNING AND PAVEMENT MARKING QUANTITIES			
ITEM	DESCRIPTION	UNIT	QTY
644 6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	3
644 6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	1
644 6007	IN SM RD SN SUP&AM TY10BWG(1)SA(U)	EA	1
644 6076	REMOVE SM RD SN SUP&AM	EA	5
666 6308	RE PM W/RET REQ TY I (W)6"(SLD)(090MIL)	LF	1280
666 6320	RE PM W/RET REQ TY I (Y)6"(SLD)(090MIL)	LF	1280
672 6009	REFL PAV MRKR TY II-A-A	EA	17
678 6002	PAV SURF PREP FOR MRK (6")	LF	2560

LEGEND:

- (A) *RE PM W/RET REQ TY I (W)6"(SLD) (90MIL)*
- (B) *RE PM W/RET REQ TY I (Y)6"(SLD) (90MIL)*
- (C) *REFL PAV MRK TY I (W)8"(SLD) (90MIL)*
- (D) *REFL PAV MRK TY I (W)24"(SLD) (90MIL)*
- (E) *REFL PAV MRKR TY II-A-A*
- (F) *REF PAV MRK TY I(W)36"(YLD TRI)(90MIL)*
- *TRAFFIC FLOW*
- (#) *SIGN TO BE REMOVED AND REINSTALLED*
- *SIGN TO BE INSTALLED*

NOTES:

1. *ALL POSTED REGULATORY AND ADVISORY SPEED SIGNS SHALL BE ESTABLISHED ON THE BASIS OF AN ENGINEERING STUDY. CONTRACTOR TO COORDINATE WITH THE ENGINEER FOR APPROPRIATE SIGN LOCATION AND SPEED TO SHOW ON ALL R2-1 AND W13-1P PLAQUES UNLESS OTHERWISE DIRECTED BY THE ENGINEER.*
2. *ALL SIGNING AND PAVEMENT MARKINGS MUST COMPLY WITH TxDOT STANDARDS AND TMUTCD, UNLESS OTHERWISE APPROVED BY ENGINEER.*
3. *ALL SMALL SIGN LOCATIONS ARE APPROXIMATE UNLESS OTHERWISE NOTED. FIELD ADJUSTMENT MAY BE NECESSARY TO COMPLY WITH TxDOT STANDARDS.*
4. *REFER TO TYPICAL SECTIONS FOR LANE WIDTHS. PROPOSED DOUBLE YELLOW AND WHITE LANE LINE SHALL BE PLACED ACCORDING TO THE EXISITING CONFIGURATION.*
5. *REFER TO SIGNING DETAIL SHEETS FOR ADDITIONAL INFORMATION.*

DATE	BY	REV	REVISION

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER
5/23/2023

I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

Texas Department of Transportation

BU 67A

SIGNING AND PAVEMENT MARKING PLAN

STA 3136+00 TO STA 3144+00

SHEET 4 OF 12

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		85

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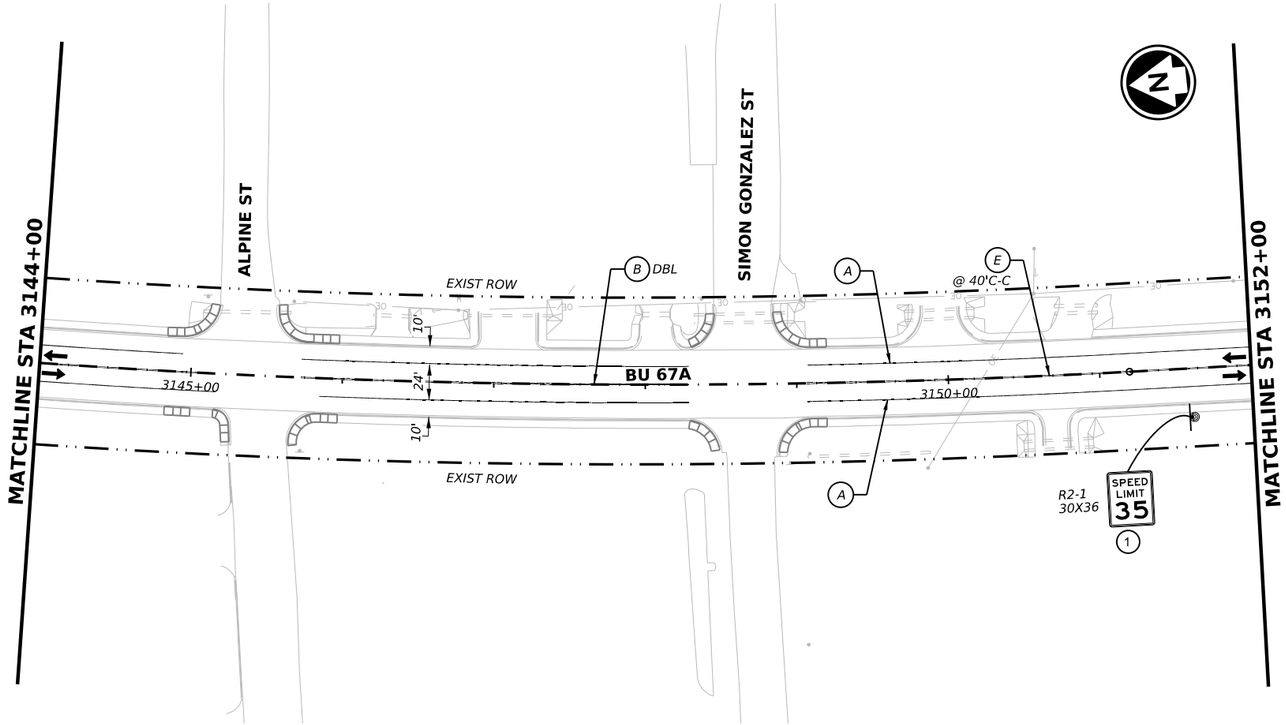

SIGNING AND PAVEMENT MARKING QUANTITIES			
ITEM	DESCRIPTION	UNIT	QTY
644 6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	1
644 6076	REMOVE SM RD SN SUP&AM	EA	1
666 6308	RE PM W/RET REQ TY I (W)6"(SLD)(090MIL)	LF	1130
666 6320	RE PM W/RET REQ TY I (Y)6"(SLD)(090MIL)	LF	1130
672 6009	REFL PAV MRKR TY II-A-A	EA	15
678 6002	PAV SURF PREP FOR MRK (6")	LF	2260

LEGEND:

- (A) *RE PM W/RET REQ TY I (W)6"(SLD) (90MIL)*
- (B) *RE PM W/RET REQ TY I (Y)6"(SLD) (90MIL)*
- (C) *REFL PAV MRK TY I (W)8"(SLD) (90MIL)*
- (D) *REFL PAV MRK TY I (W)24"(SLD) (90MIL)*
- (E) *REFL PAV MRKR TY II-A-A*
- (F) *REF PAV MRK TY I(W)36"(YLD TRI)(90MIL)*
- *TRAFFIC FLOW*
- (#) *SIGN TO BE REMOVED AND REINSTALLED*
- (#) *SIGN TO BE INSTALLED*

NOTES:

1. *ALL POSTED REGULATORY AND ADVISORY SPEED SIGNS SHALL BE ESTABLISHED ON THE BASIS OF AN ENGINEERING STUDY. CONTRACTOR TO COORDINATE WITH THE ENGINEER FOR APPROPRIATE SIGN LOCATION AND SPEED TO SHOW ON ALL R2-1 AND W13-1P PLAQUES UNLESS OTHERWISE DIRECTED BY THE ENGINEER.*
2. *ALL SIGNING AND PAVEMENT MARKINGS MUST COMPLY WITH TxDOT STANDARDS AND TMUTCD, UNLESS OTHERWISE APPROVED BY ENGINEER.*
3. *ALL SMALL SIGN LOCATIONS ARE APPROXIMATE UNLESS OTHERWISE NOTED. FIELD ADJUSTMENT MAY BE NECESSARY TO COMPLY WITH TxDOT STANDARDS.*
4. *REFER TO TYPICAL SECTIONS FOR LANE WIDTHS. PROPOSED DOUBLE YELLOW AND WHITE LANE LINE SHALL BE PLACED ACCORDING TO THE EXISITING CONFIGURATION.*
5. *REFER TO SIGNING DETAIL SHEETS FOR ADDITIONAL INFORMATION.*

0 50 100

SCALE: 1"=100'

DATE	BY	REV	REVISION

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER

5/23/2023

I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

Texas Department of Transportation

BU 67A

SIGNING AND PAVEMENT MARKING PLAN

STA 3144+00 TO STA 3152+00

SHEET 5 OF 12

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		86

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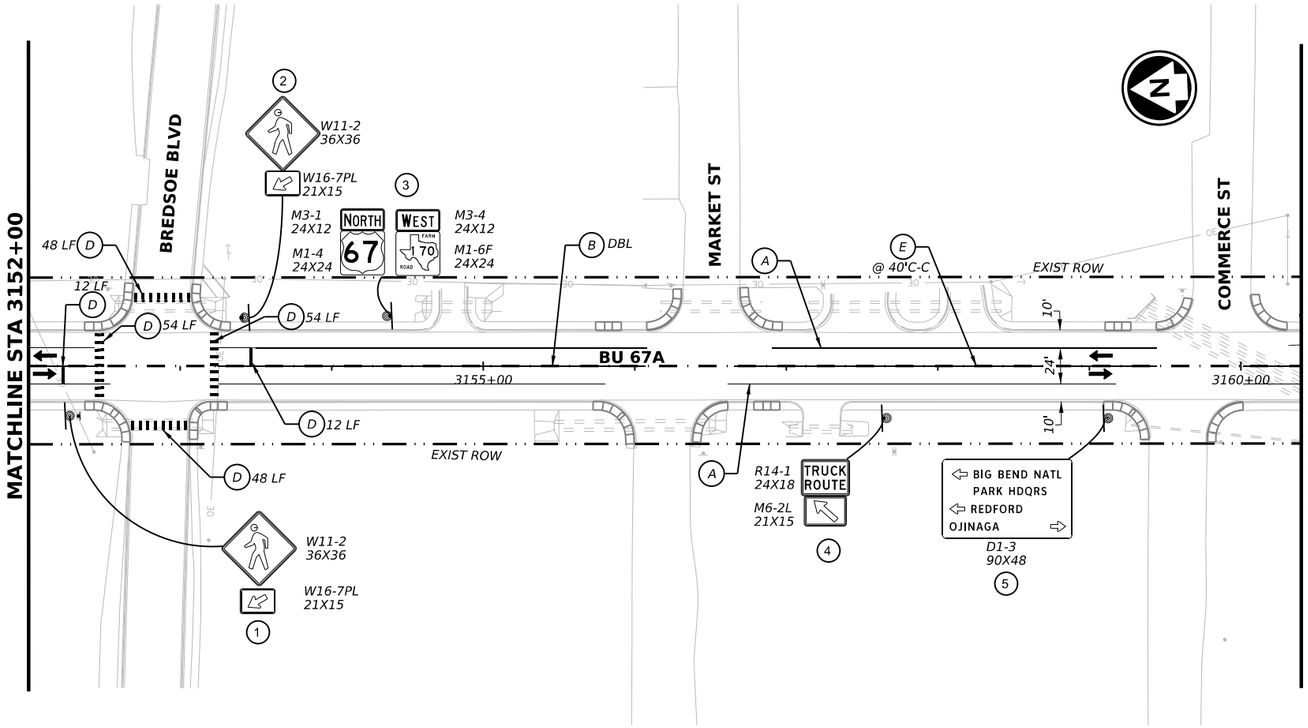

SIGNING AND PAVEMENT MARKING QUANTITIES			
ITEM	DESCRIPTION	UNIT	QTY
644 6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	3
644 6007	IN SM RD SN SUP&AM TY10BWG(1)SA(U)	EA	1
644 6037	IN SM RD SN SUP&AM TYS80(1)SA(U-WC)	EA	1
644 6076	REMOVE SM RD SN SUP&AM	EA	5
666 6308	RE PM W/RET REQ TY I (W)6"(SLD)(090MIL)	LF	1240
666 6320	RE PM W/RET REQ TY I (Y)6"(SLD)(090MIL)	LF	1400
668 6047	REFL PAV MRK TY I (W)24"(SLD)(090MIL)	LF	228
672 6009	REFL PAV MRKR TY II-A-A	EA	20
678 6002	PAV SURF PREP FOR MRK (6")	LF	2640
678 6008	PAV SURF PREP FOR MRK (24")	LF	228

LEGEND:

- (A) *RE PM W/RET REQ TY I (W)6"(SLD) (90MIL)*
- (B) *RE PM W/RET REQ TY I (Y)6"(SLD) (90MIL)*
- (C) *REFL PAV MRK TY I (W)8"(SLD) (90MIL)*
- (D) *REFL PAV MRK TY I (W)24"(SLD) (90MIL)*
- (E) *REFL PAV MRKR TY II-A-A*
- (F) *REF PAV MRK TY I(W)36"(YLD TRI)(90MIL)*
- *TRAFFIC FLOW*
- (#) *SIGN TO BE REMOVED AND REINSTALLED*
- (#) *SIGN TO BE INSTALLED*

NOTES:

1. *ALL POSTED REGULATORY AND ADVISORY SPEED SIGNS SHALL BE ESTABLISHED ON THE BASIS OF AN ENGINEERING STUDY. CONTRACTOR TO COORDINATE WITH THE ENGINEER FOR APPROPRIATE SIGN LOCATION AND SPEED TO SHOW ON ALL R2-1 AND W13-1P PLAQUES UNLESS OTHERWISE DIRECTED BY THE ENGINEER.*
2. *ALL SIGNING AND PAVEMENT MARKINGS MUST COMPLY WITH TxDOT STANDARDS AND TMUTCD, UNLESS OTHERWISE APPROVED BY ENGINEER.*
3. *ALL SMALL SIGN LOCATIONS ARE APPROXIMATE UNLESS OTHERWISE NOTED. FIELD ADJUSTMENT MAY BE NECESSARY TO COMPLY WITH TxDOT STANDARDS.*
4. *REFER TO TYPICAL SECTIONS FOR LANE WIDTHS. PROPOSED DOUBLE YELLOW AND WHITE LANE LINE SHALL BE PLACED ACCORDING TO THE EXISITING CONFIGURATION.*
5. *REFER TO SIGNING DETAIL SHEETS FOR ADDITIONAL INFORMATION.*

0 50 100

SCALE: 1"=100'

DATE	BY	REV	REVISION

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER
5/23/2023

I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

Texas Department of Transportation

BU 67A

SIGNING AND PAVEMENT MARKING PLAN

STA 3152+00 TO STA 3160+40

SHEET 6 OF 12

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		87

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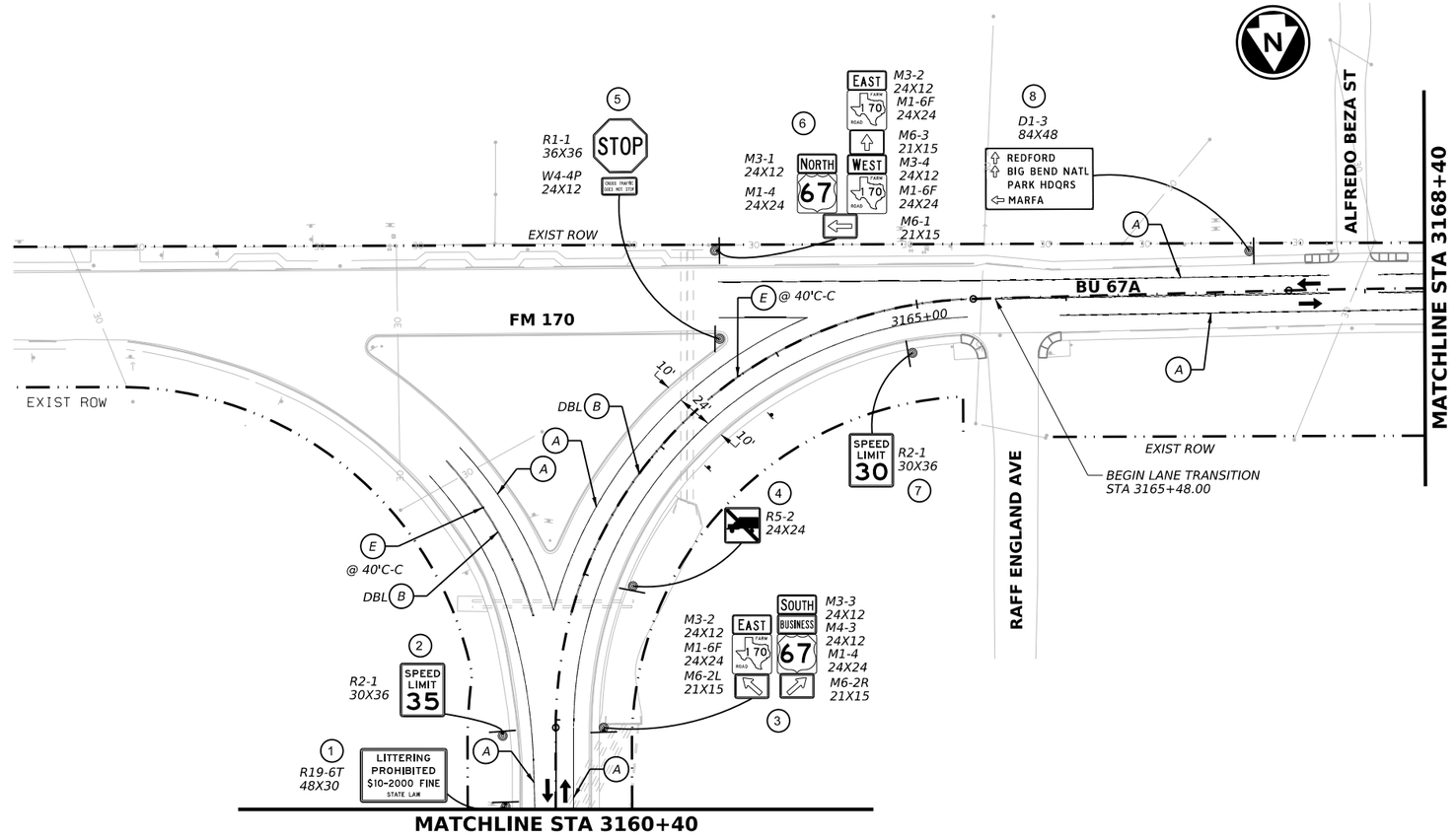

SIGNING AND PAVEMENT MARKING QUANTITIES			
ITEM	DESCRIPTION	UNIT	QTY
644 6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	3
644 6002	IN SM RD SN SUP&AM TY10BWG(1)SA(P-BM)	EA	1
644 6007	IN SM RD SN SUP&AM TY10BWG(1)SA(U)	EA	1
644 6033	IN SM RD SN SUP&AM TYS80(1)SA(U)	EA	3
644 6076	REMOVE SM RD SN SUP&AM	EA	8
666 6308	RE PM W/RET REQ TY I (W)6"(SLD)(090MIL)	LF	2100
666 6320	RE PM W/RET REQ TY I (Y)6"(SLD)(090MIL)	LF	1940
672 6009	REFL PAV MRKR TY II-A-A	EA	26
678 6002	PAV SURF PREP FOR MRK (6")	LF	4040

LEGEND:

- (A) RE PM W/RET REQ TY I (W)6"(SLD) (90MIL)
- (B) RE PM W/RET REQ TY I (Y)6"(SLD) (90MIL)
- (C) REFL PAV MRK TY I (W)8"(SLD) (90MIL)
- (D) REFL PAV MRK TY I (W)24"(SLD) (90MIL)
- (E) REFL PAV MRKR TY II-A-A
- (F) REF PAV MRK TY I(W)36"(YLD TRI)(90MIL)
- TRAFFIC FLOW
- (#) SIGN TO BE REMOVED AND REINSTALLED
- (#) SIGN TO BE INSTALLED

NOTES:

1. ALL POSTED REGULATORY AND ADVISORY SPEED SIGNS SHALL BE ESTABLISHED ON THE BASIS OF AN ENGINEERING STUDY. CONTRACTOR TO COORDINATE WITH THE ENGINEER FOR APPROPRIATE SIGN LOCATION AND SPEED TO SHOW ON ALL R2-1 AND W13-1P PLAQUES UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
2. ALL SIGNING AND PAVEMENT MARKINGS MUST COMPLY WITH TxDOT STANDARDS AND TMUTCD, UNLESS OTHERWISE APPROVED BY ENGINEER.
3. ALL SMALL SIGN LOCATIONS ARE APPROXIMATE UNLESS OTHERWISE NOTED. FIELD ADJUSTMENT MAY BE NECESSARY TO COMPLY WITH TxDOT STANDARDS.
4. REFER TO TYPICAL SECTIONS FOR LANE WIDTHS. PROPOSED DOUBLE YELLOW AND WHITE LANE LINE SHALL BE PLACED ACCORDING TO THE EXISITING CONFIGURATION.
5. REFER TO SIGNING DETAIL SHEETS FOR ADDITIONAL INFORMATION.

0 50 100

SCALE: 1"=100'

DATE	BY	REV	REVISION

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER

5/23/2023

I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

Texas Department of Transportation

BU 67A

SIGNING AND PAVEMENT MARKING PLAN

STA 3160+40 TO STA 3168+40

SHEET 7 OF 12

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		88

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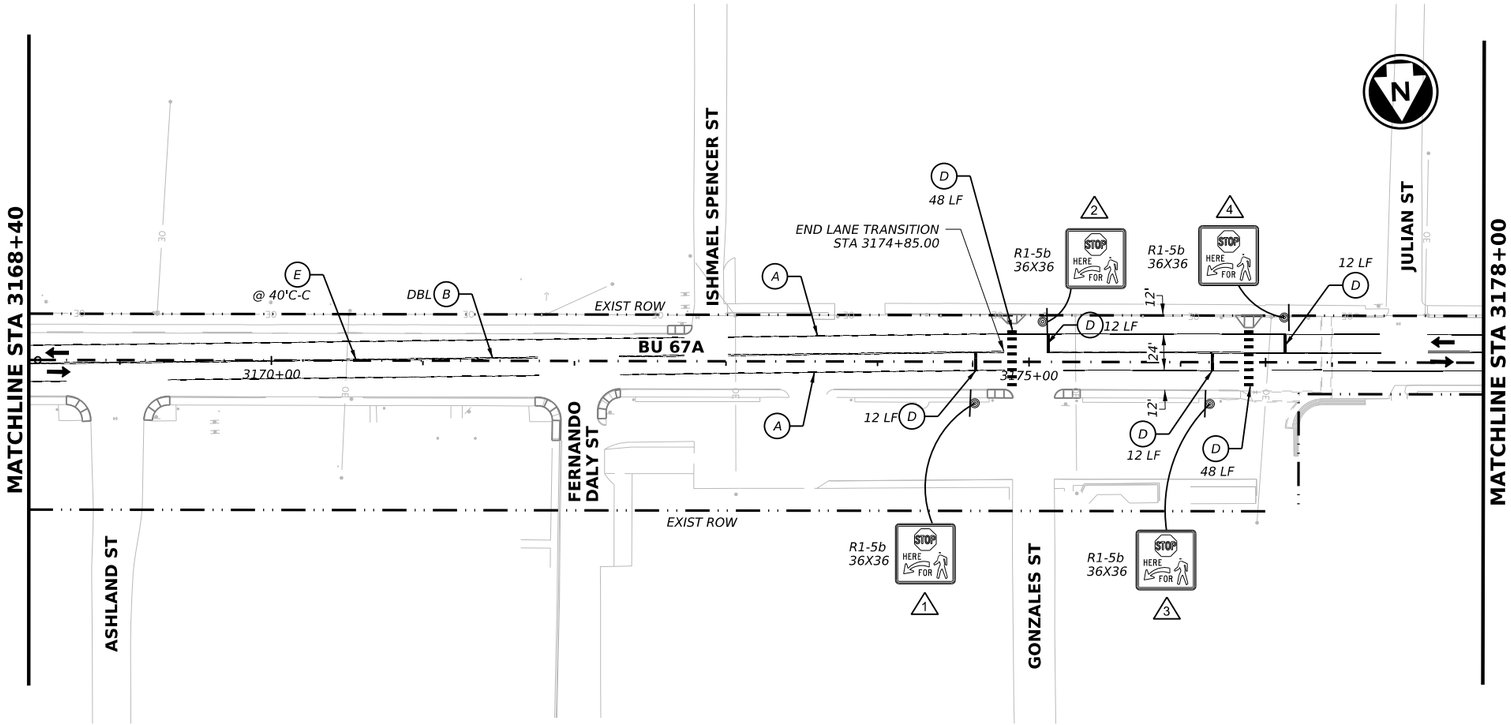

SIGNING AND PAVEMENT MARKING QUANTITIES			
ITEM	DESCRIPTION	UNIT	QTY
644 6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	3
644 6009	IN SM RD SN SUP&AM TY10BWG(1)SB(P)	EA	1
666 6308	RE PM W/RET REQ TY I (W)6"(SLD)(090MIL)	LF	1660
666 6320	RE PM W/RET REQ TY I (Y)6"(SLD)(090MIL)	LF	1650
668 6047	REFL PAV MRK TY I (W)24"(SLD)(090MIL)	LF	150
672 6009	REFL PAV MRKR TY II-A-A	EA	22
678 6002	PAV SURF PREP FOR MRK (6")	LF	3310
678 6008	PAV SURF PREP FOR MRK (24")	LF	150

LEGEND:

- (A) *RE PM W/RET REQ TY I (W)6"(SLD) (90MIL)*
- (B) *RE PM W/RET REQ TY I (Y)6"(SLD) (90MIL)*
- (C) *REFL PAV MRK TY I (W)8"(SLD) (90MIL)*
- (D) *REFL PAV MRK TY I (W)24"(SLD) (90MIL)*
- (E) *REFL PAV MRKR TY II-A-A*
- (F) *REF PAV MRK TY I(W)36"(YLD TRI)(90MIL)*
- *TRAFFIC FLOW*
- (#) *SIGN TO BE REMOVED AND REINSTALLED*
- ⚠# *SIGN TO BE INSTALLED*

NOTES:

1. *ALL POSTED REGULATORY AND ADVISORY SPEED SIGNS SHALL BE ESTABLISHED ON THE BASIS OF AN ENGINEERING STUDY. CONTRACTOR TO COORDINATE WITH THE ENGINEER FOR APPROPRIATE SIGN LOCATION AND SPEED TO SHOW ON ALL R2-1 AND W13-1P PLAQUES UNLESS OTHERWISE DIRECTED BY THE ENGINEER.*
2. *ALL SIGNING AND PAVEMENT MARKINGS MUST COMPLY WITH TxDOT STANDARDS AND TMUTCD, UNLESS OTHERWISE APPROVED BY ENGINEER.*
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4. *REFER TO TYPICAL SECTIONS FOR LANE WIDTHS. PROPOSED DOUBLE YELLOW AND WHITE LANE LINE SHALL BE PLACED ACCORDING TO THE EXISITING CONFIGURATION.*
5. *REFER TO SIGNING DETAIL SHEETS FOR ADDITIONAL INFORMATION.*

0 50 100

SCALE: 1"=100'

DATE	BY	REV	REVISION

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER

5/23/2023

I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

Texas Department of Transportation

BU 67A

SIGNING AND PAVEMENT MARKING PLAN

STA 3168+40 TO STA 3178+00

SHEET 8 OF 12

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		89

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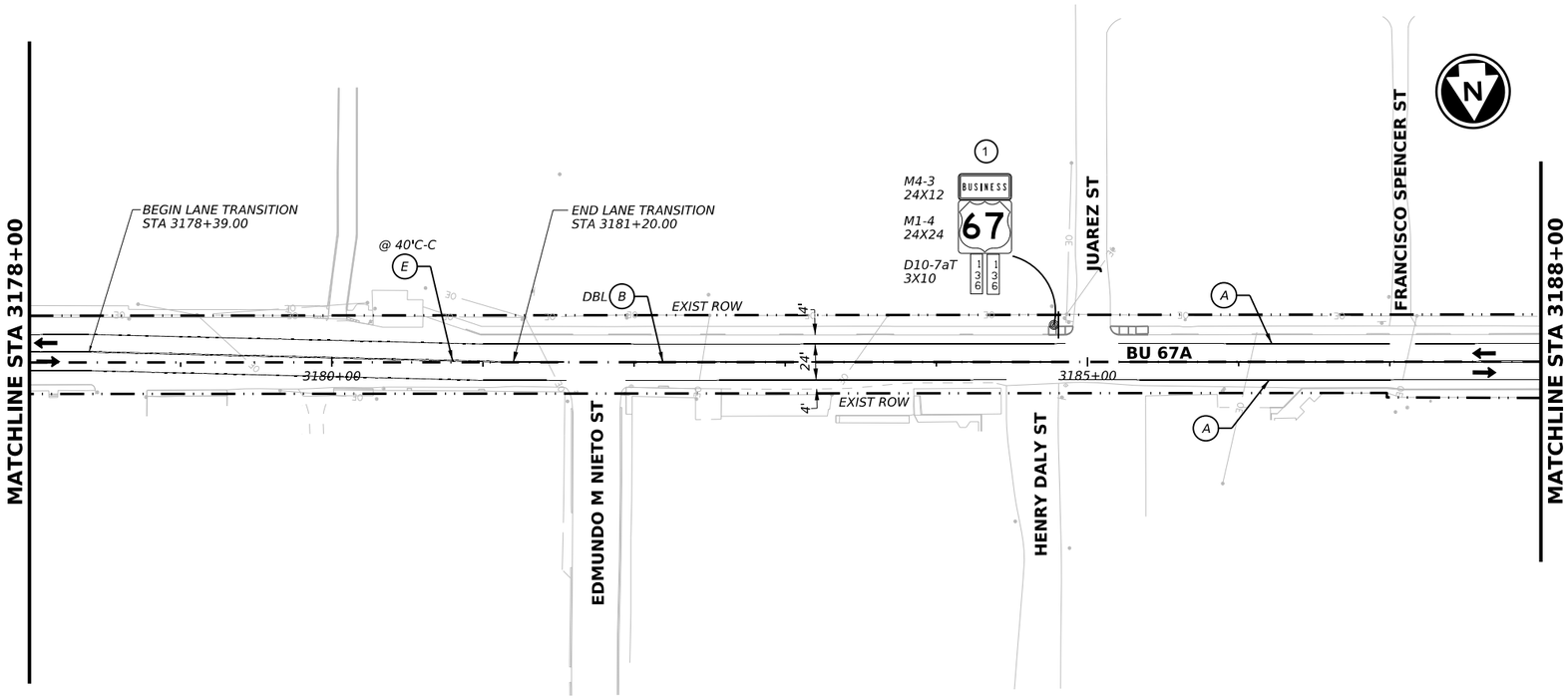

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SCALE: 1"=100'

SIGNING AND PAVEMENT MARKING QUANTITIES			
ITEM	DESCRIPTION	UNIT	QTY
644 6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	1
644 6076	REMOVE SM RD SN SUP&AM	EA	1
666 6308	RE PM W/RET REQ TY I (W)6"(SLD)(090MIL)	LF	1385
666 6320	RE PM W/RET REQ TY I (Y)6"(SLD)(090MIL)	LF	1450
672 6009	REFL PAV MRKR TY II-A-A	EA	20
678 6002	PAV SURF PREP FOR MRK (6")	LF	2835

LEGEND:

- (A) *RE PM W/RET REQ TY I (W)6"(SLD) (90MIL)*
- (B) *RE PM W/RET REQ TY I (Y)6"(SLD) (90MIL)*
- (C) *REFL PAV MRK TY I (W)8"(SLD) (90MIL)*
- (D) *REFL PAV MRK TY I (W)24"(SLD) (90MIL)*
- (E) *REFL PAV MRKR TY II-A-A*
- (F) *REF PAV MRK TY I(W)36"(YLD TRI)(90MIL)*
- *TRAFFIC FLOW*
- (#) *SIGN TO BE REMOVED AND REINSTALLED*
- *SIGN TO BE INSTALLED*

NOTES:

1. *ALL POSTED REGULATORY AND ADVISORY SPEED SIGNS SHALL BE ESTABLISHED ON THE BASIS OF AN ENGINEERING STUDY. CONTRACTOR TO COORDINATE WITH THE ENGINEER FOR APPROPRIATE SIGN LOCATION AND SPEED TO SHOW ON ALL R2-1 AND W13-1P PLAQUES UNLESS OTHERWISE DIRECTED BY THE ENGINEER.*
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4. *REFER TO TYPICAL SECTIONS FOR LANE WIDTHS. PROPOSED DOUBLE YELLOW AND WHITE LANE LINE SHALL BE PLACED ACCORDING TO THE EXISITING CONFIGURATION.*
5. *REFER TO SIGNING DETAIL SHEETS FOR ADDITIONAL INFORMATION.*

DATE	BY	REV	REVISION

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER

5/23/2023

I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

Texas Department of Transportation

BU 67A

SIGNING AND PAVEMENT MARKING PLAN

STA 3178+00 TO STA 3188+00

SHEET 9 OF 12

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		90

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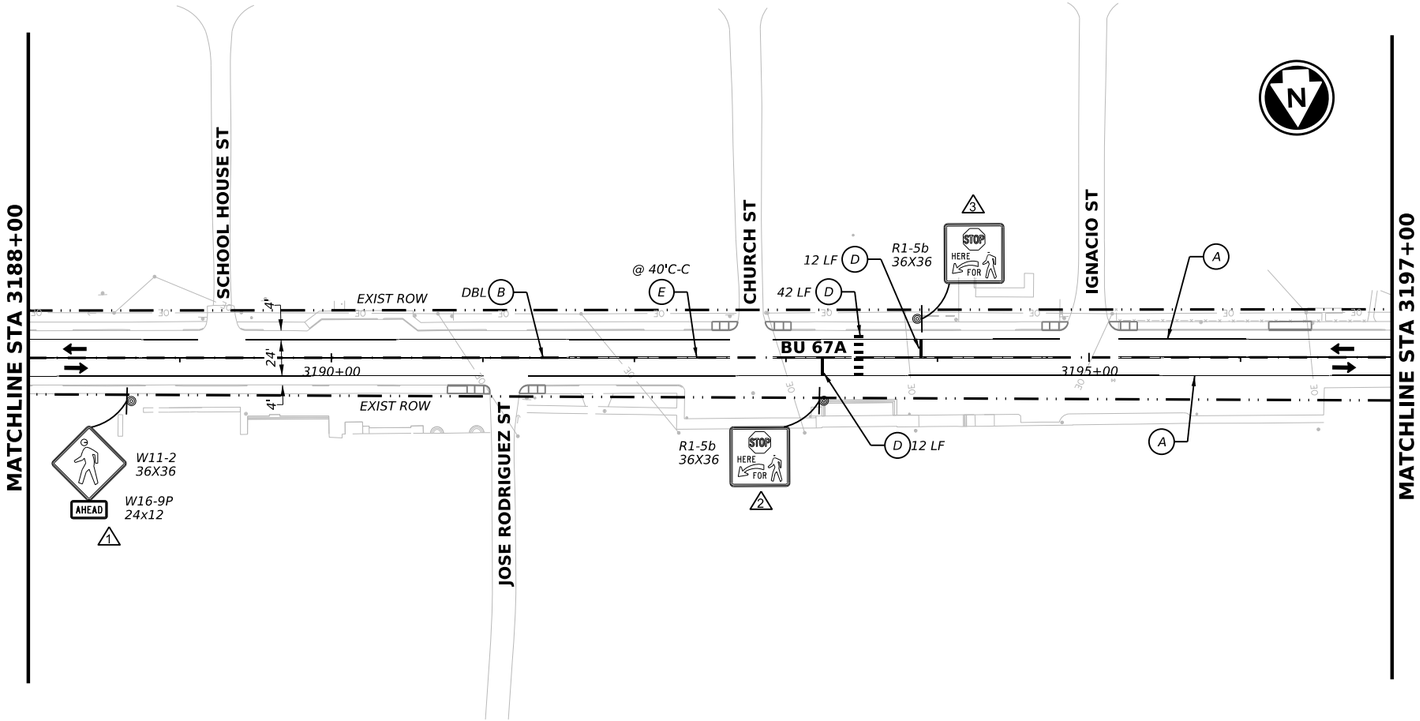

SIGNING AND PAVEMENT MARKING QUANTITIES			
ITEM	DESCRIPTION	UNIT	QTY
644 6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	2
644 6002	IN SM RD SN SUP&AM TY10BWG(1)SA(P-BM)	EA	1
666 6308	RE PM W/RET REQ TY I (W)6"(SLD)(090MIL)	LF	1680
666 6320	RE PM W/RET REQ TY I (Y)6"(SLD)(090MIL)	LF	1740
668 6047	REFL PAV MRK TY I (W)24"(SLD)(090MIL)	LF	66
672 6009	REFL PAV MRKR TY II-A-A	EA	23
678 6002	PAV SURF PREP FOR MRK (6")	LF	3420
678 6008	PAV SURF PREP FOR MRK (24")	LF	66

LEGEND:

- (A) RE PM W/RET REQ TY I (W)6"(SLD) (90MIL)
- (B) RE PM W/RET REQ TY I (Y)6"(SLD) (90MIL)
- (C) REFL PAV MRK TY I (W)8"(SLD) (90MIL)
- (D) REFL PAV MRK TY I (W)24"(SLD) (90MIL)
- (E) REFL PAV MRKR TY II-A-A
- (F) REF PAV MRK TY I(W)36"(YLD TRI)(90MIL)
- TRAFFIC FLOW
- (#) SIGN TO BE REMOVED AND REINSTALLED
- <#> SIGN TO BE INSTALLED

NOTES:

1. ALL POSTED REGULATORY AND ADVISORY SPEED SIGNS SHALL BE ESTABLISHED ON THE BASIS OF AN ENGINEERING STUDY. CONTRACTOR TO COORDINATE WITH THE ENGINEER FOR APPROPRIATE SIGN LOCATION AND SPEED TO SHOW ON ALL R2-1 AND W13-1P PLAQUES UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
2. ALL SIGNING AND PAVEMENT MARKINGS MUST COMPLY WITH TxDOT STANDARDS AND TMUTCD, UNLESS OTHERWISE APPROVED BY ENGINEER.
3. ALL SMALL SIGN LOCATIONS ARE APPROXIMATE UNLESS OTHERWISE NOTED. FIELD ADJUSTMENT MAY BE NECESSARY TO COMPLY WITH TxDOT STANDARDS.
4. REFER TO TYPICAL SECTIONS FOR LANE WIDTHS. PROPOSED DOUBLE YELLOW AND WHITE LANE LINE SHALL BE PLACED ACCORDING TO THE EXISITING CONFIGURATION.
5. REFER TO SIGNING DETAIL SHEETS FOR ADDITIONAL INFORMATION.

0 50 100

SCALE: 1"=100'

DATE	BY	REV	REVISION

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER

5/23/2023

I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

Texas Department of Transportation

BU 67A

SIGNING AND PAVEMENT MARKING PLAN

STA 3188+00 TO STA 3197+00

SHEET 10 OF 12

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		91

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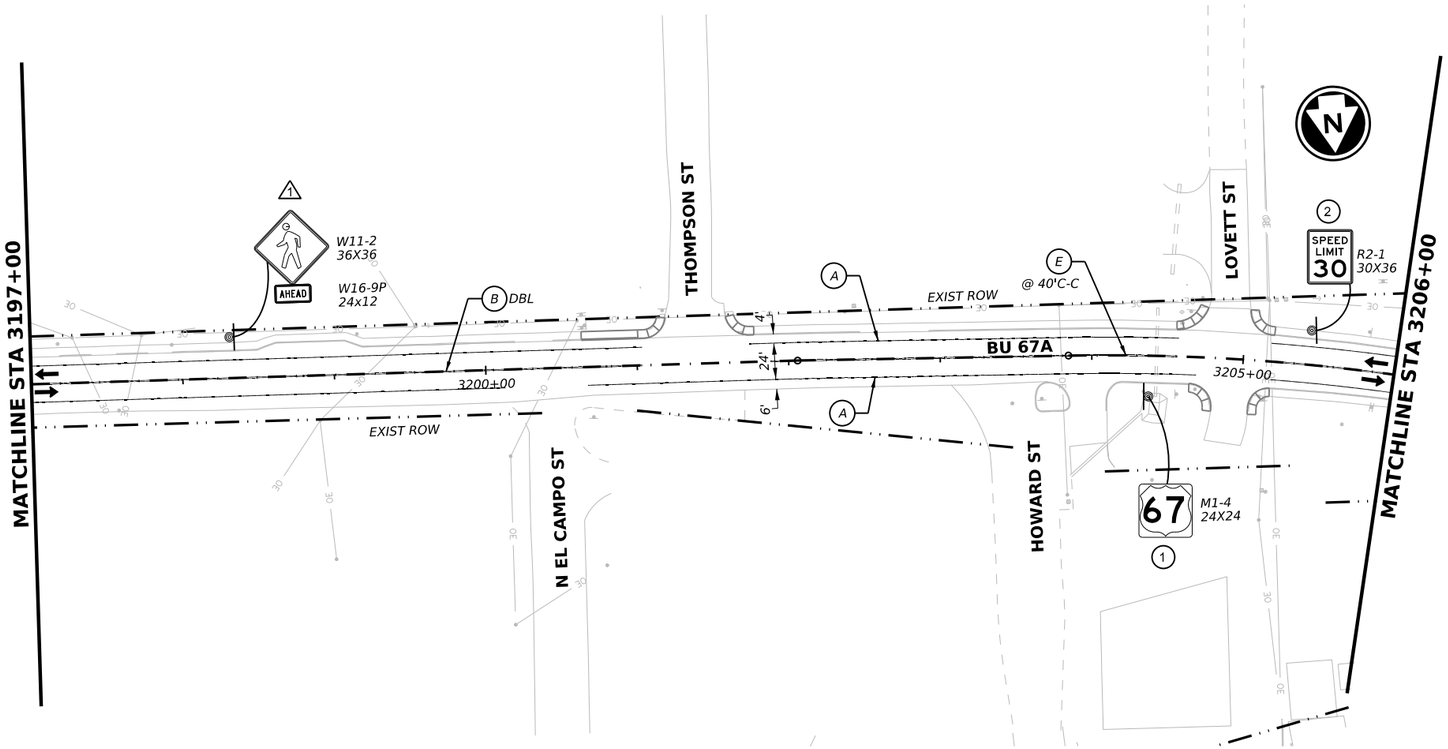

SIGNING AND PAVEMENT MARKING QUANTITIES			
ITEM	DESCRIPTION	UNIT	QTY
644 6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	2
644 6002	IN SM RD SN SUP&AM TY10BWG(1)SA(P-BM)	EA	1
644 6076	REMOVE SM RD SN SUP&AM	EA	2
666 6308	RE PM W/RET REQ TY I (W)6"(SLD)(090MIL)	LF	1450
666 6320	RE PM W/RET REQ TY I (Y)6"(SLD)(090MIL)	LF	1500
672 6009	REFL PAV MRKR TY II-A-A	EA	20
678 6002	PAV SURF PREP FOR MRK (6")	LF	2950

LEGEND:

- (A) RE PM W/RET REQ TY I (W)6"(SLD) (90MIL)
- (B) RE PM W/RET REQ TY I (Y)6"(SLD) (90MIL)
- (C) REFL PAV MRK TY I (W)8"(SLD) (90MIL)
- (D) REFL PAV MRK TY I (W)24"(SLD) (90MIL)
- (E) REFL PAV MRKR TY II-A-A
- (F) REF PAV MRK TY I(W)36"(YLD TRI)(90MIL)
- TRAFFIC FLOW
- (#) SIGN TO BE REMOVED AND REINSTALLED
- (#) SIGN TO BE INSTALLED

NOTES:

1. ALL POSTED REGULATORY AND ADVISORY SPEED SIGNS SHALL BE ESTABLISHED ON THE BASIS OF AN ENGINEERING STUDY. CONTRACTOR TO COORDINATE WITH THE ENGINEER FOR APPROPRIATE SIGN LOCATION AND SPEED TO SHOW ON ALL R2-1 AND W13-1P PLAQUES UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
2. ALL SIGNING AND PAVEMENT MARKINGS MUST COMPLY WITH TxDOT STANDARDS AND TMUTCD, UNLESS OTHERWISE APPROVED BY ENGINEER.
3. ALL SMALL SIGN LOCATIONS ARE APPROXIMATE UNLESS OTHERWISE NOTED. FIELD ADJUSTMENT MAY BE NECESSARY TO COMPLY WITH TxDOT STANDARDS.
4. REFER TO TYPICAL SECTIONS FOR LANE WIDTHS. PROPOSED DOUBLE YELLOW AND WHITE LANE LINE SHALL BE PLACED ACCORDING TO THE EXISITING CONFIGURATION.
5. REFER TO SIGNING DETAIL SHEETS FOR ADDITIONAL INFORMATION.

0 50 100

SCALE: 1"=100'

DATE	BY	REV	REVISION

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER

5/26/2023

I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

Texas Department of Transportation

BU 67A

SIGNING AND PAVEMENT MARKING PLAN

STA 3197+00 TO STA 3206+00

SHEET 11 OF 12

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		92

DATE: 5/26/2023 1:33:48 AM
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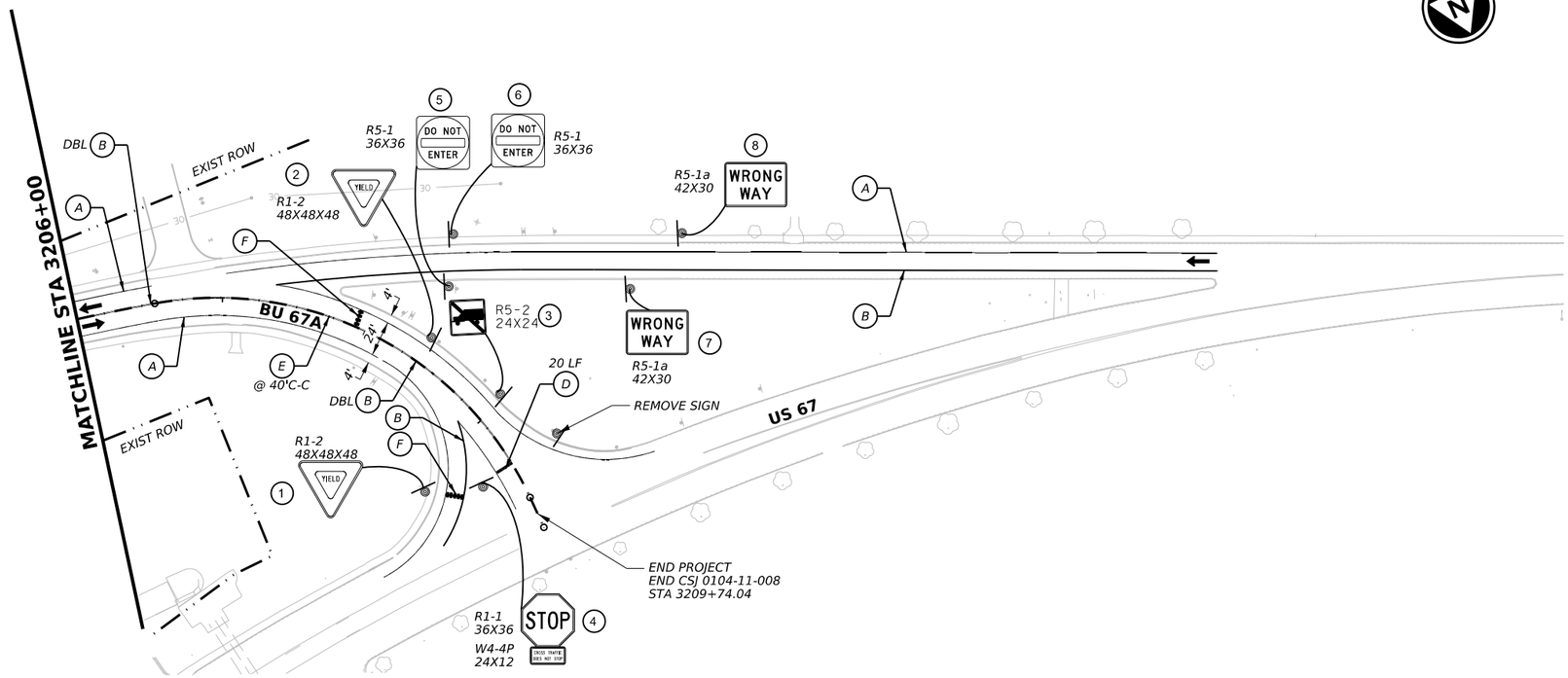

SIGNING AND PAVEMENT MARKING QUANTITIES			
ITEM	DESCRIPTION	UNIT	QTY
644 6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	4
644 6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	2
644 6007	IN SM RD SN SUP&AM TY10BWG(1)SA(U)	EA	2
644 6076	REMOVE SM RD SN SUP&AM	EA	8
666 6101	REF PAV MRK TY I(W)36"(YLD TRI)(090MIL)	EA	5
666 6308	RE PM W/RET REQ TY I (W)6"(SLD)(090MIL)	LF	1630
666 6320	RE PM W/RET REQ TY I (Y)6"(SLD)(090MIL)	LF	1150
668 6047	REFL PAV MRK TY I (W)24"(SLD)(090MIL)	LF	20
672 6009	REFL PAV MRKR TY II-A-A	EA	20
678 6002	PAV SURF PREP FOR MRK (6")	LF	2780
678 6008	PAV SURF PREP FOR MRK (24")	LF	20
678 6023	PAV SURF PREP FOR MRK (36") (YLD TRI)	EA	5

LEGEND:

- (A) RE PM W/RET REQ TY I (W)6"(SLD) (90MIL)
- (B) RE PM W/RET REQ TY I (Y)6"(SLD) (90MIL)
- (C) REFL PAV MRK TY I (W)8"(SLD) (90MIL)
- (D) REFL PAV MRK TY I (W)24"(SLD) (90MIL)
- (E) REFL PAV MRKR TY II-A-A
- (F) REF PAV MRK TY I(W)36"(YLD TRI)(90MIL)
- TRAFFIC FLOW
- (#) SIGN TO BE REMOVED AND REINSTALLED
- #/ SIGN TO BE INSTALLED

NOTES:

1. ALL POSTED REGULATORY AND ADVISORY SPEED SIGNS SHALL BE ESTABLISHED ON THE BASIS OF AN ENGINEERING STUDY. CONTRACTOR TO COORDINATE WITH THE ENGINEER FOR APPROPRIATE SIGN LOCATION AND SPEED TO SHOW ON ALL R2-1 AND W13-1P PLAQUES UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
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4. REFER TO TYPICAL SECTIONS FOR LANE WIDTHS. PROPOSED DOUBLE YELLOW AND WHITE LANE LINE SHALL BE PLACED ACCORDING TO THE EXISITING CONFIGURATION.
5. REFER TO SIGNING DETAIL SHEETS FOR ADDITIONAL INFORMATION.

0 50 100

SCALE: 1"=100'

DATE	BY	REV	REVISION

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER

5/23/2023

I. S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

Texas Department of Transportation

BU 67A

SIGNING AND PAVEMENT MARKING PLAN

STA 3206+00 TO END OF PROJECT

SHEET 12 OF 12

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		93

DATE: 5/23/2023 11:21:36 AM
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SUMMARY OF SMALL SIGNS

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

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
82	(1)	R1-1	STOP	36 x 36	A		10BWG	1	SA	P	BM	
		W4-4P	CROSS TRAFFIC DOES NOT STOP (PLAQUE)	24 x 12	A							
82	(2)	R1-2	YIELD	48 x 48 x 48	A		10BWG	1	SA	T		
82	(3)	R1-2	YIELD	48 x 48 x 48	A		10BWG	1	SA	T		
82	(4)	M4-5	TO <AUXILIARY SIGN>	24 x 12	A							
		M4-3	BUSINESS <AUXILIARY SIGN>	24 x 12	A							
		M1-4(2 dgt)	<US HIGHWAY ROUTE SHIELD> (ROUTE #)	24 x 24	A		10BWG	1	SA	P		
			Route 67									
		M6-3	<ARROW - VERTICAL STRGHT> <AUX. SIGN>	21 x 15	A							
82	(5)	R2-1	SPEED LIMIT (SPEED)	30 x 36	A		10BWG	1	SA	P		
			35 mph									
82	(6)	M4-3	BUSINESS <AUXILIARY SIGN>	24 x 12	A							
		M1-4(2 dgt)	INTERSTATE (ROUTE #)	24 x 24	A							
			Route 67				10BWG	1	SA	P		
		D10-7aT	ROUTE MARKER	3 x 10	A							
		D10-7aT	ROUTE MARKER	3 x 10	A							
82	(7)	D1-2	(DESTINATION - 3 LINE)	156 x 30	A		S80	1	SA	U	BM	
			CONSULATE OF MEXICO									
82	(8)	W1-2R	SYMBOL - HORIZ CURVE RIGHT	36 x 36	A		10BWG	1	SA	P		
		W13-1P	(SPEED) MPH <ADVISORY SPEED PLAQUE>	18 x 18	A							
			25 mph									
82	(9)	R4-5	TO <AUXILIARY SIGN>	24 x 12	A							
		R14-1	TRUCK ROUTE	24 x 18	A		10BWG	1	SA	P		
		M6-2L	<ARROW - ANGLED UP LEFT> <AUXILIARY SIGN>	21 x 15	A							
82	(10)	D1-2	(DESTINATION - 2 LINE)	102X30	A		S80	1	SA	U	BM	
			Ojinaga MEX									
			Marfa									
83	(1)	M2-1	JCT <AUXILIARY SIGN>	21 x 15	A		10BWG	1	SA	P		
		M1-4(2 dgt)	INTERSTATE (ROUTE #)	24 x 24	A							
			Route 67									
83	(2)	R14-1	TRUCK ROUTE	24 x 18	A		10BWG	1	SA	P		
		M6-2R	<ARROW - ANGLED UP RIGHT> <AUXILIARY SIGN>	21 x 15	A							
83	(3)	R2-1	SPEED LIMIT (SPEED)	30 x 36	A		10BWG	1	SA	P		
			35 mph									

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

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

NOTE:

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

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

SHEET 1 OF 5

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0104	11	008	BU 67A
4-16 8-16	DIST	COUNTY		SHEET NO.
	ELP	PRESIDIO		94

18

DATE: 5/23/2023 3:53:43 PM
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SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"		TY N TY S
83	④	D25-3TL	GUIDE SIGN	48x60	A		S80	1	SA	T		
			Presidio County Medical Clinic									
84	①	M1-3	ROUTE SIGN	30 x 24	A							
			Spur 203				10BWG	1	SA	P		
		M6-1	<ARROW - HORIZ. STRGHT> <AUXILIARY SIGN>	21 x 15	A							
84	②	D25-3TR	GUIDE SIGN									
			Presidio County	48x60	A		S80	1	SA	T		
			Medical Clinic									
84	③	M1-6S	ROUTE SIGN	24 x 24	A							
			Spur 203				10BWG	1	SA	P		
		M6-3	<ARROW - VERTICAL STRGHT> <AUX. SIGN>	21 x 15	A							
84	④	R2-1	SPEED LIMIT (SPEED)	30 x 36	A		10BWG	1	SA	P		
			35 mph									
		M3-4	WEST <AUXILIARY SIGN>	24 x 12	A							
		M1-6F	<FM SHIELD> FARM ROAD (ROUTE #)	24 x 24	A							
			FM 170									
84	⑤	M6-1	<ARROW - HORIZ. STRGHT> <AUXILIARY SIGN>	21 x 15	A		S80	1	SA	U		
		M3-1	NORTH <AUXILIARY SIGN>	24 x 12	A							
		M1-4	<US HIGHWAY ROUTE SHIELD> (ROUTE #)	24 x 24	A							
			Route 67									
		M6-1	<ARROW - HORIZ. STRGHT> <AUXILIARY SIGN>	21 x 15	A							
		D25-3TR	GUIDE SIGN	70X60	A							
			BBCAC Presidio									
			Neighborhood Center									
84	⑥						S80	1	SA	U		
		D25-3TL	GUIDE SIGN	70X60	A							
			BBCAC Presidio									
			Neighborhood Center									
84	⑦	D1-3	(DESTINATION - 3 LINE)	102 x 42	A		S80	1	SA	U	BM	
			Marfa									
			Ruidosa									
			Ojinaga MEX									
85	①	R14-1	TRUCK ROUTE	24 x 18	A		10BWG	1	SA	P		
		M6-2L	<ARROW - ANGLED UP LEFT> <AUXILIARY SIGN>	21 x 15	A							
85	②	R4-17	DO NOT DRIVE ON SHOULDER	24 x 30	A		10BWG	1	SA	T		

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

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

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NOTE:

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2. For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS)Standard Sheet.
3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

SHEET 2 OF 5

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0104	11	008	BU 67A
4-16	DIST	COUNTY		SHEET NO.
8-16	ELP	PRESIDIO		95

18

DATE: 5/23/2023 2:31:53 PM
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SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"		TY N TY S
		M3-2	EAST <AUXILIARY SIGN>	24 x 12	A							
85	③	M1-6F	<FM SHIELD> FARM ROAD (ROUTE #)	24 x 24	A							
		M3-3	FM 170				10BWG	1	SA	U		
		M1-4(2 dgt)	SOUTH <AUXILIARY SIGN>	24 x 12	A							
			<US HIGHWAY ROUTE SHIELD> (ROUTE #)	24 x 24	A							
			Route 67									
85	④	D26-3TL	TEXAS DEPARTMENT OF STATE	48 x 24	A		10BWG	1	SA	P		
			HEALTH SERVICES									
85	⑤	D26-3TR	TEXAS DEPARTMENT OF STATE	48 x 24	A		10BWG	1	SA	P		
			HEALTH SERVICES									
86	①	R2-1	SPEED LIMIT (SPEED)	30 x 36	A		10BWG	1	SA	P		
			35mph									
87	①	W11-2	SYMBOL - BE ALERT FOR PEDESTIRANS	36 x 36	A		10BWG	1	SA	P		
		W16-7PL	<ARROW > <AUXILIARY SIGN>	21 x 15	A							
87	②	W11-2	SYMBOL - BE ALERT FOR PEDESTIRANS	36 x 36	A		10BWG	1	SA	P		
		W16-7PL	<ARROW > <AUXILIARY SIGN>	21 x 15	A							
87	③	M3-1	NORTH <AUXILIARY SIGN>	24 x 12	A							
		M1-4	<US HIGHWAY ROUTE SHIELD> (ROUTE #)	24 x 24	A							
			Route 67				10BWG	1	SA	U		
		M3-4	WEST <AUXILIARY SIGN>	24 x 12	A							
		M1-6F	<FM SHIELD> FARM ROAD (ROUTE #)	24 x 24	A							
			FM 170									
87	④	R14-1	TRUCK ROUTE	24 x 18	A		10BWG	1	SA	P		
		M6-2L	ARROW - ANGLED UP RIGHT> <AUXILIARY SIGN	21 x 15	A							
87	⑤	D1-3	(DESTINATION - 3 LINE)									
			(Customized 4 lines dstination sign)									
			BIG BEND NATL	90 x 48	A		S80	1	SA	U	WC	
			PARK HDQRS									
			REDFORD									
			OJINAGA									
88	①	R19-6T	LITTERING PROHIB $10-2000 FINE STATE LAW	48 x 30	A		10BWG	1	SA	U		
88	②	R2-1	SPEED LIMIT (SPEED)	30 x 36	A		10BWG	1	SA	P		
			35mph									

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

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NOTE:

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3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

SHEET 3 OF 5

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		0104	11	008	BU 67A
4-16		DIST	COUNTY		SHEET NO.
8-16		ELP	PRESIDIO		96

18

DATE:
FILE:

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"		TY N TY S
88	③	M3-2	EAST <AUXILIARY SIGN>	24 x 12	A							
		M1-6F	<FM SHIELD> FARM ROAD (ROUTE #)	24 x 24	A							
			FM 170									
		M6-2L	<ARROW - ANGLED UP LEFT> <AUXILIARY SIGN>	21 x 15	A		S80	1	SA	U		
		M3-3	SOUTH <AUXILIARY SIGN>	24 x 12	A							
		M4-3	BUSINESS <AUXILIARY SIGN>	24 x 12	A							
		M1-4	INTERSTATE (ROUTE #)	24 x 24	A							
			Route 67									
		M6-2R	<ARROW - ANGLED UP RIGHT> <AUXILIARY SIGN>	21 x 15	A							
88	④	R5-2	SYMBOL - TRUCKS PROHIBITED	24 x 24	A		10BWG	1	SA	P		
88	⑤	R1-1	STOP	36 x 36	A		10BWG	1	SA	P	BM	
		W4-4P	CROSS TRAFFIC DOES NOT STOP (PLAQUE)	24 x 12	A							
88	⑥	M3-1	NORTH <AUXILIARY SIGN>	24 x 12	A							
		M1-4	<US HIGHWAY ROUTE SHIELD> (ROUTE #)	24 x 24	A							
			Route 67									
		M3-2	EAST <AUXILIARY SIGN>	24 x 12	A		S80	1	SA	U		
		M1-6F	<FM SHIELD> FARM ROAD (ROUTE #)	24 x 24	A							
			FM 170									
		M6-3	<ARROW - VERTICAL STRGHT> <AUX. SIGN>	21 x 15	A							
		M3-4	WEST <AUXILIARY SIGN>	24 x 12	A							
		M1-6F	<FM SHIELD> FARM ROAD (ROUTE #)	24 x 24	A							
			FM 170									
		M6-1	<ARROW - HORIZ. STRGHT> <AUXILIARY SIGN>	21 x 15	A							
88	⑦	R2-1	SPEED LIMIT (SPEED)	30 x 36	A		10BWG	1	SA	P		
			30mph									
88	⑧	D1-3	(DESTINATION - 3 LINE)									
			(Customized 4 lines dstination sign)									
			Redford (up Arrow)	84 x 48	A		S80	1	SA	U		
			Big Bend NATL									
			PARK HDQRS (up Arrow)									
			Marfa (LF Arrow)									
89	①	R1-5b	STOP HERE FOR PEDESTRIANS	36 x 36	A		10BWG	1	SB	P		
89	②	R1-5b	STOP HERE FOR PEDESTRIANS	36 x 36	A		10BWG	1	SA	P		
89	③	R1-5b	STOP HERE FOR PEDESTRIANS	36 x 36	A		10BWG	1	SB	P		
89	④	R1-5b	STOP HERE FOR PEDESTRIANS	36 x 36	A		10BWG	1	SA	P		
90	①	M4-3	INTERSTATE (ROUTE #)	24 x 12	A							
		M1-4	Route 67	24 x 24	A							
		D10-7aT	ROUTE MARKER < 136 >	3 X 10	A		10BWG	1	SA	P		
		D10-7aT	ROUTE MARKER < 136 >	3 X 10	A							

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

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

NOTE:

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

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

SHEET 4 OF 5

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0104	11	008	BU 67A
4-16	DIST	COUNTY		SHEET NO.
8-16	ELP	PRESIDIO		97

18

DATE: 5/23/2023 3:54:03 PM
FILE: \\stanpwllics03\ics_pdf_work_dir\24863\65801_24\008_SP_SOSS04.dgn

SUMMARY OF SMALL SIGNS

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

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
91	⚠	W11-2	SYMBOL - BE ALERT FOR PEDESTRIANS	36 x 36	A		10BWG	1	SA	P	BM	
		W16-9P	AHEAD (PLAQUE)	24 x 12	A							
91	⚠	R1-5b	STOP HERE FOR PEDESTRIANS	36 x 36	A		10BWG	1	SA	P		
91	⚠	R1-5b	STOP HERE FOR PEDESTRIANS	36 x 36	A		10BWG	1	SA	P		
92	⚠	W11-2	SYMBOL - BE ALERT FOR PEDESTRIANS	36 x 36	A		10BWG	1	SA	P	BM	
		W16-9P	AHEAD (PLAQUE)	24 x 12	A							
92	①	M1-4	INTERSTATE (ROUTE #) Route 67	24 x 24	A		10BWG	1	SA	P		
92	②	R2-1	SPEED LIMIT (SPEED) 30mph	30 x 36	A		10BWG	1	SA	P		
93	①	R1-2	YIELD	48 x 48 x 48	A		10BWG	1	SA	T		
93	②	R1-2	YIELD	48 x 48 x 48	A		10BWG	1	SA	T		
93	③	R5-2	SYMBOL - TRUCKS PROHIBITED	24 x 24	A		10BWG	1	SA	P		
93	④	R1-1	STOP	36 x 36	A		10BWG	1	SA	P		
		W4-4P	CROSS TRAFFIC DOES NOT STOP (PLAQUE)	24 x 12	A							
93	⑤	R5-1	DO NOT ENTER	36 x 36	A		10BWG	1	SA	P		
93	⑥	R5-1	DO NOT ENTER	36 x 36	A		10BWG	1	SA	P		
93	⑦	R5-1a	WRONG WAY	42 x 30	A		10BWG	1	SA	U		
93	⑧	R5-1a	WRONG WAY	42 x 30	A		10BWG	1	SA	U		

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

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

NOTE:

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

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

SHEET 5 OF 5

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0104	11	008	BU 67A
4-16 8-16	DIST	COUNTY		SHEET NO.
	ELP	PRESIDIO		98

18

DATE: 5/23/2023
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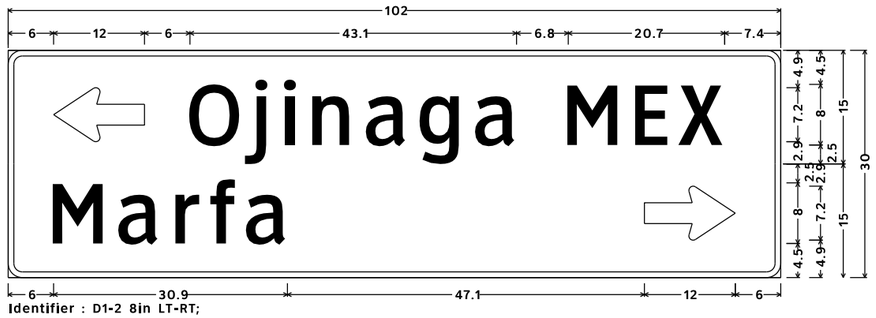
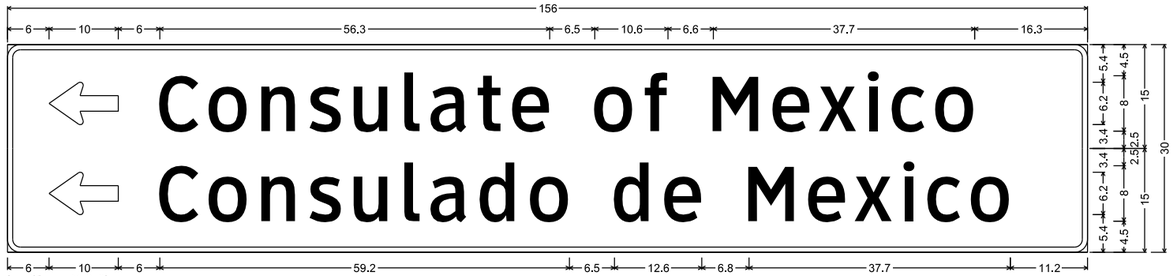


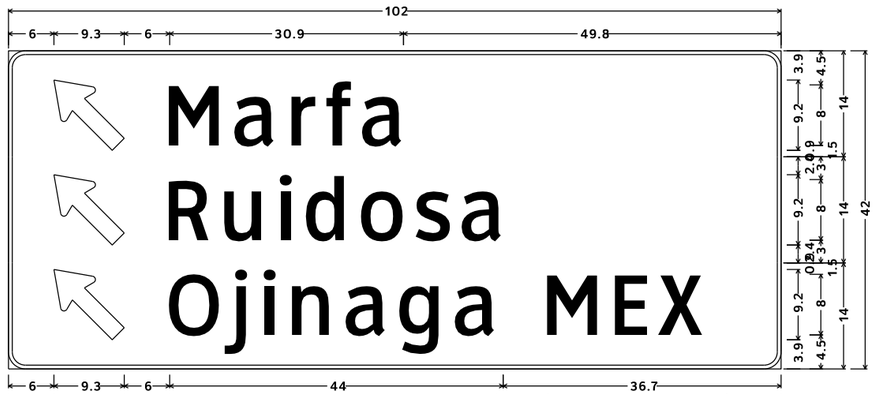
Identifier : D1-2 8in LT-RT;
1.9" Radius, 0.8" Border, White on Green;
Standard Arrow Custom 12.0" X 7.1" 180{; [Ojinaga MEX] ClearviewHwy-3-W;
1.9" Radius, 0.8" Border, White on Green;
[Marfa] ClearviewHwy-3-W; Standard Arrow Custom 12.0" X 7.1" 0{;

SPM SHEET 1 OF 12



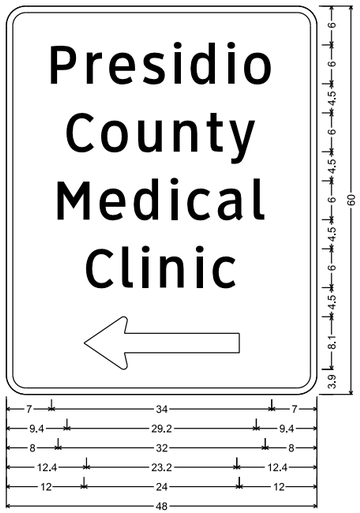
Identifier : D1-2 8in LT-LT;
1.9" Radius, 0.8" Border, White on Green;
Standard Arrow Custom 10.0" X 6.1" 180^; [Consulate of Mexico] ClearviewHwy-3-W;
1.9" Radius, 0.8" Border, White on Green;
Standard Arrow Custom 10.0" X 6.1" 180^; [Consulado de Mexico] ClearviewHwy-3-W;

SPM SHEET 1 OF 12



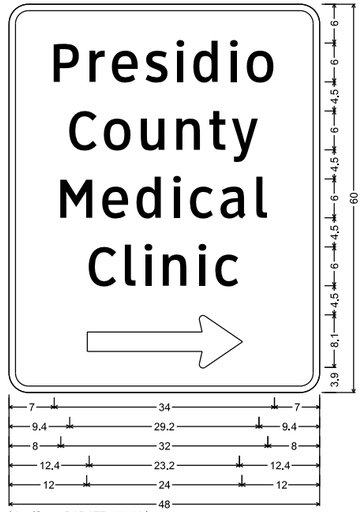
Identifier : D1-3 8in 45LT-45LT-45LT;
2.3" Radius, 0.5" Border, White on Green;
Standard Arrow Custom 12.0" X 6.1" 135{; [Marfa] ClearviewHwy-3-W;
2.3" Radius, 0.5" Border, White on Green;
Standard Arrow Custom 12.0" X 6.1" 135{; [Ruidosa] ClearviewHwy-3-W;
2.3" Radius, 0.5" Border, White on Green;
Standard Arrow Custom 12.0" X 6.1" 135{; [Ojinaga MEX.] ClearviewHwy-3-W;

SPM SHEET 3 OF 12



Identifier : D25-3TL_48x60◊;
3.0" Radius, 1.0" Border, White on Green;
[Presidio] ClearviewHwy-3-W; [County] ClearviewHwy-3-W;
[Medical] ClearviewHwy-3-W; [Clinic] ClearviewHwy-3-W;
Standard Arrow Custom 24.0" X 8.1" 180|;

SPM SHEET 2 OF 12



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3.0" Radius, 1.0" Border, White on Green;
[Presidio] ClearviewHwy-3-W; [County] ClearviewHwy-3-W;
[Medical] ClearviewHwy-3-W; [Clinic] ClearviewHwy-3-W;
Standard Arrow Custom 24.0" X 8.1" 0^;

SPM SHEET 3 OF 12

DATE	BY	REV	REVISION

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER

5/23/2023

L S. ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

Texas Department of Transportation

BU 67A

SIGN DETAILS

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		99

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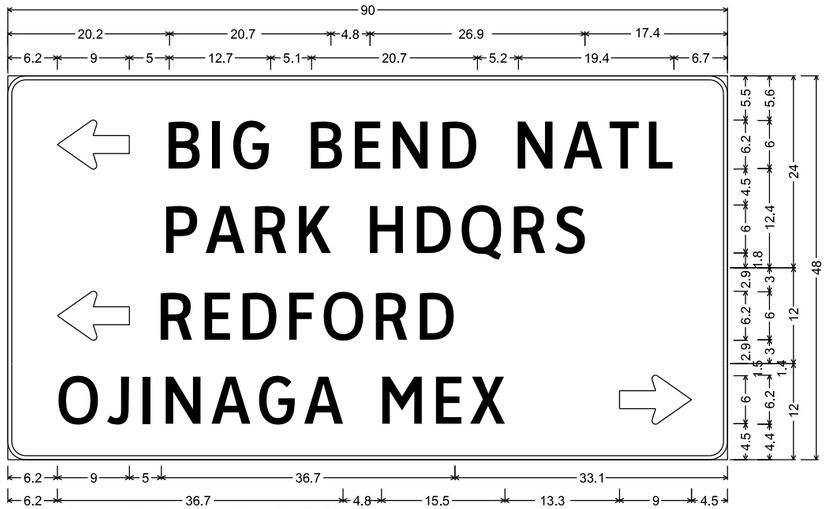
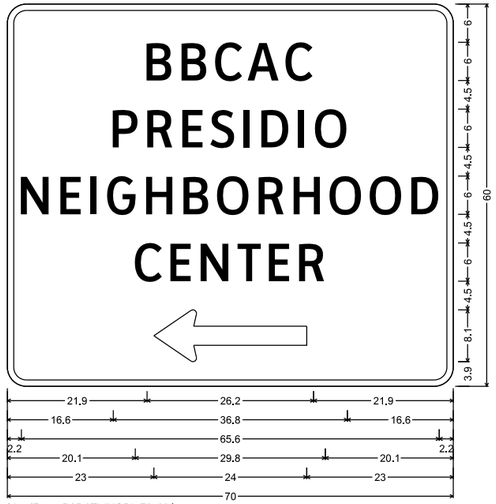


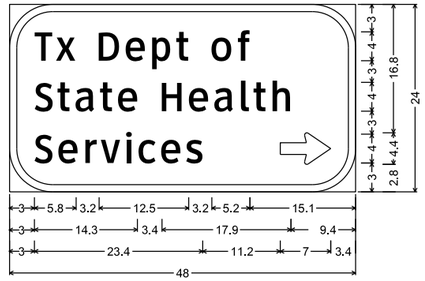
Identifier : D1-3 6in(MOD) LT-LT-RT;
2.3" Radius, 0.5" Border, White on Green;
Standard Arrow Custom 9.0" X 6.1" 180^; [BIG BEND NATL] ClearviewHwy-3-W;
[PARK HDQRS] ClearviewHwy-3-W;
2.3" Radius, 0.5" Border, White on Green;
Standard Arrow Custom 9.0" X 6.1" 180^; [REDFORD] ClearviewHwy-3-W;
2.3" Radius, 0.5" Border, White on Green;
[OJINAGA MEX] ClearviewHwy-3-W; Standard Arrow Custom 9.0" X 6.1" 0^;

SPM SHEET 6 OF 12



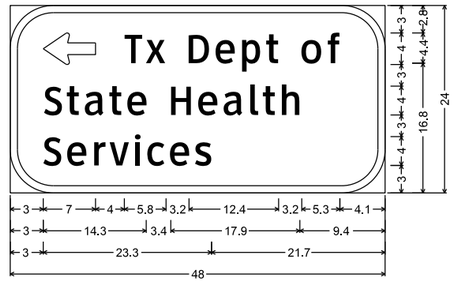
Identifier : D25-3TL(MOD)_70x60^;
3.0" Radius, 1.0" Border, White on Green;
[BBCAC] ClearviewHwy-3-W; [PRESIDIO] ClearviewHwy-3-W;
[NEIGHBORHOOD] ClearviewHwy-3-W; [CENTER] ClearviewHwy-3-W;
Standard Arrow Custom 24.0" X 8.1" 180^;

SPM SHEET 3 OF 12



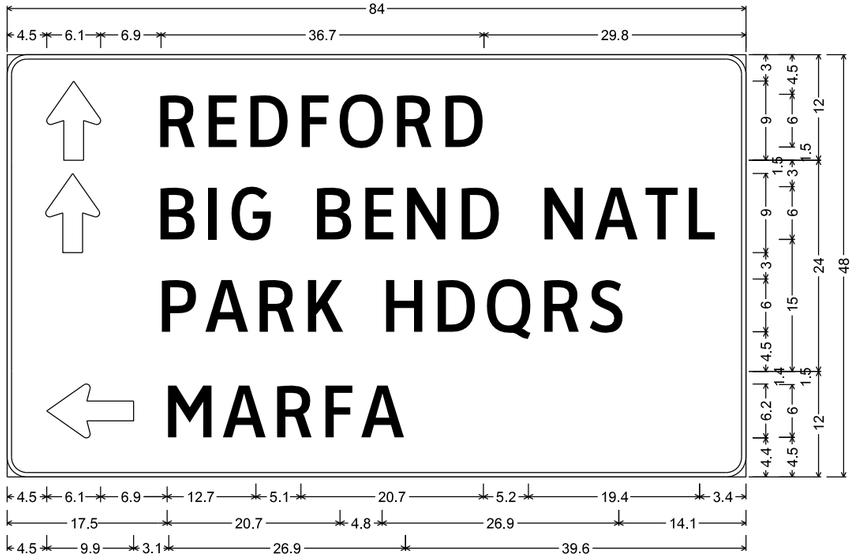
Identifier : D26-3TR
6.0" Radius, 1.0" Border, White on Green;
[Tx Dept of] ClearviewHwy-3-W;
[State Health] ClearviewHwy-3-W;
[Services] ClearviewHwy-3-W;
Standard Arrow Custom 7.0" X 4.4" 0^;

SPM SHEET 4 OF 12



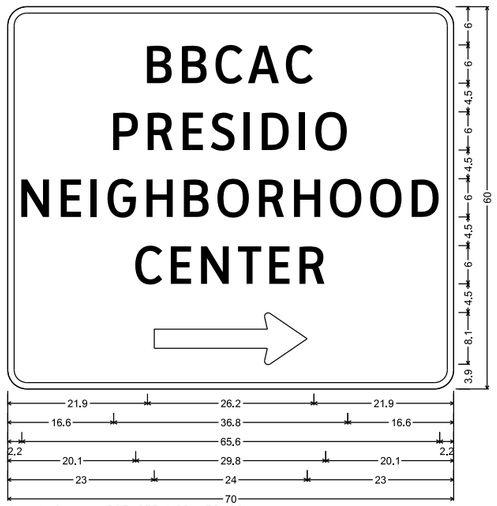
Identifier : D26-3TL
6.0" Radius, 1.0" Border, White on Green;
Standard Arrow Custom 7" X 4.4" 180^;
[Tx Dept of] ClearviewHwy-3-W;
[State Health] ClearviewHwy-3-W;
[Services] ClearviewHwy-3-W;

SPM SHEET 4 OF 12



Identifier : D1-3 6in (MOD) UP-UP-LT;
2.3" Radius, 0.5" Border, White on Green;
Standard Arrow Custom 9.0" X 6.1" 90^; [REDFORD] ClearviewHwy-3-W;
2.3" Radius, 0.5" Border, White on Green;
Standard Arrow Custom 9.0" X 6.1" 90^; [BIG BEND NATL] ClearviewHwy-3-W;
[PARK HDQRS] ClearviewHwy-3-W;
2.3" Radius, 0.5" Border, White on Green;
Standard Arrow Custom 9.9" X 6.1" 180^; [MARFA] ClearviewHwy-3-W;

SPM SHEET 7 OF 6



Identifier : D25-3TR(MOD)*70x60*;
3.0" Radius, 1.0" Border, White on Green;
[BBCAC] ClearviewHwy-3-W; [PRESIDIO] ClearviewHwy-3-W;
[NEIGHBORHOOD] ClearviewHwy-3-W; [CENTER] ClearviewHwy-3-W;
Standard Arrow Custom 24.0" X 8.1" 0^;

SPM SHEET 3 OF 12

DATE	BY	REV	REVISION

STATE OF TEXAS
M. N. MOZAFFAR
85191
LICENSED
PROFESSIONAL ENGINEER

5/23/2023

L S, ENGINEERS, LLC
7670 WOODWAY DRIVE, SUITE 320
HOUSTON, TEXAS 77063
TBPE REG. # F-11657

Texas Department of Transportation

BU 67A

SIGN DETAILS

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		100

DATE: 5/24/2023 2:28:07 PM
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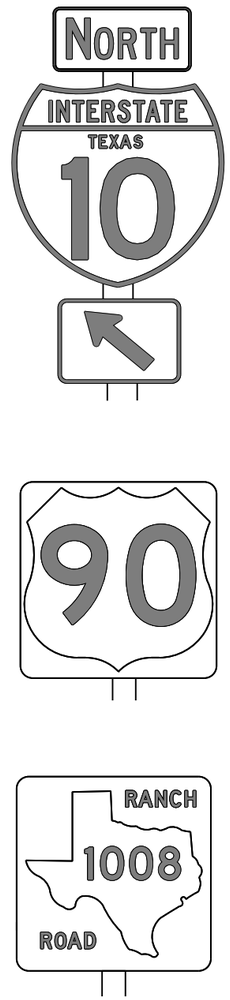
REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

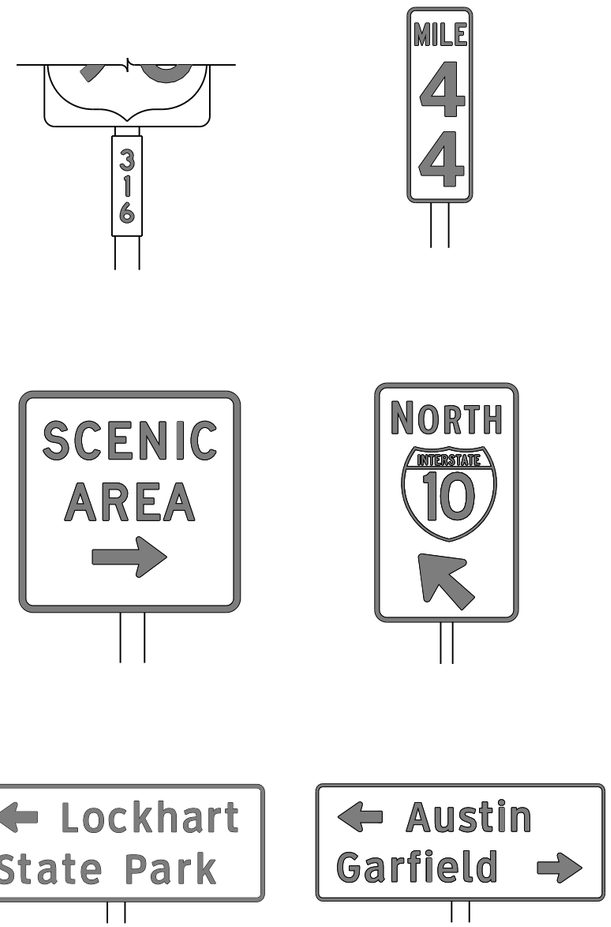
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B or C SHEETING



TYPICAL EXAMPLES

REQUIREMENTS FOR BLUE, BROWN & GREEN D AND I SERIES GUIDE SIGNS

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	ALL	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE D SHEETING
LEGEND, SYMBOLS & BORDERS	ALL OTHERS	TYPE B OR C SHEETING



TYPICAL EXAMPLES

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).

2. White legend shall use the Clearview Alphabet. The following Clearview fonts shall be used to replace the existing white Federal Highway Administration (FHWA) Standard Highway Alphabets, when not specified in the SHSD, or in the plans.

B	CV-1W
C	CV-2W
D	CV-3W
E	CV-4W
Emod	CV-5WR
F	CV-6W

3. Route sign legend (ie. IH, US, SH and FM shields) shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets B, C, D, E, Emod or F).

4. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.

5. Independent mounted route sign with white or colored legend and borders shall be applied by screening process with transparent color ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof. White legend, symbols and borders on all other signs shall be cut-out white sheeting applied to colored background sheeting.

6. Information regarding borders and radii for signs is found in the "Standard Highway Sign Designs for Texas". Dimensions shown and described for borders and corner radii on parent sign are nominal. Borders may vary in width as much as 1/2 inch. Corner radii above 3 inches may vary in width as much as 1 inch. Borders and corner radii within a parent sign must be of matching widths. The sign area outside the corner radius should be trimmed or rounded.

7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.

8. Mounting details of roadside signs are shown in the "SMD series" Standard Plan Sheets.

DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

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

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

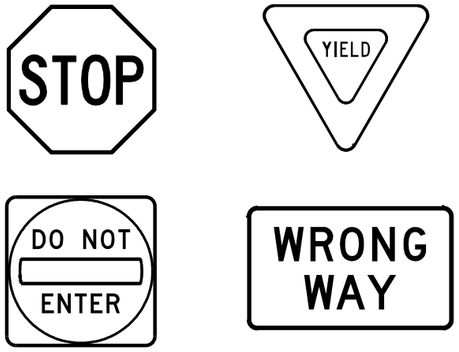
TSR(3)-13

FILE: tsr3-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0104	11	008	BU 67A
12-03 7-13 9-08	DIST	COUNTY		SHEET NO.
	ELP	PRESIDIO		101

DATE: 4/24/2023 12:51:18 AM
FILE: c:\pw_working\infra02\wtee\dms65805\tsr4-13.dgn

REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS

(STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	WHITE	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE B OR C SHEETING
LEGEND	RED	TYPE B OR C SHEETING

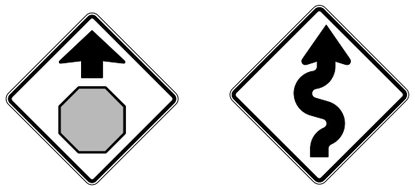
REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS

(EXCLUDING STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)

TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND,BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND,BORDERS AND SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR WARNING SIGNS



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	FLOURESCENT YELLOW	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR SCHOOL SIGNS

TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	FLOURESCENT YELLOW GREEN	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND,BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
SYMBOLS	RED	TYPE B OR C SHEETING

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. Sign legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod or F).
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
5. White legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof.
6. Colored legend shall be applied by screening process with transparent colored ink, transparent colored overlay film or colored sheeting to background sheeting, or combination thereof.
7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.
8. Mounting details for roadside mounted signs are shown in the "SMD series" Standard Plan Sheets.

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

DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

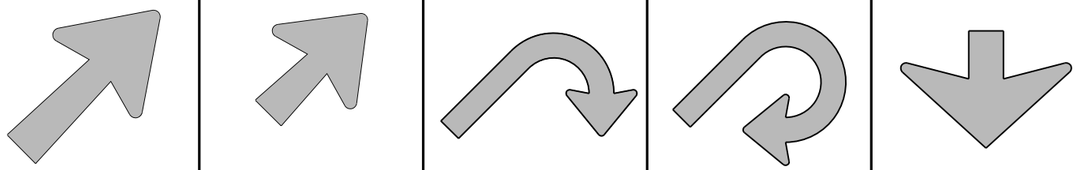
TYPICAL SIGN REQUIREMENTS

TSR(4)-13

FILE: tsr4-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0104	11	008	BU 67A
12-03 7-13 9-08	DIST	COUNTY		SHEET NO.
	ELP	PRESIDIO		102

ARROW DETAILS

for Large Ground-Mounted and Overhead Guide Signs



TYPE	LETTER SIZE	USE
A-1	10.67" U/L and 10" Caps	Single Lane Exits
A-2	13.33" U/L and 12" Caps	
A-3	16" & 20" U/L	
B-1	10.67" U/L and 10" Caps	Multiple Lane Exits
B-2	13.33" U/L and 12" Caps	
B-3	16" & 20" U/L	

CODE	USED ON SIGN NO.
E-3	E5-1aT
E-4	E5-1bT

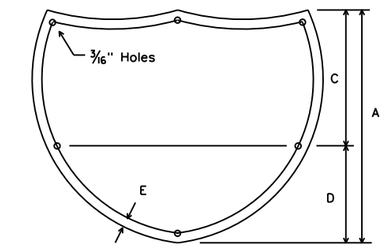
NOTE

Arrow dimensions are shown in the "Standard Highway Sign Designs for Texas" manual.

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

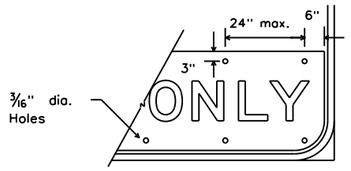
http://www.txdot.gov/

SIGN BLANK PUNCHING DETAILS FOR ATTACHMENTS WHEN SPECIFIED TO BE TYPE A ALUMINUM SIGNS (FOR MOUNTING TO GUIDE SIGN FACE)

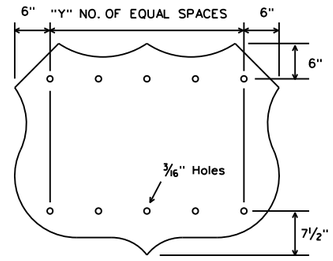


INTERSTATE ROUTE MARKERS

A	C	D	E
36	21	15	1½
48	28	20	1¾

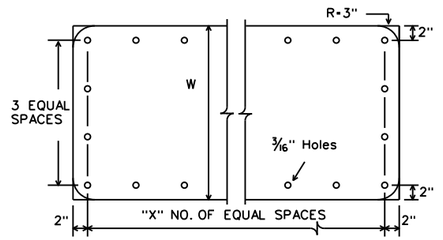


EXIT ONLY PANEL



U.S. ROUTE MARKERS

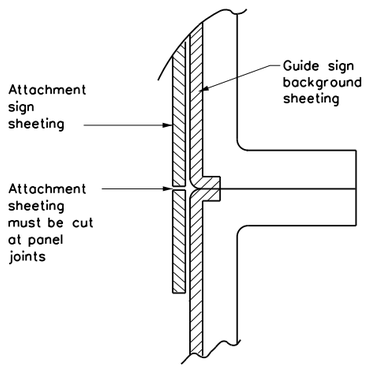
Sign Size	"Y"
24x24	2
30x24	3
36x36	3
45x36	4
48x48	4
60x48	5



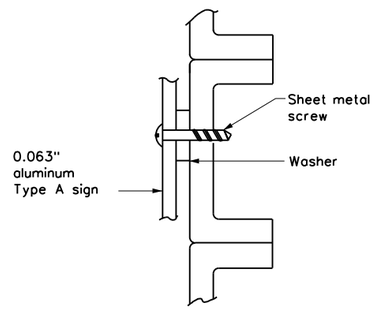
STATE ROUTE MARKERS

No. of Digits	W	X
4	24	4
4	36	5
4	48	6
3	24	3
3	36	4
3	48	5

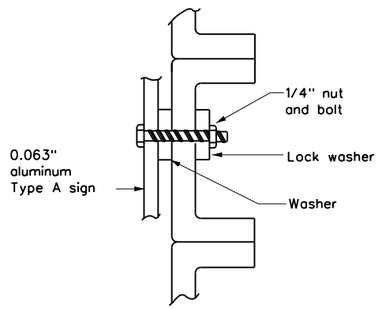
MOUNTING DETAILS OF ATTACHMENTS TO GUIDE SIGN FACE ("EXIT ONLY" AND "LEFT EXIT" PANELS, ROUTE MARKERS AND OTHER ATTACHMENTS)



DIRECT APPLIED ATTACHMENT



SCREW ATTACHMENT



NUT/BOLT ATTACHMENT

NOTE:

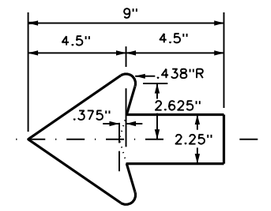
1. Sheeting for legend, symbols, and borders must be cut at panel joints.
2. Direct applied attachment signs will be subsidiary to "Aluminum Signs" or "Fiberglass Signs".

NOTE:

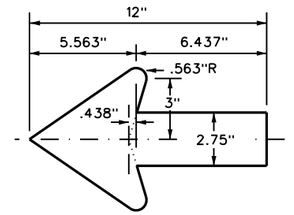
Furnish Type A aluminum sign attachments only when specified in the plans. These signs will be paid for under "Aluminum Signs".

ARROW DETAILS

for Destination Signs (Type D)



Standard arrow to be used with 6 inch letters.



Standard arrow to be used with 8 inch letters.

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(5)-13

FILE: tsr5-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0104	11	008	BU 67A
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	ELP	PRESIDIO		103

5

DATE: 4/24/2023 12:51:20 AM
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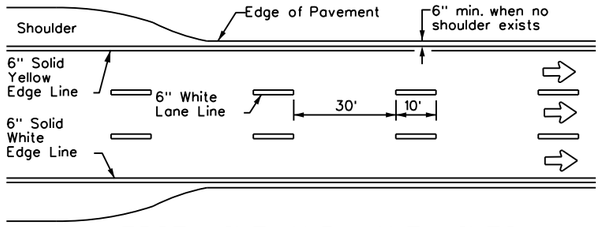
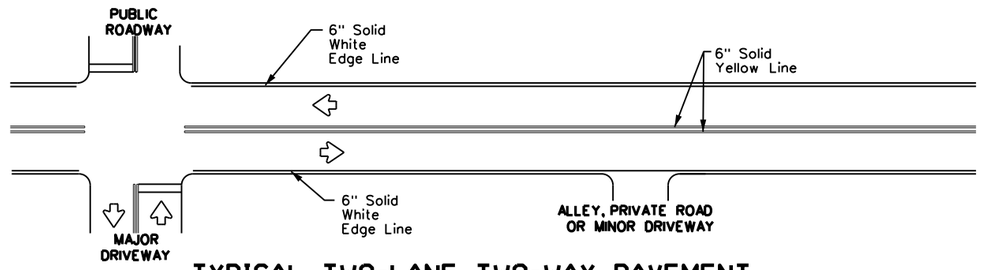
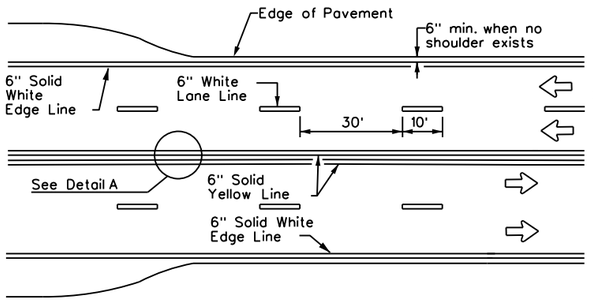
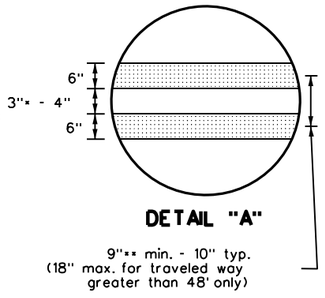


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS

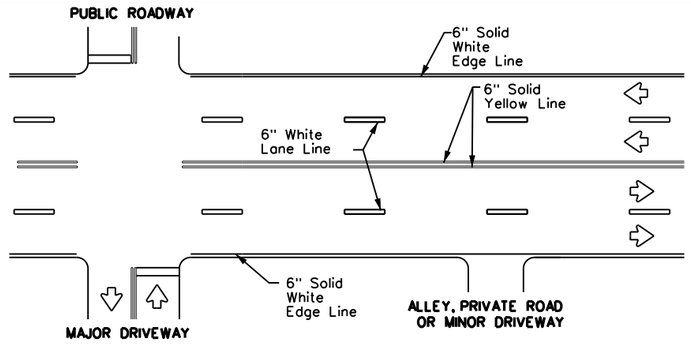




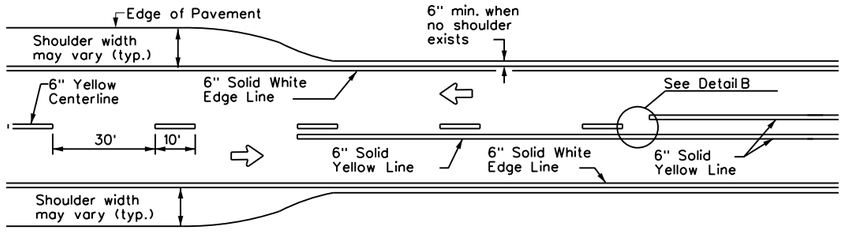
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

* 2" minimum for restripe projects when approved by the Engineer.

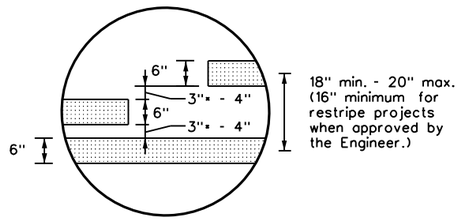
** 8" minimum for restripe projects when approved by the Engineer.



TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS

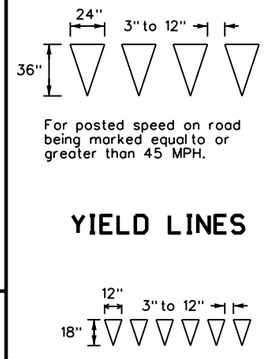


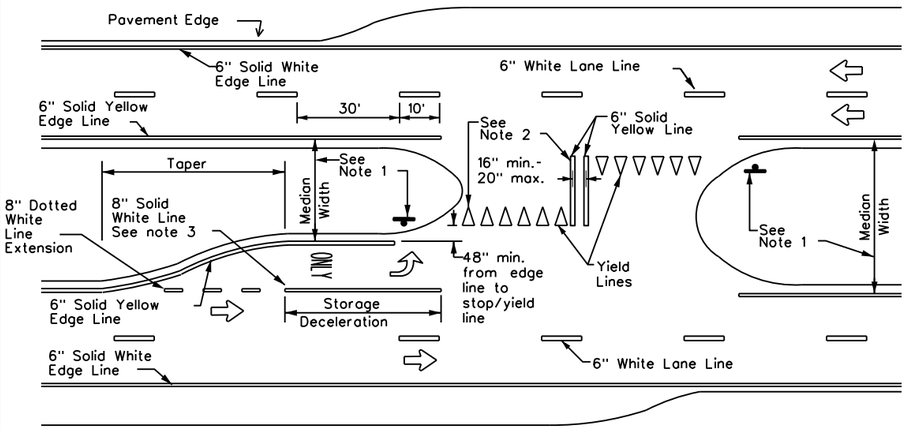
TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



DETAIL "B"

* 2" minimum for restripe projects when approved by the Engineer.





FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

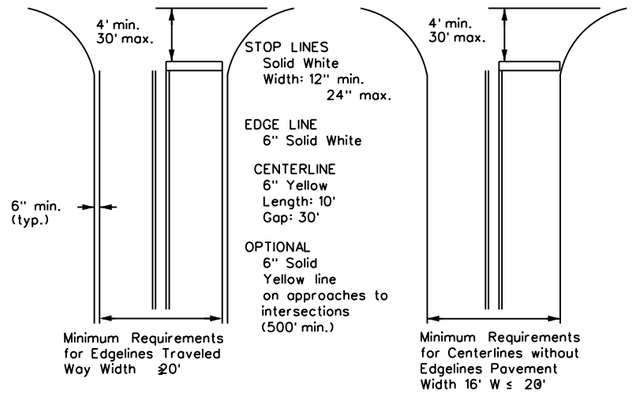
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections.
   Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs and stop bars are optional as determined by the Engineer.
2. Install median striping (double yellow centerlines and stop lines/yield lines) when a 50' or greater median centerline can be placed. Stop lines shall only be used with stop signs. Yield lines shall only be used with yield signs.
3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

GENERAL NOTES

1. Edge line striping shall be as shown in the plans or as directed by the Engineer. The edge line should not be placed less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edge lines are not required in curb and gutter sections of roadways.
2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the center of edge line to the center of edge line of a two lane roadway.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



NOTE: Traveled way is exclusive of shoulder widths. Refer to General Note 2 for additional details.

GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Roadways

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

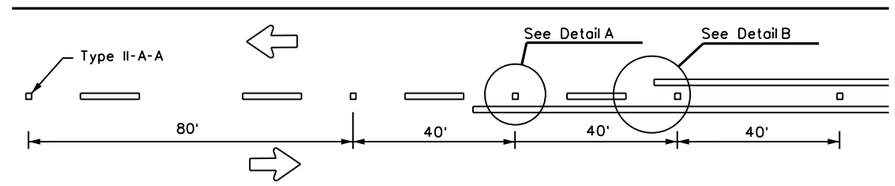
PM(1)-22

FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 11-78 8-00 6-20 8-95 3-03 12-22 5-00 2-12	0104	11	008	BU 67A
	DIST	COUNTY		SHEET NO.
	ELP	PRESIDIO		104

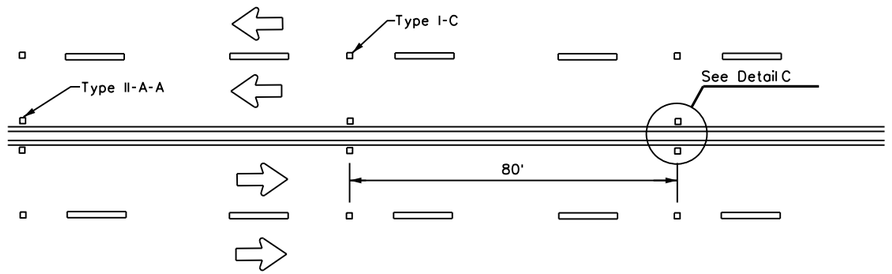
22A

DATE: 4/24/2023 12:51:23 AM
FILE: c:\pw-working\txinfra02\wtee\dms65805\pm1-22.dgn

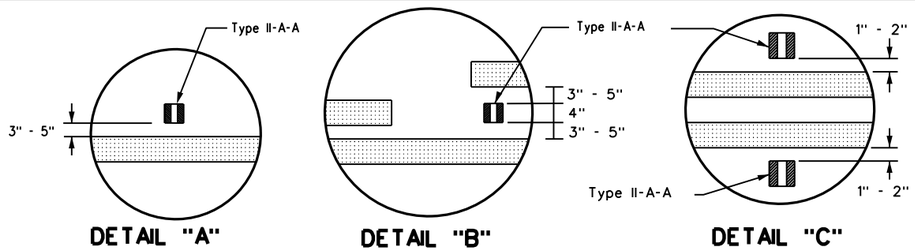
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

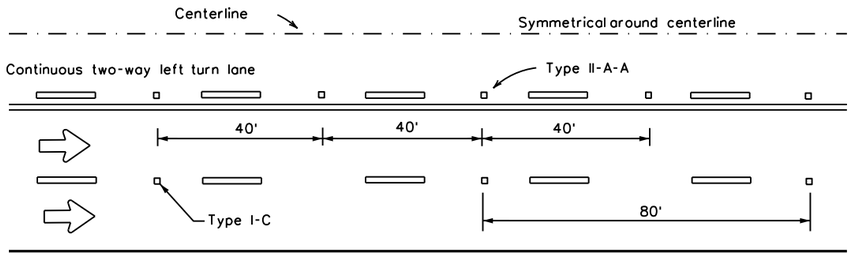


CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS

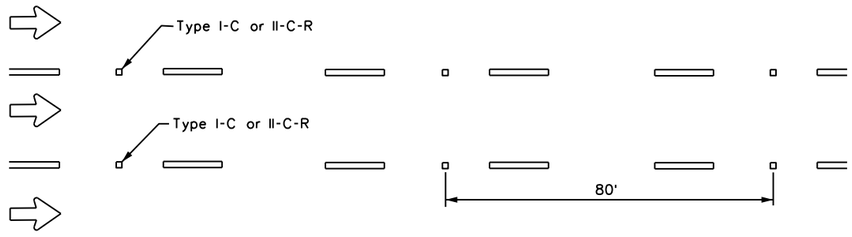


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY ROADWAYS





CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



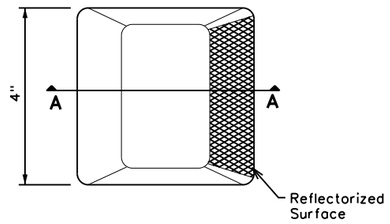
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

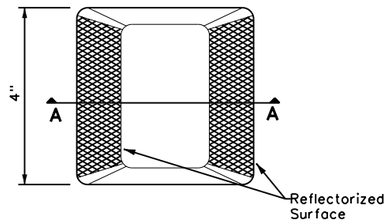
See Note 3.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

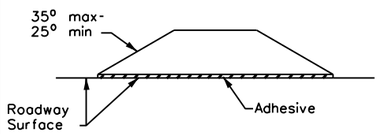
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

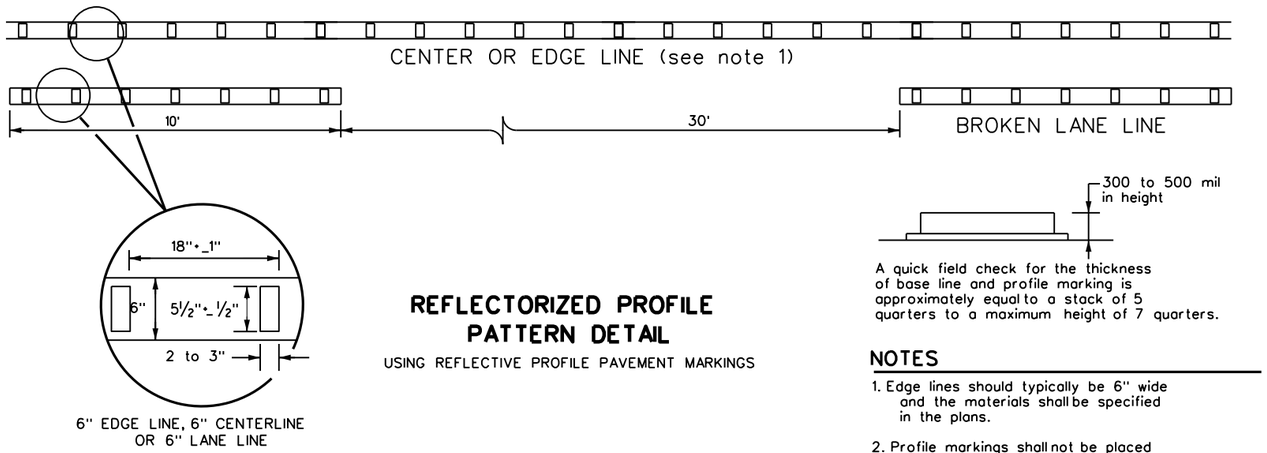


Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS



REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

NOTES

1. Edge lines should typically be 6" wide and the materials shall be specified in the plans.
2. Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

1. All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.
3. Use raised pavement marker Type I-C with undivided roadways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.

Texas Department of Transportation

Traffic Safety Division Standard

POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS PM(2)-22

FILE: pm2-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-77 8-00 6-20 4-92 2-10 12-22 5-00 2-12	0104	11	008	BU 67A
	DIST	COUNTY		SHEET NO.
	ELP	PRESIDIO		105

22B

DATE: 4/24/2023 12:51:26 AM
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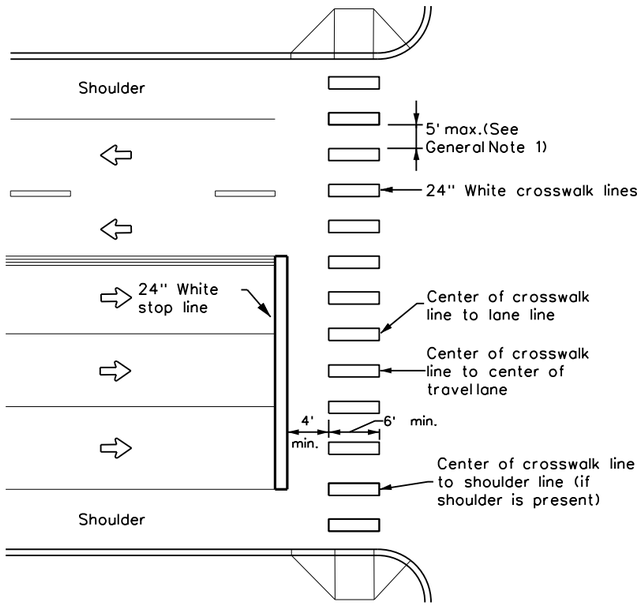


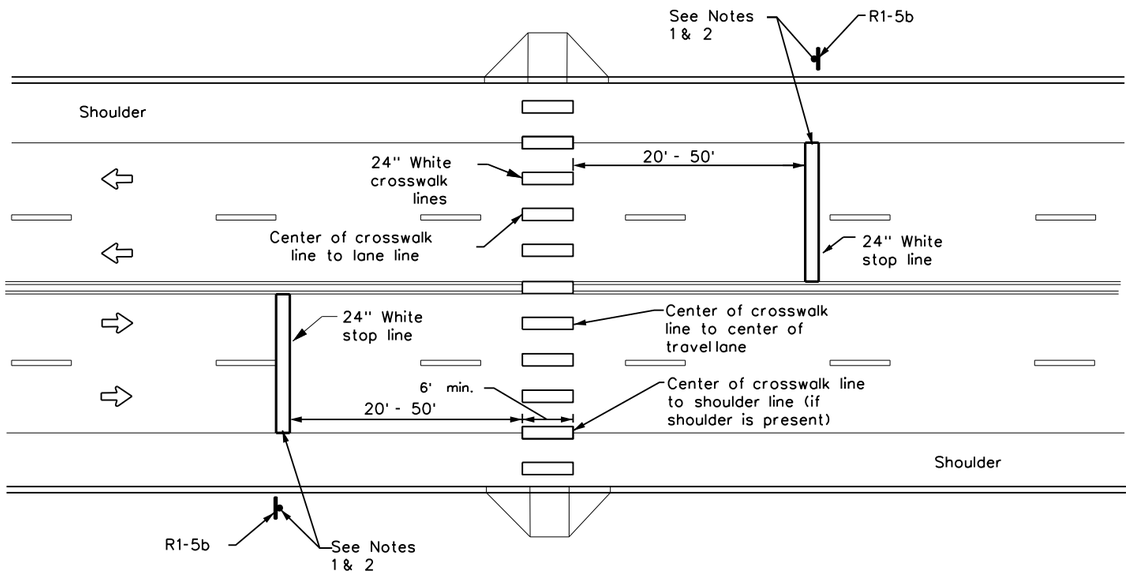
HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH

GENERAL NOTES

1. Longitudinal crosswalk lines should not be placed in the wheel path of vehicles. Center the crosswalk lines on travel lanes, lane lines, and shoulder lines (if present).
2. A minimum 6" clear distance shall be provided to the curb face. If the last crosswalk line falls into this distance it must be omitted.
3. For divided roadways, adjustments in spacing of the crosswalk lines should be made in the median so that the crosswalk lines are maintained in their proper location across the travel portion of the roadway.
4. At skewed crosswalks, the crosswalk lines are to remain parallel to the lane lines.
5. Each crosswalk shall be a minimum of 6' wide.
6. The High-Visibility Longitudinal Crosswalk is the preferred crosswalk pattern on State Highways. Other crosswalk patterns as shown in the "Texas Manual on Uniform Traffic Control Devices" may be used. All crosswalk designs and dimension shall comply with the "Texas Manual on Uniform Traffic Control Devices."
7. Final placement of Stop Bar and Crosswalk shall be approved by the Engineer in the field.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



UNSIGNALIZED MIDBLOCK HIGH-VISIBILITY LONGITUDINAL CROSSWALK

NOTES:

1. Use stop bars with Stop Here For Pedestrians (R1-5b) signs at unsignalized midblock cross walks.
2. Use stop bars with STOP HERE ON RED (R10-6 or R10-6a) signs at mid block crosswalks controlled by traffic signals or pedestrian hybrid beacons.

Texas Department of Transportation

Traffic Safety Division Standard

CROSSWALK PAVEMENT MARKINGS

PM(4)-22A

FILE: pm4-22a.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0104	11	008	BU 67A
6-20	DIST	COUNTY		SHEET NO.
6-22	ELP	PRESIDIO		106
12-22				
22D				

DATE: 4/24/2023 12:51:28 AM
FILE: c:\pw_working\txinfra02\wtee\dms65805\pm4-22a.dgn

SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

Post Type

FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
TWT = Thin-Walled Tubing (see SMD(TWT))
10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2)

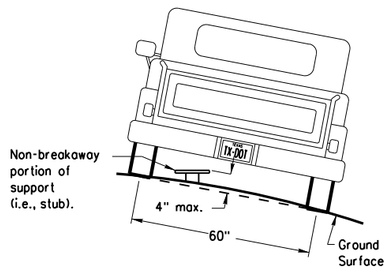
Anchor Type

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

Sign Mounting Designation

P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
IF REQUIRED
1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
WC = 1.12 #/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))
EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-3))

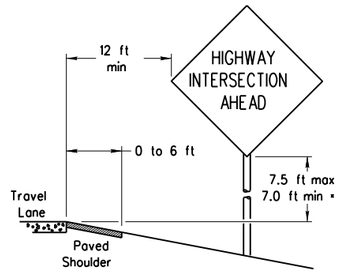
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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

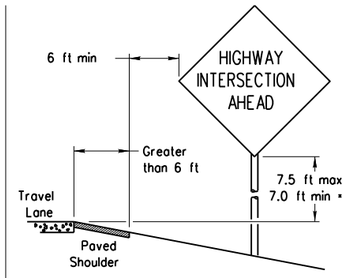
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

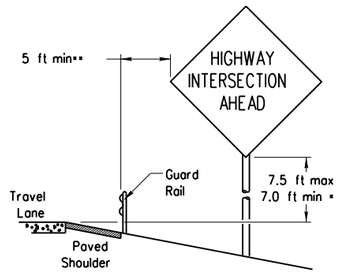
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



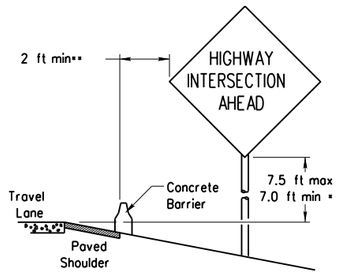
GREATER THAN 6 FT. WIDE

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

BEHIND BARRIER



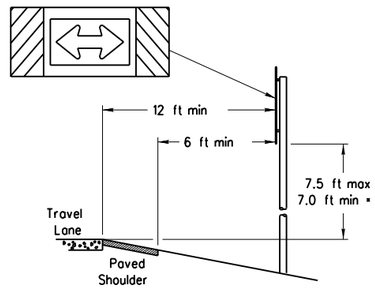
BEHIND GUARDRAIL



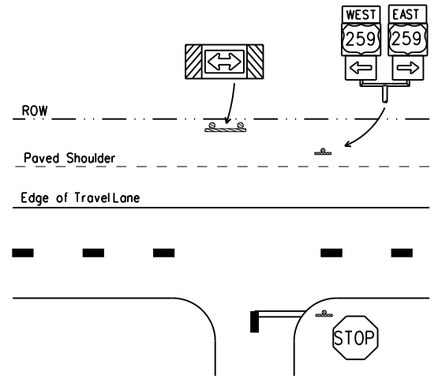
BEHIND CONCRETE BARRIER

**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

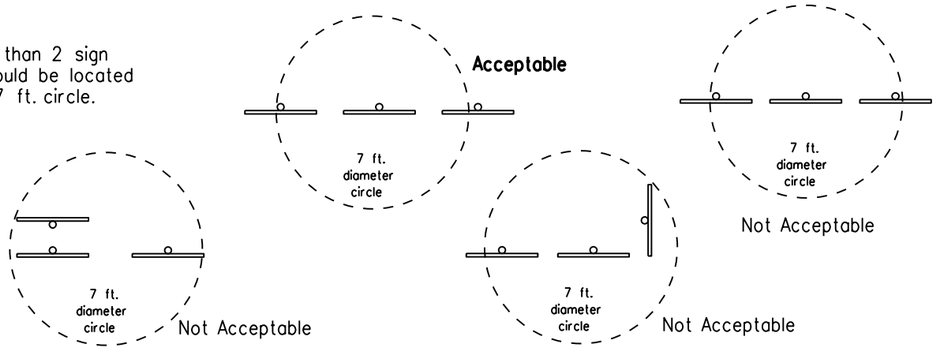
T-INTERSECTION



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

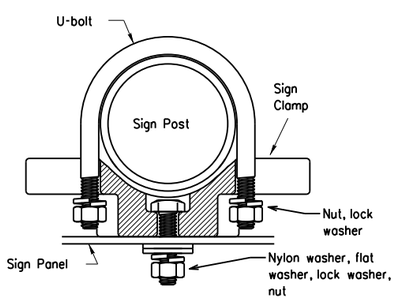


No more than 2 sign posts should be located within a 7 ft. circle.



TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

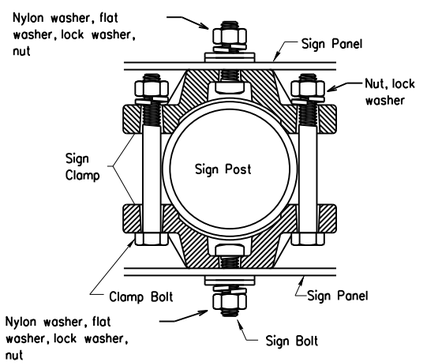


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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

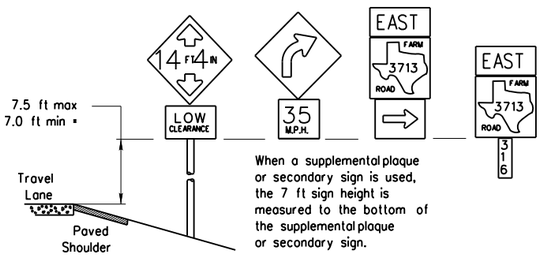
Sign clamps may be either the specific size clamp or the universal clamp.

Back-to-Back Signs



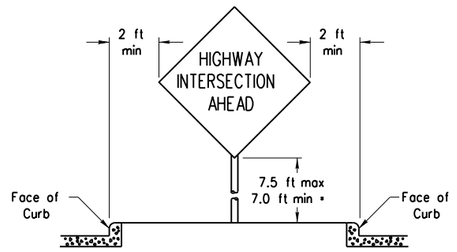
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



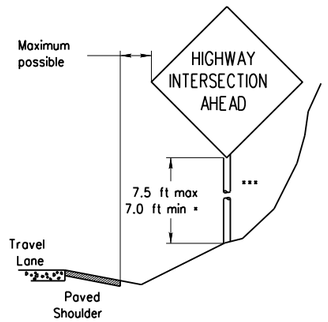
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



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

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

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

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

(1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or

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

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

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

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A

DIST	COUNTY	SHEET NO.
ELP	PRESIDIO	107

9-08 REVISIONS

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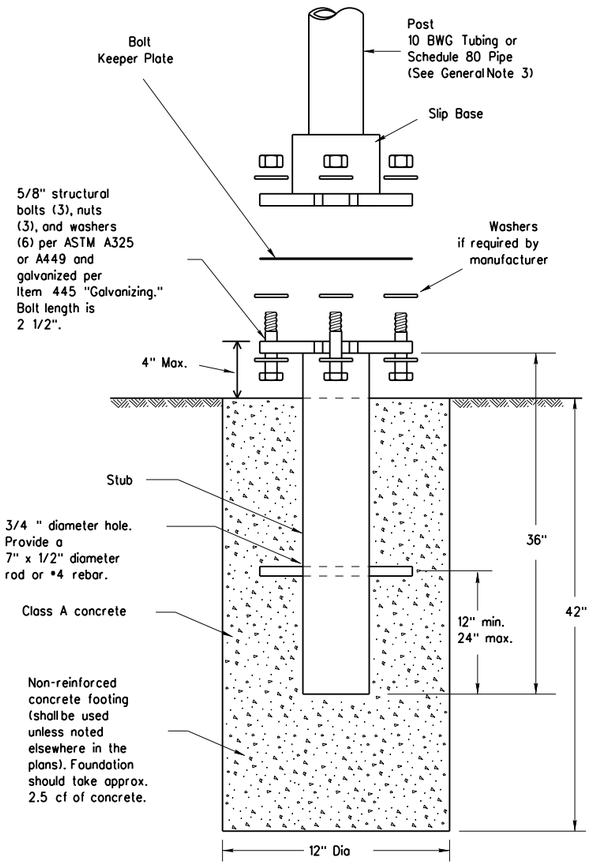
TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



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

NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer list.htm_ The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   - 10 BWG Tubing (2.875" outside diameter)
     - 0.134" nominal wall thickness
     - Seamless or electric-resistance welded steel tubing or pipe
     - Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
     - Other steels may be used if they meet the following:
       - 55,000 PSI minimum yield strength
       - 70,000 PSI minimum tensile strength
       - 20% minimum elongation in 2"
     - Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
     - Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
     - Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
   - Schedule 80 Pipe (2.875" outside diameter)
     - 0.276" nominal wall thickness
     - Steel tubing per ASTM A500 Gr C
     - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
       - 46,000 PSI minimum yield strength
       - 62,000 PSI minimum tensile strength
       - 21% minimum elongation in 2"
     - Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
     - Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
     - Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

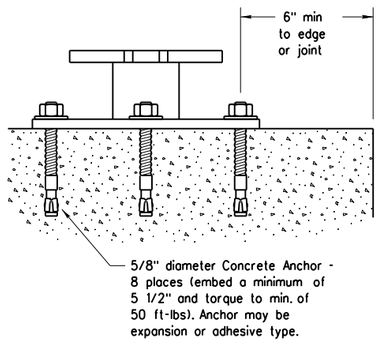
Foundation

1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support

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

CONCRETE ANCHOR



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

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

© TxDOT July 2002	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
REVISIONS	CONT	SECT	JOB	HIGHWAY
9-08	0104	11	008	BU 67A
	DIST	COUNTY		SHEET NO.
	ELP	PRESIDIO		108

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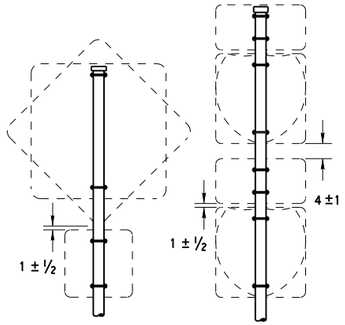
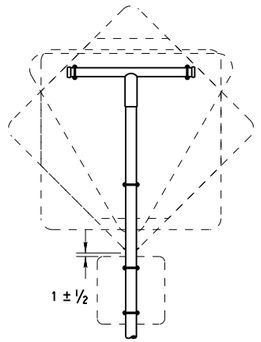
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



SM RD SGN ASSM TY XXXXX(1)XX(P)



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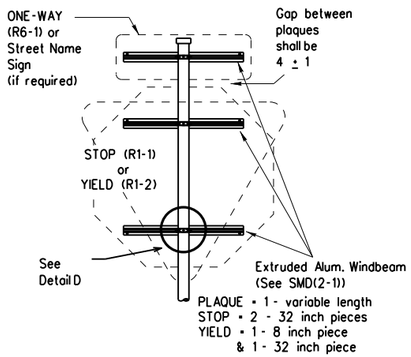

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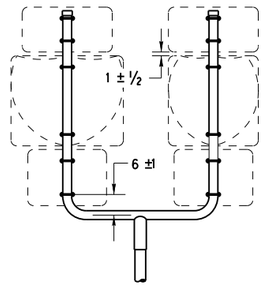

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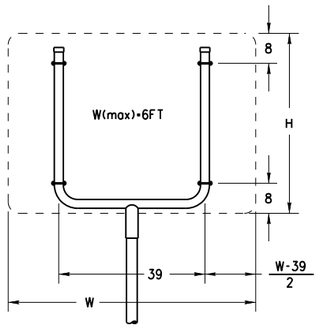

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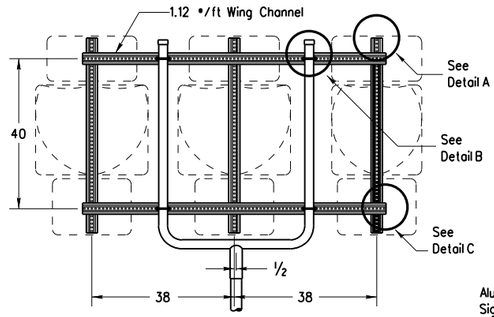
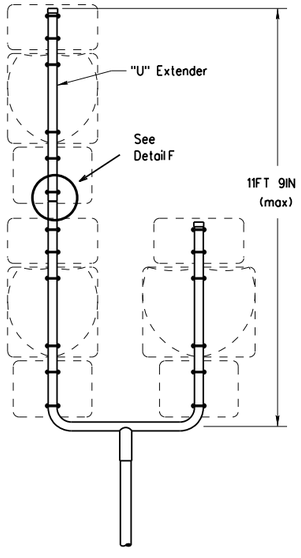


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)



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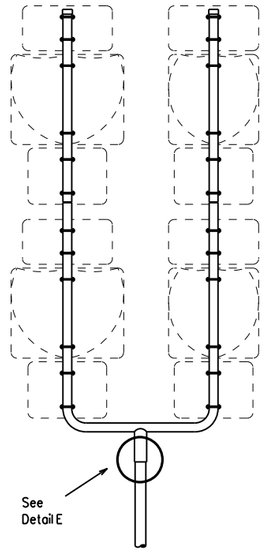

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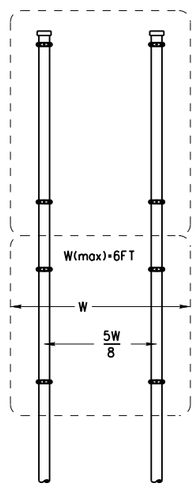
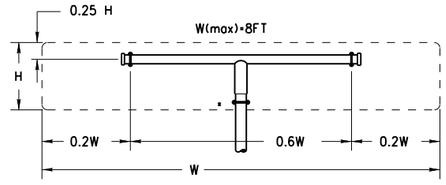
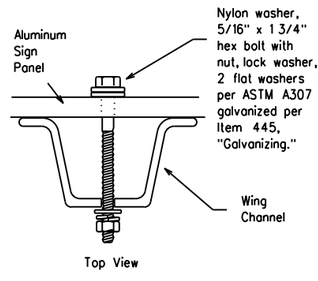


SM RD SGN ASSYM TY XXXXX(2)XX(P)

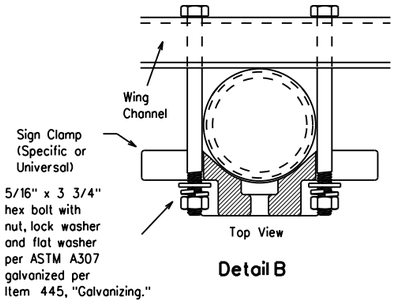


SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

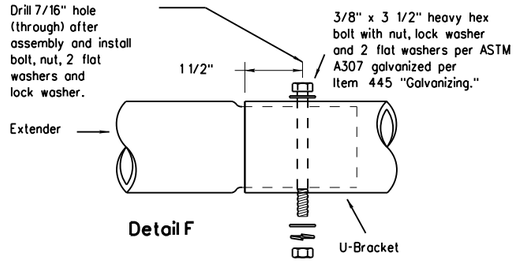
All dimensions are in english unless detailed otherwise.



Detail A

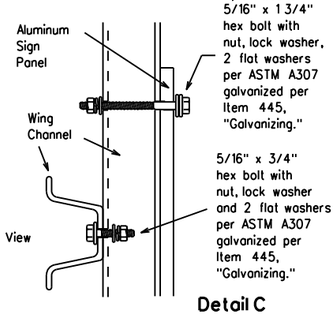


Detail B

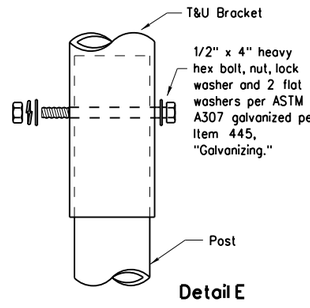


Detail F

Splices shall only be allowed behind the sign substrate.

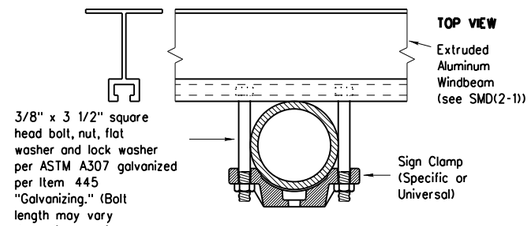


Detail C

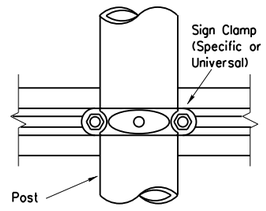


Detail E

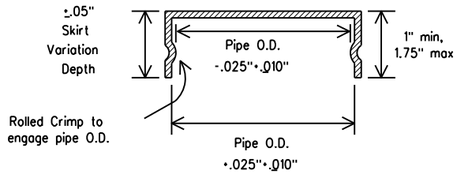
SIDE VIEW



Detail D



FRICTION CAP DETAIL



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

GENERAL NOTES:

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

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

REQUIRED SUPPORT

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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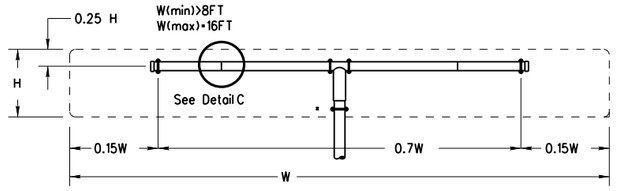
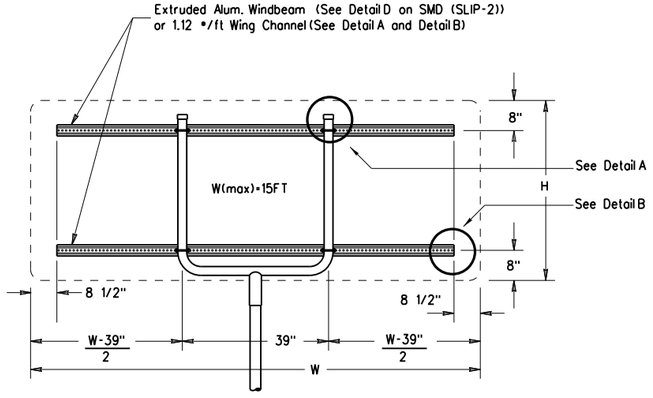


SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)
(• - See Note 12)



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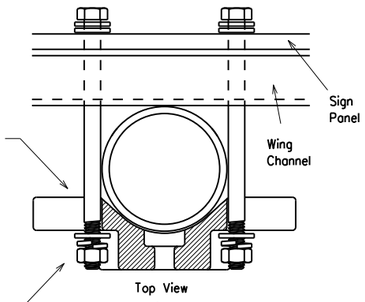
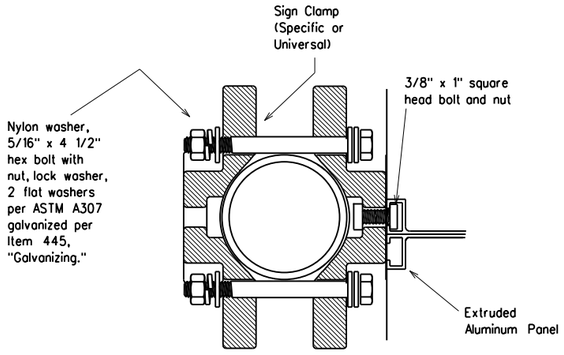
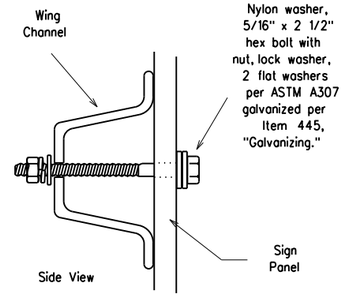


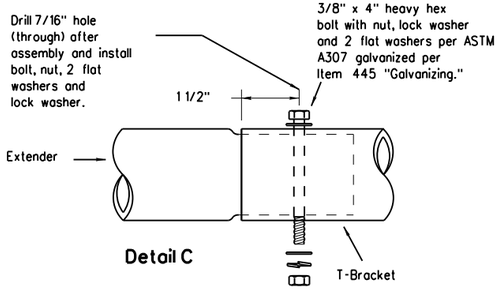
Detail A



Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET

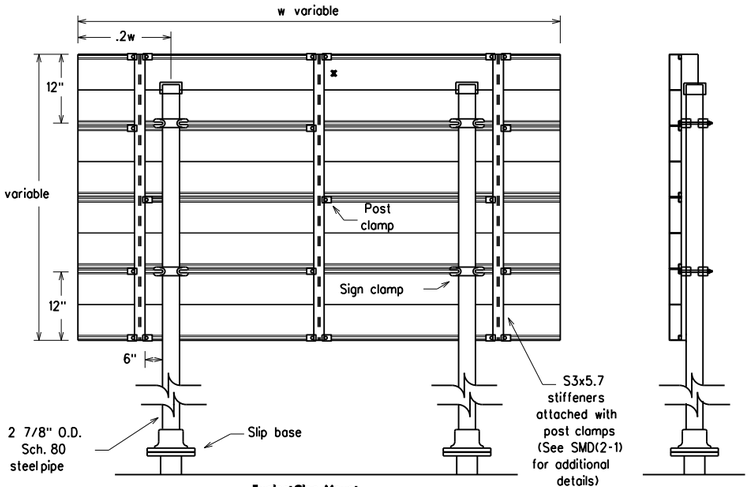


Detail B



Detail C

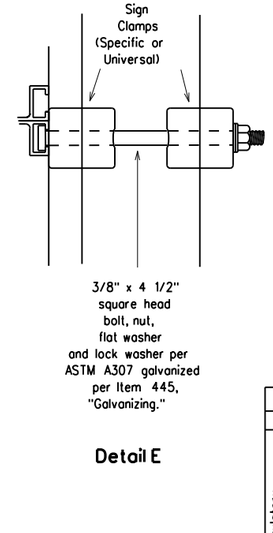
Splices shall only be allowed behind the sign substrate.



Typical Sign Mount

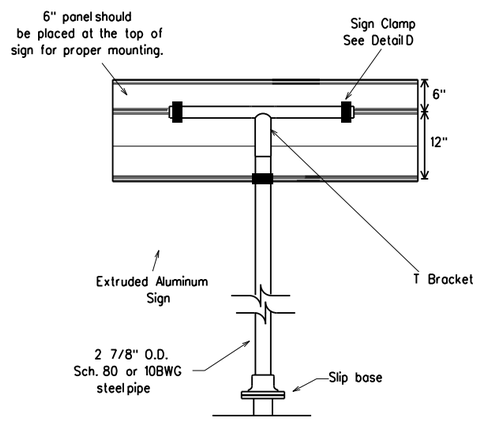
SM RD SGN ASSM TY S80(2)XX(P-EXAL)

• Additional stiffener placed at approximate center of signs when sign width is greater than 10'.

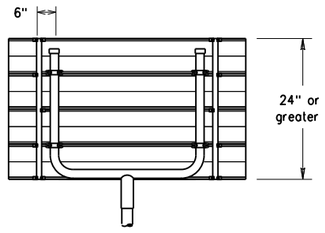


Detail E

See Detail E
for clamp installation



Extruded Aluminum Sign
With T Bracket



Use Extruded Alum. Windbeam as stiffeners
See SMD (2-1) for additional details

See Detail E
for clamp installation

GENERAL NOTES:

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

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

REQUIRED SUPPORT

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-3)-08

REVISIONS
9-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A

DIST	COUNTY	SHEET NO.
ELP	PRESIDIO	110

DATE: 4/24/2023 12:51:41 AM
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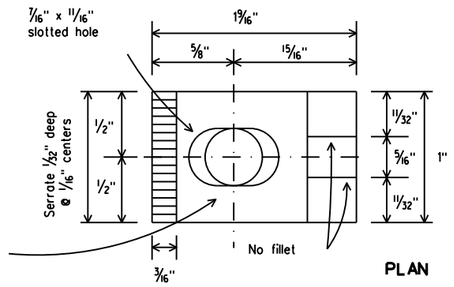
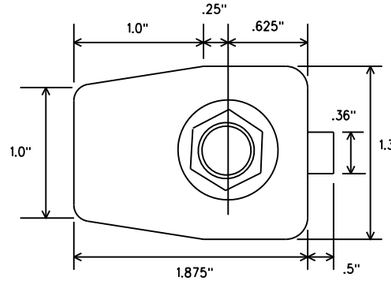
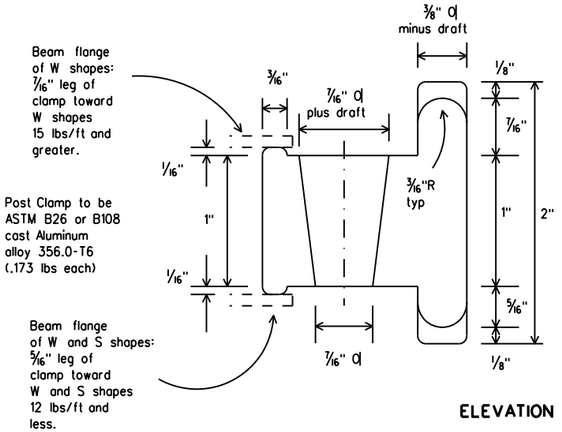
NOTE: centerline of hole for 3/8" diameter squarehead bolt x 2 1/4" long with a flat washer and self-locking nut, or lock washer and hex. nut. Bolt head dimensions shall be in accordance with ANSI B 18.2.1 as referred to in the AISC Manual of steel construction. Bolt assembly shall be galvanized.



PLAN

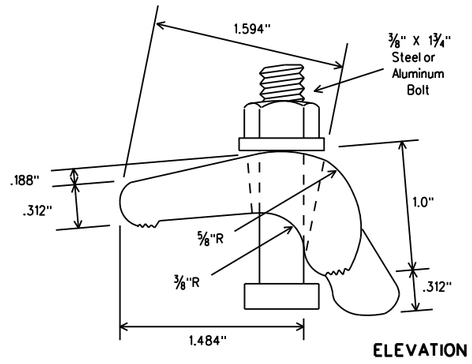


PLAN



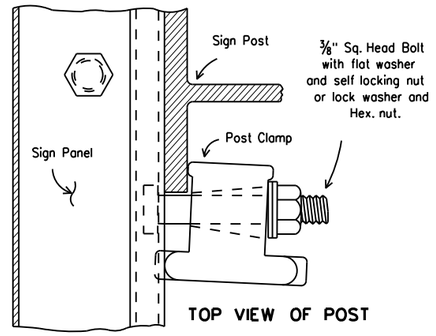
ELEVATION

POST CLAMP DETAIL

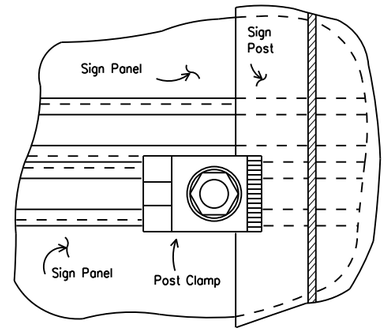


ELEVATION

ALTERNATE POST CLAMP DETAIL



TOP VIEW OF POST



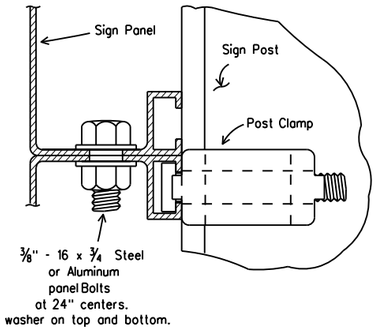
TOP VIEW OF CLAMP

DEPARTMENTAL MATERIAL SPECIFICATIONS

SIGN HARDWARE DMS-7120

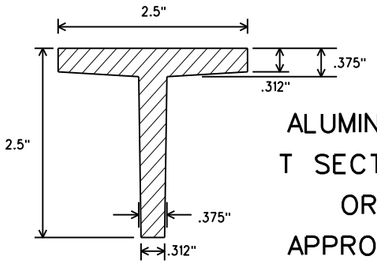
GENERAL NOTES:

1. Design conforms with AASHTO Specifications for the design and construction of structural supports for highway signs.
2. Materials and fabrication shall conform to the requirements of the Department material specifications.
3. Structural steel shall be "low-alloy steel" for non-bridge structures per Item 442, "Metal For Structures."
4. For fiberglass substrate connection details, see manufacturer's recommendations.



SIDE VIEW OF PANELS

CONNECTION DETAILS

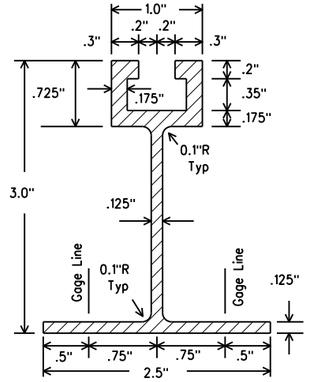


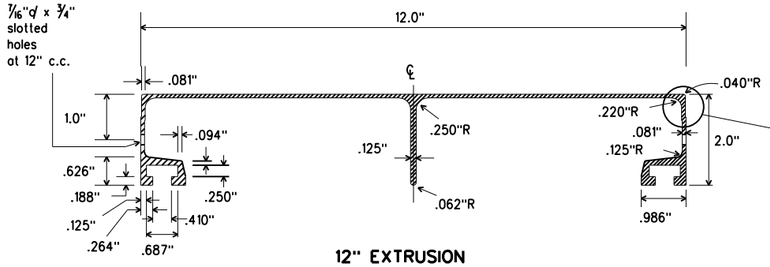
1.912 lbs/ft

ALUMINUM T SECTION OR APPROVED ALTERNATIVE

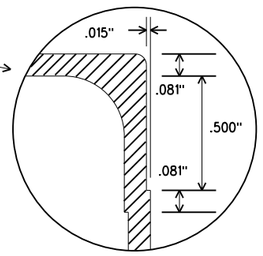
WINDBEAM CROSS SECTION

Windbeam to be extruded aluminum (1.175 lbs/ft) or approved alternative

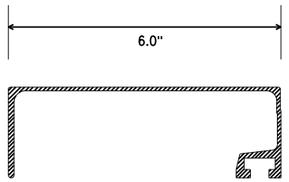




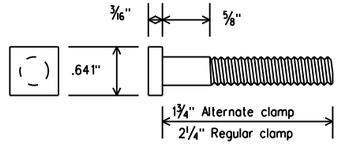
12" EXTRUSION



ALUMINUM SIGN PANEL EXTRUSION DETAILS



6" EXTRUSION



POST CLAMP BOLT DETAIL

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS- EXTRUDED ALUMINUM SIGN PANELS & HARDWARE

SMD(2-1)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS 9-08

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A

DIST	COUNTY	SHEET NO.
ELP	PRESIDIO	111

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

This SWP3 has been developed in accordance with TxDOT policy for projects disturbing less than 1 acre of soil, and not part of a larger common plan of development.

For all projects with any soil disturbing activities, TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office. If no field office is available, then this SWP3 shall be kept at the appropriate TxDOT Area Office.

This SWP3 is consistent with requirements specified in applicable stormwater plans, and the project's environmental permits, issues, and commitments (EPICs).

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):
0104-11-008

1.2 PROJECT LIMITS:
From: US 67 NORTH

To: US 67 SOUTH

1.3 PROJECT COORDINATES:
BEGIN: (Lat) 29.5703214 ,(Long) -104.3751574

END: (Lat) 29.5614340 ,(Long) -104.3861113

1.4 TOTAL PROJECT AREA (Acres): 24.07

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0.23

1.6 NATURE OF CONSTRUCTION ACTIVITY:
ROADWAY REHABILITATION, PARTIAL ADA IMPROVEMENS AND INSTALLING SIGNS

1.7 MAJOR SOIL TYPES:

Soil Type	Description
Corazones-Ojinaga complex, 1 to 12% slopes	Gravelly sandy loam, well drained, low to very high rate of runoff, and slight erosion potential.
Vicente, Lomapelona, and Castolon soils, 0 to 1% slopes	Sandy loam and silty clay loam, moderately well to well drained, low rate of runoff, and slight erosion potential.

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

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

Type	Sheet #s
N/A	

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

1.9 CONSTRUCTION ACTIVITIES:
(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.3.)

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

1.10 POTENTIAL POLLUTANTS AND SOURCES:

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

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

Tributaries	Classified Waterbody
N/A	*Rio Grande Below Riverside Diversion Dam (2307); Impaired for Chloride and TSS

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

1.12 ROLES AND RESPONSIBILITIES: TxDOT

☒ Development of plans and specifications
☒ Perform SWP3 inspections
☒ Maintain SWP3 records and update to reflect daily operations
☐ Other:
☐ Other:

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

☒ Day To Day Operational Control
☒ Maintain schedule of major construction activities
☒ Install, maintain and modify BMPs
☐ Other:
☐ Other:
☐ Other:

STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	C 104-11-8		112
STATE	STATE DIST.	COUNTY	
TEXAS	ELP	PRESIDIO	
CONT.	SECT.	JOB	HIGHWAY NO.
0104	11	008	BU 67A

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

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

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

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

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

2.2 SEDIMENT CONTROL BMPs:

T / P

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

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

2.3 PERMANENT CONTROLS:

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

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To
Concrete riprap	3149+00	3154+70

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

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

- X Excess dirt/mud on road removed daily
- ☐ Haul roads dampened for dust control
- X Loaded haul trucks to be covered with tarpaulin
- ☐ Stabilized construction exit
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

2.5 POLLUTION PREVENTION MEASURES:

- ☐ Chemical Management
- ☐ Concrete and Materials Waste Management
- X Debris and Trash Management
- ☐ Dust Control
- X Sanitary Facilities
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

2.6 VEGETATED BUFFER ZONES:

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

Type	Stationing	
	From	To
N/A		

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

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

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

2.8 INSPECTIONS:

All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3 .

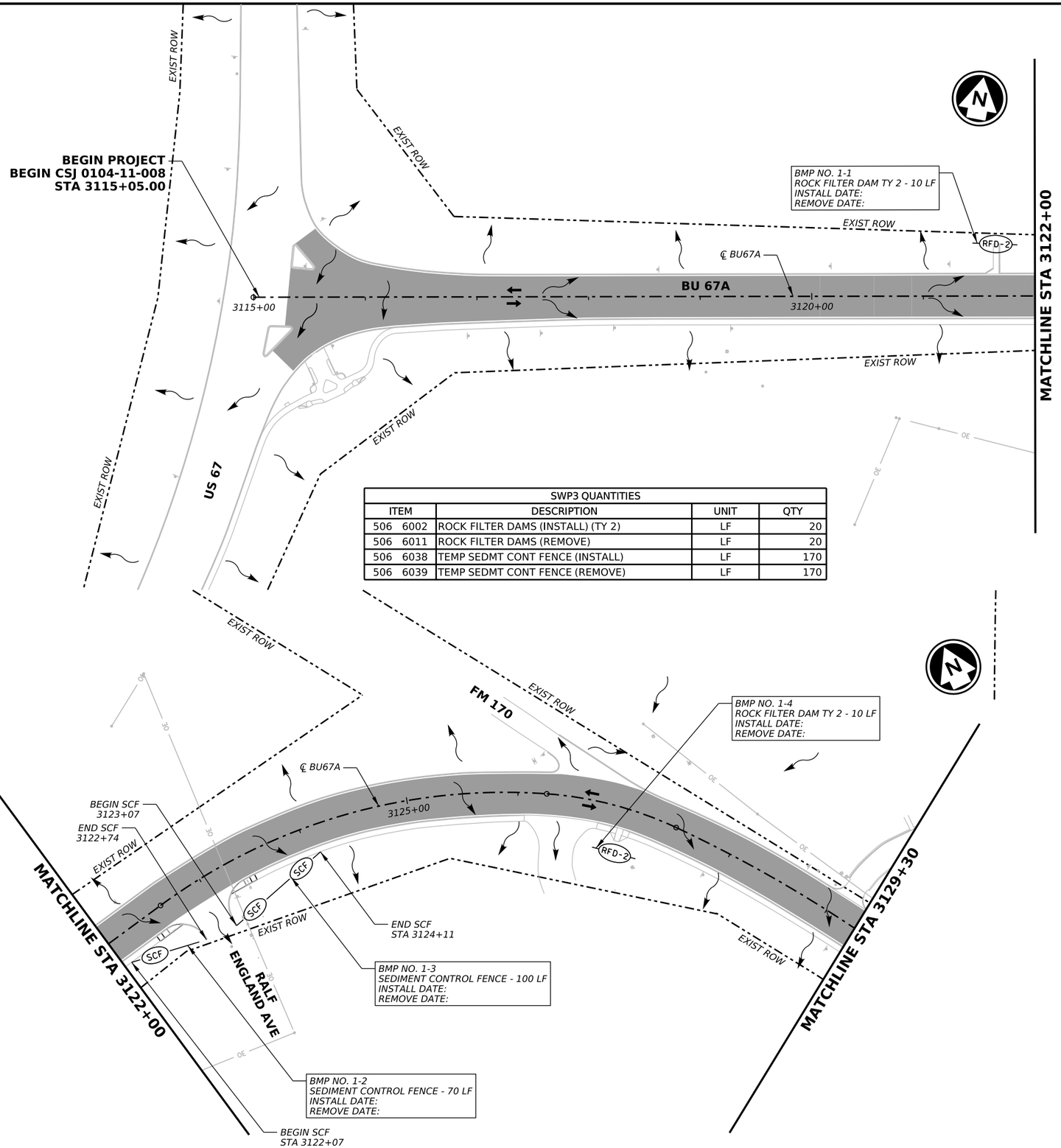
2.9 MAINTENANCE:

Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. Maintenance shall be performed by the Contractor as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3.

STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	C 104-11-8		113
STATE	STATE DIST.	COUNTY	
TEXAS	ELP	PRESIDIO	
CONT.	SECT.	JOB	HIGHWAY NO.
0104	11	008	BU 67A



SWP3 QUANTITIES			
ITEM	DESCRIPTION	UNIT	QTY
506 6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	20
506 6011	ROCK FILTER DAMS (REMOVE)	LF	20
506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	170
506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	170

LEGEND:

- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- CONCRETE RIPRAP (4")
- 6" PAVEMENT REPAIR
- 2.5" SP MIXES
- EXISTING ROW
- DIRECTION OF FLOW
- SCF — SEDIMENT CONTROL FENCE
- RFD-2 — ROCK FILTER DAM (TY 2)
- RFD-3 — ROCK FILTER DAM (TY 3)

NOTES:

1. REFER TO TRAFFIC CONTROL PLAN FOR CONSTRUCTION PHASING AND STEPS.

0 50 100

SCALE: 1"=100'

DATE	BY	REV	REVISION

STATE OF TEXAS
WEIYIH TEE
98478
LICENSED PROFESSIONAL ENGINEER

5/20/2023

Stantec
Engineered by Stantec Consulting Services Inc.
Texas Registered Engineering Firm F-6324

©2023
Texas Department of Transportation

BU 67A

SWP3 LAYOUT

BEGIN OF PROJECT TO STA 3129+30

SHEET 1 OF 6

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		114

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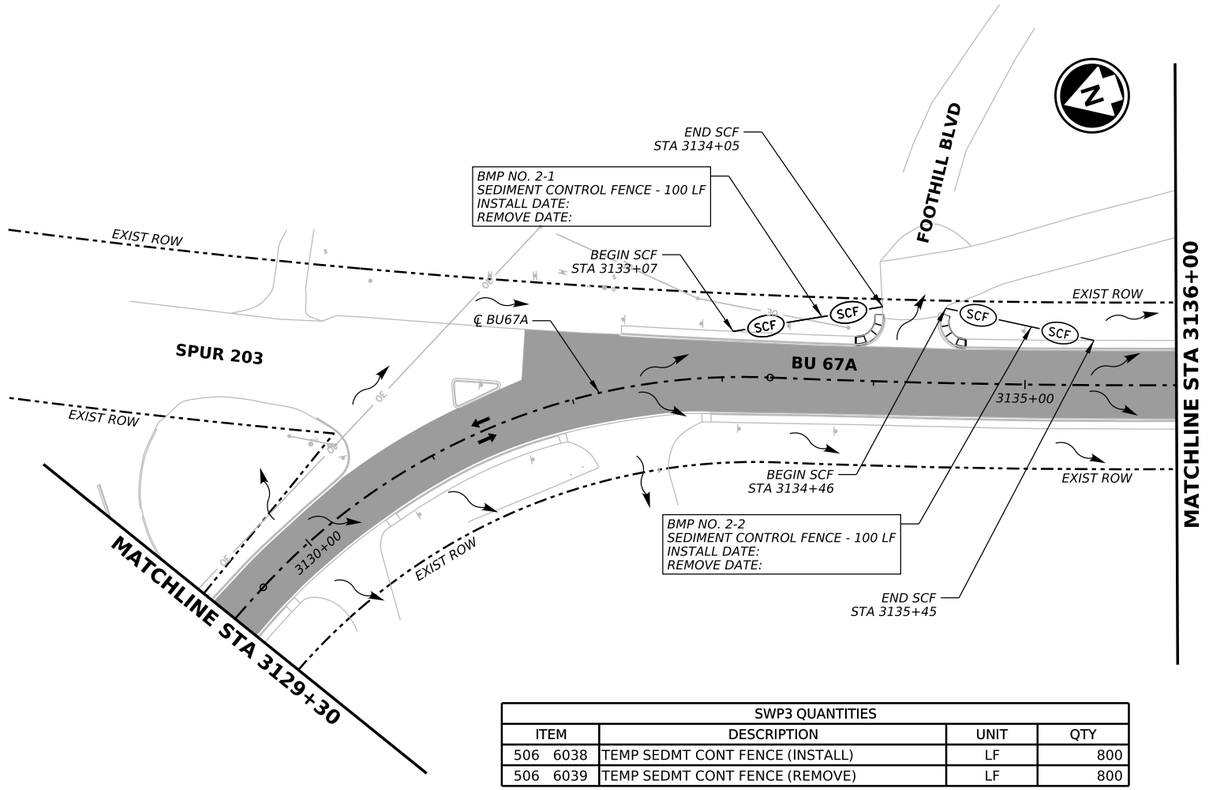

SWP3 QUANTITIES			
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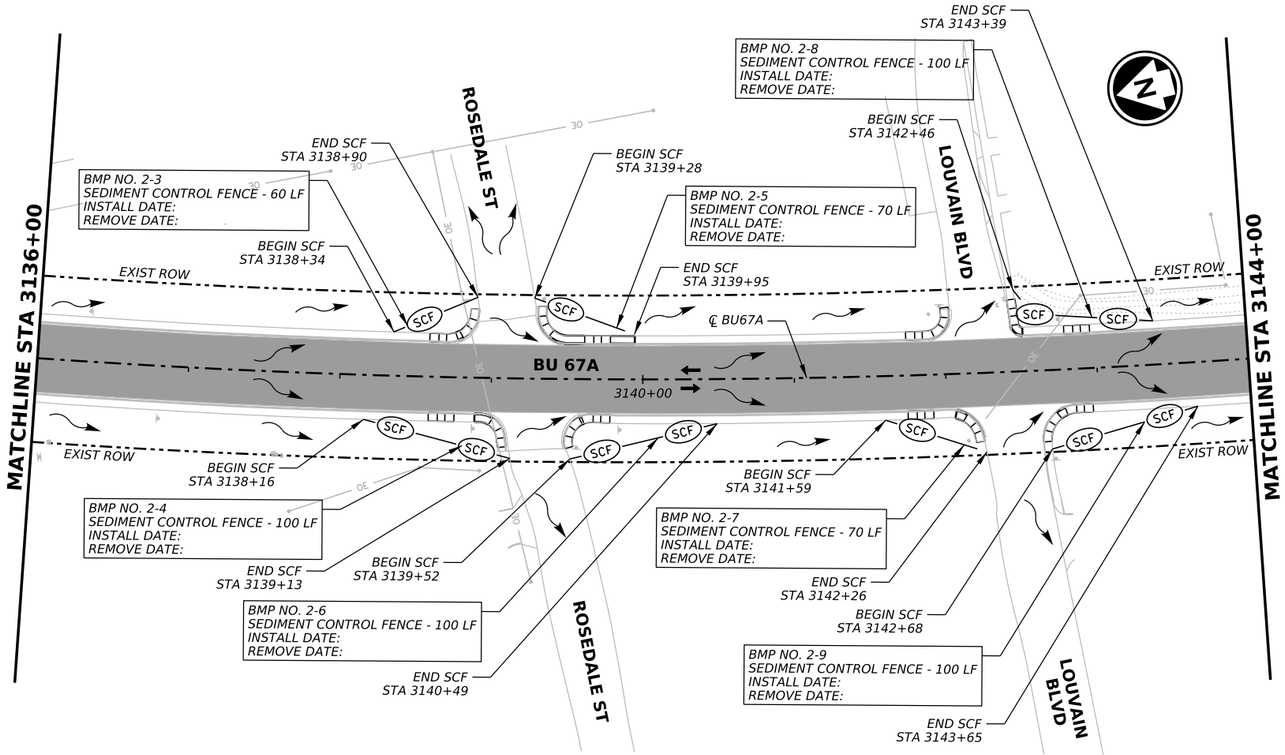

LEGEND:

- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- CONCRETE RIPRAP (4")
- 6" PAVEMENT REPAIR
- 2.5" SP MIXES
- EXISTING ROW
- DIRECTION OF FLOW
- SCF — SEDIMENT CONTROL FENCE
- RFD-2 — ROCK FILTER DAM (TY 2)
- RFD-3 — ROCK FILTER DAM (TY 3)

NOTES:

1. REFER TO TRAFFIC CONTROL PLAN FOR CONSTRUCTION PHASING AND STEPS.

0 50 100

SCALE: 1"=100'

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Texas Department of Transportation

BU 67A

SWP3 LAYOUT

STA 3129+30 TO STA 3144+00

SHEET 2 OF 6

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		115

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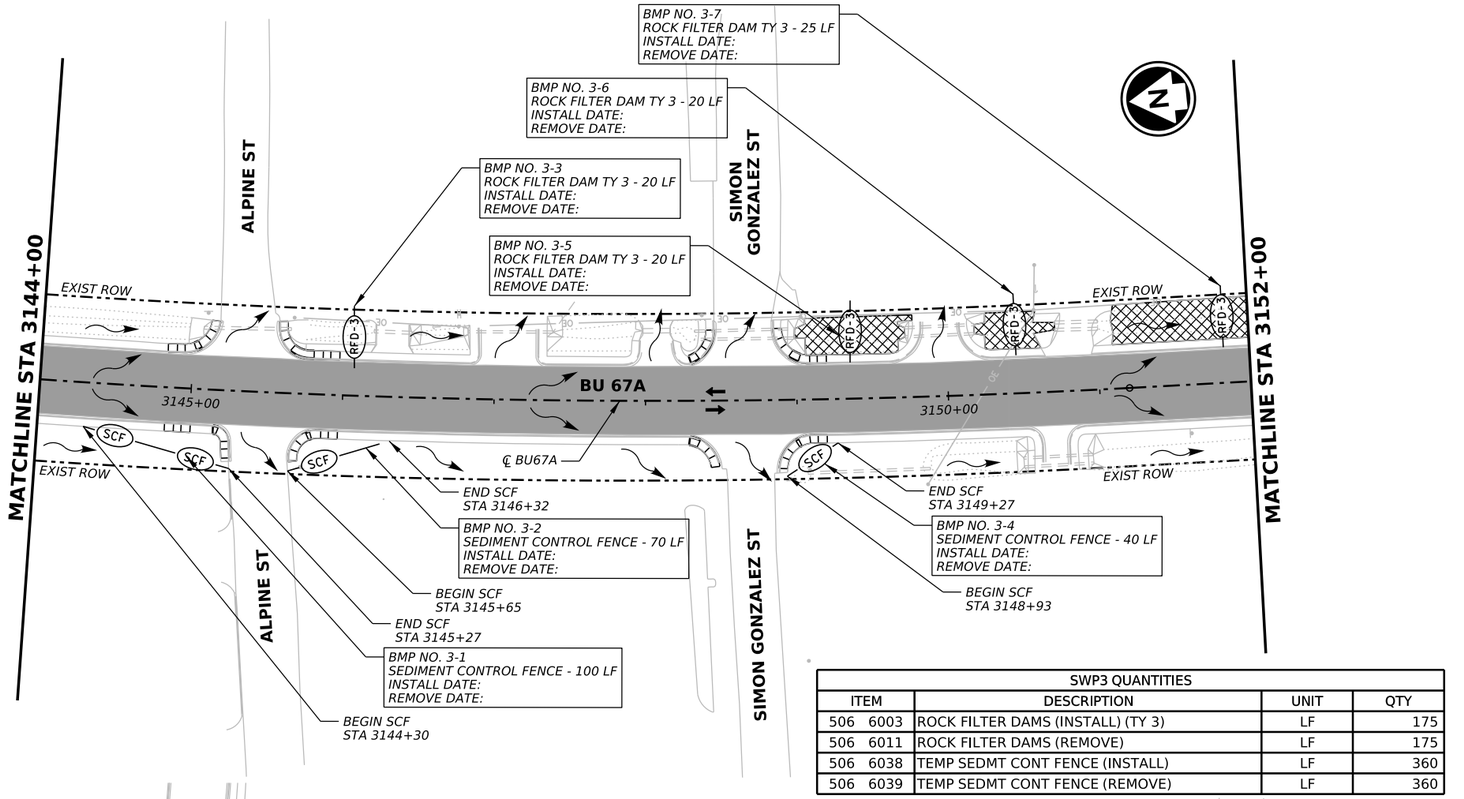

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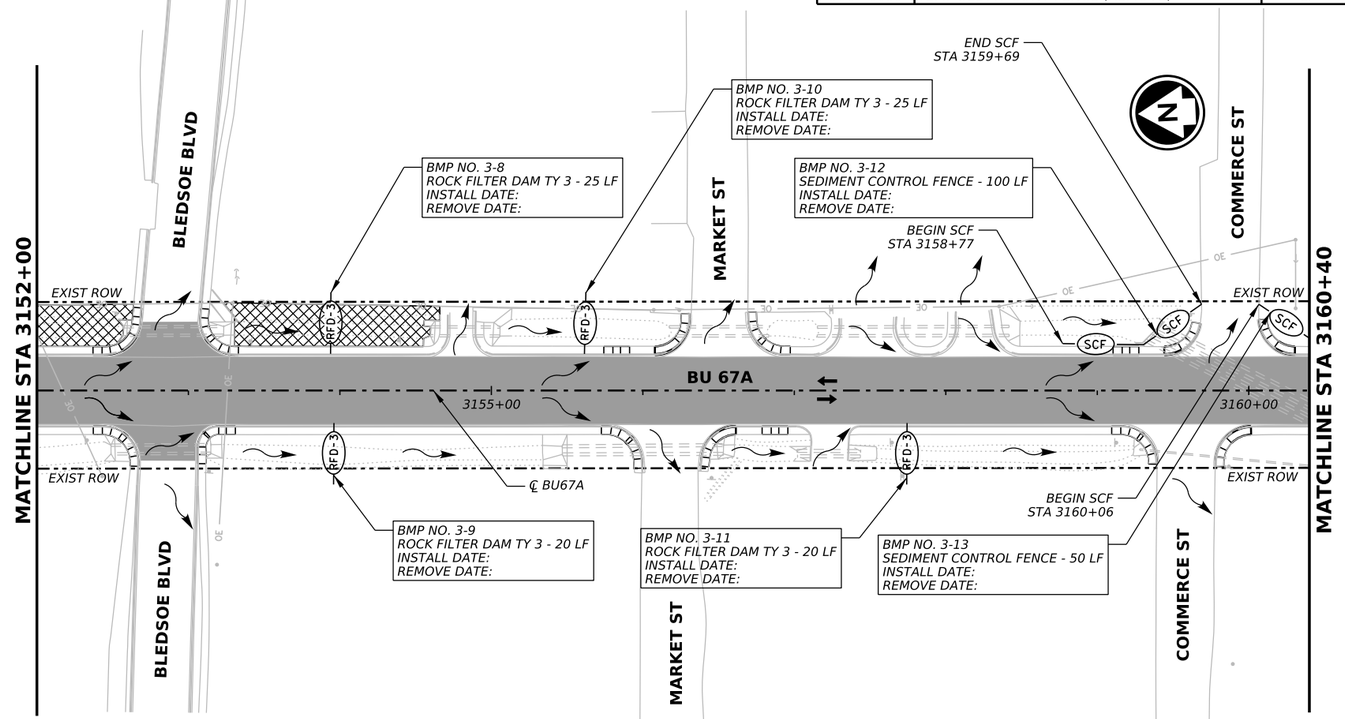
506 6011	ROCK FILTER DAMS (REMOVE)	LF	175
506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	360
506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	360



LEGEND:

- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- CONCRETE RIPRAP (4")
- 6" PAVEMENT REPAIR
- 2.5" SP MIXES
- EXISTING ROW
- DIRECTION OF FLOW
- SCF — SEDIMENT CONTROL FENCE
- RFD-2 — ROCK FILTER DAM (TY 2)
- RFD-3 — ROCK FILTER DAM (TY 3)

NOTES:

1. REFER TO TRAFFIC CONTROL PLAN FOR CONSTRUCTION PHASING AND STEPS.

0 50 100

SCALE: 1"=100'

DATE	BY	REV	REVISION

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BU 67A

SWP3 LAYOUT

STA 3144+00 TO STA 3160+40

SHEET 3 OF 6

CONT	SECT	JOB	HIGHWAY
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DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		116

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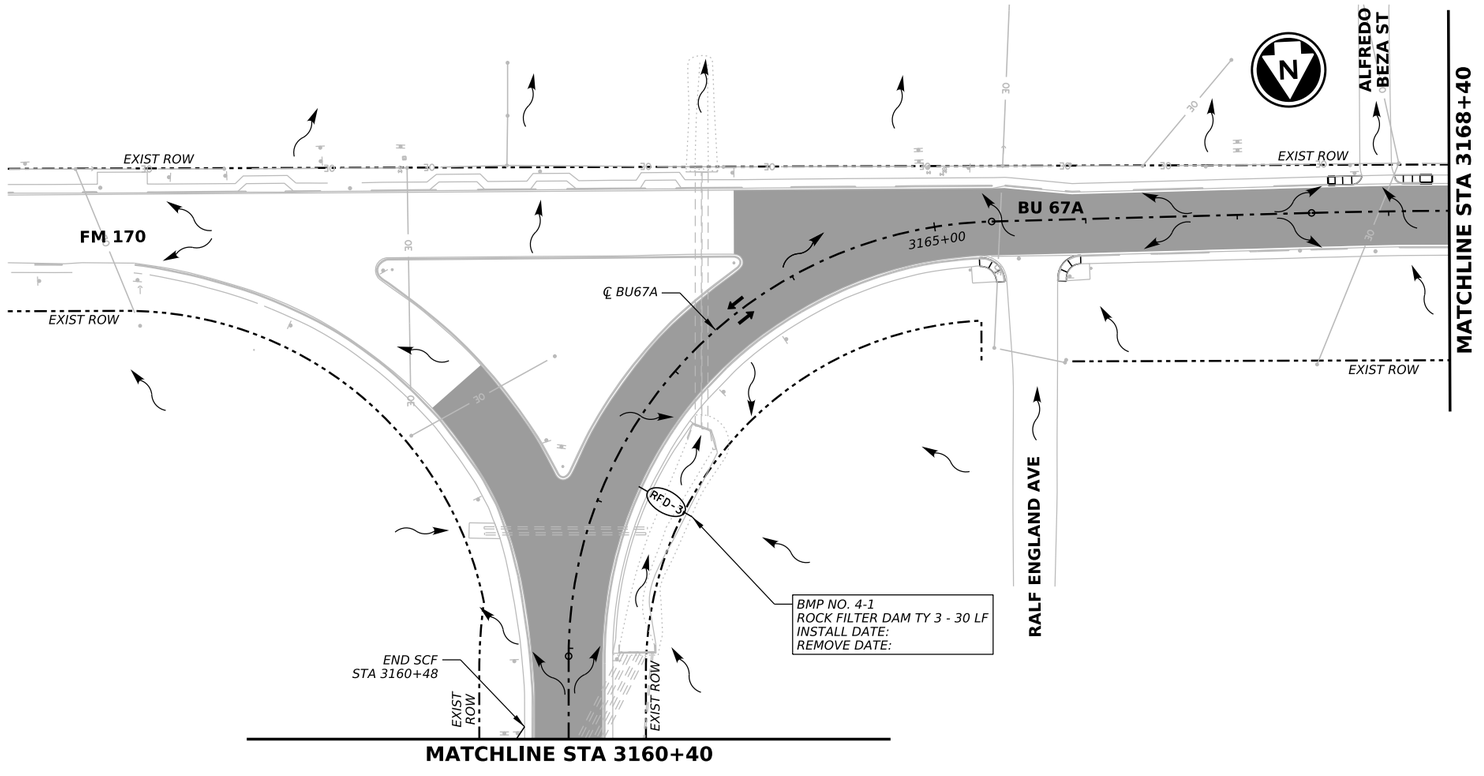

LEGEND:

- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- CONCRETE RIPRAP (4")
- 6" PAVEMENT REPAIR
- 2.5" SP MIXES
- EXISTING ROW
- DIRECTION OF FLOW
- SCF — SEDIMENT CONTROL FENCE
- RFD-2 — ROCK FILTER DAM (TY 2)
- RFD-3 — ROCK FILTER DAM (TY 3)

NOTES:

1. REFER TO TRAFFIC CONTROL PLAN FOR CONSTRUCTION PHASING AND STEPS.

SWP3 QUANTITIES			
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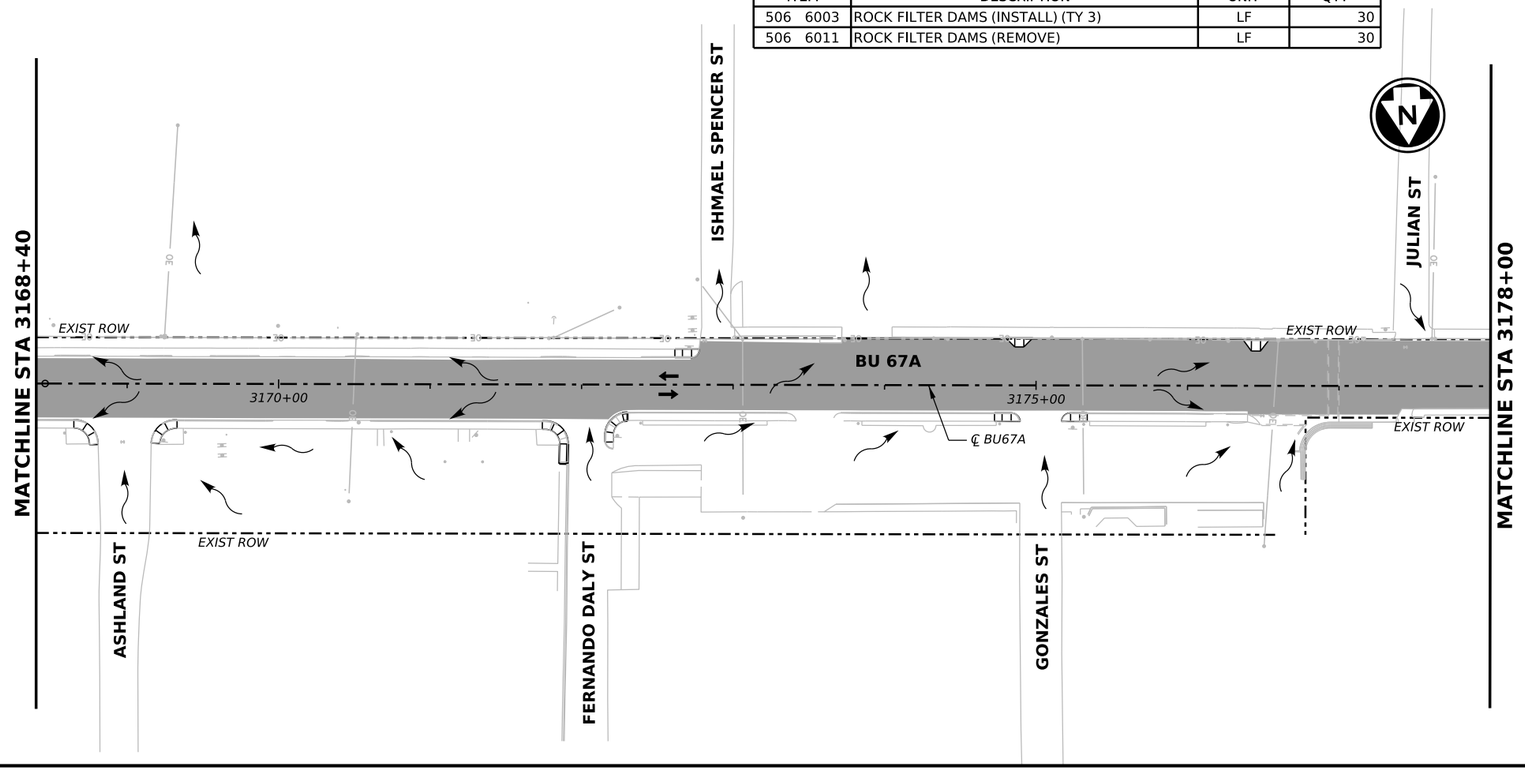
506 6011	ROCK FILTER DAMS (REMOVE)	LF	30



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SCALE: 1"=100'

DATE	BY	REV	REVISION

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BU 67A

SWP3 LAYOUT

STA 3160+40 TO STA 3178+00

SHEET 4 OF 6

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		117

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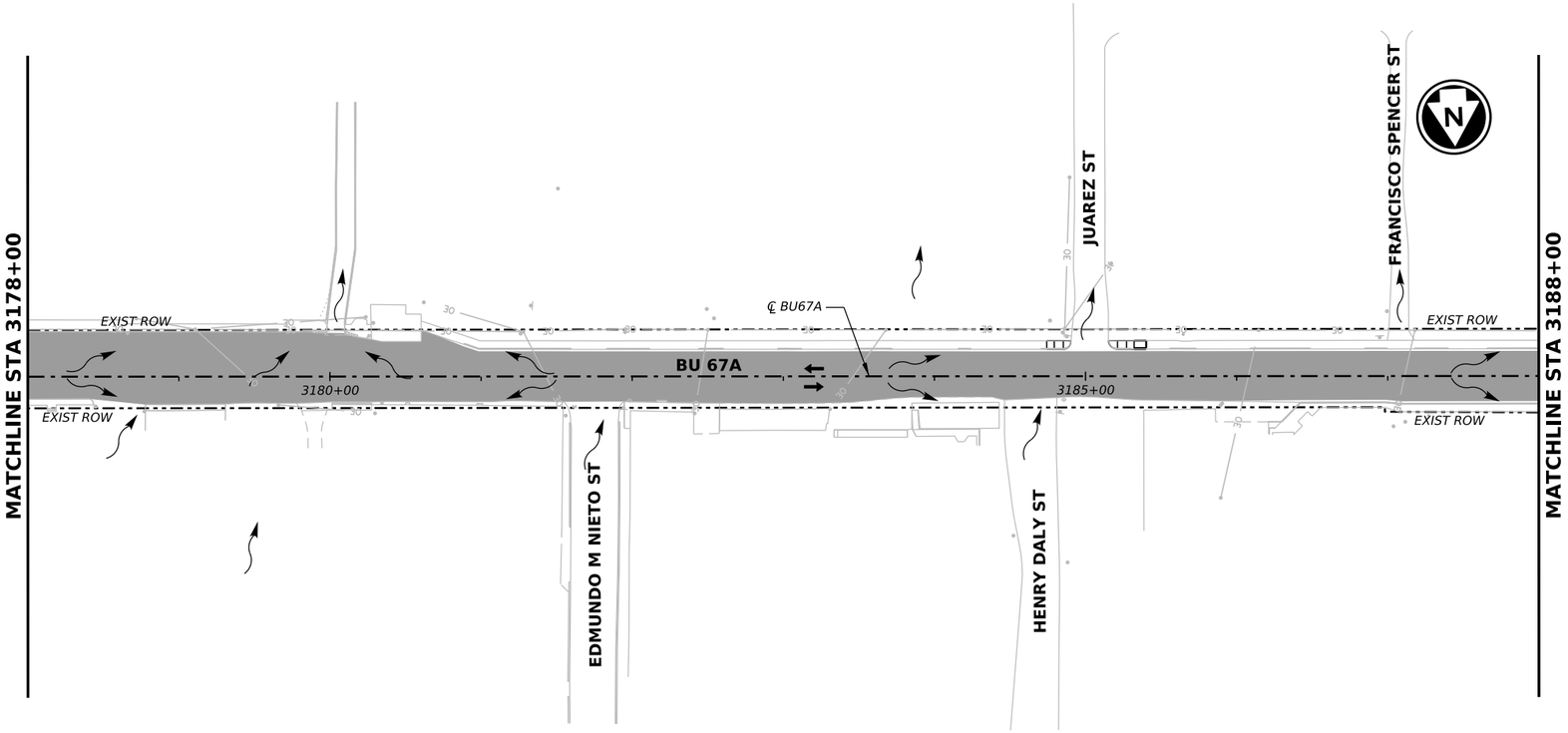

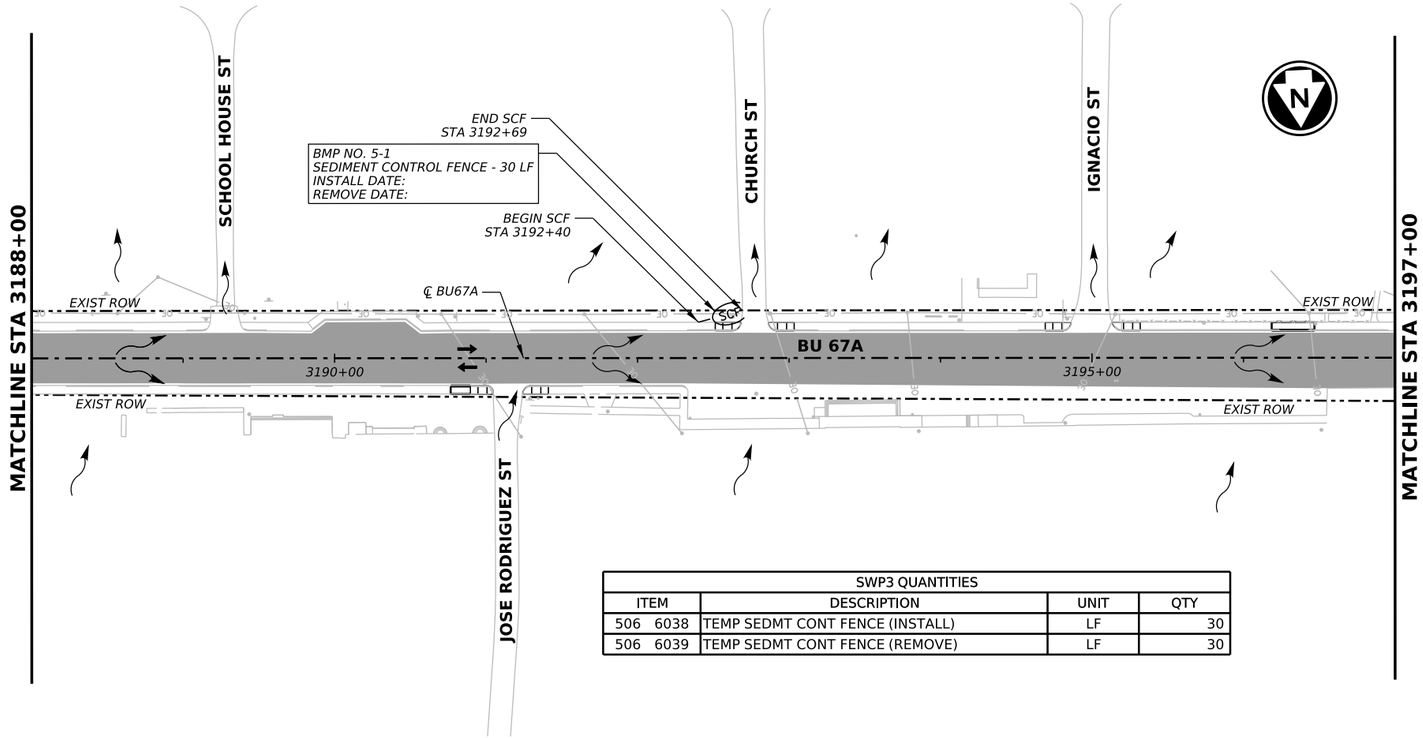

SWP3 QUANTITIES			
ITEM	DESCRIPTION	UNIT	QTY
506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	30
506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	30

LEGEND:

- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- CONCRETE RIPRAP (4")
- 6" PAVEMENT REPAIR
- 2.5" SP MIXES
- EXISTING ROW
- DIRECTION OF FLOW
- SCF — SEDIMENT CONTROL FENCE
- RFD-2 — ROCK FILTER DAM (TY 2)
- RFD-3 — ROCK FILTER DAM (TY 3)

NOTES:

1. REFER TO TRAFFIC CONTROL PLAN FOR CONSTRUCTION PHASING AND STEPS.

0 50 100

SCALE: 1"=100'

DATE	BY	REV	REVISION

STATE OF TEXAS
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98478
LICENSED PROFESSIONAL ENGINEER
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Texas Department of Transportation

BU 67A

SWP3 LAYOUT

STA 3178+00 TO STA 3197+00

SHEET 5 OF 6

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		118

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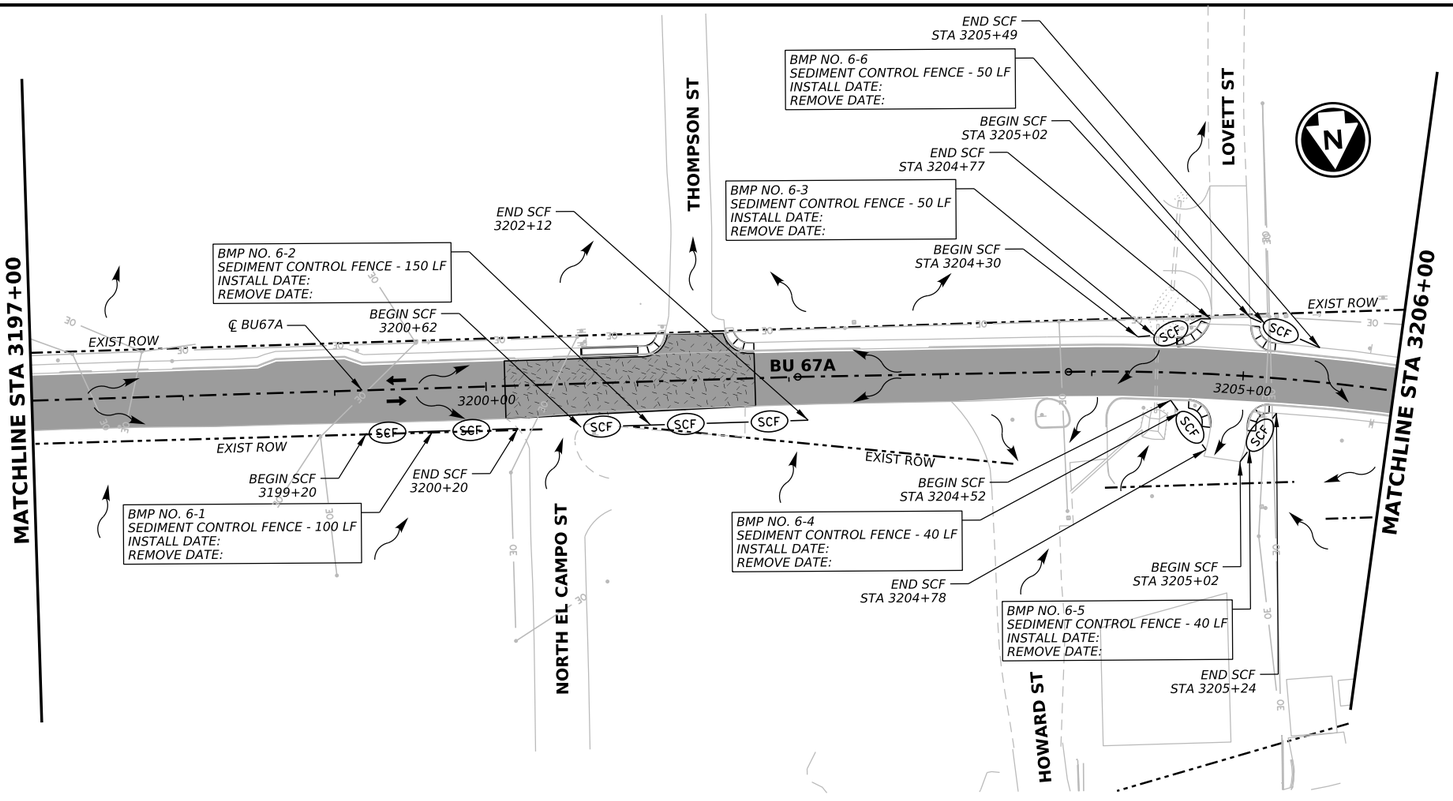

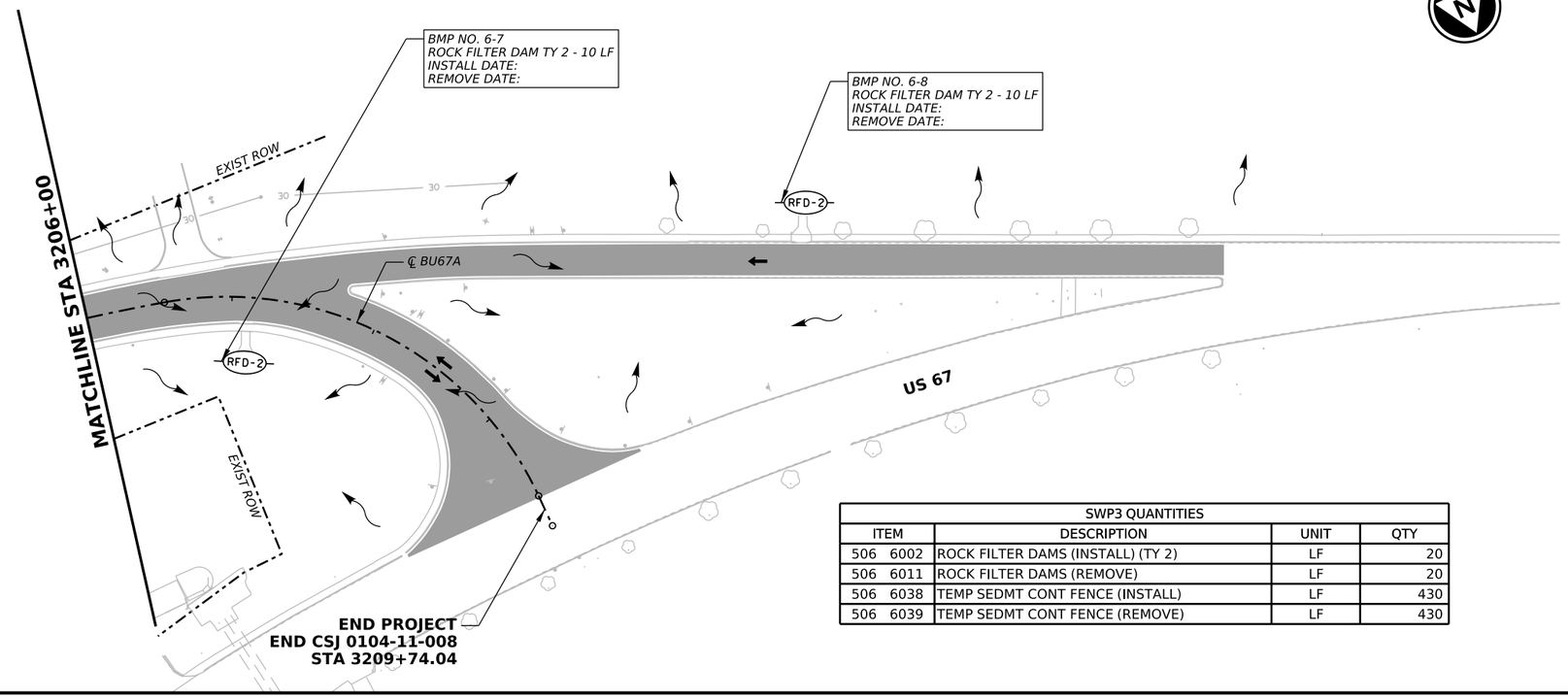

SWP3 QUANTITIES			
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506 6011	ROCK FILTER DAMS (REMOVE)	LF	20
506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	430
506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	430

LEGEND:

- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- CONCRETE RIPRAP (4")
- 6" PAVEMENT REPAIR
- 2.5" SP MIXES
- EXISTING ROW
- DIRECTION OF FLOW
- SCF — SEDIMENT CONTROL FENCE
- RFD-2 — ROCK FILTER DAM (TY 2)
- RFD-3 — ROCK FILTER DAM (TY 3)

NOTES:

1. REFER TO TRAFFIC CONTROL PLAN FOR CONSTRUCTION PHASING AND STEPS.

0 50 100

SCALE: 1"=100'

DATE	BY	REV	REVISION

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WEIYIH TEE
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5/20/2023

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Texas Department of Transportation

BU 67A

SWP3 LAYOUT

STA 3197+00 TO END OF PROJECT

SHEET 6 OF 6

CONT	SECT	JOB	HIGHWAY
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DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		119

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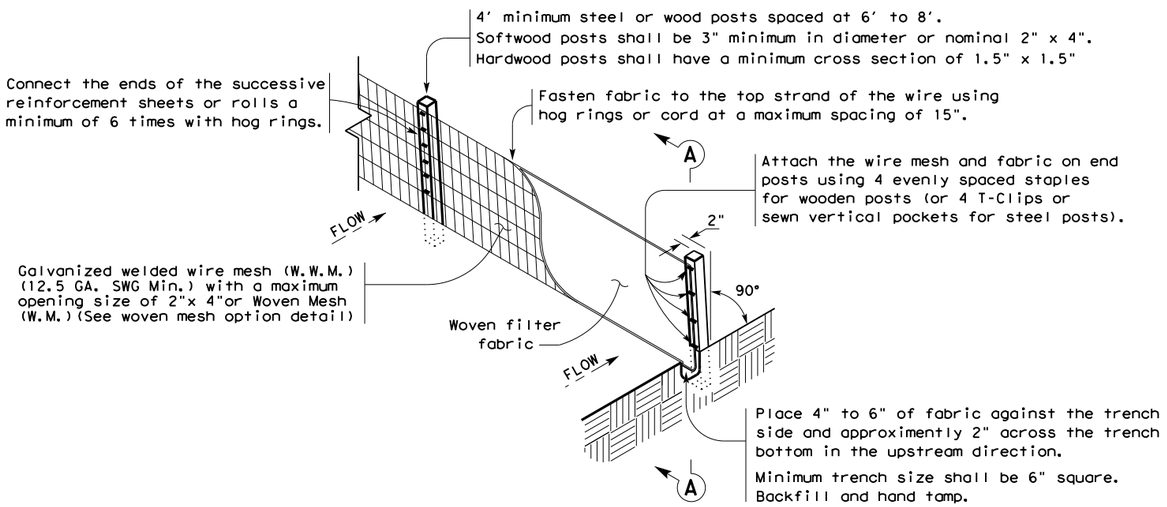
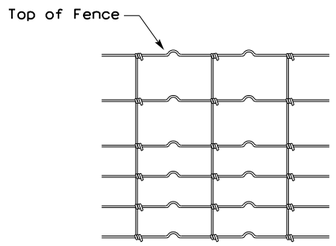
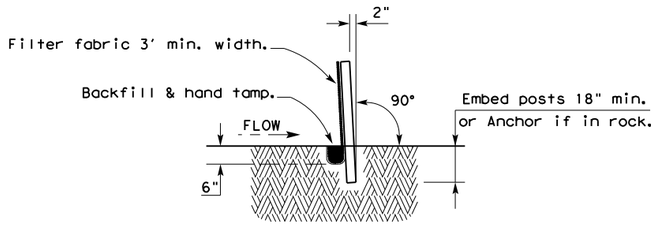


TEMPORARY SEDIMENT CONTROL FENCE

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.

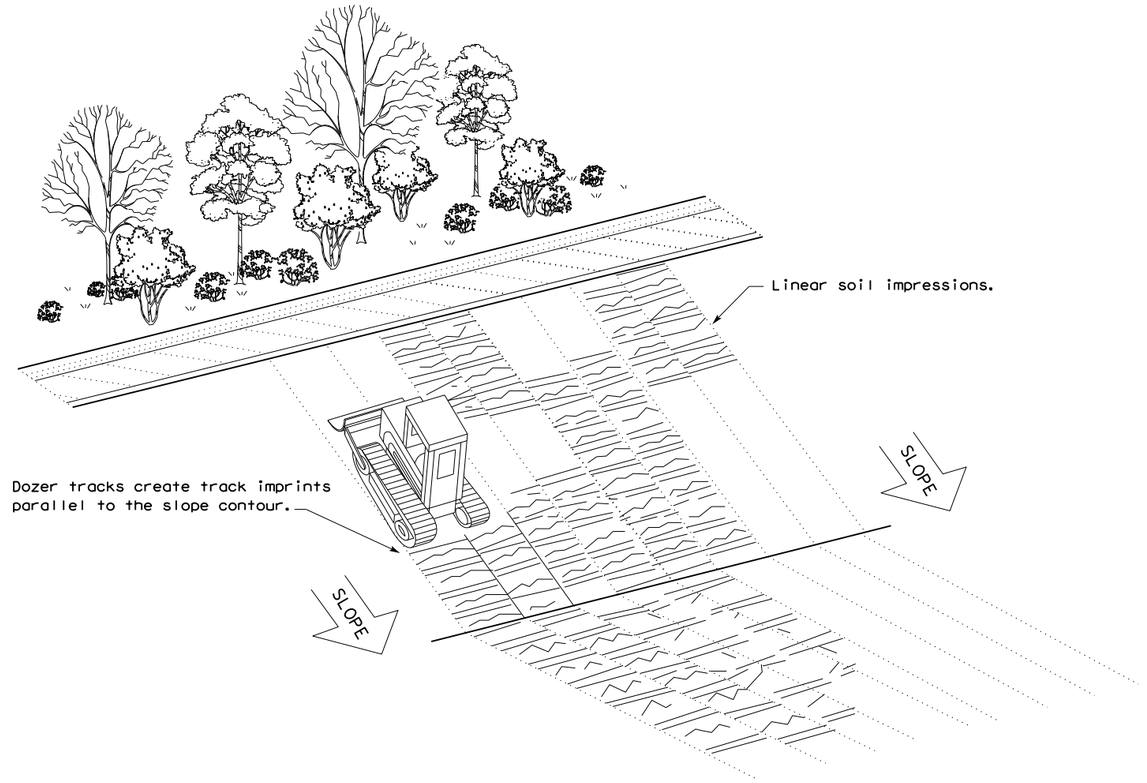
LEGEND

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	0104	11	008		BU 67A	
	DIST	COUNTY			SHEET NO.	
	ELP	PRESIDIO			120	

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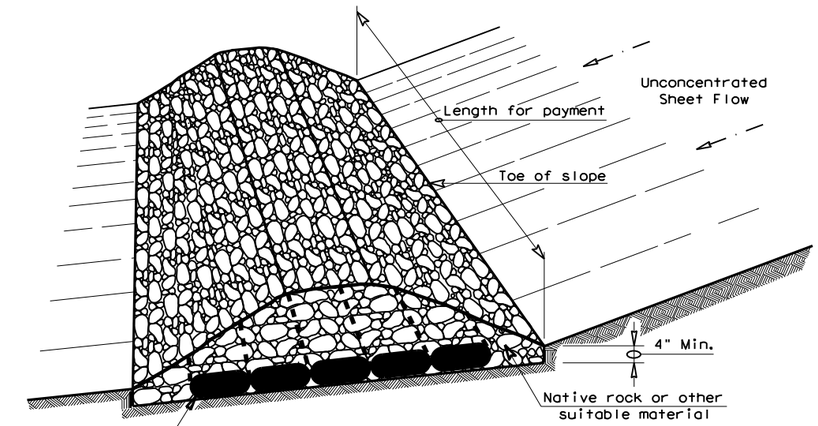
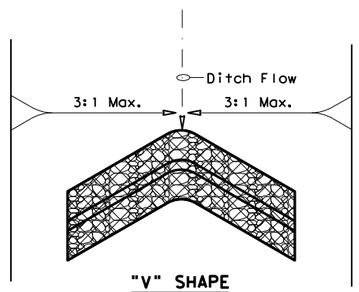
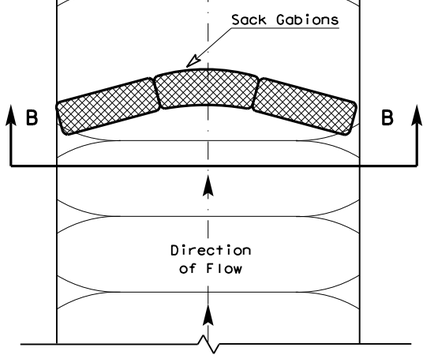


FILTER DAM AT TOE OF SLOPE

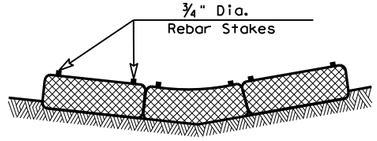
RFD1



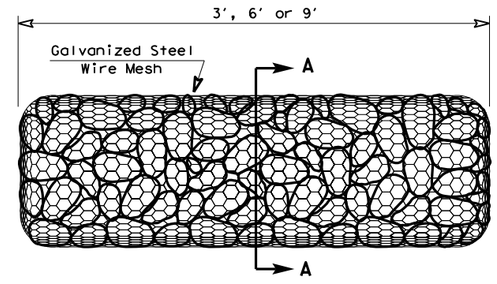
"V" SHAPE PLAN VIEW



PLAN VIEW

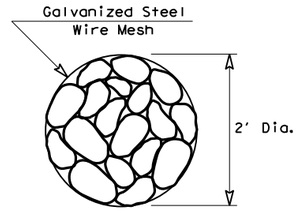


SECTION B-B

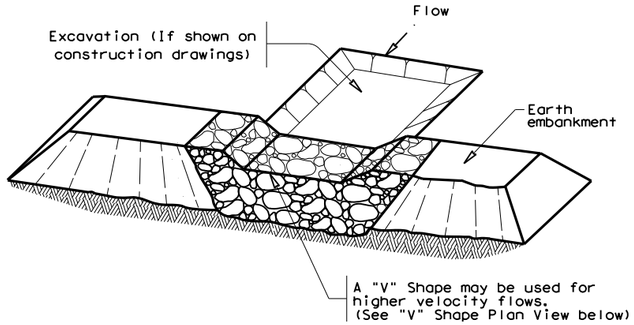


TYPE 4 (SACK GABIONS)

RFD4

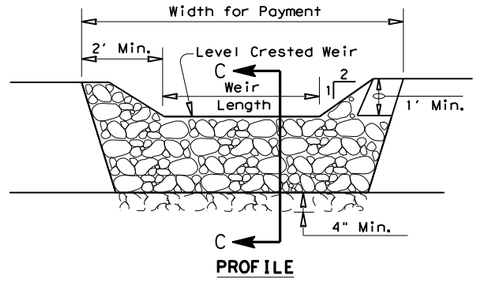


SECTION A-A



FILTER DAM AT SEDIMENT TRAP

RFD1 — OR — RFD2



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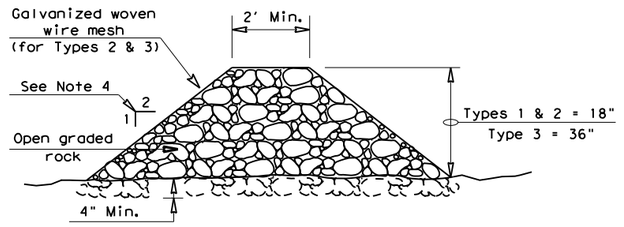
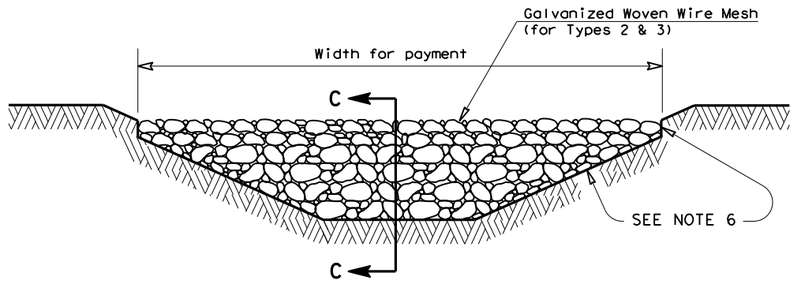


SECTION C-C



FILTER DAM AT CHANNEL SECTIONS

RFD1 — OR — RFD2 — OR — RFD3

ROCK FILTER DAM USAGE GUIDELINES

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

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

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

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

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

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

GENERAL NOTES

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with ¾" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 ½" x 3 ¼"
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

PLAN SHEET LEGEND

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

Texas Department of Transportation — Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

ROCK FILTER DAMS

EC(2)-16

FILE: ec216	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0104	11	008	BU 67A
	DIST	COUNTY		SHEET NO.
	ELP	PRESIDIO		121

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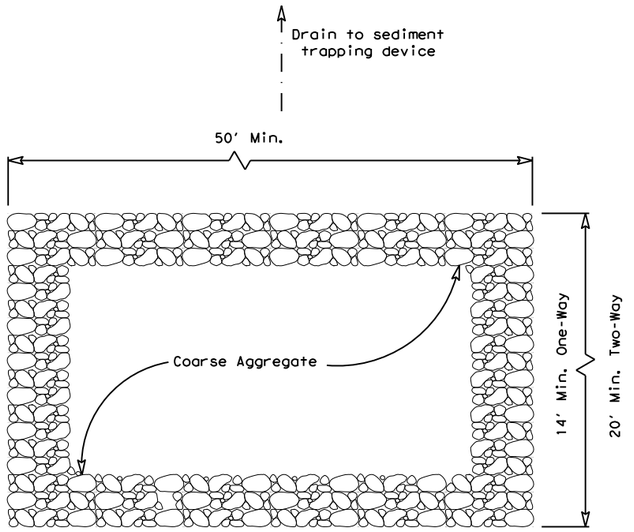

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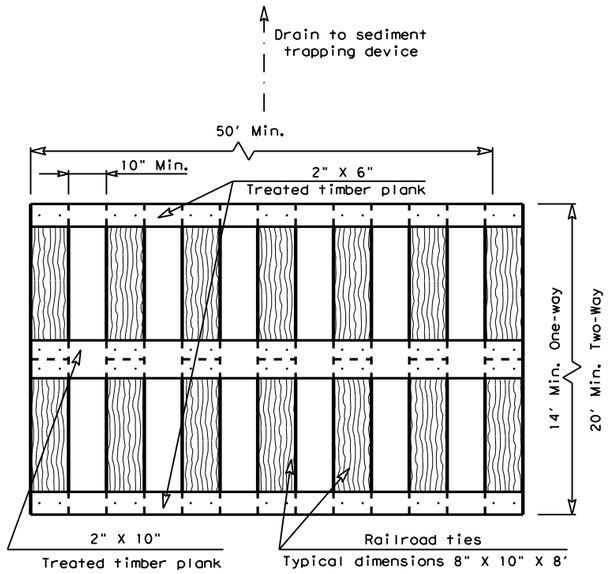

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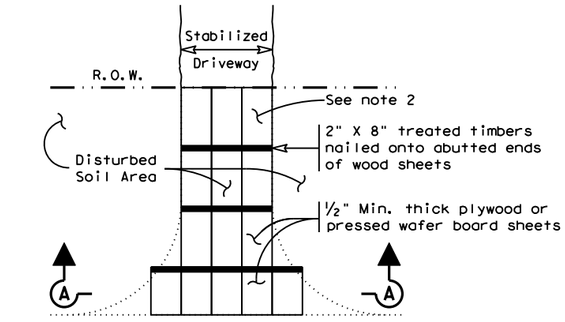

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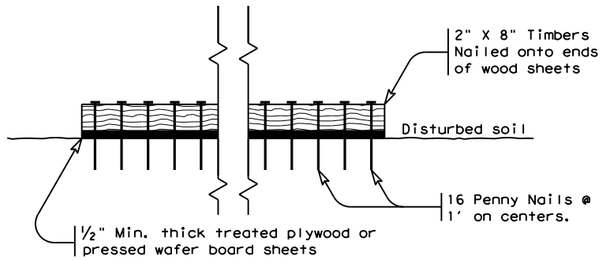
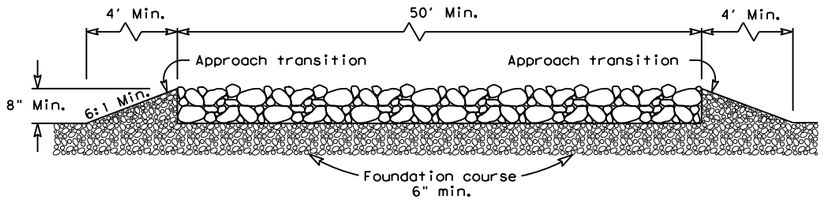


SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

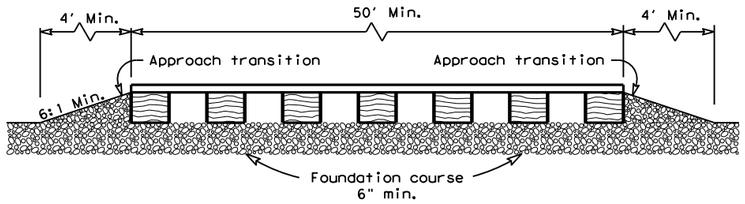
SHORT TERM



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 1)

ROCK CONSTRUCTION (LONG TERM)



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 2)

TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 1)

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

GENERAL NOTES (TYPE 2)

1. The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50'.
2. The treated timber planks shall be attached to the railroad ties with ½"x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
5. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
6. The construction exit should be graded to allow drainage to a sediment trapping device.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
8. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 3)

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

Texas Department of Transportation

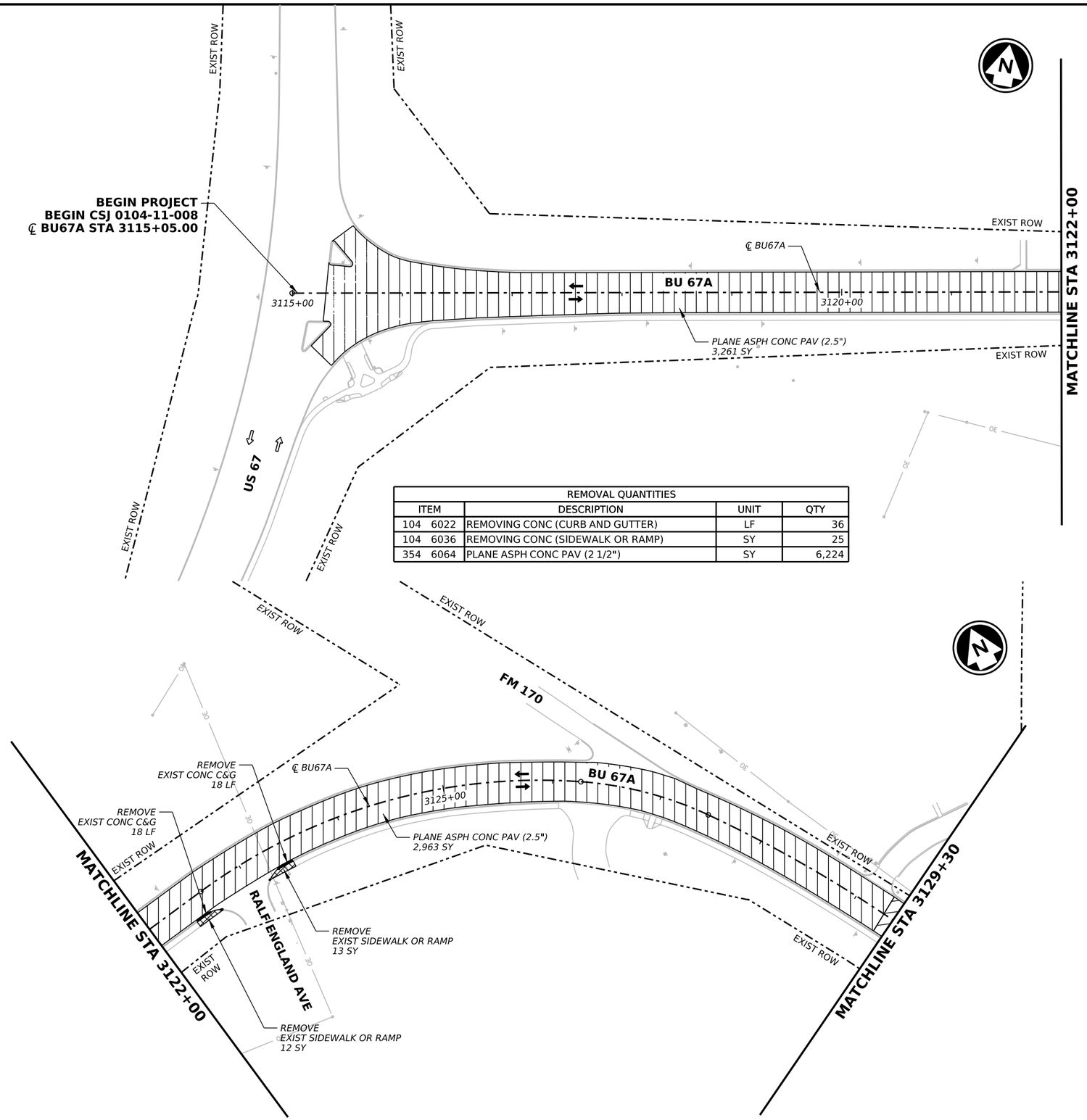
Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

CONSTRUCTION EXITS

EC(3)-16

FILE: ec316	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
	CONT	SECT	JOB	HIGHWAY
REVISIONS	0104	11	008	BU 67A
	DIST	COUNTY		SHEET NO.
	ELP	PRESIDIO		122



REMOVAL QUANTITIES			
ITEM	DESCRIPTION	UNIT	QTY
104 6022	REMOVING CONC (CURB AND GUTTER)	LF	36
104 6036	REMOVING CONC (SIDEWALK OR RAMP)	SY	25
354 6064	PLANE ASPH CONC PAV (2 1/2")	SY	6,224

LEGEND:

- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- EXISTING ROW
- PLANE ASPH CONC PVMT (2.5")
- REMOVE CONC SIDEWALK OR RAMP
- REMOVE CONC DRIVEWAY
- REMOVE CONC PAVER
- REMOVE CONC CURB AND GUTTER

0 50 100

SCALE: 1"=100'

DATE	BY	REV	REVISION

STATE OF TEXAS
WEIYIH TEE
98478
LICENSED
PROFESSIONAL ENGINEER

5/20/2023

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BU 67A

REMOVAL PLAN

BEGIN OF PROJECT TO STA 3129+30

SHEET 1 OF 6

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		123

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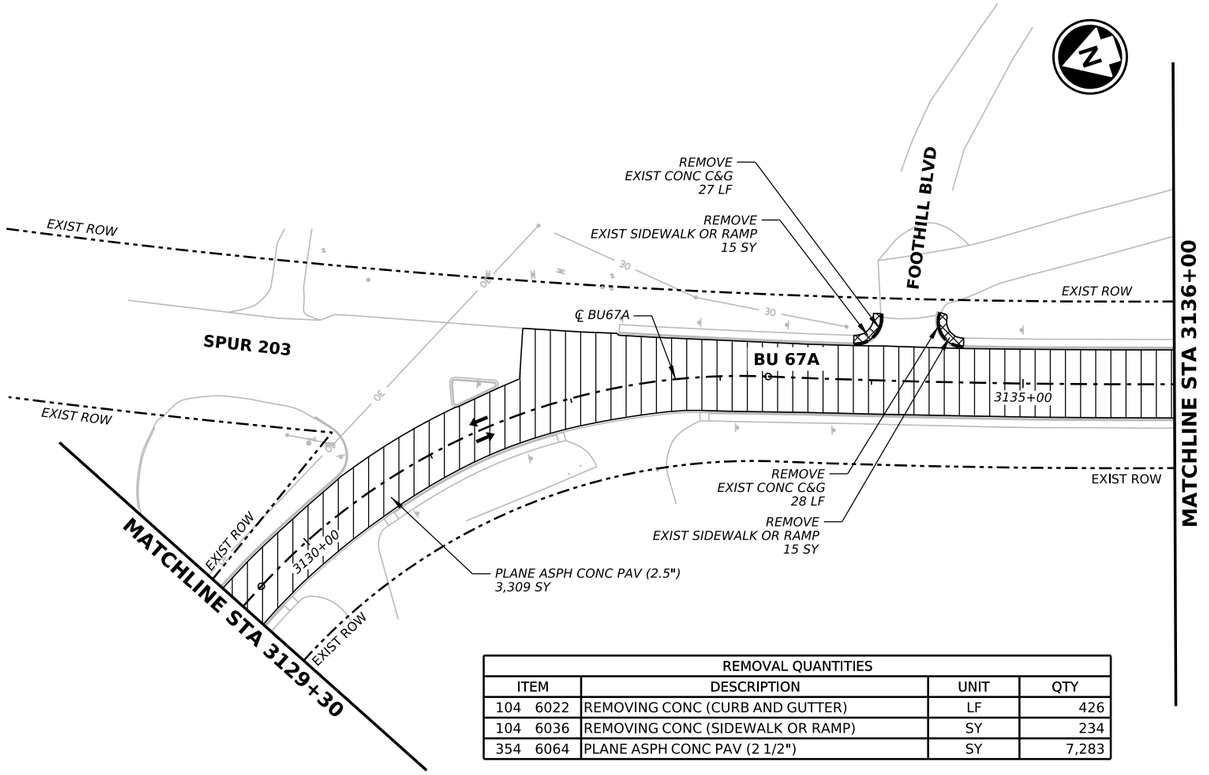
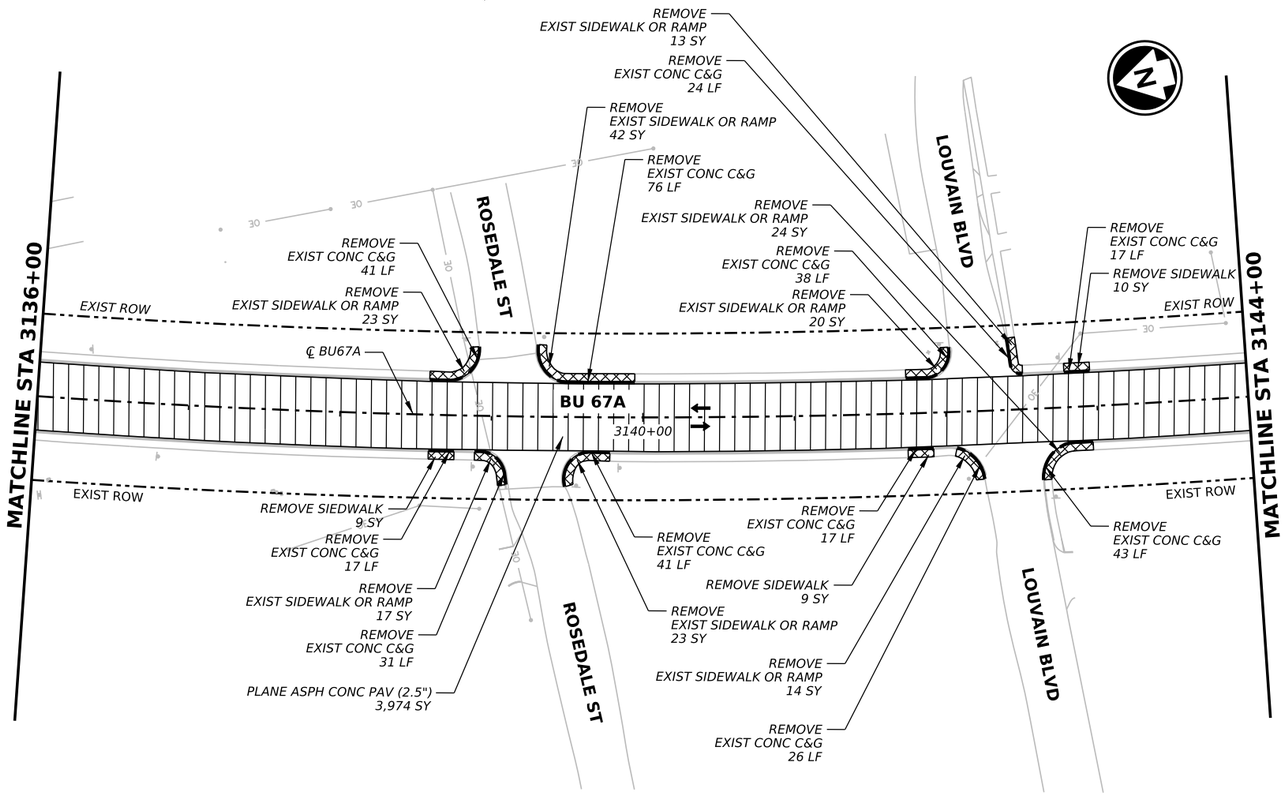


REMOVAL QUANTITIES			
ITEM	DESCRIPTION	UNIT	QTY
104 6022	REMOVING CONC (CURB AND GUTTER)	LF	426
104 6036	REMOVING CONC (SIDEWALK OR RAMP)	SY	234
354 6064	PLANE ASPH CONC PAV (2 1/2")	SY	7,283



LEGEND:

- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- EXISTING ROW
- PLANE ASPH CONC PVMT (2.5")
- REMOVE CONC SIDEWALK OR RAMP
- REMOVE CONC DRIVEWAY
- REMOVE CONC PAVER
- REMOVE CONC CURB AND GUTTER

0 50 100

SCALE: 1"=100'

DATE	BY	REV	REVISION

STATE OF TEXAS
WEIYIH TEE
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PROFESSIONAL ENGINEER
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BU 67A

REMOVAL PLAN

STA 3129+30 TO STA 3144+00

SHEET 2 OF 6

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		124

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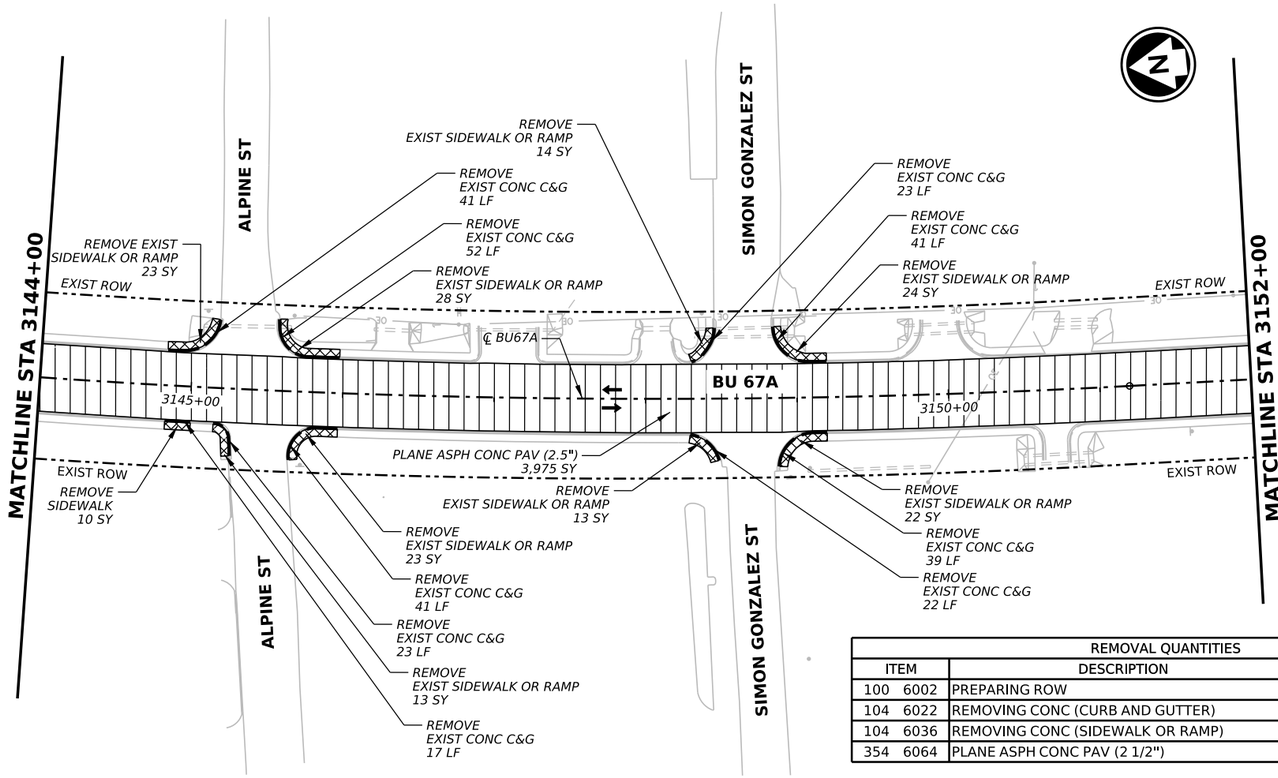
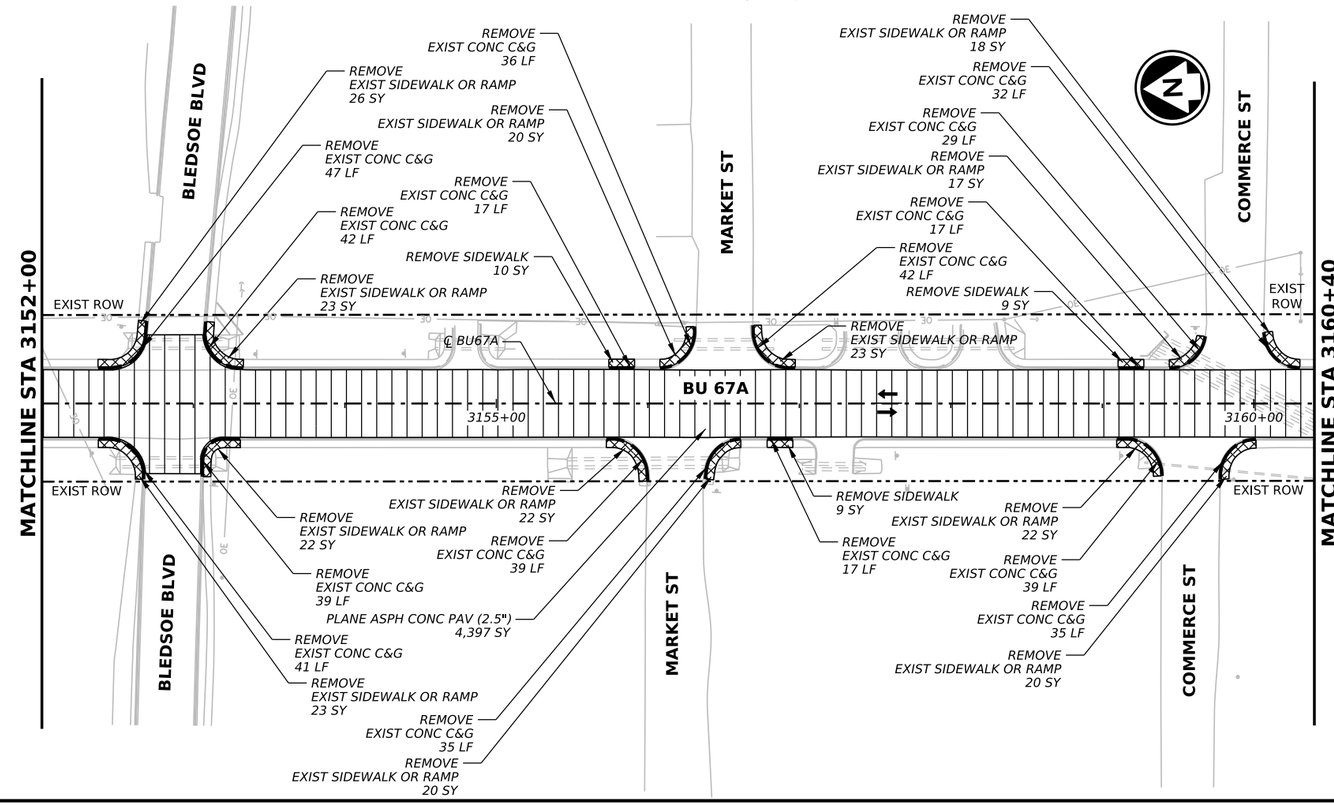


REMOVAL QUANTITIES			
ITEM	DESCRIPTION	UNIT	QTY
100 6002	PREPARING ROW	STA	6
104 6022	REMOVING CONC (CURB AND GUTTER)	LF	806
104 6036	REMOVING CONC (SIDEWALK OR RAMP)	SY	454
354 6064	PLANE ASPH CONC PAV (2 1/2")	SY	8,372



LEGEND:

- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- EXISTING ROW
- PLANE ASPH CONC PVMT (2.5")
- REMOVE CONC SIDEWALK OR RAMP
- REMOVE CONC DRIVEWAY
- REMOVE CONC PAVER
- REMOVE CONC CURB AND GUTTER

0 50 100

SCALE: 1"=100'

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BU 67A

REMOVAL PLAN

STA 3144+00 TO STA 3160+40

SHEET 3 OF 6

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		125

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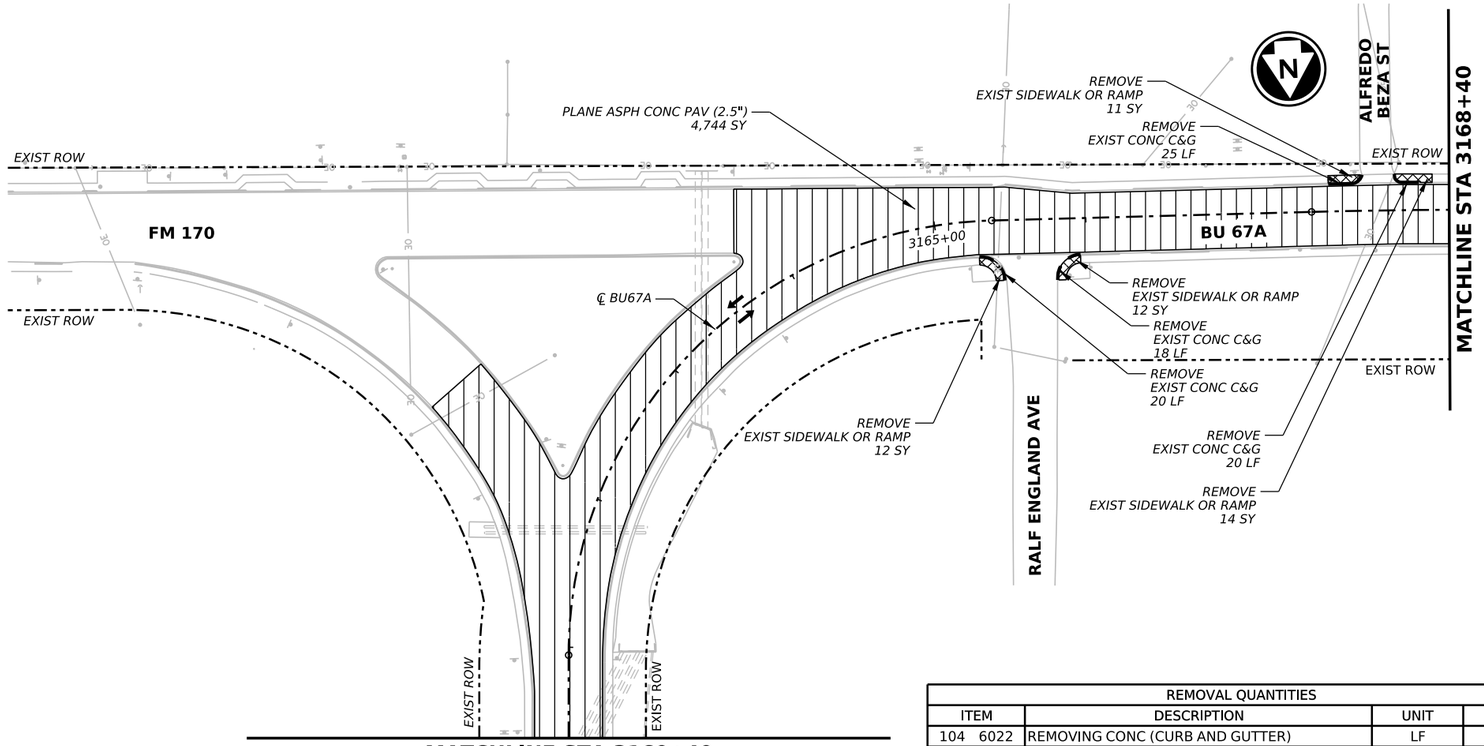
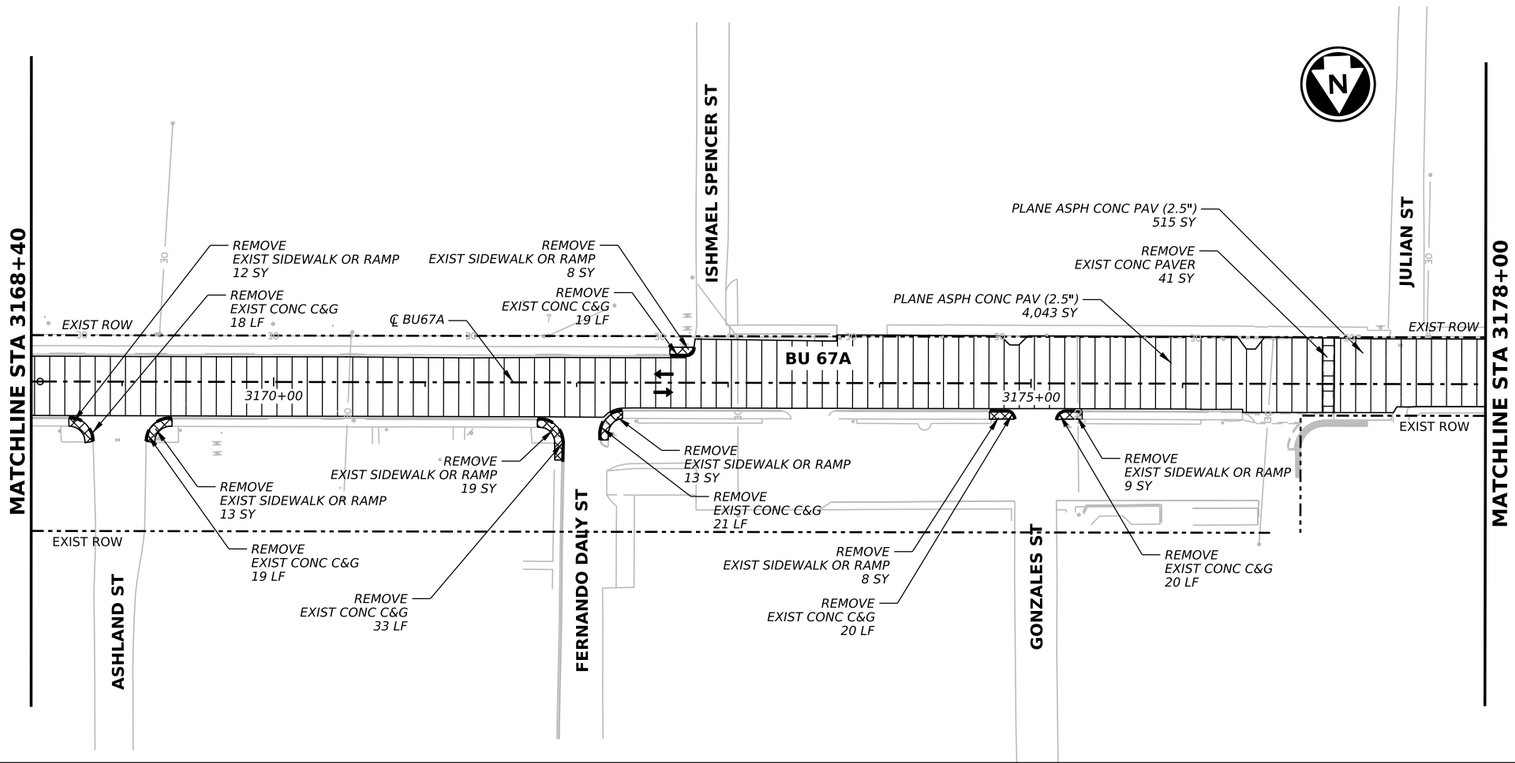


LEGEND:

- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- EXISTING ROW
- PLANE ASPH CONC PVMT (2.5")
- REMOVE CONC SIDEWALK OR RAMP
- REMOVE CONC DRIVEWAY
- REMOVE CONC PAVER
- REMOVE CONC CURB AND GUTTER

REMOVAL QUANTITIES				
ITEM		DESCRIPTION	UNIT	QTY
104	6022	REMOVING CONC (CURB AND GUTTER)	LF	233
104	6036	REMOVING CONC (SIDEWALK OR RAMP)	SY	131
104	6040	REMOVING CONC (PAVERS)	SY	41
354	6064	PLANE ASPH CONC PAV (2 1/2")	SY	9,302



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SCALE: 1"=100'

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BU 67A

REMOVAL PLAN

STA 3160+40 TO STA 3178+00

SHEET 4 OF 6

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		126

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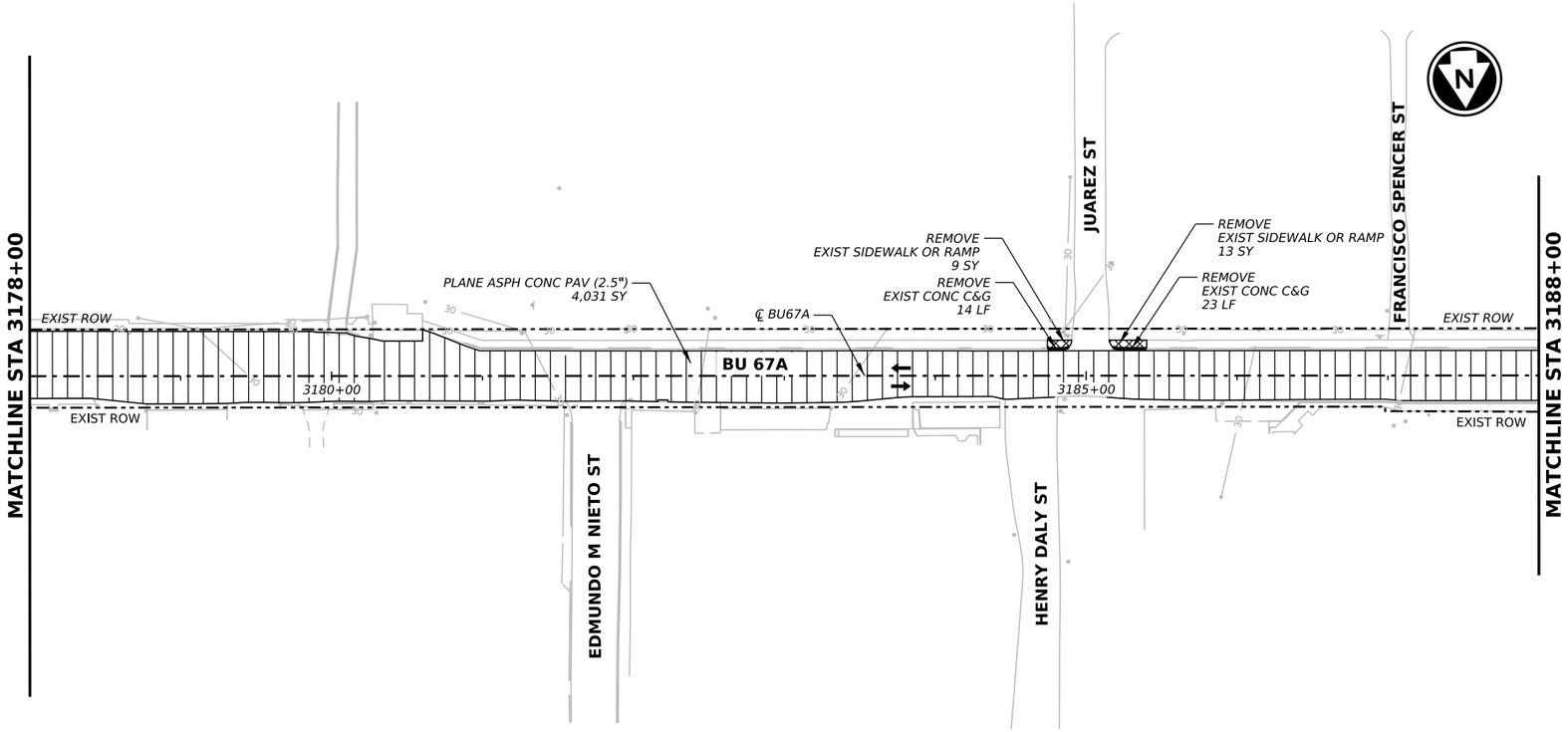

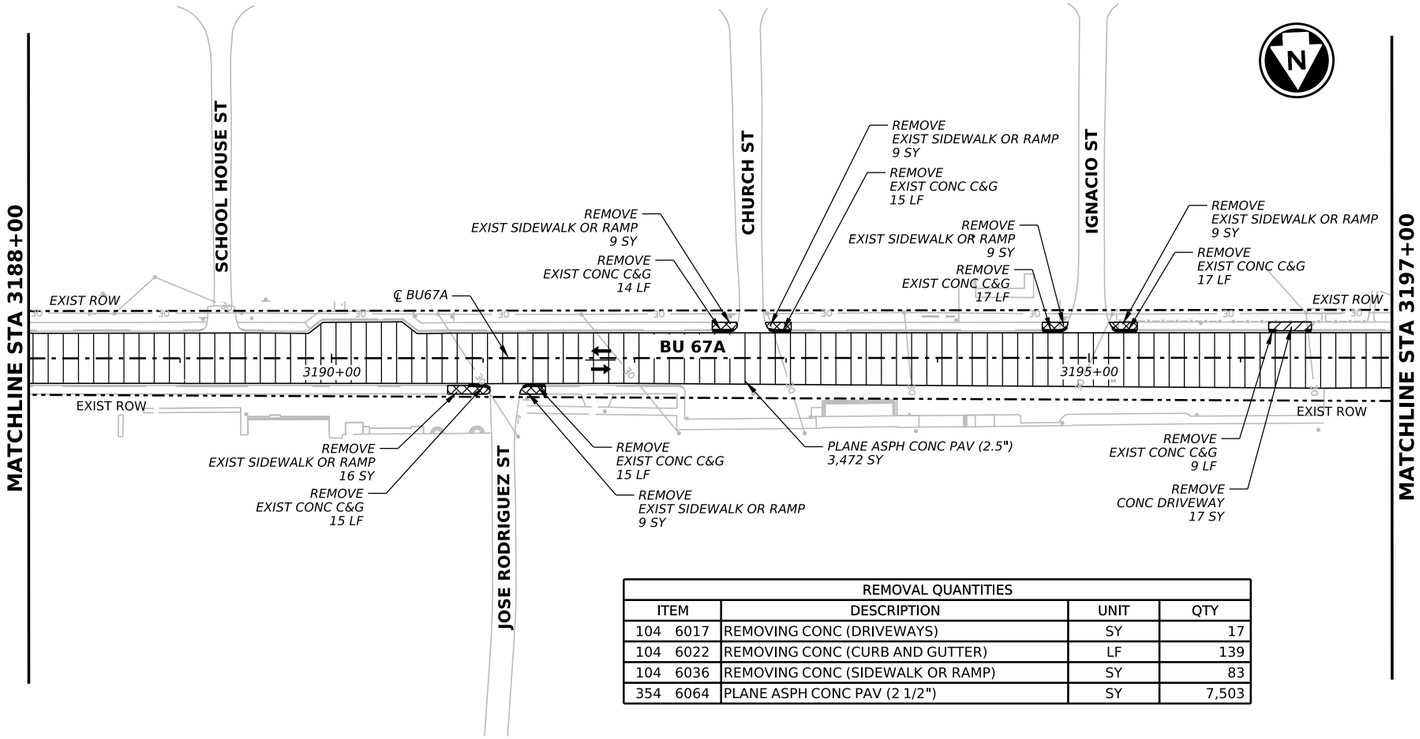

LEGEND:

- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- EXISTING ROW
- PLANE ASPH CONC PVMT (2.5")
- REMOVE CONC SIDEWALK OR RAMP
- REMOVE CONC DRIVEWAY
- REMOVE CONC PAVER
- REMOVE CONC CURB AND GUTTER

0 50 100

SCALE: 1"=100'

REMOVAL QUANTITIES			
ITEM	DESCRIPTION	UNIT	QTY
104 6017	REMOVING CONC (DRIVEWAYS)	SY	17
104 6022	REMOVING CONC (CURB AND GUTTER)	LF	139
104 6036	REMOVING CONC (SIDEWALK OR RAMP)	SY	83
354 6064	PLANE ASPH CONC PAV (2 1/2")	SY	7,503

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BU 67A

REMOVAL PLAN

STA 3178+00 TO STA 3197+00

SHEET 5 OF 6

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		127

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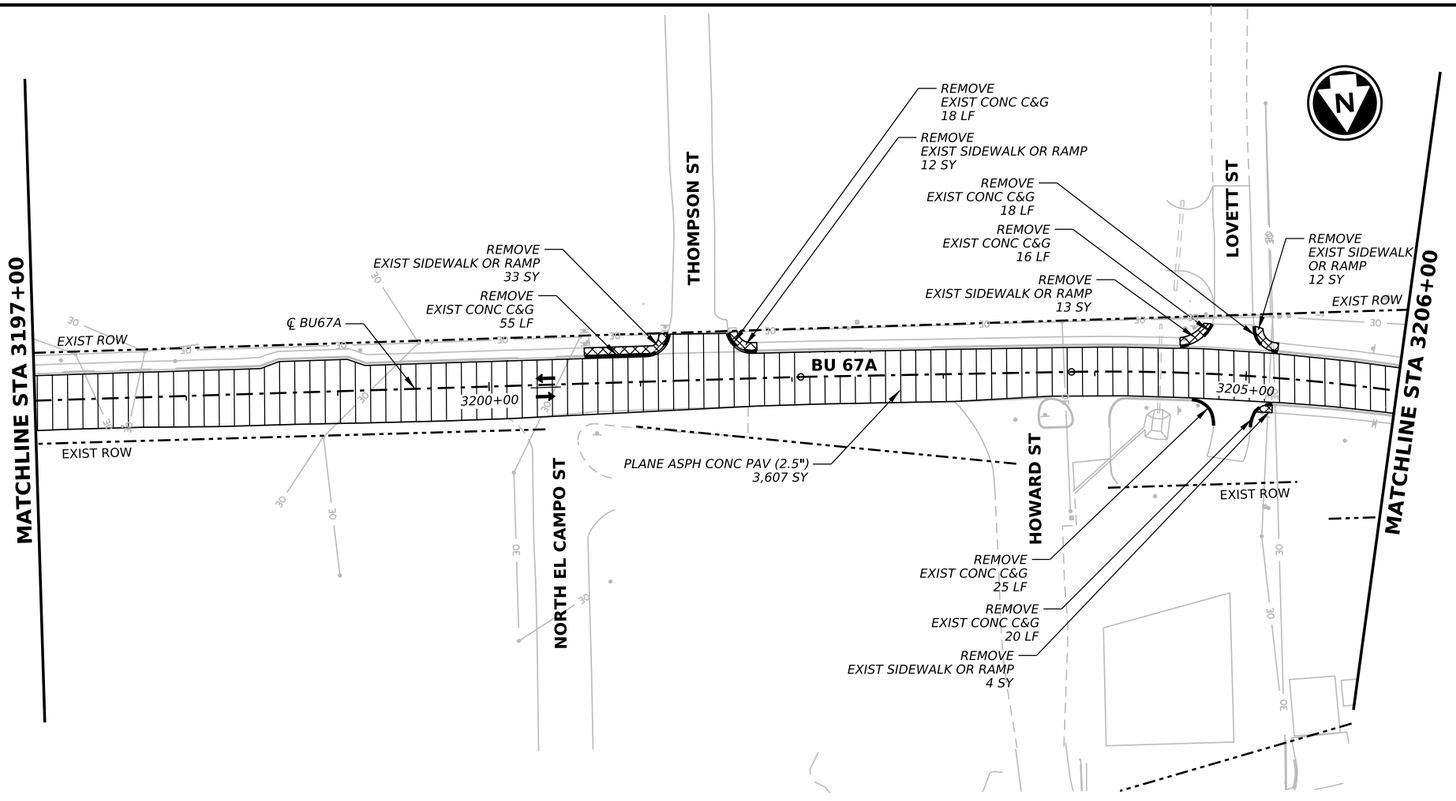
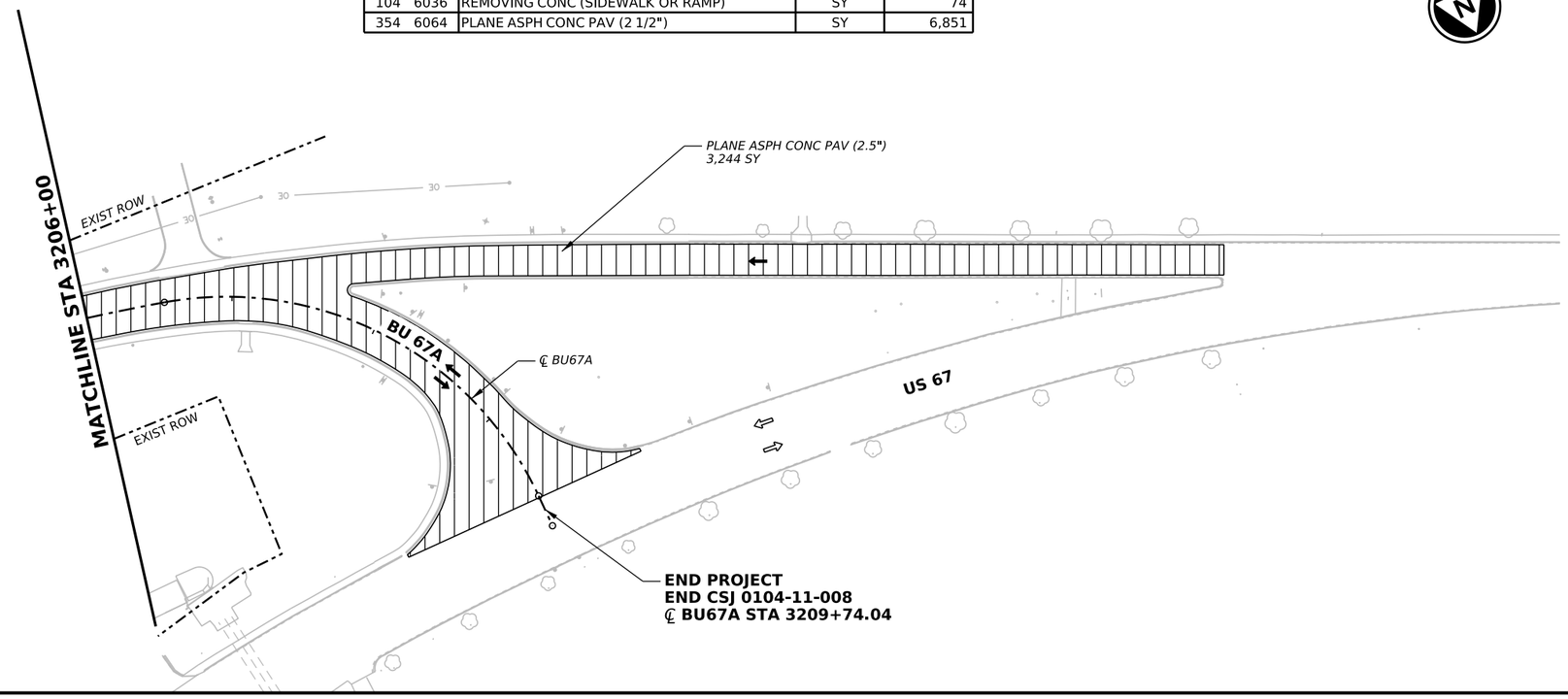


LEGEND:

- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- EXISTING ROW
- PLANE ASPH CONC PVMT (2.5")
- REMOVE CONC SIDEWALK OR RAMP
- REMOVE CONC DRIVEWAY
- REMOVE CONC PAVER
- REMOVE CONC CURB AND GUTTER

REMOVAL QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY
104 6022	REMOVING CONC (CURB AND GUTTER)	LF	152
104 6036	REMOVING CONC (SIDEWALK OR RAMP)	SY	74
354 6064	PLANE ASPH CONC PAV (2 1/2")	SY	6,851



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BU 67A

REMOVAL PLAN

STA 3197+00 TO END OF PROJECT

SHEET 6 OF 6

CONT	SECT	JOB	HIGHWAY
0104	11	008	BU 67A
DIST	COUNTY		SHEET NO.
ELP	PRESIDIO		128

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