FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
6	C 0915-00-238			1
STATE	STATE DIST.	COUNTY		
TEXAS	SAT	BEXAR		
CONT.	SECT.	JOB	HIGHWAY NO.	
0915	00	238	VARIOUS	

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

INDEX OF SHEETS

SEE SHEET 2 FOR INDEX OF SHEETS

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

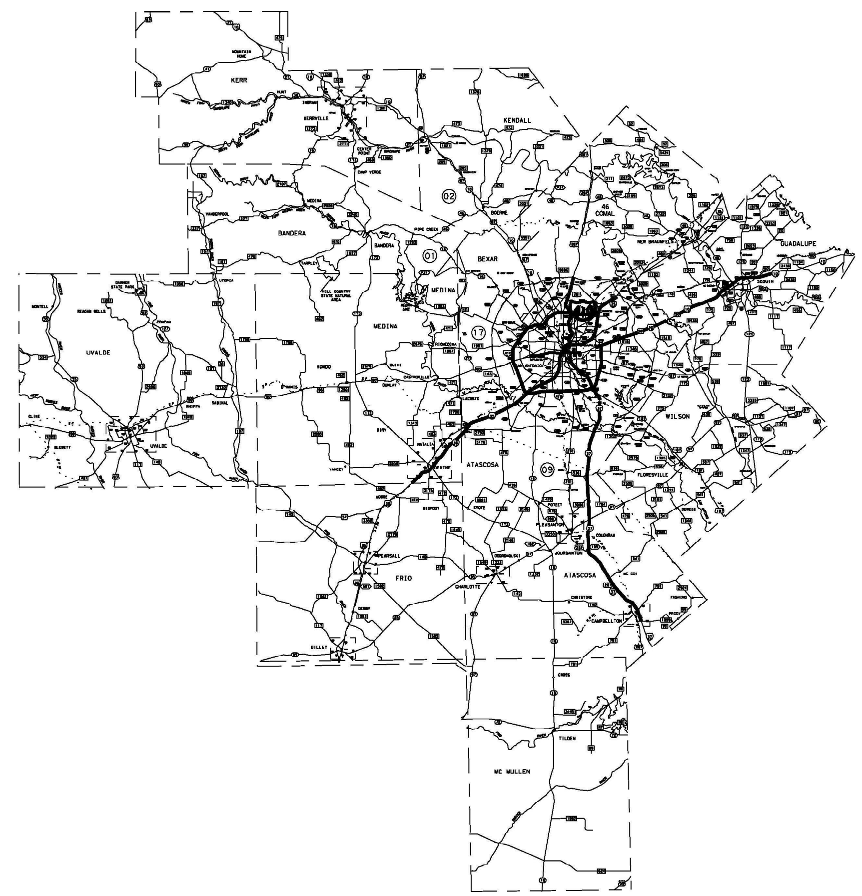
STATE PROJECT
PROJECT NO.: C 915-00-238
CSJ: 0915-00-238

BEXAR
VARIOUS

PROJECT LENGTH : N/A
LIMITS: DISTRICTWIDE GUIDE SIGNS FY 2022
FOR WORK CONSISTING OF PURCHASING AND INSTALL SIGNS & EQUIP

DESIGN SPEED = N/A
AREA OF DISTURBED SOIL = N/A
ADT: N/A

N
N. T. S.



FINAL PLANS

LETTING DATE: ____________

DATE CONTRACTOR BEGAN WORK: ____________

DATE WORK WAS ACCEPTED: ____________

FINAL CONTRACT COST: $ ____________

CONTRACTOR: ____________

FINAL PLANS STATEMENT:

THE CONSTRUCTION WORK WAS PERFORMED IN ACCORDANCE WITH THE PLANS.

____________ P.E. ____________
AREA ENGINEER DATE

TEXAS DEPARTMENT OF TRANSPORTATION

EXCEPTIONS: N/A
EQUATIONS: N/A
R.R. CROSSINGS: N/A

SUBMITTED FOR LETTING 2/28/2022
TRANSPORTATION ENGINEER SUPERVISOR

RECOMMENDED FOR LETTING 3/3/2022
DocuSigned by: Gregg Granato, P.E.
0D08C713B58C45C...
DISTRICT DESIGN ENGINEER

RECOMMENDED FOR LETTING 3/3/2022
DocuSigned by: Clayton Ripps, P.E.
74F59ACBB83D4EB...
DIRECTOR OF TRANSPORTATION PLANNING & DEVELOPMENT

APPROVED FOR LETTING 3/4/2022
DocuSigned by: Gina Gallegos, P.E.
124372CCDF604F5...
DISTRICT ENGINEER

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: SPECIAL LABOR PROVISIONS FOR STATE PROJECS (000--008)

T:\Traffic\Signal Design\NonSite Specific (NSS)
FILE LOCATION AND NAME

COUNTY____ PROJ. NO.____
HWY. NO.____ LETTING DATE____
DATE ACCEPTED____

LEVELS DISPLAYED

SHEET NO.	DESCRIPTION
	GENERAL
1	TITLE SHEET
2	INDEX OF SHEETS
3	LOCATION MAP
4, 4A-4D	GENERAL NOTES
5-5A	ESTIMATE & QUANTITY
6-7	QUANTITY SUMMARY
8	TMA SUMMARY SHEET
	TRAFFIC CONTROL PLAN
9-10	TCP NARRATIVE
	TCP STANDARDS
11-22	BC(1)-21 THRU BC(12)-21
23	WZ (TD)-17
24	WZ (RCD)-13
25-26	WZ(BTS-1)-13 THRU WZ(BTS-2)-13
27	WZ (BRK)-13
28-33	TCP(1-1)-18 THRU TCP(1-6)-18
34-41	TCP(2-1)-18 THRU TCP(2-8)-18
42	TCP (3-1)-13
43	TCP (3-2)-13
44	TCP (3-4)-13
45	TCP (5-1)-18
46-52	TCP(6-1)-12 THRU TCP(6-7)-12
53-54	TCP(6-8)-14 THRU TCP(6-9)-14
	SIGN SUMMARIES
	US 281 (BROOK HOLLOW BLVD TO W. JOSEPHINE ST)
55	LOCATION SUMMARY
56-57	SUMMARY OF LARGE SIGNS (SOLS)
58	SUMMARY OF SMALL SIGNS (SOSS)
59-68	GUIDE SIGN DETAILS
	IH- 35 (AT WALNUT AVE EXIT)
69	LOCATION SUMMARY
70	OSB ELEVATION VIEW
71	SUMMARY OF LARGE SIGNS (SOLS)
72	GUIDE SIGN DETAILS
	IH- 35 (IH- 410 TO LP 1604)
73	LOCATION SUMMARY
74-75	SUMMARY OF LARGE SIGNS (SOLS)
76-83	GUIDE SIGN DETAILS
84-86	OSB ELEVATION VIEW
	IH- 35 (IH- 10 TO IH- 410)
87	LOCATION SUMMARY
88	SUMMARY OF LARGE SIGNS (SOLS)
89	SUMMARY OF SMALLE SIGNS (SOSS)
90-91	GUIDE SIGN DETAILS
	IH- 35 (IH- 410 TO BEXAR COUNTY LINE)
92	LOCATION SUMMARY
93	SUMMARY OF LARGE SIGNS (SOLS)
94-95	SUMMARY OF SMALLE SIGNS (SOSS)
96-98	GUIDE SIGN DETAILS
	IH- 35 (FM 471 TO FRIO COUNTY LINE)
99	LOCATION SUMMARY
100	SUMMARY OF LARGE SIGNS (SOLS)
101	SUMMARY OF SMALLE SIGNS (SOSS)
102-104	GUIDE SIGN DETAILS

SHEET NO.	DESCRIPTION
	IH- 10 (LP 1604 TO IH- 410)
105	LOCATION SUMMARY
106	SUMMARY OF LARGE SIGNS (SOLS)
107-109	GUIDE SIGN DETAILS
	IH- 10 (IH-35 TO VANCE JACKSON)
110	LOCATION SUMMARY
111	OSB ELEVATION VIEW
112	SUMMARY OF LARGE SIGNS (SOLS)
113	SUMMARY OF SMALLE SIGNS (SOSS)
114-115	GUIDE SIGN DETAILS
	IH- 10 (FM-1518 TO SH 80)
116	LOCATION SUMMARY
117	SUMMARY OF LARGE SIGNS (SOLS)
118	SUMMARY OF SMALLE SIGNS (SOSS)
119-122	GUIDE SIGN DETAILS
	IH 37(IH 10 TO IH 35)
123	LOCATION SUMMARY
124-127	SUMMARY OF LARGE SIGNS (SOLS)
128-129	SUMMARY OF SMALLE SIGNS (SOSS)
130-147	GUIDE SIGN DETAILS
	IH 37(US 97 TO FM 1099)
148	LOCATION SUMMARY
149	SUMMARY OF LARGE SIGNS (SOLS)
150	SUMMARY OF SMALLE SIGNS (SOSS)
151	GUIDE SIGN DETAILS
	US 90 (WEST OF LEON CREEK)
152	LOCATION SUMMARY
153	BALANCED "T" ELEVATION
	SH 16 (GRISSOM RD TO IH 410)
154	LOCATION SUMMARY
155	SUMMARY OF LARGE SIGNS (SOLS)
156	SUMMARY OF SMALLE SIGNS (SOSS)
157-159	GUIDE SIGN DETAILS
	FM 1535(HUEBNER RD TO IH-410 LOOP
160	LOCATION SUMMARY
161-162	SUMMARY OF SMALLE SIGNS (SOSS)
163-168	GUIDE SIGN DETAILS
	LP 410 NORTH (SH 16 TO IH 35)
169	LOCATION SUMMARY
170-171	SUMMARY OF LARGE SIGNS (SOLS)
172-174	SUMMARY OF SMALLE SIGNS (SOSS)
175-189	GUIDE SIGN DETAILS
	LP 410 SOUTH (IH-35 TO IH-37)
190	LOCATION SUMMARY
191-192	SUMMARY OF LARGE SIGNS (SOLS)
193	SUMMARY OF SMALLE SIGNS (SOSS)
194-206	GUIDE SIGN DETAILS
207-209	OSB ELEVATION VIEW
	US 281/IH-410 N INTERCHANGE (DC CHEVRON)
210	LOCATION SUMMARY
211-213	SUMMARY OF WARNING SIGNS (SOSS)

SHEET NO.	DESCRIPTION
	IH 35/IH-10 INTERCHANGE(DC CHEVRON)
214	LOCATION SUMMARY
215	EXISTING CONDITIONS & REMOVAL
216	PROPOSED SIGNAGE
217	SUMMARY OF WARNING SIGNS (SOSS)
	IH-35 DC US-90 ALL CONNECTIONS(DC CHEVRON)
218	LOCATION SUMMARY
219-220	PROPOSED SIGNAGE
221-224	SUMMARY OF WARNING SIGNS (SOSS)
	IH 410/IH10 INTERCHANGE(DC CHEVRON)
225	LOCATION SUMMARY
226-227	SUMMARY OF WARNING SIGNS (SOSS)
	SIGN STANDARDS
228-232	TSR(1)-13 THRU TSR(5)-13
233	SMD(GEN)-08
234-236	SMD(SLIP-1)-08 THRU SMD(SLIP-3)-08
237	SMD(TWT)-08
238	SMD(FRP)-08
239-241	SMD(BR-1)-14 THRU SMD(BR-3)-14
242-245	SMD(2-1)-08 THRU SMD(2-4)-08
246	SMD(TY G)-08
247-248	SMD(8W-1)-08 THRU SMD(8W-2)-08
	ELECTRICAL STANDARDS
249-260	ED(1)-14 THRU ED(12)-14
	OSB & DMS STANDARDS
261	WV & IZ-14
262	WV & IZ(LTS2013)-14
263	COSS & OSB-SZ-21
264	COSSF-21
265	DMS(TM-1)-16
266	DMS(TM-2)-16
267	DMS(TM-3)-16
268	OSB-SE
269-270	OSB-Z1
271-272	OSB-Z3
273-274	OSB-Z3I
275-276	OSBT-21
277	COSS-Z3 & Z3I-10
278-279	COSSD
280	COSS-FD
	ENVIRONMENTAL STANDARDS
281	ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENT (EPIC)
282	STORM WATER POLLUTION PREVENTION PLAN (SW3P)

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

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

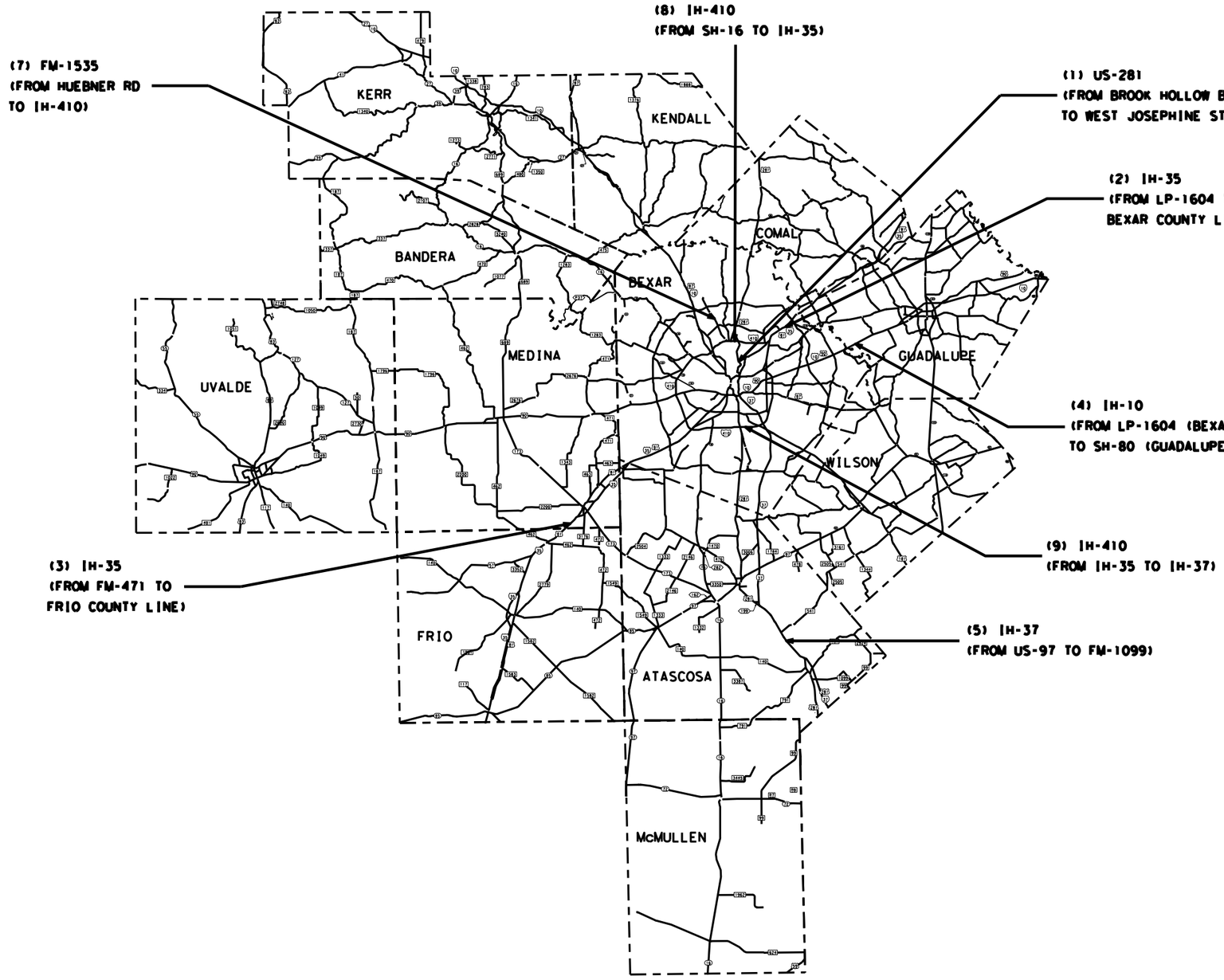
EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

Texas Department of Transportation

INDEX OF SHEETS

SHEET 1 OF 1

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		2
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS



N

N. T. S.

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E.

2/28/2022
DATE

Texas Department of Transportation

LOCATION MAP
SITE SPECIFIC SIGNS

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		3
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

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

--General--
This project includes the installation of new signs on new supports, the removal of existing signs, and the replacement of existing signs on the State Highway System in the San Antonio District.

Work may occur in multiple counties simultaneously.

Each contract awarded by the Department stands on its own and as such is separate from other contracts. A contractor that is awarded multiple contracts must be capable and sufficiently staffed to concurrently process any and all contracts concurrently.

Notify the Engineer's representative by telephone each morning by 8:00 AM to confirm scheduled work, work location, and estimated time of arrival or reason for not working that day.

It is the Contractor's responsibility to verify all locations, dimensions, and elevations in the field prior to ordering signs and supports.

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. Depending on the type and extent of the damage, the Engineer reserves the right to perform the repair or replacement work and the Contractor will be billed for this work.

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

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

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

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

Locate and reference all manholes and valves within the construction area with station and offset. Each manhole and valve shall be identified by its owner (SAWS, CPS, etc.). No roadwork will begin until this list has been submitted. All valves and manhole covers have to be

accessible at all times, therefore; temp. CTB, material stock piles, etc. cannot be placed over these valves or covers.

Hurricane Evacuation

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

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

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

The Contractor should be aware that the "City Public Service" (CPS) will be consulted by the Engineer in matters concerning the execution of the work, materials and testing related to the CPS work. As such; a CPS employee may be observing the construction and related operations as they progress.

Submit locate request for SAWS water and sewer to TXDOTlocates@saws.org.

Contractor questions on this project are to be addressed to the following individual(s):
Eduardo L. Villalon, P.E. District Traffic Engineer, eduardo.villalon@txdot.gov
Orlando Gallegos, P.E. Transportation Engineer, orlando.gallegos@txdot.gov

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

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

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

--Item 5--
When working near aerial electrical lines or utility poles, comply with Federal, State and local regulations. A horizontal boom or equivalent equipment is required for construction in the vicinity of the CPS Energy electric lines in order to provide vertical clearance of equipment during construction. Contact CPS Energy Utility Coordination Group sixteen (16) week in anticipation of pole bracing. The estimated duration for pole bracing is 6 to 10 weeks (or longer if temporary construction easements are required) after invoice is paid. For de-energizing or sleeving of the overhead electrical lines depicted on the plans, please contact CPS Energy Utility Coordination Group sixteen (16) week in anticipation of needed de-energization. The estimated duration for de-energizing is approximately 4 to 6 weeks (after invoice is paid) but could vary on system scenario and backfeed requirements. De-energizing may not be possible in all instances or may be restricted during specific periods of time due to load demand. Contractor will be reimbursed for the invoice cost for pole bracing and/or de-energizing or sleeving through force account.

Prevention of Migratory Bird Nesting

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

Structures

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

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

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

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

Provide a non-intrusive back-up alarm system on all heavy equipment used in close proximity to residential areas. This item is subsidiary to various bid items.

--Item 6--
Show the stockpile lot and/or sub lot numbers on all tickets for all materials.

--Item 7--
The total disturbed areas within the project is anticipated at less than one (1) acre. Due to this type of construction, the project qualifies for exclusion under the Construction General Permit (CGP) issued by the Texas Commission on Environmental Quality (TCEQ). However; should the sum of the Engineer's anticipated disturbances and the Contractor's (On ROW and off ROW) PSL's equal or exceed the one (1) acre threshold; both TxDOT and the Contractor have project responsibilities under the CGP that reverts to non-exclusion status. Obtain approval for all non-depicted areas of disturbance that increases the initial soil and vegetation disturbed area estimates before work starts at these locations.

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

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

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

Create and maintain a Bar Chart schedule.

Replacement of overhead signs in Bexar County will be performed at night between 9:00 PM Sunday night and 5:00 AM Friday morning.

Unless otherwise approved by the Engineer, no daytime closures of main lanes, frontage road lanes, ramps or connectors will be allowed. When approved, daytime lane closures will be limited to between the hours of 8:30 AM and 4:00 PM.

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

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

Show proof of certification by the Texas Commission on Law Enforcement Standards.

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

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

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

--Item 421--
Use an automated ticket that contains the same information as TxDOT's ticket. Submit the ticket for approval prior to use. The concrete producer will contact the District Laboratory or the Engineer’s Office (outside the San Antonio area) to inform TxDOT of scheduled structural concrete batching. Structural concrete includes bridge drill shafts, columns, caps, abutments, deck or top slabs of direct traffic culverts.

For this project, the Contractor will be allowed to use a potable, motor-driven concrete mixer for batches of concrete less than 2 cubic yards that will be used for new sign post foundations. For small placements of concrete less than 0.5 cubic yards that are for new sign post foundations, the contractor can hand mix the concrete in a suitable container. The concrete shall be Class A or a bagged concrete product meeting the requirements of DMS-4655 for Type C-General Purpose Repairs with a minimum 3-day compressive strength of 3,600 psi.

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

--Item 502--
When advanced warning flashing arrow panels and/or changeable message sign is specified, have one standby unit in good condition at the job site. Standby time shall be considered subsidiary to the bid item.

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

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

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

For closures not listed in the TCP; the lane closures are limited to between the hours of 9:00 PM and 5:00 AM, and at least one lane has to remain open at all times.

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

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

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

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

The Contractor Force Account “Safety Contingency” that has been established for this project is intended to be utilized for work zone enhancements, to improve the effectiveness of the Traffic Control Plan, that could not be foreseen in the project planning and design stage. These enhancements will be mutually agreed upon by the Engineer and the Contractor’s Responsible

Person based on weekly or more frequent traffic management reviews on the project. The Engineer may choose to use existing bid items if it does not slow the implementation of enhancement.

At no time shall two consecutive ramps be closed at one time during construction.

Coordination with adjacent projects will be required.

Place “electronic” portable changeable message signs” (PCMS) at locations requiring lane closures for 5 (five) days prior to the closure, or as directed by the Engineer. Obtain approval for the actual message that will appear on the boards. If more than two phases of a message are required per board, provide additional PCMSs to meet the two-phases-per-board requirement.

Meet with the Engineer’s representative immediately prior to effectuating lane, ramp, or connector closures to ensure that sufficient equipment, materials, devises, and workers are available and will be used. Agree upon contingency plans and maintain a sufficient number of workers to revise traffic control as directed.

For each lane closure set-up, provide a “buffer space” and shadow vehicle with truck mounted attenuator (TMA) as directed.

Weekend lane closures will not be allowed unless approved by the engineer.

Lane closures concurrent with events at the AT&T Center or Alamodome must be approved by the engineer.

--Item 506--
It is not anticipated that erosion control devices will be needed. However; in the event devices are needed, the SW3P shall consist of the control measures approved. Depending on the type and amount of work, payment will be handled with the Force Account Procedure, or by individual pay items.

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

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

--Item 618--
It might be necessary to cut concrete for placement of conduit. Saw cut existing concrete, remove the concrete from the steel reinforcement (bars or fabric) and bend the steel to install the

conduit. After the conduit has been placed, bend the steel back to its original position and back-fill the trench with an approved concrete. This work is subsidiary to this Item.

The conduit depth for illumination under the City of San Antonio streets is 36 inches.

Use materials from Material Producers list as shown on the Construction Division’s (CST) web site. Category is “Roadway Illumination and Electrical Supplies.”

--Item 620--
For both transformer and shoe-base type illumination poles, provide double-pole breakaway fuse holder as shown on the Construction Division’s (CST) materials producers list Category is “Roadway Illumination and Electrical Supplies.” Fuse holder is shown on list under Items 610 & 620.

Provide 10 amp time delay fuses.

--Item 628--
Make all arrangements for electrical service, and compliance with local standards and practices for proper installations.

--Item 636--
Bottom align overhead signs on the OSB structure unless the difference in height is 2 feet or greater. If the sign height is 2 feet or more, the Contractor shall center align the signs.

When replacing signs, the Contractor shall plumb all existing mounts prior to the placement of the new sign panel.

Sign replacement shall be accomplished on a single workday; no existing mount is to be left without a sign over night. Existing signs shall remain in place until a new sign and mount are complete and in place.

Any missing or damaged sign mounting hardware shall be replaced. This work shall be considered subsidiary to Item 636.

All sign panels of aluminum Type G shall have stiffeners per TxDOT standards.

All sign assemblies or supports that require modifications shall be coordinated with the Engineer.

After signs have been replaced, wash signs requiring cleaning with an approved cleaning solution to remove all grease, oil, dirt, smears, streaks, and other foreign particles.

Any sign supports that are leaning shall be straightened as part of the sign replacement.

All signs removed become property of the Contractor.

Contractor shall utilize appropriate equipment (bucket truck, cranes, lifts, etc.) for replacing/installing signs.

All “L” Brackets on Existing Overhead Signs shall be removed at the time the sign is replaced unless there are Existing Lane Control Signs (LCS) mounted on the sign bridge. This work shall be considered subsidiary to Item 636.

Any missing Vandalism Protection Panels shall be replaced at the time the signs on the structure are replaced. Existing Vandalism Protection Panels shall be checked to confirm they are installed properly via the San Antonio District Standard, including required tact welds. This work shall be considered subsidiary to Item 636.

If the replacement of a sign on an existing support requires the shifting of adjacent overhead sign panels, then shifting of adjacent signs shall not be paid for separately but considered subsidiary to Item 636.

Direct apply signs shown in the Summary of Large Signs are subsidiary to the sign.

--Item 644--
The wedge anchor system shown on State Standard Sheet SMD (TWT) is not allowed.

The set screw type for Triangular Slipbase Systems is not allowed. Use the following products for the Triangular Slipbase System.

Triangular Slip Base Systems
(For use with 10 BWG and Schedule 80 Round Posts)

Southern Plains Fabrication	SPF Triangular Slipbase Housing	Info@SouthernPlainsFabrication.com http://SouthernPlainsFabrication.com (806) 241-0060
Structural and Steel Products	Triangular Slipbase Breakaway Support	CustServ@s-steel.com http://s-steelcom (800) 782-5804

--Item 684--
Provide an extra 10’ for each cable terminating in the controller cabinet. All cables shall be continuous without splices from terminal point to terminal point. All proposed signal cable shall be #12 AWG stranded copper.

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

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0915-00-238 **DISTRICT** San Antonio **COUNTY** Bexar
HIGHWAY Various

			CONTROL SECTION JOB		**0915-00-238**	TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00180402**		
			COUNTY		**Bexar**		
			HIGHWAY		**Various**		
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	416-6004	DRILL SHAFT (36 IN)	LF	34.000		34.000	
	416-6006	DRILL SHAFT (48 IN)	LF	26.000		26.000	
	416-6023	DRILL SHAFT (SIGN MTS) (54 IN)	LF	31.000		31.000	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	11.000		11.000	
	496-6035	REMOV STR (DRILL SHAFT)	EA	6.000		6.000	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	17.000		17.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF	125.000		125.000	
	540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	1.000		1.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1.000		1.000	
	618-6064	CONDT (RM) (1")	LF	60.000		60.000	
	618-6070	CONDT (RM) (2")	LF	60.000		60.000	
	624-6009	GROUND BOX TY D (162922)	EA	1.000		1.000	
	636-6003	ALUMINUM SIGNS (TY O)	SF	873.000		873.000	
	636-6007	REPLACE EXISTING ALUMINUM SIGNS(TY A)	SF	3,633.000		3,633.000	
	636-6008	REPLACE EXISTING ALUMINUM SIGNS(TY G)	SF	4,636.000		4,636.000	
	636-6009	REPLACE EXISTING ALUMINUM SIGNS(TY O)	SF	11,950.000		11,950.000	
	644-6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	39.000		39.000	
	644-6066	IN SM RD SN SUP&AM (RAIL MOUNT)	EA	10.000		10.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	1.000		1.000	
	647-6003	REMOVE LRSA	EA	1.000		1.000	
	650-6028	INS OH SN SUP(30 FT BAL TEE)	EA	1.000		1.000	
	650-6032	INS OH SN SUP(30 FT CANT)	EA	1.000		1.000	
	650-6084	INS OH SN SUP(75 FT BRDG)	EA	1.000		1.000	
	650-6089	INS OH SN SUP(80 FT BRDG)	EA	2.000		2.000	
	650-6204	REMOVE OVERHD SIGN SUP	EA	2.000		2.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	102.000		102.000	
	6007-6094	FIBER OPTIC FUSION SPLICE	EA	2.000		2.000	
	6007-6095	FIBER OPTIC PATCH PANEL (6 POSITION)	EA	2.000		2.000	
	6028-6001	INSTALL DMS (POLE MTD CABINET)	EA	1.000		1.000	
	6028-6002	INSTALL DMS (FOUNDATION MTD CABINET)	EA	1.000		1.000	
	6123-6001	ETHERNET SWITCH (INSTALL ONLY)	EA	2.000		2.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	220.000		220.000	
	08	CONTRACTOR FORCE ACCOUNT WORK (NON-PARTICIPATING)	LS	1.000		1.000	
		CONTRACTOR FORCE ACCOUNT EROSION CONTROL MAINTENANCE (NON-PARTICIPATING)	LS	1.000		1.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0915-00-238 **DISTRICT** San Antonio **COUNTY** Bexar
HIGHWAY Various

			CONTROL SECTION JOB		**0915-00-238**	TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00180402**		
			COUNTY		**Bexar**		
			HIGHWAY		**Various**		
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	08	CONTRACTOR FORCE ACCOUNT LAW ENFORCEMENT (NON-PARTICIPATING)	LS	1.000		1.000	
		CONTRACTOR FORCE ACCOUNT SAFETY CONTINGENCY (NON-PARTICIPATING)	LS	1.000		1.000	

ITEM	0416 6004	0416 6006	0416 6023	0432 6045	0496 6035	0624 6009
CORRIDORS	DRILL SHAFT (36 IN)	DRILL SHAFT (48 IN)	DRILL SHAFT (SIGN MTS) (54 IN)	RIPRAP (MOW STRIP) (4 IN)	REMOV STR (DRILL SHAFT)	GROUND BOX TY D 162911)
	LF	LF	LF	CY	EA	EA
US-281	0	0	0	0	0	0
IH- 35	34	0	0	0	2	0
IH-10	0	0	0	0	0	0
IH- 37	0	0	0	0	0	0
US 90	0	0	31	3	2	1
FM 1535	0	0	0	0	0	0
SH 16	0	0	0	0	0	0
LP 410	0	26	0	8	2	0
TOTAL	34	26	31	11	6	1

ITEM	0636 6003	0636 6007	0636 6008	0636 6009	**0636 XXXX	0644 6030	0647 6003
CORRIDORS	ALUMINUM SIGNS (TY O)	REPLACE EXISTING ALUMINUM SIGNS (TY A)	REPLACE EXISTING ALUMINUM SIGNS (TY G)	REPLACE EXISTING ALUMINUM SIGNS (TY O)	L-BRACKET REMOVAL	IN SM RD SN SUP&AM TYS80(1)SA(T)	REMOVE LRSA
	SF	SF	SF	SF	EA	EA	EA
US-281	0	135	124	2161	22	0	0
IH- 35	665	451	1569	2193.5	12	0	1
IH-10	0	72	1009	1001	5	0	0
IH- 37	0	237	635.25	2043	0	2	0
US 90	0	0	0	0	0	0	0
FM 1535	0	370	0	0	0	0	0
SH 16	0	101	353	0	0	0	0
LP 410	208	680	942	4551	18	0	0
TOTAL	873	2046	4636	11950	57	2	1

ITEM	0644 6076	0650 6028	0650 6032	0650 6084	0650 6089	0540 6001	0540 6016
CORRIDORS	REMOVE SM RD SN SUP&AM	INS OH SUP(30 FT BAL TEE)	INS OH SN SUP(30 FT CANT)	INS OH SN SUP(75 FT BRDG)	INS OH SN SUP(80 FT BRDG)	MTL W-BEAM GD FEN (TIM POST)	DOWNSTREAM ANCHOR TERMINAL SECTION
	EA	EA	EA	EA	EA	LF	EA
US-281	0	0	0	0	0	0	0
IH- 35	0	0	0	1	1	0	0
IH-10	1	0	0	0	1	0	0
IH- 37	0	0	0	0	0	0	0
US 90	0	1	0	0	0	0	0
FM 1535	0	0	0	0	0	0	0
SH 16	0	0	0	0	0	0	0
LP 410	0	0	1	0	0	125	1
TOTAL	1	1	1	1	2	125	1

**FOR CONTRACTOR INFORMATION ONLY.
ITEM SHALL NOT BE PAID FOR DIRECTLY BUT CONSIDERED SUBSIDIARY TO ITEM 636.

Texas Department of Transportation

QUANTITY SUMMARY

SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT		SHEET NO.
6	SEE TITLE SHEET		6
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

ITEM	0544 6001	0650 6204	6001 6001	6007 6094	6007 6095	6028 6001	6028 6002
CORRIDORS	GUARDRAIL END TREATMENT (INSTALL)	REMOVE OVERHD SIGN SUP	PORTABLE CHANGEABLE MESSAGE SIGN	FIBER OPTIC FUSION SPLICE	FIBER OPTIC PATCH PANEL (6 POSITION)	INSTALL DMS (POLE MTD CABINET)	INSTALL DMS (FOUNDATION MTD CABINET)
	EA	EA	DAY	EA	EA	EA	EA
US-281	0	0	16	0	0	0	0
IH- 35	0	0	30	1	1	1	0
IH-10	0	1	22	0	0	0	0
IH- 37	0	0	2	0	0	0	0
US 90	0	0	2	1	1	0	1
FM 1535	0	0	10	0	0	0	0
SH 16	0	0	2	0	0	0	0
LP 410	1	1	18	0	0	0	0
TOTAL	1	2	102	2	2	1	1

ITEM	0618 6064	0618 6070	6123 6001	6185 6005
CORRIDORS	CONDT (RM)(1")	CONDT (RM)(2")	ETHERNET SWITCH (INSTALL ONLY)	TMA (MOBILE OPERATION)
	LF	LF	EA	DAY
US-281	0	0	0	32
IH- 35	30	30	1	60
IH-10	0	0	0	44
IH- 37	0	0	0	4
US 90	30	30	1	4
FM 1535	0	0	0	10
SH 16	0	0	0	2
LP 410	0	0	0	64
TOTAL	60	60	2	220

CHEVRONS ON DCs			
CORRIDORS	0636 6007	0644 6066	0644 6030
	REPLACE EXISTING ALUMINUM SIGNS (TY A)	IN SM RD SN SUP&AM(RAIL MOUNT)	IN SM RD SN SUP&AM TYS80(1)SA(T)
	SF	EA	EA
IH-10 & IH-35	0	10	0
US-281 & IH-410	384	0	0
IH-410 & IH-10	724	0	0
IH-35 & US-90	479	0	37
TOTAL	1587	10	37

Texas Department of Transportation

QUANTITY SUMMARY

SHEET 2 OF 2

FED. RD. DIV. NO.	PROJECT		SHEET NO.
6	SEE TITLE SHEET		7
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

LOC NO.	TCP PHASE	SPECIFIC TCP PLAN SHEET OR TCP STANDARD SHEET	FURNISH TMA/TA	RELOCATE/REUSE TMA/TA	TOTAL TMA/TA PER SET UP	DURATION OF TMA/TA SET UP	6185 6002 TMA (STATIONARY)	6185 6005 TMA (MOBILE OPERATION)
		SHEET NUMBER	EA	EA	EA	DAYS PER TMA/TA USE	DAY	DAY
N/A	N/A	TCP(1-1)-18	1		1	10	10	
N/A	N/A	TCP(1-2)-18	1		1	10	10	
N/A	N/A	TCP(1-3)-18	2		2	5	10	
N/A	N/A	TCP(1-4)-18	1		1	10	5	
N/A	N/A	TCP(1-5)-18	1		1	10	10	
N/A	N/A	TCP(2-1)-18	1		1	10	15	
N/A	N/A	TCP(2-2)-18	1		1	10	10	
N/A	N/A	TCP(2-3)-18	2		2	5	10	
N/A	N/A	TCP(2-4)-18	1		1	10	10	
N/A	N/A	TCP(2-5)-18	1		1	10	10	
N/A	N/A	TCP(2-6)-18	1		1	10	10	
N/A	N/A	TCP(3-1)-13	2		2	55		N/A
N/A	N/A	TCP(3-2)-13	3		3	50		N/A
N/A	N/A	TCP(3-3)-14	3		3	50		N/A
N/A	N/A	TCP(3-4)-13	2		2	55		N/A
N/A	N/A	TCP(3-5)-18	1		1	55	10	
N/A	N/A	TCP(5-1)-18	1		1	10	35	
N/A	N/A	TCP(6-1)-12	2		2	5	55	
N/A	N/A	TCP(6-2)-12	1		1	10	10	
N/A	N/A	TCP(6-3)-12	1		1	10	10	
N/A	N/A	TCP(6-4)-12	2		2	5	20	
N/A	N/A	TCP(6-5)-12	2		2	5	10	
N/A	N/A	TCP(6-6)-12	3		3	5	15	
N/A	N/A	TCP(6-7)-12	3		3	5	15	
		TOTALS	39		39		290	

NOTE.
FURNISH TMA/TA - THE NUMBER OF ATTENUATORS BEING FURNISHED FOR THE SPECIFIC TCP.
RELOCATE/REUSE TMA/TA - THE NUMBER OF ATTENUATORS BEING REUSED FROM A PREVIOUS TCP FOR THE SPECIFIC TCP.
TOTAL TMA/TA PER SET UP = (FURNISH TMA/TA) + (RELOCATE/REUSE TMA/TA)
DURATION OF TMA/TA SET UP - THE NUMBER OF DAYS THE ATTENTUATORS WILL BE USED FOR THE SPECIFIC TCP.
TMA/TA (STATIONARY) = (TOTAL TMA/TA PER SET UP) X (THE DURATION OF TMA/TA SET UP)
TMA/TA (MOBILE OPERATION) = (TOTAL TMA/TA PER SET UP) X (THE DURATION OF TMA/TA SET UP)
PROJECT LOCATIONS AND PLAN DETAILS WILL BE INCORPORATED BY WORK ORDER OVER THE LIFE OF THE CONTRACT.
QUANTITIES SHOWN ON THIS SHEET ARE FOR ESTIMATING PURPOSES AND TO PROVIDE THE CONTRACTOR WITH NUMBER OF TMA'S NEEDED PER TCP SETUP.
THERE IS NO GUARANTEED AMOUNT OF WORK UNDER THIS CONTRACT.

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

FILE: tma.dgn	DN: TxDOT	CK:		CK:
© TxDOT	CONT	SECT	JOB	HIGHWAY
REVISIONS 3/2018	0915	00	238	VARIOUS
	DIST	COUNTY		
	SAT	BEXAR		
	PROJECT			SHEET NO.
	SEE TITLE SHEET			8

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

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

1. GENERAL

(1) TRAFFIC MUST BE HANDLED THROUGHOUT THE PROJECT DURING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING A SAFE AND COMFORTABLE PASSAGE FOR VEHICULAR AND PEDESTRIAN TRAFFIC WITH MINIMAL INCONVENIENCE TO THE PUBLIC, AS SHOWN IN THE PLANS OR AS DIRECTED/APPROVED BY THE ENGINEER.

(2) THE CONTRACTOR MAY PROPOSE/RECOMMEND MODIFICATIONS TO THE SEQUENCE OF WORK FOR CONSIDERATION BY THE ENGINEER. ANY MAJOR RECOMMENDED MODIFICATION BY THE CONTRACTOR SHALL INCLUDE ANY CHANGES TO THE VARIOUS BID ITEMS, IMPACT TO TRAFFIC, EFFECT OF OVERALL PROJECT IN TIME AND COST, ETC. IF THIS PROPOSAL IS IMPLEMENTED, THE CONTRACTOR WILL BE RESPONSIBLE FOR DEVELOPING DETAILED PLAN SHEETS TO BE SEALED BY A LICENSED PROFESSIONAL ENGINEER FOR INCLUSION WITH THE CHANGE ORDER. THE CONTRACTOR CANNOT PROCEED WITH ANY CONSTRUCTION OPERATIONS BASED ON A REVISED PHASE/SEQUENCE UNLESS WRITTEN APPROVAL IS OBTAINED FROM THE ENGINEER. IF AT ANY TIME DURING CONSTRUCTION THE CONTRACTOR'S PROPOSED PLAN OF OPERATION FOR HANDLING TRAFFIC DOES NOT PROVIDE FOR SAFE AND COMFORTABLE MOVEMENT, THE CONTRACTOR WILL IMMEDIATELY CHANGE THEIR OPERATION TO CORRECT THE UNSATISFACTORY CONDITION.

(3) DO NOT STORE ANY CONSTRUCTION MATERIAL OR EQUIPMENT AT ANY LOCATION THAT WILL CONSTITUTE A HAZARD AND WILL ENDANGER TRAFFIC..

(4) THE CONTRACTOR WILL PROVIDE ADVANCE NOTIFICATION TO THE ENGINEER OF IMPENDING / UPCOMING LANE CLOSURES FOR ALL TEMPORARY AND / OR PERMANENT LANE, RAMP, CONNECTOR, FRONTAGE, SHOULDER, ETC. CLOSURES OR DETOURS. SEE GENERAL NOTES FOR NOTIFICATION REQUIREMENTS.

(5) ACCESS TO ADJOINING PROPERTY MUST BE MAINTAINED AT ALL TIMES.

(6) TEMPORARY DRAINAGE IS THE RESPONSIBILITY OF THE CONTRACTOR.

(7) AT NO TIME SHALL TWO CONSECUTIVE INTERSECTING ROADWAYS BE CLOSED AT ONE TIME DURING CONSTRUCTION.

(8) AT NO TIME SHALL TWO CONSECUTIVE RAMPS BE CLOSED AT ONE TIME DURING CONSTRUCTION OR OVERLAY OPERATIONS.

(9) UNLESS OTHERWISE NOTED IN THE PLANS AND/OR AS DIRECTED BY THE ENGINEER, DAILY LANE CLOSURES SHALL BE LIMITED ACCORDING TO THE FOLLOWING RESTRICTIONS:
NIGHTTIME : WHEN APPROVED BY THE ENGINEER (WITH UNIFORMED OFF DUTY LAW ENFORCEMENT OFFICERS)
WEEKEND CLOSURES WHEN APPROVED BY THE ENGINEER:
NO LANE CLOSURES WILL BE PERMITTED FOR THE FOLLOWING DATES AND/OR SPECIAL EVENTS:
BETWEEN DECEMBER 15 AND JANUARY 1.
FIESTA WEEK AND TAX FREE WEEKEND. (BEXAR COUNTY ONLY)
WEDNESDAY BEFORE THANKSGIVING THRU THE SUNDAY AFTER THANKSGIVING
SATURDAY AND SUNDAY BEFORE MEMORIAL DAY AND LABOR DAY.
SATURDAY OR SUNDAY WHEN JULY 4 FALLS ON A FRIDAY OR MONDAY.
ELECTION DAYS (BEXAR COUNTY ONLY)
DURING MAJOR EVENTS AT THE AT&T CENTER (SPURS HOME GAMES, RODEO, CONCERTS, ETC.), ALAMODOME AND OR CONVENTION CENTER (BEXAR COUNTY ONLY) **EASTER WEEKEND (SUNDAY, APRIL 17)**

(10) REMOVAL AND DISPOSAL OF EXISTING ABANDONED UTILITIES (EITHER PREVIOUSLY ABANDONED OR ABANDONED DURING THIS PROJECT) REQUIRED TO SUPPORT THIS PROJECT'S CONSTRUCTION SHALL BE PERFORMED UNDER THE OVERALL PREPARE RIGHT-OF-WAY ITEM (ITEM 100).

(11) COORDINATE WITH ADJACENT PROJECTS.

(12) COVER PERMANENT SIGNS IF NOT USED. THIS IS SUBSIDIARY TO ITEM 502.

(13) EXCAVATION WITHIN 5 FEET OF AN EXISTING CPS ENERGY POLE WILL REQUIRE POLE BRACING. CONTACT CPS ENERGY UTILTY COORDINATION TO REQUEST POLE BRACING (JOHN OFFER, JEOFFER@CPSENERGY.COM). THE ESTIMATED DURATION FOR THE POLE BRACING PROCESS IS APPROXIMATELY 6 TO 8 WEEKS.

(14) COORDINATE WITH THE CITY OF SAN ANTONIO OR TXDOT FOR SIGNAL TIMING REVISIONS, AS NECESSARY.

(15) CONTRACTOR IS NOT PERMITTED TO WORK IN AREAS WITH ONGOING UTILITY RELOCATION OR ROW ACQUISITION.

2. SEQUENCE OF WORK

(1) THIS PROJECT WILL BE CONSTRUCTED IN 1 PHASE. BEFORE THE COMMENCEMENT OF EACH PHASE, INSTALL ADVANCE WARNING SIGNS, TEMPORARY SIGNS AND BARRICADES AS SHOWN ON THE PLANS AND/OR AS DIRECTED/APPROVED BY THE ENGINEER. DAILY LANE CLOSURES WILL BE USED IN ACCORDANCE WITH STATE TCP STANDARDS. DROP OFF CONDITIONS OF GREATER THAN 2" MUST HAVE A 3:1 SLOPE AT THE END OF EACH DAY, AS WELL AS THROUGHOUT THE PROJECT WHERE ACCESS TO ADJACENT PROPERTIES IS ALLOWED TO DRIVEWAYS AND SIDE STREETS.

(2) PREPARING ROW / REMOVAL OF EXISTING ITEMS TO BE DONE ONLY IN AREAS WHERE WORK IS OCCURING, AS PER THE PHASES NOTED BELOW.

(3) PLANING, SURFACE TREATMENTS AND OVERLAYS SHALL BE PERFORMED IN THE DIRECTION OF TRAFFIC. BEGIN SURFACE CONSTRUCTION ON HIGH SIDE OF ROAD TO AVOID WATER PONDING ISSUES.

(4) A BRIEF DESCRIPTION OF THESE PHASES ARE AS FOLLOWS:

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

Texas Department of Transportation

TRAFFIC CONTROL NARRATIVE

I SHEET 2

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		9
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

DN: DN

3. SAFETY

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

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

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

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

4. HAULING EQUIPMENT

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

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

5. FINAL CLEAN UP

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

6. PAYMENT

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

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E.

2/28/2022
DATE

Texas Department of Transportation

TRAFFIC CONTROL NARRATIVE

2 SHEET 2

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		10
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

2/25/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\Letting Documents\TCP*Narrative.dgn

DATE: 2/25/2022 9:59:57 AM
FILE: T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\Standards\bc-21.dgn

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	00	238	VARIOUS
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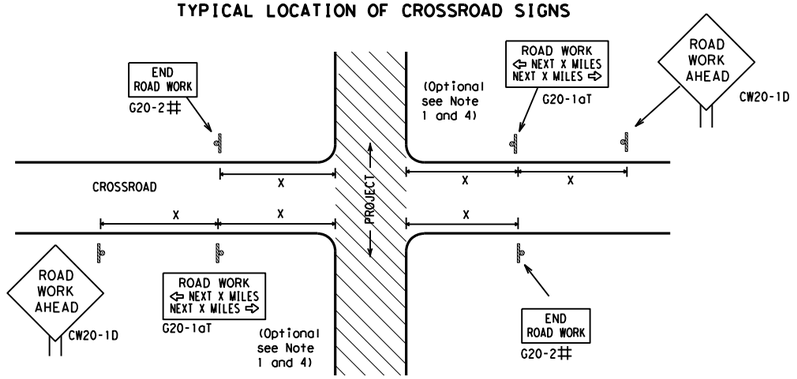
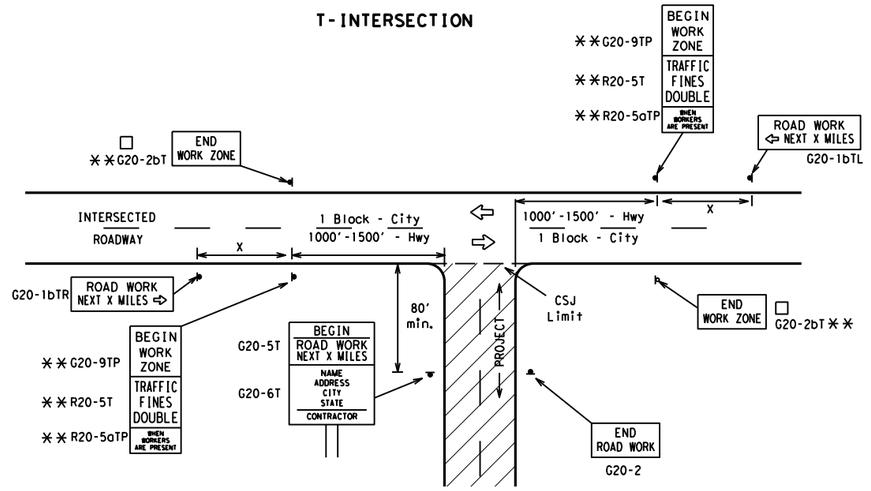
TYPICAL LOCATION OF CROSSROAD SIGNS



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]

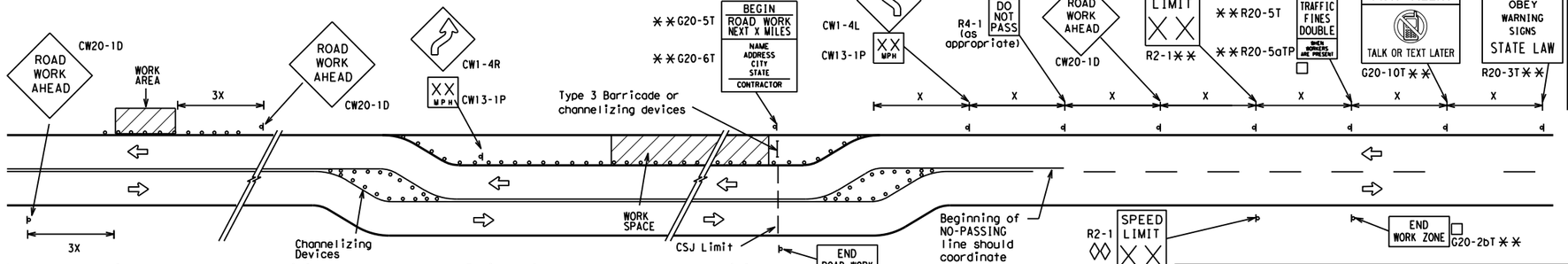
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

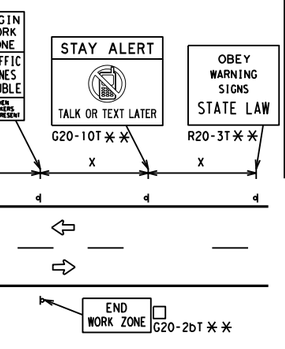
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may 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

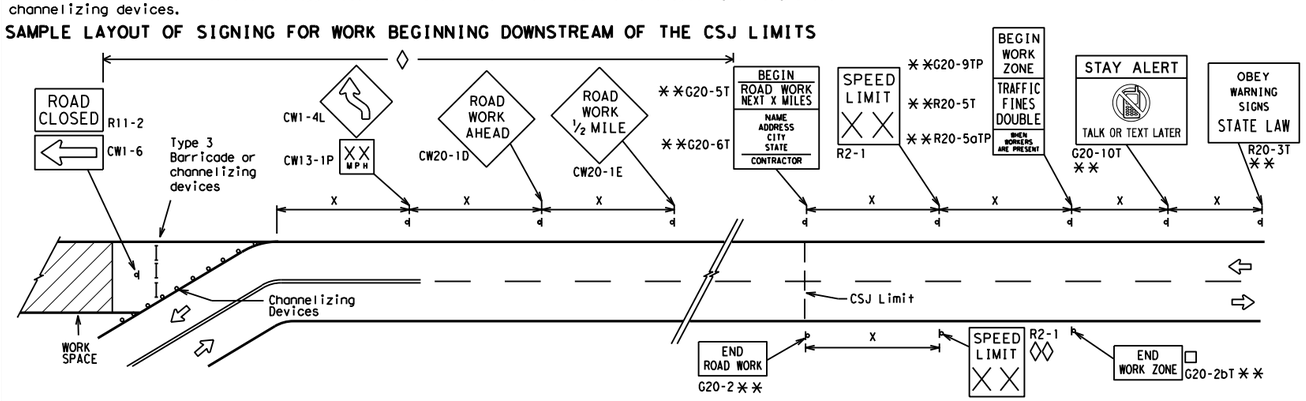


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD"(CW20-1D)signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SAT	BEXAR		12

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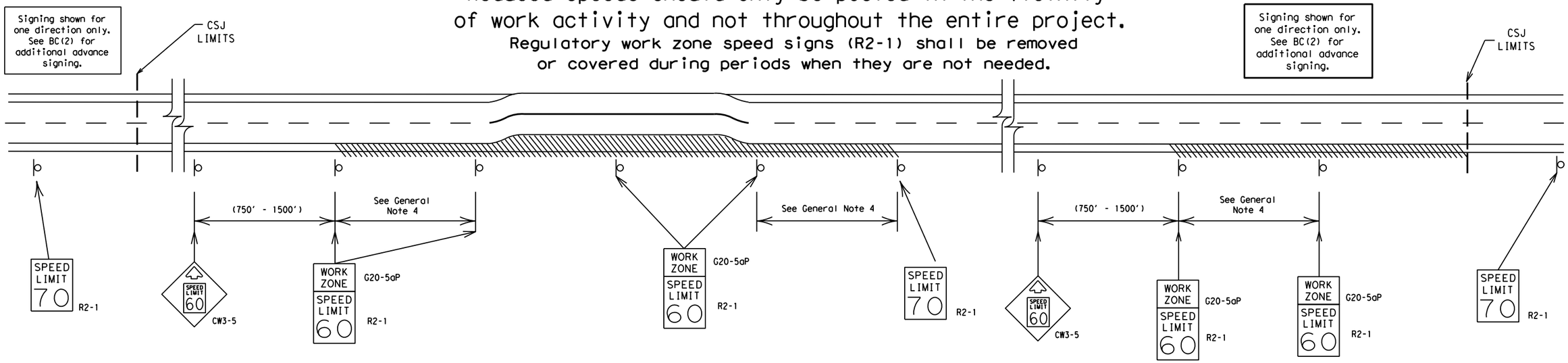
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

Reduced speeds should only be posted in the vicinity of work activity and not throughout the entire project.

Regulatory work zone speed signs (R2-1) shall be removed or covered during periods when they are not needed.



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

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© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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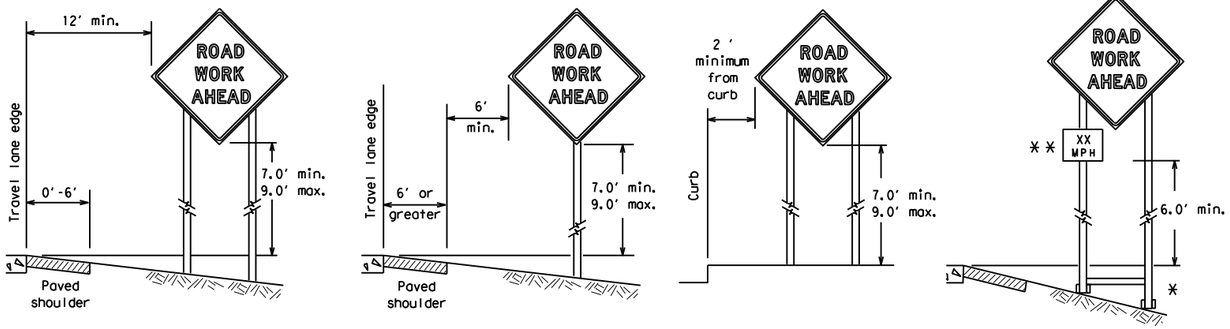
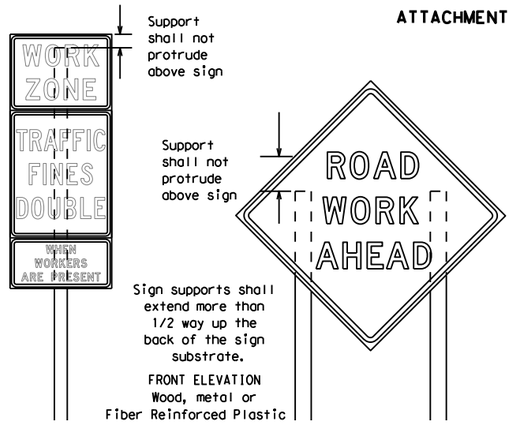
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

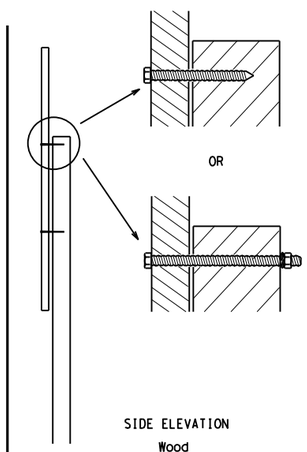


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS





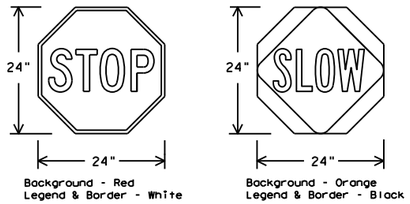
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

FILE:	bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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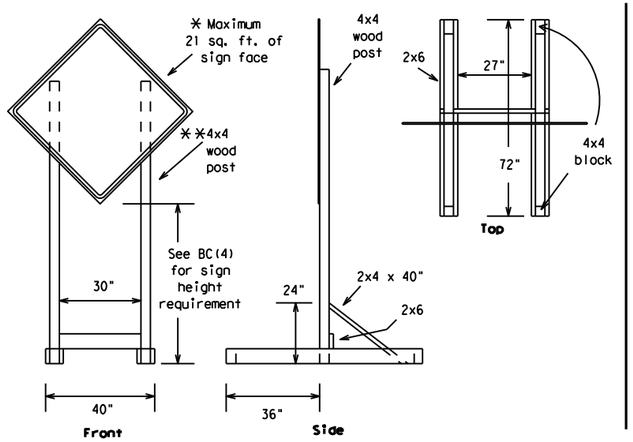
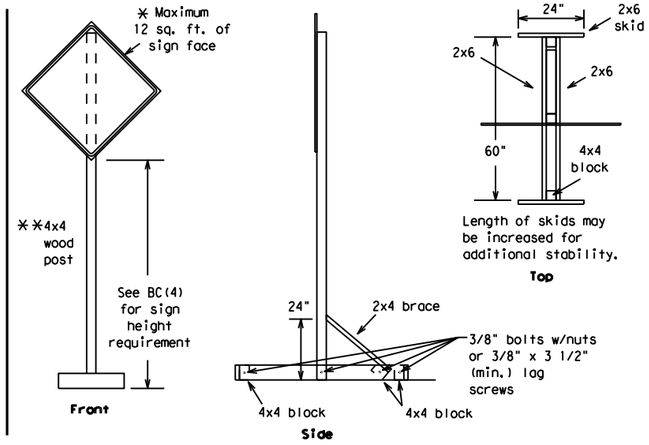
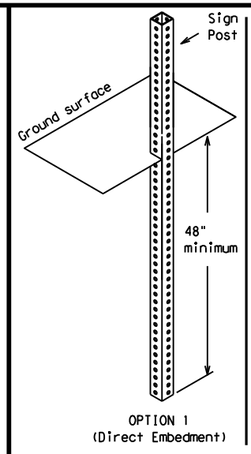
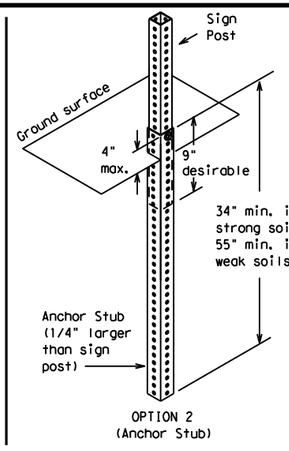


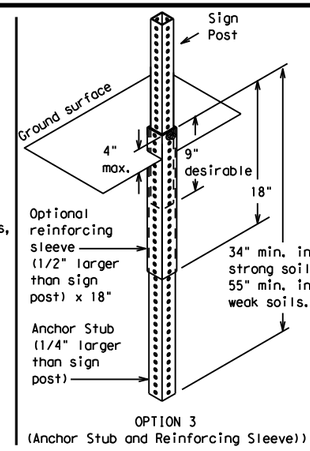


SKID MOUNTED WOOD SIGN SUPPORTS

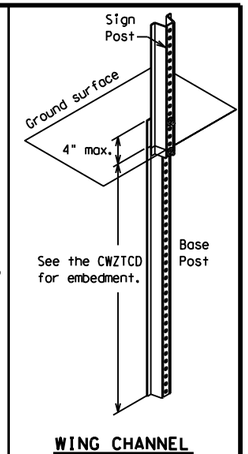
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS







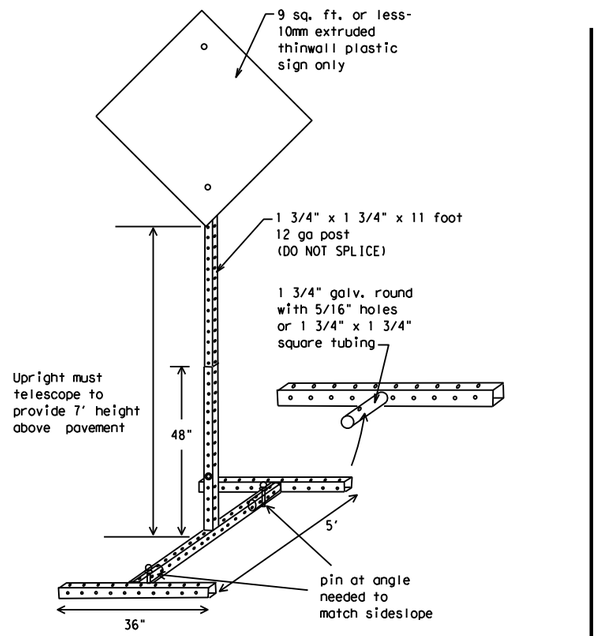
PERFORATED SQUARE METAL TUBING

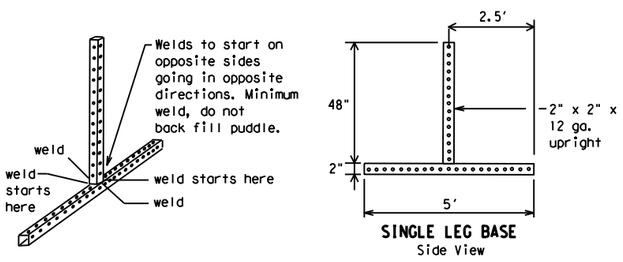


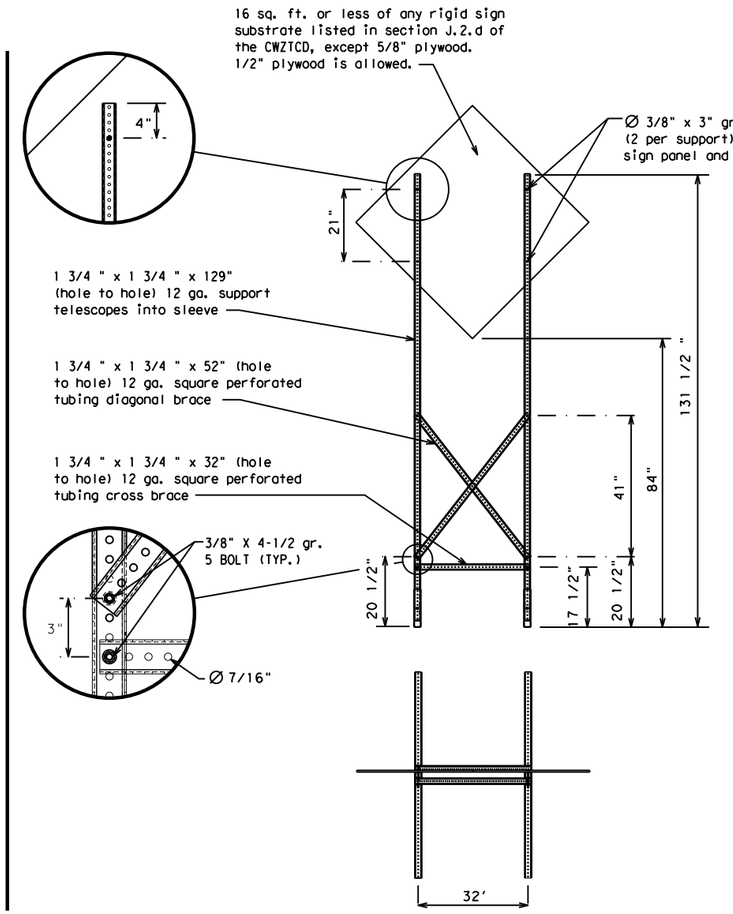
WING CHANNEL
Lap-splice/base bolted anchor

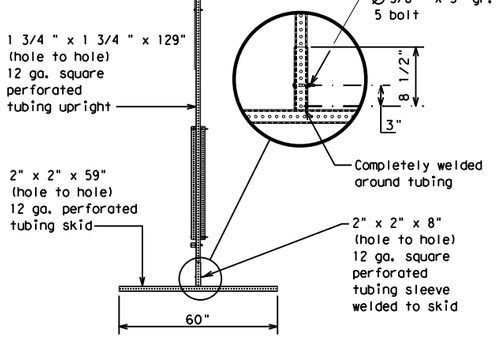
GROUND MOUNTED SIGN SUPPORTS

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	0915	00	238	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SAT	BEXAR		15

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List		Location List	Warning List	** Advance Notice List
MERGE RIGHT	FORM X LINES RIGHT	AT FM XXXX	SPEED LIMIT XX MPH	TUE-FRI XX AM- X PM
DETOUR NEXT X EXITS	USE XXXXX RD EXIT	BEFORE RAILROAD CROSSING	MAXIMUM SPEED XX MPH	APR XX-XX X PM-X AM
USE EXIT XXX	USE EXIT I-XX NORTH	NEXT X MILES	MINIMUM SPEED XX MPH	BEGINS MONDAY
STAY ON US XXX SOUTH	USE I-XX E TO I-XX N	PAST US XXX EXIT	ADVISORY SPEED XX MPH	BEGINS MAY XX
TRUCKS USE US XXX N	WATCH FOR TRUCKS	XXXXXXX TO XXXXXXX	RIGHT LANE EXIT	MAY X-X XX PM - XX AM
WATCH FOR TRUCKS	EXPECT DELAYS	US XXX TO FM XXXX	USE CAUTION	NEXT FRI-SUN
EXPECT DELAYS	PREPARE TO STOP		DRIVE SAFELY	XX AM TO XX PM
REDUCE SPEED XXX FT	END SHOULDER USE		DRIVE WITH CARE	NEXT TUE AUG XX
USE OTHER ROUTES	WATCH FOR WORKERS			TONIGHT XX PM-XX AM
STAY IN LANE *				

** 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	0915	00	238	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SAT	BEXAR		16

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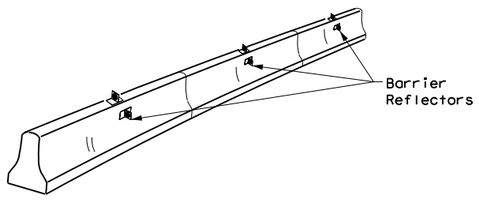
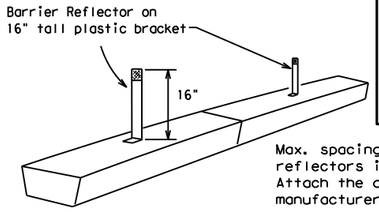
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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

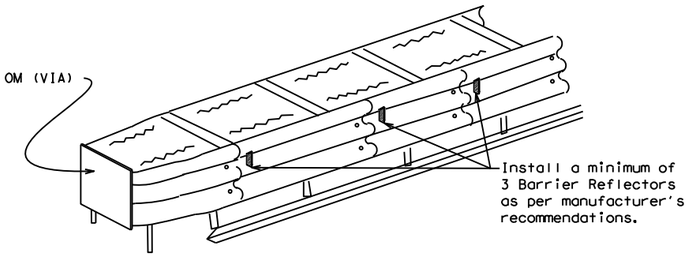


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

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)

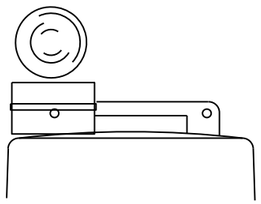


DELINEATION OF END TREATMENTS

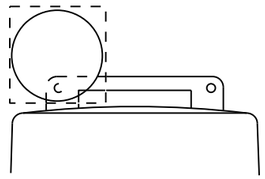
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

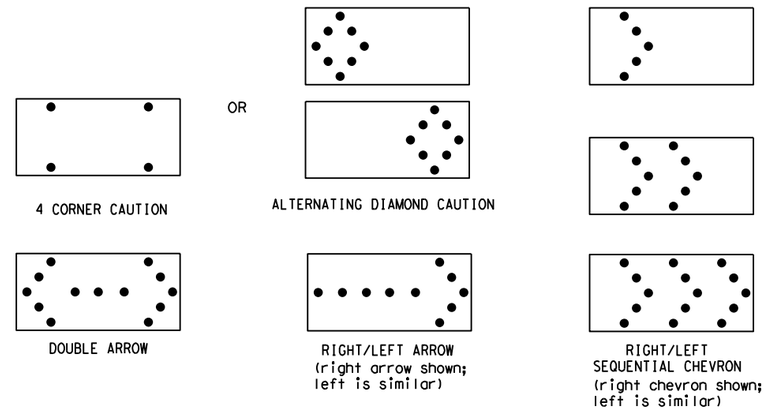
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing devices to form a merging taper may be used for delineation. If used, the successive flashing of the sequential warning lights should occur from the beginning of the taper to the end of the merging taper in order to identify the desired vehicle path. The rate of flashing for each light shall be 65 flashes per minute, plus or minus 10 flashes.
4. Type C and D steady-burn warning lights are intended to be used in a series to delineate the edge of the travel lane on detours, on lane changes, on lane closures, and on other similar conditions.
5. Type A, Type C and Type D warning lights shall be installed at locations as detailed on other sheets in the plans.
6. Warning lights shall not be installed on a drum that has a sign, chevron or vertical panel.
7. The maximum spacing for warning lights on drums should be identical to the channelizing device spacing.

WARNING 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:



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
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REVISIONS	0915	00	238	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SAT	BEXAR		17

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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:

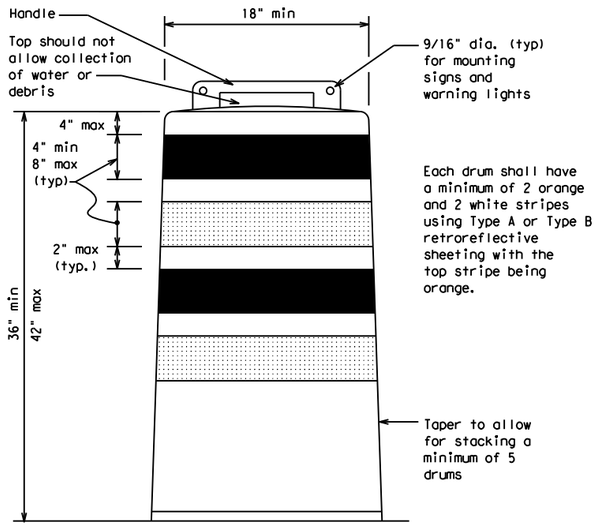
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

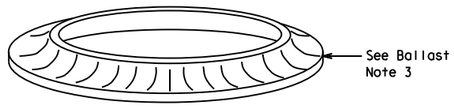
RETROREFLECTIVE SHEETING

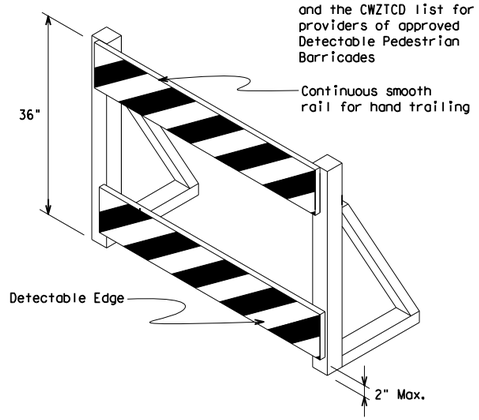
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

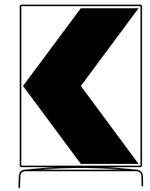




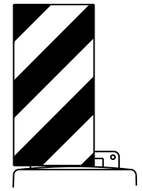


DETECTABLE PEDESTRIAN BARRICADES

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0915	00	238	VARIOUS
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9-07 5-21	SAT	BEXAR		18
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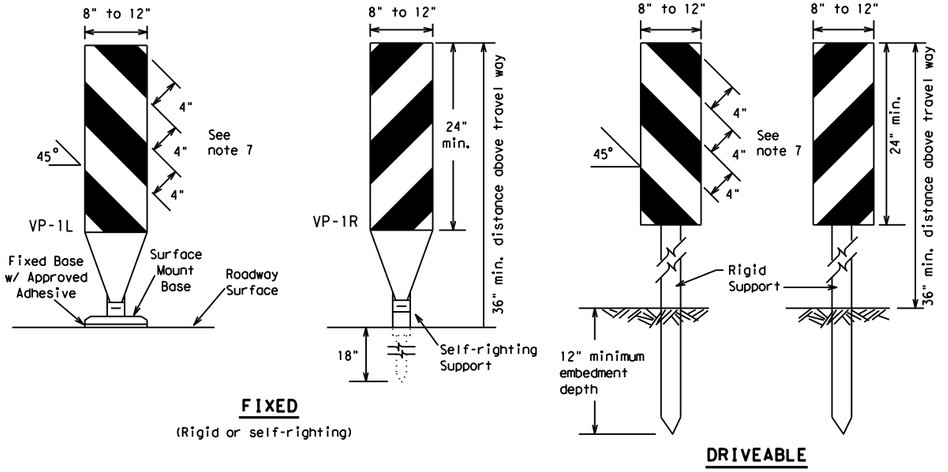
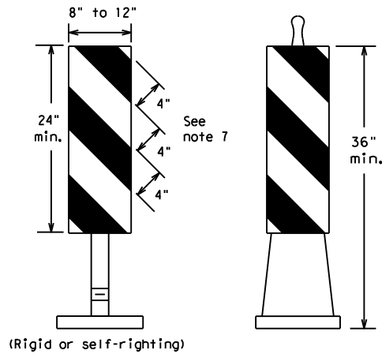


FIXED
(Rigid or self-righting)

DRIVEABLE

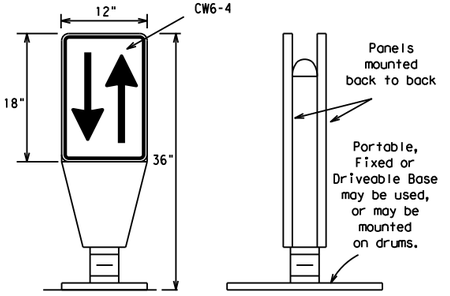


(Rigid or self-righting)

PORTABLE

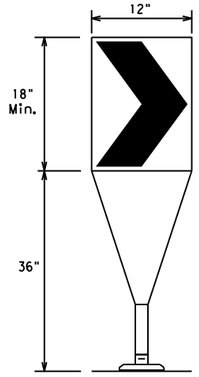
VERTICAL PANELS (VPs)

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.



OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

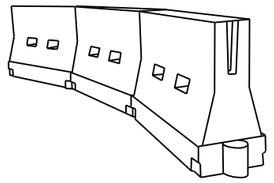
1. Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The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



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

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

CHEVRONS



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

GENERAL NOTES

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

Posted Speed	Formula	Minimum Desirable Taper Lengths ** 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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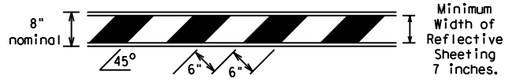
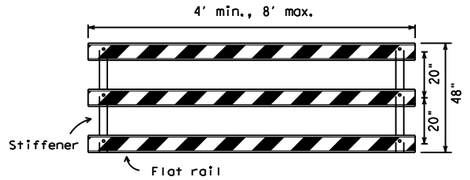
TYPE 3 BARRICADES

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.



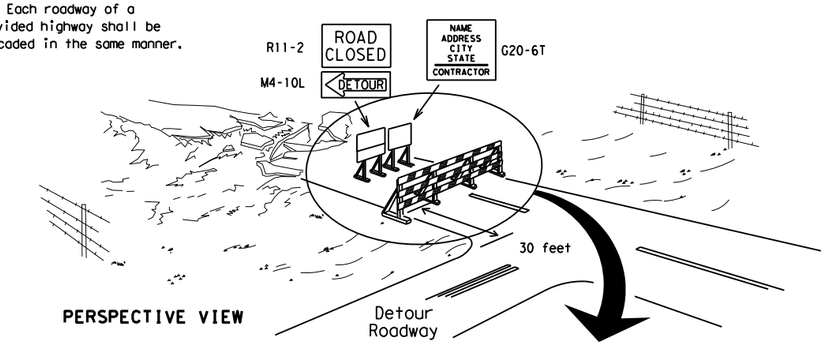
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

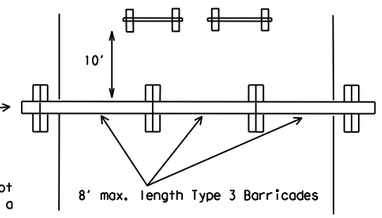
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

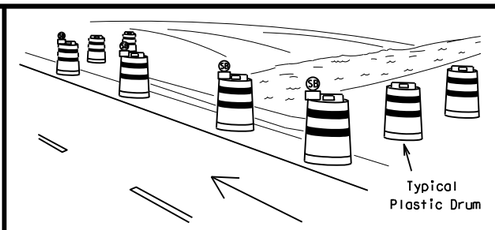
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

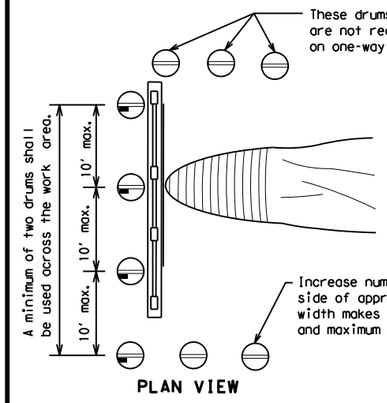
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

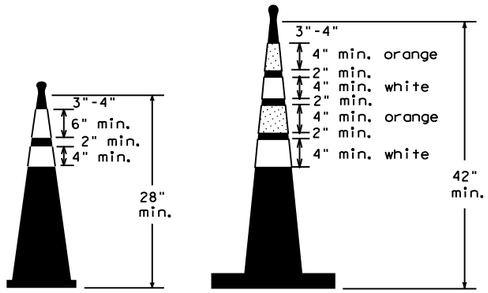
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



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

PLAN VIEW

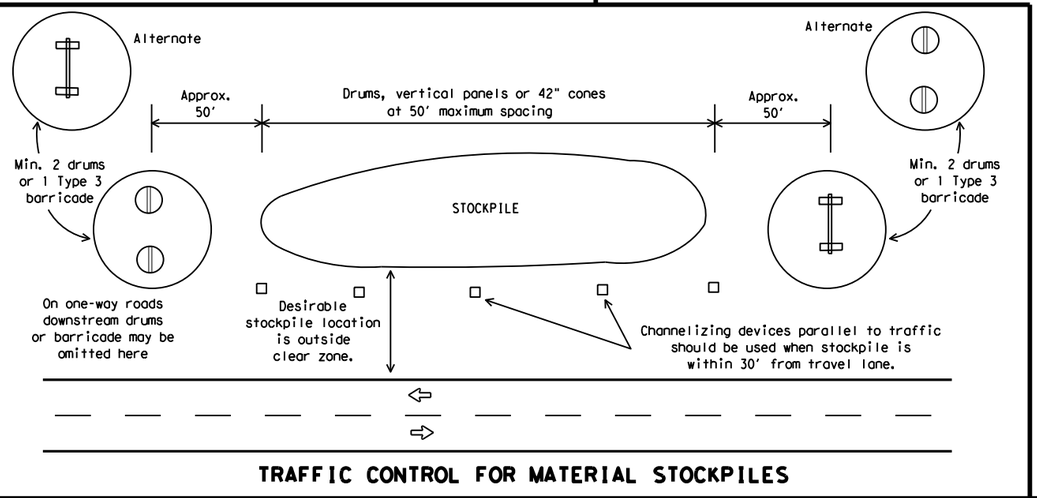
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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	0915	00	238	VARIOUS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SAT	BEXAR		20

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

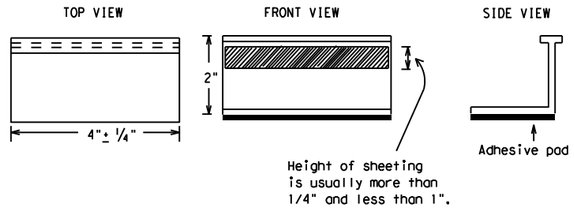
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

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©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
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1-02 7-13	SAT	BEXAR		21
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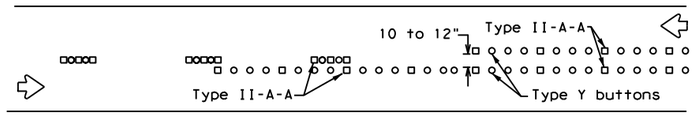
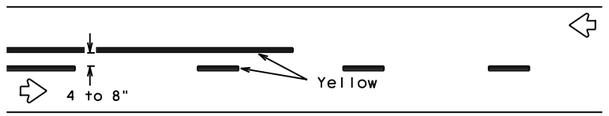
PAVEMENT MARKING PATTERNS

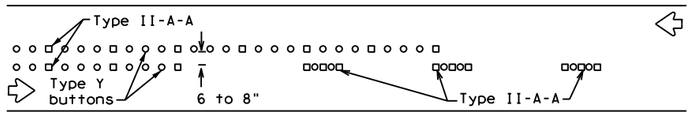
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



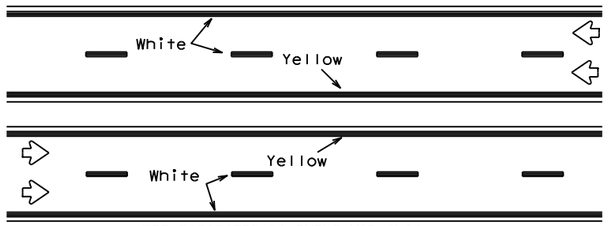
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



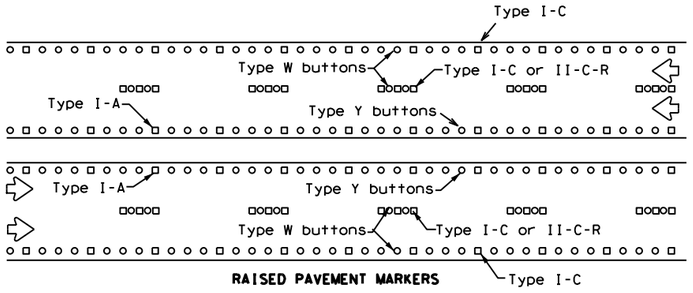
RAISED PAVEMENT MARKERS - PATTERN B

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

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



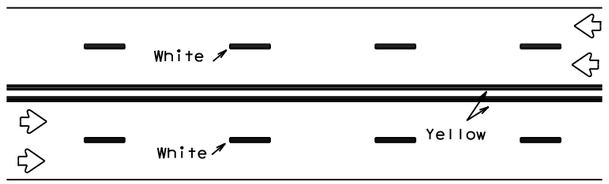
REFLECTORIZED PAVEMENT MARKINGS



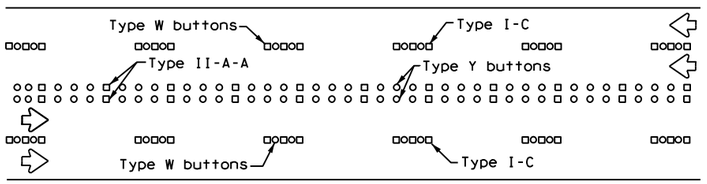
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



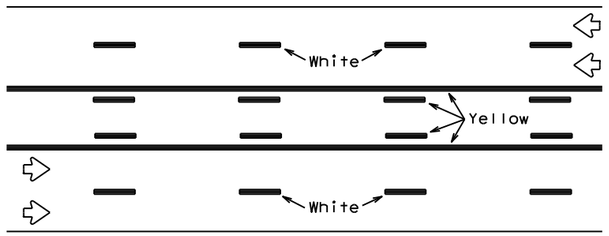
REFLECTORIZED PAVEMENT MARKINGS



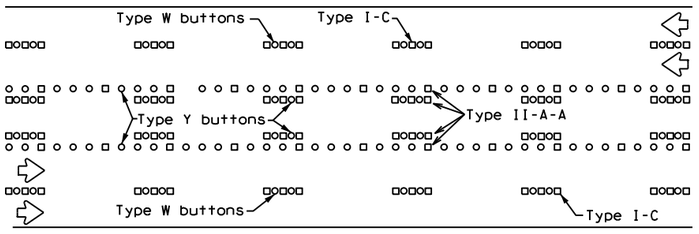
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

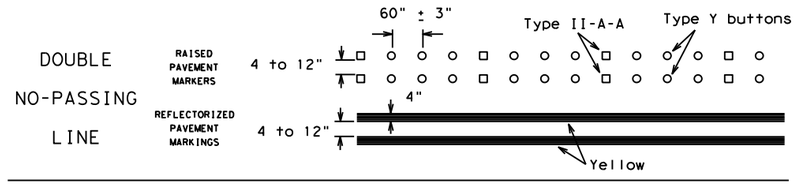
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

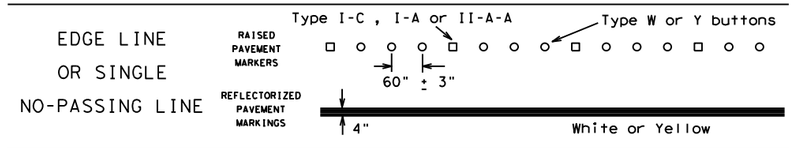
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

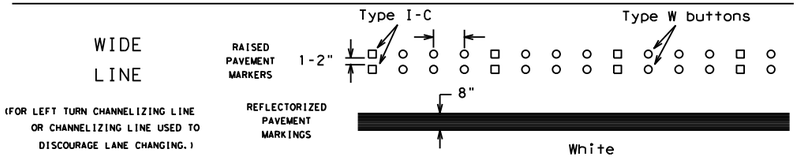


EDGE LINE OR SINGLE NO-PASSING LINE



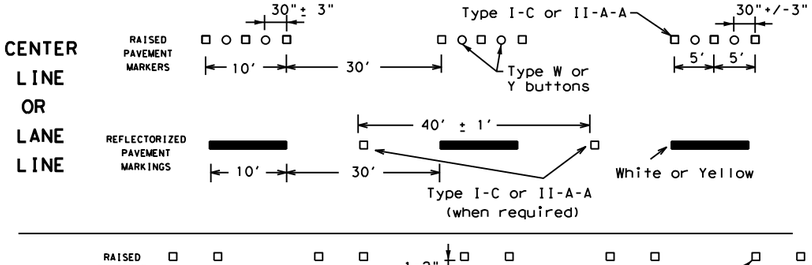
WIDE LINE

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

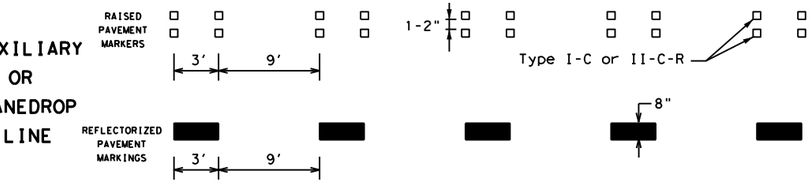


BROKEN LINES

CENTER LINE OR LANE LINE

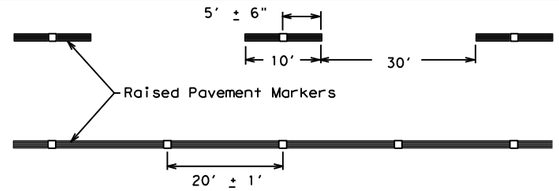


AUXILIARY OR LANEDROP LINE



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
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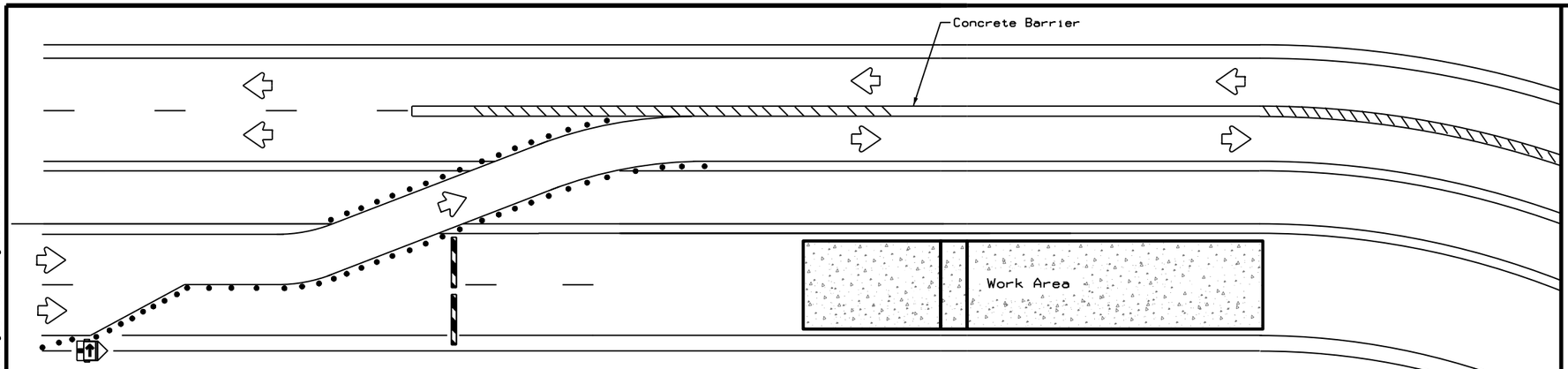


NOTES:

1. Length of Safety Glare screen will be specified elsewhere in the plans.
2. The cumulative nominal length of the modular safety glare screen units shall equal the length of the individual sections of temporary concrete traffic barrier on which they are installed so the joint between barrier sections will not be spanned by any one safety glare screen unit.
3. Screen Panel/blades will be designed such that reflective sheeting conforming with Departmental Material Specification DMS-8300, Sign Face Materials, Type B or C Yellow, minimum size of 2 inches by 12 inches can be attached to the edge of the panel/blade. The sheeting shall be attached to one glare screen panel/blade per section of concrete barrier not to exceed a spacing of 30 feet. Barrier reflectors are not necessary when panel/blades are installed with reflective sheeting as described.
4. Payment for these devices will be under statewide Special Specification "Modular Glare Screens for Headlight Barrier."
5. This detail is only intended to show types of locations where Glare Screens would be appropriate. Required signing and other devices shall be as shown elsewhere in the plans.

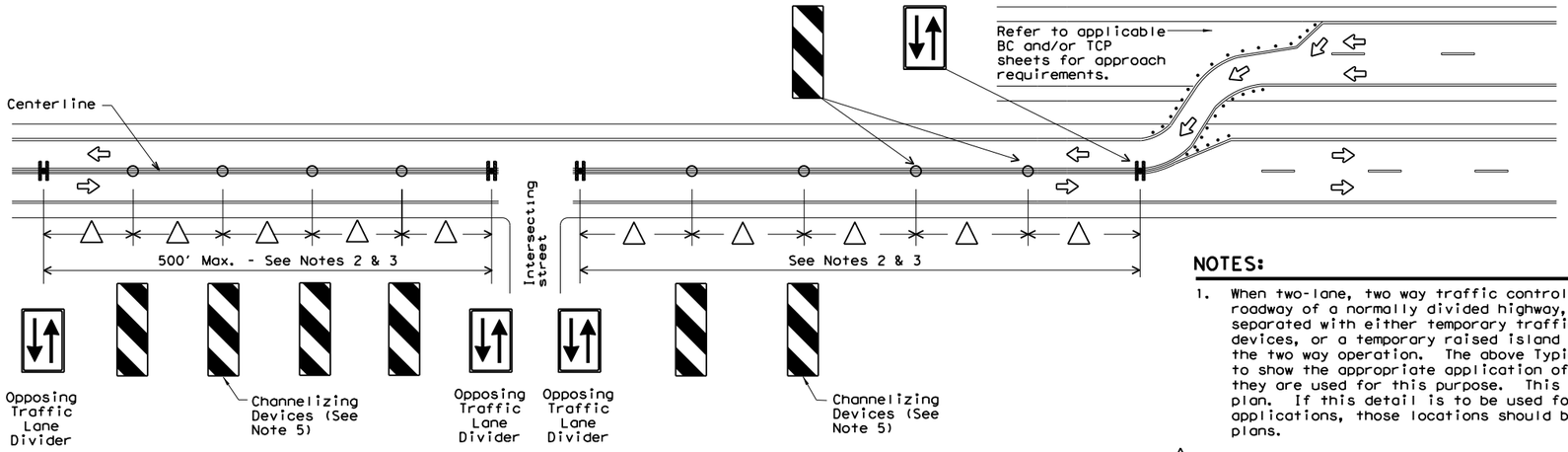
BARRIER DELINEATION WITH MODULAR GLARE SCREENS

LEGEND	
	Type 3 Barricade
• • •	Channelizing Devices
	Trailer Mounted Flashing Arrow Board
	Sign
\\\\	Safety glare screen

DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
DELINEATORS AND OBJECT MARKERS	DMS-8600
MODULAR GLARE SCREENS FOR HEADLIGHT BARRIER	DMS-8610

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/business/resources/producer-list.html



VERTICAL PANELS & OPPOSING TRAFFIC LANE DIVIDERS (OTLD) SEPARATING TWO-WAY TRAFFIC ON NORMALLY DIVIDED HIGHWAYS

NOTES:

1. When two-lane, two way traffic control must be maintained on one roadway of a normally divided highway, opposing traffic shall be separated with either temporary traffic barriers, channelizing devices, or a temporary raised island throughout the length of the two way operation. The above Typical Application is intended to show the appropriate application of channelizing devices when they are used for this purpose. This is not a traffic control plan. If this detail is to be used for other types of roads or applications, those locations should be stated elsewhere in the plans.

△2. Space devices according to the Tangent Spacing shown on the Device Spacing table on BC(9) but not exceeding 100'.

3. Every fifth device should be an OTLD except when spaced closer to accommodate an intersection. An OTLD should be the first device on each side of intersecting streets or roads.
4. Locations where surface mount bases with adhesives or self-righting devices will be required in order to maintain them in their proper position should be noted elsewhere in the plans.
5. Channelizing devices are to be vertical panels, 42" cones or tubular markers that are at least 36" tall. Tubular markers used to separate traffic should have a rubber base weighing at least 30 pounds. Tubular markers that are 42" tall or more shall have four bands of reflective material as detailed for 42" cones on BC(10). Tubular markers less than 42" but at least 36" tall shall have three bands of 3" wide white reflective material spaced 2" apart. Reflective material shall meet DMS-8300, Type A.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN TYPICAL DETAILS

WZ(TD)-17

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©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
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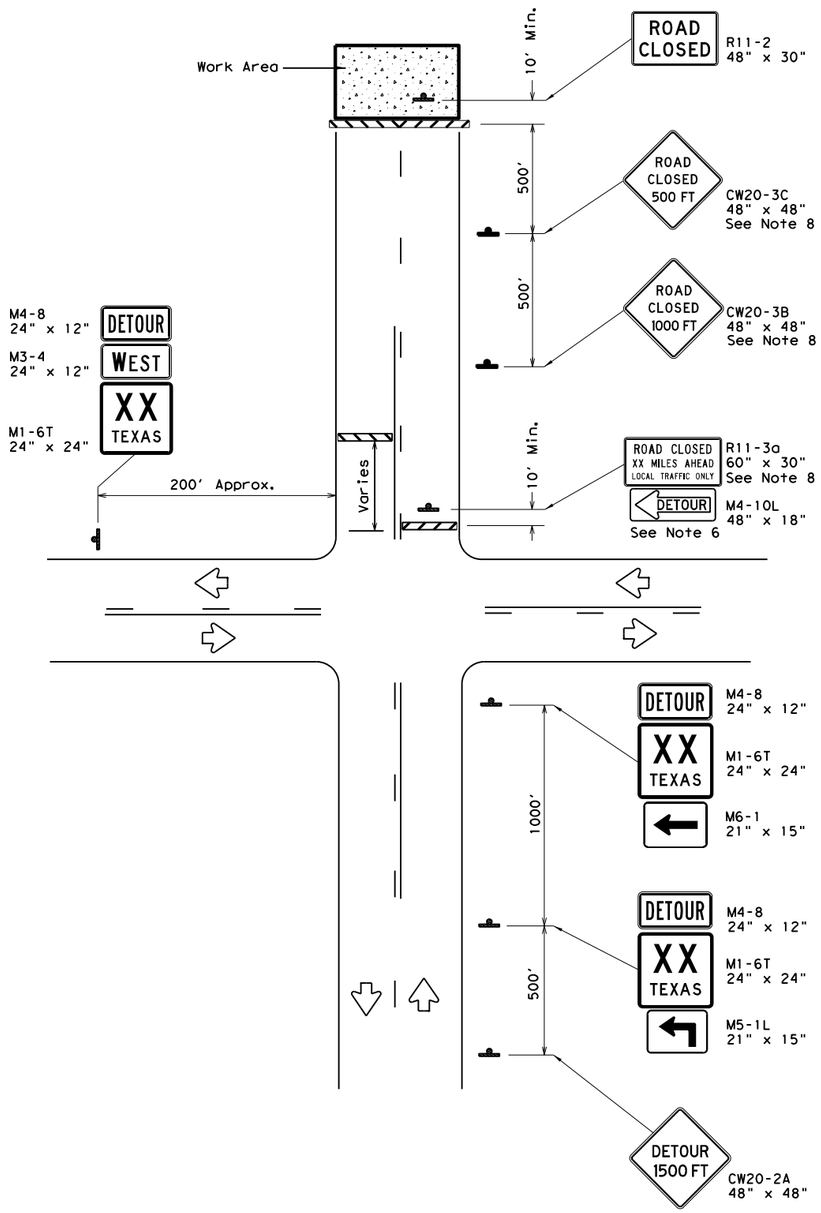
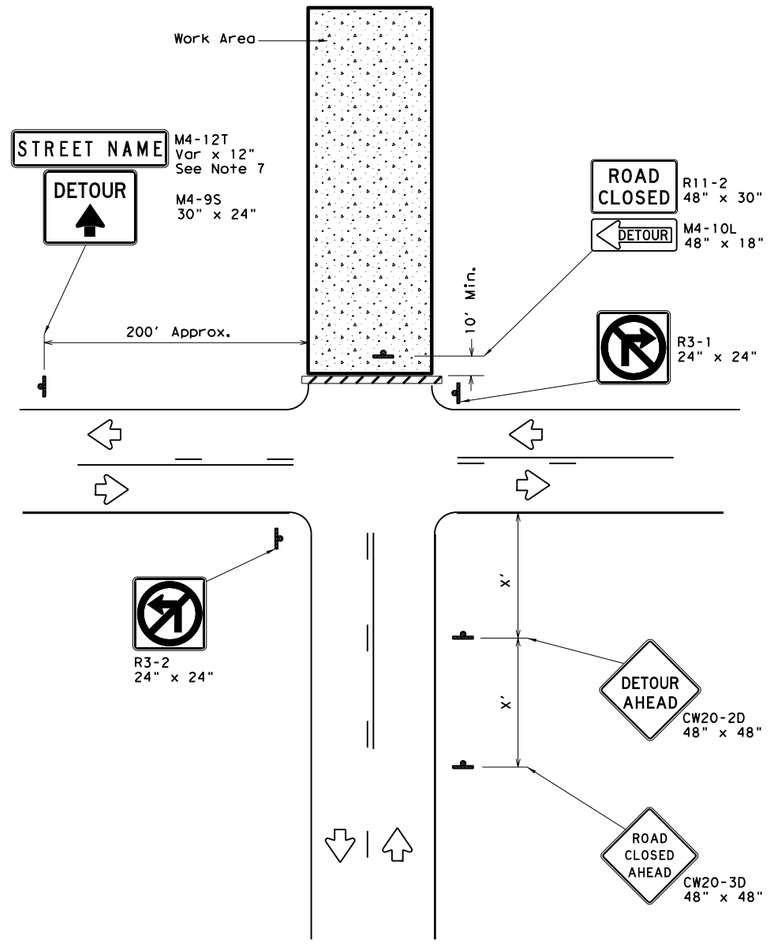


ROAD CLOSURE BEYOND THE INTERSECTION

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

FILE: wzrcd-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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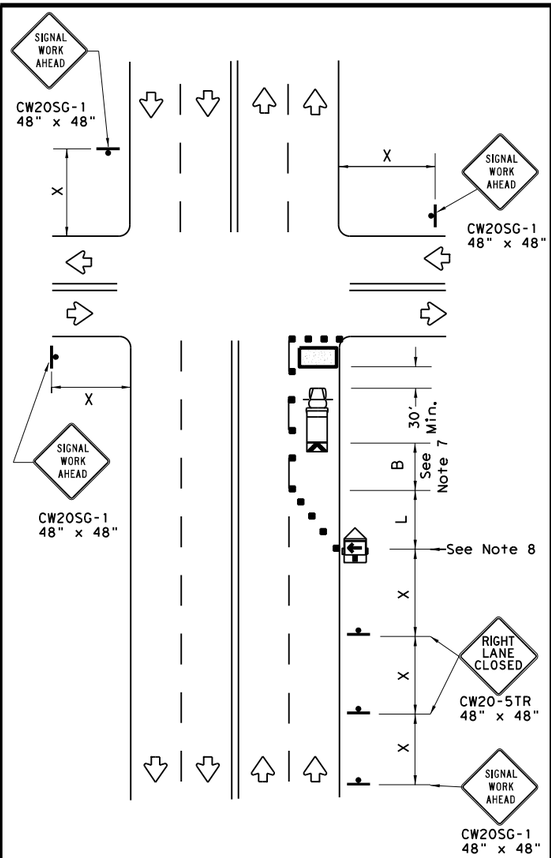
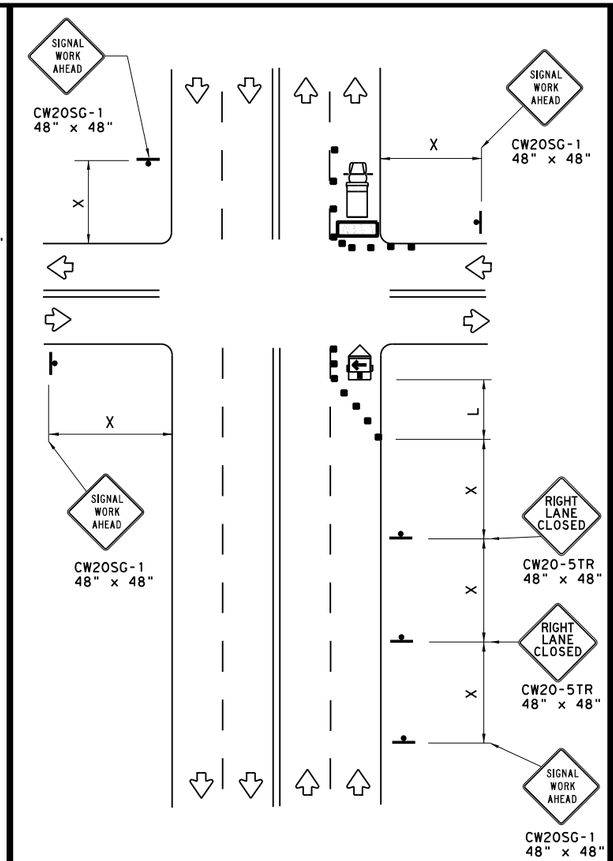


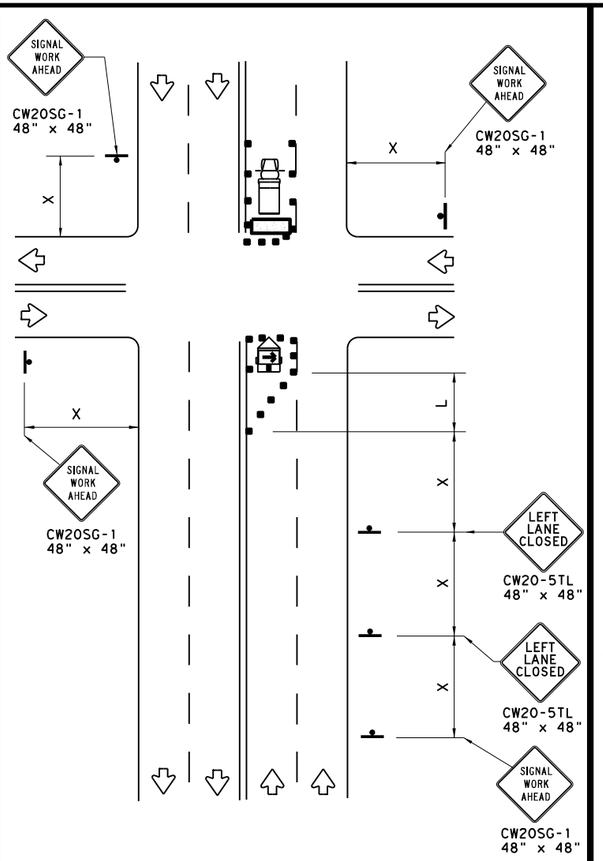
NEAR SIDE LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY



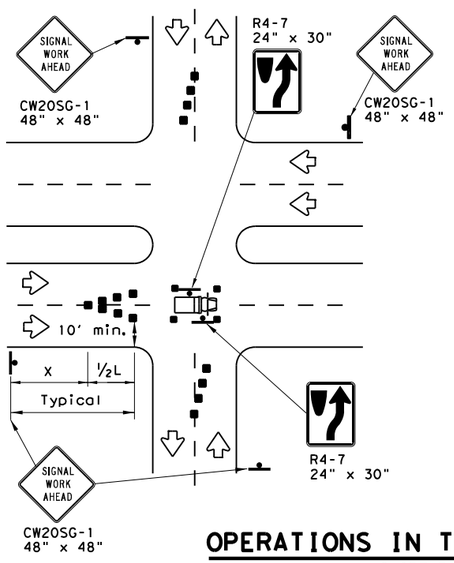
FAR SIDE RIGHT LANE CLOSURE

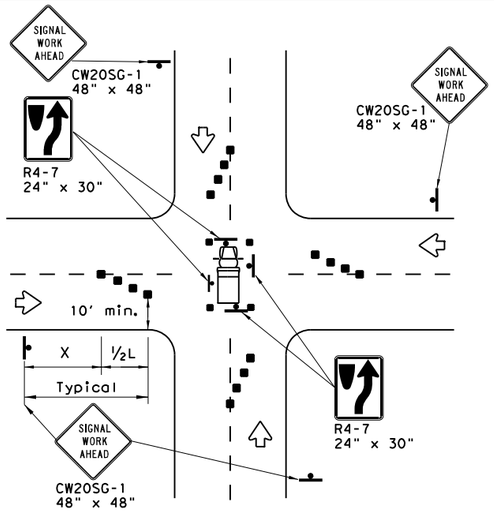
SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE LEFT LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY





OPERATIONS IN THE INTERSECTION

SHORT DURATION

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.

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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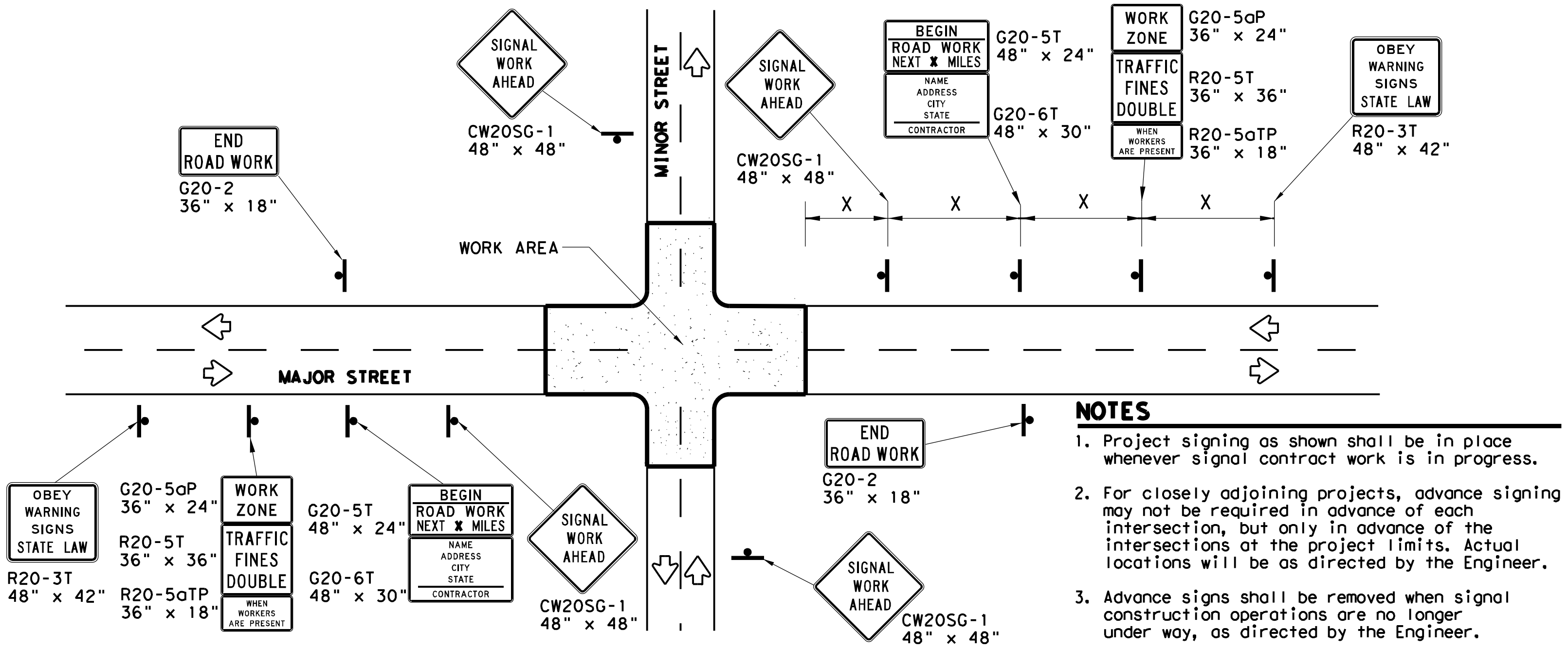


TYPICAL ADVANCE SIGNAL PROJECT SIGNING

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

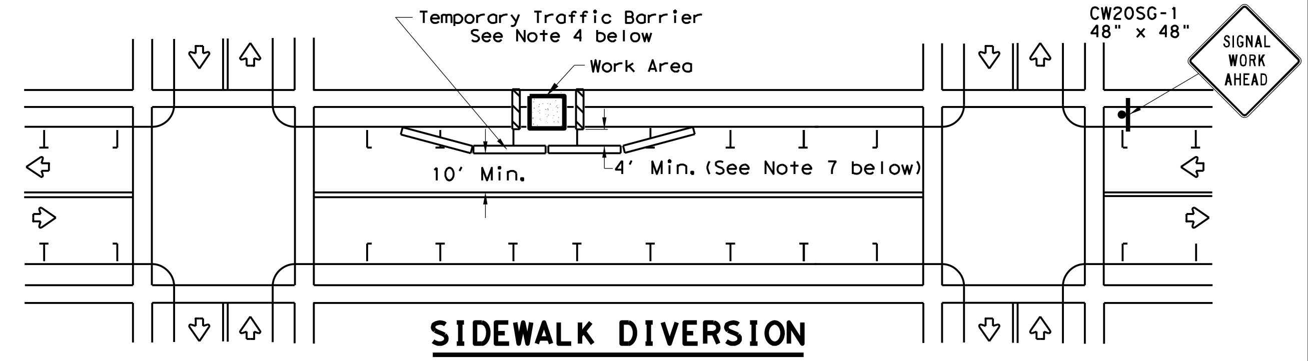
1. Weights used to keep signs from turning over should be sandbags filled with dry, cohesionless material.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects will not be permitted for use as sign support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

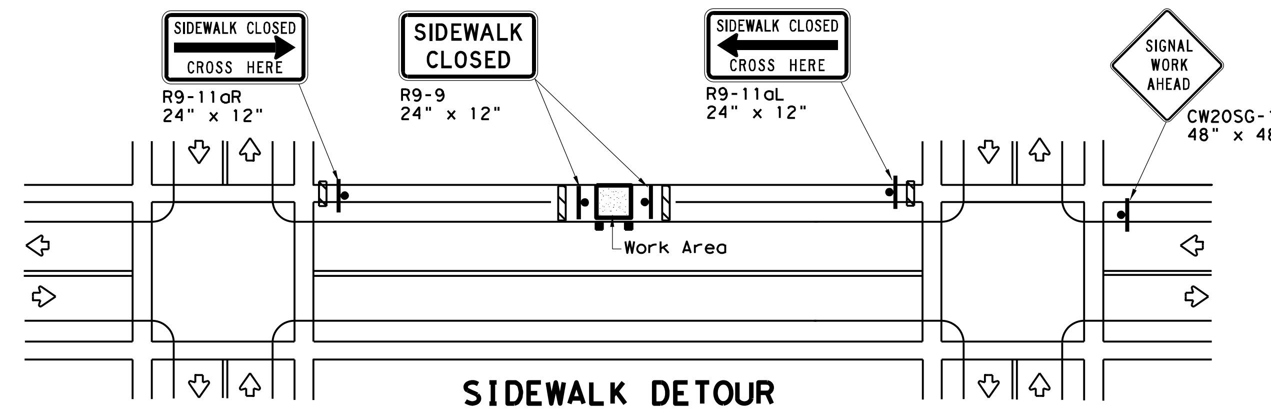
DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
FLEXIBLE ROLL-UP REFLECTIVE SIGNS	DMS-8310

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

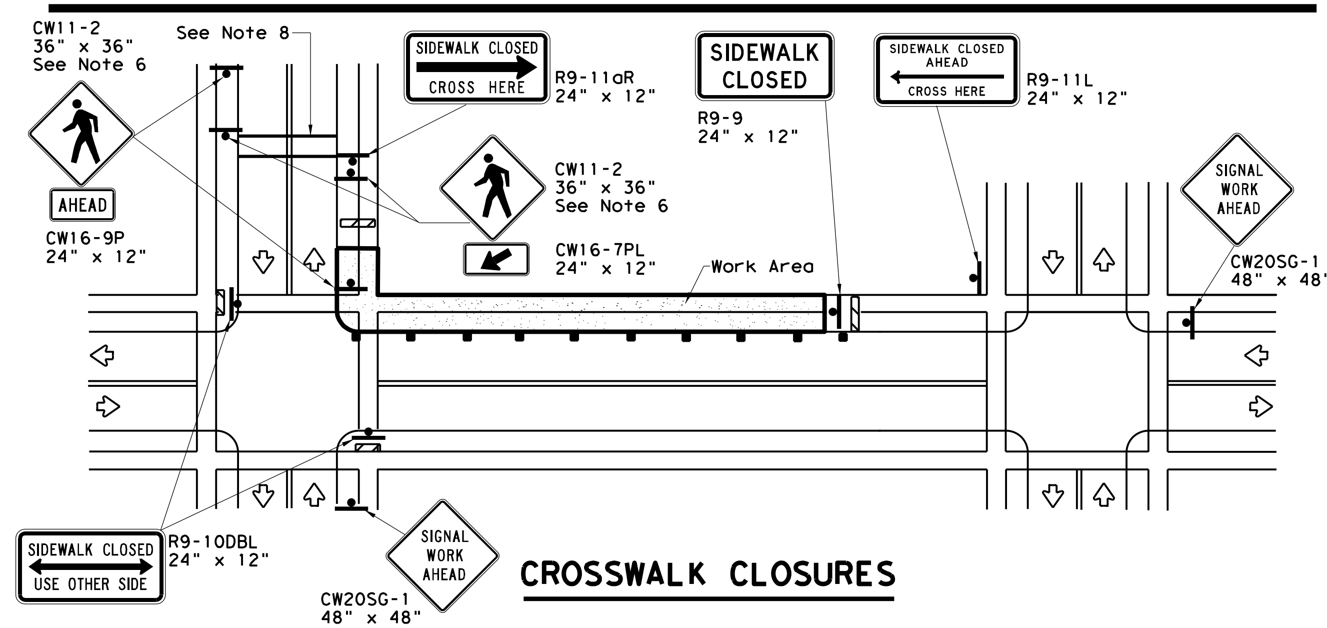
Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found at the following web address:
http://www.txdot.gov/txdot_library/publications/construction.htm



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

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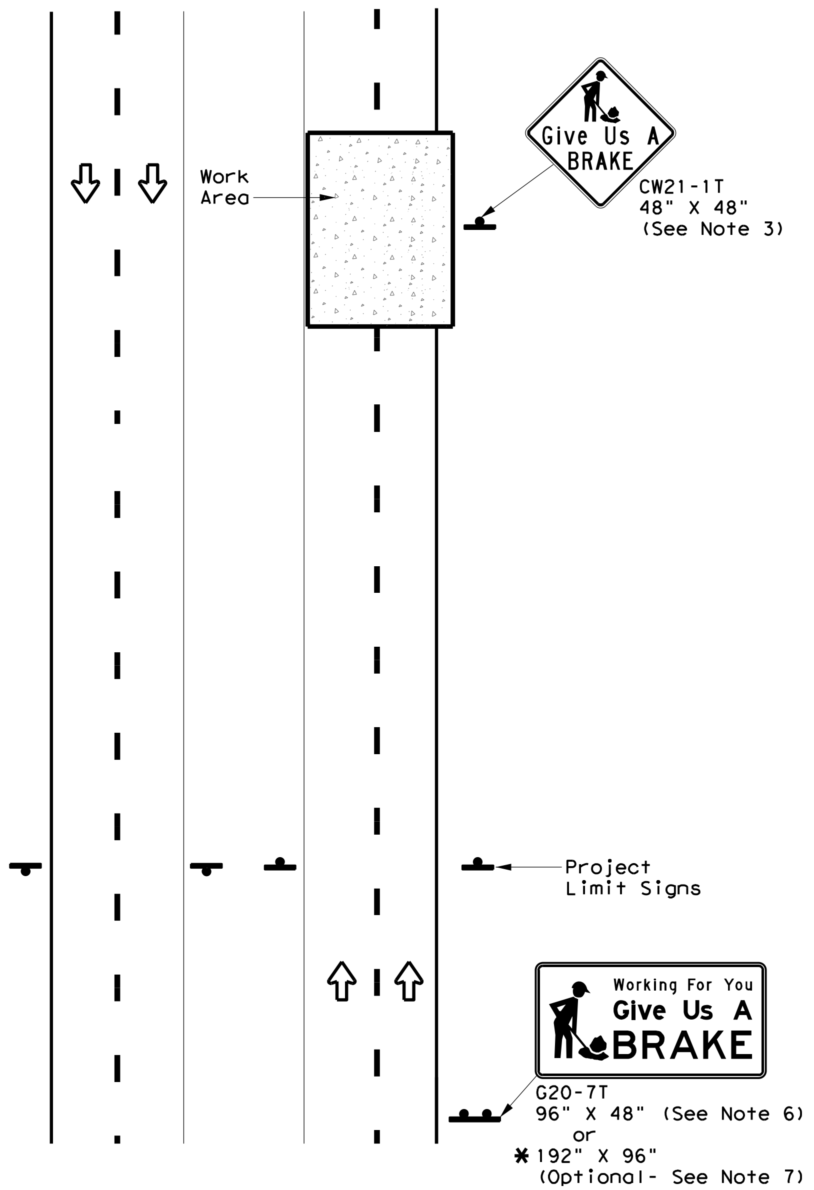
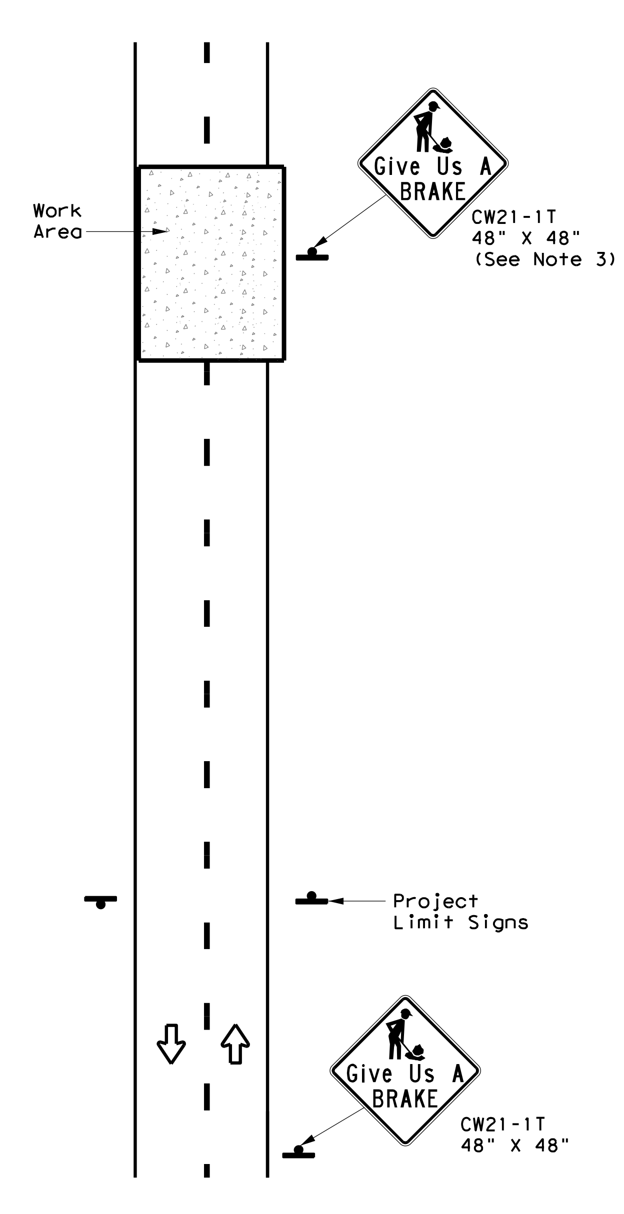


DIVIDED HIGHWAY



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 Size	(LF) ①	(LF) ②	DRILLED SHAFT 24" DIA. (LF)
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

(symbol)	Sign
(symbol)	Large Sign
(symbol)	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

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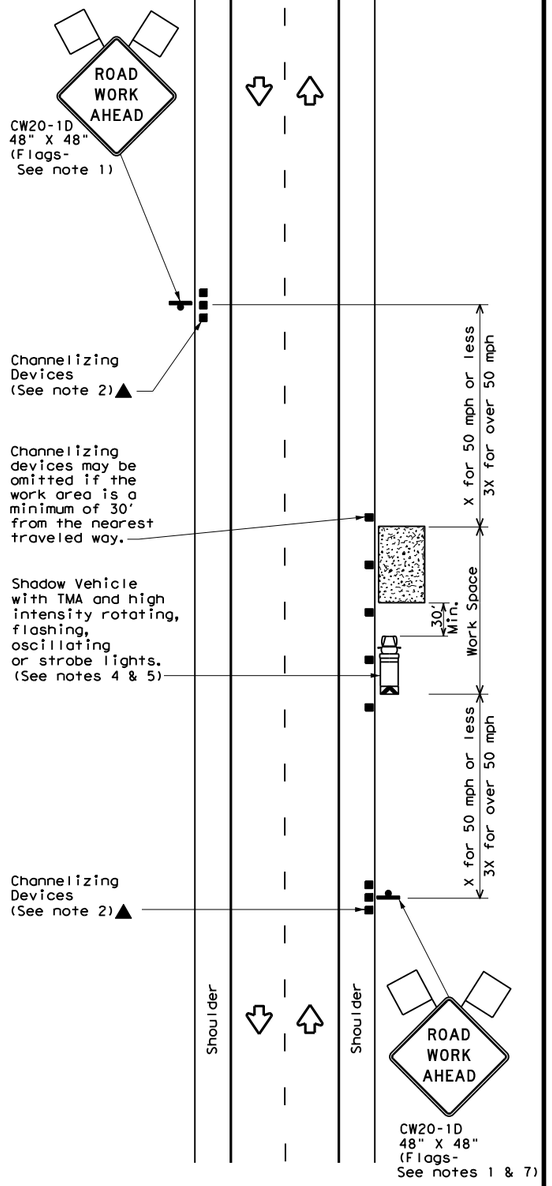
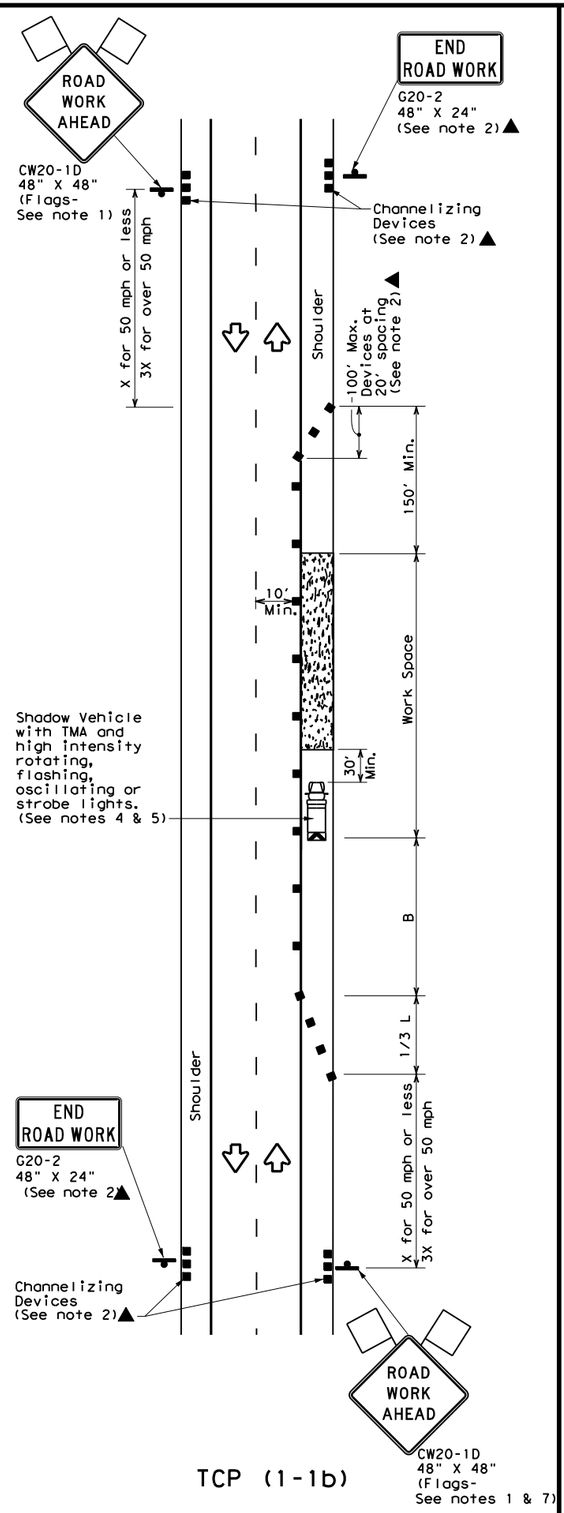


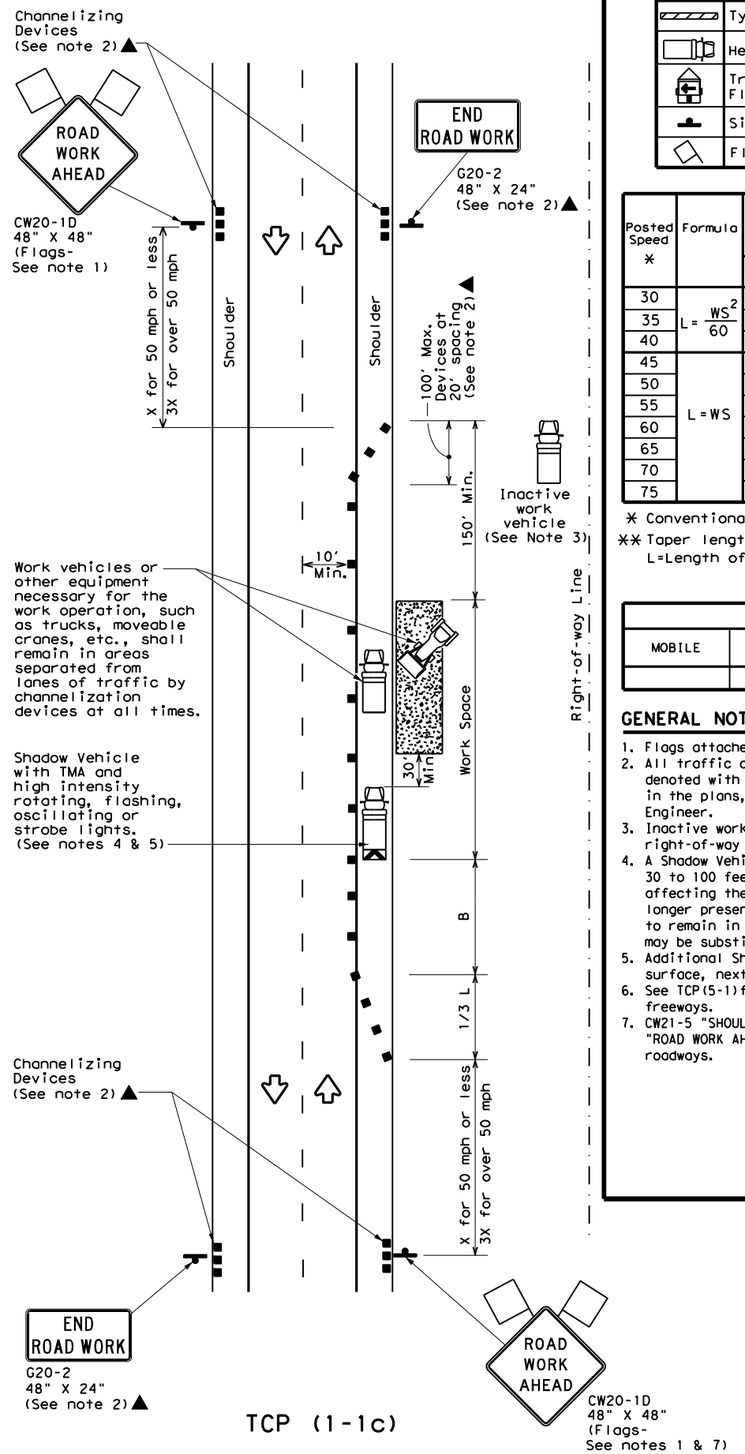
TCP (1-1a)

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

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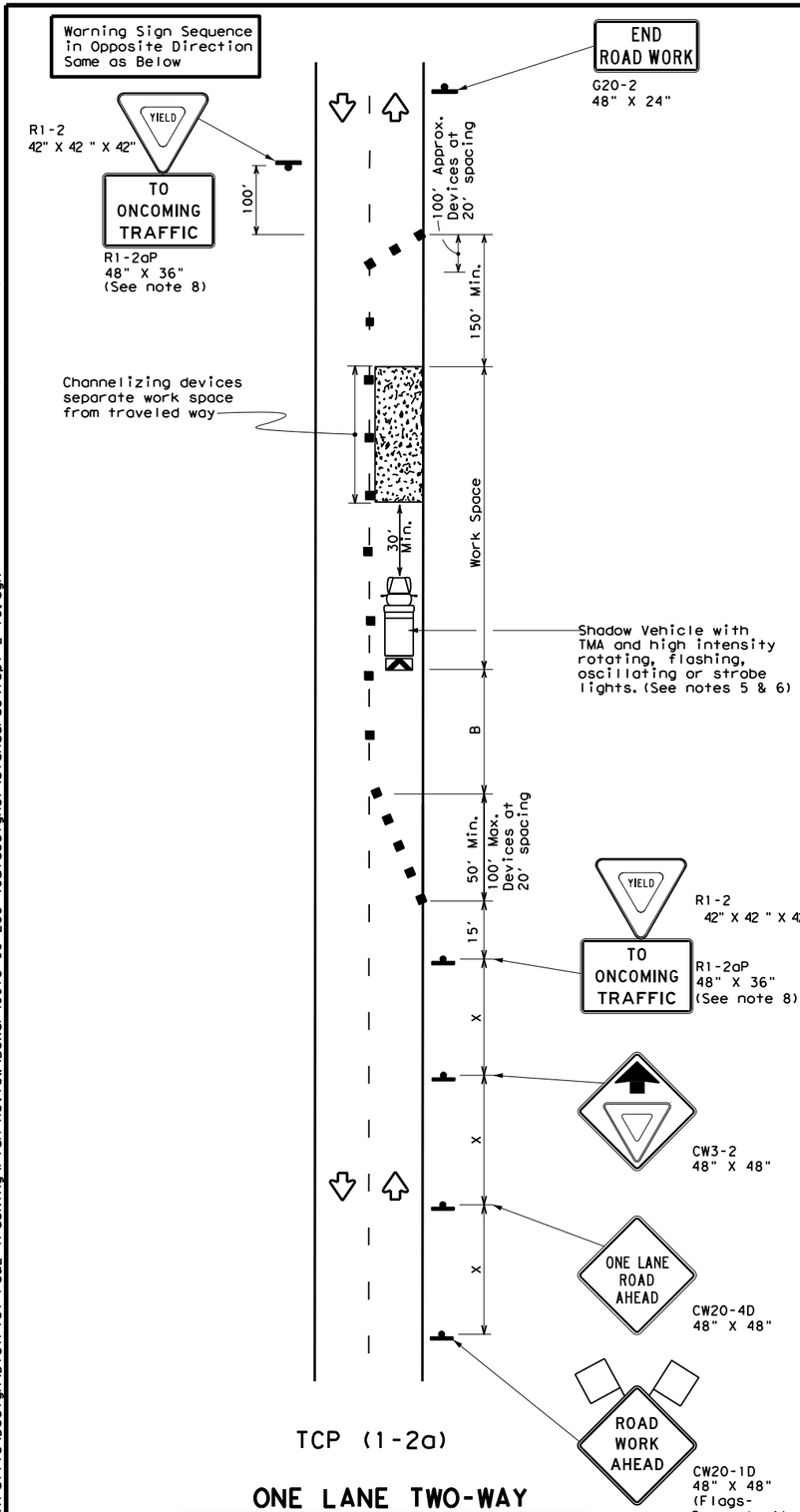
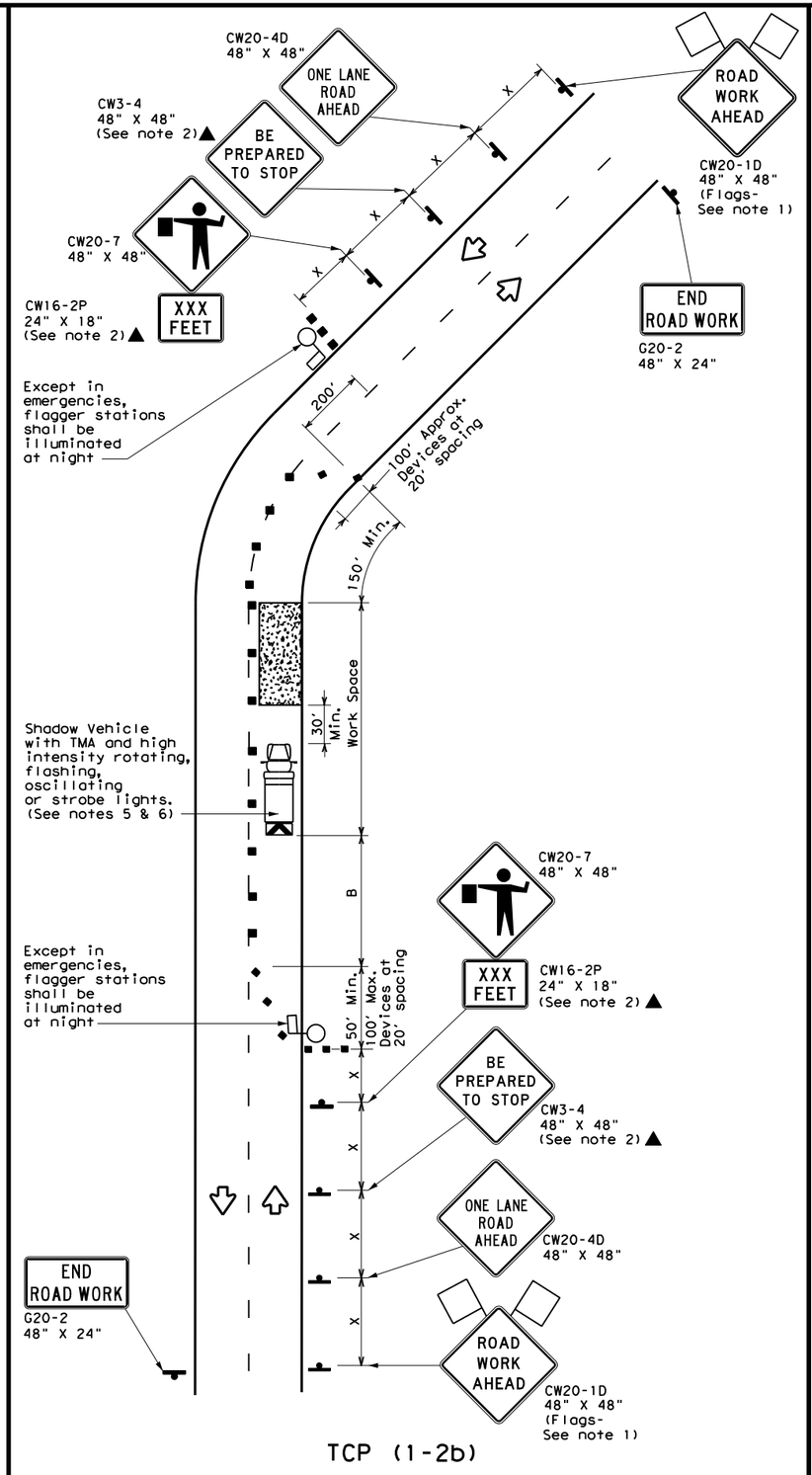


TCP (1-2a)

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.

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Traffic Operations Division Standard

TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(1-2)-18

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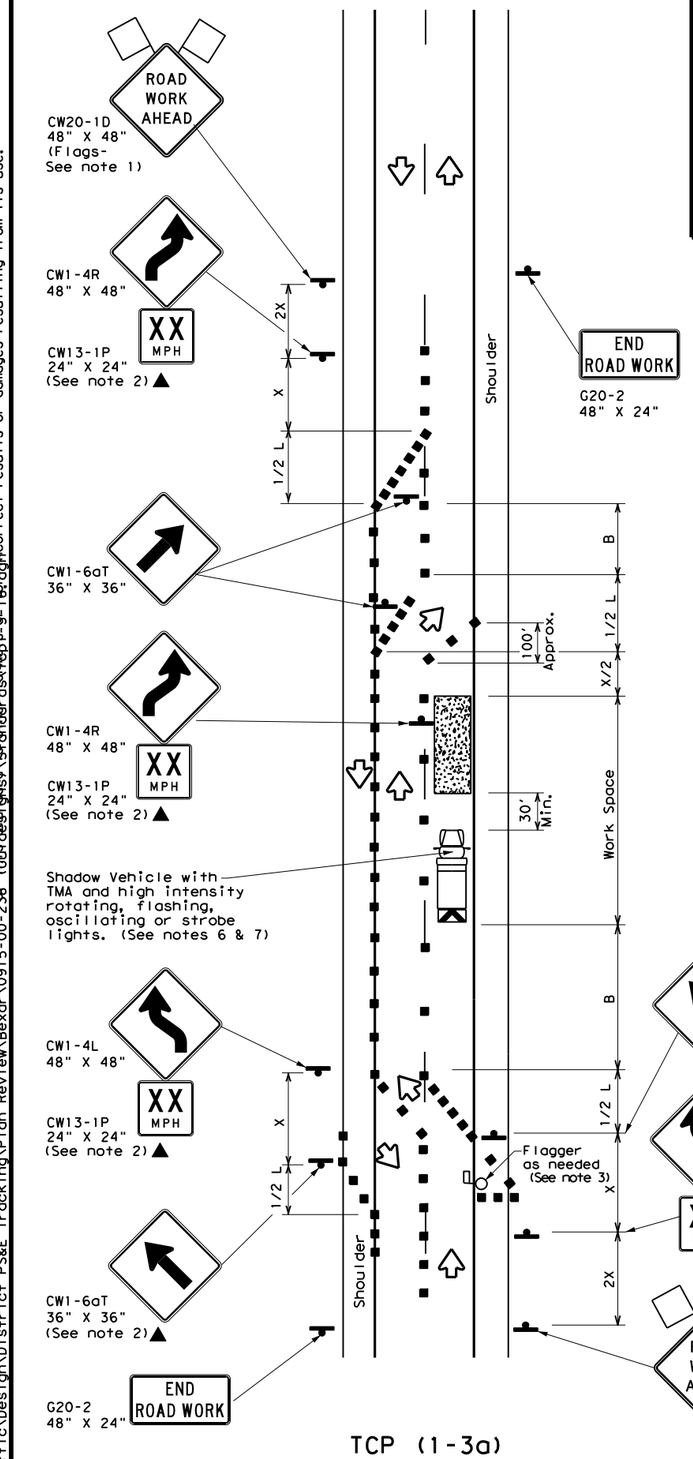
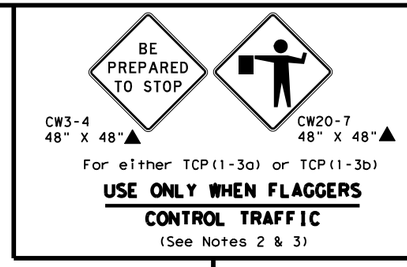


TCP (1-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

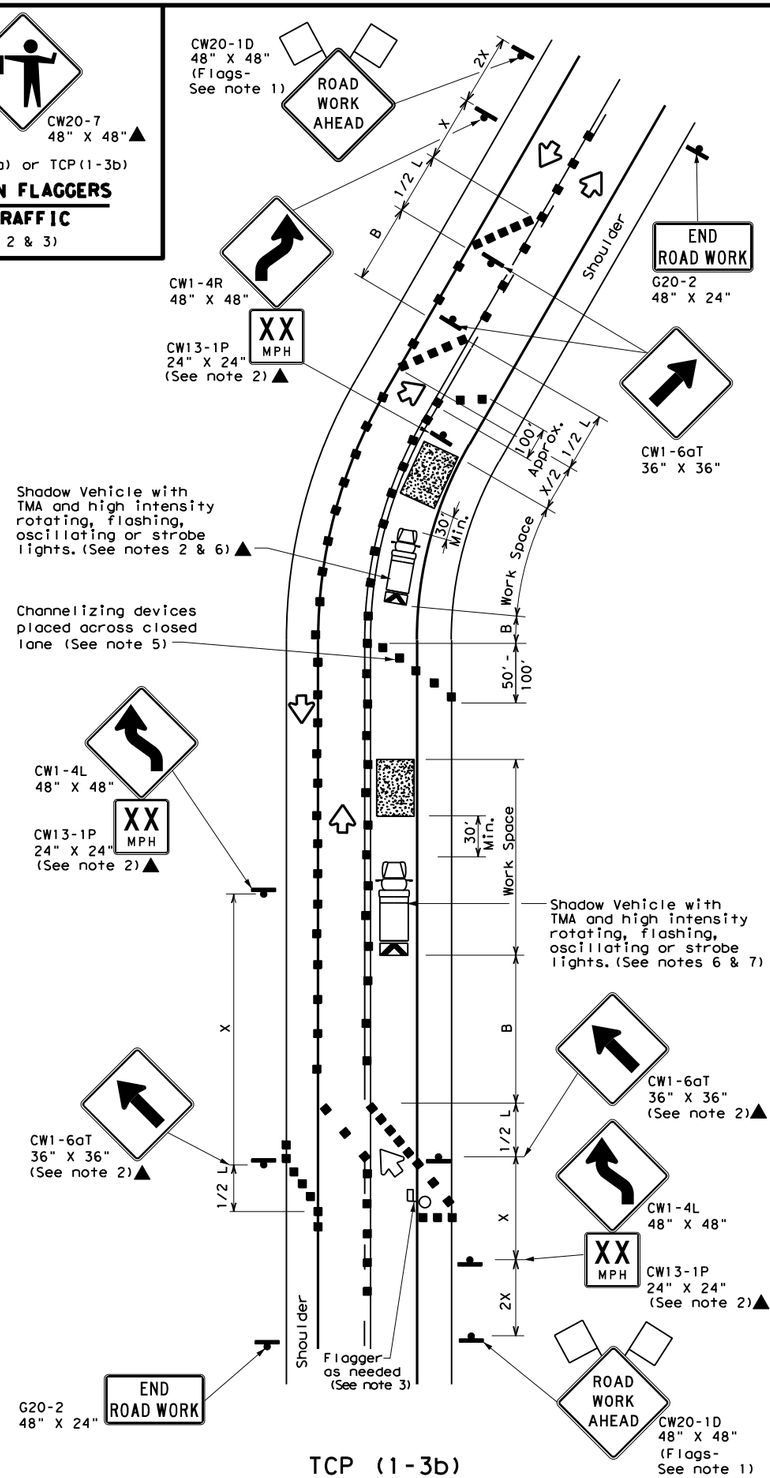
ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



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 *	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. 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	0915	00	238	VARIOUS
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	SAT	BEXAR		30
1-97 2-18				

DATE: 2/25/2022 10:00:51 AM
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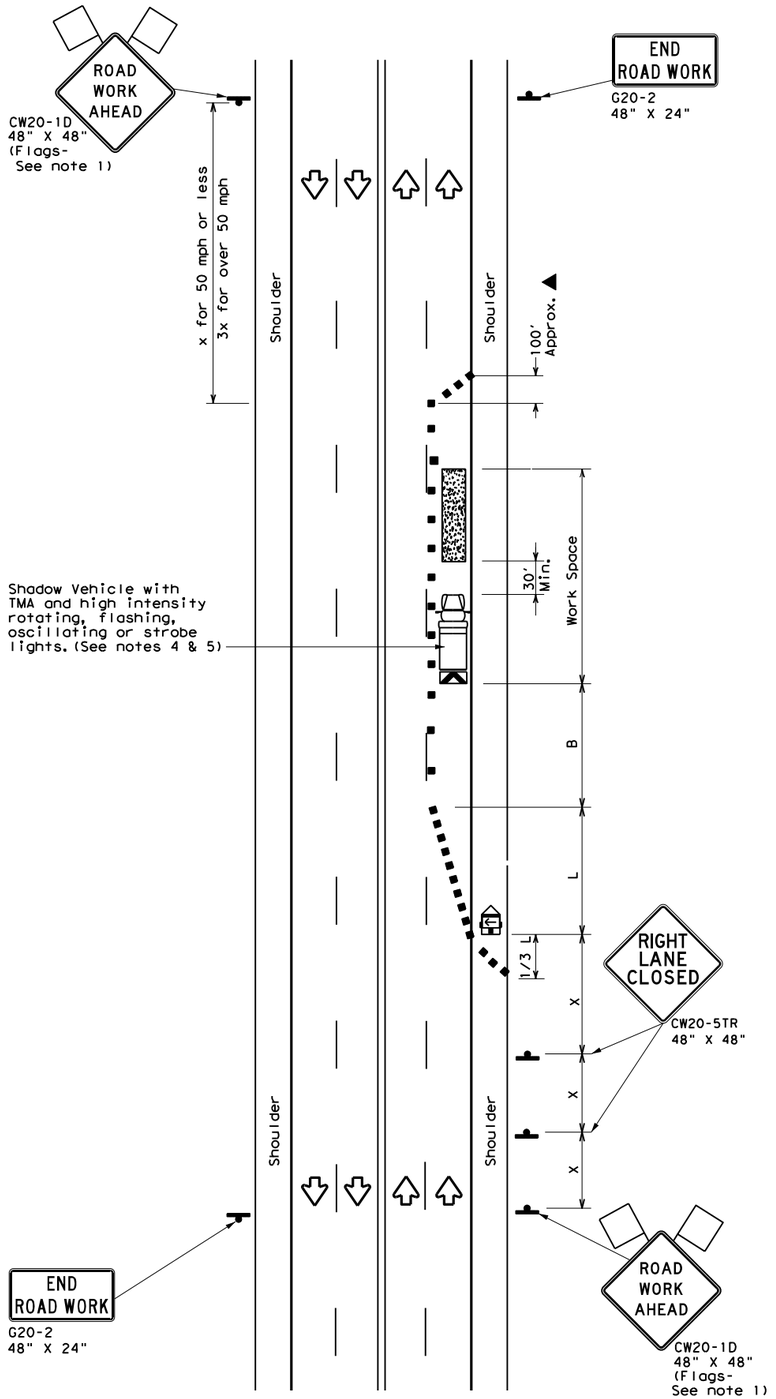
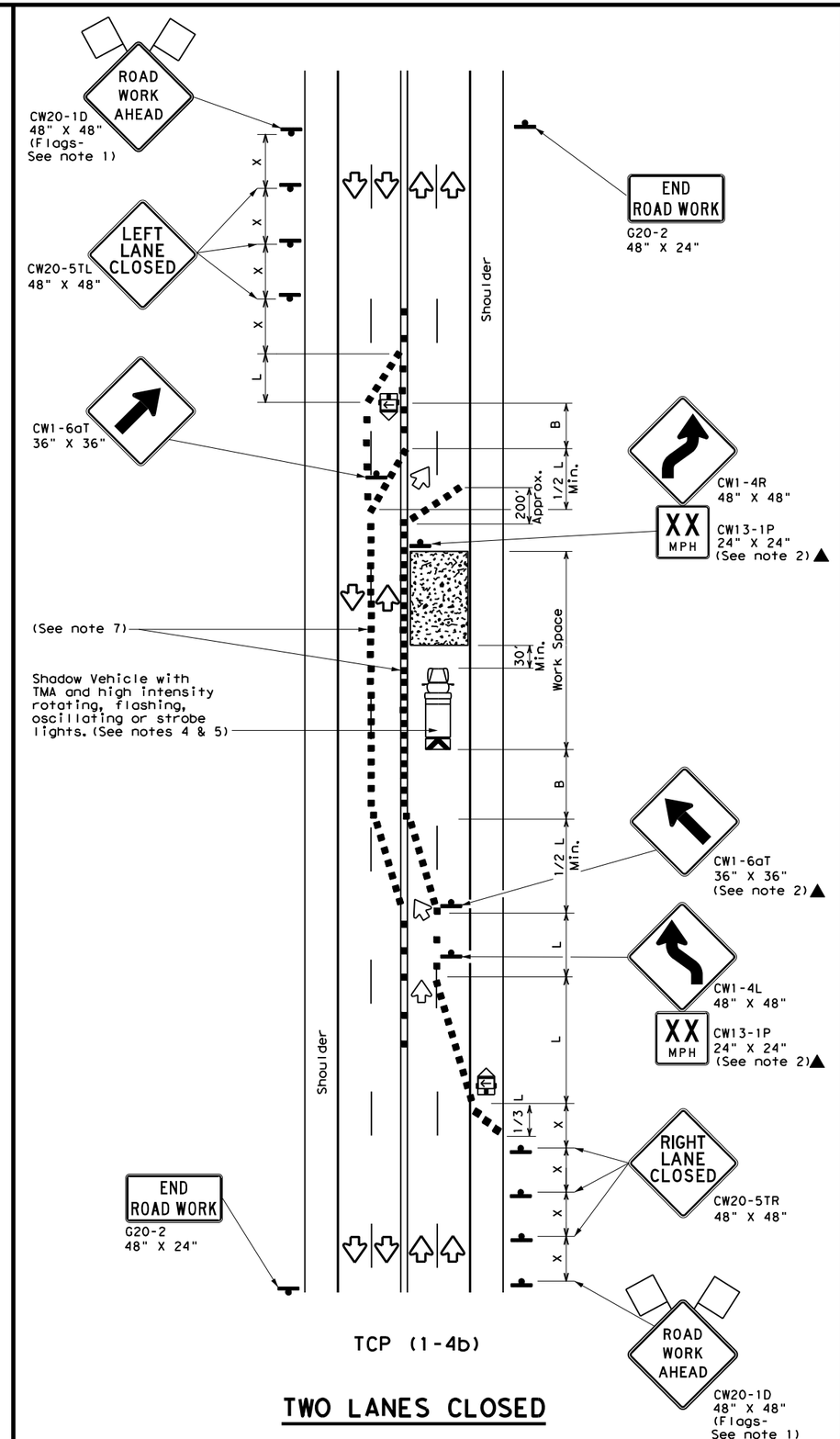


TCP (1-4a)

ONE LANE CLOSED



TCP (1-4b)

TWO LANES CLOSED

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	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. The CW20-1D "ROAD WORK AHEAD" sign may be repeated if the visibility of the work zone is less than 1500 feet.
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.

TCP (1-4a)

6. If this TCP is used for a left lane closure , CW20-5TL "LEFT LANE CLOSED" signs shall be used and channelizing devices shall be placed on the centerline where needed to protect the work space from opposing traffic with the arrow panel placed in the closed lane near the end of the merging taper.

TCP (1-4b)

7. Where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2S where S is the speed in mph. This tighter device spacing is intended for the areas of conflicting markings, not the entire work zone.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(1-4)-18

FILE: tcp1-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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8-95 2-12	DIST	COUNTY		SHEET NO.
1-97 2-18	SAT	BEXAR		31

DATE: 2/25/2022 10:00:56 AM
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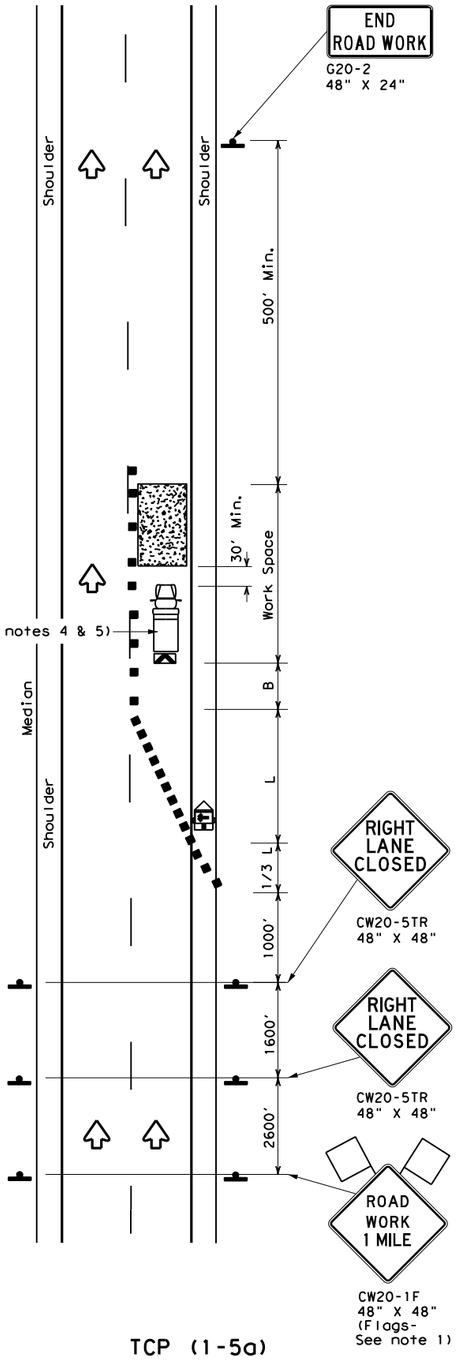
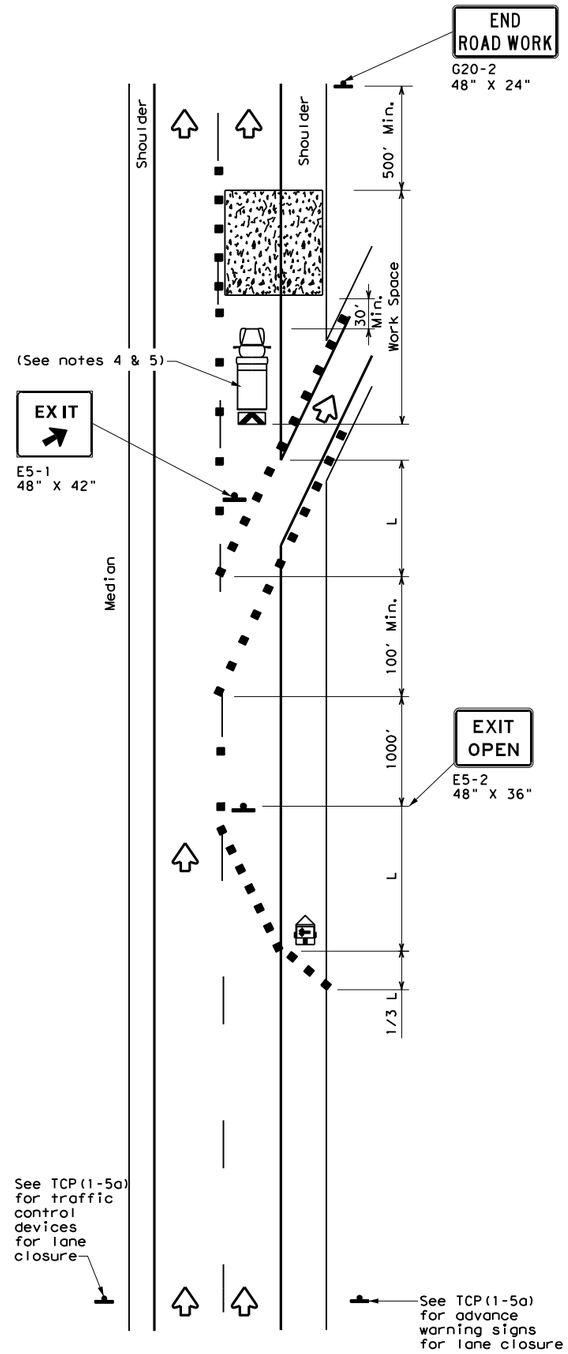


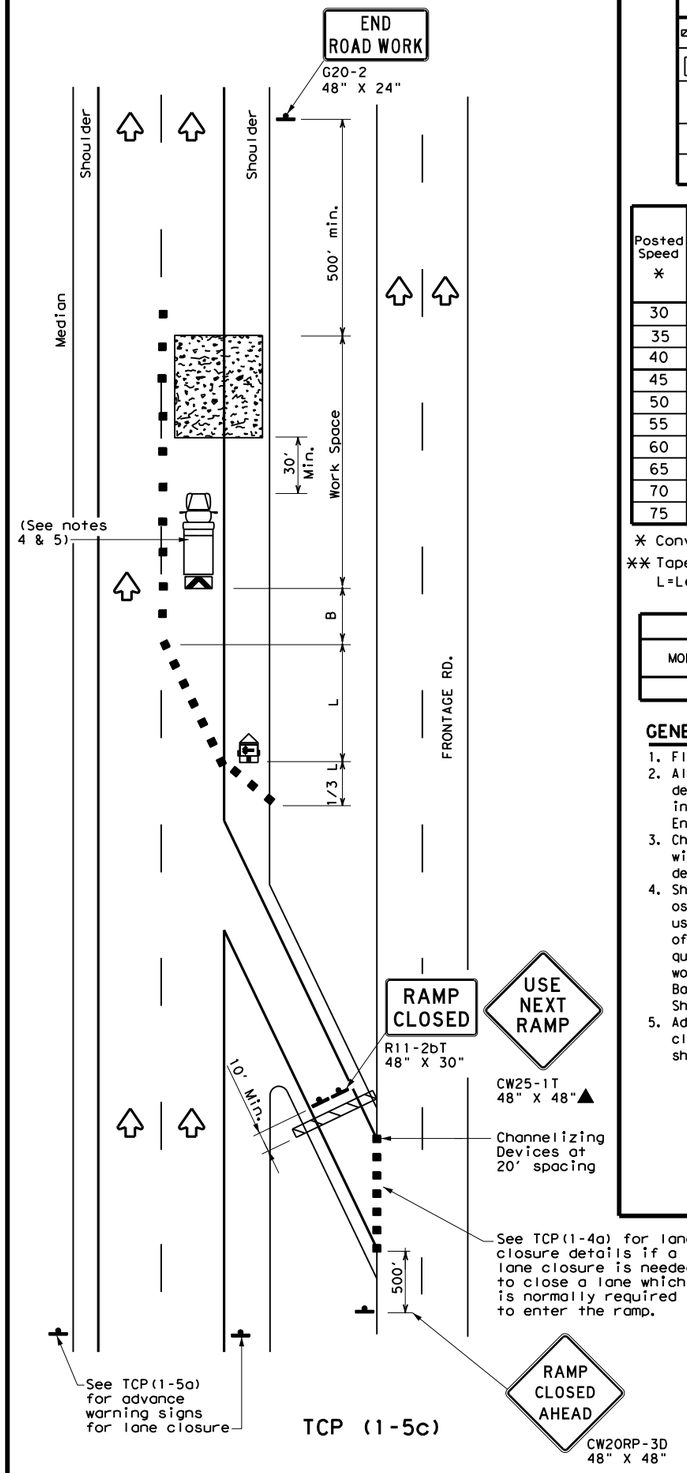
TCP (1-5a)

ONE LANE CLOSURE



TCP (1-5b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (1-5c)

LANE CLOSURE NEAR ENTRANCE RAMPS

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Channelizing devices used to close lanes may be supplemented with the Chevron Alignment Sign placed on every other channelizing device. Chevrons may be attached to plastic drums as per BC Standards.
4. 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 in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES FOR DIVIDED HIGHWAYS

TCP(1-5)-18

FILE: tcp1-5-18.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
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	SAT	BEXAR		32

DATE: 2/25/2022 10:01:00 AM
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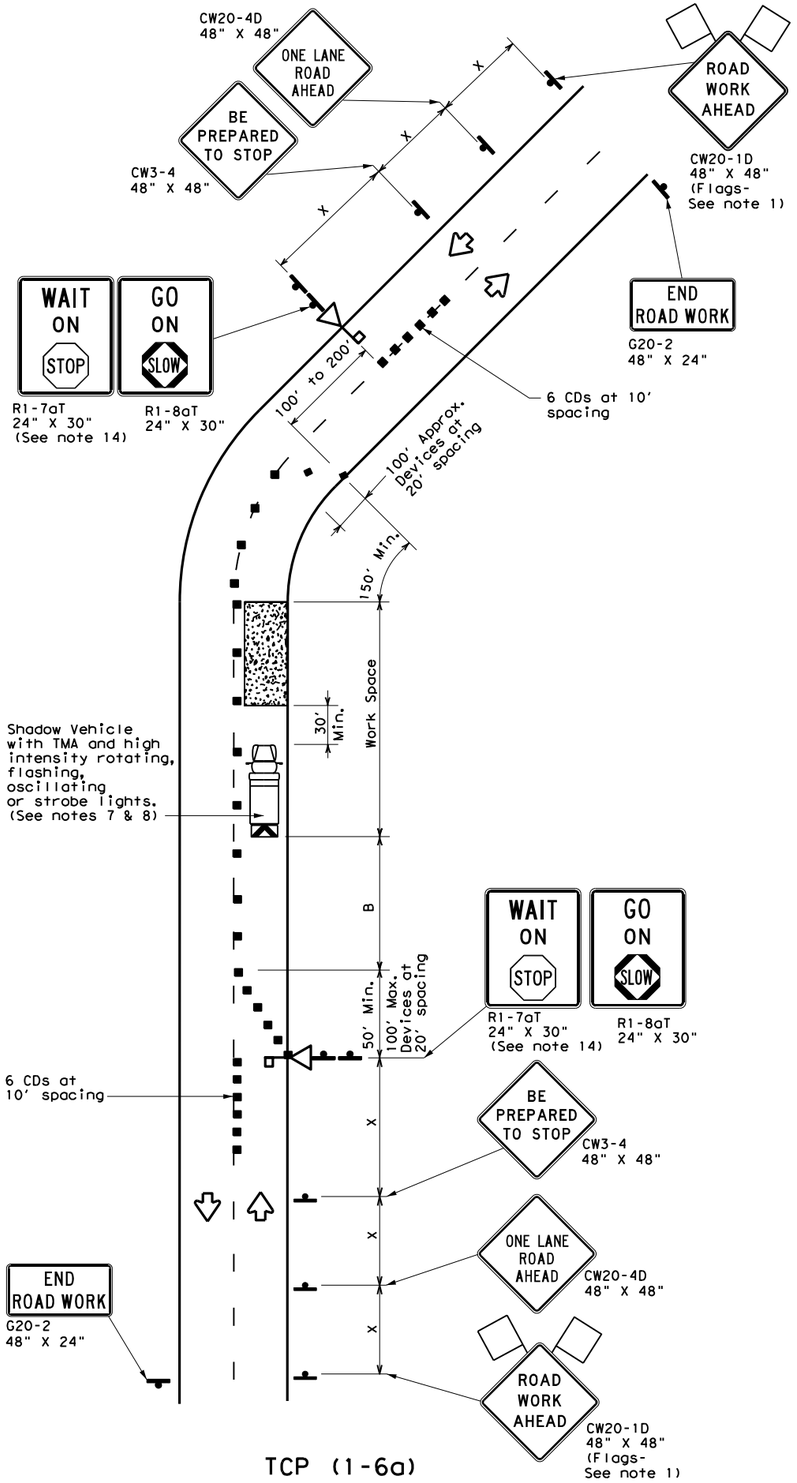
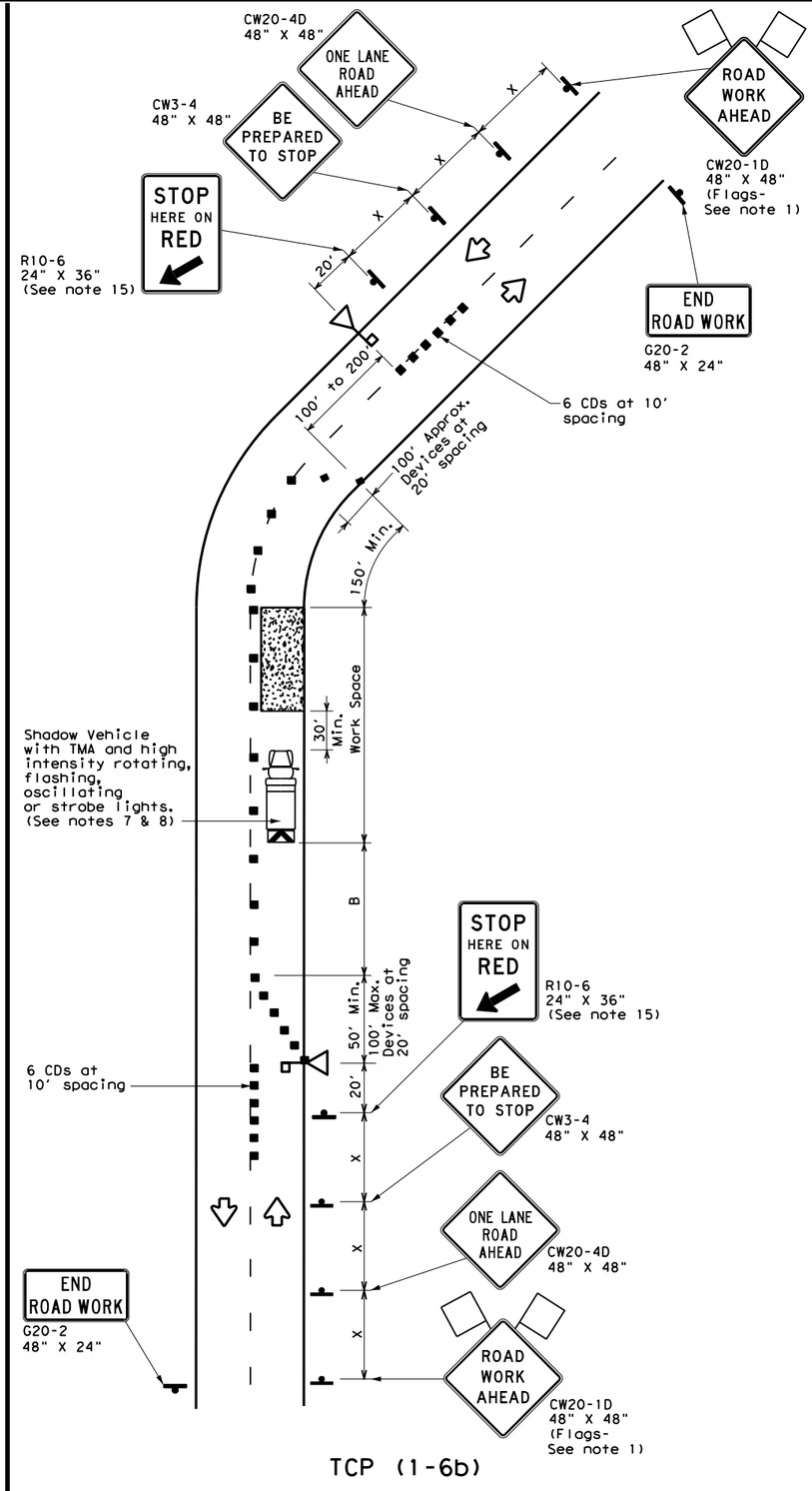


TCP (1-6a)

ONE LANE TWO-WAY CONTROL WITH STOP/SLOW AFADs



TCP (1-6b)

ONE LANE TWO-WAY CONTROL WITH RED/YELLOW LENS AFADs

LEGEND

	Type 3 Barricade		Channelizing Devices (CDs)
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Automated Flagger Assistance Device (AFAD)	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. AFADs shall only be used in situations where there is one lane of approaching traffic in the direction to be controlled.
3. Adequate stopping sight distance must be provided to each AFAD location for approaching traffic. (See table above).
4. Each AFAD shall be operated by a qualified/certified flagger. Flaggers operating AFADs shall not leave them unattended while they are in use.
5. One flagger may operate two AFADs only when the flagger has an unobstructed view of both AFADs and of the approaching traffic in both directions.
6. When pilot cars are used, a flagger controlling traffic shall be located on each approach. AFADs shall not be operated by the pilot car operator.
7. All AFADs shall be equipped with gate arms with an orange or fluorescent red-orange flag attached to the end of the gate arm. The flag shall be a minimum of 16" square.
8. 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.
9. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
10. Flaggers should use two-way radios or other methods of communication to control traffic.
11. Length of work space should be based on the ability of flaggers to communicate.
12. 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 AFAD.
13. Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
14. The R1-7aT "WAIT ON STOP" sign and the R1-8aT "GO ON SLOW" sign shall be installed at the AFAD location on separate supports or they may be fabricated as one 48" x 30" sign. They shall not obscure the face of the STOP/SLOW AFAD.
15. The R10-6 "STOP HERE ON RED" arrow sign shall be offset so as not to obscure the lenses of the AFAD.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN AUTOMATED FLAGGER ASSISTANCE DEVICES (AFADS)

TCP(1-6)-18

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© TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	00	238	VARIOUS
2-18	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		33

DATE: 2/25/2022 10:01:04 AM
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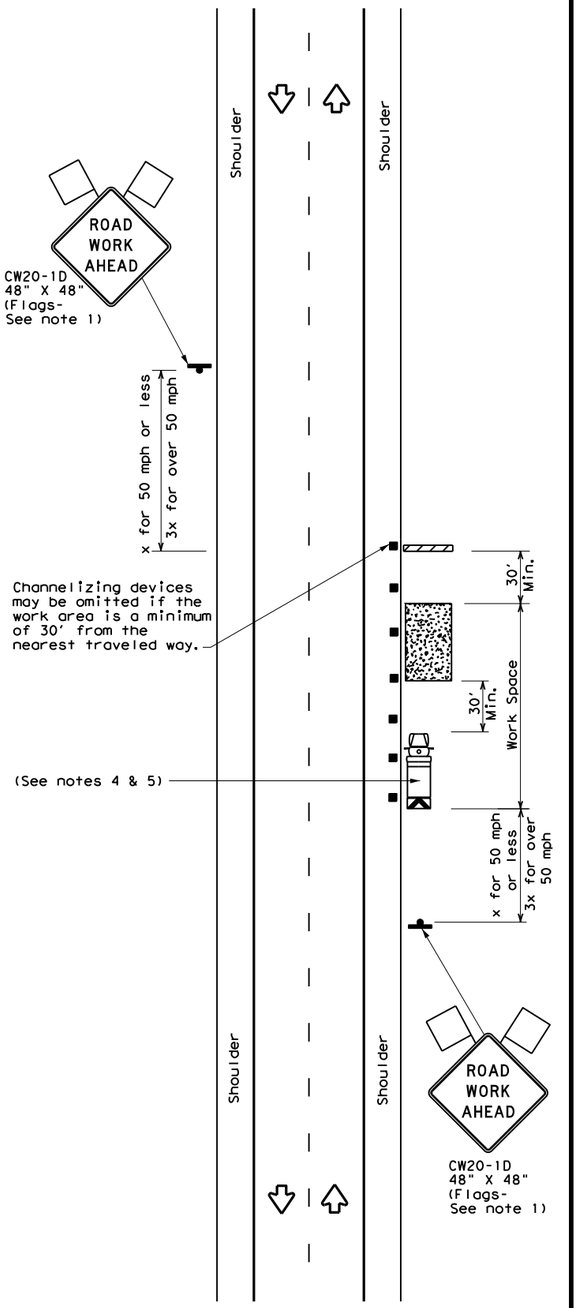
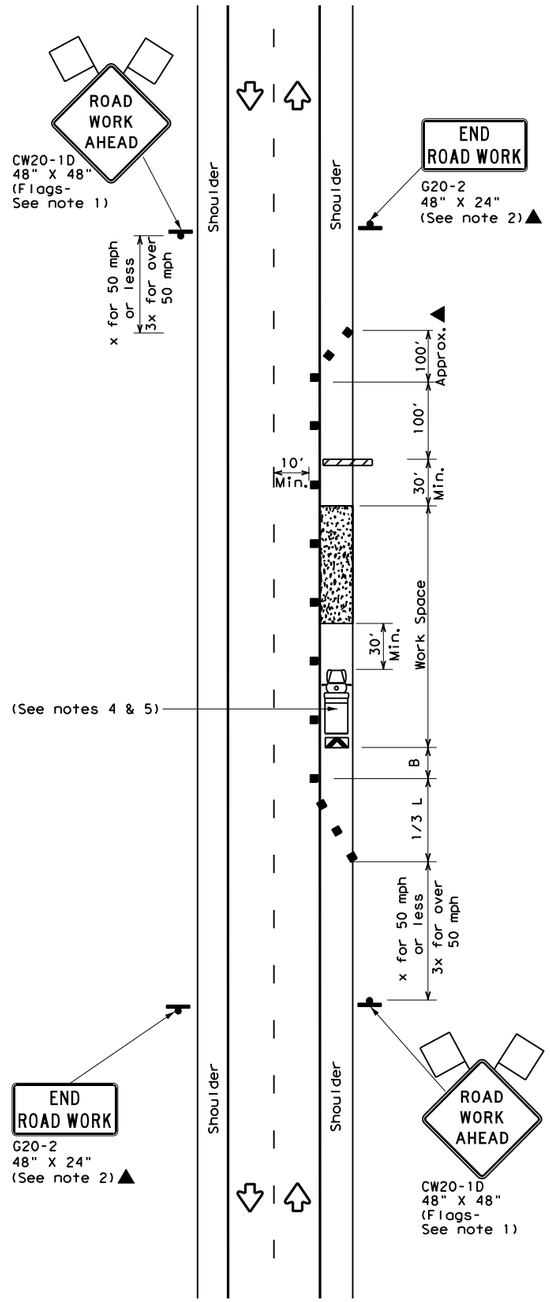


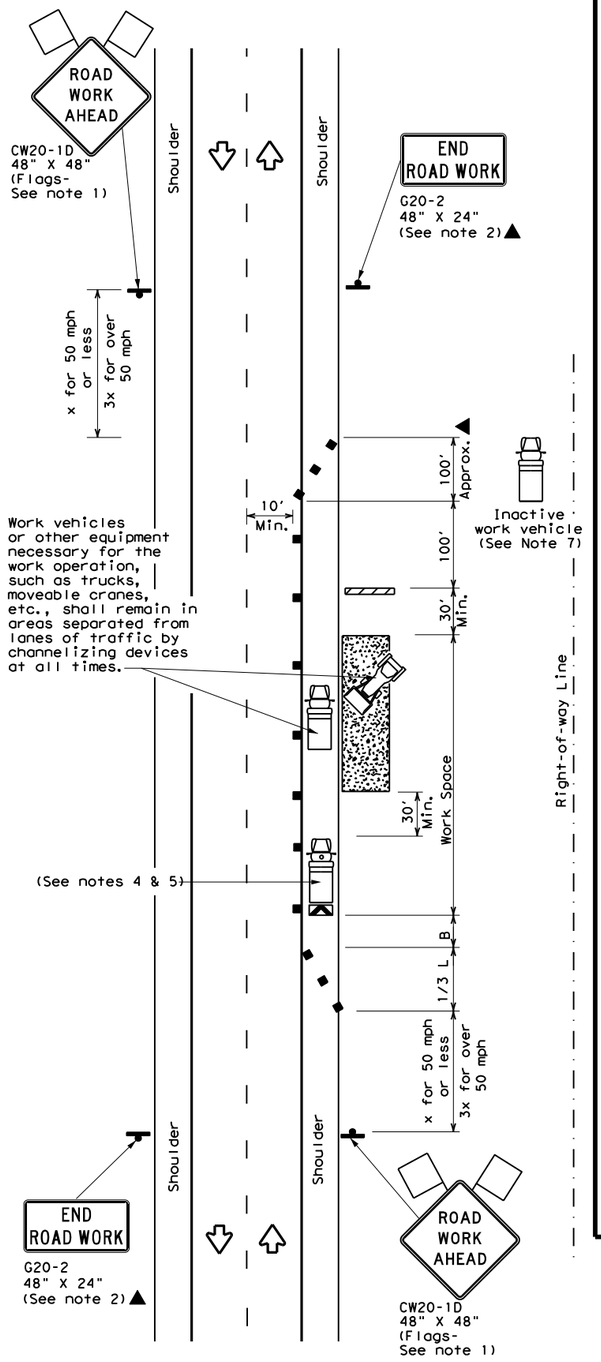
TCP (2-1a)

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

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	SAT	BEXAR		34
1-97 2-18				

DATE: 2/25/2022 10:01:09 AM
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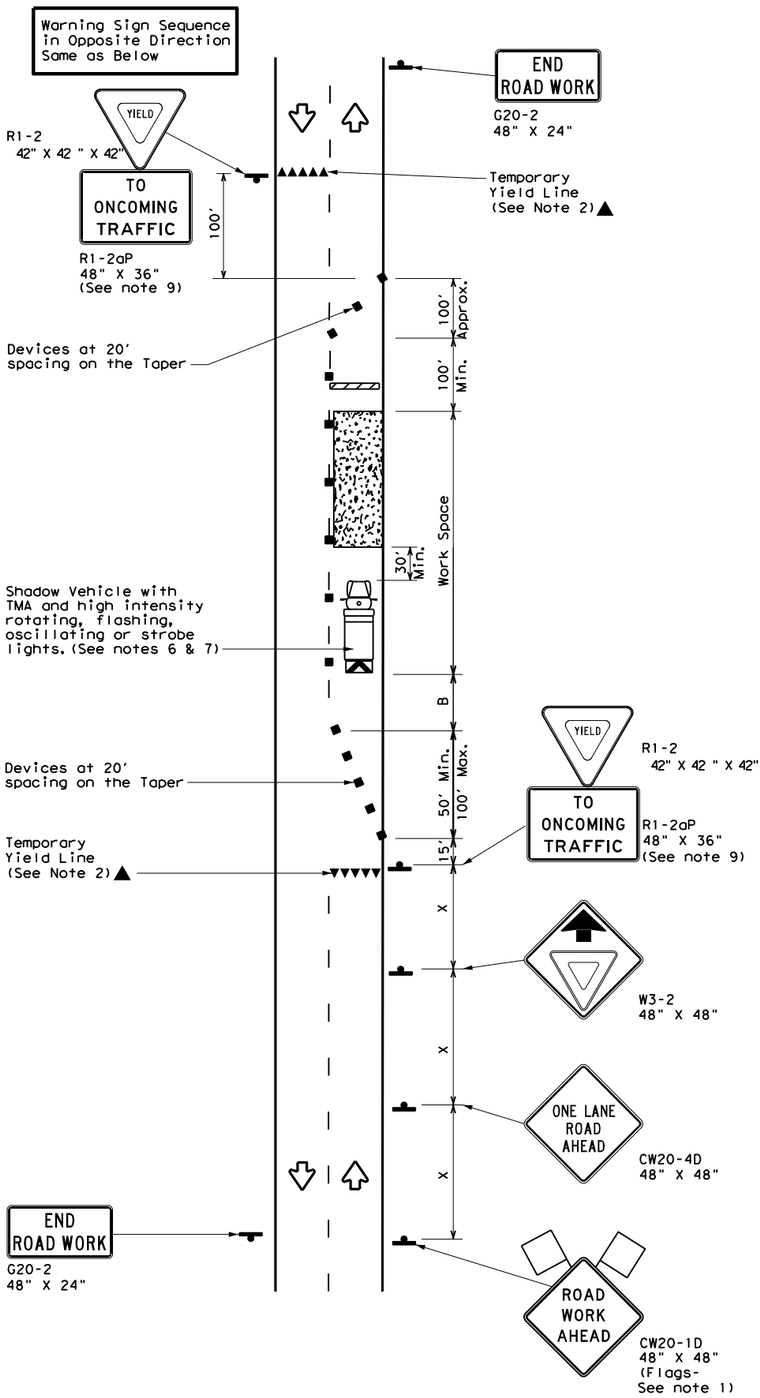
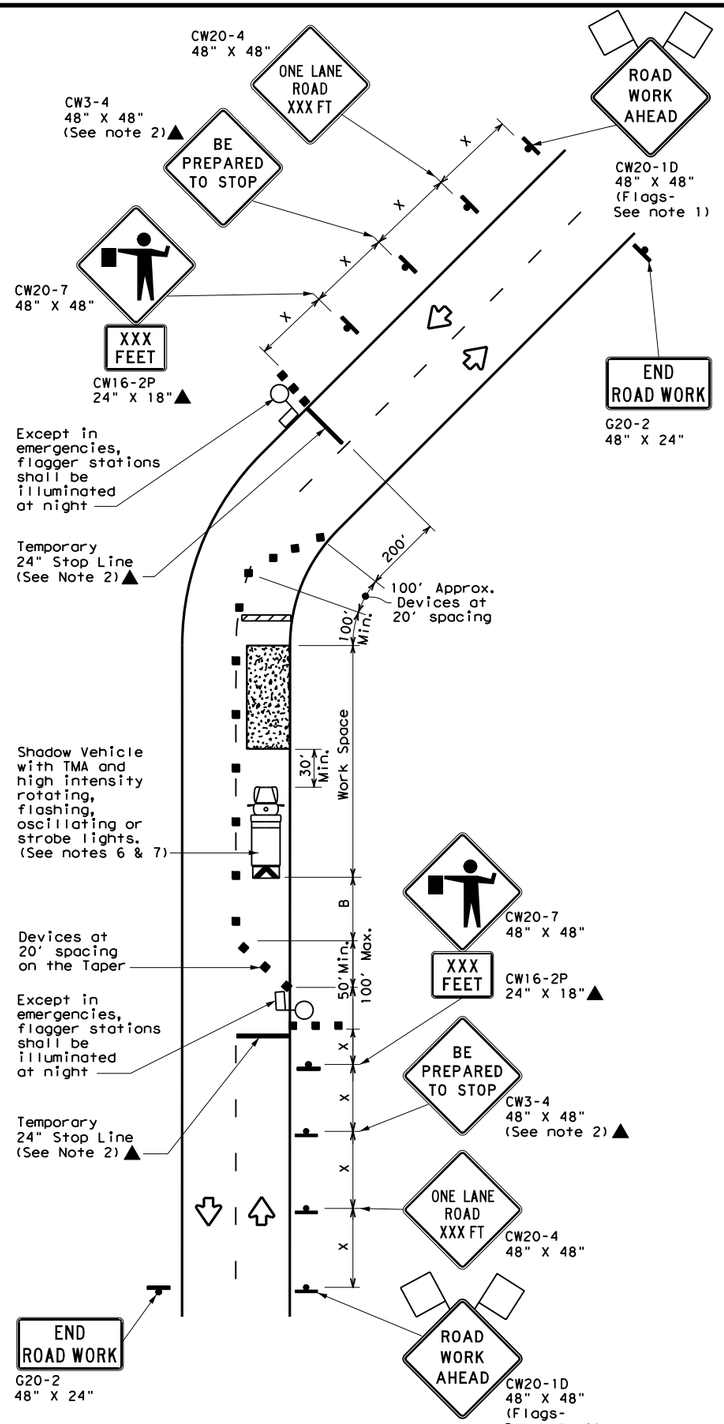


TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See Note 9)



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	0915	00	238	VARIOUS
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		35

DATE: 2/25/2022 10:01:13 AM
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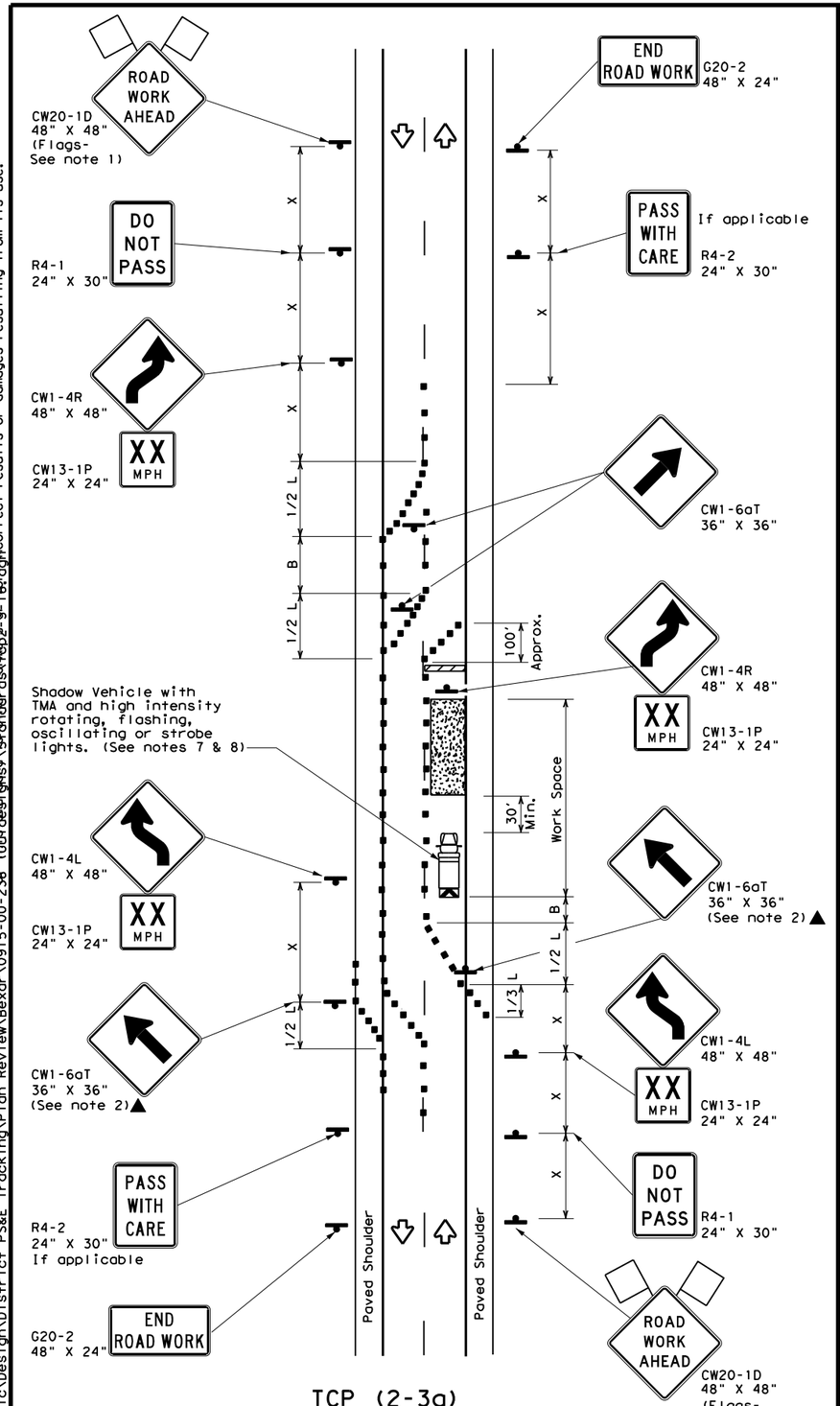
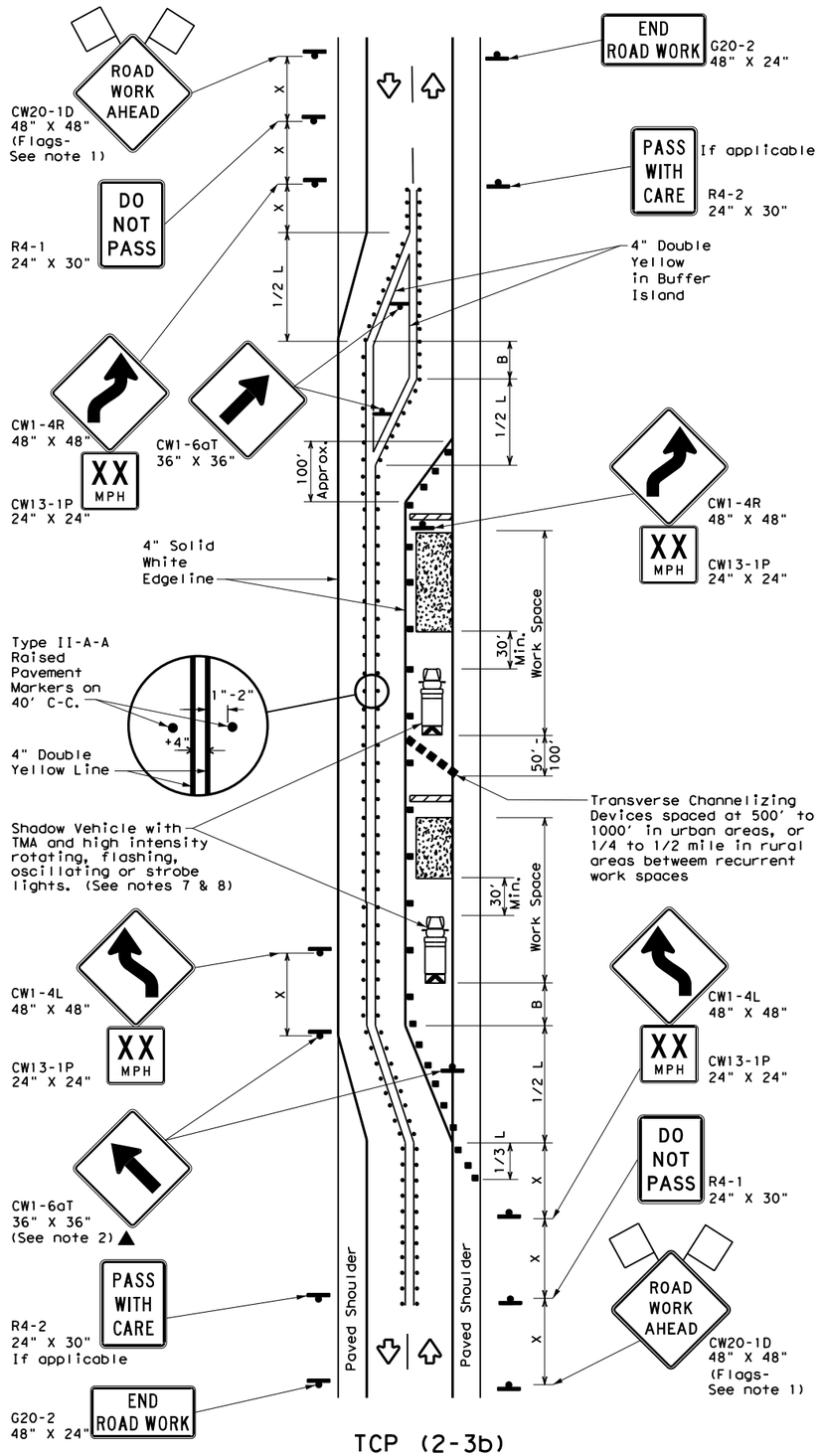


TCP (2-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

ONE LANE CLOSED
ADEQUATE FIELD OF VIEW



TCP (2-3b)
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	• • • •	Raised Pavement Markers Ty II-AA
	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
				TCP(2-3b)ONLY
			✓	✓

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. When work space will be in place less than three days existing pavement markings may remain in place. Channelizing devices shall be used to separate traffic.
4. Flagger control should NOT be used unless roadway conditions or heavy traffic volume require additional emphasis to safely control traffic. Flagger should be positioned at end of traffic queue.
5. The R4-1 "DO NOT PASS," R4-2 " PASS WITH CARE" and construction regulatory speed zone signs may be installed within CW20-1D "ROAD WORK AHEAD" signs. Proper spacing of signs shall be maintained.
6. Conflicting pavement marking shall be removed for long term projects.
7. 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.
8. 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 (2-3a)

9. Conflicting pavement markings shall be removed for long-term projects. For shorter durations where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2(S) where S is the speed in mph. This tighter device spacing is intended for the area of the 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(2-3)-18

FILE: tcp(2-3)-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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8-95 3-03	DIST	COUNTY		SHEET NO.
1-97 2-12	SAT	BEXAR		36
4-98 2-18				

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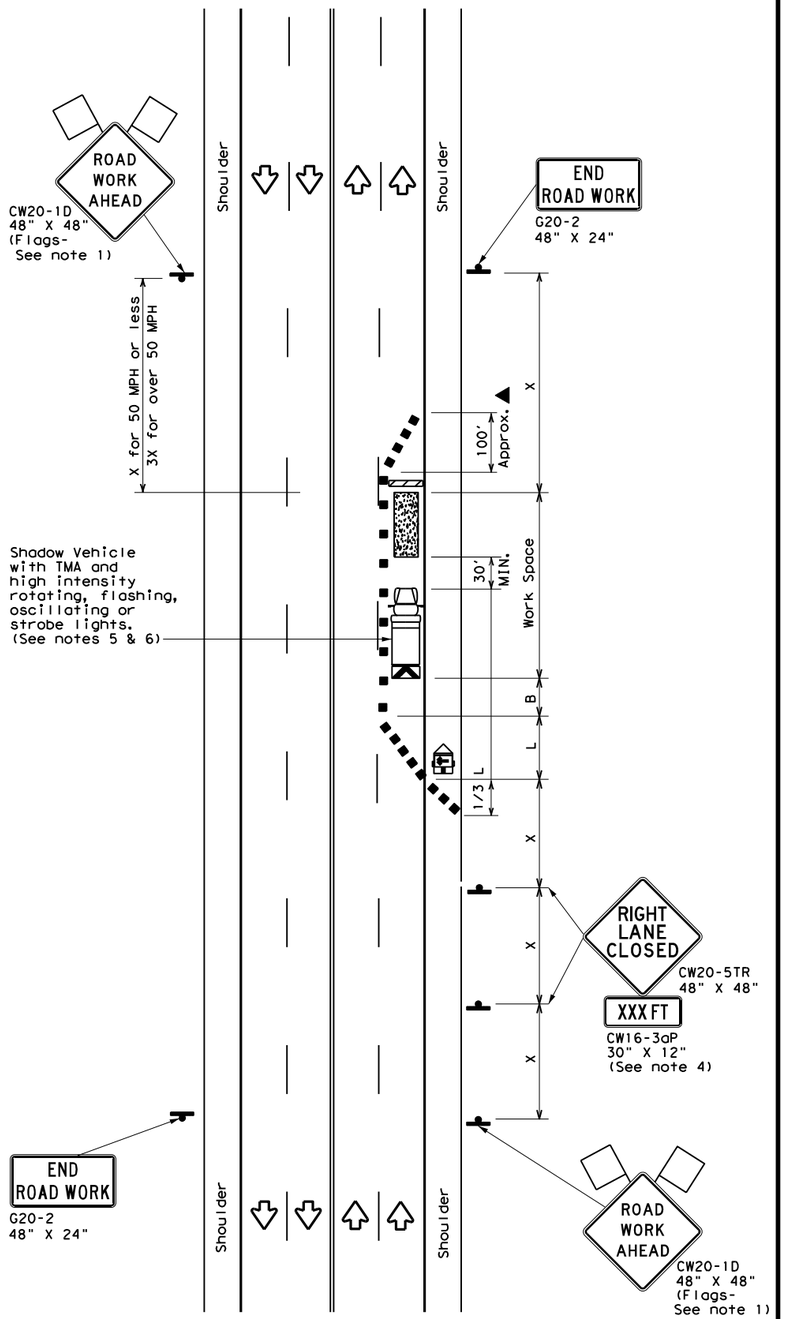
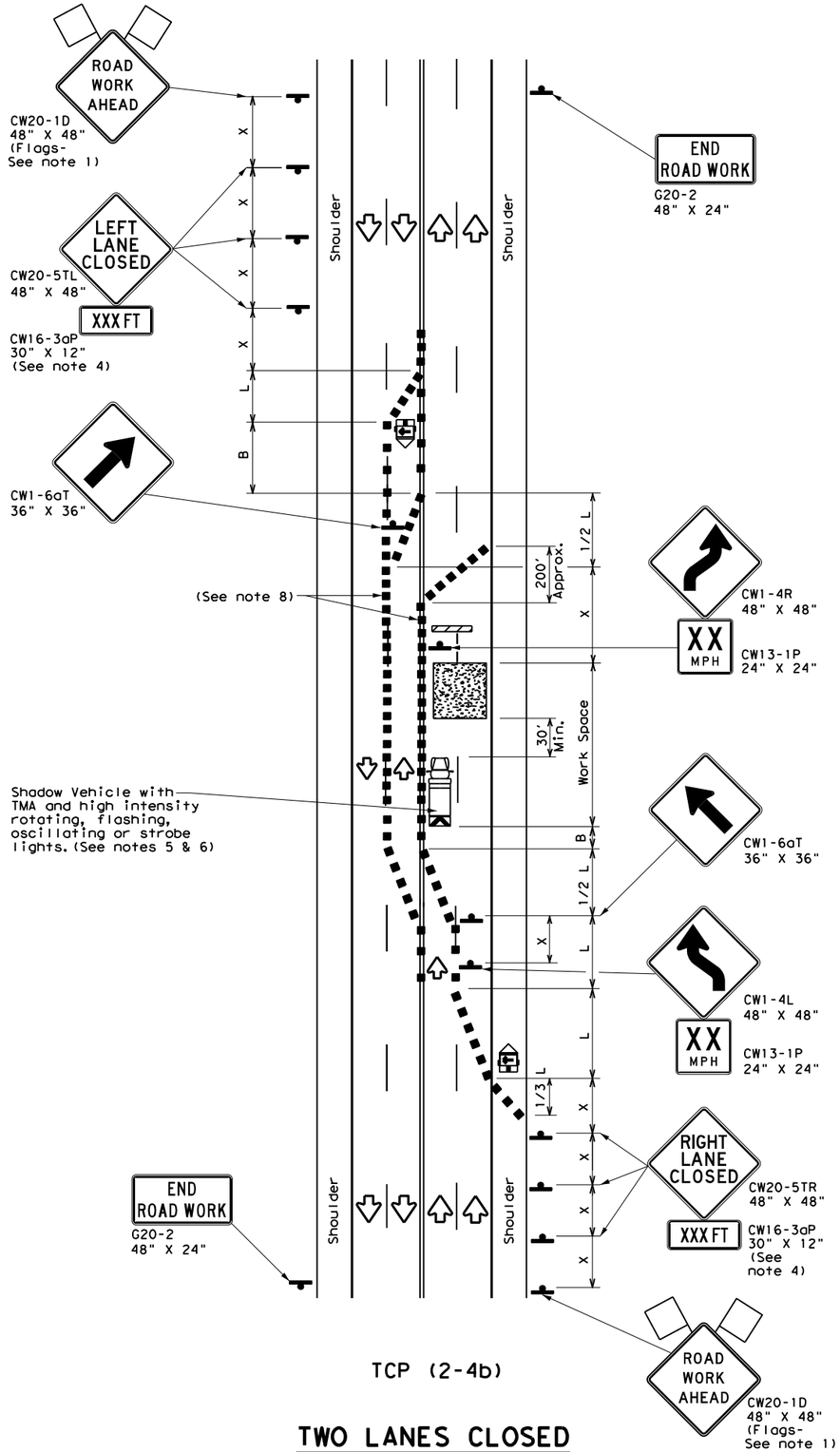


TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	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. The downstream taper is optional. When used, it should be 100 feet minimum length per lane.
4. For short term applications, when post mounted signs are not used, the distance legend may be shown on the sign face rather than on a CW16-3aP supplemental plaque.
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 in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-4a)

7. If this TCP is used for a left lane closure, CW20-5TL "LEFT LANE CLOSED"signs shall be used and channelizing devices shall be placed on the centerline to protect the work space from opposing traffic with the arrow board placed in the closed lane near the end of the merging taper.

TCP (2-4b)

8. For shorter durations where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2(S) where S is the speed in mph. This tighter devices spacing is intended for the area of conflicting markings, not the entire work zone.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

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REVISIONS	0915	00	238	VARIOUS
8-95 3-03	DIST	COUNTY		SHEET NO.
1-97 2-12	SAT	BEXAR		37
4-98 2-18				

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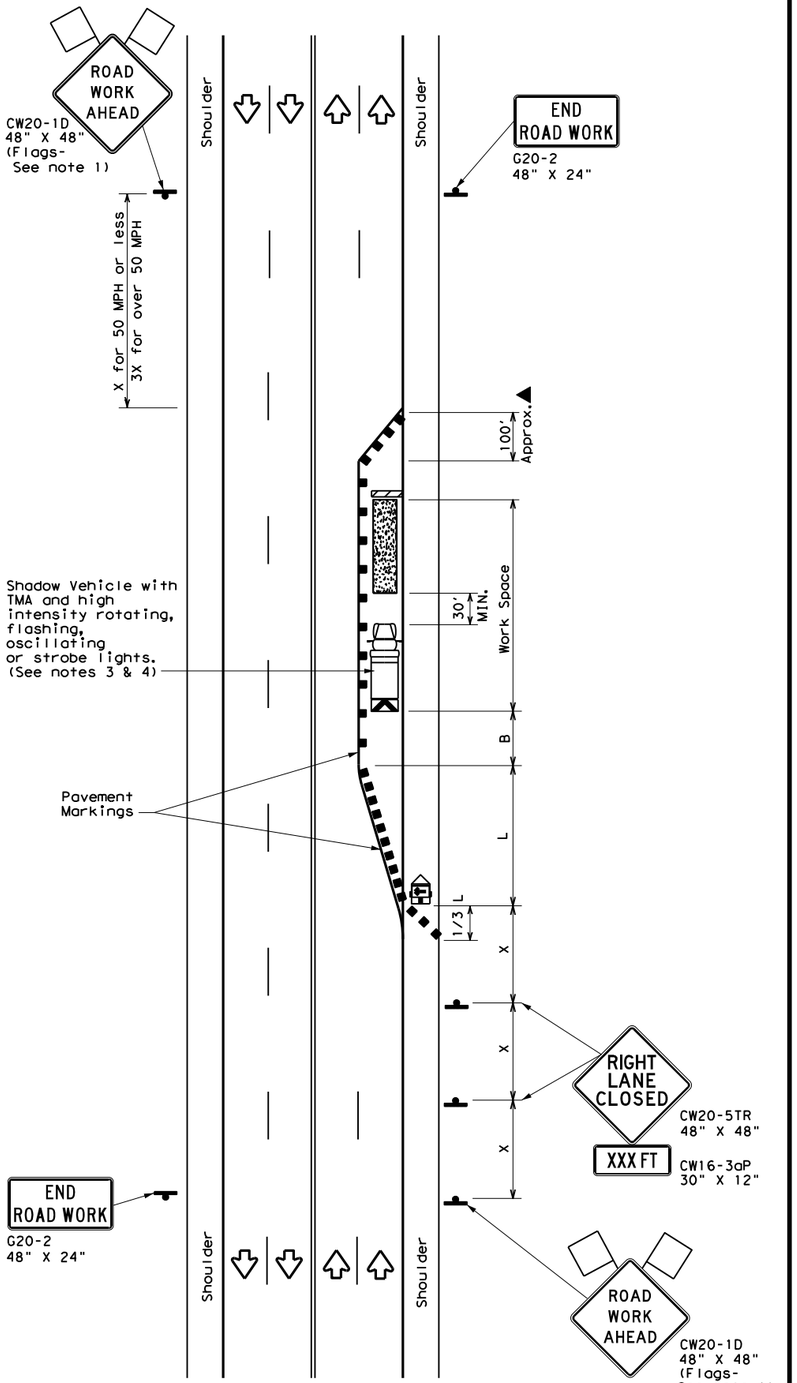
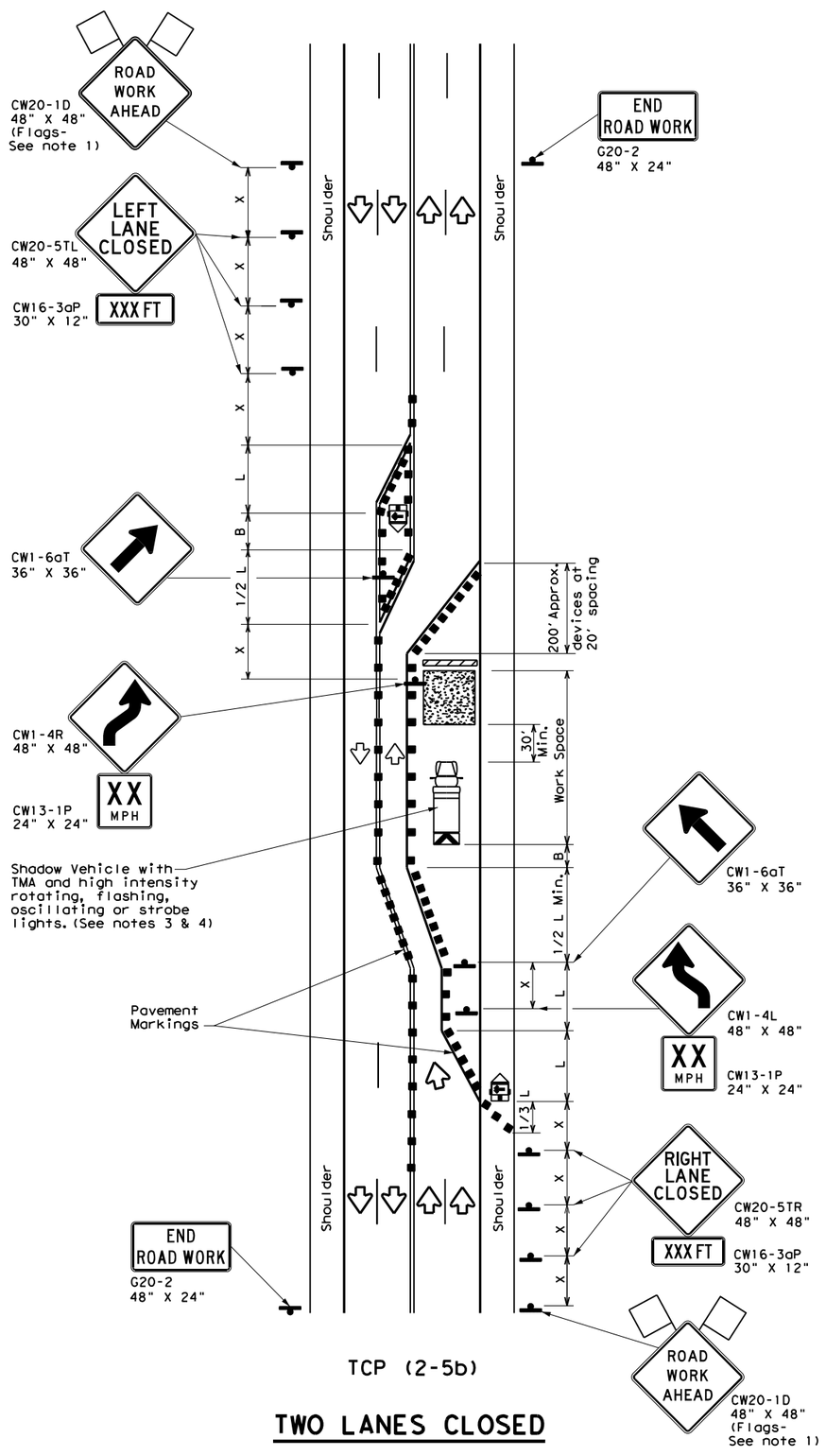


TCP (2-5a)

ONE LANE CLOSED



TCP (2-5b)

TWO LANES CLOSED

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. 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 eposure 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 substitutued for the Shadow Vehicle and TMA.
4. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.
5. The downstream taper is optional. When used, it should be 100 feet approximately per lane, with channelizing devices spaced at 20 feet.

TCP (2-5a)

6. If this TCP is used for a left lane closure, CW20-5TL "LEFT LANE CLOSED" signs shall be used and channelizing devices shall be placed on the centerline to protect the work space from opposing traffic, with the arrow board placed in the closed lane near the end of the merging taper.

TCP (2-5b)

7. Conflicting pavement markings shall be removed for long-term projects.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LONG TERM LANE CLOSURES MULTILANE CONVENTIONAL RDS.

TCP(2-5)-18

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©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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1-97 3-03	DIST	COUNTY		SHEET NO.
4-98 2-18	SAT	BEXAR		38

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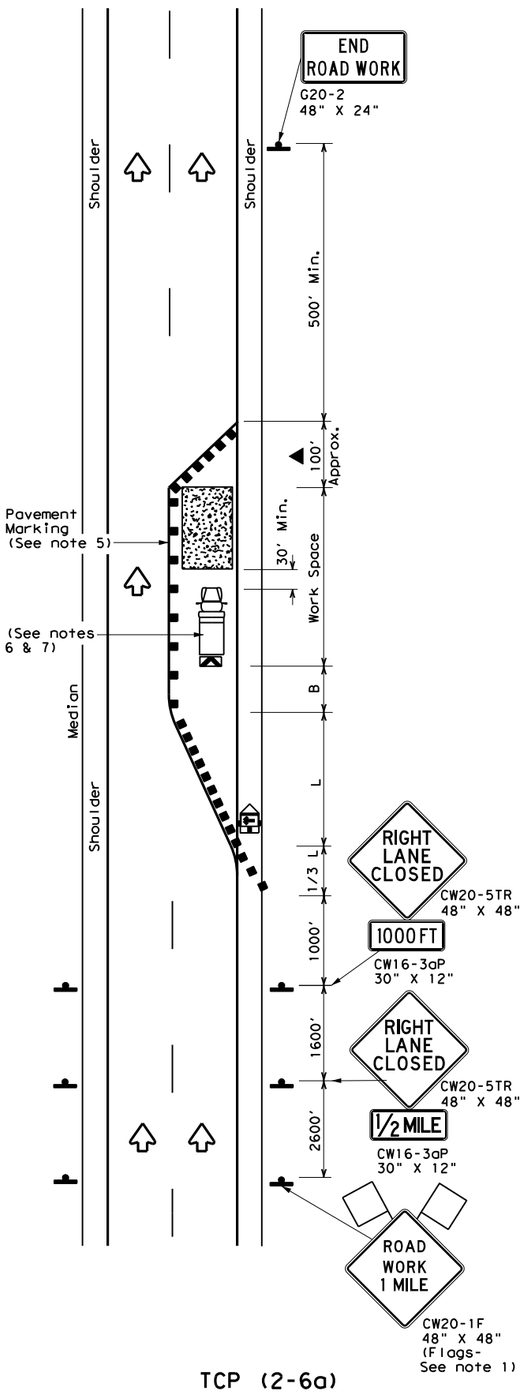
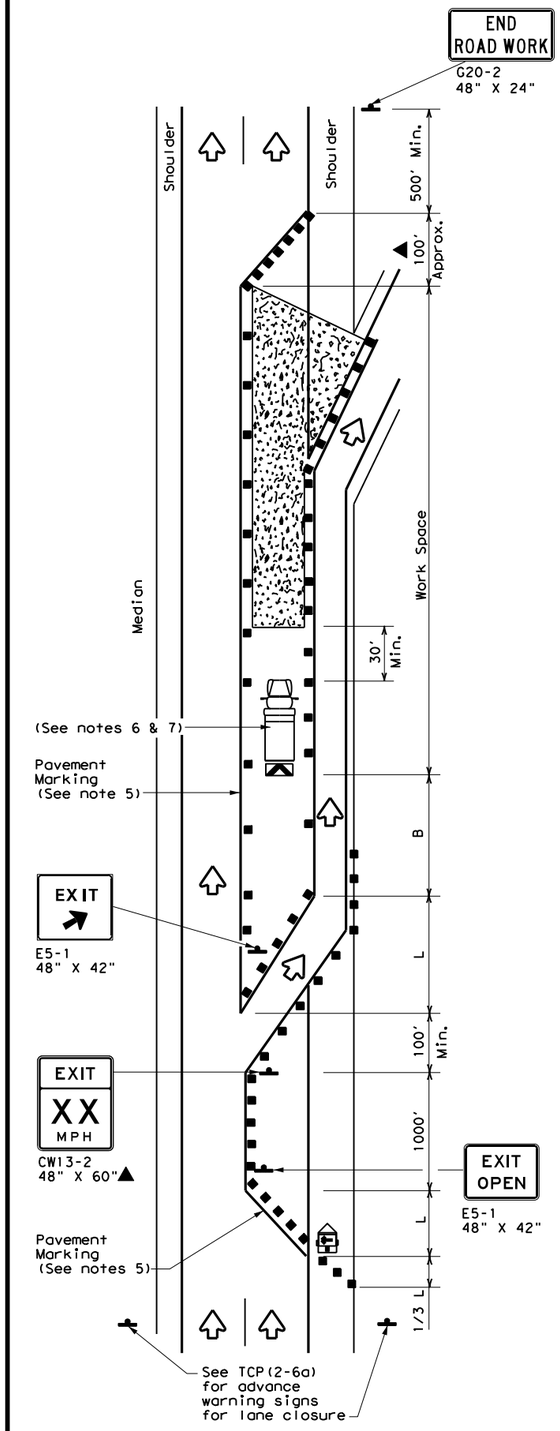


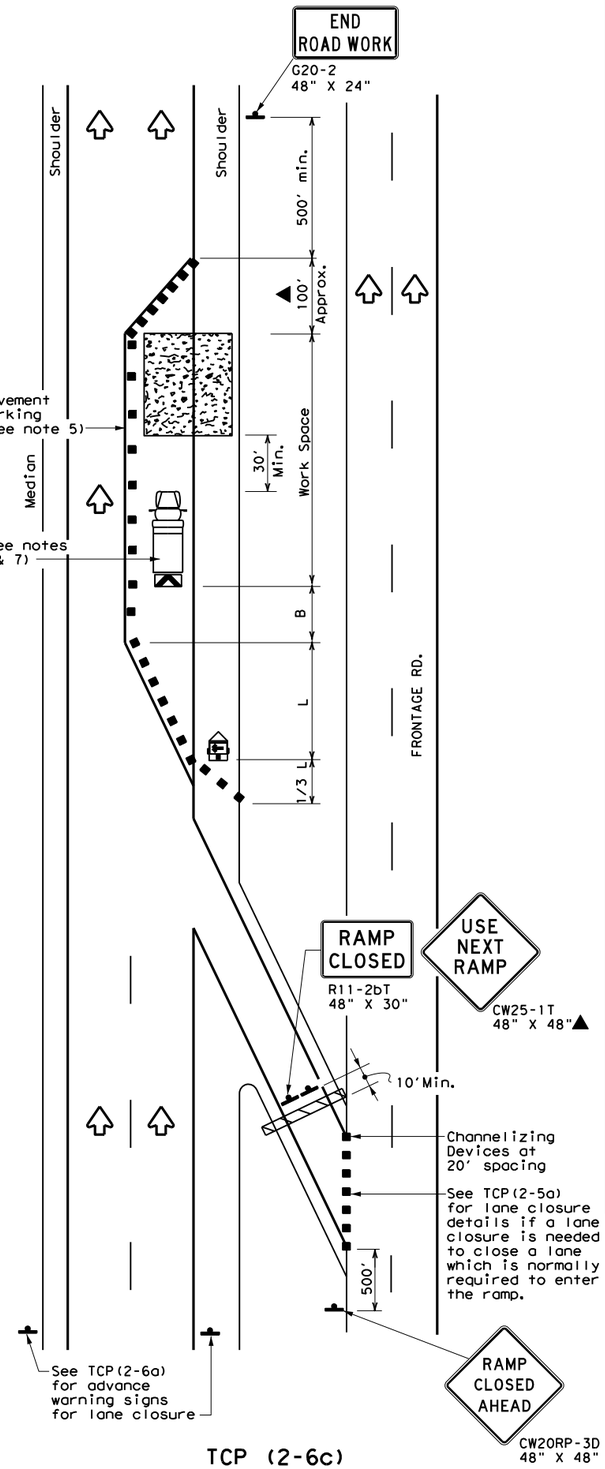
TCP (2-6a)

ONE LANE CLOSURE



TCP (2-6b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (2-6c)

LANE CLOSURE NEAR ENTRANCE RAMPS

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON DIVIDED HIGHWAYS

TCP(2-6)-18

FILE: tcp2-6-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		39

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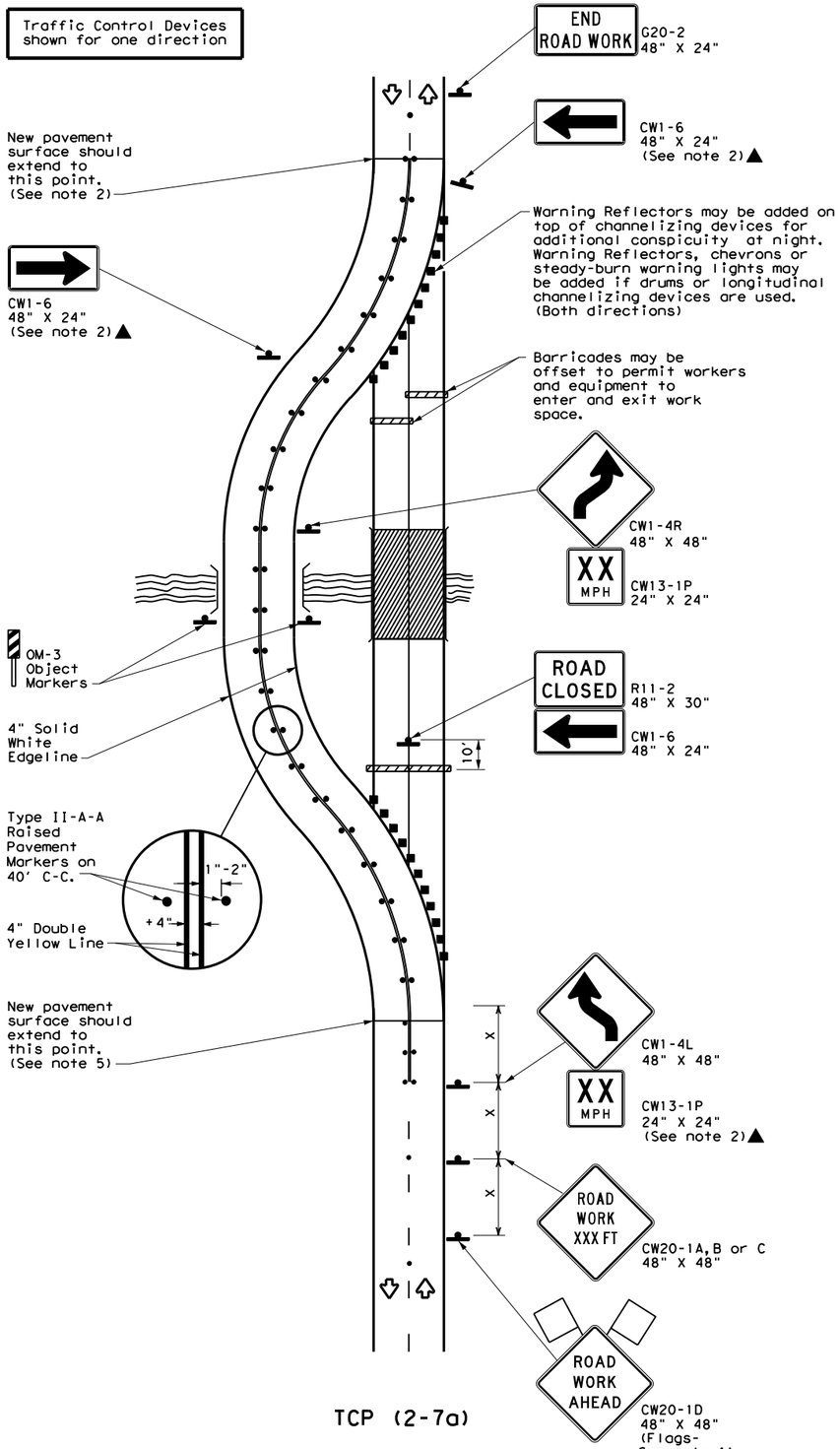
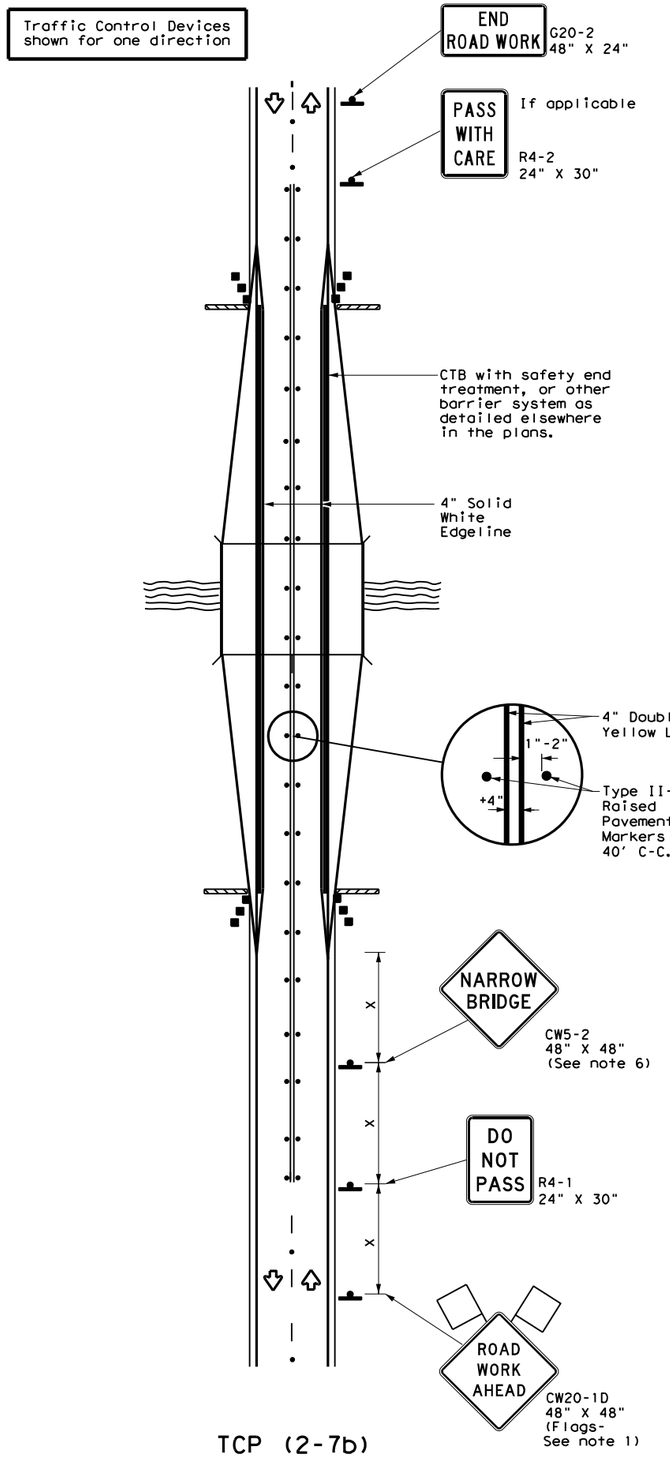


TCP (2-7a)

ROADWAY DIVERSION



TCP (2-7b)

BRIDGE WIDENING

LEGEND			
	Type 3 Barricade	■ ■	Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	• • • •	Raised Pavement Markers Ty II-AA
	Sign		Traffic Flow
	Flag		Flagger

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

* Conventional Roads Only

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

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

GENERAL NOTES

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.

TCP (2-7a)

3. Raised pavement markers shall be placed 40 feet c-c on centerline throughout project.
4. Roadway diversion design requirements should be based on posted speed limit or prevailing speed.
5. New pavement surface should be extended across existing roadway edge to a point where existing pavement markings left in place during project do not conflict with construction area pavement marking.

TCP (2-7b)

6. The CW5-2 "Narrow Bridge" sign may be omitted if lane and shoulder widths are maintained.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN DIVERSIONS AND NARROW BRIDGES

TCP(2-7)-18

FILE: tcp2-7-18.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	0915	00	238	VARIOUS
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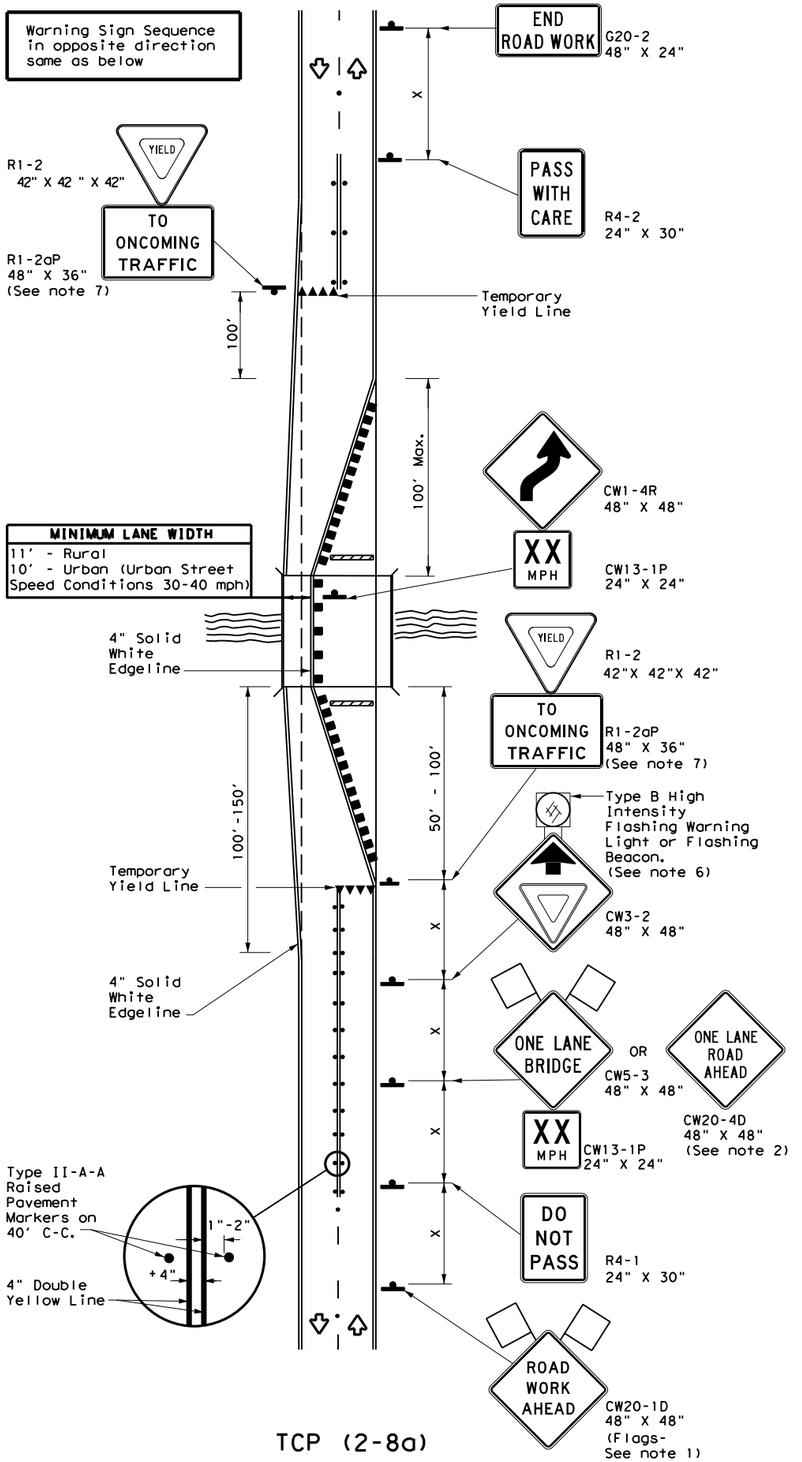
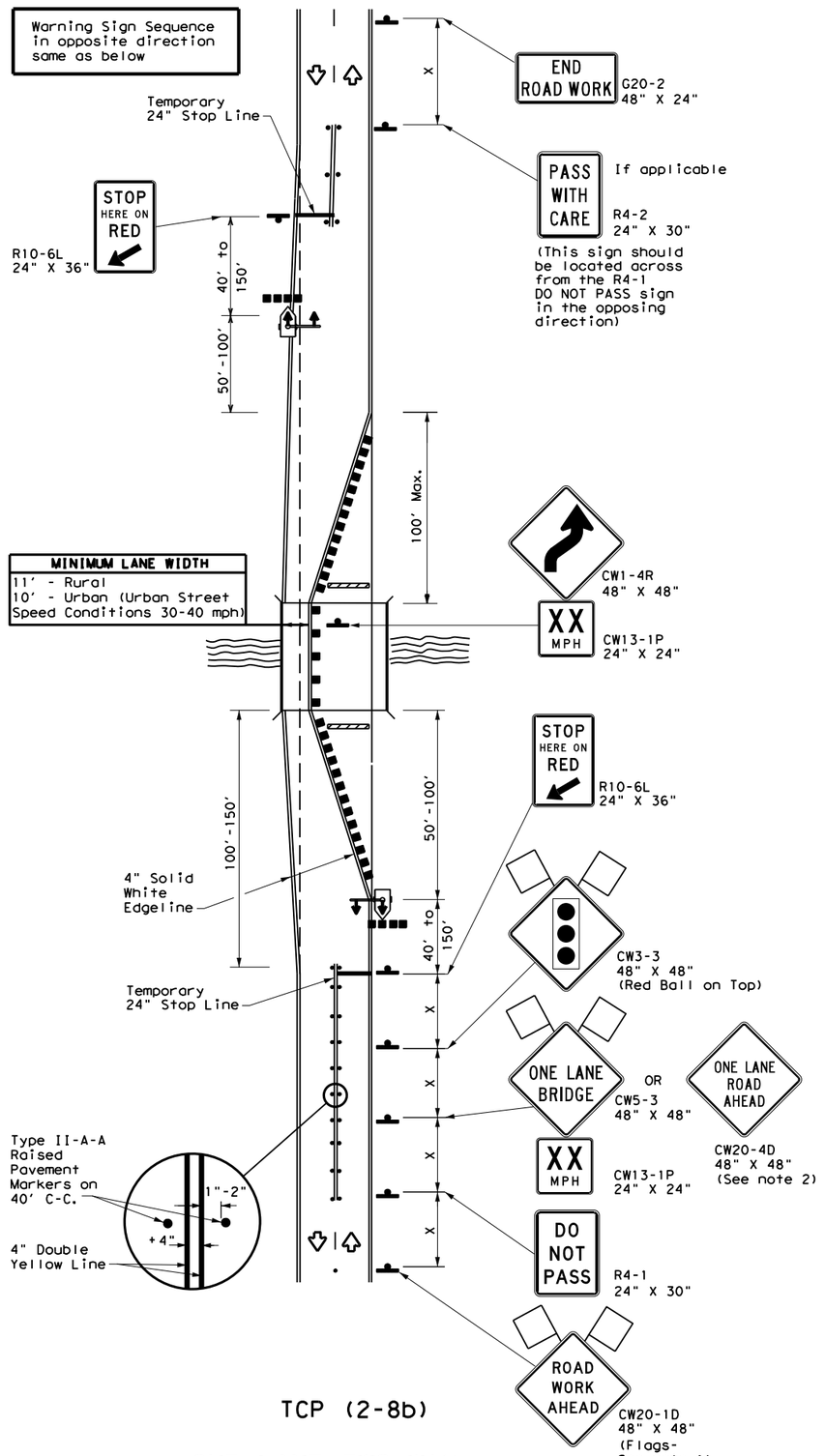


TCP (2-8a)

ONE LANE TWO-WAY
TRAFFIC CONTROL WITH YIELD SIGNS
(Less Than 2000 ADT-See Note 5)



TCP (2-8b)

ONE LANE TWO-WAY
TRAFFIC CONTROL WITH TRAFFIC SIGNAL

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Sign		Traffic Flow
	Flag		Flagger
	Raised Pavement Markers Ty II-AA		Temporary or Portable Traffic Signal

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. When this TCP is used at a location which does not involve a bridge, a 48" x 48" CW20-4D "ONE LANE ROAD AHEAD" signs should be used in lieu of the CW5-3 "ONE LANE BRIDGE" signs. The CW13-1P Advisory Speed Plaque is required with either warning sign.
3. Raised pavement markers shall be placed 40 feet c-c on centerline between DO NOT PASS signs and stop or yield lines.
4. For intermediate term situations, when it is not feasible to remove and restore pavement markings, the channelization must be made dominant by using a very close spacing. This is especially important in locations of conflicting information, such as where traffic is directed over a double yellow centerline. In such locations a maximum channelizing device spacing of 20 feet is recommended. The 20 foot channelizing device spacing recommendation is intended for the area of conflicting information and not the entire work zone.

TCP (2-8a)

5. Traffic control by CW3-2 "YIELD AHEAD" symbol signs for one lane two-way traffic control operations should be limited to work spaces less than 400 feet long and roadways with less than 2000 ADT. Otherwise, portable traffic signals should be used.
6. If power is available, a flashing beacon should be attached to the CW3-2 "YIELD AHEAD" symbol sign for emphasis.
7. The R1-2 "YIELD" and R1-2aP "TO ONCOMING TRAFFIC" signs and other regulatory signs shall be installed at 7 foot minimum mounting height.

TCP (2-8b)

8. A list of approved Portable Traffic Signals can be found in the "Compliant Work Zone Traffic Control Devices" list.
9. Portable traffic signals should be located to provide adequate stopping sight distance for approaching motorist (See table above).

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
LONG TERM ONE-LANE TWO-WAY CONTROL

TCP(2-8)-18

FILE: tcp2-8-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	00	238	VARIOUS
8-95 3-03	DIST	COUNTY		SHEET NO.
1-97 2-12	SAT	BEXAR		41
4-98 2-18				

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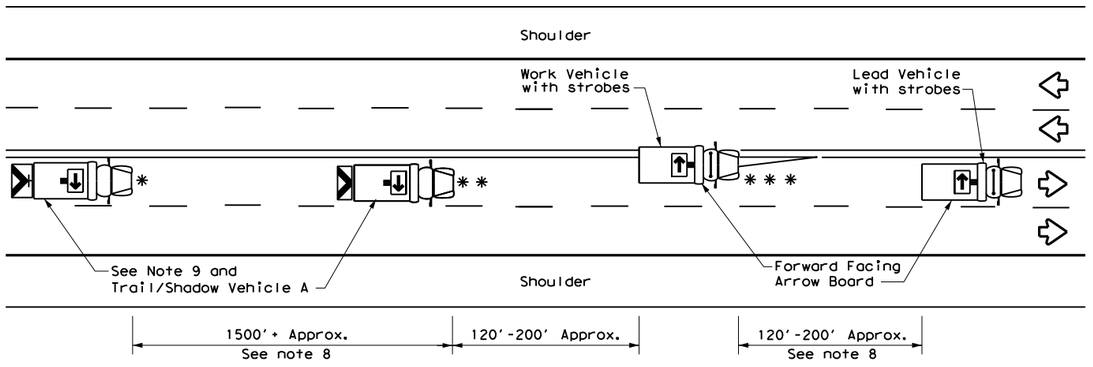
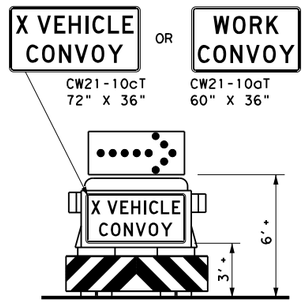


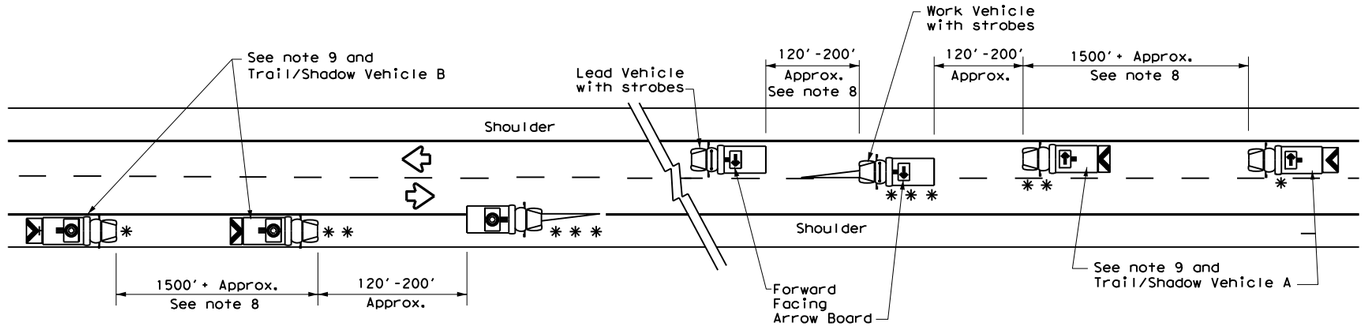
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

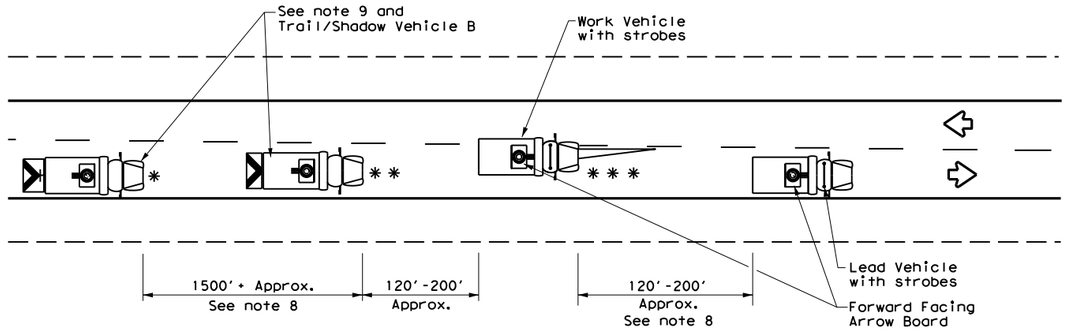


WORK ON SHOULDER

WORK ON TRAVEL LANE

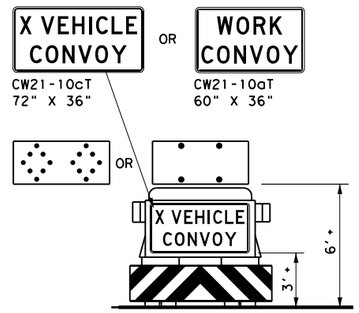
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

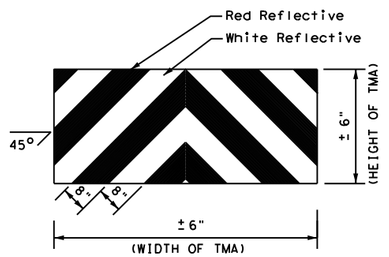
with Flashing Arrow Board in CAUTION display

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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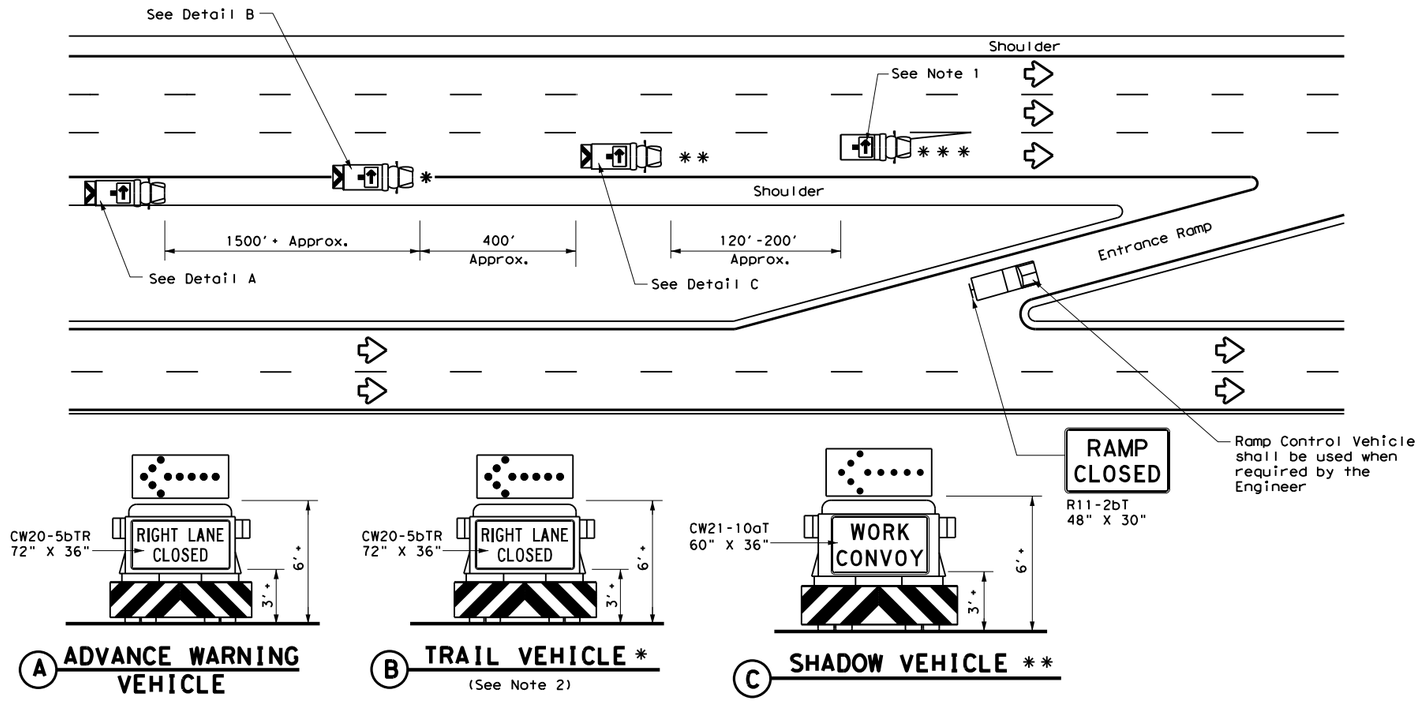
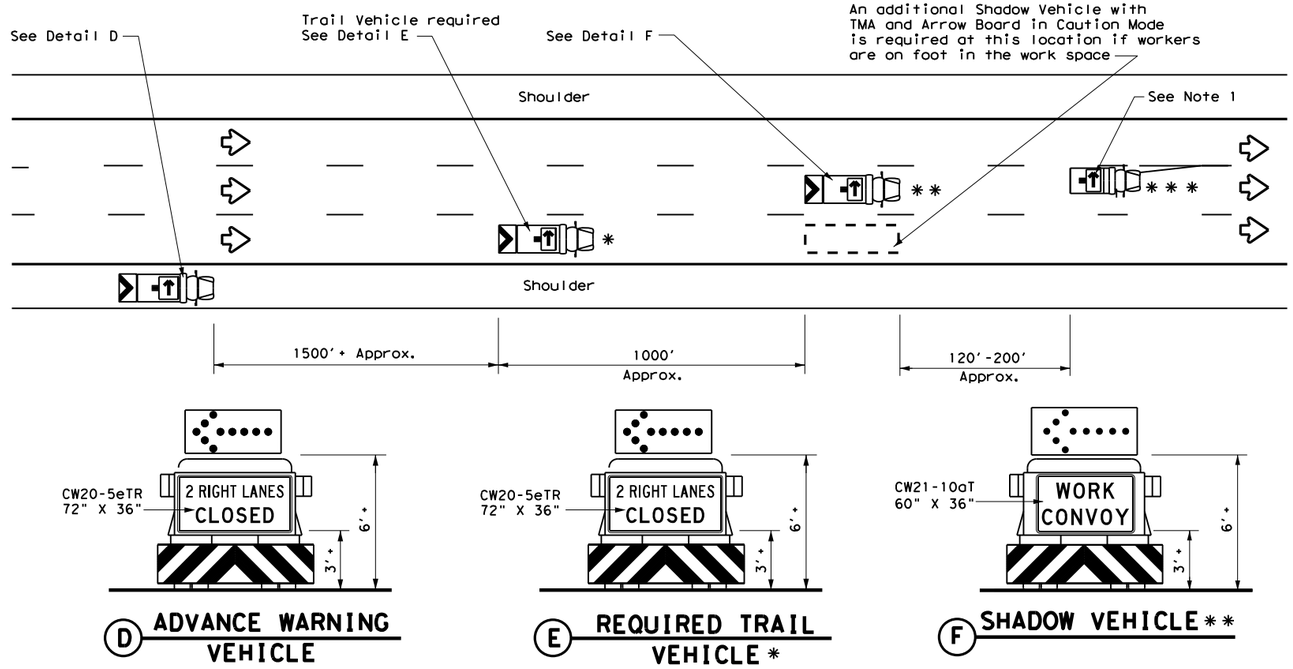


RIGHT LANE CLOSURE ON DIVIDED HIGHWAY - TCP(3-2a)



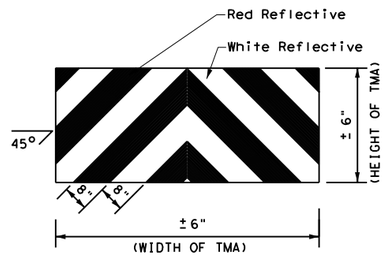
INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

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. ADVANCE WARNING, TRAIL and SHADOW vehicles shall be equipped with Type B or Type C flashing arrow boards as per the Barricade and Construction (BC) standards. Arrow boards on WORK vehicles will be optional based on the type of work being performed. The arrow boards shall be operated from inside the vehicle.
2. For TCP(3-2a) the Engineer will determine if the TRAIL VEHICLE is required based on prevailing roadway conditions, traffic volume, and sight distance restrictions. All other vehicles shown for both TCP(3-2a) and TCP(3-2b) are required.
3. 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.
4. The use of truck mounted attenuators (TMA) on the ADVANCE WARNING, SHADOW, and TRAIL vehicles are required.
5. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DMS 8300, Type A.
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 may vary according to terrain, work activity and other factors.
9. Standard 48" X 48" diamond shaped warning signs with the same message as those shown may be used where adequate mounting space exists.
10. The signs shown should be used on the Advance Warning Vehicle. As an option, a portable changeable message sign (PCMS) or a 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, must 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. Standard diamond shape versions of the CW20-5 series signs may be used as an option if the rectangular signs shown are not available.
12. The principles on this sheet may be used to close lanes from the left side of the roadway considering the number of lanes, shoulder width, sight distance, and ramp frequency.
13. Signs and flashing arrow board modes shall be appropriately altered when implementing left lane closures or interior closures which close the left lanes.
14. The Advance Warning Vehicle may straddle the edgeline when shoulder width makes it necessary.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS

TCP(3-2)-13

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	0915	00	238	VARIOUS
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	SAT	BEXAR		43

176

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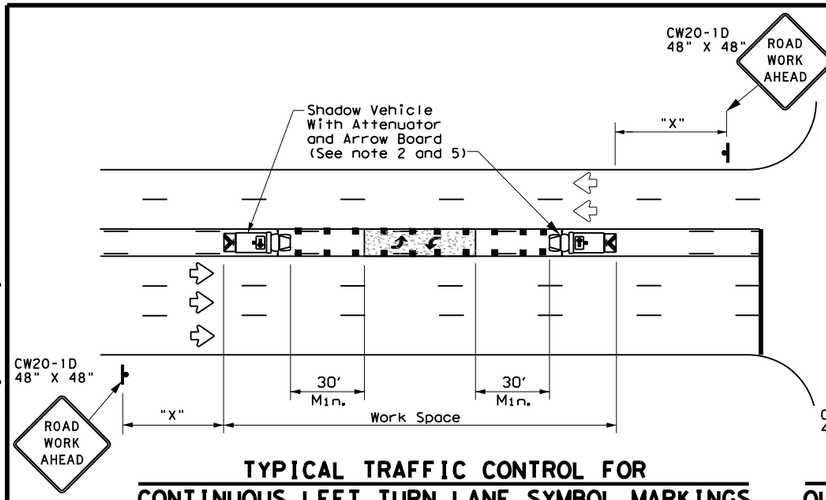
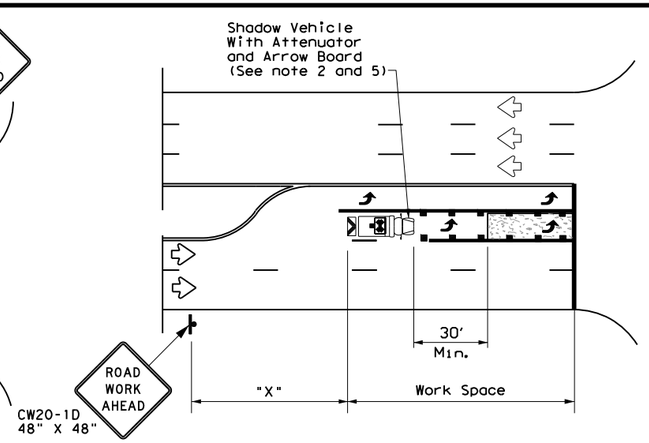
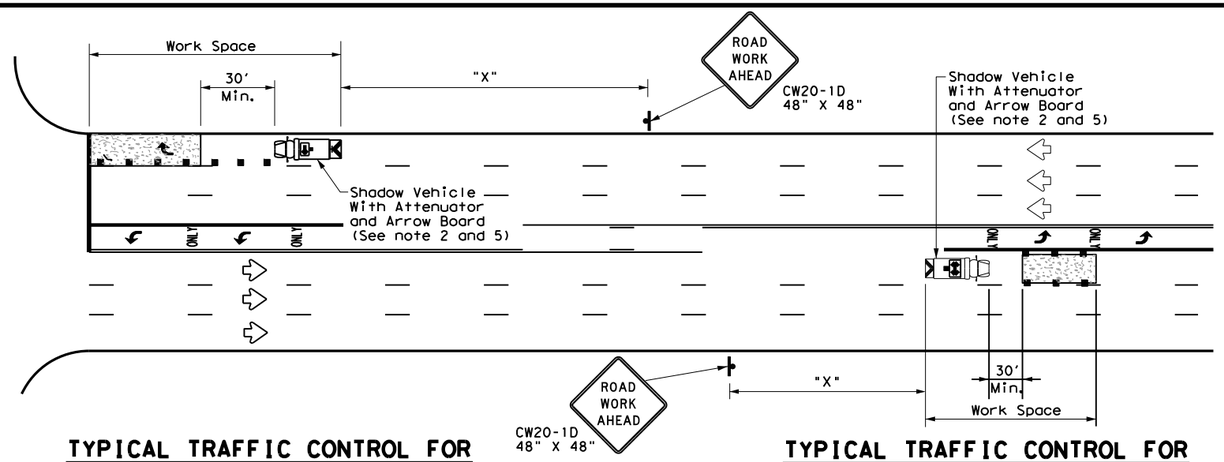


TYPICAL TRAFFIC CONTROL FOR CONTINUOUS LEFT TURN LANE SYMBOL MARKINGS

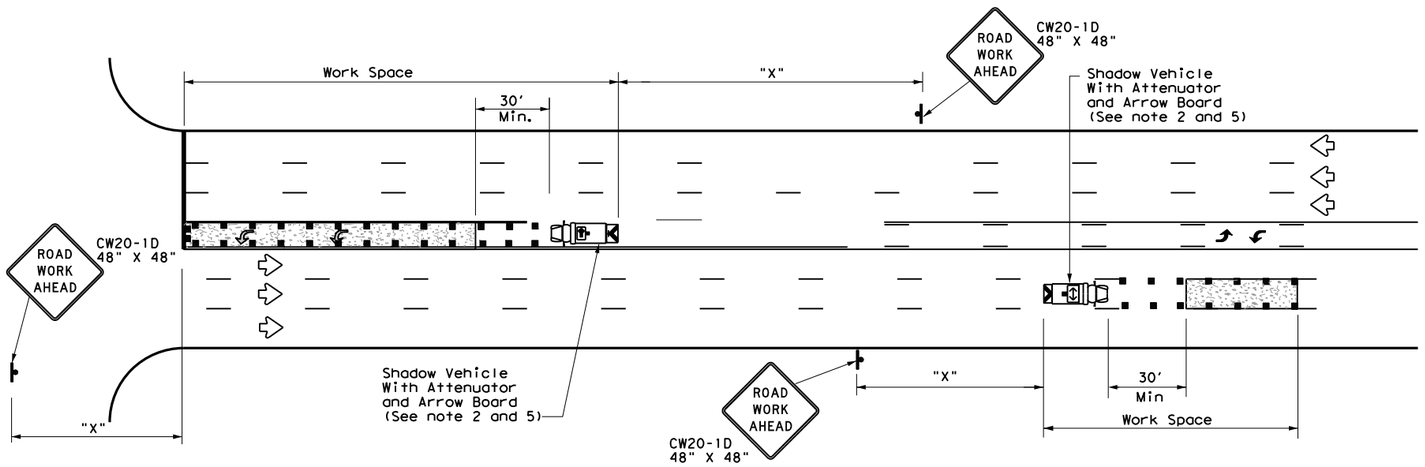


TYPICAL TRAFFIC CONTROL FOR OUTSIDE DUAL LEFT TURN LANE SYMBOL MARKINGS



TYPICAL TRAFFIC CONTROL FOR OUTSIDE LANE MARKINGS

TYPICAL TRAFFIC CONTROL FOR INSIDE LANE MARKINGS



TYPICAL TRAFFIC CONTROL FOR LEFT TURN LANE MARKINGS

TYPICAL TRAFFIC CONTROL FOR CENTER LANE MARKINGS

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	■ ■ ■	Channelizing Devices

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'

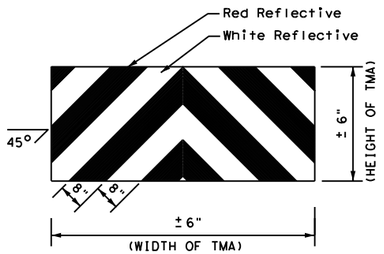
* Conventional Roads Only

** 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. This traffic control plan is for use on conventional roads posted at 45 mph or less and is intended for mobile operations that move continuously or intermittently (stopping up to approximately 15 minutes) such as short-line striping and in-lane rumble strips. When activities are anticipated to take longer amounts of time or traffic conditions warrant, a short duration or short-term stationary traffic control plan should be used.
2. A Truck Mounted Attenuator shall be used on Shadow Vehicle. Striping on the back panel of all truck mounted attenuators shall be 8" red and white reflective sheeting placed in an inverted "V" design. Reflective sheeting shall meet or exceed the reflectivity and color requirements of departmental material specification DMS-8300, Type A.
3. All traffic control devices shall be in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD), latest edition.
4. The use of yellow rotating beacons or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the drivers side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
5. Flashing arrow board shall be used on Shadow Vehicle. Flashing arrow board shall be Type B or Type C as per BC Standards. The arrow board operation shall be controlled from inside the truck.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS FOR ISOLATED WORK AREAS UNDIVIDED HIGHWAYS

TCP(3-4)-13

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© TxDOT July, 2013	CONT	SECT	JOB	HIGHWAY
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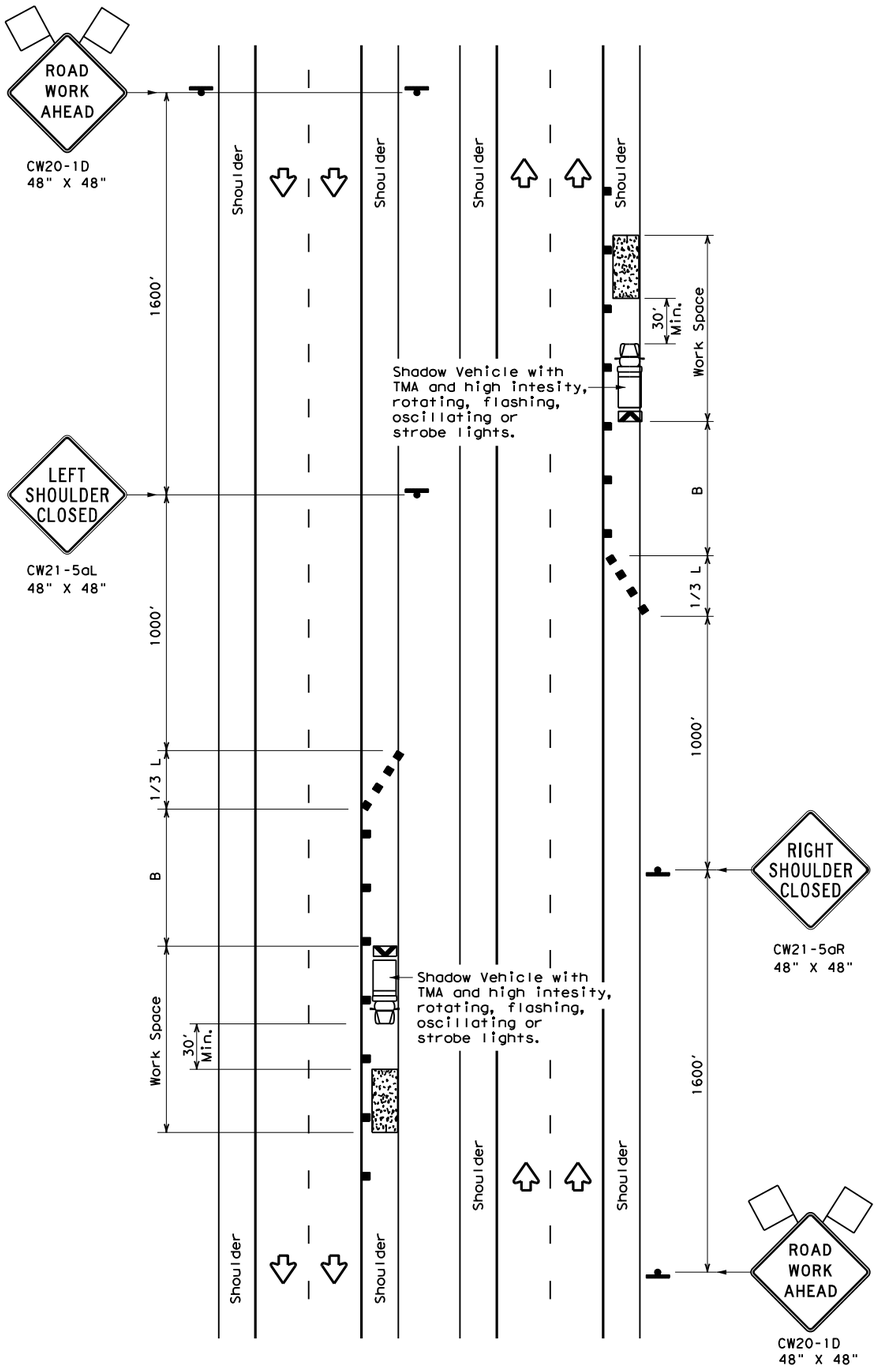
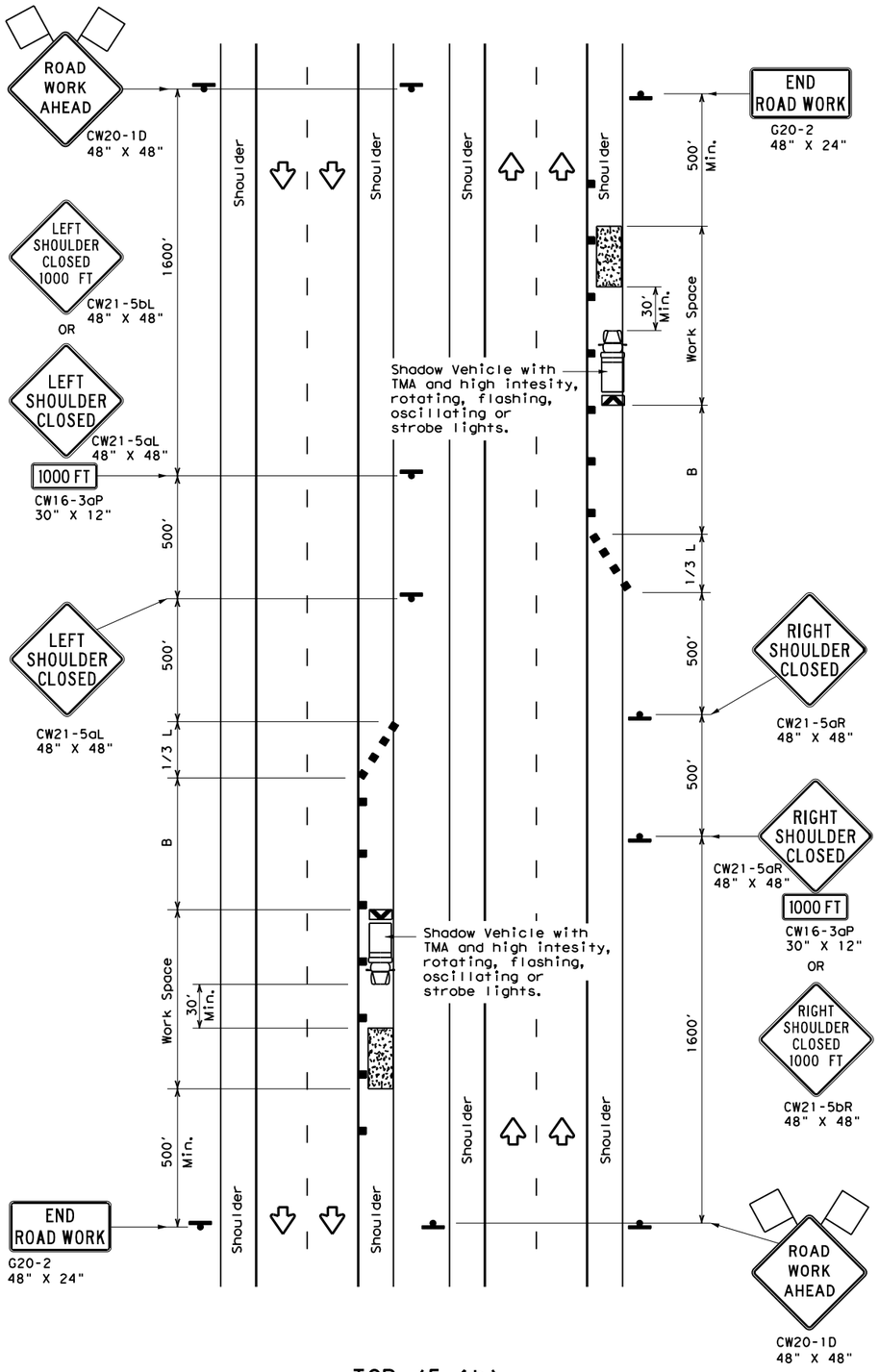


TCP (5-1a)

WORK AREA ON SHOULDER



TCP (5-1b)

WORK AREA ON SHOULDER

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN SHOULDER WORK FOR FREEWAYS / EXPRESSWAYS

TCP(5-1)-18

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©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
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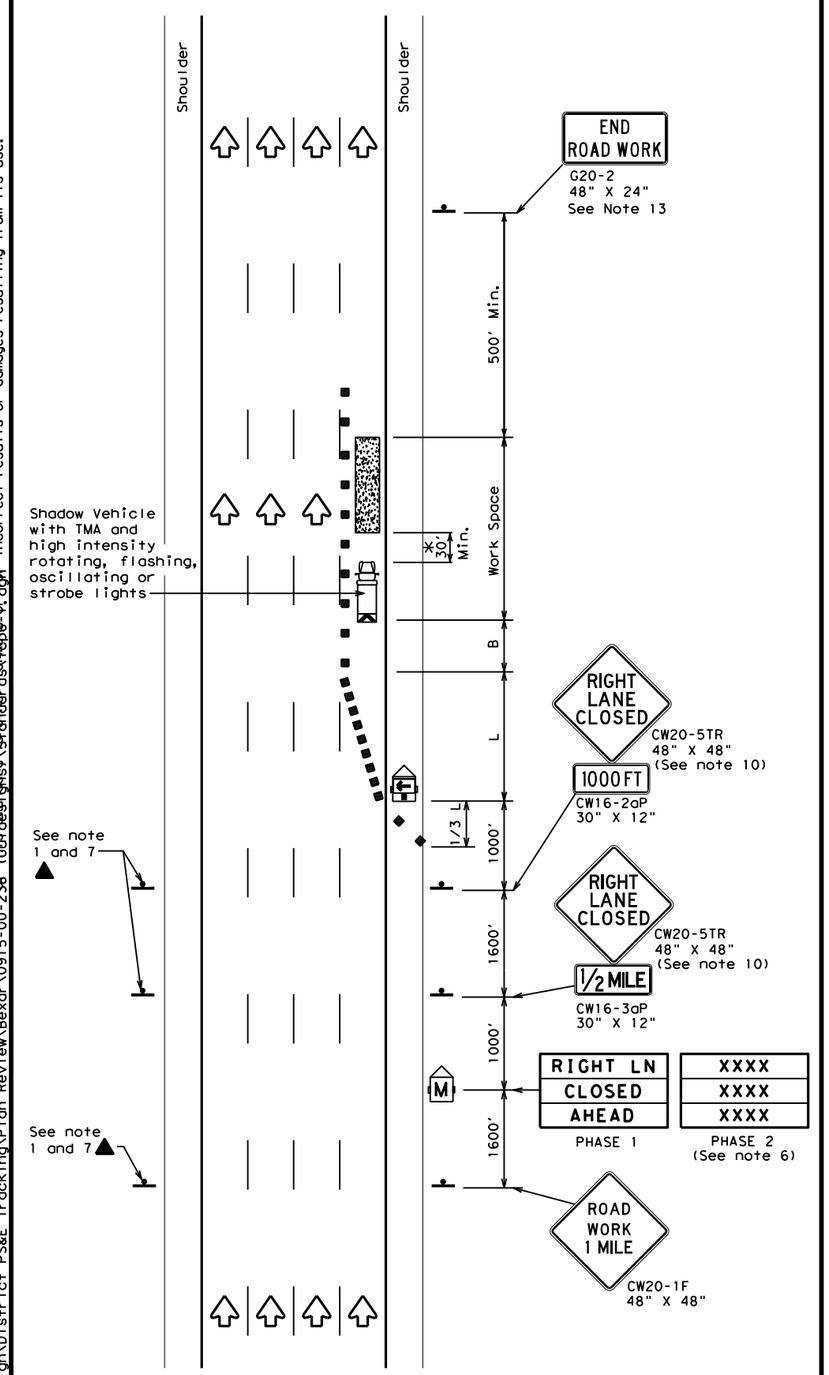
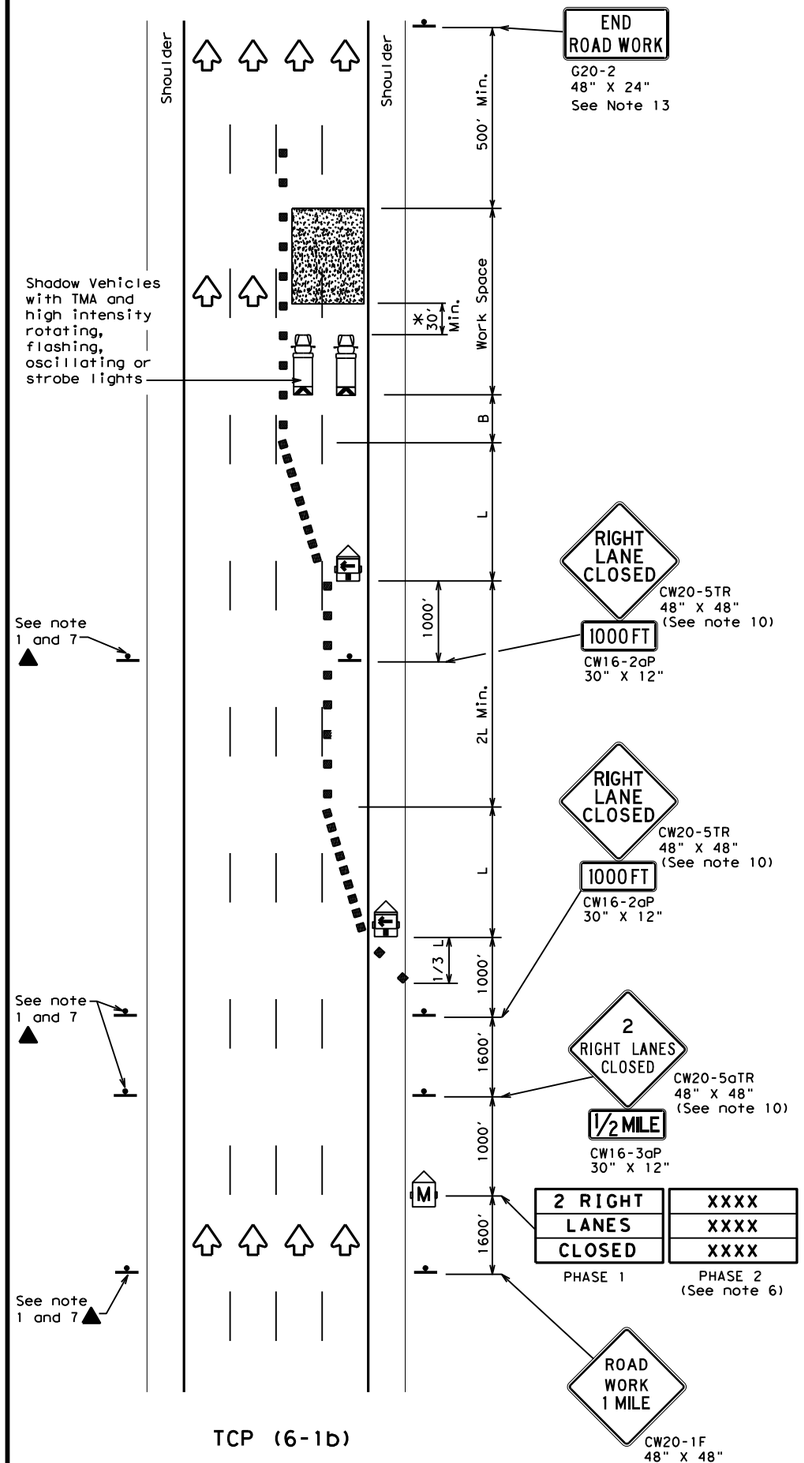


TCP (6-1a)

TYPICAL FREEWAY ONE LANE CLOSURE



TCP (6-1b)

TYPICAL FREEWAY TWO LANE CLOSURE

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 "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

** 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. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. Drums or 42"cones are the typical channelizing devices. For Intermediate Term Stationary work, drums shall be used on tapers with drums or 42" cones used on tangent sections. Other channelizing devices may be used as directed by the Engineer.
3. All construction signs and barricades placed during any phase of work shall remain in place until removal is approved by the Engineer.
4. The Engineer may direct the Contractor to furnish additional signs and barricades as required to maintain traffic flow, detours and motorist safety during construction.
5. Static message boards or changeable message signs stating the date and duration of ramp or freeway lane closures shall be placed a minimum of seven (7) calendar days in advance of the actual closure.
6. Phase 2 of the PCMS message should include appropriate information formatted as shown on BC(6), such as "MERGE LEFT," recommended advisory speed, delay information, or other specific warnings.
7. Duplicate construction warning signs should be erected on the medians side of freeways where median width will permit and traffic volume justifies the signing.
8. The number of closed lanes may be increased provided the spacing of traffic control devices, taper lengths and tangent lengths meet the requirements of the TMUTCD.
9. Warning signs for intermediate term stationary work should be mounted at 7' to the bottom of the sign.
10. Warning signs shown shall be appropriately altered for left lane closures. When signs are mounted at 1' height for short term stationary or short duration work, sign versions shown in the SHSD for Texas with distances on the sign face rather than mounted on a plaque below the sign may be used.
11. When possible, PCMS units should be located in advance of the last available exit ramp prior to the lane closure to allow motorists an alternate route. They may also be relocated to improve advance warning in case of unanticipated queuing or congestion.
12. For Intermediate Term Stationary work at night, floodlights should be used to illuminate the work area and equipment crossings. Floodlights shall not produce a disabling glare condition for road users or workers.
13. The END ROAD WORK (G20-2) sign may be omitted when it conflicts with G20-2 signs already in place on the project.

* A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN FREEWAY LANE CLOSURES

TCP(6-1)-12

FILE: tcp6-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-12	0915	00	238	VARIOUS
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		46

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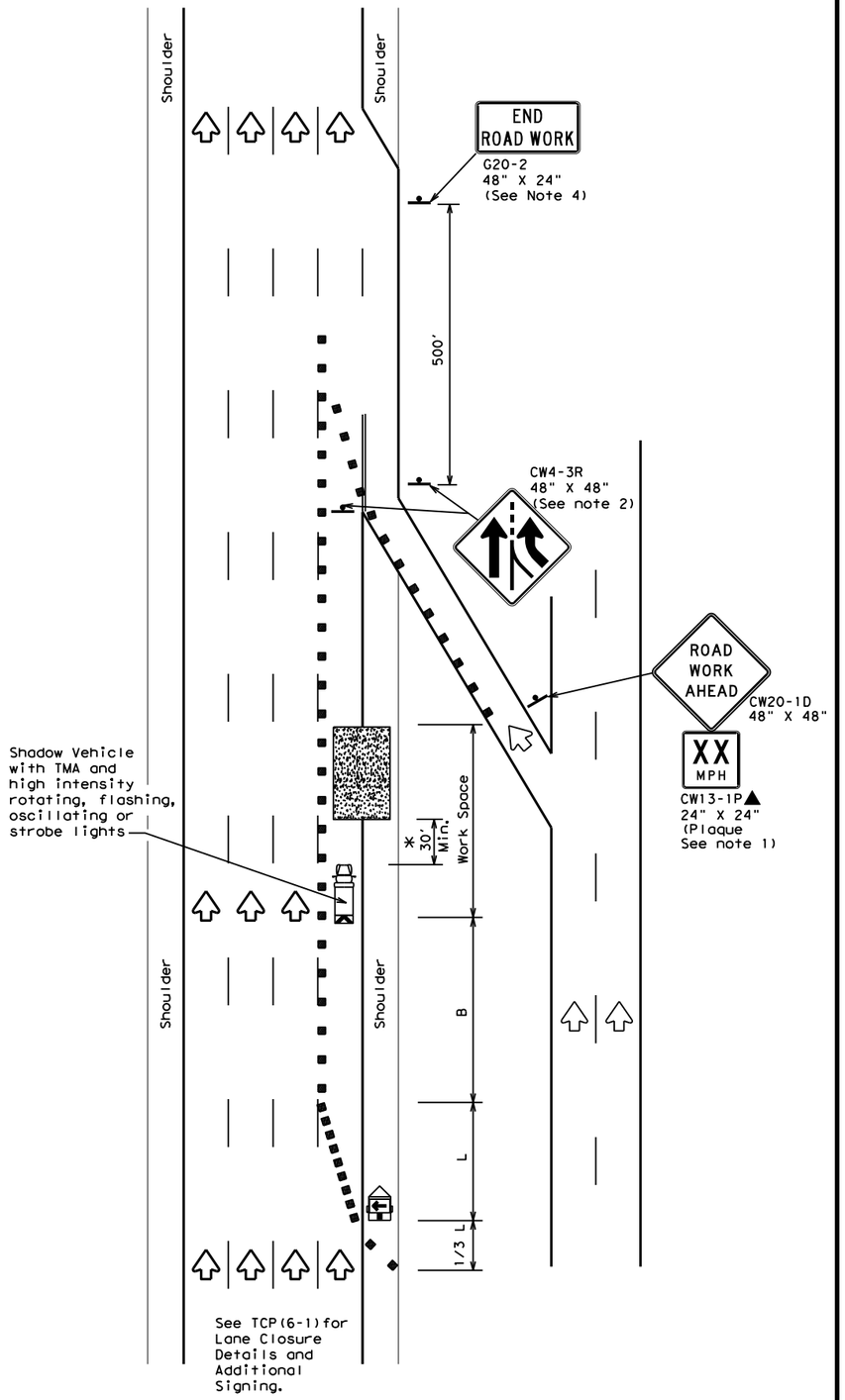
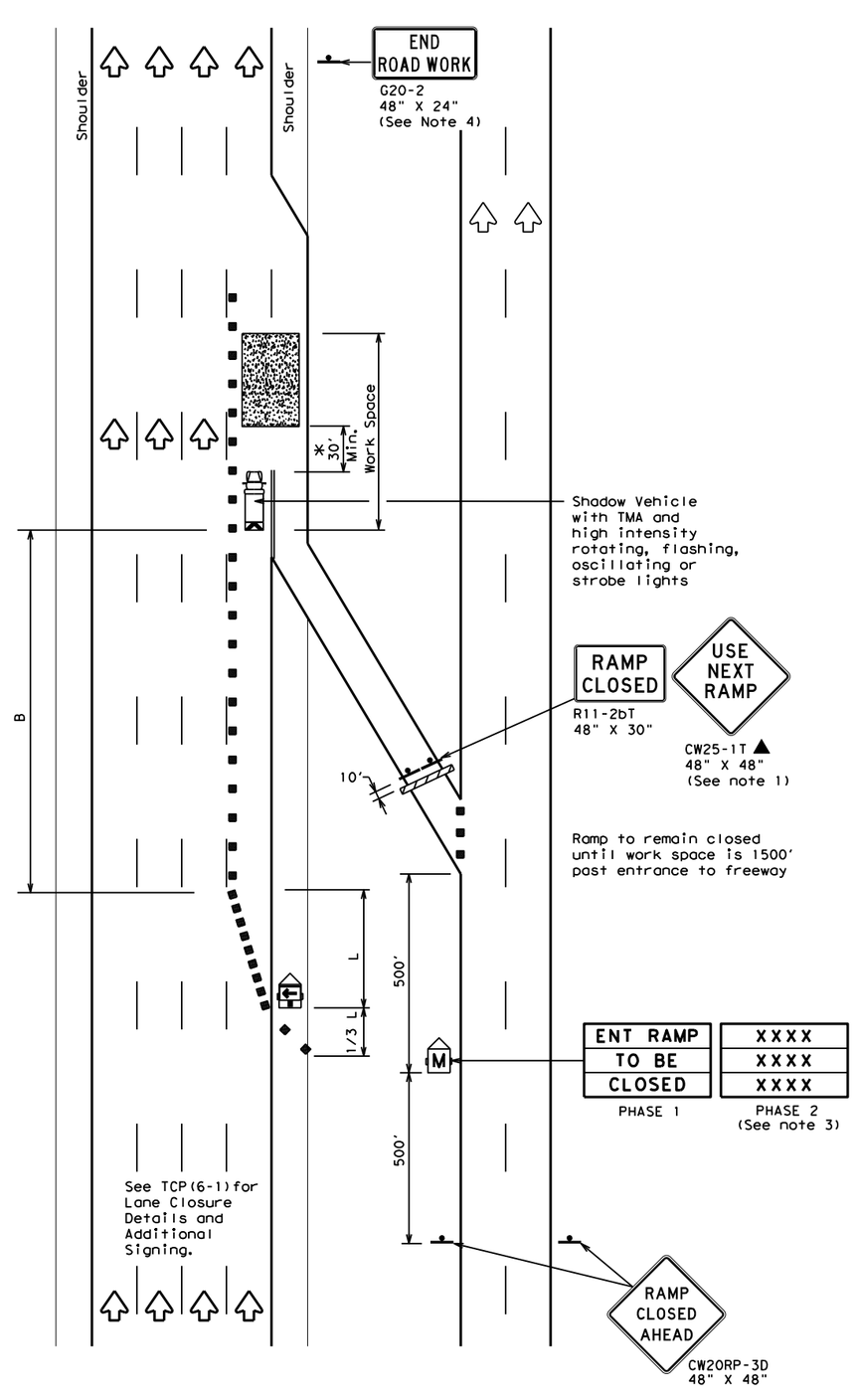


TCP (6-2a)

ENTRANCE RAMP OPEN
WORK WITHIN 500' OF RAMP



TCP (6-2b)

ENTRANCE RAMP CLOSED

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 "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

** 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. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. ADDED LANE Symbol (CW4-3) sign may be omitted when sign between ramp and mainlane can be seen from both roadways.
3. See "Advance Notice List" on BC(6) for recommended date and time formatting options for PCMS Phase 2 message.
4. The END ROAD WORK (G20-2) sign may be omitted when it conflicts with G20-2 signs already in place on the project.

*A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA NEAR RAMP

TCP(6-2)-12

FILE: tcp6-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	00	238	VARIOUS
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	SAT	BEXAR		47

DATE: 2/25/2022 10:02:09 AM
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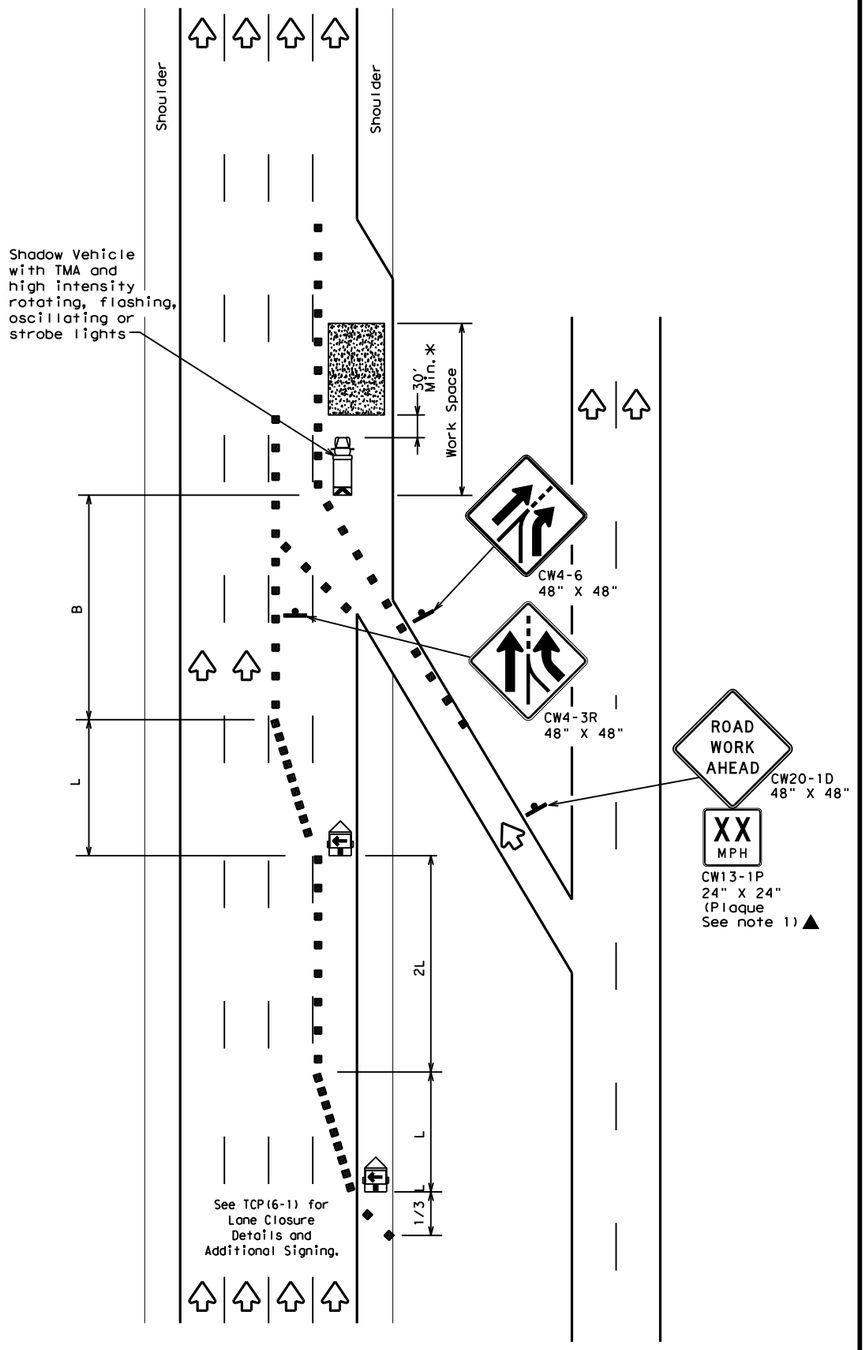
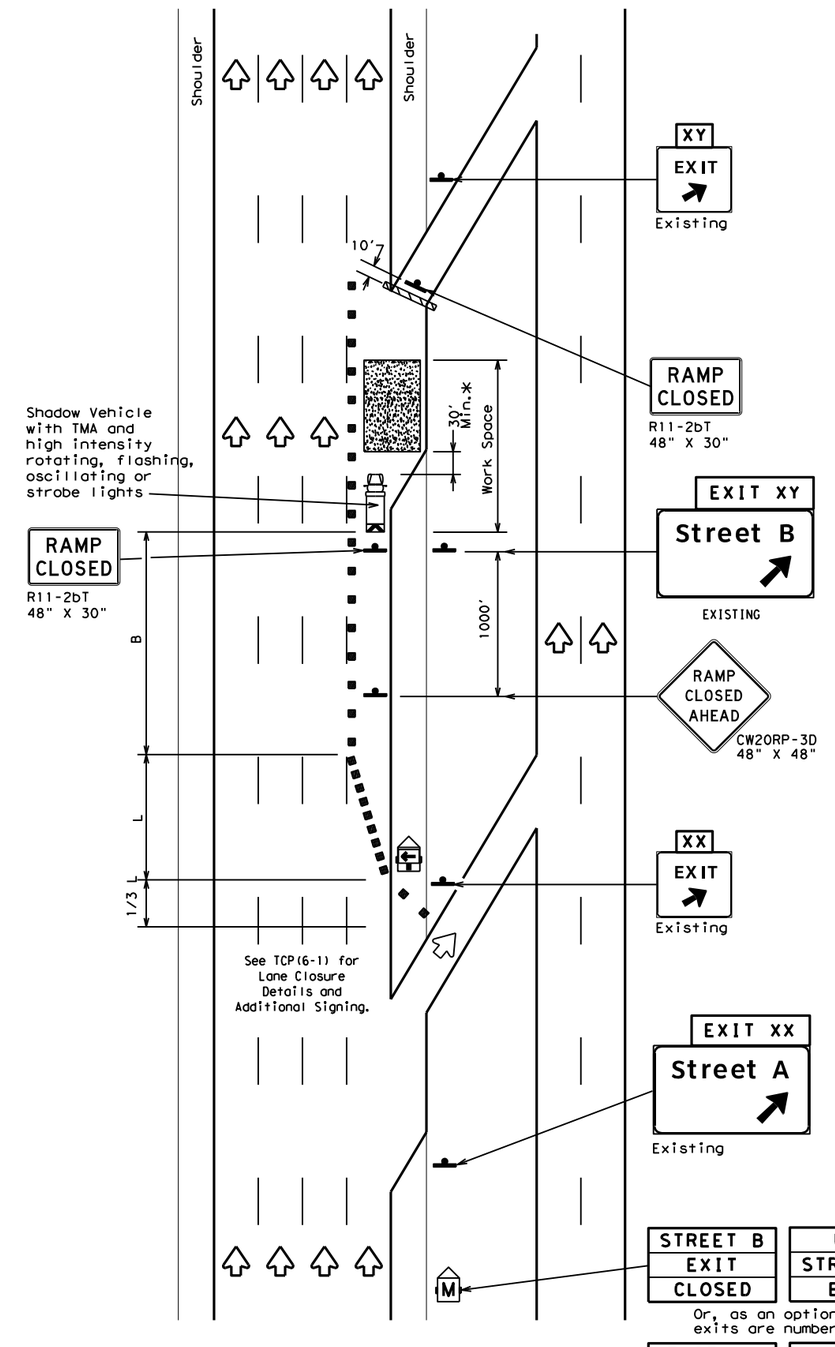


TCP (6-3a)

ENTRANCE RAMP OPEN



TCP (6-3b)

EXIT RAMP CLOSED
TRAFFIC EXITS PRIOR TO CLOSED RAMP

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 "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

** 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. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.

*A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA BEYOND RAMP

TCP(6-3)-12

FILE: tcp6-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	00	238	VARIOUS
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	SAT	BEXAR		48

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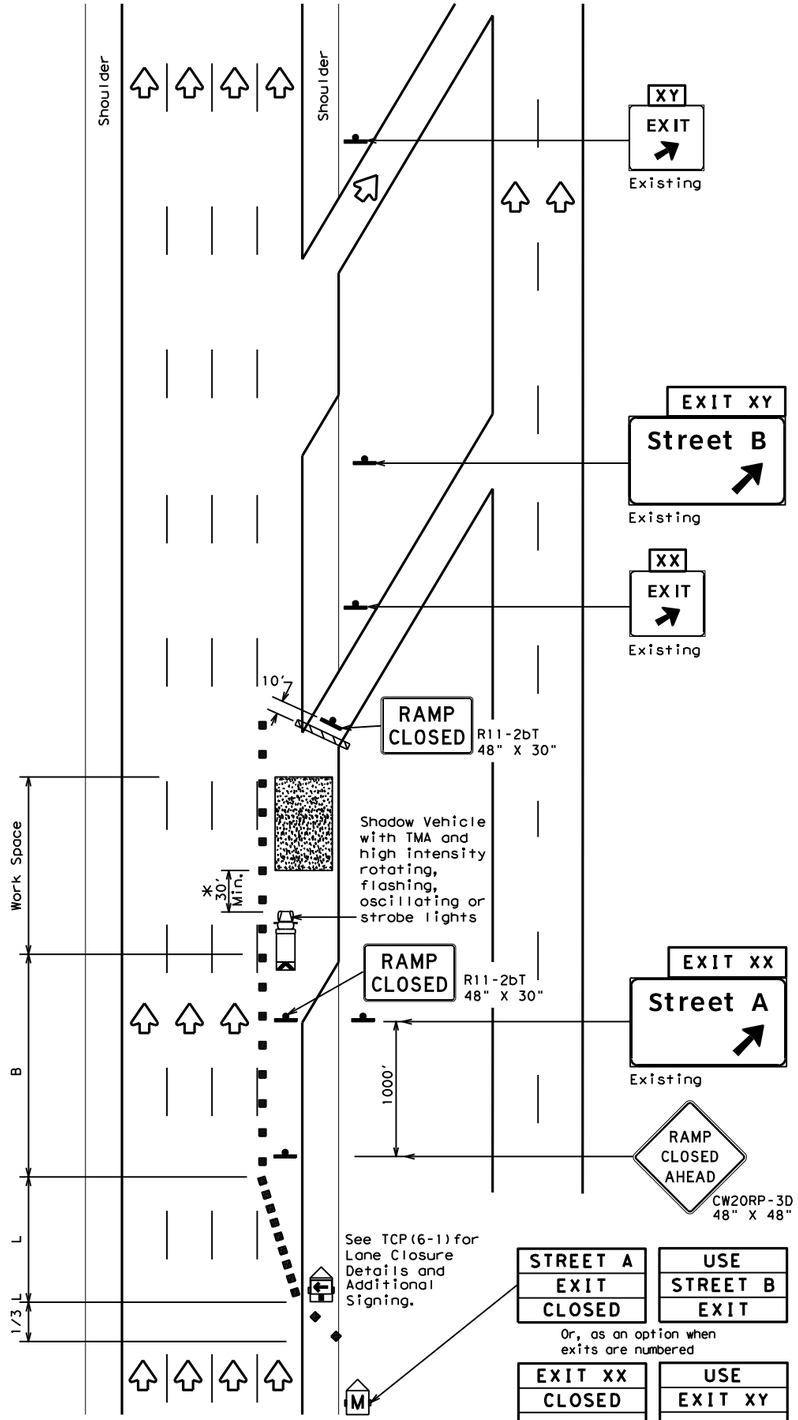
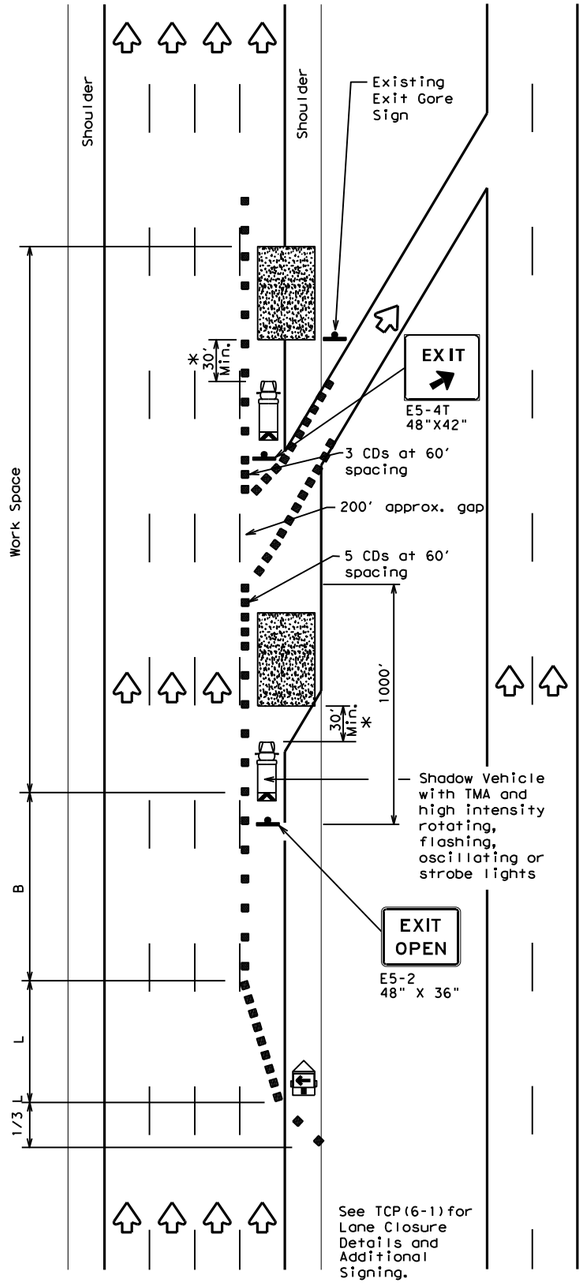


TCP (6-4a)

EXIT RAMP CLOSED
TRAFFIC EXITS PAST CLOSED RAMP



TCP (6-4b)

EXIT RAMP OPEN

LEGEND

	Type 3 Barricade		Channelizing Devices (CDs)
	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 "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

** 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. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. See BC Standards for sign details.

*A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA AT EXIT RAMP

TCP(6-4)-12

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©TxDOT Feburary 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	00	238	VARIOUS
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	SAT	BEXAR		49

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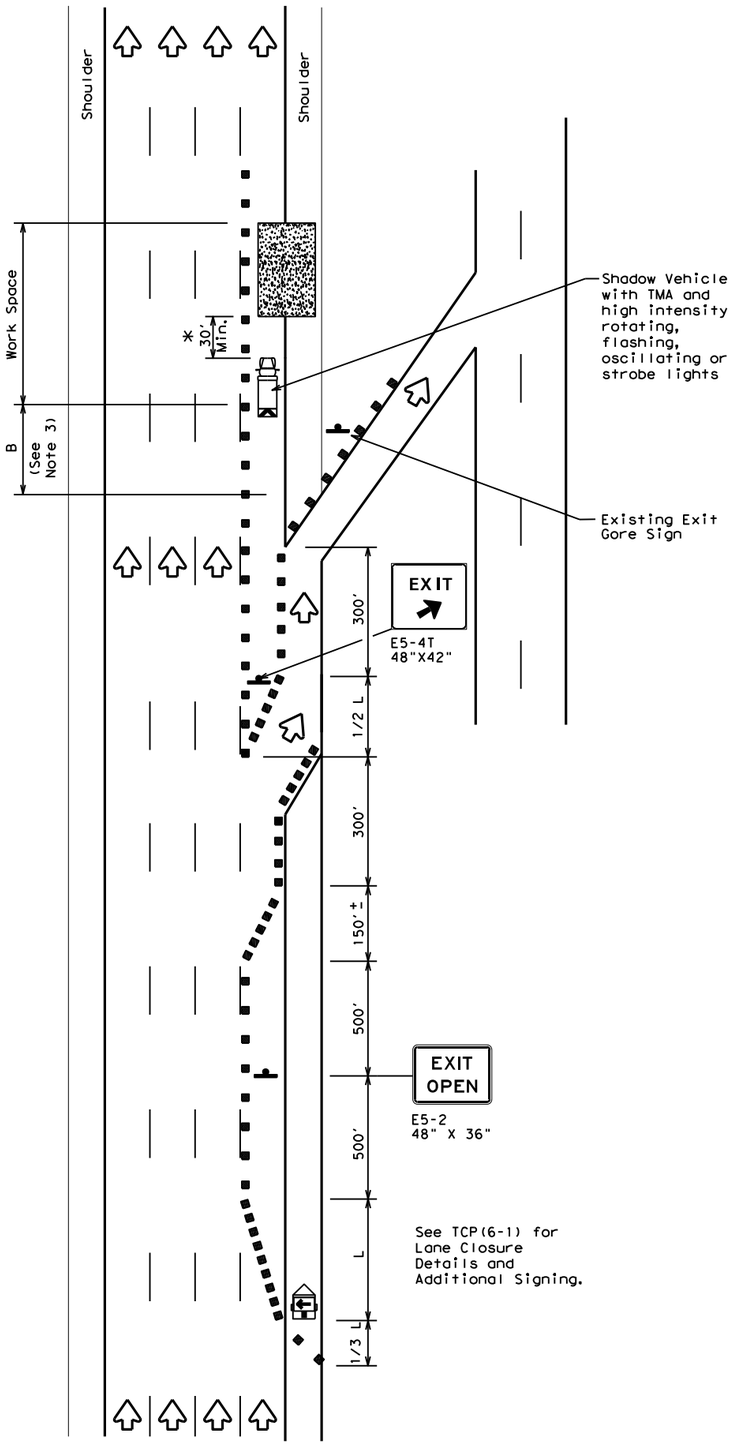
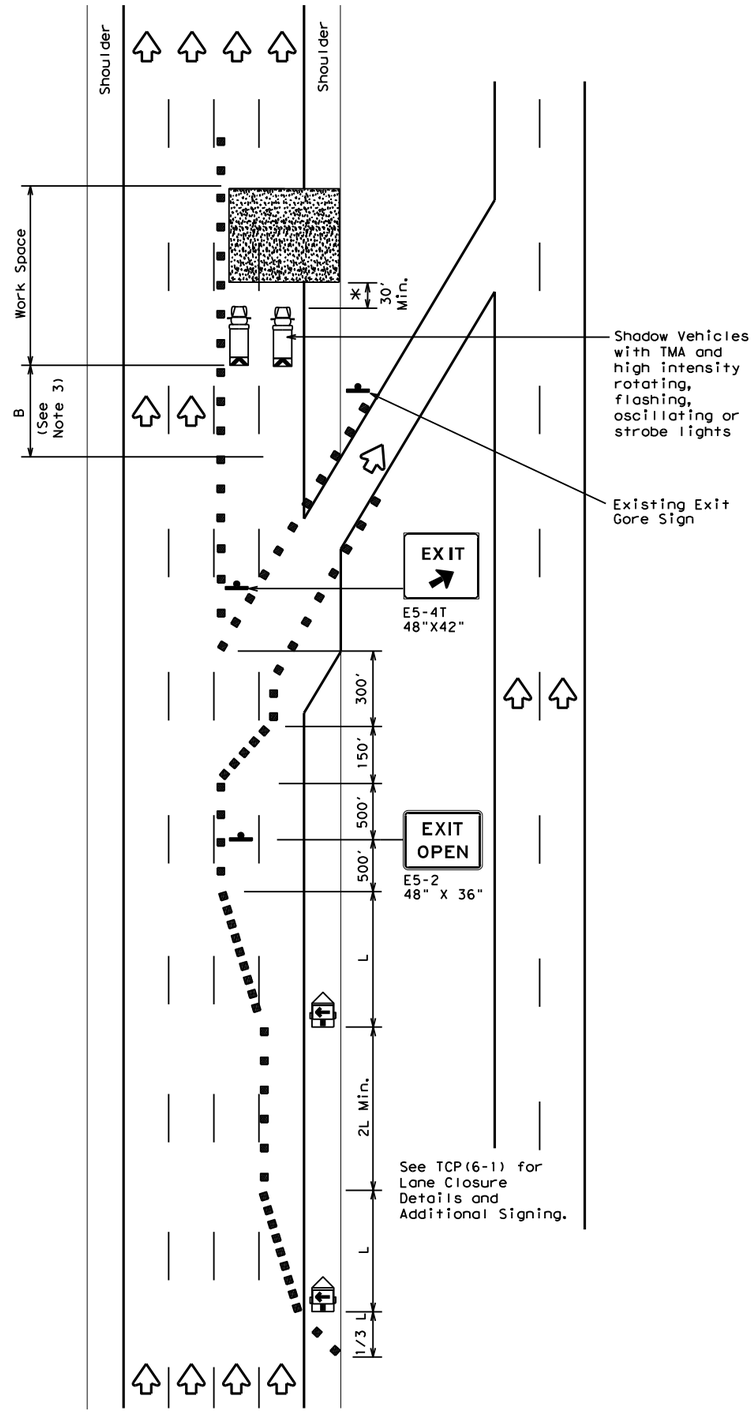


TCP (6-5a)

EXIT RAMP OPEN



TCP (6-5b)

EXIT RAMP OPEN
TWO LANE CLOSURE WITHIN 1500' PAST EXIT RAMP

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 "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

** 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. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. See BC standards for sign details.
3. If adequate longitudinal buffer length "B" does not exist between the work space and the exit ramp, consideration should be given to closing the ramp.

*A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA BEYOND EXIT RAMP

TCP(6-5)-12

FILE: tcp6-5.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT Feburary 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	00	238	VARIOUS
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	SAT	BEXAR		50

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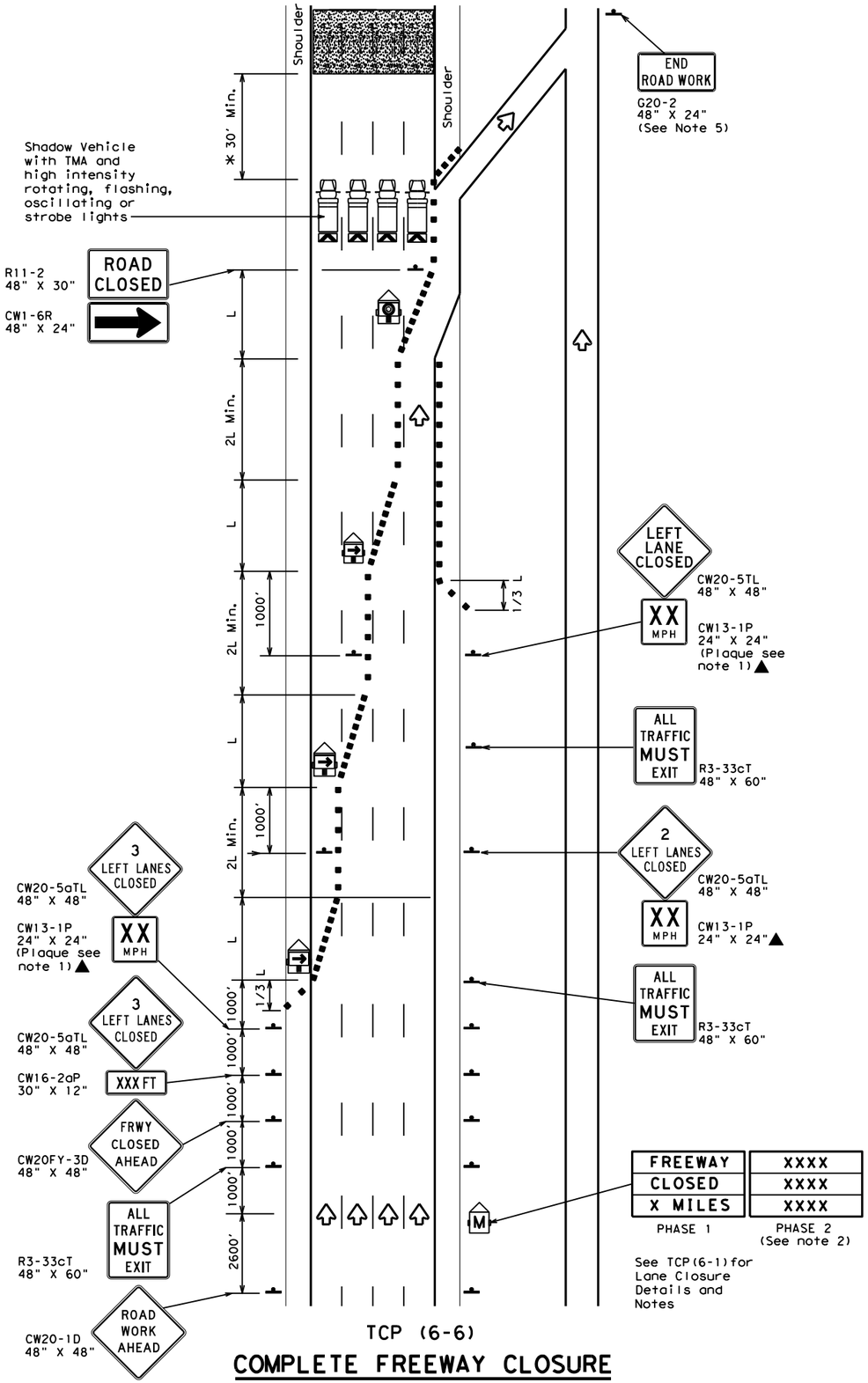

TCP (6-6)

COMPLETE FREEWAY CLOSURE

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

Posted Speed	Formula	Minimum Desirable Taper Lengths "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

** 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. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. Phase 2 of the PCMS message should include appropriate information formatted as shown on BC(6), such as "MERGE RIGHT," recommended speed, delay, exit information, or other specific warnings.
3. Where queuing is anticipated beyond signing shown, additional PCMS signs, other warning signs, devices or Law Enforcement Officers should be available to warn approaching high speed traffic of the end of the queue, as directed by the Engineer.
4. Entrance ramps located from the advance warning area to the exit ramp should be closed whenever possible.
5. The END ROAD WORK (G20-2) sign may be omitted when it conflicts with G20-2 signs already in place on the project.

* A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN FREEWAY CLOSURE

TCP(6-6)-12

FILE: tcp6-6.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	00	238	VARIOUS
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	SAT	BEXAR		51

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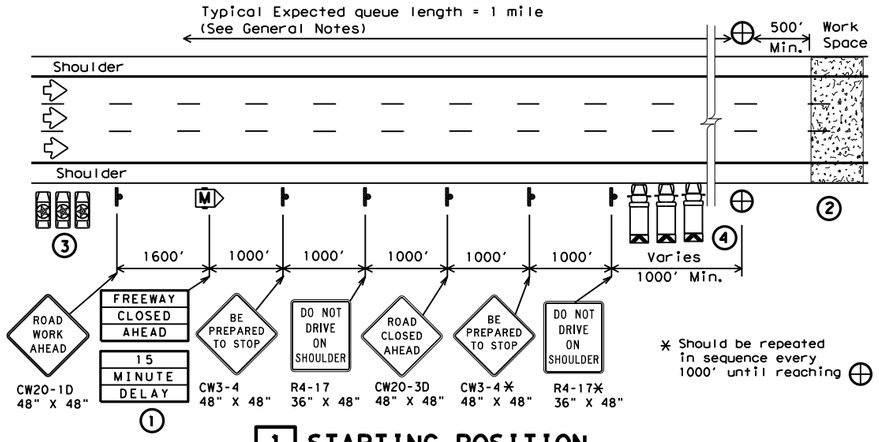


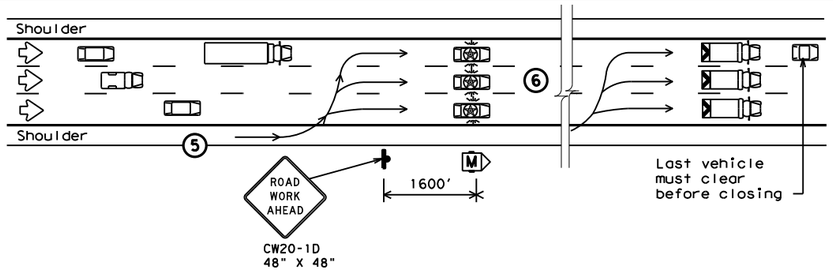
1 STARTING POSITION

① Traffic control devices should be installed or located near their intended position prior to beginning temporary roadway closure sequence. Duplicate signs should be erected on the median side of the roadway when median width permits. Warning signs should not be placed on the paved shoulders that will be used by the WARNING LEOV, or where movement of the LEOVs or barrier vehicles will be impeded.

② Prior to beginning the roadway closure sequence, all equipment, materials, personnel, and other items necessary to complete the work should be gathered near the work area. Entrance ramps located in the area where a queue is expected to build should be closed.

③ There should be one LEOV for every lane to be controlled, plus a minimum of one to warn traffic approaching a queue. An additional lead law enforcement officer is desirable to remain with the Engineer's or Contractor's point of contact (POC) during the operation in order to improve communication with all LEOVs involved.

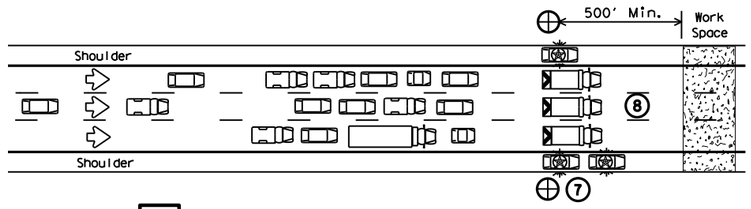
④ One barrier vehicle with a Truck Mounted Attenuator and amber or blue and amber high intensity flashing/oscillating/strobe lighting shall be used for each lane to be closed.



2 REDUCING SPEED OPERATION

⑤ Starting position of the LEOVs should be in advance of the most distant warning signs.

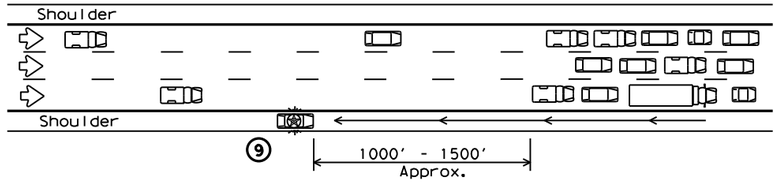
⑥ Once the LEOVs have achieved an abreast blocking formation while traveling toward the CP, emergency lights and headlights should be turned "ON". The LEOVs should maintain formation, not allow traffic to pass, and begin to decelerate. The LEOVs should continue to decelerate, giving the barrier vehicles opportunity to be staged upstream of the work space after traffic has cleared. The LEOVs should then continue to decelerate slowly until bringing traffic to a stop near the barrier vehicles.



3 ALL TRAFFIC STOPPED AT CP

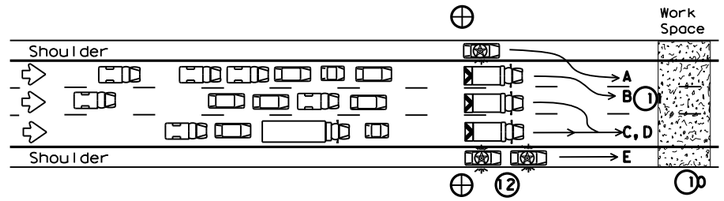
⑦ Once traffic is stopped the LEOVs should park on the shoulders with emergency lighting "ON" in order to provide law enforcement presence at the closure and keep shoulders blocked ahead of the work space. They should stay in radio contact with the WARNING LEOV.

⑧ The barrier vehicles should be parked, one in each lane, the parking brake set, with the high visibility flashing/oscillating/strobe lighting "ON," and the transmission in gear.



4 WARNING THE TRAFFIC QUEUE

⑨ The WARNING LEOV should proceed to the right shoulder of the roadway, with emergency lights on approximately 1000' in advance of the traffic queue (stopped traffic) as the queue develops. When determined that limited sight distance situations (crest of hills, sharp roadway curvature, etc.) may occur to motorists approaching the queue, the WARNING LEOV may proceed ¼ mile or more in advance of the queue.



5 RELEASING STOPPED TRAFFIC

⑩ All equipment, materials, personnel, and other items should be removed from the roadway and maintain an adequate clear zone.

⑪ When the roadway is clear for traffic, the LEOV should proceed forward from the left shoulder followed by the barrier vehicles, from left to right, as shown alphabetically in the plan view.

⑫ The LEOV or LEOVs on the right shoulder may remain on the shoulder until satisfied that traffic is moving satisfactorily before merging or proceeding.

⑬ LEOVs and barrier vehicles should re-group at their respective starting positions if necessary.

LEGEND			
■ ■	Channelizing Devices	⊕	Control Position (CP)
M	Portable Changeable Message Sign (PCMS)		Barrier Vehicle with Truck Mounted Attenuator
	Law Enforcement Officer's Vehicle(LEOV)		Traffic Flow

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

GENERAL NOTES

1. All traffic control devices shall conform with the latest edition of the Texas Manual on Uniform Traffic Control Devices (TMUTCD). Additional guidelines for traffic control devices may be found in the TMUTCD. Signs conflicting with the roadway closure sequence should be completely removed or covered. Additional traffic control devices may be required for closure of access roads, cross streets, exit and entrance ramps as directed by the Engineer.

2. Law enforcement officers and all workers involved should review and understand all procedures before the roadway closure sequence begins. Pre-work meetings may be held for this purpose. Local emergency services and media should have advance notification of roadway closure, expected dates and approximate times of closures.

3. Law enforcement officers shall be in uniform and have jurisdiction in the locale of the work area. An additional WARNING Law Enforcement Officer's Vehicle (LEOV) may be used on the median side of the roadway where median shoulder width permits (See sequence #9).

4. The roadway closure should be during off-peak hours, as shown in the plans, or as directed by the Engineer.

5. Work should be limited to approximately 15 minutes maximum duration unless otherwise directed by the Engineer based on existing roadway conditions. If the work is not complete within 15 minutes, or if the end of the traffic queue extends past the most distant advance warning signs, the work area should be cleared of all equipment, materials, personnel, and other items, and the roadway reopened. When the queue has dissipated and the traffic flow appears normal the roadway closure sequence may be repeated.

6. For traffic volumes greater than 1000 Passenger Cars Per Hour Per Lane (PCPHPL), or for roadway closures that exceed 15 minutes, see details elsewhere in the plan.

7. If traffic queues beyond the advance warning signs during one road closure sequence, the advance warning should be extended prior to repeating the road closure sequence. When possible, PCMS signs should be located in advance of the last available exit prior to the closure to allow motorists the choice of an alternate route.

THIS PLAN IS INTENDED TO BE USED AT LOCATIONS/TIMES WHEN TRAFFIC VOLUMES ARE LESS THAN 1000 PASSENGER CARS PER HOUR PER LANE.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN SHORT DURATION FREEWAY CLOSURE SEQUENCE

TCP(6-7)-12

FILE: tcp6-7.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	00	238	VARIOUS
1-97 8-12	DIST	COUNTY		SHEET NO.
4-98	SAT	BEXAR		52

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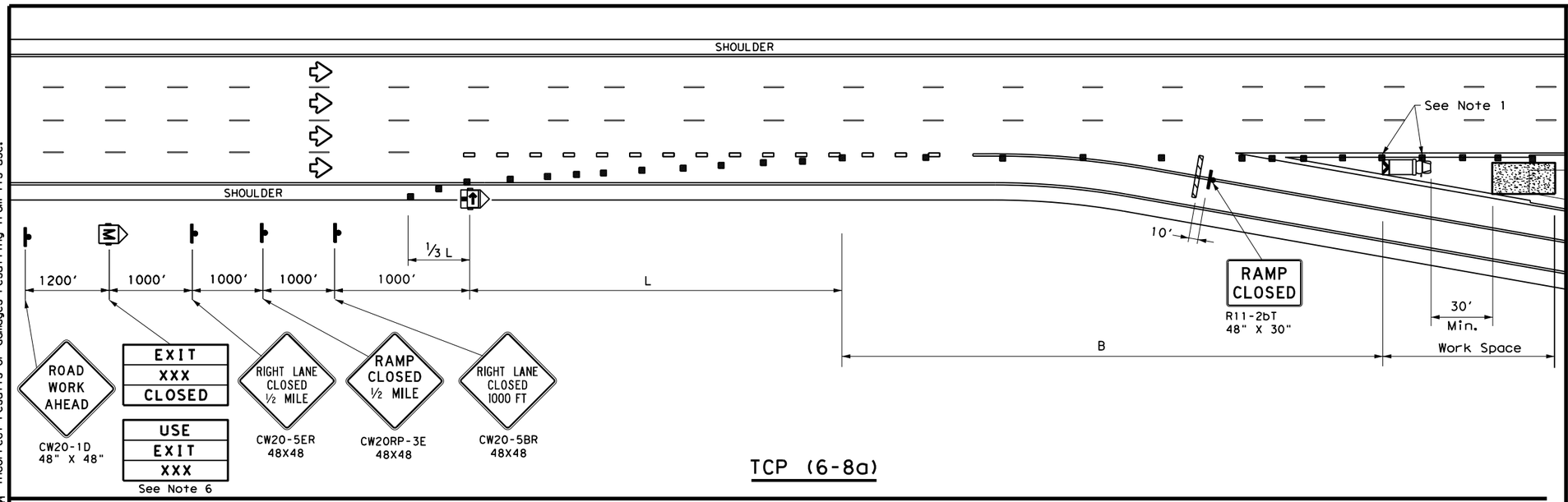
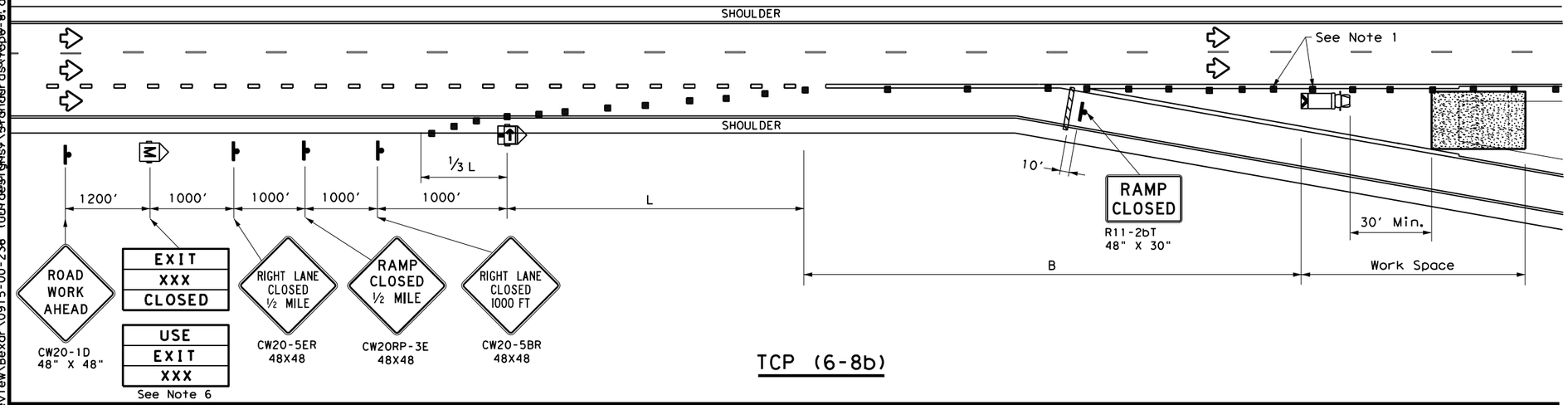
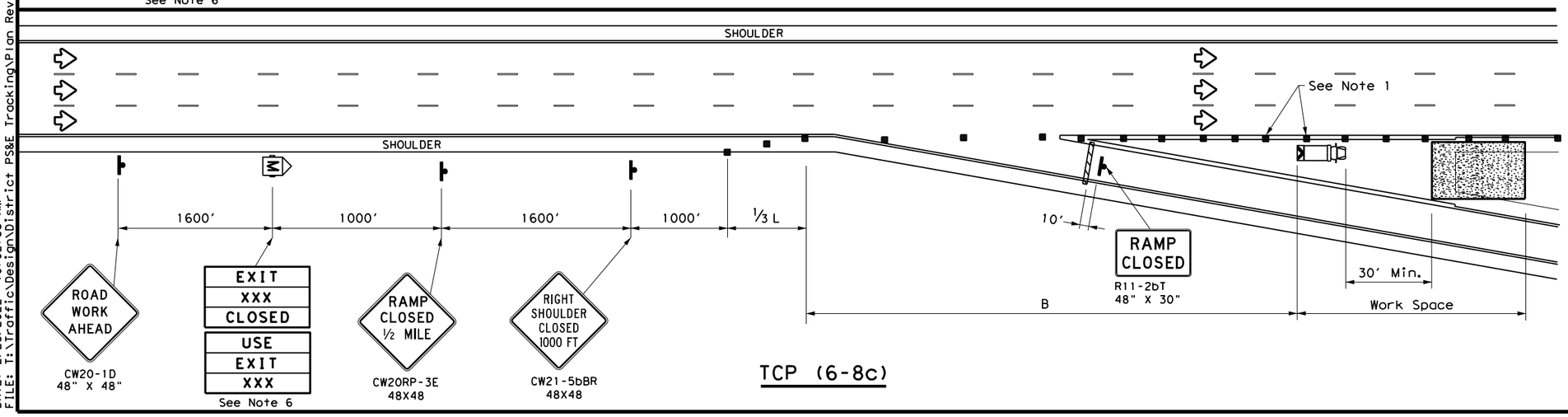


TCP (6-8a)



TCP (6-8b)



TCP (6-8c)

LEGEND

	Type 3 Barricade	■ ■	Channelizing Devices (CDs)
	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 "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

** 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. Place channelizing devices in the gore at 20' spacing.
2. See the Standard Highway Sign Design for Texas (SHSD) for sign details.
3. The PCMS may be omitted when a permanent DMS sign is available in an appropriate location to display a similar message as called for on the PCMS.
4. When it is determined that a through lane should be closed in addition to the exit ramp, refer to TCP(6-4) for traffic control details.
5. Truck mounted attenuator is required.
6. The PCMS may be omitted if replaced with a "RAMP CLOSED" AHEAD (CW20RP-3D) Sign.
7. Roadway ADT should be greater than 10,000.

Texas Department of Transportation

Traffic Operations Division Standard

WORK IN EXIT GORE FOR ADT GREATER THAN 10,000

TCP(6-8)-14

FILE: tcp6-8.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	00	238	VARIOUS
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		53

DATE: 2/25/2022 10:02:37 AM
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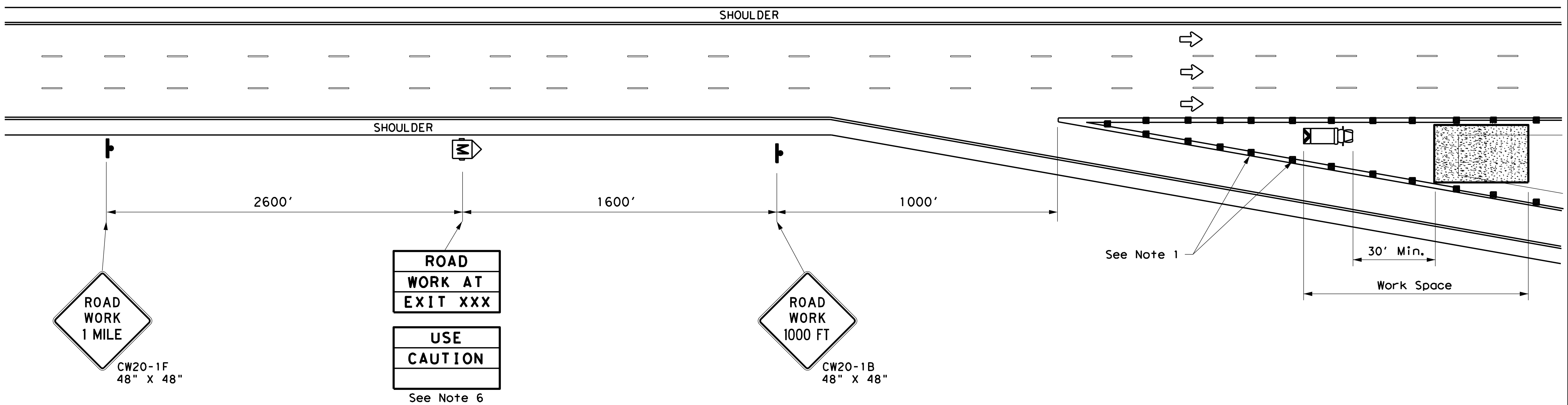
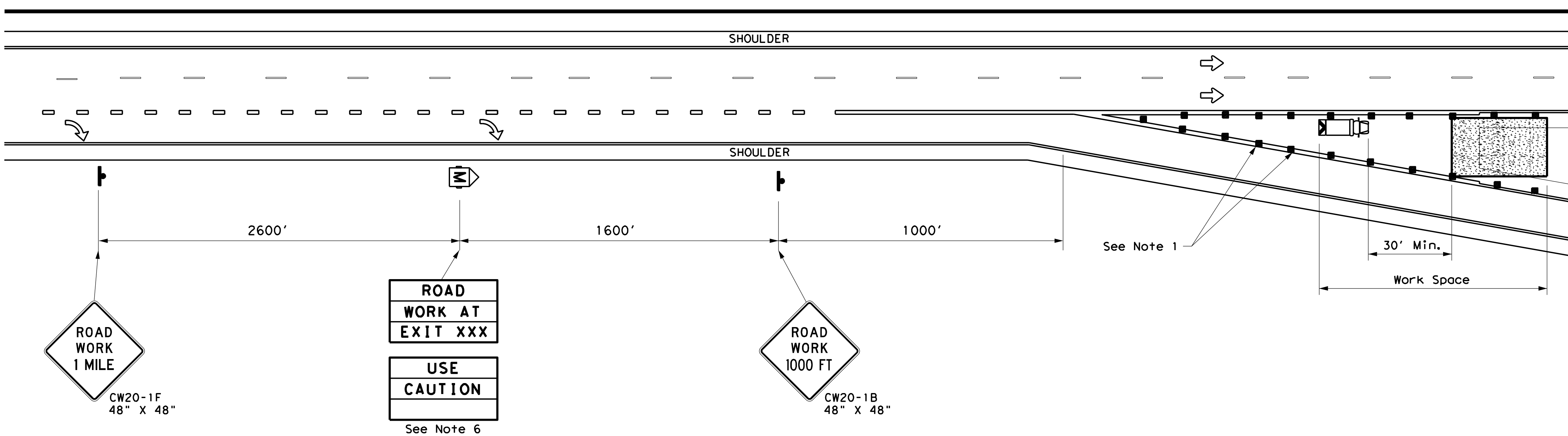


TCP (6-9a)



TCP (6-9b)

LEGEND

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

Posted Speed	Formula	Minimum Desirable Taper Lengths "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

** 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. Place channelizing devices in the gore at 20' spacing.
2. See the Standard Highway Sign Design for Texas (SHSD) for sign details.
3. The PCMS may be omitted when a permanent DMS sign is available in an appropriate location to display a similar message as called for on the PCMS.
4. When it is determined that a through lane should be closed in addition to the exit ramp, refer to TCP(6-4) and TCP(6-8) for traffic control details.
5. Truck mounted attenuators are required.
6. The PCMS may be omitted if replaced with a "ROAD WORK ½ MILE" (CW20-1E).
7. Roadway ADT should be less than 10,000.

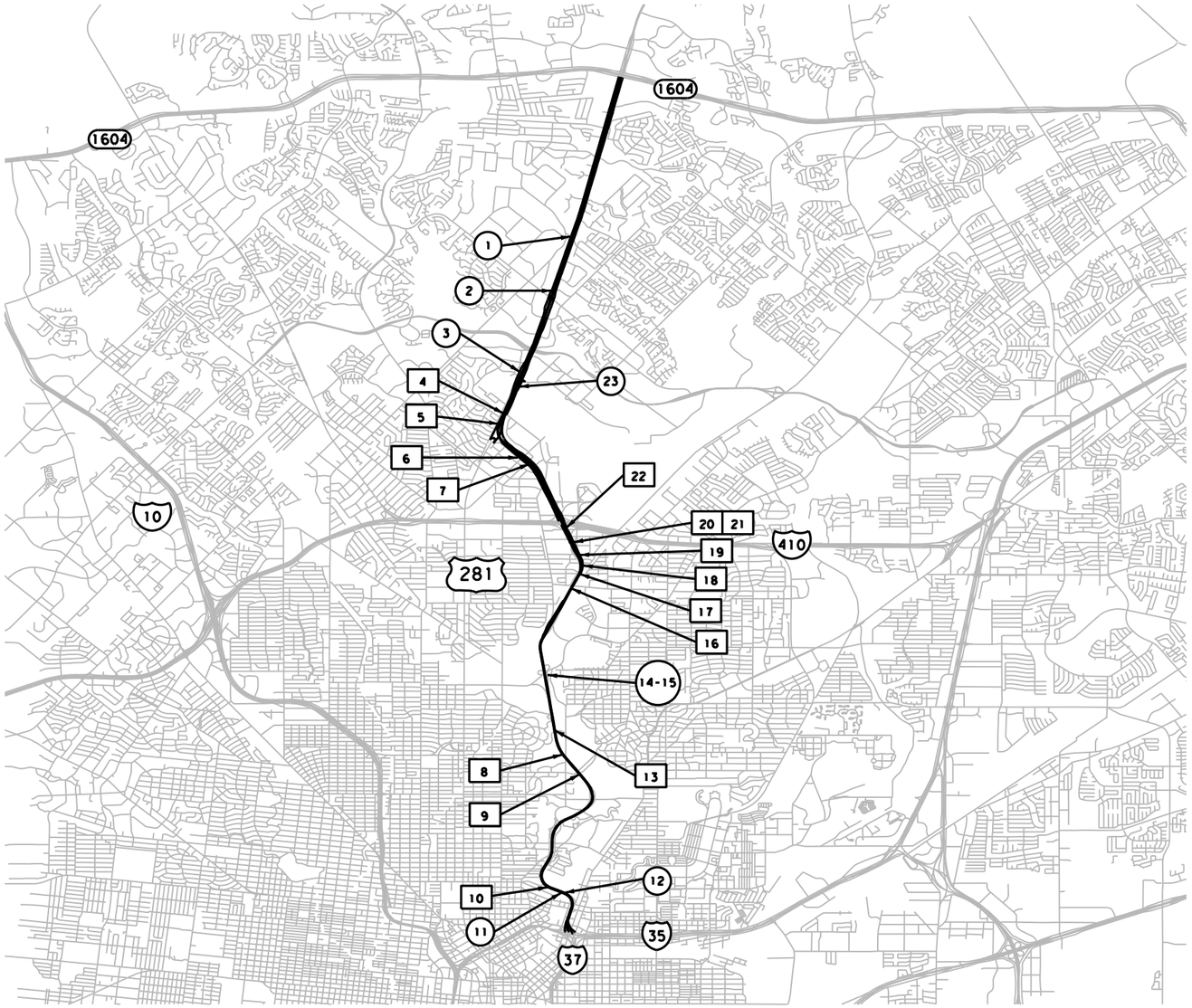
Texas Department of Transportation

Traffic Operations Division Standard

WORK IN EXIT GORE FOR ADT LESS THAN 10,000

TCP(6-9)-14

FILE: tcp6-9.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2014	CONT 0915	SECT 00	JOB 238	HIGHWAY VARIOUS
REVISIONS	DIST SAT		COUNTY BEXAR	SHEET NO. 54



N

N. T. S.

LEGEND

..... SMALL GUIDE SIGNAGE

..... LARGE GUIDE SIGNAGE

——— ..... CORIDOR LIMITS

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

Texas Department of Transportation

LOCATION MAP
US 281
(BROOK HOLLOW BLVD TO WEST JOSEPHINE ST)

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		55
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

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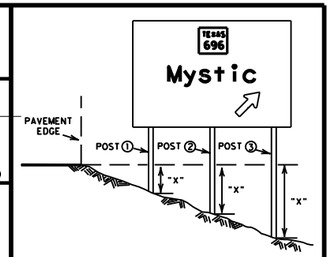
SUMMARY OF LARGE SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN BACK-GROUND COLOR	SIGN TEXT	SIGN DIMENSIONS	PLAQUES, & OTHER ATTACHMENTS		BACKGROUND SUBSTRATE (SQ FT)		TYPE OF MOUNT	"X" DIMENSION ◒			GALVANIZED STRUCTURAL STEEL					DRILLED SHAFT			
					DIRECT APPLY	ALUMINUM (TYPE A) *	GROUND MOUNT (TYPE G)	OVERHEAD (TYPE O)		post ①	post ②	post ③	SIZE	LINEAR FEET post ①	post ②	post ③	TOTAL WEIGHT LBS.	NON-REINF 12"ϕ	LINEAR FEET REINFORCED 24"ϕ	30"ϕ	36"ϕ
	4-SB	GREEN	Isom Rd Jones-Maltsberger Rd EXIT 1/2 MILE	22'-6" x 10'-6"				236.25													
	5-SB	GREEN	San Antonio Int'l Airport EXIT 1 MILE	3'-0" x 3'-0"		9															
				16'-0" x 8'-0"				128													
	6-SB	GREEN	HM 410 EXIT ⇩ ONLY	2'-6" x 2'-6"		6.25															
				24'-0" x 8'-0"	8.99			192													
	7-SB	GREEN	HM 410 EXIT ⇖ ONLY	2'-6" x 2'-6"		6.25															
				24'-0" x 8'-0"	8.99			192													
	8-SB	GREEN	Hildebrand Ave EXIT ⇩ ONLY	14'-0" x 9'-0"				126													
	9-SB	GREEN	Hildebrand Ave ⇗ EXIT ONLY	17'-6" x 9'-0"				157.5													
	10-SB	GREEN	Josephine St. Grayson St. EXIT 1/4 MILE	15'-6" x 8'-0"			124														
	13-NB	GREEN	INTERSTATE 410 EXIT 2 1/2 MILE	13'-6" x 7'-0"	8.99			94.5													
	16-NB	GREEN	INTERSTATE 410 EXIT ⇩ ONLY	24'-0" x 8'-0"	8.99			192													
	17-NB	GREEN	INTERSTATE 410 EXIT ⇖ ONLY	24'-0" x 8'-0"	8.99			192													
			PAGE TOTALS			21.5	124	1510.25													



◒ The "X" dimension is the elevation difference at the post between the ground and the edge of pavement or top of curb.

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.

The post lengths listed here are approximations, The corrected post lengths will be furnished by the Contractor after the stud posts are placed.

Tower heights shall be verified with the Engineer before fabrication.

* This column is for aluminum Type A and not direct apply. Direct apply is subsidiary to the sign.

SIGN TYPE

SIGN TYPE 1 3 0
- 1 — Wind Design Zone
- 3 — No. of Posts
- 0 — Series No. (0 Aluminum/Fiberglass, 1 Aluminum, 2 Fiberglass)

See sheet SMD(8W1)

US 281

(FROM BROOK HOLLOW BLVD TO WEST JOSEPHINE ST)

SUMMARY OF LARGE SIGNS

SOLS

		REVISIONS	
DN.: TxDOT		11-93	1-04
CK.: TxDOT		8-95	9-08
DW.: TxDOT		5-01	
CK.: TxDOT			

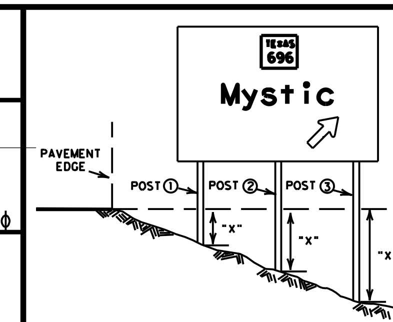
CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS
DIST	COUNTY		SHEET NO.
SAT	BEXAR		56

DATE: 2/25/2022 10:03:35 AM
FILE: $TS

DATE: 2/25/2022 10:03:36 AM
FILE: T

SUMMARY OF LARGE SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN BACK-GROUND COLOR	SIGN TEXT	SIGN DIMENSIONS	PLAQUES, & OTHER ATTACHMENTS		BACKGROUND SUBSTRATE (SQ FT)		TYPE OF MOUNT	"X" DIMENSION ⊖			GALVANIZED STRUCTURAL STEEL					DRILLED SHAFT			
					DIRECT APPLY	* ALUMINUM (TYPE A)	GROUND MOUNT (TYPE G)	OVERHEAD (TYPE O)		post 1	post 2	post 3	SIZE	LINEAR FEET post 1	LINEAR FEET post 2	LINEAR FEET post 3	TOTAL WEIGHT LBS.	LINEAR FEET NON-REINF 12"ϕ	LINEAR FEET REINFORCED 24"ϕ	LINEAR FEET REINFORCED 30"ϕ	LINEAR FEET REINFORCED 36"ϕ
	18-NB	GREEN	Airport Blvd / EXIT ONLY	24'-6" x 7'-0"				171.5													
	19-NB	GREEN	Airport Blvd / EXIT ONLY	24'-6" x 7'-0"				171.5													
	20-NB	GREEN	WEST / INTERSTATE 410 / 35 M.P.H.	12'-6" x 10'-0"	8.99			125													
	21-NB	GREEN	EAST / INTERSTATE 410 / 35 M.P.H.	12'-6" x 10'-0"	8.99			125													
	22-NB	GREEN	35 M.P.H.	16'-6" x 3'-6"				57.75													
			PAGE TOTALS					650.75								PAGE TOTALS					



⊖ The "X" dimension is the elevation difference at the post between the ground and the edge of pavement or top of curb.

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.

The post lengths listed here are approximations, The corrected post lengths will be furnished by the Contractor after the stud posts are placed.

Tower heights shall be verified with the Engineer before fabrication.

* This column is for aluminum Type A and not direct apply. Direct apply is subsidiary to the sign.

SIGN TYPE

SIGN TYPE 1 3 0
- 1 — Wind Design Zone
- 3 — No. of Posts
- 0 — Series No.: 0 Aluminum/Fiberglass, 1 Aluminum, 2 Fiberglass

See sheet SMD(8W1)

US 281
(FROM BROOK HOLLOW BLVD TO WEST JOSEPHINE ST)

SUMMARY OF LARGE SIGNS

SOLS

DN.: TxDOT	CK.: TxDOT	DW.: TxDOT	CK.: TxDOT	REVISIONS
				11-93, 8-95, 5-01, 1-04, 9-08

CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS

DIST	COUNTY	SHEET NO.
SAT	BEXAR	57

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
	1-SB	I-2cT	Winding Way NEXT SIGNAL	72" x 30"	✓							
	2-SB	I-2cT	Bitters Dr NEXT SIGNAL	54" x 30"	✓							
	3-SB	I-2cT	Nakoma Dr NEXT SIGNAL	60" x 30"	✓							
	11-SB	I-3	San Antonio River	114" x 36"	✓							
	12-NB	I-3	San Antonio River	114" x 36"	✓							
	14-NB	W8-19	NEXT 5 4 3 2 1	6" x 72"	✓							
	15-NB	W8-19aT	FLOOD GAUGE	18" x 12"	✓							
	23-NB	I-2cT	Nakoma Dr NEXT SIGNAL	60" x 30"	✓							

ALUMINUM SIGN BLANKS THICKNESS	

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).

US 281

(FROM BROOK HOLLLOW BLVD TO WEST JOSEPHINE ST)

Texas Department of Transportation

Traffic Operations Division Standard

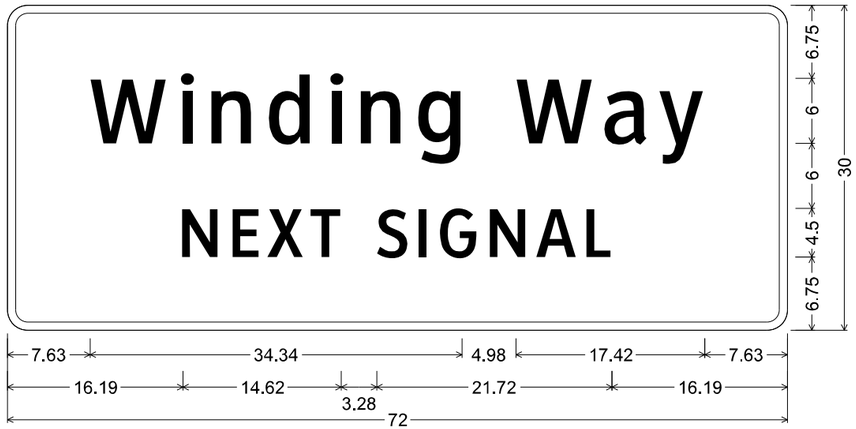
SUMMARY OF SMALL SIGNS

SOSS

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	00	238	VARIOUS
4-16	DIST	COUNTY		SHEET NO.
8-16	SAT	BEXAR		58

18

1-SB



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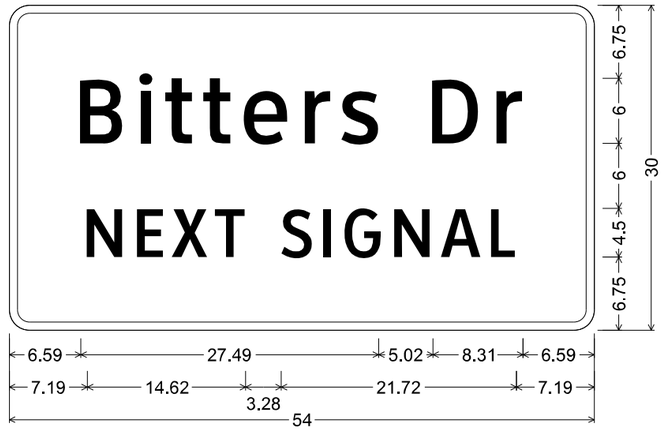
2-SB



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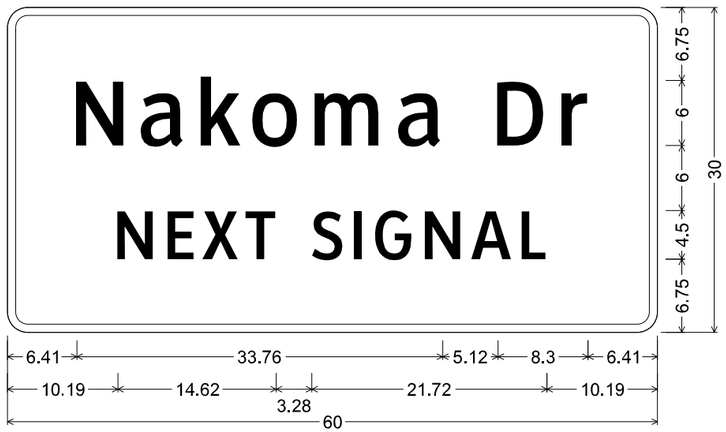
3-SB



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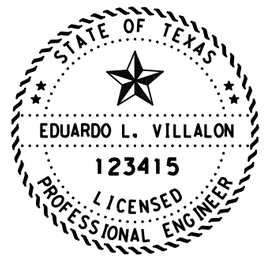


EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

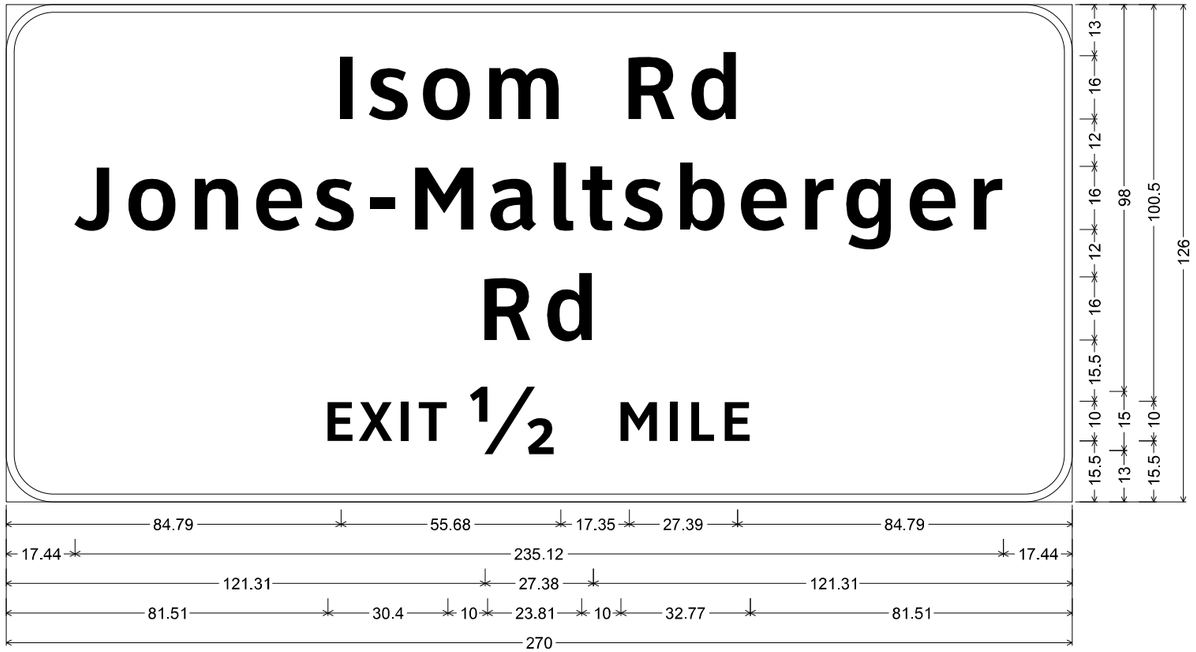
Texas Department of Transportation

GUIDE SIGN DETAILS
US 281 (SB)
BROOK HOLLOW BLVD TO JOSEPHINE ST

SHEET 1 OF 10

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		59
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

4-SB



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[½] ClearviewHwy-5-W-R; [MILE] ClearviewHwy-5-W-R;

5-SB

2.25" Radius, 0.75" Border, White on Green;
Symbol RA010;
12.00" Radius, 2.00" Border, White on Green;
[San Antonio] ClearviewHwy-5-W-R; [Int'l Airport] ClearviewHwy-5-W-R;
[EXIT] ClearviewHwy-5-W-R; [1] ClearviewHwy-5-W-R; [MILE] ClearviewHwy-5-W-R;

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

Texas Department of Transportation

GUIDE SIGN DETAILS
US 281 (SB)
BROOK HOLLOW BLVD TO JOSEPHINE ST

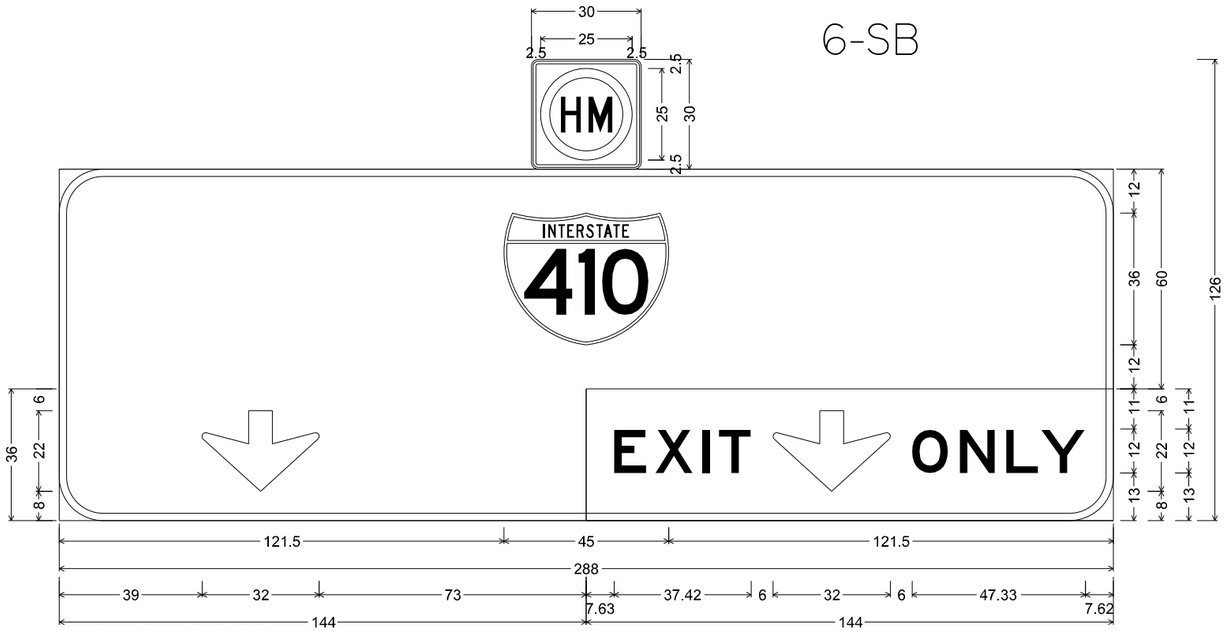
SHEET 2 OF 10

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		60
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

DW: DN

2/25/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\PLN*SHEETS\Plan Sheets\Sign Details\US 281.dgn

6-SB



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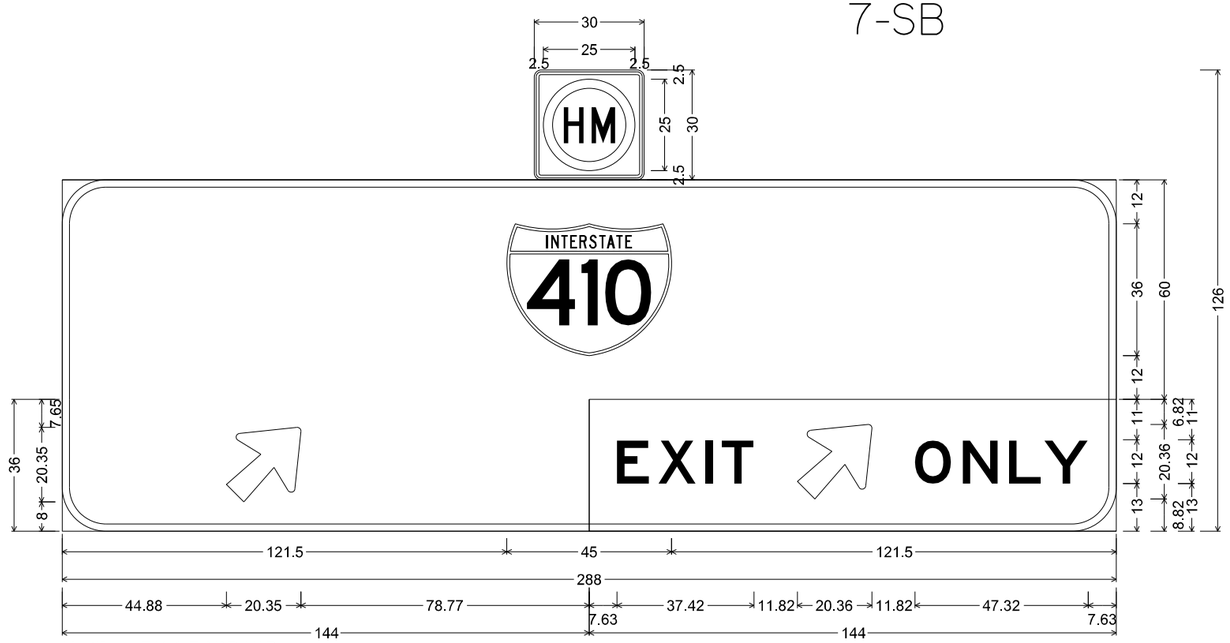
12.00" Radius, 2.00" Border, White on Green;
Interstate 410 M1-1;
12.00" Radius, 2.00" Border, White on Green;
Down Arrow 22 - 22.00" 270°;
12.00" Radius, 2.00" Border, Black on Yellow;
[EXIT] E; Down Arrow 22 - 22.00" 270°; [ONLY] E;

7-SB



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12.00" Radius, 2.00" Border, White on Green;
Interstate 410 M1-1;
12.00" Radius, 2.00" Border, White on Green;
Arrow B-3 - 25.00" 45°;
12.00" Radius, 2.00" Border, Black on Yellow;
[EXIT] E; Arrow B-3 - 25.00" 45°; [ONLY] E;

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

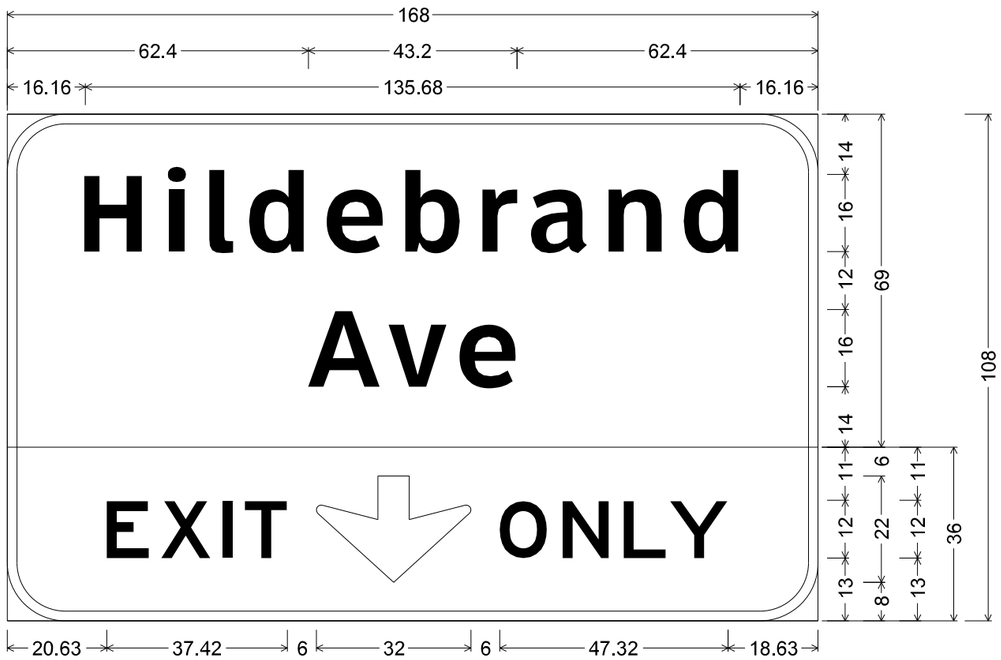
Texas Department of Transportation

GUIDE SIGN DETAILS
US 281 (SB)
BROOK HOLLOW BLVD TO JOSEPHINE ST

SHEET 3 OF 10

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		61
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

8-SB



Identifier : E11-1aT_VARxVAR;
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[Hildebrand] ClearviewHwy-5-W-R; [Ave] ClearviewHwy-5-W-R;
12.00" Radius, 2.00" Border, Black on Yellow;
[EXIT] E; Down Arrow 22 - 22.00" 270°; [ONLY] E;

9-SB

Identifier : E11-1aT_VARxVAR;
12.00" Radius, 2.00" Border, White on Green;
[Hildebrand] ClearviewHwy-5-W-R; [Ave] ClearviewHwy-5-W-R; Arrow A-3 - 35.63" 60°;
12.00" Radius, 2.00" Border, Black on Yellow;
[EXIT] E; [ONLY] E;

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

Texas Department of Transportation

GUIDE SIGN DETAILS
US 281 (SB)
BROOK HOLLOW BLVD TO JOSEPHINE ST

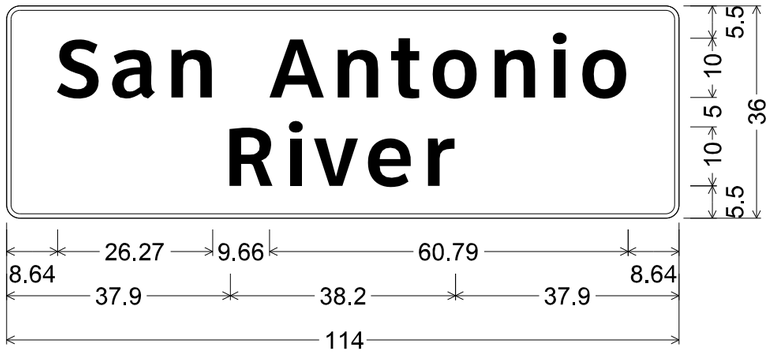
SHEET 4 OF 10

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		62
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

10-SB

12.00" Radius, 2.00" Border, White on Green;
[Josephine St] ClearviewHwy-5-W-R; [Grayson St] ClearviewHwy-5-W-R;
[EXIT] ClearviewHwy-5-W; [1/4] ClearviewHwy-5-W; [MILE] ClearviewHwy-5-W;

11-SB



2.25" Radius, 0.75" Border, White on Green;
[San Antonio] ClearviewHwy-5-W-R;
[River] ClearviewHwy-5-W-R;

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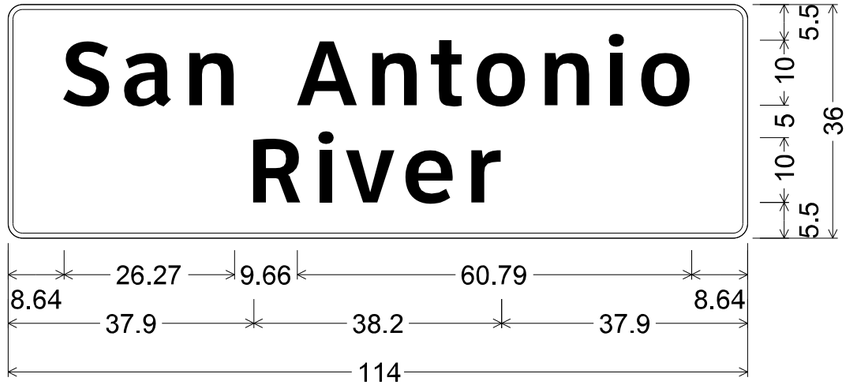
EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

GUIDE SIGN DETAILS
US 281 (SB)
BROOK HOLLOW BLVD TO JOSEPHINE ST

SHEET 5 OF 10

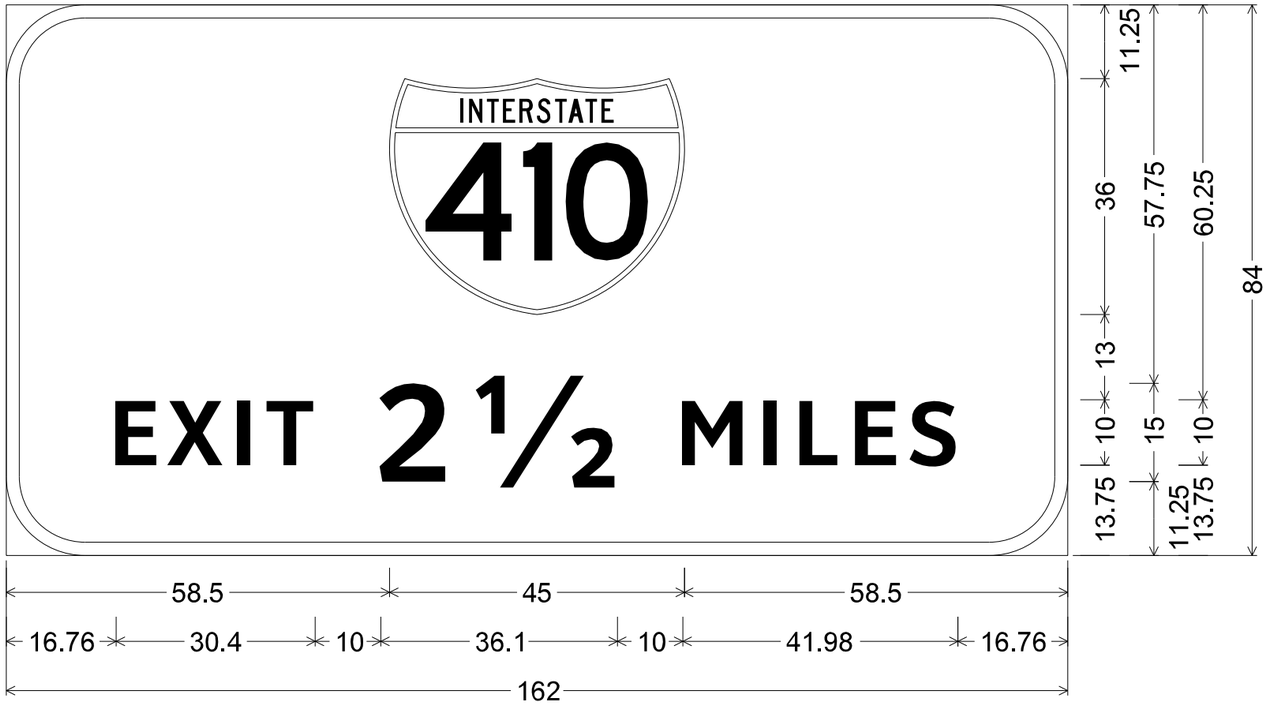
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		63
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

I2-NB



2.25" Radius, 0.75" Border, White on Green;
[San Antonio] ClearviewHwy-5-W-R;
[River] ClearviewHwy-5-W-R;

I3-NB



12.00" Radius, 2.00" Border, White on Green;
Interstate 410 M1-1; [EXIT] ClearviewHwy-5-W-R [] ClearviewHwy-5-W;
[2½] ClearviewHwy-5-W-R [] ClearviewHwy-5-W;
[MILES] ClearviewHwy-5-W-R [] ClearviewHwy-5-W;

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EDUARDO L. VILLALON
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EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

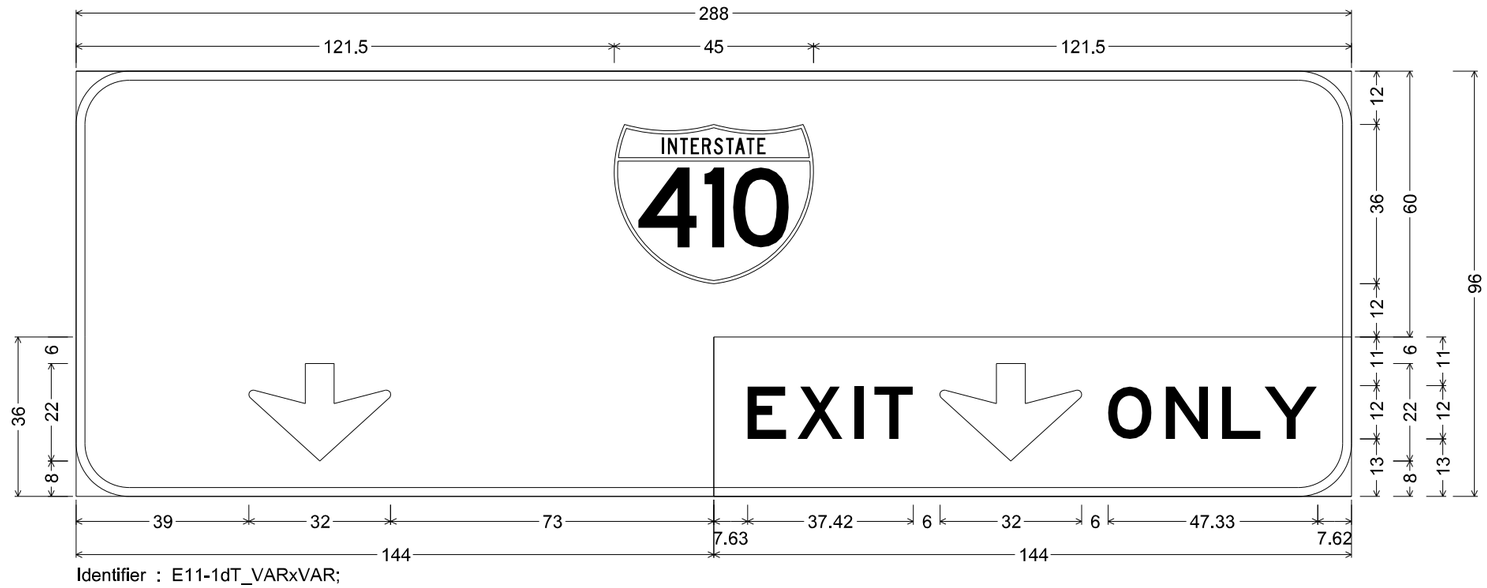
Texas Department of Transportation

GUIDE SIGN DETAILS
US 281 (NB)
BROOK HOLLOW BLVD TO JOSEPHINE ST

SHEET 6 OF 10

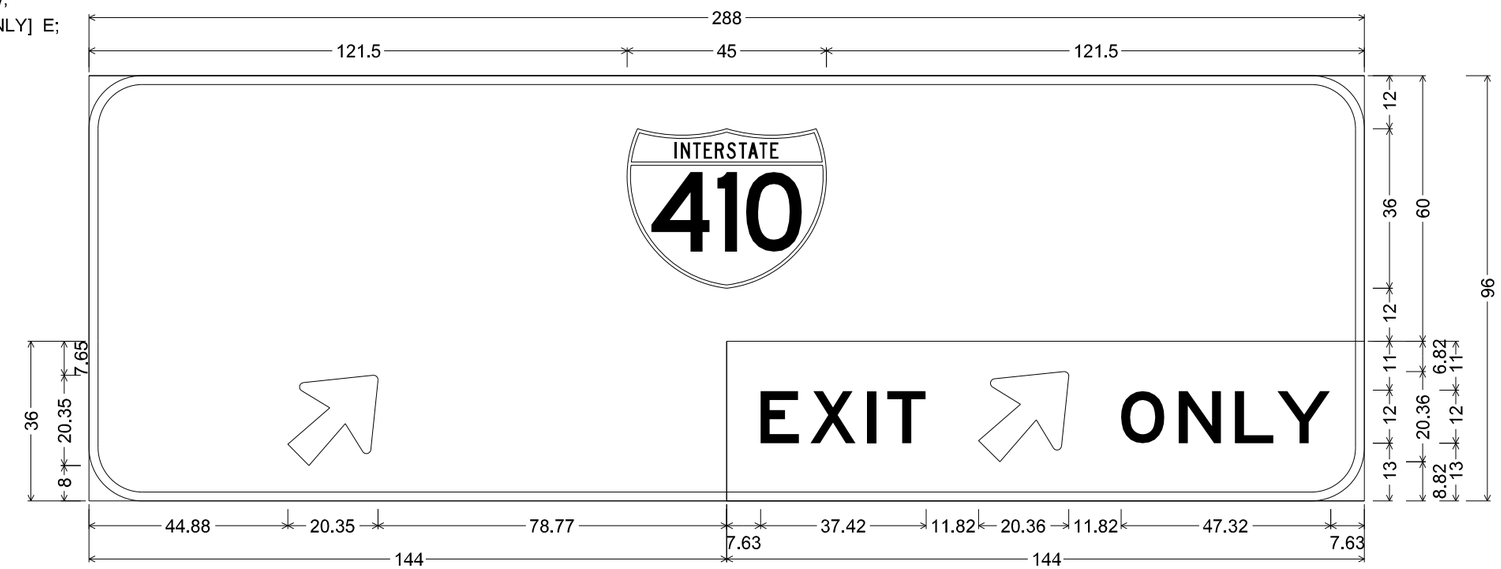
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		64
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

I6-NB



Identifier : E11-1dT_VARxVAR;
12.00" Radius, 2.00" Border, White on Green;
Interstate 410 M1-1;
12.00" Radius, 2.00" Border, White on Green;
Down Arrow 22 - 22.00" 270°;
12.00" Radius, 2.00" Border, Black on Yellow;
[EXIT] E; Down Arrow 22 - 22.00" 270°; [ONLY] E;

I7-NB



Identifier : E11-1eT_VARxVAR;
12.00" Radius, 2.00" Border, White on Green;
Interstate 410 M1-1;
12.00" Radius, 2.00" Border, White on Green;
Arrow B-3 - 25.00" 45°;
12.00" Radius, 2.00" Border, Black on Yellow;
[EXIT] E; Arrow B-3 - 25.00" 45°; [ONLY] E;

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
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Texas Department of Transportation

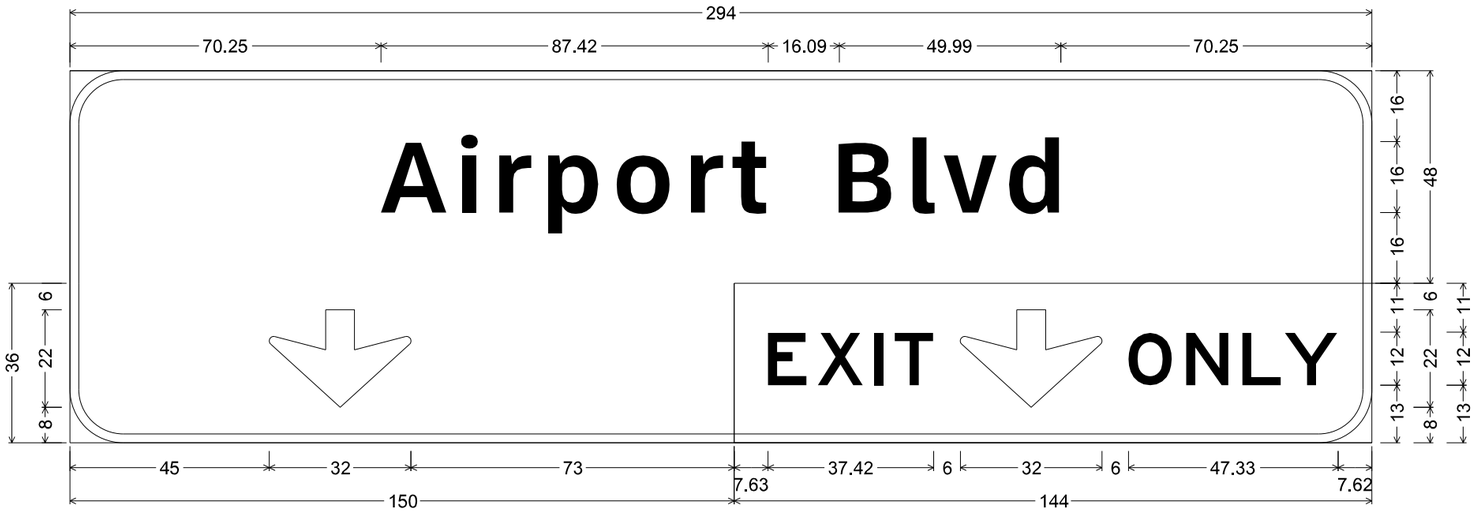
GUIDE SIGN DETAILS
US 281 (NB)
BROOK HOLLOW BLVD TO JOSEPHINE ST

SHEET 7 OF 10

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		65
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

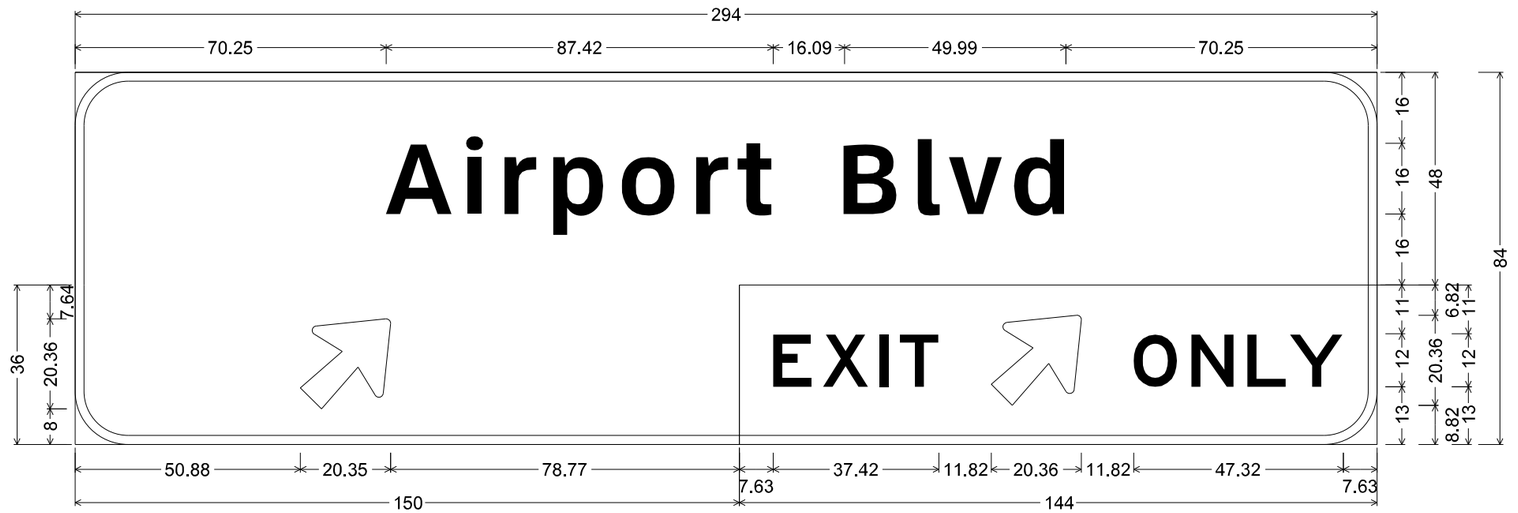
DW: DN

18-NB



12.00" Radius, 2.00" Border, White on Green;
[Airport Blvd] ClearviewHwy-5-W-R;
Identifier : E11-1dT_VARxVAR;
12.00" Radius, 2.00" Border, White on Green;
Down Arrow 22 - 22.00" 270°;
12.00" Radius, 2.00" Border, Black on Yellow;
[EXIT] E; Down Arrow 22 - 22.00" 270°; [ONLY] E;

19-NB



Identifier : E11-1eT_VARxVAR;
12.00" Radius, 2.00" Border, White on Green;
[Airport Blvd] ClearviewHwy-5-W-R;
12.00" Radius, 2.00" Border, White on Green;
Arrow B-3 - 25.00" 45°;
12.00" Radius, 2.00" Border, Black on Yellow;
[EXIT] E; Arrow B-3 - 25.00" 45°; [ONLY] E;

STATE OF TEXAS
EDUARDO L. VILLALON
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LICENSED
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EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

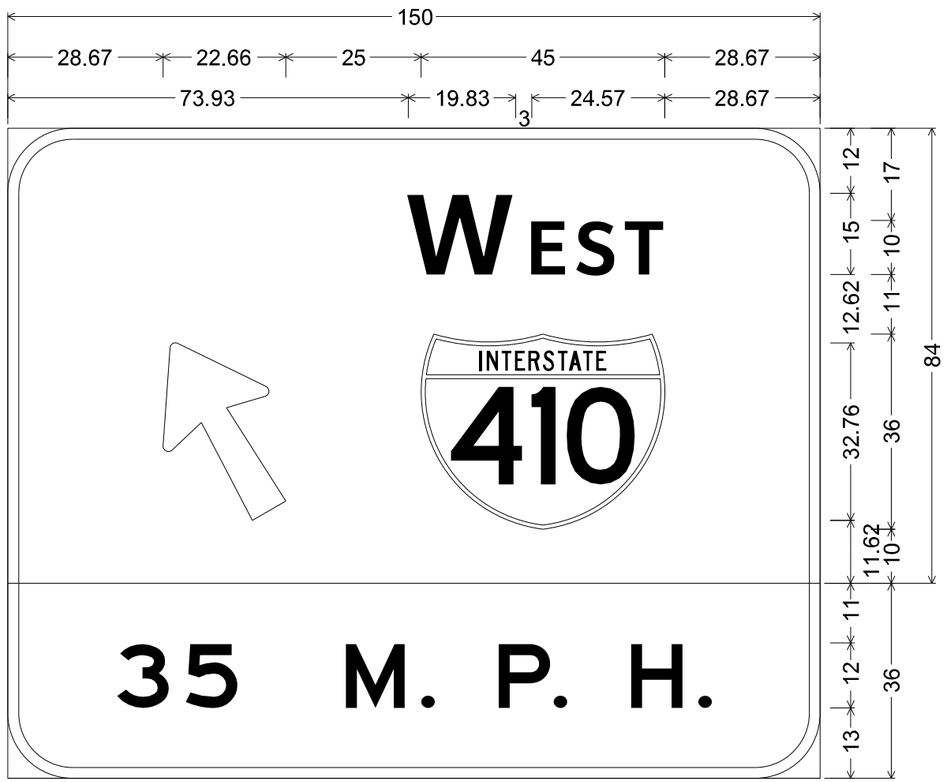
GUIDE SIGN DETAILS
US 281 (NB)
BROOK HOLLOW BLVD TO JOSEPHINE ST

SHEET 8 OF 10

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		66
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

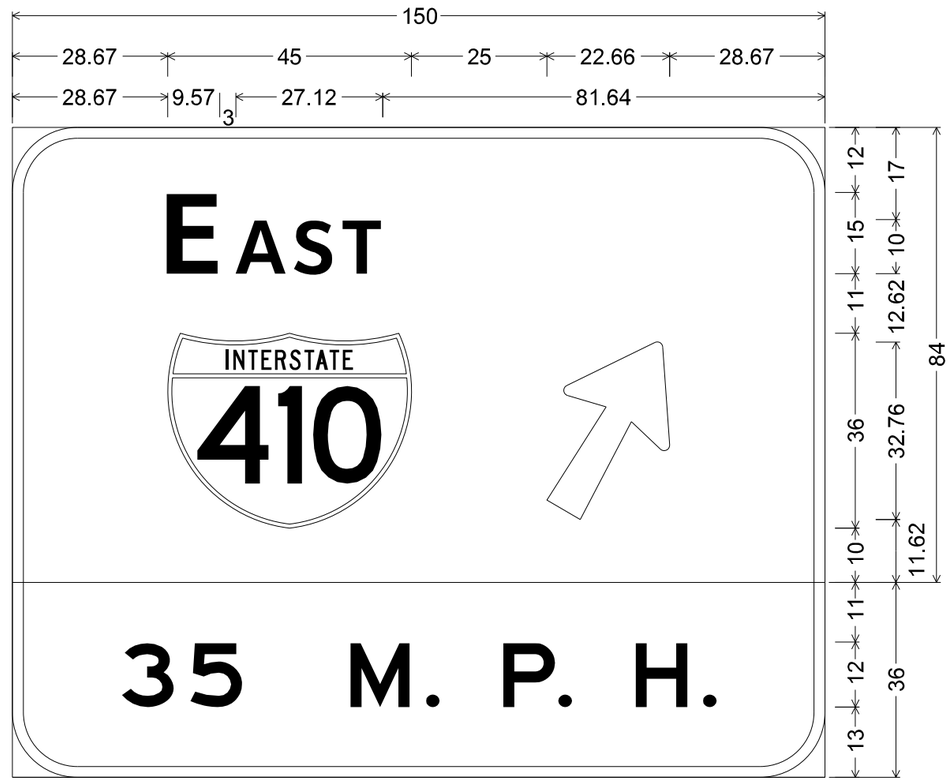
2/25/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\PLN*SHEETS\Plan Sheets\Sign Details\US 281.dgn

20-NB



12.00" Radius, 2.00" Border, White on Green;
[W] ClearviewHwy-5-W-R; [EST] ClearviewHwy-5-W-R;
Arrow A-3 - 35.63" 120°; Interstate 410 M1-1;
12.00" Radius, 2.00" Border, Black on Yellow;
[35] E; [M. P. H.] E;

21-NB



12.00" Radius, 2.00" Border, White on Green;
[E] ClearviewHwy-5-W-R; [AST] ClearviewHwy-5-W-R;
Interstate 410 M1-1; Arrow A-3 - 35.63" 60°;
12.00" Radius, 2.00" Border, Black on Yellow;
[35] E; [M. P. H.] E;

STATE OF TEXAS
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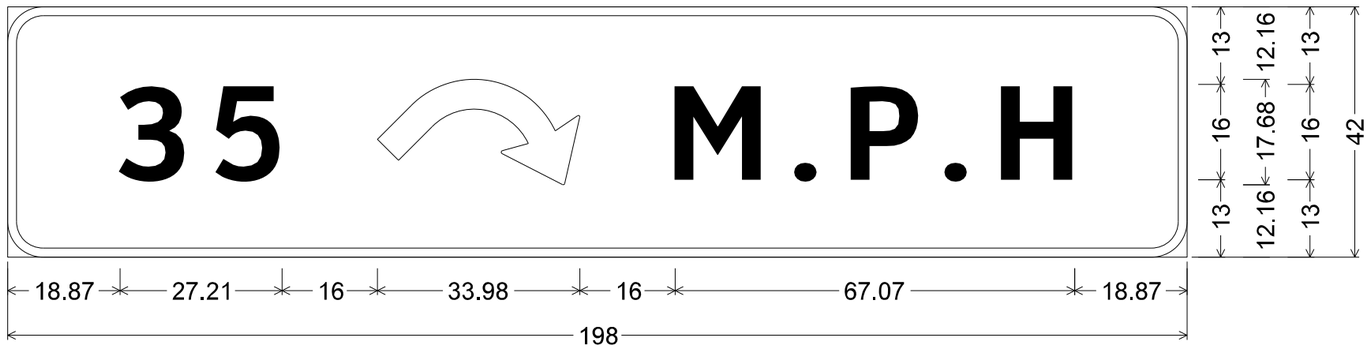
Texas Department of Transportation

GUIDE SIGN DETAILS
US 281 (NB)
BROOK HOLLOW BLVD TO JOSEPHINE ST

SHEET 9 OF 10

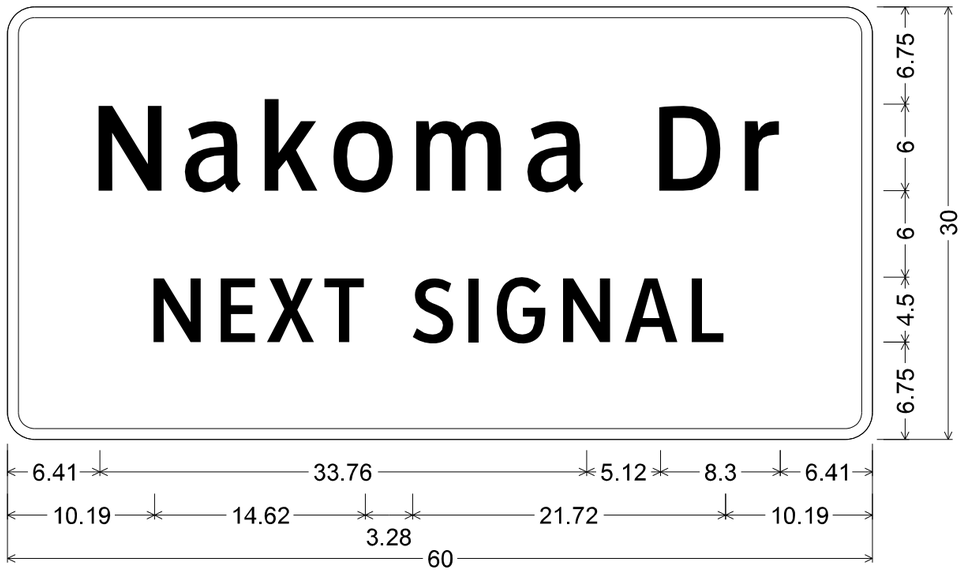
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		67
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

22-NB



6.00" Radius, 1.50" Border, Black on Yellow;
[35] ClearviewHwy-5-W; Turn Arrow Custom; [M.P.H] ClearviewHwy-5-W;

23-NB



Identifier : D3-2(1)_VARx30;
1.88" Radius, 0.75" Border, White on Green;
[Nakoma Dr] ClearviewHwy-3-W; [NEXT SIGNAL] ClearviewHwy-3-W;

STATE OF TEXAS
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123415
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EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

Texas Department of Transportation

GUIDE SIGN DETAILS
US 281 (NB)
BROOK HOLLOW BLVD TO JOSEPHINE ST

SHEET 10 OF 10

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		68
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

N

N. T. S.

OSB ..... OSB

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STATE OF TEXAS

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2/28/2022
DATE

Texas Department of Transportation

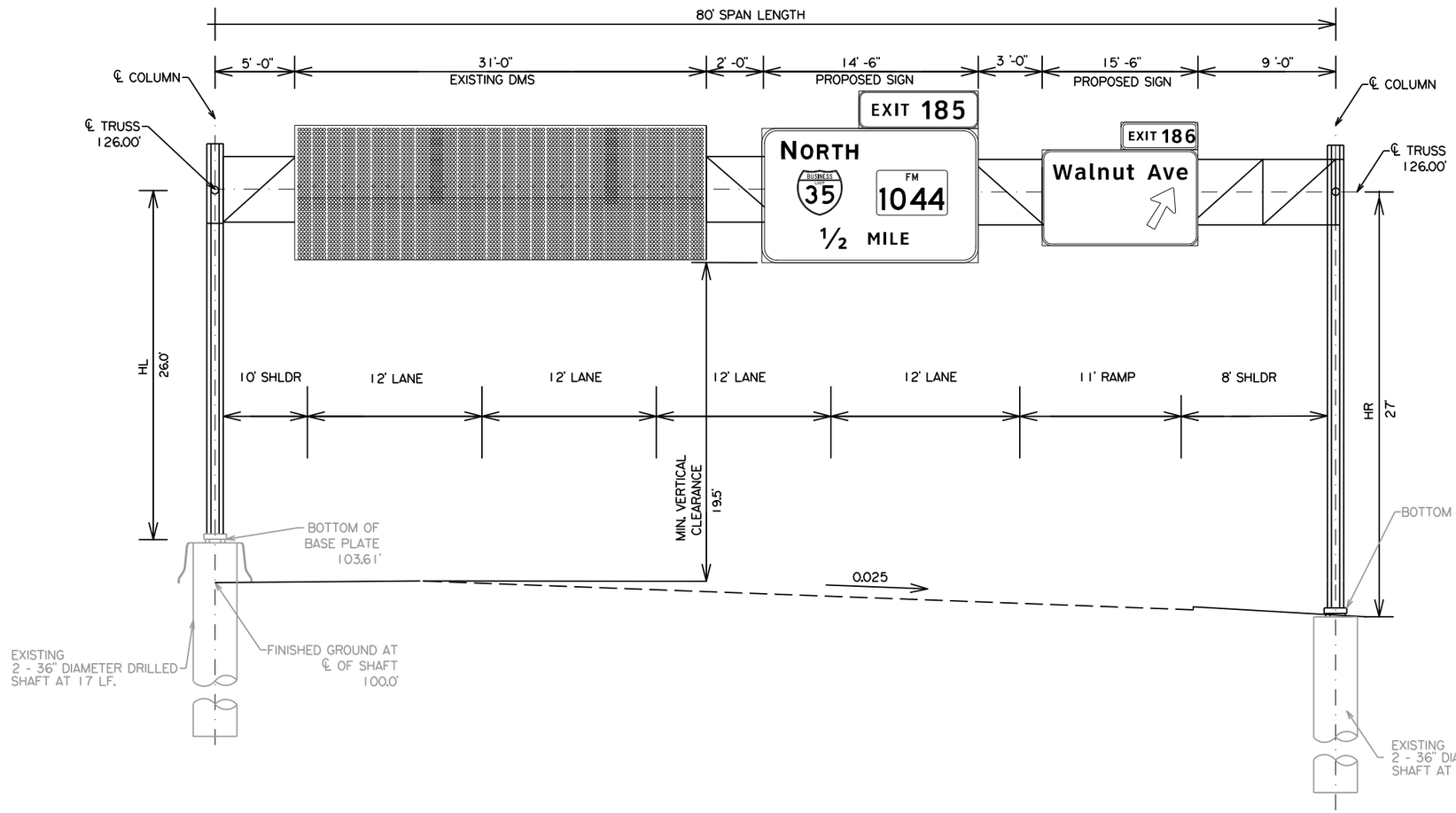
SIGN LOCATION SUMMARY
IH 35
AT WALNUT AVE EXIT

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		69
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

2/25/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\PLN*SHEETS\Plan Sheets\Location Maps\IH 35\Comal\IH-35*SIGN*LOCATION*1 WALNUT.dgn
DN: DN

QUANTITY SUMMARY CSJ: 0915-00-238

0618 6064	CONDT (RM)(1")	LF	30
0618 6070	CONDT (RM)(2")	LF	30
0636 6003	ALUMINUM SIGNS (TY O)	SF	279
0650 6089	INS OH SN SUP(80 FT BRDG)	EA	1
6007 6022	FIBER OPTIC PATCH PANEL (6 POSITION)	EA	1
6007 6094	FIBER OPTIC FUSION SPLICE	EA	1
6028 6001	INSTALL DMS (POLE MTD CABINET)	EA	1
6123 6001	ETHERNET SWITCH (INSTALL ONLY)	EA	1



PROPOSED OSB
IH 35 SBML
AT WALNUT AVE

NOTE:

1. IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO ORDERING SIGN SUPPORT MATERIALS.
2. ALL SIGN STRUCTURE AND FOUNDATION ELEVATIONS SHALL BE VERIFIED IN THE FIELD AT THE ACTUAL LOCATION BY THE CONTRACTOR.
3. FOR DESIGN DETAILS USE STANDARDS OSB-Z3, OSBT, OSB-FD & OSBC.
4. SEE SIGN DETAILS SHEET FOR GUIDE SIGN DETAILS
5. ELEVATIONS TAKEN FROM CSJ 0016-05-089
6. MIN. VERTICAL CLEARANCE SHALL BE 19'-6"
7. EXISTING CROSS SECTION SHOWN IS APPROXIMATE. CONTRACTOR TO VERIFY COLUMN HEIGHT AND VERTICAL CLEARANCE PRIOR TO CONSTRUCTION.
8. CONTRACTOR TO PICK UP DYNAMIC MESSAGE SIGN (DMS) FROM TXDOT NEW BRAUNFELS MAINTENANCE OFFICE AT 4102 N FRONTAGE RD, NEW BRAUNFELSTX 78213. DMS PICK UP SHALL BE SUBSIDIARY TO ITEM 6028.
9. TXDOT TO FURNISH CABINET AND INSTALLATION SHALL BE SUBSIDIARY TO ITEM 6028.
10. CONDUCTOR FROM DMS CONTROLLER TO DMS SHALL BE SUBSIDIARY TO ITEM 6028.

STATE OF TEXAS
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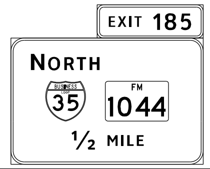
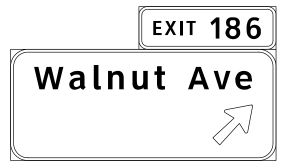
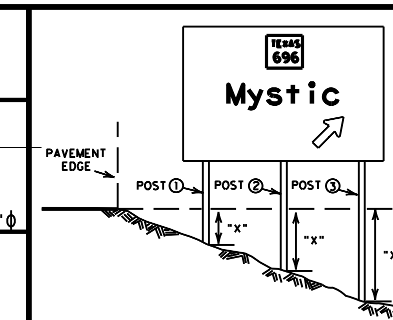
OSB ELEVATION VIEW
IH 35 SOUTHBOUND AT WALNUT AVE
COMAL COUNTY

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		70
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

SUMMARY OF LARGE SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN BACK-GROUND COLOR	SIGN TEXT	SIGN DIMENSIONS	PLAQUES, & OTHER ATTACHMENTS		BACKGROUND SUBSTRATE (SQ FT)		TYPE OF MOUNT	"X" DIMENSION ⊖			GALVANIZED STRUCTURAL STEEL					DRILLED SHAFT			
					DIRECT APPLY	* ALUMINUM (TYPE A)	GROUND MOUNT (TYPE G)	OVERHEAD (TYPE O)		post (1)	post (2)	post (3)	SIZE	LINEAR FEET post (1)	post (2)	post (3)	TOTAL WEIGHT LBS.	NON-REINF 12"ϕ	LINEAR FEET REINFORCED 24"ϕ	30"ϕ	36"ϕ
	1-OSB	GREEN		8'-0" x 2'-6"				20													
		GREEN		14'-6" x 9'-6"	21.42			137.75													
	2-OSB	GREEN		8'-0" x 2'-6"				20													
		GREEN		15'-6" x 6'-6"				100.75													
				PAGE TOTALS				278.5					PAGE TOTALS								



⊖ The "X" dimension is the elevation difference at the post between the ground and the edge of pavement or top of curb.

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.

The post lengths listed here are approximations, The corrected post lengths will be furnished by the Contractor after the stud posts are placed.

Tower heights shall be verified with the Engineer before fabrication.

* This column is for aluminum Type A and not direct apply. Direct apply is subsidiary to the sign.

SIGN TYPE

SIGN TYPE 1 3 0
- 1 — Wind Design Zone
- 3 — No. of Posts
- 0 — Series No.
  - 0 Aluminum/Fiberglass
  - 1 Aluminum
  - 2 Fiberglass

See sheet SMD(8W1)

IH-35
(FROM FM 471 TO FRIO COUNTY LINE)

SUMMARY OF LARGE SIGNS

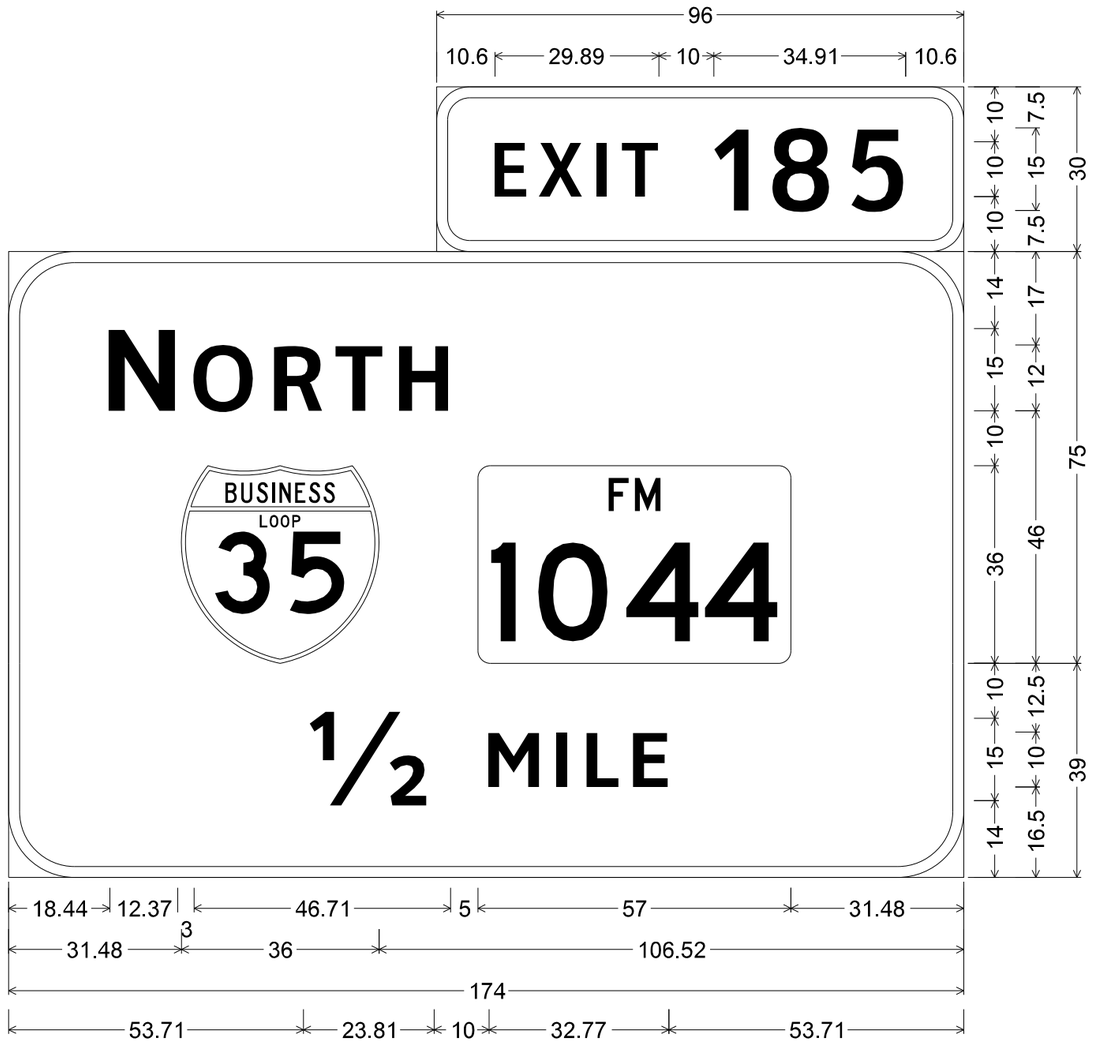
SOLS

DN.: TxDOT	REVISIONS	
CK.: TxDOT	11-93	1-04
DW.: TxDOT	8-95	9-08
CK.: TxDOT	5-01	

CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS
DIST	COUNTY		SHEET NO.
SAT	BEXAR		71

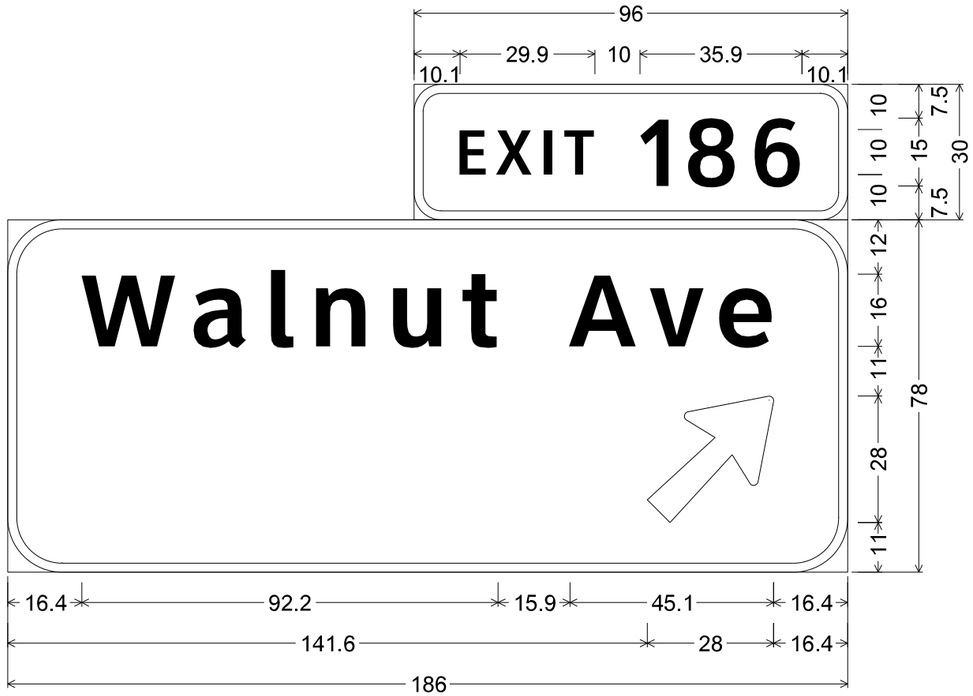
DATE: 2/25/2022 10:04:32 AM
FILE: T

1-OSB



6.00" Radius, 2.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [185] ClearviewHwy-4-W;
12.00" Radius, 2.00" Border, White on Green;
[N] ClearviewHwy-5-W-R; [ORTH] ClearviewHwy-5-W-R; Business Loop 35 M1-2;
State Highway 1044 M1-6F4;
12.00" Radius, 2.00" Border, White on Green;
[1/2] ClearviewHwy-5-W-R; [MILE] ClearviewHwy-5-W-R;

2-OSB



E1-5P(1)_102x30;
6.0" Radius, 2.0" Border, White on, Green;
"EXIT", ClearviewHwy-4-W; "186", ClearviewHwy-4-W;

12.0" Radius, 2.0" Border, White on, Green;
"Walnut Ave", ClearviewHwy-5-W; Arrow A-3 - 35.6" 45';

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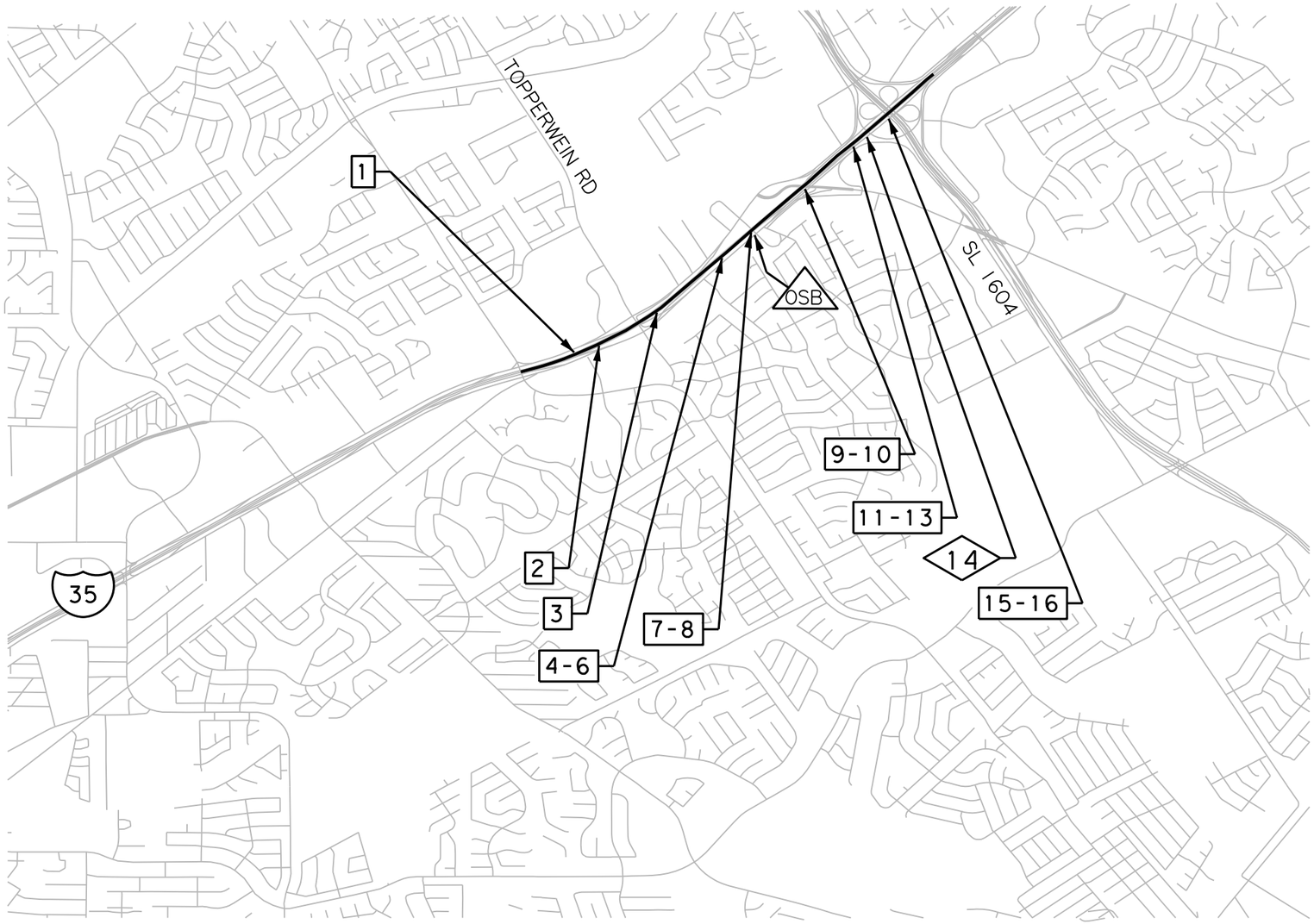
2/28/2022
DATE

Texas Department of Transportation

GUIDE SIGN DETAILS
IH 35 SOUTHBOUND AT WALNUT AVE
COMAL COUNTY

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		72
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS



N

N. T. S.

LEGEND

- # ..... SMALL GUIDE SIGNAGE
- # ..... LARGE GUIDE SIGNAGE
- ..... CORIDOR LIMITS
- OSB ..... OSB
- # ..... SIGNAGE TO BE REMOVED

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EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

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LOCATION MAP
IH-35
(IH-410 TO LP 1604)

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		73
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

2/25/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\PLN*SHEETS\Plan Sheets\Location Maps\IH 35\Bexar\IH-35*SIGN*LOCATION*3.dgn
DN: DN

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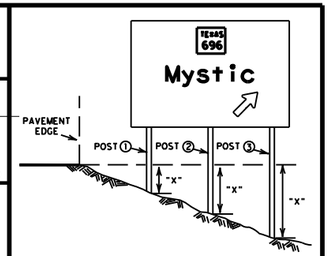
SUMMARY OF LARGE SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN BACK-GROUND COLOR	SIGN TEXT	SIGN DIMENSIONS	PLAQUES, & OTHER ATTACHMENTS		BACKGROUND SUBSTRATE (SQ FT)		TYPE OF MOUNT	"X" DIMENSION ◒			GALVANIZED STRUCTURAL STEEL					DRILLED SHAFT				
					DIRECT APPLY	⁎ ALUMINUM (TYPE A)	GROUND MOUNT (TYPE G)	OVERHEAD (TYPE O)		post ①	post ②	post ③	SIZE	LINEAR FEET post ①	post ②	post ③	TOTAL WEIGHT LBS.	NON-REINF 12"ϕ	LINEAR FEET REINFORCED 24"ϕ	30"ϕ	36"ϕ
	1-SB	GREEN	Morgan's Wonderland S.T.A.R. Soccer Complex EXIT 169	14′-6" x 11′-0"			159.5														
	2-NB	GREEN	EXIT 172 LOOP 1604 Anderson Loop 1 MILE	8′-0" x 2′-6"				20													
				19′-0" x 10′-0"	14.22			190													
		GREEN																			
	3-NB	GREEN	EXIT 172 LOOP 1604 Anderson Loop ½ MILE	8′-0" x 2′-6"				20													
				19′-0" x 10′-0"	14.22			190													
		GREEN																			
	4-NB	GREEN	NORTH INTERSTATE 35 Austin	8′-0" x 9′-0"	7.2			72													
	5-NB	GREEN	Forum Pkwy EXIT 172	13′-6" x 4′-6"				60.75					NEW SIGN TO BE PLACED BETWEEN SIGNS 4-EB & 6-EB								
	6-NB	GREEN	EXIT 172 LOOP 1604 Anderson Loop ¼ MILE	8′-0" x 2′-6"				20													
				12′-6" x 12′-6"	14.22			156.25													
		GREEN																			
	7-NB	GREEN	EXIT 173 Olympia Pkwy 1¼ MILE	8′-0" x 2′-6"				20													
				17′-6" x 6′-0"				105													
		GREEN																			
	8-NB	GREEN	EXIT 172 LOOP 1604 Anderson Loop	8′-0" x 2′-6"				20													
				12′-6" x 10′-6"	14.22			131.25													
		GREEN																			
	9-NB	GREEN	LOOP 1604 Anderson Loop	12′-0" x 10′-0"	14.22			120													
	10-NB	GREEN	Frontage Rd	11′-6" x 7′-0"				80.5													
							159.5	1205.75													
			PAGE TOTALS										PAGE TOTALS								



◒ The "X" dimension is the elevation difference at the post between the ground and the edge of pavement or top of curb.

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.

The post lengths listed here are approximations, The corrected post lengths will be furnished by the Contractor after the stud posts are placed.

Tower heights shall be verified with the Engineer before fabrication.

⁎ This column is for aluminum Type A and not direct apply. Direct apply is subsidiary to the sign.

SIGN TYPE

SIGN TYPE 1 3 0
- 1: Wind Design Zone
- 3: No. of Posts
- 0: Series No. (0 Aluminum/Fiberglass, 1 Aluminum, 2 Fiberglass)

See sheet SMD(8W1)

IH 35

(FROM IH-410 NORTH TO LP-1604)

SUMMARY OF LARGE SIGNS

SOLS

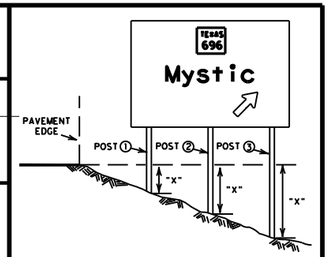
DN.: TxDOT	CK.: TxDOT	DW.: TxDOT	CK.: TxDOT	REVISIONS
				1-04
11-93	8-95	5-01		9-08

CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS
DIST	COUNTY		SHEET NO.
SAT	BEXAR		74

DATE: 2/25/2022 10:04:55 AM
FILE: $TS

SUMMARY OF LARGE SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN BACK-GROUND COLOR	SIGN TEXT	SIGN DIMENSIONS	PLAQUES, & OTHER ATTACHMENTS		BACKGROUND SUBSTRATE (SQ FT)		TYPE OF MOUNT	"X" DIMENSION ◒			GALVANIZED STRUCTURAL STEEL					DRILLED SHAFT			
					DIRECT APPLY	⁎ ALUMINUM (TYPE A)	GROUND MOUNT (TYPE G)	OVERHEAD (TYPE O)		post ①	post ②	post ③	SIZE	LINEAR FEET post ①	post ②	post ③	TOTAL WEIGHT LBS.	NON-REINF 12"ϕ	LINEAR FEET REINFORCED 24"ϕ	30"ϕ	36"ϕ
	11-NB	GREEN	EXIT 173 Olympia Pkwy ¾ MILE	8′-0" x 2′-6"				20													
				17′-6" x 6′-0"				105													
		GREEN																			
	12-NB	GREEN	WEST LOOP 1604 Anderson Loop	18′-6" x 11′-6"	14.22			212.75													
	13-NB	GREEN	SOUTH LOOP 1604 Anderson Loop	12′-6" x 12′-0"	14.22			150													
	14-NB	GREEN	Forum Pkwy LEFT LANE	REMOVE																	
	15-NB	GREEN	Forum Pkwy	9′-0" x 8′-6"				76.5													
		GREEN																			
	16-EB	GREEN	WEST LOOP 1604 Anderson Loop	12′-6" x 12′-0"	14.22			150													
			PAGE TOTALS					714.25					PAGE TOTALS								



◒ The "X" dimension is the elevation difference at the post between the ground and the edge of pavement or top of curb.

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.

The post lengths listed here are approximations, The corrected post lengths will be furnished by the Contractor after the stud posts are placed.

Tower heights shall be verified with the Engineer before fabrication.

⁎ This column is for aluminum Type A and not direct apply. Direct apply is subsidiary to the sign.

SIGN TYPE

SIGN TYPE 1 3 0
- 1 — Wind Design Zone
- 3 — Series No.
- 0 — No. of Posts

Series No.: 0 Aluminum/Fiberglass, 1 Aluminum, 2 Fiberglass

See sheet SMD(8W1)

IH 35

(FROM IH-410 NORTH TO LP-1604)

SUMMARY OF LARGE SIGNS

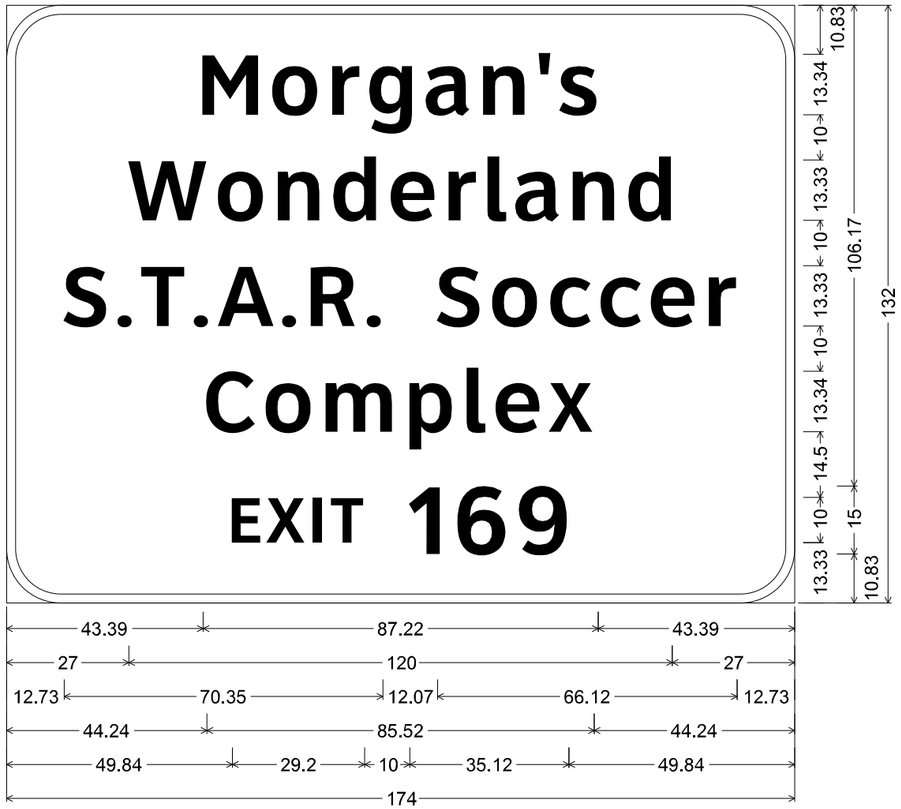
SOLS

DN.: TxDOT	REVISIONS		
CK.: TxDOT	11-93	1-04	
DW.: TxDOT	8-95	9-08	
CK.: TxDOT	5-01		

CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS
DIST	COUNTY		SHEET NO.
SAT	BEXAR		75

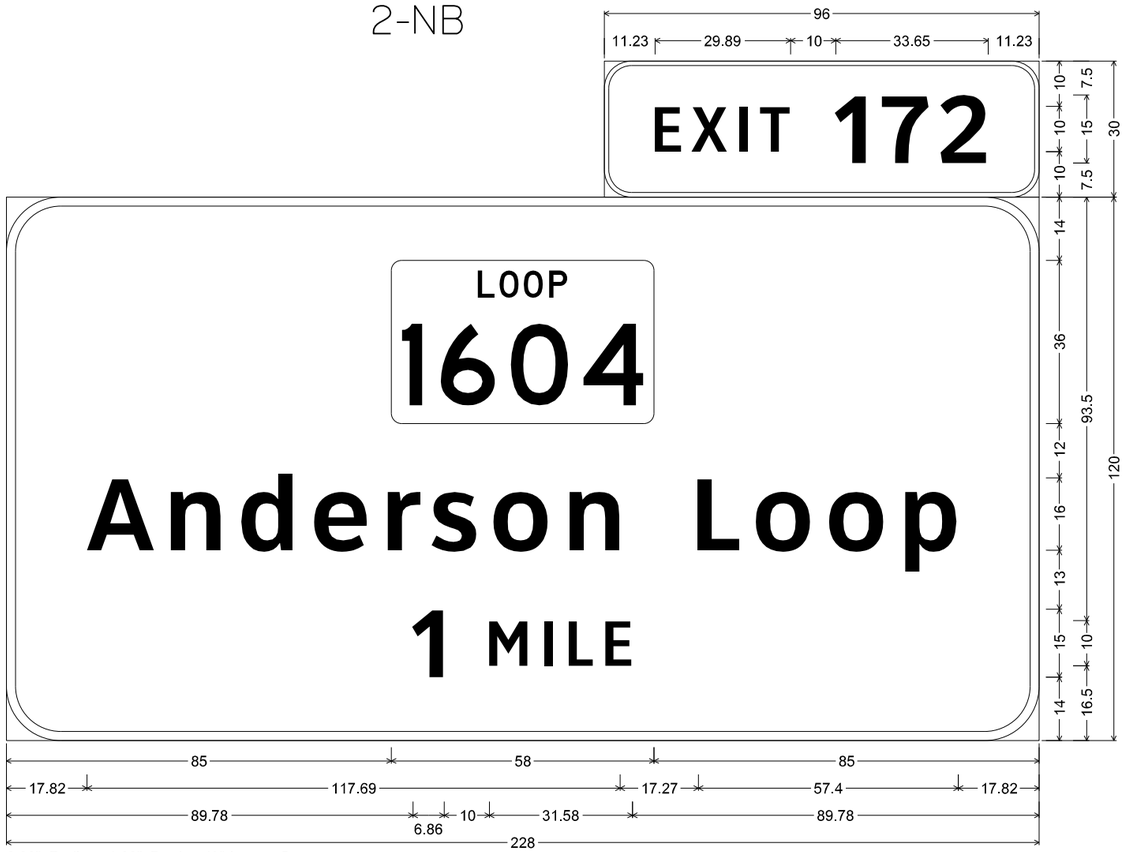
DATE: 2/25/2022 10:04:56 AM
FILE: $TS

I-SB

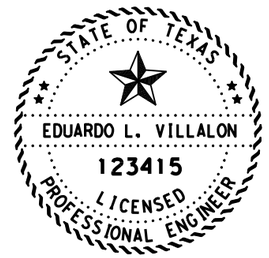


Identifier : SBD IH 35;
12.00" Radius, 2.00" Border, White on Green;
[Morgan's] ClearviewHwy-5-W-R 80% spacing;
[Wonderland] ClearviewHwy-5-W-R 80% spacing;
[S.T.A.R. Soccer] ClearviewHwy-5-W-R 80% spacing;
[Complex] ClearviewHwy-5-W-R 80% spacing;
[EXIT] ClearviewHwy-5-W-R 80% spacing; [169] ClearviewHwy-5-W-R 80% spacing;

2-NB



6.00" Radius, 1.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [172] ClearviewHwy-5-W-R;
12.00" Radius, 2.00" Border, White on Green;
State Highway 1604 M1-6L4; [Anderson Loop] ClearviewHwy-5-W-R; [1] ClearviewHwy-5-W-R; [MILE] ClearviewHwy-4-W;



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2/28/2022
DATE

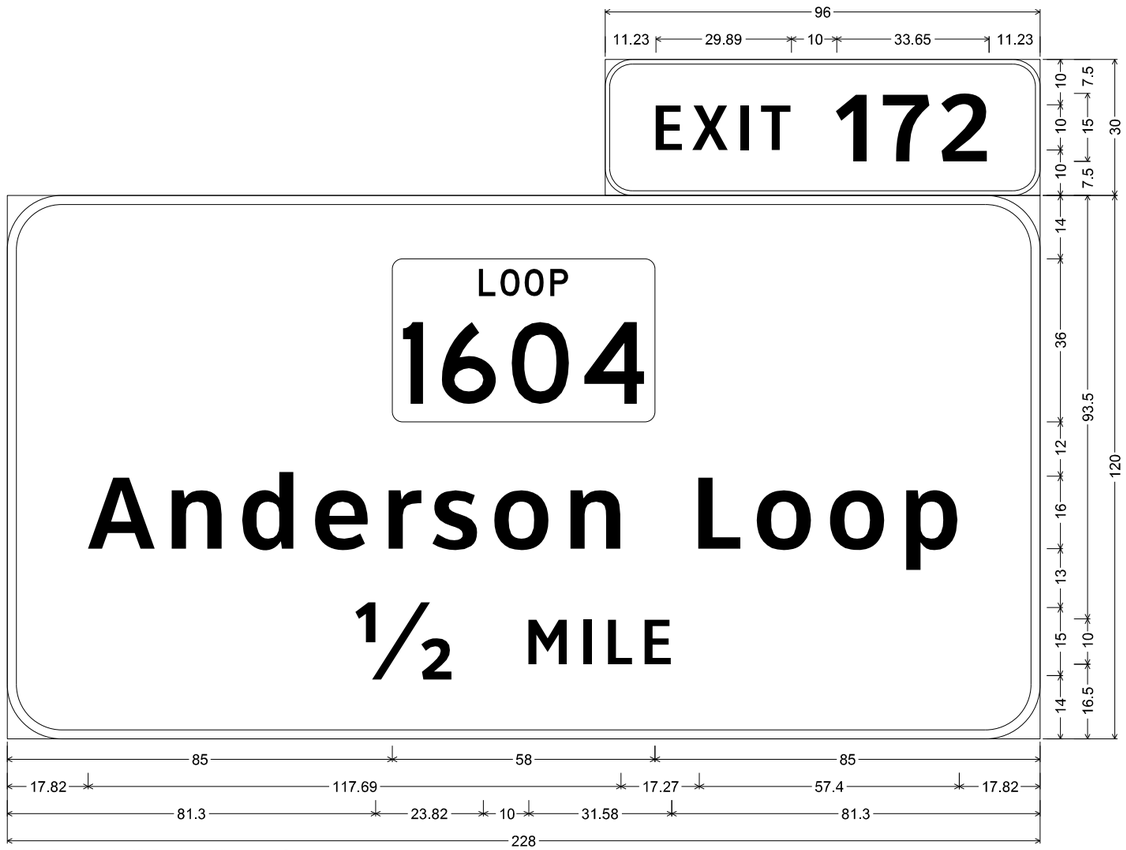
Texas Department of Transportation

GUIDE SIGN DETAILS
IH-35 (NB)
IH-35 AND US 281 INTERCHANGE

SHEET 1 OF 8

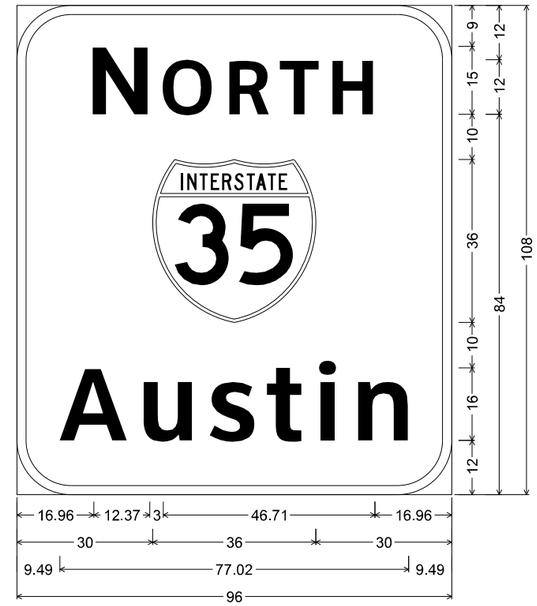
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		76
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

3-NB



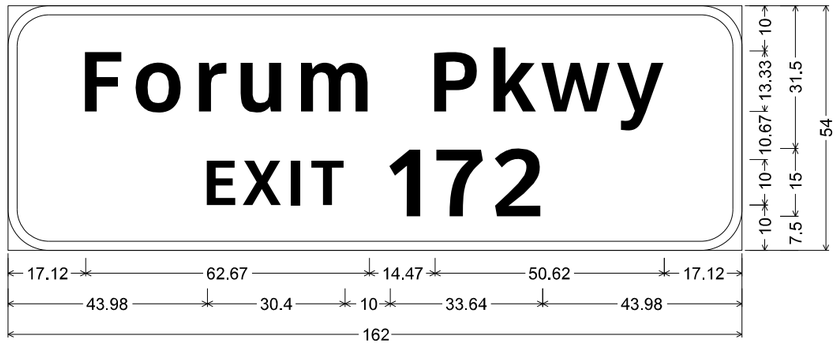
6.00" Radius, 1.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [172] ClearviewHwy-5-W-R;
12.00" Radius, 2.00" Border, White on Green;
State Highway 1604 M1-6L4; [Anderson Loop] ClearviewHwy-5-W-R; [½] ClearviewHwy-5-W-R; [MILE] ClearviewHwy-4-W;

4-NB



12.00" Radius, 2.00" Border, White on Green;
[N] ClearviewHwy-5-W-R; [ORTH] ClearviewHwy-5-W-R;
Interstate 35 M1-1; [Austin] ClearviewHwy-5-W-R;

5-NB



9.00" Radius, 2.00" Border, White on Green;
[Forum Pkwy] ClearviewHwy-5-W-R; [EXIT] ClearviewHwy-5-W-R;
[172] ClearviewHwy-5-W-R;

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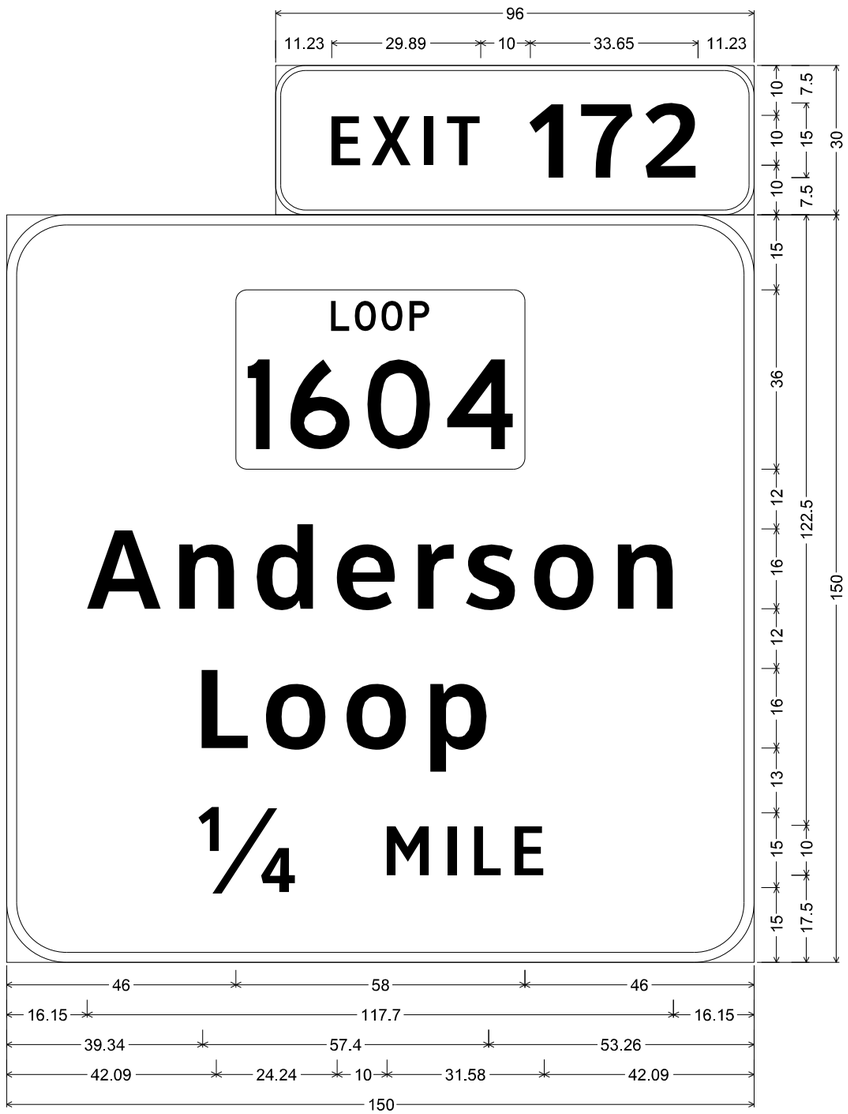
GUIDE SIGN DETAILS
IH-35 (NB)
BINZ-ENGLEMAN RD TO RITTIMAN RD

SHEET 2 OF 8

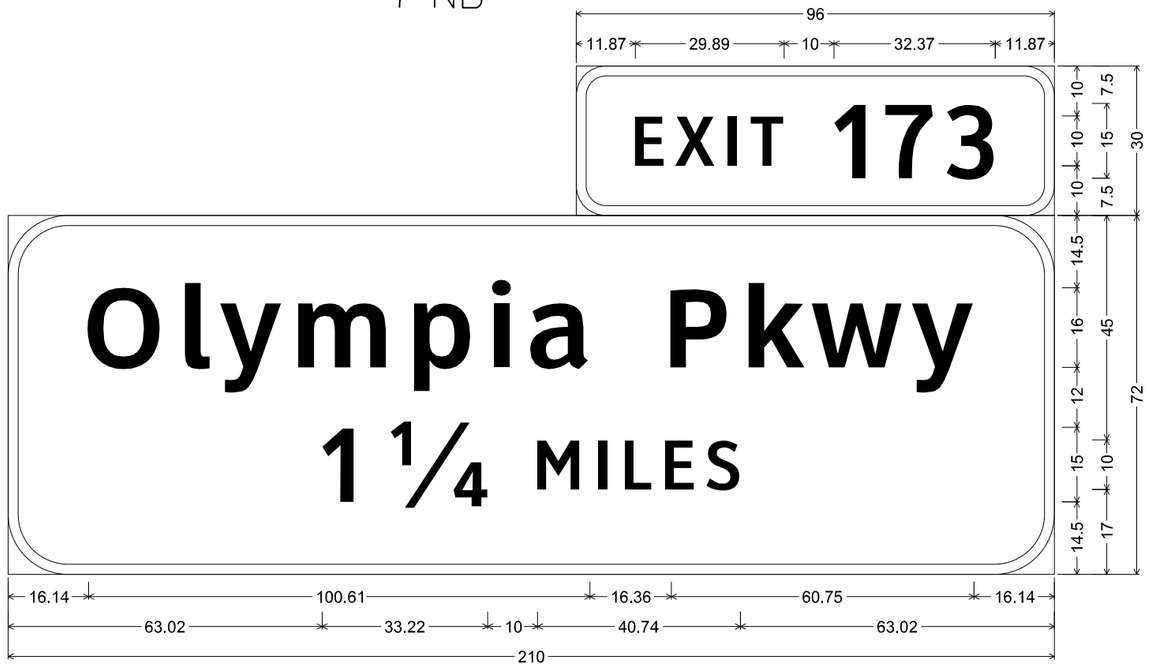
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		77
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

6-NB



6.00" Radius, 1.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [172] ClearviewHwy-5-W-R;
12.00" Radius, 2.00" Border, White on Green;
State Highway 1604 M1-6L4; [Anderson] ClearviewHwy-5-W-R;
[Loop] ClearviewHwy-5-W-R; [1/4] ClearviewHwy-4-W; [MILE] ClearviewHwy-4-W;

7-NB



6.00" Radlus, 2.00" Border, Whlte on Green;
[EXIT] ClearviewHwy-4-W; [173] ClearviewHwy-4-W;
12.00" Radius, 2.00" Border, White on Green;
[Olympia Pkwy] ClearviewHwy-5-W-R; [1¼] ClearviewHwy-4-W; [MILES] ClearviewHwy-4-W;

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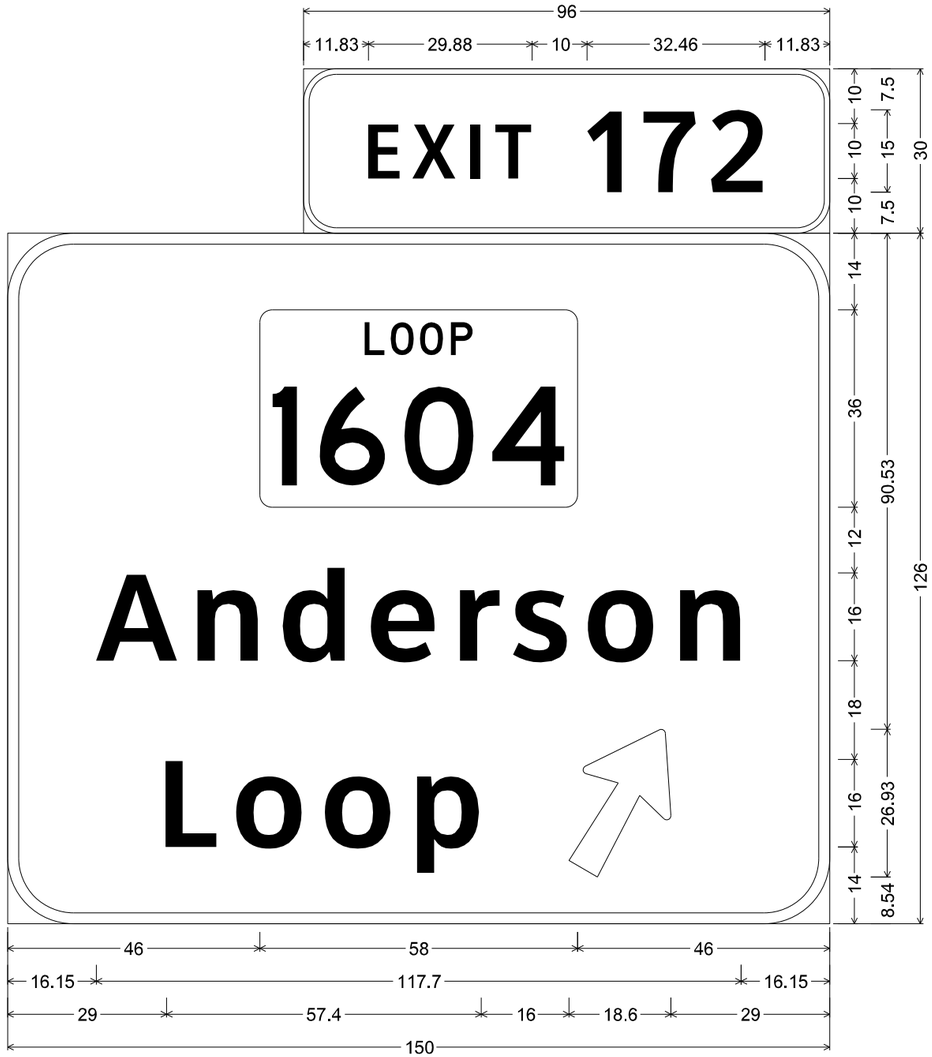
GUIDE SIGN DETAILS
IH-35 (NB)
IH-410 TO LP 1604

SHEET 3 OF 8

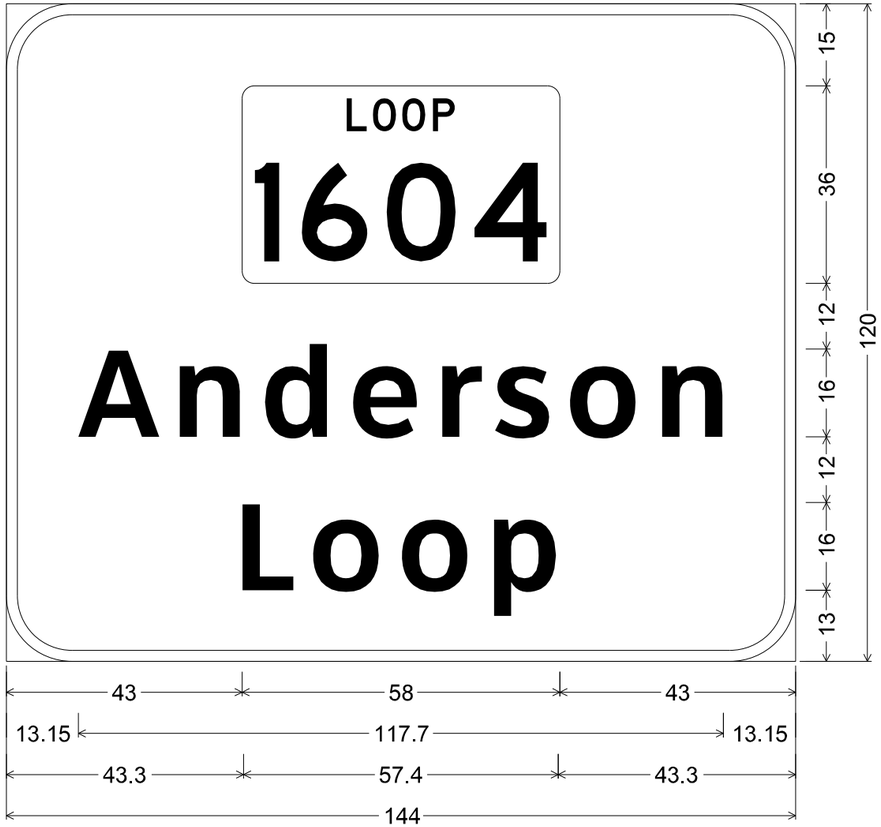
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		78
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

8-NB



6.00" Radius, 1.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [172] ClearviewHwy-4-W;
Identifier : Ground Mount-317-Southwest-IH 35 SB before Luckey Rd Exit;
12.00" Radius, 2.00" Border, White on Green;
State Highway 1604 M1-6L4; [Anderson] ClearviewHwy-5-W-R; [Loop] ClearviewHwy-5-W-R;
Arrow A-2 - 29.25" 60°;

9-NB



12.00" Radius, 2.00" Border, White on Green;
State Highway 1604 M1-6L4; [Anderson] ClearviewHwy-5-W-R;
[Loop] ClearviewHwy-5-W-R;

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GUIDE SIGN DETAILS
IH-35 (NB)
IH-410 TO LP 1604

SHEET 4 OF 8

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		79
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

DW DN

2/25/2022
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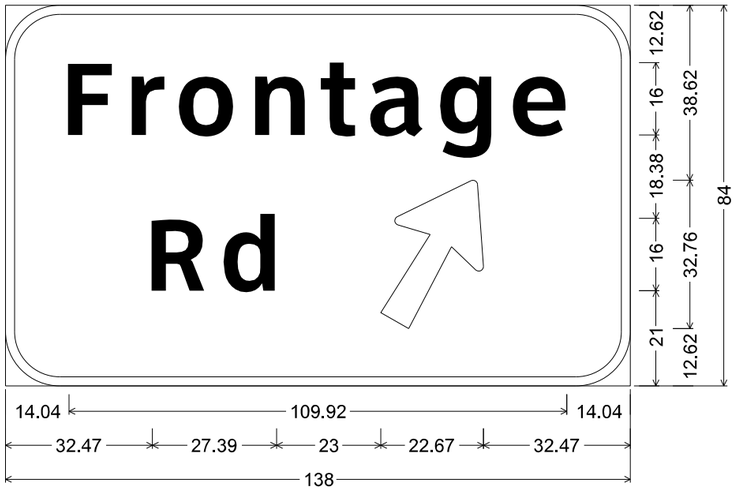
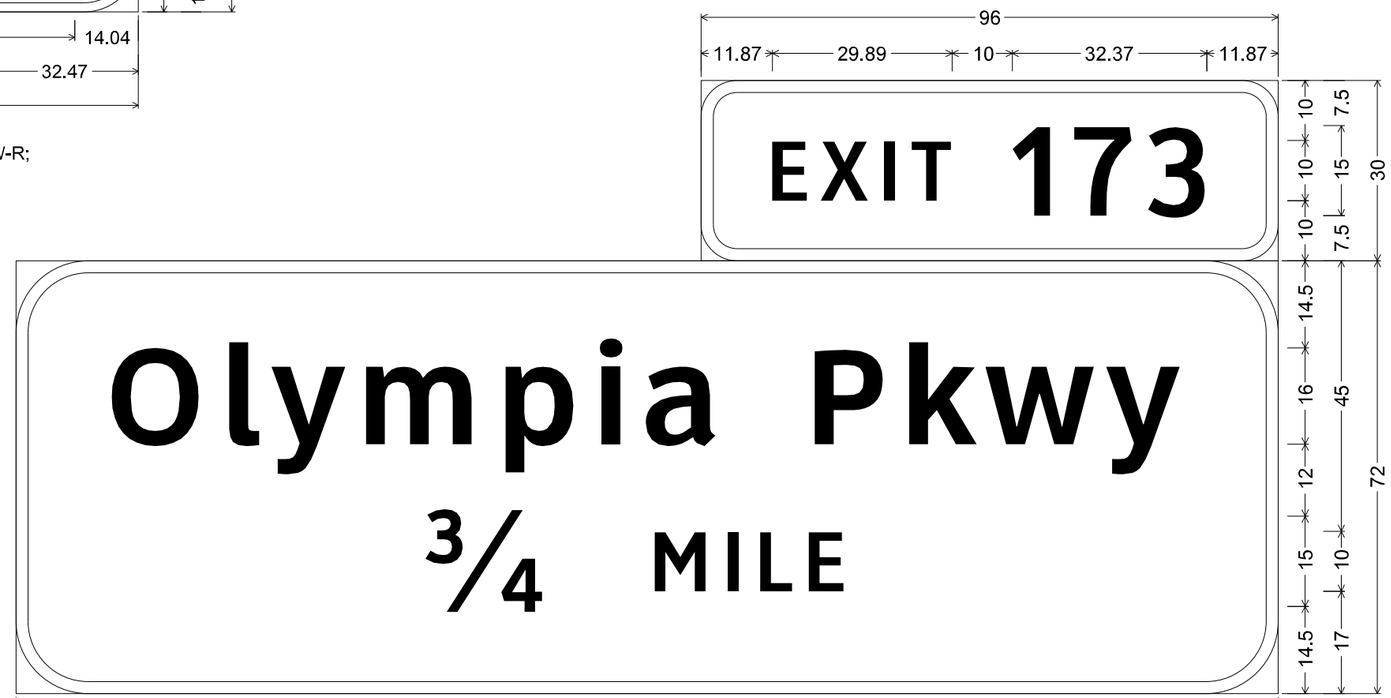
I0-NB



12.00" Radius, 2.00" Border, White on Green;
[Frontage] ClearviewHwy-5-W-R; [Rd] ClearviewHwy-5-W-R;
Arrow A-3 - 35.63" 60°;

I1-NB



6.00" Radius, 2.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [173] ClearviewHwy-4-W;
12.00" Radius, 2.00" Border, White on Green;
[Olympia Pkwy] ClearviewHwy-5-W-R; [3/4] ClearviewHwy-4-W; [MILE] ClearviewHwy-4-W;

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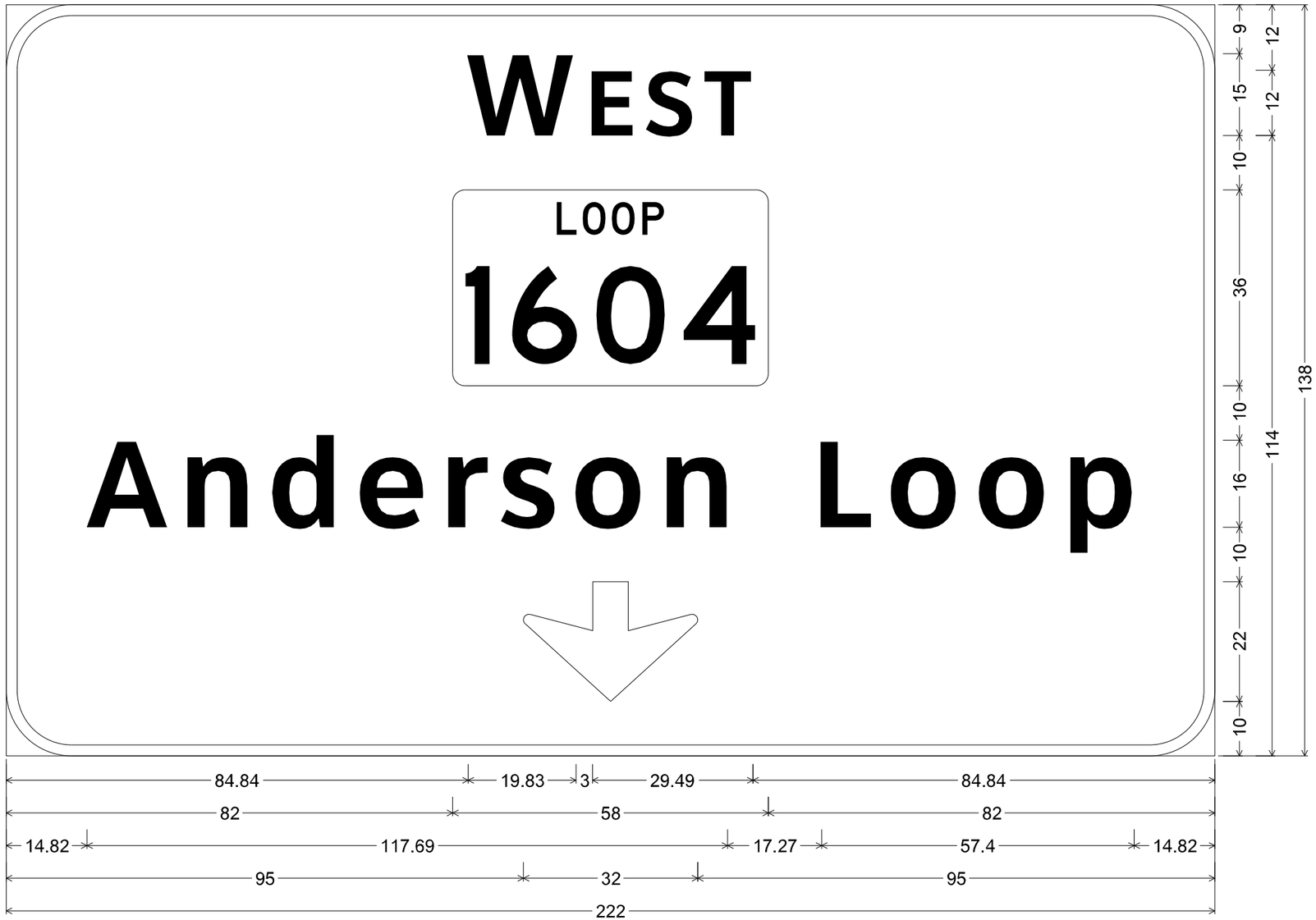
GUIDE SIGN DETAILS
IH-35 (NB)
IH-410 TO LP 1604

SHEET 5 OF 8

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		80
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

I2-NB



Identifier : Ground Mount-317-Southwest-IH 35 SB before Luckey Rd Exit;
12.00" Radius, 2.00" Border, White on Green;
[W] ClearviewHwy-5-W-R; [EST] ClearviewHwy-5-W-R; State Highway 1604 M1-6L4; [Anderson Loop] ClearviewHwy-5-W-R;
Down Arrow 22 - 22.00" 270°;

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IH-35 (NB)
IH-410 TO LP 1604

SHEET 6 OF 8

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		81
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

DW: DN

2/25/2022
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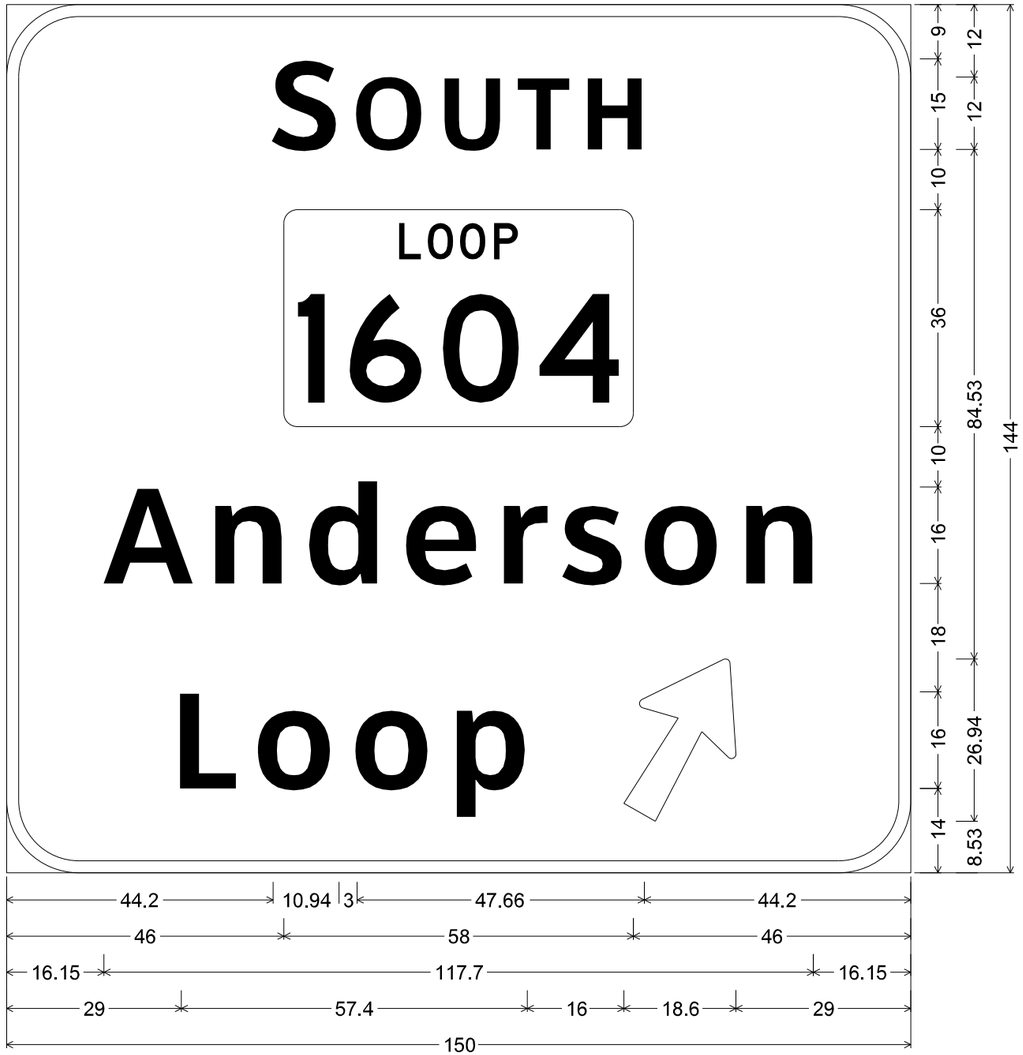
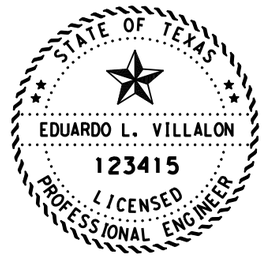
I 3-NB



Identifier : Ground Mount-317-Southwest-IH 35 SB before Luckey Rd Exit;
12.00" Radius, 2.00" Border, White on Green;
[S] ClearviewHwy-5-W-R; [OUTH] ClearviewHwy-5-W-R; State Highway 1604 M1-6L4;
[Anderson] ClearviewHwy-5-W-R; [Loop] ClearviewHwy-5-W-R; Arrow A-2 - 29.25" 60°;

I 4-NB (REMOVE)



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2/28/2022
DATE

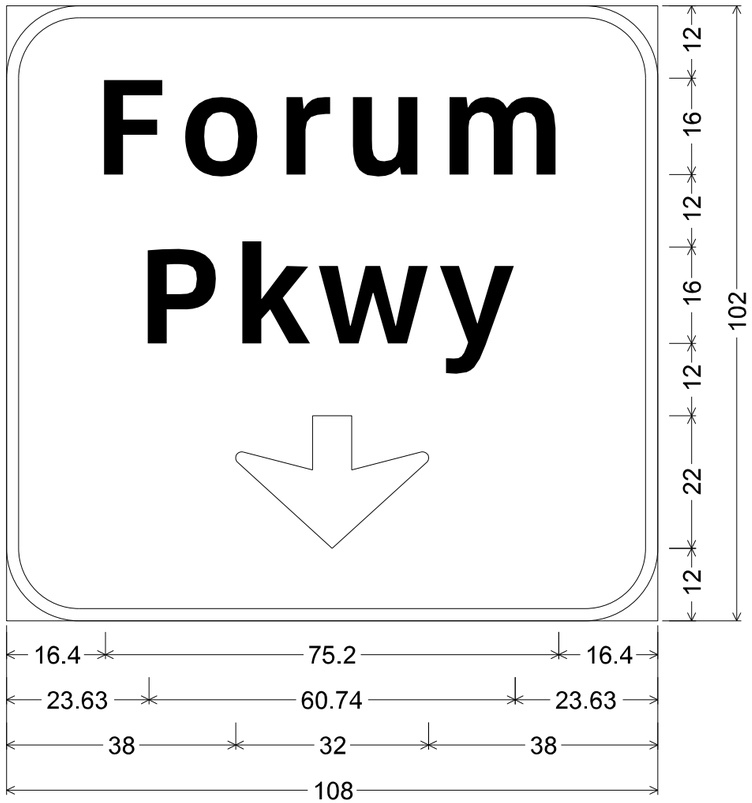
Texas Department of Transportation

GUIDE SIGN DETAILS
IH-35 (NB)
IH-410 TO LP 1604

SHEET 7 OF 8

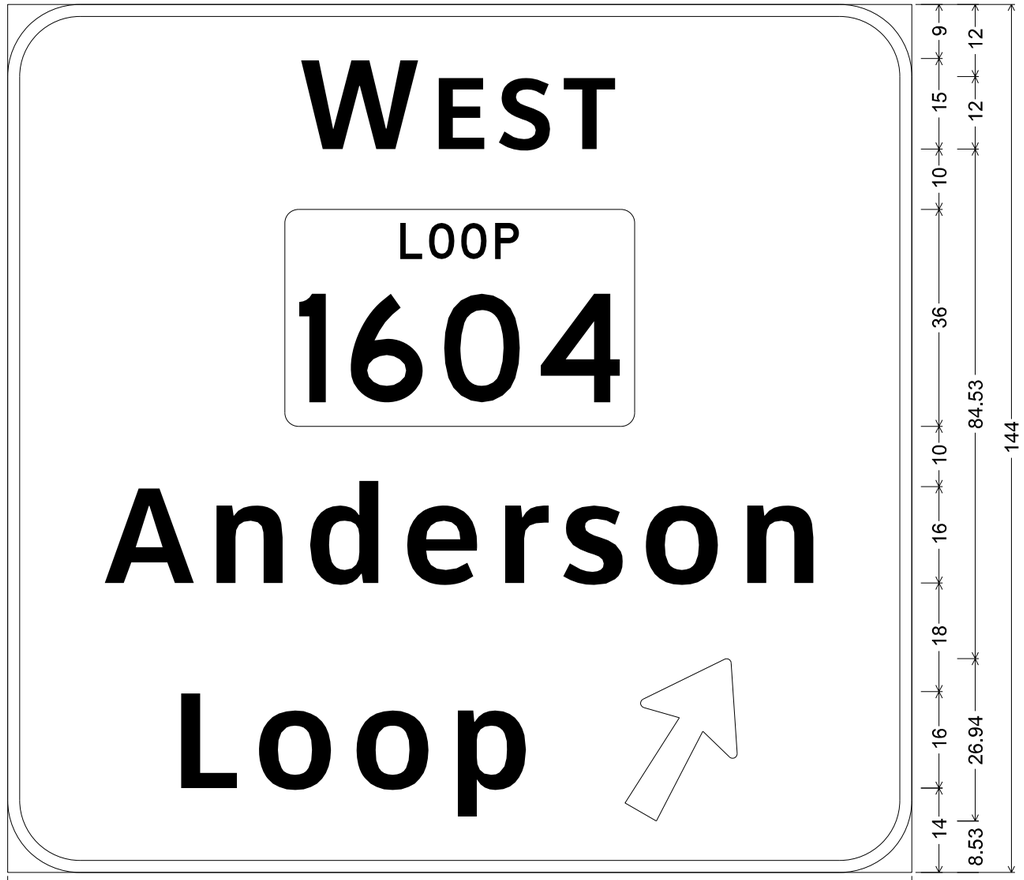
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		82
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

I5-NB



12.00" Radius, 2.00" Border, White on Green;
[Forum] ClearviewHwy-5-W-R;
[Pkwy] ClearviewHwy-5-W-R;
Down Arrow 22 - 22.00" 270°;

I6-NB



Identifier : Ground Mount-317-Southwest-IH 35 SB before Luckey Rd Exit;
12.00" Radius, 2.00" Border, White on Green;
[W] ClearviewHwy-5-W-R; [EST] ClearviewHwy-5-W-R; State Highway 1604 M1-6L4;
[Anderson] ClearviewHwy-5-W-R; [Loop] ClearviewHwy-5-W-R; Arrow A-2 - 29.25" 60°;

STATE OF TEXAS
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EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

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GUIDE SIGN DETAILS
IH-35 (NB)
IH-410 TO LP 1604

SHEET 8 OF 8

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		83
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

DW: DN

2/25/2022
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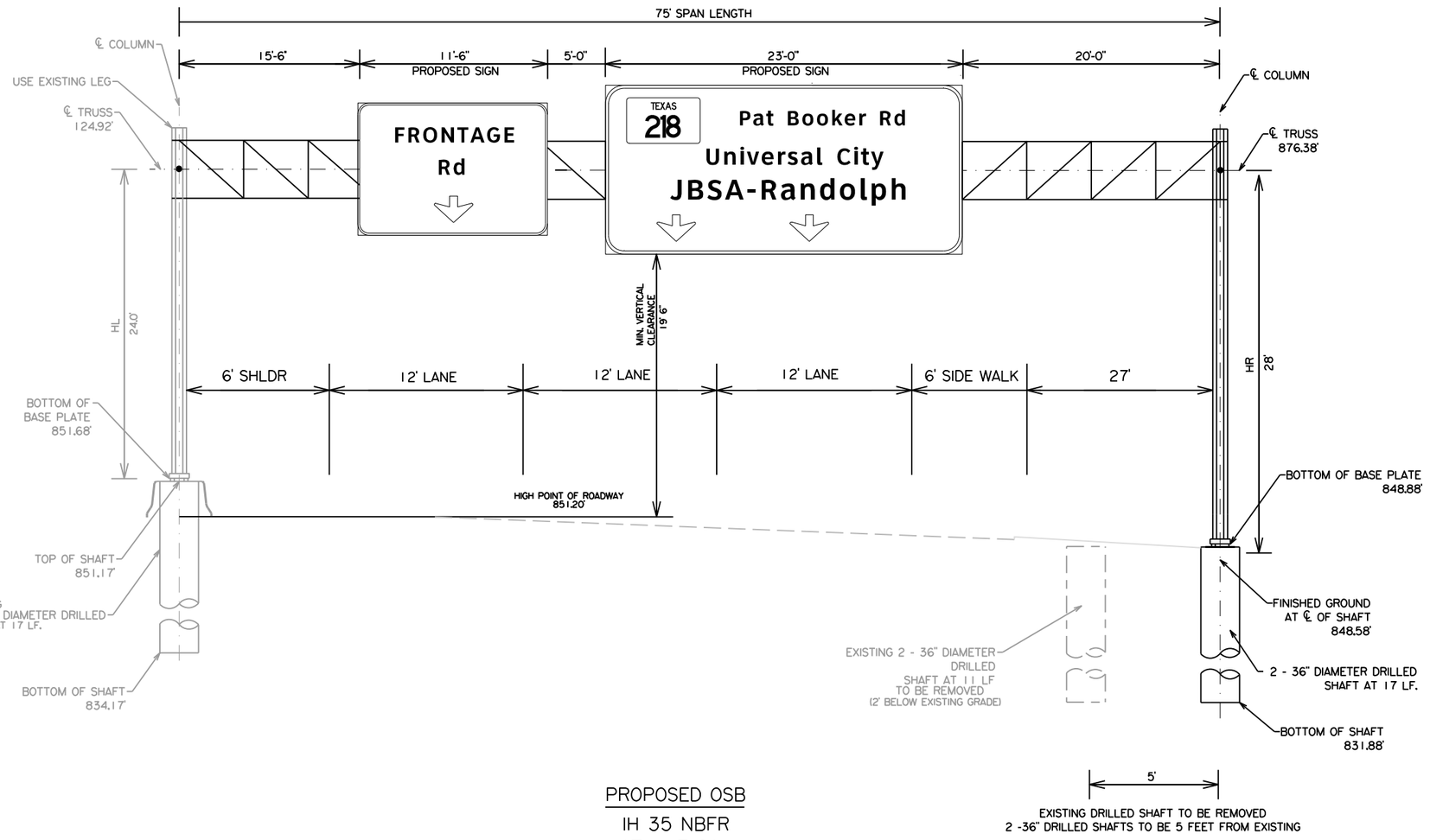
QUANTITY SUMMARY CSJ: 0915-00-238			
0416 6004	DRILL SHAFT (36 IN)	LF	34
0636 6003	ALUMINUM SIGNS (TY O)	SF	386
0650 6084	INS OH SN SUP(75 FT BRDG)	EA	1
0496 6035	REMOV STR (DRILL SHAFT)	EA	2



PROPOSED OSB
IH 35 NBFR
AT LIVE OAK

NOTE:
1. IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO ORDERING SIGN SUPPORT MATERIALS.
2. STAKE LOCATION OF OVERHEAD SIGN STRUCTURE TO BE APPROVED BY THE ENGINEER.
3. ALL SIGN STRUCTURE AND FOUNDATION ELEVATIONS SHALL BE VERIFIED IN THE FIELD AT THE ACTUAL LOCATION BY THE CONTRACTOR PRIOR TO DRILLING FOUNDATION.
4. FOR DESIGN DETAILS USE STANDARDS OSB-Z3, OSBT, OSB-FD & OSBC.
5. SEE SIGN DETAILS SHEET FOR GUIDE SIGN DETAILS
6. ELEVATIONS TAKEN FROM CSJ 0073-08-042
7. TOP OF DRILLED SHAFT TO FINISHED GRADE SHALL BE A MIN. OF 6"
8. MIN. VERTICAL CLEARANCE SHALL BE 19'-6"
9. EXISTING CROSS SECTION SHOWN IS APPROXIMATE. CONTRACTOR TO VERIFY COLUM HEIGHT AND VERTICAL CLEARANCE PRIOR TO CONSTRUCTION.
10. PENETROMETER VALUE OF N=10 BLOWS/FT WAS ASSUMED FOR FOUNDATION DEPTH DETERMINATION.
11. HARDWARE REQUIRED TO MAKE CONNECTION TO EXISTING OSB STRUCTURE SHALL BE SUBSIDIARY TO ITEM 650.
12. IT IS THE CONTRACTORS' RESPONSIBILITY TO VERIFY ALL UTILITIES PRIOR TO DRILLING FOUNDATIONS.

STATE OF TEXAS
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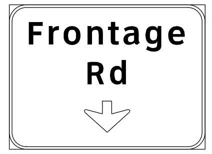
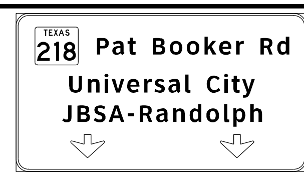
123415
LICENSED
PROFESSIONAL ENGINEER

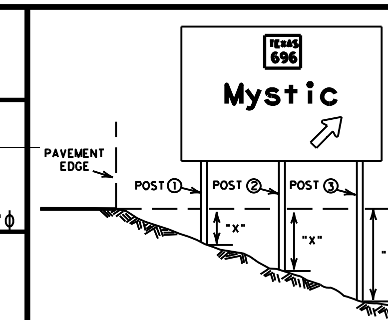
EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

OSB ELEVATION VIEW
IH 35 NORTHBOUND AT UNIVERSAL CITY LIVE OAK

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		84
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

SUMMARY OF LARGE SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN BACK-GROUND COLOR	SIGN TEXT	SIGN DIMENSIONS	PLAQUES, & OTHER ATTACHMENTS: DIRECT APPLY	PLAQUES, & OTHER ATTACHMENTS: * ALUMINUM (TYPE A)	BACKGROUND SUBSTRATE (SQ FT): GROUND MOUNT (TYPE G)	BACKGROUND SUBSTRATE (SQ FT): OVERHEAD (TYPE O)	TYPE OF MOUNT	"X" DIMENSION ⊖: post ①	"X" DIMENSION ⊖: post ②	"X" DIMENSION ⊖: post ③	GALVANIZED STRUCTURAL STEEL: SIZE	GALVANIZED STRUCTURAL STEEL: LINEAR FEET post ①	GALVANIZED STRUCTURAL STEEL: LINEAR FEET post ②	GALVANIZED STRUCTURAL STEEL: LINEAR FEET post ③	GALVANIZED STRUCTURAL STEEL: TOTAL WEIGHT LBS.	DRILLED SHAFT: LINEAR FEET NON-REINF 12"ϕ	DRILLED SHAFT: LINEAR FEET REINFORCED 24"ϕ	DRILLED SHAFT: LINEAR FEET REINFORCED 30"ϕ	DRILLED SHAFT: LINEAR FEET REINFORCED 36"ϕ
	1-OSB	GREEN		11'-6" x 8'-6"				97.75													
	2-OSB	GREEN		23'-0" x 12'-6"	11.97			287.5													
			PAGE TOTALS					385.25								PAGE TOTALS					



⊖ The "X" dimension is the elevation difference at the post between the ground and the edge of pavement or top of curb.
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.
The post lengths listed here are approximations, The corrected post lengths will be furnished by the Contractor after the stud posts are placed.
Tower heights shall be verified with the Engineer before fabrication.

* This column is for aluminum Type A and not direct apply. Direct apply is subsidiary to the sign.

SIGN TYPE

SIGN TYPE 1 3 0
- 1 — Wind Design Zone
- 3 — No. of Posts
- 0 — Series No.
  - 0 Aluminum/Fiberglass
  - 1 Aluminum
  - 2 Fiberglass

See sheet SMD(8W1)

IH 35
(FROM IH-410 NORTH TO LP-1604)

SUMMARY OF LARGE SIGNS
SOLS

DN.: TxDOT	CK.: TxDOT	DW.: TxDOT	CK.: TxDOT

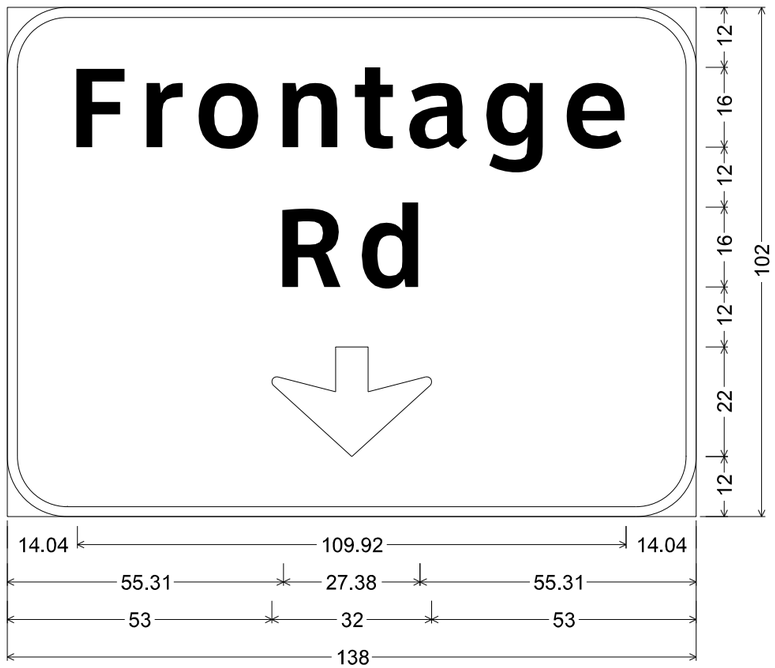
REVISIONS: 11-93, 8-95, 5-01, 1-04, 9-08

CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS

DIST	COUNTY	SHEET NO.
SAT	BEXAR	85

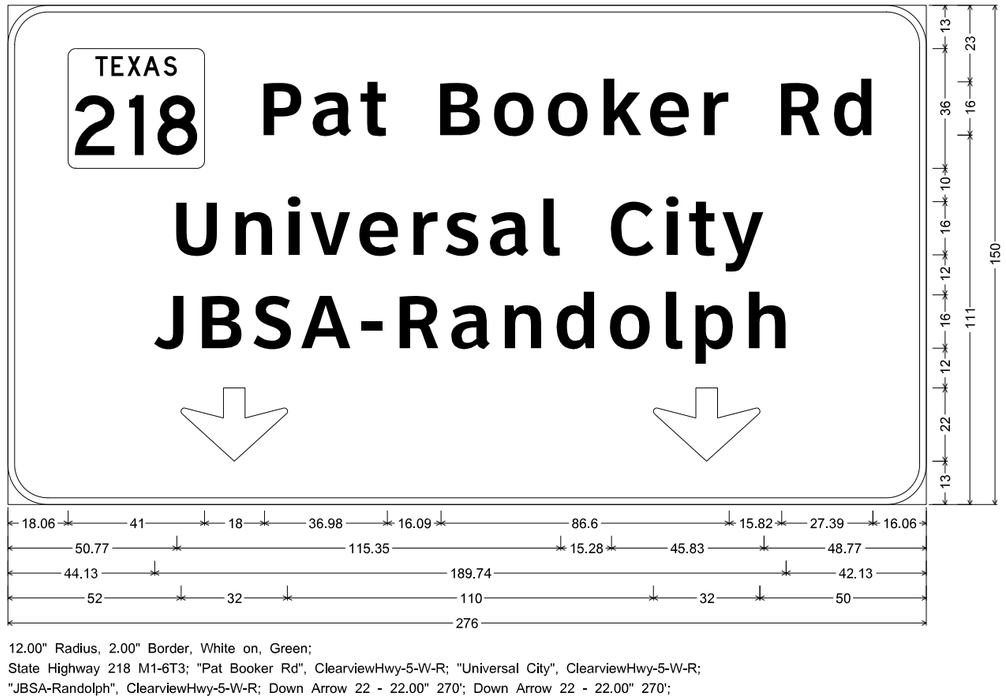
DATE: 2/25/2022 10:05:31 AM
FILE: T

1-OSB



12.00" Radius, 2.00" Border, White on, Green;
"Frontage", ClearviewHwy-5-W-R; "Rd", ClearviewHwy-5-W-R;
Down Arrow 22 - 22.00" 270';

2-OSB



12.00" Radius, 2.00" Border, White on, Green;
State Highway 218 M1-6T3; "Pat Booker Rd", ClearviewHwy-5-W-R; "Universal City", ClearviewHwy-5-W-R;
"JBSA-Randolph", ClearviewHwy-5-W-R; Down Arrow 22 - 22.00" 270'; Down Arrow 22 - 22.00" 270';

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

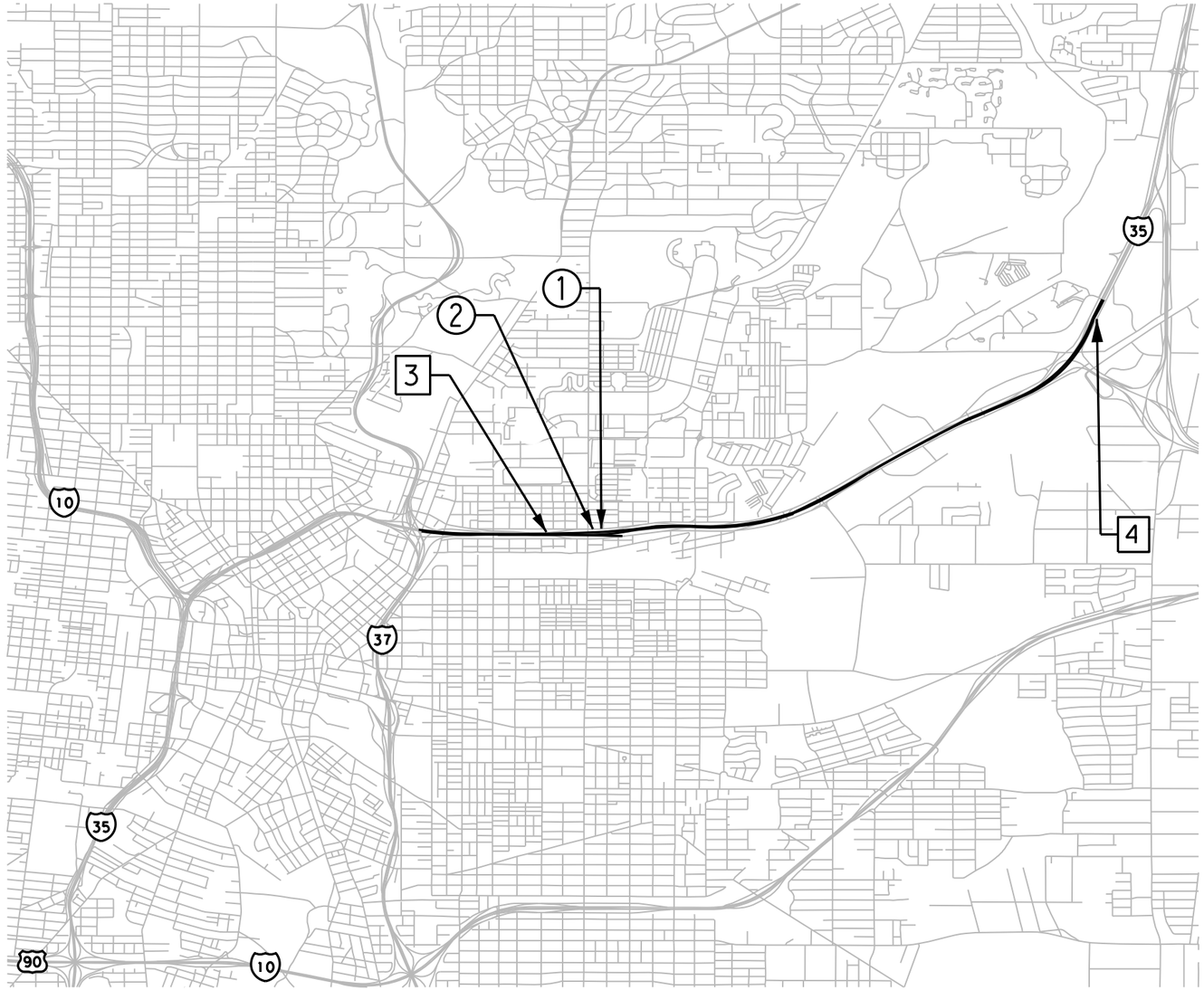
EDUARDO L. VILLALON, P.E.

2/28/2022
DATE

Texas Department of Transportation

GUIDE SIGN DETAILS
IH 35 NORTHBOUND AT UNIVERSAL CITY
LIVE OAK

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		86
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS



N

N. T. S.

LEGEND

- # ..... SMALL GUIDE SIGNAGE
- # ..... LARGE GUIDE SIGNAGE
- ——— ..... CORIDOR LIMITS

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E.

2/28/2022
DATE

Texas Department of Transportation

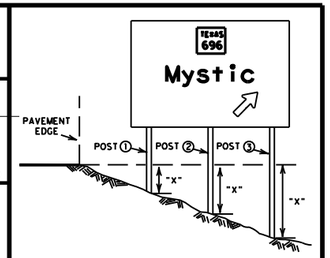
LOCATION MAP
IH-35
(IH-10 TO IH-410)

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		87
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

2/25/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\PLN*SHEETS\Plan Sheets\Location Maps\IH 35\Bexar\IH-35*SIGN*LOCATION*2.dgn
DN: DN

SUMMARY OF LARGE SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN BACK-GROUND COLOR	SIGN TEXT	SIGN DIMENSIONS	PLAQUES, & OTHER ATTACHMENTS		BACKGROUND SUBSTRATE (SQ FT)		TYPE OF MOUNT	"X" DIMENSION ◒			GALVANIZED STRUCTURAL STEEL					DRILLED SHAFT				
					DIRECT APPLY	⁎ ALUMINUM (TYPE A)	GROUND MOUNT (TYPE G)	OVERHEAD (TYPE O)		post ①	post ②	post ③	SIZE	LINEAR FEET post ①	post ②	post ③	TOTAL WEIGHT LBS.	NON-REINF 12"ϕ	LINEAR FEET REINFORCED 24"ϕ	30"ϕ	36"ϕ
	3-SB	BROWN	San Antonio Museum of Art NEXT RIGHT	16'-6" x 6'-6"			107.25														
	4-NB	GREEN	NORTH 35 410 Austin	11'-6" x 9'-0"	16.19			103.5													
PAGE TOTALS							107.25	103.5													



◒ The "X" dimension is the elevation difference at the post between the ground and the edge of pavement or top of curb.

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.

The post lengths listed here are approximations, The corrected post lengths will be furnished by the Contractor after the stud posts are placed.

Tower heights shall be verified with the Engineer before fabrication.

⁎ This column is for aluminum Type A and not direct apply. Direct apply is subsidiary to the sign.

SIGN TYPE

SIGN TYPE 1 3 0
- 1 — Wind Design Zone
- 3 — No. of Posts
- 0 — Series No.: 0 Aluminum/Fiberglass, 1 Aluminum, 2 Fiberglass

See sheet SMD(8W1)

IH 35

(FROM IH-410 TO IH-10)

SUMMARY OF LARGE SIGNS

SOLS

DN.: TxDOT	CK.: TxDOT	DW.: TxDOT	CK.: TxDOT	REVISIONS
				1-04
11-93	8-95	5-01		9-08

CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS
DIST	COUNTY		SHEET NO.
SAT	BEXAR		88

DATE: 2/25/2022 10:05:52 AM
FILE: I

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
	1-WB	D1-1	New Braunfels Ave NEXT SIGNAL	108" X 30"	✓							
	2-WB	D7-1	Historical Ft. Sam Houston ⇨ Government Hill Historical District ⇨	102" X 48"		✓						

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).

IH-35

(FROM IH-410 TO IH-10)

Texas Department of Transportation

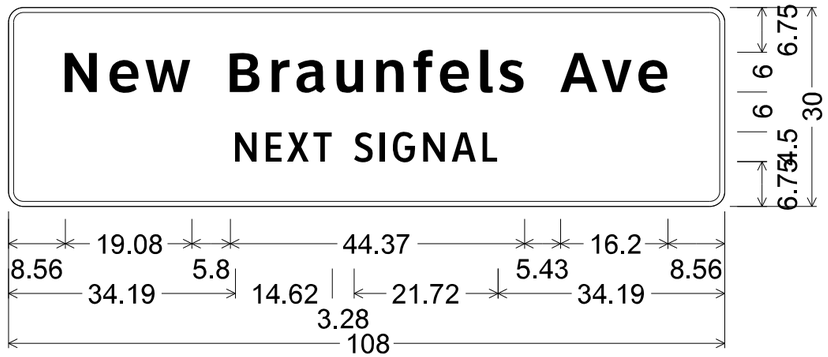
Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

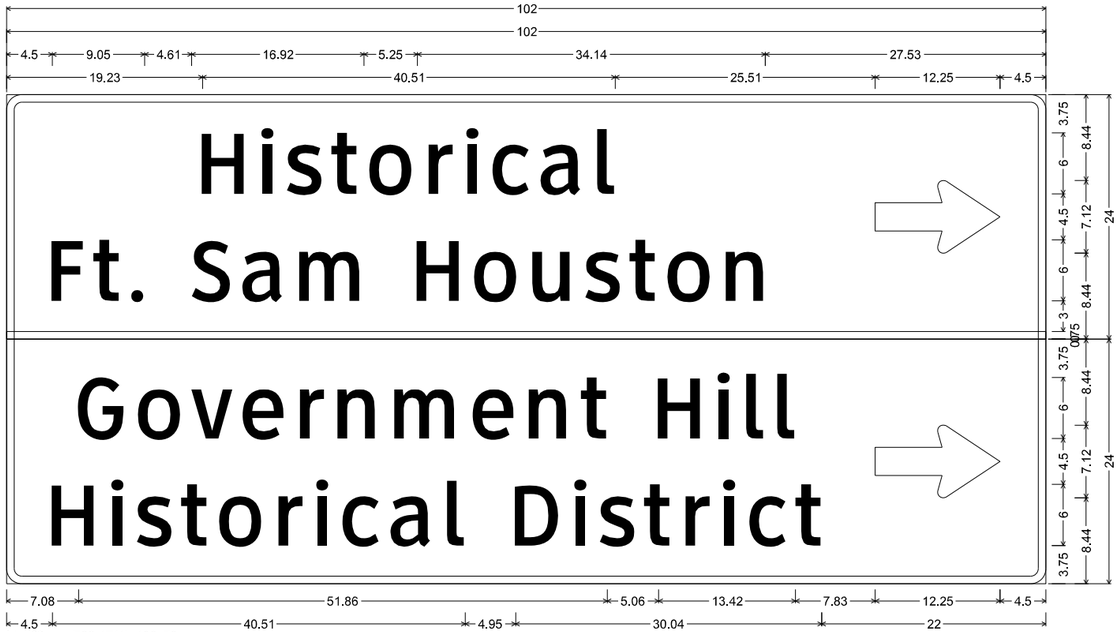
FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	2021	CONT	SECT	JOB	HIGHWAY
REVISIONS		0915	00	238	VARIOUS
4-16		DIST	COUNTY		SHEET NO.
8-16		SAT	BEXAR		89

1-SB



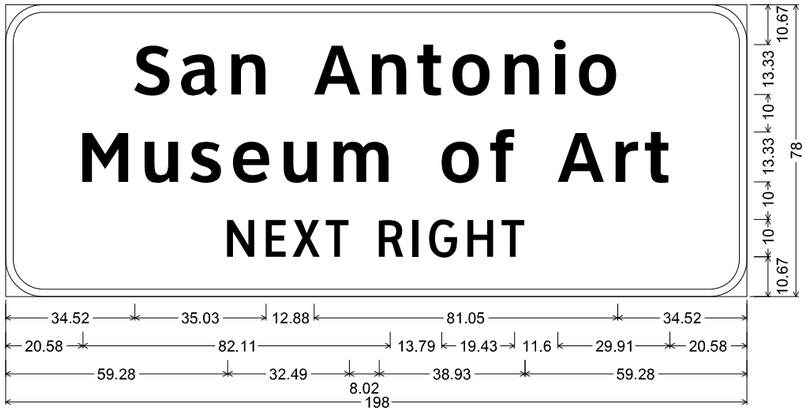
Identifier : D1-1 8in RT;
2.25" Radius, 0.75" Border, White on Green;
[New Braunfels Ave] ClearviewHwy-5-W-R;
[NEXT SIGNAL] ClearviewHwy-3-W;

2-SB



Identifier : E22-1T(1)_198x78;
1.50" Radius, 0.75" Border, White on Brown;
[Historical] ClearviewHwy-3-W; [Ft. Sam Houston] ClearviewHwy-3-W; Standard Arrow Custom 12.25" X 7.13" 0°;
Identifier : E22-1T(1)_198x78;
1.50" Radius, 0.75" Border, White on Brown;
[Government Hill] ClearviewHwy-3-W; [Historical District] ClearviewHwy-3-W; Standard Arrow Custom 12.25" X 7.13" 0°;

3-SB



Identifier : E22-1T(1)_198x78;
10.00" Radius, 2.00" Border, White on Brown;
[San Antonio] ClearviewHwy-5-W-R; [Museum of Art] ClearviewHwy-5-W-R;
[NEXT RIGHT] ClearviewHwy-3-W;

STATE OF TEXAS
EDUARDO L. VILLALON
123415
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PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

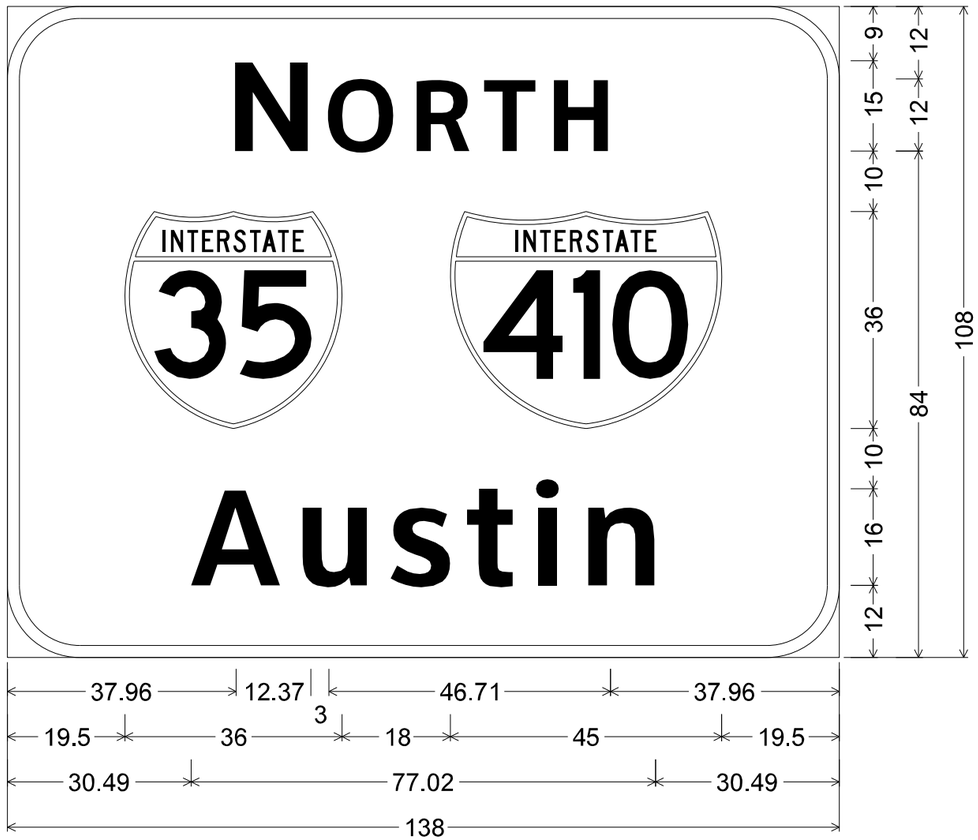
Texas Department of Transportation

GUIDE SIGN DETAILS
IH-35 (SB)
IH-410 TO IH-37

SHEET 1 OF 2

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		90
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

4-NB



12.00" Radius, 2.00" Border, White on Green;
[N] ClearviewHwy-5-W-R; [ORTH] ClearviewHwy-5-W-R;
Interstate 35 M1-1; Interstate 410 M1-1;
[Austin] ClearviewHwy-5-W-R;

STATE OF TEXAS
EDUARDO L. VILLALON
123415
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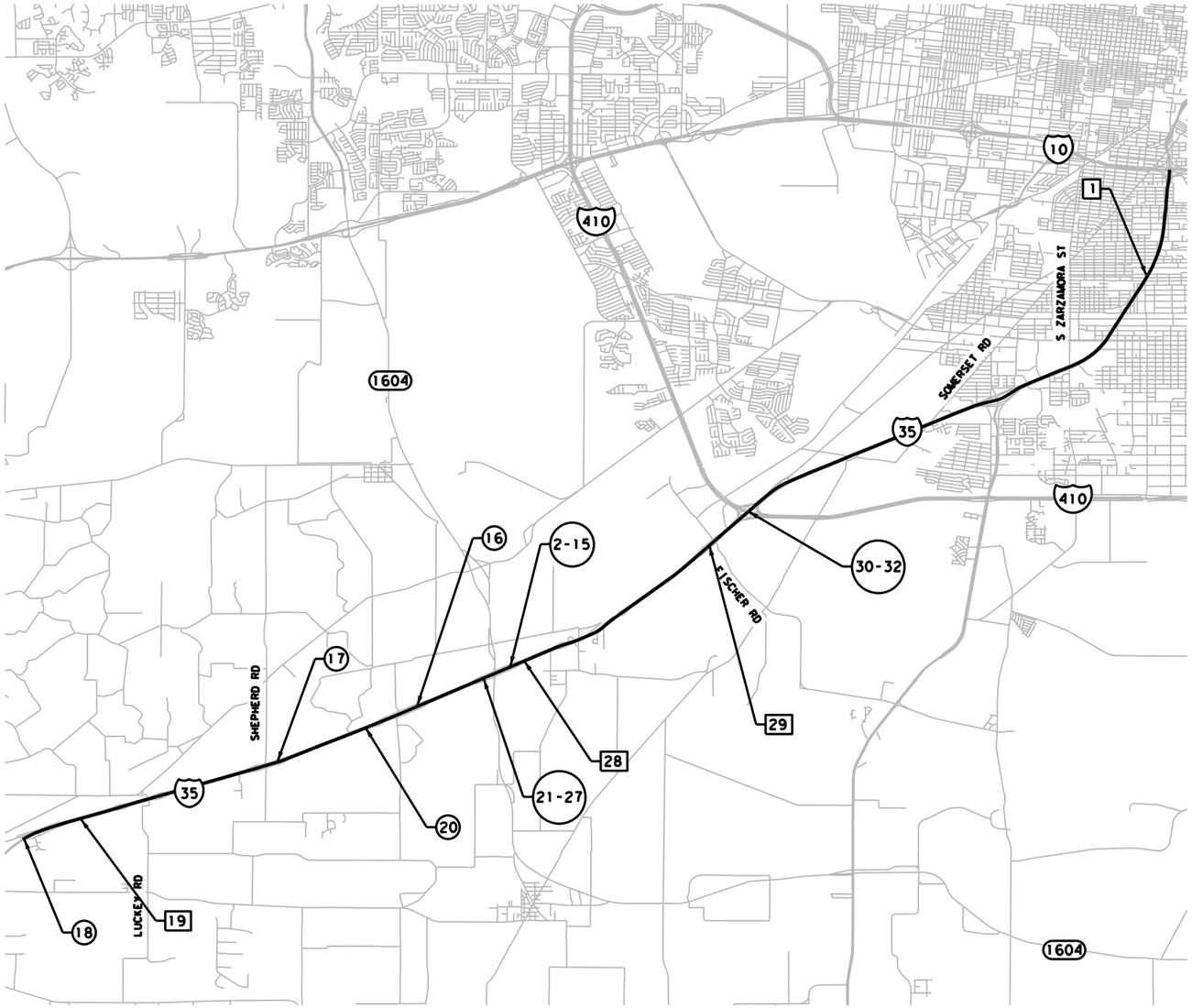
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

GUIDE SIGN DETAILS
IH-35 (NB)
DIVISION AVE TO SW MILITARY DR

SHEET 2 OF 2

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		91
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS



N

N. T. S.

LEGEND

- # ..... SMALL GUIDE SIGNAGE
- # ..... LARGE GUIDE SIGNAGE
- ——— ..... CORIDOR LIMITS

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

Texas Department of Transportation

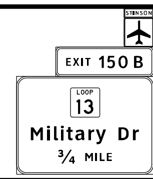
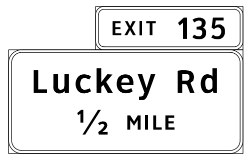
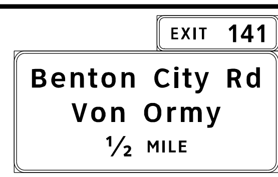
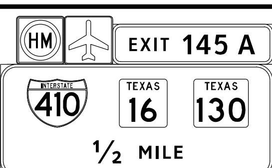
SIGN LOCATION SUMMARY
IH-35
(BEXAR COUNTY LINE TO IH-10)

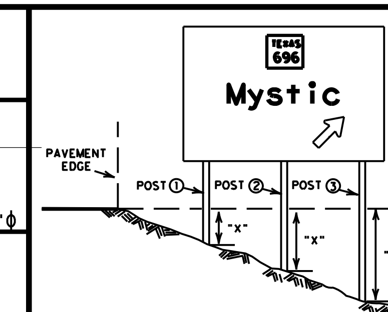
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		92
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

2/25/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\PLN*SHEETS\Plan Sheets\Location Maps\IH 35\Bexar\IH-35*SIGN*LOCATION*1.dgn
DN: DN

DATE: 2/25/2022 10:06:28 AM
FILE: T

SUMMARY OF LARGE SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN BACK-GROUND COLOR	SIGN TEXT	SIGN DIMENSIONS	PLAQUES, & OTHER ATTACHMENTS: DIRECT APPLY	PLAQUES, & OTHER ATTACHMENTS: * ALUMINUM (TYPE A)	BACKGROUND SUBSTRATE (SQ FT): GROUND MOUNT (TYPE G)	BACKGROUND SUBSTRATE (SQ FT): OVERHEAD (TYPE O)	TYPE OF MOUNT	"X" DIMENSION ⊖ post ①	"X" DIMENSION ⊖ post ②	"X" DIMENSION ⊖ post ③	GALVANIZED STRUCTURAL STEEL: SIZE	GALVANIZED STRUCTURAL STEEL: LINEAR FEET post ①	GALVANIZED STRUCTURAL STEEL: LINEAR FEET post ②	GALVANIZED STRUCTURAL STEEL: LINEAR FEET post ③	GALVANIZED STRUCTURAL STEEL: TOTAL WEIGHT LBS.	DRILLED SHAFT: LINEAR FEET NON-REINF 12"ϕ	DRILLED SHAFT: LINEAR FEET REINFORCED 24"ϕ	DRILLED SHAFT: LINEAR FEET REINFORCED 30"ϕ	DRILLED SHAFT: LINEAR FEET REINFORCED 36"ϕ
	1-SB	GREEN		3'-0" x 1'-0"		3															
				3'-0" x 3'-0"		9															
				10'-0" x 3'-0"				30													
		GREEN		14'-0" x 10'-0"	8.97			140													
	19-NB	GREEN		8'-0" x 2'-6"			20														
				13'-6" x 6'-0"			81														
	28-NB	GREEN		8'-0" x 2'-6"			20														
		GREEN		18'-6" x 8'-0"			148														
	29-NB	WHITE		2'-6" X 2'-6"		6.25															
		GREEN		2'-6" X 2'-6"		6.25															
		GREEN		10'-0" x 2'-6"			25														
		GREEN		16'-6" x 7'-6"	29.93		123.75														
			PAGE TOTALS			24.5	417.75	170									PAGE TOTALS				



⊖ The "X" dimension is the elevation difference at the post between the ground and the edge of pavement or top of curb.

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.

The post lengths listed here are approximations, The corrected post lengths will be furnished by the Contractor after the stud posts are placed.

Tower heights shall be verified with the Engineer before fabrication.

* This column is for aluminum Type A and not direct apply. Direct apply is subsidiary to the sign.

SIGN TYPE

SIGN TYPE 1 3 0
- 1 — Wind Design Zone
- 3 — No. of Posts
- 0 — Series No.
  - 0 Aluminum/Fiberglass
  - 1 Aluminum
  - 2 Fiberglass

See sheet SMD(8W1)

IH 35

(FROM US 90 TO BEXAR COUNTY LINE)

SUMMARY OF LARGE SIGNS

SOLS

DN.: TxDOT | CK.: TxDOT | DW.: TxDOT | CK.: TxDOT

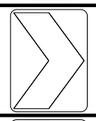
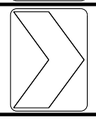
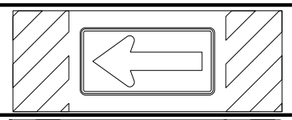
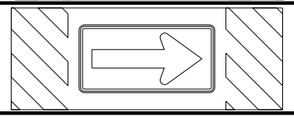
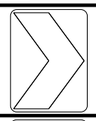
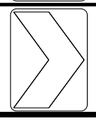
REVISIONS: 11-93, 8-95, 5-01, 1-04, 9-08

CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS

DIST	COUNTY	SHEET NO.
SAT	BEXAR	93

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
	2-SB	W1-3R		36" x 36"	✓							
	3-SB	W13-1P		24" x 24"	✓							
	4-SB	CW1-8R		18" X 24"	✓							
	5-SB	CW1-8R		18" X 24"	✓							
	6-SB	CW1-8R		18" X 24"	✓							
	7-SB	CW1-8R		18" X 24"	✓							
	8-SB	CW1-8R		18" X 24"	✓							
	9-SB	R5-1a		36" X 24"	✓							
	10-SB	R5-1a		36" X 24"	✓							
	11-SB	R5-1		36" X 36"	✓							
	12-SB	R5-1		36" X 36"	✓							
	13-SB	R5-1		36" X 36"	✓							
	14-SB	R1-2		36" X 36"	✓							
	15-SB	W1-9TL		96" X 36"	✓							
	16-SB	W1-9TR		96" x 36"	✓							
	17-SB	W1-9TR		96" x 36"	✓							
	18-NB	I-2dT		66" x 36"	✓							
	20-NB	CW13-2		36" x 48"	✓							
	21-NB	CW1-8R		18" X 24"	✓							
	22-NB	CW1-8R		18" X 24"	✓							
	23-NB	CW1-8R		18" X 24"	✓							
	24-NB	CW1-8R		18" X 24"	✓							
	25-NB	CW1-8R		18" X 24"	✓							
	26-NB	CW1-8R		18" X 24"	✓							

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).

IH-35

(FROM IH-410 SOUTH TO BEXAR COUNTY LINE)

Texas Department of Transportation

Traffic Operations Division Standard

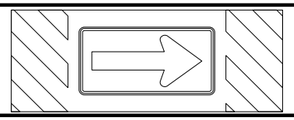
SUMMARY OF SMALL SIGNS

SOSS

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	2021	CONT	SECT	JOB	HIGHWAY
REVISIONS		0915	00	238	VAR
4-16		DIST	COUNTY		SHEET NO.
8-16		SAT	BEXAR		94

18

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	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"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	TY N TY S
	27-NB	W1-9TR		96" x 36"	✓							
	30-NB	M3-3B		36" x 18"	✓							
	31-NB	M1-1		36" x 36"	✓							
	32-NB	M6-2R(L)		30" x 24"	✓							

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).

IH-35

(FROM IH-410 SOUTH TO BEXAR COUNTY LINE)

Texas Department of Transportation

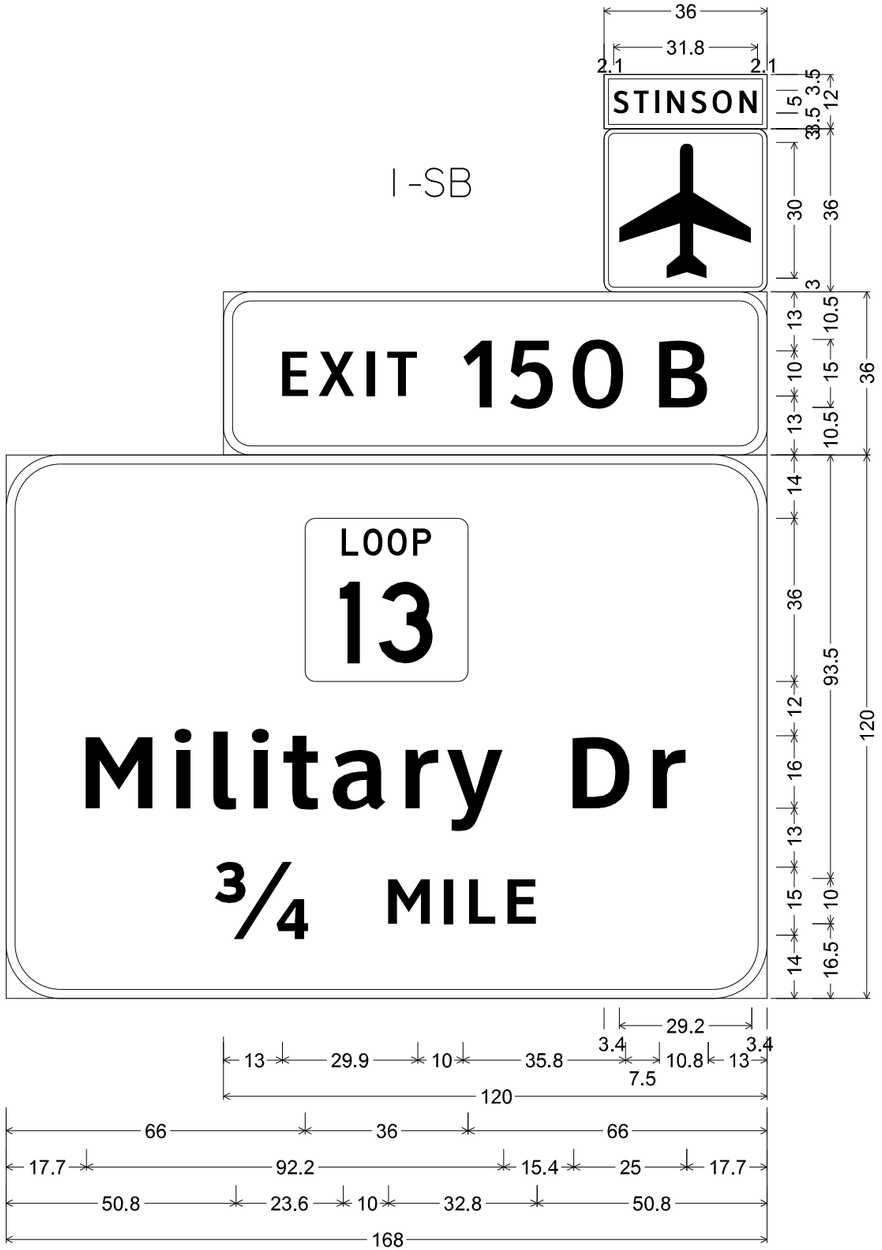
Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

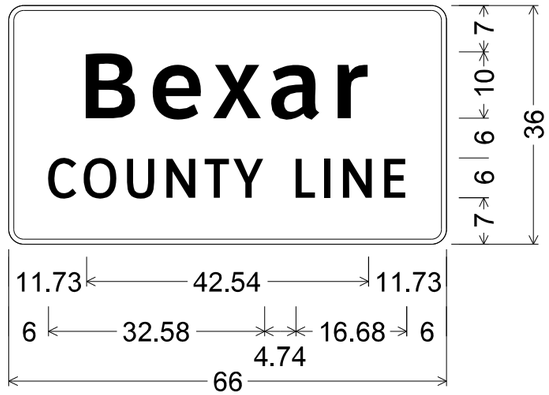
FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	2021	CONT	SECT	JOB	HIGHWAY
REVISIONS		0915	00	238	VAR
4-16		DIST	COUNTY		SHEET NO.
8-16		SAT	BEXAR		95

I-SB



2.3" Radius, 1.0" Border, White on Green;
[STINSON] ClearviewHwy-4-W;
Identifier : FI-5_36x36;
2.3" Radius, 1.0" Border, White on Green;
Symbol RA010;
6.0" Radius, 2.0" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [150] ClearviewHwy-4-W; [B] ClearviewHwy-4-W;
Identifier : E1-2_VARx120;
12.0" Radius, 2.0" Border, White on Green;
State Highway 13 M1-6L2; [Military Dr] ClearviewHwy-5-W-R;
[3/4] ClearviewHwy-5-W-R; [MILE] ClearviewHwy-5-W-R;

I8-NB



Identifier : I-2dT 10in;
2.25" Radius, 0.75" Border, White on Green;
[Bexar] ClearviewHwy-5-W-R;
[COUNTY LINE] ClearviewHwy-3-W;

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

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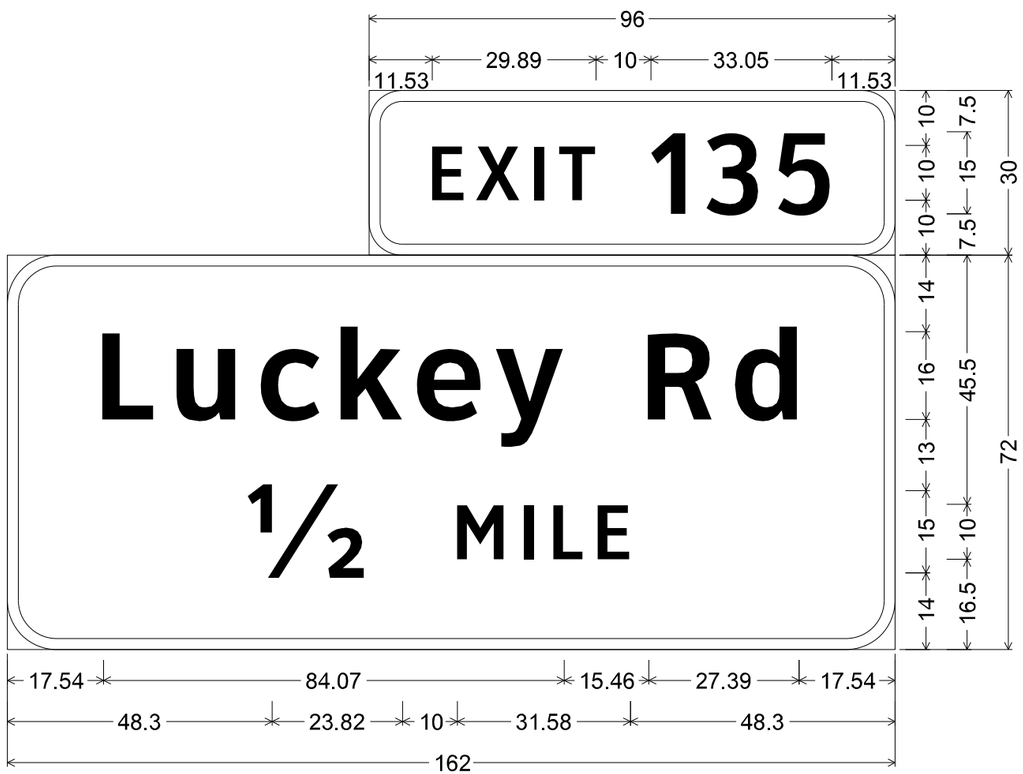
GUIDE SIGN DETAILS
IH-35 (NB)
LP 1604 TO IH-410

SHEET 1 OF 3

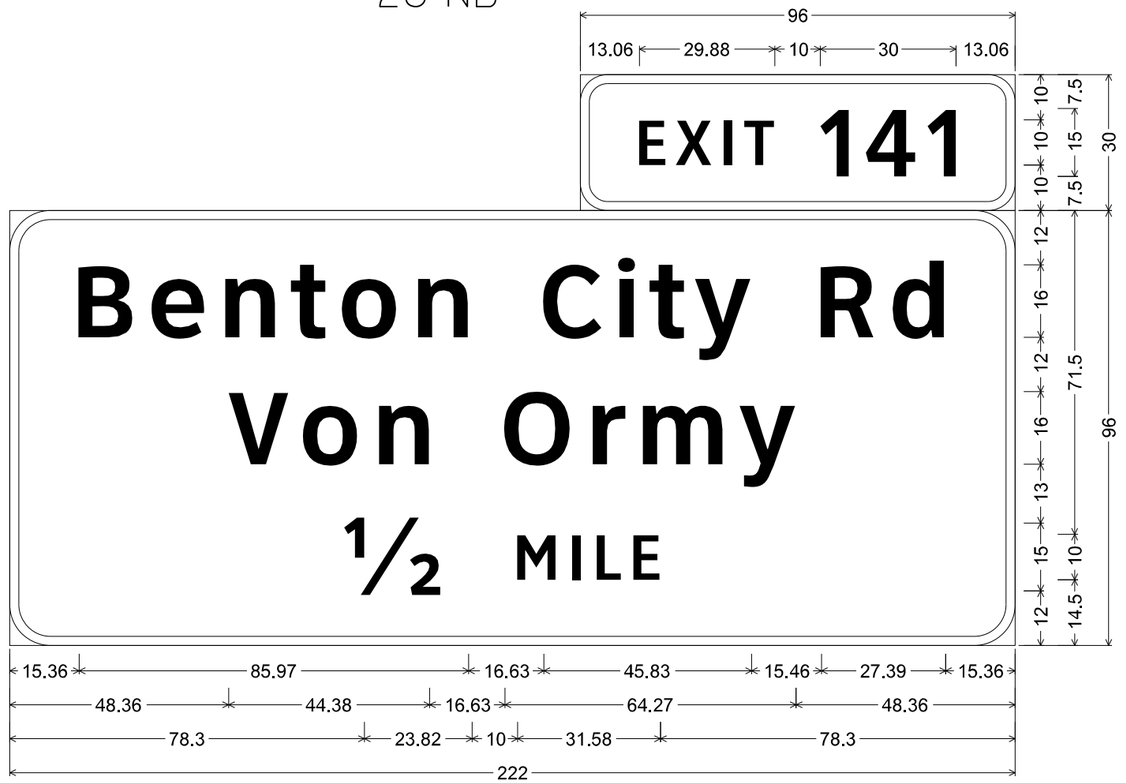
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		96
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

I9-NB



6.00" Radius, 2.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [135] ClearviewHwy-4-W;
9.00" Radius, 2.00" Border, White on Green;
[Luckey Rd] ClearviewHwy-5-W-R; [½] ClearviewHwy-5-W-R;
[MILE] ClearviewHwy-4-W;

28-NB



6.00" Radius, 2.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [141] ClearviewHwy-4-W;
9.00" Radius, 2.00" Border, White on Green;
[Benton City Rd] ClearviewHwy-5-W-R; [Von Ormy] ClearviewHwy-5-W-R; [½] ClearviewHwy-5-W-R;
[MILE] ClearviewHwy-4-W;

STATE OF TEXAS
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PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

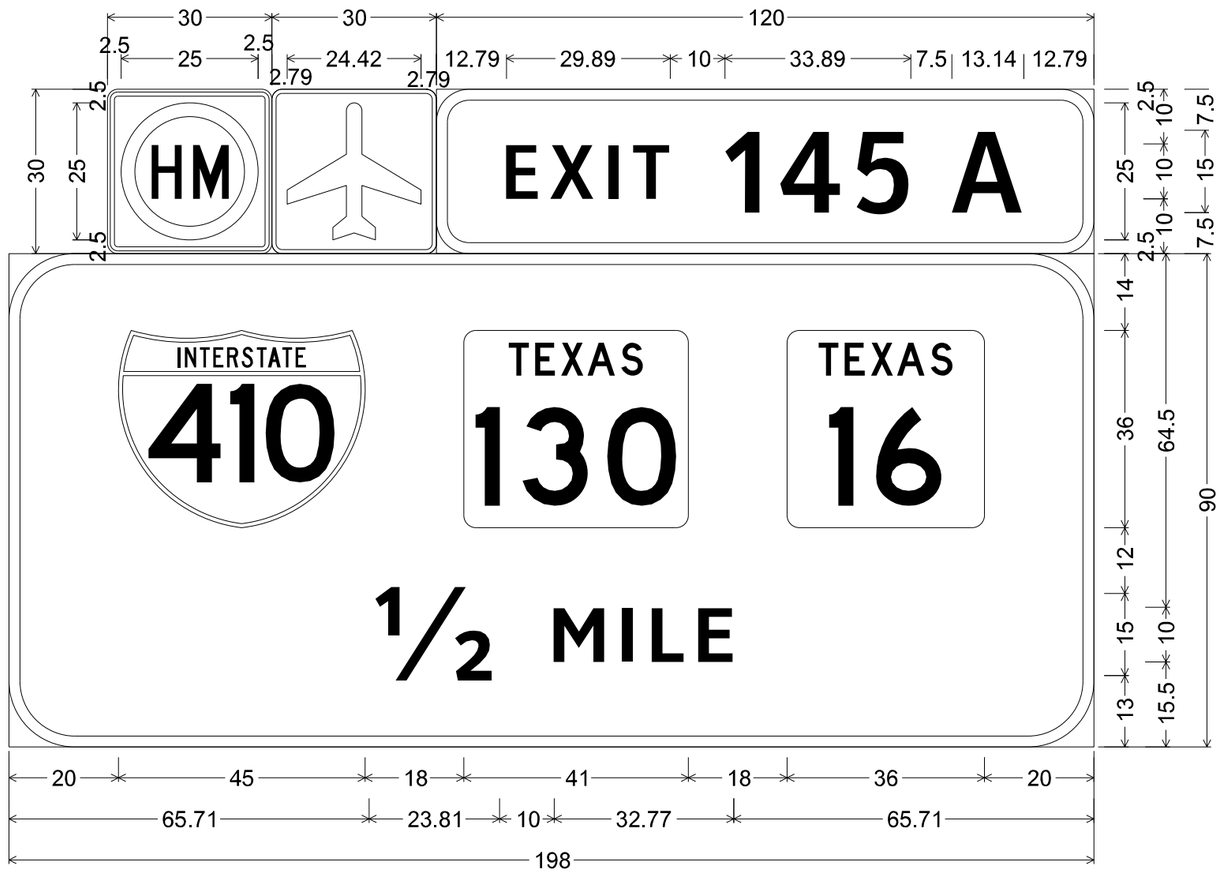
Texas Department of Transportation

GUIDE SIGN DETAILS
IH-35 (NB)
LP 1604 TO IH-410

SHEET 2 OF 3

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		97
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

29-NB



Identifier : R14-2_30x30;
1.88" Radius, 0.75" Border, 0.50" Indent, Black on White;
Identifier : I-5_30x30;
1.88" Radius, 0.75" Border, White on Green;
Symbol I-5;
6.00" Radius, 2.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [145] ClearviewHwy-4-W; [A] ClearviewHwy-4-W;
12.00" Radius, 2.00" Border, White on Green;
Interstate 410 M1-1; State Highway 130 M1-6T3; State Highway 16 M1-6T2;
[½] ClearviewHwy-5-W-R; [MILE] ClearviewHwy-5-W-R;

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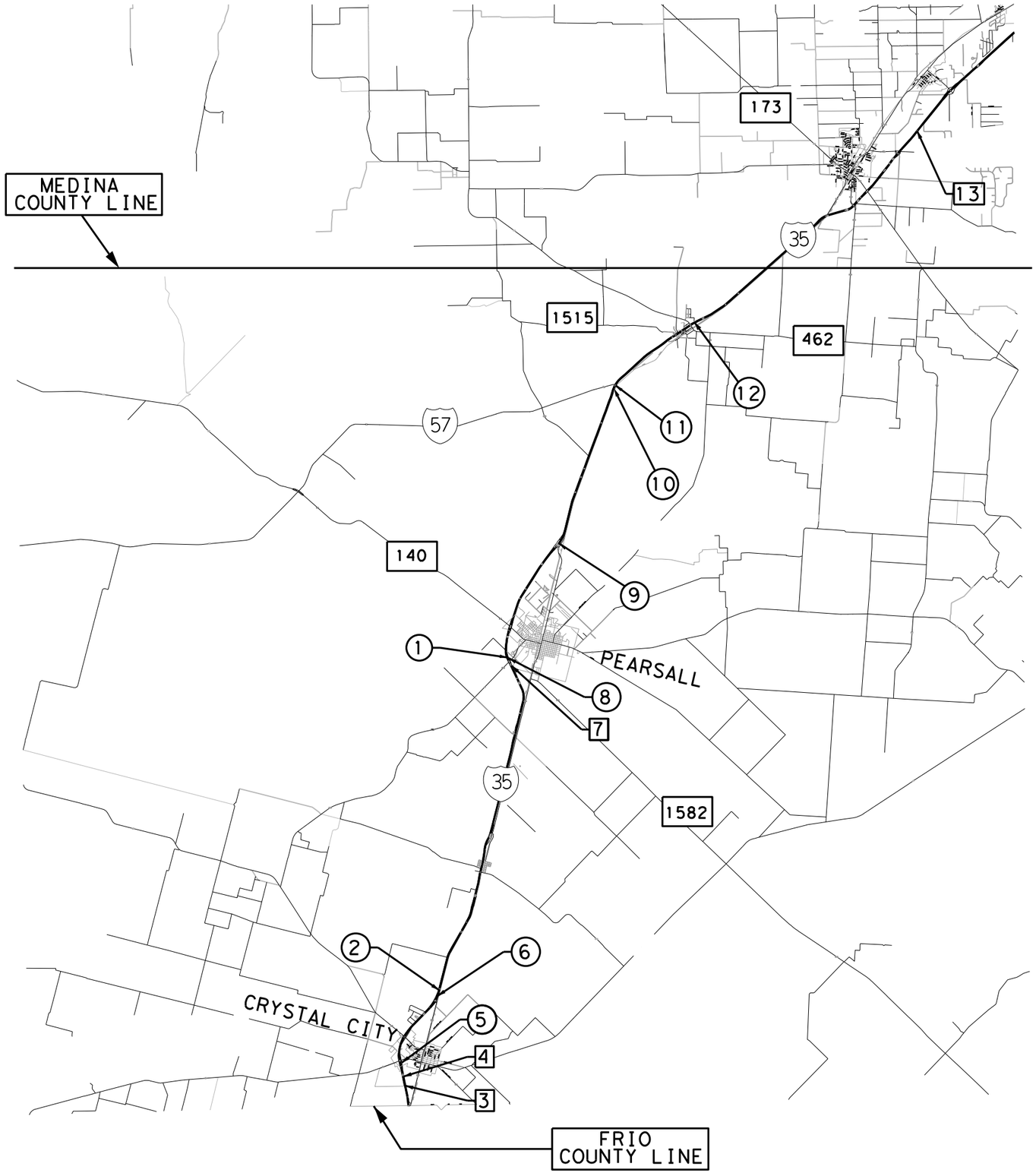
Texas Department of Transportation

GUIDE SIGN DETAILS
IH-35 (NB)
LP 1604 TO IH-410
SHEET 3 OF 3

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		98
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS



N

N. T. S.

LEGEND

(#) ..... SMALL GUIDE SIGNAGE

[#] ..... LARGE GUIDE SIGNAGE

STATE OF TEXAS
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123415
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EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

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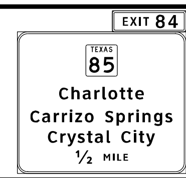
LOCATION MAP

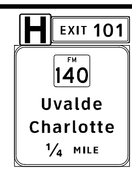
IH 35
(FM 471 TO FRIO COUNTY LINE)

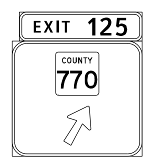
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		99
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

2/25/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\PLN*SHEETS\Plan Sheets\Location Maps\IH 35\Medina & Frio\IH 35*Medina&Frio*Loc.dgn
DW: DN

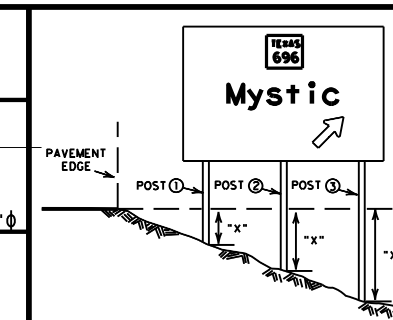
SUMMARY OF LARGE SIGNS







PLAN SHEET NO.	SIGN NO.	SIGN BACK-GROUND COLOR	SIGN TEXT	SIGN DIMENSIONS	PLAQUES, & OTHER ATTACHMENTS: DIRECT APPLY	PLAQUES, & OTHER ATTACHMENTS: * ALUMINUM (TYPE A)	BACKGROUND SUBSTRATE (SQ FT): GROUND MOUNT (TYPE G)	BACKGROUND SUBSTRATE (SQ FT): OVERHEAD (TYPE O)	TYPE OF MOUNT	"X" DIMENSION ⊖ post ①	post ②	post ③	GALVANIZED STRUCTURAL STEEL: SIZE	LINEAR FEET post ①	post ②	post ③	TOTAL WEIGHT LBS.	DRILLED SHAFT: LINEAR FEET NON-REINF 12"ϕ	REINFORCED 24"ϕ	30"ϕ	36"ϕ
	3-NB	GREEN		7'-0" x 2'-6"			17.5														
				18'-6" x 14'-6"	8.97		268.25														
		GREEN																			
	4-NB	GREEN		7'-0" x 2'-6"			17.5														
				18'-6" x 15'-6"	8.97		286.75														
		GREEN																			
	7-NB	BLUE		3'-0" x 3'-0"		9															
		GREEN		8'-0" x 2'-6"			20														
		GREEN		12'-6" x 12'-6"	11.97		156.25														
	13-NB	GREEN		8'-0" x 2'-6"			20														
				8'-0" x 8'-0"	11.97		64														
PAGE TOTALS						9	850.25									PAGE TOTALS					



⊖ The "X" dimension is the elevation difference at the post between the ground and the edge of pavement or top of curb.

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.

The post lengths listed here are approximations, The corrected post lengths will be furnished by the Contractor after the stud posts are placed.

Tower heights shall be verified with the Engineer before fabrication.

* This column is for aluminum Type A and not direct apply. Direct apply is subsidiary to the sign.

SIGN TYPE

SIGN TYPE 1 3 0
- 1 — Wind Design Zone
- 3 — No. of Posts
- 0 — Series No.
  - 0 Aluminum/Fiberglass
  - 1 Aluminum
  - 2 Fiberglass

See sheet SMD(8W1)

IH-35

(FROM FM 471 TO FRIO COUNTY LINE)

SUMMARY OF LARGE SIGNS

SOLS

DN.:-TxDOT
CK.:-TxDOT
DW.:-TxDOT
CK.:-TxDOT

REVISIONS: 11-93, 8-95, 5-01, 1-04, 9-08

CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS

DIST	COUNTY	SHEET NO.
SAT	BEXAR	100

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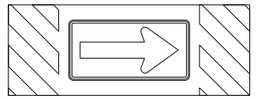
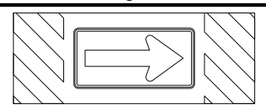
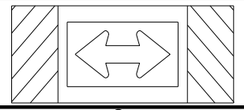
DATE: 2/25/2022 10:07:22 AM
FILE: T

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
	1-SB	W1-9TR		96" x 36"	✓							
	2-SB	CW13-2		36" x 48"	✓							
	5-NB	D1-3		120" x 42"	✓							
	6-NB	W4-1R		36" x 36"	✓							
	8-NB	CW13-2		36" x 48"	✓							
	9-NB	W4-1R		36" x 36"	✓							
	10-NB	W1-9TR		96" x 36"	✓							
	11-NB	W1-7T		96" x 36"	✓							
	12-NB	W4-1R		36" x 36"	✓							

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).

IH-35

(FROM FM 471 TO FRIO COUNTY LINE)

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	2021	CONT	SECT	JOB	HIGHWAY
REVISIONS		0915	00	238	VAR
4-16		DIST	COUNTY		SHEET NO.
8-16		SAT	BEXAR		101

18

3-NB

6.00" Radius, 2.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [84] ClearviewHwy-4-W;
12.00" Radius, 2.00" Border, White on Green;
State Highway 85 M1-6T2; [Charlotte] ClearviewHwy-5-W-R; [Carrizo Springs] ClearviewHwy-5-W-R;
[Crystal City] ClearviewHwy-5-W-R; [½] ClearviewHwy-5-W-R; [MILE] ClearviewHwy-4-W;

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

Texas Department of Transportation

GUIDE SIGN DETAILS
IH 35 (NB)
FM 4700 TO FM 1581

SHEET 1 OF 3

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		102
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

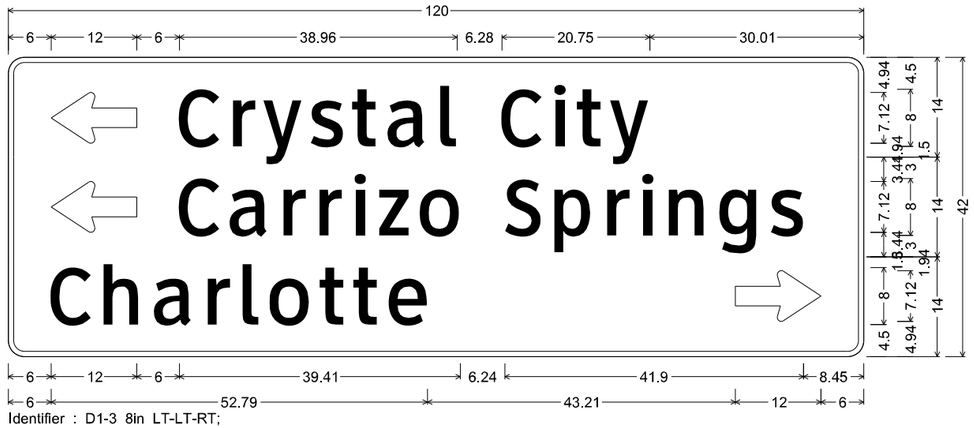
DW DN

2/25/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\PLN*SHEETS\Plan Sheets\Sign Details\IH 35 (Medina-Frio).dgn

4-NB

6.00" Radius, 2.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [84] ClearviewHwy-4-W;
12.00" Radius, 2.00" Border, White on Green;
State Highway 85 M1-6T2; [Charlotte] ClearviewHwy-5-W-R; [Carrizo Springs] ClearviewHwy-5-W-R;
[Crystal City] ClearviewHwy-5-W-R; Arrow A-3 - 35.63" 45°;

5-NB



Identifier : D1-3 8in LT-LT-RT;
2.25" Radius, 0.75" Border, White on Green;
Standard Arrow Custom 12.00" X 7.13" 180°; [Crystal City] ClearviewHwy-3-W;
2.25" Radius, 0.75" Border, White on Green;
Standard Arrow Custom 12.00" X 7.13" 180°; [Carrizo Springs] ClearviewHwy-3-W;
2.25" Radius, 0.75" Border, White on Green;
[Charlotte] ClearviewHwy-3-W; Standard Arrow Custom 12.00" X 7.13" 0°;

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E.

2/28/2022
DATE

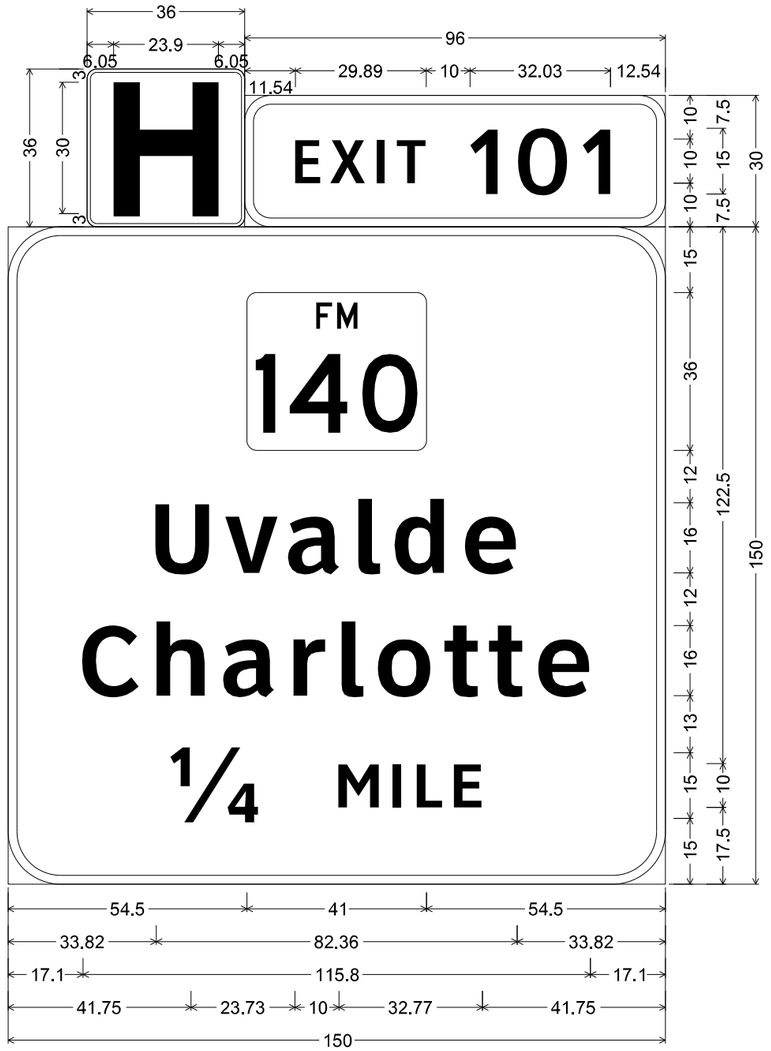
Texas Department of Transportation

GUIDE SIGN DETAILS
IH 35 (NB)
FM 4700 TO FM 1581

SHEET 2 OF 3

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		103
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

7-NB



Identifier : D9-2_36x36;
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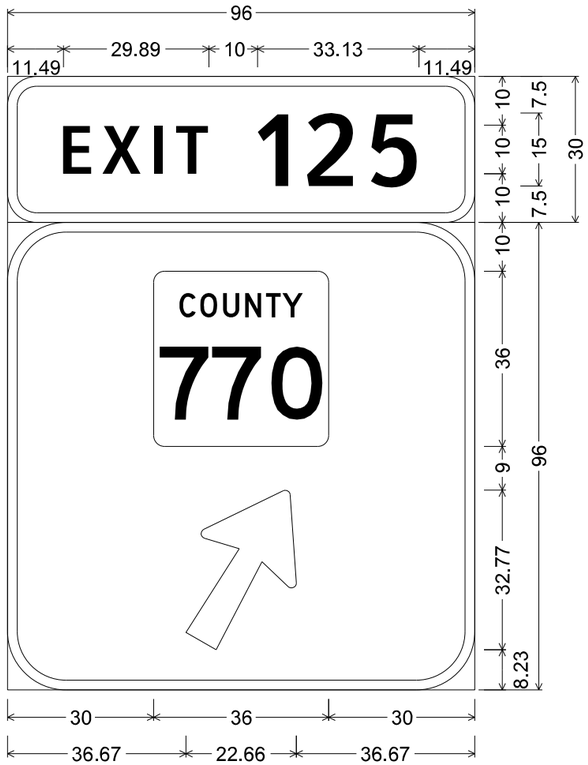
[H] E Mod;
6.00" Radius, 2.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [101] ClearviewHwy-4-W;
12.00" Radius, 2.00" Border, White on Green;
State Highway 140 M1-6F3; [Uvalde] ClearviewHwy-5-W-R;
[Charlotte] ClearviewHwy-5-W-R; [¼] ClearviewHwy-5-W-R;
[MILE] ClearviewHwy-5-W-R;

I 3-NB



6.00" Radius, 2.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W;
[125] ClearviewHwy-4-W;
12.00" Radius, 2.00" Border, White on Green;
Arrow A-3 - 35.63" 60°;

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

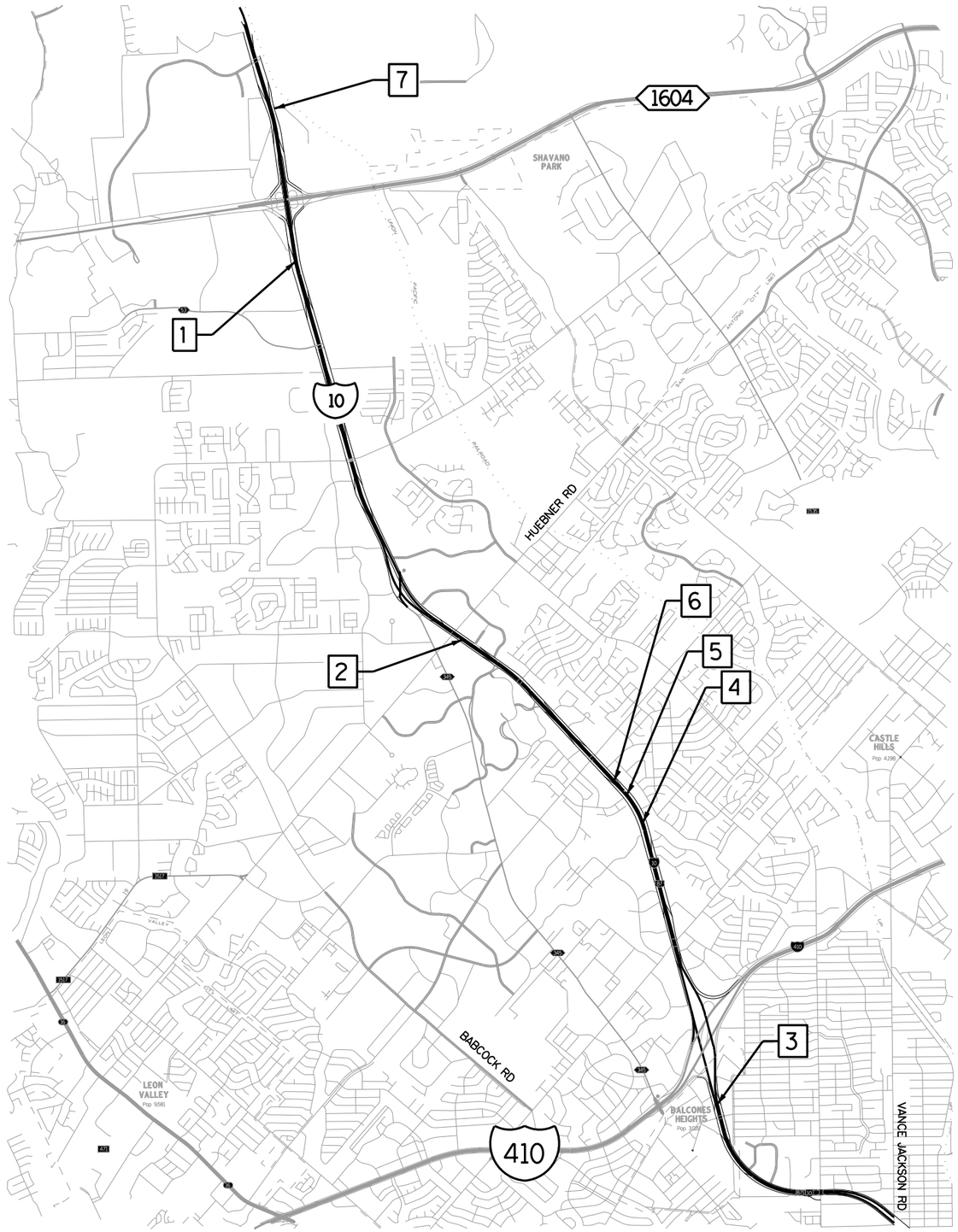
Texas Department of Transportation

GUIDE SIGN DETAILS
IH 35 (NB)
FM 4700 TO FM 1581

SHEET 3 OF 3

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		104
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

DN: DN



N

N.T.S.

LEGEND

- # ..... SMALL GUIDE SIGNAGE
- # ..... LARGE GUIDE SIGNAGE
- ——— ..... CORIDOR LIMITS

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

Texas Department of Transportation

LOCATION MAP
IH-10
(LP 1604 TO VANCE JACKSON RD)

SHEET 1 OF 1

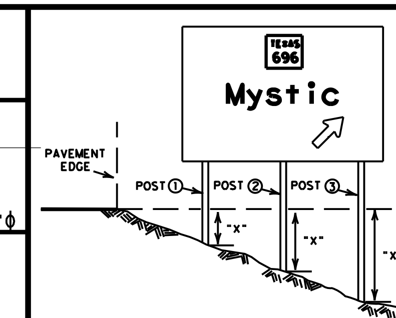
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		105
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

2/25/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\PLN*SHEETS\Plan Sheets\Location Maps\IH 10\IH-10*SIGN*LOCATION*1.dgn

SUMMARY OF LARGE SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN BACK-GROUND COLOR	SIGN TEXT	SIGN DIMENSIONS	PLAQUES, & OTHER ATTACHMENTS: DIRECT APPLY	PLAQUES, & OTHER ATTACHMENTS: * ALUMINUM (TYPE A)	BACKGROUND SUBSTRATE (SQ FT): GROUND MOUNT (TYPE G)	BACKGROUND SUBSTRATE (SQ FT): OVERHEAD (TYPE O)	TYPE OF MOUNT	"X" DIMENSION ◒ post (1)	"X" DIMENSION ◒ post (2)	"X" DIMENSION ◒ post (3)	GALVANIZED STRUCTURAL STEEL: SIZE	GALVANIZED STRUCTURAL STEEL: LINEAR FEET post (1)	GALVANIZED STRUCTURAL STEEL: LINEAR FEET post (2)	GALVANIZED STRUCTURAL STEEL: LINEAR FEET post (3)	GALVANIZED STRUCTURAL STEEL: TOTAL WEIGHT LBS.	DRILLED SHAFT LINEAR FEET: NON-REINF 12"ϕ	DRILLED SHAFT LINEAR FEET: REINFORCED 24"ϕ	DRILLED SHAFT LINEAR FEET: REINFORCED 30"ϕ	DRILLED SHAFT LINEAR FEET: REINFORCED 36"ϕ
	1-SB	GREEN	EXIT 557 UTSA Blvd University of Texas at San Antonio 1/4 MILE	8'-0" x 2'-6" 23'-0" x 10'-6"				20 241.5													
	2-SB	GREEN	560B EXIT	6'-0" x 2'-0" 6'-0" x 5'-0"			12 30														
	3-NB **	YELLOW	35 M.P.H.	15'-0" x 3'-0"				45													
	4-NB	GREEN	EXIT 560 Huebner Rd 3/4 MILE	8'-0" x 2'-6" 15'-0" x 6'-0"				20 90													
	5-NB	GREEN YELLOW	EXIT 560 Huebner Rd EXIT ONLY	8'-0" x 2'-6" 24'-6" x 7'-0"				20 171.5													
	6-NB	GREEN YELLOW	EXIT 560 Huebner Rd EXIT ONLY	8'-0" x 2'-6" 24'-0" x 7'-0"				20 168													
	7-NB	GREEN	EXIT 555	5'-0" x 7'-6"			37.5														
			PAGE TOTALS				79.5	796							PAGE TOTALS						

** OVER PASS ONTO IH 410 WEST BOUND



◒ The "X" dimension is the elevation difference at the post between the ground and the edge of pavement or top of curb.

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.

The post lengths listed here are approximations, The corrected post lengths will be furnished by the Contractor after the stud posts are placed.

Tower heights shall be verified with the Engineer before fabrication.

* This column is for aluminum Type A and not direct apply. Direct apply is subsidiary to the sign.

SIGN TYPE

SIGN TYPE 1 3 0
- 1 — Wind Design Zone
- 3 — No. of Posts
- 0 — Series No.: 0 Aluminum/Fiberglass, 1 Aluminum, 2 Fiberglass

See sheet SMD(8W1)

IH- 10

(FROM LP-1604 TO IH-410)

SUMMARY OF LARGE SIGNS

SOLS

DN.: TxDOT | CK.: TxDOT | DW.: TxDOT | CK.: TxDOT

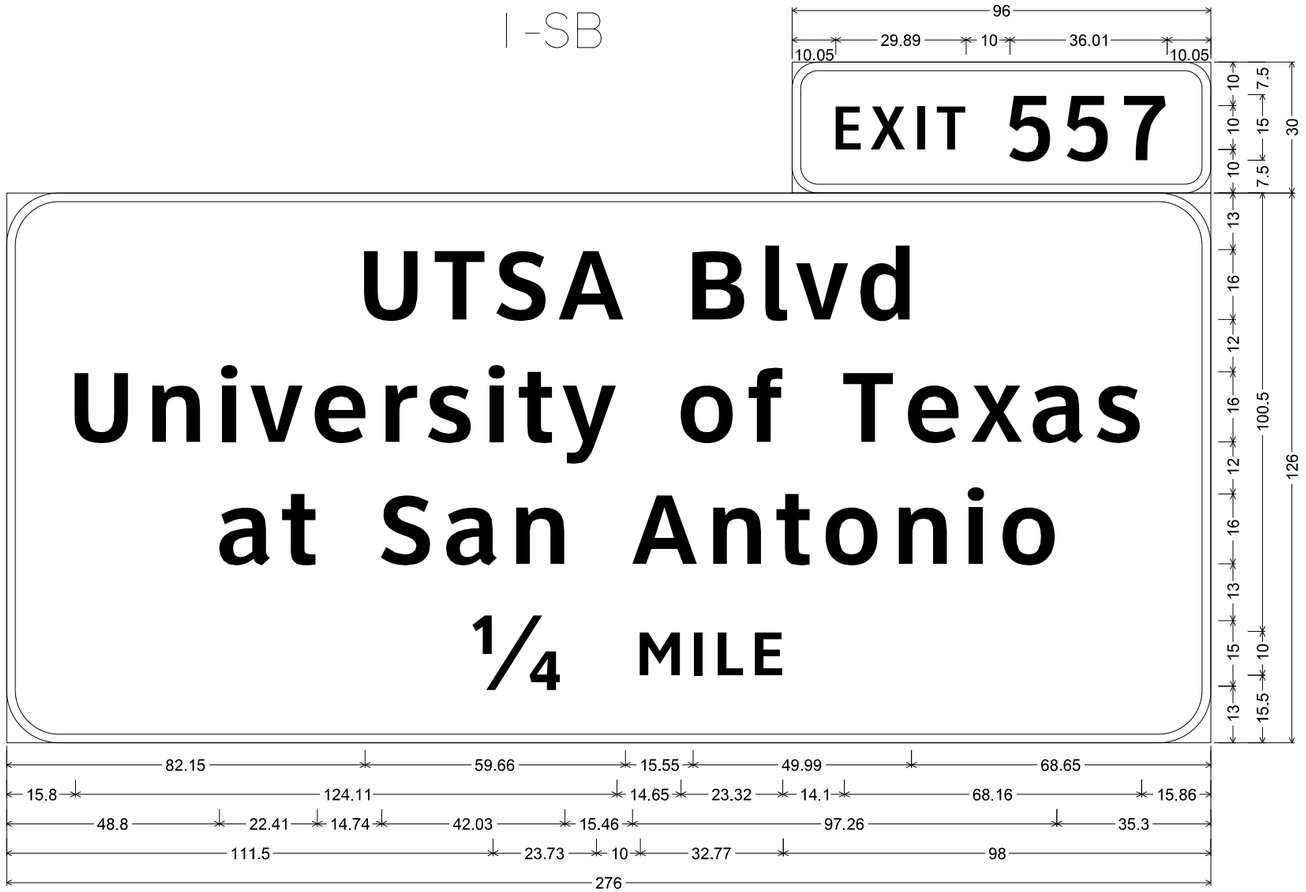
REVISIONS: 11-93, 8-95, 5-01, 1-04, 9-08

CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS

DIST	COUNTY	SHEET NO.
SAT	BEXAR	106

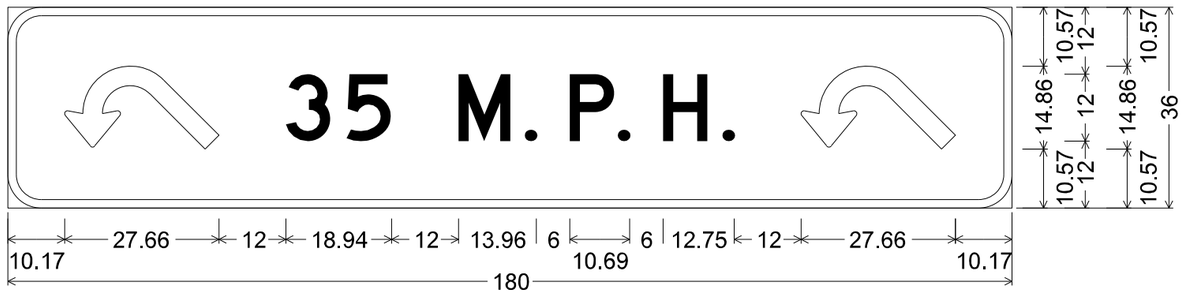
DATE: 2/25/2022 10:08:30 AM
FILE: T

I-SB



6.00" Radius, 2.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [557] ClearviewHwy-4-W;
12.00" Radius, 2.00" Border, White on Green;
[UTSA Blvd] ClearviewHwy-5-W-R; [University of Texas] ClearviewHwy-5-W-R; [at San Antonio] ClearviewHwy-5-W-R; [¼] ClearviewHwy-5-W-R;
[MILE] ClearviewHwy-5-W-R;

3-NB



6.00" Radius, 1.50" Border, Black on Yellow;
Turn Arrow E-3a; [35] D; [M.] D; [P.] D; [H.] D; Turn Arrow E-3a;

STATE OF TEXAS
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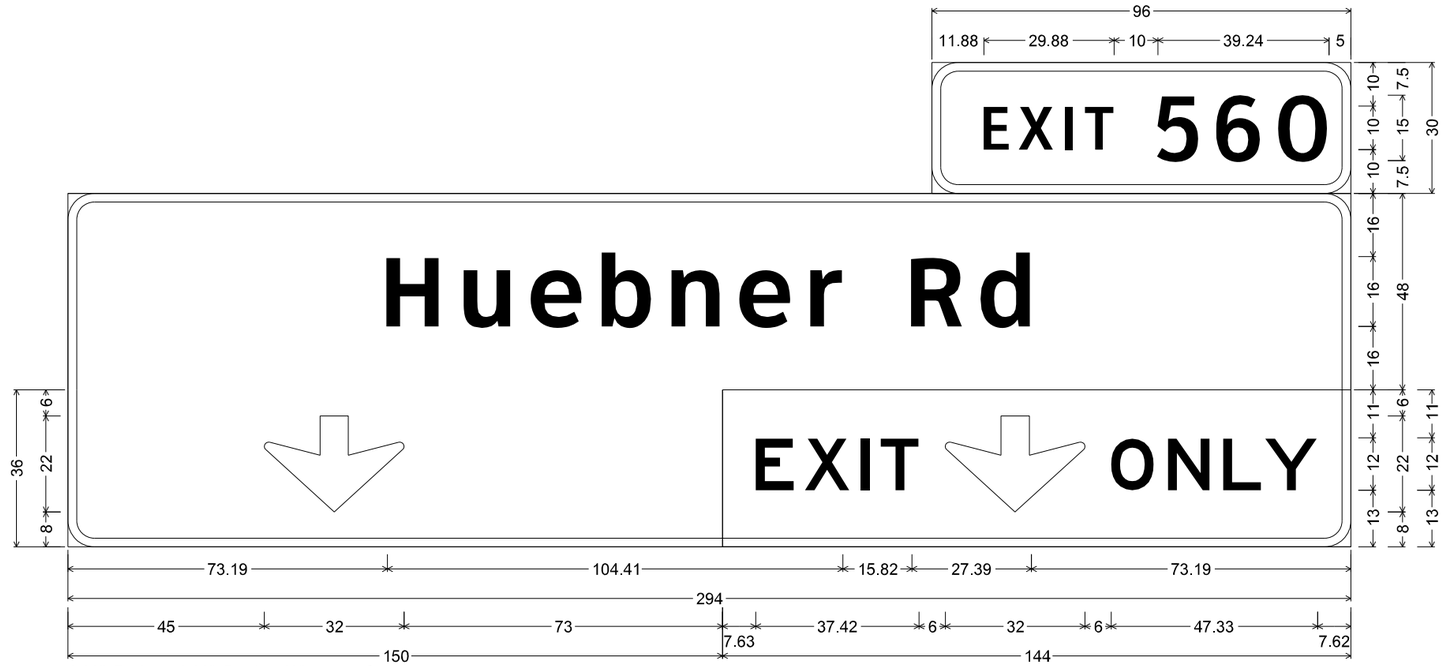
GUIDE SIGN DETAILS
IH-10
LP-1604 TO IH-410

SHEET 1 OF 3

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		107
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

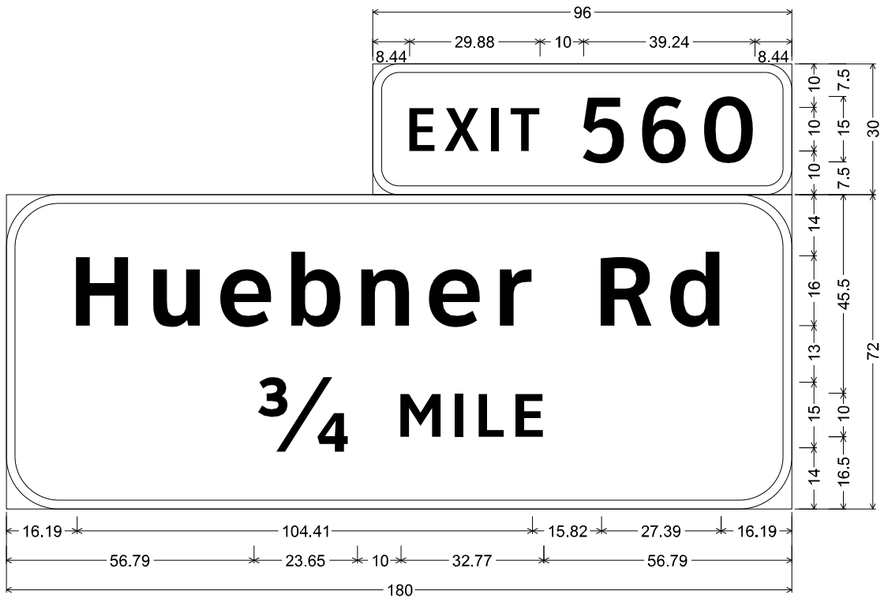
DW: DN

5-NB



6.00" Radius, 2.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [560] ClearviewHwy-4-W;
6.00" Radius, 2.00" Border, White on Green;
[Huebner Rd] ClearviewHwy-5-W-R;
Identifier : E11-1dT_VARxVAR;
6.00" Radius, 2.00" Border, White on Green;
Down Arrow 22 - 22.00" 270°;
6.00" Radius, 2.00" Border, Black on Yellow;
[EXIT] E; Down Arrow 22 - 22.00" 270°; [ONLY] E;

4-NB



6.00" Radius, 2.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [560] ClearviewHwy-4-W;
12.00" Radius, 2.00" Border, White on Green;
[Huebner Rd] ClearviewHwy-5-W-R; [3/4] ClearviewHwy-5-W-R; [MILE] ClearviewHwy-5-W-R;

STATE OF TEXAS
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EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

Texas Department of Transportation

GUIDE SIGN DETAILS
IH-10 (NB)
IH-410 TO WURZBACH RD

SHEET 2 OF 3

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		108
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

2/25/2022
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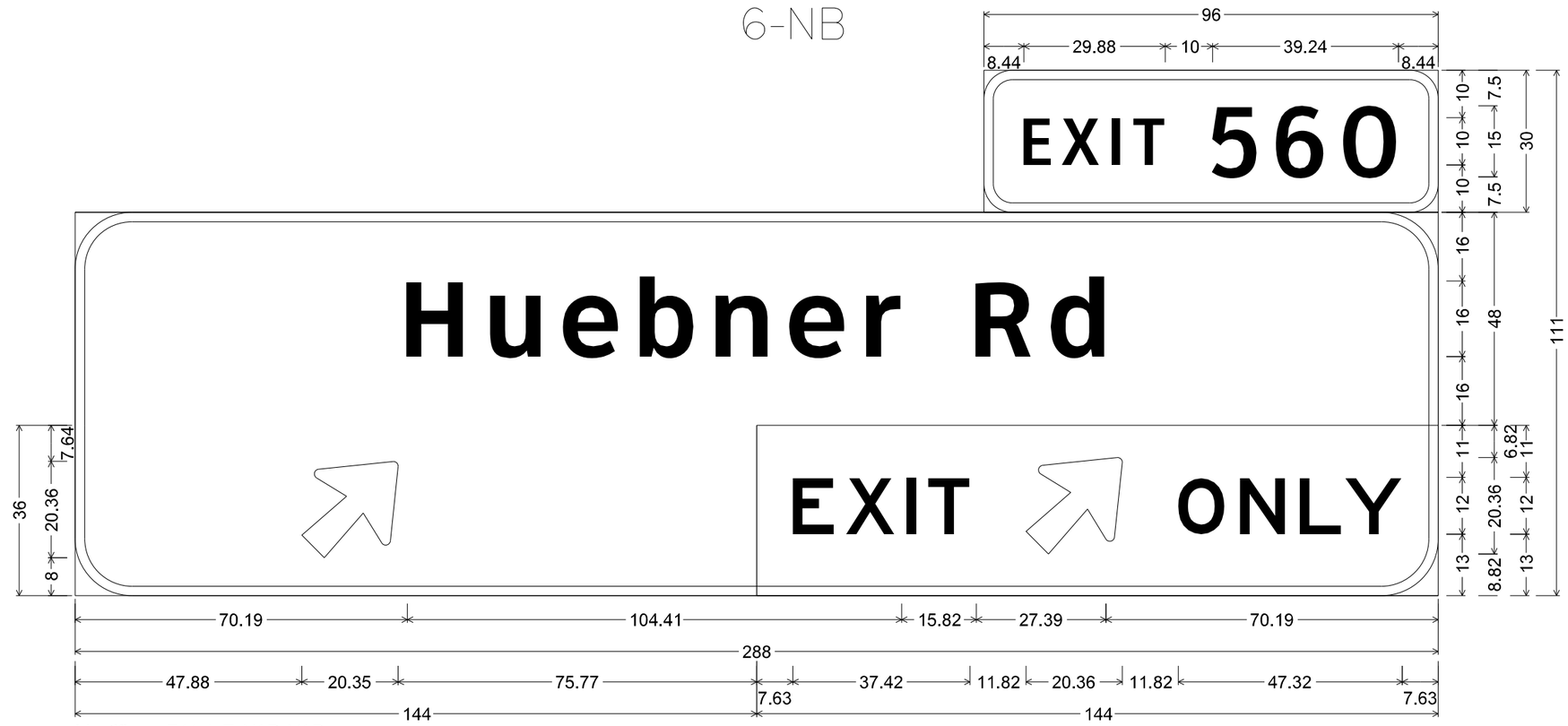
6-NB



Identifier : E11-1eT_VARxVAR;
6.00" Radius, 2.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [560] ClearviewHwy-4-W;
12.00" Radius, 2.00" Border, White on Green;
[Huebner Rd] ClearviewHwy-5-W-R;
12.00" Radius, 2.00" Border, White on Green;
Arrow B-3 - 25.00" 45°;
12.00" Radius, 2.00" Border, Black on Yellow;
[EXIT] E; Arrow B-3 - 25.00" 45°; [ONLY] E;

STATE OF TEXAS
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EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

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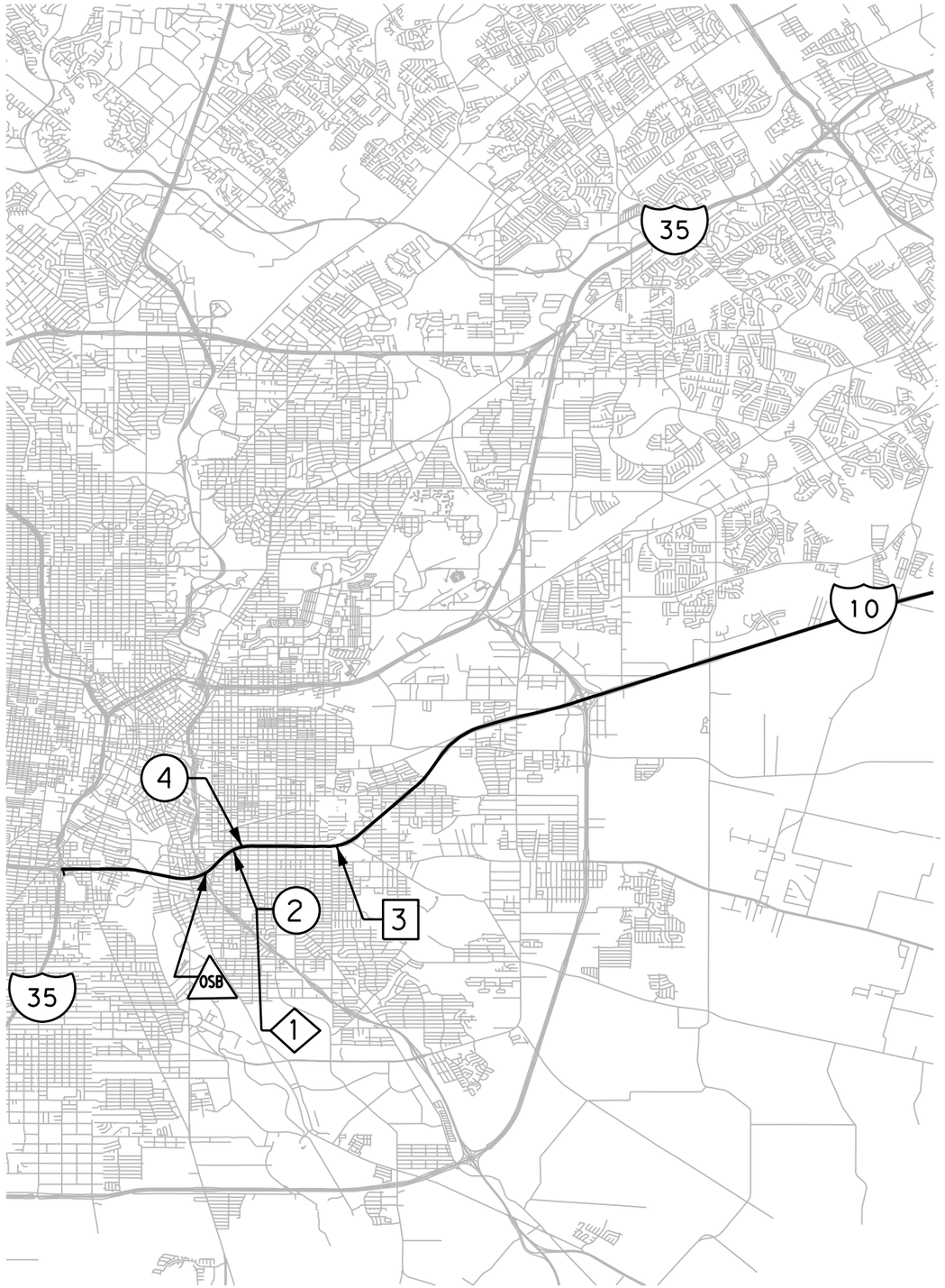
GUIDE SIGN DETAIL
IH-10 (NB)
IH-410 TO WURZBACH RD

SHEET 3 OF 3

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		109
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS



N

N.T.S.

LEGEND

- # ..... SMALL GUIDE SIGNAGE
- # ..... LARGE GUIDE SIGNAGE
- ..... CORIDOR LIMITS
- OSB ..... OSB
- ..... REMOVE

STATE OF TEXAS
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EDUARDO L. VILLALON, P.E.

2/28/2022
DATE

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LOCATION MAP
IH-10
(FROM IH-35 TO IH 410)

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		110
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

DN: DN

2/25/2022
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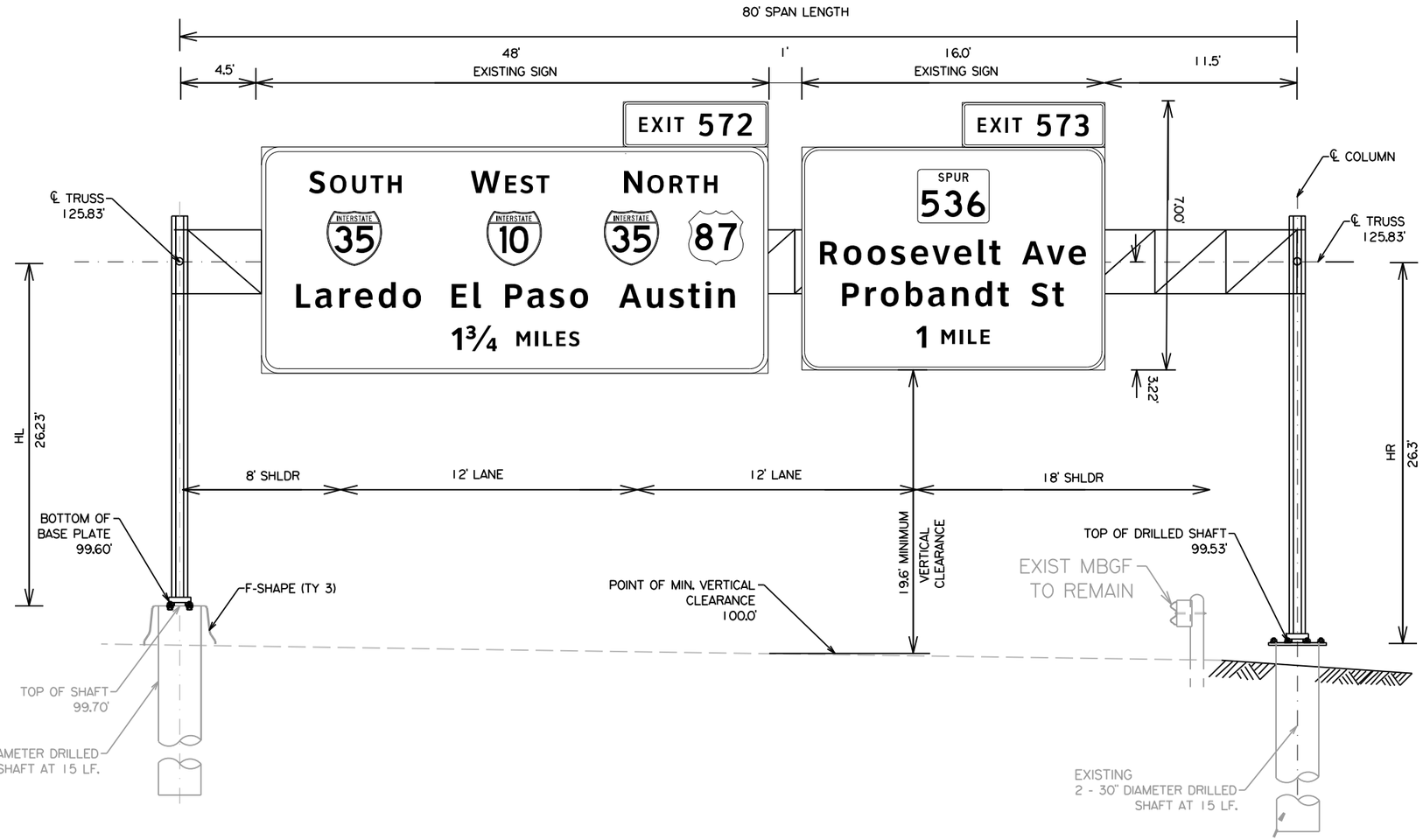
	QUANTITY SUMMARY CSJ: 0915-00-238		
650-6089	INS OH SN SUP(80 FT BRDG)	EA	1
650-6204	REMOVE OVERHD SIGN SUP	EA	1



NOTE:

1. IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO ORDERING SIGN SUPPORT MATERIALS.
2. STAKE LOCATION OF OVERHEAD SIGN STRUCTURE TO BE APPROVED BY THE ENGINEER.
3. ALL SIGN STRUCTURE AND FOUNDATION ELEVATIONS SHALL BE VERIFIED IN THE FIELD AT THE ACTUAL LOCATION BY THE CONTRACTOR.
4. FOR DESIGN DETAILS USE STANDARDS OSB-Z3, OSBT, OSB-FD & OSBC.
5. SEE SIGN DETAILS SHEET FOR GUIDE SIGN DETAILS
6. ELEVATIONS TAKEN FROM CSJ 0025-02-053
7. MIN. VERTICAL CLEARANCE SHALL BE 19'-6"
8. EXISTING CROSS SECTION SHOWN IS APPROXIMATE. CONTRACTOR TO VERIFY COLUM HEIGHT AND VERTICAL CLEARANCE PRIOR TO CONSTRUCTION.
9. ALL TYPE O SIGNS TO BE REUSED. INSTALLATION OF TY O SIGNS ON NEW OSB SHALL BE SUBSIDIARY TO ITEM 650.

PROPOSED OSB

IH 10 WBML

AT ROOSEVELT AVE PROBANDT ST

STATE OF TEXAS
EDUARDO L. VILLALON
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PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E.

2/28/2022
DATE

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OSB ELEVATION VIEW
IH 10 WESTBOUND AT I-37

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		111
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

DN: DN

2/25/2022
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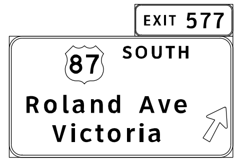
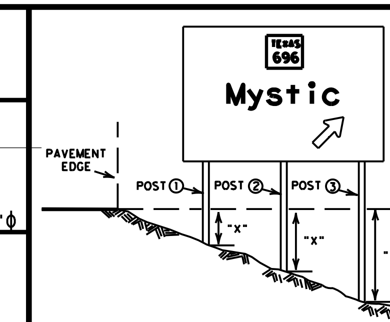
SUMMARY OF LARGE SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN BACK-GROUND COLOR	SIGN TEXT	SIGN DIMENSIONS	PLAQUES, & OTHER ATTACHMENTS: DIRECT APPLY	PLAQUES, & OTHER ATTACHMENTS: * ALUMINUM (TYPE A)	BACKGROUND SUBSTRATE (SQ FT): GROUND MOUNT (TYPE G)	BACKGROUND SUBSTRATE (SQ FT): OVERHEAD (TYPE O)	TYPE OF MOUNT	"X" DIMENSION ⊖: post ①	"X" DIMENSION ⊖: post ②	"X" DIMENSION ⊖: post ③	GALVANIZED STRUCTURAL STEEL: SIZE	GALVANIZED STRUCTURAL STEEL: LINEAR FEET post ①	GALVANIZED STRUCTURAL STEEL: LINEAR FEET post ②	GALVANIZED STRUCTURAL STEEL: LINEAR FEET post ③	GALVANIZED STRUCTURAL STEEL: TOTAL WEIGHT LBS.	DRILLED SHAFT: LINEAR FEET NON-REINF 12"ϕ	DRILLED SHAFT: LINEAR FEET REINFORCED 24"ϕ	DRILLED SHAFT: LINEAR FEET REINFORCED 30"ϕ	DRILLED SHAFT: LINEAR FEET REINFORCED 36"ϕ
				8'-0" x 2'-6"				20													
	3-EB	GREEN		18'-6" x 10'-0"	7.16			185													
PAGE TOTALS								205					PAGE TOTALS								



⊖ The "X" dimension is the elevation difference at the post between the ground and the edge of pavement or top of curb.

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.

The post lengths listed here are approximations, The corrected post lengths will be furnished by the Contractor after the stud posts are placed.

Tower heights shall be verified with the Engineer before fabrication.

* This column is for aluminum Type A and not direct apply. Direct apply is subsidiary to the sign.

SIGN TYPE

SIGN TYPE 1 3 0
- 1 — Wind Design Zone
- 3 — No. of Posts
- 0 — Series No.
  - 0 Aluminum/Fiberglass
  - 1 Aluminum
  - 2 Fiberglass

See sheet SMD(8W1)

IH- 10

(FROM IH-35 TO ROLAND RD)

SUMMARY OF LARGE SIGNS

SOLS

DN.:- TxDOT CK.:- TxDOT DW.:- TxDOT CK.:- TxDOT

REVISIONS: 11-93, 8-95, 5-01, 1-04, 9-08

CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS

DIST	COUNTY	SHEET NO.
SAT	BEXAR	112

DATE: 2/25/2022 10:09:32 AM
FILE: T

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)					BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		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	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	TY N TY S
	1-EB	D1-1	⇦ Hackberry St	REMOVE	✓							
	2-EB	D1-2	⇔ S Pine St ↶ Hackberry St	108"x30"	✓		REMOVE EXISTING LEFT ARROW HACKBERRY ST SIGN AND PLACE THIS SIGN AT SAME LOCATION					
	4-WB	D1-1	⇔ S Pine St	90"x18"	✓		SIGN TO BE PLACED AT 600FT EAST OF S PINE ST. INTERSECTION					

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).

IH-10

(FROM LP-1604 TO ROLAND RD)

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

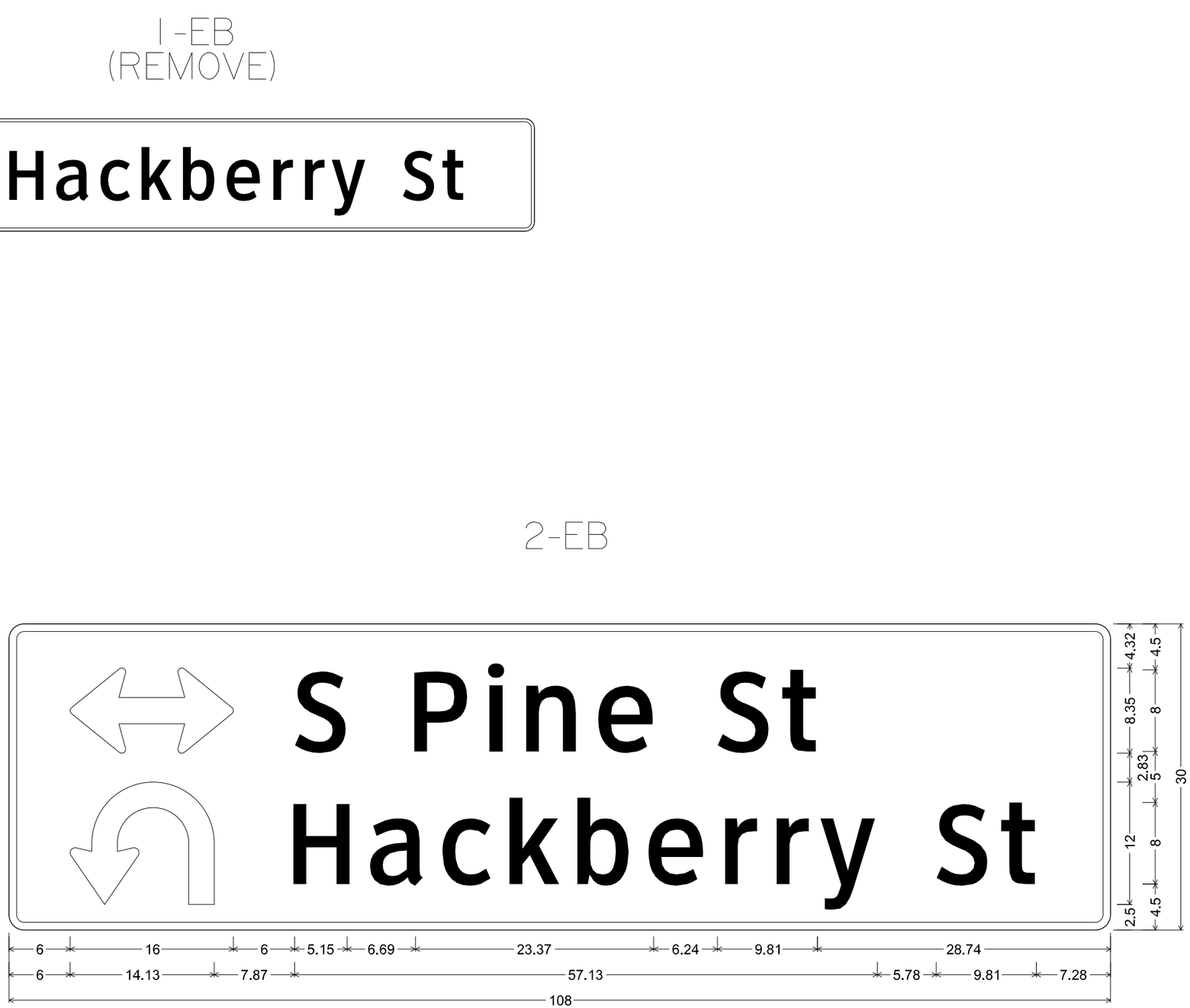
SOSS

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	2021	CONT	SECT	JOB	HIGHWAY
REVISIONS		0915	00	238	VARIOUS
4-16		DIST	COUNTY		SHEET NO.
8-16		SAT	BEXAR		113

DN: DN

1-EB
(REMOVE)

2-EB



1.50" Radius, 0.75" Border, White on Green;
Double Headed Arrow Custom - 16.00" 0°; [S Pine St] ClearviewHwy-3-W; UL ir=3.5, s=2.5; [Hackberry St] ClearviewHwy-3-W;

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

GUIDE SIGN DETAILS
IH-10 (SB-EB)
LP 1604 TO ROLAND RD

SHEET 1 OF 2

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		114
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

2/25/2022
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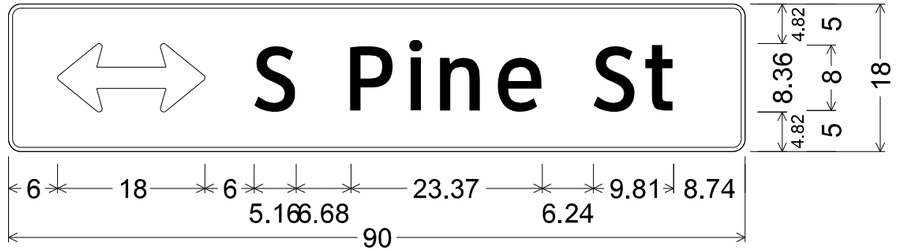
3-EB

6.00" Radius, 2.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [577] ClearviewHwy-4-W;
12.00" Radius, 2.00" Border, White on Green;
US 87 M1-4; Rounded Rectangle 3.00" Radius Green;
[Roland Ave] ClearviewHwy-5-W-R; [Victoria] ClearviewHwy-5-W-R; Arrow A-3 - 35.63" 45°;

4-WB



Identifier : D1-1 8in LR;
1.50" Radius, 0.50" Border, White on Green;
Double Headed Arrow 3 - 18.00" 0°;
[S Pine St] ClearviewHwy-3-W;

STATE OF TEXAS
EDUARDO L. VILLALON
123415
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PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

GUIDE SIGN DETAILS
IH-10 (WB)
S NEW BRAUNFELS AVE TO LP 410

SHEET 2 OF 2

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		115
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

N

N. T. S.

LEGEND

- # ..... SMALL GUIDE SIGNAGE
- # ..... LARGE GUIDE SIGNAGE
- ——— ..... CORIDOR LIMITS

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E.

3/4/2022
DATE

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LOCATION MAP
IH-10
(FM 725 TO SH 80)

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		116
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

3/4/2022
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DN: DN

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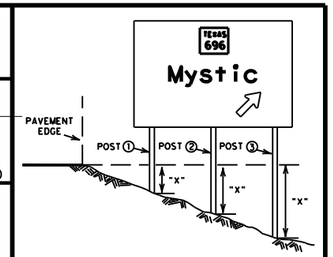
DATE: 3/4/2022 9:20:41 AM
FILE: $TS

SUMMARY OF LARGE SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN BACK-GROUND COLOR	SIGN TEXT	SIGN DIMENSIONS	PLAQUES, & OTHER ATTACHMENTS		BACKGROUND SUBSTRATE (SQ FT)		TYPE OF MOUNT	"X" DIMENSION ◒			GALVANIZED STRUCTURAL STEEL					DRILLED SHAFT			
					DIRECT APPLY	✳ ALUMINUM (TYPE A)	GROUND MOUNT (TYPE G)	OVERHEAD (TYPE O)		post ①	post ②	post ③	SIZE	LINEAR FEET post ①	post ②	post ③	TOTAL WEIGHT LBS.	NON-REINF 12"ϕ	LINEAR FEET REINFORCED 24"ϕ	30"ϕ	36"ϕ
	2-EB	GREEN	EXIT 605 / FM 464	8′-0" x 2′-6"			20														
				11′-0" x 5′-6"	11.97		60.5														
	3-EB	GREEN	612 / EXIT	4′-6" x 2′-0"			9														
				6′-0" x 5′-0"			30														
	5-WB	GREEN	H EXIT 628 / TEXAS 80 / San Marcos Nixon	3′-0" x 3′-0"		9															
				8′-0" x 2′-6"			20														
				18′-6" x 10′-0"	8.97		185														
	6-WB	GREEN	WEIGH STATION 1 MILE	11′-0" x 6′-6"			71.5														
	8-WB	GREEN	EXIT 612 / 90 / Seguin 1 MILE	8′-0" x 2′-6"			20														
				10′-0" x 10′-0"	7.16		100														
	9-WB	GREEN	EXIT 612 / 90 / Seguin 1/4 MILE	8′-0" x 2′-6"			20														
				10′-0" x 10′-0"	7.16		100														
	10-WB	GREEN	EXIT 612 / 90 / Seguin	8′-0" x 2′-6"			20														
				13′-0" x 7′-6"	7.16		97.5														
	11-WB	GREEN	EXIT 609 / BUSINESS / TEXAS 123 / Austin St 3/4 MILE	8′-0"x 2′-6"			20														
				13′-0"x 12′-0"	11.97		156														
			PAGE TOTALS			9	929.5														



◒ The "X" dimension is the elevation difference at the post between the ground and the edge of pavement or top of curb.

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.

The post lengths listed here are approximations, The corrected post lengths will be furnished by the Contractor after the stud posts are placed.

Tower heights shall be verified with the Engineer before fabrication.

✳ This column is for aluminum Type A and not direct apply. Direct apply is subsidiary to the sign.

SIGN TYPE

SIGN TYPE 1 3 0
- 1: Wind Design Zone
- 3: Series No.
- 0: 0 Aluminum/Fiberglass, 1 Aluminum, 2 Fiberglass
- 0: No. of Posts

See sheet SMD(8W1)

IH- 10

(FROM FM 725 TO SH 80)

SUMMARY OF LARGE SIGNS

SOLS

DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT

REVISIONS
11-93 1-04
8-95 9-08
5-01

CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS
DIST	COUNTY		SHEET NO.
SAT	BEXAR		117

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
	1-EB	GREEN	Juan Seguin Highway	84" X 30"								
	4-EB	GREEN	Luling 12 Houston 152	102" X 42"								
	7-WB	YELLOW	16 1	48" X 48"								

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).

IH-10

(FROM FM 725 TO SH 80)

Texas Department of Transportation

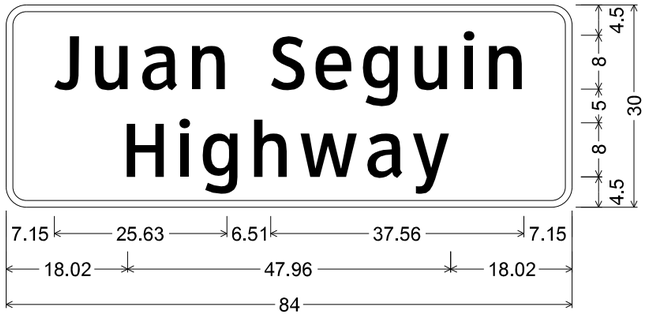
Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

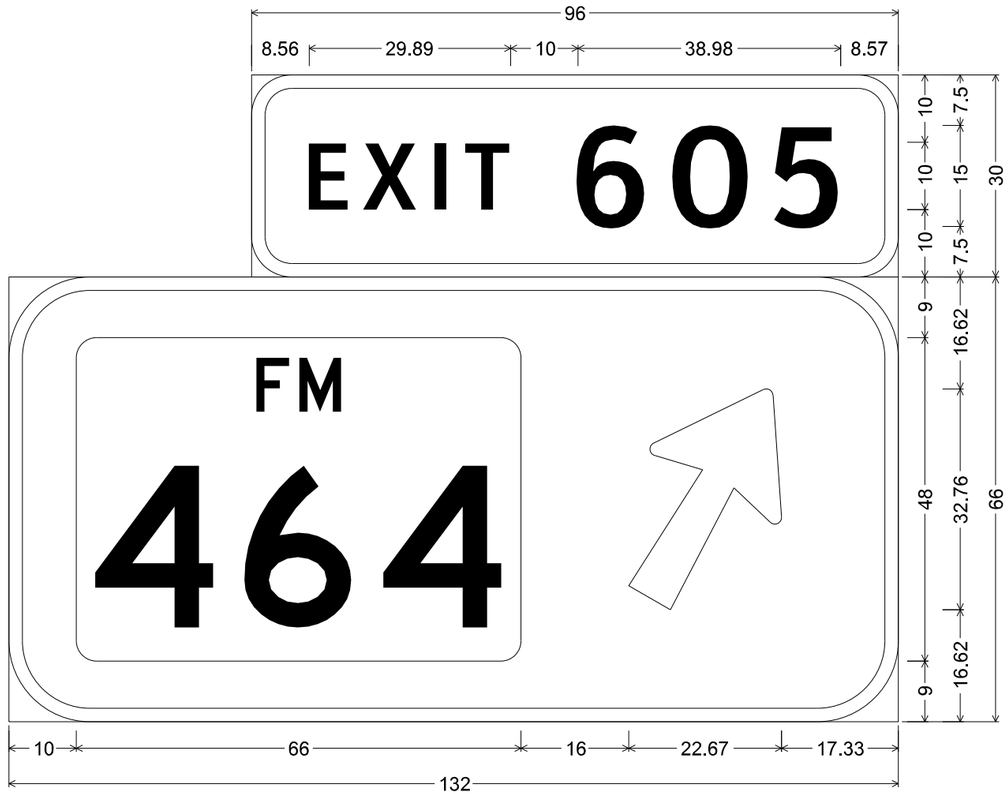
FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	00	201	VARIOUS
4-16	DIST	COUNTY		SHEET NO.
8-16	SAT	BEXAR		118

1-EB



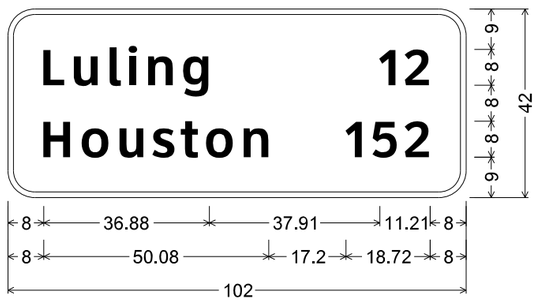
3.00" Radius, 1.00" Border, White on Green;
[Juan Seguin] ClearviewHwy-3-W;
[Highway] ClearviewHwy-3-W;

2-EB

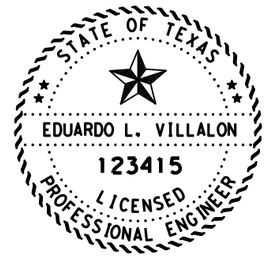


6.00" Radius, 2.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [605] ClearviewHwy-4-W;
12.00" Radius, 2.00" Border, White on Green;
State Highway 464 M1-6F3; Arrow A-3 - 35.63" 60^;

4-EB



6.00" Radius, 1.25" Border, White on Green;
[Luling] ClearviewHwy-5-W-R;
[12] ClearviewHwy-5-W-R;
[Houston] ClearviewHwy-5-W-R;
[152] ClearviewHwy-5-W-R;



EDUARDO L. VILLALON, P.E.

3/4/2022
DATE

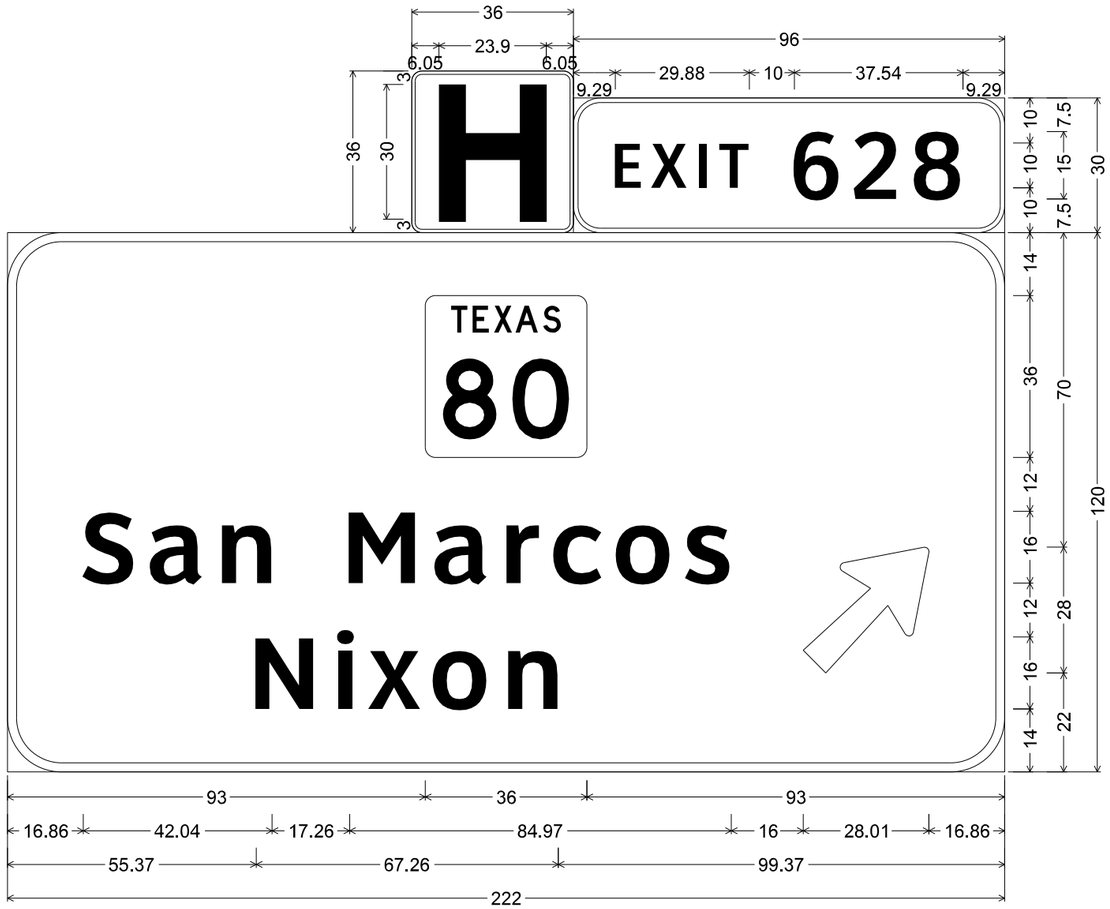
Texas Department of Transportation

GUIDE SIGN DETAILS
IH-10 (EB)
FROM FM 725 TO SH 80

SHEET 1 OF 4

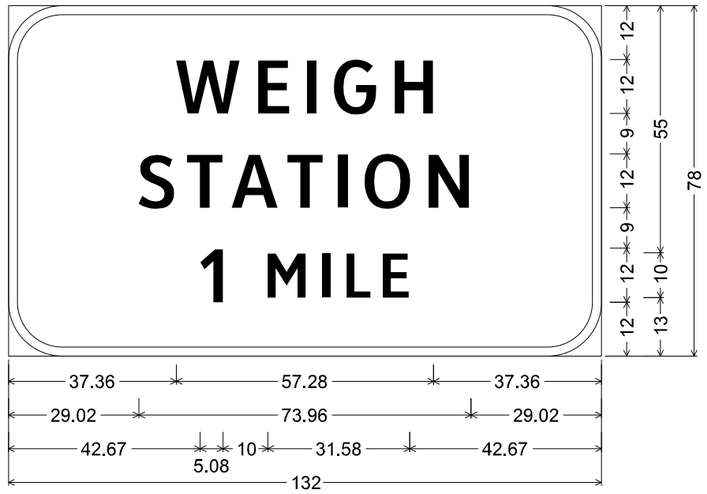
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		119
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

5-WB

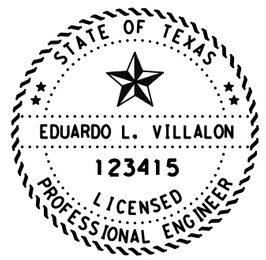


Identifier : D9-2_36x36;
2.25" Radius, 0.75" Border, White on Blue;
[H] E Mod;
6.00" Radius, 1.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [628] ClearviewHwy-4-W;
12.00" Radius, 2.00" Border, White on Green;
State Highway 80 M1-6T2; [San Marcos] ClearviewHwy-5-W-R; [Nixon] ClearviewHwy-5-W-R;
Arrow A-3 - 35.63" 45^;

6-WB



Identifier : D8-1_60x48;
2.00" Border, White on Green;
[WEIGH] ClearviewHwy-4-W; [STATION] ClearviewHwy-4-W;
[1] ClearviewHwy-4-W; [MILE] ClearviewHwy-4-W;



EDUARDO L. VILLALON, P.E.

3/4/2022
DATE

Texas Department of Transportation

GUIDE SIGN DETAILS
IH-10 (WB)
FROM FM 725 TO SH 80

SHEET 2 OF 4

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		120
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

DN: DN

8-WB

6.00" Radius, 2.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [612] ClearviewHwy-4-W;
12.00" Radius, 2.00" Border, White on Green;
US 90 M1-4; [Seguin] ClearviewHwy-5-W-R; [1] ClearviewHwy-5-W-R;
[MILE] ClearviewHwy-5-W-R;

9-WB

6.00" Radius, 2.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [612] ClearviewHwy-4-W;
12.00" Radius, 2.00" Border, White on Green;
US 90 M1-4; [Seguin] ClearviewHwy-5-W-R; [¼] ClearviewHwy-5-W-R;
[MILE] ClearviewHwy-5-W-R;

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E.

3/4/2022
DATE

Texas Department of Transportation
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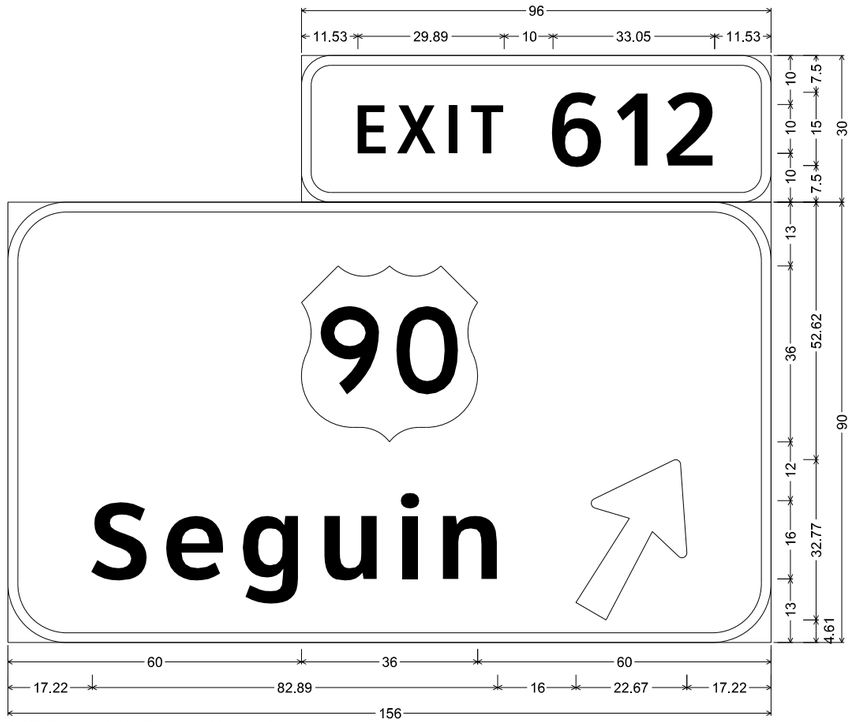
GUIDE SIGN DETAILS
IH-10 (WB)
FROM FM 725 TO SH 80

SHEET 3 OF 4

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		121
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

3/4/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\PLN*SHEETS\Plan Sheets\Sign Details\IH 10-WB-EB.dgn

I0-WB



6.00" Radius, 2.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [612] ClearviewHwy-4-W;
12.00" Radius, 2.00" Border, White on Green;
US 90 M1-4; [Seguin] ClearviewHwy-5-W-R; Arrow A-3 - 35.63" 60^;

I1-WB

6.00" Radius, 1.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [609] ClearviewHwy-4-W;
12.00" Radius, 2.00" Border, White on Green;
[BUSINESS] ClearviewHwy-5-W-R; State Highway 123 M1-6T3; [Austin St] ClearviewHwy-5-W;
[¾] ClearviewHwy-5-W; [MILE] ClearviewHwy-5-W;

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

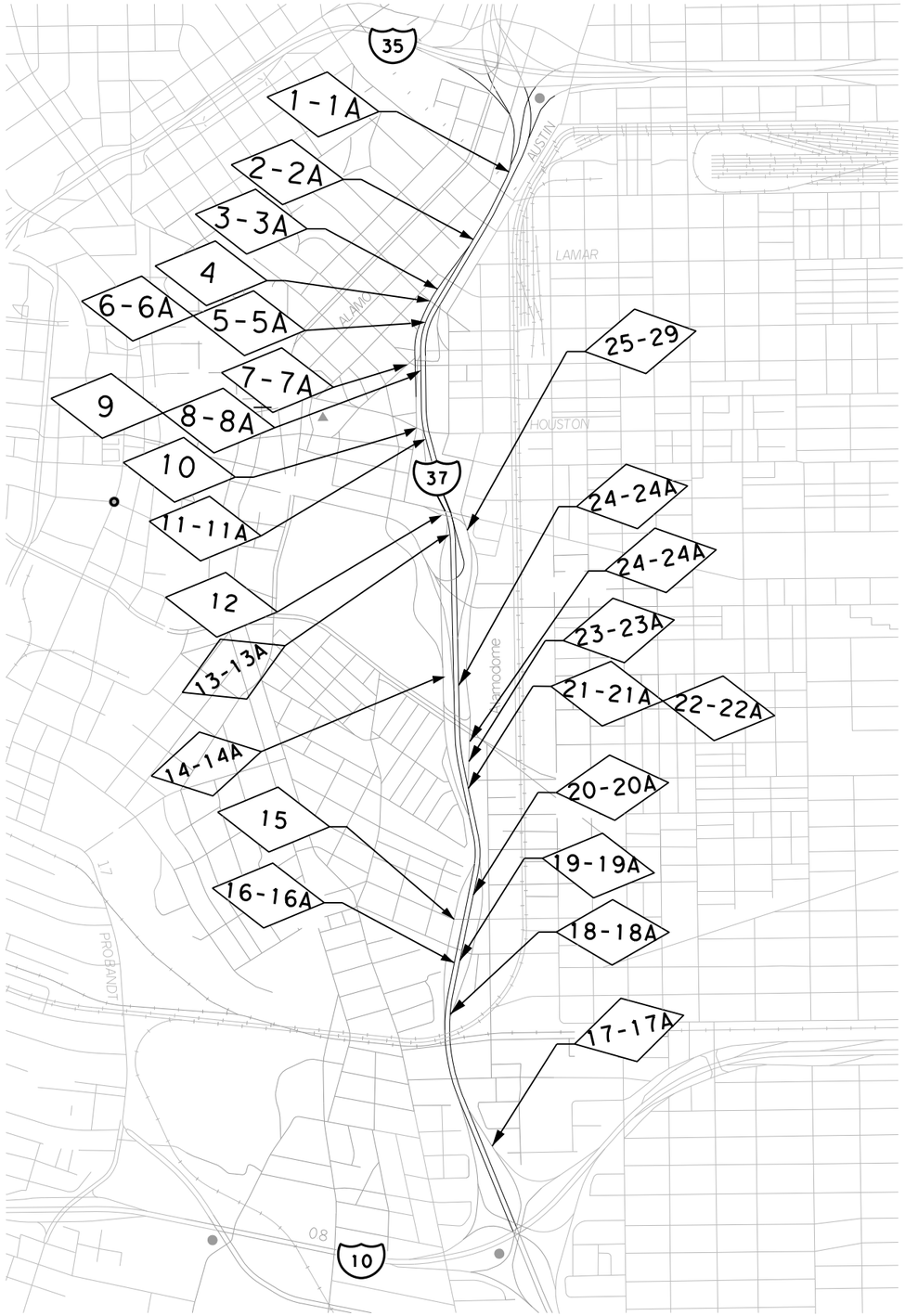
EDUARDO L. VILLALON, P.E. — 3/4/2022 DATE

Texas Department of Transportation

GUIDE SIGN DETAILS
IH-10 (WB)
FROM FM 725 TO SH 80

SHEET 4 OF 4

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		122
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS



N

N.T.S.

LEGEND

#	LARGE GUIDE SIGNAGE
#	SIGNAGE TO BE REMOVED/REPLACED
	CORIDOR LIMITS

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

3/4/2022

Eduardo Villalon, PE

Texas Department of Transportation
© 2022

LOCATION MAP
IH-37
(IH 35 TO IH 10)

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		123
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

3/4/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\IH 37 Downtown Sign Schematic - Legacy Engineering\DESIGN\LOCATION MAP\IH-37*SIGN*LOCATION*SHEET.dgn

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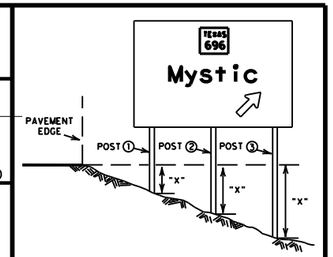
DATE: 3/4/2022 9:20:47 AM
FILE: $TS

SUMMARY OF LARGE SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN BACK-GROUND COLOR	SIGN TEXT	SIGN DIMENSIONS	PLAQUES, & OTHER ATTACHMENTS: DIRECT APPLY	PLAQUES, & OTHER ATTACHMENTS: ✳ ALUMINUM (TYPE A)	BACKGROUND SUBSTRATE (SQ FT): GROUND MOUNT (TYPE G)	BACKGROUND SUBSTRATE (SQ FT): OVERHEAD (TYPE O)	TYPE OF MOUNT	"X" DIMENSION ◒: post ①	"X" DIMENSION ◒: post ②	"X" DIMENSION ◒: post ③	GALVANIZED STRUCTURAL STEEL: SIZE	GALVANIZED STRUCTURAL STEEL: LINEAR FEET post ①	GALVANIZED STRUCTURAL STEEL: LINEAR FEET post ②	GALVANIZED STRUCTURAL STEEL: LINEAR FEET post ③	GALVANIZED STRUCTURAL STEEL: TOTAL WEIGHT LBS.	DRILLED SHAFT: LINEAR FEET NON-REINF 12"ϕ	DRILLED SHAFT: LINEAR FEET REINFORCED 24"ϕ	DRILLED SHAFT: LINEAR FEET REINFORCED 30"ϕ	DRILLED SHAFT: LINEAR FEET REINFORCED 36"ϕ
	1-SB	BROWN	SSgt Wm J Bordelon Frwy	14′-0" x 8′- 6"			119														
	2-SB	BROWN	The Alamo EXIT 141B	10′-0" x 8′- 6"				85													
	5-SB	GREEN	Convention Center Univ of Houston EXIT 141A	REMOVE																	
	5A-SB	GREEN	Henry B Gonzalez Convention Center EXIT 141A	19′-6" x 7′- 6"				146.25		THIS SIGN WILL REPLACE EXISTING SIGN NO. 5 ON OSB											
	6-SB	GREEN	EXIT 140B Cesar E Chavez Blvd Alamodome ½ MILE	REMOVE																	
	6A-SB	GREEN	EXIT 140B Cesar E Chavez Blvd ½ MILE	9′-6" x 2′- 6"				23.75													
				19′-0" x 8′- 0"				152													
	8-SB	GREEN	HemisFair Plaza Institute of Texas Cultures EXIT 140B	REMOVE																	
	8A-SB	GREEN	HemisFair Park Alamodome EXIT 140B	16′-0" x 8′- 6"				136		THIS SIGN WILL REPLACE EXISTING SIGN NO. 8 ON OSB											
	9-SB	GREEN	Sunset Station NEXT RIGHT	REMOVE																	
	11-SB		EXIT 140B Cesar E Chavez Blvd Alamodome ¼ MILE	REMOVE																	
				PAGE TOTALS			119	543													



◒ The "X" dimension is the elevation difference at the post between the ground and the edge of pavement or top of curb.

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.

The post lengths listed here are approximations, The corrected post lengths will be furnished by the Contractor after the stud posts are placed.

Tower heights shall be verified with the Engineer before fabrication.

✳ This column is for aluminum Type A and not direct apply. Direct apply is subsidiary to the sign.

SIGN TYPE

SIGN TYPE 1 3 0
- 1: Wind Design Zone
- 3: Series No.
- 0: 0 Aluminum/Fiberglass, 1 Aluminum, 2 Fiberglass
- 0: No. of Posts

See sheet SMD(8W1)

IH 37
(IH 35 to IH 10)

SUMMARY OF LARGE SIGNS
SOLS

DN.: TxDOT	REVISIONS		
CK.: TxDOT	11-93	1-04	
DW.: TxDOT	8-95	9-08	
CK.: TxDOT	5-01		

CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS
DIST	COUNTY		SHEET NO.
SAT	BEXAR		124

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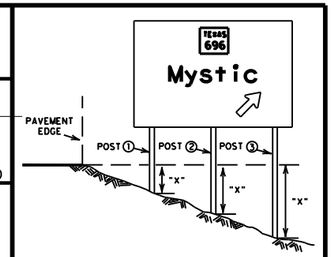
SUMMARY OF LARGE SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN BACK-GROUND COLOR	SIGN TEXT	SIGN DIMENSIONS	PLAQUES, & OTHER ATTACHMENTS		BACKGROUND SUBSTRATE (SQ FT)		TYPE OF MOUNT	"X" DIMENSION ◒			GALVANIZED STRUCTURAL STEEL					DRILLED SHAFT			
					DIRECT APPLY	⁎ ALUMINUM (TYPE A)	GROUND MOUNT (TYPE G)	OVERHEAD (TYPE O)		post ①	post ②	post ③	SIZE	LINEAR FEET post ①	post ②	post ③	TOTAL WEIGHT LBS.	NON-REINF 12"ϕ	LINEAR FEET REINFORCED 24"ϕ	30"ϕ	36"ϕ
	11A-SB		EXIT 140 B Cesar E Chavez Blvd ¼ MILE	9′-6" x 2′- 6"				23.75													
				19′-0" x 8′- 0"				152													
	13L-SB	GREEN	EXIT 140 B Cesar E Chavez Blvd Alamodome	REMOVE																	
	13LA-SB	GREEN	EXIT 140 B Cesar E Chavez Blvd	9′-6" x 2′ -6"				23.75													
				19′-0" x 7′ -0"				133													
	14-SB	BROWN	Jose Lopez Frwy EXIT 139	9′-6" x 10′-6"			99.75														
	15-NB	BROWN	SSgt Wm J Bordelon Frwy	14′-0" x 8′-6"			119														
	16-NB		EXIT 140 B Cesar E Chavez Blvd Alamodome ½ MILE	REMOVE																	
	16A-NB		EXIT 140 B Cesar E Chavez Blvd ½ MILE	9′-6" x 2′- 6"				23.75	THIS SIGN WILL REPLACE EXISTING SIGN NO. 16 ON OSB												
				19′-0" x 8′- 0"																	
	17-NB	GREEN	HemisFair Plaza Institute of Texan Cultures EXIT 140B	REMOVE																	
	17A-NB	GREEN	HemisFair Park Alamodome EXIT 140B	16′-0" x 8′- 6"				136	THIS SIGN WILL REPLACE EXISTING SIGN NO. 17 ON OSB												
	18-NB	GREEN	EXIT 141 Commerce St Downtown The Alamo ¾ MILE	REMOVE																	
			PAGE TOTALS				218.75	645					PAGE TOTALS								



◒ The "X" dimension is the elevation difference at the post between the ground and the edge of pavement or top of curb.

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.

The post lengths listed here are approximations, The corrected post lengths will be furnished by the Contractor after the stud posts are placed.

Tower heights shall be verified with the Engineer before fabrication.

⁎ This column is for aluminum Type A and not direct apply. Direct apply is subsidiary to the sign.

SIGN TYPE

SIGN TYPE 1 3 0
- 1: Wind Design Zone
- 3: No. of Posts
- 0: Series No. (0 Aluminum/Fiberglass, 1 Aluminum, 2 Fiberglass)

See sheet SMD(8W1)

IH 37
(IH 35 to IH 10)

SUMMARY OF LARGE SIGNS
SOLS

DN.: TxDOT	CK.: TxDOT	DW.: TxDOT	CK.: TxDOT	REVISIONS
				11-93 1-04 8-95 9-08 5-01

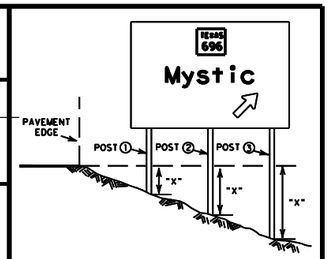
CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS
DIST	COUNTY		SHEET NO.
SAT	BEXAR		125

DATE: 3/4/2022 9:20:48 AM
FILE: $TS

146.25 THIS SIGN WILL REPLACE EXISTING SIGN NO.20 ON OSB

SUMMARY OF LARGE SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN BACK-GROUND COLOR	SIGN TEXT	SIGN DIMENSIONS	PLAQUES, & OTHER ATTACHMENTS: DIRECT APPLY	PLAQUES, & OTHER ATTACHMENTS: ✱ ALUMINUM (TYPE A)	BACKGROUND SUBSTRATE (SQ FT): GROUND MOUNT (TYPE G)	BACKGROUND SUBSTRATE (SQ FT): OVERHEAD (TYPE O)	TYPE OF MOUNT	"X" DIMENSION ◒: post ①	"X" DIMENSION ◒: post ②	"X" DIMENSION ◒: post ③	GALVANIZED STRUCTURAL STEEL: SIZE	GALVANIZED STRUCTURAL STEEL: LINEAR FEET post ①	GALVANIZED STRUCTURAL STEEL: LINEAR FEET post ②	GALVANIZED STRUCTURAL STEEL: LINEAR FEET post ③	GALVANIZED STRUCTURAL STEEL: TOTAL WEIGHT LBS.	DRILLED SHAFT: LINEAR FEET NON-REINF 12"ϕ	DRILLED SHAFT: LINEAR FEET REINFORCED 24"ϕ	DRILLED SHAFT: LINEAR FEET REINFORCED 30"ϕ	DRILLED SHAFT: LINEAR FEET REINFORCED 36"ϕ
	18A-NB	GREEN	EXIT 141 Commerce St Downtown ¾ MILE	8′-0" x 2′- 6"				20	THIS SIGN WILL REPLACE EXISTING SIGN NO.18 ON OSB												
				17′-0" x 8′- 0"				136													
	19-NB	BROWN	The Alamo EXIT 141	10′-0" x 8′- 6"				85													
	20-NB	GREEN	Convention Center Univ of Houston EXIT 141	REMOVE																	
	20A-NB	GREEN	Henry B Gonzalez Convention Center EXIT 141	19′-6" x 7′ -6"				146.25													
	21L-NB		EXIT 140 B Cesar E Chavez Blvd Alamodome ↗	REMOVE																	
	21LA-NB	GREEN	EXIT 140 B Cesar E Chavez Blvd ↗	9′-6" x 2′ -6"				23.75													
				19′-0" x 7′ -0"				133													
	23-NB	GREEN	Sunset Station NEXT RIGHT	REMOVE																	
	24-NB	GREEN	HemisFair Plaza Institute of Texan Cultures EXIT 140B	REMOVE																	
	24A-NB	GREEN	HemisFair Park Alamodome EXIT 140B	16′-0" x 8′- 6"				136	THIS SIGN WILL REPLACE EXISTING SIGN NO.25 ON OSB												
	25-NB	GREEN	EXIT 140 B Cesar E Chavez Blvd Alamodome ½ MILE	REMOVE																	
				PAGE TOTALS			0	680					PAGE TOTALS								



◒ The "X" dimension is the elevation difference at the post between the ground and the edge of pavement or top of curb.

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.

The post lengths listed here are approximations, The corrected post lengths will be furnished by the Contractor after the stud posts are placed.

Tower heights shall be verified with the Engineer before fabrication.

✱ This column is for aluminum Type A and not direct apply. Direct apply is subsidiary to the sign.

SIGN TYPE

SIGN TYPE 1 3 0
- 1: Wind Design Zone
- 3: No. of Posts
- 0: Series No. (0 Aluminum/Fiberglass, 1 Aluminum, 2 Fiberglass)

See sheet SMD(8W1)

IH 37
(IH 35 to IH 10)

SUMMARY OF LARGE SIGNS
SOLS

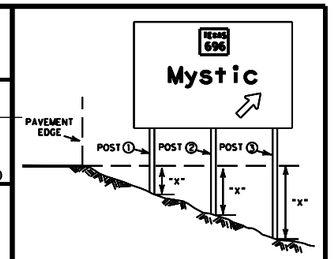
	REVISIONS	
DN.: TxDOT	11-93	1-04
CK.: TxDOT	8-95	9-08
DW.: TxDOT	5-01	
CK.: TxDOT		

CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS
DIST	COUNTY		SHEET NO.
SAT	BEXAR		126

DATE: 3/4/2022 9:20:48 AM
FILE: T

SUMMARY OF LARGE SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN BACK-GROUND COLOR	SIGN TEXT	SIGN DIMENSIONS	PLAQUES, & OTHER ATTACHMENTS		BACKGROUND SUBSTRATE (SQ FT)		TYPE OF MOUNT	"X" DIMENSION ◒			GALVANIZED STRUCTURAL STEEL					DRILLED SHAFT			
					DIRECT APPLY	* ALUMINUM (TYPE A)	GROUND MOUNT (TYPE G)	OVERHEAD (TYPE O)		post ①	post ②	post ③	SIZE	LINEAR FEET post ①	post ②	post ③	TOTAL WEIGHT LBS.	NON-REINF 12"ϕ	LINEAR FEET REINFORCED 24"ϕ	30"ϕ	36"ϕ
	25A-NB	GREEN	EXIT 140 B Cesar E Chavez Blvd ½ MILE	9'-6" x 2'-6" 19'-0"x 8'-0"				23.75 152	THIS SIGN WILL REPLACE EXISTING SIGN NO. 25 ON OSB												
	26-NB	GREEN	Convention Center Univ of Houston EXIT 141	REMOVE																	
	26A-NB	GREEN	Henry B Gonzalez Convention Center EXIT 141	19'-6" x 7'-6"			146.25		THIS SIGN WILL REPLACE EXISTING SIGN NO. 26 ON OSB												
PAGE TOTALS							147	175.75													
PAGE TOTALS																					



◒ The "X" dimension is the elevation difference at the post between the ground and the edge of pavement or top of curb.

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.

The post lengths listed here are approximations, The corrected post lengths will be furnished by the Contractor after the stud posts are placed.

Tower heights shall be verified with the Engineer before fabrication.

* This column is for aluminum Type A and not direct apply. Direct apply is subsidiary to the sign.

SIGN TYPE

SIGN TYPE 1 3 0
- 1 — Wind Design Zone
- 3 — No. of Posts
- 0 — Series No.: 0 Aluminum/Fiberglass, 1 Aluminum, 2 Fiberglass

See sheet SMD(BW1)

IH 37
(IH 35 to IH 10)

SUMMARY OF LARGE SIGNS

SOLS

DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT	REVISIONS
		11-93	1-04	
		8-95	9-08	
		5-01		

CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS
DIST	COUNTY		SHEET NO.
SAT	BEXAR		127

DATE: 3/4/2022 9:20:48 AM
FILE: I

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	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION: PREFABRICATED	MOUNTING DESIGNATION	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)
							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"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	TY = TYPE TY N TY S
	3-SB		Brooklyn Ave NEXT INTERSECTION Nolan St McCullough Ave 2ND INTERSECTION	96x60	✓				USE PRE-EXISTING MOUNT/ HARDWARE		N/A THIS SIGN WILL REPLACE 3A	
	3A-SB		Brooklyn Ave ⇗ Broadway ⇗	REMOVE							N/A	
	4-SB		⇦ Nolan St McCullough Ave ⇨	96x24	✓							
	4A-SB		⇧ Nolan St ⇧ Houston St	REMOVE								
	7-SB		INTERSTATE 35		✓						THIS SIGN WILL REPLACE 7	
	7A-SB		INTERSTATE 37	REMOVE								
	10-SB		⇦ St Paul Square ⇦ Amtrak Rail Sta	90x24	✓						THIS SIGN WILL REPLACE 10	
	10A-SB		⇦ St Paul Square	REMOVE								
	10B-SB		HOSPITAL ⇨	REMOVE								
	12-SB		US Rep Joaquin Castro District 20 ⇨ US Rep Tony Gonzales District 20 ⇨	54x48	✓						THIS SIGN WILL REPLACE 12A	
	12A-SB		US Rep Joaquin Castro District 20 ⇨	REMOVE								
	13-SB		Florida St NEXT INTERSECTION Carolina St 2ND INTERSECTION	96x54	✓						THIS SIGN WILL REPLACE 13A	

ALUMINUM SIGN BLANKS THICKNESS	

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).

IH 37
(FROM IH 10 TO IH 35)

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	00	238	VARIOUS
4-16 8-16	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		128

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
	13A-SB		⇧ Carolina St	REMOVE								
	17-NB		Carolina St NEXT INTERSECTION Florida St 2ND INTERSECTION	96x54	✓							
	21-NB		⇦ Downtown ⇦ The Alamo ⇦ Visitor Info Center	108x36	✓						THIS SIGN WILL REPLACE 22A	
	21A-NB		⇦ Downtown ⇦ The Alamo	REMOVE								
	21B-NB		VISITOR INFO ⇦	REMOVE								
	21C-NB		⇦ HOSPITAL	REMOVE								
	22-NB		St Paul Square ⇨ Amtrak Rail Sta ⇨	96x24	✓						THIS SIGN WILL REPLACE 23A	
	22A-NB		ST. PAUL'S SQUARE SUNSET STATION AMTRAK ⇨	REMOVE								
	22B-NB		St Paul Square ⇨ Amtrak ⇨ Sunset Station ⇨	REMOVE								

ALUMINUM SIGN BLANKS THICKNESS	

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).

IH 37
(FROM IH 10 TO IH 35)

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		0915	00	238	VARIOUS
4-16		DIST	COUNTY		SHEET NO.
8-16		SAT	BEXAR		129

1-SB

168x102:
12.0" Radius, 2.0" Border, White on, Brown:
"SSgt Wm J", ClearviewHwy-5-W-R; "Bordelon", ClearviewHwy-5-W-R; "Frwy", ClearviewHwy-5-W-R;

2-SB

120x102:
12.0" Radius, 2.0" Border, White on, Brown:
"The", ClearviewHwy-5-W-R; "Alamo", ClearviewHwy-5-W-R; "EXIT 141B", ClearviewHwy-5-W-R;

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E.

2/28/2022
DATE

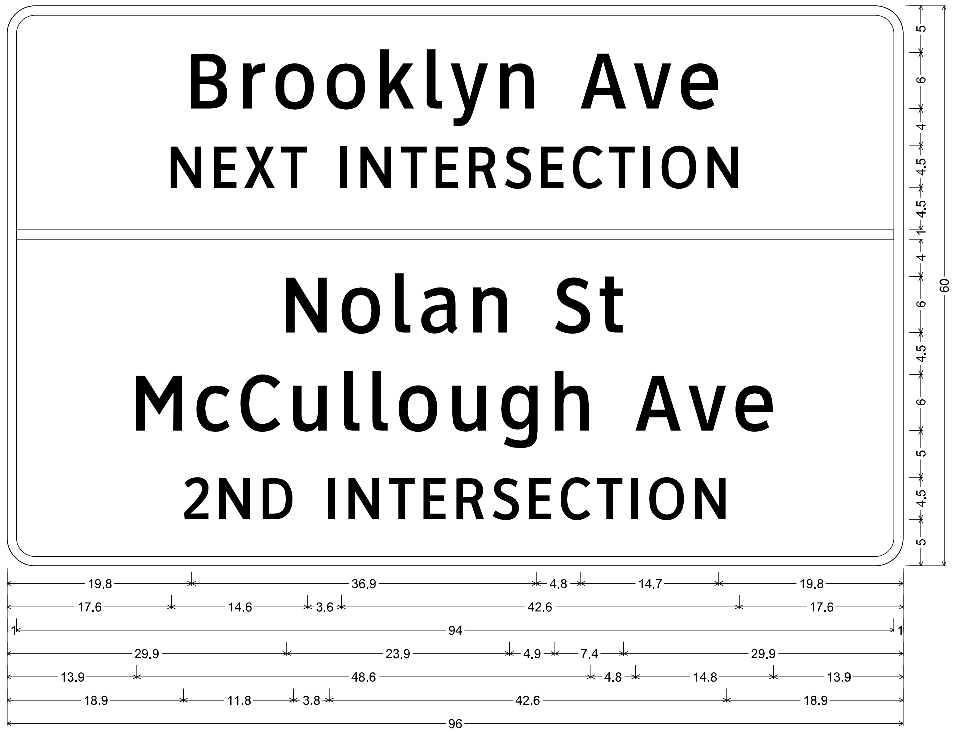
Texas Department of Transportation

GUIDE SIGN DETAILS
IH 37 SOUTHBOUND
BEXAR COUNTY

SHEET 1 OF 18

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		130
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

3-SB

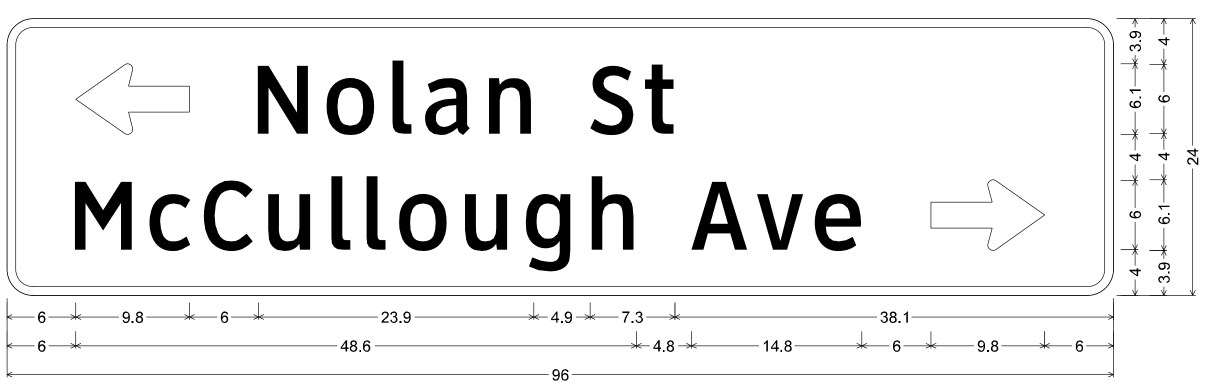


D3-2(4)_96x60;
3.0" Radius, 1.0" Border, White on, Green;
"Brooklyn Ave", ClearviewHwy-3-W; "NEXT INTERSECTION", ClearviewHwy-3-W; "Nolan St", ClearviewHwy-3-W;
"McCullough Ave", ClearviewHwy-3-W; "2ND INTERSECTION", ClearviewHwy-3-W;

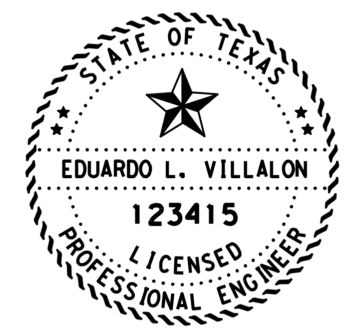
REMOVE 3A-SB

REMOVE 4-SB

4-SB



96x24;
2.3" Radius, 0.8" Border, White on, Green;
Standard Arrow Custom 9.9" X 6.1" 180'; "Nolan St", ClearviewHwy-3-W; "McCullough Ave", ClearviewHwy-3-W;
Standard Arrow Custom 9.9" X 6.1" 0';



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GUIDE SIGN DETAILS
IH 37 SOUTHBOUND
BEXAR COUNTY

SHEET 2 OF 18

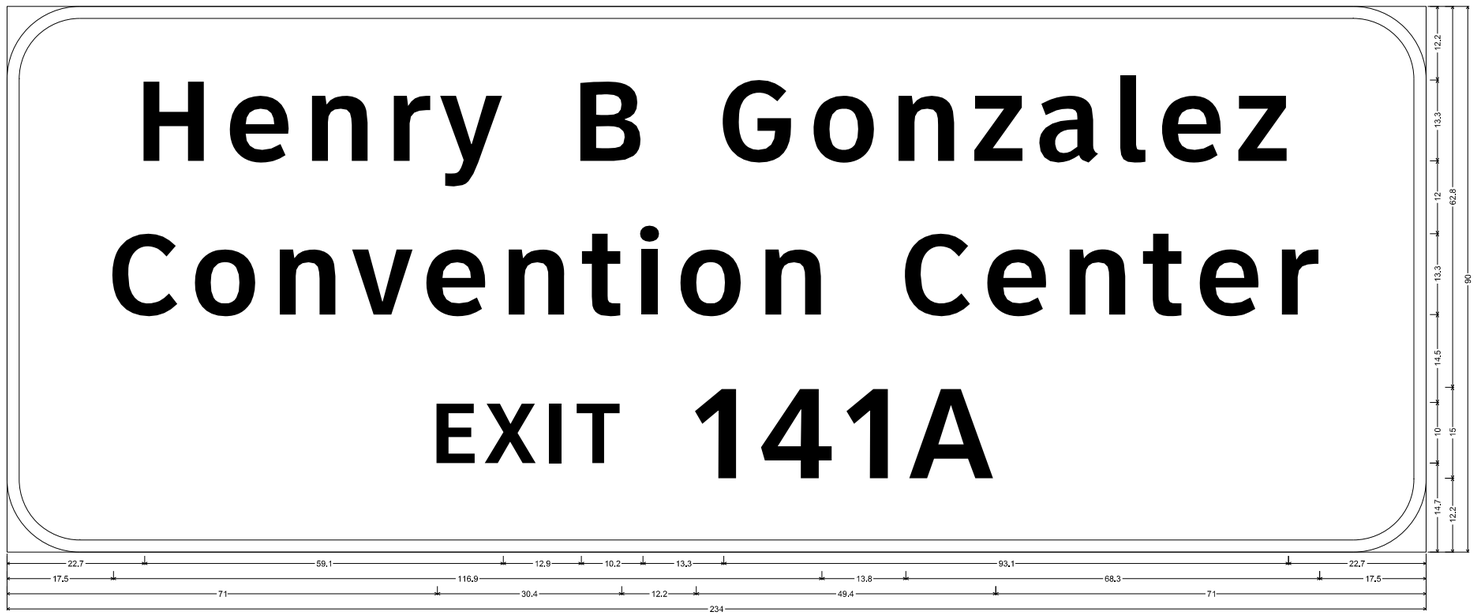
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		131
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

REMOVE
5-SB

Convention
Center
Univ of Houston
EXIT 141A

5A-SB

Henry B Gonzalez
Convention Center
EXIT 141A



234x90;
12.0" Radius, 2.0" Border, White on, Green;
"Henry B Gonzalez", ClearviewHwy-5-W-R; "Convention Center", ClearviewHwy-5-W-R; "EXIT 141A", ClearviewHwy-5-W-R;

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

Texas Department of Transportation

GUIDE SIGN DETAILS
IH 37 SOUTHBOUND
BEXAR COUNTY

SHEET 3 OF 18

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		132
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

2/25/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\IH 37 Downtown Sign Schematic - Legacy Engineering\DESIGN\SIGN DETAIL\IH37*SIGN-DETAIL.dgn

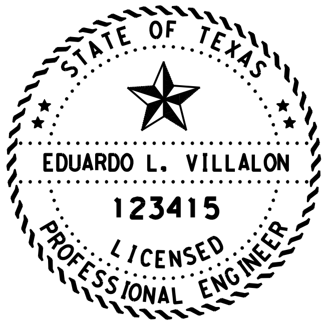
REMOVE
6-SB

6A-SB

228x126;

E1-5P_114x30;
6.0" Radius, 1.0" Border, White on, Green;
"EXIT 140", ClearviewHwy-4-W; "B", ClearviewHwy-4-W specified length;

12.0" Radius, 2.0" Border, White on, Green;
"Cesar E Chavez", ClearviewHwy-5-W-R; "Blvd", ClearviewHwy-5-W-R; " ½ MILE", ClearviewHwy-5-W-R;



EDUARDO L. VILLALON, P.E. 2/28/2022
DATE

Texas Department of Transportation

GUIDE SIGN DETAILS
IH 37 SOUTHBOUND
BEXAR COUNTY

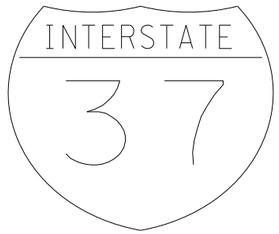
SHEET 4 OF 18

FHWA TEXAS DIVISION	FEDERAL AID PROJECT			SHEET NO.
	SEE TITLE SHEET			133
STATE	DIST.	COUNTY		
TEXAS	SAT	BEXAR		
CONT.	SECT.	JOB	HIGHWAY NO.	
0915	00	238	VARIOUS	

2/25/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\IH 37 Downtown Sign Schematic - Legacy Engineering\DESIGN\SIGN DETAIL\IH37*SIGN-DETAIL.dgn

7-SB

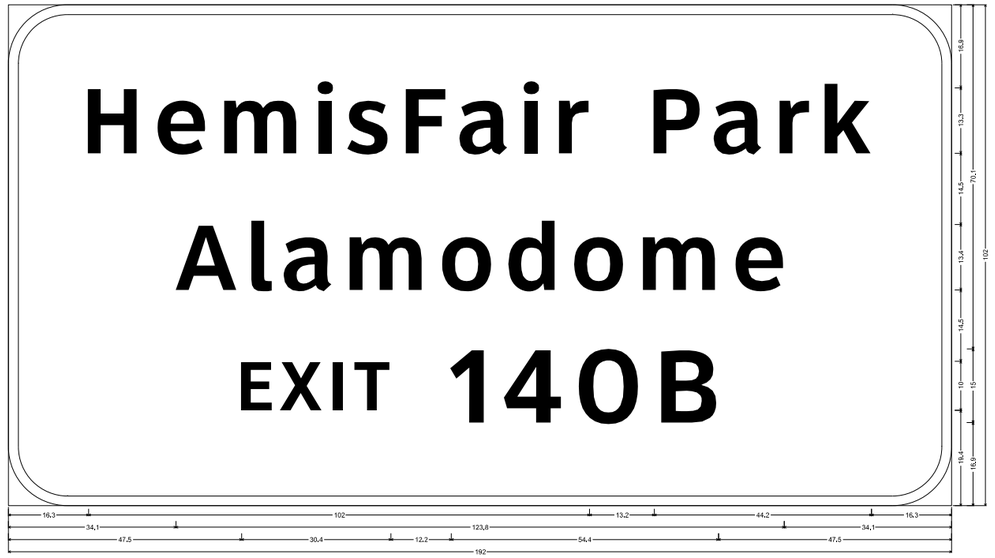
REMOVE
7A-SB



REMOVE
8-SB

HemisFair Plaza
Institute of Texas Culture
EXIT 140B

8A-SB



192x102:
12.0" Radius, 2.0" Border, White on Green:
"HemisFair Park", Clearview Hwy 5-WR; "Alamodome", Clearview Hwy 5-WR; "EXIT 140B", Clearview Hwy 5-WR;

REMOVE
9-SB

Sunset Station
NEXT RIGHT

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E.

2/28/2022
DATE

Texas Department of Transportation

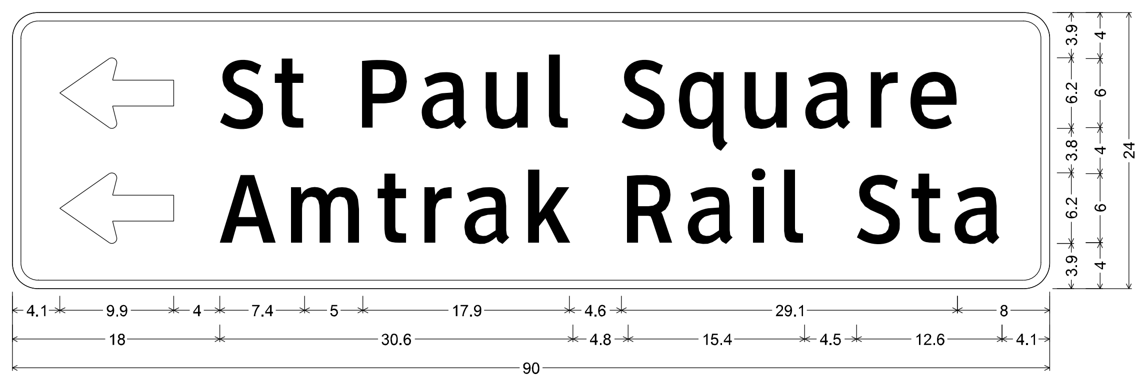
GUIDE SIGN DETAILS
IH 37 SOUTHBOUND
BEXAR COUNTY

SHEET 5 OF 18

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		134
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

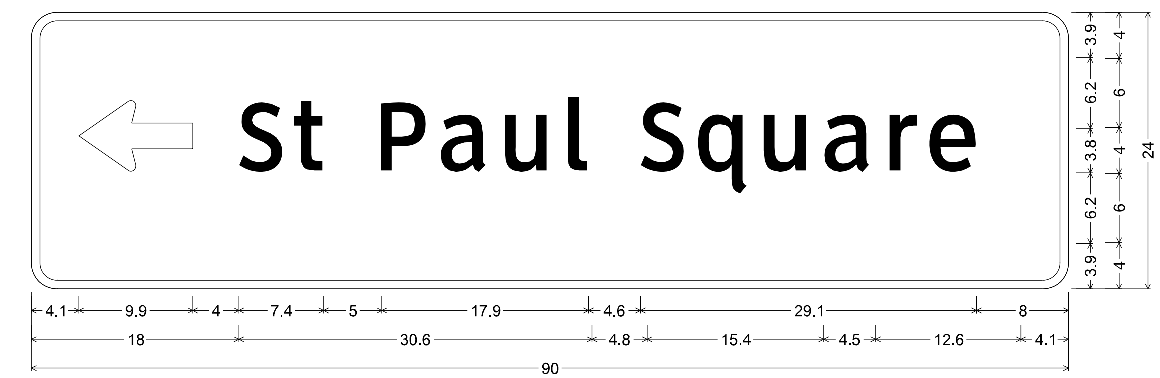
2/25/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\IH 37 Downtown Sign Schematic - Legacy Engineering\DESIGN\SIGN DETAIL\IH37*SIGN-DETAIL.dgn
DATE

10-SB



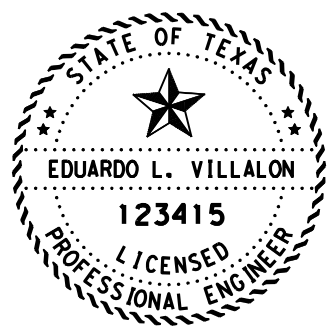
90x24;
2.3" Radius, 0.8" Border, White on, Green;
Standard Arrow Custom 9.9" X 6.1" 180'; "St Paul Square", ClearviewHwy-3-W; Standard Arrow Custom 9.9" X 6.1" 180';
"Amtrak Rail Sta", ClearviewHwy-3-W;

10A-SB



90x24;
2.3" Radius, 0.8" Border, White on, Green;
Standard Arrow Custom 9.9" X 6.1" 180'; "St Paul Square", ClearviewHwy-3-W; Standard Arrow Custom 9.9" X 6.1" 180';
"Amtrak Rail Sta", ClearviewHwy-3-W;

REMOVE 10B-SB



EDUARDO L. VILLALON, P.E. — DATE: 2/28/2022

Texas Department of Transportation

GUIDE SIGN DETAILS
IH 37 SOUTHBOUND
BEXAR COUNTY

SHEET 6 OF 18

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		135
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

2/25/2022
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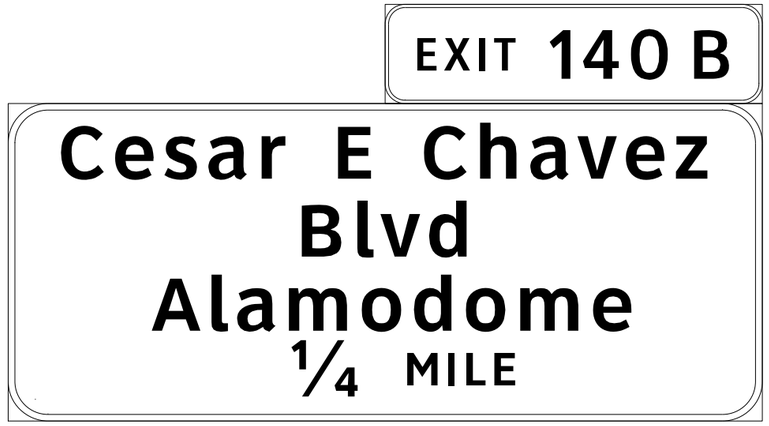
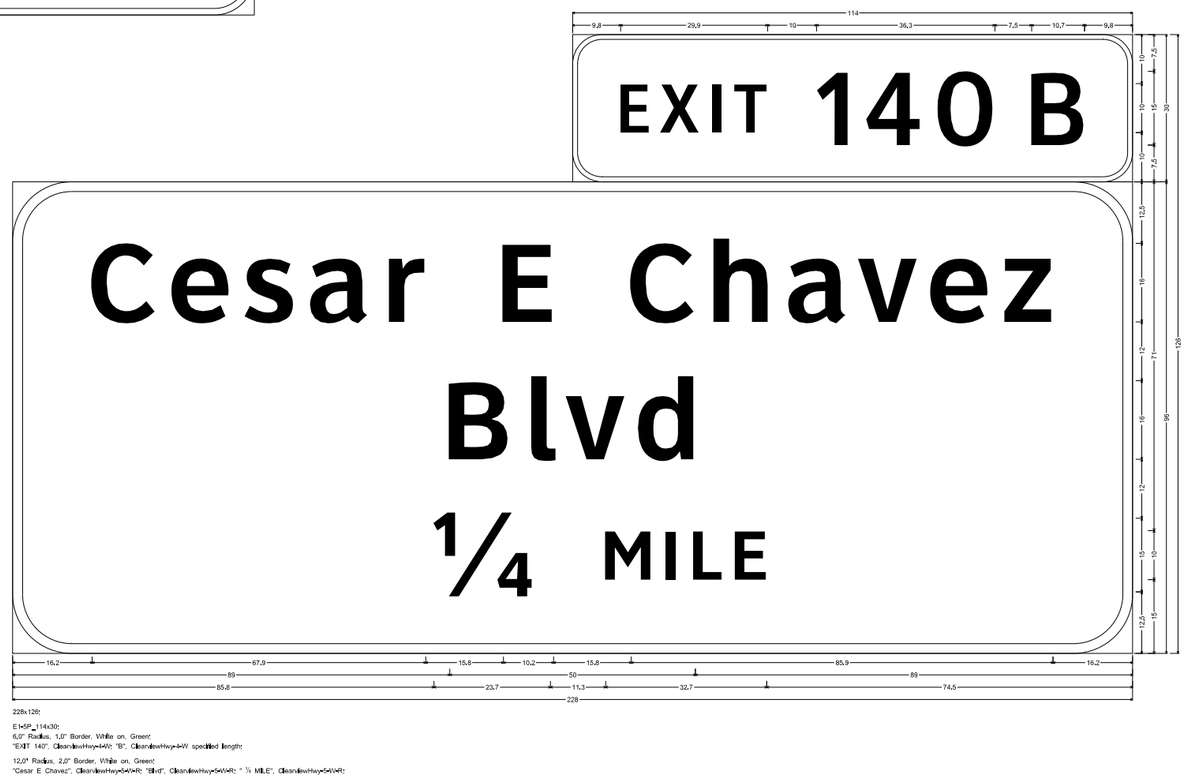
REMOVE
I I-SB



I IA-SB



228x126:

E14SP_114x30:
6,0" Radius, 1,0" Border, White on, Green:
"EXIT 140", CleanviewHwy-64W; "B", CleanviewHwy-64W specified length:

12,0" Radius, 2,0" Border, White on, Green:
"Cesar E Chavez", CleanviewHwy-64WR; "Blvd", CleanviewHwy-64WR; " ¼ MILE", CleanviewHwy-64WR:

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

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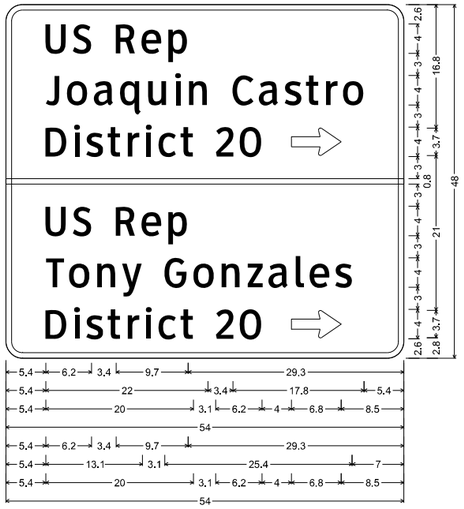
GUIDE SIGN DETAILS
IH 37 SOUTHBOUND
BEXAR COUNTY

SHEET 7 OF 18

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		136
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

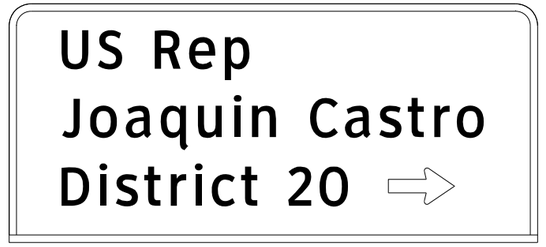
2/25/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\IH 37 Downtown Sign Schematic - Legacy Engineering\DESIGN\SIGN DETAIL\IH37*SIGN-DETAIL.dgn

12-SB

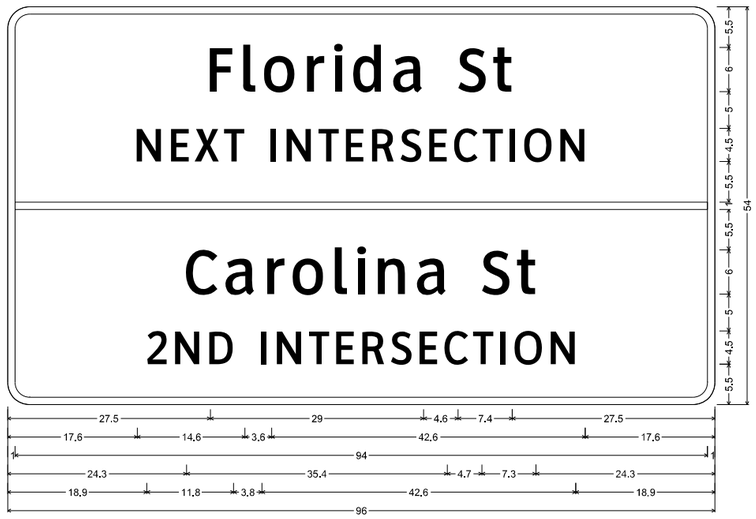


54x48;
2.3" Radius, 0.8" Border, White on, Green;
"US Rep", ClearviewHwy-3-W 98% spacing;
"Joaquin Castro", ClearviewHwy-3-W; "District 20", ClearviewHwy-3-W;
Standard Arrow Custom 6.8" X 3.7" 0';
"US Rep", ClearviewHwy-3-W 98% spacing;
"Tony Gonzales", ClearviewHwy-3-W; "District 20", ClearviewHwy-3-W;
Standard Arrow Custom 6.8" X 3.7" 0';

REMOVE 12A-SB



13-SB



D3-2(4)_96x54;
3.0" Radius, 1.0" Border, White on, Green;
"Florida St", ClearviewHwy-3-W; "NEXT INTERSECTION", ClearviewHwy-3-W; "Carolina St", ClearviewHwy-3-W;
"2ND INTERSECTION", ClearviewHwy-3-W;

REMOVE 13A-SB

STATE OF TEXAS
EDUARDO L. VILLALON
123415
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EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

Texas Department of Transportation

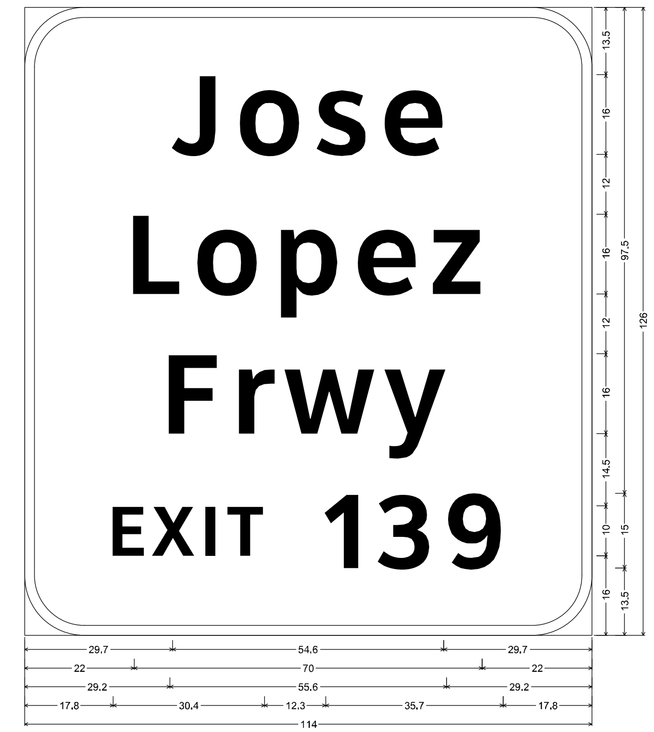
GUIDE SIGN DETAILS
IH 37 SOUTHBOUND
BEXAR COUNTY

SHEET 8 OF 18

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		137
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

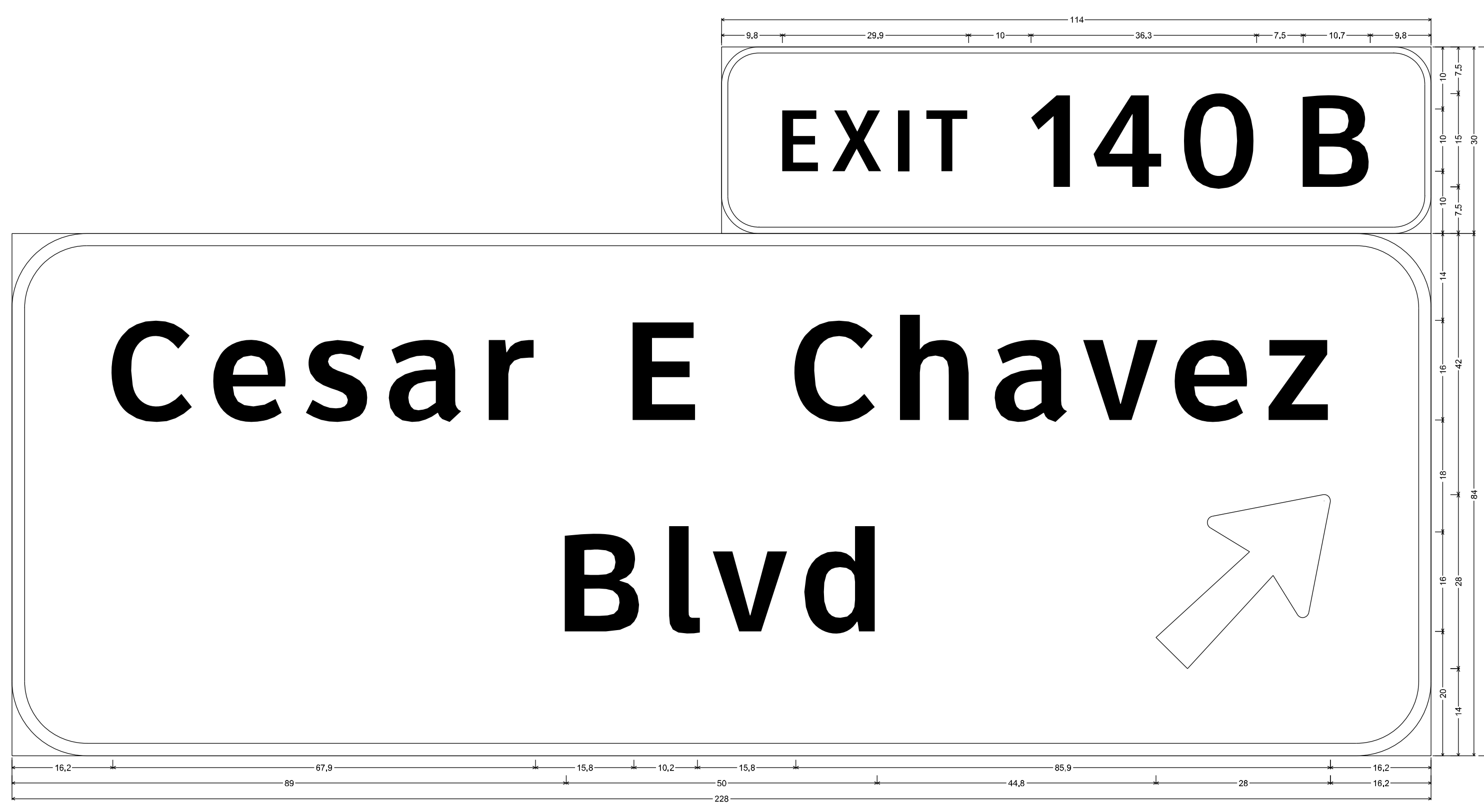
REMOVE
13L-SB

14-SB



114x126;
12.0" Radius, 2.0" Border, White on, Brown;
"Jose", ClearviewHwy-5-W-R; "Lopez", ClearviewHwy-5-W-R; "Frwy", ClearviewHwy-5-W-R;
"EXIT 139", ClearviewHwy-5-W-R;

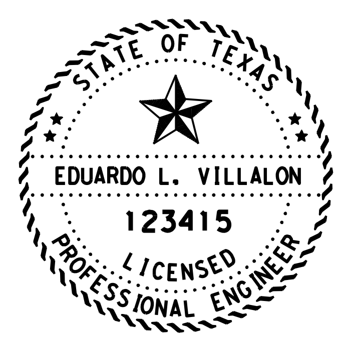
13AL-SB



228x114;

E1-5P_114x30;
6.0" Radius, 1.0" Border, White on, Green;
"EXIT 140", ClearviewHwy-4-W; "B", ClearviewHwy-4-W specified length;

12.0" Radius, 2.0" Border, White on, Green;
"Cesar E Chavez", ClearviewHwy-5-W-R; "Blvd", ClearviewHwy-5-W-R; Arrow A-3 - 35.6" 45';



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GUIDE SIGN DETAILS
IH 37 SOUTHBOUND
BEXAR COUNTY

SHEET 9 OF 18

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		138
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

2/25/2022
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I5-NB

REMOVE
I6-NB

I6A-NB

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GUIDE SIGN DETAILS
IH 37 NORTHBOUND
BEXAR COUNTY

SHEET 10 OF 18

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		139
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

2/25/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\IH 37 Downtown Sign Schematic - Legacy Engineering\DESIGN\SIGN DETAIL\IH37*SIGN-DETAIL.dgn

REMOVE

17-NB

17A-NB

192x102;
12.0" Radius, 2.0" Border, White on, Green;
"HemisFair Park", ClearviewHwy-5-W-R; "Alamodome", ClearviewHwy-5-W-R; "EXIT 140B", ClearviewHwy-5-W-R;

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EDUARDO L. VILLALON, P.E. | DATE: 2/28/2022

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GUIDE SIGN DETAILS
IH 37 NORTHBOUND
BEXAR COUNTY

SHEET 11 OF 18

FHWA TEXAS DIVISION	FEDERAL AID PROJECT			SHEET NO.
	SEE TITLE SHEET			140
STATE	DIST.	COUNTY		
TEXAS	SAT	BEXAR		
CONT.	SECT.	JOB	HIGHWAY NO.	
0915	00	238	VARIOUS	

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DN: DN

REMOVE
I8-NB

I8A-NB

204x126:
E1-5P_114x30:
6,0" Radius, 1,0" Border, White on, Green
"EXIT 141", CleanviewHwy-5-W 80% spacing;

12,0" Radius, 2,0" Border, White on, Green
"Commerce St", CleanviewHwy-5-WR; "Downtown", CleanviewHwy-5-WR; " ¾ MILE", CleanviewHwy-5-WR;

I9-NB

120x102:
12,0" Radius, 2,0" Border, White on, Brown
"The", CleanviewHwy-5-WR; "Alamo", CleanviewHwy-5-WR; "EXIT 141", CleanviewHwy-5-WR;

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LICENSED
PROFESSIONAL ENGINEER

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2/28/2022
DATE

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GUIDE SIGN DETAILS
IH 37 NORTHBOUND
BEXAR COUNTY

SHEET 12 OF 18

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		141
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

2/25/2022
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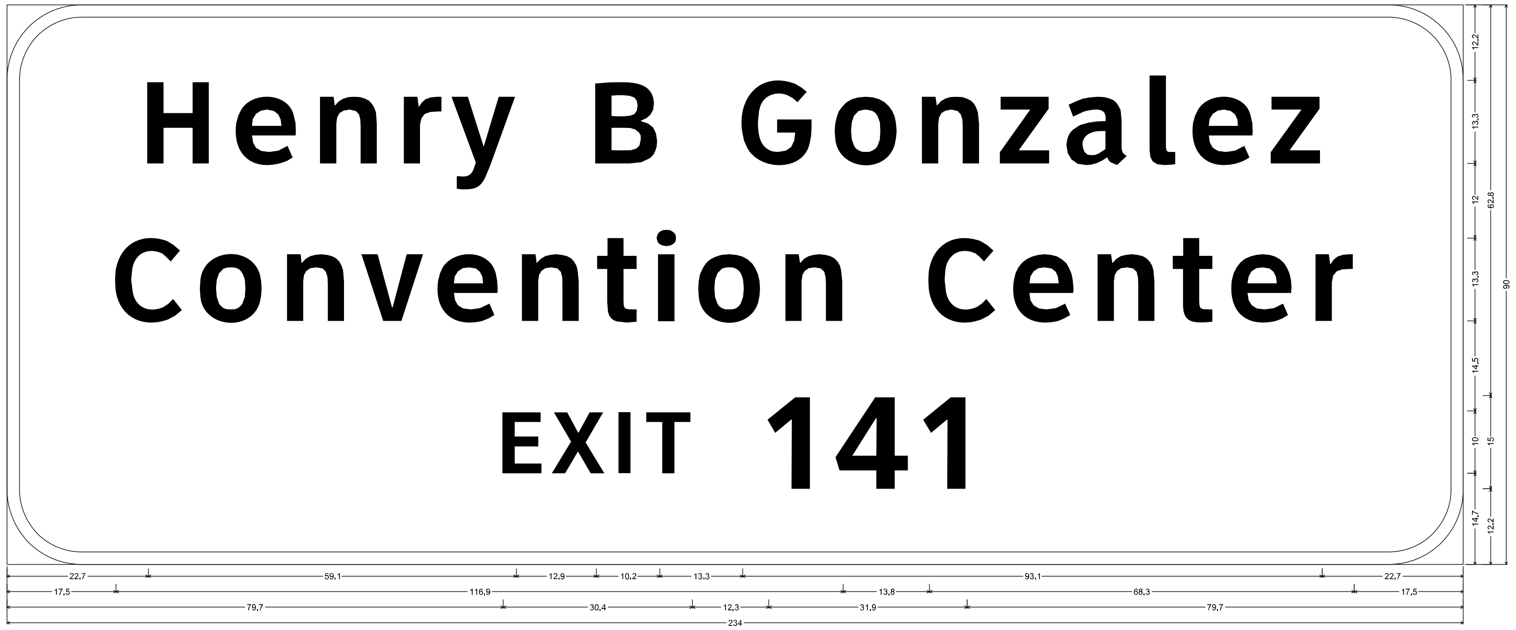
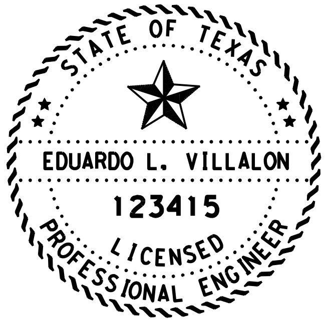
DATE
SIGNS

REMOVE
20-NB

20A-NB



234x90;
12.0" Radius, 2.0" Border, White on, Green;
"Henry B Gonzalez", ClearviewHwy-5-W-R; "Convention Center", ClearviewHwy-5-W-R; "EXIT 141", ClearviewHwy-5-W-R;



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Texas Department of Transportation

GUIDE SIGN DETAILS
IH 37 NORTHBOUND
BEXAR COUNTY

SHEET 13 OF 18

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		142
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

2/25/2022
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DN: DN

REMOVE
21L-NB

21LA-NB

228x114:

E1=5P_114x30:
6,0" Radius, 1,0" Border, White on, Green:
"EXIT 140", CleanviewHwy-5-W; "B", CleanviewHwy-4-W specified length;

12,0" Radius, 2,0" Border, White on, Green:
"Cesar E Chavez", CleanviewHwy-5-W-R; "Blvd", CleanviewHwy-5-W-R; Arrow Aw3 = 35,6° 45°;

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2/28/2022
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GUIDE SIGN DETAILS
IH 37 NORTHBOUND
BEXAR COUNTY

SHEET 14 OF 18

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		143
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

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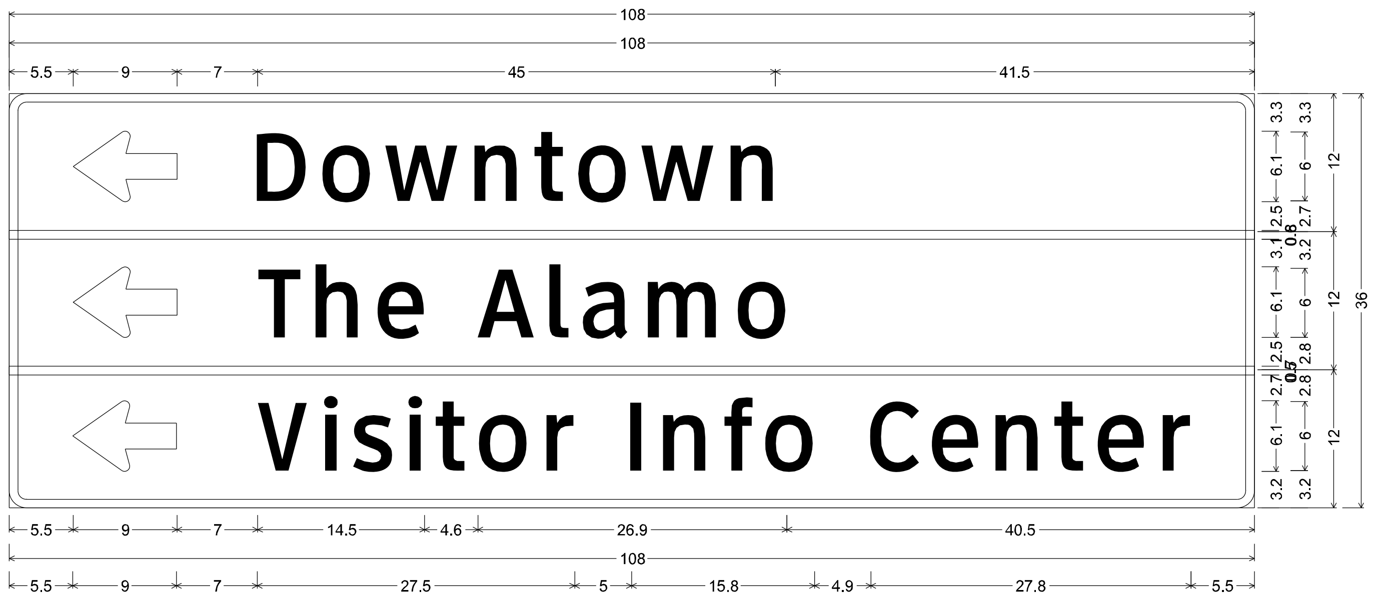
22-NB



108x36;

1.5" Radius, 0.8" Border, White on, Green;
Standard Arrow Custom 9.0" X 6.1" 180'; "Downtown", ClearviewHwy-3-W 107% spacing;

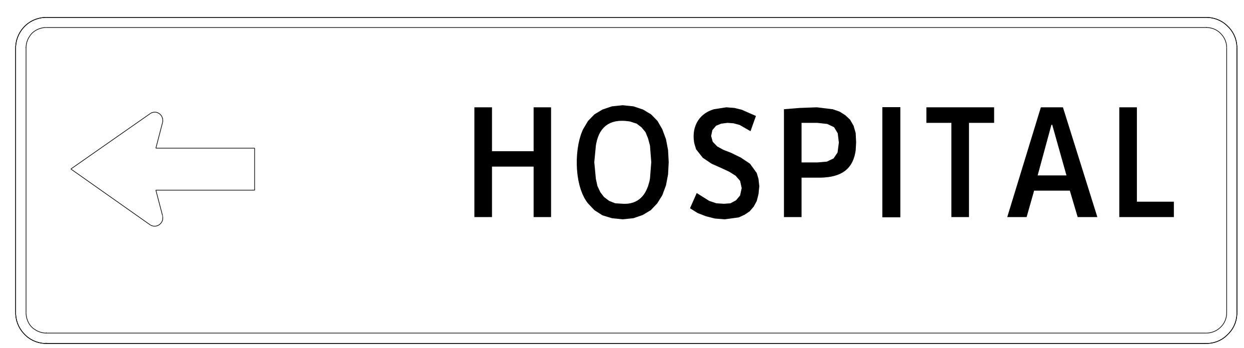
1.5" Radius, 0.8" Border, White on, Green;
Standard Arrow Custom 9.0" X 6.1" 180'; "The Alamo", ClearviewHwy-3-W 105% spacing;

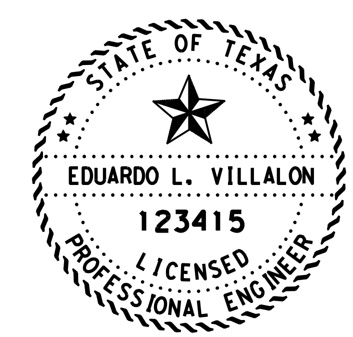
1.5" Radius, 0.8" Border, White on, Blue;
Standard Arrow Custom 9.0" X 6.1" 180'; "Visitor Info Center", ClearviewHwy-3-W 101% spacing;

REMOVE 22A-NB

REMOVE 22B-NB

REMOVE 22C-NB





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GUIDE SIGN DETAILS
IH 37 NORTHBOUND
BEXAR COUNTY

SHEET 15 OF 18

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		144
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

2/25/2022
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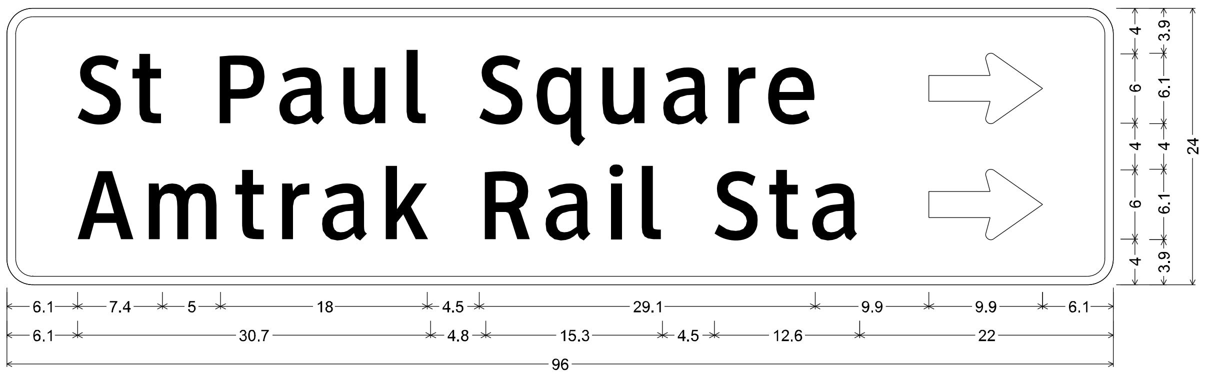
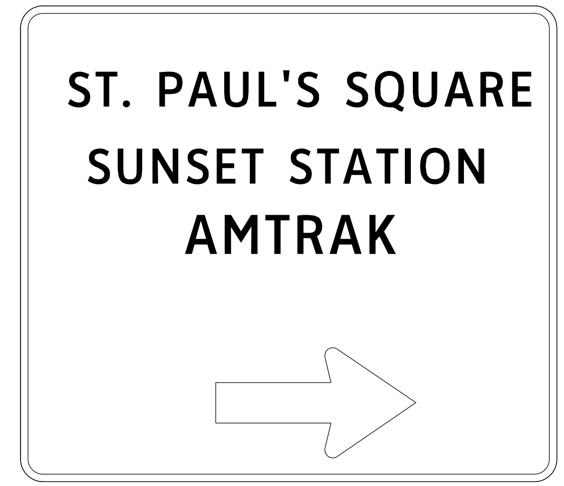
23-NB

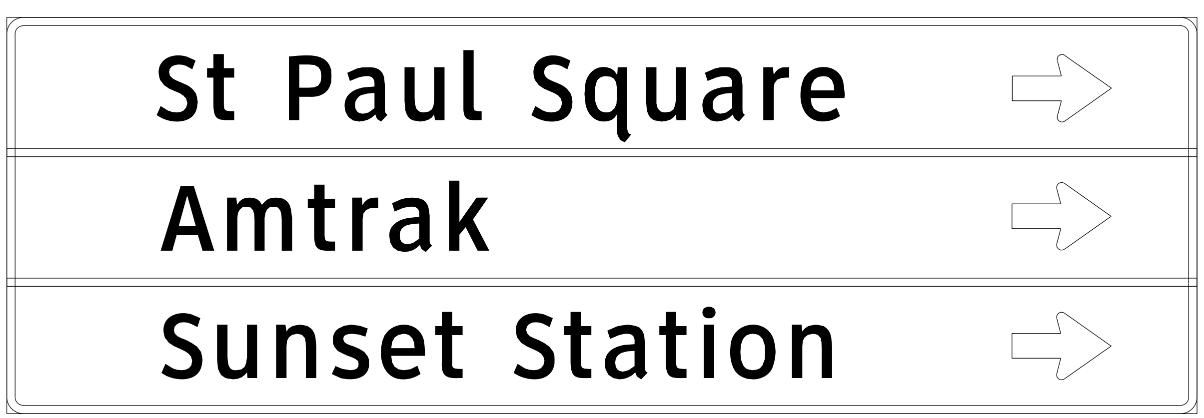


96x24;
2.3" Radius, 0.8" Border, White on, Green;
"St Paul Square", ClearviewHwy-3-W; Standard Arrow Custom 9.9" X 6.1" 0'; "Amtrak Rail Sta", ClearviewHwy-3-W;
Standard Arrow Custom 9.9" X 6.1" 0';

REMOVE
23A-NB



REMOVE
23B-NB



REMOVE
24-NB

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Texas Department of Transportation

GUIDE SIGN DETAILS
IH 37 NORTHBOUND
BEXAR COUNTY

SHEET 16 OF 18

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		145
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

2/25/2022
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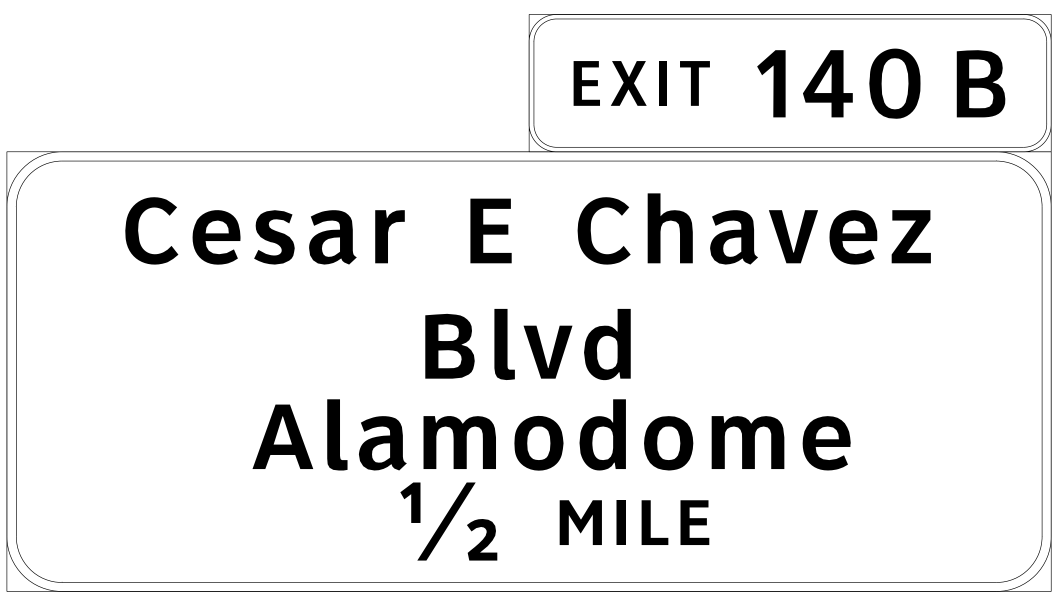
REMOVE
25-NB

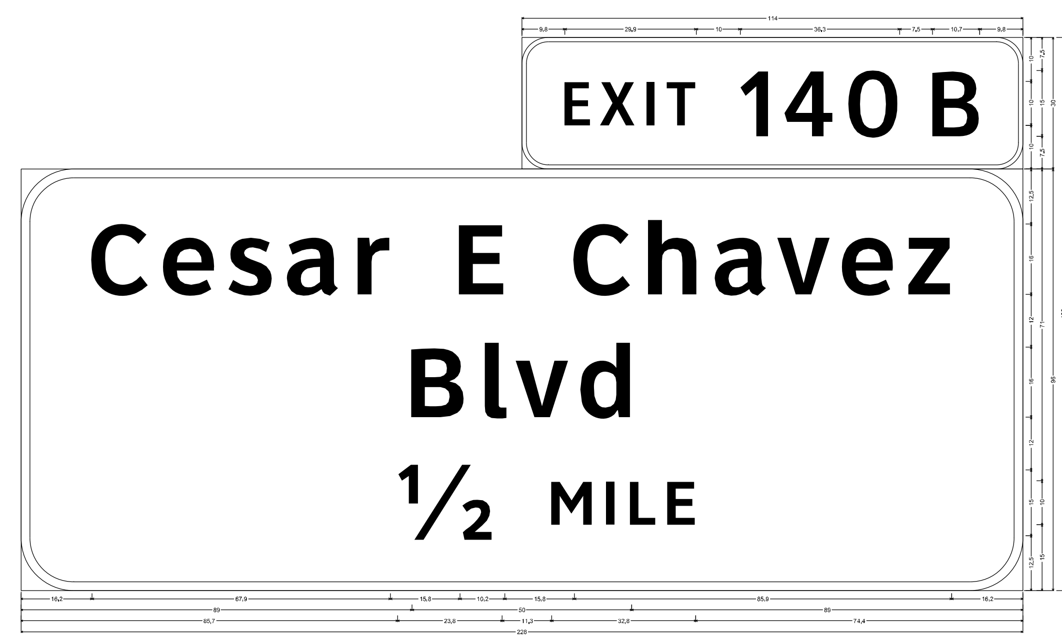
25A-NB

192x102;
12.0" Radius, 2.0" Border, White on, Green;
"HemisFair Park", ClearviewHwy-5-W-R; "Alamodome", ClearviewHwy-5-W-R; "EXIT 140B", ClearviewHwy-5-W-R;

REMOVE
26-NB



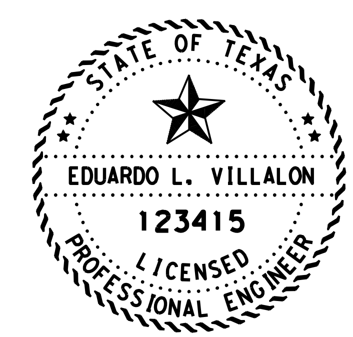
26A-NB



228x126;

E1-5P_114x30;
6.0" Radius, 1.0" Border, White on, Green;
"EXIT 140", ClearviewHwy-4-W; "B", ClearviewHwy-4-W specified length;

12.0" Radius, 2.0" Border, White on, Green;
"Cesar E Chavez", ClearviewHwy-5-W-R; "Blvd", ClearviewHwy-5-W-R; " ½ MILE", ClearviewHwy-5-W-R;



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GUIDE SIGN DETAILS
IH 37 NORTHBOUND
BEXAR COUNTY

SHEET 17 OF 18

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		146
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

2/25/2022
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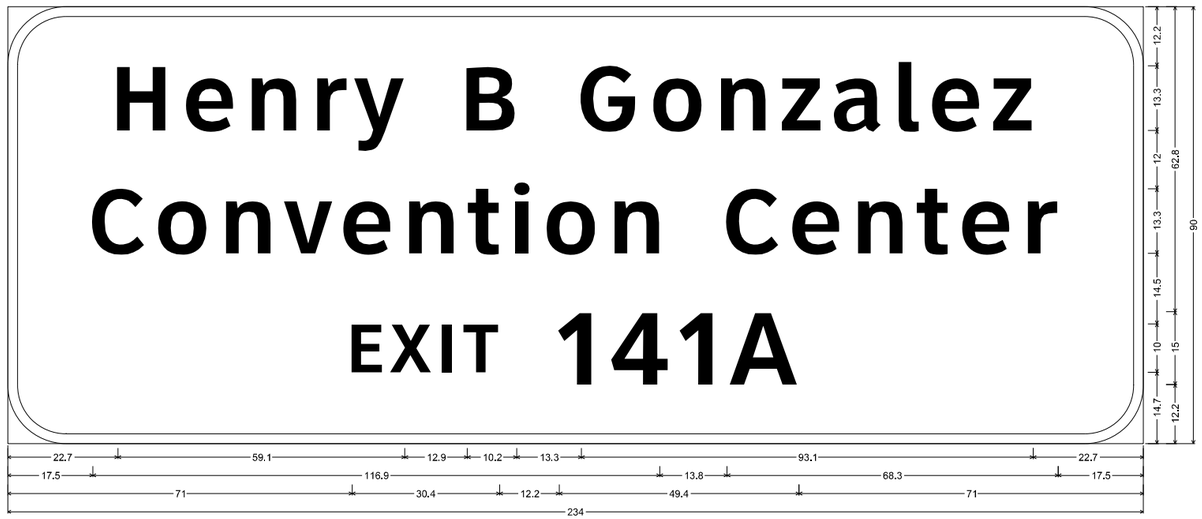
REMOVE
27-NB

Convention
Center
Univ of Houston
EXIT 141

27A-NB

Henry B Gonzalez
Convention Center
EXIT 141A



234x90;
12.0" Radius, 2.0" Border, White on, Green;
"Henry B Gonzalez", ClearviewHwy-5-W-R; "Convention Center", ClearviewHwy-5-W-R; "EXIT 141A", ClearviewHwy-5-W-R;

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2/28/2022
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GUIDE SIGN DETAILS
IH 37 NORTHBOUND
BEXAR COUNTY

SHEET 18 OF 18

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		147
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

2/25/2022
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N

N.T.S.

LEGEND

- # ..... SMALL GUIDE SIGNAGE
- # ..... LARGE GUIDE SIGNAGE
- ——— ..... CORIDOR LIMITS

STATE OF TEXAS
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LOCATION MAP
IH-37
(US 97 TO FM 1099)

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		148
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

2/25/2022
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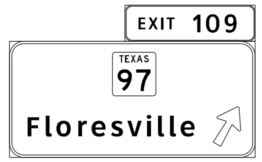
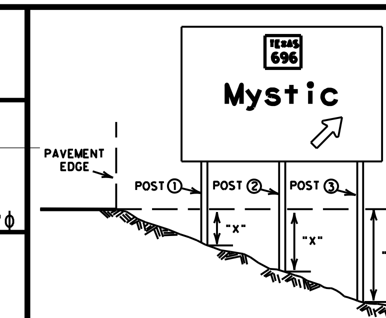
DN: DN

SUMMARY OF LARGE SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN BACK-GROUND COLOR	SIGN TEXT	SIGN DIMENSIONS	PLAQUES, & OTHER ATTACHMENTS: DIRECT APPLY	PLAQUES, & OTHER ATTACHMENTS: * ALUMINUM (TYPE A)	BACKGROUND SUBSTRATE (SQ FT): GROUND MOUNT (TYPE G)	BACKGROUND SUBSTRATE (SQ FT): OVERHEAD (TYPE O)	TYPE OF MOUNT	"X" DIMENSION ⊖: post ①	"X" DIMENSION ⊖: post ②	"X" DIMENSION ⊖: post ③	GALVANIZED STRUCTURAL STEEL: SIZE	GALVANIZED STRUCTURAL STEEL: LINEAR FEET post ①	GALVANIZED STRUCTURAL STEEL: LINEAR FEET post ②	GALVANIZED STRUCTURAL STEEL: LINEAR FEET post ③	GALVANIZED STRUCTURAL STEEL: TOTAL WEIGHT LBS.	DRILLED SHAFT: LINEAR FEET NON-REINF 12"ϕ	DRILLED SHAFT: LINEAR FEET REINFORCED 24"ϕ	DRILLED SHAFT: LINEAR FEET REINFORCED 30"ϕ	DRILLED SHAFT: LINEAR FEET REINFORCED 36"ϕ
	10-NB	GREEN		8'-0" x 2'-5" 17'-6" x 7'-6"	8.97		20 131.25														
			PAGE TOTALS				151.25						PAGE TOTALS								

~ For contractor information only



⊖ The "X" dimension is the elevation difference at the post between the ground and the edge of pavement or top of curb.

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.

The post lengths listed here are approximations, The corrected post lengths will be furnished by the Contractor after the stud posts are placed.

Tower heights shall be verified with the Engineer before fabrication.

* This column is for aluminum Type A and not direct apply. Direct apply is subsidiary to the sign.

SIGN TYPE

SIGN TYPE 1 3 0
- 1 — Wind Design Zone
- 3 — No. of Posts
- 0 — Series No.: 0 Aluminum/Fiberglass, 1 Aluminum, 2 Fiberglass

See sheet SMD(8W1)

IH 37 SOUTH
(FROM US 97 TO FM 1099)

SUMMARY OF LARGE SIGNS

SOLS

DN.: TxDOT | CK.: TxDOT | DW.: TxDOT | CK.: TxDOT

REVISIONS: 11-93, 8-95, 5-01, 1-04, 9-08

CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS
DIST	COUNTY		SHEET NO.
SAT	BEXAR		149

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
	1-SB	W1-8		18" x 24"	✓							
	2-SB	W1-8										
	3-SB	W1-8										
	4-SB	W1-8										
	5-NB	W1-8		18" x 24"	✓							
	6-NB	W1-8										
	7-NB	W1-8										
	8-NB	W1-8										
	9-NB	W12-2		36" x 36"	✓							

ALUMINUM SIGN BLANKS THICKNESS

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).

IH 37
(FROM US 97 TO FM 1099)

Texas Department of Transportation

Traffic Operations Division Standard

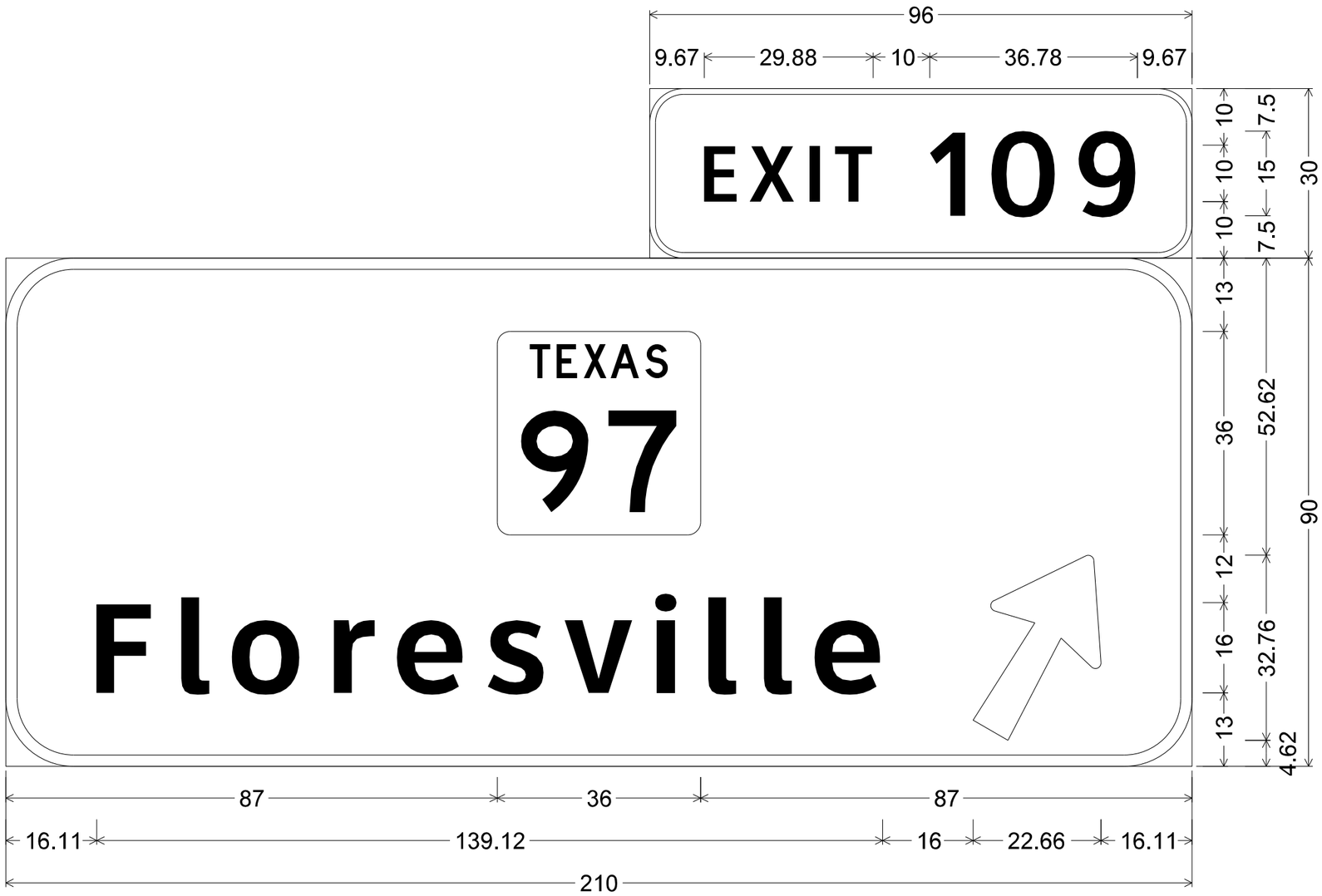
SUMMARY OF SMALL SIGNS

SOSS

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	2021	CONT	SECT	JOB	HIGHWAY
REVISIONS		0915	00	238	VARIOUS
4-16		DIST	COUNTY		SHEET NO.
8-16		SAT	BEXAR		150

18

I O-NB



6.00" Radius, 1.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [109] ClearviewHwy-4-W;
12.00" Radius, 2.00" Border, White on Green;
State Highway 97 M1-6T2; [Floresville] ClearviewHwy-5-W; Arrow A-3 - 35.63" 60°;

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PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

GUIDE SIGN DETAILS
IH 37
US 97 TO FM 1099

SHEET 1 OF 1

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		151 ·
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

DW: DN

2/25/2022
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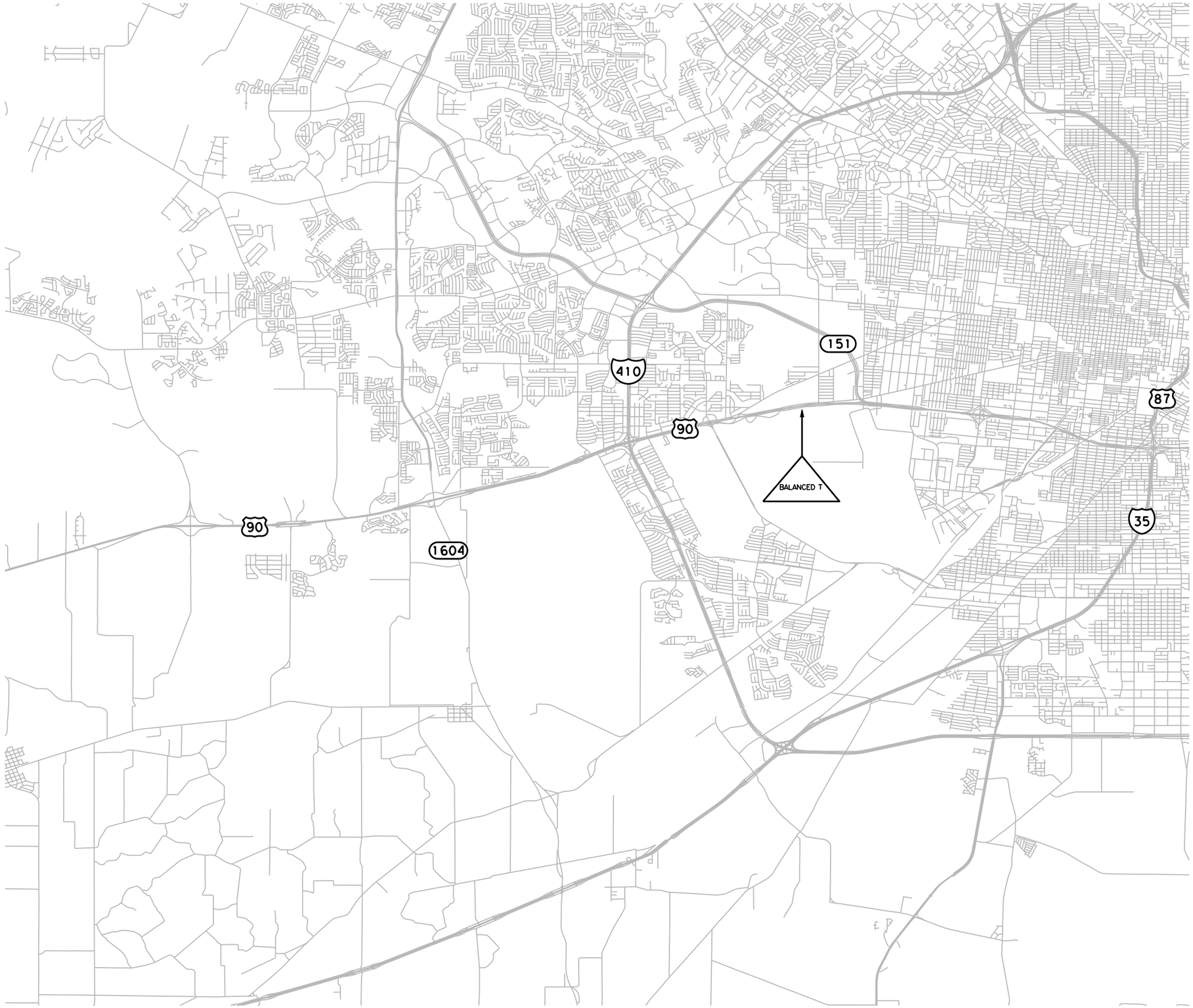

N

N.T.S

LEGEND

BALANCED T ..... BALANCED T

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E.

2/28/2022
DATE

Texas Department of Transportation
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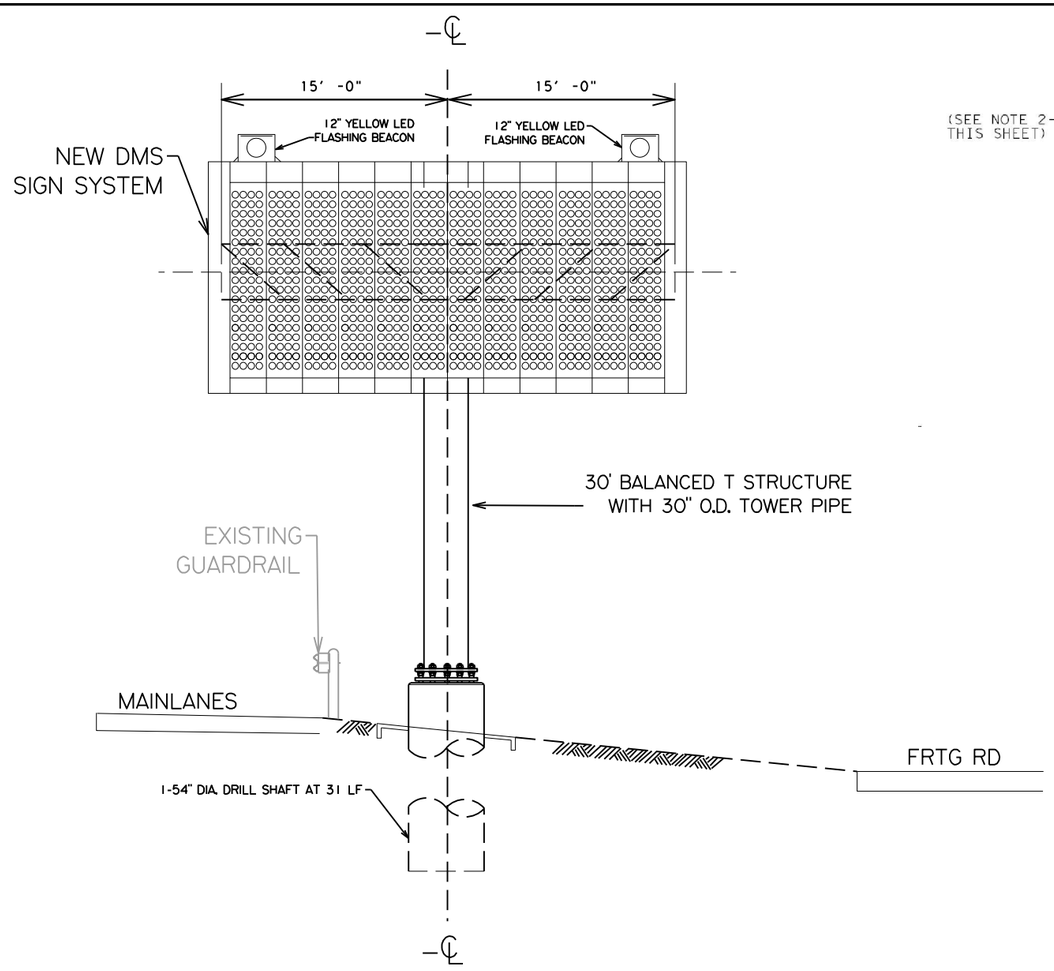
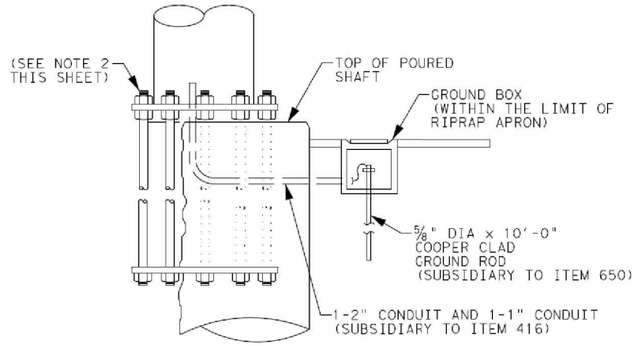
LOCATION MAP
US 90 (EB)
WEST OF LEON CREEK

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		152
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

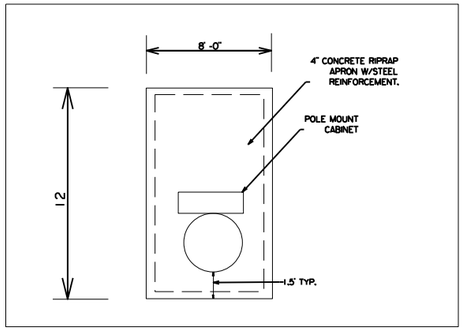
2/25/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\PLN*SHEETS\Plan Sheets\Location Maps\US 90\US 90*SIGN*LOCATION*1.dgn
DN: DN



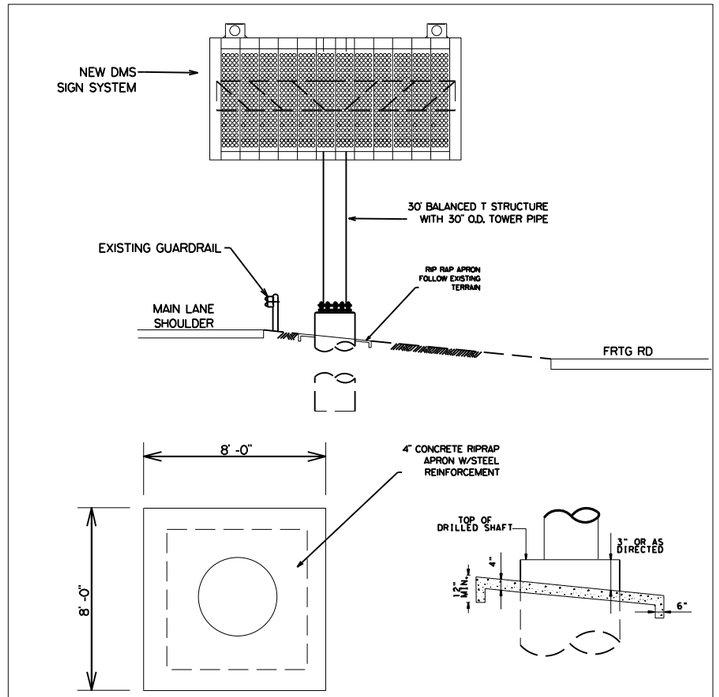
DMS BALANCED "T" MOUNT
NTS



BEARING SEAT ELEVATION



RIPRAP APRON DETAIL
(POLE MOUNT CABINET)
(NOT TO SCALE)



NOTE:
CLASS B CONCRETE RIPRAP APRON TO BE INSTALLED AT GRASSY LOCATION, ESTIMATED AT 1.00 CY PER SITE, PAID FOR UNDER ITEM 432 "RIPRAP"

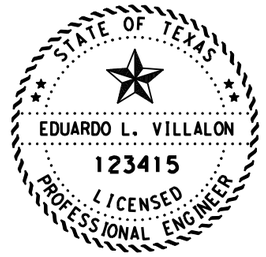
RIPRAP APRON DETAIL
GROUND MOUNTED CABINET
(NOT TO SCALE)

QUANTITY SUMMARY CSJ: 0915-00-238

0416 6005	DRILL SHAFT (SIGN MTS) (54 IN)	LF	31
0432 6045	RIPRAP (MOW STRIP) (4 IN)	CY	3
0496 6035	REMOV STR (DRILL SHAFT)	EA	2
0618 6064	CONDT (RM)(1")	LF	30
0496 6035	CONDT (RM)(2")	LF	30
0624 6009	GROUND BOX TY D 162911)	EA	1
0650 6028	INS OH SUP(30 FT BAL TEE)	EA	1
6007 6094	FIBER OPTIC FUSION SPLICE	EA	1
6007 6095	FIBER OPTIC PATCH PANEL (6 POSITION)	EA	1
6028 6002	INSTALL DMS (FOUNDATION MTD CABINET)	EA	1
6123 6001	ETHERNET SWITCH (INSTALL ONLY)	EA	1

NOTE:

1. CONTRACTOR IS RESPONSIBLE FOR COORDINATING INSTALLATION OF BALANCED "T" MOUNTS WITH ENGINEER.
2. CONTRACTOR IS RESPOSIBLE FOR SURVEYING THE LOCATION(S) OF NEW SIGN SUPPORT STRUCTURES TO CONFIRM THAT THEY MEET THE HEIGHT AND OFFSET DIMMENSIONS SHOWN.
3. THE NEW DMS SIGNS SUPPLIED BY TXDOT ARE TYPICAL 29'-1" WIDE X 7-10 3/16" TALL WITH 2 EA FLASHING BEACONS ON TOP. SHOP DRAWINGS MAY BE REQUESTED FROM THE TRANSGUIDE OFFICE.
4. THE CONTRACTOR SUPPLIED "T" MOUNTS ARE TO BE DESIGNED USING THE COSS-Z3 STANDARD SHEET WITH A 30 FT SPAN.
5. FOR ADDITIONAL DETAILS SEE THE FOLLOWING STANDARD SHEETS: COSS-SE, COSS-Z3, COSSD, COSSF, COSS-FD
6. THE BALANCED "T" MOUNTS SUPPLIED AND INSTALLED BY THE CONTRACTOR WILL BE PAID FOR UNDER ITEM 650.
7. CONTRACTOR IS REQUIRED TO VERIFY ALL ABOVE DIMMENSIONS BEFORE FABRICATION OF NEW BALANCED "T" MOUNTS.
8. CONTRACTOR SHALL STAKE PROPOSED SIGN LOCATIONS. ENGINEER APPROVAL OF STAKED LOCATIONS IS REQUIRED BEFORE STARTING DRILL SHAFT CONSTRUCTION.
9. CONTRACTOR SHALL COORDINATE WITH THE ENGINEER TO ADJUST SIGN LOCATIONS AND ACCOMODATE FIELD CONDITIONS (TO AVOID ANY CONFLICTS WITH EXISTING UTILITIES OR DRAINAGE STRUCTURES).
10. THE BALANCED "T" SHALL BE PLACED 7 FEET EAST OF EXISTING DRILL SHAFTS.
11. EXISTING 13 FT DRILL SHAFT TO BE REMOVED UNDER ITEM 496.
12. CONDUCTOR FROM DMS CONTROLLER TO DMS SHALL BE SUBSIDIARY TO ITEM 6028.
13. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL UTILITIES PRIOR TO DRILLING BALANCED "T" FOUNDATION.

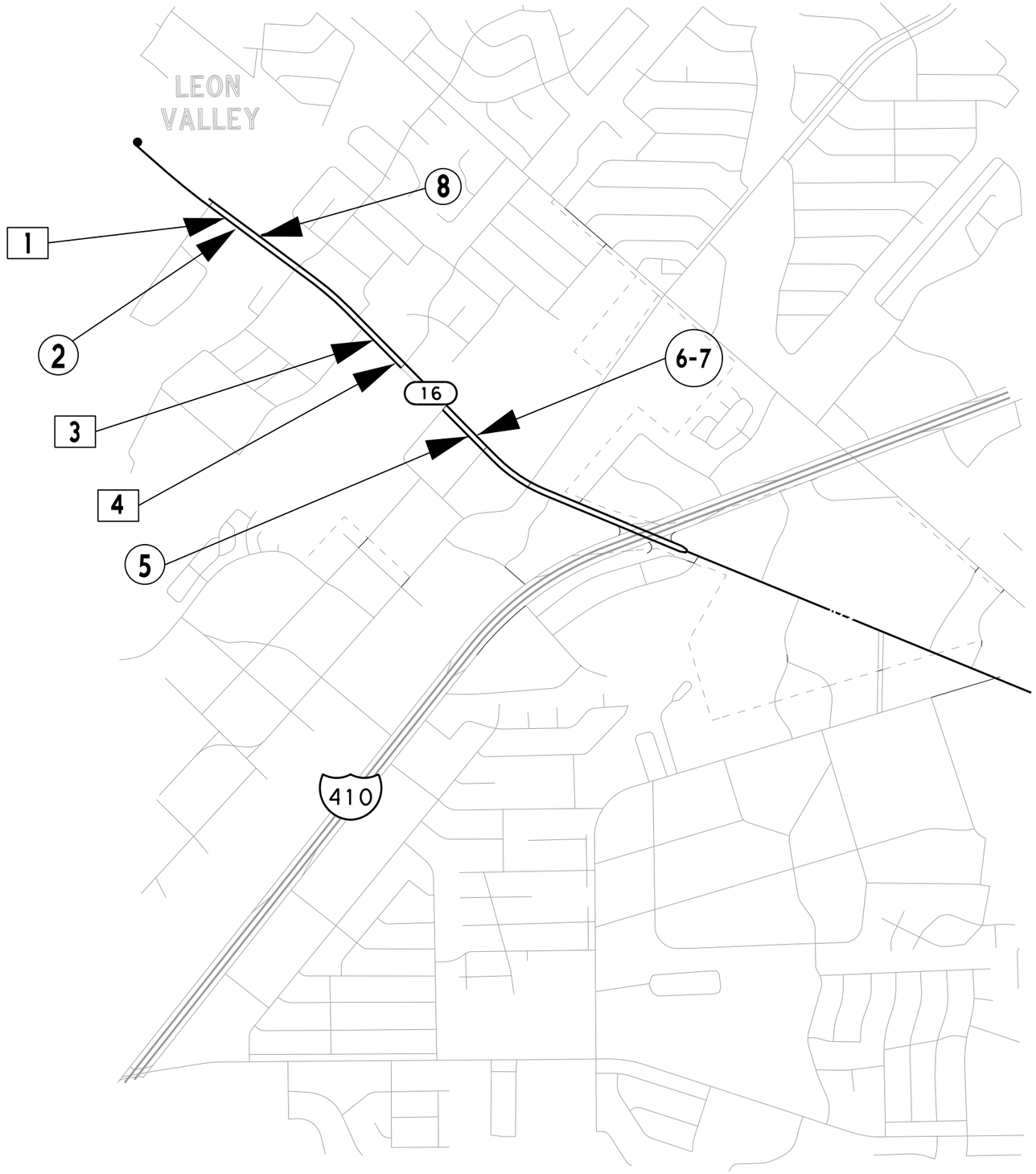


EDUARDO L. VILLALON, P.E.

3/4/2022
DATE

BALANCED T
US 90 (EB)
WEST OF LEON CREEK

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		153
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS



N

N. T. S.

LEGEND

#	SMALL GUIDE SIGNAGE
#	LARGE GUIDE SIGNAGE
	CORIDOR LIMITS

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E.

2/28/2022
DATE

Texas Department of Transportation

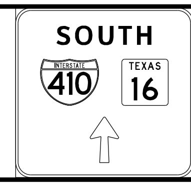
LOCATION MAP
SH-16
FROM GRISSOM RD TO WURZBACH RD

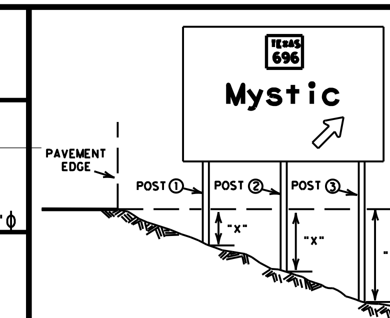
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		154
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

2/25/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\PLN*SHEETS\Plan Sheets\Location Maps\TX 16\Texas 16.dgn
DN: DN

DATE: 3/4/2022 9:21:06 AM
FILE: T

SUMMARY OF LARGE SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN BACK-GROUND COLOR	SIGN TEXT	SIGN DIMENSIONS	PLAQUES, & OTHER ATTACHMENTS: DIRECT APPLY	PLAQUES, & OTHER ATTACHMENTS: * ALUMINUM (TYPE A)	BACKGROUND SUBSTRATE (SQ FT): GROUND MOUNT (TYPE G)	BACKGROUND SUBSTRATE (SQ FT): OVERHEAD (TYPE O)	TYPE OF MOUNT	"X" DIMENSION ⊖: post ①	"X" DIMENSION ⊖: post ②	"X" DIMENSION ⊖: post ③	GALVANIZED STRUCTURAL STEEL: SIZE	GALVANIZED STRUCTURAL STEEL: LINEAR FEET post ①	GALVANIZED STRUCTURAL STEEL: LINEAR FEET post ②	GALVANIZED STRUCTURAL STEEL: LINEAR FEET post ③	GALVANIZED STRUCTURAL STEEL: TOTAL WEIGHT LBS.	DRILLED SHAFT: LINEAR FEET NON-REINF 12"ϕ	DRILLED SHAFT: LINEAR FEET REINFORCED 24"ϕ	DRILLED SHAFT: LINEAR FEET REINFORCED 30"ϕ	DRILLED SHAFT: LINEAR FEET REINFORCED 36"ϕ
	1-EB	GREEN YELLOW		12'-0" x 11'-5"	8.99		138														
	3-EB	GREEN YELLOW		10'-0" x 9'-6"	8.99		95														
	4-EB	GREEN		11'6" X 10'6"	17.96		120.75														
			PAGE TOTALS				353.75							PAGE TOTALS							



⊖ The "X" dimension is the elevation difference at the post between the ground and the edge of pavement or top of curb.

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.

The post lengths listed here are approximations, The corrected post lengths will be furnished by the Contractor after the stud posts are placed.

Tower heights shall be verified with the Engineer before fabrication.

* This column is for aluminum Type A and not direct apply. Direct apply is subsidiary to the sign.

SIGN TYPE

SIGN TYPE 1 3 0
- 1 — Wind Design Zone
- 3 — No. of Posts
- 0 — Series No.
  - 0 Aluminum/Fiberglass
  - 1 Aluminum
  - 2 Fiberglass

See sheet SMD(8W1)

SH 16

(GRISSOM RD TO WURZBACH RD)

SUMMARY OF LARGE SIGNS

SOLS

DN.: TxDOT	CK.: TxDOT	DW.: TxDOT	CK.: TxDOT

REVISIONS: 11-93, 8-95, 5-01, 1-04, 9-08

CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS

DIST	COUNTY	SHEET NO.
SAT	BEXAR	155

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	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"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	TY N TY S
	2-EB	I-3	Huebner Creek	60" x 30"	✓							
	5-WB	D13-1TL	TURNAROUND ⇦	96" x 48"	✓							
	6-WB	D13-1TL		96" x 48"	✓							
	7-WB	D13-1TL	17FT 3IN	96" x 18"	✓							
	8-WB	I-3	Huebner Creek	60" x 30"	✓							

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).

SH 16

(GRISSOM RD TO WURZBACH RD)

Texas Department of Transportation

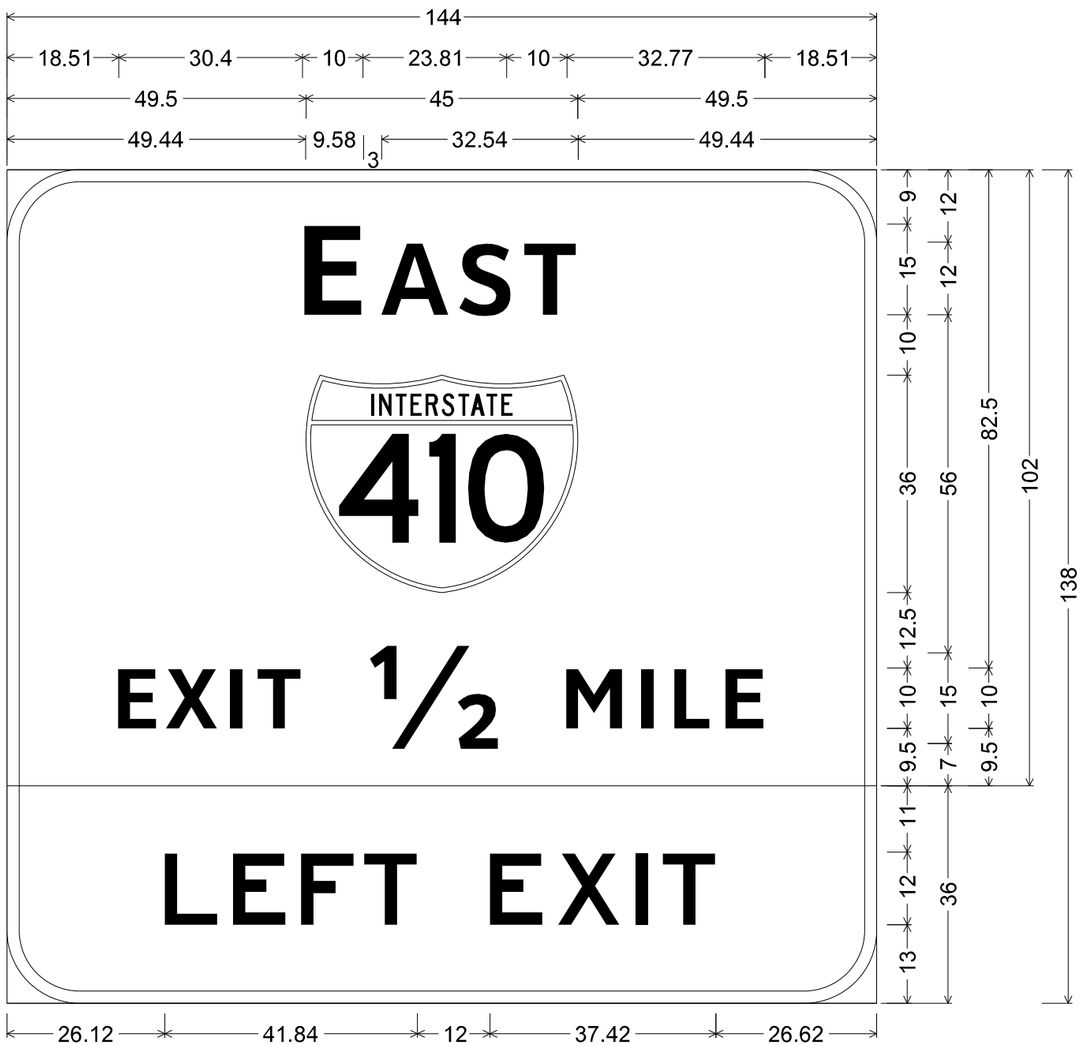
Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

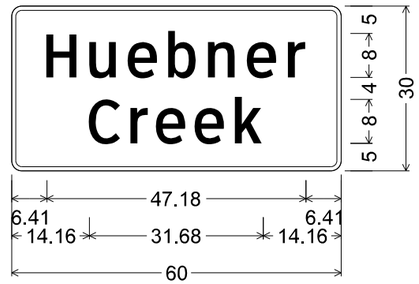
FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	2021	CONT	SECT	JOB	HIGHWAY
REVISIONS		0915	00	238	VARIOUS
4-16		DIST	COUNTY		SHEET NO.
8-16		SAT	BEXAR		156

I-EB

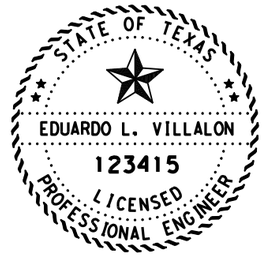


Identifier : E11-2aT_VARxVAR;
12.00" Radius, 2.00" Border, White on Green;
[E] ClearviewHwy-5-W-R; [AST] ClearviewHwy-5-W-R; Interstate 410 M1-1;
[EXIT] ClearviewHwy-5-W-R; [½] ClearviewHwy-5-W-R;
[MILE] ClearviewHwy-5-W-R;
12.00" Radius, 2.00" Border, Black on Yellow;
[LEFT EXIT] E;

2-EB



1.88" Radius, 0.75" Border, White on Green;
[Huebner] ClearviewHwy-3-W;
[Creek] ClearviewHwy-3-W;



EDUARDO L. VILLALON, P.E.

2/28/2022
DATE

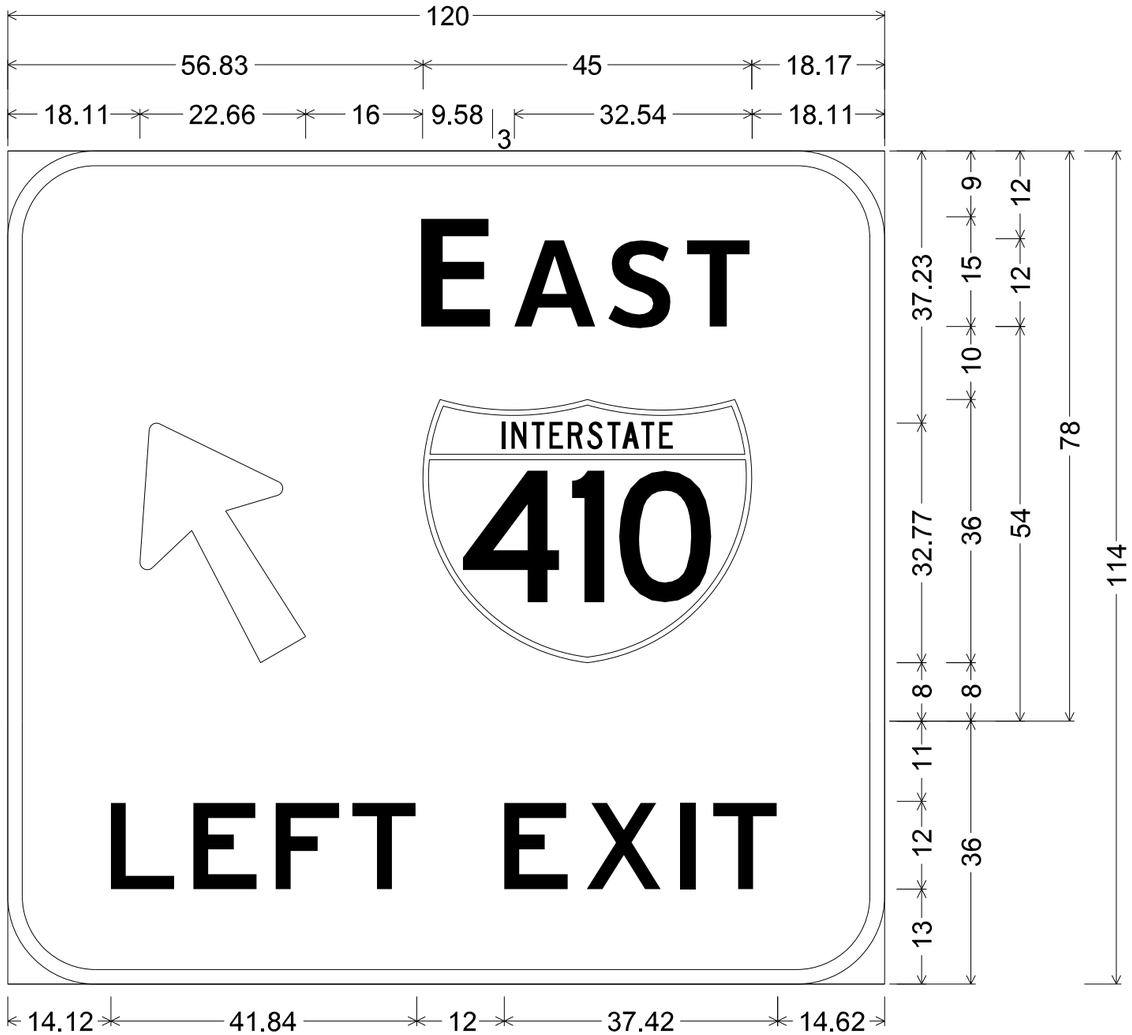
Texas Department of Transportation

GUIDE SIGN DETAILS
SH 16 (SB)
GRISSOM RD TO WURZBACH DR

SHEET 1 OF 3

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		157
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

3-EB



Identifier : E11-2aT_VARxVAR;
12.00" Radius, 2.00" Border, White on Green;
Arrow A-3 - 35.63" 120°; [E] ClearviewHwy-5-W-R;
[AST] ClearviewHwy-5-W-R; Interstate 410 M1-1;
12.00" Radius, 2.00" Border, Black on Yellow;
[LEFT EXIT] E;

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

Texas Department of Transportation
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GUIDE SIGN DETAILS
SH 16 (SB)
GRISSOM RD TO WURZBACH DR

SHEET 2 OF 3

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		158
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

DW: DN

2/25/2022
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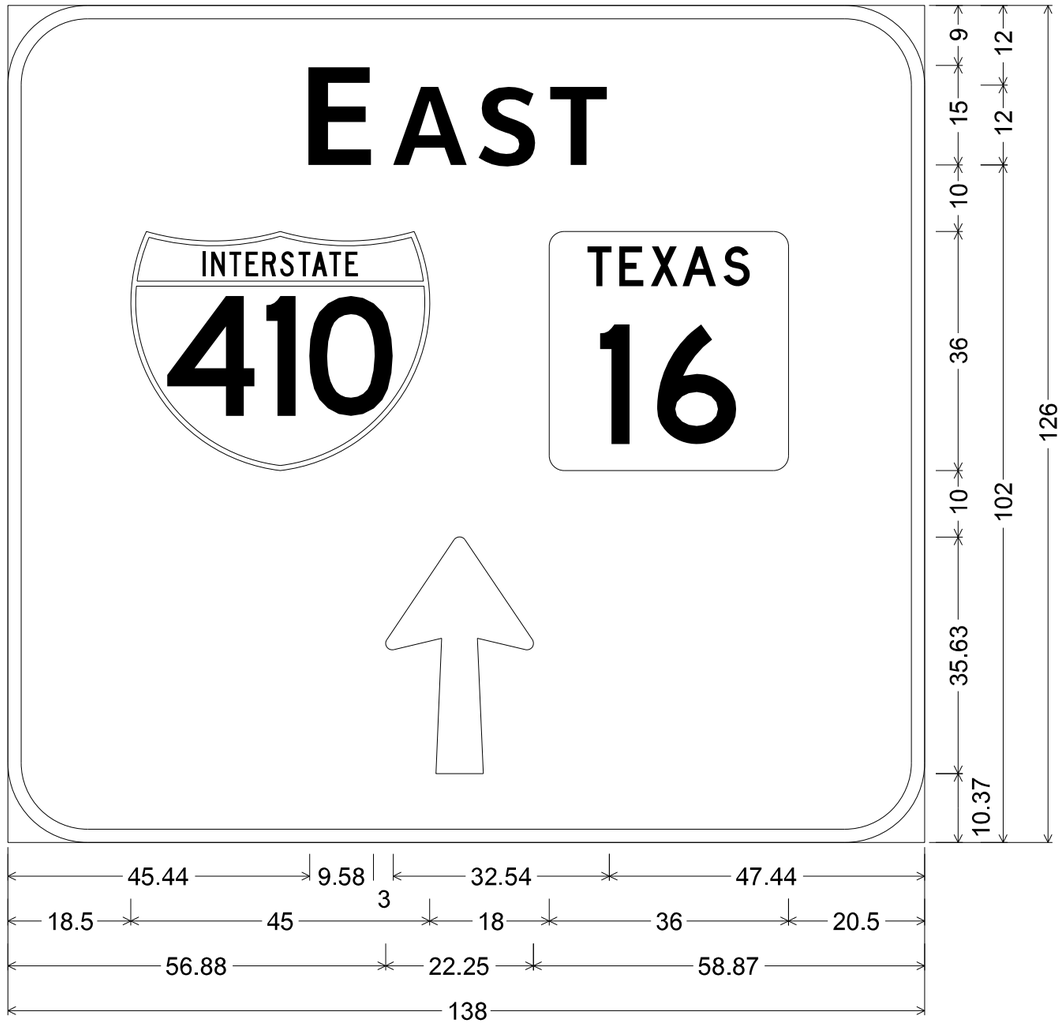
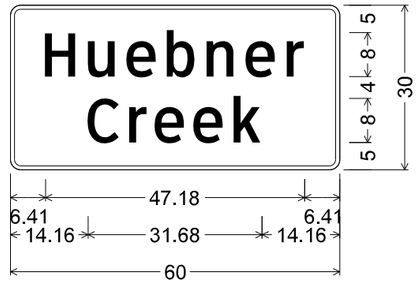
4-EB



12.00" Radius, 2.00" Border, White on Green;
[E] ClearviewHwy-5-W-R; [AST] ClearviewHwy-5-W-R; Interstate 410 M1-1;
State Highway 16 M1-6T2; Arrow A-3 - 35.63" 90°;

7-EB



1.88" Radius, 0.75" Border, White on Green;
[Huebner] ClearviewHwy-3-W;
[Creek] ClearviewHwy-3-W;

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

Texas Department of Transportation
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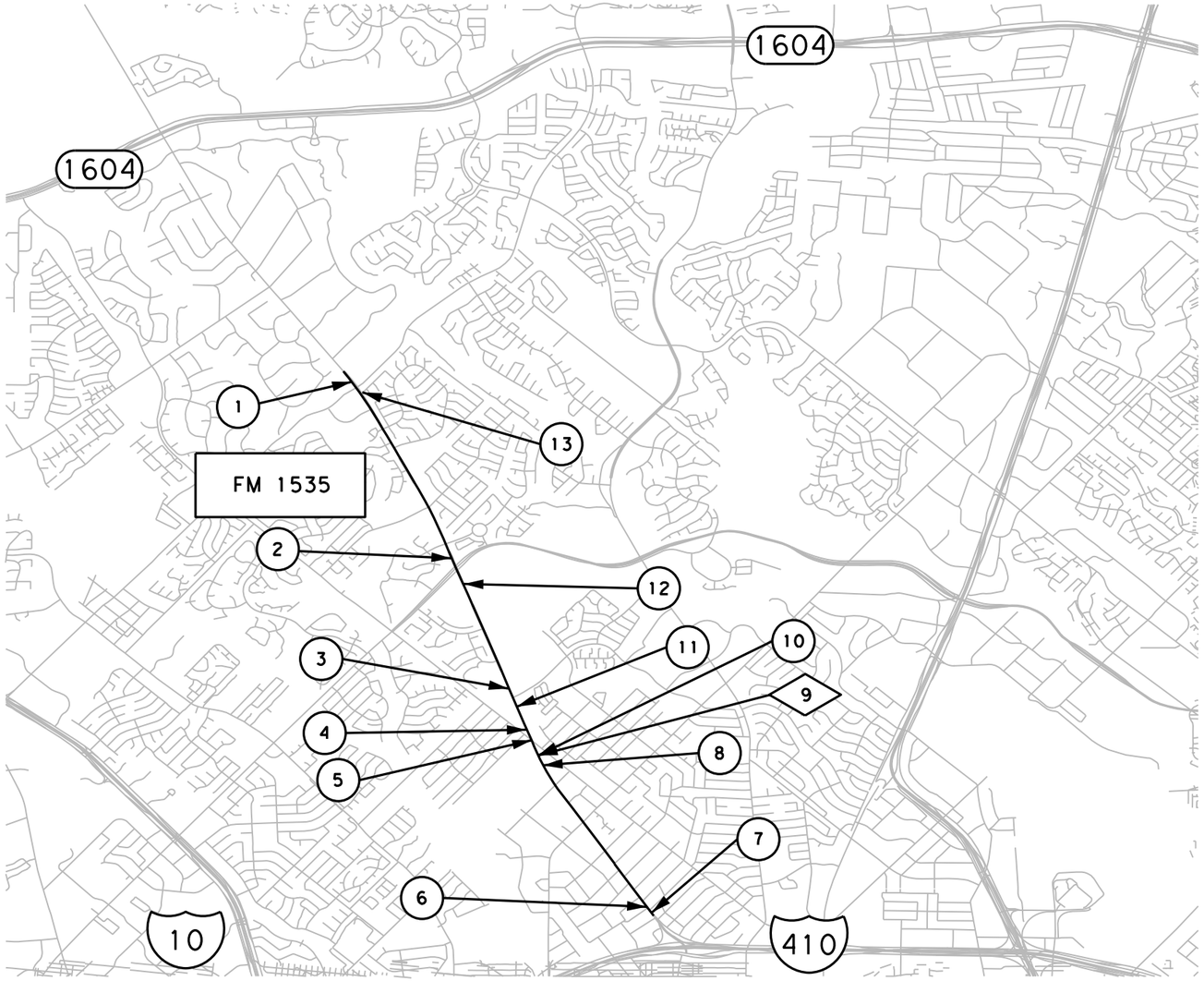
GUIDE SIGN DETAILS
SH 16 (NB)
WURZBACH TO SENECA DR

SHEET 3 OF 3

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		159
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

DW: DN

2/25/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\PLN*SHEETS\Plan Sheets\Sign Details\Texas 16.dgn



N

N. T. S.

LEGEND

#	SMALL GUIDE SIGNAGE
——	CORIDOR LIMITS
#	SIGNAGE TO BE REMOVED

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E.

2/28/2022
DATE

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LOCATION MAP

FM 1535
(HUEBNER RD TO IH-410 LOOP)

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		160
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

DW: DN

2/25/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\PLN*SHEETS\Plan Sheets\Location Maps\FM 1535\FM*1535*Loc.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
	1-SB	D3-2	Huebner Rd NEXT SIGNAL	78" x 36"	✓							
	2-SB	D3-2	Wurzbach Pkwy NEXT SIGNAL	54" x 36"	✓							
	3-SB	D1-1	⇦ Braesview Dr	114" x 18"	✓							
	4-SB	D3-2	Lockhill-Selma Rd NEXT SIGNAL	54" x 36"	✓							
	5-SB	I-2bT	ENTERING Castle Hills CITY LIMIT LEAVING San Antonio	66" x 42"	✓							
	6-SB	D1-2	⇦ Carolwood Dr Lemonwood Dr ⇨ NEXT SIGNAL	120" x 48"	✓							
	7-NB	D3-2	⇦ Lemonwood Dr Carolwood Dr ⇨ NEXT SIGNAL	120" x 48"	✓							
	8-NB	D3-2	Lockhill-Selma Rd NEXT SIGNAL	54" x 36"	✓							
	9-NB	D1-2	LOCKHILL-SELMA RD ⇧ SHAVANO PARK 3	REMOVE								
	10-NB	D1-1	⇧ Shavano Park	108" x 18"	✓							
	11-NB	D1-1	Braesview Dr ⇨	114" x 18"	✓							
	12-NB	D3-2	Wurzbach Pkwy NEXT SIGNAL	54" x 36"	✓							

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).

FM 1535

(HUEBNER TO IH-410)

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	00	238	VARIOUS
4-16	DIST	COUNTY		SHEET NO.
8-16	SAT	BEXAR		161

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)					BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		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	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	TY N TY S
	13-NB	D3-2	Huebner Rd NEXT SIGNAL	78" x 36"	✓							

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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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).

FM 1535

(HUEBNER TO IH-410)

Texas Department of Transportation

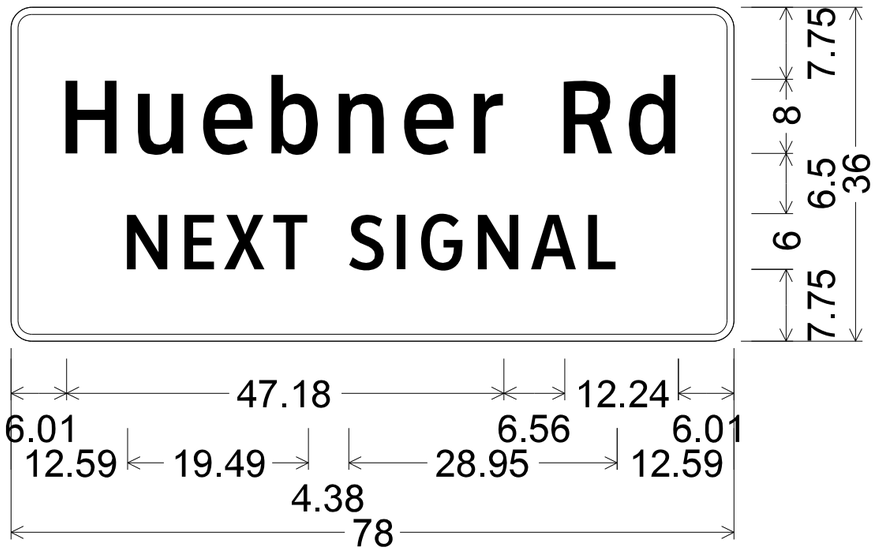
Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

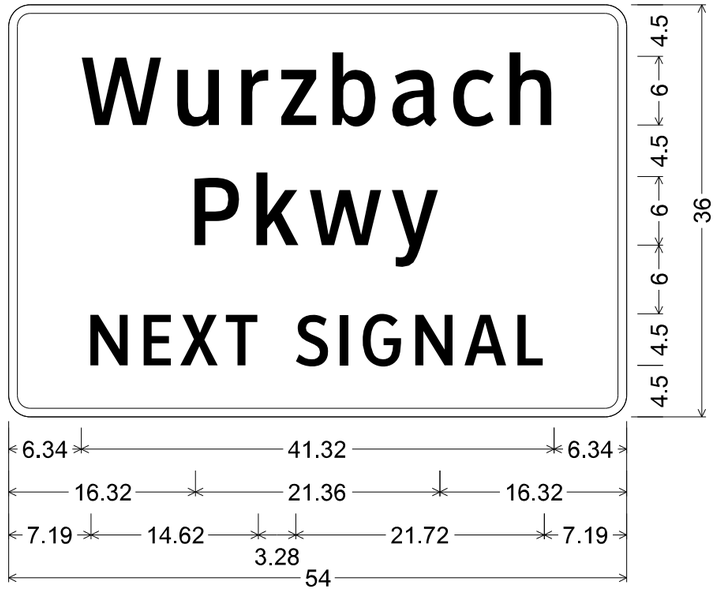
FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	00	238	VARIOUS
4-16 8-16	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		162

1-SB



Identifier : D3-2;
2.25" Radius, 0.75" Border, White on Green;
[Huebner Rd] ClearviewHwy-3-W;
[NEXT SIGNAL] ClearviewHwy-3-W;

2-SB



1.88" Radius, 0.75" Border, White on Green;
[Wurzbach] ClearviewHwy-3-W;
[Pkwy] ClearviewHwy-3-W;
[NEXT SIGNAL] ClearviewHwy-3-W;

3-SB

Identifier : D1-1 8in LT;
1.50" Radius, 0.50" Border, White on Green;
Standard Arrow Custom 12.00" X 7.13" 180°; [Braesview Dr] ClearviewHwy-5-W-R;

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

Texas Department of Transportation

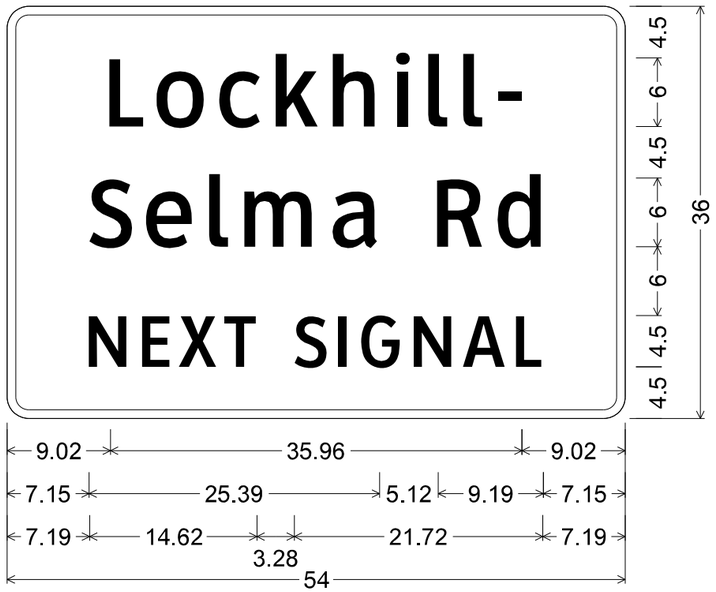
GUIDE SIGN DETAILS

FM 1535
(HUEBNER RD TO IH-410 LOOP)

SHEET 1 OF 6

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		163
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

4-SB



1.88" Radius, 0.75" Border, White on Green;
[Lockhill-] ClearviewHwy-3-W;
[Selma Rd] ClearviewHwy-3-W;
[NEXT SIGNAL] ClearviewHwy-3-W;

5-SB

2.25" Radius, 0.75" Border, White on Green;
[ENTERING] ClearviewHwy-3-W; [Castle Hills] ClearviewHwy-5-W-R;
[CITY LIMIT] ClearviewHwy-3-W; [LEAVING] ClearviewHwy-3-W;
[San Antonio] ClearviewHwy-5-W-R;

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

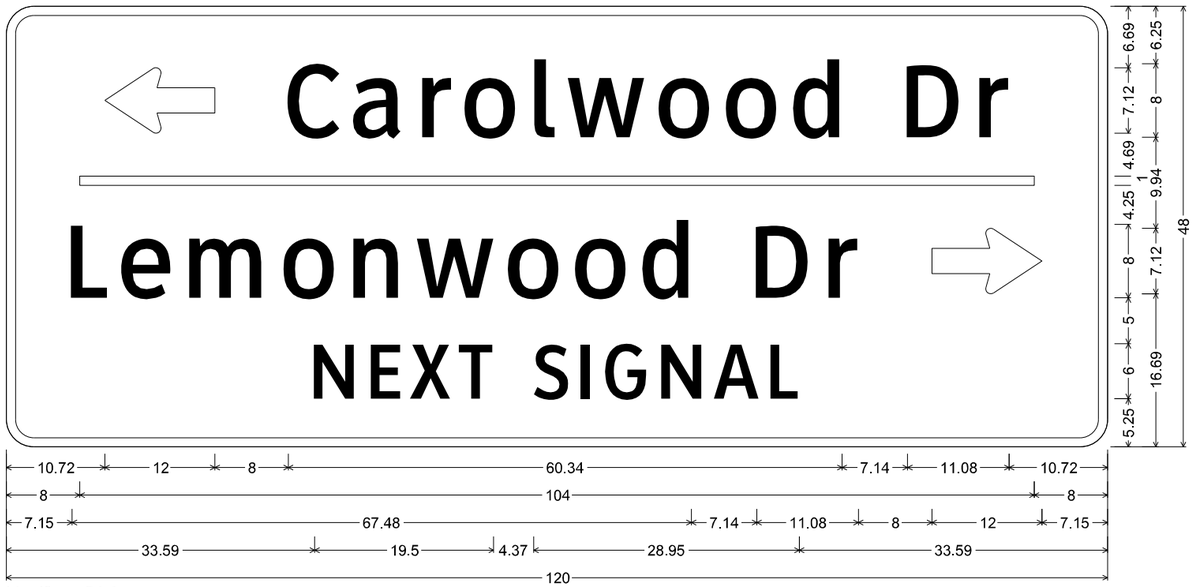
EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

GUIDE SIGN DETAILS

FM 1535
(HUEBNER RD TO IH-410 LOOP)
SHEET 2 OF 6

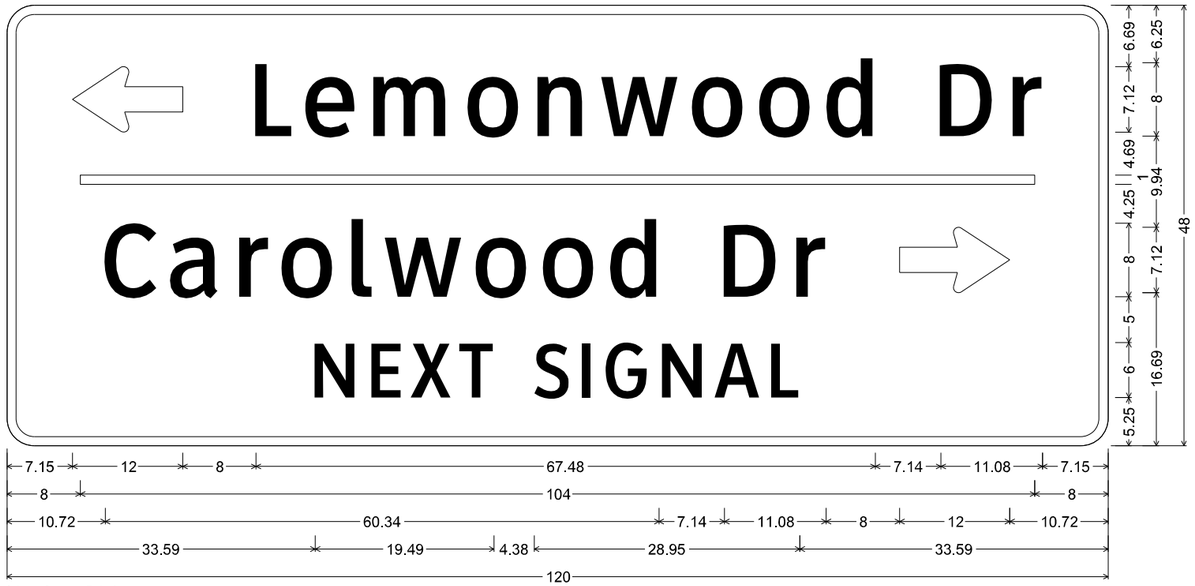
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		164
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

6-SB



Identifier : D3-2;
3.00" Radius, 1.00" Border, White on Green;
Standard Arrow Custom 12.00" X 7.13" 180°; [Carolwood Dr] ClearviewHwy-3-W; [Lemonwood Dr] ClearviewHwy-3-W;
Standard Arrow Custom 12.00" X 7.13" 0°; [NEXT SIGNAL] ClearviewHwy-3-W;

7-NB



Identifier : D3-2;
3.00" Radius, 1.00" Border, White on Green;
Standard Arrow Custom 12.00" X 7.13" 180°; [Lemonwood Dr] ClearviewHwy-3-W; [Carolwood Dr] ClearviewHwy-3-W;
Standard Arrow Custom 12.00" X 7.13" 0°; [NEXT SIGNAL] ClearviewHwy-3-W;

STATE OF TEXAS
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123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

Texas Department of Transportation

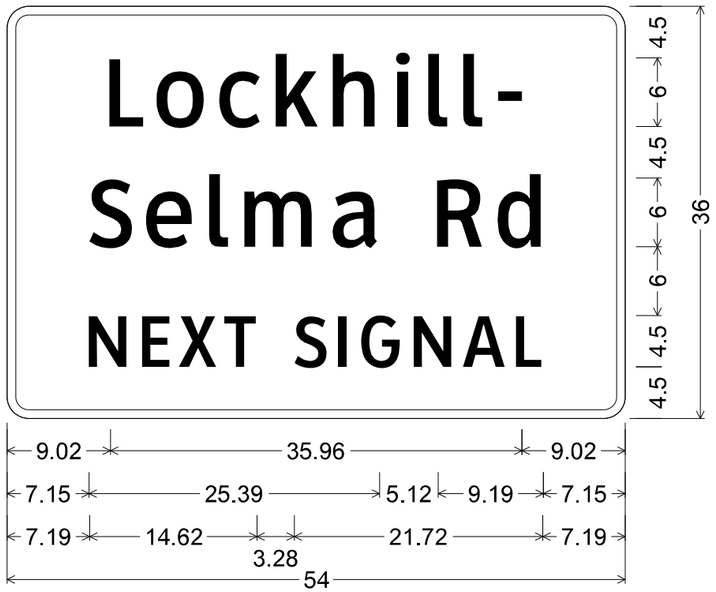
GUIDE SIGN DETAILS

FM 1535
(HUEBNER RD TO IH-410 LOOP)

SHEET 3 OF 6

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		165
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

8-NB



1.88" Radius, 0.75" Border, White on Green;
[Lockhill-] ClearviewHwy-3-W;
[Selma Rd] ClearviewHwy-3-W;
[NEXT SIGNAL] ClearviewHwy-3-W;

9-NB {REMOVE}

D1-2 8in UP-UP;

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123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E.

2/28/2022
DATE

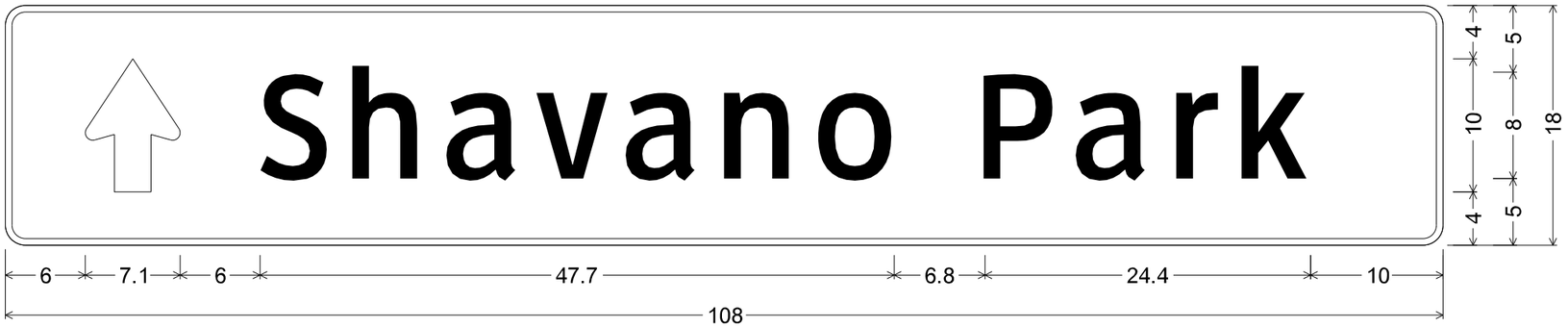
GUIDE SIGN DETAILS

FM 1535
(HUEBNER RD TO IH-410 LOOP)

SHEET 4 OF 6

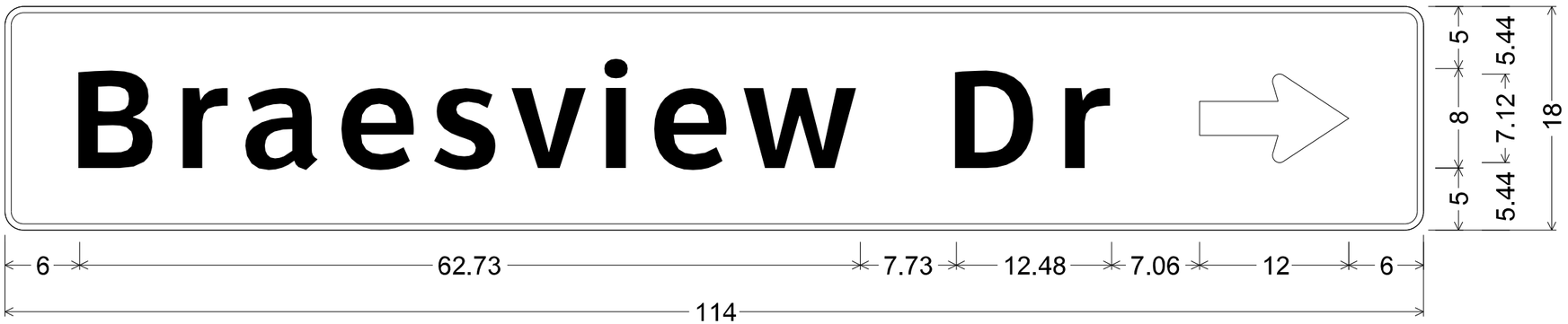
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		166
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

I O-NB



Identifier : D1-1 8in UP;
1.5" Radius, 0.5" Border, White on Green;
Standard Arrow Custom 10.0" X 7.1" 90°; [Shavano Park] ClearviewHwy-3-W;

I I-NB



Identifier : D1-1 8in RT;
1.50" Radius, 0.50" Border, White on Green;
[Braesview Dr] ClearviewHwy-5-W-R; Standard Arrow Custom 12.00" X 7.13" 0°;

STATE OF TEXAS
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123415
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PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

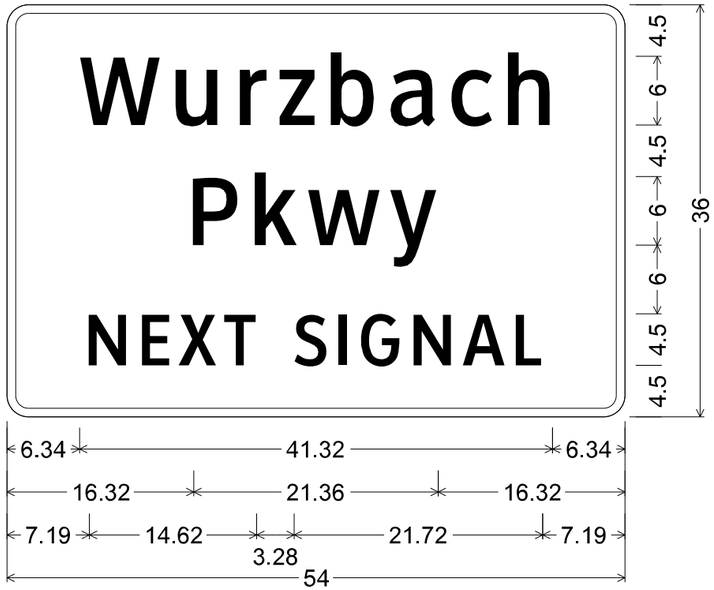
Texas Department of Transportation

GUIDE SIGN DETAILS

FM 1535
(HUEBNER RD TO IH-410 LOOP)
SHEET 5 OF 6

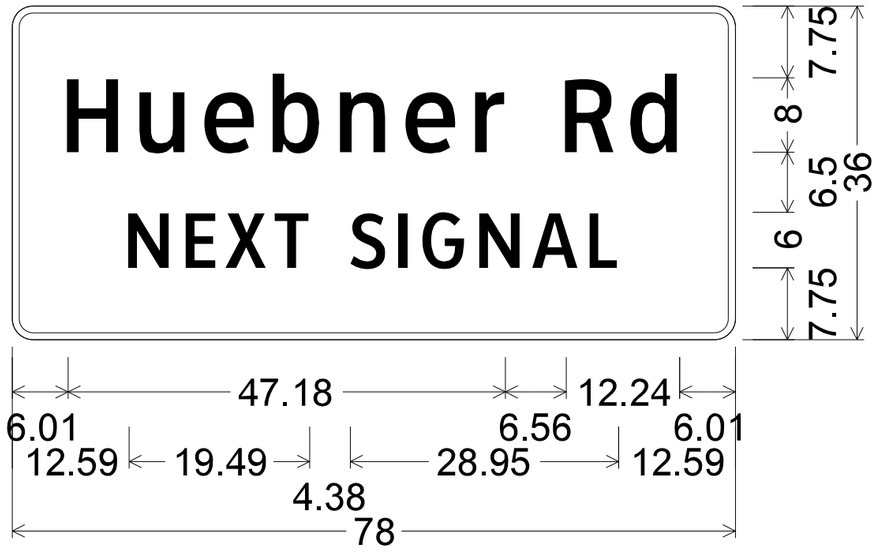
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		167
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

I 2-NB



1.88" Radius, 0.75" Border, White on Green;
[Wurzbach] ClearviewHwy-3-W;
[Pkwy] ClearviewHwy-3-W;
[NEXT SIGNAL] ClearviewHwy-3-W;

I 3-NB



Identifier : D3-2;
2.25" Radius, 0.75" Border, White on Green;
[Huebner Rd] ClearviewHwy-3-W;
[NEXT SIGNAL] ClearviewHwy-3-W;

STATE OF TEXAS
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123415
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PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

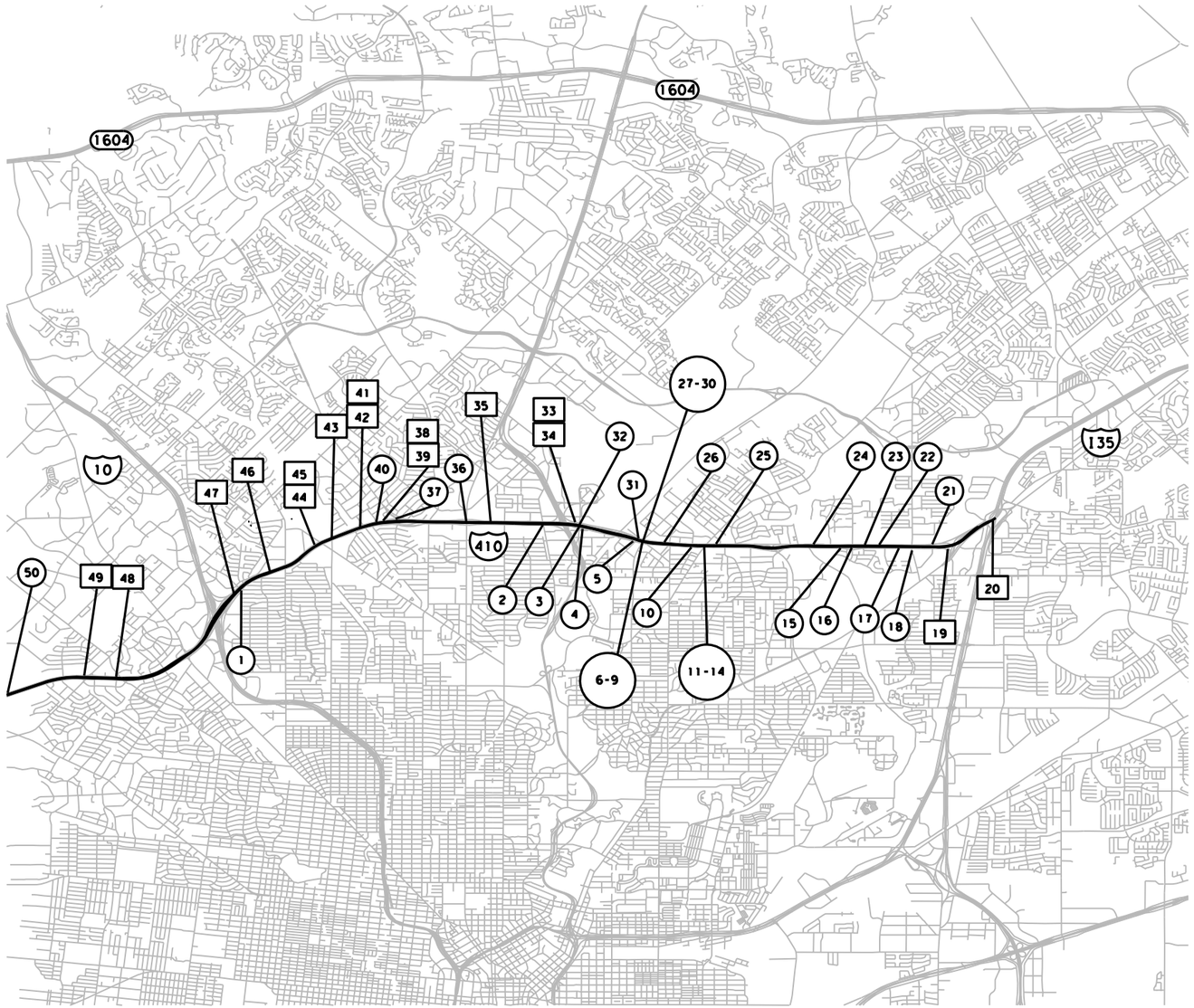
Texas Department of Transportation

GUIDE SIGN DETAILS

FM 1535
(HUEBNER RD TO IH-410 LOOP)

SHEET 6 OF 6

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		168
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS



N

N. T. S.

LEGEND

#	SMALL GUIDE SIGNAGE
#	LARGE GUIDE SIGNAGE
	CORIDOR LIMITS

STATE OF TEXAS
EDUARDO L. VILLALON
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PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E.

2/28/2022
DATE

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LOCATION MAP

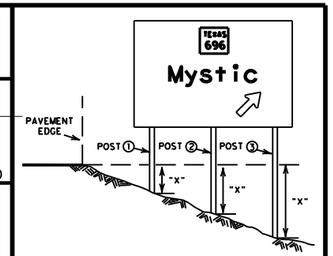
IH-410 NORTH
(SH 16 TO IH-35)

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		169
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

2/25/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\PLN*SHEETS\Plan Sheets\Location Maps\LP 410\LOOP 410*NORTHERN*SIGN*LOCATION*1.dgn
DN: DN

SUMMARY OF LARGE SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN BACK-GROUND COLOR	SIGN TEXT	SIGN DIMENSIONS	PLAQUES, & OTHER ATTACHMENTS		BACKGROUND SUBSTRATE (SQ FT)		TYPE OF MOUNT	"X" DIMENSION ◒			GALVANIZED STRUCTURAL STEEL					DRILLED SHAFT				
					DIRECT APPLY	⁎ ALUMINUM (TYPE A)	GROUND MOUNT (TYPE G)	OVERHEAD (TYPE O)		post ①	post ②	post ③	SIZE	LINEAR FEET post ①	post ②	post ③	TOTAL WEIGHT LBS.	NON-REINF 12"ϕ	LINEAR FEET REINFORCED 24"ϕ	30"ϕ	36"ϕ
	19-EB	YELLOW	25 M.P.H.	12′-0" x 3′-0"				36													
	20-EB	GREEN	VIA Park & Ride	12′-6" x 10′-0"	12.22		125														
	33-WB	GREEN	SOUTH TO 281 37 San Antonio RAMP 35 M.P.H.	19′-6" x 13′-0"	16.31			253.5													
	34-WB	GREEN	NORTH 281 Johnson City RAMP 35 M.P.H.	20′-6" x 13′-0"	9.11			266.5													
	35-WB	GREEN	EXIT 20A	7′-6" x 5′-0"			37.5														
	38-WB	GREEN	EXIT 19 A Honeysuckle Lane Frontage Rd	8′-6" x 2′-6"				21.25													
				22′-0" x 8′-6"				187													
	39-WB	GREEN	West Ave Jackson-Keller Rd ¼ / Vance Jackson Rd Cherry Ridge Dr 1	26′-0" x 11′-0"				286													
	41-WB	GREEN	EXIT 18 West Ave Jackson-Keller Rd	7′-0" x 2′-6"				17.5													
				22′-0" x 8′-6"				187													
	42-WB	GREEN	EXIT 17 Vance Jackson Rd Cherry Ridge Dr ½ MILE	7′-0" x 2′-6"				17.5													
				22′-0" x 7′-6"				165													
	43-WB	GREEN	EXIT 17 Vance Jackson Rd Cherry Ridge Dr ¼ MILE	7′-0" x 2′-6"				17.5													
				22′-0" x 7′-6"				165													
			PAGE TOTALS				162.5	1619.75													



◒ The "X" dimension is the elevation difference at the post between the ground and the edge of pavement or top of curb.

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.

The post lengths listed here are approximations, The corrected post lengths will be furnished by the Contractor after the stud posts are placed.

Tower heights shall be verified with the Engineer before fabrication.

⁎ This column is for aluminum Type A and not direct apply. Direct apply is subsidiary to the sign.

SIGN TYPE

SIGN TYPE 1 3 0
- 1 — Wind Design Zone
- 3 — Series No.
- 0 — Number of Posts
  - 0 Aluminum/Fiberglass
  - 1 Aluminum
  - 2 Fiberglass

See sheet SMD(8W1)

IH- 410 NORTH
(SH 16 TO IH-35)

SUMMARY OF LARGE SIGNS

SOLS

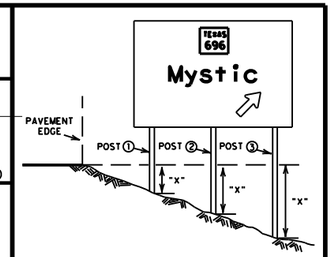
DN.: TxDOT	CK.: TxDOT	DW.: TxDOT	CK.: TxDOT	REVISIONS
				11-93 1-04 8-95 9-08 5-01

CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS
DIST	COUNTY		SHEET NO.
SAT	BEXAR		170

DATE: 2/25/2022 10:14:12 AM
FILE: I

SUMMARY OF LARGE SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN BACK-GROUND COLOR	SIGN TEXT	SIGN DIMENSIONS	PLAQUES, & OTHER ATTACHMENTS: DIRECT APPLY	PLAQUES, & OTHER ATTACHMENTS: ✳ ALUMINUM (TYPE A)	BACKGROUND SUBSTRATE (SQ FT): GROUND MOUNT (TYPE G)	BACKGROUND SUBSTRATE (SQ FT): OVERHEAD (TYPE O)	TYPE OF MOUNT	"X" DIMENSION ◒: post ①	"X" DIMENSION ◒: post ②	"X" DIMENSION ◒: post ③	GALVANIZED STRUCTURAL STEEL: SIZE	GALVANIZED STRUCTURAL STEEL: LINEAR FEET post ①	GALVANIZED STRUCTURAL STEEL: LINEAR FEET post ②	GALVANIZED STRUCTURAL STEEL: LINEAR FEET post ③	GALVANIZED STRUCTURAL STEEL: TOTAL WEIGHT LBS.	DRILLED SHAFT: LINEAR FEET NON-REINF 12"ϕ	DRILLED SHAFT: LINEAR FEET REINFORCED 24"ϕ	DRILLED SHAFT: LINEAR FEET REINFORCED 30"ϕ	DRILLED SHAFT: LINEAR FEET REINFORCED 36"ϕ
	44-WB	GREEN	EXIT 17 Vance Jackson Rd Cherry Ridge Dr	7′-0" x 2′-6"				17.5													
				22′-0" x 8′-6"				187													
	45-WB	GREEN	EXIT 16 10 87 San Antonio El Paso 1 MILE	7′-0" x 2′-6"				17.5													
				15′-6" x 11′-6"	14.36			178.25													
	46-WB	GREEN	H BUS 345 Fredricksburg Rd Balcones Hts	3′-0" x 3′-0"		9															
				20′-6" x 13′-0"	11.97			266.50													
	47-WB	GREEN	EXIT 15	7′-6" x 5′-0"			37.5														
	48-WB	GREEN	EXIT 14 A Summit Pkwy Evers Rd EXIT ONLY	8′-6" x 2′-6"				21.25													
				18′-0" x 9′-0"				162													
	49-WB	GREEN	EXIT 14 A Summit Pkwy Evers Rd EXIT ONLY	8′-6" x 2′-6"				21.25													
				18′-0" x 9′-0"				162													
			PAGE TOTALS			9	37.5	1033.25					PAGE TOTALS								



◒ The "X" dimension is the elevation difference at the post between the ground and the edge of pavement or top of curb.

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.

The post lengths listed here are approximations, The corrected post lengths will be furnished by the Contractor after the stud posts are placed.

Tower heights shall be verified with the Engineer before fabrication.

✳ This column is for aluminum Type A and not direct apply. Direct apply is subsidiary to the sign.

SIGN TYPE

SIGN TYPE 1 3 0
- 1: Wind Design Zone
- 3: No. of Posts
- 0: Series No. (0 Aluminum/Fiberglass, 1 Aluminum, 2 Fiberglass)

See sheet SMD(8W1)

IH- 410 NORTH

(SH 16 TO IH-35)

SUMMARY OF LARGE SIGNS

SOLS

DN.: TxDOT	REVISIONS		
CK.: TxDOT	11-93	1-04	
DW.: TxDOT	8-95	9-08	
CK.: TxDOT	5-01		

CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS
DIST	COUNTY		SHEET NO.
SAT	BEXAR		171

DATE: 3/4/2022 9:21:19 AM
FILE: $TS

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")	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: TY N, TY S
	1-EB	D13-1T(L)	TURNAROUND	96" x 48"	✓							
	2-EB	D13-1T(L)	TURNAROUND	96" x 48"	✓							
	3-EB	W12-2a	18 FT 8 IN	84" x 24"	✓							
	4-EB	W12-2a	16 FT 1 IN	84" x 24"	✓							
	5-EB	W12-2a	17 FT 3 IN	84" x 24"	✓							
	6-EB	D3-2	Broadway NEXT SIGNAL	54" x 30"	✓							
	7-EB	R3-5(L)	ONLY	30" x 36"	✓							
	8-EB	R3-6(L)		30" x 36"	✓							
	9-EB	R3-5a	ONLY	30" x 36"	✓							
	10-EB	D3-2	Nacogdoches Rd NEXT SIGNAL	84" x 30"	✓							
	11-EB	W12-2a	17 FT 2 IN	84" x 24"	✓							
	12-EB	R3-5(L)	ONLY	30" x 36"	✓							

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).

IH- 410 NORTH

(SH 16 TO IH-35)

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		0915	00	238	VARIOUS
4-16		DIST	COUNTY		SHEET NO.
8-16		SAT	BEXAR		172

18

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: 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"	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: TY N, TY S
	13-EB	R3-6(L)		30" x 36"	✓							
	14-EB	R3-5a		30" x 36"	✓							
	15-EB	D3-2		66" x 30"	✓							
	16-EB	D13-1T(L)		96" x 48"	✓							
	17-EB	D3-2		84" x 30"	✓							
	18-EB	D13-1T(L)		96" x 48"	✓							
	21-WB	D3-2		84" x 30"	✓							
	22-WB	D1-2		114" x 30"	✓							
	23-WB	D3-2		66" x 30"	✓							
	24-WB	D1-3		60" x 36"	✓							
	25-WB	D3-2		84" x 30"	✓							
	26-WB	D3-2		54" x 30"	✓							

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).

IH- 410 NORTH

(SH 16 TO IH-35)

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	00	238	VARIOUS
4-16	DIST	COUNTY		SHEET NO.
8-16	SAT	BEXAR		173

18

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: 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
	27-WB	W12-2a	17 FT 7 IN	84" x 24"	✓							
	28-WB	R3-5(L)	ONLY	30" x 36"	✓							
	29-WB	R3-6(L)		30" x 36"	✓							
	30-WB	R3-5a	ONLY	30" x 36"	✓							
	31-WB	D21-3T(2)	Crownhill Blvd / Turnaround	72" x 36"	✓							
	32-WB	W12-2a	16 FT 10IN	84" x 24"	✓							
	36-WB	D13-1T(L)	TURNAROUND	96" x 48"	✓							
	37-WB	D1-1	Ivywood Cir	96" x 18"	✓							
	40-WB	W12-2a	18 FT 11 IN	84" x 24"	✓							
	50-WB	I-2bT	ENTERING San Antonio CITY LIMIT / LEAVING Leon Valley	66" x 42"	✓							

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).

IH- 410 NORTH

(SH 16 TO IH-35)

Texas Department of Transportation

Traffic Operations Division Standard

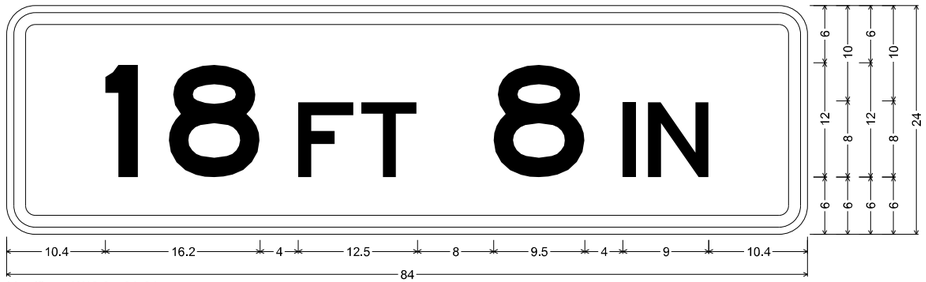
SUMMARY OF SMALL SIGNS

SOSS

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	00	238	VARIOUS
4-16	DIST	COUNTY		SHEET NO.
8-16	SAT	BEXAR		174

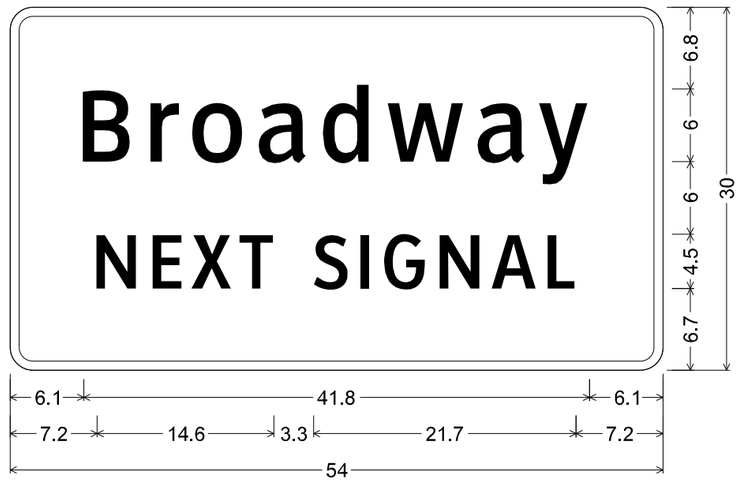
18

3-EB



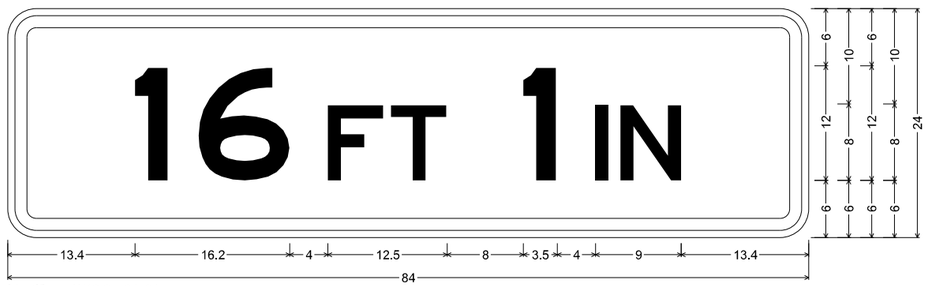
Identifier : W12-2a_84x24;
3.0" Radius, 1.3" Border, 0.8" Indent, Black on Yellow;
[18] E; [FT] E specified length; [8] E; [IN] E specified length;

6-EB



Identifier : D3-2(1)_VARx30;
Drawn by : MSD;
1.9" Radius, 0.8" Border, White on Green;
[Broadway] ClearviewHwy-3-W;
[NEXT SIGNAL] ClearviewHwy-3-W;

4-EB



Identifier : W12-2a_84x24;
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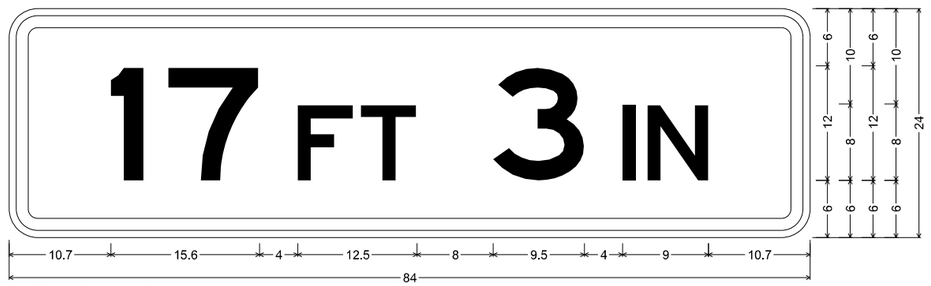
[16] E; [FT] E specified length; [1] E; [IN] E specified length;

5-EB



Identifier : W12-2a_84x24;
3.0" Radius, 1.3" Border, 0.8" Indent, Black on Yellow;
[17] E; [FT] E specified length; [3] E; [IN] E specified length;

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2/28/2022
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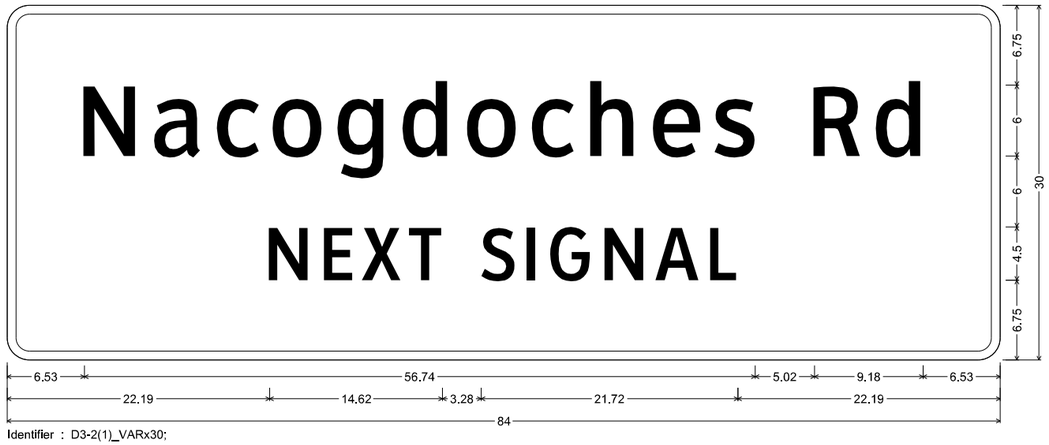
Texas Department of Transportation

GUIDE SIGN DETAILS
IH 410
TX-16 TO IH-35

SHEET 1 OF 15

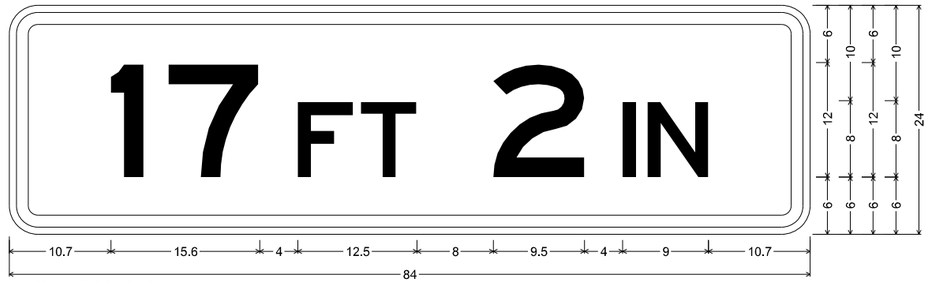
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		175
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

10-EB



Identifier : D3-2(1)_VARx30;
1.88" Radius, 0.75" Border, White on Green;
[Nacogdoches Rd] ClearviewHwy-3-W; [NEXT SIGNAL] ClearviewHwy-3-W;

11-EB



Identifier : W12-2a_84x24;
3.0" Radius, 1.3" Border, 0.8" Indent, Black on Yellow;
[17] E; [FT] E specified length; [2] E; [IN] E specified length;

15-EB

Identifier : D3-2(1)_VARx30;
1.88" Radius, 0.75" Border, White on Green;
[Starcrest Dr] ClearviewHwy-3-W; [NEXT SIGNAL] ClearviewHwy-3-W;

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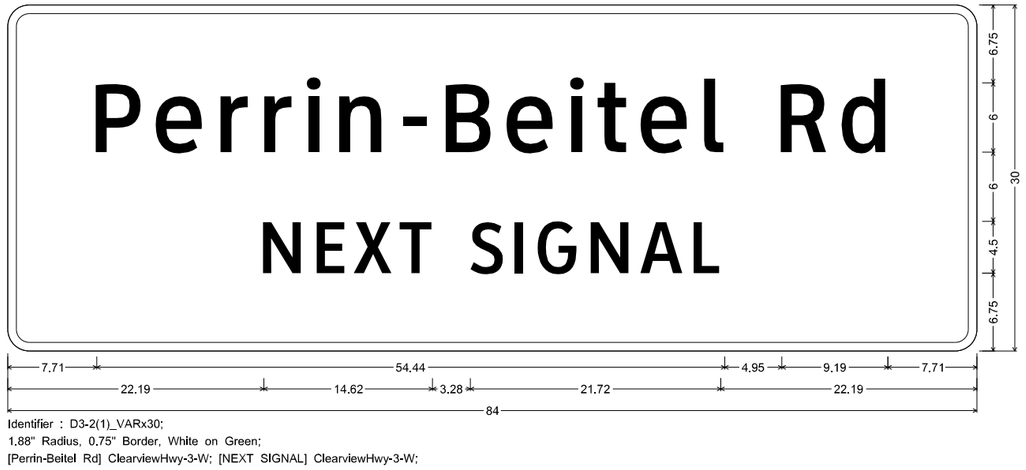
Texas Department of Transportation

GUIDE SIGN DETAILS
IH 410 (EB)
SH-16 TO IH-35

SHEET 2 OF 15

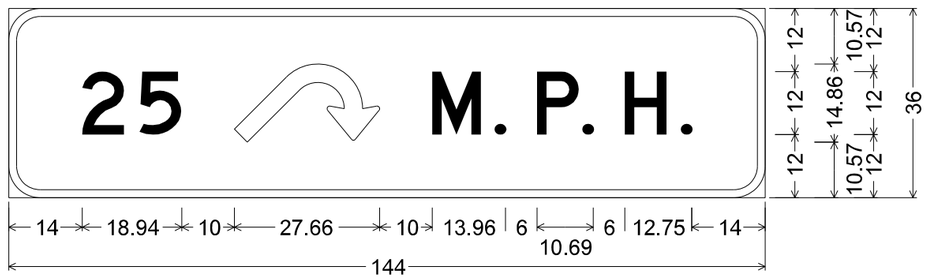
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		176
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

I7-EB



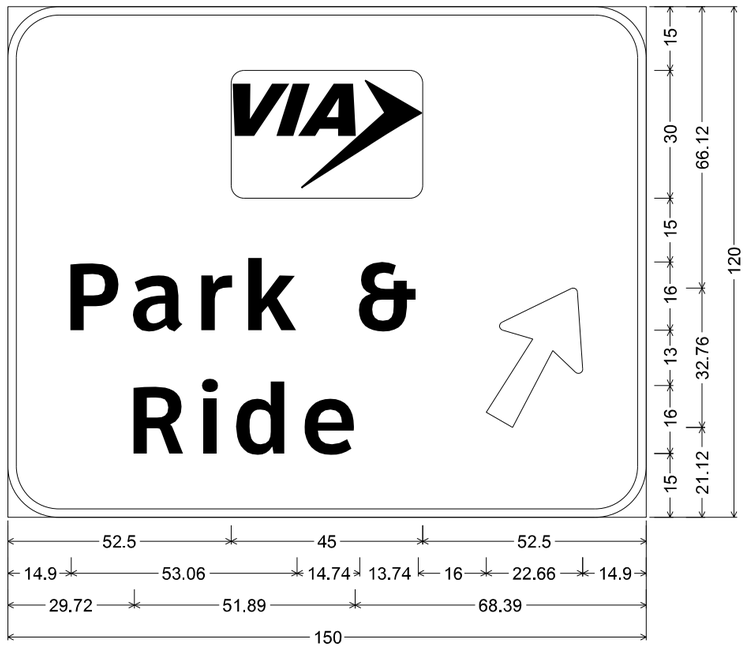
Identifier : D3-2(1)_VARx30;
1.88" Radius, 0.75" Border, White on Green;
[Perrin-Beitel Rd] ClearviewHwy-3-W; [NEXT SIGNAL] ClearviewHwy-3-W;

I9-EB



6.00" Radius, 1.50" Border, Black on Yellow;
[35] D; Turn Arrow E-3a; [M.] D; [P.] D; [H.] D;

20-EB



12.00" Radius, 2.00" Border, White on Green;
Rounded Rectangle 3.00" Radius; [Park &] ClearviewHwy-5-W-R;
[Ride] ClearviewHwy-5-W-R; Arrow A-3 - 35.63" 60^;

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3/4/2022
DATE

Texas Department of Transportation

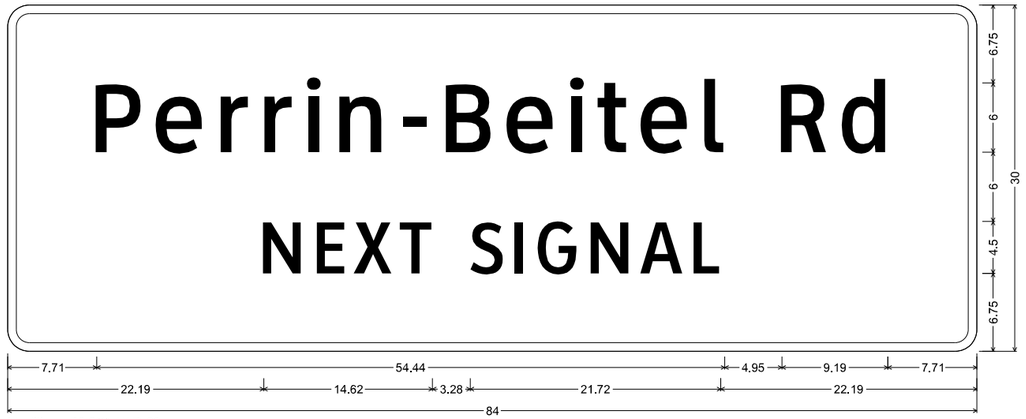
GUIDE SIGN DETAILS
IH 410 (EB)
SH-16 TO IH-35

SHEET 3 OF 15

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		177
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

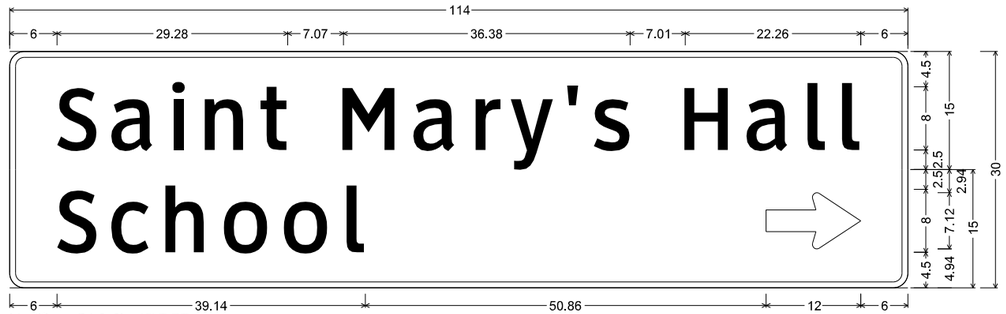
DN: DN

21-WB



Identifier : D3-2(1)_VARx30;
1.88" Radius, 0.75" Border, White on Green;
[Perrin-Beitel Rd] ClearviewHwy-3-W; [NEXT SIGNAL] ClearviewHwy-3-W;

22-WB

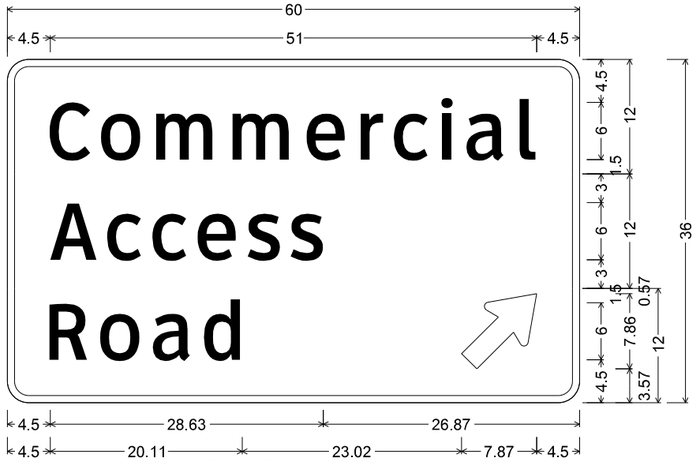


Identifier : D1-2 8in 45LT-RT;
1.88" Radius, 0.75" Border, White on Green;
[Saint Mary's Hall] ClearviewHwy-3-W 117% spacing;
1.88" Radius, 0.75" Border, White on Green;
[School] ClearviewHwy-3-W 117% spacing; Standard Arrow Custom 12.00" X 7.13" 0^;

23-WB

Identifier : D3-2(1)_VARx30;
1.88" Radius, 0.75" Border, White on Green;
[Starcrest Dr] ClearviewHwy-3-W; [NEXT SIGNAL] ClearviewHwy-3-W;

24-WB



Identifier : D1-3 6in UP-45RT-45RT;
2.25" Radius, 0.75" Border, White on Green;
[Commercial] ClearviewHwy-3-W 103% spacing;
2.25" Radius, 0.75" Border, White on Green;
[Access] ClearviewHwy-3-W 103% spacing;
2.25" Radius, 0.75" Border, White on Green;
[Road] ClearviewHwy-3-W 103% spacing;
Standard Arrow Custom 10.00" X 6.13" 45^;

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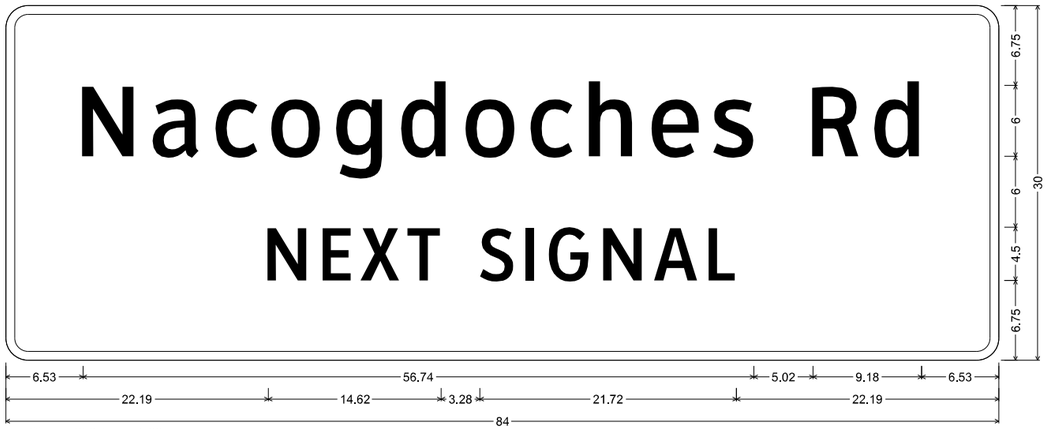
GUIDE SIGN DETAILS
IH 410 (WB)
SH-16 TO IH-35

SHEET 4 OF 15

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		178
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

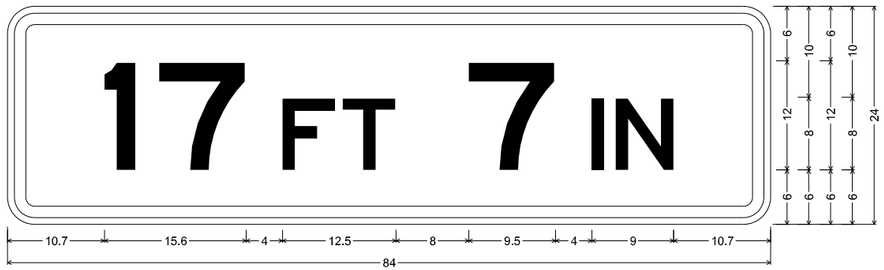
3/4/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\PLN*SHEETS\Plan Sheets\Sign Details\IH 410 (North).dgn

25-WB



Identifier : D3-2(1)_VARx30;
1.88" Radius, 0.75" Border, White on Green;
[Nacogdoches Rd] ClearviewHwy-3-W; [NEXT SIGNAL] ClearviewHwy-3-W;

27-WB



Identifier : W12-2a_84x24;
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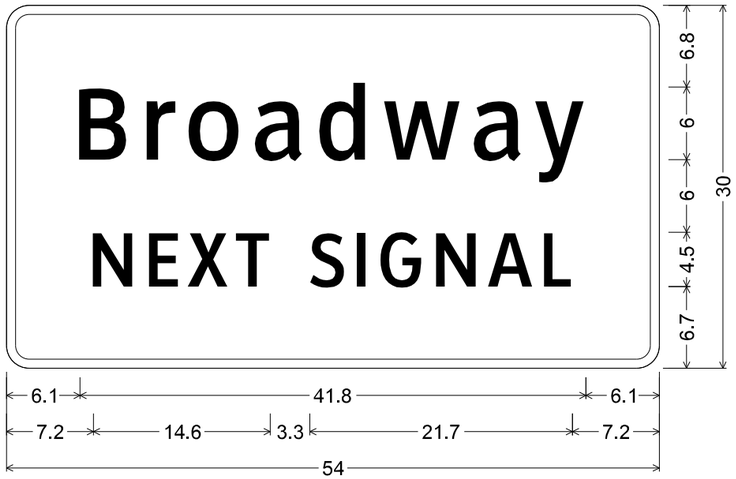
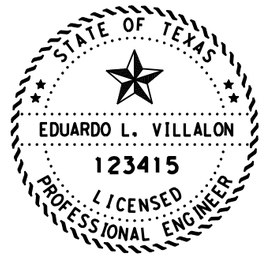
[17] E; [FT] E specified length; [7] E; [IN] E specified length;

26-WB



Identifier : D3-2(1)_VARx30;
Drawn by : MSD;
1.9" Radius, 0.8" Border, White on Green;
[Broadway] ClearviewHwy-3-W;
[NEXT SIGNAL] ClearviewHwy-3-W;



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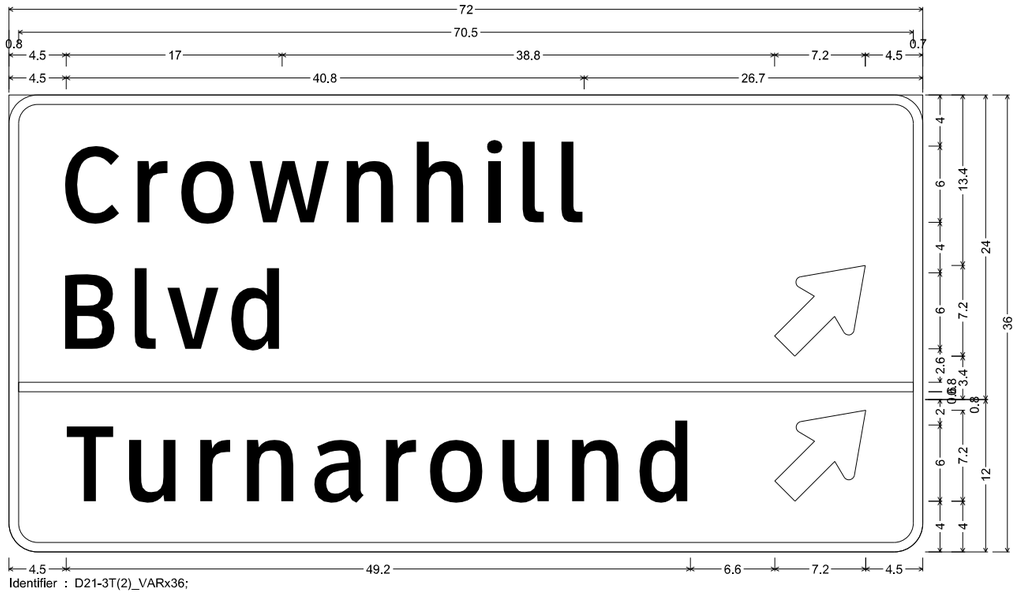
GUIDE SIGN DETAILS
IH 410 (WB)
SH-16 TO IH-35

SHEET 5 OF 15

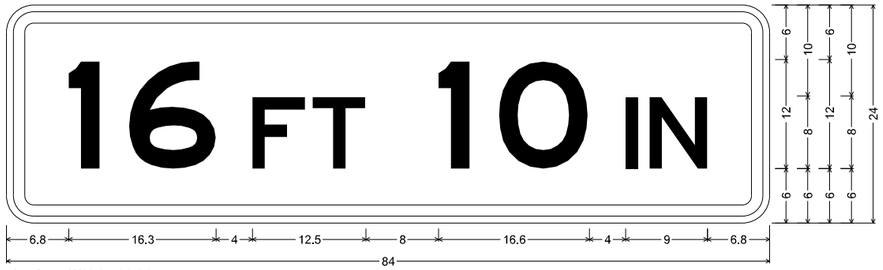
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		179
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

31-WB



Identifier : D21-3T(2)_VARx36;
2.3" Radius, 0.8" Border, White on Green;
[Crownhill] ClearviewHwy-3-W; [Blvd] ClearviewHwy-3-W; Standard Arrow Custom 9.0" X 6.1" 45^;
2.3" Radius, 0.8" Border, White on Green;
[Turnaround] ClearviewHwy-3-W; Standard Arrow Custom 9.0" X 6.1" 45^;

32-WB



Identifier : W12-2a_84x24;
3.0" Radius, 1.3" Border, 0.8" Indent, Black on Yellow;
[16] E; [FT] E specified length; [10] E; [IN] E specified length;

STATE OF TEXAS
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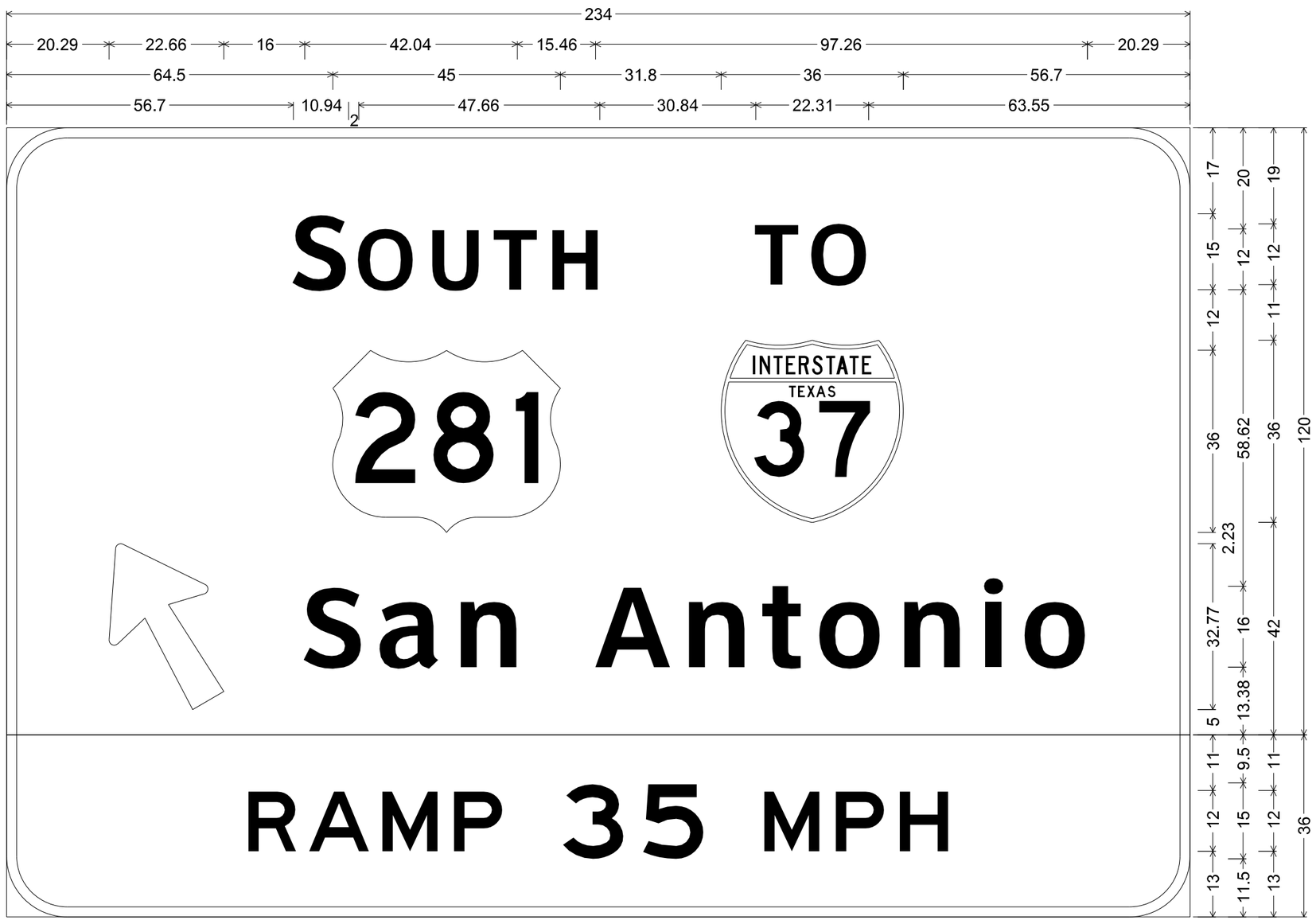
GUIDE SIGN DETAILS
IH 410 (WB)
SH-16 TO IH-35

SHEET 6 OF 15

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		180
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

33-WB



12.00" Radius, 2.00" Border, White on Green;
[S] ClearviewHwy-5-W-R; [OUTH] ClearviewHwy-5-W-R; US 281 M1-4; [TO] ClearviewHwy-5-W-R; State Name 37 M1-2;
Arrow A-3 - 35.63" 120^; [San Antonio] ClearviewHwy-5-W-R;
12.00" Radius, 2.00" Border, Black on Yellow;
[RAMP] E; [35] E; [MPH] E;

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3/4/2022
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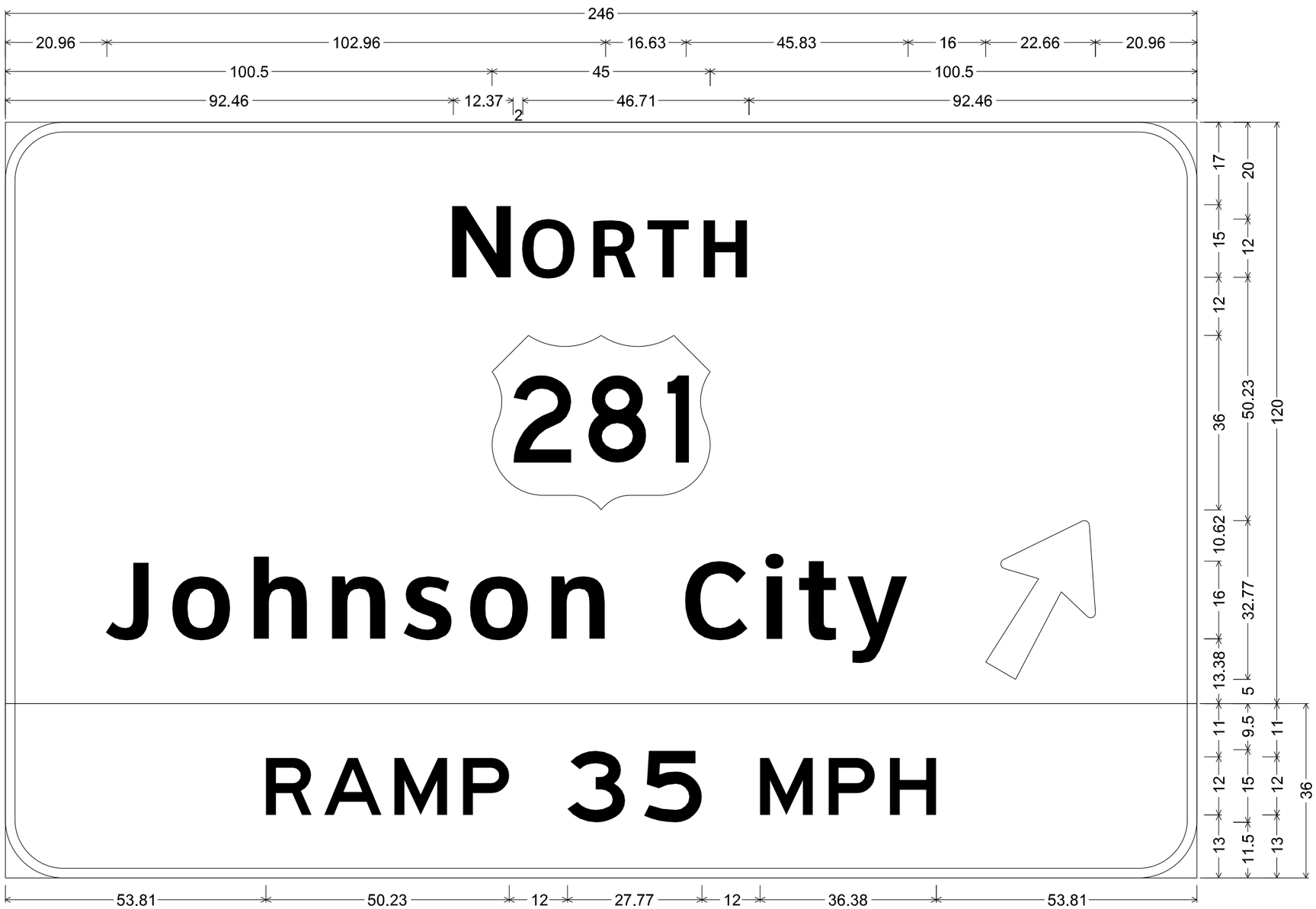
GUIDE SIGN DETAILS
IH 410 (WB)
SH-16 TO IH-35

SHEET 7 OF 15

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		181
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS



12.00" Radius, 2.00" Border, White on Green;
[N] ClearviewHwy-5-W-R; [ORTH] ClearviewHwy-5-W-R; US 281 M1-4; [Johnson City] ClearviewHwy-5-W-R; Arrow A-3 - 35.63" 60^;
12.00" Radius, 2.00" Border, Black on Yellow;
[RAMP] E; [35] E; [MPH] E;

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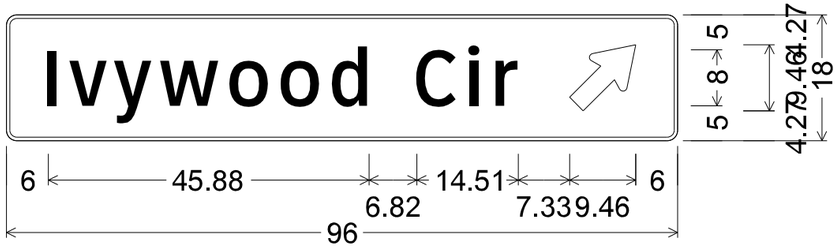
GUIDE SIGN DETAILS
IH 410 (WB)
SH-16 TO IH-35

SHEET 8 OF 15

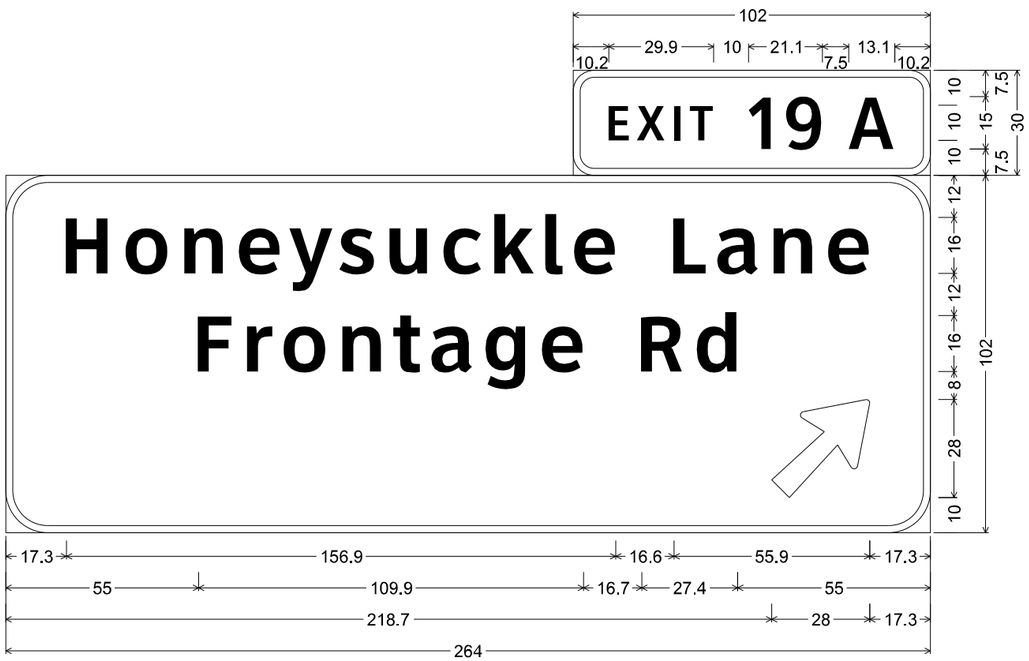
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		182
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

37-WB



Identifier : D1-1 8in 45 RT;
1.50" Radius, 0.50" Border, White on Green;
[Ivywood Cir] ClearviewHwy-3-W;
Standard Arrow Custom 12.00" X 7.13" 45^;

38-WB



Identifier : E1-5P(1)_102x30;
6.0" Radius, 2.0" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [19] ClearviewHwy-4-W; [A] ClearviewHwy-4-W;
12.0" Radius, 2.0" Border, White on Green;
[Honeysuckle Lane] ClearviewHwy-5-W-R; [Frontage Rd] ClearviewHwy-5-W-R; Arrow A-3 - 35.6" 45^;

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3/4/2022
DATE

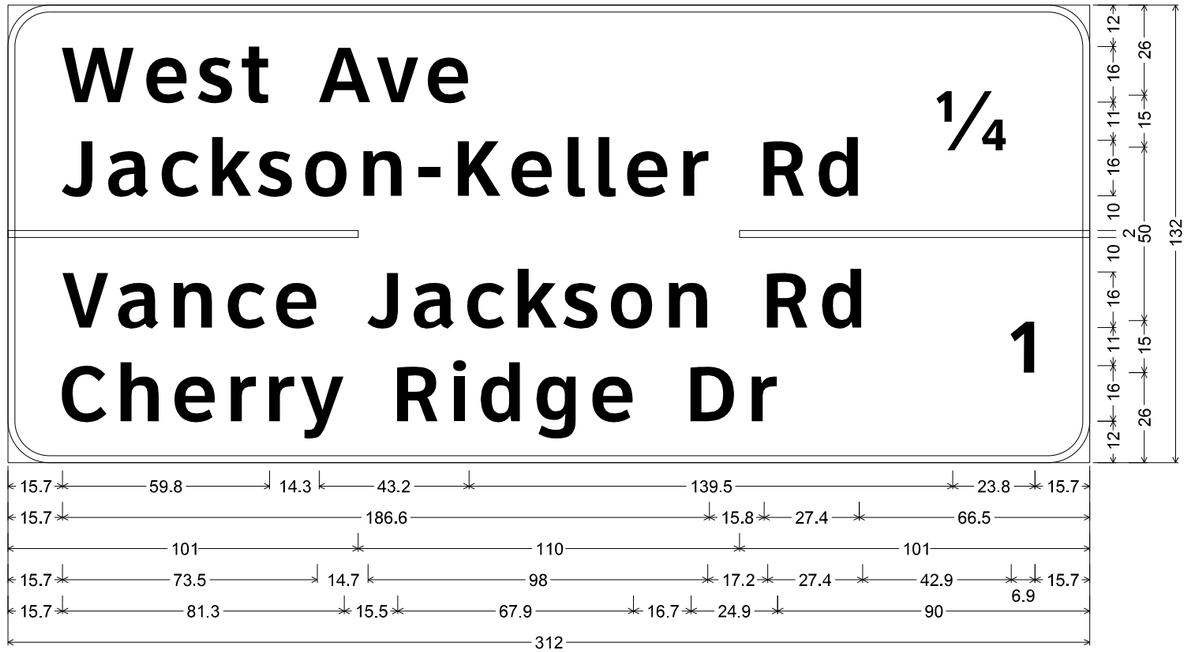
Texas Department of Transportation

GUIDE SIGN DETAILS
IH 410 (WB)
SH-16 TO IH-35

SHEET 9 OF 15

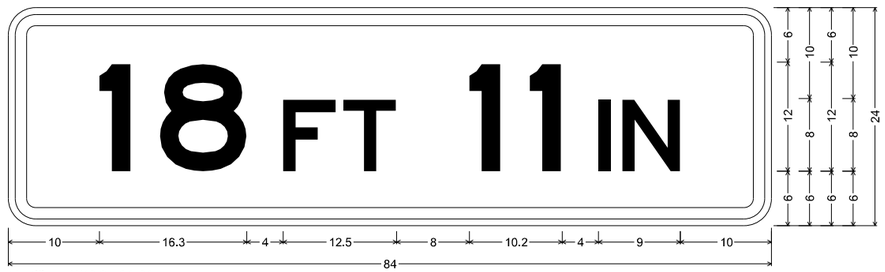
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		183
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

39-WB



12.0" Radius, 2.0" Border, White on Green;
[West Ave] ClearviewHwy-5-W-R; [Jackson-Keller Rd] ClearviewHwy-5-W-R; [¼] ClearviewHwy-5-W-R; [ ] ClearviewHwy-5-W-R;
[Vance Jackson Rd] ClearviewHwy-5-W-R; [Cherry Ridge Dr] ClearviewHwy-5-W-R; [1] ClearviewHwy-5-W-R;

40-WB



Identifier : W12-2a_84x24;
3.0" Radius, 1.3" Border, 0.8" Indent, Black on Yellow;
[18] E; [FT] E specified length; [11] E; [IN] E specified length;

STATE OF TEXAS
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123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. — 3/4/2022 DATE

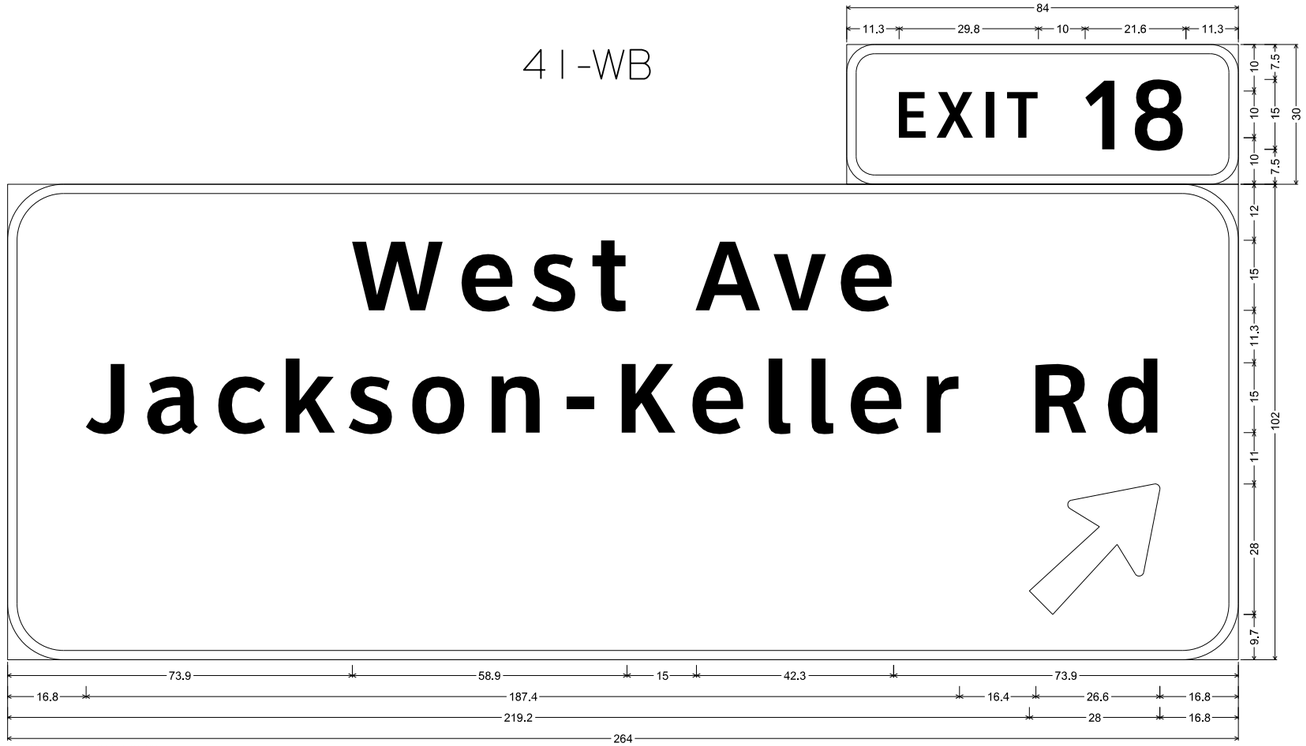
Texas Department of Transportation

GUIDE SIGN DETAILS
IH 410 (WB)
SH-16 TO IH-35

SHEET 10 OF 15

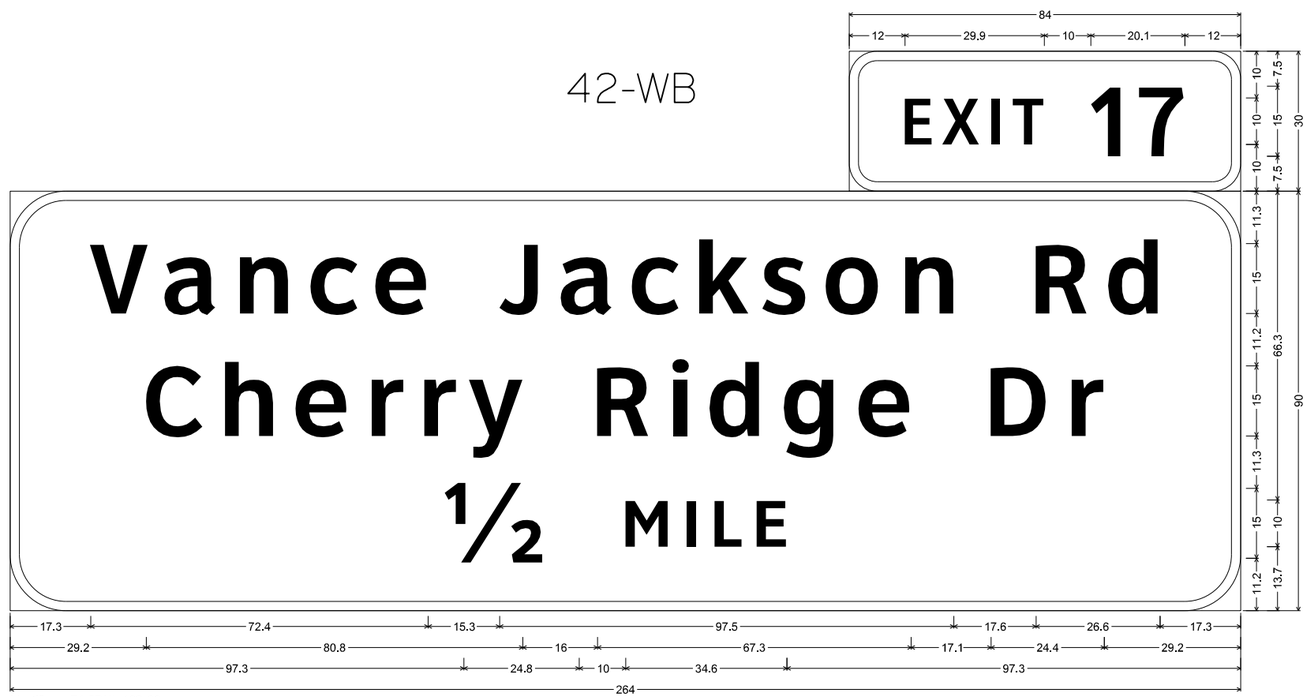
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		184
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

41-WB



Identifier : E1-5P(1)_102x30;
6.0" Radius, 2.0" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [18] ClearviewHwy-4-W;
12.0" Radius, 2.0" Border, White on Green;
[West Ave] ClearviewHwy-5-W; [Jackson-Keller Rd] ClearviewHwy-5-W; Arrow A-3 - 35.6" 45^;

42-WB



Identifier : E1-5P(1)_102x30;
6.0" Radius, 2.0" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [17] ClearviewHwy-4-W;
12.0" Radius, 2.0" Border, White on Green;
[Vance Jackson Rd] ClearviewHwy-5-W; [Cherry Ridge Dr] ClearviewHwy-5-W; [1/2] ClearviewHwy-5-W; [MILE] ClearviewHwy-5-W;

STATE OF TEXAS
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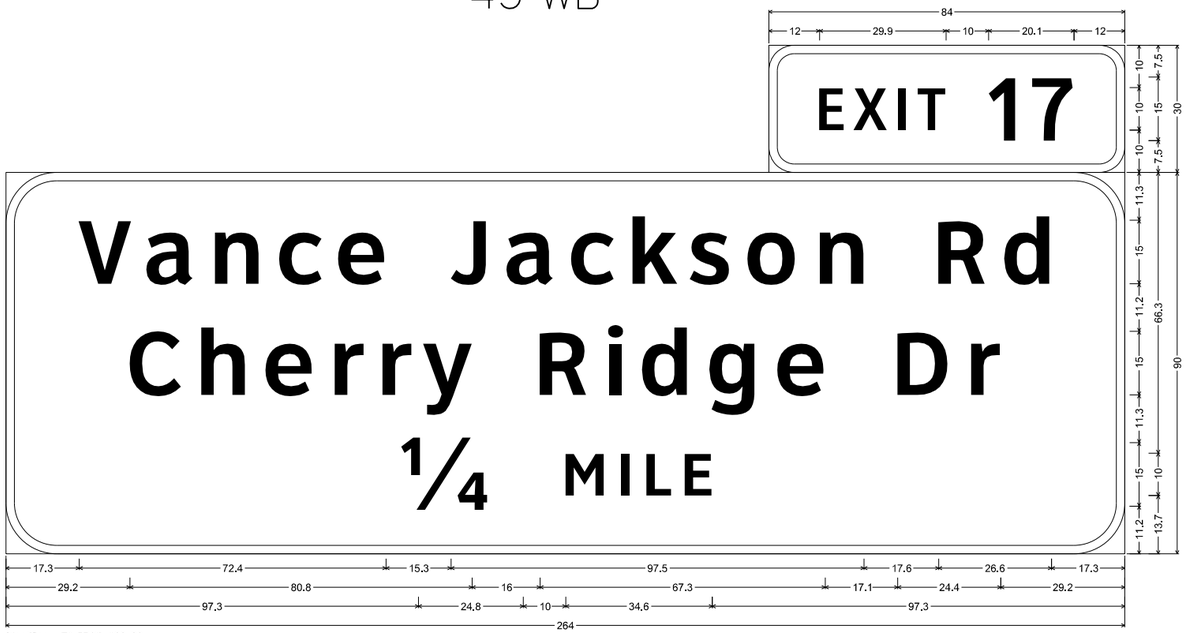
GUIDE SIGN DETAILS
IH 410 (WB)
SH-16 TO IH-35

SHEET 11 OF 15

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		185
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

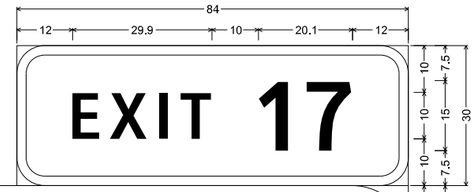
DN: DN

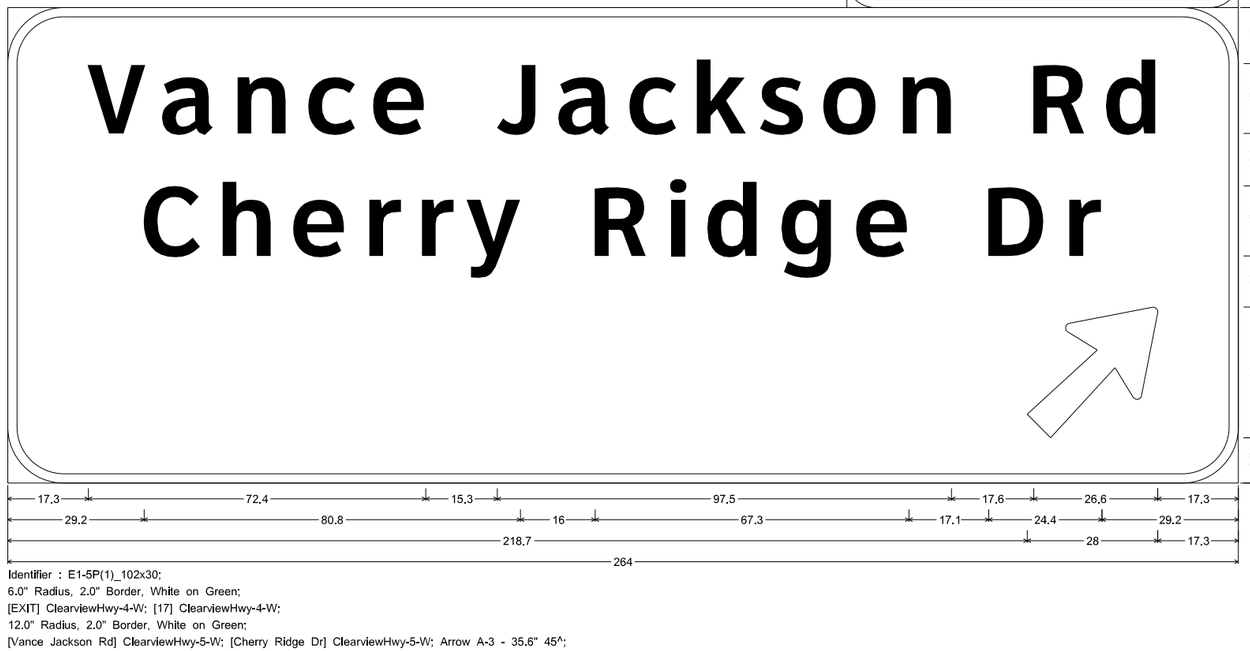
43-WB



Identifier : E1-5P(1)_102x30;
6.0" Radius, 2.0" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [17] ClearviewHwy-4-W;
12.0" Radius, 2.0" Border, White on Green;
[Vance Jackson Rd] ClearviewHwy-5-W; [Cherry Ridge Dr] ClearviewHwy-5-W; [1/4] ClearviewHwy-5-W; [MILE] ClearviewHwy-5-W;

44-WB





Identifier : E1-5P(1)_102x30;
6.0" Radius, 2.0" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [17] ClearviewHwy-4-W;
12.0" Radius, 2.0" Border, White on Green;
[Vance Jackson Rd] ClearviewHwy-5-W; [Cherry Ridge Dr] ClearviewHwy-5-W; Arrow A-3 - 35.6° 45^;

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3/4/2022
DATE

Texas Department of Transportation

GUIDE SIGN DETAILS
IH 410 (WB)
SH-16 TO IH-35

SHEET 12 OF 15

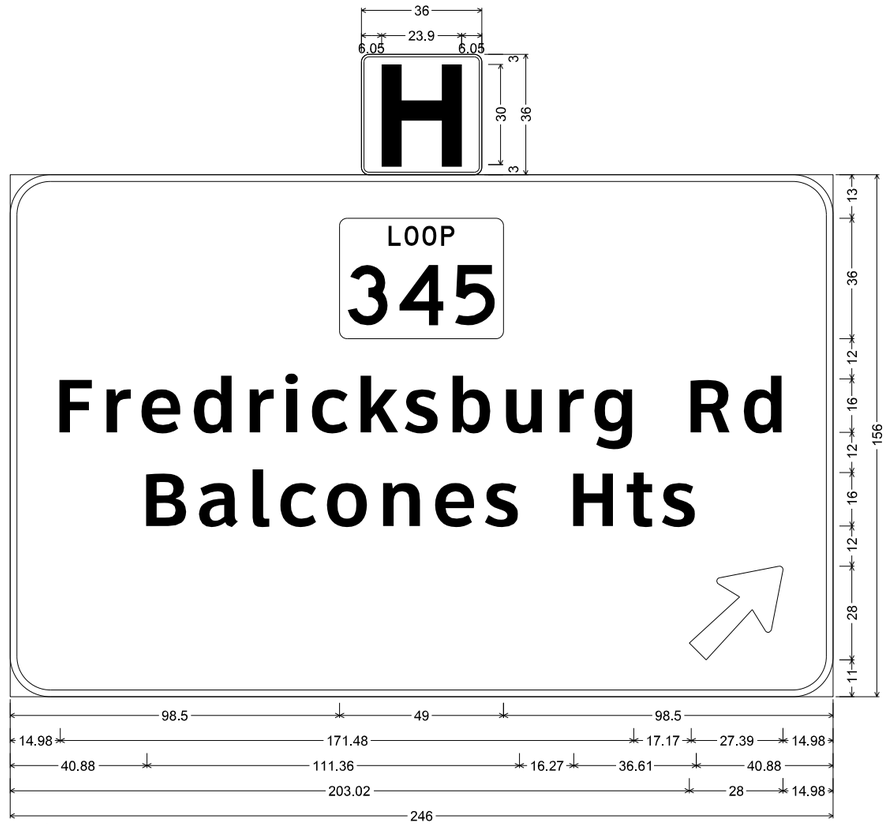
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		186
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

3/4/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\PLN*SHEETS\Plan Sheets\Sign Details\IH 410 (North).dgn

45-WB

6.00" Radius, 1.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [16] ClearviewHwy-4-W;
12.00" Radius, 2.00" Border, White on Green;
Interstate 10 M1-1; US 87 M1-4; [San Antonio] ClearviewHwy-5-W-R;
[El Paso] ClearviewHwy-5-W-R; [1] ClearviewHwy-5-W-R; [MILE] ClearviewHwy-5-W-R;

46-WB



Identifier : D9-2_36x36;
2.25" Radius, 0.75" Border, White on Blue;
[H] E Mod;
12.00" Radius, 2.00" Border, White on Green;
State Highway 345 M1-6L3; [Fredricksburg Rd] ClearviewHwy-5-W-R; [Balcones Hts] ClearviewHwy-5-W-R;
Arrow A-3 - 35.63" 45^;

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GUIDE SIGN DETAILS
IH 410 (WB)
SH-16 TO IH-35

SHEET 13 OF 15

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		187
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

DW: DN

3/4/2022
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48-WB

6.00" Radius, 2.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [14] ClearviewHwy-4-W 90% spacing; [A] ClearviewHwy-4-W 90% spacing;
12.00" Radius, 2.00" Border, White on Green;
[Summit Pkwy] ClearviewHwy-5-W; [Evers Rd] ClearviewHwy-5-W;
12.00" Radius, 2.00" Border, Black on Yellow;
[EXIT] E; [ONLY] E; Down Arrow 22 - 22.00" 270^;

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3/4/2022
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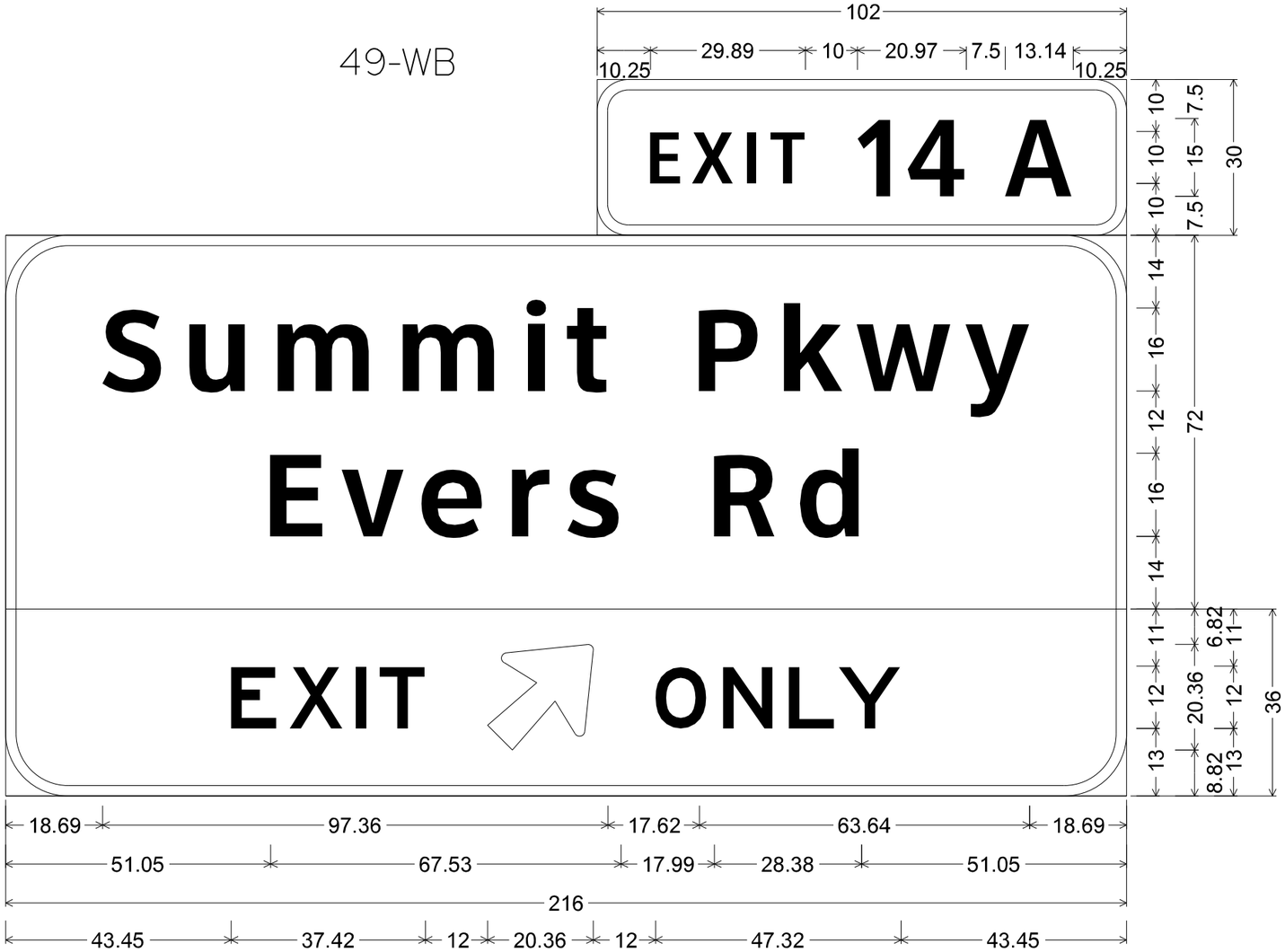
Texas Department of Transportation

GUIDE SIGN DETAILS
IH 410 (WB)
SH-16 TO IH-35

SHEET 14 OF 15

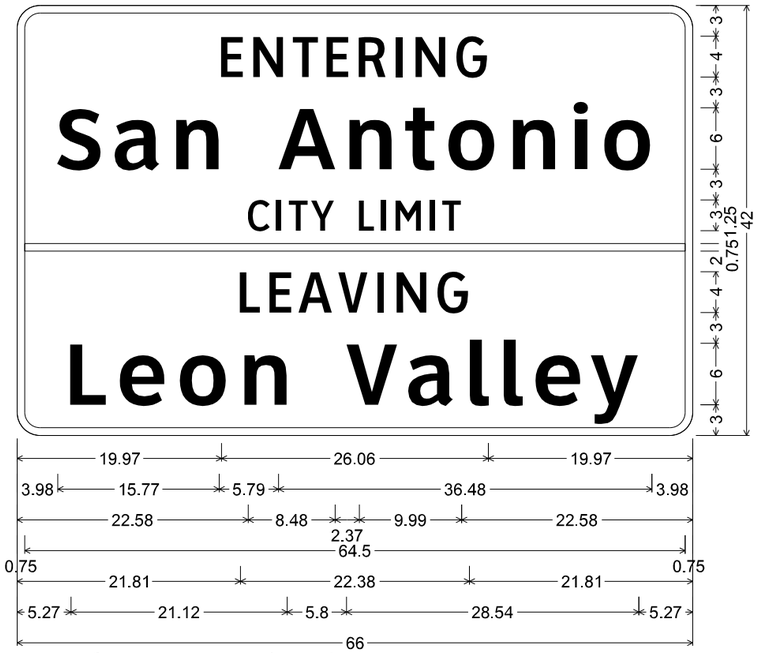
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		188
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

49-WB

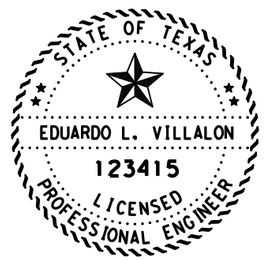


6.00" Radius, 2.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [14] ClearviewHwy-4-W 90% spacing; [A] ClearviewHwy-4-W 90% spacing;
12.00" Radius, 2.00" Border, White on Green;
[Summit Pkwy] ClearviewHwy-5-W; [Evers Rd] ClearviewHwy-5-W;
12.00" Radius, 2.00" Border, Black on Yellow;
[EXIT] E; Arrow B-3 - 25.00" 45^; [ONLY] E;

50-WB



2.25" Radius, 0.75" Border, White on Green;
[ENTERING] ClearviewHwy-3-W; [San Antonio] ClearviewHwy-5-W-R;
[CITY LIMIT] ClearviewHwy-3-W; [LEAVING] ClearviewHwy-3-W;
[Leon Valley] ClearviewHwy-5-W-R;



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3/4/2022
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GUIDE SIGN DETAILS
IH 410 (WB)
SH-16 TO IH-35

SHEET 15 OF 15

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		189
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

3/4/2022
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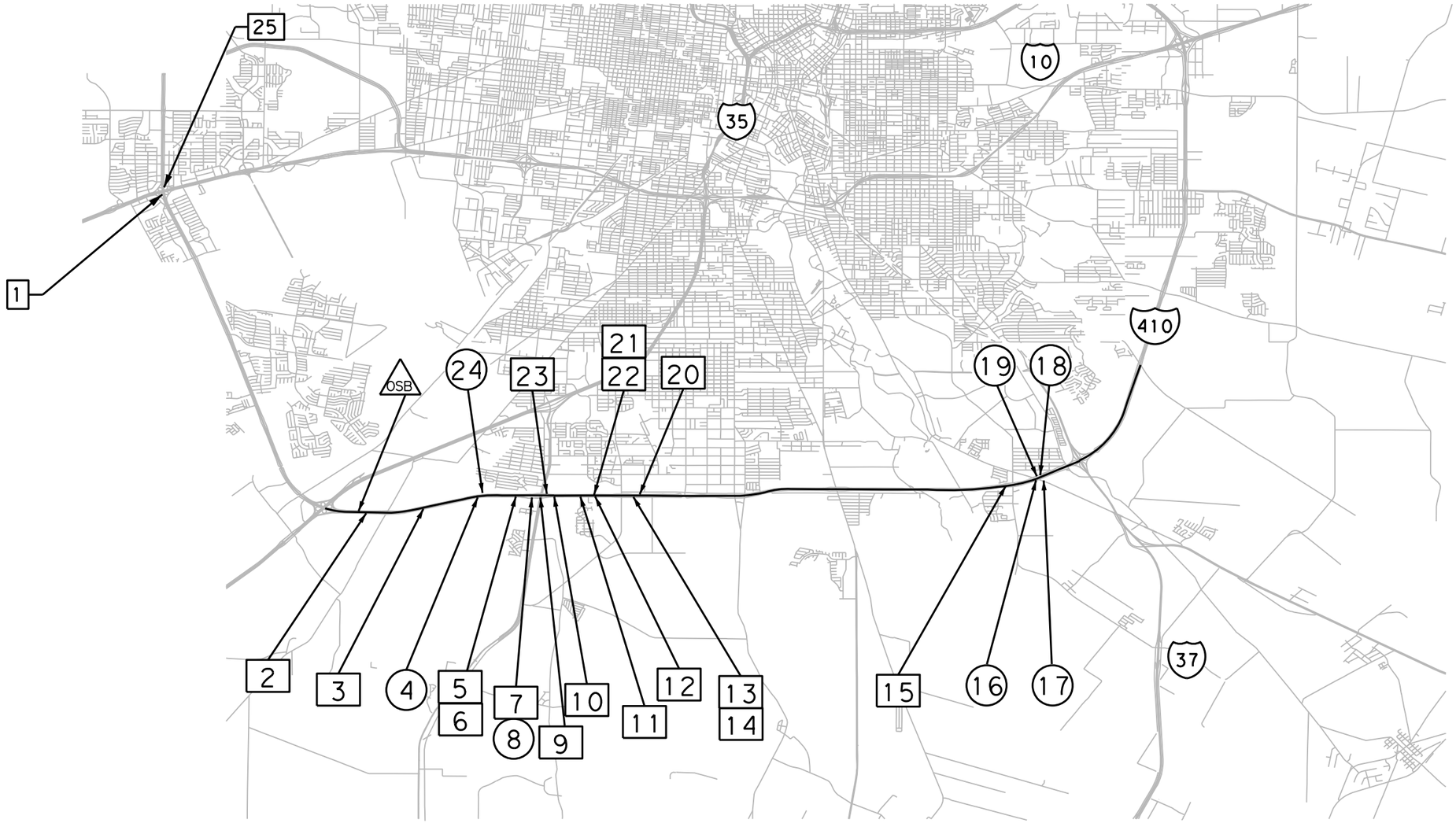
DN: DN



N

N. T. S

LEGEND

- (#) ..... SMALL GUIDE SIGNAGE
- [#] ..... LARGE GUIDE SIGNAGE
- OSB ..... OSB & SIGNAGE
- ——— ..... CORIDOR LIMITS

STATE OF TEXAS
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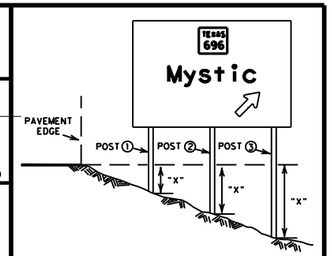
LOCATION MAP

IH-410 SOUTH
(IH-35 TO IH-37)

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		190
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

SUMMARY OF LARGE SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN BACK-GROUND COLOR	SIGN TEXT	SIGN DIMENSIONS	PLAQUES, & OTHER ATTACHMENTS		BACKGROUND SUBSTRATE (SQ FT)		TYPE OF MOUNT	"X" DIMENSION ◒			GALVANIZED STRUCTURAL STEEL					DRILLED SHAFT			
					DIRECT APPLY	✳ ALUMINUM (TYPE A)	GROUND MOUNT (TYPE G)	OVERHEAD (TYPE O)		post ①	post ②	post ③	SIZE	LINEAR FEET post ①	post ②	post ③	TOTAL WEIGHT LBS.	NON-REINF 12"ϕ	LINEAR FEET REINFORCED 24"ϕ	30"ϕ	36"ϕ
	1-EB	GREEN	EAST 90 San Antonio	20′-0" x 9′-6"	7.16			190													
	2-EB	GREEN	FM 2790 Somerset 1/4 MILE	12′-0" x 10′-0"	14.22		120														
	3-EB	GREEN	H EXIT 49 TEXAS 16 SOUTH SPUR 422 Palo Alto Rd Poteet 1 MILE	3′-0" x 3′-0"		9															
				7′-0" x 2′-6"			17.5														
				18′-6" x 12′-6"	20.94		231.25														
	5-EB	GREEN	H EXIT 49 TEXAS 16 SOUTH SPUR 422 Palo Alto Rd Poteet	3′-0" x 3′-0"		9															
				7′-0" x 2′-6"				17.5													
				19′-6" x 10′-0"	20.94			195													
	6-EB	GREEN	HM EAST NORTH INTERSTATE 410 TEXAS 130	3′-0" x 3′-0"		9															
				14′-0" x 7′-0"	20.96			98													
	7-EB	GREEN	EXIT 48 Zarzamora St 1/4 MILE	7′-0" x 2′-6"				17.5													
				17′-6" x 6′-0"				105													
	8-EB	GREEN	⇦ Palo Alto College ⇦ Hospital	12′-0" x 4′-0"			48														
	9-EB	GREEN	EXIT 48 Zarzamora St	7′-0" x 2′-6"				17.5													
				17′-0" x 6′-6"				110.5													
	10-EB	GREEN	HM EAST NORTH INTERSTATE 410 TEXAS 130	3′-0" x 3′-0"		9															
				14′-0" x 7′-0"	20.96			98													
	11-EB	GREEN	EXIT 47 University Way 3/4 MILE	7′-0" x 2′-6"			17.5														
				17′-6" x 6′-0"			105														
			PAGE TOTALS			36	539.25	849					PAGE TOTALS								



◒ The "X" dimension is the elevation difference at the post between the ground and the edge of pavement or top of curb.

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.

The post lengths listed here are approximations, The corrected post lengths will be furnished by the Contractor after the stud posts are placed.

Tower heights shall be verified with the Engineer before fabrication.

✳ This column is for aluminum Type A and not direct apply. Direct apply is subsidiary to the sign.

SIGN TYPE

SIGN TYPE 1 3 0
- 1 — Wind Design Zone
- 3 — Series No.
- 0 — Series No.: 0 Aluminum/Fiberglass, 1 Aluminum, 2 Fiberglass
- No. of Posts

See sheet SMD(8W1)

IH- 410
(IH-35 TO WW WHITE RD)

SUMMARY OF LARGE SIGNS
SOLS

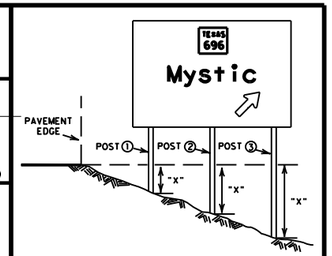
DN.:- TxDOT	REVISIONS	
CK.:- TxDOT	11-93	1-04
DW.:- TxDOT	8-95	9-08
CK.:- TxDOT	5-01	

CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS
DIST	COUNTY		SHEET NO.
SAT	BEXAR		191

DATE: 2/25/2022 10:15:10 AM
FILE: I

SUMMARY OF LARGE SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN BACK-GROUND COLOR	SIGN TEXT	SIGN DIMENSIONS	PLAQUES, & OTHER ATTACHMENTS		BACKGROUND SUBSTRATE (SQ FT)		TYPE OF MOUNT	"X" DIMENSION ◒			GALVANIZED STRUCTURAL STEEL					DRILLED SHAFT			
					DIRECT APPLY	⁎ ALUMINUM (TYPE A)	GROUND MOUNT (TYPE G)	OVERHEAD (TYPE O)		post ①	post ②	post ③	SIZE	LINEAR FEET post ①	post ②	post ③	TOTAL WEIGHT LBS.	NON-REINF 12"ϕ	LINEAR FEET REINFORCED 24"ϕ	30"ϕ	36"ϕ
	12-EB	GREEN	Texas A&M Univ. - San Antonio EXIT 47	18′-6" x 8′-0"			148														
	13-EB	GREEN	EXIT 46 Moursund Blvd 1 MILE	7′-0" x 2′-6"				17.5													
				17′-6" x 6′-0"				105													
	14-EB	GREEN	EXIT 47 University Way	7′-0" x 2′-6"				17.5													
				17′-6" x 6′-6"				113.75													
	15-EB	GREEN	H EXIT 41 NORTH 37 281 San Antonio Corpus Christi 1 MILE	3′-0" x 3′-0"		9															
				7′-0" x 2′-6"				17.5													
				18′-0" x 13′-0"	16.31			243													
	20-WB	GREEN	Texas A&M Univ. - San Antonio	9′-0" x 4′-0"				36													
	21-WB	GREEN	HM WEST NORTH SOUTH BUSINESS 410 TEXAS 16 TEXAS 130	3′-0" x 3′-0"		9															
				20′-6" x 7′-0"	29.93			143.5													
	22-WB	GREEN	H EXIT 49 TEXAS 16 SOUTH SPUR 422 Palo Alto Rd Poteet	3′-0" x 3′-0"		9															
				7′-0" x 2′-6"				17.5													
				19′-6" x 10′-0"	20.94			195													
	23-WB	GREEN	Poteet Palo Alto College Hospital	12′-0" x 4′-6"			54														
		BLUE																			
	25-WB	GREEN	WEST 90 Del Rio	15′-0" x 9′-6"	7.16			142.5													
			PAGE TOTALS			27	202	1048.75													



◒ The "X" dimension is the elevation difference at the post between the ground and the edge of pavement or top of curb.

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.

The post lengths listed here are approximations, The corrected post lengths will be furnished by the Contractor after the stud posts are placed.

Tower heights shall be verified with the Engineer before fabrication.

⁎ This column is for aluminum Type A and not direct apply. Direct apply is subsidiary to the sign.

SIGN TYPE

SIGN TYPE 1 3 0
- 1: Wind Design Zone
- 3: No. of Posts
- 0: Series No. (0 Aluminum/Fiberglass, 1 Aluminum, 2 Fiberglass)

See sheet SMD(8W1)

IH- 410

(IH-35 TO WW WHITE RD)

SUMMARY OF LARGE SIGNS

SOLS

DN.- TxDOT	REVISIONS				
CK.- TxDOT	11-93	1-04			
DW.- TxDOT	8-95	9-08			
CK.- TxDOT	5-01				
CONT	SECT	JOB	HIGHWAY		
0915	00	238	VARIOUS		
DIST	COUNTY	SHEET NO.			
SAT	BEXAR	192			

DATE: 2/25/2022 10:15:11 AM
FILE: I

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
	4-EB	I-3	Leon Creek	30" x 18"	✓							
	16-EB	D1-1	Floresville ⇨	90" x 18"	✓							
	17-EB	D1-2	Texas Dept. of Trans. Bexar Metro Office ⇨	120" x 24"	✓							
	18-WB	D1-2	⇦ Texas Dept. of Trans. Bexar Metro Office	120" x 24"	✓							
	19-WB	D7-1T	⇧ S.A. Missions Natl. Historical Park	90" x 24"	✓							
	24-WB	I-3	Leon Creek	30" x 18"	✓							

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).

IH- 410 SOUTH

(IH-35 TO S PRESA ST)

Texas Department of Transportation

Traffic Operations Division Standard

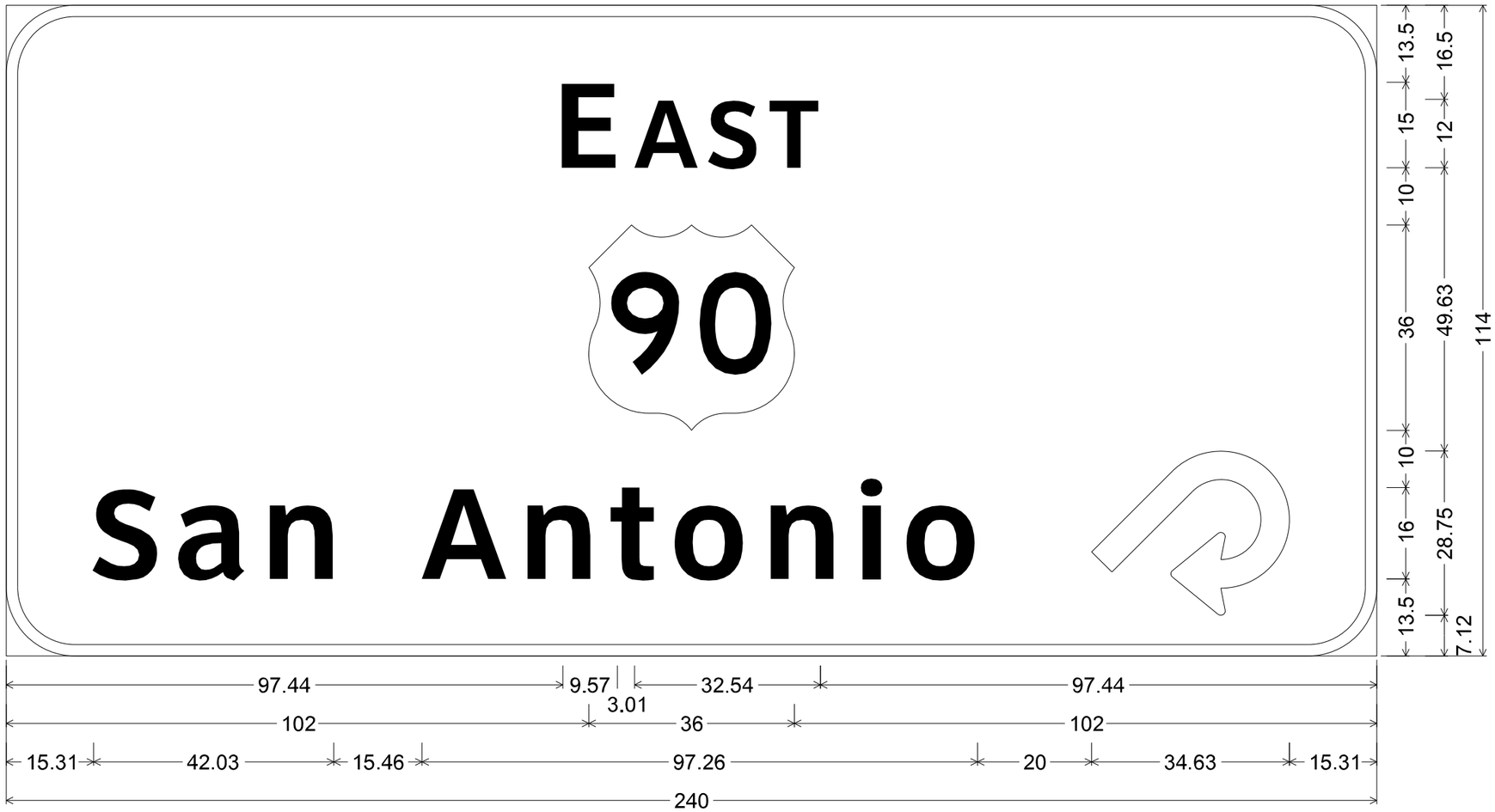
SUMMARY OF SMALL SIGNS

SOSS

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		0915	00	238	VARIOUS
4-16		DIST	COUNTY		SHEET NO.
8-16		SAT	BEXAR		193

18

I-EB



12.00" Radius, 2.00" Border, White on Green;
[E AST] ClearviewHwy-5-W-R; US 90 M1-4; [San Antonio] ClearviewHwy-5-W-R; Turn Arrow E-4;

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

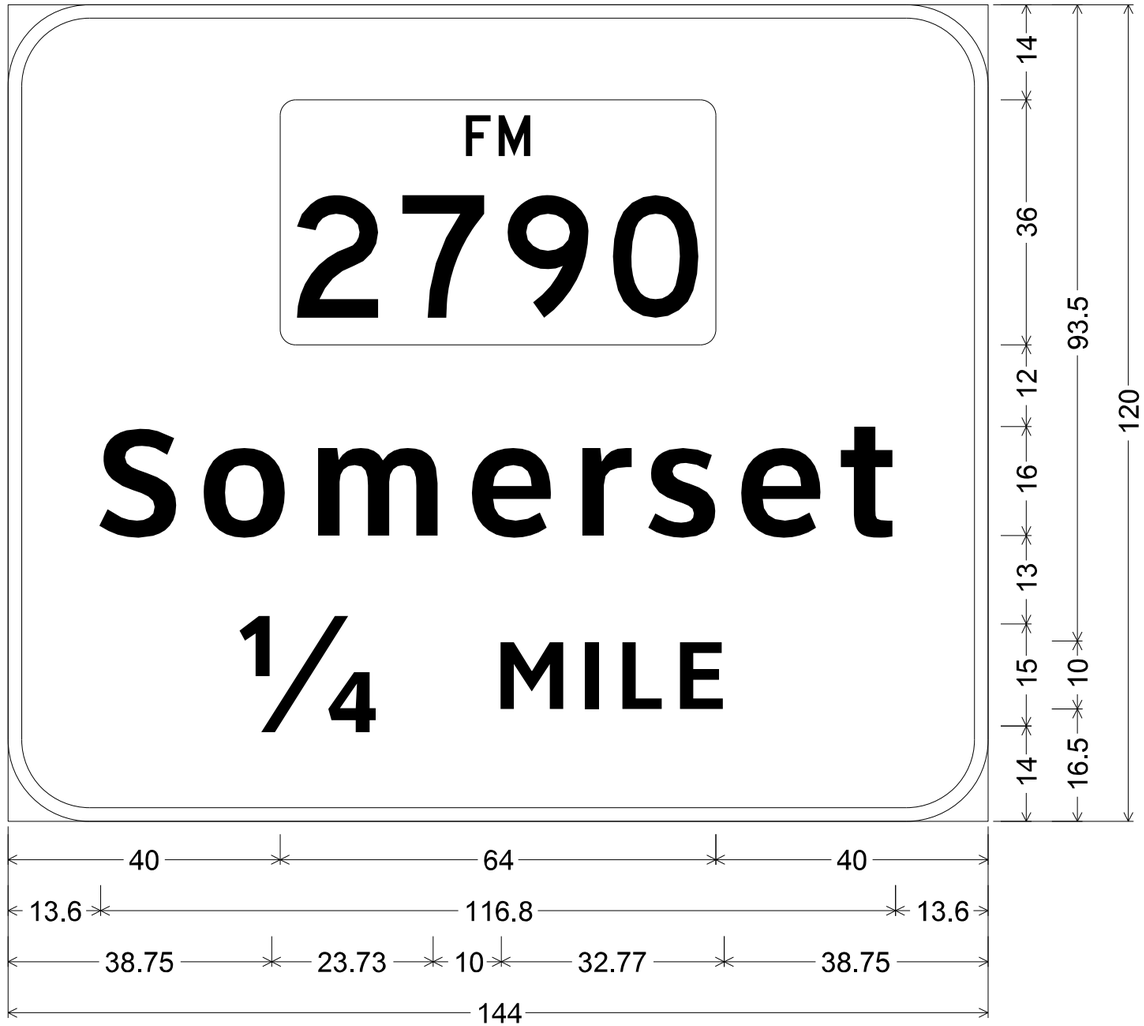
Texas Department of Transportation

GUIDE SIGN DETAILS
IH-410 (EB)
IH-35 TO IH-37

SHEET 1 OF 13

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		194
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

2-EB



12.00" Radius, 2.00" Border, White on Green;
State Highway 2790 M1-6F4; [Somerset] ClearviewHwy-5-W-R;
[1/4] ClearviewHwy-5-W-R [] ClearviewHwy-5-W;
[MILE] ClearviewHwy-5-W-R [] ClearviewHwy-5-W;

STATE OF TEXAS
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EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

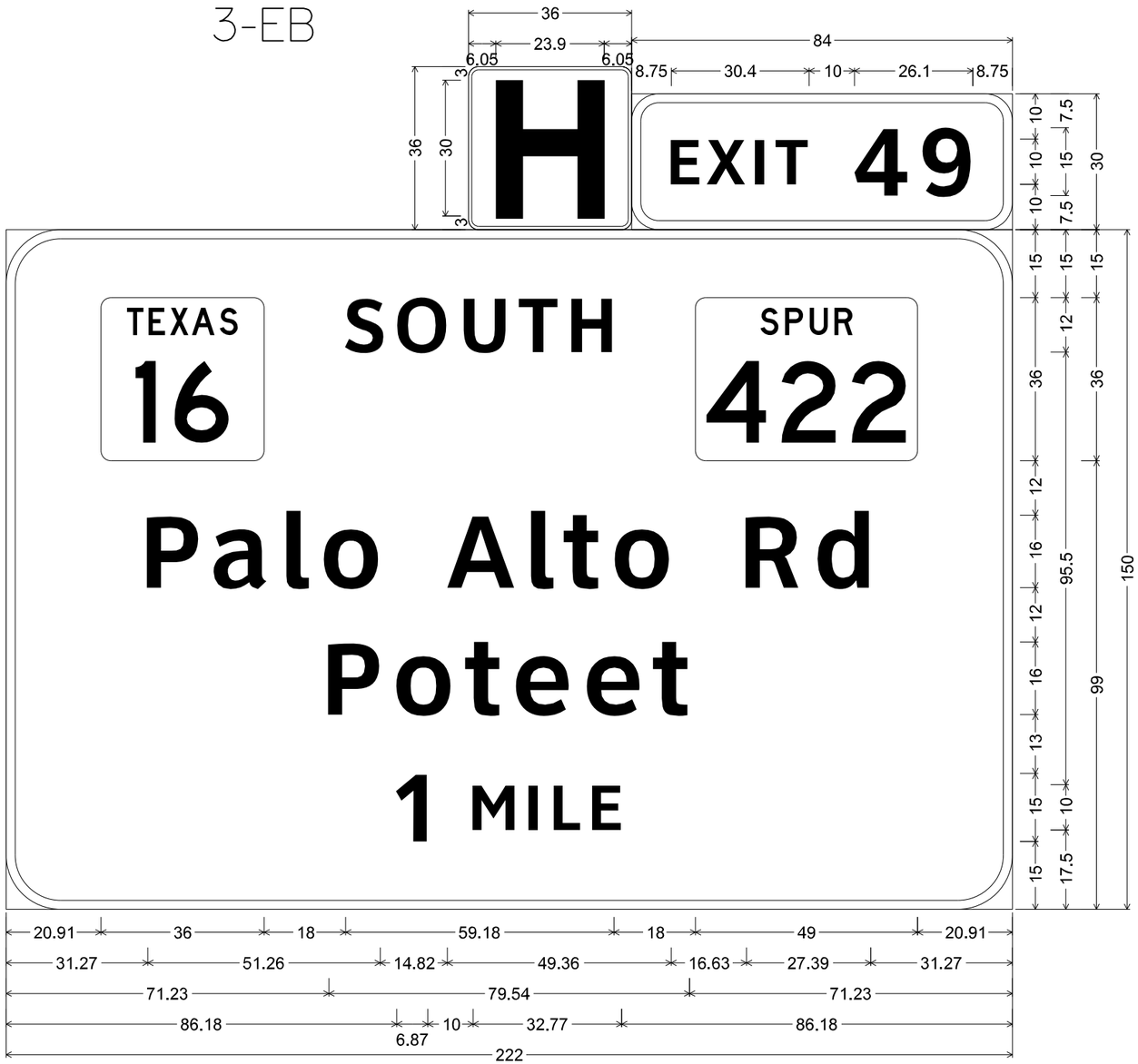
Texas Department of Transportation

GUIDE SIGN DETAILS
IH-410 (EB)
IH-35 TO IH-37

SHEET 2 OF 13

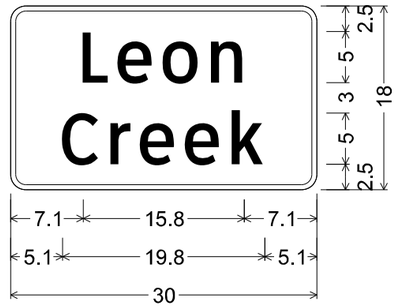
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		195
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

3-EB



Identifier : D9-2_36x36;
2.25" Radius, 0.75" Border, White on Blue;
[H] E Mod;
6.00" Radius, 2.00" Border, White on Green;
[EXIT] ClearviewHwy-5-W-R; [49] ClearviewHwy-5-W-R;
12.00" Radius, 2.00" Border, White on Green;
State Highway 16 M1-6T2; [SOUTH] ClearviewHwy-5-W-R; State Highway 422 M1-6S3;
[Palo Alto Rd] ClearviewHwy-5-W-R; [Poteet] ClearviewHwy-5-W-R; [1] ClearviewHwy-5-W-R;
[MILE] ClearviewHwy-5-W-R;

4-EB



Identifier : I-3 5in;
1.5" Radius, 0.5" Border, White on Green;
[Leon] ClearviewHwy-3-W;
[Creek] ClearviewHwy-3-W;

STATE OF TEXAS
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123415
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PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E.

2/28/2022
DATE

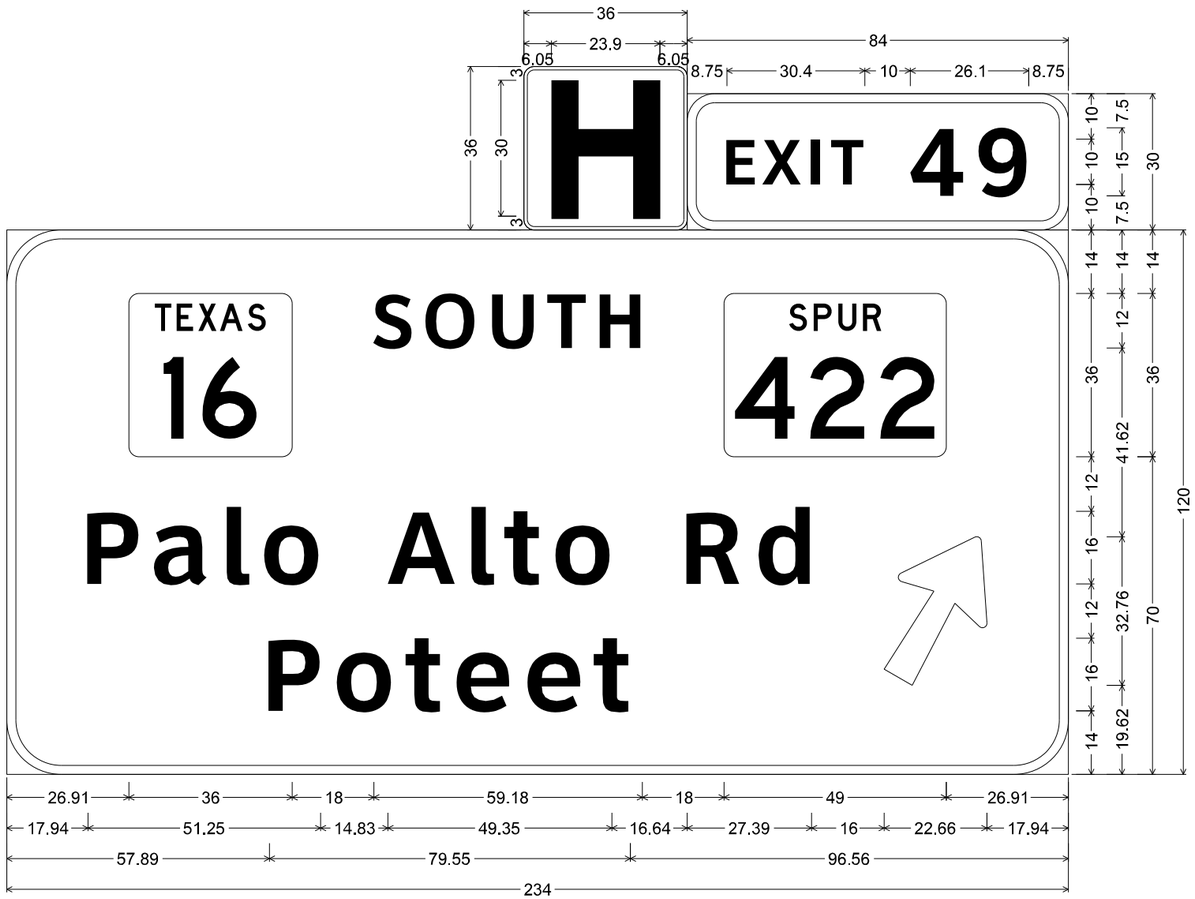
Texas Department of Transportation

GUIDE SIGN DETAILS
IH-410 (EB)
IH-35 TO IH-37

SHEET 3 OF 13

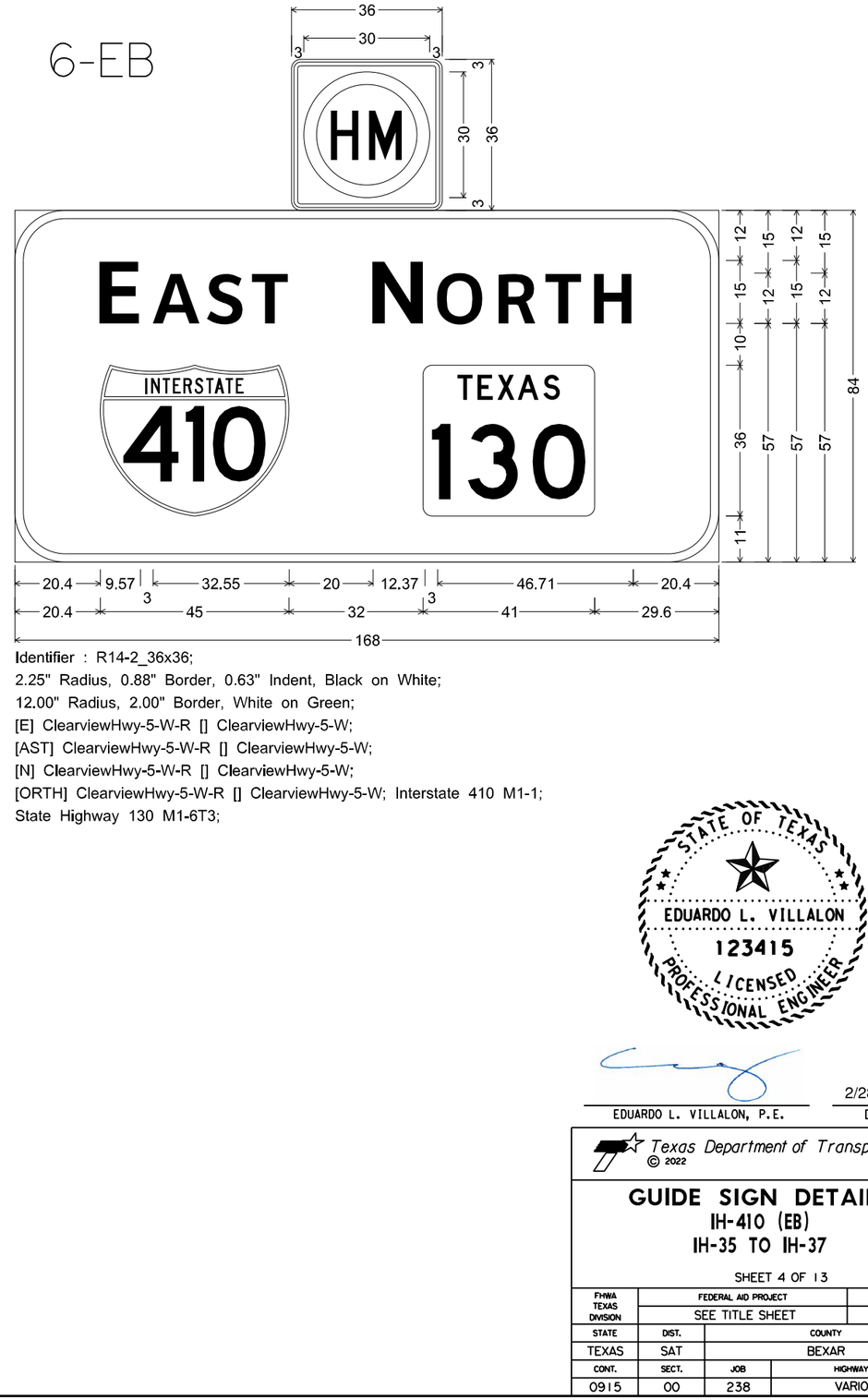
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		196
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

5-EB



Identifier : D9-2_36x36;
2.25" Radius, 0.75" Border, White on Blue;
[H] E Mod;
6.00" Radius, 2.00" Border, White on Green;
[EXIT] ClearviewHwy-5-W-R; [49] ClearviewHwy-5-W-R;
12.00" Radius, 2.00" Border, White on Green;
State Highway 16 M1-6T2; [SOUTH] ClearviewHwy-5-W-R; State Highway 422 M1-6S3; [Palo Alto Rd] ClearviewHwy-5-W-R;
[Poteet] ClearviewHwy-5-W-R; Arrow A-3 - 35.63" 60°;

6-EB



Identifier : R14-2_36x36;
2.25" Radius, 0.88" Border, 0.63" Indent, Black on White;
12.00" Radius, 2.00" Border, White on Green;
[E] ClearviewHwy-5-W-R [] ClearviewHwy-5-W;
[AST] ClearviewHwy-5-W-R [] ClearviewHwy-5-W;
[N] ClearviewHwy-5-W-R [] ClearviewHwy-5-W;
[ORTH] ClearviewHwy-5-W-R [] ClearviewHwy-5-W; Interstate 410 M1-1;
State Highway 130 M1-6T3;

STATE OF TEXAS
EDUARDO L. VILLALON
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LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

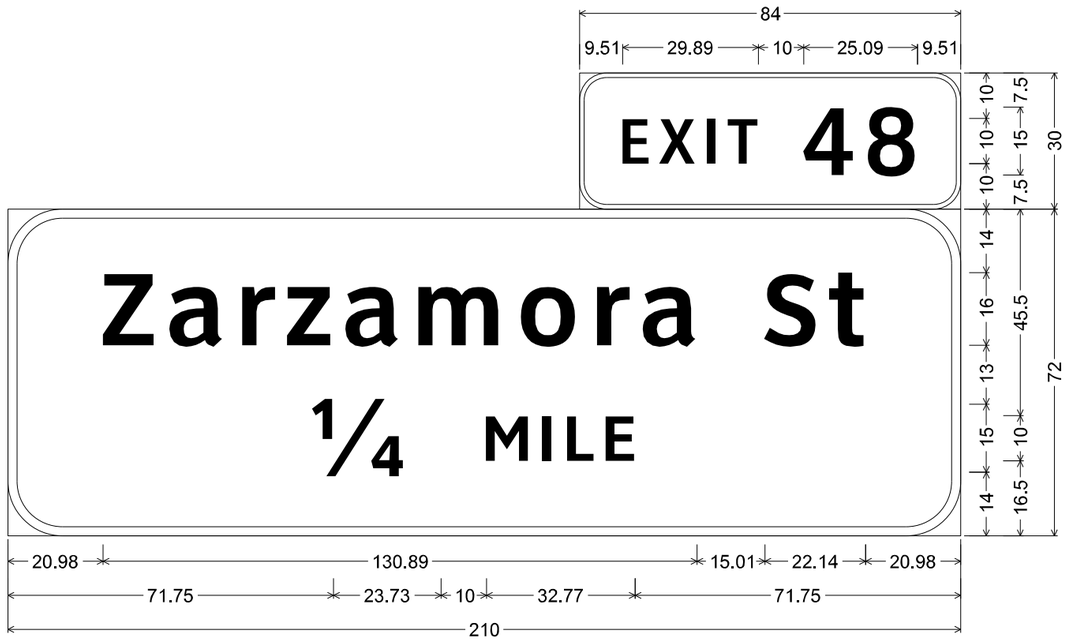
Texas Department of Transportation

GUIDE SIGN DETAILS
IH-410 (EB)
IH-35 TO IH-37

SHEET 4 OF 13

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		197
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

7-EB



6.00" Radius, 1.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [48] ClearviewHwy-4-W;
12.00" Radius, 2.00" Border, White on Green;
[Zarzamora St] ClearviewHwy-5-W-R; [1/4] ClearviewHwy-5-W-R; [MILE] ClearviewHwy-5-W-R;

8-EB

6.00" Radius, 1.25" Border, White on Green;
Standard Arrow Custom 12.00" X 7.13" 180°; [Palo Alto College] ClearviewHwy-5-W-R;
6.00" Radius, 1.25" Border, White on Blue;
Standard Arrow Custom 12.00" X 7.13" 180°; [Hospital] ClearviewHwy-5-W-R;

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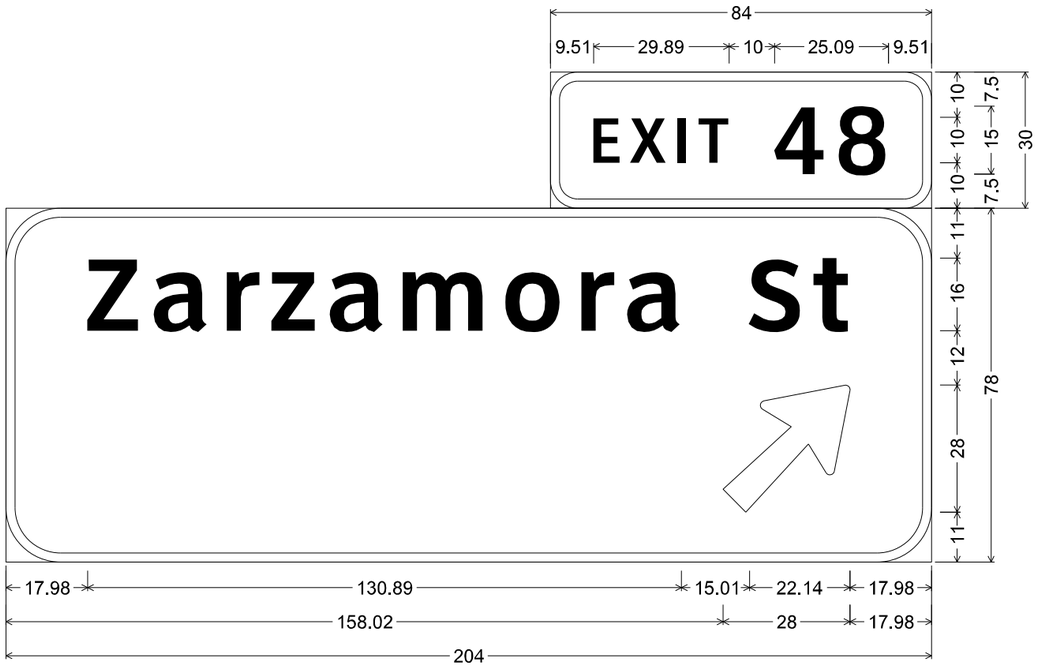
Texas Department of Transportation

GUIDE SIGN DETAILS
IH-410 (EB)
IH-35 TO IH-37

SHEET 5 OF 13

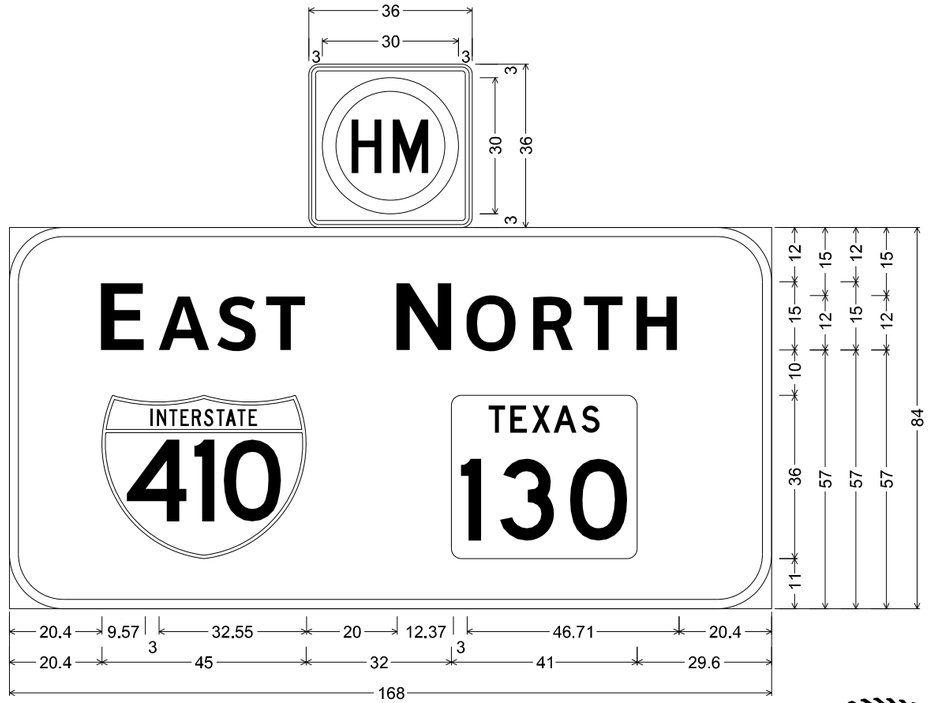
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		198
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

9-EB

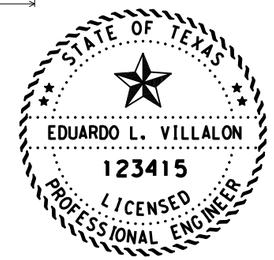


6.00" Radius, 2.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [48] ClearviewHwy-4-W;
12.00" Radius, 2.00" Border, White on Green;
[Zarzamora St] ClearviewHwy-5-W-R; Arrow A-3 - 35.63" 45°;

10-EB



Identifier : R14-2_36x36;
2.25" Radius, 0.88" Border, 0.63" Indent, Black on White;
12.00" Radius, 2.00" Border, White on Green;
[E] ClearviewHwy-5-W-R [] ClearviewHwy-5-W;
[AST] ClearviewHwy-5-W-R [] ClearviewHwy-5-W;
[N] ClearviewHwy-5-W-R [] ClearviewHwy-5-W;
[ORTH] ClearviewHwy-5-W-R [] ClearviewHwy-5-W; Interstate 410 M1-1;
State Highway 130 M1-6T3;



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2/28/2022
DATE

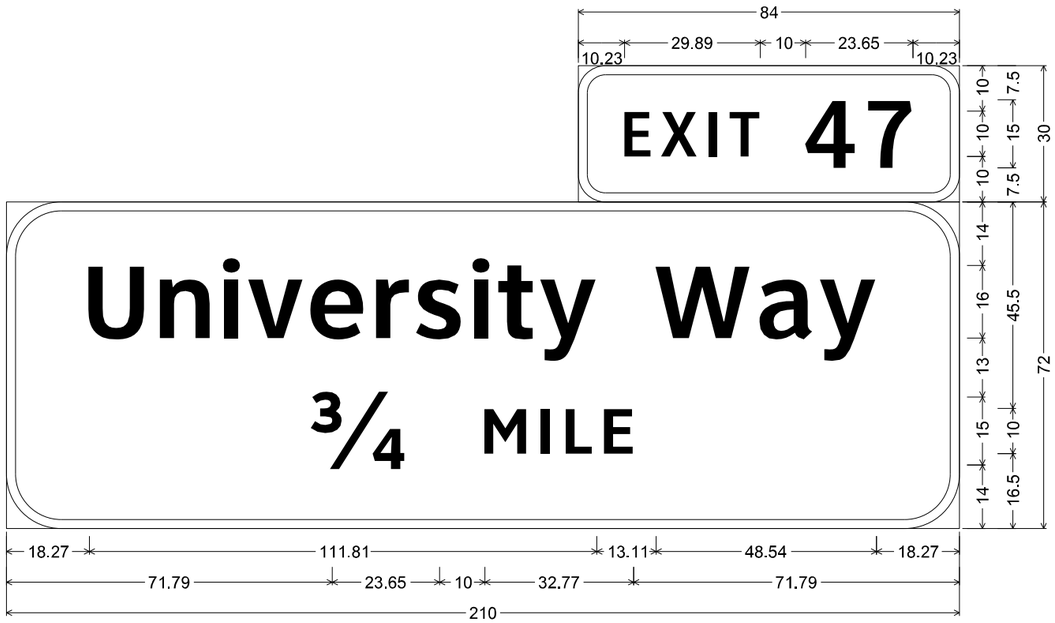
Texas Department of Transportation

GUIDE SIGN DETAILS
IH-410 (EB)
IH-35 TO IH-37

SHEET 6 OF 13

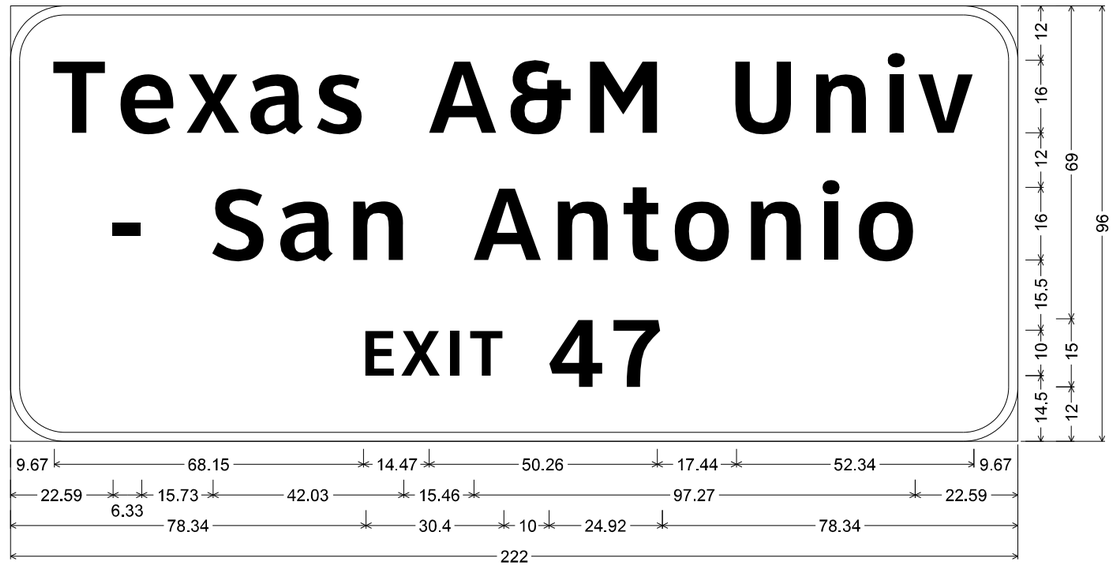
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		199
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

I1-EB



6.00" Radius, 2.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [47] ClearviewHwy-4-W;
12.00" Radius, 2.00" Border, White on Green;
[University Way] ClearviewHwy-5-W-R 60% spacing; [3/4] ClearviewHwy-5-W-R; [MILE] ClearviewHwy-5-W-R;

I2-EB



12.00" Radius, 2.00" Border, White on Green;
[Texas A&M Univ] ClearviewHwy-5-W-R; [- San Antonio] ClearviewHwy-5-W-R; [EXIT] ClearviewHwy-5-W-R;
[47] ClearviewHwy-5-W-R;

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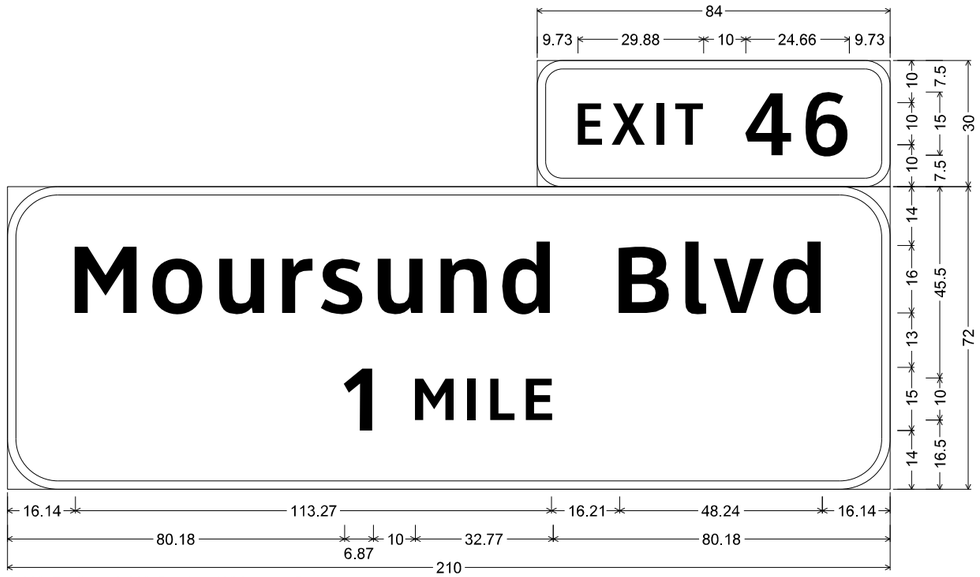
GUIDE SIGN DETAILS
IH-410 (EB)
IH-35 TO IH-37

SHEET 7 OF 13

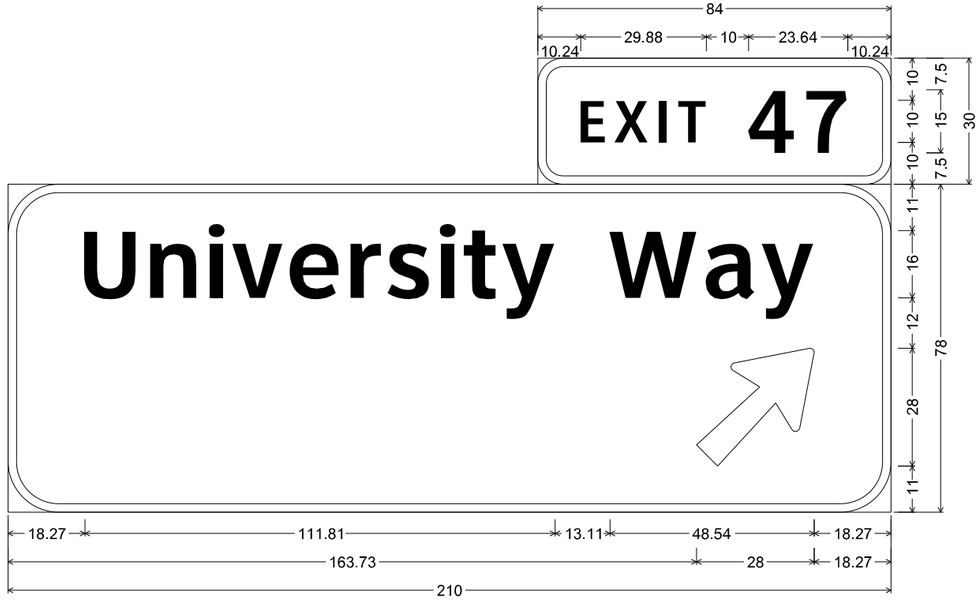
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		200
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

I3-EB



6.00" Radius, 2.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [46] ClearviewHwy-4-W;
12.00" Radius, 2.00" Border, White on Green;
[Moursund Blvd] ClearviewHwy-5-W-R 80% spacing; [1] ClearviewHwy-5-W-R; [MILE] ClearviewHwy-5-W-R;

I4-EB



6.00" Radius, 2.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [47] ClearviewHwy-4-W;
12.00" Radius, 2.00" Border, White on Green;
[University Way] ClearviewHwy-5-W-R 60% spacing; Arrow A-3 - 35.63" 45°;

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EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

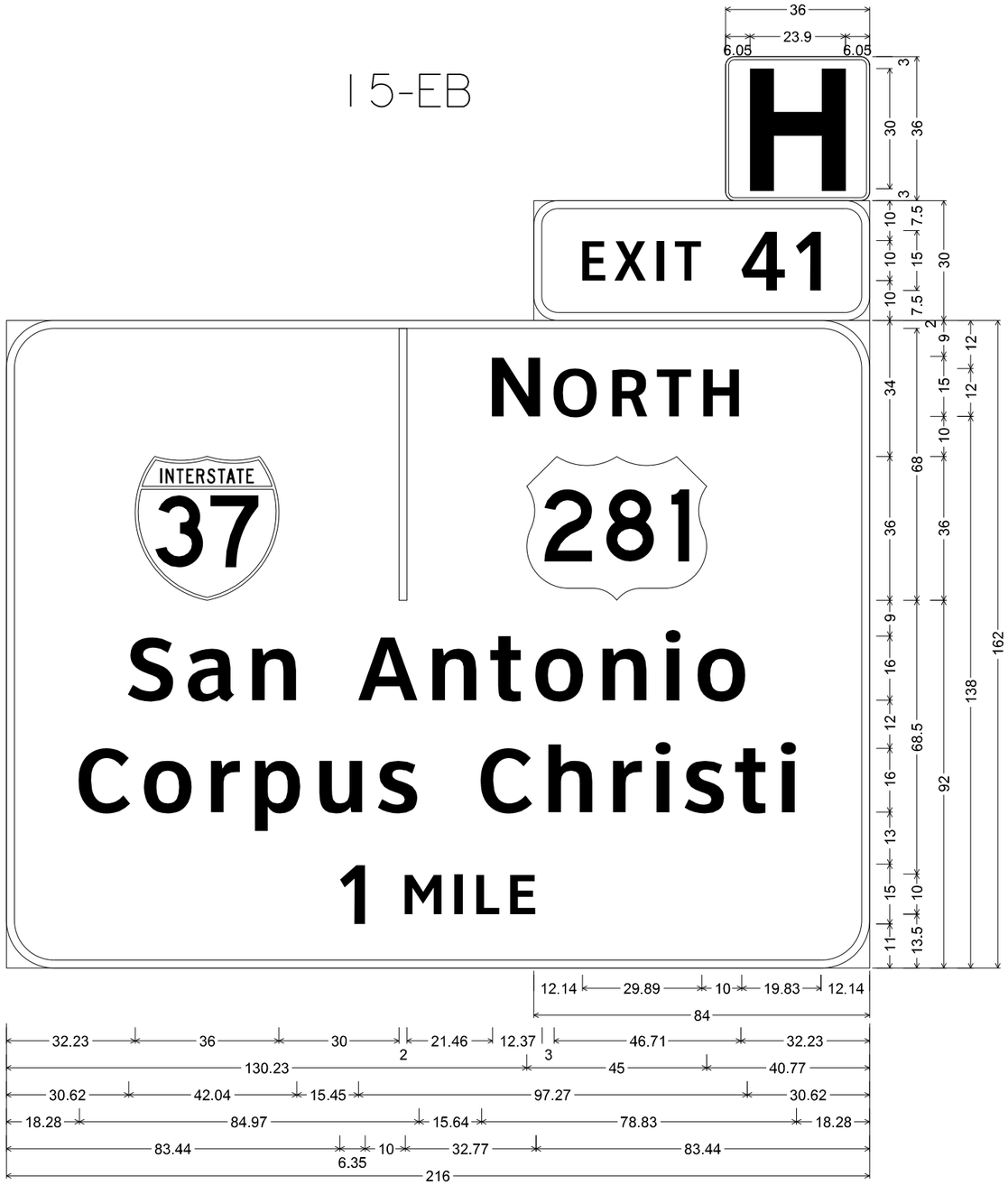
GUIDE SIGN DETAILS

IH 410 (WB)
SH 16 TO IH-37

SHEET 8 OF 13

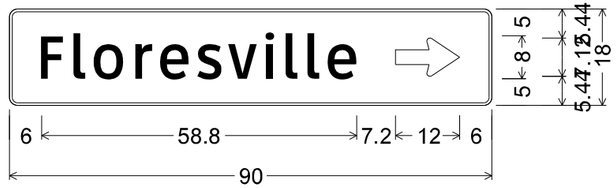
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		201
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

15-EB



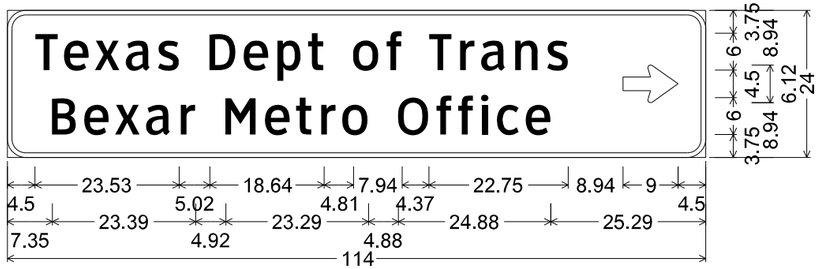
Identifier : D9-2_36x36;
2.25" Radius, 0.75" Border, White on Blue;
[H] E Mod;
6.00" Radius, 2.00" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [41] ClearviewHwy-4-W;
12.00" Radius, 2.00" Border, White on Green;
Interstate 37 M1-1; [N] ClearviewHwy-5-W-R; [ORTH] ClearviewHwy-5-W-R; US 281 M1-4;
[San Antonio] ClearviewHwy-5-W-R; [Corpus Christi] ClearviewHwy-5-W-R; [1] ClearviewHwy-4-W;
[MILE] ClearviewHwy-5-W-R;

16-EB



Identifier : D1-1 8in RT;
1.50" Radius, 0.50" Border, White on Green;
[Floresville] ClearviewHwy-3-W;
Standard Arrow Custom 12.00" X 7.13" 0°;

17-EB



3.00" Radius, 0.75" Border, White on Green;
[Texas Dept of Trans] ClearviewHwy-3-W;
[Bexar Metro Office] ClearviewHwy-3-W;
Standard Arrow Custom 9.00" X 6.13" 0°;

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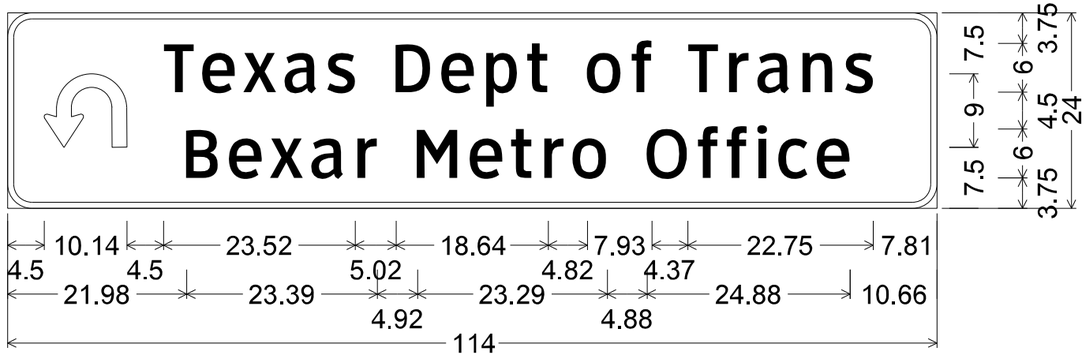
IH-410 (EB)
IH-35 TO IH-37

SHEET 9 OF 13

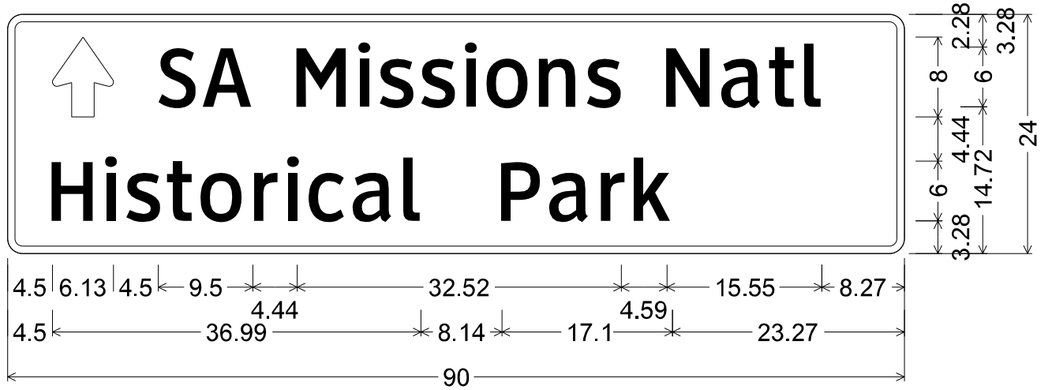
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		202
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

18-WB



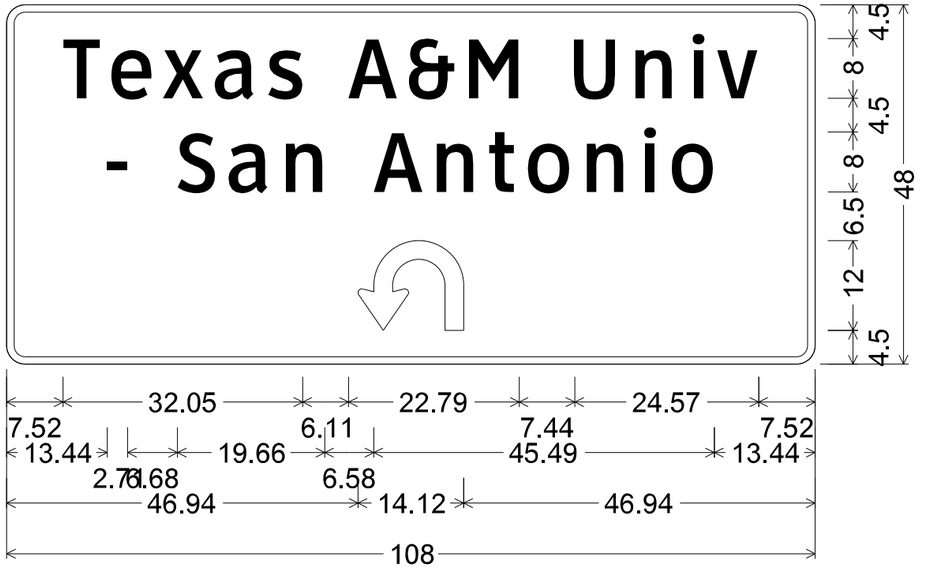
3.00" Radius, 0.75" Border, White on Green;
north; [Texas Dept of Trans] ClearviewHwy-3-W;
[Bexar Metro Office] ClearviewHwy-3-W;

19-WB



1.50" Radius, 0.75" Border, White on Brown;
Standard Arrow Custom 8.00" X 6.13" 90°;
[SA Missions Natl] ClearviewHwy-3-W 70% spacing;
[Historical Park] ClearviewHwy-3-W 70% spacing;

20-WB



Identifier : D1-3;
2.50" Radius, 1.00" Border, White on Green;
[Texas A&M Univ] ClearviewHwy-3-W 113% spacing;
[- San Antonio] ClearviewHwy-3-W 113% spacing;
UL ir=3.5, s=2.5;

STATE OF TEXAS
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123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

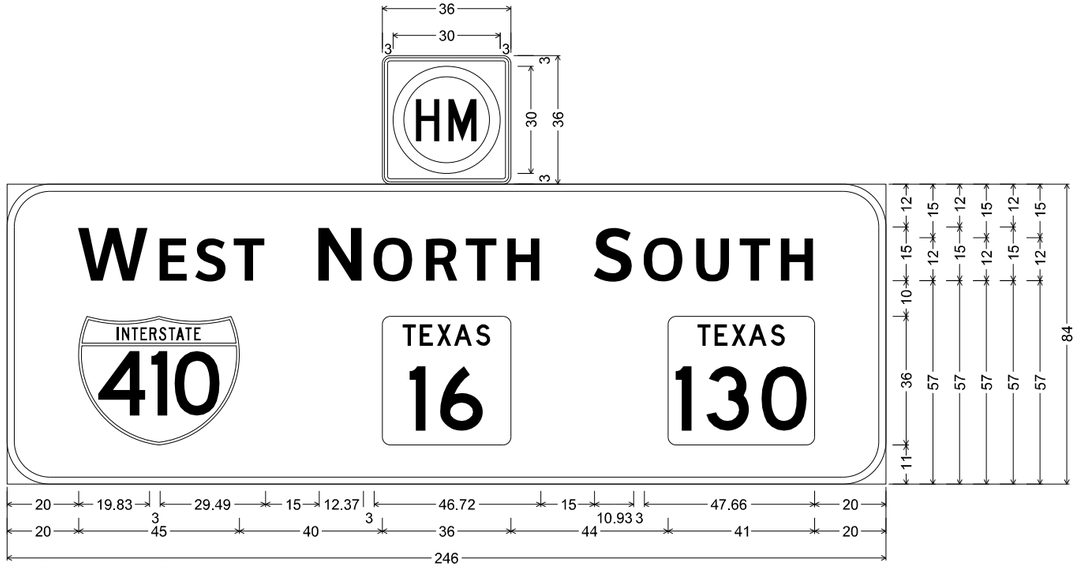
Texas Department of Transportation

GUIDE SIGN DETAILS
IH-410 (WB)
IH-37 TO US 87

SHEET 10 OF 13

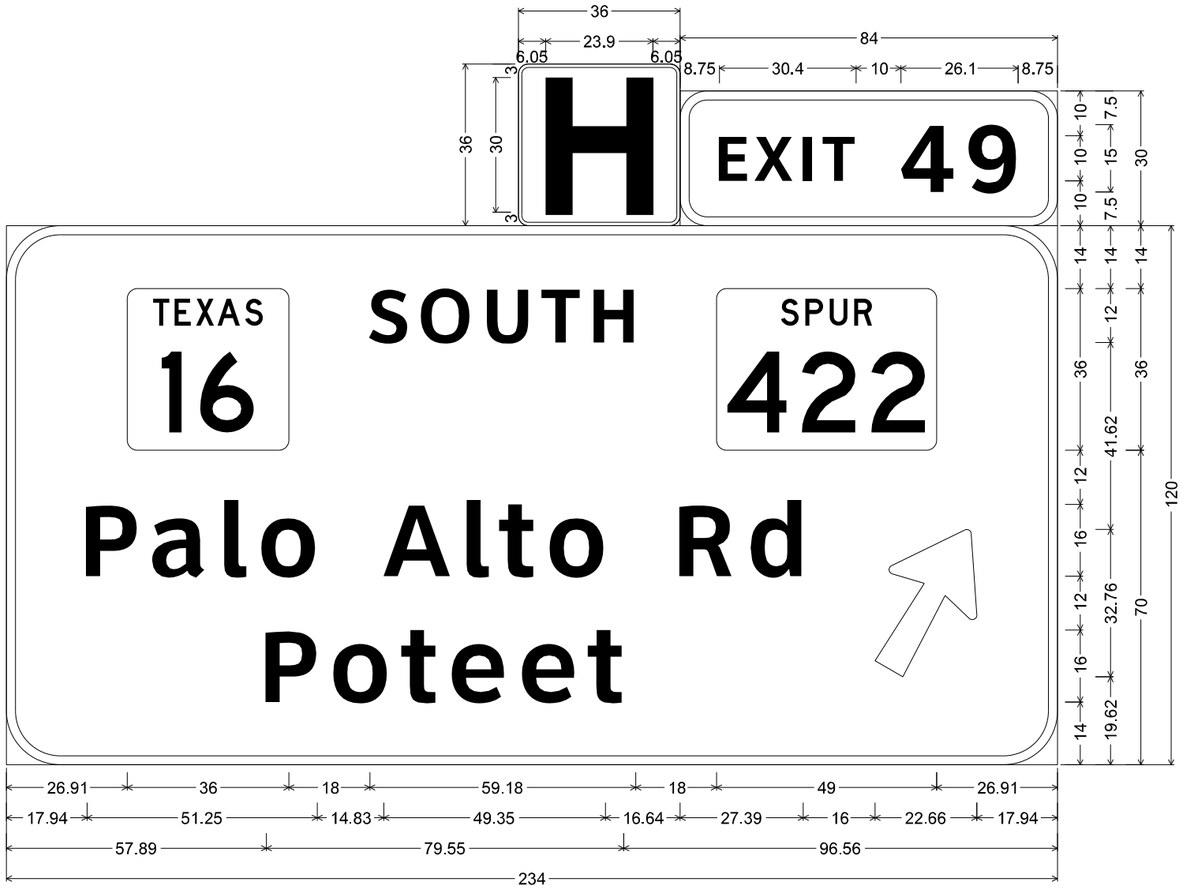
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		203
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

21-WB



Identifier : R14-2_36x36;
2.25" Radius, 0.88" Border, 0.63" Indent, Black on White;
12.00" Radius, 2.00" Border, White on Green;
[W] ClearviewHwy-5-W-R; [EST] ClearviewHwy-5-W-R; [N] ClearviewHwy-5-W-R; [ORTH] ClearviewHwy-5-W-R;
[S] ClearviewHwy-5-W-R; [OUTH] ClearviewHwy-5-W-R; Interstate 410 M1-1; State Highway 16 M1-6T2;
State Highway 130 M1-6T3;

22-WB



Identifier : D9-2_36x36;
2.25" Radius, 0.75" Border, White on Blue;
[H] E Mod;
6.00" Radius, 2.00" Border, White on Green;
[EXIT] ClearviewHwy-5-W-R; [49] ClearviewHwy-5-W-R;
12.00" Radius, 2.00" Border, White on Green;
State Highway 16 M1-6T2; [SOUTH] ClearviewHwy-5-W-R; State Highway 422 M1-6S3; [Palo Alto Rd] ClearviewHwy-5-W-R;
[Poteet] ClearviewHwy-5-W-R; Arrow A-3 - 35.63" 60°;

STATE OF TEXAS
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123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

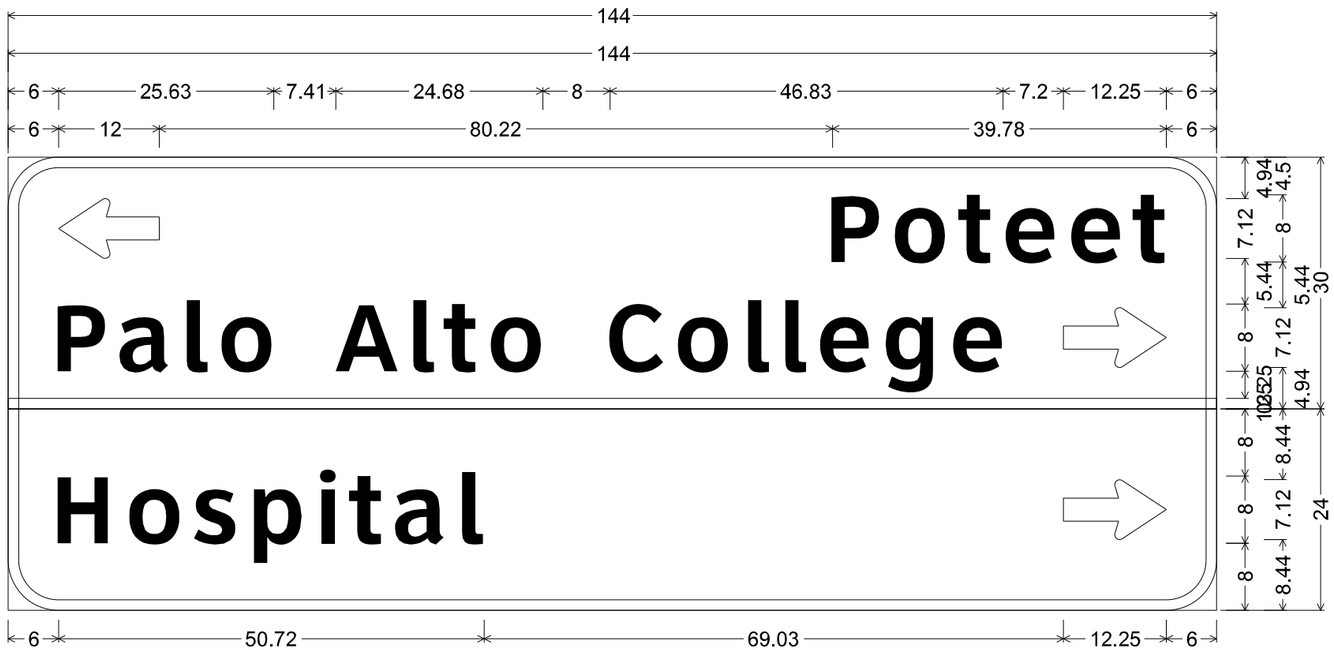
Texas Department of Transportation

GUIDE SIGN DETAILS
IH-410 (WB)
IH-35 TO IH-37

SHEET 11 OF 13

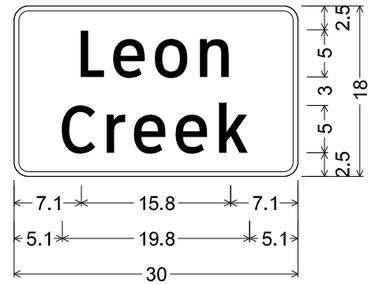
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		204
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

23-WB



6.00" Radius, 1.25" Border, White on Green;
Standard Arrow Custom 12.00" X 7.13" 180°; [Poteet] ClearviewHwy-5-W-R; [Palo Alto College] ClearviewHwy-5-W-R;
Standard Arrow Custom 12.25" X 7.13" 0°;
6.00" Radius, 1.25" Border, White on Blue;
[Hospital] ClearviewHwy-5-W-R; Standard Arrow Custom 12.25" X 7.13" 0°;

24-WB



Identifier : I-3 5in;
1.5" Radius, 0.5" Border, White on Green;
[Leon] ClearviewHwy-3-W;
[Creek] ClearviewHwy-3-W;

STATE OF TEXAS
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PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E.

2/28/2022
DATE

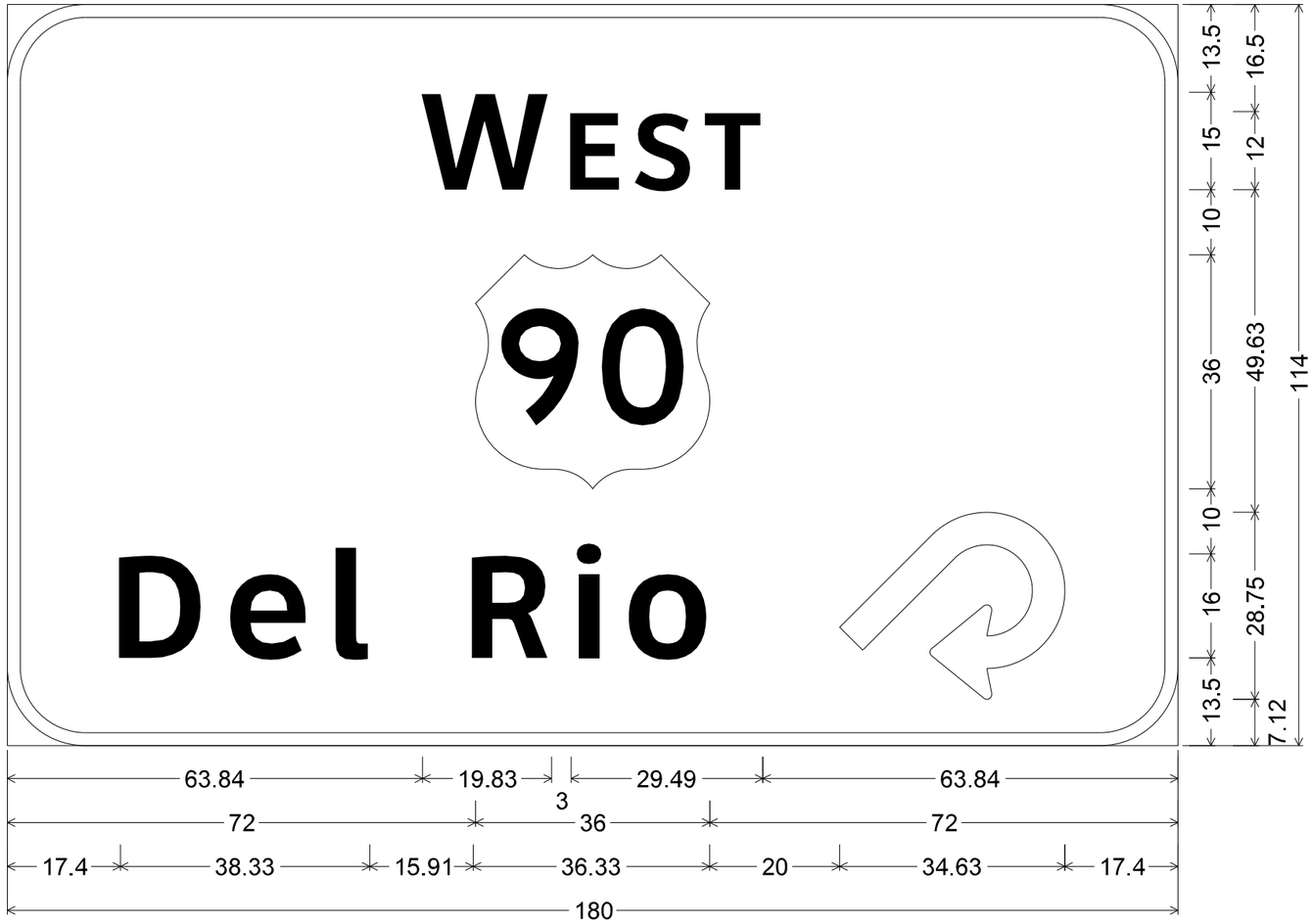
GUIDE SIGN DETAILS

IH 410 (WB)
SH 16 TO IH-37

SHEET 12 OF 13

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		205
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

25-WB



12.00" Radius, 2.00" Border, White on Green;
[W EST] ClearviewHwy-5-W-R; US 90 M1-4; [Del Rio] ClearviewHwy-5-W-R; Turn Arrow E-4;

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IH-410 (WB)
IH-35 TO IH-37

SHEET 13 OF 13

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		206
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

DN: DN

2/25/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\PLN*SHEETS\Plan Sheets\Sign Details\IH 410 (South).dgn

DESIGN DATA

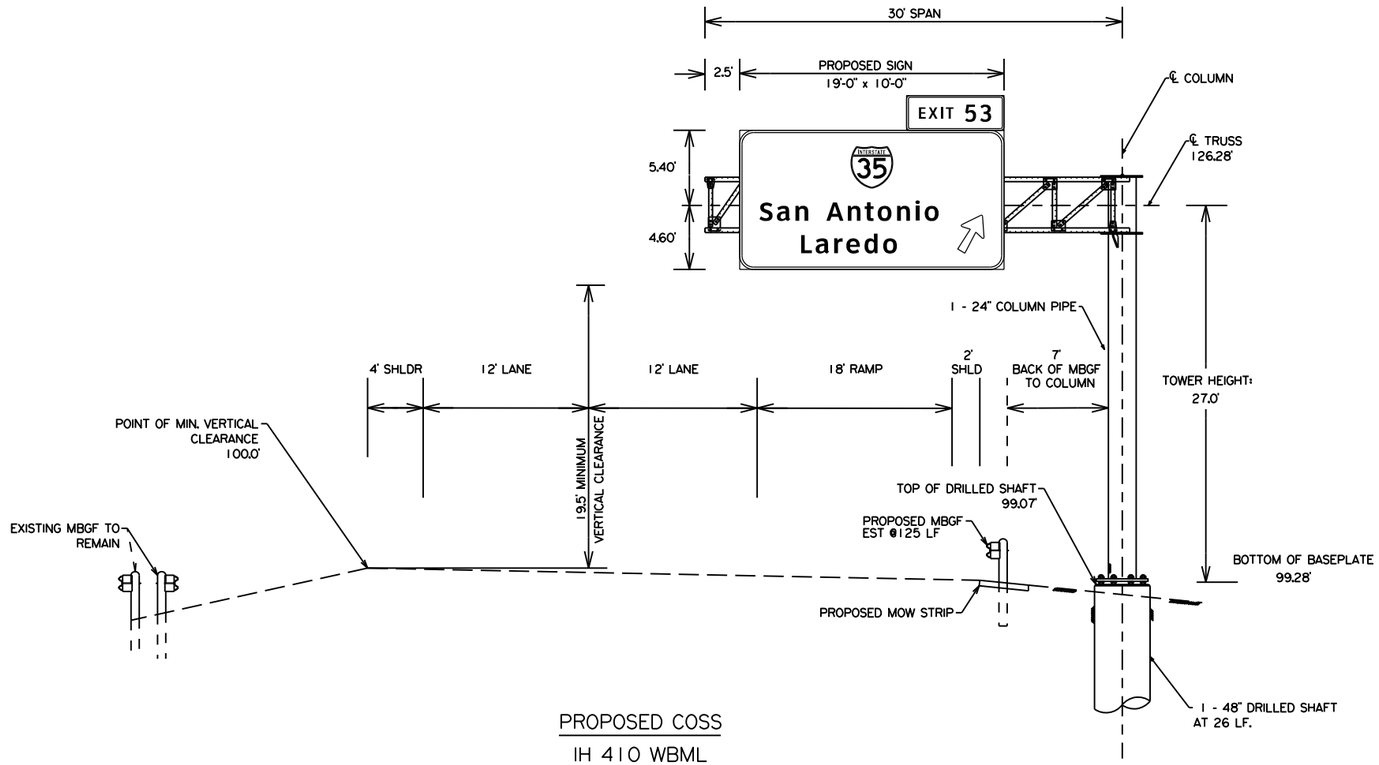
SPAN LENGTH	30 FT
ACTUAL SIGN AREA	207.5 SQ FT
WIND ZONE	ZONE 3
STRUCTURE ZONE	COSS-Z3
TRUSS SIZE	4.0' X 4.0'
DESIGN HEIGHT	27 FT
DESIGN SPAN	30 FT
PENETROMETER	10
TORSION	155.44 K-FT.
MOMENT	305.77 K-FT

FOUNDATION DETAILS

SHAFT DIAMETER	48 IN.
SHAFT REINF.	16 - #10
SHAFT EMBEDMENT LENGTH	23 FT.
SHAFT TOTAL LENGTH	26 FT.

STRUCTURE DETAILS

TRUSS TYPE	4.0 FT. x 4.0 FT.
TOWER PIPE DIAMETER	24 IN.
ANCHORS	2 IN. x 4 FT. 3 IN.



PROPOSED COSS
IH 410 WBML
AT IH 35 NB EXIT

ITEM NO.	DESCRIPTION	UNIT	QTY.
0416-6006	DRILL SHAFT (48 IN)	LF	26
0636-6003	ALUMINUM SIGNS (TY 0)	SF	208
0650-6032	INS OH SN SUP(30 FT CANT)	EA	1
0432 6045	RIPRAP (MOW STRIP)(4 IN)	CY	8
0496 6035	REMOV STR (DRILL SHAFT)	EA	2
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	125
0540 6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	1
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1
0650 6204	REMOVE OVERHD SIGN SUP	EA	1

NOTE:

1. IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL DIMENSIONS AND ELEVATIONS IN FIELD PRIOR TO ORDERING SIGN SUPPORT MATERIALS.
2. STAKE LOCATION OF OVERHEAD SIGN STRUCTURE TO BE APPROVED BY THE ENGINEER.
3. ALL SIGN STRUCTURE AND FOUNDATION ELEVATIONS SHALL BE VERIFIED IN THE FIELD AT THE ACTUAL LOCATION BY THE CONTRACTOR PRIOR TO DRILLING FOUNDATION.
4. SEE COSS-Z3 & Z31-10 STANDARD FOR DESIGN LOADS AND TRUSS DETAILS.
5. SEE SIGN DETAILS SHEET FOR GUIDE SIGN DETAILS
6. TOP OF DRILLED SHAFT TO FINISHED GRADE SHALL BE A MIN. OF 6"
7. MIN. VERTICAL CLEARANCE SHALL BE 19.5'
8. PENETROMETER VALUE OF N=10 BLOWS/FT WAS ASSUMED FOR FOUNDATION DEPTH DETERMINATION.
9. IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL UTILITIES PRIOR TO DRILLING COSS FOUNDATION.

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. — 3/4/2022 DATE

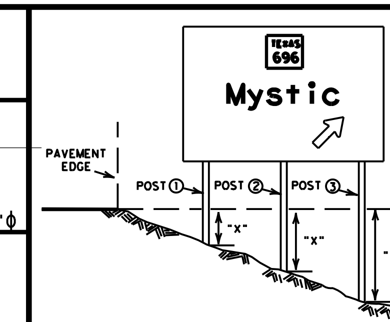
Texas Department of Transportation

COSS ELEVATION
IH 410 WESTBOUND
AT IH 35 NORTHBOUND EXIT

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		207
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

SUMMARY OF LARGE SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN BACK-GROUND COLOR	SIGN TEXT	SIGN DIMENSIONS	PLAQUES, & OTHER ATTACHMENTS: DIRECT APPLY	PLAQUES, & OTHER ATTACHMENTS: * ALUMINUM (TYPE A)	BACKGROUND SUBSTRATE (SQ FT): GROUND MOUNT (TYPE G)	BACKGROUND SUBSTRATE (SQ FT): OVERHEAD (TYPE O)	TYPE OF MOUNT	"X" DIMENSION ⊖ post ①	"X" DIMENSION ⊖ post ②	"X" DIMENSION ⊖ post ③	GALVANIZED STRUCTURAL STEEL: SIZE	GALVANIZED STRUCTURAL STEEL: LINEAR FEET post ①	GALVANIZED STRUCTURAL STEEL: LINEAR FEET post ②	GALVANIZED STRUCTURAL STEEL: LINEAR FEET post ③	GALVANIZED STRUCTURAL STEEL: TOTAL WEIGHT LBS.	DRILLED SHAFT: LINEAR FEET NON-REINF 12"ϕ	DRILLED SHAFT: LINEAR FEET REINFORCED 24"ϕ	DRILLED SHAFT: LINEAR FEET REINFORCED 30"ϕ	DRILLED SHAFT: LINEAR FEET REINFORCED 36"ϕ
	OSB-1	GREEN		7'-0" x 2'-6"				17.5													
					7.2																
				19'-0" x 10'-0"				190													
		GREEN																			
PAGE TOTALS								207.5													



⊖ The "X" dimension is the elevation difference at the post between the ground and the edge of pavement or top of curb.
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.
The post lengths listed here are approximations, The corrected post lengths will be furnished by the Contractor after the stud posts are placed.
Tower heights shall be verified with the Engineer before fabrication.

* This column is for aluminum Type A and not direct apply. Direct apply is subsidiary to the sign.

SIGN TYPE

SIGN TYPE 1 3 0
- 1 — Wind Design Zone
- 3 — No. of Posts
- 0 — Series No.: 0 Aluminum/Fiberglass, 1 Aluminum, 2 Fiberglass

See sheet SMD(8W1)

IH-410
(AT IH 35 NORTHBOUND EXIT)

SUMMARY OF LARGE SIGNS

SOLS

DN.: TxDOT	CK.: TxDOT	DW.: TxDOT	CK.: TxDOT	REVISIONS: 11-93, 8-95, 5-01, 1-04, 9-08

CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS
DIST	COUNTY		SHEET NO.
SAT	BEXAR		208

DATE: 2/25/2022 10:16:13 AM
FILE: T

3.00" Radius, 1.50" Border, White on Green;
[EXIT] ClearviewHwy-4-W; [53] ClearviewHwy-4-W;
12.00" Radius, 2.00" Border, White on Green;
Interstate 37 M1-1; [San Antonio] ClearviewHwy-5-W-R; [Laredo] ClearviewHwy-5-W-R; Arrow A-3 - 35.63" 60°;

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. — 2/28/2022 DATE

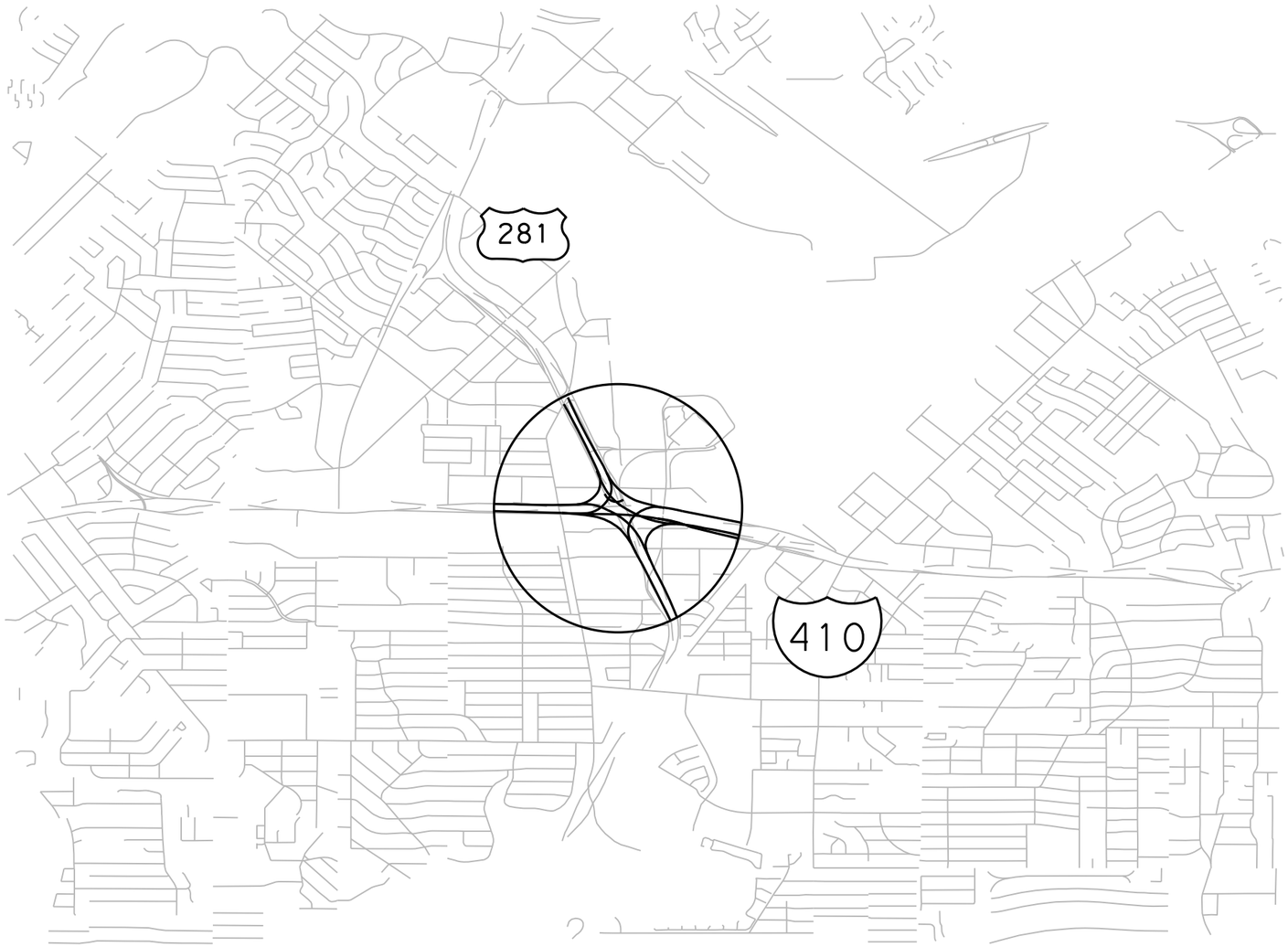
Texas Department of Transportation

GUIDE SIGN DETAILS
IH 410

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		209
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

DW: DN

2/25/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\OSB\IH 410\Design\SIGN DETAILS\Sign Detail SA-Laredo.dgn



N

N. T. S.

LEGEND

US 281 VIA IH-410 INTERCHANGE AREA

CORIDOR LIMITS

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E.

2/28/2022
DATE

Texas Department of Transportation

LOCATION MAP

US 281 AT IH-410
DIRECT CONNECTORS

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		210
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

2/25/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\PLN*SHEETS\Plan Sheets\Location Maps\DC Chevron maps\IH-410*DC*US-281\410-281-DC*LOC. dgn DN

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 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
		W1-8R		36x48	✓				USE PRE-EXISTING MOUNT/ HARDWARE		N/A FROM NB US 281 TO EB IH-410	
		W12-1		48x48	✓				USE PRE-EXISTING MOUNT/ HARDWARE		N/A FROM NB US 281 TO EB IH-410	
		W4-3L		48x48	✓				USE PRE-EXISTING MOUNT/ HARDWARE		N/A FROM NB US 281 TO EB IH-410	
		W9-1R		48x48	✓				USE PRE-EXISTING MOUNT/ HARDWARE		N/A FROM NB US 281 TO EB IH-410	
		W9-2TL		48x48	✓				USE PRE-EXISTING MOUNT/ HARDWARE		N/A FROM NB US 281 TO EB IH-410	
		W1-8L		36x48	✓				USE PRE-EXISTING MOUNT/ HARDWARE		N/A FROM NB US 281 TO WB IH-410	
		W4-3R		48x48	✓				USE PRE-EXISTING MOUNT/ HARDWARE		N/A FROM NB US 281 TO WB IH-410	
		W1-8		36x48	✓				USE PRE-EXISTING MOUNT/ HARDWARE		N/A FROM SB US 281 TO WB IH-410	
		W12-1		48x48	✓				USE PRE-EXISTING MOUNT/ HARDWARE		N/A FROM SB US 281 TO WB IH-410	
		W4-3L		48x48	✓				USE PRE-EXISTING MOUNT/ HARDWARE		N/A FROM SB US 281 TO WB IH-410	
		W9-1R		48x48	✓				USE PRE-EXISTING MOUNT/ HARDWARE		N/A FROM SB US 281 TO WB IH-410	
		W9-2TL		48x48	✓				USE PRE-EXISTING MOUNT/ HARDWARE		N/A FROM SB US 281 TO WB IH-410	

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).

US 281 AT IH-410
DIRECT CONNECTORS

Texas Department of Transportation | Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

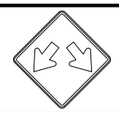
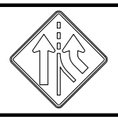
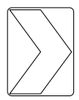
SOSS

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		0915	00	238	VARIOUS
4-16 8-16		DIST	COUNTY		SHEET NO.
		SAT	BEXAR		211

18

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
		W1-8R		36x48	✓				USE PRE-EXISTING MOUNT/ HARDWARE		N/A FROM SB US 281 TO EB IH-410	
		W4-3R		48x48	✓				USE PRE-EXISTING MOUNT/ HARDWARE		N/A FROM NB US 281 TO EB IH-410	
		W1-8L		36x48	✓				USE PRE-EXISTING MOUNT/ HARDWARE		N/A FROM EB IH-410 TO NB US 281	
		W4-3R		48x48	✓				USE PRE-EXISTING MOUNT/ HARDWARE		N/A FROM EB IH-410 TO NB US 281	
		W9-1R		48x48	✓				USE PRE-EXISTING MOUNT/ HARDWARE		N/A FROM EB IH-410 TO NB US 281	
		W9-2TL		48x48	✓				USE PRE-EXISTING MOUNT/ HARDWARE		N/A FROM EB IH-410 TO NB US 281	
		W1-8		36x48	✓				USE PRE-EXISTING MOUNT/ HARDWARE		N/A FROM WB IH-410 TO NB US 281	
		W12-1		48x48	✓				USE PRE-EXISTING MOUNT/ HARDWARE		N/A FROM WB IH-410 TO NB US 281	
		W1-8R		36x48	✓				USE PRE-EXISTING MOUNT/ HARDWARE		N/A FROM WB IH-410 TO SB US 281	
		W4-3R		48x48	✓				USE PRE-EXISTING MOUNT/ HARDWARE		N/A FROM WB IH-410 TO SB US 281	
		W1-8R		36x48	✓				USE PRE-EXISTING MOUNT/ HARDWARE		N/A FROM EB IH-410 TO SB US 281	
		W9-2TL		48x48	✓				USE PRE-EXISTING MOUNT/ HARDWARE		N/A FROM EB IH-410 TO SB US 281	

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).

US 281 AT IH-410
DIRECT CONNECTORS

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	00	238	VARIOUS
4-16 8-16	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		212

18

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
		W9-1R		48x48	✓				USE PRE-EXISTING MOUNT/ HARDWARE		N/A FROM EB IH-410 TO SB US 281	
		W4-3R		48x48	✓				USE PRE-EXISTING MOUNT/ HARDWARE		N/A FROM EB IH-410 TO SB US 281	

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).

US 281 AT IH-410
DIRECT CONNECTORS

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	00	238	VARIOUS
4-16 8-16	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		213

N

N. T. S.

LEGEND

IH-35/IH-10 INTERCHANGE AREA

CORIDOR LIMITS

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E.

2/28/2022
DATE

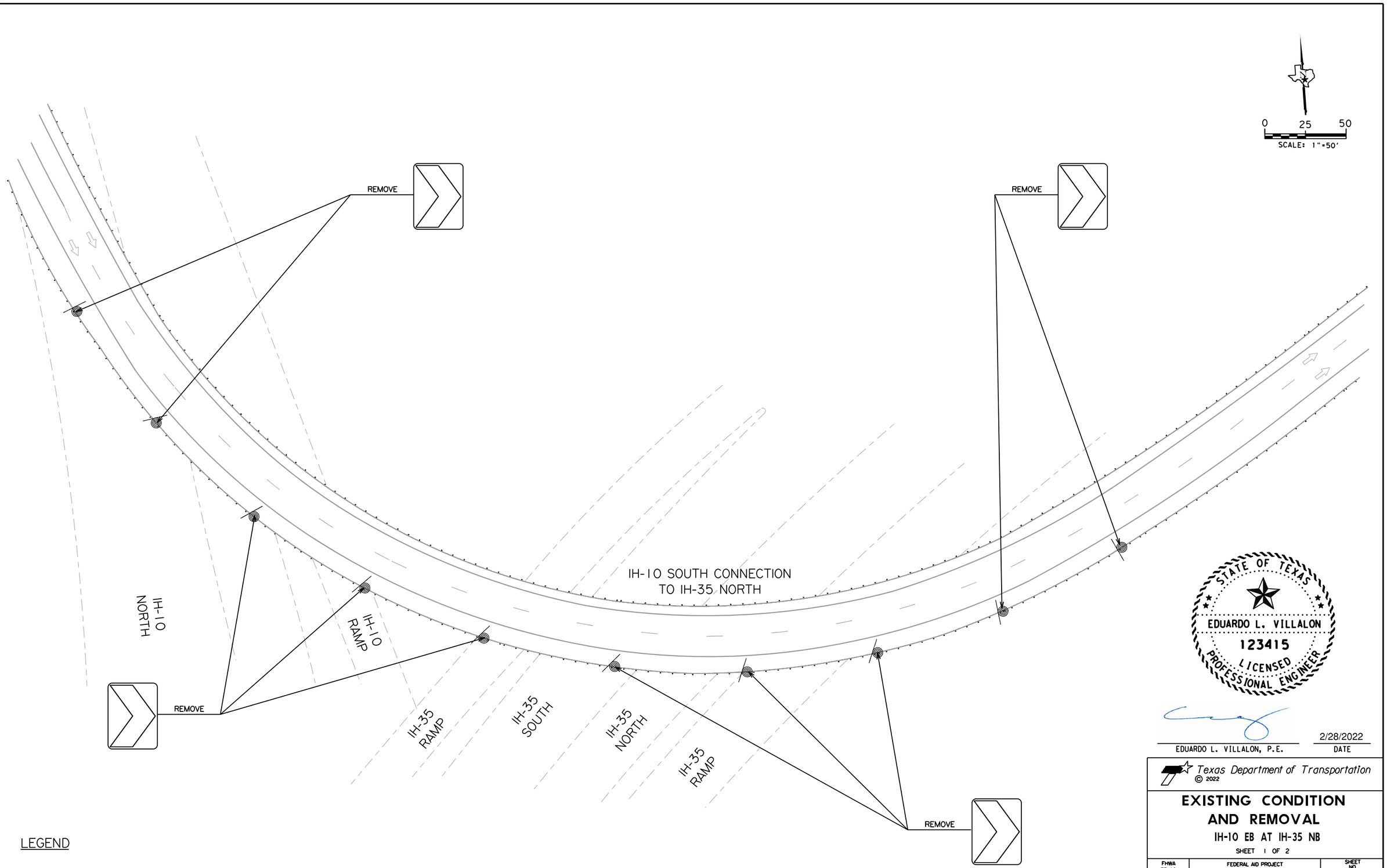
Texas Department of Transportation

LOCATION MAP

IH-10 EAST AT IH-35 NORTH DIRECT CONNECTION

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		214
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

2/25/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\PLN*SHEETS\Plan Sheets\Location Maps\DC Chevron maps\IH-35*DC*IH-10\IH-35*DC*IH-10*LOCATION.dgn
dw $$BN



LEGEND

⇦ ····· DIRECTION OF TRAFFIC FLOW

EXISTING SIGNAGE

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E.

2/28/2022
DATE

Texas Department of Transportation

EXISTING CONDITION AND REMOVAL

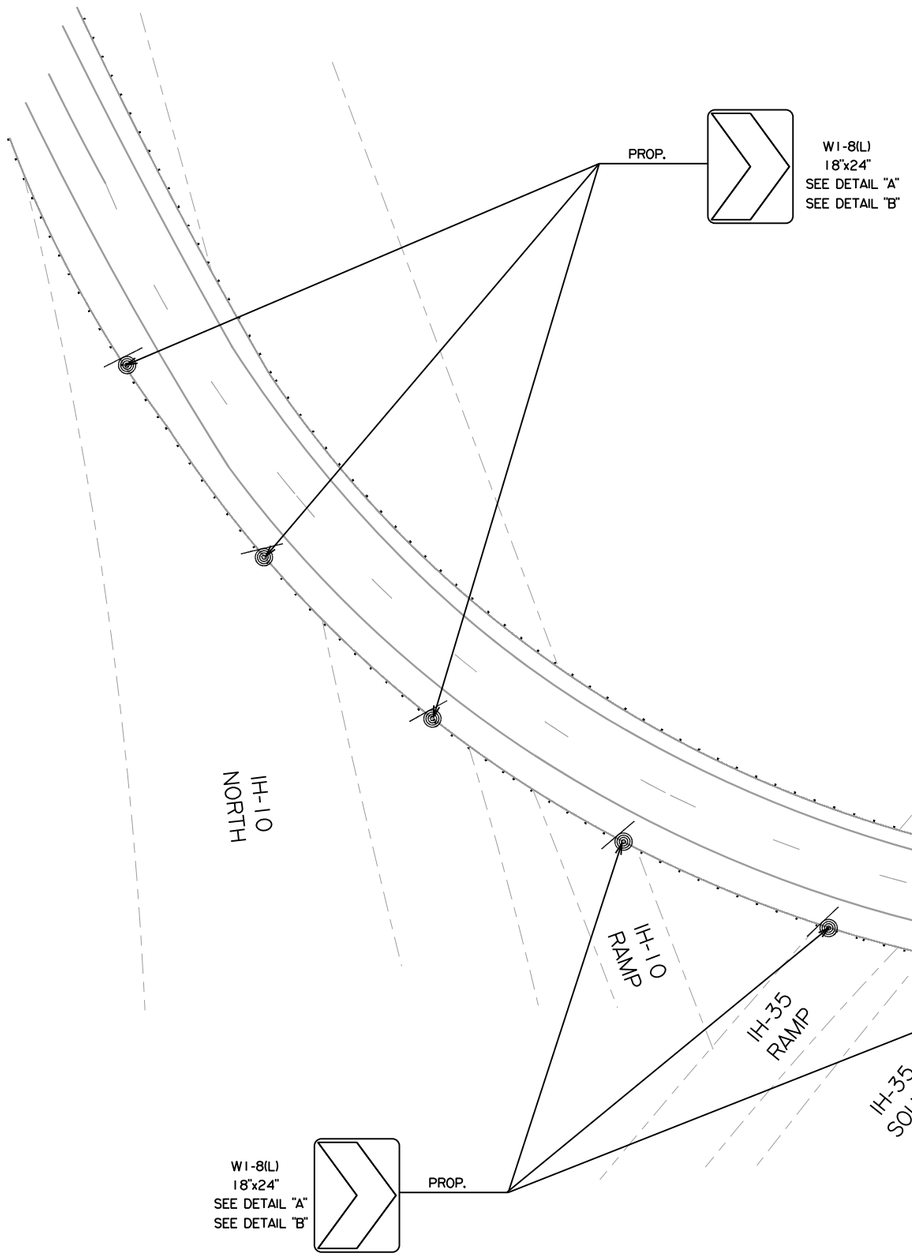
IH-10 EB AT IH-35 NB

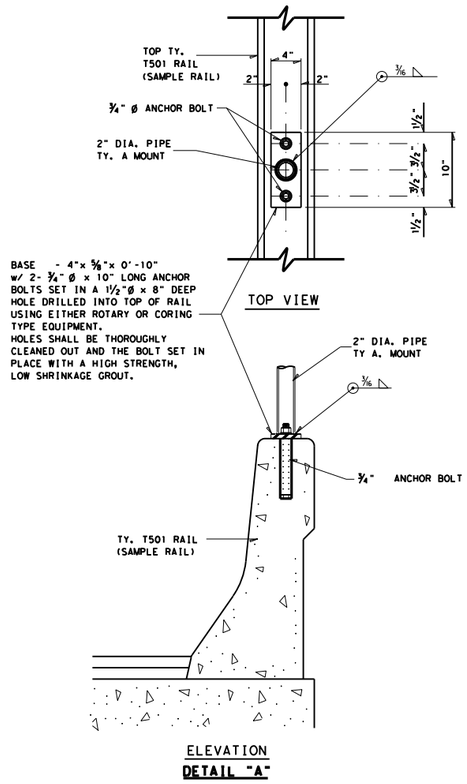
SHEET 1 OF 2

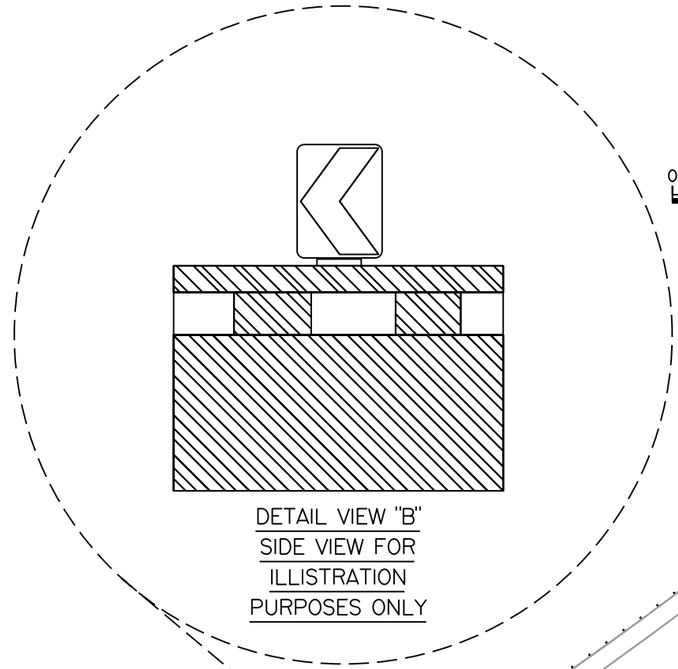
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		215
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

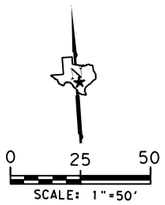
2/25/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\PLN*SHEETS\Plan Sheets\Summary\Working Files\IH-35*via*IH-10\IH-35*IH-10*DC-INTERCHANGE_DETAIL.dgn

NOTES:
PROPOSED SIGNAGE WILL BE MOUNTED AS PER THE DETAILS ALONG TOP OF THE TANKER RAIL BARRIER.
DISTANCE BETWEEN PROPOSED SIGNS WILL BE APPROXIMATELY 80 LF.





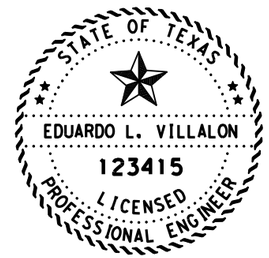




LEGEND

⇦ DIRECTION OF TRAFFIC FLOW

EXISTING SIGNAGE



EDUARDO L. VILLALON, P.E.

2/28/2022
DATE

Texas Department of Transportation
© 2022

PROPOSED CHEVRON SIGNAGE

IH-10 NB AT IH-35 EB

SHEET 2 OF 2

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		216
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

2/25/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\PLN*SHEETS\Plan Sheets\Summary\Working Files\IH-35*via*IH-10\IH-35*IH-10*DC-INTERCHANGE_DETAIL.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
	1-10	W1-8L		18x24	✓		RAIL		SEE DETAIL SHEETS FOR MOUNTING & HARDWARE SPEC		N/A FROM EB IH-410 TO NB IH-10	

ALUMINUM SIGN BLANKS THICKNESS	

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).

IH-35 INT AT IH-10
(IH-10 SOUTH
TO IH-35 NORTH)

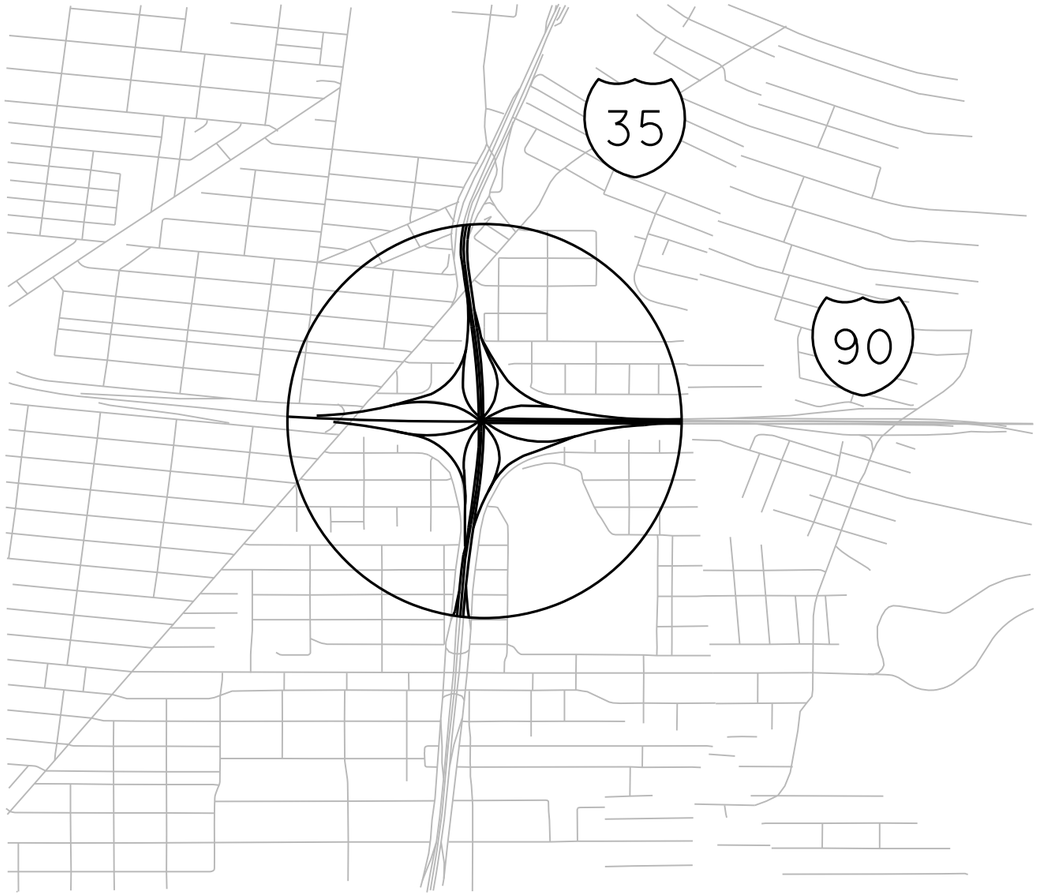
Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	00	238	VARIOUS
4-16 8-16	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		217



N

N. T. S.

LEGEND

CONNECTION

CORIDOR LIMITS

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E.

2/28/2022
DATE

LOCATION MAP

IH-35 AT US-90
DIRECT CONNECTORS

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		218
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

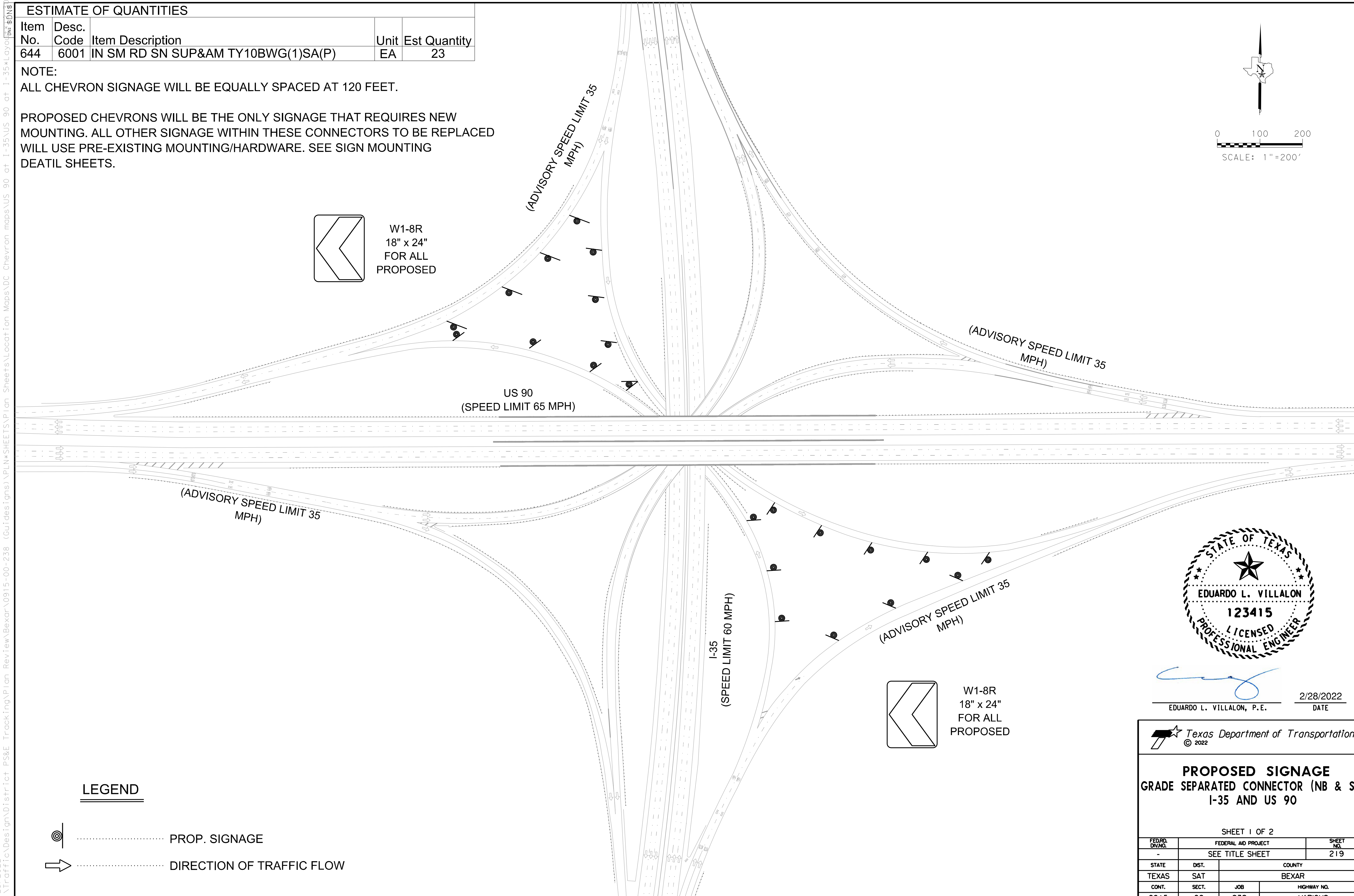
ESTIMATE OF QUANTITIES

Item No.	Desc. Code	Item Description	Unit	Est Quantity
644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	23

NOTE:

ALL CHEVRON SIGNAGE WILL BE EQUALLY SPACED AT 120 FEET.

PROPOSED CHEVRONS WILL BE THE ONLY SIGNAGE THAT REQUIRES NEW MOUNTING. ALL OTHER SIGNAGE WITHIN THESE CONNECTORS TO BE REPLACED WILL USE PRE-EXISTING MOUNTING/HARDWARE. SEE SIGN MOUNTING DEATIL SHEETS.



STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E. 2/28/2022
DATE

Texas Department of Transportation
© 2022

PROPOSED SIGNAGE
GRADE SEPARATED CONNECTOR (NB & SB)
I-35 AND US 90

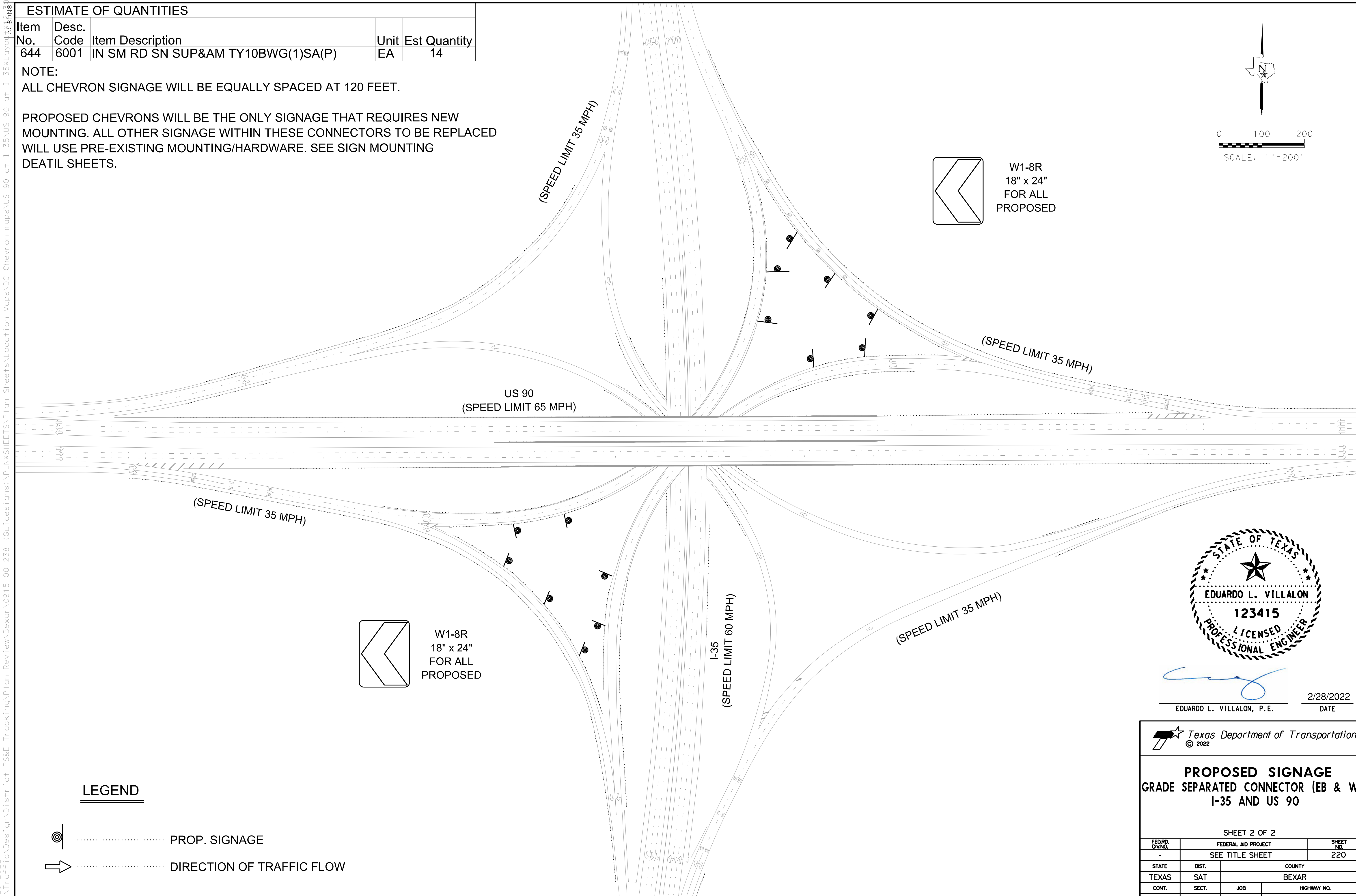
SHEET 1 OF 2

FED.RD. DIV.NO.	FEDERAL AID PROJECT		SHEET NO.
-	SEE TITLE SHEET		219
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

ESTIMATE OF QUANTITIES				
Item No.	Desc. Code	Item Description	Unit	Est Quantity
644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	14

NOTE:
ALL CHEVRON SIGNAGE WILL BE EQUALLY SPACED AT 120 FEET.

PROPOSED CHEVRONS WILL BE THE ONLY SIGNAGE THAT REQUIRES NEW MOUNTING. ALL OTHER SIGNAGE WITHIN THESE CONNECTORS TO BE REPLACED WILL USE PRE-EXISTING MOUNTING/HARDWARE. SEE SIGN MOUNTING DEATIL SHEETS.



LEGEND

PROP. SIGNAGE

DIRECTION OF TRAFFIC FLOW

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E.

2/28/2022
DATE

Texas Department of Transportation

PROPOSED SIGNAGE
GRADE SEPARATED CONNECTOR (EB & WB) I-35 AND US 90

SHEET 2 OF 2

FED.RD. DIV.NO.	FEDERAL AID PROJECT	SHEET NO.
-	SEE TITLE SHEET	220

STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

2/25/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\PLN*SHEETS\Plan Sheets\Location Maps\DC Chevron maps\US 90 at I-35\US 90 at I-35*Layout...

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
											(SEE DETAIL SHEET)	
		W1-8R		36x48 (X3)	✓		S80	1	SB	T	N/A FROM NB IH-35 TO EB US 90	
		W13-2		48x60	✓						N/A FROM NB IH-35 TO EB US 90	
		W1-2R		48x48	✓						N/A FROM NB IH-35 TO EB US 90	
		W13-1P		30x30	✓						N/A FROM NB IH-35 TO EB US 90	
		W9-2TR		48x48	✓						N/A FROM NB IH-35 TO EB US 90	
		W1-8L		36x48 (X7)	✓		S80	1	SB	T	N/A FROM NB IH-35 TO WB US 90	
		W1-2L		48x48	✓						N/A FROM NB IH-35 TO WB US 90	
		W13-1P		30x30	✓						N/A FROM NB IH-35 TO WB US 90	
		W12-2		48x48	✓						N/A FROM NB IH-35 TO WB US 90	
		W1-1L		48x48	✓						N/A FROM NB IH-35 TO WB US 90	
		W13-1P		30x30	✓						N/A FROM NB IH-35 TO WB US 90	
		W3-2		48x48	✓						N/A FROM NB IH-35 TO WB US 90	

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).

IH-35 AT US-90
DIRECT CONNECTORS

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		0915	00	238	VARIOUS
4-16 8-16		DIST	COUNTY		SHEET NO.
		SAT	BEXAR		221

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"	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 TY N TY S
		W8-13aT	BRIDGE MAY ICE IN COLD WEATHER	48x48	✓						N/A FROM NB IH-35 TO WB US 90	
		R1-2	YIELD	48x48	✓						N/A FROM NB IH-35 TO WB US 90	
		W1-8R		36x48 (X4)	✓		S80	1	SB	T	N/A FROM SB IH-35 TO WB US 90	
		W13-2	EXIT 40 MPH	48x60	✓						N/A FROM SB IH-35 TO WB US 90	
		W1-2R		48x48	✓						N/A FROM SB IH-35 TO WB US 90	
		W13-1P	35 MPH	30x30	✓						N/A FROM SB IH-35 TO WB US 90	
		W8-13aT	BRIDGE MAY ICE IN COLD WEATHER	48x48	✓						N/A FROM SB IH-35 TO WB US 90	
		W1-8L		36x48 (X8)	✓		S80	1	SB	T	N/A FROM SB IH-35 TO EB US 90	
		W1-2L		48x48	✓						N/A FROM SB IH-35 TO EB US 90	
		W13-1P	35 MPH	30x30	✓						N/A FROM SB IH-35 TO EB US 90	
		W12-2	15"=6'	48x48	✓						N/A FROM SB IH-35 TO EB US 90	
		W1-1L		48x48	✓						N/A FROM SB IH-35 TO EB US 90	

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:

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

IH-35 AT US-90
DIRECT CONNECTORS

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		0915	00	238	VARIOUS
4-16 8-16		DIST	COUNTY		SHEET NO.
		SAT	BEXAR		222

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")	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: TY N, TY S
		W13-1P		30x30	✓						N/A FROM SB IH-35 TO EB US 90	
		W1-8R		36x48 (X3)	✓		S80	1	SB	T	N/A FROM WB US 90 TO NB IH-35	
		W1-2R		48x48	✓						N/A FROM WB US 90 TO NB IH-35	
		W13-1P		30x30	✓						N/A FROM WB US 90 TO NB IH-35	
		R1-2		48x48	✓						N/A FROM WB US 90 TO NB IH-35	
		W1-8L		36x48 (X4)	✓		S80	1	SB	T	N/A FROM WB US 90 TO SB IH-35	
		W1-2L		48x48	✓						N/A FROM WB US 90 TO SB IH-35	
		W13-1P		30x30	✓						N/A FROM WB US 90 TO SB IH-35	
		W12-2		48x48	✓						N/A FROM WB US 90 TO SB IH-35	
		W4-1R		48x48	✓						N/A FROM WB US 90 TO SB IH-35	
		W1-8R		36x48 (X3)	✓		S80	1	SB	T	N/A FROM EB US 90 TO SB IH-35	
		W1-2R		48x48	✓						N/A FROM EB US 90 TO SB IH-35	

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:

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

IH-35 AT US-90
DIRECT CONNECTORS

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	00	238	VARIOUS
4-16	DIST	COUNTY		SHEET NO.
8-16	SAT	BEXAR		223

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
		W13-1P	35 MPH	30x30	✓						N/A FROM EB US 90 TO SB IH-35	
		W8-13aT	BRIDGE MAY ICE IN COLD WEATHER	48x48	✓						N/A FROM EB US 90 TO SB IH-35	
		W3-2		48x48	✓						N/A FROM EB US 90 TO SB IH-35	
		R1-2	YIELD	48x48	✓						N/A FROM EB US 90 TO SB IH-35	
		W1-8L		36x48 (X4)	✓		S80	1	SB	T	N/A FROM EB US 90 TO NB IH-35	
		W1-2L		48x48	✓						N/A FROM EB US 90 TO NB IH-35	
		W13-1P	35 MPH	30x30	✓						N/A FROM EB US 90 TO NB IH-35	
		W8-13aT	BRIDGE MAY ICE IN COLD WEATHER	48x48	✓						N/A FROM EB US 90 TO NB IH-35	
		W4-1R		48x48	✓						N/A FROM EB US 90 TO NB IH-35	

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).

IH-35 AT US-90
DIRECT CONNECTORS

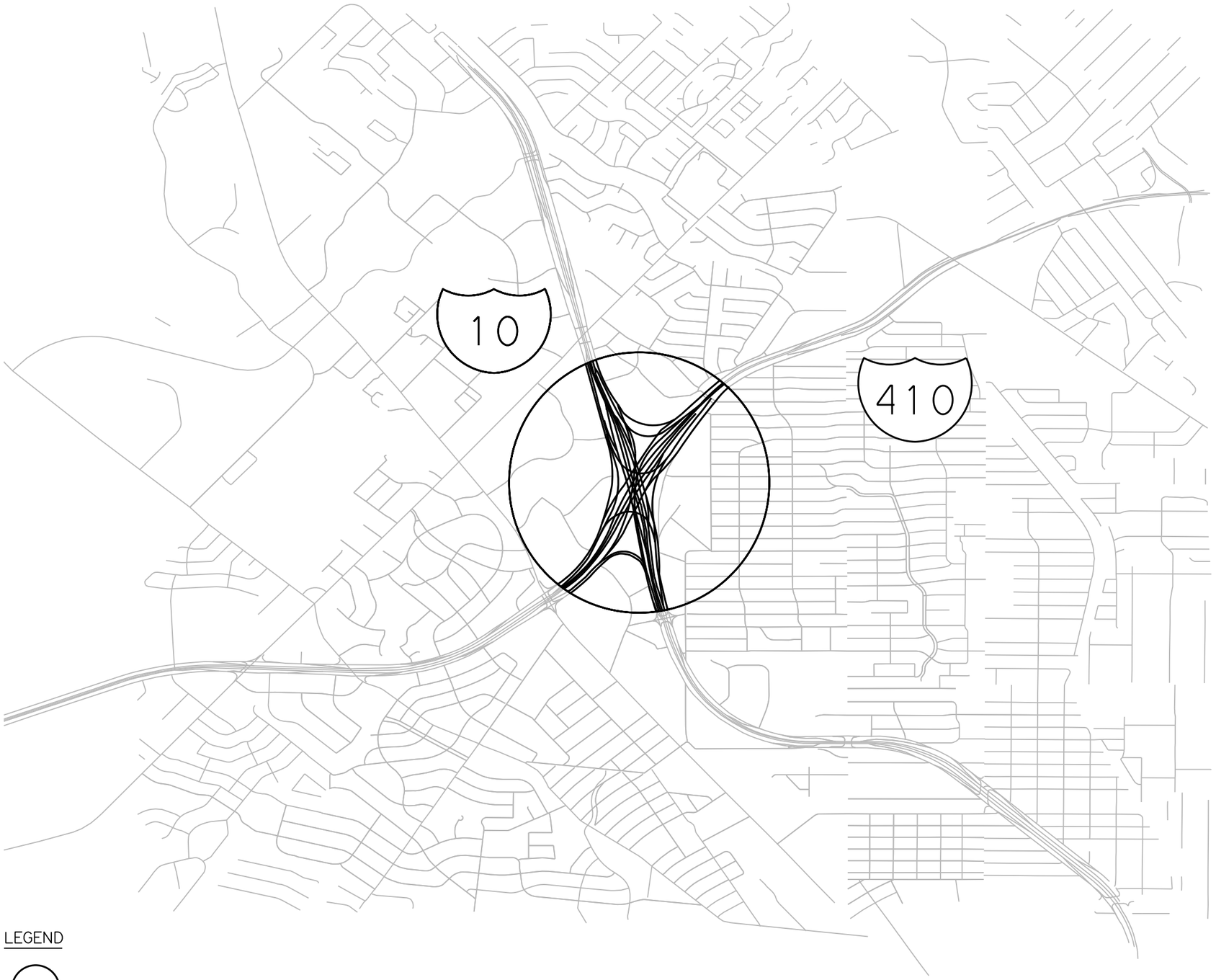
Texas Department of Transportation | Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	00	238	VARIOUS
4-16 8-16	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		224

18



N

N. T. S.

LEGEND

IH-10 VIA IH-410 LOOP INTERCHANGE AREA

CORIDOR LIMITS

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

EDUARDO L. VILLALON, P.E.

2/28/2022
DATE

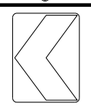
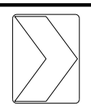
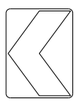
LOCATION MAP

IH-10 AT IH-410
DIRECT CONNECTORS

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		225
STATE	DIST.	COUNTY	
TEXAS	SAT	BEXAR	
CONT.	SECT.	JOB	HIGHWAY NO.
0915	00	238	VARIOUS

2/25/2022
T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\PLN*SHEETS\Plan Sheets\Location Maps\DC Chevron maps\IH-410*DC*IH-10\410via10*Loc.dgn DN

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	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"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	TY N TY S
		W1-8R		36x48 (X6)	✓						N/A FROM NB IH-10 TO EB IH-410 LOOP	
		W1-8L		36x48 (X11)	✓						N/A FROM NB IH-10 TO WB IH-410 LOOP	
		W4-3L		48x48	✓						N/A FROM NB IH-10 TO WB IH-410 LOOP	
		W12-2		48x48	✓						N/A FROM NB IH-10 TO WB IH-410 LOOP	
		W4-3L		48x48	✓						N/A FROM SB IH-10 TO WB IH-410 LOOP	
		W1-8L		36x48 (X8)	✓						N/A FROM SB IH-10 TO EB IH-410 LOOP	
		W1-8R		36x48 (X8)	✓						N/A FROM WB IH-410 TO NB IH-10	
		W4-3L		48x48	✓						N/A FROM WB IH-410 TO NB IH-10	
		W1-8L		36x48 (X6)	✓						N/A FROM EB IH-410 TO NB IH-10	
		W9-1R		48x48	✓						N/A FROM WB IH-410 TO SB IH-10	
		W1-8R		36x48 (X9)	✓						N/A FROM EB IH-410 TO SB IH-10	
		W4-3L		48x48	✓						N/A FROM EB IH-410 TO SB IH-10	

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).

IH-10 INT AT IH-410
DIRECT CONNECTORS

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	00	238	VARIOUS
4-16 8-16	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		226

18

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
		W9-1R	RIGHT LANE ENDS	48X48	✓						N/A FROM EB IH-410 TO NB IH-10	TY N TY S

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"

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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IH-10 AT IH-410
DIRECT CONNECTORS

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

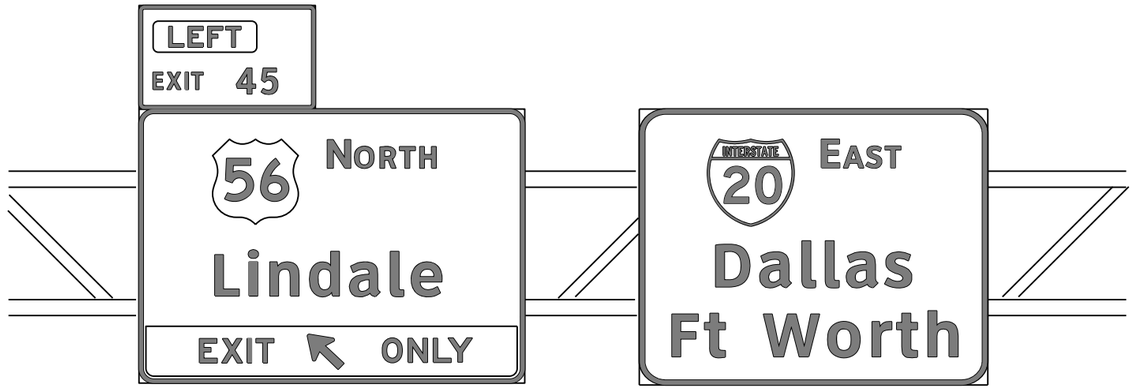
FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		0915	00	238	VARIOUS
4-16		DIST	COUNTY		SHEET NO.
8-16		SAT	BEXAR		227

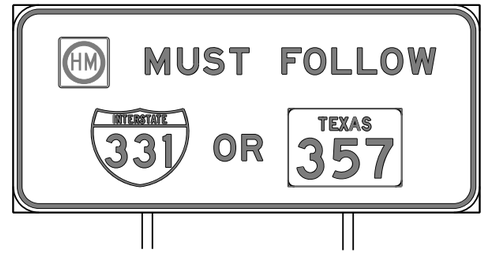
18

DATE: 2/25/2022 10:19:24 AM
FILE: I:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 TSR designs\TSR1-13.dgn

REQUIREMENTS FOR OVERHEAD AND LARGE GROUND-MOUNTED SIGNS

TYPICAL EXAMPLES





GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign summary sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. Black legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod, or F).
   White legend shall use the Clearview Alphabet.
   The following Clearview fonts shall be used to replace the existing white FHWA lettering, 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. 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 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 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 need not be trimmed or rounded if fabricated from an extruded material.
7. Sign substrate for ground-mounted signs shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative. Sign substrate for overhead signs shall be any material that meets DMS-7110. Exit Number Panels attached above the parent sign shall be made with the same substrate and sheeting as the parent sign.
8. Mounting details of attachments to parent sign face are shown on Standard Plan Sheet TSR(5). Mounting details of exit number panels above parent sign are shown in the "SMD series" Standard Plan Sheets.
9. Background sheeting shall be applied to the substrate per sheeting manufacturer's recommendations. Sheeting will not be allowed to bridge the horizontal gap between panels.
10. Cut all legend, symbols, borders, and direct applied sign attachments at panel joints.

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/

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

Texas Department of Transportation

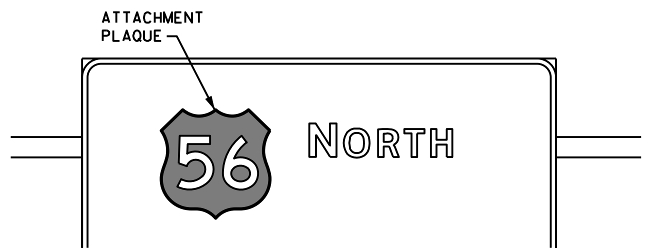
Traffic Operations Division Standard

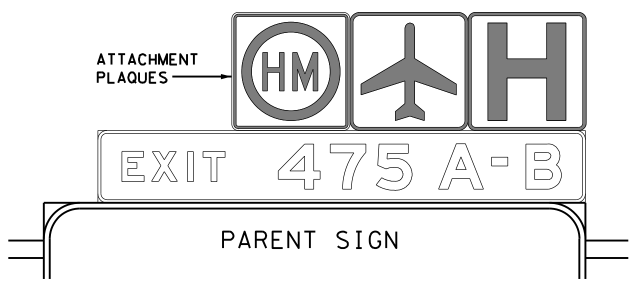
TYPICAL SIGN REQUIREMENTS

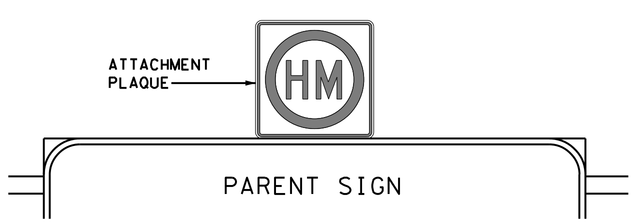
TSR(1)-13

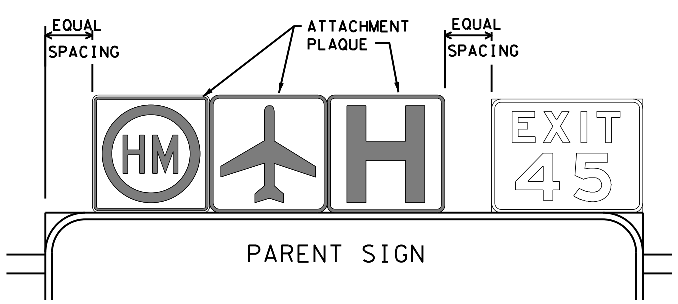
FILE: tsr1-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	00	238	VARIOUS
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	SAT	BEXAR		228

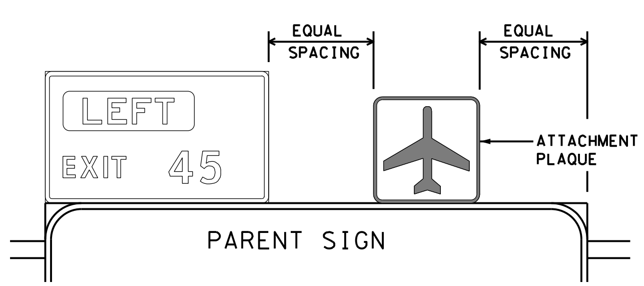
REQUIREMENTS FOR ATTACHMENTS TO OVERHEAD AND LARGE GROUND MOUNTED SIGNS









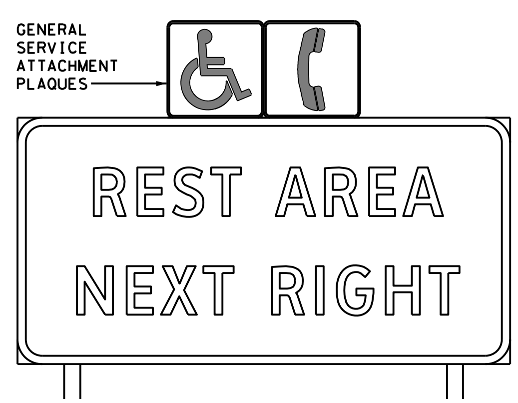


DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	ALL	TYPE B OR C SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	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. Route Marker legends (ie. IH, US, SH and FM shields) 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 and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film or colored sheeting to white background sheeting, or combination thereof.
7. Route markers and other attachments within the parent sign face shall be direct applied unless otherwise specified in the plans. Attachments not direct applied shall use 0.063 inch thick one piece sheet aluminum signs (Type A).
8. General Service Plaques shall be 0.080 inch thick and Routing Plaques shall be 0.100 inch thick.
9. The priority for Routing Plaques shall be (left to right) Hazardous Material, Airport then Hospital. See examples for mounting location.
10. Mounting details of attachments to parent signs face are shown on Standard Plan Sheet TSR(5). Mounting details of sign plaque attachments above and below parent sign are shown in the "SMD series" Standard Plan Sheets.
11. Plaques shall be horizontally centered at the top of the parent sign. If an exit number panel exists, the plaque shall be centered between the edge of the parent sign and the edge of the exit number panel. The plaque may be placed above the exit number panel when there is insufficient space.

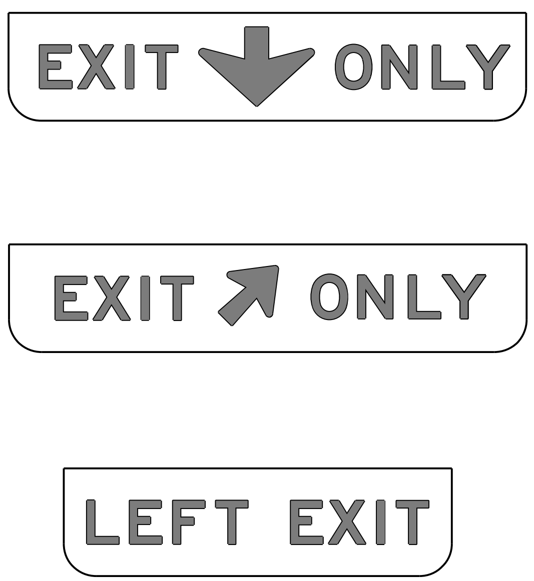


TYPICAL EXAMPLES

REQUIREMENTS FOR EXIT ONLY AND LEFT EXIT PANELS

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

SHEETING REQUIREMENTS FOR OVERHEAD EXIT PANELS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	FLUORESCENT YELLOW	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND	BLACK	ACRYLIC NON-REFLECTIVE FILM



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). Individual panel sizes shown in the plans may be adjusted to fit actual parent sign sizes if necessary.
2. Exit Panel legend shall use the Federal Highway Administration (FHWA)Standard Highway Alphabets E Series.
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 shall be applied by screening process or cut-out acrylic non-reflective black film to yellow background sheeting, or combination thereof.
5. Exit Only and Left Exit panels within the parent sign face shall be direct applied unless otherwise specified in the plans. Panels not direct applied shall use 0.063 inch thick one piece sheet aluminum signs (Type A).
6. Mounting details of Exit Only and Left Exit panel attachments to parent signs face are shown on Standard Plan Sheet TSR(5).

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(2)-13

FILE: tsr2-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT 0915	SECT 00	JOB 238	HIGHWAY VARIOUS
REVISIONS 12-03 7-13 9-08	DIST SAT	COUNTY BEXAR		SHEET NO. 229

2

DATE: 2/25/2022 10:19:28 AM
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DATE: 2/25/2022 10:19:33 AM
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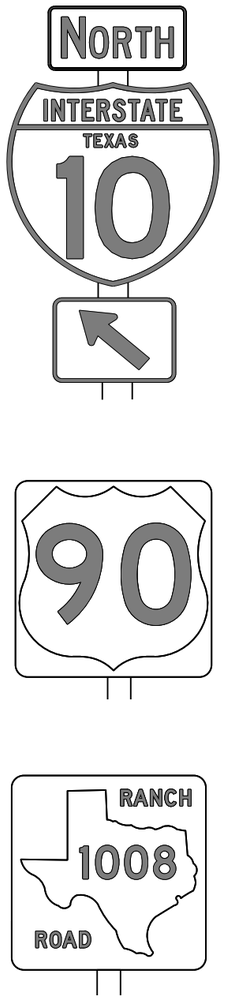
REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

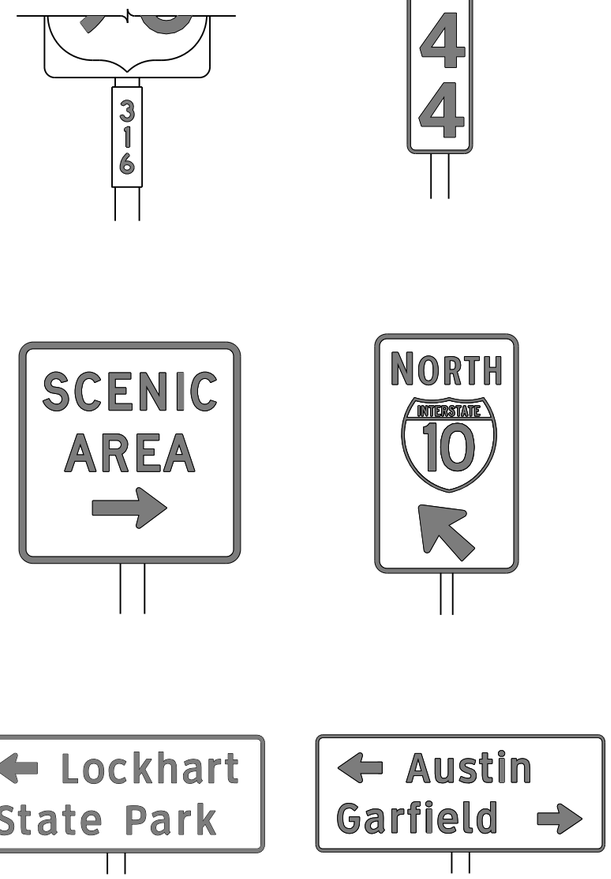
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B or C SHEETING



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

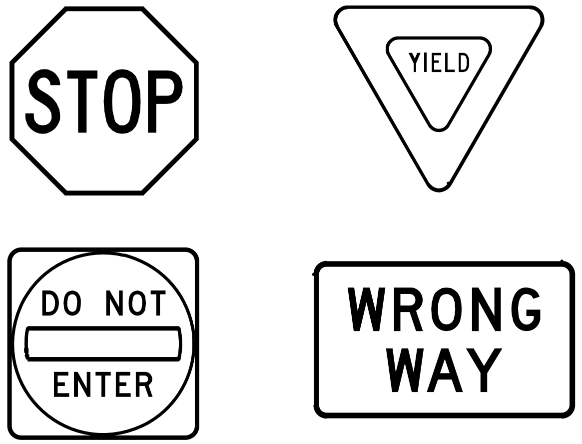
Traffic Operations Division Standard

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	0915	00	238	VARIOUS
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	SAT	BEXAR		230

REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS
(STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

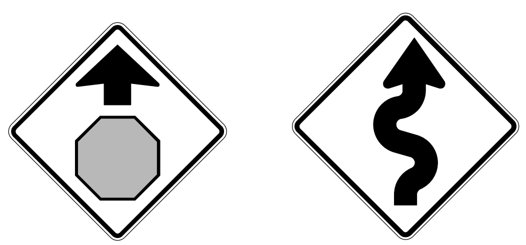
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	WHITE	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE B OR C SHEETING
LEGEND	RED	TYPE B OR C SHEETING

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 0915	SECT 00	JOB 238	HIGHWAY VARIOUS
REVISIONS 12-03 7-13 9-08	DIST SAT		COUNTY BEXAR	SHEET NO. 231

4

DATE: 2/25/2022 10:19:37 AM
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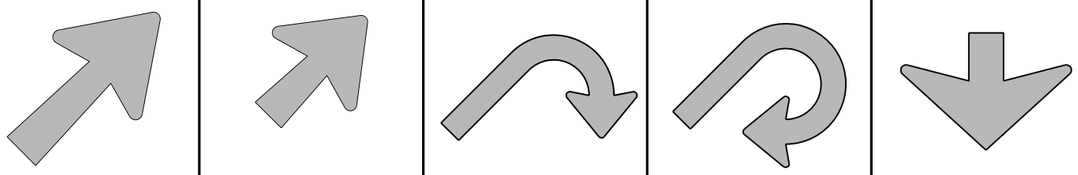
ARROW DETAILS

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

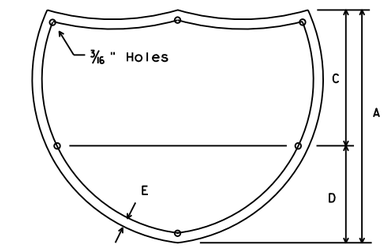
NOTE

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.

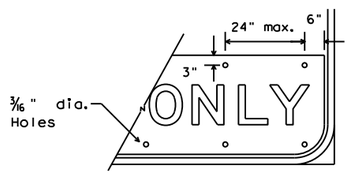
http://www.txdot.gov/

SIGN BLANK PUNCHING DETAILS FOR ATTACHMENTS WHEN SPECIFIED TO BE TYPE A ALUMINUM SIGNS (FOR MOUNTING TO GUIDE SIGN FACE)

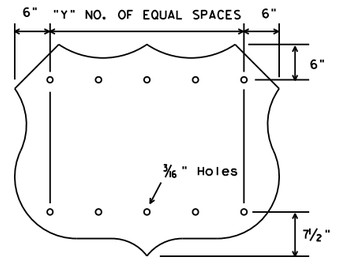


INTERSTATE ROUTE MARKERS

A	C	D	E
36	21	15	1 1/2
48	28	20	1 3/4

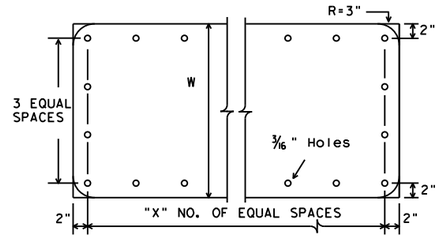


EXIT ONLY PANEL



U.S. ROUTE MARKERS

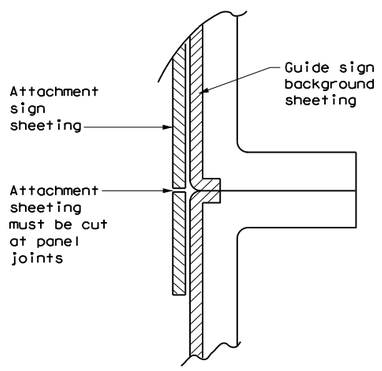
Sign Size	"Y"
24x24	2
30x24	3
36x36	3
45x36	4
48x48	4
60x48	5



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

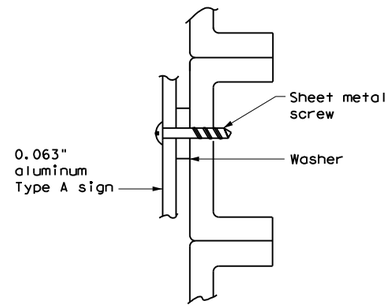
MOUNTING DETAILS OF ATTACHMENTS TO GUIDE SIGN FACE ("EXIT ONLY" AND "LEFT EXIT" PANELS, ROUTE MARKERS AND OTHER ATTACHMENTS)



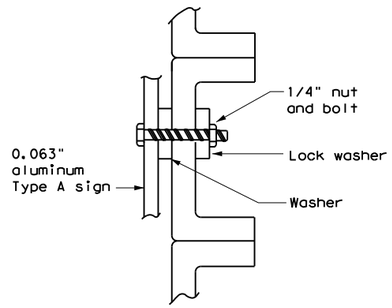
DIRECT APPLIED ATTACHMENT

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".



SCREW ATTACHMENT



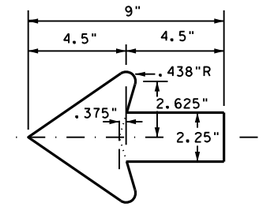
NUT/BOLT ATTACHMENT

NOTE:

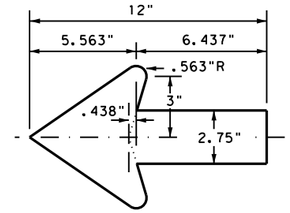
Furnish Type A aluminum sign attachments only when specified in the plans. These signs will be paid for under "Aluminum Signs".

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	0915	00	238	VARIOUS
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	SAT	BEXAR		232

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SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

Post Type

FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
TWT = Thin-Walled Tubing (see SMD(TWT))
10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2)

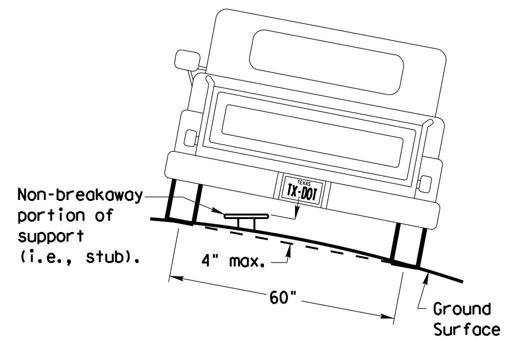
Anchor Type

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))

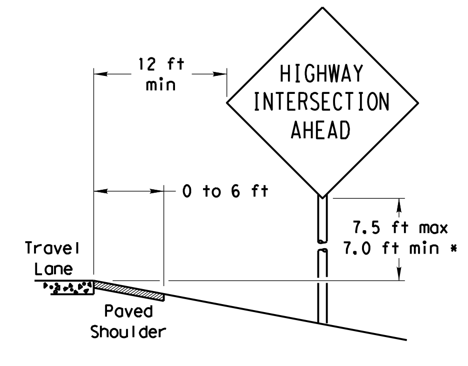
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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).

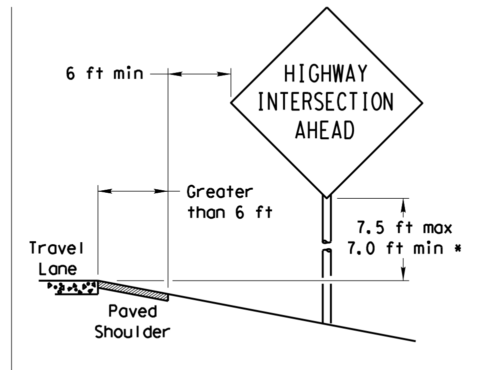
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

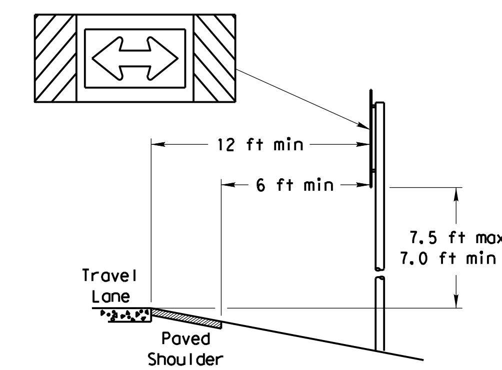
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



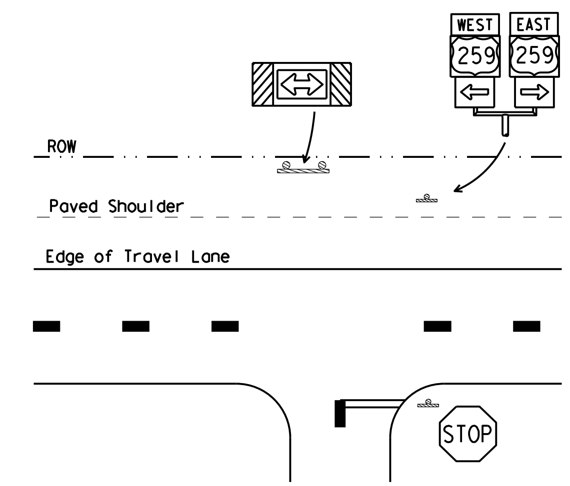
GREATER THAN 6 FT. WIDE

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.

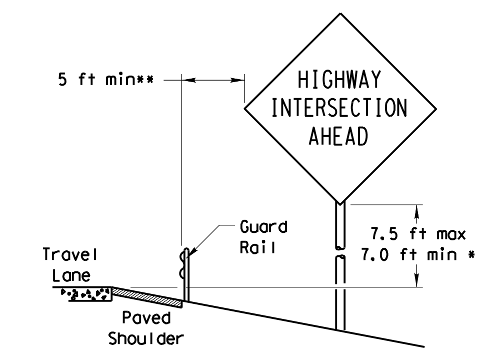
T-INTERSECTION



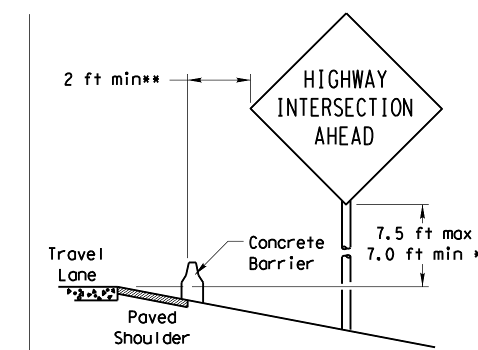
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



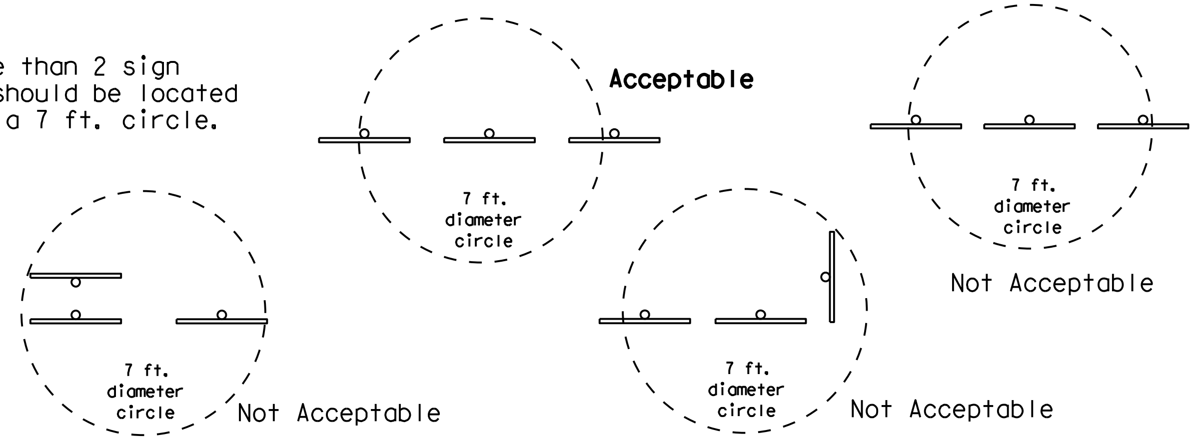
BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

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



* 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.

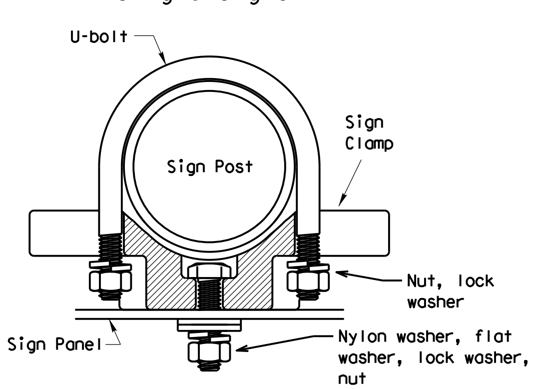
The maximum values may be increased when directed by the Engineer.

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

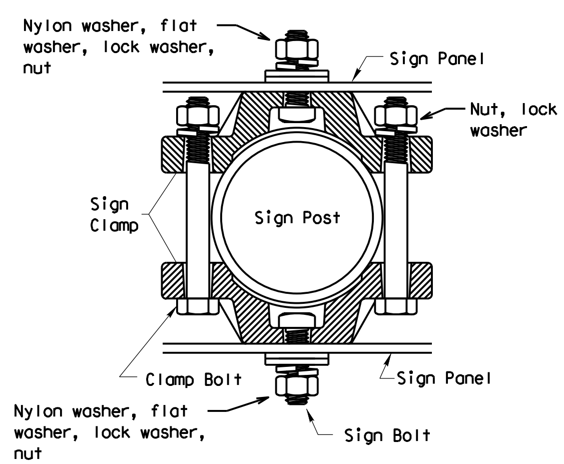
The website address is:
http://www.txdot.gov/publications/traffic.htm

TYPICAL SIGN ATTACHMENT DETAIL

Single Signs



Back-to-Back Signs



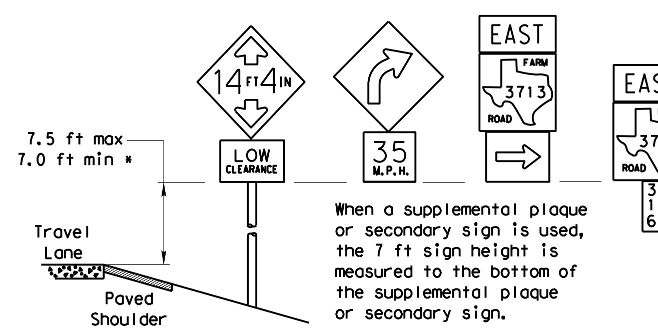
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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.

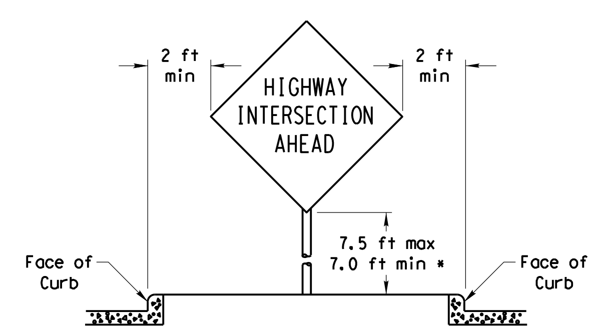
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



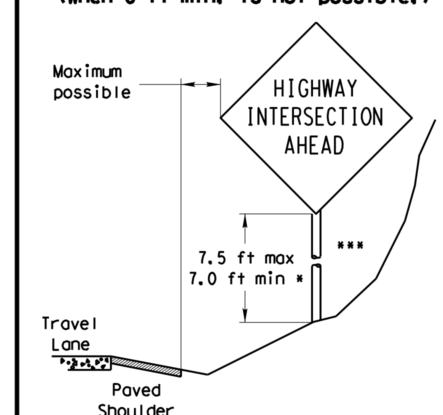
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

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.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

©TxDOT July 2002	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
REVISIONS	CONT	SECT	JOB	HIGHWAY
9-08	0915	00	238	VARIOUS
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DATE: 2/25/2022 10:19:49 AM
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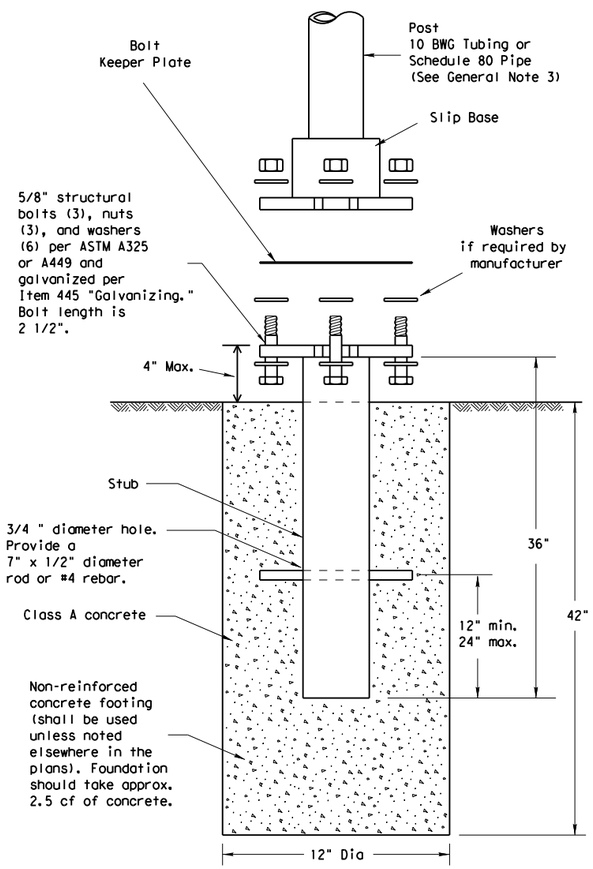
TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



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.

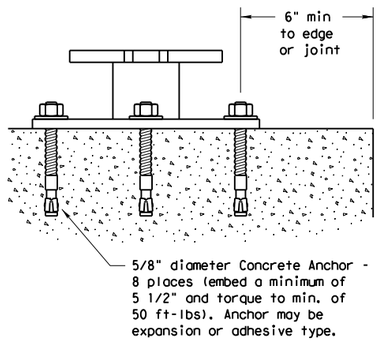
   Schedule 80 Pipe (2.875" outside diameter)
   - 0.276" nominal wall thickness
   - Steel tubing per ASTM A500 Gr C
   - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
     - 46,000 PSI minimum 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

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
9-08

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0915	00	238	VARIOUS

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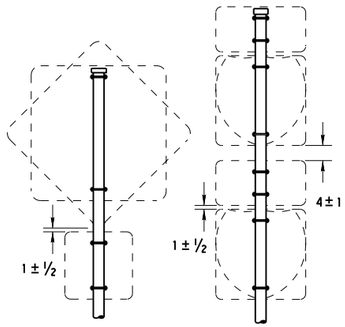
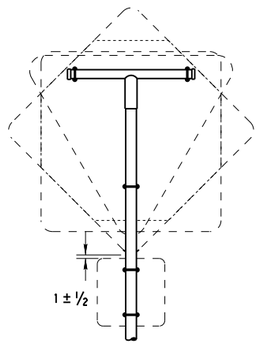


SM RD SGN ASSM TY XXXXX(1)XX(P)



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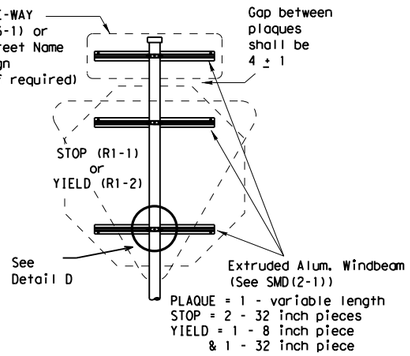

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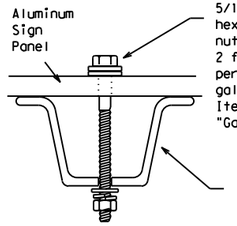
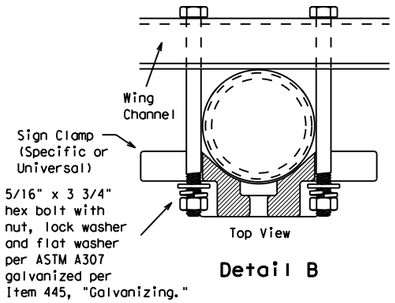
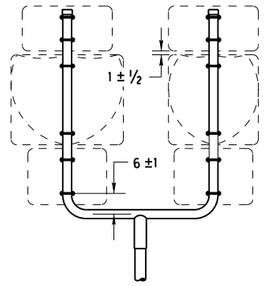


Detail A



Detail B



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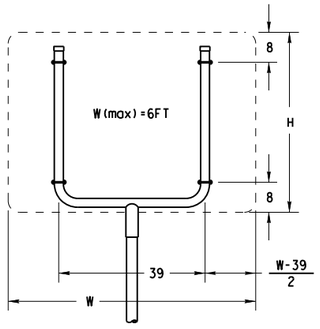

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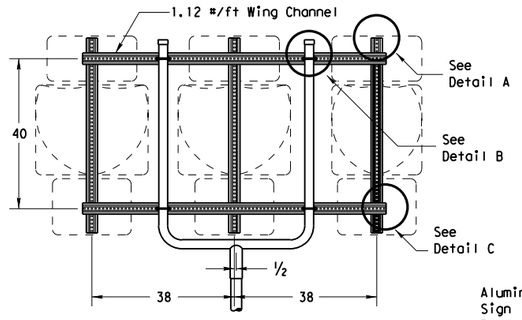
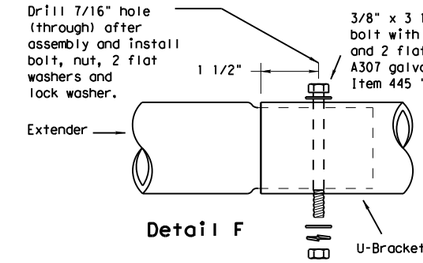
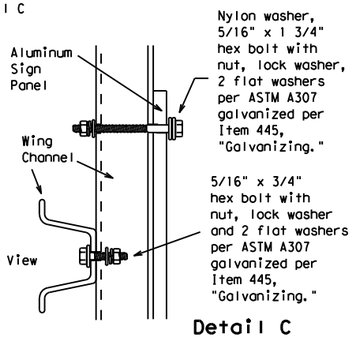


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)

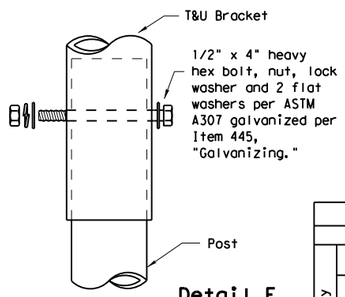


Detail F

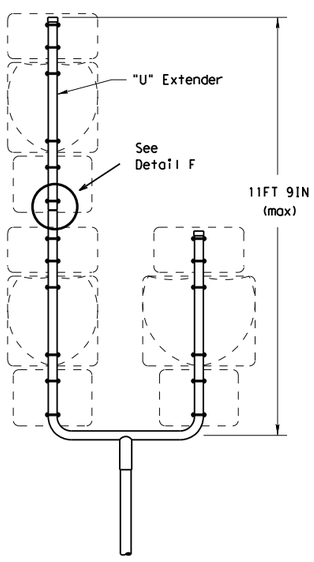
Splices shall only be allowed behind the sign substrate.



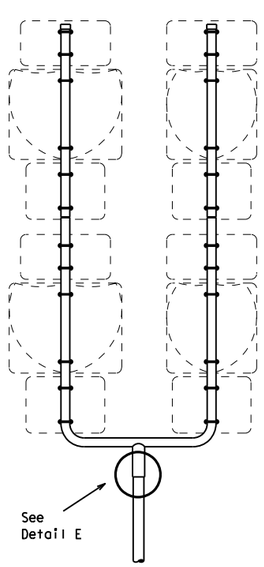
Detail C



Detail E



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



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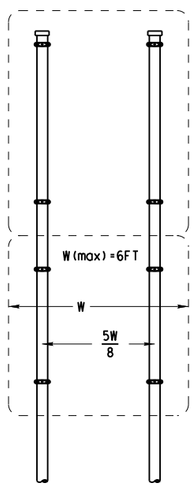
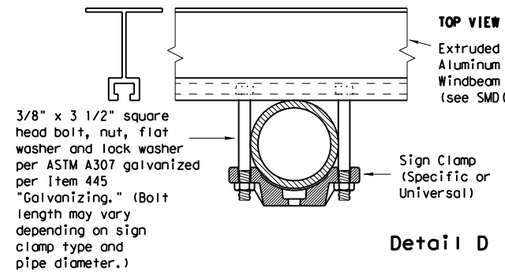
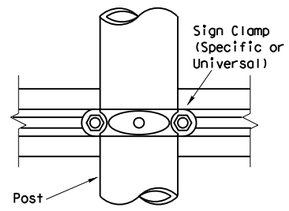


SM RD SGN ASSYM TY XXXXX(2)XX(P)

SIDE VIEW



Detail D



GENERAL NOTES:

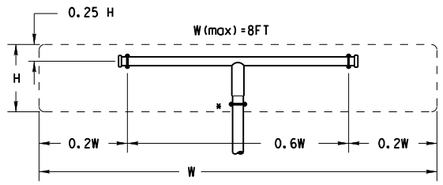
1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 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

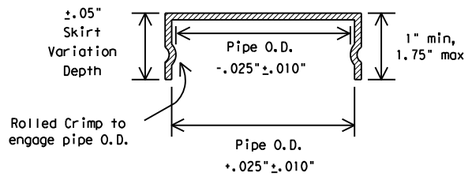
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	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)



SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

All dimensions are in english unless detailed otherwise.

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.

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
9-08	CONT	SECT	JOB	HIGHWAY
	0915	00	238	VARIOUS
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		235

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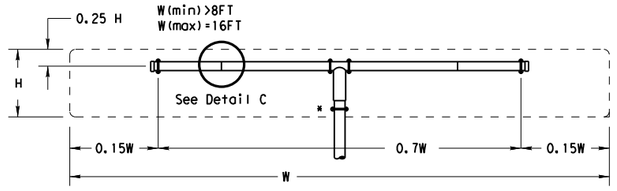
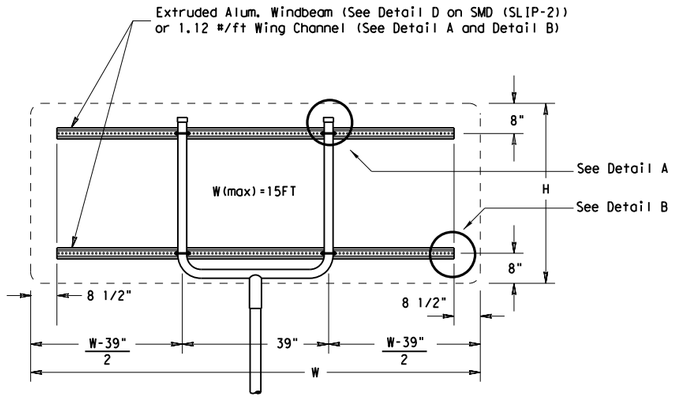


SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)
(* - See Note 12)



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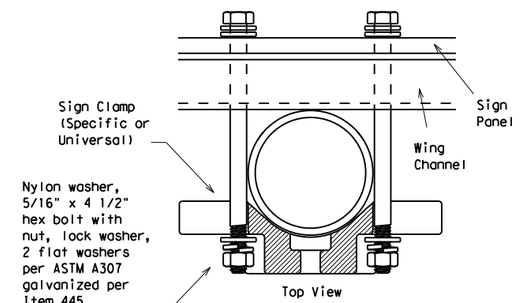
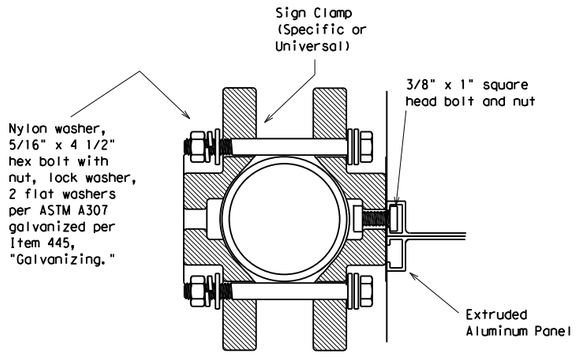
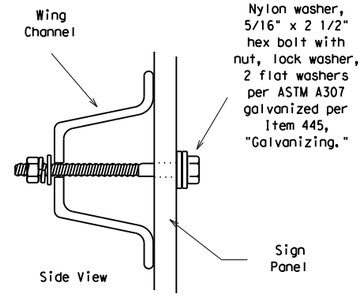


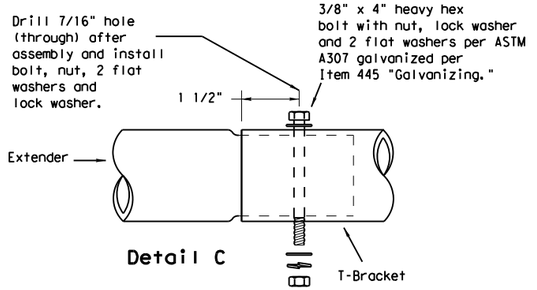
Detail A



Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET

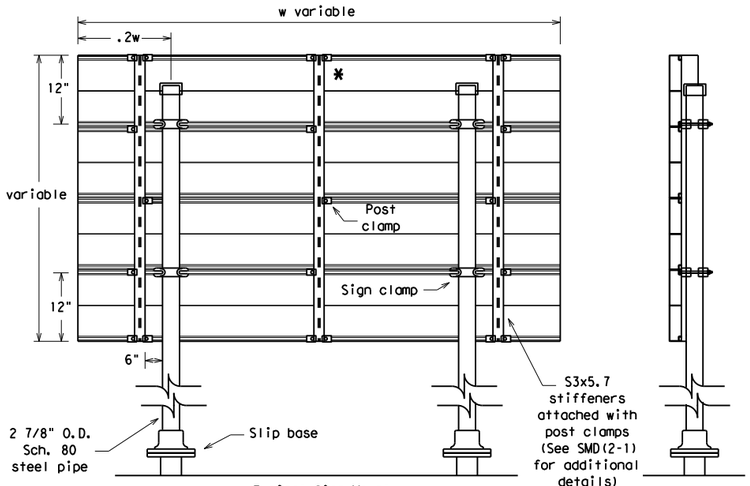


Detail B



Detail C

Splices shall only be allowed behind the sign substrate.

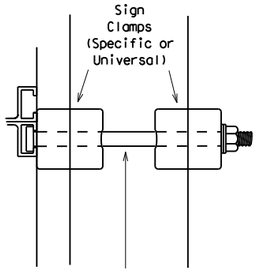


Typical Sign Mount

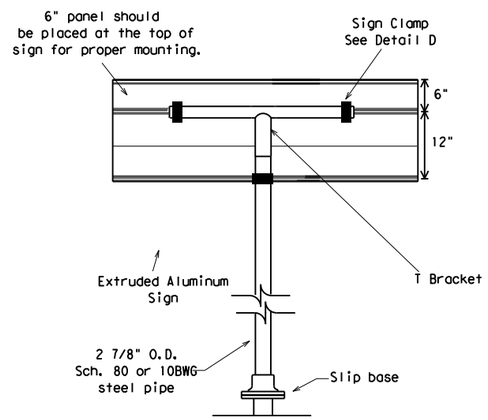
SM RD SGN ASSM TY S80(2)XX(P-EXAL)

* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.

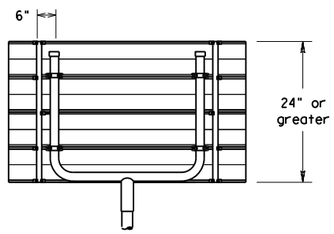
See Detail E
for clamp installation



Detail E



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
0915	00	238	VARIOUS

DIST	COUNTY	SHEET NO.
SAT	BEXAR	236

DATE: 2/25/2022 10:20:00 AM
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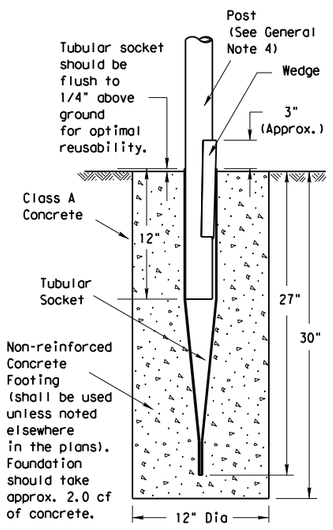
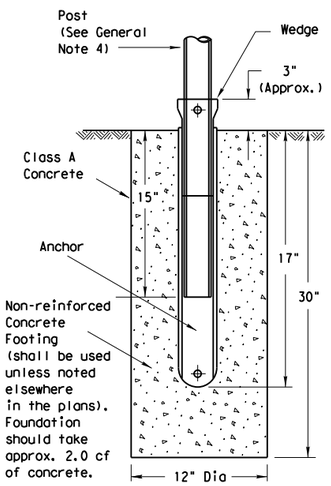
Wedge Anchor Steel System



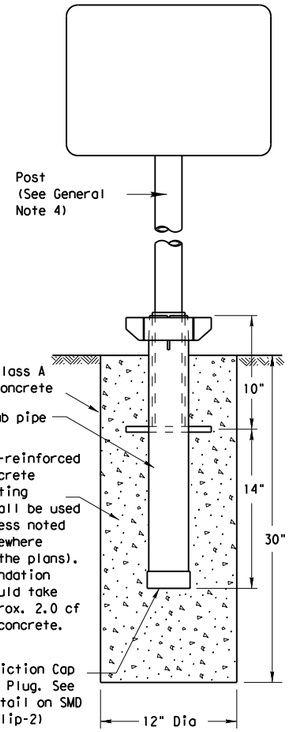
SM RD SGN ASSM TY TWT(X)WS(X)

Wedge Anchor High Density Polyethylene (HDPE) System

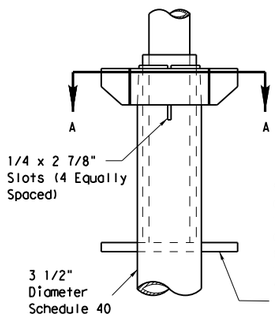


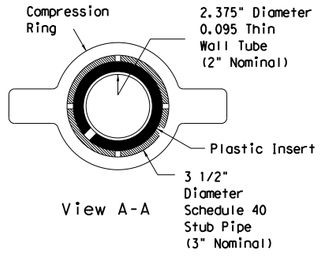
SMD RD SGN ASSM TY TWT(X)WP(X)

Universal Anchor System with Thin-Walled Tubing Post



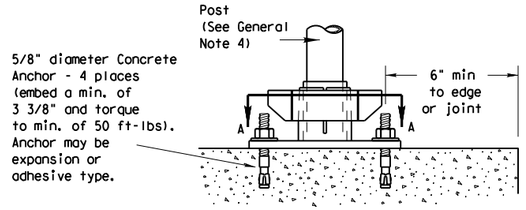
SM RD SGN ASSM TY TWT(X)UA(P)



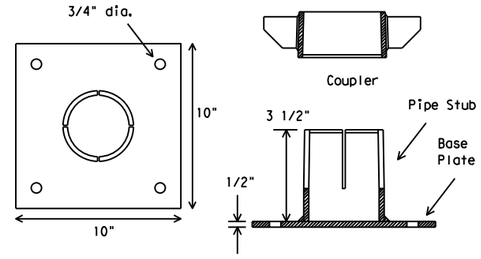


View A-A

Plastic insert must be used when using the TWT with either the Universal Anchor System or the Bolt Down Universal Anchor System. The insert should be approx. 10" long and cover the tubing from just above the top of the stub pipe to the bottom of the sign post when using the Universal Anchor System. The insert should be cut to approx. 4 1/2" when used with the Bolt Down Universal Anchor System.

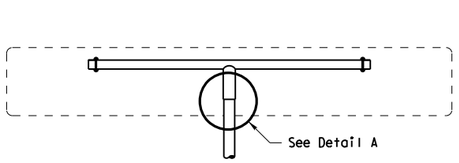


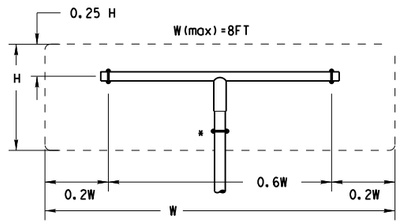
Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. A heavy hex nut per ASTM A563 and hardened washer per ASTM F436. The stud bolt shall have minimum yield and ultimate tensile strengths of 50 and 75 ksi, respectively. Nuts, bolts and washers shall be galvanized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



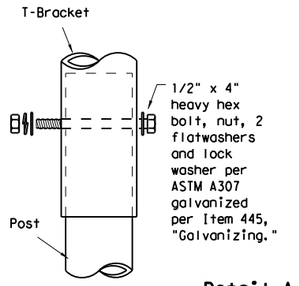
SM RD SGN ASSM TY TWT(X)UB(P)

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





SM RD SGN ASSM TY TWT(X)XX(T)
(* - See General Note 6)



Detail A

9/16" hole may need to be drilled through post to accommodate bolt.

NOTE

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

GENERAL NOTES:

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

WEDGE ANCHOR SYSTEM INSTALLATION PROCEDURE

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

UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURE

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS WEDGE & UNIVERSAL ANCHOR WITH THIN WALL TUBING POST

SMD(TWT)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS	CONT	SECT	JOB	HIGHWAY
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	SAT	BEXAR		237

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DATE: 2/25/2022 10:20:04 AM
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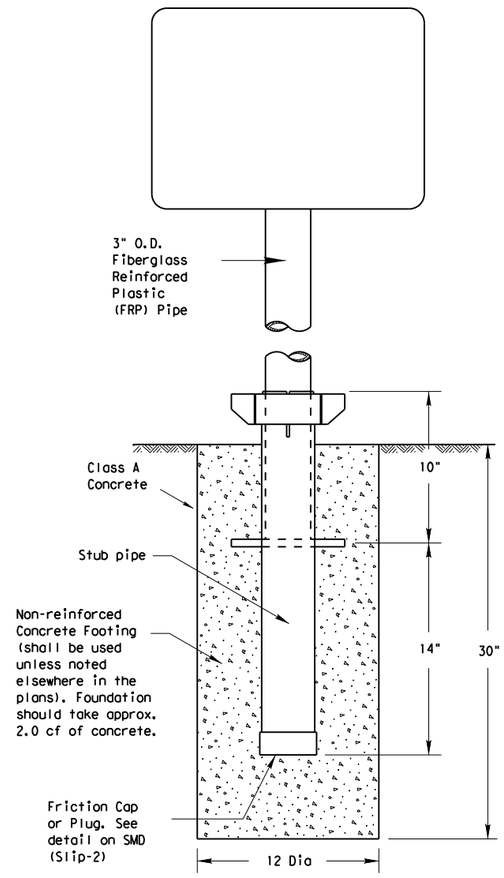
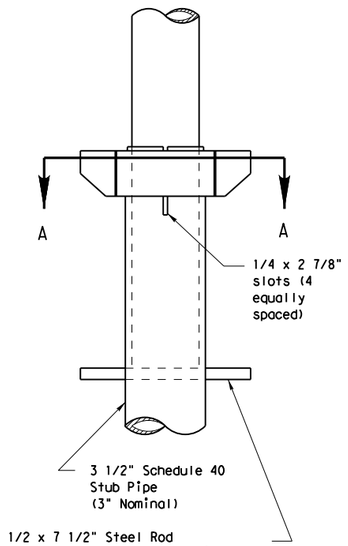
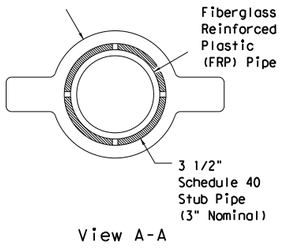
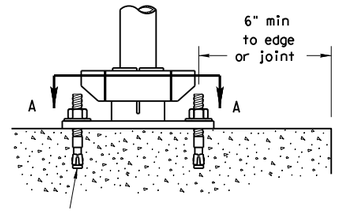
Universal Anchor System with Fiberglass Reinforced Plastic (FRP) Post





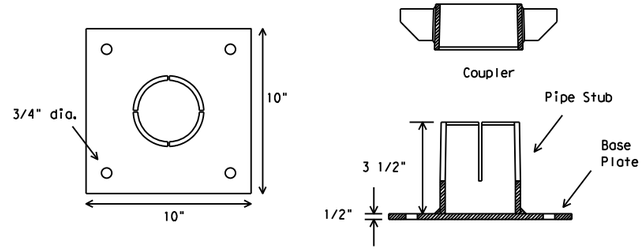


SM RD SGN ASSM TY FRP(X)UA(P)



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

BOLT-DOWN DETAILS



SM RD SGN ASSM TY FRP(X)UB(P)

GENERAL NOTES:

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

FRP POST REQUIREMENTS

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

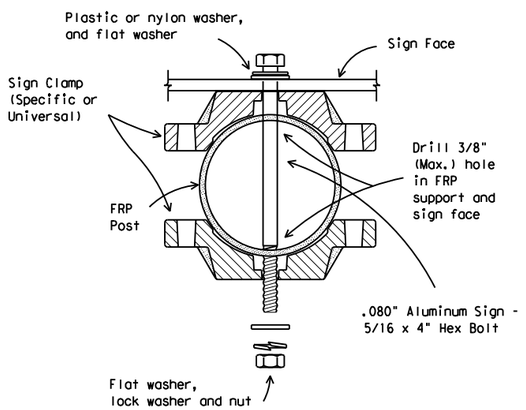
UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURES

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
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. Insert base post in foundation hole to depths shown and fill hole with concrete. Cut base post from bottom and ensure a minimum of 18" embedment if installed in solid rock.
4. Level and plumb the base post with coupler using a torpedo level and let concrete set a minimum of 4 days, unless otherwise directed by Engineer. Bottom of base post slots shall be above the concrete footing.
5. Attach sign to FRP post.
6. Insert sign post into base post. Lower until the post comes to rest on the steel rod.
7. Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
8. Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

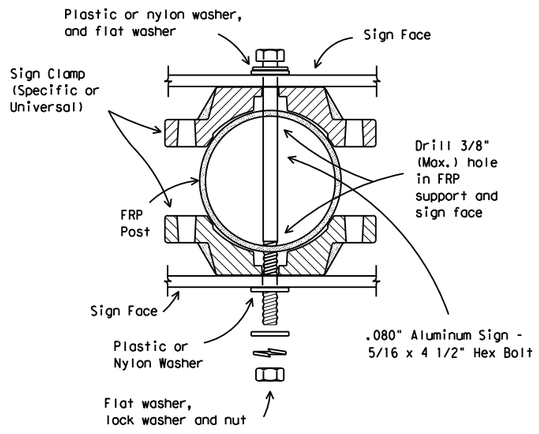
BOLT DOWN SIGN SUPPORT

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

Typical Sign Mounting Detail for FRP Support with Single Sign



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



Texas Department of Transportation
Traffic Operations Division

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

SMD(FRP)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
9-08

CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS

DIST	COUNTY	SHEET NO.
SAT	BEXAR	238

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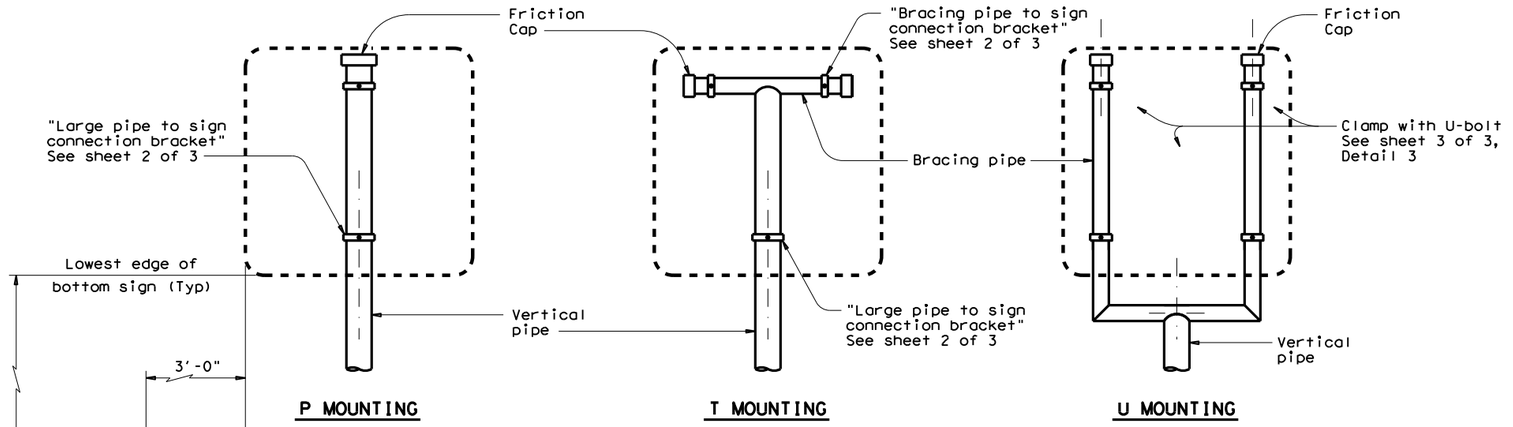
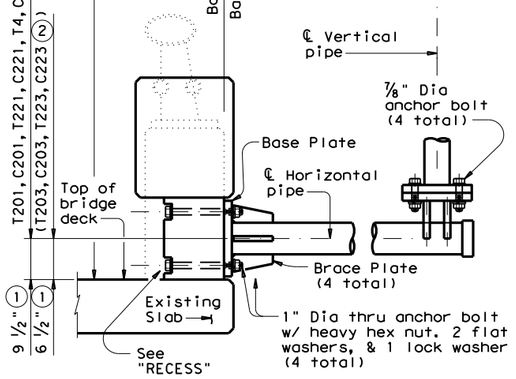
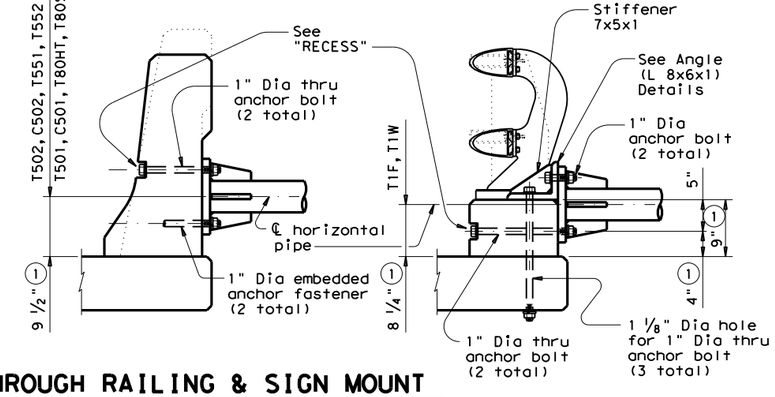


VARIOUS SIGN ATTACHMENTS

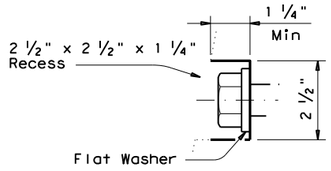
(Mounting NOT deviated from SHSD)





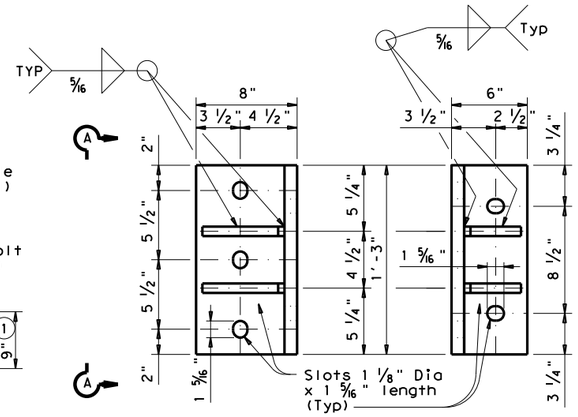
LONGITUDINAL SECTION THROUGH RAILING & SIGN MOUNT

(1) Increase 2" for structure with overlay.
(2) Attached at ℄ post.

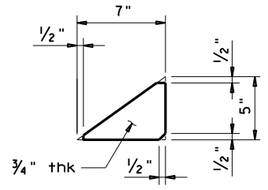


RECESS

PIPE SIZE AND THICKNESS			
Pipe Placement / Design Wind Speed	Horizontal	Vertical	Bracing
90 mph	5" X-Strong (.375")	4" X-Strong (.337")	2 1/2" Standard (.203")
130 mph	6" X-Strong (.432")	5" X-Strong (.375")	3" X-Strong (.300")



PLAN VIEW SECTION A-A



STIFFENER

ANGLE (L 8x6x1) DETAILS

GENERAL NOTES:

Design conforms to 2013 AASHTO Standard Specifications for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications thereto. Design 3-second gust wind speeds of 90 mph and 130 mph with a 1.14 gust factor, and a wind importance factor of 1.0 (50-year mean recurrence interval) for the supporting structures. For mounting connection between sign panel and pipe, wind importance factors of 0.71 and 0.54, for 90 mph and 130 mph winds, respectively, are applied to adjust the wind speeds to a 10-year mean recurrence interval.

See standard sheet WV & IZ(LTS2013) for the boundaries of each design wind zone. All mounting shall be based on 130 mph wind speed design except when located in 90 mph wind zone. Maximum panel area is 30 sq. ft. Maximum design height is 50 ft, with design height defined as the distance between natural ground (average elevation of surrounding terrain) and the center of sign(s) at the mounting location.

Material for pipe shall be ASTM A53 Grade B, or A501. Structural steel plates shall be ASTM A36, A572 Grade 50, or A588. Bolts used to connect pipe and mounting bracket, and wind beam to sign panel shall be ASTM A307. Anchor bolts shall be ASTM A325 or A193 B7. Each anchor bolt shall be provided with 2 flat washers, 1 lock washer, and 1 heavy hex nut. All parts shall be galvanized in accordance with Standard Specifications Item 445, "Galvanizing".

Attach horizontal pipe at least 2'-0" from the edge of any nearby drain slot.

Contractor shall verify applicable field dimensions before fabrication. Holes drilled through the railing parapet wall shall be drilled with rotary (coring or masonry drill) type equipment. Percussion (star) drilling shall not be allowed. Anchorage for pipe attached to rail shall be placed using an anchoring system approved by the engineer. Installation of anchor fasteners including hole depth, diameter and material shall be in accordance with the manufacturers' recommendation.

Each embedded anchor fastener shall resist an allowable design loading (after applying the reduction factors of bolt spacing and bolt edge distance) of:

	130 mph	90 mph
Tension	12.5 kips	7.5 kips
Shear	9.0 kips	5.0 kips

Each anchoring system shall provide a capacity to resist the required tension and shear acting simultaneously.

For sign connection to mounting, shop drill holes on sign blank in accordance with the current Standard Highway Sign Designs for Texas (SHSD). Additional hole(s) needed to meet a stipulated-type mounting may be field drilled. For multi-sign or back-to-back signs mounting, the engineer shall determine the proper type which ensures each individual mounting meets requirements.

Refer to Standard sheets SMD(GEN), SMD(SLIP-2 and SMD(2-1) for details not covered here.

Texas Department of Transportation | Traffic Operations Division Standard

BRIDGE RAILING SIGN MOUNT DETAILS

SMD(BR-1)-14

FILE: smdbr-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT August 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	00	238	VARIOUS
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		239

DATE: 2/25/2022 10:20:10 AM
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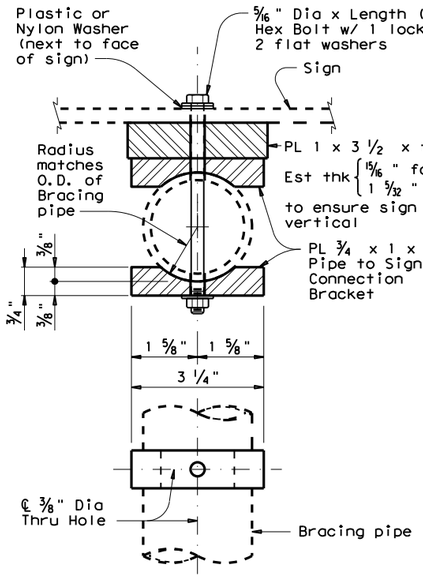
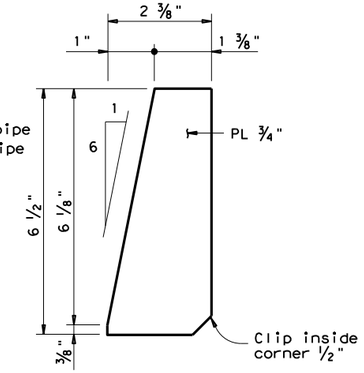
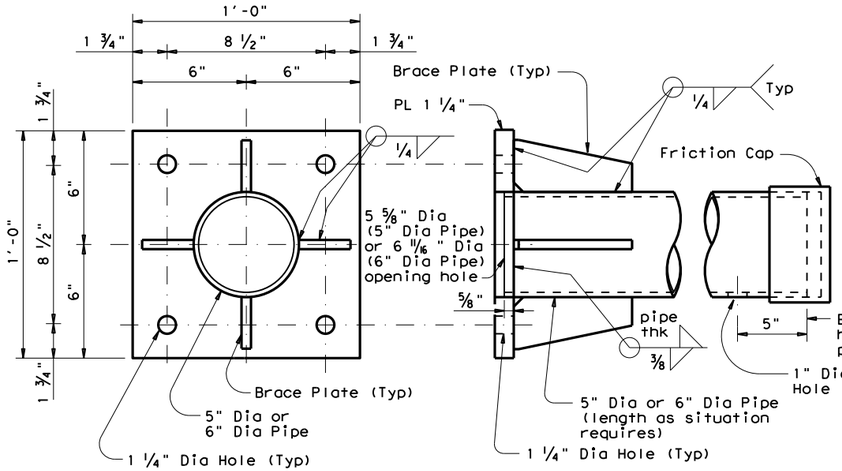


BRACING PIPE TO SIGN CONNECTION BRACKET DETAILS

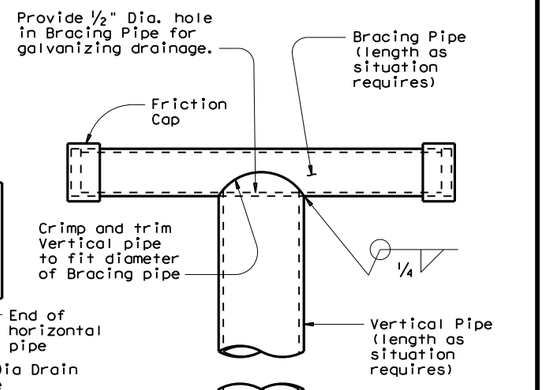
(Showing T Mounting)

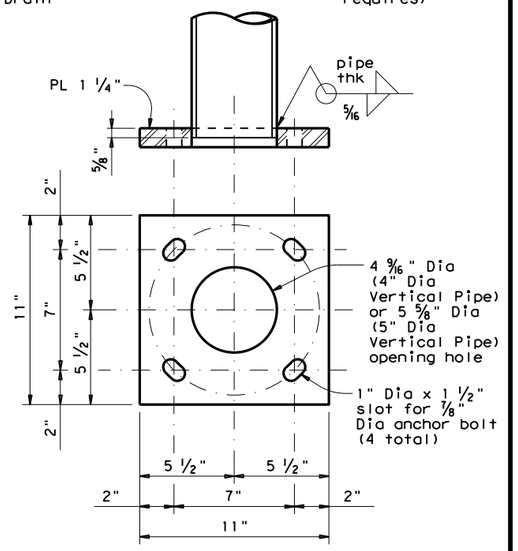


BRACE PLATE DETAILS



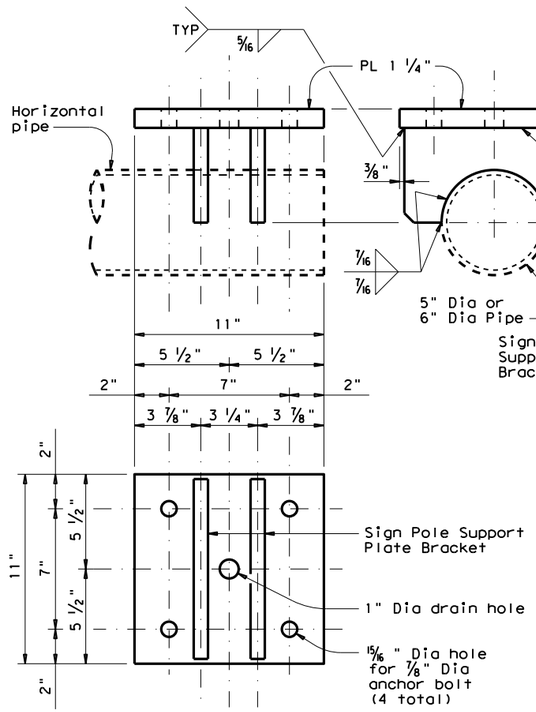
BASE PLATE DETAILS



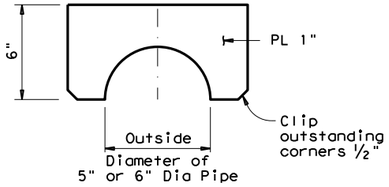


SIGN POLE & POLE BASE PLATE DETAILS

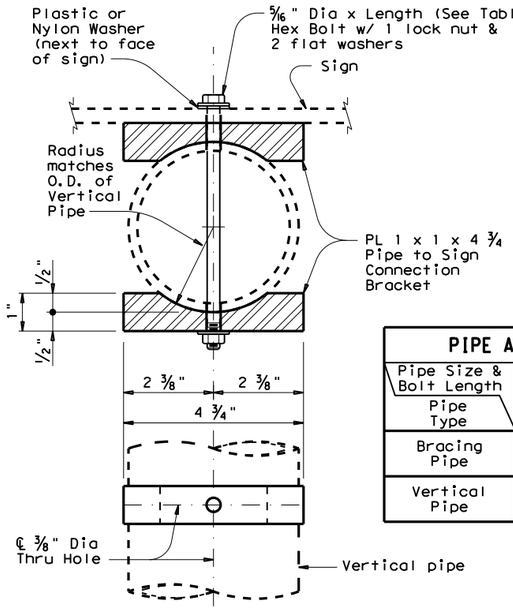
(Showing only T Mounting)



SIGN POLE SUPPORT PLATE DETAILS



SIGN POLE SUPPORT PLATE BRACKET DETAILS



PIPE AND BOLT SPECIFICATIONS		
Pipe Size & Bolt Length / Pipe Type	Nominal Pipe Dia (in.)	Bolt Length (in.)
Bracing Pipe	2 1/2	6
	3	7
Vertical Pipe	4	7
	5	8

LARGE PIPE TO SIGN CONNECTION BRACKET DETAILS

(Showing P or T Mounting)

SHEET 2 OF 3

Texas Department of Transportation

Traffic Operations Division Standard

BRIDGE RAILING SIGN MOUNT DETAILS

SMD(BR-2)-14

FILE: smdbr-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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26H

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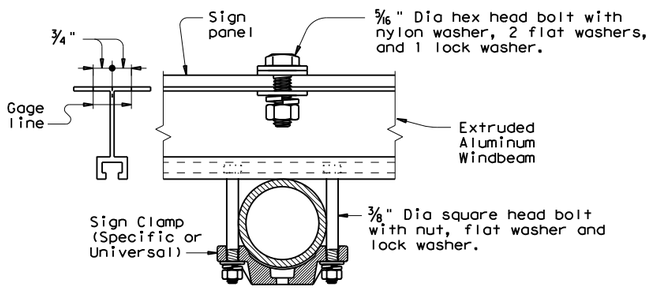
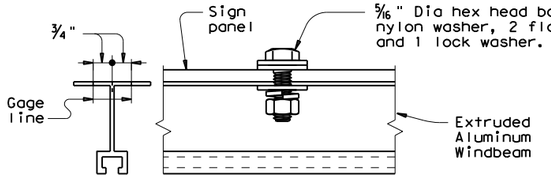
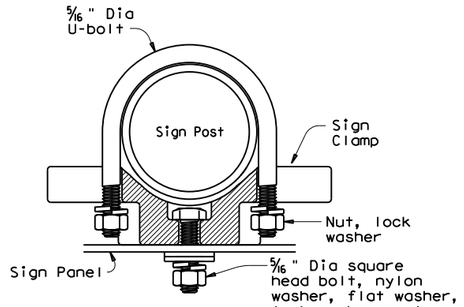


DETAIL 1



DETAIL 2

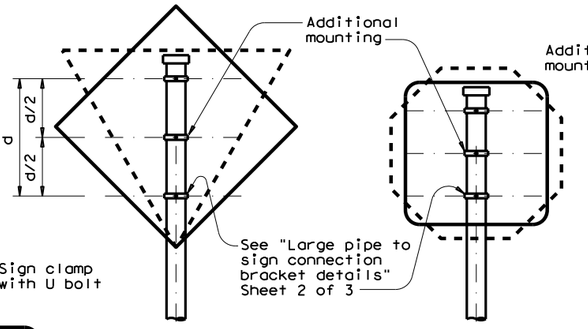


DETAIL 3

SIGN SHAPE	SQUARE			HORIZONTAL RECTANGLE			VERTICAL RECTANGLE			DIAMOND			OCTAGON			EQUILATERAL TRIANGLE			INTERSTATE SHIELD	PENTAGON (SCHOOL)	
Type of Sign Mounting on SHSD / Design Wind Speed	P	T	U	P	T	U	P	T	U	P	T	U	P	T	U	P	T	U	P	P	T
90 mph					(Type 23) 60"x48"	(Type 3) 72"x36" 78"x36" (Type 23) 72"x30" 84"x24"		(Type 2) 36"x48" (Type 32) 36"x60" 36"x72" 42"x60" 48"x54" 48"x60" 48"x72" (Type 3) 48"x84"			(Type 3) 60"x60"									(Type Special) 45"x36"		
130 mph	(Type 1) 30"x30" 36"x36"	(Type 3) 48"x48"		(Type 1) 36"x24" 36"x30"	(Type 23) 48"x42" 54"x42" 60"x30" 66"x36" 84"x24" (Type 3) 60"x48"	(Type 3) 72"x36" 78"x36" (Type 23) 72"x30" 84"x24"	(Type 1) 30"x36" 30"x42"	(Type 3) 36"x48" 36"x60" 36"x72" 42"x60" 48"x54" 48"x60" (Type 4) 48"x72" 48"x84"	(Type 3) 48"x60"	(Type 1) 36"x36"	(Type 3) 48"x48" 60"x60"					(Type 1) 48"x48"			(Type Special) 36"x36" 45"x36"		

Notes:
1. Drill holes in addition to the hole pattern of the Standard Highway Sign Designs for Texas (SHSD) at specified locations to meet a stipulated-type mounting indicated in the parenthesis ( ).
2. "Blank" in the above table indicates all other signs excluded from stipulated mounting shall be mounted in accordance with SHSD.

(1) In lieu of welding, the Fabricator may bend bracing pipe elbows if the following conditions are met:
a. Spacing between vertical bracing pipes is equal to or greater than 2'-6".
b. Bending radius is 12".
c. The distance between the lowest clamp and centerline of horizontal bent pipe is 13" max.



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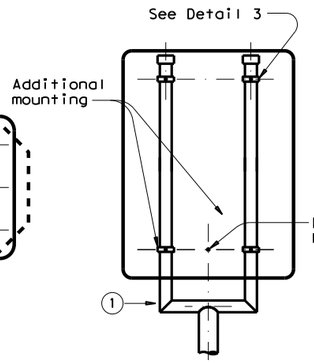

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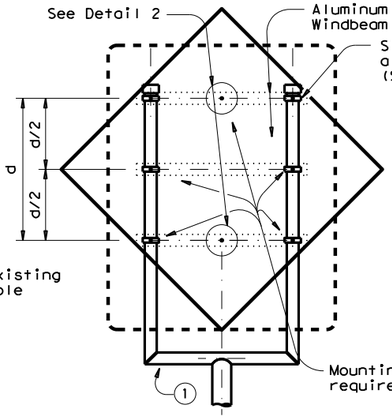
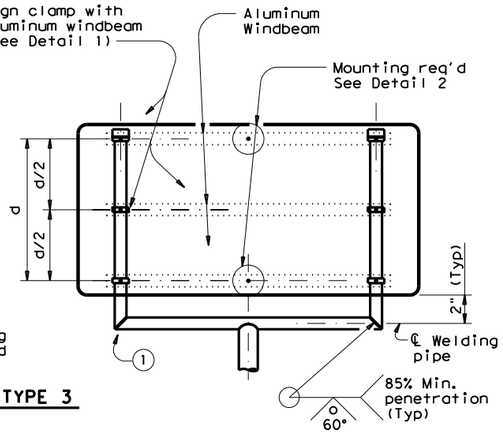
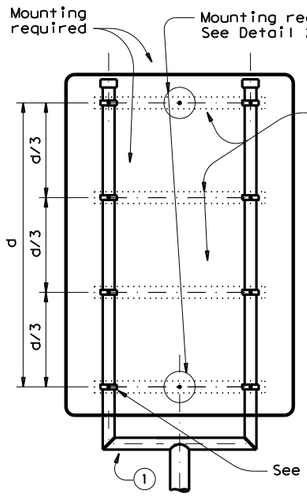
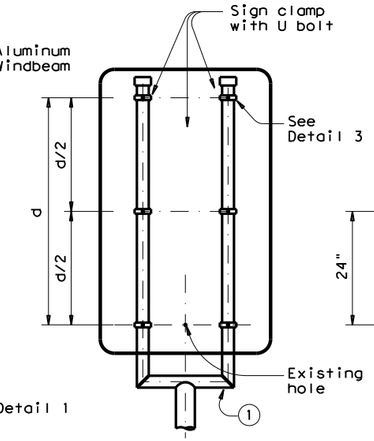




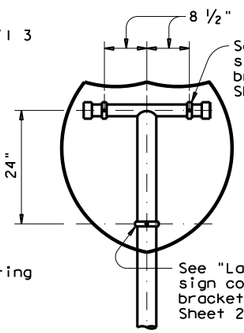
TYPE 3



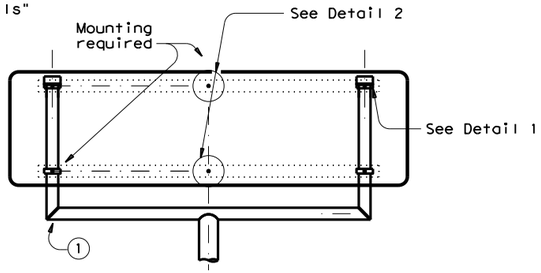
TYPE 4



TYPE 32



TYPE SPECIAL



TYPE 23

SHEET 3 OF 3

Texas Department of Transportation | Traffic Operations Division Standard

BRIDGE RAILING SIGN MOUNT DETAILS

SMD(BR-3)-14

FILE: smdbr-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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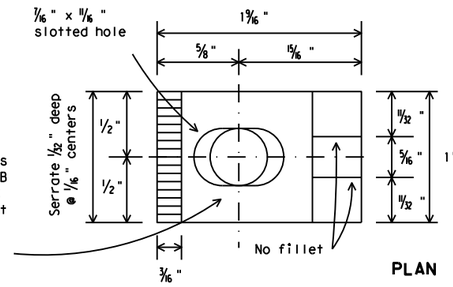
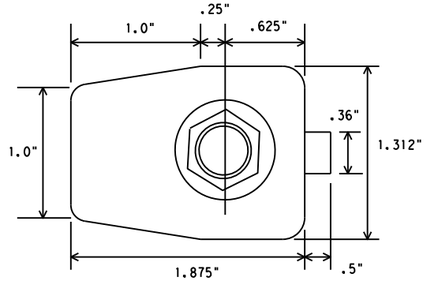
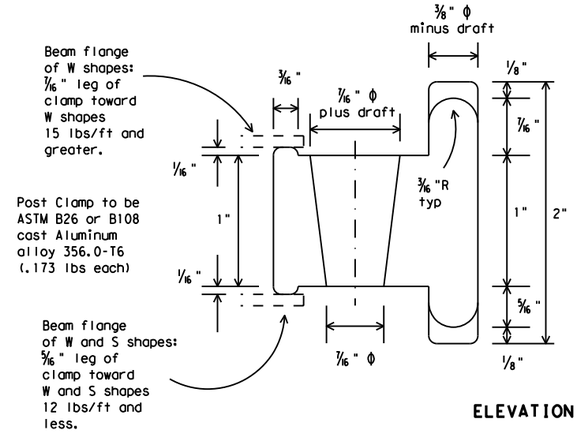
NOTE: centerline of hole for 3/8" diameter squarehead bolt x 2 1/4" long with a flat washer and self-locking nut, or lock washer and hex. nut. Bolt head dimensions shall be in accordance with ANSI B 18.2.1 as referred to in the AISC Manual of steel construction. Bolt assembly shall be galvanized.



PLAN

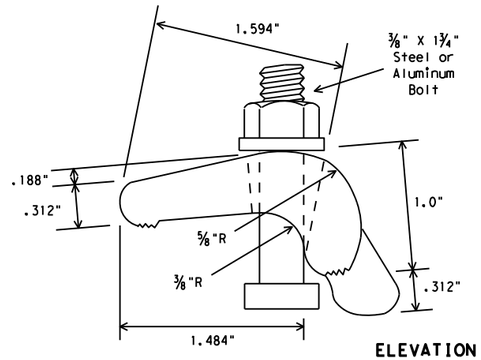


PLAN



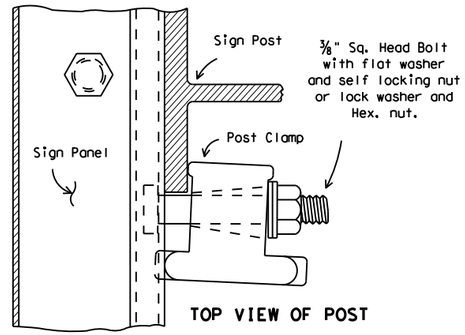
ELEVATION

POST CLAMP DETAIL

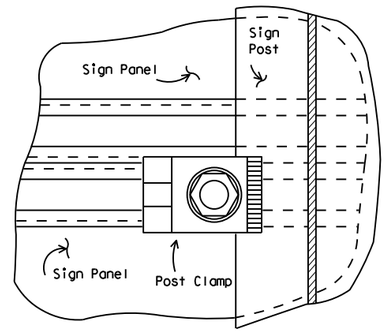


ELEVATION

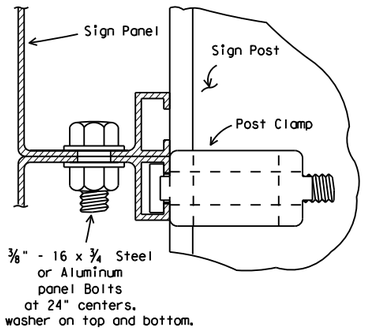
ALTERNATE POST CLAMP DETAIL



TOP VIEW OF POST



TOP VIEW OF CLAMP



SIDE VIEW OF PANELS

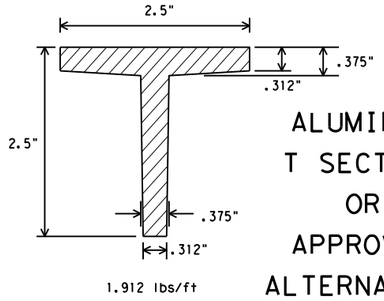
CONNECTION DETAILS

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.

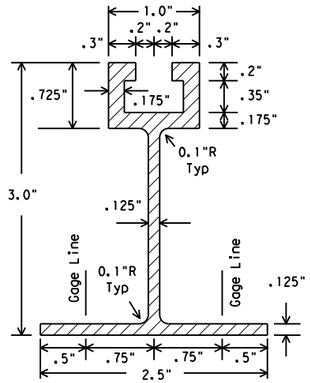


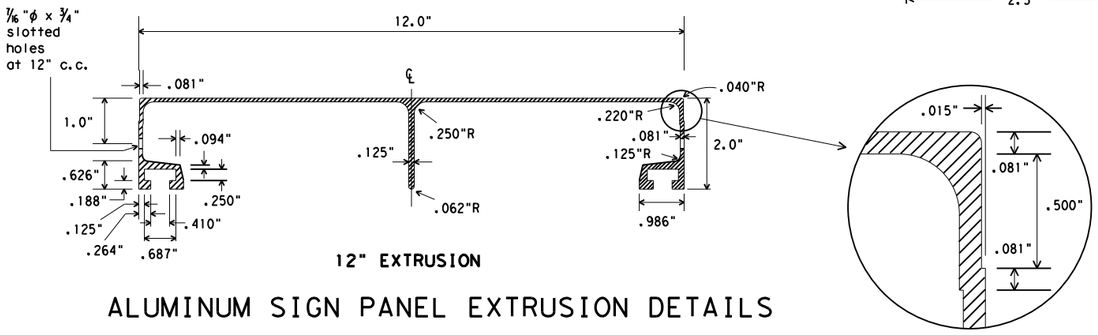
1.912 lbs/ft

ALUMINUM T SECTION OR APPROVED ALTERNATIVE

WINDBEAM CROSS SECTION

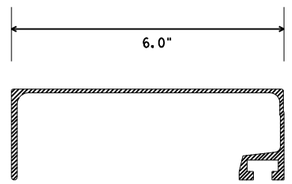
Windbeam to be extruded aluminum (1.175 lbs/ft) or approved alternative



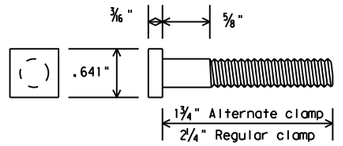


12" EXTRUSION

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

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9-08	0915	00	238	VARIOUS
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27A

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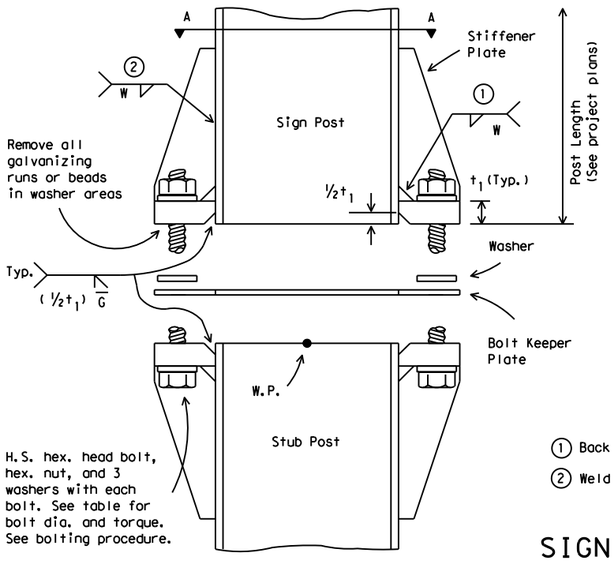
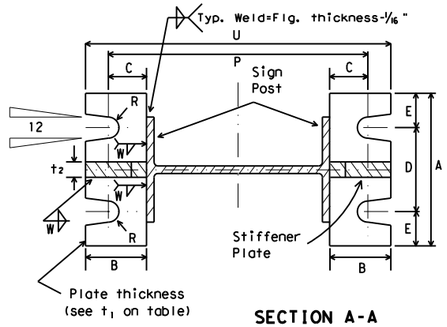
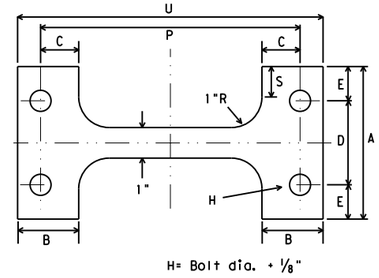


ELEVATION

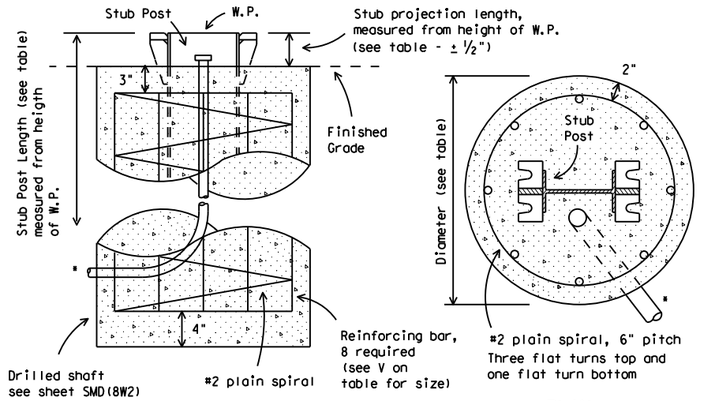


SECTION A-A



H= Bolt dia. + ⅛"

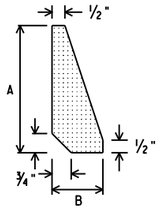
BOLT KEEPER PLATE
30 Ga galv. sheet steel



ELEVATION PLAN

FOUNDATION DETAIL

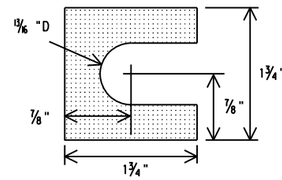
*Note: For signs with electrical apparatus, see ED(10) for conduit required in founation.



STIFFENER PLATE DETAIL

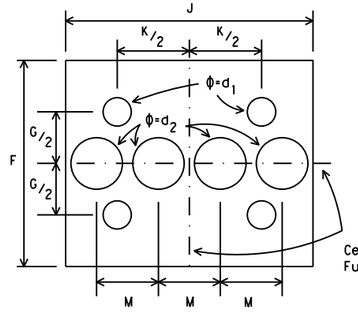
Steel Plate (thickness = t_2)

(See table for dimensions)



SHIM DETAIL

Furnish two .012"+ thick and two .032"+ thick shims per post. Shims shall be fabricated from brass shim stock or strip conforming to ASTM B36.



PERFORATED FUSE PLATE DETAIL

Use H.S. hex head bolts, hex head nut and bevel or flat washer (where req'd) under nut. All holes shall be drilled, sub-punched and reamed. All plate cuts shall preferably be saw cuts. However, flame cutting will be permitted provided all edges are ground. Metal projecting beyond the plane of the plate face will not be permitted. Steel fuse plates shall conform to the requirements of ASTM A36. ASTM A572 Grade 50 or ASTM A588 may be substituted for A36 at the option of the fabricator. Mill test reports shall be submitted for Fuse Plates. Steel used shall have an ultimate tensile strength not to exceed 80 KSI. For alternative Fuse Plate contact Traffic Operations Division.

SIGN POST AND STUB POST

(For W Shapes)

① Back up weld to be made before installing stiffener plate

② Weld W may be continued across clips to seal joint

BOLTING PROCEDURE FOR ASSEMBLY OF BASE CONNECTION:

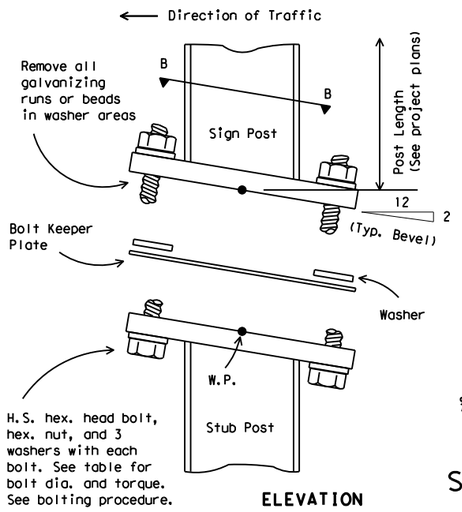
1. Assemble sign post, BOLT KEEPER PLATE and stub post with bolts and three flat washers per bolt as shown.
2. Shim as required to plumb post.
3. Tighten all bolts the maximum possible with a 12 to 15 inch wrench to clean bolt threads and to bed washers and shims.
4. Loosen each bolt in sequence and retighten bolts in a systematic order to the prescribed torque. Do not overtighten.
5. To prevent nut loosening, burr threads of bolt at junction with nut using a center punch.

Dimensions / Post Size	Base Connection Data Table: Bolt Size & Torque	A	B	C	D	E	t_1	t_2	W	R
W6x9	⅝"ϕ x 2¾" 440-450 inch pounds 36-38 foot pounds	5"	2"	1¼"	2¾"	1⅛"	¾"	½"	¼"	11/32"
W6x12										
W6x15										
W8x18										
W8x21	¾"ϕ x 3½" 740-750 inch pounds 62-63 foot pounds	6"	2¼"	1⅜"	3½"	1¼"	1"	¾"	5/16"	13/32"
W10x22										
W10x26										
W12x26										
S3x5.7	½"ϕ x 2½" 440-450 inch pounds 36-38 foot pounds	See Detail Below								
S4x7.7										

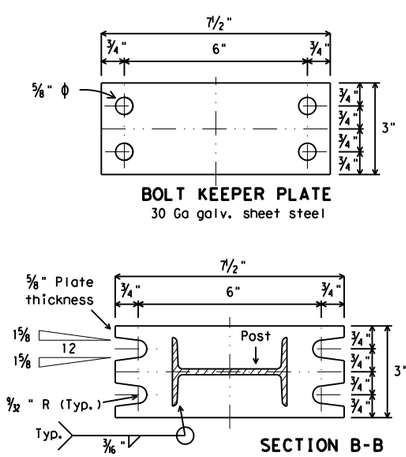
Perforated Fuse Plate Data Table											
F	G	J	K	M	d_1	d_2	t_3	Bolt Dia.	Wt. (ea.) (lbs.)	Bolt length
4¼"	2"	4"	2¼"	1"	9/16"	¾"	¼"	½"	1.01	1½"
5"	2½"	6"	3½"	1½"	11/16"	1¼"	⅜"	⅝"	2.51	2¼"
5"	2½"	5¼"	2¾"	1¼"	11/16"	1 1/16"	⅜"	⅝"	2.26	2¼"
5½"	2½"	5¼"	2¾"	1¼"	13/16"	1"	½"	¾"	3.35	2¼"
6"	3"	5¾"	2¾"	1⅜"	13/16"	1⅛"	½"	¾"	4.03	2¼"
6"	3"	6½"	3½"	1⅝"	13/16"	1 5/16"	½"	¾"	4.47	2¼"
3¾"	1½"	2⅝"	1½"	⅝"	9/16"	⅜"	¼"	½"	0.60	1½"

Bolt Keeper Data			Foundation Data			
P	S	U	Stub length	Stub projection	Dr. Shaft diameter	Bar V Size
8⅜"	1"	9⅞"	2'-0"	3"	24"	#5
8½"		10"	2'-0"	3"		#5
8½"		10"	2'-6"	3"		#6
10⅝"		12⅛"	2'-6"	3"		#7
11"	1½"	12¾"	3'-0"	2½"		#8
12⅞"		14⅝"	3'-0"	2½"		#9
13⅛"		14⅞"	3'-0"	2½"		#10
15"		16¾"	3'-0"	2½"		#11
See Detail Below			3'-3½"	3½"	12"	Non-reinforced ③

③ Foundation design shall be Type G Mount, see SMD (TY G).

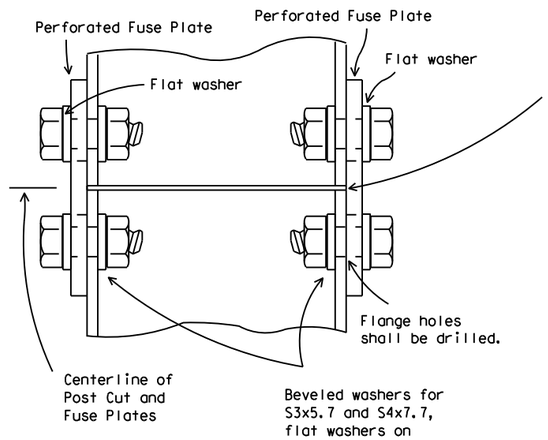


ELEVATION



SIGN POST AND STUB POST

(For S4x7.7 and S3x5.7)



DETAIL "A"

Parts shall be saw cut either before galvanizing and the galvanized cut cleaned of zinc build-up, or saw cut after galvanizing and the cut surface repaired per Item 445, "Galvanizing."

Texas Department of Transportation
Traffic Operations Division

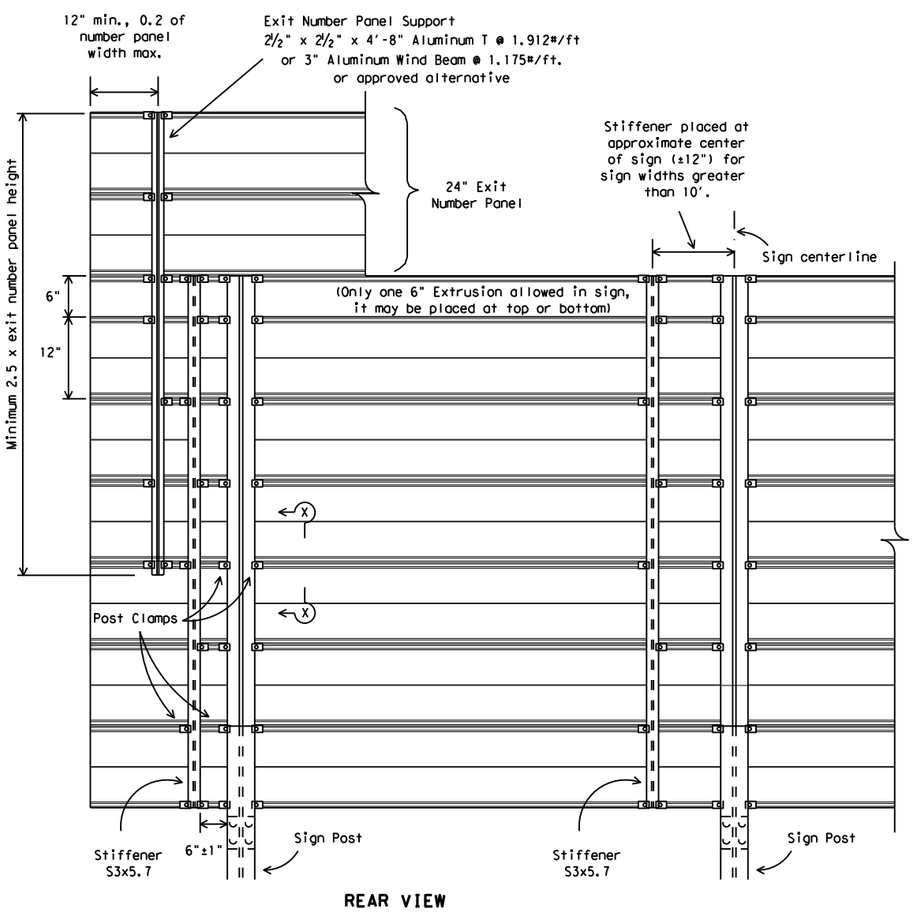
SIGN MOUNTING DETAILS- LARGE ROADSIDE SIGNS FOUNDATION & STUB

SMD(2-2)-08

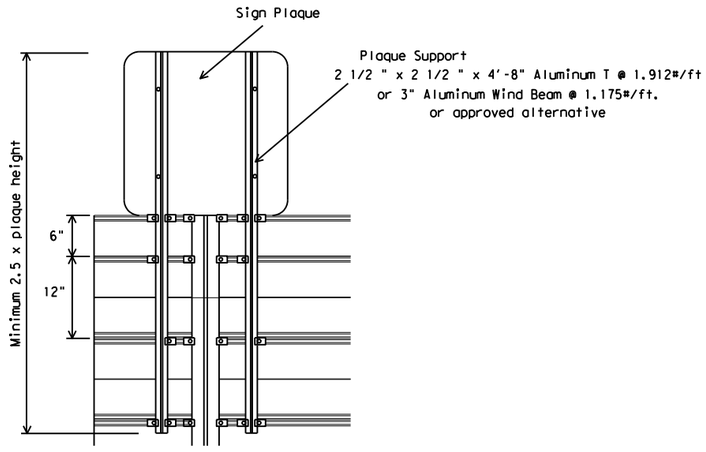
REVISIONS
4-98
9-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS
DIST	COUNTY		SHEET NO.
SAT	BEXAR		243

DATE: 2/25/2022 10:20:23 AM
FILE: T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\Standards\smd23-08.dgn

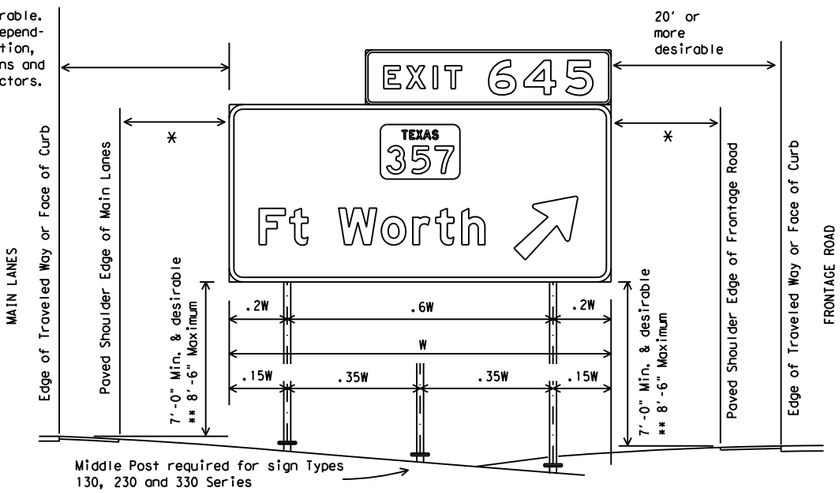


ALUMINUM PARENT SIGN & EXIT NUMBER PANEL MOUNTING DETAILS



SIGN PLAQUE MOUNTING DETAIL TO ALUMINUM PARENT SIGN

30' or more desirable. May be reduced depending on cross section, viewing conditions and other related factors.



TYPICAL SIGN INSTALLATION AND LOCATION

LATERAL CLEARANCE NOTES:

Lateral clearances of signs mounted on median side of main lanes are the same as shown above where space will permit.

Where a sign is to be located behind guardrail, an allowable minimum clearance of five feet may be used, measured from the face of the guardrail to the near edge of sign.

* - 6' minimum and desirable may be used only in areas of limited lateral clearance and when approved by the Engineer.

POST SPACING NOTES:

Post spacing on a two post sign may vary a maximum of plus or minus 10% of total sign width to fit field conditions.

Post spacing on a three post sign may vary a maximum of plus or minus 5% of total sign width to fit field conditions.

SIGN HEIGHT NOTES:

** The 8' 6" maximum may be exceeded when placing signs on extreme slopes. In these conditions, a 7' minimum from natural ground to bottom of sign must be maintained.

DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110
SIGN HARDWARE	DMS-7120

GENERAL NOTES:

1. Exit number panel shall be mounted to the right hand side of the parent sign for right exits and to the left hand side for left exits. The number panel shall be mounted with two uprights so its right edge is even with the right edge of the parent sign or vice-versa for left hand exits.
2. Exit number panel support shall be symmetrical about number panel centerline.
3. Exit number panel support shall be ASTM A36 structural steel galvanized after fabrication, or ASTM B221 aluminum alloy 6061-T6 or approved alternative.
4. All bolts, nuts and washers shall be galvanized per ASTM Designation: B695 Class 50, or A153 Class C or D.
5. Posts, parent sign panels, and exit number panels shall comply with notes on sheets SMD(2-1) and SMD(2-2).
6. Signs (such as exit number panels) attached above a parent sign shall be made of the same type material as the parent sign. General Service and Routing signs may be fabricated from flat sheet aluminum.
7. Exit number panel support and other connection hardware required to fasten exit number panel to parent sign shall be subsidiary to "Aluminum Signs" or "Fiberglass Signs."
8. For fiberglass sign installation details, see manufacturer's recommendations.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS-LARGE ROADSIDE SIGNS

SMD(2-3)-08

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	0915	00	238	VARIOUS
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		244

DATE: 2/25/2022 10:20:27 AM
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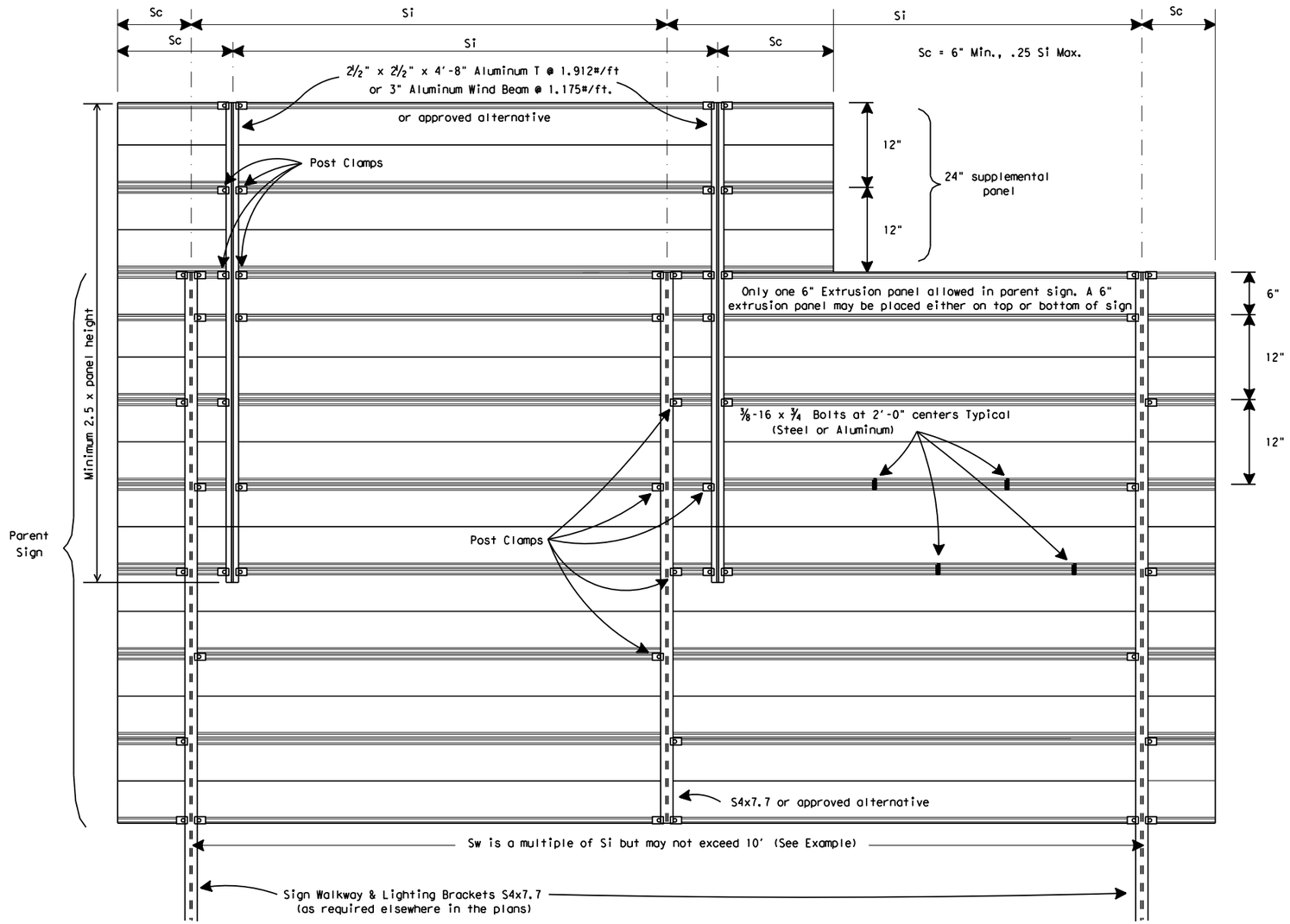
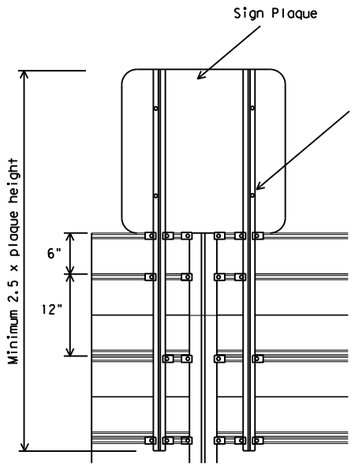


REAR VIEW

EXAMPLES (FOR DETERMINING Si and Sw)

NO.	ZONE	"d"	EXIT PANEL	WALKWAY	Si	Sw	COMMENT
1	1	15.0	YES	YES	4.5	9.0	Sw=2x(Si)
2	2	14.0	YES	NO	7.5	7.5	Sw = Si
3	1	15.0	NO	NO	8.5	8.5	Sw = Si
4	3	14.0	NO	YES	10.0	10.0	Sw = Si

Values shown for Si are maximum values. Si may be varied for different sign lengths and Truss mounting conditions. Sw should not exceed two times Si(Max.) or 10 feet.



SIGN PLAQUE MOUNTING DETAIL

MAXIMUM SIGN SUPPORT SPACING "Si" (FEET)

"d" Deepest Sign in Group (Ft.)	EXTRUDED ALUMINUM SIGN PANELS															
	WITH EXIT NUMBER PANELS								WITHOUT EXIT NUMBER PANELS							
	WITH WALKWAYS				WITHOUT WALKWAYS				WITH WALKWAYS				WITHOUT WALKWAYS			
	WIND ZONE				WIND ZONE				WIND ZONE				WIND ZONE			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
15	4.5	7	8	10	5	7	8	10	7	8	9	10	8.5	10	10	10
14	6	7.5	9.5	10	6	7.5	9.5	10	8	9	10	10	10	10	10	10
13	7.5	9	10	10	7.5	9	10	10	9	10	10	10	10	10	10	10
12	8.5	10	10	10	8.5	10	10	10	10	10	10	10	10	10	10	10
11 or less	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

For fiberglass sign installations, see manufacturer's recommendations.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS- OVERHEAD SIGNS EXTRUDED ALUMINUM

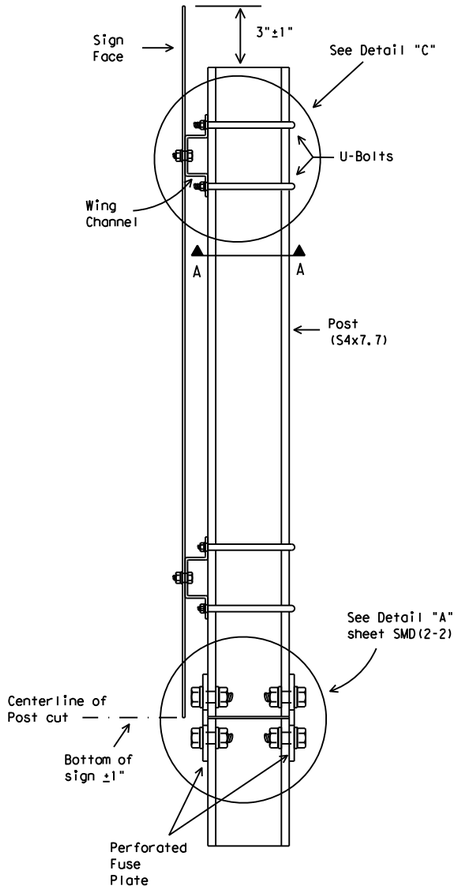
SMD(2-4)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

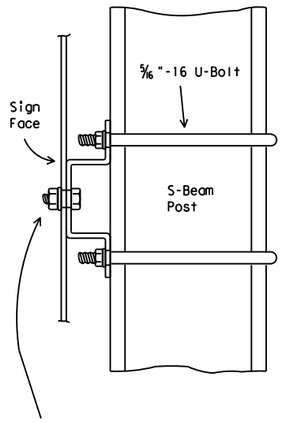
REVISIONS	CONT	SECT	JOB	HIGHWAY
9-08	0915	00	238	VARIOUS
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		245

DATE: 2/25/2022 10:20:30 AM
FILE: T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\Standards\smdtyg08.dgn

WING CHANNEL CLAMP DETAIL FOR TYPE G MOUNT

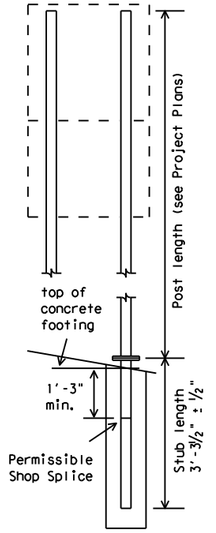


SIDE VIEW

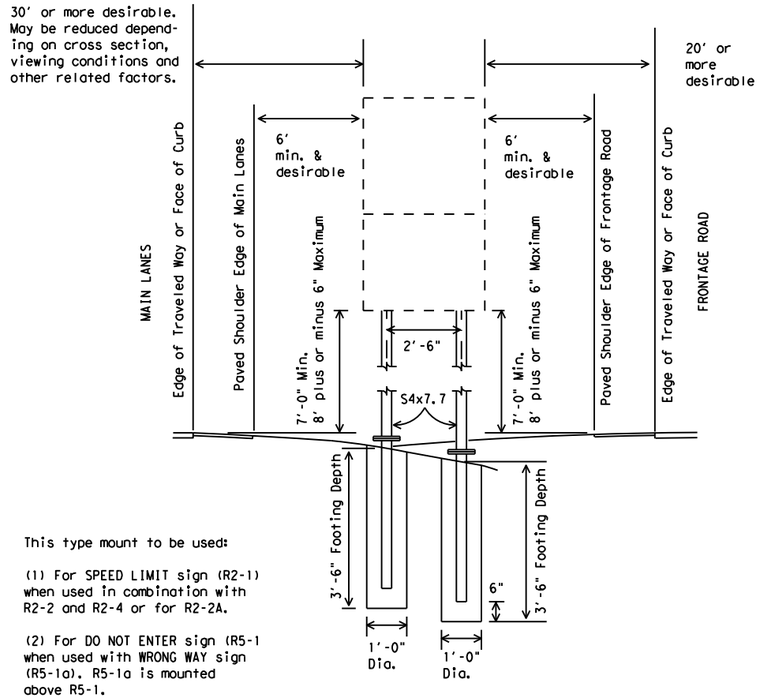


Galvanized steel or aluminum self-locking hex. head nut. 3/8 " - 16 x 3/4 " hex. head bolt for sheet metal. 3/8 " - 16 x 1 1/4 " hex. head bolt for plywood. 3/8 " galvanized medium washer.

DETAIL "C"



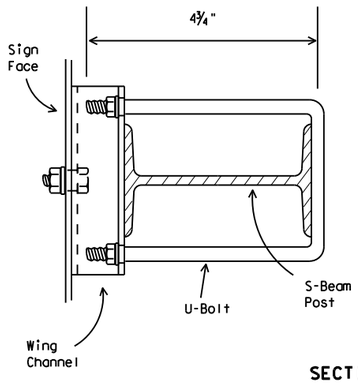
The weight of one S4x7.7 post is equal to 112.2 lbs. plus 7.7 lbs./ft x (post length in feet minus 10 ft). The weight of 112.2 lbs. includes 10 feet of post length, post foundation stub, related connection plates, friction fuse plate, and all high strength bolts, nuts and washers.



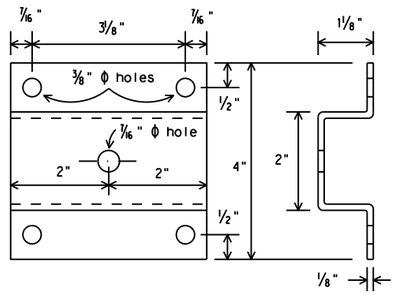
This type mount to be used:

(1) For SPEED LIMIT sign (R2-1) when used in combination with R2-2 and R2-4 or for R2-2A.

(2) For DO NOT ENTER sign (R5-1 when used with WRONG WAY sign (R5-1a). R5-1a is mounted above R5-1.



SECTION A-A



WING CHANNEL

Wing channel, 4" width x 1⅛" depth x ⅛" thickness, shall be aluminum (ASTM B221 6061-T6 or B308 6061-T6), galvanized steel (ASTM A36) or stainless steel (ASTM A167 type 304, No. 2B finish).

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. Parts shall be saw cut either before galvanizing and the galvanized cut cleaned of zinc build-up, or saw cut after galvanizing and the cut surface repaired per Item 445, "Galvanizing." (Cut surface will not be treated until plate is installed and all bolts fully tightened.)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS, TYPE G SUPPORT

SMD(TY G)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
1-97
9-08

CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS
DIST	COUNTY		SHEET NO.
SAT	BEXAR		246

DATE: 2/25/2022 10:20:39 AM
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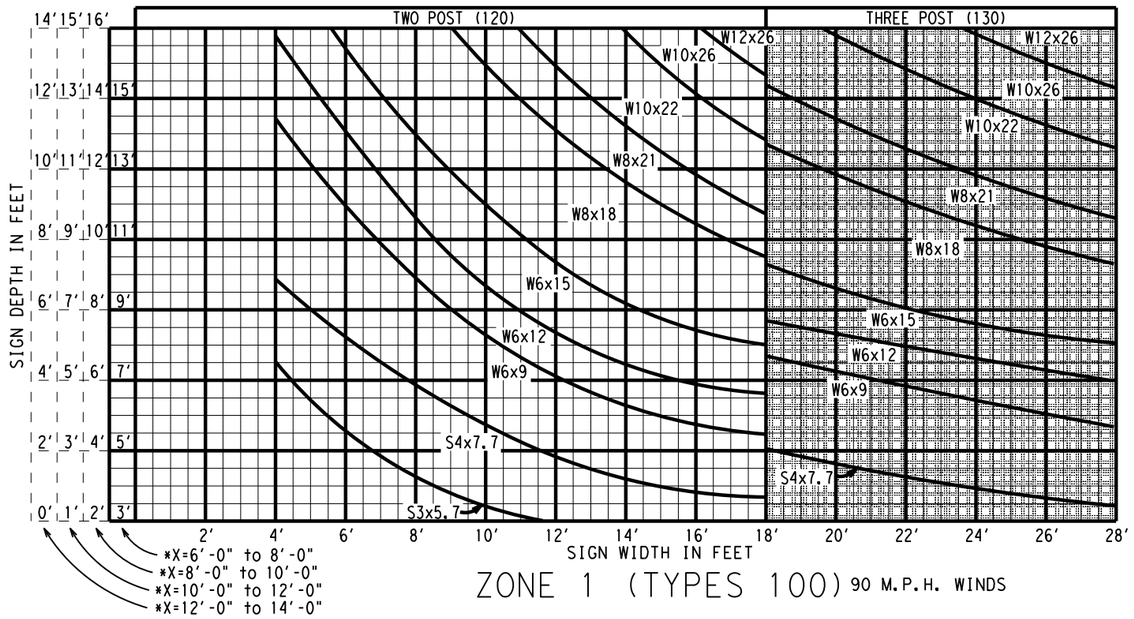
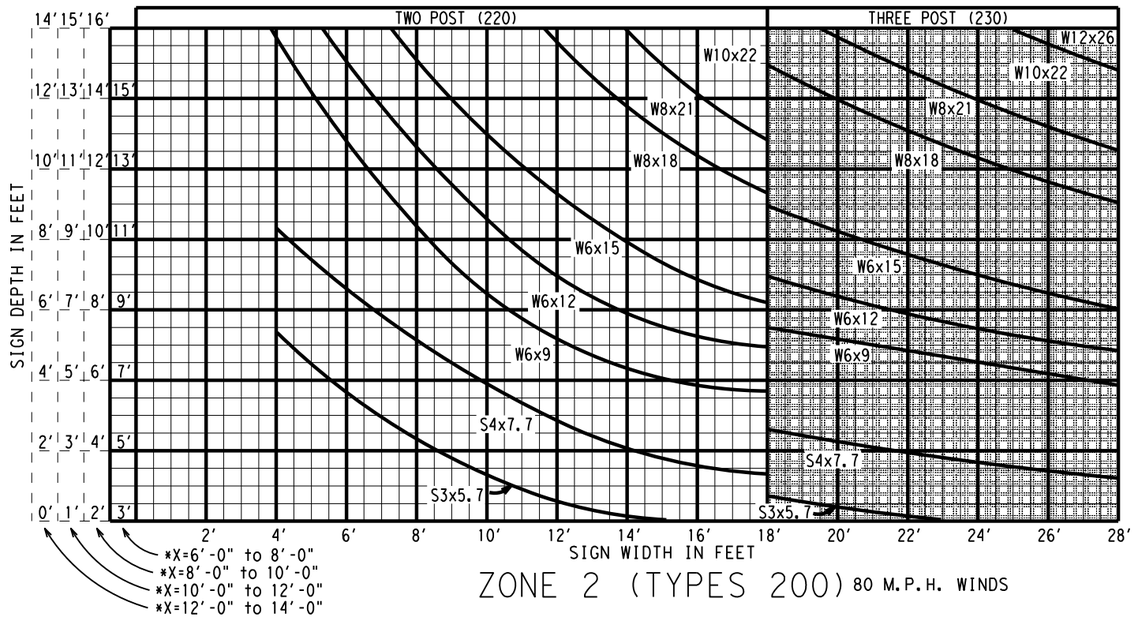
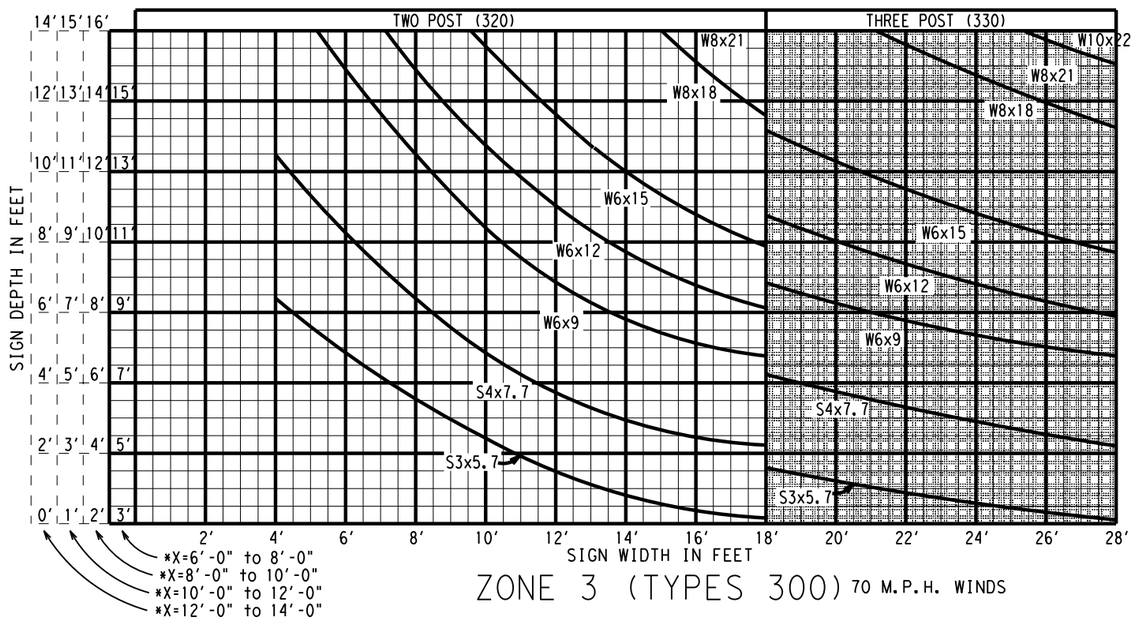


ZONE 1 (TYPES 100) 90 M.P.H. WINDS



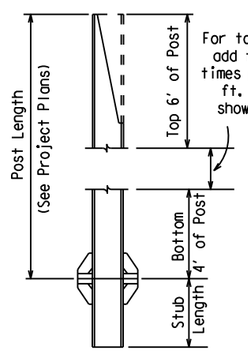
ZONE 2 (TYPES 200) 80 M.P.H. WINDS



ZONE 3 (TYPES 300) 70 M.P.H. WINDS

* NOTE: "X" EQUALS THE AVERAGE HEIGHT FROM THE GROUND LINE TO THE BOTTOM EDGE OF THE SIGN.

SHADED AREA DENOTES 3 POST SUPPORTS



POST WEIGHT DATA

POST SIZE	WEIGHT OF ONE POST (#)	WEIGHT OF TWO POSTS (#)	WEIGHT OF THREE POSTS (#)
W6x9*	123.2	246.4	369.6
W6x12*	160.3	320.6	480.9
W6x15*	167.8	335.6	503.4
W8x18*	201.8	403.6	605.4
W8x21*	254.7	509.4	764.1
W10x22*	266.0	532.0	798.0
W10x26*	308.0	616.0	924.0
W12x26*	308.6	617.2	925.8
S3x5.7*	85.9	171.8	257.7
S4x7.7*	112.2	224.4	336.6

*LAST FIGURES=POST WT. PER FT.

Weight Data is the weight of items shown for one, two or three posts - (includes top 6' of post, bottom 4' of post, post foundation stub, related base connection plates and stiffeners, friction fuse plate and all high strength bolts, nuts and washers).

SIGN TYPE

SIGN TYPE 1 3 0
- 1 = Wind Design Zone
- 3 = Series No.
- 0 = Number of Posts
- 0 Aluminum/Fiberglass
- 1 Aluminum
- 2 Fiberglass

Note: Footings for S3x5.7 and S4x7.7 post sizes shall be non-reinforced with Class A concrete, while footing for all other post sizes shall be reinforced with Class C concrete.

Texas Department of Transportation
Traffic Operations Division

LARGE ROADSIDE SIGN SUPPORTS
POST SELECTION
WORKSHEET
SMD(8W1)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
1-82
5-01
9-08

CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS

DIST	COUNTY	SHEET NO.
SAT	BEXAR	247

DATE: 2/25/2022 10:20:40 AM
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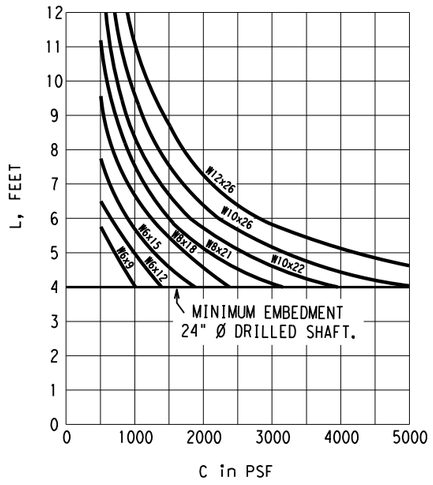
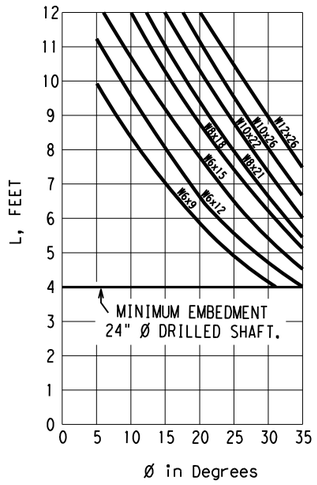
I



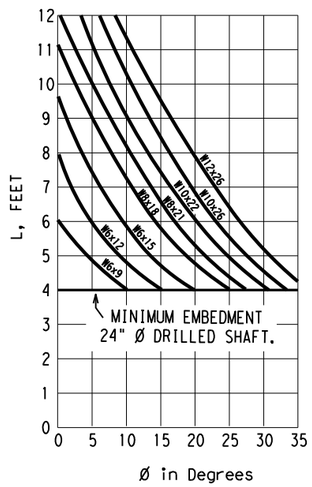
Ø = 0 Degrees

II



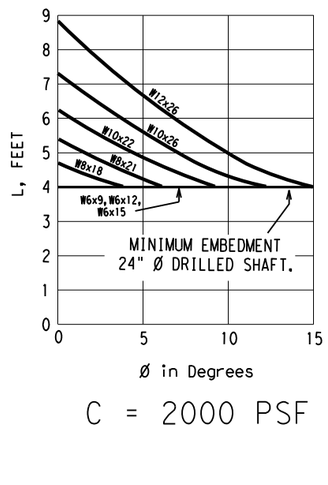
C = 0 PSF

III



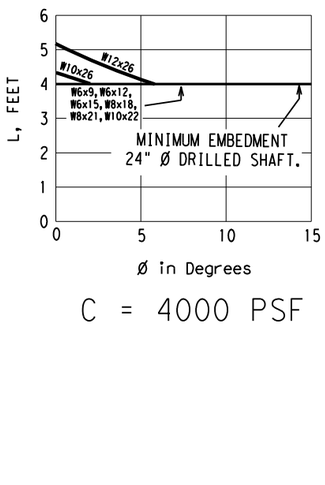
C = 500 PSF

IV



C = 2000 PSF

V



C = 4000 PSF

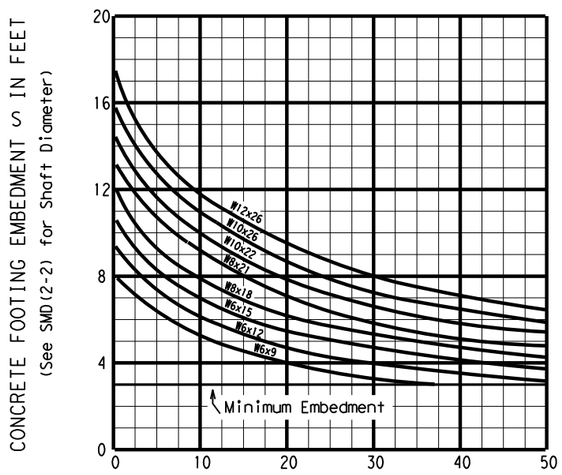
DRILLED CONCRETE FOOTING DEPTH CHART
(COHFRIC DESIGN)

NOTE: THESE CHARTS MAY BE USED AS AN ALTERNATE TO THE CHART BELOW, PROVIDED THAT SOIL COHESION AND INTERNAL FRICTION (COHFRIC) DATA ARE AVAILABLE.

LEGEND:

L = Required embedment of concrete drilled shaft, in feet
C = Cohesive shear strength of soil, in psf
Ø = Angle of internal friction of soil, in degrees

For values of C and Ø which are intermediate to those on the charts, embedments may be determined by straight - line interpolation.



DRILLED CONCRETE FOOTING DEPTH CHART
(TxDOT PENETROMETER DESIGN)

NOTE: ESTIMATED N SHOULD BE BASED AT APPROXIMATELY THE UPPER ONE-THIRD POINT OF THE DRILLED CONCRETE FOOTING BELOW THE GROUND LINE

Note:
1. Curves shown on this sheet are applicable for reinforced concrete footings only.

Texas Department of Transportation
Traffic Operations Division

LARGE ROADSIDE SIGN SUPPORTS FOUNDATION WORKSHEET
SMD(8W2)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
5-74
4-78
9-08

CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS
DIST	COUNTY		SHEET NO.
SAT	BEXAR		248

29B

GENERAL NOTES FOR ALL ELECTRICAL WORK

1. The location of all conduits, junction boxes, ground boxes, and electrical services is diagrammatic and may be shifted to accommodate field conditions.

2. Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC), TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA), and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association (CSA), Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Where reference is made to NEMA listed devices, International Electrotechnical Commission (IEC) listed devices will not be considered an acceptable equal to a NEMA listed device. Acceptable devices may have both a NEMA and IEC listing. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection. Replace or reinstall rejected material or equipment at no additional cost to the Department.

3. Miscellaneous nuts, bolts and hardware, except for high strength bolts, may be stainless steel when plans specify galvanized, provided the bolt size is ½ in. or less in diameter.

4. Provide the following test equipment as required by the Engineer to confirm compliance with the contract and the NEC: voltmeter, ammeter, megohm meter (1000 volt DC), ground resistance tester, torque wrenches, and torque screwdrivers. Ensure all equipment has been properly calibrated within the last year. Provide calibration certification to the Engineer upon request. Operate test equipment during inspection as requested by the Engineer.

5. Install grounding as shown on the plans and in accordance with the NEC. Ensure all metallic conduits; metal poles; luminaires; and metal enclosures are bonded to the equipment grounding conductor. Provide stranded bare copper or green insulated grounding conductors. Ground rods, connectors, and bonding jumpers are subsidiary to the various bid items.

6. When required by the Engineer, notify the Department in writing of materials from the Material Producers List (MPL) intended for use on each project. Prequalified materials are listed on the MPL on TxDOT's website under "Roadway Illumination and Electrical Supplies." No substitutions will be allowed for materials on this list.

CONDUIT

A. MATERIALS

1. Provide conduit, junction boxes, fittings, and hardware as per TxDOT Departmental Material Specification (DMS) 11030 "Conduit" and Item 618 "Conduit" of TxDOT's "Standard Specifications For Construction And Maintenance Of Highways, Streets, And Bridges," latest edition. Provide conduits listed under Item 618 on the MPL under "Roadway Illumination and Electrical Supplies." Provide conduit types according to the descriptive code or as shown on the plans. Do not substitute other types of conduits for those shown. Provide liquidtight flexible metal conduit (LFMC) when flexible conduit is called for on galvanized steel rigid metallic conduit (RMC) systems. Provide liquidtight flexible nonmetallic conduit (LFNC) when flexible conduit is called for on polyvinyl chloride (PVC) systems.

2. Provide galvanized steel RMC for all exposed conduits, unless otherwise shown on the plans. Properly bond all metal conduits.

3. Unless otherwise shown on the plans, provide junction boxes with a minimum size as shown in the following table, which applies to the greatest number of conductors entering the box through one conduit with no more than four conduits per box. When a mixture of conductor sizes is present, count the conductors as if all are of the larger size. For situations not applicable to the table, size junction boxes in accordance with NEC.

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

4. Junction boxes with an internal volume of less than 100 cu. in. and supported by entering raceways must have threaded entries or hubs identified for the intended purpose and supported by connection of two or more rigid metal conduits. Secure conduit within 3 ft. of the enclosure or within 18 in. of the enclosure if all conduit entries are on the same side. Mechanically secure all junction boxes with an internal volume greater than 100 cu. inches.

5. Provide hot dipped galvanized cast iron or sand cast aluminum outlet boxes for junction boxes containing only 10 AWG or 12 AWG conductors. Do not use die cast aluminum boxes. Size outlet boxes according to the NEC.

6. Do not use intermediate metal conduit (IMC) or electrical metallic tubing (EMT) unless specifically required by the plan sheets. When EMT is called for, provide junction boxes made from galvanized steel sheeting, listed and approved for outdoor use, unless otherwise noted on the plans. Size all galvanized steel junction boxes in accordance with the NEC. Provide junction boxes for IMC conduit systems that meet the same requirements for junction boxes used with RMC systems.

7. Provide PVC junction boxes intended for outdoor use on PVC conduit systems, unless otherwise noted on the plans.

8. Provide PVC elbows in PVC conduit systems, unless otherwise shown on the plans. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the PVC conduit system. When galvanized steel RMC elbows are specifically called for in the plans and any portion of the RMC elbow is buried less than 18 in., ground the RMC elbow by means of a grounding bushing on a rigid metal extension. Grounding of the rigid metal elbow is not required if the entire RMC elbow is encased in a minimum of 2 in. of concrete. PVC extensions are allowed on these concrete encased rigid metal elbows. RMC or PVC elbows are subsidiary to various bid items.

9. When required, provide High-Density Polyethylene (HDPE) conduit with factory installed internal conductors according to Item 622 "Duct Cable." At the Contractor's request and with approval by the Engineer, substitute HDPE conduit with no conductors for bored schedule 40 or schedule 80 PVC conduit bid under Item 618. Ensure bored HDPE substituted for PVC is schedule 40 and of the same size PVC called for in the plans. Ensure the substituted HDPE meets the requirements of Item 622, except that the conduit is supplied without factory-installed conductors. Make the transition of the HDPE conduit to PVC (or RMC elbow when required) at the bore pit. Provide conduit of the size and schedule as shown on the plans. Do not extend substituted conduit into ground boxes or foundations. Provide PVC or galvanized steel RMC elbows as called for at all ground boxes and foundations.

10. Use two-hole straps when supporting 2 in. and larger conduits. On electrical service poles, properly sized stainless steel or hot dipped galvanized one-hole standoff straps are allowed on the service riser conduit.

B. CONSTRUCTION METHODS

1. Provide and install expansion joint conduit fittings on all structure-mounted conduits at the structure's expansion joints to allow for movement of the conduit. In addition, provide and install expansion joint fittings on all continuous runs of galvanized steel RMC conduit externally exposed on structures such as bridges at maximum intervals of 150 ft. When requested by the project Engineer, supply manufacturer's specification sheet for expansion joint conduit fittings. Repair or replace expansion joint fittings that do not allow for movement at no additional cost to the Department. Provide the method of determining the amount of expansion to the Engineer upon request. Do not use LFMC or LFNC as a substitute for the required expansion conduit fittings.

2. Space all conduit supports at maximum intervals of 5 ft. Install conduit spacers when attaching metal conduit to surface of concrete structures. See "Conduit Mounting Options" on ED(2). Install conduit support within 3 ft. of all enclosures and conduit terminations.

3. Do not attach conduit supports directly to pre-stressed concrete beams except as shown specifically in the plans or as approved by the Engineer.

4. Unless otherwise shown on the plans, jack or bore conduit placed beneath existing roadways, driveways, sidewalks, or after the base or surfacing operation has begun. Backfill and compact the bore pits below the conduit per Item 476 "Jacking, Boring, or Tunneling Pipe or Box" prior to installing conduit or duct cable to prevent bending of the connections.

5. When placing conduit in the sub-grade of new roadways, backfill all trenches with excavated material unless otherwise noted on the plans. When placing conduit in the sub-base of new roadways, backfill all trenches with cement-stabilized base as per requirements of Items 110 "Excavation", 400 "Excavation and Backfill for Structures", 401 "Flowable Backfill", 402 "Trench Excavation Protection", and 403 "Temporary Special Shoring."

6. Provide and place warning tape approximately 10 in. above all trenched conduit as per Item 618.

7. During construction, temporarily cap or plug open ends of all conduit and raceways immediately after installation to prevent entry of dirt, debris and animals. Temporary caps constructed of durable duct tape are allowed. Tightly fix the tape to the conduit opening. Clean out the conduit and prove it clear in accordance with Item 618 prior to installing any conductors.

8. Ensure conduit entry into the top of any enclosure is waterproof by installing conduit sealing hubs or using boxes with threaded bosses. This includes surface mounted safety switches, meter cans, service enclosures, auxiliary enclosures and junction boxes. Grounding bushings on water tight sealing hubs are not required.

9. Fit the ends of all PVC conduit terminations with bushings or bell end fittings. Provide and install a grounding type bushing on all metal conduit terminations.

10. Install a bonding jumper from each grounding bushing to the nearest ground rod, grounding lug, or equipment grounding conductor. Ensure all bonding jumpers are the same size as the equipment grounding conductor. Bonding of conduit used as a casing under roadways for duct cable is not required, if the duct extends the full length through the casing.

11. At all electrical services, install a 6 AWG solid copper grounding electrode conductor.

12. Place conduits entering ground boxes so that the conduit openings are between 3 in. and 6 in. from the bottom of the box. See the ground box detail on sheet ED(4).

13. Seal ends of all conduits with duct seal, expandable foam, or by other methods approved by the Engineer. Seal conduit immediately after completion of conductor installation and pull tests. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a conduit sealant.

14. File smooth the cut ends of all mounting strut and conduit. Before installing, paint the field cut ends of all mounting strut and RMC (threaded or non-threaded) with zinc rich paint (94% or more zinc content) to alleviate overspray. Use zinc rich paint to touch up galvanized material as allowed under Item 445 "Galvanizing." Do not paint non-galvanized material with a zinc rich paint as an alternative for materials required to be galvanized.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUITS & NOTES

ED(1)-14

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	DIST		COUNTY	SHEET NO.
	SAT		BEXAR	249

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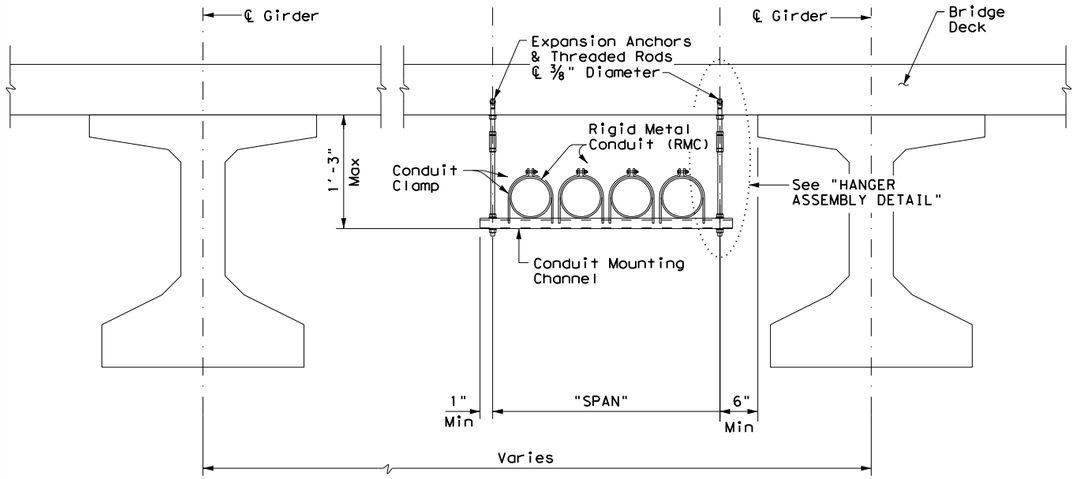
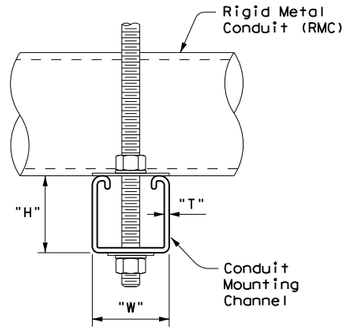
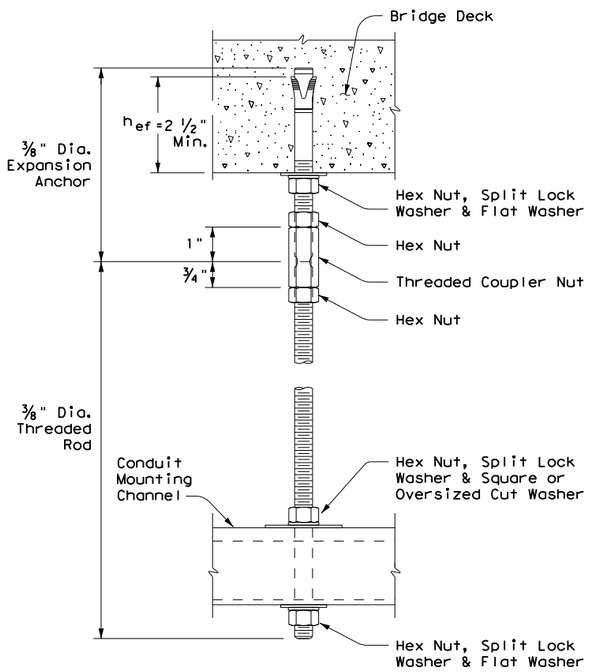


CONDUIT HANGING DETAIL

CONDUIT MOUNTING CHANNEL		
"SPAN"	"W" x "H"	"T"
less than 2'	1 5/8" x 1 3/8"	12 Ga.
2'-0" to 2'-6"	1 5/8" x 1 5/8"	12 Ga.
>2'-6" to 3'-0"	1 5/8" x 2 7/16"	12 Ga.

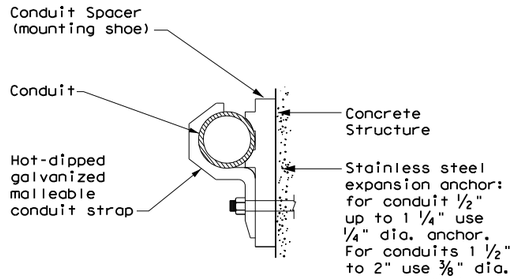
Channels with round or short slotted hole patterns are allowed, if the load carrying capacity is not reduced by more than 15%.

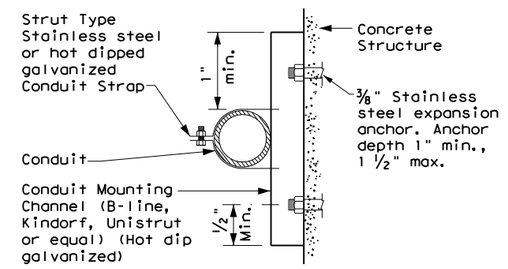




HANGER ASSEMBLY DETAIL

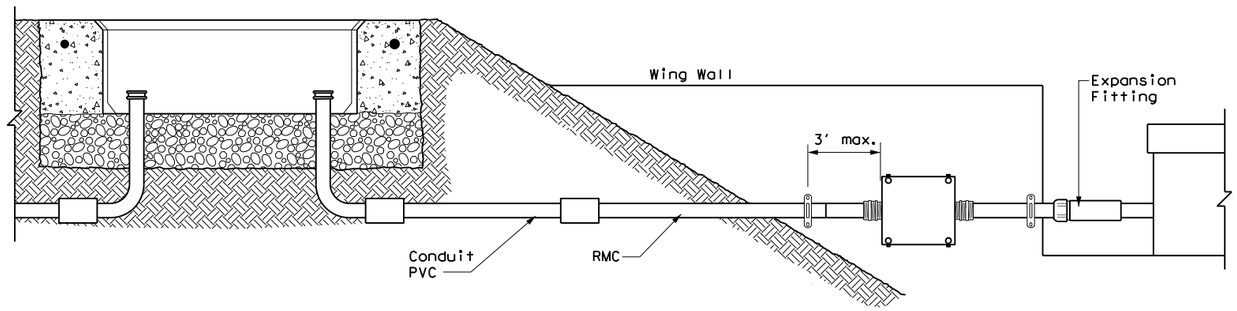
ELECTRIC CONDUIT TO BRIDGE DECK ATTACHMENT





CONDUIT MOUNTING OPTIONS

Attachment to concrete surfaces
See ED(1)B.2



TYPICAL CONDUIT ENTRY TO BRIDGE STRUCTURE DETAIL

EXPANSION ANCHOR NOTES FOR BRIDGE DECK ATTACHMENT

1. Use torque controlled mechanical expansion anchors that are approved for use in cracked concrete by the International Code Council, Evaluation Service (ICC-ES). The chosen anchor product shall have a designated ICC-ES Evaluation Report number, and its approval status shall be maintained on the ICC-ES website under Division 031600 for Concrete Anchors.
2. Unless otherwise approved by the Engineer: do not use adhesive anchors; do not use expansion anchors that are not included in the ICC-ES approval list; and do not use expansion anchors that are only approved for use in uncracked concrete.
3. Use anchors manufactured with stainless steel expansion wedges. Anchors manufactured with carbon steel expansion wedges are not allowed. Anchor bodies can be either zinc-plated carbon steel or stainless steel. For application in marine environment, both the anchor body and expansion wedge shall be stainless steel.
4. Install anchors as shown on the plans and in accordance with the anchor manufacturer's published installation instructions. Arrange a field demonstration test to evaluate the procedures and tools. The test shall be witnessed and approved by the Engineer prior to furnishing anchors on the structure.
5. Prior to hole drilling, use rebar locator to ensure clearing of existing deck strands or reinforcement. Install anchors to ensure a minimum effective embedment depth, (h_{ef}), as shown. Increase (h_{ef})as needed to ensure sufficient thread length for proper torqueing and tightening of anchors.
6. Use anchors of minimum 1600 Lbs tensile capacity (minimum of steel, concrete breakout, and concrete pullout strengths as determined by ACI 318 Appendix D) at the required minimum embedment depth (h_{ef}). No lateral loads shall be introduced after conduit installation.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUIT SUPPORTS

ED(2)-14

FILE: ed2-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	00	238	VARIOUS
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		250

71B

ELECTRICAL CONDUCTORS

A. MATERIAL INFORMATION

1. Provide Type XHHW insulated conductors in accordance with Departmental Material Specification (DMS)11040 "Conductors" and Item 620 "Electrical Conductors." Provide conductors as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies" Item 620. Color code insulated conductors in conformance with the NEC. Identify grounded (neutral) conductors with white insulation. Identify grounding conductors (ground wires) with green insulation or bare conductors. Identify ungrounded (hot) conductors with any color insulation except green, white, or gray. Keep color scheme consistent throughout the wiring system. Identify conductors 6 American Wire Gauge (AWG) and smaller by continuous color jacket. Identify electrical conductors 4 AWG and larger by continuous color jacket or by colored tape. When identifying conductors with colored tape, mark at least 6 in. of the conductor's insulation with half laps of tape.

2. Provide a solid copper 6 AWG grounding electrode conductor to bond the electrical service equipment to the concrete encased grounding electrode or the ground rod at the service location. Connect the grounding electrode conductor to the ground rod with a UL listed connector in accordance with DMS 11040. Connect the grounding electrode conductor to the concrete encased grounding electrode as shown in the plans.

3. Where two or more circuits are present in one conduit or enclosure, permanently identify the conductors of each branch circuit by attaching a non-metallic tag around both circuit conductors at each accessible location. Provide tags with two straps, large enough to indicate circuit number, letter, or other identification as shown in the plans. Print circuit identification on the tag with a permanent marker.

4. Use listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors for splicing as specified in DMS 11040. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Provide UL listed gel-filled insulating splice covers. Splicing materials, insulating materials, breakaway disconnects, splice covers, and fuse holders are subsidiary to various bid items.

B. CONSTRUCTION METHODS

1. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the conduit system. After installing conductors in conduit, perform conductor pull test. If a conductor cannot be freely pulled, make any needed alterations or repairs at no additional cost to the department. Perform insulation resistance tests in accordance with Item 620. Coordinate with the Engineer to witness the tests.

2. Leave 2 ft. minimum, 3 ft. maximum length for each conductor up to the splice in ground boxes. Leave 3 ft. minimum, 4 ft. maximum length of conductor in ground boxes when pulled through with no splice. Leave 1 ft. minimum, 1.5 ft. maximum length of conductor at enclosures, weatherheads and pole bases.

3. Make splices only in junction boxes, ground boxes, pole bases, or electrical enclosures and use only listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors. Insulate splices with heavy wall heat shrink tubing or gel-filled insulating splice covers to provide a watertight splice. Overlap conductor insulation with heat shrink tubing a minimum of 2 in. past both sides of the splice. Where heat shrink tubing may not shrink sufficiently to provide a watertight seal around the individual conductors, prior to heating the tubing, increase the diameter of the conductor insulation using hot melt adhesive tape to provide a watertight seal between the individual conductors and the heat shrink tubing. Ensure the tape extends past the heat shrink tubing. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Heat shrink tubing that appears to have been burned, or overheated, is considered defective and must be replaced.

4. Size and install gel-filled insulating splice covers according to manufacturer's specifications when used in place of heat shrink tubing.

5. Wire nuts with factory applied waterproof sealant may be used for 8 AWG or smaller conductors in above ground junction boxes, but not in pole bases or ground boxes. Install wire nuts in an upright position to prevent the accumulation of water.

6. Support conductors in illumination poles with a J-hook at the top of the pole.

7. When terminating conductors, remove the insulation and jacketing material without nicking the individual strands of the conductor. Conductors with nicked individual conductor strands or removed strands will be considered damaged.

8. Replace conductors and cables that are damaged beyond repair or that fail an insulation resistance test at no additional cost to the department.

9. Do not repair damaged conductors with duct tape, electrical tape, or wire nuts. Use only approved splicing methods.

10. Do not terminate more than one conductor under a single connector, unless the connector is rated for multiple conductors. Do not exceed the pressure connector's listing for maximum number and size of conductors allowed.

11. Install breakaway connectors on conductors bid under Item 620 whenever those conductors pass through a breakaway support device. Follow manufacturer's instructions when terminating conductors to breakaway connectors. Properly torque threaded connections. Proper terminations are critical to the safe operation of breakaway devices. Trim waterproofing boots on breakaway connectors to fit snugly around the conductor to ensure waterproof connection. Only one conductor may enter a single opening in a boot. Provide waterproof boots with the correct number of openings. Leave unused openings factory sealed. Use prequalified breakaway connectors as shown on the MPL.

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

C. TEMPORARY WIRING

1. Install temporary conductors and electrical equipment in accordance with the NEC article "Temporary Installations" and Department standard sheets.

2. Provide a ground fault circuit interrupter (GFCI) for power outlets for portable electrical equipment, power tools, ice machines, ice storage bins and refrigerators located outdoors at grade. GFCI may be any one of the following: molded cord and plug set, receptacle, or circuit breaker type.

3. Use listed wire nuts with factory applied sealant for temporary wiring where approved.

4. Enclose conductor splices within a listed enclosure or ground box, or ensure the splices are more than 10 ft. above grade vertically and more than 5 ft. horizontally from any metal structure. Where installing temporary conductors in areas subject to vehicle traffic or mobile construction equipment, ensure the vertical clearance to ground is at least 18 ft. when measured at the lowest point. Ground messenger wires that support power conductors in conformance with the NEC.

5. Protect and when necessary repair any existing electrical conduits uncovered during the construction process in a timely manner and in conformance with the NEC.

GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

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

B. CONSTRUCTION METHODS

1. Furnish auxiliary ground rods for lightning protection and install in soil, concrete, or both, as called for in the plans. For ground rods installed in concrete, ensure the connection of the conductor to the ground rod is readily accessible for inspection or repairs. For ground rods installed in soil, ensure that the upper end is between 2 to 4 in. below finished grade.

2. Do not place ground rods in the same drilled hole as a timber pole.

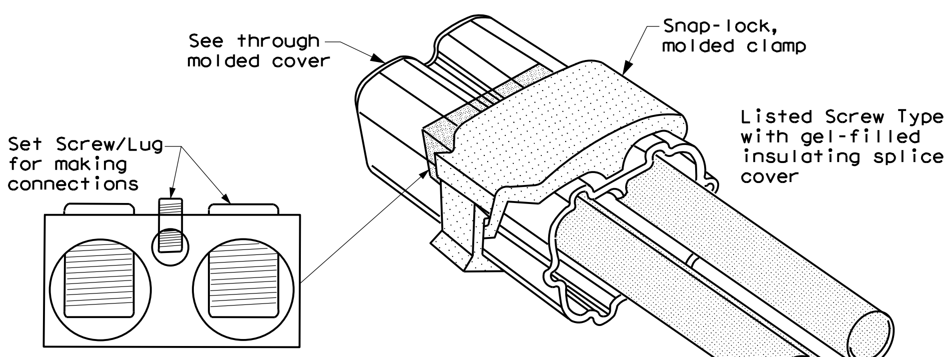
3. Install ground rods so the imprinted part number is at the upper end of the rod.

4. Remove all non-conductive coatings such as concrete splatter from the rod at the clamp location.

5. Route all conductors as short and straight as possible for connection to lightning protection ground rods. When a bend is required, ensure a minimum radius bend of four inches for these conductors.

6. Unless otherwise called for in the plans, protect grounding electrode conductors with non-metallic conduit. When protecting grounding electrode conductors with metal conduit, provide and install a grounding type bushing and properly sized bonding jumper on each end of the metal conduit.

7. Written authorization is required before installing a ground rod in a horizontal trench for rocky soil or a solid rock bottom.



SPLICE OPTION 3
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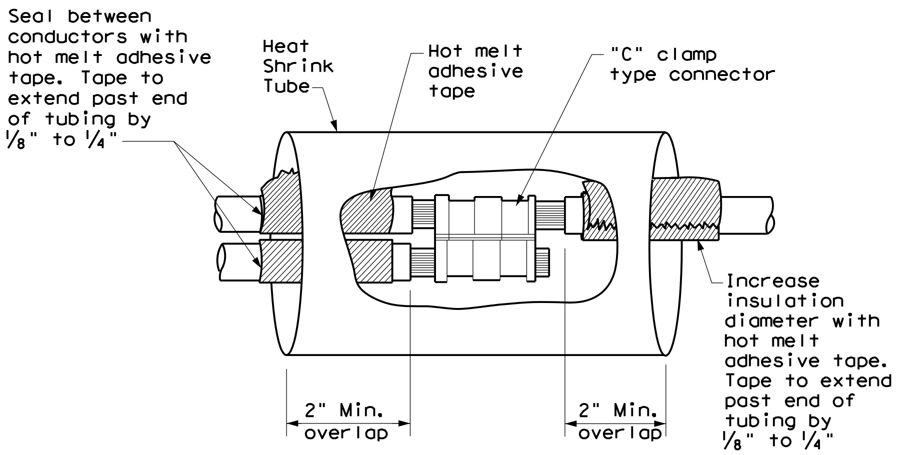
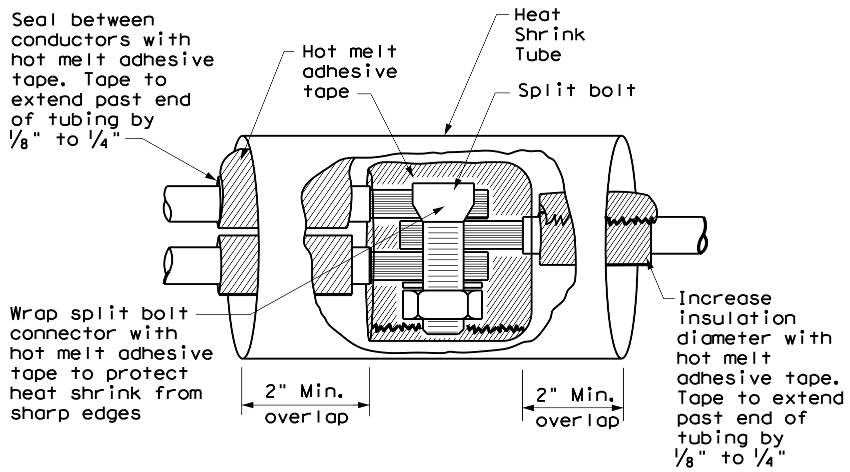


SPLICE OPTION 1
Compression Type



SPLICE OPTION 2
Split Bolt Type

Texas Department of Transportation — Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUCTORS

ED(3)-14

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©TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
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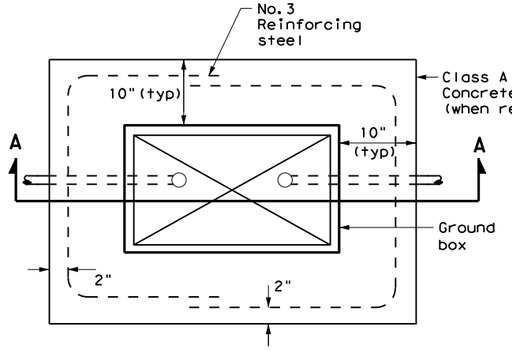
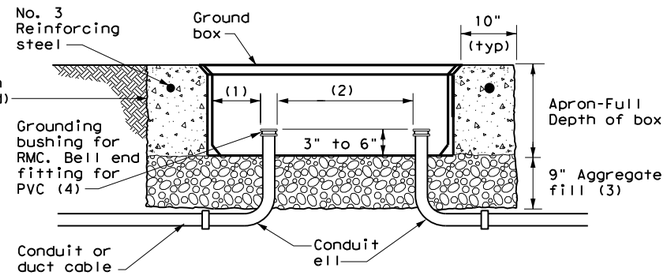


PLAN VIEW



SECTION A - A

APRON FOR GROUND BOX

(1) Uniformly space ends of conduits within the ground box. Position ends of conduits so that ground box walls do not interfere with the installation of grounding bushings or bell end fittings.

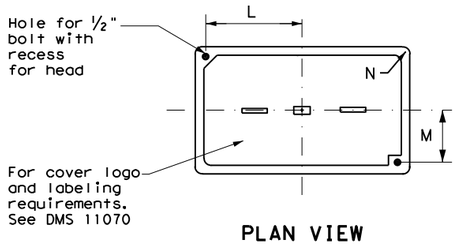
(2) Maintain sufficient space between conduits to allow for proper installation of bushing.

(3) Place aggregate under the box, not in the box. Aggregate should not encroach on the interior volume of the box.

(4) Install a grounding bushing on the upper end of all RMC terminating in a ground box. Ground RMC elbows when any part of the elbow is less than 18 in. below the bottom of the ground box. Install a PVC bushing or bell end fitting on the upper end of all PVC conduits terminating in a ground box.

GROUND BOX DIMENSIONS	
TYPE	OUTSIDE DIMENSIONS (INCHES) (Width x Length X Depth)
A	12 X 23 X 11
B	12 X 23 X 22
C	16 X 29 X 11
D	16 X 29 X 22
E	12 X 23 X 17

GROUND BOX COVER DIMENSIONS								
TYPE	DIMENSIONS (INCHES)							
	H	I	J	K	L	M	N	P
A, B & E	23 1/4	23	13 3/4	13 1/2	9 7/8	5 1/8	1 3/8	2
C & D	30 1/2	30 1/4	17 1/2	17 1/4	13 1/4	6 3/4	1 3/8	2



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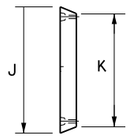

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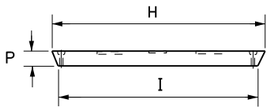

SIDE

GROUND BOX COVER

GROUND BOXES

A. MATERIALS

1. Provide polymer concrete ground boxes measuring 16x30x24 in. (WxLxD) or smaller in accordance with Departmental Material Specification (DMS) 11070 "Ground Boxes" and Item 624 "Ground Boxes."

2. Provide Type A, B, C, D, and E ground boxes as shown in the plans, and as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 624.

3. Ensure ground box cover is correctly labeled in accordance with DMS 11070.

4. Provide larger ground boxes in accordance with Item 624 and as shown in the plans.

B. CONSTRUCTION METHODS

1. Remove all gravel and dirt from conduit. Cap all conduits prior to placing aggregate and setting ground box. Provide Grade 3 or 4 coarse aggregate as shown on Table 2 of Item 302 "Aggregates for Surface Treatments." Ensure aggregate bed is in place and at least 9 inches deep, prior to setting the ground box. Install ground box on top of aggregate.

2. Cast ground box aprons in place. Reinforcing steel may be field bent. Ensure the depth of concrete for the apron extends from finished grade to the top of the aggregate bed under the box. Ground box aprons, including concrete and reinforcing steel, are subsidiary to ground boxes when called for by descriptive code.

3. Keep bolt holes in the box clear of dirt. Bolt covers down when not working in ground boxes.

4. Install all conduits and ells in a neat and workmanlike manner. Uniformly space conduits so grounding bushings and bell end fittings can easily be installed.

5. Temporarily seal all conduits in the ground box until conductors are installed.

6. Permanently seal conduits immediately after the completion of conductor installation and pull tests. Permanently seal the ends of all conduits with duct seal, expandable foam, or other method as approved. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a sealant.

7. When a ground rod is present in a ground box, bond all equipment grounding conductors together and to the ground rod with listed connectors.

8. When a type B or D ground box is stacked to meet volume requirements, it is allowable to cut an appropriately sized hole for conduit entry in the side wall at least 18 inches below grade.

9. If an existing ground box in the contract has a metal cover, bond the cover to the equipment grounding conductor with a 3 ft. long stranded bonding jumper the same size as the grounding conductor. The bonding jumper is subsidiary to various bid items. Verify existing ground boxes with metal covers are shown on the plans, with notes fully describing the work required.

10. If other ground boxes with metal covers are within the project limits but are not part of the contract, the Engineer may direct the Contractor to bond the metal covers, identifying the specific boxes in writing. This work will be paid for separately.

11. Bond metal ground box covers to the grounding conductor with a tank ground type lug.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS GROUND BOXES

ED(4)-14

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ELECTRICAL SERVICES NOTES

1. Provide new materials. Ensure installation and materials comply with the applicable provisions of the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards. Ensure material is Underwriters Laboratories (UL) listed. Provide and install electrical service conduits, conductors, disconnects, contactors, circuit breaker panels, and branch circuit breakers as shown on the Electrical Service Data chart in the plans. Faulty fabrication or poor workmanship in material, equipment, or installation is justification for rejection. Where manufacturers provide warranties and guarantees as a customary trade practice, furnish these to the State.

2. Provide electrical services in accordance with Electrical Details standard sheets, Departmental Material Specification (DMS) 11080 "Electrical Services,"DMS 11081 "Electrical Services-Type A," DMS 11082 "Electrical Services-Type C," DMS 11083 "Electrical Services-Type D," DMS 11084 "Electrical Services-Type T," DMS 11085 "Electrical Services-Pedestal (PS)", and Item 628 "Electrical Services" of the Standard Specifications. Provide electrical service types A, C, and D, as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 628. Provide other service types as detailed on the plans.

3. Provide all work, materials, services, and any incidentals needed to install a complete electrical service as specified in the plans.

4. Coordinate with the Engineer and the utility provider for metering and compliance with utility requirements. Primary line extensions, connection charges, meter charges, and other charges by the utility company to provide power to the location are paid for in accordance with Item 628. Get approval for the costs associated with these charges prior to engaging the utility company to do the work. Consult with the utility provider to determine costs and requirements, and coordinate the work as approved.

5. The enclosure manufacturer will provide Master Lock Type 2 with brass tumblers keyed #2195 for all custom electrical enclosures. Installing Contractor is to provide Master Lock #2195 Type 2 with brass tumblers for "off the shelf" enclosures. Master Lock #2195 keys and locks become property of the State. Unless otherwise approved, do not energize electrical service equipment until locks are installed.

6. Enclosures with external disconnects that de-energize all equipment inside the enclosure do not need a dead front trim. Protect incoming line terminations from incidental contact as required by the NEC.

7. When galvanized is specified for nuts, screws, bolts or miscellaneous hardware, stainless steel may be used.

8. Provide wiring and electrical components rated for 75°C. Provide red, black, and white colored XHHW service entrance conductors of minimum size 6 American Wire Gauge (AWG). Identify size 6 AWG conductors by continuous color jacket. Identify electrical conductors sized 4 AWG and larger by continuous color jacket or by colored tape. Mark at least 6 inches of the conductor's insulation with half laps of colored tape, when identifying conductors. Ensure each service entrance conductor exits through a separately bushed non-metallic opening in the weatherhead. The lengths of the conductors outside the weatherhead are to be 12 inches minimum, 18 inches maximum, or as required by utility.

9. All electrical service conduit and conductors attached to the electrical service including the riser or the elbow below ground are subsidiary to the electrical service. For an underground utility feed, all service conduit and conductors after the elbow, including service conduit and conductors for the utility pole riser when furnished by the Contractor, will be paid for separately.

10. Provide rigid metal conduit (RMC) for all conduits on service, except for the ½ in. PVC conduit containing the electrical service grounding electrode conductor. Size the service entrance conduit as shown in the plans. Ensure conduit for branch circuit entry to enclosure is the same size as that shown on the layout sheets for branch circuit conduit. Extend all rigid metal conduits a minimum of 6 inches underground and then couple to the type and schedule of the conduit shown on the layout for that particular branch circuit. Install a grounding bushing on the RMC where it terminates in the service enclosure.

11. Use of liquidtight flexible metal conduit (LFMC) is allowed between the meter and service enclosure when they are mounted 90 to 180 degrees to each other. Size the LFMC the same size as service entrance conduit. LFMC must not exceed 3 feet in length. Strap LFMC within 1 foot of each end. LFMC less than 12 inches in length need not be strapped. Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting. The LFMC must contain a grounded (neutral) conductor. Ensure any bend in LFMC never exceeds 180 degrees. A pull test is required on all installed conductors, with at least six inches of free conductor movement demonstrated to the satisfaction of the Engineer.

12. Ensure all mounting hardware and installation details of services conform to utility company specifications.

13. For all electrical service enclosures listed under Item 628 on the MPL, the UL 508 enclosure manufacturers will prepare and submit a schematic drawing unique to each service. Before shipment to the job site, place the applicable laminated schematic drawings and the laminated plan sheet showing the electrical service data chart used to build the enclosure in the enclosure's data pocket. The installing contractor will copy and laminate the actual project plan sheets detailing all equipment and branch circuits supplied by that service. The laminated plan sheets are to be placed in the service enclosure's document pocket. Reduce 11 in. x 17 in. plan sheets to 8 ½ in. x 11 in. before laminating. If the installation differs from the plan sheets, the installing contractor is to redline plan sheets before laminating.

14. When providing an "Off The Shelf" Type D or Type T service, provide laminated plan sheets detailing equipment and branch circuits supplied by that service. Reduce 11 in. x 17 in. plan sheets to 8 ½ in. x 11 in before laminating. Deliver these drawings before completion of the work to the Engineer, instead of placing in enclosure that has no door pocket.

15. Do not install conduit in the back wall of a service enclosure where it would penetrate the equipment mounting panel inside the enclosure. Provide grounding bushings on all metal conduits, and terminate bonding jumpers to grounding bus. Grounding bushings are not required when the end of the metal conduit is fitted with a conduit sealing hub or threaded boss, such as a meter base hub.

SERVICE ASSEMBLY ENCLOSURE

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

2. Type galvanized steel (GS) enclosures may be used for Type C panelboards and for Type D and T services that do not use an enclosure mounted photocell or lighting contactor. Provide GS enclosures in accordance with DMS 11080, 11082, 11083, and 11084.

3. Provide aluminum (AL) and stainless steel (SS) enclosures for Types A, C, and D in accordance with DMS 11080, 11081, 11082, 11083, and 11084. Do not paint stainless steel.

4. Provide pedestal service (PS) enclosures in accordance with ED(9) and DMS 11080 and 11085. Do not provide GS pedestal services. If GS is shown in the PS descriptive code, provide an AL enclosure.

MAIN DISCONNECT & BRANCH CIRCUIT BREAKERS

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

2. When the utility company provides a transformer larger than 50 KVA, verify that the available fault current is less than the circuit breaker's ampere interrupting capacity (AIC) rating and provide documentation from the electric utility provider to the Engineer.

PHOTOELECTRIC CONTROL

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

*ELECTRICAL SERVICE DATA

Elec. Service ID	Plan Sheet Number	Electrical Service Description	Service Conduit **Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amps	Two-Pole Contractor Amps	Panelbd/ Loadcenter Amp Rating	Branch Circuit ID	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
SB 183	289	ELC SRV TY A 240/480 100(SS)AL(E)SF(U)	2"	3/#2	100	2P/100	100	N/A	Lighting NB	2P/40	26	28.1
									Lighting SB	2P/40	25	
									Underpass	1P/20	15	
NB Access	30	ELC SRV TY D 120/240 060(NS)SS(E)TS(O)	1 ¼"	3/#6	N/A	2P/60		100	Sig. Controller	1P/30	23	5.3
							30		Luminaires	2P/20	9	
									CCTV	1P/20	3	
2nd & Main	58	ELC SRV TY T 120/240 000(NS)GS(N)SP(O)	1 ¼"	3/#6	N/A	N/A	N/A	70	Flashing Beacon 1	1P/20	4	1.0
									Flashing Beacon 2	1P/20	4	

* Example only, not for construction. All new electrical services must have electrical service data chart specific to that service as shown in the plans.

** Verify service conduit size with utility. Size may change due to utility meter requirements. Ensure conduit size meets the National ELectrical Code.

EXPLANATION OF ELECTRICAL SERVICE DESCRIPTIVE CODE

ELEC SERV TY X XXX/XXX XXX (XX) XX (X) XX (X)

Schematic Type

Service Voltage V / V

Disconnect Amp Rating
000 indicates main lug only/
Typically Type T

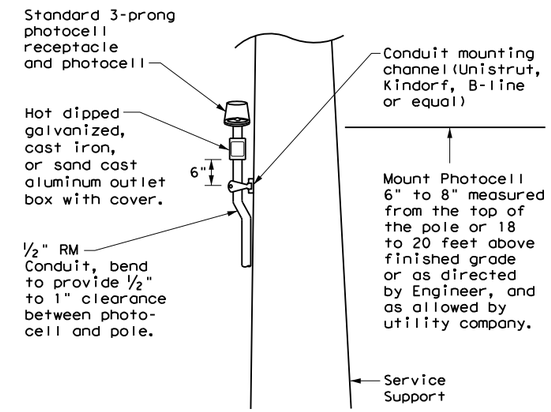
(SS)= Safety Switch Ahead of Meter-Check with Utility
(NS)= No safety Switch Ahead of Meter-Check with Utility

Enclosure Type
GS= Galvanized steel("off the shelf")
SS= Stainless steel(Custom Enclosure)See MPL
AL= Aluminum (Custom Enclosure)See MPL

Photocell Mounting Location
(E)= Inside Service/Enclosure Mounted
(T)= Top of pole
(L)= Luminaire mounted
(N)= None/No Photocell or Lighting Contactor Required

Service Support Type
GC= Granite concrete
OC= Other concrete
TP= Timber pole
SP= Steel pole
SF= Steel frame
OT= Pole by others or paid for separately
EX= Existing pole
TS= Service on traffic signal pole
PS= Pedestal Service

O= Overhead Service Feed from Utility
U= Underground Service Feed from Utility



TOP MOUNTED PHOTOCELL

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

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE NOTES & DATA

ED(5)-14

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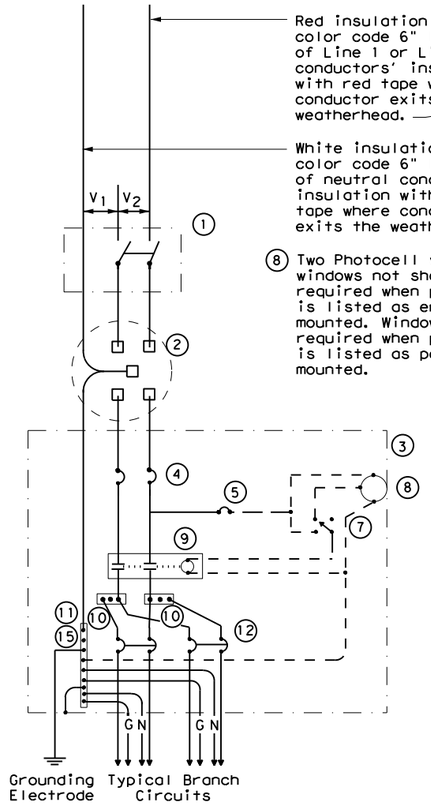
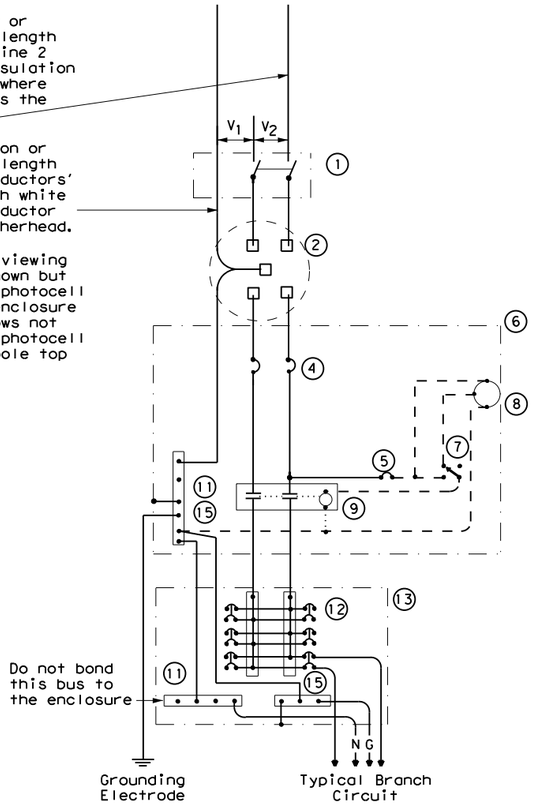
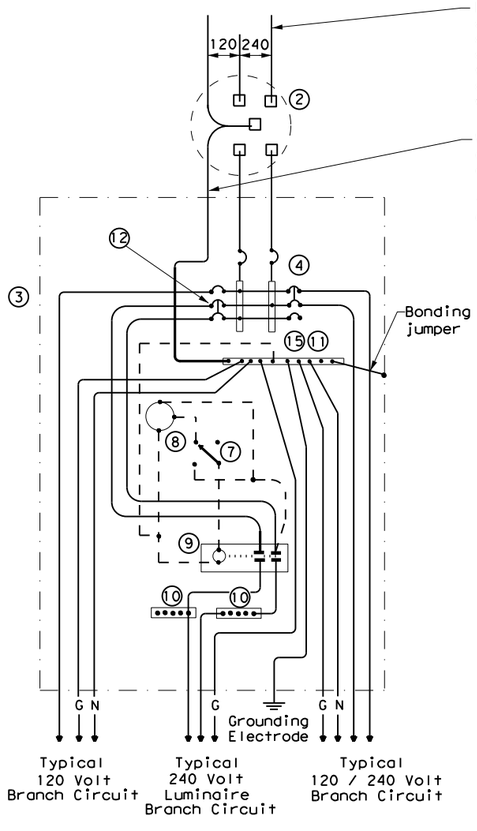


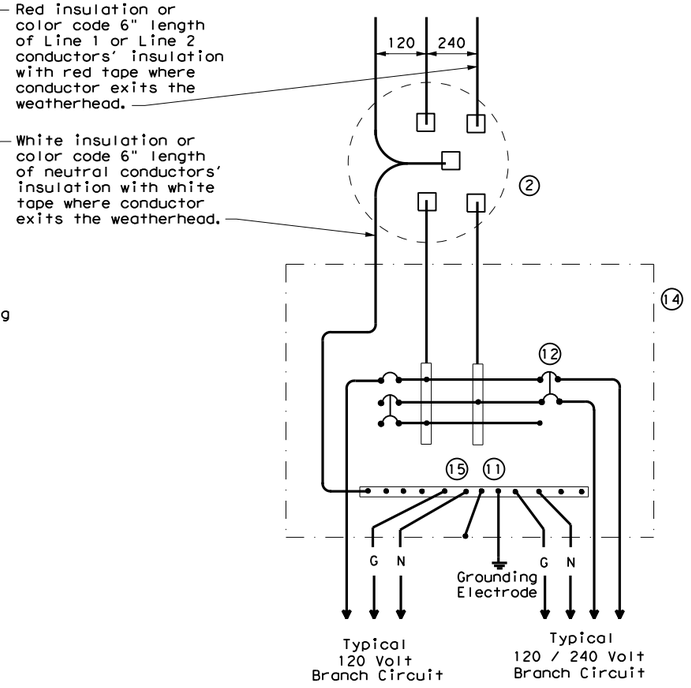
SCHEMATIC TYPE A
THREE WIRE



SCHEMATIC TYPE C
THREE WIRE



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



SCHEMATIC TYPE T
120/240 VOLTS - THREE WIRE

Galvanized steel-"Buy Off The Shelf" only. When required install photocell top of the pole or on luminaire only, no lighting contractor will be installed.

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

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

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE ENCLOSURE AND NOTES

ED(6)-14

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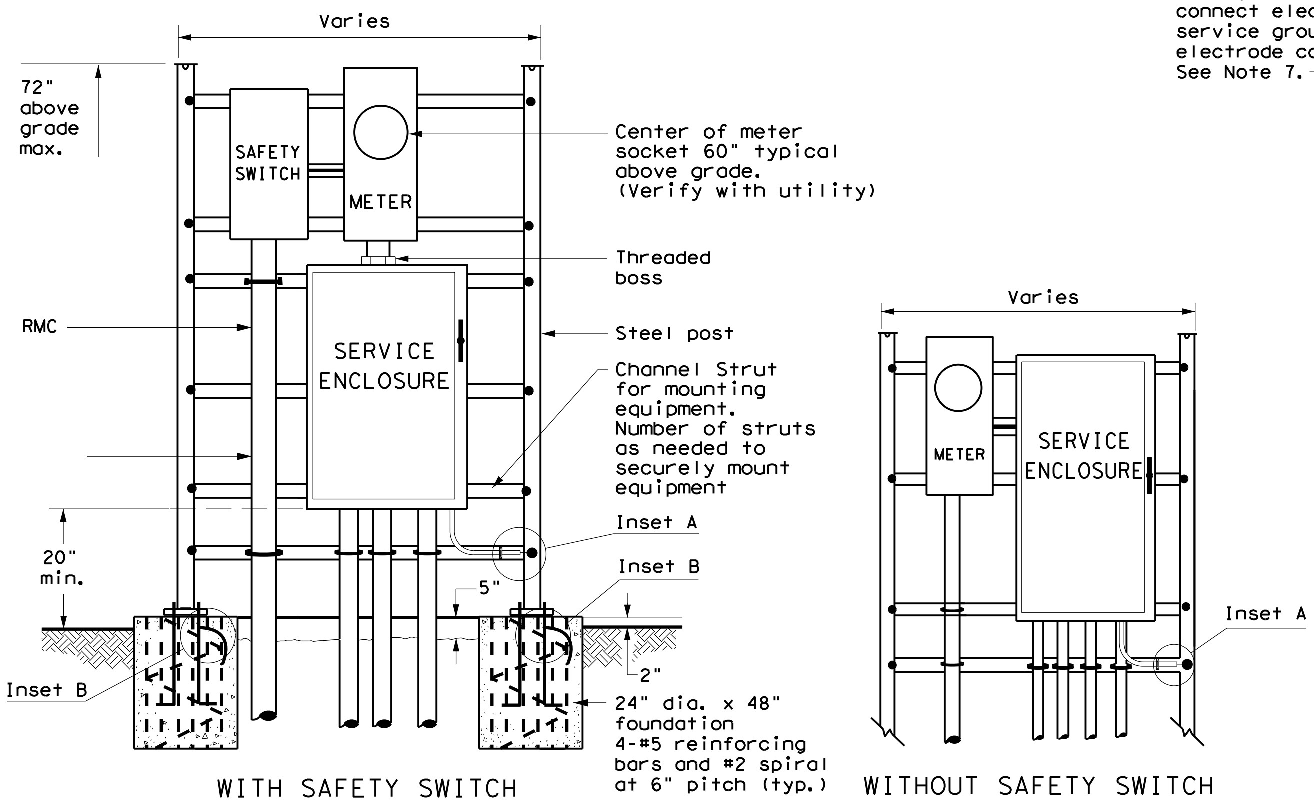
71F

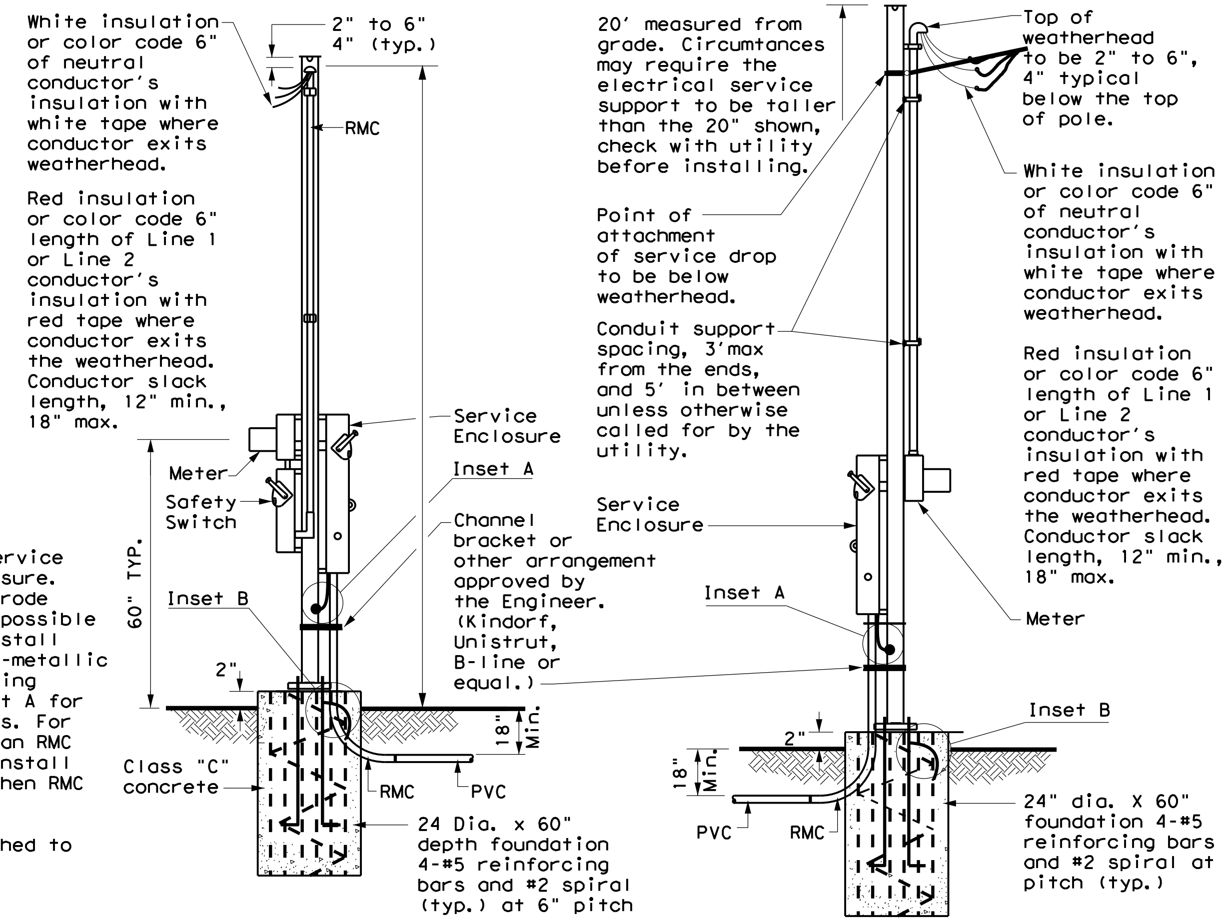
SUPPORT TYPE STEEL POLE (SP) AND STEEL FRAME (SF)

1. Provide steel pole and steel frame supports as per TxDOT Departmental Material Specification (DMS)11080 "Electrical Services." Mount all equipment and conduit on 12 gauge galvanized steel or stainless steel channel strut, 1 ½ in. or 1 ⅝ in. wide by 1 in. up to 3 ¾ in. deep Unistrut, Kindorf, B-line or equal. Bolt or weld all channel and hardware to vertical members as approved. Do not stack channel. File smooth and paint field cut ends of all channel with zinc-rich paint before installing.
2. Provide poles for overhead service with an eyebolt or similar fitting for attachment of the service drop to the pole in conformance with the electric utility provider's specifications.
3. Provide and install galvanized ¾ in. x 18 in. x 4 in. (dia. x length x hook length) anchor bolts for underground service supports. Provide and install galvanized ¾ in. x 56 in. x 4 in. anchor bolts for overhead service supports. Ensure anchor bolts have 3 in of thread, with 3 ¼ in. to 3 ½ in. of the exposed anchor bolt projecting above finished foundation. Provide and install leveling nuts for all anchor bolts.
4. Bond one of the anchor bolts to the rebar cage with 6 AWG bare stranded copper conductor. Use listed mechanical connectors rated for embedment in concrete. See Inset B.
5. Furnish and install rigid metallic ells in all steel pole and steel frame foundations for all conduits entering the service from underground.
6. Use class C concrete for foundations. Ensure reinforcing steel is Grade 60 with 3" of unobstructed concrete cover.
7. Drill and tap steel poles and frames for ½ in. X 13 UNC tank ground fitting. For steel pole service supports, provide and install tank ground fitting 4 in. to 6 in. below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. For steel frame service supports, provide and install tank ground fitting on steel frame post. Install service grounding electrode conductor in a non-metallic conduit or tubing from the enclosure to the steel frame post. Connect electrical service grounding electrode conductor to the tank ground fitting. See steel frame and steel pole details and Inset A for more information. Size service entrance conduit and branch circuit conduit as shown in the plans. For underground conduit runs from the electrical service, extend RMC from the service enclosure to an RMC elbow, and then connect the schedule type and size of conduit shown in the plans. Provide and install grounding bushings where RMC terminates in the enclosure. Grounding bushings are not required when RMC is fitted into a sealing hub or threaded boss.
8. If Steel pole or frame is painted, bond each separate painted piece with a bonding jumper attached to a tapped hole.
9. Provide ¼" - 20 machine screws for bonding. Do not use sheet metal screws. Remove all non-conductive material at contact points. Terminate bonding jumpers with listed devices. Install minimum size 6 AWG stranded copper bonding jumpers. Make up all threaded bonding connections wrench tight.
10. Avoid contact of the service drop and service entrance conductors with the metal pole to prevent abrasion of the insulated conductors.
11. Shop drawings are not required for service support structure unless specifically stated elsewhere or directed by the Engineer.

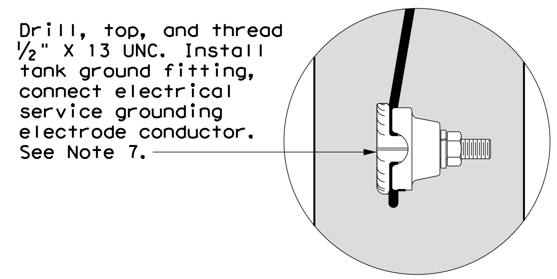


FRONT VIEW

SERVICE SUPPORT TYPE SF(U) - UNDERGROUND SERVICE

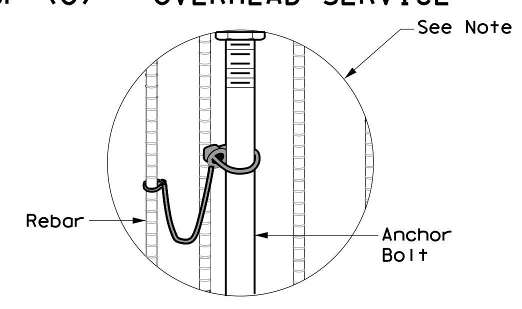


SERVICE SUPPORT TYPE SP (O) - OVERHEAD SERVICE

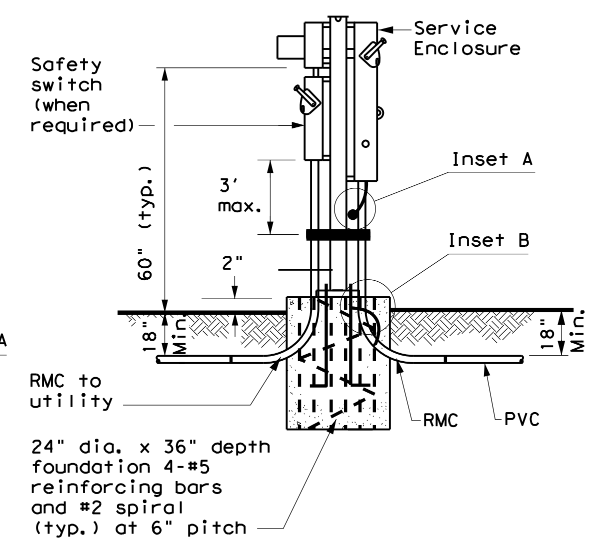


FRONT VIEW

INSET A

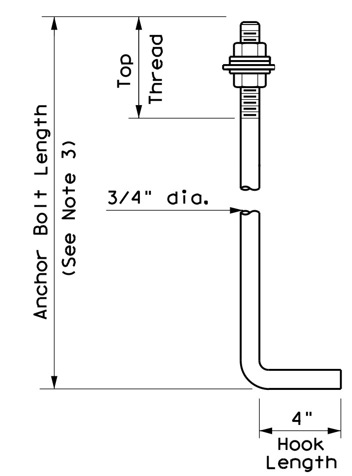


INSET B

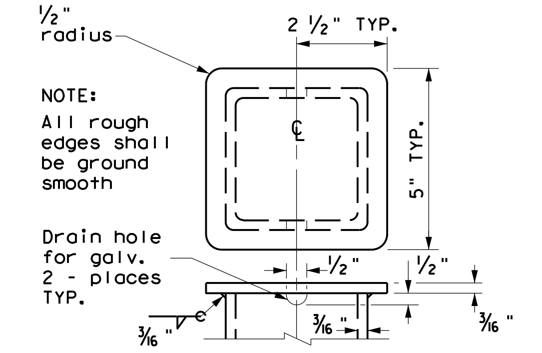


WITH SAFETY SWITCH

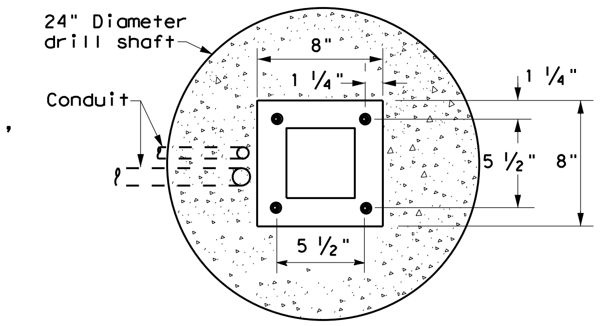
SERVICE SUPPORT TYPE SP(U) - UNDERGROUND SERVICE



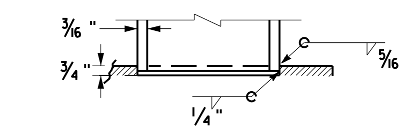
HOOKED ANCHOR DETAIL



POLE TOP PLATE

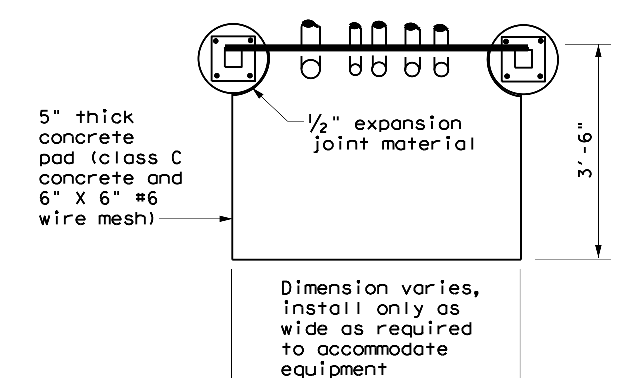


BASE PLATE DETAIL



BOTTOM OF POLE

SERVICE SUPPORT TYPE SF & SP



TOP VIEW

SERVICE SUPPORT TY SF (O) & SF (U)

Texas Department of Transportation — Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE SUPPORT TYPES SF & SP

ED(7)-14

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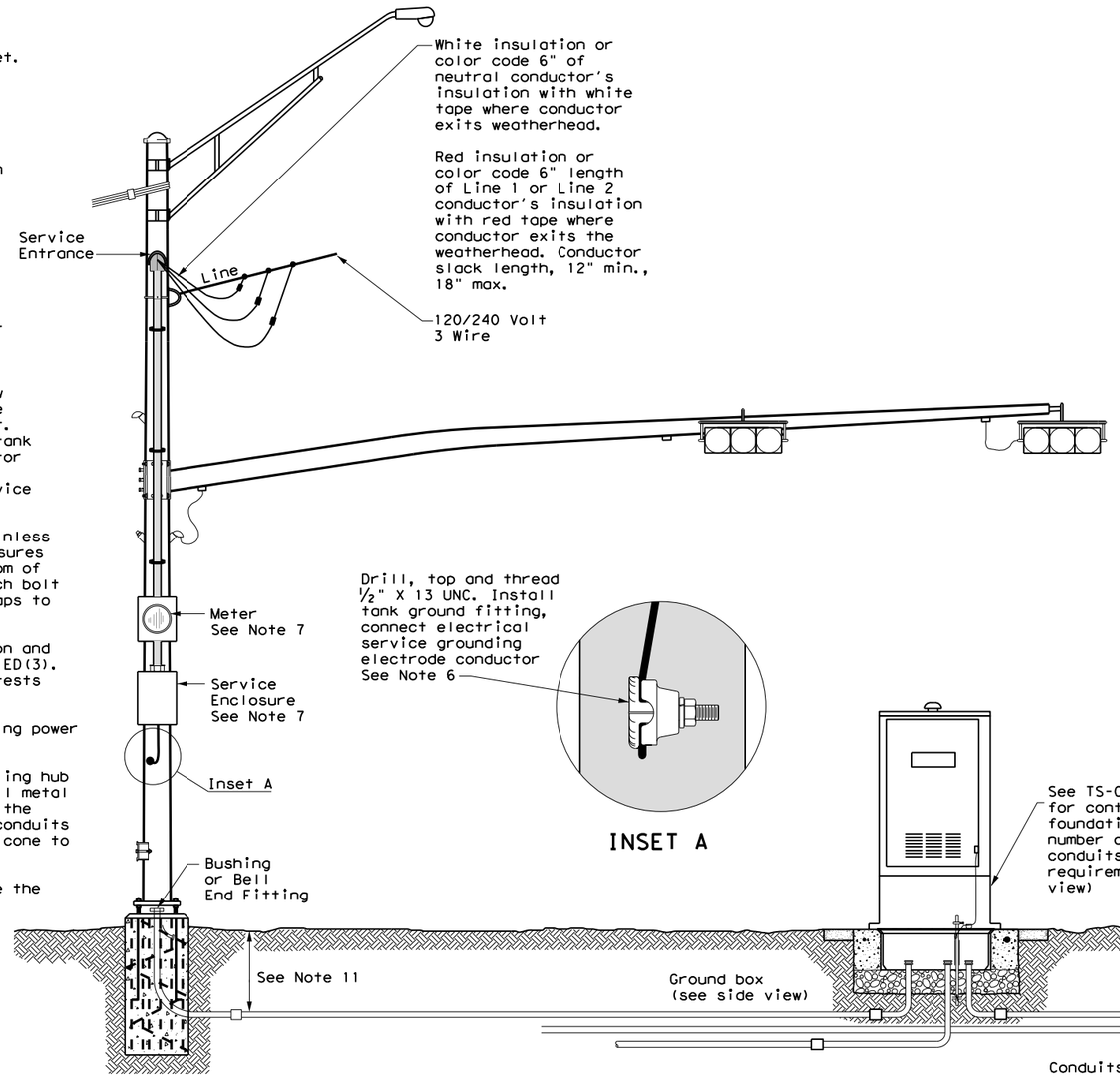
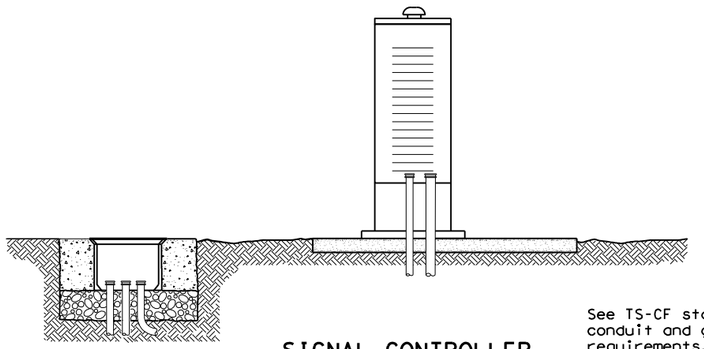
TRAFFIC SIGNAL NOTES

1. Do not pass luminaire conductors through the signal controller cabinet.
2. Include an equipment grounding conductor in all conduits throughout the electrical system. Bond all exposed metal parts to the grounding conductor.
3. Provide roadway luminaires, when required, in accordance with the material and construction sections of Item 610, "Roadway Illumination Assemblies," except for performance testing of luminaires. Test installed roadway luminaires for proper operation as a part of the associated traffic signal system test.
4. If internally illuminated street name signs are approved for use, ground the fixture to the pole with a 12 AWG green XHHW conductor.
5. Bond anchor bolts to rebar cage in two locations using #3 bars or 6 AWG stranded copper conductors. Use listed mechanical connectors rated for embedment in concrete. See TXDOT standard TS-FD for further details.
6. Drill and tap signal poles for ½ in. X 13 UNC tank ground fitting. Provide and install tank ground fitting 4 in. to 6 in. directly below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Connect the electrical service grounding electrode conductor to the tank ground fitting. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. See Inset A detail for further information. Size service entrance conduit and branch circuit conduit as shown in the plans.
7. Mount electrical service enclosure and meter to signal pole with stainless steel bands. Ensure bands are a minimum width of ¾ in. Secure enclosures to bands using two-bolt brackets. Install brackets near top and bottom of each enclosure. Install properly sized stainless steel washers on each bolt in the enclosure. Band or drill and tap properly sized stand-off straps to signal pole for attaching conduit.
8. Conduct pull tests and insulation resistance tests on all illumination and power conductors as required in Item 620 "Electrical Conductors" and ED(3). To prevent electronics damage, do not conduct insulation resistance tests on traffic signal cables after termination.
9. Lock all enclosures and bolt down all ground box covers before applying power to the signal installation.
10. Terminate conduits entering the top of enclosures with a conduit-sealing hub or threaded boss such as meter hub. Install a grounding bushing on all metal conduits not connected to conduit-sealing hub or threaded boss. Bond the grounding bushing to the ground bus with a bonding jumper. Seal all conduits entering enclosures with duct seal or expanding foam. Do not use silicone to seal conduit ends.
11. For all conduits, ensure the burial depth is a minimum of 18". Ensure the minimum burial depth for conduit placed under a roadway is 24".



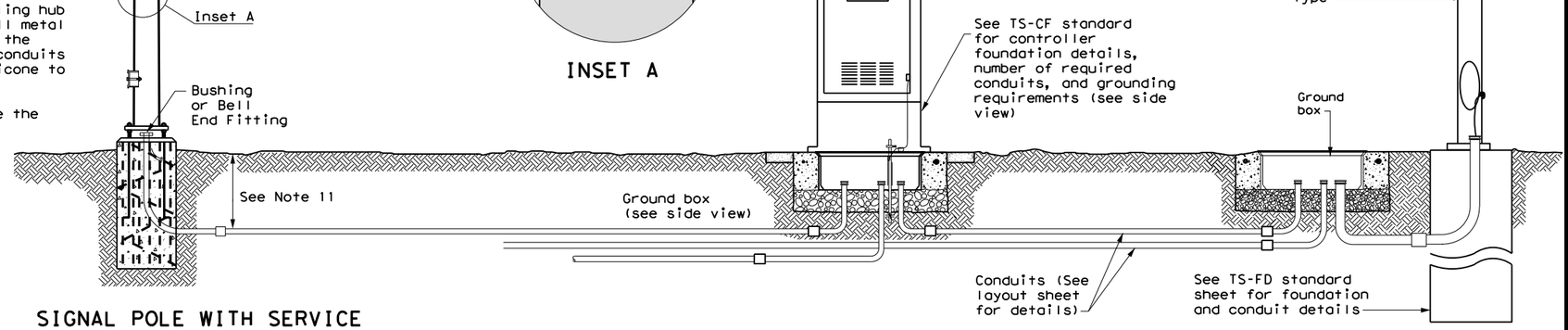
SIGNAL POLE WITH SERVICE

Type T electrical service mounted on signal pole shown as an example. See electrical details, layout sheets, and electrical service data chart for additional details.



SIGNAL CONTROLLER SIDE VIEW

See TS-CF standard for conduit and grounding requirements. See layout sheets for ground box locations and any additional conduits that are required.



SIGNAL CONTROLLER FRONT VIEW

SIGNAL POLE

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS TYPICAL TRAFFIC SIGNAL SYSTEM DETAILS

ED(8)-14

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PEDESTAL SERVICE NOTES

1. Manufacture pedestal electrical services in accordance with Departmental Material Specifications (DMS)11080 "Electrical Services", 11085 "Electrical Services-Pedestal (PS)" and Item 628 "Electrical Services. "Provide pedestal electrical services as listed on the Material Producers list (MPL) on the Department's web site under "Roadway Illumination and Electrical Supplies," Item 628. Ensure all mounting hardware and installation details of services meet utility company specifications. Contact the local utility company for approval of pedestal details prior to installing the electrical pedestal service. Submit any changes required by the utility company prior to manufacturing the pedestal enclosure.

2. When a meter socket is required, provide a socket with a minimum 100 amp rating that complies with local utility requirements.

3. Provide Class A or C concrete for pedestal service foundations in accordance with Item 420, "Concrete Substructures," except that concrete will not be paid for directly but is considered subsidiary to Item 628.

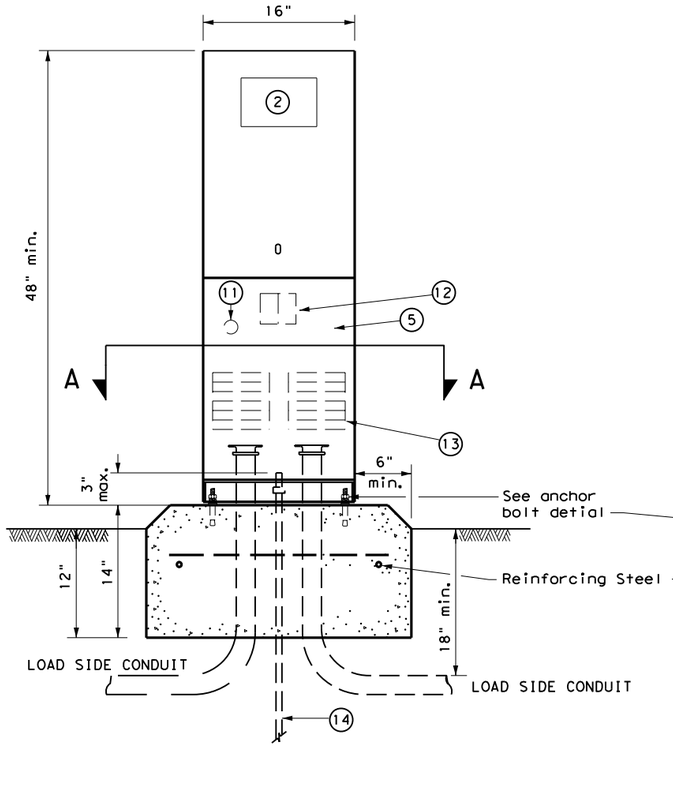
4. Provide #4 reinforcing steel for foundations in accordance with Item 440, "Reinforcement for Concrete."

5. Install ½ in. X 2 ⅛ in. minimum length concrete single expansion type anchors for mounting pedestal enclosure to foundation. Anchor location to match mounting holes in each corner of enclosure. Secure each of the four corners of the pedestal enclosure to the anchors in the foundation with a ½ in. galvanized or stainless steel machine thread bolt, a properly sized locknut and a flat washer.

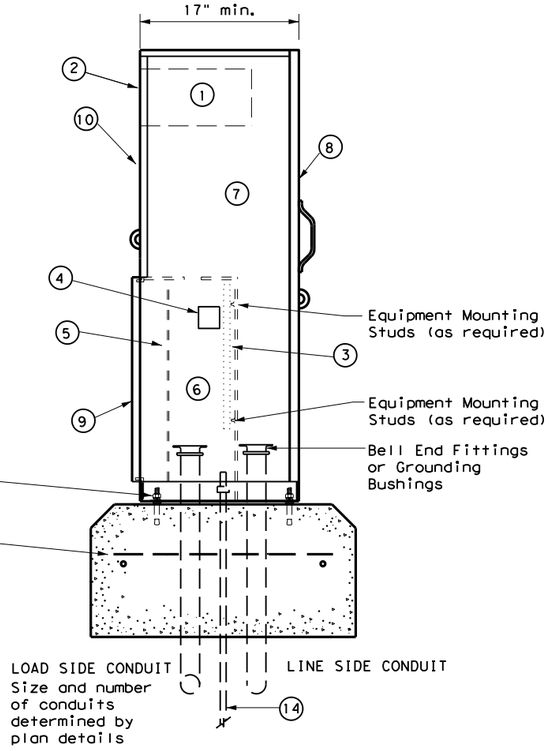
6. Finish top of concrete foundation in a neat and workmanlike manner. If leveling washers are used, ensure no more than ⅛ in. gap at any corner. Do not exceed a maximum dip or rise in the foundation of ⅛ in. per foot. When properly installed, ensure the top of the service enclosure is level front to back and side to side within ¼ in. Repair rocking or movement of the service enclosure at no additional cost to the department.

7. Do not use liquidtight flexible metal conduit (LFMC) on pedestal type services.

8. Ensure all elbows in the foundation are sized as per utility provider's conduit requirements for underground conduit and feeders. PVC extensions may be installed provided the ends of the rigid metal conduits are more than 2 in. below the top of the concrete foundation. Where extension conduits are metal, grounding bushings must be installed with a bonding jumper properly terminated.

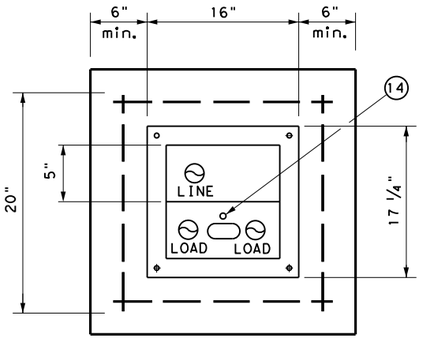


FRONT VIEW

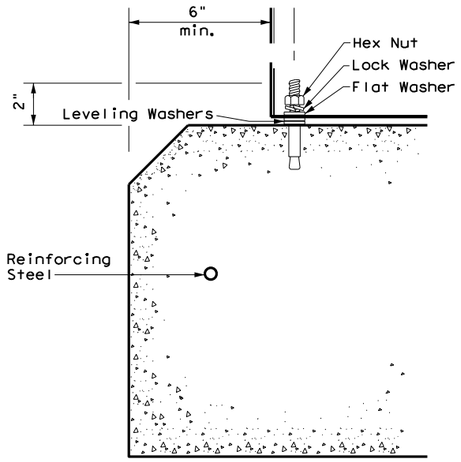


SIDE VIEW

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



SECTION A-A



ANCHOR BOLT DETAIL

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

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS
ELECTRICAL SERVICE SUPPORT
PEDESTAL SERVICE TYPE PS

ED(9)-14

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TIMBER POLE (TP) SERVICE SUPPORT NOTES

1. Ensure electrical service support is a class 5 treated timber pole as per Item 627 "Treated Timber Poles." Embed timber pole to depth required in Item 627.
2. Conduit and electrical conductors attached to the electrical service pole and underground within 12 in. of service pole are not paid for directly but are subsidiary to the electrial service.
3. Install pole-top mounted photocell (T) on north side of pole, or in service enclosure (E) as required. See Electrical Service Data chart in plan set.
4. Gain pole as required to provide flat surface for each channel. Gain timber pole to 5/8 in. max. depth and 1 7/8 in. max. height. Gain pole in a neat and workmanlike manner.
5. Mount meter and service equipment on stainless steel or galvanized channel (Unistrut, Kindorf, or equal). Provide channel sized 1 in. to 3 3/4 in. maximum depth, and 1 1/2 in. to 1 5/8 in. maximum width. File smooth the cut ends of galvanized channel and paint with zinc rich paint before installing on pole. Secure each channel section to timber pole with two galvanized or SS lag bolts, 1/4 in. minimum diameter by 1 1/2 in. minimum length. Use a galvanized or SS flat washer on each lag bolt. Do not stack channel.
6. When excess length must be trimmed from poles, trim from the top end only.

(1) Class 5 pole, height as required

(2) Service drop from utility company (attached below weatherhead)

(3) Service conduit (RMC) and service entrance conductors - One Red, One Black, One White (See Electrical Service Data)

(4) Safety switch (when required)

(5) Meter (when required)

(6) Service enclosure

(7) 6 AWG bare grounding electrode conductor in 1/2 in. PVC to ground rod - extend 1/2 in. PVC 6 in. underground.

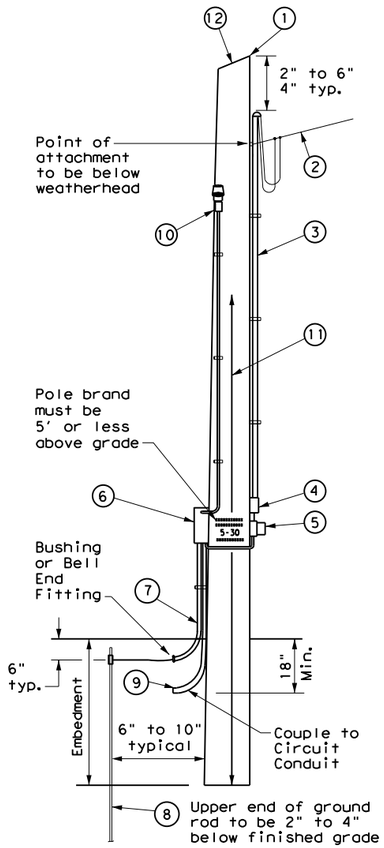
(8) 5/8 in. x 8 ft. Copper clad ground rod - drive ground rod to a depth of 2 in. to 4 in. below grade.

(9) RMC same size as branch circuit conduit.

(10) See pole-top mounted photocell detail on ED(5).

(11) When required by the serving utility provide bare 6 AWG copper conductor. Run wire from pole top to butt wrap or copper butt plate. Protect conductor with non-conductive material to a height of 8 ft. above finished grade.

(12) When required by utility, cut top of pole at an angle to enhance rain run off.

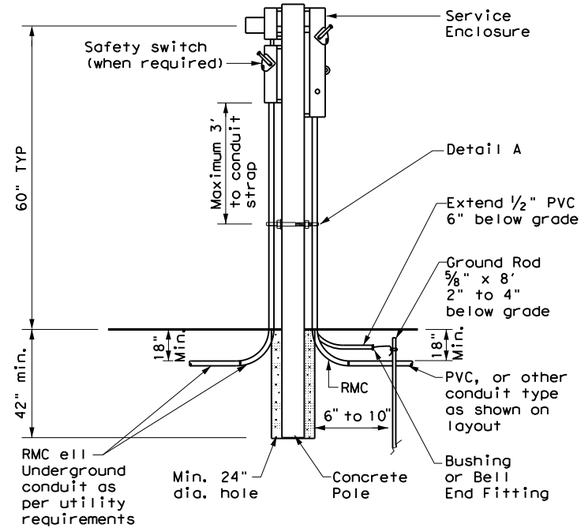


SERVICE SUPPORT TYPE TP (O)

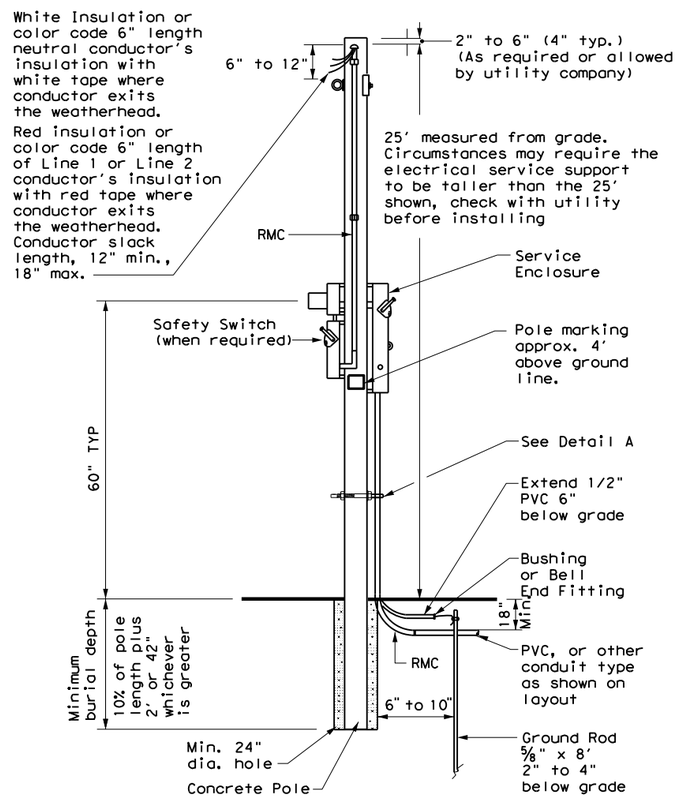
GRANITE CONCRETE (GC) & OTHER CONCRETE (OC) NOTES

Ensure electrical service support structures bid as type Granite Concrete (GC) or Other Concrete (OC) meet the following requirements.

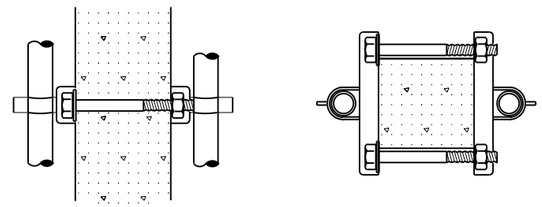
1. Provide GC and OC poles that meet the requirements of DMS 11080 "Electrical Services."
2. Provide prestressed concrete poles suitable for direct embedment into the ground without special foundations.
3. Verify poles are marked as required on DMS 11080. Location of marking should be approximately 4' above final grade. Use the two-point pickup locations when handling pole in horizontal position, and one-point pickup location for use in raising the pole to a vertical position. These marks are small but conspicuous.
4. Embed poles 42 in. or 10% of the length plus 2 ft., whichever is greater.
5. Ensure all installation details of services are in accordance with utility company specifications.
6. Install a one point rack or eye bolt bracket 6 inches to 12 inches below the weatherhead as an overhead service drop anchoring point for the electric utility.
7. Furnish and install galvanized or stainless steel channel strut 1 1/2 in. or 1 5/8 in. wide by 1 in. up to 3 3/4 in. deep (Unistrut, Kindorf, B-line or equal). Attach channel strut with stainless steel concrete anchors (max. 1" depth), square U-bolts or back to back channel strut with long bolts, or other secure mounting as approved by the Engineer. Ensure bolts are galvanized in accordance with ASTM A153. Do not stack channel struts.
8. Backfill the holes thoroughly by tamping in 6 in. lifts. After tamping to grade, place additional backfill material in a 6 inch high cone around the pole to allow for settling. Use material equal in composition and density to the surrounding area. Backfilling will not be paid for directly but is subsidiary to various bid items.



CONCRETE SERVICE SUPPORT
Underground (U)



CONCRETE SERVICE SUPPORT
Overhead (O)



DETAIL A

See Note 7. Before installing channel that has been cut, file sharp edges and paint with zinc-rich paint. Ensure there is no paint splatter on the pole.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE SUPPORT TYPES GC, OC, & TP

ED(10)-14

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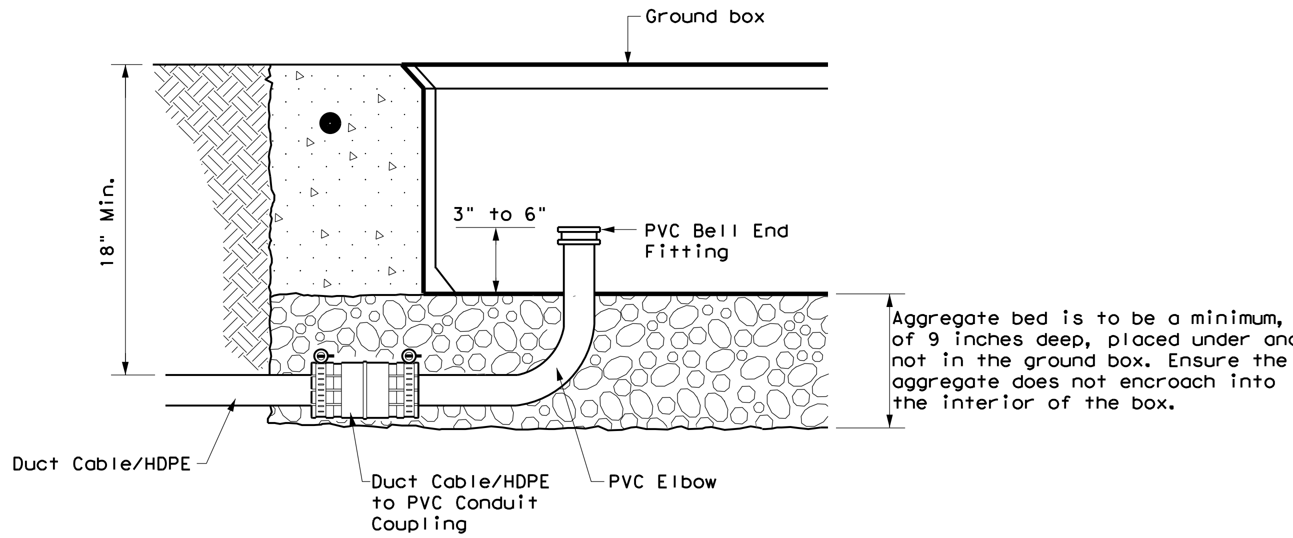
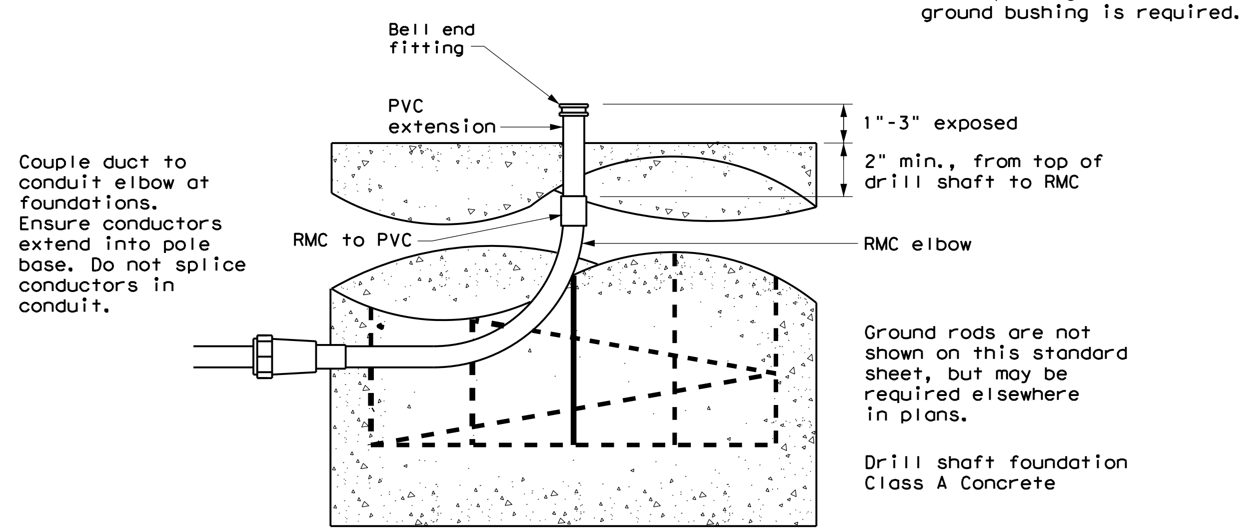
DUCT CABLE & HDPE CONDUIT NOTES

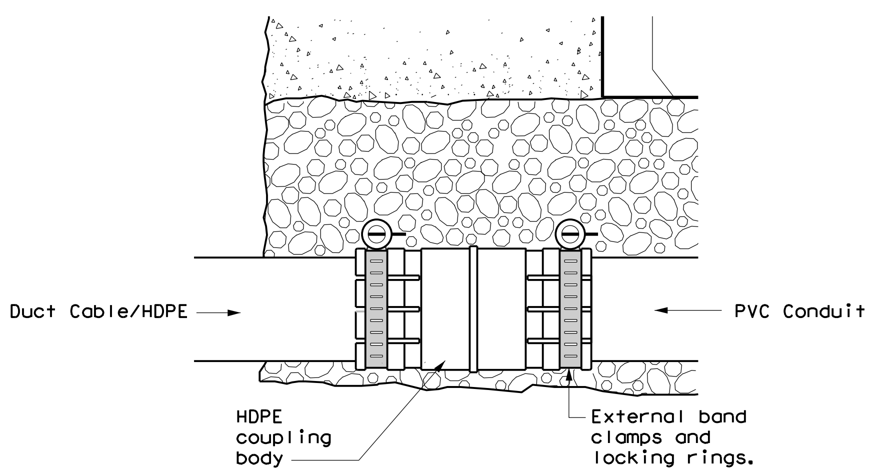
1. Provide duct cable in accordance with Departmental Material Specification (DMS) 11060 "Duct Cable" and Item 622 "Duct Cable." Provide duct cable as listed on the Material Producer List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies" Item 622.
2. Provide High-Density Polyethylene (HDPE) conduit in accordance with DMS 11060 and Item 618, "Conduit." Provide HDPE as listed on the MPL on the Department web site under "Roadway Illumination and Electrical Supplies," Item 618.
3. Supply duct cable with a minimum 2 in. diameter, unless otherwise shown in the plans. Provide duct cable and HDPE conduit as shown by descriptive code or on the plans. Bend duct cable and HDPE conduit as recommended by the manufacturer, with a minimum bending radius of 26 in. for 2 in. duct. Follow manufacturers' recommendations when handling duct cable and HDPE conduit reels and during installation of duct cable and HDPE conduit.
4. Do not splice conductors within duct cable or HDPE conduit. Couple duct cable and HDPE entering a ground box or foundation to a PVC elbow. When galvanized steel RMC elbows are called for in the plans and any portion of the RMC elbow is buried less than 18" from possible contact, ground the RMC elbow.
5. Furnish and install duct cable with factory installed conductors, sized as shown in the plans and as required by the National Electrical Code (NEC). The NEC contains specific requirements for duct cable in Article, "Nonmetallic Underground Conduit with Conductors: Type NUCC."
6. When conduit casing is called for in the plans, extend duct cable or HDPE conduit through the conduit casing in one continuous length without connection to the casing.
7. Seal the ends of duct cable or HDPE conduit with duct seal, expandable foam, or other approved method after completing the pull tests required by Item 622.
8. Provide minimum cover of 24 in. under roadways, 18 in. in other locations, or as shown on the plans.
9. Furnish and install listed fittings to couple duct cable or HDPE conduit to other types of conduit. Duct cable and HDPE conduit may be field-threaded and spliced with PVC or RMC threaded couplings; connected with listed tie-wrap fittings; connected using listed coupling made of HDPE with stainless steel external banding clamps and locking rings; connected with approved electrofusion conduit couplings; or connected using an approved chemical fusion method using an epoxy or adhesive specifically designed for HDPE couplings and connectors all installed in accordance with their manufacturer's instructions. Do not use PVC glue on HDPE. Do not use water pipe fittings, or connect conduit with heat shrink tubing.



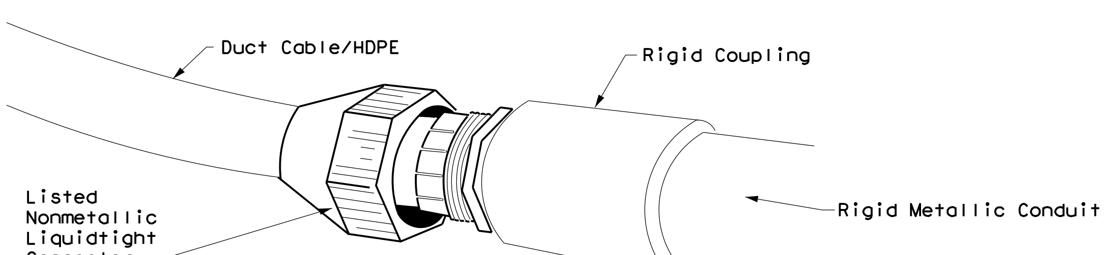
DUCT CABLE/HDPE AT GROUND BOX



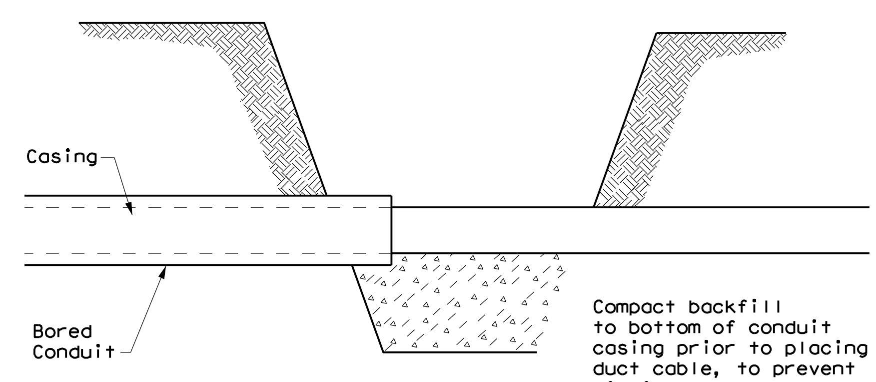
DUCT CABLE / HDPE AT FOUNDATION



DUCT CABLE/HDPE TO PVC



DUCT CABLE/HDPE TO RMC



BORE PIT DETAIL

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS DUCT CABLE/ HDPE CONDUIT

ED(11)-14

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BATTERY BOX GROUND BOXES NOTES

A. MATERIALS

1. Provide polymer concrete or fiberglass reinforced plastic (FRP) battery box ground box and cover in accordance with Departmental Material Specification (DMS) 11071 "Battery Box Ground Boxes." Battery box will accommodate up to 4 batteries, each measuring 8 in. x 13.5 in. x 10 in. (W x L x D). Label battery box ground box cover in accordance with DMS 11071.

2. Supply a marine grade batteries with covers. Secure the marine grade batteries with covers to the stainless steel rack in the bottom of the ground box with tie down straps.

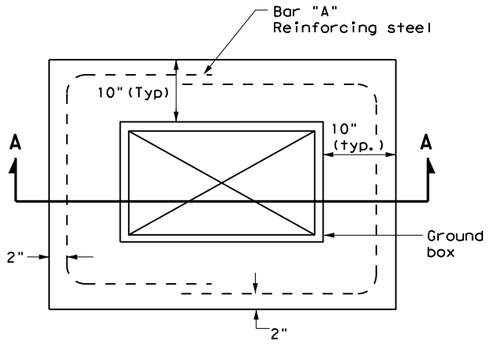
B. CONSTRUCTION METHODS

1. Ensure conduit entry will not interfere with placement of the batteries in the battery box ground box.

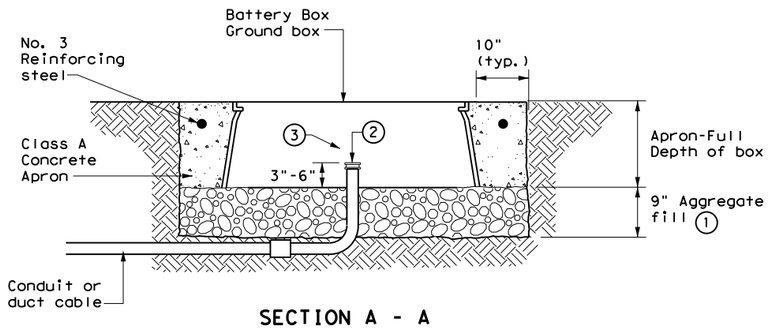
2. Remove all gravel and dirt from conduit. Cap all conduits prior to placing aggregate and setting battery box ground box. Provide Grade 3 or 4 coarse aggregate as shown on Table 2 of Item 302 "Aggregates for Surface Treatments." Ensure the aggregate bed is in place and is a minimum of 9 in. deep prior to setting the box. Install battery box ground box on top of aggregate.

3. Cast battery box aprons in place. Reinforcing steel may be field bent. Ensure the depth of concrete for the apron extends from finished grade to the top of the aggregate bed under the box. Battery box ground box aprons, including concrete and reinforcing steel, are subsidiary to battery box ground boxes when called for by descriptive code.

4. Bolt covers down when not working in battery box ground boxes. Keep bolt holes in the box clear of dirt.



PLAN VIEW



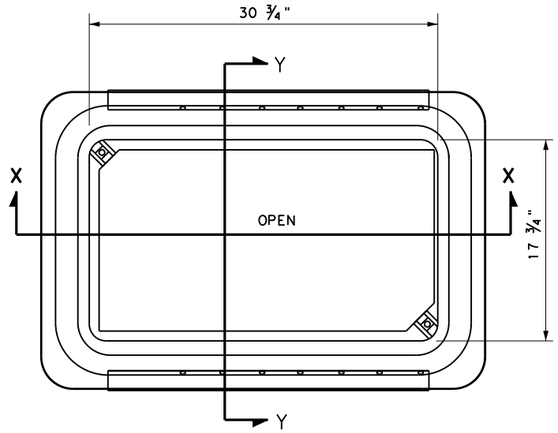
SECTION A - A

APRON FOR BATTERY BOX GROUND BOXES

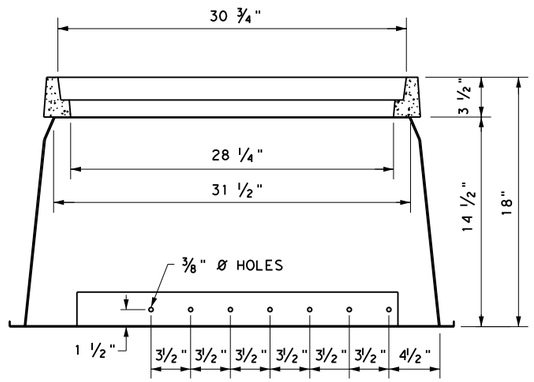
(1) Place aggregate under the box and not in the box. Aggregate should not encroach on the interior volume of the box.

(2) Install bushing or bell end fitting on the upper end of all ells.

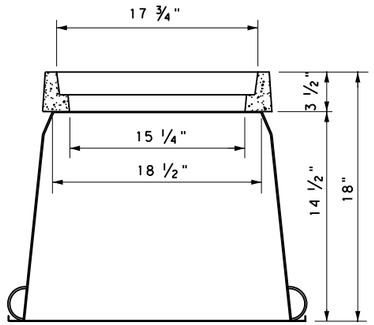
(3) Install all conduits in a neat and workmanlike manner.



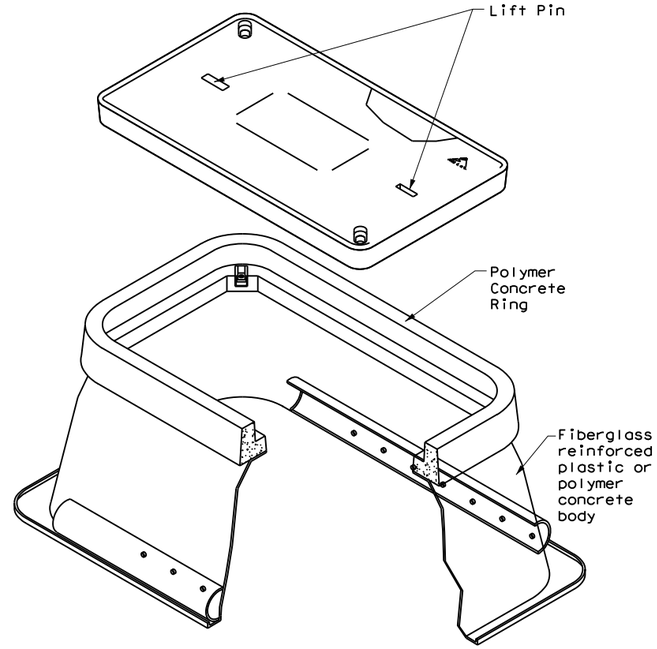
BATTERY BOX TOP VIEW



SECTION X-X



SECTION Y-Y



Texas Department of Transportation | Traffic Operations Division Standard

ELECTRICAL DETAILS
BATTERY BOX
GROUND BOXES

ED(12)-14

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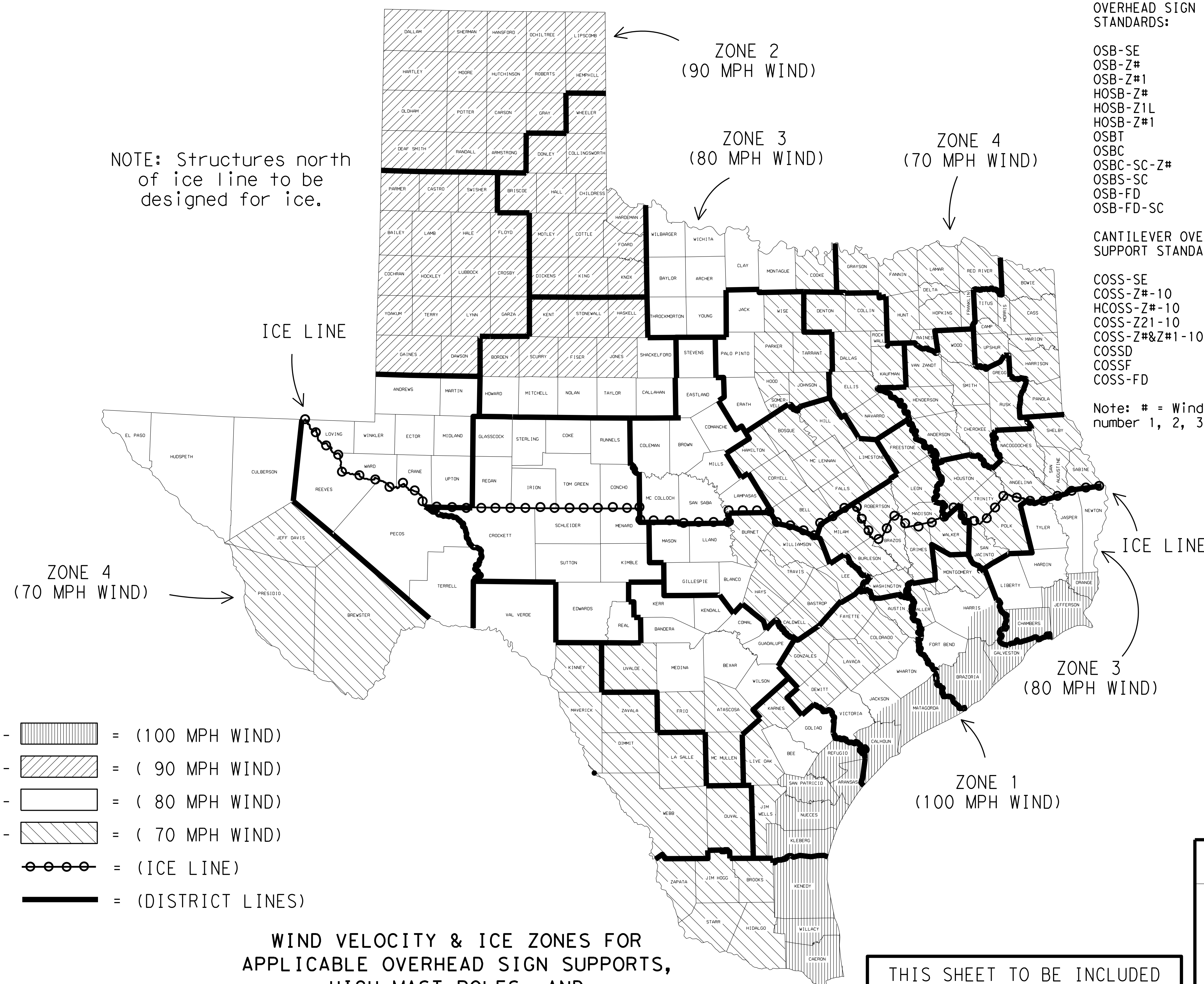

APPLICABLE STANDARDS SHEETS

OVERHEAD SIGN BRIDGE STANDARDS:

OSB-SE
OSB-Z#
OSB-Z#1
HOSB-Z#
HOSB-Z1L
HOSB-Z#1
OSBT
OSBC
OSBC-SC-Z#
OSBS-SC
OSB-FD
OSB-FD-SC

CANTILEVER OVERHEAD SIGN SUPPORT STANDARDS:

COSS-SE
COSS-Z#-10
HCOSS-Z#-10
COSS-Z21-10
COSS-Z#&Z#1-10
COSSD
COSSF
COSS-FD

Note: # = Wind Zone number 1, 2, 3 or 4

HIGH MAST ILLUMINATION POLE STANDARDS:

HMIP-98
HMIF-98

WALKWAYS AND BRACKETS STANDARDS:

SWW
SB(SWL-1)

TRAFFIC SIGNAL POLE STANDARDS:

SP-80
SP-100
SMA-80
SMA-100
DMA-80
DMA-100
MA-C
MAC(ILSN)
MAD-D
TS-FD
LUM-A
CFA
LMA
TS-C
MA-DPD

FOR HARRIS CO. ONLY
Zone line is just North of US 90, around on the North, West and South sides of IH 610 and down the West side of SH 288.

FOR JACKSON CO. ONLY
Zone line is just North of SH 616.

LEGEND

ZONE 1 - = (100 MPH WIND)
ZONE 2 - = (90 MPH WIND)
ZONE 3 - = (80 MPH WIND)
ZONE 4 - = (70 MPH WIND)
= (ICE LINE)
= (DISTRICT LINES)

WIND VELOCITY & ICE ZONES FOR APPLICABLE OVERHEAD SIGN SUPPORTS, HIGH MAST POLES, AND TRAFFIC SIGNAL POLES

Based on 50 Year Mean Recurrence Interval of Fastest Mile Wind Velocity at 33 feet height.

THIS SHEET TO BE INCLUDED IN ALL P.S.&E. PACKAGES CONTAINING ONE OR MORE OF THE APPLICABLE STANDARD SHEETS LISTED HEREON

Texas Department of Transportation | Traffic Operations Division Standard

WIND VELOCITY AND ICE ZONES

WV & IZ-14

FILE:	windice.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT		CK: TxDOT	
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8-14-Added list of applicable standards, restricting use to structures designed for Fastest Mile wind speeds.		DIST		COUNTY		SHEET NO.	
		SAT		BEXAR		261	

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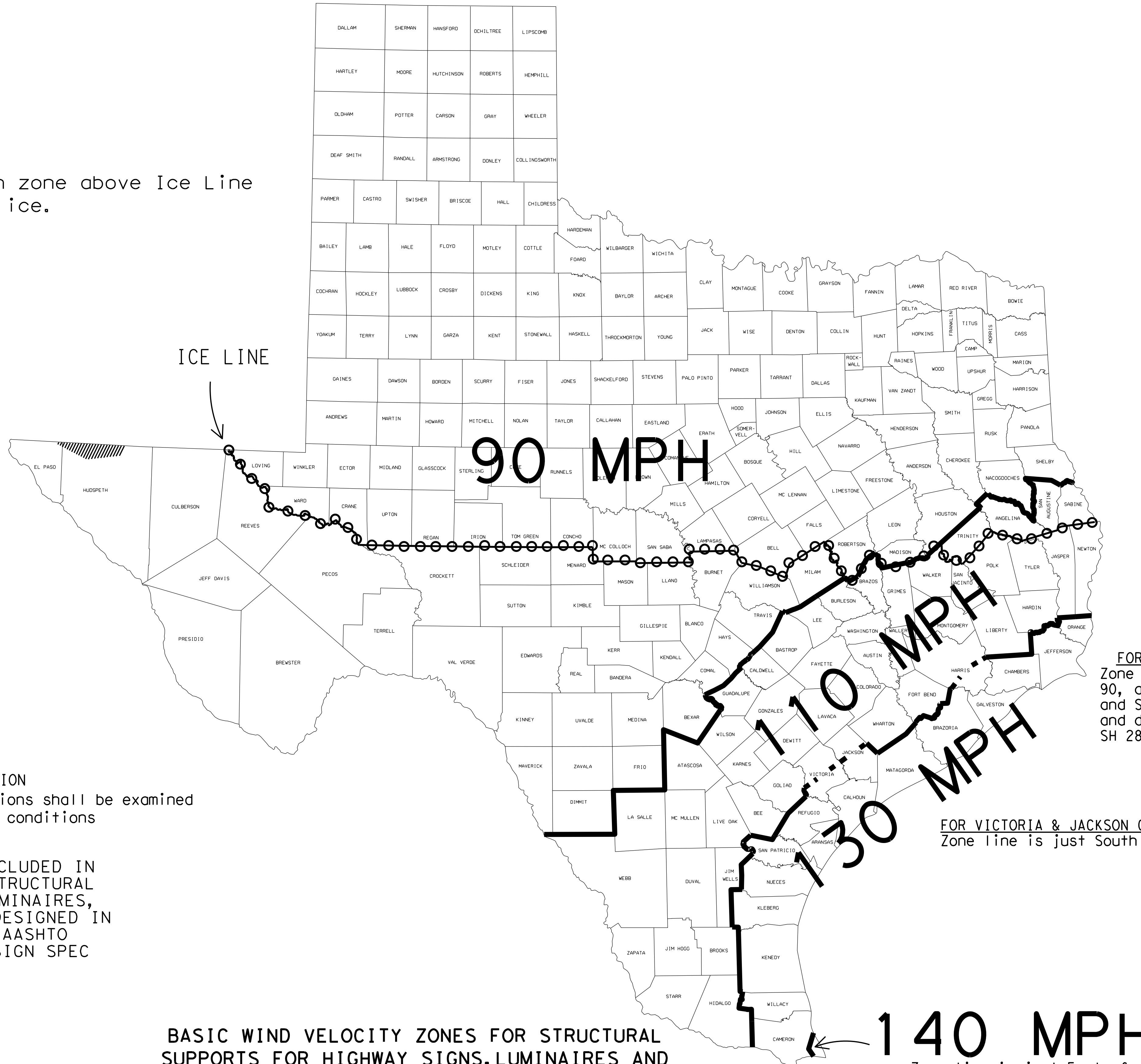
NOTE: Structures in zone above Ice Line to be designed for ice.



Zone line is just East of both CO 1847 & FM 511

FOR HARRIS CO. ONLY
Zone line is just North of US 90, around on the North, West and South sides of IH 610 and down the West side of SH 288.

FOR VICTORIA & JACKSON COUNTIES ONLY
Zone line is just South of US 59.

SPECIAL WIND REGION
Special wind regions shall be examined for unusual wind conditions

THIS SHEET IS TO BE INCLUDED IN ALL P.S.&E.'s HAVING STRUCTURAL SUPPORTS FOR SIGNS, LUMINAIRES, AND/OR TRAFFIC SIGNALS DESIGNED IN ACCORDANCE WITH THE AASHTO 2001 THRU 2013 LTS DESIGN SPEC

BASIC WIND VELOCITY ZONES FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS DESIGNED IN ACCORDANCE WITH THE AASHTO 2001 THRU 2013 LTS DESIGN SPEC

Values are nominal design 3-sec gust wind speeds in mph at 33 ft above ground for Exposure C category. (50-year mean recurrence interval)

NOTE: AASHTO 2001 THRU 2013 LTS DESIGN SPEC =AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 4th thru 6th Edition

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WIND VELOCITY AND ICE ZONES (AASHTO 2001-2013 LTS DESIGN SPEC)

WV & IZ(LTS2013)-14

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	DIST	COUNTY			SHEET NO.
	SAT	BEXAR			262

30B

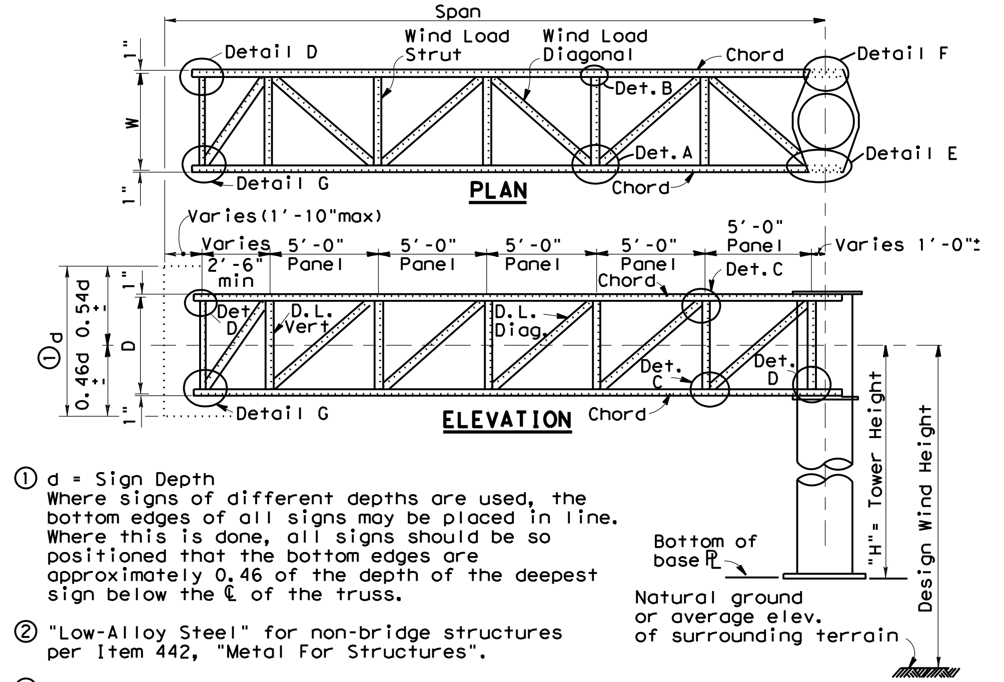
COSS STRUCTURES

	STRUCTURE NO. AND STATION			
	DESIGN WIND HEIGHT, Hd (feet)			
TRUSS DETAILS	LENGTH OF SPAN (feet)			
	W x D & SIZE HS BOLTS	x w/ " Dia HS Bolts	x w/ " Dia HS Bolts	x w/ " Dia HS Bolts
	LENGTH OF TRUSS PANELS	End = Other =	End = Other =	End = Other =
	CHORD			
	DEAD LOAD DIAGONAL			
	WIND LOAD DIAGONAL			
	DEAD LOAD VERTICAL			
	WIND LOAD STRUT			
	TRUSS DL & DEFL	DL = lb/ft, Δ_v = "	DL = lb/ft, Δ_v = "	DL = lb/ft, Δ_v = "
TOWER DETAILS	TOWER HEIGHT AT TRUSS ℄ (feet)			
	TOWER PIPE DIA & WALL THICKNESS	Dia = Thick =	Dia = Thick =	Dia = Thick =
	TOWER PIPE Δ_H AT ℄ TRUSS			
	NO. & SIZE OF ANCHOR BOLTS			
	ANCHOR BOLT CIRCLE DIA			
	BASE ℙ SIZE			
	TRUSS TO TOWER CONNECTION			
DESIGN LOADS				
	SHEAR (Kips)			
	TORSION (Kip-ft)			
	MOMENT (Kip-ft)			
FOUNDATION		w/ "N" =	w/ "N" =	w/ "N" =
	SOIL (Sand or Clay) & "N"			
	SIZE & LENGTH OF DR SHAFT			
	MAIN SHAFT STEEL			
	SHAFT SPIRAL REINFORCING			

OSB STRUCTURES

	STRUCTURE NO. AND STATION			
	DESIGN WIND HEIGHT, Hd (feet)			
TRUSS	LENGTH OF SPAN (feet)			
	W x D & SIZE HS BOLTS	x w/ " Dia HS Bolts	x w/ " Dia HS Bolts	x w/ " Dia HS Bolts
	LENGTH OF TRUSS PANELS	5.0' w/ Center Panel(s) at	5.0' w/ Center Panel(s) at	5.0' w/ Center Panel(s) at
	CHORD			
	DEAD LOAD DIAGONAL			
	WIND LOAD DIAGONAL			
	DEAD LOAD VERTICAL			
	WIND LOAD STRUT			
	TRUSS DL & DEFL	DL = lb/ft, Δ = "	DL = lb/ft, Δ = "	DL = lb/ft, Δ = "

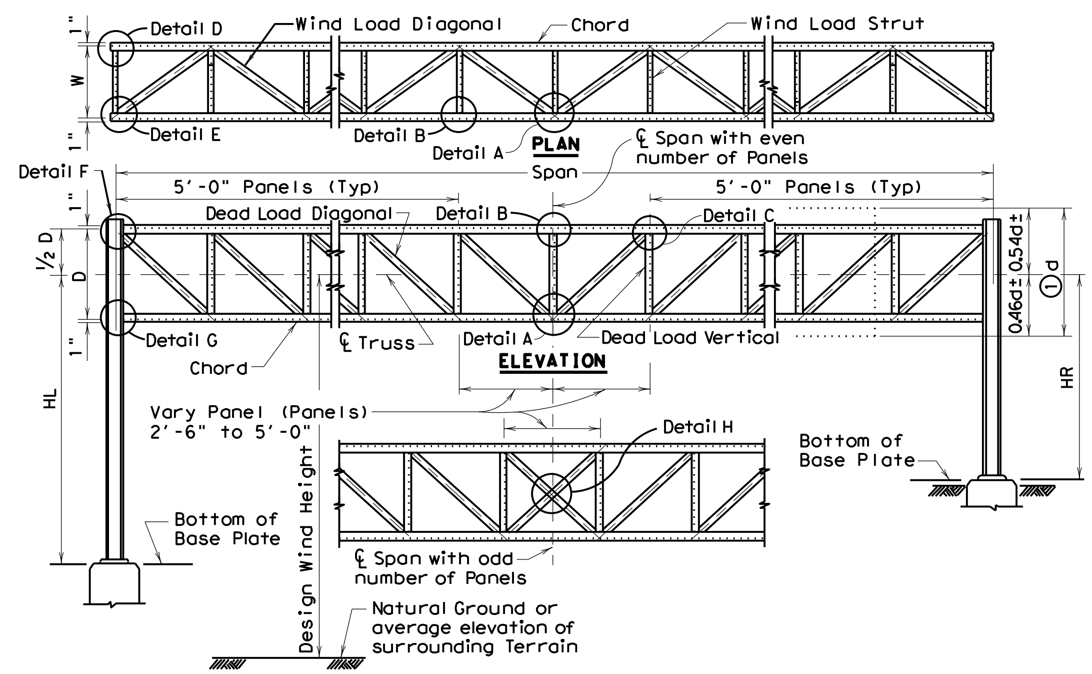
		LEFT TOWER	RIGHT TOWER	LEFT TOWER	RIGHT TOWER	LEFT TOWER	RIGHT TOWER
TOWERS	COLUMN SPACING						
	TOWER HEIGHT (feet)	H_L =	H_R =	H_L =	H_R =	H_L =	H_R =
	COLUMN SIZE	W x	W x	W x	W x	W x	W x
	ANCHOR BOLTS						
	BASE PLATE						
	TOWER DIAGONALS						
	TOWER STRUTS						
	TOWER UPLIFT (Kips)						
	DRILLED SHAFTS						
	MAXIMUM BRACING SPACING, "S"						
	SOIL N (BLOWS PER FT.)						



① d = Sign Depth
Where signs of different depths are used, the bottom edges of all signs may be placed in line. Where this is done, all signs should be so positioned that the bottom edges are approximately 0.46 of the depth of the deepest sign below the ℄ of the truss.

② "Low-Alloy Steel" for non-bridge structures per Item 442, "Metal For Structures".

③ "Carbon Steel" for non-bridge structures per Item 442, "Metal For Structures".



GENERAL NOTES

1. Use tower details, truss details, truss to tower connection, and foundation details, shown on standard drawings OSBT, OSBC, COSSD, and COSSF.
2. Dimensions and connections, should be determined, using member size or combination of members shown on this sheet.
3. Number of high strength bolts required in truss connection or splice are indicated in brackets, e.g. [3], after the member size.
4. Design of truss includes 3 pounds per square foot for sign panel, 20 pounds per foot for lights, and 50 pounds per foot for walkway, all placed as specified for the design sign panel.

NOTES ON USAGE

1. This sheet shall only be included in the PS&E package when the COSS and/or OSB standards are not sufficient to define the COSS or OSB design and details.
2. These sheets should not be included in the PS&E package if no design data is included hereon.
3. If included in the contract plans this sheet must contain "(MOD)" after the designation and must be sealed by a Texas P.E.

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Texas Department of Transportation
Traffic Safety Division Standard

OVERHEAD SIGN BRIDGE DETAILS

COSS & OSB-SZ-21

FILE: coss-osb-sz-21.dgn	DN:	CK:	DW:	CK:
© TxDOT November 2007	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	00	238	VARIOUS
8-21	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		263

DATE: 2/25/2022 10:21:46 AM
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Washers shall conform to ASTM F436.

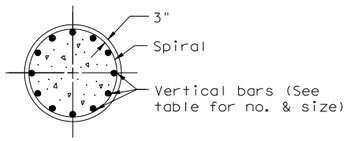
ANCHOR BOLT DIA.	WASHER DIMENSIONS				HOLE IN BASE PLATE
	OUTSIDE DIAMETER	HOLE DIAMETER	THICKNESS		
d			MIN.	MAX.	
1 ½" or less	2d	d + ⅛"	0.136"	0.177"	d + ¼"
1 ¾"	2d - ⅛"	d + ⅛"	0.178"	0.280"	d + 5/16"
2"	2d - ¼"	d + ⅛"	0.178"	0.280"	d + 5/16"
Over 2"	2d - ½"	d + ⅛"	0.240"	0.340"	d + 5/16"

ANCHOR BOLT SIZE				
DIA	BOLT ① LENGTH	THREAD ① LENGTH	PROJECTION LENGTH	GALVAN. ① LENGTH
1 ¼"	2'-11"	5"	5 ¼"	11 ¼"
1 ⅜"	3'-1"	5 ½"	5 ¾"	11 ¾"
1 ½"	3'-4"	6"	6 ¼"	1'-0 ¼"
1 ¾"	3'-10"	7"	7 ¼"	1'-1 ¼"
2"	4'-3"	8"	8 ¼"	1'-2 ¼"
2 ¼"	4'-9"	9"	9 ¼"	1'-3 ¼"
2 ½"	5'-2"	10"	10 ¼"	1'-4 ¼"
2 ¾"	5'-8"	11"	11 ¼"	1'-5 ¼"
3"	6'-1"	1'-0"	1'-0 ¼"	1'-6 ¼"

① Anchor Bolt Fabrication Tolerances:
Bolt Length ~ ±½"
Thread Length ~ ±½"
Galvanized Length ~ -¼"

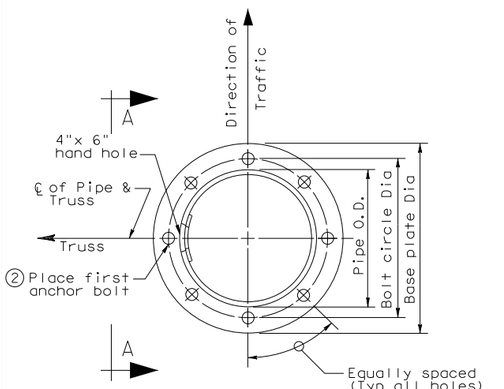
② Thread lenght applies to upper and lower threads

	PIPE OUTSIDE DIAMETER											
	16"			20"			24"			30"		
ANCHOR BOLT SIZE	BOLT CIRCLE DIA	DRILLED SHAFT SIZE	DRILLED SHAFT REINF	BOLT CIRCLE DIA	DRILLED SHAFT SIZE	DRILLED SHAFT REINF	BOLT CIRCLE DIA	DRILLED SHAFT SIZE	DRILLED SHAFT REINF	BOLT CIRCLE DIA	DRILLED SHAFT SIZE	DRILLED SHAFT REINF
1 ¼"Dia x 2'-11"	20 ½"	36" Dia	14-#8 (A)	24 ½"	36" Dia	14-#8 (A)						
1 ⅜"Dia x 3'-1"	20 ¾"	36" Dia	12-#9 (A)	24 ¾"	42" Dia	14-#9 (A)						
1 ½"Dia x 3'-4"	21"	36" Dia	12-#9 (A)	25"	42" Dia	14-#9 (A)	29"	42" Dia	14-#9 (C)			
1 ¾"Dia x 3'-10"	21 ½"	36" Dia	10-#10(A)	25 ⅜"	42" Dia	12-#10(B)	29 ⅜"	48" Dia	16-#10(C)	35 ⅜"	54" Dia	18-#10(C)
2"Dia x 4'-3"	22"	36" Dia	12-#10(A)	25 ¾"	42" Dia	12-#10(B)	29 ¾"	48" Dia	16-#10(C)	35 ¾"	54" Dia	18-#10(C)
2 ¼"Dia x 4'-9"	22 ½"	42" Dia	12-#11(A)	26"	42" Dia	10-#11(B)	30"	48" Dia	14-#11(C)	36"	54" Dia	14-#11(D)
2 ½"Dia x 5'-2"				26 ½"	42" Dia	12-#11(B)	30 ½"	48" Dia	16-#11(C)	36 ½"	54" Dia	16-#11(D)
2 ¾"Dia x 5'-8"							31 ½"	48" Dia	18-#11(D)	37"	54" Dia	20-#11(D)
3"Dia x 6'-1"										37 ½"	54" Dia	24-#11(D)



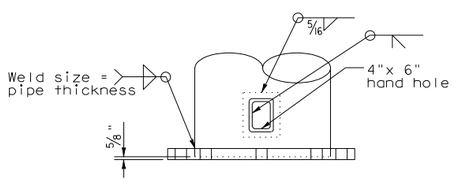
SECTION

A = #3 Plain spiral at 6" pitch (Grade 40)
B = #4 Plain spiral at 6" pitch (Grade 40)
C = #4 Plain spiral at 6" pitch (Grade 60)
D = #4 Plain spiral at 3 ½" pitch (Grade 60)



PLAN

② See "Cantilever Overhead Sign Support" or "High Lever Cantilever Overhead Sign Support" sheets for number and size.

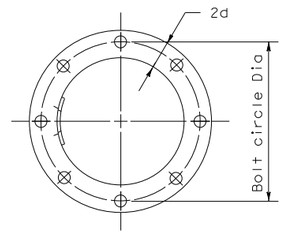


Cut 5" x 7" hole in pipe. Center 4" x 6" hand hole in ⅜" x 8" x 10" back up plate. Provide attachable cover made from section cut from pipe.

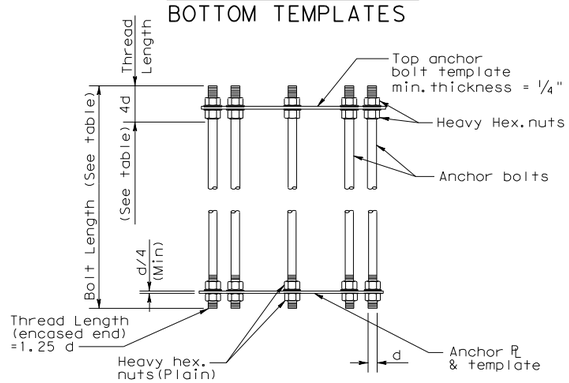
VIEW A-A

③ BASE PLATE & HANDHOLE DETAILS

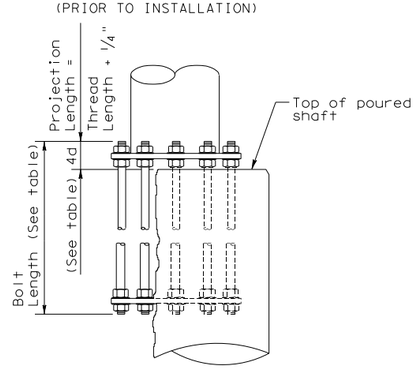
③ See "Cantilever Overhead Sign Support" or "High Level Cantilever Overhead Sign Support" sheets for Diameter and thickness of base plate.



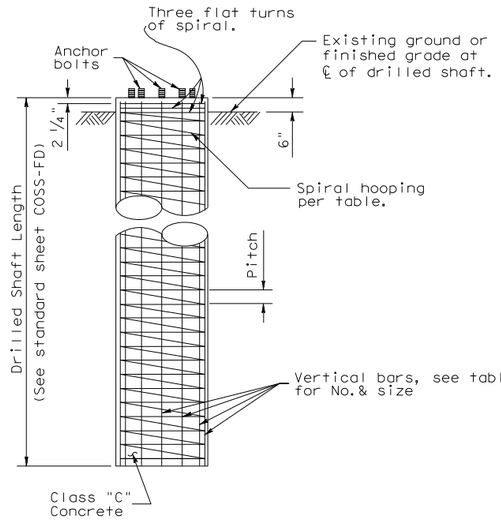
TOP VIEW OF TOP & BOTTOM TEMPLATES



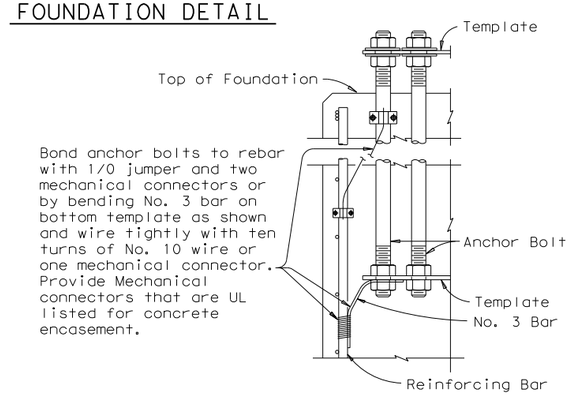
ANCHOR BOLT ASSEMBLY
(PRIOR TO INSTALLATION)



BEARING SEAT ELEVATION



FOUNDATION DETAIL



LIGHTNING PROTECTION SYSTEM

GENERAL NOTES

1. Concrete shall be Class "C".
2. Reinforcing shall conform to Item 440, "Reinforcing Steel".
3. Anchor bolts and nuts for anchor bolts shall be "Alloy Steel" per Item 449, "Anchor Bolts".
4. Anchor bolts shall be rigidly held in position during concrete placement using steel templates at the top and bottom. The top templates shall be removed after the concrete has set.
5. Lubricate and tighten anchor bolts when erecting the structure per Item 449, "Anchor Bolts". After the structure has been aligned in its final position and the anchor bolts have been properly tightened, tack weld anchor bolt nuts to washer, and tack weld washers to base plate. Galvanizing in tack welded areas shall be repaired in accordance with Item 445, "Galvanizing".
6. All vertical reinforcing shall be carried to the bottom of the Drilled Shaft.

Texas Department of Transportation

Traffic Safety Division Standard

CANTILEVER OVERHEAD SIGN SUPPORT FOUNDATION

COSSF-21

FILE: cossf-21.dgn	DN:	CK:	DW:	CK:
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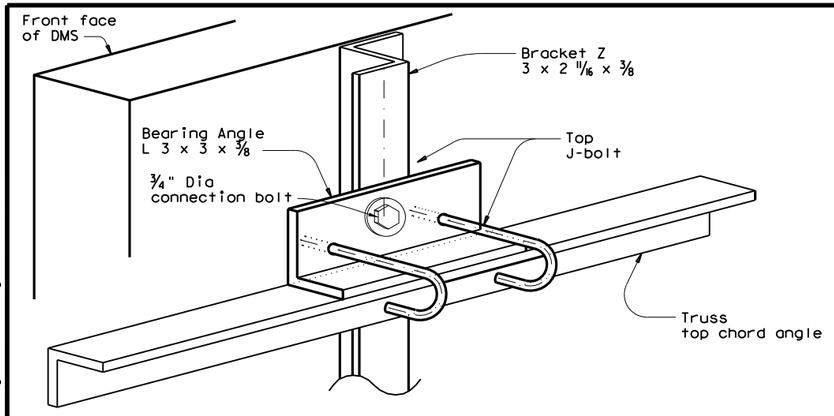
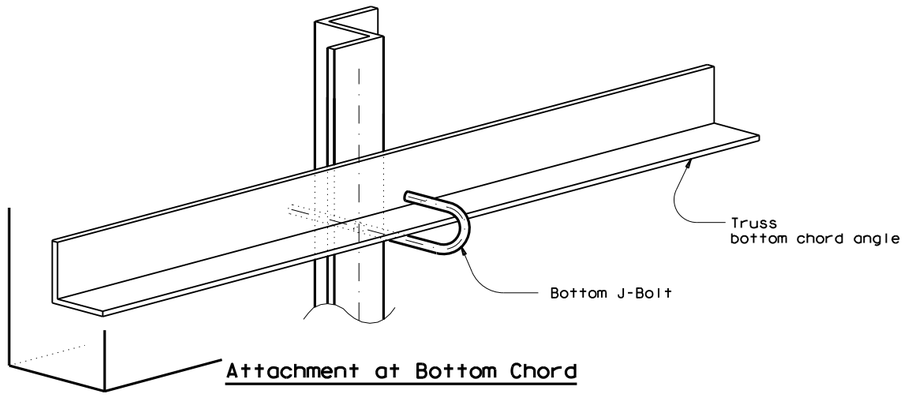
8-21	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		264



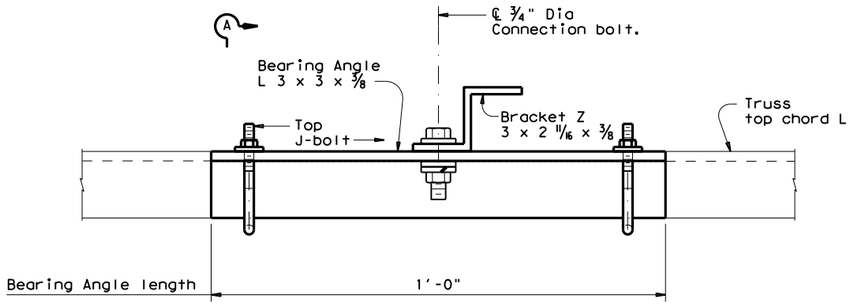
Attachment at Top Chord

(Showing Chord Angle 3")



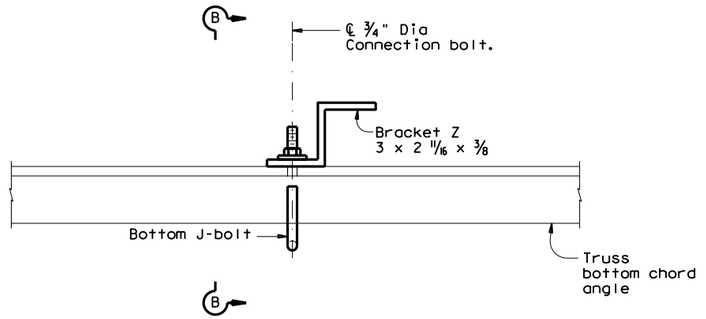
Attachment at Bottom Chord

ISOMETRIC VIEW



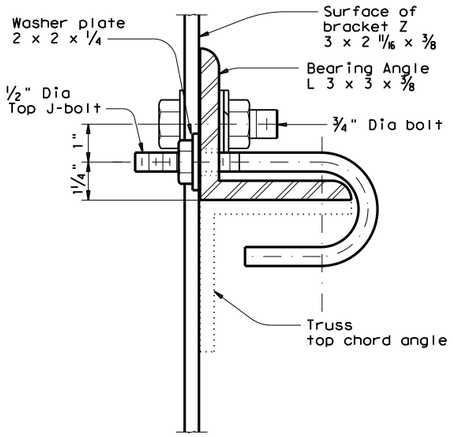
Attachment at Top Chord

(Showing Chord Angle 3")

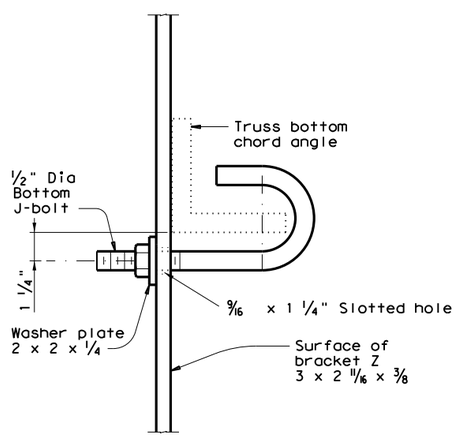


Attachment at Bottom Chord

PLAN VIEW



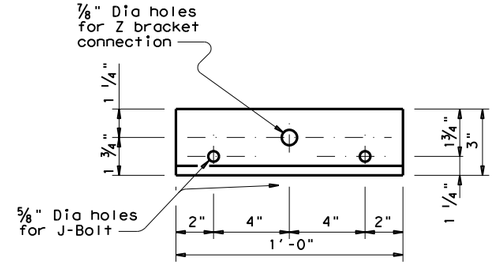
SECTION A-A



SECTION B-B

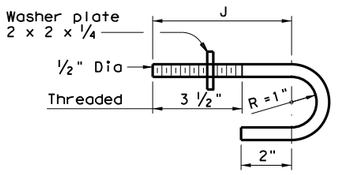
GENERAL NOTES:

1. Application of the mounting detailed on Sheet 1 of 3 is limited to a dynamic message sign (DMS) attachment that is not in conflict with the truss connection bolts at the point(s) of attachment. The overhead sign structure must have adequate capacity to support the DMS. A determination of adequacy shall be made prior to attaching the DMS supports to the truss.
2. Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Revisions thereto. The Design Sustained Wind Velocity is 100 mph with a gust factor of 1.3. Connections are designed for a DMS weight of 3600 lbs and a design Effective Projected Area (EPA) of 441 sq ft, with the EPA based on a DMS nominal width of 30.5 feet and nominal depth of 8.25 feet plus four top and bottom 1'-8" square flashing beacons. The EPA includes drag coefficients of 1.7 (applied to sign area) and 1.2 (applied to flashing beacon area). A horizontal eccentricity of 1.0 ft from the face of the truss to the center of gravity of the DMS for attachment of DMS is assumed. An even number of Z brackets, spaced at 5 ft max., is assumed to transfer forces through the connection.
3. All structural steel shall conform to ASTM A36, A572 Gr 50 or A588. Connection bolts shall conform to ASTM A325 or A449. Each connection bolt shall be provided with 1 heavy hex nut, 2 flat washers, and 1 lock washer. J bolts and washer plate both shall be Type 304 stainless steel, with bolt minimum yield strength of 50 ksi and an elongation of 16 percent in 2 inches. All parts except stainless steel shall be galvanized.
4. Contractor shall verify applicable field dimensions before fabrication.



BEARING ANGLE 3 x 3 x 3/8

Chord Angle	J
3", 3 1/2", 4"	5 1/2"
5" and 6"	7 1/2"



TOP & BOTTOM J-BOLT

SHEET 1 OF 3

Texas Department of Transportation

Traffic Operations Division Standard

DMS-TO-TRUSS MOUNTING AT OVERHEAD SIGN SUPPORTS (NON BUILD-UP)

DMS(TM-1)-16

FILE: dms-tm-16.dgn	DN: TxDOT	CK:	DW: TxDOT	CK:
© TxDOT June 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	00	238	VARIOUS
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		265

29C

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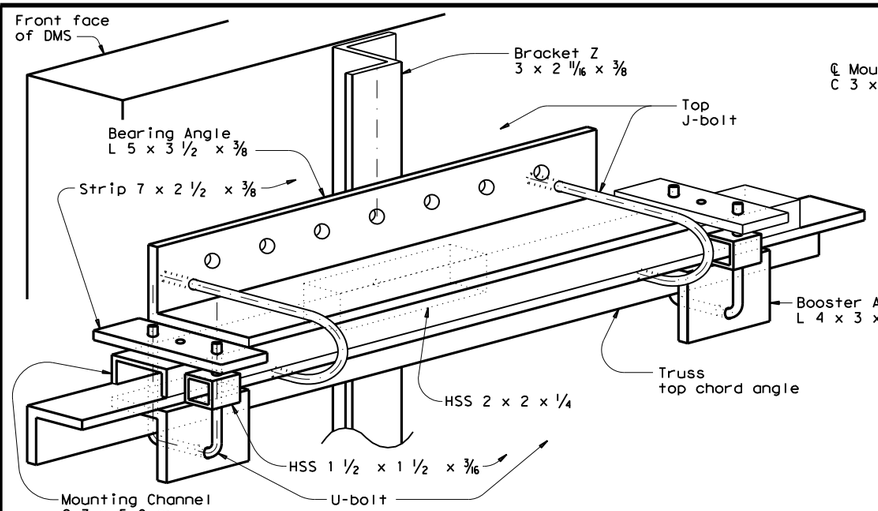
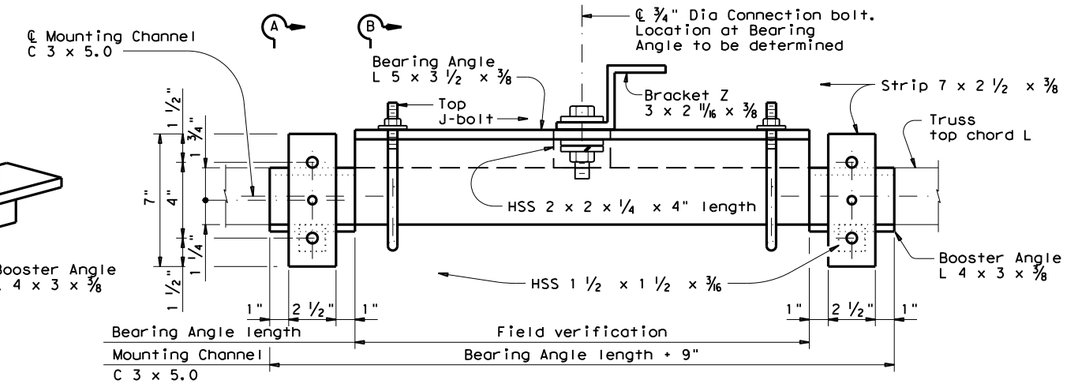
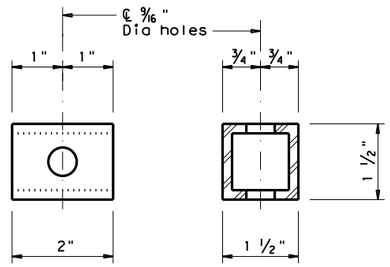


Built-up Attachment at Top Chord

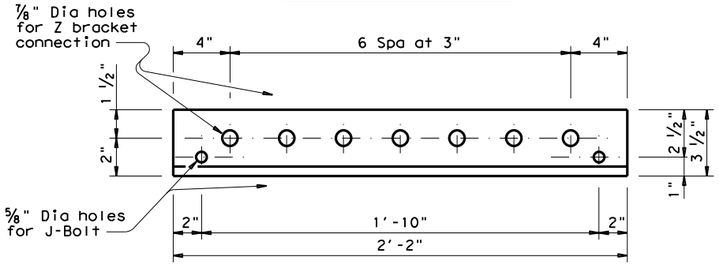
(Showing Chord Angle 3")



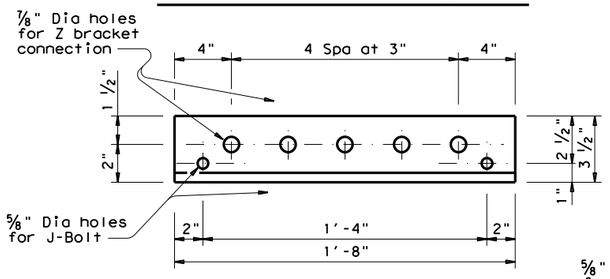


① HSS 1 1/2 x 1 1/2 x 3/16

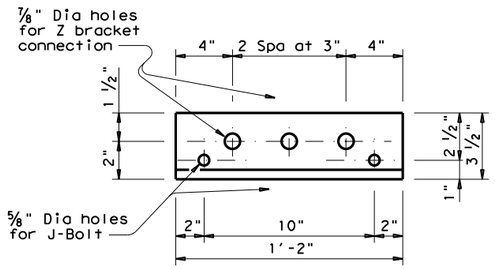
ISOMETRIC VIEW



BEARING ANGLE 5 x 3 1/2 x 3/8



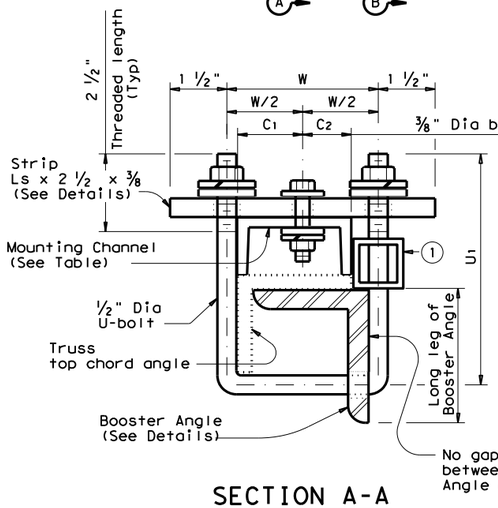
BEARING ANGLE 5 x 3 1/2 x 3/8



BEARING ANGLE 5 x 3 1/2 x 3/8

PLAN VIEW (AT TOP CHORD)

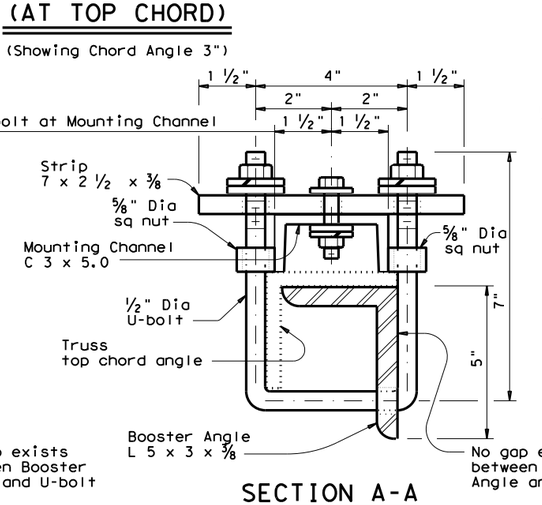
(Showing Chord Angle 3")



SECTION A-A

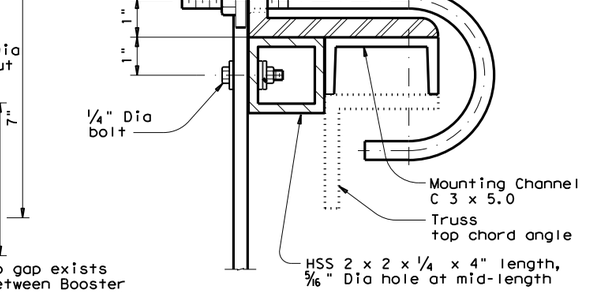
(Showing Chord Angle 3",4",5" & 6")

Chord Angle	U1	W	C1	C2	Mounting Channel
3"	7"	4"	1 3/4"	1 1/4"	C3 x 5.0
4"	8"	5"	2 1/4"	1 3/4"	C4 x 7.25
5"	9"	6"	2 3/4"	2 1/4"	C5 x 9.0
6"	10 1/2"	7"	3 1/4"	2 3/4"	C6 x 13

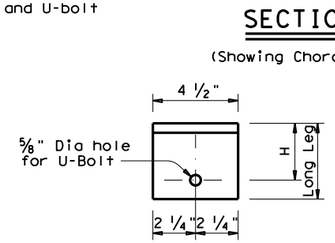


SECTION A-A

(Showing Chord Angle 3 1/2")

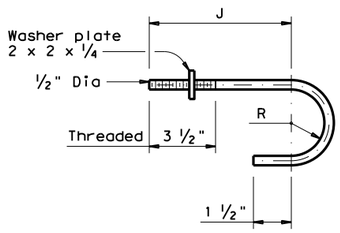


SECTION B-B



Strip Ls x 2 1/2 x 3/8

Chord Angle	S	Ls
3"	4"	7"
3 1/2"	4"	7"
4"	5"	8"
5"	6"	9"
6"	7"	10"



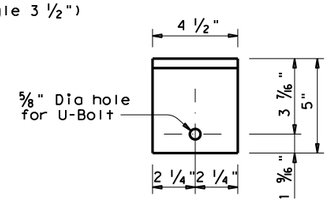
TOP J-BOLT

Chord Angle	J	R
3 & 3 1/2"	7"	1 3/4"
4 & 5"	8"	2"
6"	9"	2 1/4"

BOOSTER ANGLE

(For Chord Angle 3",4",5" and 6")

Chord Angle	Booster Angle	H
3"	4 x 3 x 3/8	3"
4"	5 x 3 1/2 x 3/8	3 13/16"
5"	6 x 4 x 3/8	4 13/16"
6"	7 x 4 x 3/8	5 5/8"



BOOSTER ANGLE 5 x 3 x 3/8

(For Chord Angle 3 1/2")

SHEET 2 OF 3

Texas Department of Transportation

Traffic Operations Division Standard

DMS-TO-TRUSS MOUNTING AT OVERHEAD SIGN SUPPORTS (WITH BUILD-UP)

DMS(TM-2)-16

FILE: dms-tm-16.dgn	DN: TxDOT	CK:	DW: TxDOT	CK:
©TxDOT JUNE 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	00	238	VARIOUS
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		266

29D

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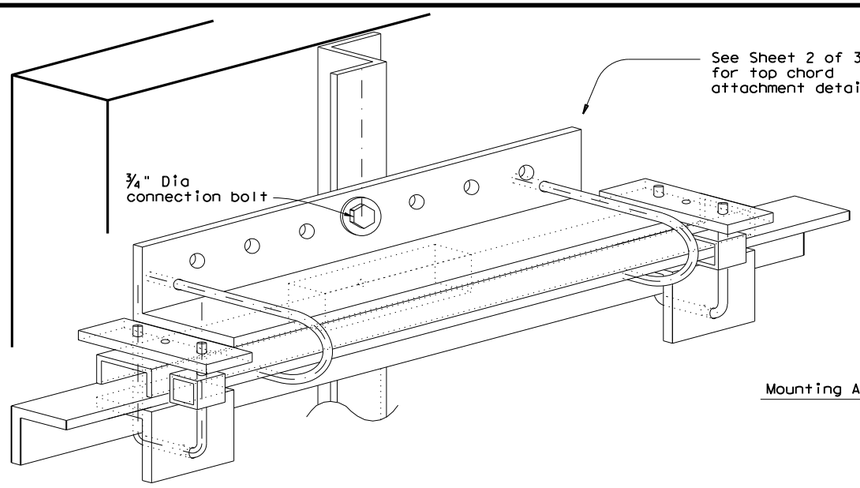
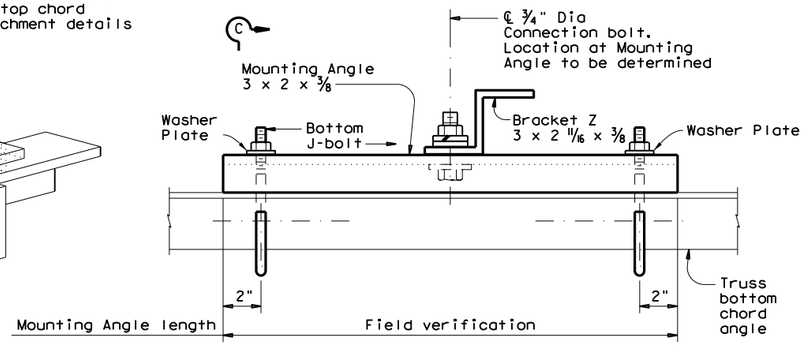
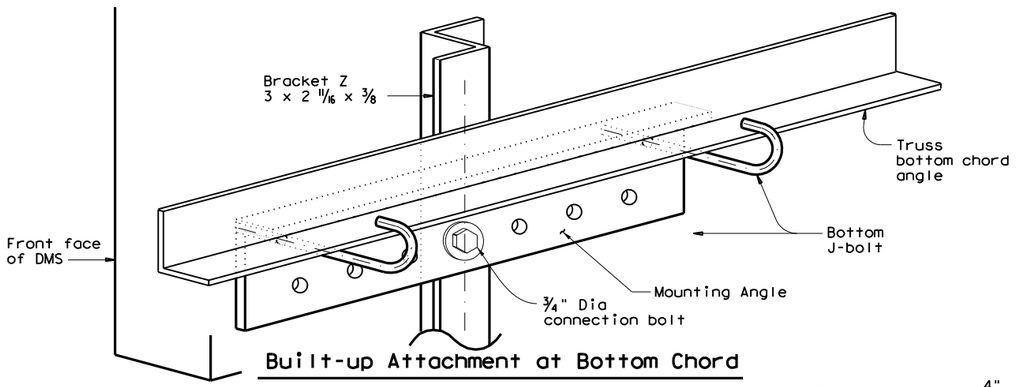


Built-up Attachment at Top Chord

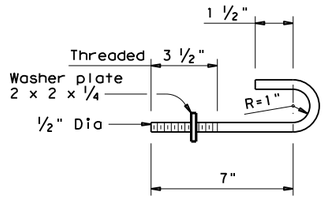




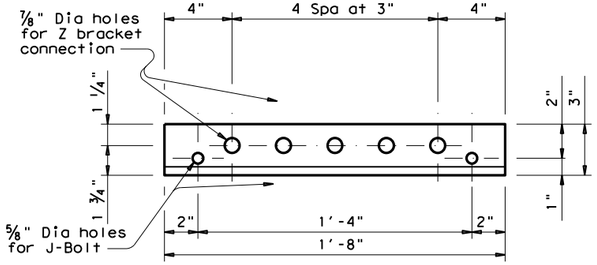
Built-up Attachment at Bottom Chord

ISOMETRIC VIEW

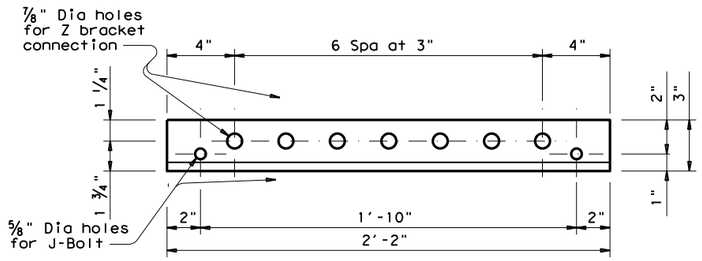
PLAN VIEW (AT BOTTOM CHORD)



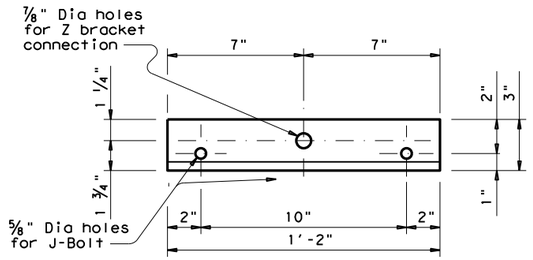
BOTTOM J-BOLT



MOUNTING ANGLE 3 x 2 x ⅜



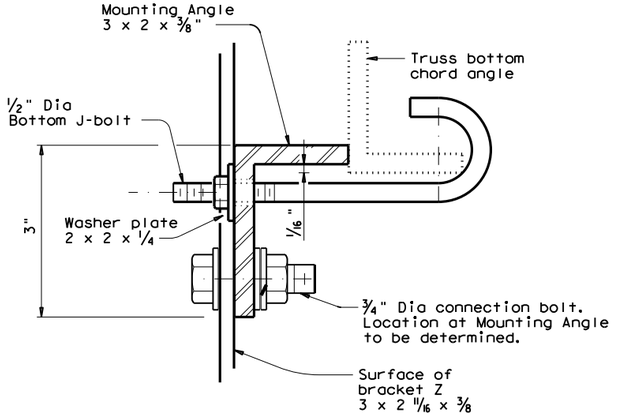
MOUNTING ANGLE 3 x 2 x ⅜



MOUNTING ANGLE 3 x 2 x ⅜

GENERAL NOTES:

1. Application of the built-up detailed on Sheet 2 and 3 of 3 is limited to the dynamic message sign (DMS) attachment which is in conflict with the truss connection bolts at the point(s) of attachment. The overhead sign structure must have adequate capacity to support the DMS. A determination of adequacy shall be made prior to attaching the DMS supports to the truss.
2. Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Revisions thereto. The Design Sustained Wind Velocity is 100 mph with a gust factor of 1.3. Connections are designed for a DMS weight of 3600 lbs and a design Effective Projected Area (EPA) of 441 sq ft, with the EPA based on a DMS nominal width of 30.5 feet and nominal depth of 8.25 feet plus four top and bottom 1'-8" square flashing beacons. The EPA includes drag coefficients of 1.7 (applied to sign area) and 1.2 (applied to flashing beacon area). A horizontal eccentricity of 1.0 ft from the face of the truss to the center of gravity of the DMS for attachment of DMS is assumed. An even number of Z brackets, spaced at 5 ft max., is assumed to transfer forces through the connection.
3. All structural steel shall conform to ASTM A36, A572 Gr 50 or A588. Connection bolts shall conform to ASTM A325 or A449. Each connection bolt shall be provided with 1 heavy hex nut, 2 flat washers, and 1 lock washer. U bolts shall conform to ASTM A307 with 2 hex nuts, 2 flat washers and 2 lock washers. Hollow structural section (HSS) shall conform to ASTM A500, A501, or A847. J bolts and washer plate both shall be Type 304 stainless steel, with bolt minimum yield strength of 50 ksi and an elongation of 16 percent in 2 inches. All parts, except stainless steel shall be galvanized.
4. Contractor shall verify applicable field dimensions before fabrication. Various lengths of bearing and mounting angle are provided for suitable mounting. Contractor shall determine the proper bearing and mounting angle length, and the connection along the length at Z bracket to accommodate J-bolt hook. Contractor may substitute HSS for the mounting channel as long as the HSS has equal or greater thickness at the mounting channel. Limit HSS height to achieved mounting clearance.



SECTION C-C

SHEET 3 OF 3

Texas Department of Transportation

Traffic Operations Division Standard

DMS-TO-TRUSS MOUNTING AT OVERHEAD SIGN SUPPORTS (WITH BUILD-UP)

DMS(TM-3)-16

FILE: dms-tm-16.dgn	DN: TxDOT	CK:	DW: TxDOT	CK:
©TxDOT JUNE 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	00	238	VARIOUS
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		267

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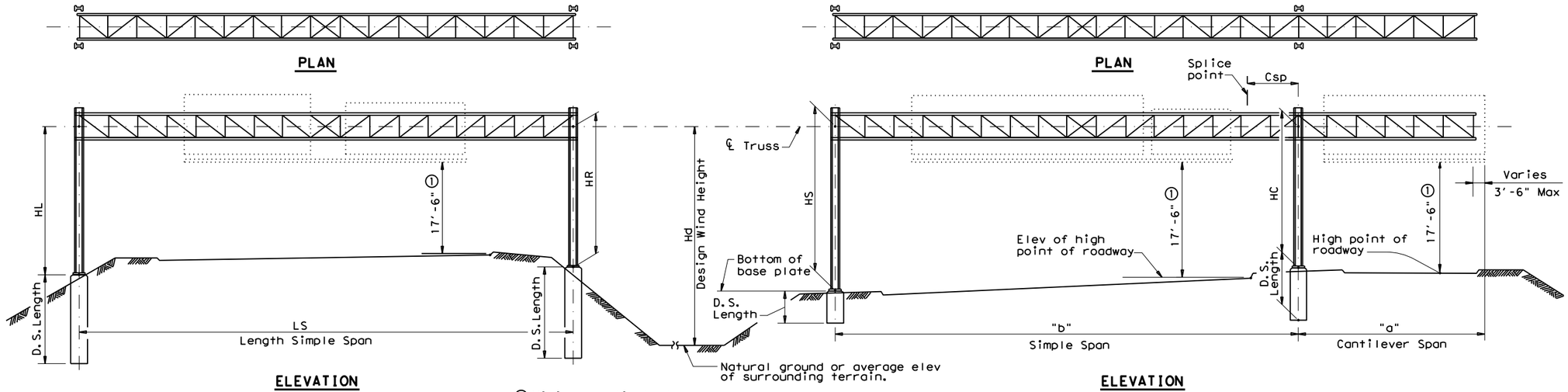

① Minimum vertical clearance

② "Low-Alloy Steel" for non-bridge structures per Item 442, "Metal For Structures".

③ "Carbon Steel" for non-bridge structures per Item 442, "Metal For Structures".

SIMPLE SPAN

SIMPLE SPAN PROCEDURE:

Given: Span, Ls = 93.0′; Left Tower Height, H_L = 26.3′; Right Tower Height, H_R = 22.6′; Design Height, Hd = 27.0′; Avg. Penetrometer Value, N = 25; Dawson County.

Step 1: Select applicable OSB standard. From Wind Velocity and Ice Zone sheet (WV&IZ-96) determine that Dawson County is in Zone 2 (90 mph) and ice above the ice line. Since Design Height, Hd = 27.0′, use standard OSB-Z2I. If the Design Height were more than 30.0′, the applicable standard would be HOSB-Z2I.

Step 2: Determine truss details and tower size from OSB-Z2I. For our 93.0′ span go to the next larger span, i.e. 95.0′. Truss members are:
Chord ~ L 4"x 4"x ⅜"② w/ 10 bolt splice
D.L. Diag. ~ L 3"x 2 ½"x ⅜"③ w/ 2 bolt connection
W.L. Diag. ~ L 3"x 3"x ¼" ③ w/ 3 bolt connection
D.L. Vert. ~ L 3"x 2"x ⅜" ③ w/ 2 bolt connection
W.L. Strut ~ 2 ½"x 2 ½"x ⅜"③ w/ 1 bolt connection
Bolts are ¾" Dia high strength. Truss W x D = 4.5′x 4.5′. Required truss camber to compensate for dead load deflection is 1.46". Dead load of truss is 77 lb/ft. Avg. Tower Height = (26.3′+ 22.6′)÷ 2 = 24.45′. Use 25.0′ to determine column size and spacing for both towers, i.e. W14 x 34 spaced at 7.0′. Use actual tower heights for drilled shaft uplift as follows. For H_L = 26.3′ use 26.0′ to determine design uplift at the left tower = 79.8ᵏ. For H_R = 22.6′ use 23.0′ to determine design uplift at the right tower = 69.9ᵏ.

Step 3: Determine tower and anchor bolt details. Use OSBT standard.
From OSBT with W14 x 34 columns spaced at 7′-0":
Anchor Bolts = 1 ¾" Dia x 3′-10"
Base Plate = 11 ½"x 2 ¼"x 2′-1"
X, Y, and Z = 9 ½", 3", and 2 ¾" respectively
Tower Bracing = 2Ls ~ 3"x 2 ½"x ¼"
Foundation = 36" Dia shafts with 8 ~ #9 Bars.

Step 4: Determine drilled shaft length from OSB-FD. Enter chart for 36" Dia drilled shafts at N = 25.
Left Tower Uplift = 79.8ᵏ, therefore, L = 9′+ 3′= 12′
Right Tower Uplift = 69.9ᵏ, therefore, L = 8′+ 3′= 11′.

Step 5: Determine maximum spacing of tower bracing. The maximum spacing would normally be the same as the column spacing, i.e. 7.0′. However, the special note for tower bracing on Sheet 1 of the OSBT standard makes provision for an increase in spacing as follows:
On OSB-Z2I under 95.0′ span, the W14 x 34 column is shown for 25.0′ and 26.0′ column heights. Thus, the W14 x 34 is shown one time for heights greater than the design height of 25′-0". The special note for tower bracing allows a 1′-0" increase in the maximum spacing from 7.0′ to 8.0′.

CANTILEVER SPAN

CANTILEVER SPAN PROCEDURE:

Given: Simple Span, b = 80.0′; Cantilever Span, a = 30.0′; Left Tower Height, H_L = 20.0′; Right Tower Height, H_R = 28.0′; Design Wind Height, H = 30.0′; Avg. Penetrometer Value, N = 25.0′; Duval County.

Step 1: Calculate the following:
Equiv. Simple Span, E_{ss} = b + 2a + (a^2÷ b)
= 151.30′, Use 155.0′.
If E_{ss} exceeds 155.0′ a special tower design is required. Cantilever Equiv. Simple Span, Cess = 2a = 60.0′; Splice Point, Csp = (a^2÷ b) = 11.30′;
Equiv. Simple Span for Truss Web, Essw = b + (a^2÷ b) = 91.0′, Use 95.0′.

Step 2: Select applicable OSB standard. From Wind Velocity and Ice Zone sheet determine that Duval County is in Zone 4 (70 mph) and is below the ice line. Since Design Wind Height, H = 30.0′, Use standard OSB-Z4. If the Design Height were more than 30.0′ the applicable standard would be HOSB-Z4.

Step 3: Determine truss details and tower size from OSB-Z4.
Cantilever Truss: For Ccss= 60.0′ truss members are:
Chord L 3"x 3"x ¼"② with 6 bolt splice
D.L. Diag. L 2"x 2"x ⅜" with 2 bolt connection
W.L. Diag. L 2 ½"x 2 ½"x ⅜" with 2 bolt connection
D.L. Vert. L 2"x 2"x ⅜" with 2 bolt connection
W.L. Strut L 2"x 2"x ⅜" with 1 bolt connection
Bolts are ⅝" Dia High Strength. Truss WxD = 4.0′x 4.0′. Required cantilever truss camber to compensate for dead load deflection is 0.49".

Simple Span Truss: For b = 80.0′ truss members are:
Chord L 3"x 3"x ⅜"② with 9 bolt splice
D.L. Diag. L 2"x 2"x ⅜" with 2 bolt connection
W.L. Diag. L 3"x 3"x ⅜" with 2 bolt connection
D.L. Vert. L 2"x 2"x ⅜" with 2 bolt connection
W.L. Strut L 2"x 2"x ⅜" with 1 bolt connection
Bolts are ⅝" Dia High Strength. Truss WxD = 4.0′x 4.0′. If W and D for the cantilever and simple spans are different, increase smaller W and D to match the larger truss. Required simple span camber to compensate for dead load deflection is 1.12".

Truss from cantilever tower to splice point: Extend cantilever chords past the tower a distance, Csp= 11.2′ which falls in the third panel. The splice is permissible at any point within the third panel. Web members from the tower out to and including the splice panel, i.e. the third panel, shall be modified as follows. For Essw= 95.0′ web members are:
D.L. Diag. L 2 ½"x 2 ½"x ⅜" with 2 bolt connection
W.L. Diag. L 3"x 2 ½"x ¼" with 2 bolt connection
D.L. Vert. L 2"x 2"x ⅜" with 2 bolt connection
W.L. Strut L 2"x 2"x ⅜" with 1 bolt connection
Ignore W and D dimensions. Instead, use W and D as required for cantilever and simple span trusses. Use ⅝" Dia high strength bolts as required for 95.0′ span.

Tower Size: Avg. Tower Height = (20.0′+ 28.0′)÷ 2 = 24.0′. Use 24.0′ height and 155.0′ equivalent simple span to determine column size and spacing for both towers, i.e. W14 x 34 spaced at 7.5′
Use spans and actual tower heights for uplift as follows:
For H_S = 20.0′, and b = 80.0′ determine uplift = 31.7ᵏ.
For H_C = 28.0′, and E_{ss} = 155.0′ determine uplift = 77.9ᵏ.

Step 4: Determine tower and anchor bolt details. Use standard OSBT.
From OSBT with W14 x 34 columns spaced at 7.5′:
Anchor Bolts = 1 ¾" Dia x 3′-10"
Base Plate = 11 ½"x 2 ¼"x 2′-1"
X, Y, and Z = 9 ½", 3", and 2 ¾" respectively
Tower Bracing = 2Ls ~ 3"x 2 ½"x ¼"
Foundation = 36" Dia shafts with 8~#9 bars.

Step 5: Determine drilled shaft length from OSB-FD.
Enter chart for 36" Dia drilled shaft at N = 25.0′
Left Tower Uplift = 31.7ᵏ, therefore L = 6′+ 3′= 9′
Right Tower Uplift = 77.9ᵏ, therefore L = 8′+ 3′= 11′.

Step 6: Determine maximum spacing of tower bracing. The maximum spacing would normally be the same as the column spacing, i.e. 7.5′. However, the special note for tower bracing on Sheet 1 of the OSBT standard makes provision for an increase in spacing as follows:
On OSB-Z4 under 155.0′ span, the W14 x 34 column is shown for 23.0′ through 26.0′ column heights. Thus, the W14 x 34 column is shown two times for heights greater than 24.0′. The special note allows a 2.0′ increase from 7.5′ to 9.5′.

Texas Department of Transportation
Traffic Operations Division

OVERHEAD SIGN BRIDGE SELECTION EXAMPLES

OSB-SE

REVISIONS

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS
DIST	COUNTY		SHEET NO.
SAT	BEXAR		268

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ZONE 1 NO ICE 100 M.P.H. WIND

TRUSS DETAILS

5/8" Dia. H.S. Bolts — Spans 40' Thru 75'

SPAN	40'	45'	50'	55'	60'	65'	70'	75'
W x D = WIDTH x DEPTH	4.5 x 4.5	4.5 x 4.5	4.5 x 4.5	4.5 x 4.5	4.5 x 4.5	4.5 x 4.5	4.5 x 4.5	4.5 x 4.5
CHORD -②, Unless Otherwise Shown	L 3 x 3 x 3/16 ③ [3]	L 3 x 3 x 1/4 ③ [4]	L 3 x 3 x 1/4 ③ [4]	L 3 x 3 x 1/4 [6]	L 3 1/2x 3 1/2x 1/4 [7]	L 3 1/2x 3 1/2x 5/16 [9]	L 3 1/2x 3 1/2x 5/16 [9]	L 4 x 4 x 5/16 [10]
DEAD LOAD DIAGONAL -③	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]
WIND LOAD DIAGONAL -③	L 3 x 3 x 3/16 [2]	L 3 x 3 x 3/16 [2]	L 3 x 3 x 3/16 [2]	L 3 x 2 1/2x 1/4 [3]	L 3 x 2 1/2x 1/4 [3]	L 3 x 2 1/2x 1/4 [3]	L 3 x 3 x 1/4 [2]	L 3 x 3 x 1/4 [3]
DEAD LOAD VERTICAL -③	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]
WIND LOAD STRUT - ③	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]
TOTAL DEFL. & TRUSS D.L.	DEFL=0.12" L=42 lb/ft	DEFL=0.18" L=42 lb/ft	DEFL=0.21" L=47 lb/ft	DEFL=0.30" L=47 lb/ft	DEFL=0.38" L=53 lb/ft	DEFL=0.44" L=59 lb/ft	DEFL=0.58" L=60 lb/ft	DEFL=0.75" L=64 lb/ft

TOWER DETAILS

S = COLUMN SPACING	6.0'	6.0'	6.0'	6.0'	6.5'	6.5'	6.5'	6.5'
TOWER HEIGHT								
15'	W 10 x 17 (28.0)	W 10 x 17 (31.5)	W 10 x 22 (34.3)	W 10 x 22 (37.8)	W 10 x 22 (36.7)	W 10 x 22 (39.9)	W 10 x 22 (42.9)	W 10 x 26 (45.7)
16'	W 10 x 17 (30.0)	W 10 x 22 (33.7)	W 10 x 22 (36.7)	W 10 x 22 (40.5)	W 10 x 22 (39.3)	W 10 x 22 (42.7)	W 10 x 26 (45.9)	W 10 x 26 (48.9)
17'	W 10 x 22 (33.0)	W 10 x 22 (36.0)	W 10 x 22 (39.0)	W 10 x 22 (43.1)	W 10 x 26 (42.3)	W 10 x 26 (45.5)	W 10 x 26 (48.8)	W 12 x 26 (53.4)
18'	W 10 x 22 (34.0)	W 10 x 22 (38.2)	W 10 x 22 (41.4)	W 10 x 22 (45.8)	W 10 x 26 (44.9)	W 10 x 26 (48.4)	W 10 x 26 (51.9)	W 12 x 26 (56.8)
19'	W 10 x 22 (36.4)	W 10 x 22 (40.5)	W 10 x 26 (43.9)	W 10 x 26 (48.4)	W 10 x 26 (47.6)	W 12 x 26 (51.8)	W 12 x 26 (55.6)	W 12 x 26 (59.3)
20'	W 10 x 22 (38.5)	W 10 x 22 (42.7)	W 10 x 26 (46.4)	W 10 x 26 (51.1)	W 10 x 26 (50.2)	W 12 x 26 (54.7)	W 12 x 26 (58.7)	W 12 x 26 (62.6)
21'	W 10 x 22 (40.6)	W 10 x 26 (45.0)	W 10 x 26 (49.3)	W 12 x 26 (54.4)	W 12 x 26 (53.6)	W 12 x 26 (57.6)	W 12 x 26 (61.8)	W 14 x 30 (66.8)
22'	W 10 x 22 (42.7)	W 10 x 26 (47.4)	W 10 x 26 (51.9)	W 12 x 26 (57.1)	W 12 x 26 (56.4)	W 12 x 26 (60.6)	W 12 x 26 (64.9)	W 14 x 30 (70.3)
23'	W 10 x 26 (44.2)	W 10 x 26 (49.7)	W 12 x 26 (55.1)	W 12 x 26 (60.0)	W 12 x 26 (59.2)	W 14 x 30 (64.6)	W 14 x 30 (69.1)	W 14 x 30 (73.7)
24'	W 10 x 26 (46.3)	W 10 x 26 (52.0)	W 12 x 26 (57.7)	W 12 x 26 (62.8)	W 12 x 26 (62.0)	W 14 x 30 (67.7)	W 14 x 30 (72.4)	W 14 x 30 (77.2)
25'	W 12 x 26 (49.7)	W 12 x 26 (55.0)	W 12 x 26 (60.3)	W 14 x 30 (66.9)	W 14 x 30 (65.9)	W 14 x 30 (70.7)	W 14 x 34 (75.6)	W 14 x 34 (80.5)
26'	W 12 x 26 (51.9)	W 12 x 26 (57.4)	W 12 x 26 (63.0)	W 14 x 30 (69.8)	W 14 x 30 (68.8)	W 14 x 30 (73.8)	W 14 x 34 (78.9)	W 14 x 34 (84.0)
27'	W 12 x 26 (54.1)	W 12 x 26 (59.9)	W 14 x 30 (67.0)	W 14 x 30 (72.8)	W 14 x 30 (71.6)	W 14 x 34 (76.9)	W 14 x 34 (82.2)	W 16 x 36 (87.4)
28'	W 12 x 26 (56.4)	W 12 x 26 (62.4)	W 14 x 30 (69.8)	W 14 x 30 (75.8)	W 14 x 30 (74.7)	W 14 x 34 (80.0)	W 14 x 34 (85.5)	W 16 x 36 (90.9)
29'	W 12 x 26 (58.7)	W 14 x 30 (66.5)	W 14 x 30 (72.6)	W 14 x 34 (78.7)	W 14 x 34 (77.6)	W 14 x 34 (83.1)	W 16 x 36 (90.4)	W 16 x 36 (94.5)
30'	W 12 x 26 (61.0)	W 14 x 30 (69.1)	W 14 x 30 (75.5)	W 14 x 34 (81.7)	W 14 x 34 (80.7)	W 16 x 36 (86.3)	W 16 x 36 (93.9)	W 16 x 36 (98.0)

COLUMN SIZE & UPLIFT (kips)

Tower Height = (HL + HR)/2

ZONE 1 NO ICE 100 M.P.H. WIND

TRUSS DETAILS

3/4" Dia. H.S. Bolts — Spans 76' Thru 155'

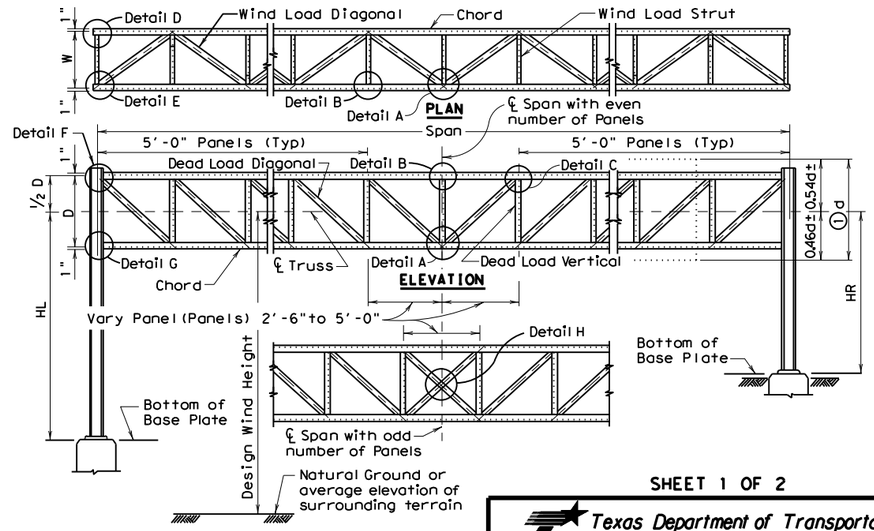
SPAN	80'	85'	90'	95'
W x D = WIDTH x DEPTH	4.5 x 4.5	4.5 x 4.5	4.5 x 4.5	4.5 x 4.5
CHORD -②, Unless Otherwise Shown	L 3 1/2x 3 1/2x 3/8 [8]	L 4 x 4 x 3/8 [9]	L 4 x 4 x 3/8 [10]	L 4 x 4 x 7/16 [11]
DEAD LOAD DIAGONAL -③	L 3 x 2 x 3/16 [2]	L 3 x 2 x 3/16 [2]	L 3 x 2 x 3/16 [2]	L 3 x 2 x 3/16 [2]
WIND LOAD DIAGONAL -③	L 3 x 3 x 1/4 [3]	L 3 x 3 x 1/4 [3]	L 3 x 3 x 1/4 [3]	L 3 1/2x 3 1/2x 1/4 [3]
DEAD LOAD VERTICAL -③	L 3 x 2 x 3/16 [2]	L 3 x 2 x 3/16 [2]	L 3 x 2 x 3/16 [2]	L 3 x 2 x 3/16 [2]
WIND LOAD STRUT - ③	L 2 1/2x 2 1/2x 3/16 [1]	L 2 1/2x 2 1/2x 3/16 [1]	L 2 1/2x 2 1/2x 3/16 [1]	L 2 1/2x 2 1/2x 3/16 [1]
TOTAL DEFL. & TRUSS D.L.	DEFL=0.86" L=70 lb/ft	DEFL=1.08" L=76 lb/ft	DEFL=1.20" L=76 lb/ft	DEFL=1.43" L=86 lb/ft

TOWER DETAILS

S = COLUMN SPACING	7.0'	7.0'	7.0'	7.0'
TOWER HEIGHT				
15'	W 10 x 26 (44.0)	W 10 x 26 (46.8)	W 12 x 26 (50.0)	W 12 x 26 (52.8)
16'	W 10 x 26 (47.2)	W 10 x 26 (50.1)	W 12 x 26 (53.6)	W 12 x 26 (56.5)
17'	W 12 x 26 (51.2)	W 12 x 26 (54.3)	W 12 x 26 (57.2)	W 12 x 26 (60.3)
18'	W 12 x 26 (54.4)	W 12 x 26 (57.7)	W 12 x 26 (60.8)	W 14 x 30 (64.1)
19'	W 12 x 26 (57.7)	W 14 x 30 (61.8)	W 14 x 30 (65.1)	W 14 x 30 (68.6)
20'	W 12 x 26 (60.9)	W 14 x 30 (65.3)	W 14 x 30 (68.8)	W 14 x 30 (72.5)
21'	W 14 x 30 (65.0)	W 14 x 30 (68.8)	W 14 x 30 (72.5)	W 14 x 34 (76.5)
22'	W 14 x 30 (68.3)	W 14 x 30 (72.4)	W 14 x 34 (76.3)	W 14 x 34 (80.4)
23'	W 14 x 30 (71.7)	W 14 x 34 (76.0)	W 14 x 34 (80.0)	W 16 x 36 (85.2)
24'	W 14 x 34 (75.1)	W 14 x 34 (79.5)	W 14 x 34 (83.8)	W 16 x 36 (89.3)
25'	W 14 x 34 (78.6)	W 16 x 36 (83.0)	W 16 x 36 (88.7)	W 16 x 36 (93.4)
26'	W 14 x 34 (82.0)	W 16 x 36 (86.6)	W 16 x 36 (92.5)	W 16 x 40 (97.4)
27'	W 16 x 36 (86.7)	W 16 x 36 (91.6)	W 16 x 40 (96.4)	W 16 x 40 (101.4)
28'	W 16 x 36 (90.2)	W 16 x 36 (95.4)	W 16 x 40 (100.3)	W 16 x 40 (105.6)
29'	W 16 x 40 (93.7)	W 16 x 40 (97.5)	W 16 x 40 (104.2)	W 18 x 46 (111.2)
30'	W 16 x 40 (97.3)	W 16 x 40 (101.2)	W 18 x 46 (108.2)	W 18 x 46 (115.5)

COLUMN SIZE & UPLIFT (kips)

Tower Height = (HL + HR)/2



① d = Sign Depth
Where signs of different depths are used, the bottom edges of all signs may be placed in line. Where this is done, all signs should be so positioned that the bottom edges are approximately 0.46 of the depth of the deepest sign below the ℄ of the truss.

② "Low-Alloy Steel" for non-bridge structures per Item 442, "Metal For Structures".

③ "Carbon Steel" for non-bridge structures per Item 442, "Metal For Structures".

SHEET 1 OF 2

Texas Department of Transportation
Traffic Operations Division

OVERHEAD SIGN BRIDGE DETAILS

OSB-Z1

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
8/08 # of HS bolts;angle sizes; add missing HS bolt dia (select spans)

CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS

DIST	COUNTY	SHEET NO.
SAT	BEXAR	269

DATE: 2/25/2022 10:22:07 AM
FILE: T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\OSB\Standards\DGNs\strds32.dgn

ZONE 1 NO ICE 100 M.P.H. WIND

TRUSS DETAILS

¾" Dia. H.S. Bolts — Spans 76' Thru 155'

SPAN	100'	105'	110'	115'	120'	125'	130'	135'
W x D = WIDTH x DEPTH	5.0 x 5.0	5.0 x 5.0	5.0 x 5.0	5.0 x 5.0	5.0 x 5.0	5.0 x 5.0	5.0 x 5.0	5.0 x 5.0
CHORD -②, Unless Otherwise Shown	L 5 x 5 x ⅜ [11]	L 4 x 4 x ½ [12]	L 5 x 5 x ⅜ [14]	L 5 x 5 x 7/16 [15]	L 5 x 5 x ½ [16]	L 5 x 5 x ½ [18]	L 6 x 6 x ½ [20]	L 6 x 6 x ½ [21]
DEAD LOAD DIAGONAL -③	L 3 x 2 x 3/16 [2]	L 3 x 2 x 3/16 [2]	L 3 x 2 x 3/16 [2]	L 3 x 2 x 3/16 [2]	L 3 x 2 ½x 3/16 [2]	L 3 x 3 x 3/16 [2]	L 3 x 2 x ¼ [2]	L 3 x 2 ½x ¼ [2]
WIND LOAD DIAGONAL -③	L 3 ½x 3 ½x ¼ [3]	L 3 ½x 3 ½x ¼ [3]	L 3 ½x 3 ½x ¼ [3]	L 3 ½x 3 ½x ¼ [4]	L 4 x 4 x ¼ [4]	L 4 x 4 x ¼ [4]	L 4 x 4 x ¼ [4]	L 3 ½x 3 ½x 5/16 [4]
DEAD LOAD VERTICAL -③	L 3 x 2 x 3/16 [2]	L 3 x 2 x 3/16 [2]	L 3 x 2 x 3/16 [2]	L 3 x 2 x 3/16 [2]	L 3 x 2 ½x 3/16 [2]	L 3 x 2 ½x 3/16 [2]	L 3 x 2 ½x 3/16 [2]	L 3 x 2 ½x 3/16 [2]
WIND LOAD STRUT - ③	L 2 ½x 2 ½x 3/16 [1]	L 2 ½x 2 ½x 3/16 [1]	L 2 ½x 2 ½x 3/16 [1]	L 2 ½x 2 ½x 3/16 [1]	L 2 ½x 2 ½x 3/16 [1]	L 2 ½x 2 ½x 3/16 [1]	L 2 ½x 2 ½x 3/16 [1]	L 2 ½x 2 ½x 3/16 [1]
TOTAL DEFL. & TRUSS D.L.	DEFL=1.46" L=92 lb/ft	DEFL=1.58" L=95 lb/ft	DEFL=1.88" L=101 lb/ft	DEFL=2.04" L=101 lb/ft	DEFL=2.30" L=113 lb/ft	DEFL=2.61" L=114 lb/ft	DEFL=2.74" L=130 lb/ft	DEFL=3.14" L=133 lb/ft

TOWER DETAILS

S = COLUMN SPACING	7.5'	7.5'	7.5'	7.5'	7.5'	7.5'	7.5'	7.5'
TOWER HEIGHT								
15'	W 12 x 26 (54.0)	W 12 x 26 (56.4)	W 14 x 30 (59.5)	W 14 x 30 (62.0)	W 14 x 34 (64.5)	W 14 x 34 (66.9)	W 14 x 34 (69.2)	W 14 x 34 (71.9)
16'	W 12 x 26 (57.8)	W 14 x 30 (60.4)	W 14 x 30 (63.7)	W 14 x 30 (66.4)	W 14 x 34 (69.1)	W 14 x 34 (71.6)	W 14 x 34 (74.2)	W 14 x 34 (77.0)
17'	W 14 x 30 (61.5)	W 14 x 30 (64.4)	W 14 x 30 (68.0)	W 14 x 34 (70.6)	W 14 x 34 (73.7)	W 14 x 34 (76.4)	W 14 x 34 (79.1)	W 16 x 36 (82.7)
18'	W 14 x 30 (65.4)	W 14 x 30 (68.4)	W 14 x 30 (72.2)	W 14 x 34 (75.1)	W 14 x 34 (78.3)	W 14 x 34 (81.2)	W 16 x 36 (84.1)	W 16 x 36 (88.0)
19'	W 14 x 30 (69.2)	W 14 x 34 (73.0)	W 14 x 30 (76.4)	W 14 x 34 (79.6)	W 16 x 36 (83.6)	W 16 x 36 (86.7)	W 16 x 36 (89.9)	W 16 x 40 (93.8)
20'	W 14 x 34 (73.1)	W 14 x 34 (77.1)	W 14 x 34 (80.7)	W 16 x 36 (84.1)	W 16 x 36 (88.3)	W 16 x 36 (91.6)	W 16 x 40 (95.0)	W 16 x 40 (99.1)
21'	W 14 x 34 (77.6)	W 16 x 36 (82.0)	W 16 x 36 (85.8)	W 16 x 36 (88.4)	W 16 x 40 (92.9)	W 16 x 40 (96.4)	W 16 x 40 (99.5)	W 18 x 46 (104.4)
22'	W 14 x 34 (81.6)	W 16 x 36 (86.2)	W 16 x 36 (90.1)	W 16 x 36 (92.9)	W 16 x 40 (97.7)	W 16 x 40 (101.3)	W 16 x 40 (105.1)	W 18 x 46 (109.8)
23'	W 16 x 36 (86.5)	W 16 x 36 (90.4)	W 16 x 40 (94.3)	W 16 x 40 (98.3)	W 16 x 40 (102.4)	W 18 x 46 (107.2)	W 18 x 46 (111.2)	W 18 x 46 (115.2)
24'	W 16 x 36 (90.6)	W 16 x 40 (94.6)	W 16 x 40 (98.7)	W 16 x 40 (102.9)	W 18 x 46 (107.2)	W 18 x 46 (112.2)	W 18 x 46 (116.5)	W 18 x 46 (120.6)
25'	W 16 x 40 (94.5)	W 16 x 40 (98.8)	W 16 x 40 (103.1)	W 18 x 46 (108.8)	W 18 x 46 (113.1)	W 18 x 46 (117.3)	W 18 x 50 (121.6)	W 18 x 50 (126.1)
26'	W 16 x 40 (98.6)	W 16 x 40 (103.1)	W 18 x 46 (107.6)	W 18 x 46 (113.5)	W 18 x 46 (118.0)	W 18 x 46 (122.3)	W 18 x 50 (126.9)	W 18 x 50 (131.6)
27'	W 16 x 40 (100.2)	W 18 x 46 (108.5)	W 18 x 46 (113.4)	W 18 x 46 (118.3)	W 18 x 46 (122.9)	W 18 x 50 (127.5)	W 18 x 50 (132.2)	W 18 x 50 (137.1)
28'	W 16 x 40 (104.2)	W 18 x 46 (112.9)	W 18 x 46 (118.0)	W 18 x 46 (123.0)	W 18 x 50 (127.9)	W 18 x 50 (132.6)	W 18 x 50 (137.5)	W 18 x 55 (142.6)
29'	W 18 x 46 (112.4)	W 18 x 46 (117.3)	W 18 x 46 (122.6)	W 18 x 50 (127.7)	W 18 x 50 (132.9)	W 18 x 55 (137.5)	W 18 x 55 (142.6)	W 18 x 55 (148.1)
30'	W 18 x 46 (116.6)	W 18 x 46 (121.8)	W 18 x 50 (127.2)	W 18 x 50 (132.5)	W 18 x 50 (137.9)	W 18 x 55 (142.6)	W 18 x 55 (147.9)	W 21 x 57 (153.7)

COLUMN SIZE & UPLIFT (kips)

Tower Height = $\frac{HL + HR}{2}$

ZONE 1 NO ICE 100 M.P.H. WIND

TRUSS DETAILS

¾" Dia. H.S. Bolts — Spans 76' Thru 155'

SPAN	140'	145'	150'	155'
W x D = WIDTH x DEPTH	5.5 x 5.5	5.5 x 5.5	5.5 x 5.5	5.5 x 5.5
CHORD -②, Unless Otherwise Shown	L 6 x 6 x ½ [21]	L 6 x 6 x 9/16 [23]	L 6 x 6 x 9/16 [24]	L 6 x 6 x ⅝ [26]
DEAD LOAD DIAGONAL -③	L 3 x 2 ½x ¼ [2]	L 3 x 2 ½x ¼ [2]	L 3 x 2 ½x ¼ [2]	L 3 x 3 x ¼ [3]
WIND LOAD DIAGONAL -③	L 3 ½x 3 ½x 5/16 [4]	L 3 ½x 3 ½x 5/16 [4]	L 3 ½x 3 ½x 5/16 [4]	L 4 x 3 ½x 5/16 [4]
DEAD LOAD VERTICAL -③	L 3 x 3 x 3/16 [2]	L 3 x 2 ½x ¼ [2]	L 3 x 2 ½x ¼ [2]	L 3 x 2 ½x ¼ [2]
WIND LOAD STRUT - ③	L 2 ½x 2 ½x 3/16 [1]	L 2 ½x 2 ½x 3/16 [1]	L 2 ½x 2 ½x 3/16 [1]	L 2 ½x 2 ½x 3/16 [1]
TOTAL DEFL. & TRUSS D.L.	DEFL=3.09" L=137 lb/ft	DEFL=3.36" L=149 lb/ft	DEFL=3.82" L=149 lb/ft	DEFL=4.14" L=162 lb/ft

TOWER DETAILS

S = COLUMN SPACING	7.5'	7.5'	7.5'	7.5'
TOWER HEIGHT				
15'	W 14 x 34 (74.8)	W 16 x 36 (77.2)	W 16 x 36 (80.1)	W 16 x 36 (82.6)
16'	W 14 x 34 (80.1)	W 16 x 36 (82.7)	W 16 x 36 (85.8)	W 16 x 36 (88.5)
17'	W 16 x 36 (85.5)	W 16 x 36 (88.3)	W 16 x 40 (91.5)	W 16 x 40 (94.3)
18'	W 16 x 36 (90.8)	W 16 x 40 (93.8)	W 16 x 40 (97.2)	W 16 x 40 (100.3)
19'	W 16 x 40 (96.1)	W 16 x 40 (99.3)	W 18 x 46 (104.5)	W 18 x 46 (107.7)
20'	W 16 x 40 (101.5)	W 16 x 40 (104.9)	W 18 x 46 (110.4)	W 18 x 46 (113.9)
21'	W 18 x 46 (108.6)	W 18 x 46 (112.2)	W 18 x 46 (116.3)	W 18 x 46 (120.0)
22'	W 18 x 46 (114.2)	W 18 x 46 (118.0)	W 18 x 46 (122.3)	W 18 x 50 (126.2)
23'	W 18 x 46 (119.8)	W 18 x 46 (123.8)	W 18 x 50 (128.1)	W 18 x 50 (132.1)
24'	W 18 x 46 (125.4)	W 18 x 50 (129.6)	W 18 x 50 (134.1)	W 18 x 50 (138.3)
25'	W 18 x 50 (130.8)	W 18 x 50 (135.2)	W 18 x 55 (140.0)	W 18 x 55 (144.4)
26'	W 18 x 50 (136.5)	W 18 x 55 (141.1)	W 18 x 55 (146.1)	W 18 x 55 (150.7)
27'	W 18 x 55 (141.9)	W 18 x 55 (146.8)	W 21 x 57 (154.0)	W 21 x 57 (158.9)
28'	W 18 x 55 (147.7)	W 18 x 55 (152.7)	W 21 x 57 (160.2)	W 21 x 57 (165.3)
29'	W 21 x 57 (155.6)	W 21 x 57 (160.8)	W 21 x 62 (166.5)	W 21 x 62 (171.8)
30'	W 21 x 57 (161.5)	W 21 x 57 (166.8)	W 21 x 62 (172.7)	W 21 x 62 (178.3)

COLUMN SIZE & UPLIFT (kips)

Tower Height = $\frac{HL + HR}{2}$

KEY TO TRUSS AND TOWER DETAILS

Truss members are all angles.
Truss columns are all wide flange shapes.

W 10 x 26 (44.2) ← 44.2 kips Uplift at base plate
- 26 Pounds per foot.
- 10" Nominal size
- Wide Flange

DEFL = 0.12" = inches Deflection due to dead load of truss, walkway, signs and lights.
DL = 42 lb/ft = pounds per foot dead load of truss members only; does not include walkway, signs, and lights.

NOTE: Details on these sheets are for Design Wind Heights up to 30 feet.

GENERAL NOTES

Design conforms to AASHTO 1994 Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Revisions thereto.

For overhead sign bridges with different tower heights, average the height of the two towers and use the tabulated height nearest the calculated average. For average heights falling midway between the two tabulated heights use the larger height.

For truss lengths falling between those shown in the tables use the sizes called for in the next longer span.

Overhead sign bridges are designed for the equivalent area of a 10 foot deep sign panel over 75 percent of the span length, located as necessary to produce maximum stress. Design includes 3 pounds per square foot for sign panel, 20 pounds per linear foot for lights, and 50 pounds per linear foot for walkway, all placed as specified for the design sign panel.

Refer to "Overhead Sign Bridge Truss Details" for details called out in plan and elevation views.

The number of High Strength Bolts required in truss connection or splice are indicated in brackets, e.g. [3], after the member size.

Texas Department of Transportation
Traffic Operations Division

OVERHEAD SIGN BRIDGE DETAILS

OSB-Z1

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
8/08 add missing HS bolt dia (select spans); applicability note; noted design specifications

CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS
DIST	COUNTY		SHEET NO.
SAT	BEXAR		270

DATE: 2/25/2022 10:22:11 AM
FILE: T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\OSB\Standards\DGNs\stds37.dgn

ZONE 3 NO ICE 80 M.P.H. WIND

TRUSS DETAILS

5/8" Dia. H.S. Bolts — Spans 40' Thru 95'

SPAN	40'	45'	50'	55'	60'	65'	70'	75'
W x D = WIDTH x DEPTH	4.0 x 4.0	4.0 x 4.0	4.0 x 4.0	4.0 x 4.0	4.0 x 4.0	4.0 x 4.0	4.5 x 4.5	4.5 x 4.5
CHORD -②, Unless Otherwise Shown	L 3 x 3 x 3/16 ③ [3]	L 3 x 3 x 3/16 ③ [3]	L 3 x 3 x 1/4 ③ [4]	L 3 x 3 x 1/4 ③ [4]	L 3 x 3 x 1/4 [6]	L 3 x 3 x 5/16 [7]	L 3 x 3 x 5/16 [7]	L 3 1/2 x 3 1/2 x 5/16 [9]
DEAD LOAD DIAGONAL -③	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]
WIND LOAD DIAGONAL -③	L 2 1/2 x 2 1/2 x 3/16 [2]	L 2 1/2 x 2 1/2 x 3/16 [2]	L 2 1/2 x 2 1/2 x 3/16 [2]	L 3 x 3 x 3/16 [2]	L 3 x 3 x 3/16 [2]	L 3 x 3 x 3/16 [2]	L 3 x 3 x 3/16 [2]	L 3 x 3 x 3/16 [3]
DEAD LOAD VERTICAL -③	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]
WIND LOAD STRUT - ③	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]
TOTAL DEFL. & TRUSS D.L.	DEFL=0.14" L=38 lb/ft	DEFL=0.21" L=38 lb/ft	DEFL=0.25" L=43 lb/ft	DEFL=0.36" L=45 lb/ft	DEFL=0.50" L=45 lb/ft	DEFL=0.58" L=50 lb/ft	DEFL=0.63" L=52 lb/ft	DEFL=0.73" L=57 lb/ft

TOWER DETAILS

S = COLUMN SPACING	6.0'	6.0'	6.0'	6.0'	6.0'	6.5'	6.5'	6.5'
TOWER HEIGHT								
15'	W 10 x 15 (18.0)	W 10 x 15 (20.1)	W 10 x 15 (22.1)	W 10 x 15 (24.2)	W 10 x 15 (26.2)	W 10 x 17 (25.8)	W 10 x 17 (27.9)	W 10 x 22 (29.8)
16'	W 10 x 15 (19.3)	W 10 x 15 (21.5)	W 10 x 15 (23.7)	W 10 x 15 (25.9)	W 10 x 15 (28.1)	W 10 x 17 (27.6)	W 10 x 22 (29.9)	W 10 x 22 (31.9)
17'	W 10 x 15 (20.6)	W 10 x 15 (23.0)	W 10 x 15 (25.3)	W 10 x 17 (27.6)	W 10 x 17 (29.9)	W 10 x 22 (29.4)	W 10 x 22 (31.8)	W 10 x 22 (34.0)
18'	W 10 x 15 (21.9)	W 10 x 15 (24.4)	W 10 x 17 (26.9)	W 10 x 17 (29.3)	W 10 x 17 (31.8)	W 10 x 22 (31.3)	W 10 x 22 (33.8)	W 10 x 22 (36.1)
19'	W 10 x 15 (23.3)	W 10 x 17 (25.9)	W 10 x 17 (28.5)	W 10 x 22 (31.1)	W 10 x 22 (33.7)	W 10 x 22 (33.1)	W 10 x 22 (35.7)	W 10 x 22 (38.2)
20'	W 10 x 15 (24.6)	W 10 x 17 (27.4)	W 10 x 17 (30.1)	W 10 x 22 (32.8)	W 10 x 22 (35.5)	W 10 x 22 (35.0)	W 10 x 22 (37.7)	W 10 x 22 (40.3)
21'	W 10 x 17 (25.9)	W 10 x 17 (28.9)	W 10 x 22 (31.7)	W 10 x 22 (34.6)	W 10 x 22 (37.1)	W 10 x 22 (36.9)	W 10 x 26 (39.7)	W 10 x 26 (42.5)
22'	W 10 x 17 (27.3)	W 10 x 17 (30.4)	W 10 x 22 (33.3)	W 10 x 22 (36.4)	W 10 x 22 (39.0)	W 10 x 22 (38.7)	W 10 x 26 (41.8)	W 10 x 26 (44.6)
23'	W 10 x 22 (28.7)	W 10 x 22 (31.9)	W 10 x 22 (35.0)	W 10 x 22 (38.4)	W 10 x 26 (41.3)	W 10 x 26 (40.6)	W 10 x 26 (43.8)	W 12 x 26 (47.1)
24'	W 10 x 22 (30.1)	W 10 x 22 (33.4)	W 10 x 22 (36.6)	W 10 x 22 (39.9)	W 10 x 26 (43.2)	W 10 x 26 (42.5)	W 10 x 26 (45.8)	W 12 x 26 (49.3)
25'	W 10 x 22 (31.4)	W 10 x 22 (34.9)	W 10 x 22 (38.3)	W 10 x 26 (41.7)	W 10 x 26 (44.6)	W 10 x 26 (44.5)	W 12 x 26 (48.3)	W 12 x 26 (51.5)
26'	W 10 x 22 (32.9)	W 10 x 22 (36.5)	W 10 x 26 (40.0)	W 10 x 26 (43.5)	W 10 x 26 (46.6)	W 12 x 26 (46.4)	W 12 x 26 (50.4)	W 12 x 26 (53.7)
27'	W 10 x 22 (33.7)	W 10 x 26 (38.0)	W 10 x 26 (41.8)	W 10 x 26 (45.4)	W 12 x 26 (49.6)	W 12 x 26 (48.8)	W 12 x 26 (52.5)	W 12 x 26 (56.0)
28'	W 10 x 22 (35.1)	W 10 x 26 (39.6)	W 10 x 26 (43.4)	W 12 x 26 (47.2)	W 12 x 26 (51.6)	W 12 x 26 (50.8)	W 12 x 26 (54.6)	W 14 x 30 (58.2)
29'	W 10 x 26 (37.1)	W 10 x 26 (41.6)	W 12 x 26 (45.7)	W 12 x 26 (50.0)	W 12 x 26 (53.6)	W 12 x 26 (52.7)	W 12 x 26 (56.7)	W 14 x 30 (61.5)
30'	W 10 x 26 (38.6)	W 10 x 26 (42.8)	W 12 x 26 (47.4)	W 12 x 26 (51.6)	W 12 x 26 (55.6)	W 12 x 26 (54.7)	W 12 x 26 (58.8)	W 14 x 30 (63.8)

COLUMN SIZE & UPLIFT (kips)

Tower Height = (HL + HR)/2

ZONE 3 NO ICE 80 M.P.H. WIND

TRUSS DETAILS

5/8" Dia. H.S. Bolts — Spans 40' Thru 95'

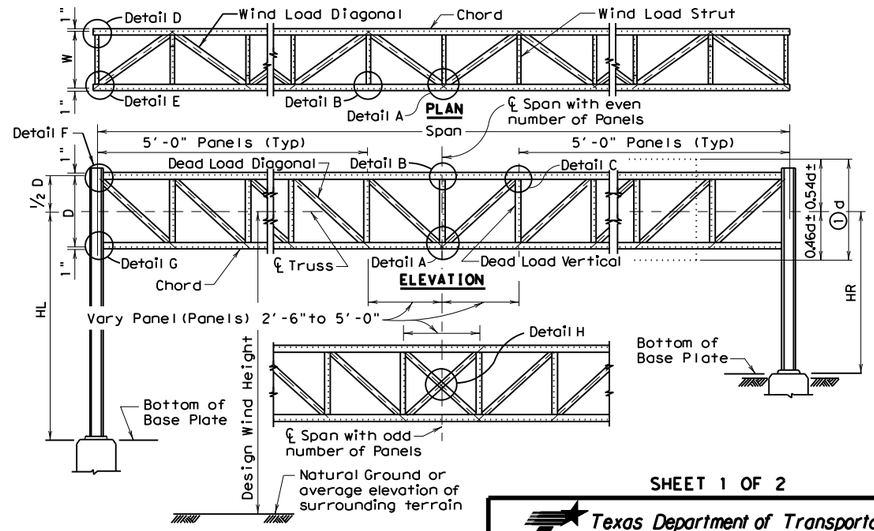
SPAN	80'	85'	90'	95'
W x D = WIDTH x DEPTH	4.5 x 4.5	4.5 x 4.5	4.5 x 4.5	4.5 x 4.5
CHORD -②, Unless Otherwise Shown	L 3 1/2 x 3 1/2 x 5/16 [9]	L 3 1/2 x 3 1/2 x 5/16 [9]	L 3 1/2 x 3 1/2 x 3/8 [10]	L 3 1/2 x 3 1/2 x 3/8 [11]
DEAD LOAD DIAGONAL -③	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]
WIND LOAD DIAGONAL -③	L 3 x 3 x 1/4 [3]	L 3 x 3 x 1/4 [3]	L 3 x 3 x 1/4 [3]	L 3 x 3 x 1/4 [3]
DEAD LOAD VERTICAL -③	L 2 x 2 x 3/16 [2]	L 2 1/2 x 2 1/2 x 3/16 [2]	L 3 x 2 x 3/16 [2]	L 3 x 2 x 3/16 [2]
WIND LOAD STRUT - ③	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]
TOTAL DEFL. & TRUSS D.L.	DEFL=0.95" L=61 lb/ft	DEFL=1.19" L=61 lb/ft	DEFL=1.32" L=67 lb/ft	DEFL=1.61" L=67 lb/ft

TOWER DETAILS

S = COLUMN SPACING	6.5'	6.5'	6.5'	6.5'
TOWER HEIGHT				
15'	W 10 x 22 (31.7)	W 10 x 22 (33.6)	W 10 x 22 (35.5)	W 10 x 22 (37.5)
16'	W 10 x 22 (33.9)	W 10 x 22 (36.0)	W 10 x 22 (38.0)	W 10 x 22 (40.1)
17'	W 10 x 22 (36.1)	W 10 x 22 (38.3)	W 10 x 22 (40.5)	W 10 x 26 (42.8)
18'	W 10 x 22 (38.4)	W 10 x 22 (40.7)	W 10 x 26 (43.0)	W 10 x 26 (45.4)
19'	W 10 x 26 (40.6)	W 10 x 26 (43.1)	W 10 x 26 (45.8)	W 10 x 26 (47.8)
20'	W 10 x 26 (42.9)	W 10 x 26 (45.5)	W 10 x 26 (48.4)	W 10 x 26 (50.4)
21'	W 10 x 26 (45.1)	W 12 x 26 (48.2)	W 12 x 26 (50.9)	W 12 x 26 (53.7)
22'	W 10 x 26 (47.4)	W 12 x 26 (50.6)	W 12 x 26 (53.5)	W 12 x 26 (56.4)
23'	W 12 x 26 (50.0)	W 12 x 26 (52.7)	W 12 x 26 (56.1)	W 12 x 26 (59.7)
24'	W 12 x 26 (52.4)	W 12 x 26 (55.2)	W 12 x 26 (58.7)	W 12 x 26 (61.8)
25'	W 12 x 26 (54.7)	W 12 x 26 (58.0)	W 14 x 30 (62.1)	W 14 x 30 (65.4)
26'	W 12 x 26 (57.1)	W 14 x 30 (60.5)	W 14 x 30 (64.7)	W 14 x 30 (68.2)
27'	W 14 x 30 (60.3)	W 14 x 30 (63.9)	W 14 x 30 (67.4)	W 14 x 34 (71.0)
28'	W 14 x 30 (62.8)	W 14 x 30 (66.5)	W 14 x 30 (70.1)	W 14 x 34 (73.8)
29'	W 14 x 30 (65.2)	W 14 x 30 (69.0)	W 14 x 34 (72.9)	W 14 x 34 (76.7)
30'	W 14 x 30 (67.8)	W 14 x 34 (71.6)	W 14 x 34 (75.8)	W 14 x 34 (79.5)

COLUMN SIZE & UPLIFT (kips)

Tower Height = (HL + HR)/2



① d = Sign Depth
Where signs of different depths are used, the bottom edges of all signs may be placed in line. Where this is done, all signs should be so positioned that the bottom edges are approximately 0.46 of the depth of the deepest sign below the ℄ of the truss.

② "Low-Alloy Steel" for non-bridge structures per Item 442, "Metal For Structures".

③ "Carbon Steel" for non-bridge structures per Item 442, "Metal For Structures".

SHEET 1 OF 2

Texas Department of Transportation
Traffic Operations Division

OVERHEAD SIGN BRIDGE DETAILS

OSB-Z3

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS
DIST	COUNTY		SHEET NO.
SAT	BEXAR		271

REVISIONS

DATE: 2/25/2022 10:22:12 AM
FILE: T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\OSB\Standards\DGNs\stds37.dgn

ZONE 3 NO ICE 80 M.P.H. WIND

TRUSS DETAILS

¾" Dia. H.S. Bolts — Spans 96' Thru 155'

SPAN	100'	105'	110'	115'	120'	125'	130'	135'
W x D = WIDTH x DEPTH	4.5 x 4.5	4.5 x 4.5	4.5 x 4.5	4.5 x 4.5	5.0 x 5.0	5.0 x 5.0	5.0 x 5.0	5.0 x 5.0
CHORD -②, Unless Otherwise Shown	L 4 x 4 x 3/8 [9]	L 4 x 4 x 3/8 [10]	L 4 x 4 x 7/16 [11]	L 4 x 4 x 1/2 [12]	L 4 x 4 x 1/2 [12]	L 4 x 4 x 1/2 [13]	L 5 x 5 x 7/16 [14]	L 5 x 5 x 7/16 [15]
DEAD LOAD DIAGONAL -③	L 3 x 2 x 3/16 [2]	L 3 x 2 x 3/16 [2]	L 3 x 2 x 3/16 [2]	L 3 x 2 1/2 x 3/16 [2]	L 3 x 2 1/2 x 3/16 [2]	L 3 x 3 x 3/16 [2]	L 3 x 3 x 3/16 [2]	L 3 x 3 x 3/16 [2]
WIND LOAD DIAGONAL -③	L 3 x 3 x 1/4 [2]	L 3 x 3 x 1/4 [3]	L 3 x 3 x 1/4 [3]	L 3 x 3 x 1/4 [3]	L 3 1/2 x 3 1/2 x 1/4 [3]	L 3 1/2 x 3 1/2 x 1/4 [3]	L 3 1/2 x 3 1/2 x 1/4 [3]	L 3 1/2 x 3 1/2 x 1/4 [3]
DEAD LOAD VERTICAL -③	L 3 x 2 x 3/16 [2]	L 3 x 2 x 3/16 [2]	L 3 x 2 x 3/16 [2]	L 3 x 2 x 3/16 [2]	L 3 x 2 x 3/16 [2]	L 3 x 2 1/2 x 3/16 [2]	L 3 x 2 1/2 x 3/16 [2]	L 3 x 2 1/2 x 3/16 [2]
WIND LOAD STRUT - ③	L 2 1/2 x 2 1/2 x 3/16 [1]	L 2 1/2 x 2 1/2 x 3/16 [1]	L 2 1/2 x 2 1/2 x 3/16 [1]	L 2 1/2 x 2 1/2 x 3/16 [1]	L 2 1/2 x 2 1/2 x 3/16 [1]	L 2 1/2 x 2 1/2 x 3/16 [1]	L 2 1/2 x 2 1/2 x 3/16 [1]	L 2 1/2 x 2 1/2 x 3/16 [1]
TOTAL DEFL. & TRUSS D.L.	DEFL=1.77" L=76 lb/ft	DEFL=2.13" L=76 lb/ft	DEFL=2.32" L=82 lb/ft	DEFL=2.54" L=90 lb/ft	DEFL=2.54" L=95 lb/ft	DEFL=3.03" L=97 lb/ft	DEFL=3.22" L=103 lb/ft	DEFL=3.72" L=103 lb/ft

TOWER DETAILS

COLUMN SIZE & UPLIFT (kips)

S = COLUMN SPACING	7.0'	7.0'	7.0'	7.0'	7.5'	7.5'	7.5'	7.5'
TOWER HEIGHT								
15'	W 10 x 22 (36.0)	W 10 x 26 (37.8)	W 10 x 26 (39.5)	W 10 x 26 (41.1)	W 12 x 26 (39.9)	W 12 x 26 (41.5)	W 12 x 26 (43.1)	W 12 x 26 (44.7)
16'	W 10 x 22 (38.6)	W 10 x 26 (40.5)	W 10 x 26 (42.3)	W 10 x 26 (44.0)	W 12 x 26 (42.7)	W 12 x 26 (44.5)	W 12 x 26 (46.2)	W 12 x 26 (48.0)
17'	W 10 x 26 (40.9)	W 10 x 26 (43.2)	W 10 x 26 (45.1)	W 12 x 26 (47.1)	W 12 x 26 (45.6)	W 12 x 26 (47.4)	W 12 x 26 (49.3)	W 12 x 26 (51.2)
18'	W 10 x 26 (43.5)	W 10 x 26 (45.9)	W 12 x 26 (47.9)	W 12 x 26 (50.1)	W 12 x 26 (48.5)	W 12 x 26 (50.4)	W 12 x 26 (52.4)	W 12 x 26 (54.4)
19'	W 12 x 26 (46.5)	W 12 x 26 (48.8)	W 12 x 26 (51.0)	W 12 x 26 (53.1)	W 12 x 26 (51.4)	W 12 x 26 (53.4)	W 14 x 30 (56.0)	W 14 x 30 (58.1)
20'	W 12 x 26 (49.1)	W 12 x 26 (51.5)	W 12 x 26 (53.8)	W 12 x 26 (56.0)	W 12 x 26 (54.3)	W 14 x 30 (56.9)	W 14 x 30 (59.2)	W 14 x 30 (61.4)
21'	W 12 x 26 (51.7)	W 12 x 26 (54.3)	W 12 x 26 (56.7)	W 14 x 30 (59.6)	W 14 x 30 (57.7)	W 14 x 30 (60.0)	W 14 x 30 (62.3)	W 14 x 30 (64.7)
22'	W 12 x 26 (54.3)	W 12 x 26 (57.0)	W 14 x 30 (59.6)	W 14 x 30 (62.6)	W 14 x 30 (60.7)	W 14 x 30 (63.1)	W 14 x 30 (65.5)	W 14 x 34 (68.0)
23'	W 14 x 30 (57.7)	W 14 x 30 (60.4)	W 14 x 30 (63.1)	W 14 x 30 (65.7)	W 14 x 30 (63.7)	W 14 x 34 (66.2)	W 14 x 34 (68.8)	W 14 x 34 (71.3)
24'	W 14 x 30 (60.4)	W 14 x 30 (63.3)	W 14 x 30 (66.0)	W 14 x 30 (67.8)	W 14 x 30 (66.6)	W 14 x 34 (69.3)	W 14 x 34 (72.0)	W 14 x 34 (74.7)
25'	W 14 x 30 (63.1)	W 14 x 30 (66.3)	W 14 x 34 (69.8)	W 14 x 34 (71.8)	W 14 x 34 (69.6)	W 14 x 34 (72.4)	W 16 x 36 (76.0)	W 16 x 36 (78.8)
26'	W 14 x 30 (65.8)	W 14 x 30 (68.9)	W 14 x 34 (72.8)	W 14 x 34 (74.9)	W 14 x 34 (72.6)	W 14 x 34 (75.5)	W 16 x 36 (79.3)	W 16 x 36 (82.2)
27'	W 14 x 34 (68.6)	W 14 x 34 (72.0)	W 14 x 34 (74.9)	W 16 x 36 (78.9)	W 16 x 36 (76.5)	W 16 x 36 (79.5)	W 16 x 36 (82.6)	W 16 x 40 (85.6)
28'	W 14 x 34 (71.3)	W 14 x 34 (74.7)	W 14 x 34 (77.9)	W 16 x 36 (82.1)	W 16 x 36 (79.6)	W 16 x 36 (82.7)	W 16 x 36 (85.9)	W 16 x 40 (89.1)
29'	W 14 x 34 (74.1)	W 16 x 36 (78.6)	W 16 x 36 (82.0)	W 16 x 36 (85.3)	W 16 x 36 (82.7)	W 16 x 40 (85.9)	W 16 x 40 (89.2)	W 16 x 40 (92.5)
30'	W 14 x 34 (76.9)	W 16 x 36 (81.5)	W 16 x 36 (85.0)	W 16 x 36 (88.5)	W 16 x 40 (85.8)	W 16 x 40 (89.1)	W 16 x 40 (92.6)	W 16 x 40 (96.0)

Tower Height = (HL + HR)/2

ZONE 3 NO ICE 80 M.P.H. WIND

TRUSS DETAILS

¾" Dia. H.S. Bolts — Spans 96' Thru 155'

SPAN	140'	145'	150'	155'
W x D = WIDTH x DEPTH	5.0 x 5.0	5.0 x 5.0	5.0 x 5.0	5.0 x 5.0
CHORD -②, Unless Otherwise Shown	L 5 x 5 x 1/2 [17]	L 5 x 5 x 1/2 [18]	L 6 x 6 x 1/2 [20]	L 6 x 6 x 1/2 [21]
DEAD LOAD DIAGONAL -③	L 3 x 2 1/2 x 1/4 [2]	L 3 x 2 1/2 x 1/4 [2]	L 3 x 2 1/2 x 1/4 [2]	L 3 x 3 x 1/4 [2]
WIND LOAD DIAGONAL -③	L 3 1/2 x 3 1/2 x 1/4 [3]	L 3 1/2 x 3 1/2 x 1/4 [3]	L 3 1/2 x 3 1/2 x 1/4 [3]	L 3 1/2 x 3 1/2 x 1/4 [3]
DEAD LOAD VERTICAL -③	L 3 x 3 x 3/16 [2]	L 3 x 3 x 3/16 [2]	L 3 x 3 x 3/16 [2]	L 3 x 3 x 3/16 [2]
WIND LOAD STRUT - ③	L 2 1/2 x 2 1/2 x 3/16 [1]	L 2 1/2 x 2 1/2 x 3/16 [1]	L 2 1/2 x 2 1/2 x 3/16 [1]	L 2 1/2 x 2 1/2 x 3/16 [1]
TOTAL DEFL. & TRUSS D.L.	DEFL=3.96" L=114 lb/ft	DEFL=4.53" L=114 lb/ft	DEFL=4.65" L=129 lb/ft	DEFL=5.27" L=131 lb/ft

TOWER DETAILS

COLUMN SIZE & UPLIFT (kips)

S = COLUMN SPACING	7.5'	7.5'	7.5'	7.5'
TOWER HEIGHT				
15'	W 12 x 26 (46.1)	W 12 x 26 (47.9)	W 12 x 26 (49.3)	W 12 x 26 (51.1)
16'	W 12 x 26 (49.4)	W 12 x 26 (51.3)	W 12 x 26 (52.9)	W 12 x 26 (54.7)
17'	W 12 x 26 (52.7)	W 14 x 30 (55.2)	W 14 x 30 (56.9)	W 14 x 30 (58.8)
18'	W 14 x 30 (56.1)	W 14 x 30 (58.7)	W 14 x 30 (60.5)	W 14 x 30 (62.6)
19'	W 14 x 30 (59.9)	W 14 x 30 (62.2)	W 14 x 30 (64.2)	W 14 x 34 (66.4)
20'	W 14 x 30 (63.3)	W 14 x 30 (65.8)	W 14 x 34 (67.9)	W 14 x 34 (70.2)
21'	W 14 x 34 (66.7)	W 14 x 34 (69.3)	W 14 x 34 (71.5)	W 16 x 36 (74.0)
22'	W 14 x 34 (70.2)	W 14 x 34 (72.9)	W 14 x 34 (75.2)	W 16 x 36 (77.9)
23'	W 14 x 34 (73.6)	W 16 x 36 (77.1)	W 16 x 36 (79.6)	W 16 x 36 (81.7)
24'	W 16 x 36 (77.1)	W 16 x 36 (80.7)	W 16 x 36 (83.4)	W 16 x 36 (85.6)
25'	W 16 x 36 (81.3)	W 16 x 36 (84.4)	W 16 x 40 (87.2)	W 16 x 40 (90.2)
26'	W 16 x 36 (84.8)	W 16 x 40 (88.0)	W 16 x 40 (91.0)	W 16 x 40 (94.1)
27'	W 16 x 40 (88.4)	W 16 x 40 (91.7)	W 16 x 40 (94.8)	W 18 x 46 (98.9)
28'	W 16 x 40 (91.9)	W 16 x 40 (95.4)	W 18 x 46 (98.6)	W 18 x 46 (102.9)
29'	W 18 x 46 (97.9)	W 18 x 46 (100.1)	W 18 x 46 (103.4)	W 18 x 46 (106.9)
30'	W 18 x 46 (101.6)	W 18 x 46 (103.9)	W 18 x 46 (107.3)	W 18 x 46 (110.9)

Tower Height = (HL + HR)/2

KEY TO TRUSS AND TOWER DETAILS

Truss members are all angles.
Truss columns are all wide flange shapes.

W 10 x 26 (44.2) ← 44.2 kips Uplift at base plate
- 26 Pounds per foot.
- 10" Nominal size
- Wide Flange

DEFL = 0.12" = inches Deflection due to dead load of truss, walkway, signs and lights.
DL = 42 lb/ft = pounds per foot dead load of truss members only; does not include walkway, signs, and lights.

NOTE: Details on these sheets are for Design Wind Heights up to 30 feet.

GENERAL NOTES

Design conforms to AASHTO 1994 Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Revisions thereto.

For overhead sign bridges with different tower heights, average the height of the two towers and use the tabulated height nearest the calculated average. For average heights falling midway between the two tabulated heights use the larger height.

For truss lengths falling between those shown in the tables use the sizes called for in the next longer span.

Overhead sign bridges are designed for the equivalent area of a 10 foot deep sign panel over 75 percent of the span length, located as necessary to produce maximum stress. Design includes 3 pounds per square foot for sign panel, 20 pounds per linear foot for lights, and 50 pounds per linear foot for walkway, all placed as specified for the design sign panel.

Refer to "Overhead Sign Bridge Truss Details" for details called out in plan and elevation views.

The number of High Strength Bolts required in truss connection or splice are indicated in brackets, e.g. [3], after the member size.

SHEET 2 OF 2

Texas Department of Transportation
Traffic Operations Division

OVERHEAD SIGN BRIDGE DETAILS

OSB-Z3

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
8/08 add missing HS bolt dia (select spans); applicability note; noted design specifications

CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS
DIST	COUNTY		SHEET NO.
SAT	BEXAR		272

DATE: 2/25/2022 10:22:17 AM
FILE: T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\OSB\Standards\DGNs\stds39.dgn

ZONE 3 WITH ICE 80 M.P.H. WIND

TRUSS DETAILS

5/8" Dia. H.S. Bolts — Spans 40' Thru 95'

SPAN	40'	45'	50'	55'	60'	65'	70'	75'
W x D = WIDTH x DEPTH	4.0 x 4.0	4.0 x 4.0	4.0 x 4.0	4.0 x 4.0	4.0 x 4.0	4.0 x 4.0	4.5 x 4.5	4.5 x 4.5
CHORD -②, Unless Otherwise Shown	L 3 x 3 x 3/16 ③ [3]	L 3 x 3 x 3/16 ③ [3]	L 3 x 3 x 1/4 ③ [4]	L 3 x 3 x 1/4 ③ [4]	L 3 x 3 x 1/4 [6]	L 3 x 3 x 5/16 [7]	L 3 x 3 x 5/16 [7]	L 3 1/2 x 3 1/2 x 5/16 [9]
DEAD LOAD DIAGONAL -③	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [3]
WIND LOAD DIAGONAL -③	L 2 1/2 x 2 1/2 x 3/16 [2]	L 2 1/2 x 2 1/2 x 3/16 [2]	L 2 1/2 x 2 1/2 x 3/16 [2]	L 3 x 3 x 3/16 [2]	L 3 x 3 x 3/16 [2]	L 3 x 3 x 3/16 [2]	L 3 x 3 x 3/16 [2]	L 3 x 3 x 3/16 [3]
DEAD LOAD VERTICAL -③	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 1/2 x 2 1/2 x 3/16 [2]	L 2 1/2 x 2 1/2 x 3/16 [2]
WIND LOAD STRUT - ③	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]
TOTAL DEFL. & TRUSS D.L.	DEFL=0.14" L=38 lb/ft	DEFL=0.21" L=38 lb/ft	DEFL=0.25" L=43 lb/ft	DEFL=0.36" L=45 lb/ft	DEFL=0.50" L=45 lb/ft	DEFL=0.58" L=50 lb/ft	DEFL=0.63" L=53 lb/ft	DEFL=0.73" L=58 lb/ft

TOWER DETAILS

S = COLUMN SPACING	6.0'	6.0'	6.0'	6.0'	6.0'	6.5'	6.5'	6.5'
TOWER HEIGHT								
15'	W 10 x 15 (18.0)	W 10 x 15 (20.1)	W 10 x 15 (22.1)	W 10 x 15 (24.2)	W 10 x 15 (26.2)	W 10 x 17 (25.8)	W 10 x 17 (27.9)	W 10 x 22 (29.8)
16'	W 10 x 15 (19.3)	W 10 x 15 (21.5)	W 10 x 15 (23.7)	W 10 x 15 (25.9)	W 10 x 15 (28.1)	W 10 x 17 (27.6)	W 10 x 22 (29.9)	W 10 x 22 (31.9)
17'	W 10 x 15 (20.6)	W 10 x 15 (23.0)	W 10 x 15 (25.3)	W 10 x 17 (27.6)	W 10 x 17 (29.9)	W 10 x 22 (29.4)	W 10 x 22 (31.8)	W 10 x 22 (34.0)
18'	W 10 x 15 (21.9)	W 10 x 15 (24.4)	W 10 x 17 (26.9)	W 10 x 17 (29.3)	W 10 x 17 (31.8)	W 10 x 22 (31.3)	W 10 x 22 (33.8)	W 10 x 22 (36.1)
19'	W 10 x 15 (23.3)	W 10 x 17 (25.9)	W 10 x 17 (28.5)	W 10 x 22 (31.1)	W 10 x 22 (33.7)	W 10 x 22 (33.1)	W 10 x 22 (35.7)	W 10 x 22 (38.2)
20'	W 10 x 15 (24.6)	W 10 x 17 (27.4)	W 10 x 17 (30.1)	W 10 x 22 (32.8)	W 10 x 22 (35.5)	W 10 x 22 (35.0)	W 10 x 22 (37.7)	W 10 x 22 (40.3)
21'	W 10 x 17 (25.9)	W 10 x 17 (28.9)	W 10 x 22 (31.7)	W 10 x 22 (34.6)	W 10 x 22 (37.1)	W 10 x 22 (36.9)	W 10 x 26 (39.7)	W 10 x 26 (42.5)
22'	W 10 x 17 (27.3)	W 10 x 17 (30.4)	W 10 x 22 (33.3)	W 10 x 22 (36.4)	W 10 x 22 (39.0)	W 10 x 22 (38.7)	W 10 x 26 (41.8)	W 10 x 26 (44.6)
23'	W 10 x 22 (28.7)	W 10 x 22 (31.9)	W 10 x 22 (35.0)	W 10 x 22 (38.4)	W 10 x 26 (41.3)	W 10 x 26 (40.6)	W 10 x 26 (43.8)	W 12 x 26 (47.1)
24'	W 10 x 22 (30.1)	W 10 x 22 (33.4)	W 10 x 22 (36.6)	W 10 x 22 (39.9)	W 10 x 26 (43.2)	W 10 x 26 (42.5)	W 10 x 26 (45.8)	W 12 x 26 (49.3)
25'	W 10 x 22 (31.4)	W 10 x 22 (34.9)	W 10 x 22 (38.3)	W 10 x 26 (41.7)	W 10 x 26 (44.6)	W 10 x 26 (44.5)	W 12 x 26 (48.3)	W 12 x 26 (51.5)
26'	W 10 x 22 (32.9)	W 10 x 22 (36.5)	W 10 x 26 (40.0)	W 10 x 26 (43.5)	W 10 x 26 (46.6)	W 12 x 26 (46.4)	W 12 x 26 (50.4)	W 12 x 26 (53.7)
27'	W 10 x 22 (33.7)	W 10 x 26 (38.0)	W 10 x 26 (41.8)	W 10 x 26 (45.4)	W 12 x 26 (49.6)	W 12 x 26 (48.8)	W 12 x 26 (52.5)	W 12 x 26 (56.0)
28'	W 10 x 22 (35.1)	W 10 x 26 (39.6)	W 10 x 26 (43.4)	W 12 x 26 (47.2)	W 12 x 26 (51.6)	W 12 x 26 (50.8)	W 12 x 26 (54.6)	W 14 x 30 (58.2)
29'	W 10 x 26 (37.1)	W 10 x 26 (41.6)	W 12 x 26 (45.7)	W 12 x 26 (50.0)	W 12 x 26 (53.6)	W 12 x 26 (52.7)	W 12 x 26 (56.7)	W 14 x 30 (61.5)
30'	W 10 x 26 (38.6)	W 10 x 26 (42.8)	W 12 x 26 (47.4)	W 12 x 26 (51.6)	W 12 x 26 (55.6)	W 12 x 26 (54.7)	W 12 x 26 (58.8)	W 14 x 30 (63.8)

COLUMN SIZE & UPLIFT (kips)

Tower Height = (HL + HR)/2

ZONE 3 WITH ICE 80 M.P.H. WIND

TRUSS DETAILS

5/8" Dia. H.S. Bolts — Spans 40' Thru 95'

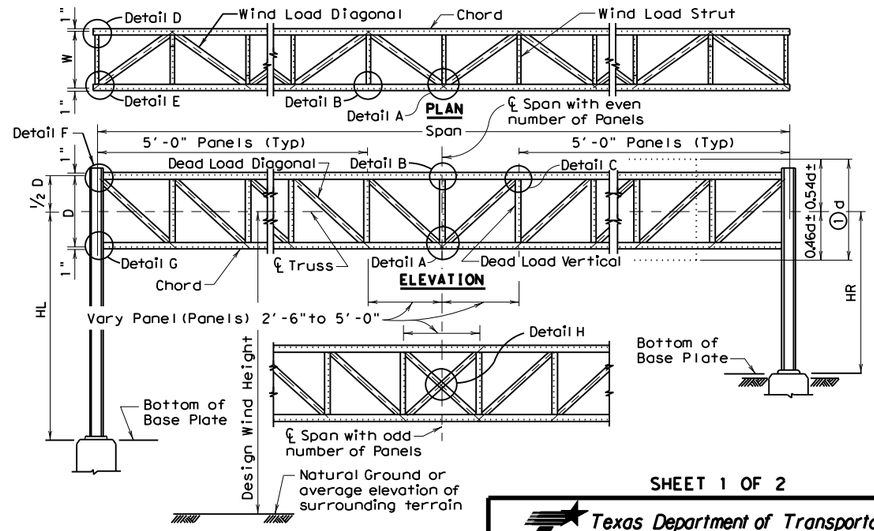
SPAN	80'	85'	90'	95'
W x D = WIDTH x DEPTH	4.5 x 4.5	4.5 x 4.5	4.5 x 4.5	4.5 x 4.5
CHORD -②, Unless Otherwise Shown	L 3 1/2 x 3 1/2 x 5/16 [9]	L 3 1/2 x 3 1/2 x 5/16 [9]	L 3 1/2 x 3 1/2 x 3/8 [10]	L 3 1/2 x 3 1/2 x 3/8 [11]
DEAD LOAD DIAGONAL -③	L 2 1/2 x 2 1/2 x 3/16 [3]	L 2 1/2 x 2 1/2 x 3/16 [3]	L 2 1/2 x 2 1/2 x 3/16 [3]	L 2 1/2 x 2 1/2 x 3/16 [3]
WIND LOAD DIAGONAL -③	L 3 x 3 x 1/4 [3]	L 3 x 3 x 1/4 [3]	L 3 x 3 x 1/4 [3]	L 3 x 3 x 1/4 [3]
DEAD LOAD VERTICAL -③	L 2 1/2 x 2 1/2 x 3/16 [2]	L 2 1/2 x 2 1/2 x 3/16 [2]	L 3 x 2 x 3/16 [2]	L 3 x 2 x 3/16 [2]
WIND LOAD STRUT - ③	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]
TOTAL DEFL. & TRUSS D.L.	DEFL=0.95" L=62 lb/ft	DEFL=1.18" L=63 lb/ft	DEFL=1.30" L=69 lb/ft	DEFL=1.59" L=69 lb/ft

TOWER DETAILS

S = COLUMN SPACING	6.5'	6.5'	6.5'	6.5'
TOWER HEIGHT				
15'	W 10 x 22 (31.7)	W 10 x 22 (33.6)	W 10 x 22 (35.5)	W 10 x 22 (37.5)
16'	W 10 x 22 (33.9)	W 10 x 22 (36.0)	W 10 x 22 (38.0)	W 10 x 22 (40.1)
17'	W 10 x 22 (36.1)	W 10 x 22 (38.3)	W 10 x 22 (40.5)	W 10 x 26 (42.8)
18'	W 10 x 22 (38.4)	W 10 x 22 (40.7)	W 10 x 26 (43.0)	W 10 x 26 (45.4)
19'	W 10 x 26 (40.6)	W 10 x 26 (43.1)	W 10 x 26 (45.8)	W 10 x 26 (47.8)
20'	W 10 x 26 (42.9)	W 10 x 26 (45.5)	W 10 x 26 (48.4)	W 10 x 26 (50.4)
21'	W 10 x 26 (45.1)	W 12 x 26 (48.2)	W 12 x 26 (50.9)	W 12 x 26 (53.7)
22'	W 10 x 26 (47.4)	W 12 x 26 (50.6)	W 12 x 26 (53.5)	W 12 x 26 (56.4)
23'	W 12 x 26 (50.0)	W 12 x 26 (52.7)	W 12 x 26 (56.1)	W 12 x 26 (59.7)
24'	W 12 x 26 (52.4)	W 12 x 26 (55.2)	W 12 x 26 (58.7)	W 12 x 26 (61.8)
25'	W 12 x 26 (54.7)	W 12 x 26 (58.0)	W 14 x 30 (62.1)	W 14 x 30 (65.4)
26'	W 12 x 26 (57.1)	W 14 x 30 (60.5)	W 14 x 30 (64.7)	W 14 x 30 (68.2)
27'	W 14 x 30 (60.3)	W 14 x 30 (63.9)	W 14 x 30 (67.4)	W 14 x 34 (71.0)
28'	W 14 x 30 (62.8)	W 14 x 30 (66.5)	W 14 x 30 (70.1)	W 14 x 34 (73.8)
29'	W 14 x 30 (65.2)	W 14 x 30 (69.0)	W 14 x 34 (72.9)	W 14 x 34 (76.7)
30'	W 14 x 30 (67.8)	W 14 x 34 (71.6)	W 14 x 34 (75.8)	W 14 x 34 (79.5)

COLUMN SIZE & UPLIFT (kips)

Tower Height = (HL + HR)/2



① d = Sign Depth
Where signs of different depths are used, the bottom edges of all signs may be placed in line. Where this is done, all signs should be so positioned that the bottom edges are approximately 0.46 of the depth of the deepest sign below the ℄ of the truss.

② "Low-Alloy Steel" for non-bridge structures per Item 442, "Metal For Structures".

③ "Carbon Steel" for non-bridge structures per Item 442, "Metal For Structures".

SHEET 1 OF 2

Texas Department of Transportation
Traffic Operations Division

OVERHEAD SIGN BRIDGE DETAILS

OSB-Z31

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS	CONT	SECT	JOB	HIGHWAY
8/08 # of HS bolts; angle sizes	0915	00	238	VARIOUS
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		273

DATE: 2/25/2022 10:22:17 AM
FILE: T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\OSB\Standards\DGNs\stds39.dgn

ZONE 3 WITH ICE 80 M.P.H. WIND

TRUSS DETAILS

" Dia. H.S. Bolts — Spans 96' Thru 155'

SPAN	100'	105'	110'	115'	120'	125'	130'	135'
W x D = WIDTH x DEPTH	4.5 x 4.5	4.5 x 4.5	4.5 x 4.5	4.5 x 4.5	5.0 x 5.0	5.0 x 5.0	5.0 x 5.0	5.0 x 5.0
CHORD -②, Unless Otherwise Shown	L 4 x 4 x 3/8 [9]	L 4 x 4 x 3/8 [10]	L 4 x 4 x 7/16 [11]	L 4 x 4 x 1/2 [12]	L 4 x 4 x 1/2 [12]	L 4 x 4 x 1/2 [13]	L 5 x 5 x 7/16 [14]	L 5 x 5 x 7/16 [15]
DEAD LOAD DIAGONAL -③	L 3 x 3 x 3/16 [2]	L 3 x 3 x 3/16 [3]	L 3 x 3 x 3/16 [3]	L 3 x 2 1/2 x 1/4 [3]	L 3 x 2 1/2 x 1/4 [3]	L 3 x 3 x 1/4 [3]	L 3 x 3 x 1/4 [3]	L 3 x 3 x 1/4 [3]
WIND LOAD DIAGONAL -③	L 3 x 3 x 1/4 [2]	L 3 x 3 x 1/4 [3]	L 3 x 3 x 1/4 [3]	L 3 x 3 x 1/4 [3]	L 3 1/2 x 3 1/2 x 1/4 [3]	L 3 1/2 x 3 1/2 x 1/4 [3]	L 3 1/2 x 3 1/2 x 1/4 [3]	L 3 1/2 x 3 1/2 x 1/4 [3]
DEAD LOAD VERTICAL -③	L 3 x 2 x 3/16 [2]	L 3 x 2 x 3/16 [2]	L 3 x 2 x 3/16 [2]	L 3 x 2 1/2 x 3/16 [2]	L 3 x 2 1/2 x 3/16 [2]	L 3 x 2 1/2 x 3/16 [2]	L 3 x 2 1/2 x 3/16 [2]	L 3 x 3 x 3/16 [2]
WIND LOAD STRUT - ③	L 2 1/2 x 2 1/2 x 3/16 [1]	L 2 1/2 x 2 1/2 x 3/16 [1]	L 2 1/2 x 2 1/2 x 3/16 [1]	L 2 1/2 x 2 1/2 x 3/16 [1]	L 2 1/2 x 2 1/2 x 3/16 [1]	L 2 1/2 x 2 1/2 x 3/16 [1]	L 2 1/2 x 2 1/2 x 3/16 [1]	L 2 1/2 x 2 1/2 x 3/16 [1]
TOTAL DEFL. & TRUSS D.L.	DEFL=1.77" L=78 lb/ft	DEFL=2.13" L=78 lb/ft	DEFL=2.31" L=84 lb/ft	DEFL=2.53" L=93 lb/ft	DEFL=2.53" L=98 lb/ft	DEFL=2.96" L=100 lb/ft	DEFL=3.22" L=107 lb/ft	DEFL=3.72" L=108 lb/ft

TOWER DETAILS

COLUMN SIZE & UPLIFT (kips)

S = COLUMN SPACING	7.0'	7.0'	7.0'	7.0'	7.5'	7.5'	7.5'	7.5'
TOWER HEIGHT								
15'	W 10 x 22 (36.0)	W 10 x 26 (37.8)	W 10 x 26 (39.5)	W 10 x 26 (41.1)	W 12 x 26 (39.9)	W 12 x 26 (41.5)	W 12 x 26 (43.1)	W 12 x 26 (44.7)
16'	W 10 x 22 (38.6)	W 10 x 26 (40.5)	W 10 x 26 (42.3)	W 10 x 26 (44.0)	W 12 x 26 (42.7)	W 12 x 26 (44.5)	W 12 x 26 (46.2)	W 12 x 26 (48.0)
17'	W 10 x 26 (40.9)	W 10 x 26 (43.2)	W 10 x 26 (45.1)	W 12 x 26 (47.1)	W 12 x 26 (45.6)	W 12 x 26 (47.4)	W 12 x 26 (49.3)	W 12 x 26 (51.2)
18'	W 10 x 26 (43.5)	W 10 x 26 (45.9)	W 12 x 26 (47.9)	W 12 x 26 (50.1)	W 12 x 26 (48.5)	W 12 x 26 (50.4)	W 12 x 26 (52.4)	W 12 x 26 (54.4)
19'	W 12 x 26 (46.5)	W 12 x 26 (48.8)	W 12 x 26 (51.0)	W 12 x 26 (53.1)	W 12 x 26 (51.4)	W 12 x 26 (53.4)	W 14 x 30 (56.0)	W 14 x 30 (58.1)
20'	W 12 x 26 (49.1)	W 12 x 26 (51.5)	W 12 x 26 (53.8)	W 12 x 26 (56.0)	W 12 x 26 (54.3)	W 14 x 30 (56.9)	W 14 x 30 (59.2)	W 14 x 30 (61.4)
21'	W 12 x 26 (51.7)	W 12 x 26 (54.3)	W 12 x 26 (56.7)	W 14 x 30 (59.6)	W 14 x 30 (57.7)	W 14 x 30 (60.0)	W 14 x 30 (62.3)	W 14 x 30 (64.7)
22'	W 12 x 26 (54.3)	W 12 x 26 (57.0)	W 14 x 30 (59.6)	W 14 x 30 (62.6)	W 14 x 30 (60.7)	W 14 x 30 (63.1)	W 14 x 30 (65.5)	W 14 x 34 (68.0)
23'	W 14 x 30 (57.7)	W 14 x 30 (60.4)	W 14 x 30 (63.1)	W 14 x 30 (65.7)	W 14 x 30 (63.7)	W 14 x 34 (66.2)	W 14 x 34 (68.8)	W 14 x 34 (71.3)
24'	W 14 x 30 (60.4)	W 14 x 30 (63.3)	W 14 x 30 (66.0)	W 14 x 30 (67.8)	W 14 x 30 (66.6)	W 14 x 34 (69.3)	W 14 x 34 (72.0)	W 14 x 34 (74.7)
25'	W 14 x 30 (63.1)	W 14 x 30 (66.3)	W 14 x 34 (69.8)	W 14 x 34 (71.8)	W 14 x 34 (69.6)	W 14 x 34 (72.4)	W 16 x 36 (76.0)	W 16 x 36 (78.8)
26'	W 14 x 30 (65.8)	W 14 x 30 (68.9)	W 14 x 34 (72.8)	W 14 x 34 (74.9)	W 14 x 34 (72.6)	W 14 x 34 (75.5)	W 16 x 36 (79.3)	W 16 x 36 (82.2)
27'	W 14 x 34 (68.6)	W 14 x 34 (72.0)	W 14 x 34 (74.9)	W 16 x 36 (78.9)	W 16 x 36 (76.5)	W 16 x 36 (79.5)	W 16 x 36 (82.6)	W 16 x 40 (85.6)
28'	W 14 x 34 (71.3)	W 14 x 34 (74.7)	W 14 x 34 (77.9)	W 16 x 36 (82.1)	W 16 x 36 (79.6)	W 16 x 36 (82.7)	W 16 x 36 (85.9)	W 16 x 40 (89.1)
29'	W 14 x 34 (74.1)	W 16 x 36 (78.6)	W 16 x 36 (82.0)	W 16 x 36 (85.3)	W 16 x 36 (82.7)	W 16 x 40 (85.9)	W 16 x 40 (89.2)	W 16 x 40 (92.5)
30'	W 14 x 34 (76.9)	W 16 x 36 (81.5)	W 16 x 36 (85.0)	W 16 x 36 (88.5)	W 16 x 40 (85.8)	W 16 x 40 (89.1)	W 16 x 40 (92.6)	W 16 x 40 (96.0)

Tower Height = (HL + HR)/2

ZONE 3 WITH ICE 80 M.P.H. WIND

TRUSS DETAILS

" Dia. H.S. Bolts — Spans 96' Thru 155'

SPAN	140'	145'	150'	155'
W x D = WIDTH x DEPTH	5.0 x 5.0	5.0 x 5.0	5.0 x 5.0	5.0 x 5.0
CHORD -②, Unless Otherwise Shown	L 5 x 5 x 1/2 [17]	L 5 x 5 x 1/2 [18]	L 6 x 6 x 1/2 [20]	L 6 x 6 x 1/2 [21]
DEAD LOAD DIAGONAL -③	L 3 x 3 x 1/4 [3]	L 3 1/2 x 3 1/2 x 1/4 [3]	L 3 1/2 x 3 1/2 x 1/4 [4]	L 3 1/2 x 3 1/2 x 1/4 [4]
WIND LOAD DIAGONAL -③	L 3 1/2 x 3 1/2 x 1/4 [3]	L 3 1/2 x 3 1/2 x 1/4 [3]	L 3 1/2 x 3 1/2 x 1/4 [3]	L 3 1/2 x 3 1/2 x 1/4 [3]
DEAD LOAD VERTICAL -③	L 3 x 2 1/2 x 1/4 [3]	L 3 x 2 1/2 x 1/4 [3]	L 3 x 2 1/2 x 1/4 [3]	L 3 x 2 1/2 x 1/4 [3]
WIND LOAD STRUT - ③	L 2 1/2 x 2 1/2 x 3/16 [1]	L 2 1/2 x 2 1/2 x 3/16 [1]	L 2 1/2 x 2 1/2 x 3/16 [1]	L 2 1/2 x 2 1/2 x 3/16 [1]
TOTAL DEFL. & TRUSS D.L.	DEFL=3.98" L=117 lb/ft	DEFL=4.55" L=120 lb/ft	DEFL=4.66" L=135 lb/ft	DEFL=5.29" L=135 lb/ft

TOWER DETAILS

COLUMN SIZE & UPLIFT (kips)

S = COLUMN SPACING	7.5'	7.5'	7.5'	7.5'
TOWER HEIGHT				
15'	W 12 x 26 (46.1)	W 12 x 26 (47.9)	W 12 x 26 (49.3)	W 12 x 26 (51.1)
16'	W 12 x 26 (49.4)	W 12 x 26 (51.3)	W 12 x 26 (52.9)	W 12 x 26 (54.7)
17'	W 12 x 26 (52.7)	W 14 x 30 (55.2)	W 14 x 30 (56.9)	W 14 x 30 (58.8)
18'	W 14 x 30 (56.1)	W 14 x 30 (58.7)	W 14 x 30 (60.5)	W 14 x 30 (62.6)
19'	W 14 x 30 (59.9)	W 14 x 30 (62.2)	W 14 x 30 (64.2)	W 14 x 34 (66.4)
20'	W 14 x 30 (63.3)	W 14 x 30 (65.8)	W 14 x 34 (67.9)	W 14 x 34 (70.2)
21'	W 14 x 34 (66.7)	W 14 x 34 (69.3)	W 14 x 34 (71.5)	W 16 x 36 (74.0)
22'	W 14 x 34 (70.2)	W 14 x 34 (72.9)	W 14 x 34 (75.2)	W 16 x 36 (77.9)
23'	W 14 x 34 (73.6)	W 16 x 36 (77.1)	W 16 x 36 (79.6)	W 16 x 36 (81.7)
24'	W 16 x 36 (77.1)	W 16 x 36 (80.7)	W 16 x 36 (83.4)	W 16 x 36 (85.6)
25'	W 16 x 36 (81.3)	W 16 x 36 (84.4)	W 16 x 40 (87.2)	W 16 x 40 (90.2)
26'	W 16 x 36 (84.8)	W 16 x 40 (88.0)	W 16 x 40 (91.0)	W 16 x 40 (94.1)
27'	W 16 x 40 (88.4)	W 16 x 40 (91.7)	W 16 x 40 (94.8)	W 18 x 46 (98.9)
28'	W 16 x 40 (91.9)	W 16 x 40 (95.4)	W 18 x 46 (98.6)	W 18 x 46 (102.9)
29'	W 18 x 46 (97.9)	W 18 x 46 (100.1)	W 18 x 46 (103.4)	W 18 x 46 (106.9)
30'	W 18 x 46 (101.6)	W 18 x 46 (103.9)	W 18 x 46 (107.3)	W 18 x 46 (110.9)

Tower Height = (HL + HR)/2

KEY TO TRUSS AND TOWER DETAILS

Truss members are all angles.
Truss columns are all wide flange shapes.

W 10 x 26 (44.2) ← 44.2 kips Uplift at base plate
- 26 Pounds per foot.
- 10" Nominal size
- Wide Flange

DEFL = 0.12" = inches Deflection due to dead load of truss, walkway, signs and lights.
DL = 42 lb/ft = pounds per foot dead load of truss members only; does not include walkway, signs, and lights.

NOTE: Details on these sheets are for Design Wind Heights up to 30 feet.

GENERAL NOTES

Design conforms to AASHTO 1994 Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Revisions thereto.

For overhead sign bridges with different tower heights, average the height of the two towers and use the tabulated height nearest the calculated average. For average heights falling midway between the two tabulated heights use the larger height.

For truss lengths falling between those shown in the tables use the sizes called for in the next longer span.

Overhead sign bridges are designed for the equivalent area of a 10 foot deep sign panel over 75 percent of the span length, located as necessary to produce maximum stress. Design includes 3 pounds per square foot for sign panel, 20 pounds per linear foot for lights, and 50 pounds per linear foot for walkway, all placed as specified for the design sign panel.

Refer to "Overhead Sign Bridge Truss Details" for details called out in plan and elevation views.

The number of High Strength Bolts required in truss connection or splice are indicated in brackets, e.g. [3], after the member size.

SHEET 2 OF 2

Texas Department of Transportation
Traffic Operations Division

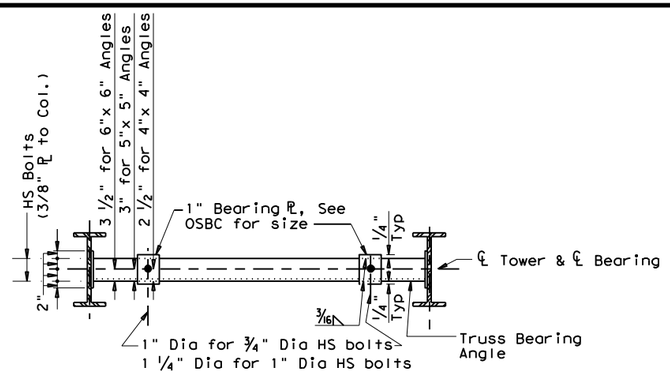
OVERHEAD SIGN BRIDGE DETAILS

OSB-Z31

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS	CONT	SECT	JOB	HIGHWAY
8/08 add missing HS bolt dia (select spans); applicability note; noted design specifications	0915	00	238	VARIOUS
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		274

DATE: 2/25/2022 10:22:22 AM
FILE: T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\OSB\Standards\DGNs\stds45.dgn



PLAN AT TRUSS BEARING ANGLE

COLUMN SPA. "S"	TRUSS BEARING ANGLE	HS BOLTS (DIA)
6'-0"	L 4 x 4 x 5/16	5/8"
6'-6"	L 5 x 5 x 3/8	5/8"
7'-0"	L 5 x 5 x 1/2	3/4"
7'-6" to 8'-6"	L 6 x 6 x 5/8	3/4"
9'-0"	L 6 x 6 x 3/4	3/4"
9'-6"	L 6 x 6 x 7/8	3/4"

② Nominal Dia. x 1 ½" slots in plate. (Top ℄ only) Use washer on plate side of HS bolt. (See table above for size of bolts.)

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals and Interim revisions thereto for design heights up to 50 feet.

For size and spacing of columns see sheets, "Overhead Sign Bridge Details."

At contractor's option tower bracing connections may be high strength (HS) bolted or welded. If welded connections are used, length of connection shall be taken from the table shown on sheet, "Overhead Sign Bridge Truss Details-OSBC."

All connection bolts shall conform to ASTM A325 Type 1. Washers shall conform to ASTM F436. Bolts, nuts and washers shall be galvanized per Item 445, "Galvanizing".

All structural steel shall conform to ASTM A36 except where noted. Structural steel shall be galvanized after fabrication per Item 445, "Galvanizing".

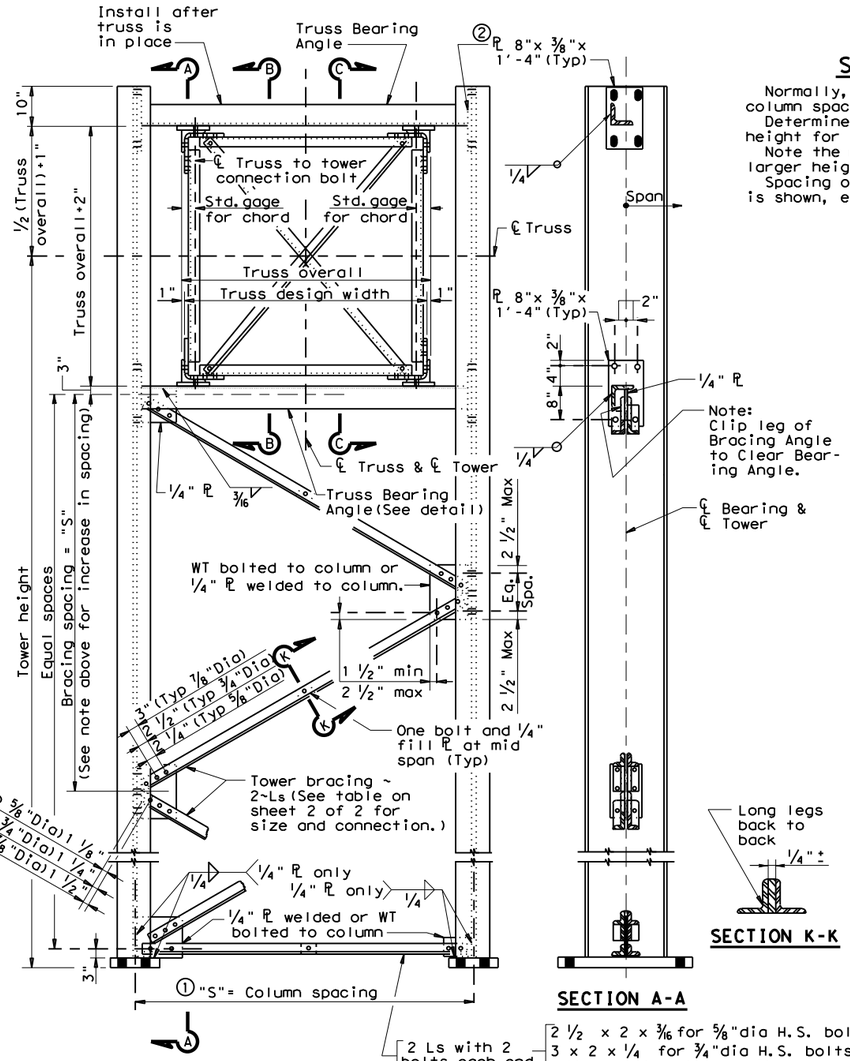
Anchor bolts and nuts for anchor bolts shall be "Alloy steel" per Item 449, "Anchor Bolts".

Anchor bolts shall be rigidly held in position during concrete placement by using steel templates at the top and bottom. The bottom template and anchor plate assembly shall remain in place and shall not be damaged during concrete placement. The top template shall be removed after concrete has set.

Exposed nuts and washers shall be galvanized in accordance with Item 449, "Galvanizing". Embedded nuts and top and bottom templates need not be galvanized.

Lubricate and tighten the anchor bolts when erecting the structure per Item 449, "Anchor Bolts". After the structure has been aligned in its final position and the anchor bolts have been properly tightened, tack weld anchor bolt nuts to washers, and tack weld washers to base plates. Galvanizing in tack welded areas shall be repaired per Item 445, "Galvanizing".

Concrete shall be Class "C".



TRUSS DETAILS

① For column spacing see standard drawing, "Overhead Sign Bridge Details"

SPECIAL NOTE FOR TOWER BRACING

Normally, the maximum spacing for tower bracing is the same as column spacing; However, this spacing may be increased as follows:

Determine required column size and spacing to satisfy height for the wind zone and truss span being used. Height=$(H_L + H_R)/2$.

Note the number of times this column size is shown for larger heights for the same span and wind zone.

Spacing of bracing may be increased 1'-0" for each time height is shown, except the increase shall not exceed 5'-0".

TRUSS-TO-TOWER CONNECTION DETAILS

SHEET 1 OF 2

Texas Department of Transportation
Traffic Operations Division

OVERHEAD SIGN BRIDGE TOWER DETAILS

OSBT

REVISIONS

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS
DIST	COUNTY		SHEET NO.
SAT	BEXAR		275

DATE: 2/25/2022 10:22:23 AM
FILE: T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\OSB\Standards\DGNs\stds45.dgn

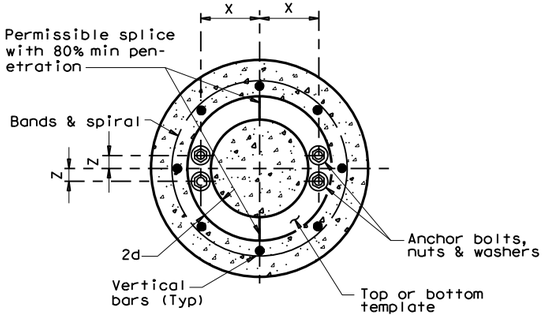
BRACING FOR 9'-0" TO 9'-6" COLUMN SPACING				
SIZE DOUBLE ANGLES	BOLTS REQUIRED			
	BRACING		WT to W	
	¾"	⅞"	¾"	⅞"
2 Ls 4 x 4 x 5/16	6	4	10	8
2 Ls 4 x 4 x 5/16	6	4	10	8
2 Ls 4 x 4 x 5/16	6	4	10	8
2 Ls 4 x 4 x 5/16	6	4	10	8
2 Ls 4 x 3 ½ x 5/16	5	4	10	8
2 Ls 4 x 3 ½ x 5/16	5	4	10	8
2 Ls 4 x 3 ½ x 5/16	5	4	10	8
2 Ls 4 x 3 x 5/16	5	4	10	8
2 Ls 4 x 3 x 5/16	5	4	10	8
2 Ls 4 x 3 x 5/16	5	4	10	8

BRACING FOR 8'-0" TO 8'-6" COLUMN SPACING.				
SIZE DOUBLE ANGLES	BOLTS REQUIRED			
	BRACING		WT to W	
	¾"	⅞"	¾"	⅞"
2 Ls 4 x 3 x 5/16	5	4	10	8
2 Ls 4 x 3 x 5/16	5	4	10	8
2 Ls 4 x 3 x 5/16	5	4	10	8
2 Ls 4 x 3 x 5/16	5	4	10	8
2 Ls 3 ½ x 3 x 5/16	5	4	8	6
2 Ls 3 ½ x 3 x 5/16	5	4	8	6
2 Ls 3 ½ x 3 x 5/16	5	4	8	6
2 Ls 4 x 3 x ¼	4	3	8	6
2 Ls 4 x 3 x ¼	4	3	8	6
2 Ls 4 x 3 x ¼	4	3	8	6
2 Ls 3 ½ x 3 x ¼	4	3	8	6
2 Ls 3 ½ x 3 x ¼	4	3	8	6

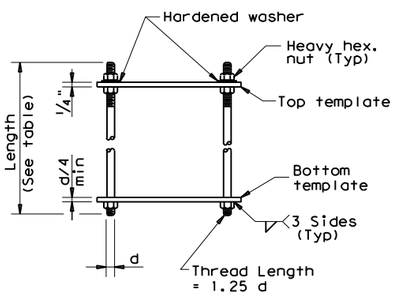
BRACING FOR 7'-0" TO 7'-6" COLUMN SPACING.						
SIZE DOUBLE ANGLES	BOLTS REQUIRED					
	BRACING			WT to W		
	5/8"	¾"	⅞"	5/8"	¾"	⅞"
2 Ls 4 x 3 x 5/16	7	5	4	12	10	8
2 Ls 4 x 3 x 5/16	7	5	4	12	10	8
2 Ls 3 ½ x 3 x 5/16	6	5	4	12	8	6
2 Ls 3 ½ x 3 x ¼	6	4	3	10	8	6
2 Ls 3 ½ x 3 x ¼	6	4	3	10	8	6
2 Ls 3 ½ x 3 x ¼	6	4	3	10	8	6
2 Ls 3 ½ x 3 x ¼	6	4	3	10	8	6
2 Ls 3 ½ x 3 x ¼	5	4	3	10	6	4
2 Ls 3 ½ x 2 ½ x ¼	5	4	3	8	6	4
2 Ls 3 ½ x 2 ½ x ¼	4	3	~	8	6	4
2 Ls 3 x 2 ½ x ¼	4	3	~	8	6	4
2 Ls 3 x 2 ½ x ¼	4	3	~	8	6	4
2 Ls 3 x 2 ½ x ¼	3	2	~	6	4	4
2 Ls 3 x 3 x 3/16	2	2	~	4	4	4
2 Ls 3 x 3 x 3/16	2	2	~	4	4	4
2 Ls 2 ½ x 2 ½ x 3/16	2	~	~	4	4	4
2 Ls 2 ½ x 2 x 3/16	2	~	~	4	4	4

BRACING FOR 6'-0" TO 6'-6" COLUMN SPACING.				
SIZE DOUBLE ANGLES	BOLTS REQUIRED			
	BRACING		WT to W	
	5/8"	¾"	5/8"	¾"
2 Ls 3 x 3 x ¼	4	3	8	6
2 Ls 3 x 3 x ¼	4	3	8	6
2 Ls 3 x 2 ½ x ¼	4	3	8	6
2 Ls 3 x 2 ½ x ¼	4	3	6	4
2 Ls 3 x 2 ½ x ¼	4	3	6	4
2 Ls 3 x 2 ½ x ¼	4	3	6	4
2 Ls 3 x 2 ½ x ¼	4	3	6	4
2 Ls 2 ½ x 2 ½ x 3/16	3	~	4	4
2 Ls 2 ½ x 2 x 3/16	2	~	4	4
2 Ls 2 ½ x 2 x 3/16	2	~	4	4
2 Ls 2 ½ x 2 x 3/16	2	~	4	4
2 Ls 2 ½ x 2 x 3/16	2	~	4	4
2 Ls 2 ½ x 2 x 3/16	2	~	4	4

"X"	"Y"	"Z"	BASE PLATE SIZE L x W x T	ANCHOR BOLT SIZE DIA. x LENGTH	FOUNDATION DATA DIA. DRILL SHAFT/W REINF.	COLUMN SIZE
15 ¼"	5"	4"	18"x 3 ¼"x 3'-4 ½"	2 ¾"x 5'-8"	48" Dr Shaft with 18~#11	W24 x 117
15 ¼"	5"	4"	18"x 3 ⅛"x 3'-4 ½"	2 ¾"x 5'-8"	48" Dr Shaft with 18~#11	W24 x 104
15 ¼"	5"	4"	18"x 3"x 3'-4 ½"	2 ¾"x 5'-8"	48" Dr Shaft with 18~#11	W24 x 94
15"	4 ½"	3 ¾"	16 ½"x 3"x 3'-3"	2 ½"x 5'-2"	48" Dr Shaft with 14~#11	W24 x 84
14 ¾"	4 ½"	3 ¾"	16 ½"x 2 ¾"x 3'-2 ½"	2 ½"x 5'-2"	48" Dr Shaft with 14~#11	W24 x 76
14 ¾"	4 ½"	3 ¾"	16 ½"x 2 ¾"x 3'-2 ½"	2 ½"x 5'-2"	48" Dr Shaft with 14~#11	W24 x 68
13 ½"	4 ½"	3 ¾"	16 ½"x 2 ¾"x 3'-0"	2 ½"x 5'-2"	42" Dr Shaft with 12~#11	W21 x 68
13 ½"	4 ½"	3 ¾"	16 ½"x 2 ½"x 3'-0"	2 ½"x 5'-2"	42" Dr Shaft with 12~#11	W21 x 62
13"	4"	3 ½"	15"x 2 ½"x 2'-10"	2 ¼"x 4'-9"	42" Dr Shaft with 10~#11	W21 x 57
11 ¾"	4"	3 ½"	15"x 2 ½"x 2'-7 ½"	2 ¼"x 4'-9"	42" Dr Shaft with 10~#11	W18 x 55
11 ¾"	4"	3 ½"	15"x 2 ½"x 2'-7 ½"	2 ¼"x 4'-9"	42" Dr Shaft with 10~#11	W18 x 50
11 ½"	3 ½"	3"	13"x 2 ½"x 2'-6"	2"x 4'-3"	42" Dr Shaft with 8~#10	W18 x 46
10 ½"	3 ½"	3"	13"x 2 ¼"x 2'-4"	2"x 4'-3"	36" Dr Shaft with 8~#10	W16 x 40
10 ¼"	3"	2 ¾"	11 ½"x 2 ¼"x 2'-2 ½"	1 ¾"x 3'-10"	36" Dr Shaft with 8~#9	W16 x 36
9 ½"	3"	2 ¾"	11 ½"x 2 ¼"x 2'-1"	1 ¾"x 3'-10"	36" Dr Shaft with 8~#9	W14 x 34
9 ¼"	3"	2 ⅜"	11 ½"x 2"x 2'-0 ½"	1 ¾"x 3'-10"	36" Dr Shaft with 8~#9	W14 x 30
8"	2 ¾"	2 ⅛"	9 ¾"x 1 ¾"x 1'-9 ½"	1 ½"x 3'-4"	30" Dr Shaft with 8~#8	W12 x 26
7"	2 ½"	2"	9"x 1 ¾"x 1'-7"	1 ⅜"x 3'-1"	30" Dr Shaft with 8~#8	W10 x 26
6 ¾"	2 ¼"	1 ⅞"	8 ¼"x 1 ½"x 1'-6"	1 ¼"x 2'-11"	30" Dr Shaft with 8~#8	W10 x 22
6 ¾"	2"	1 ⅝"	7 ¼"x 1 ⅜"x 1'-5 ½"	1 ⅛"x 2'-8"	24" Dr Shaft with 8~#7	W10 x 17
6 ½"	1 ¾"	1 ½"	6 ½"x 1 ¼"x 1'-4 ½"	1"x 2'-5"	24" Dr Shaft with 8~#7	W10 x 15

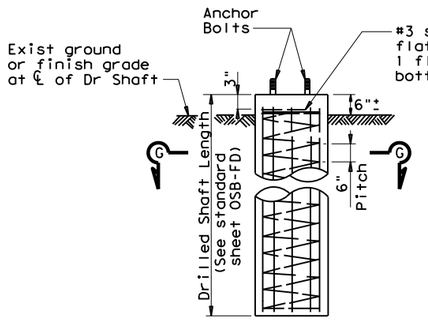


TOP VIEW

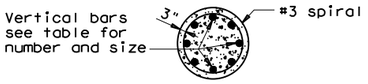


SIDE VIEW
(PRIOR TO INSTALLATION)

ANCHOR BOLT ASSEMBLY



FOUNDATION DETAIL

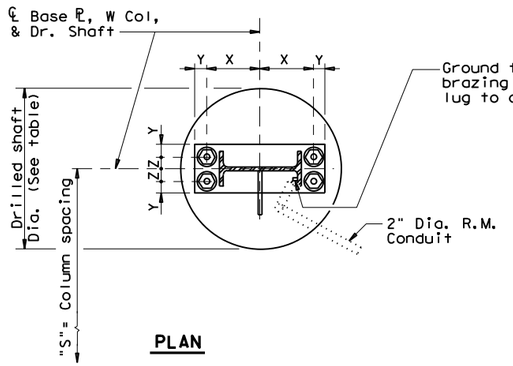


SECTION G-G

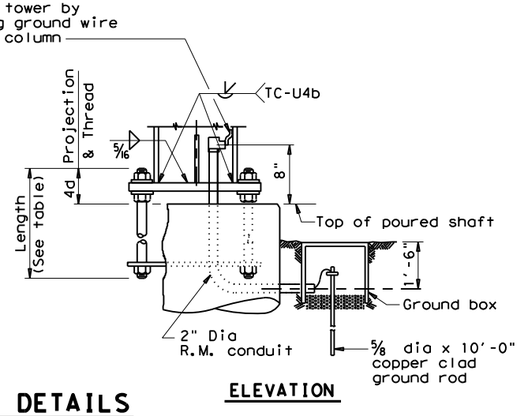
Anchor Bolt Dia. (d)	Washer Dimensions				Hole in Base Plate
	Outside Diameter	Hole Diameter	Thickness Min	Thickness Max	
1½"orless	2d	d + ⅛"	0.136"	0.177"	d + ¼"
1 ¾"	2d - ⅛"	d + ⅛"	0.178"	0.280"	d + 5/16"
2"	2d - ¼"	d + ⅛"	0.178"	0.280"	d + 5/16"
over 2"	2d - ½"	d + ⅛"	0.240"	0.340"	d + 5/16"

ANCHOR BOLT SIZE				
DIA	BOLT ③ LENGTH	THREAD ③ LENGTH	PROJECTION LENGTH	GALVAN. ③ LENGTH
1"	2'-5"	4"	4 ½"	10"
1 ⅛"	2'-8"	4 ½"	5"	10 ½"
1 ¼"	2'-11"	5"	5 ½"	11"
1 ⅜"	3'-1"	5 ½"	6"	11 ½"
1 ½"	3'-4"	6"	6 ½"	1'-0"
1 ¾"	3'-10"	7"	7 ½"	1'-1"
2"	4'-3"	8"	8 ½"	1'-2"
2 ¼"	4'-9"	9"	9 ½"	1'-3"
2 ½"	5'-2"	10"	10 ½"	1'-4"
2 ¾"	5'-8"	11"	11 ½"	1'-5"

③ Anchor Bolt Fabrication Tolerances:
Bolt Length ~ ±½"
Thread Length ~ ±½"
Galvanized Length ~ -¼"



PLAN



ELEVATION

BEARING SEAT DETAILS

(See table for base plate size anchor bolt size, dimensions X, Y, Z and drilled shaft diameter.)

SHEET 2 OF 2

Texas Department of Transportation
Traffic Operations Division

OVERHEAD SIGN BRIDGE TOWER DETAILS

OSBT

REVISIONS

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS

DIST	COUNTY	SHEET NO.
SAT	BEXAR	276

DATE: 2/25/2022 10:22:27 AM
FILE: T:\Traffic\Design\District PS&E Tracking\Plan Review\Bexar\0915-00-238 (Guidesigns)\OSB\Standards\DGNs\stds64.dgn

ZONE 3 WITH AND WITHOUT ICE 80 MPH WIND

10' SPAN

TOWER HEIGHT (ft)	TOWER PIPE O.D. (in)	TOWER PIPE WALL THICK (in)	TOWER PIPE DEFL ΔH (in)	ANCHOR BOLTS SIZE DIA (in)	ANCHOR BOLTS NO.	ANCHOR BOLTS BOLT CIR DIA	BASE PLATE SIZE (in)	TRUSS DEFL ΔV (in)	DESIGN LOADS SHEAR V (Kips)	DESIGN LOADS TORSION T (K-ft)	DESIGN LOADS MOMENT M (K-ft)
14'	16	0.250	0.105	1 1/4	6	20 1/2"	24 x 1 1/4	0.2	3.59	16.19	49.87
15'			0.120						3.61		53.42
16'			0.137						3.62		57.00
17'			0.154						3.64		60.59
18'			0.173						3.66		64.21
19'			0.193		6				3.67		67.85
20'			0.214		8				3.69		71.51
21'			0.235						3.71		75.18
22'			0.258					0.2	3.73		78.88
23'			0.282					0.3	3.74		82.59
24'			0.308						3.76		86.33
25'			0.334				24 x 1 1/4		3.78		90.08
26'			0.361				24 x 1 3/8		3.79		93.85
27'			0.389						3.81		97.64
28'			0.419						3.83		101.44
29'			0.449						3.84		105.26
30'			0.481						3.86		109.11
31'			0.513				24 x 1 3/8		3.88		112.96
32'	16	0.250	0.547	1 1/4	8	20 1/2"	24 x 1 1/2	0.3	3.89	16.19	116.84

15' SPAN

TOWER HEIGHT (ft)	TOWER PIPE O.D. (in)	TOWER PIPE WALL THICK (in)	TOWER PIPE DEFL ΔH (in)	ANCHOR BOLTS SIZE DIA (in)	ANCHOR BOLTS NO.	ANCHOR BOLTS BOLT CIR DIA	BASE PLATE SIZE (in)	TRUSS DEFL ΔV (in)	DESIGN LOADS SHEAR V (Kips)	DESIGN LOADS TORSION T (K-ft)	DESIGN LOADS MOMENT M (K-ft)
14'	16	0.250	0.235	1 3/8	8	20 3/4"	24 1/2 x 1 3/8	0.5	5.40	37.56	76.63
15'			0.270					0.6	5.41		81.91
16'			0.308					0.6	5.43		87.23
17'			0.347					0.7	5.45		92.57
18'			0.389				24 1/2 x 1 3/8	0.7	5.46		97.94
19'			0.434				24 1/2 x 1 1/2	0.7	5.48		103.33
20'			0.481					0.8	5.50		108.75
21'		0.250	0.530						5.51		114.19
22'		0.281	0.521	1 3/8		20 3/4"	24 1/2 x 1 1/2		5.53		119.66
23'		0.281	0.569	1 1/2		21"	25 x 1 5/8		5.55		125.14
24'		0.281	0.620						5.56		130.65
25'		0.312	0.610						5.58		136.18
26'		0.312	0.660				25 x 1 5/8		5.60		141.73
27'		0.312	0.711				25 x 1 3/4		5.62		147.30
28'		0.344	0.699						5.63		152.89
29'		0.344	0.750						5.65		158.50
30'		0.344	0.802	1 1/2		21"	25 x 1 3/4		5.67		164.12
31'		0.375	0.791	1 3/4		21 1/2"	26 x 1 7/8		5.68		169.77
32'	16	0.375	0.843	1 3/4	8	21 1/2"	26 x 1 7/8	0.8	5.70	37.56	175.43

20' SPAN

TOWER HEIGHT (ft)	TOWER PIPE O.D. (in)	TOWER PIPE WALL THICK (in)	TOWER PIPE DEFL ΔH (in)	ANCHOR BOLTS SIZE DIA (in)	ANCHOR BOLTS NO.	ANCHOR BOLTS BOLT CIR DIA	BASE PLATE SIZE (in)	TRUSS DEFL ΔV (in)	DESIGN LOADS SHEAR V (Kips)	DESIGN LOADS TORSION T (K-ft)	DESIGN LOADS MOMENT M (K-ft)
14'	20	0.250	0.213	1 1/4	8	24 1/2"	28 x 1 1/4	0.7	7.43	69.08	107.16
15'			0.244	1 1/4		24 1/2"	28 x 1 1/4	0.7	7.43		113.96
16'			0.278	1 3/8		24 3/4"	28 1/2 x 1 3/8	0.8	7.45		121.17
17'			0.314					0.8	7.47		128.42
18'			0.352					0.9	7.49		135.72
19'			0.392	1 3/8		24 3/4"	28 1/2 x 1 3/8	0.9	7.51		143.06
20'			0.435	1 1/2		25"	29 x 1 1/2	1.0	7.53		150.43
21'			0.479					1.0	7.55		157.84
22'			0.526					1.1	7.57		165.28
23'		0.250	0.575				29 x 1 1/2		7.60		172.75
24'		0.281	0.560				29 x 1 5/8		7.62		180.26
25'		0.281	0.607	1 1/2		25"	29 x 1 5/8		7.64		187.79
26'		0.281	0.657	1 3/4		25 3/8"	29 3/4 x 1 5/8		7.66		195.35
27'		0.310	0.640				29 3/4 x 1 3/4		7.68		202.94
28'		0.310	0.688						7.70		210.55
29'		0.310	0.738						7.72		218.20
30'		0.340	0.721				29 3/4 x 1 3/4		7.74		225.86
31'		0.340	0.770				29 3/4 x 1 7/8		7.77		233.56
32'	20	0.340	0.821	1 3/4	8	25 3/8"	29 3/4 x 1 7/8	1.1	7.79	69.08	241.27

25' SPAN

TOWER HEIGHT (ft)	TOWER PIPE O.D. (in)	TOWER PIPE WALL THICK (in)	TOWER PIPE DEFL ΔH (in)	ANCHOR BOLTS SIZE DIA (in)	ANCHOR BOLTS NO.	ANCHOR BOLTS BOLT CIR DIA	BASE PLATE SIZE (in)	TRUSS DEFL ΔV (in)	DESIGN LOADS SHEAR V (Kips)	DESIGN LOADS TORSION T (K-ft)	DESIGN LOADS MOMENT M (K-ft)
14'	20	0.281	0.308	1 1/2	8	25"	29 x 1 1/2	1.3	9.14	107.68	135.49
15'		0.281	0.354					1.4	9.17		144.13
16'		0.281	0.403					1.4	9.19		152.86
17'		0.281	0.455	1 1/2		25"	29 x 1 1/2	1.5	9.21		161.65
18'		0.312	0.460	1 3/4		25 3/8"	29 3/4 x 1 5/8	1.5	9.23		170.51
19'		0.312	0.513				29 3/4 x 1 5/8	1.5	9.25		179.43
20'		0.312	0.568				29 3/4 x 1 3/4	1.6	9.27		188.39
21'		0.312	0.627					1.6	9.29		197.41
22'		0.344	0.628					1.6	9.31		206.47
23'		0.344	0.686				29 3/4 x 1 3/4	1.7	9.34		215.57
24'		0.344	0.747				29 3/4 x 1 7/8		9.36		224.71
25'		0.375	0.748				29 3/4 x 1 7/8		9.38		233.89
26'		0.375	0.809	1 3/4		25 3/8"	29 3/4 x 1 7/8	1.7	9.40		243.10
27'		0.375	0.872	2		25 3/4"	30 1/2 x 2	1.8	9.42		252.34
28'		0.406	0.870						9.44		261.62
29'		0.406	0.933						9.46		270.93
30'		0.406	0.999				30 1/2 x 2		9.48		280.27
31'		0.441	0.992				30 1/2 x 2 1/4		9.50		289.64
32'	20	0.441	1.057	2	8	25 3/4"	30 1/2 x 2 1/4	1.8	9.53	107.68	299.04

ZONE 3 WITH AND WITHOUT ICE 80 MPH WIND

30' SPAN

TOWER HEIGHT (ft)	TOWER PIPE O.D. (in)	TOWER PIPE WALL THICK (in)	TOWER PIPE DEFL ΔH (in)	ANCHOR BOLTS SIZE DIA (in)	ANCHOR BOLTS NO.	ANCHOR BOLTS BOLT CIR DIA	BASE PLATE SIZE (in)	TRUSS DEFL ΔV (in)	DESIGN LOADS SHEAR V (Kips)	DESIGN LOADS TORSION T (K-ft)	DESIGN LOADS MOMENT M (K-ft)
14'	24	0.250	0.289	1 1/2	8	29"	33 x 1 1/2	1.6	11.00	155.44	167.11
15'		0.250	0.331	1 1/2		29"	33 x 1 1/2	1.6	11.03		177.27
16'		0.281	0.338	1 3/4		29 3/8"	33 3/4 x 1 1/2	1.6	11.05		187.54
17'			0.381				33 3/4 x 1 1/2	1.7	11.08		197.93
18'			0.428				33 3/4 x 1 1/2	1.8	11.10		208.40
19'		0.281	0.477				33 3/4 x 1 5/8		11.13		218.97
20'		0.312	0.477				33 3/4 x 1 5/8		11.15		229.60
21'			0.526				33 3/4 x 1 5/8	1.8	11.18		240.31
22'			0.577				33 3/4 x 1 3/4	1.9	11.20		251.08
23'			0.631				33 3/4 x 1 3/4	2.0	11.23		261.91
24'		0.312	0.687	1 3/4		29 3/8"	33 3/4 x 1 3/4		11.25		272.80
25'		0.344	0.679	2		29 3/4"	34 1/2 x 1 3/4		11.28		283.74
26'			0.735				34 1/2 x 2	2.0	11.30		294.73
27'			0.792					2.1	11.33		305.77
28'			0.852					2.2	11.36		316.85
29'		0.344	0.914						11.38		327.97
30'		0.375	0.901						11.41		339.13
31'		0.375	0.962					2.2	11.43		350.34
32'	24	0.375	1.023	2	8	29 3/4"	34 1/2 x 2	2.3	11.44	155.44	361.13

35' SPAN

TOWER HEIGHT (ft)	TOWER PIPE O.D. (in)	TOWER PIPE WALL THICK (in)	TOWER PIPE DEFL ΔH (in)	ANCHOR BOLTS SIZE DIA (in)	ANCHOR BOLTS NO.	ANCHOR BOLTS BOLT CIR DIA	BASE PLATE SIZE (in)	TRUSS DEFL ΔV (in)	DESIGN LOADS SHEAR V (Kips)	DESIGN LOADS TORSION T (K-ft)	DESIGN LOADS MOMENT M (K-ft)
14'	30	0.250	0.210	1 3/4	8	35 3/8"	39 3/4 x 1 1/2	1.5	12.87	211.58	202.48
15'			0.241					1.6	12.90		213.97
16'			0.275					1.6	12.93		225.63
17'		0.250	0.310					1.7	12.97		237.46
18'		0.281	0.310					1.7	13.00		249.43
19'			0.346					1.7	13.03		261.52
20'			0.383					1.8	13.06		273.72
21'			0.422					1.8	13.09		286.04
22'			0.463					1.9	13.12		298.44
23'			0.507	1 3/4		35 3/8"	39 3/4 x 1 1/2	2.0	13.16		310.94
24'			0.552	2		35 3/4"	40 1/2 x 1 5/8	2.0	13.19		323.51
25'			0.598				40 1/2 x 1 5/8	2.1	13.22		336.16
26'			0.647				40 1/2 x 1 5/8	2.2	13.25		348.89
27'			0.698				40 1/2 x 1 3/4	2.2	13.28		361.68
28'		0.281	0.751					2.3	13.31		374.53
29'		0.310	0.726					2.2	13.35		387.45
30'			0.777					2.2	13.38		400.42
31'			0.830					2.3	13.41		413.45
32'	30	0.310	0.884	2	8	35 3/4"	40 1/2 x 1 3/4	2.4	13.44	211.58	426.53

40' SPAN

TOWER HEIGHT (ft)	TOWER PIPE O.D. (in)	TOWER PIPE WALL THICK (in)	TOWER PIPE DEFL ΔH (in)	ANCHOR BOLTS SIZE DIA (in)	ANCHOR BOLTS NO.	ANCHOR BOLTS BOLT CIR DIA	BASE PLATE SIZE (in)	TRUSS DEFL ΔV (in)	DESIGN LOADS SHEAR V (Kips)	DESIGN LOADS TORSION T (K-ft)	DESIGN LOADS MOMENT M (K-ft)
14'	30	0.280	0.260	1 3/4	8	35 3/8"	39 7/8 x 1 1/2	2.1	14.65	276.72	242.20
15'			0.298	1 3/4		35 3/8"	39 7/8 x 1 1/2	2.2	14.68		254.69
16'			0.339	1 3/4		35 3/8"	39 7/8 x 1 1/2	2.3	14.71		267.44
17'			0.383	2		35 3/4"	40 1/2 x 1 1/2	2.4	14.75		280.40
18'			0.429				40 1/2 x 1 5/8	2.5	14.78		293.56
19'		0.280	0.478					2.6	14.81		306.90
20'		0.312	0.478					2.6	14.84		320.39
21'			0.527				40 1/2 x 1 5/8	2.6	14.87		334.02
22'			0.578				40 1/2 x 1 3/4	2.7	14.90		347.79
23'			0.632					2.8	14.94		361.67
24'			0.688					2.9	14.97		375.66
25'		0.312	0.747				40 1/2 x 1 3/4	3.0	15.00		389.75
26'		0.340	0.736				40 1/2 x 2	3.0	15.03		403.94
27'			0.794	2		35 3/4"	40 1/2 x 2	3.0	15.06		418.22
28'			0.854	2 1/4		36"	41 x 2	3.1	15.09		432.57
29'			0.916					3.2	15.13		447.01
30'		0.340	0.980						15.16		461.52
31'		0.375	0.963						15.19		476.10
32'	30	0.375	1.026	2 1/4	8	36"	41 x 2	3.2	15.22	276.72	490.75

GENERAL NOTES :

Design conforms to AASHTO 1994 Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Revisions thereto.

Steel for tower pipe shall conform to ASTM A53 Grade B or to ASTM A501. Tower pipe wall thickness shown is the minimum allowable. Fabricator may use the wall thickness shown or pipe of the same diameter with greater wall thickness.

All connection bolts shall conform to Item 447, "Structural Bolting". All structural steel, connection bolts, nuts and washers shall be galvanized in accordance with the Specifications.

Compensate for truss deflection at free end by offsetting upper and lower bolt holes at truss-to-tower connection.

For truss details see standard drawing COSSD.

For base and foundation details see standard drawing COSSF.

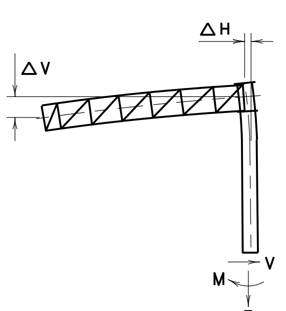
For cantilever truss lengths falling between those shown use sizes called for in the next longer span.

Truss and towers for cantilever sign supports are designed for the equivalent area of a 10'-0" deep sign panel over 100% of the span length. Design includes 3 pounds per foot squared for sign panel and 20 pounds per foot for lights and 50 pounds per foot for walkways all placed as specified for the design sign panel.

Details called for hereon are applicable for Design Wind Heights up to 30' inclusive.

Number of High Strength bolts required in truss connection or splice are indicated in brackets, e.g. [3], after the member size.

Deflections shown include the design loads for Truss, Sign Panel, Lights and Walkways.



ELEVATION
(SHOWING DESIGN LOADS AND DEAD LOAD DEFLECTIONS)

TRUSS DETAILS

SPAN	10', 15', & 20'	25'	30'	35'	40'
W x D = WIDTH x DEPTH	4.0 x 4.0	4.0 x 4.0	4.0 x 4.0	4.5 x 4.5	4.5 x 4.5
CHORD-①, Unless Otherwise Shown	L 3 x 3 x 3/16 ② [3]	L 3 x 3 x 1/4 ② [4]	L 3 x 3 x 1/4 [6]	L 3 x 3 x 5/16 [7]	L 3 1/2 x 3 1/2 x 5/16 [9]
DEAD LOAD DIAGONAL-②	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [3]
WIND LOAD DIAGONAL-②	L 2 1/2 x 2 1/2 x 3/16 [2]	L 2 1/2 x 2 1/2 x 3/16 [2]	L 3 x 3 x 1/4 [2]	L 3 x 3 x 1/4 [2]	L 3 x 3 x 1/4 [3]
DEAD LOAD VERTICAL-②	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 x 2 x 3/16 [2]	L 2 1/2 x 2 1/2 x 3/16 [2]	L 2 1/2 x 2 1/2 x 3/16 [2]
WIND LOAD STRUT-②	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]	L 2 x 2 x 3/16 [1]
TRUSS DEAD LOAD	38 lb/ft	43 lb/ft	45 lb/ft	53 lb/ft	62 lb/ft
SIZE H.S. BOLTS IN CONNECTION	5/8" DIA	5/8" DIA	5/8" DIA	5/8" DIA	5/8" DIA
NO. & SIZE OF H.S. BOLTS IN CHORD ANGLE TO TOWER CONNECTION PLATE	3 ~ 5/8" DIA ea	4 ~ 5/8" DIA or 3 ~ 3/4" DIA ea	6 ~ 5/8" DIA or 5 ~ 3/4" DIA ea	7 ~ 5/8" DIA or 5 ~ 3/4" DIA ea	9 ~ 5/8" DIA or 7 ~ 3/4" DIA ea

① "Low-Alloy Steel" for non-bridge structures per Item 442, "Metal For Structures".

② "Carbon Steel" for non-bridge structures per Item 442, "Metal For Structures".

Texas Department of Transportation
Traffic Operations Division

CANTILEVER OVERHEAD SIGN SUPPORTS

COSS-Z3 & Z3I-10

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
REVISIONS	CONT	SECT	JOB	HIGHWAY
4-10	0915	00	238	VARIOUS
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		277

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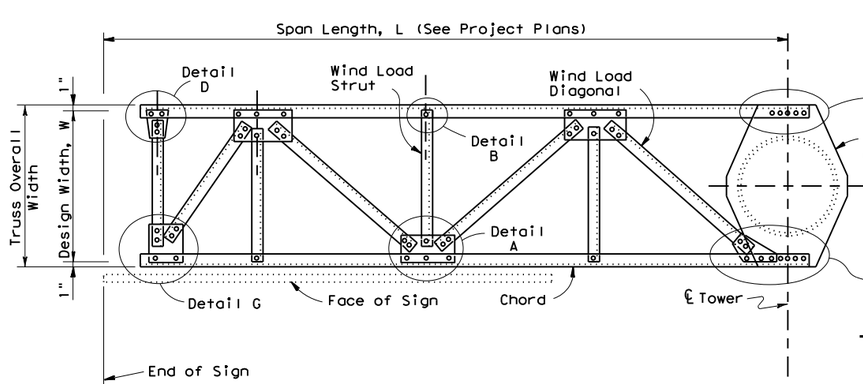
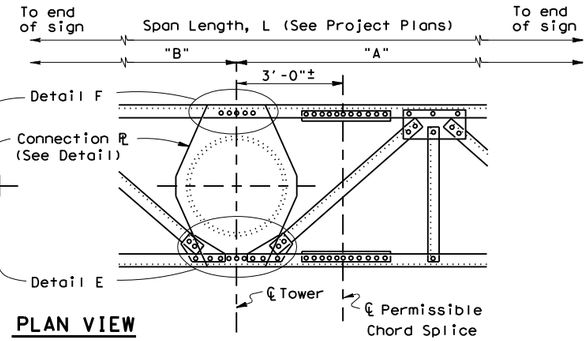


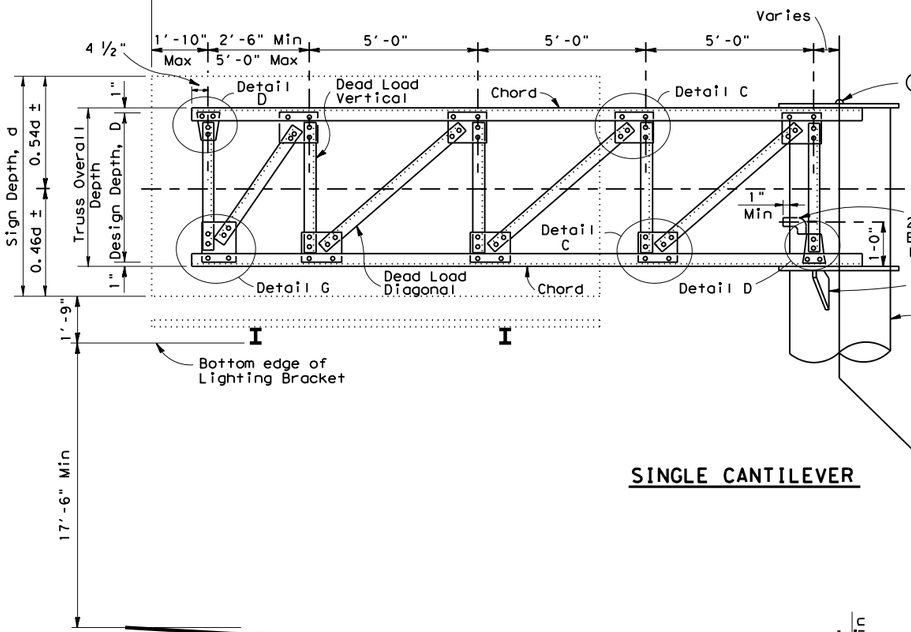


PLAN VIEW

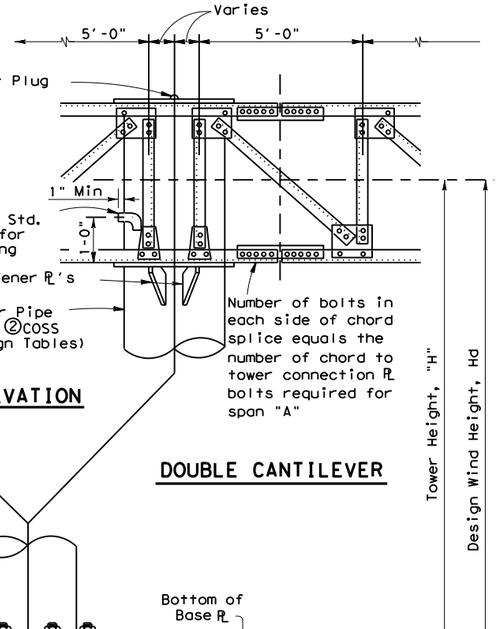
GENERAL NOTES:

Design conforms to 1975 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals and Interim revisions thereto. Connection details are typical only. Actual size of member and number of bolts will vary. The details on this sheet are intended as a guide only. See "Cantilever Overhead Sign Supports" or "High Level Cantilever Overhead Sign Supports" sheets for number of bolts and size of members.

Gusset plates to be same thickness as thickest web member in connection.

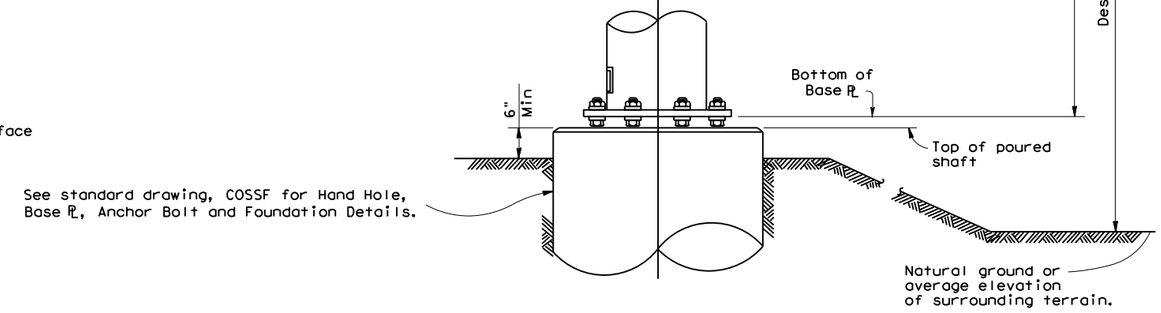


SINGLE CANTILEVER



ELEVATION

DOUBLE CANTILEVER



① Note: Cap shall be solid steel sheet ⅜" nominal thickness. Drill, tap and plug galvanizing vent. Weld plate to pipe with ⅜" weld all around.

② For COSS design tables see standard drawing, "Cantilever Overhead Sign Supports" or "High Level Cantilever Overhead Sign Supports".

SHEET 1 OF 2

Texas Department of Transportation
Traffic Operations Division

CANTILEVER OVERHEAD SIGN SUPPORT DETAILS

COSSD

REVISIONS

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS

DIST	COUNTY	SHEET NO.
SAT	BEXAR	278

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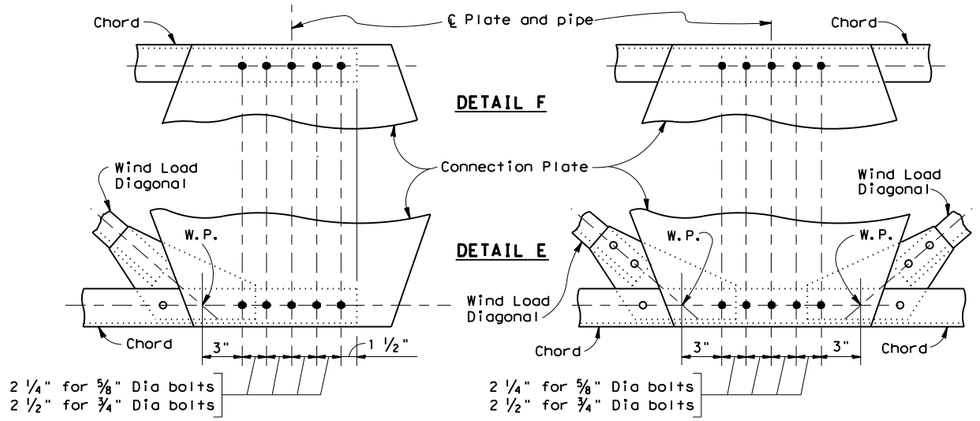
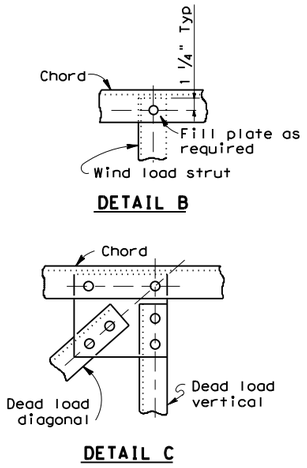
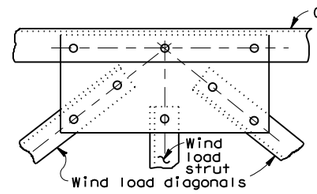


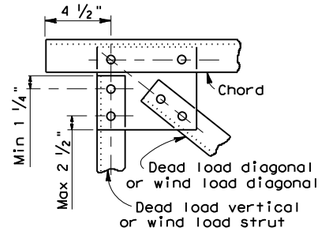
SINGLE CANTILEVER

DOUBLE CANTILEVER

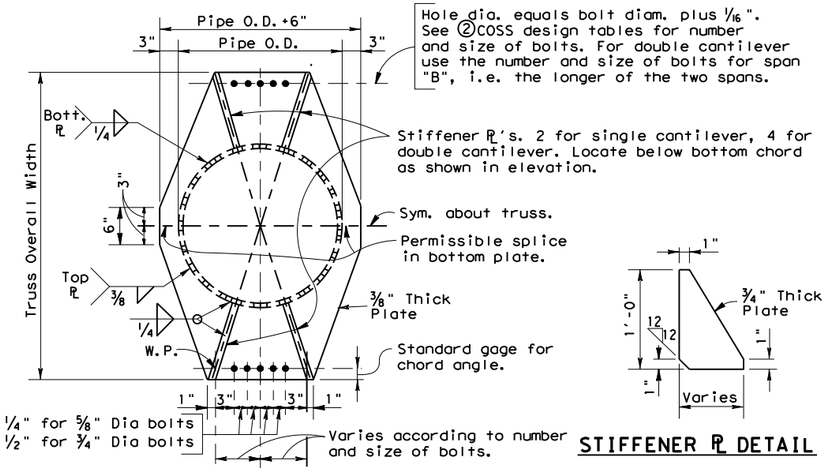


CONNECTION DETAILS



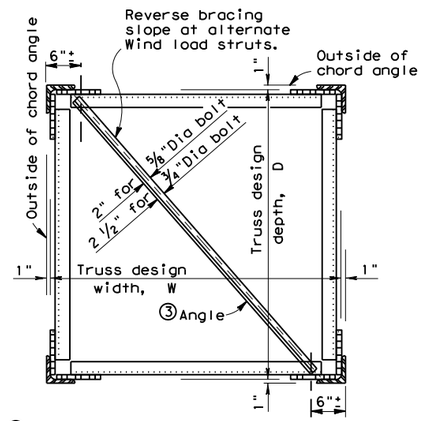


TOTAL NO. OF BOLTS IN DIAG'S. IN JOINT	NUMBER OF BOLTS REQD. IN GUSSET ℄ TO CHORD CONNECTION
0	2
2	2
3	3
4	3
5	4
6	4
8	5
10	6

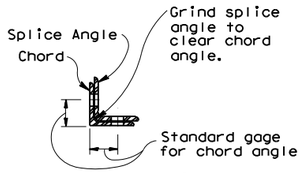


CONNECTION PLATE DETAIL

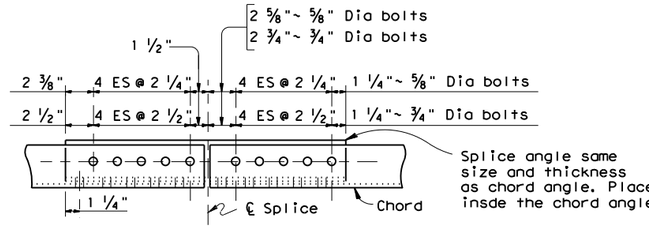
STIFFENER ℄ DETAIL



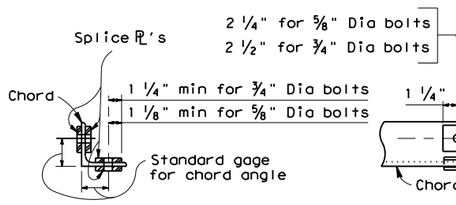
TRUSS SECTION
(DIAGONALS NOT SHOWN)



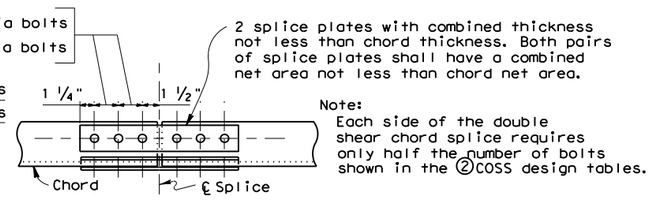
SECTION ON ℄ SPLICE



SINGLE SHEAR CHORD SPLICE

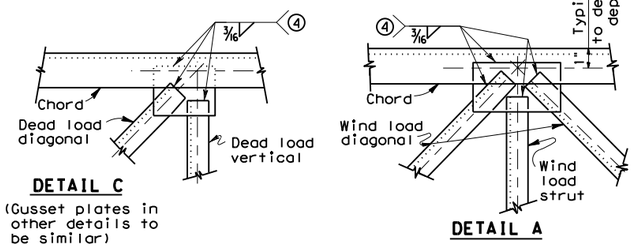


SECTION ON ℄ SPLICE

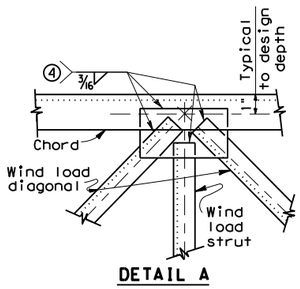


DOUBLE SHEAR CHORD SPLICE

SPLICE DETAILS



DETAIL C
(Gusset plates in other details to be similar)



DETAIL A

ALTERNATE WELDED CONNECTION DETAILS

④MINIMUM LENGTH OF 3/16" FILLET WELD REQUIRED		
NUMBER OF BOLTS	TO REPLACE ⅝" DIA BOLTS	TO REPLACE ¾" DIA BOLTS
1	2"	3"
2	4"	6"
3	6"	9"
4	8"	11 ½"
5	10"	14 ½"
6	12"	17 ½"
7	14"	20"

SHEET 2 OF 2

Texas Department of Transportation
Traffic Operations Division

CANTILEVER OVERHEAD SIGN SUPPORT DETAILS

COSSD

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
	CONT	SECT	JOB	HIGHWAY
	0915	00	238	VARIOUS
	DIST	COUNTY		SHEET NO.
	SAT	BEXAR		279

66B

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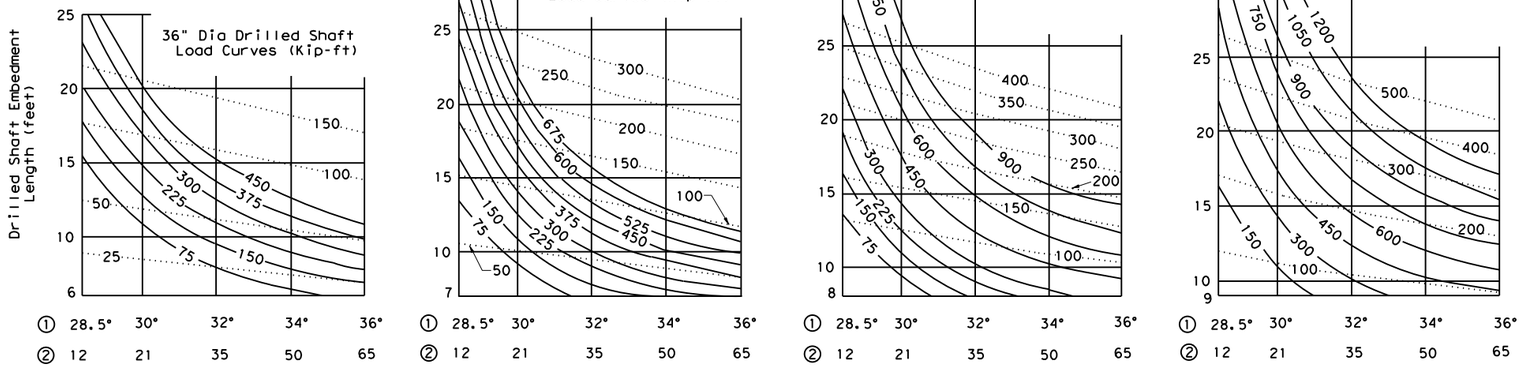


① Ø = Angle of internal friction of soil (degrees)

② N = Texas cone penetrometer value (blows per ft)

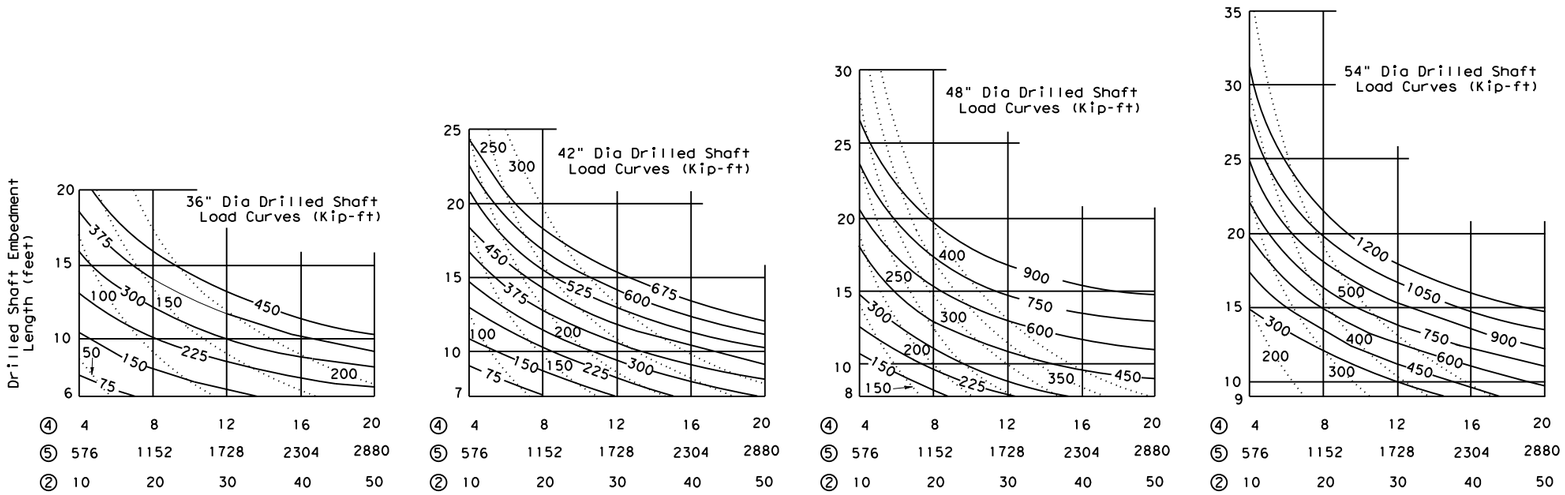
④ C(psi) = Cohesive shear strength of soil (psi)

⑤ C(psf) = Cohesive shear strength of soil (psf)

③ SUBMERGED SAND SOIL (COHESIONLESS)

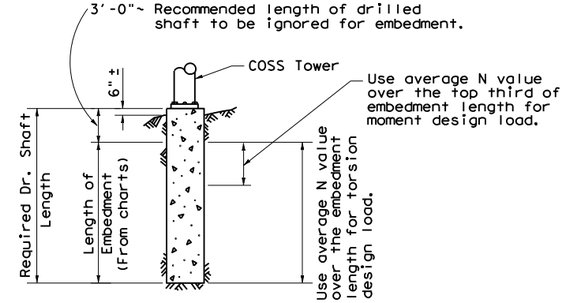
Moment ——————
Torsion ·····

③ Note:
For unsubmerged sands and clayey sands the charts for clay soil will give a conservative foundation design.



CLAY SOIL (COHESIVE)

Moment ——————
Torsion ·····



PROCEDURE:

1. Determine design moment and torsion, and the required drilled shaft diameter as outlined in the selection example sheet COSS-SE.
2. Make an initial estimate of the required embedment length.
3. From soil exploration data determine type of soil and average N value or soil property along the upper third of the drilled shaft.
4. Enter chart (for the correct shaft diameter and soil type) from the bottom at the average N value or soil property determined in step 3.
5. Proceed vertically into chart and locate intersection with design moment. Interpolate between moment curves (solid lines) as needed.
6. From intersection point turn 90° to left and read embedment length along vertical scale.
7. If embedment length differs significantly from estimated value return to step 3 with the embedment length determined in step 6.
8. From soil exploration data determine average N value or soil property over the entire length of the embedment.
9. Enter chart (for correct shaft diameter and soil type) from the bottom at the average N value or soil property determined in step 8.
10. Proceed vertically into chart and locate intersection with design torsion. Interpolate between torsion curves (dashed lines) as needed.
11. From intersection point turn 90° to left and read embedment length along vertical scale.
12. Compute the required length of drilled shaft by adding 3'-0" to longer embedment length required for moment or torsion.

GENERAL NOTES:

These charts are for use with Cantilever Overhead Sign Supports with one shaft per tower.
Solid curves are base moment in Kip-ft.
Dash curves are base torsion in Kip-ft.
Minimum embedment of drilled shaft is two diameters.
Add 3'-0" to the required embedment length to determine the required length of drilled shaft.

Texas Department of Transportation
Traffic Operations Division

FOUNDATION EMBEDMENT SELECTION CHARTS

COSS-FD

REVISIONS

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

CONT	SECT	JOB	HIGHWAY
0915	00	238	VARIOUS
DIST	COUNTY		SHEET NO.
SAT	BEXAR		280

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

☒ No Action Required ☐ Required Action

Action No.

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

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

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

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

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

☒ No Permit Required
☐ Nationwide Permit (NWP) 14 - Pre-construction Notice (PCN) not Required
☐ Nationwide Permit 14 - PCN Required
☐ Individual 404 Permit Required
☐ Other Nationwide Permit Required: NWP# _______

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

1.

2.

3.

4.

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

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

III. CULTURAL RESOURCES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

IV. VEGETATION RESOURCES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

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

☐ No Action Required ☒ Required Action

Action No.

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

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

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

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

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

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

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

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

Contact the Engineer if any of the follwing are detected:

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

Hazardous Materials or Contamination Issues Specific to this Project:

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

Does the project involve the demolition of a span bridge?

☐ Yes ☒ No (No further action required)

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

VII. OTHER ENVIRONMENTAL ISSUES

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

☐ No Action Required ☒ Required Action

Action No.

1.

2.

3.

Texas Department of Transportation
San Antonio District Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic_2015-10-09_SAT.dgn	DN: TxDOT	CK: TxDOT	DW: BW	CK: GAG
© TxDOT OCTOBER 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0915	00	238	VARIOUS
	DIST		COUNTY	SHEET NO.
	SAT		BEXAR	281

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

A. GENERAL SITE DATA

1. PROJECT LIMITS: *Same as stated on the Title Sheet*

2. PROJECT SITE MAPS:

- *Project Latitude _____ Project Longitude _____*
- *Project Location Map: Shown on Title Sheet*
- *Drainage Patterns: Shown on Drainage Area Maps (Sheets X-Y)*
- *Approx. Slopes Anticipated After Major Gradings and Areas of Soil Disturbance: Shown on Typical Sections (Sheets X-Y)*
- *Major Controls and Locations of Stabilization Practices: Shown on SW3P Sheets (Sheets X-Y)*
- *Project Specific Locations: Off-site waste, borrow, or storage areas are not part of this SW3P.*
- *Surface Waters and Discharge Locations: Shown on Drainage and Culvert Layout Sheets (Sheets X-Y)*

3. PROJECT DESCRIPTION: *Same description as stated on Title Sheet*

- *Joint-bid utilities are covered by this SW3P (Sheets X-Y)*
  Non-Joint Bid Utilities are not part of this SW3P.

4. FOR MAJOR SOIL DISTURBING ACTIVITIES SEQUENCE OF EVENTS:

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

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

5. EXISTING AND PROPOSED CONDITIONS:

Description of existing vegetative cover: (Provide type and description of vegetative cover)
Percentage of existing vegetative cover: (Provide percentage)
Existing vegetative cover: (mark one)
___ *Thick or uniformly established*
_X_ *Thin and Patchy*
___ *None or minimal cover*
Description of soils: (Provide classification and description of soils)
Site Acreage: ___0___ *Acreage disturbed: ___0___*
Site runoff coefficient (pre-construction): _____ *Site runoff coefficient (post-construction): _____*

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

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

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

B. BEST MANAGEMENT PRACTICES

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

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

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

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

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

3. STORM WATER MANAGEMENT:

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

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

4. NON-STORM WATER DISCHARGES:

Off-site discharges are prohibited except as follows:

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

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

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

C. OTHER REQUIREMENTS & PRACTICES

1. MAINTENANCE:

All erosion and sediment controls shall be maintained in good working order. If a repair is necessary, it shall be performed before the next anticipated storm event but no later than 7 calendar days after the surrounding exposed ground has dried sufficiently to prevent further damage from equipment. If maintenance prior to the next anticipated storm event is impracticable, maintenance must be scheduled and accomplished as soon as practicable. Disturbed areas on which construction activities have ceased, temporarily or permanently, shall be stabilized within 14 calendar days unless they are scheduled to and do resume within 21 calendar days. The areas adjacent to creeks and drainageways shall have priority followed by protecting storm sewer inlets.

2. INSPECTION:

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

3. WASTE MATERIALS:

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

4. OFFSITE VEHICLE TRACKING:

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

5. OTHER:

See the EPIC sheet for additional environmental information.

Design Consultant Logo here - delete block if not applicable

STATE OF TEXAS
EDUARDO L. VILLALON
123415
LICENSED
PROFESSIONAL ENGINEER

P.E. 2/28/2022
Signature of Registrant & Date

REVISION DATE: 10/12

 Texas Department of Transportation

STORM WATER POLLUTION PREVENTION PLAN (SW3P)

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		VARIOUS
STATE	DISTRICT	COUNTY	
TEXAS	SAT	BEXAR	
CONTROL	SECTION	JOB	SHEET NO.
0915	00	238	282