DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
ASA	6	STP 2024(633)VRU		VARIOUS
GRAPHICS AM	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK HMF	TEXAS	FTW	JOHNSON	1
APPROVED ASA	CONTROL	SECTION	JOB	
	0902	50	143	

INDEX OF SHEETS

SEE SHEET 2 FOR INDEX

FINAL PLANS

NAME OF CONTRACTOR: _____

DATE OF LETTING: _____

DATE WORK BEGAN: _____

DATE WORK COMPLETED: _____

DATE WORK ACCEPTED: _____

SUMMARY OF CHANGE ORDERS:

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

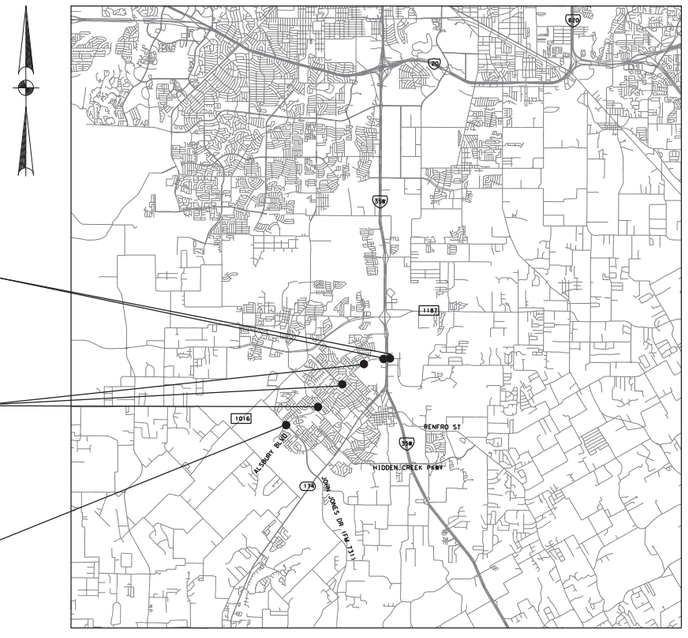
PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT # STP 2024(633)VRU

VA (ALSBURY BOULEVARD)
JOHNSON COUNTY

NET LENGTH OF PROJECT (ALSBURY BLVD) = 16,520.00 FT. = 3.128 MI.
LIMITS (ALSBURY BLVD): FROM FM 731 TO IH 35W

FOR THE CONSTRUCTION OF: INTERSECTION & OPERATIONAL IMPROVEMENTS
CONSISTING OF: IMPROVE TRAFFIC SIGNALS, INTERCONNECT SIGNALS, INSTALL FLASHING YELLOW ARROW, ETC.



NO RAILROAD
NO EXCEPTIONS
NO EQUATIONS

NOTE:

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

PLANS PREPARED BY:

Kimley»Horn
TBPE FIRM F-928
2600 N. CENTRAL EXPRESSWAY
SUITE 400
RICHARDSON, TEXAS 75080
PH (214) 617-0535
CONTACT: ABIGAIL AXELSON, P.E.

9/29/2023

STATE OF TEXAS
ABIGAIL AXELSON
146056
LICENSED
PROFESSIONAL ENGINEER

THE CITY OF BURLESON TEXAS

CONCURRENCE 11/17/2023
DocuSigned by: tommy ludwig
9FB77EBC76944DC...
TY OF BURLESON

RECOMMENDED 11/17/2023
DocuSigned by: Eric Oscarson
8F9F1F5FD3884A3...
, P.E.
CITY OF BURLESON

TEXAS DEPARTMENT OF TRANSPORTATION

RECOMMENDED FOR LETTING 11/27/2023
DocuSigned by:
7879B0B92E5D403...
R, TP&D

SUBMITTED 11/17/2023
DocuSigned by: Theresa Poer
7645CDCD25274F3...

APPROVED 11/28/2023
DocuSigned by: David M Salazar, P.E.
B741E64FAD82411...
NEER

SHEETS	DESCRIPTION
I. GENERAL	
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4	ESTIMATE AND QUANTITY SHEET
5	SUMMARY OF QUANTITIES
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26	PROPOSED QUANTITIES
ALSBURY BOULEVARD AT SUMMERCREST BOULEVARD	
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35	PROPOSED CONDITIONS
36	PROPOSED QUANTITIES
ALSBURY BOULEVARD AT BURLESON BOULEVARD (NORTHBOUND)	
37	PROPOSED CONDITIONS
38	PROPOSED QUANTITIES

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

Signature of Registrant & Date 9/29/2023

9/29/2023

STATE OF TEXAS
ABIGAIL AXELSON
146056
LICENSED
PROFESSIONAL ENGINEER

Kimley»Horn F-928
2600 N. Central Expressway
Suite 400
Richardson, TX 75080 Tel. No. (214) 617-0535

THE CITY OF BURLESON TEXAS

TRAFFIC SAFETY IMPROVEMENTS

INDEX OF SHEETS

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
ASA	6	(SEE TITLE SHEET)		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
AM	TEXAS	FTW	JOHNSON	2
CHECK	CONTROL	SECTION	JOB	
HMF	0902	50	143	
CHECK				
ASA				

PLOTTED: 11/29/2023
FILENAME: K:\DAL_TPTO\1project\061166095 - Burleson HSIP - Alsbury PS&E\CADD\BURL-ALS_02_Index.dgn
40.0000 ft / in.
BY: Abby.Axelson

Control: 0902-50-143

County: Johnson

Highway: Various

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

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

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

Access is read-only.

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

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

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

Traffic Operation Director's Email:	Theresa.Poer@txdot.gov
Construction Supervisor Email:	Michael.Flaming@txdot.gov
Maintenance Supervisor Email:	Jose.Gomez1@txdot.gov
Traffic Signal Team Lead's Email:	Abigail.Tucker@txdot.gov

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

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

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

Special Notes

Contact the TXDOT Signal Shop at 817-370-3661 prior to delivery of equipment, request for electrical inspection, placing signals into flash or turn on, or set up of signal detection.

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Personnel will be experienced in items of work in the contract, which they will be performing. Provide a qualified technician, approved by the Engineer, on the project site to place the traffic signals in flash or in full operation. A qualified TXDOT signal technician must also be present.

The contractor is responsible for picking up materials furnished by the State with a forty-eight (48) hour notice to the signal shop.

Existing storm sewers and utilities are shown from the best available information. Verify the location of all underground facilities prior to starting work. Contractor will be responsible for notifying a "one call" center when necessary. It will also be the Contractor's responsibility to notify the State and appropriate City for any utility and line locations.

Contact Texas excavation safety system at 1-800-dig-tess or 1-800-344-8377, and TxDOT Signal Shop at 817-370-3661 prior to beginning any excavation work in the area of existing utilities, to prevent any damage or interference with present facilities.

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

A pre-construction/conference meeting between the contractor and TXDOT will be held prior to beginning operations. This meeting will outline the proposed work procedures, sequence of work to be followed, and discuss the required traffic control. Plans, specifications, unusual conditions, and other pertinent items regarding the work will be discussed. The Contractor's job superintendent is requested to attend this meeting.

Contractor shall notify the TXDOT inspector no later than 8 AM each day and advise work locations for the day, number of workers, and equipment used on work site.

Safety vests and hard hats will be worn at all times when outside vehicles within the work area.

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

Modifications to Lane Closure / Work Restrictions:

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

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

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

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

Do not discolor or damage existing curb and curb and gutter during construction operations. In the event of discoloration or damage, clean or repair as directed.

Install all required concrete riprap flumes immediately following the construction of ditches in which they are to be placed. In addition, apply all erosion control measures as shown on the plans or as directed, immediately following construction of channels to their required line, grade, and section.

The City will perform certain preliminary work and will complete the work in such sequence and manner that the Contractor will be able to begin his work at the specified time.

The State will perform certain preliminary work and will complete the work in such sequence and manner that the Contractor will be able to begin his work at the specified time.

Item 4. Scope of Work

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

Item 5. Control of the Work

The locations of all signal related items, pavement markings, signing, etc. are diagrammatic only and may be adjusted to accommodate field conditions or as directed by Engineer.

Item 5.2. Plans and Working Drawings

Electronic submittal of shop drawings, working drawings, equipment manuals, and product brochures is permitted for this project.

Item 5.5. Cooperation of Contractor

Designate superintendent in accordance with second paragraph of Article 5.5 Cooperation of Contractor in the Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges.

Item 6. Control of Materials

To comply with the latest provisions of Build America, Buy America Act (BABA Act) of the Bipartisan Infrastructure Law, the contractor must submit an original of the TxDOT Construction

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Material Buy America Certification Form for all items classified as construction materials. This form is not required for materials classified as a manufactured product.

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

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

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

Item 7. Legal Relations and Responsibilities

This contract requires work to be done on railroad property. Cooperate with the railroads and comply with all of their requirements including obtaining any required training before performing work on railroad property.

Submit to the Engineer an original railroad liability insurance policy.

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

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

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

(1) Restricted Use of Materials for Previously Evaluated Permit Areas. Document both the project specific location (PSL) and its authorization. Maintain copies for

review by the Department or any regulatory agency. When an area within the project limits has been evaluated by the USACE as part of the permit process for this project:

a. Suitable excavation of required material in the areas shown on the plans and cross sections as specified in Item 110 is used for permanent or temporary fill (Item 132, Embankment) within a USACE permit area;
b. Suitable embankment (Item 132) from within the USACE permit area is used as fill within a USACE evaluated area; and,
c. Unsuitable excavation or excess excavation ["Waste"] (Item 110) that is disposed of at a location approved by the Engineer within a USACE evaluated area.

(2) Contractor Materials from Areas Other than Previously Evaluated Areas. Provide the Department with a copy of all USACE coordination or approvals prior to initiating any activities for an area within the project limits that has not been evaluated by the USACE or for any off right of way locations used for the following, but not limited to haul roads, equipment staging areas, borrow and disposal sites:

a. Item 132, Embankment, used for temporary or permanent fill within a USACE permit area; and,
b. Unsuitable excavation or excess excavation ["Waste"] (Item 110, Excavation) that is disposed of outside a USACE evaluated area.

The total area disturbed for this project is 0.28 acres. The disturbed area in this project, all project locations in the Contract, and the Contractor project specific locations (PSLs), within 1 mile of the project limits, for the Contract will further establish the authorization requirements for storm water discharges. The Department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. The Contractor is to obtain required authorization from the TCEQ for Contractor PSLs for construction support activities on or off the right of way. When the total area disturbed in the Contract and PSLs within 1 mile of the project limits exceeds 5 acres, provide a copy of the Contractor NOI for PSLs on the right of way to the Engineer and to the local government that operates a separate storm sewer system.

When a bridge deck is milled, seal coated and overlaid, remove excess material. Do not just broom to the sides of the bridge, under guardrail, etc. Cover or protect all sealed expansion joints and rails on bridges and all railroad tracks encountered as approved. Clean and repair all of these features if they weren't properly protected at contractor's expense. This work is subsidiary work to applicable bid items.

Prevention of Migratory Bird Nesting

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

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Structures

Do not begin bridge and culvert construction operations 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.

Personal vehicles will not be parked within the right-of-way at any time, including any section closed to the traveling public. Operations will be curtailed or halted during special events that may result in delays or congestion to the traveling public.

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

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

Thanksgiving Holiday (Wednesday through Sunday)	3 PM Tuesday through 9 AM Monday
Christmas Holiday (December 23 through December 26)	3 PM December 22 through 9 AM December 27

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

No significant traffic generator events identified.

Item 8. Prosecution and Progress

Working days will be computed and charged in accordance with Section 8.3.1.4, 'Standard Workweek.' There are 150 working days in the contract.

The start of work will be delayed 90 calendar days after the authorization date to begin work to allow time for the procurement of signal equipment.

Item 8.3.2. Restricted Work Hours

No work will be permitted to commence on the road before sunrise or after sunset. Single lane closures, except as otherwise shown in the plans, will be restricted to off-peak hours as defined in the following table:

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

Complete work Monday through Friday, excluding holidays. Night and weekend work will be allowed with prior approval from the Engineer. Exceptions will be made for emergency work. Submit a request in writing for approval by the Engineer a minimum of 10 days in advance of implementing a change to lane closure restrictions.

Item 8.5. Project Schedules

Provide daily notifications to the Engineer of planned daily operations.

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Maintain and submit the project schedule monthly for each work order in accordance with Item 8.5.5.2. If the schedule for the work order changes in any way, a new schedule is required in accordance with Item 8.5.5.2.3.

Item 8.6. Failure to Complete Work on Time

The amount assessed for liquidated damages will be based on the total value of original contract, in accordance with Special Provision 000-1243, not the estimated amount on individual work orders.

Item 432. Riprap

Provide weep holes as directed.

The quantities for riprap at the location indicated may be varied to the extent necessary to ensure proper functioning for the purpose intended.

All concrete riprap will be 5" (.42') in thickness, unless otherwise shown on the plans, and must be reinforced.

An 8 inch (.67 ft.) by 18 inch (1.5 ft.) toe wall is required at the exposed edges of all concrete riprap, unless otherwise directed.

Provide a toe wall at all exposed edges of all protection stone riprap, unless otherwise directed.

Item 502. Barricades, Signs, and Traffic Handling

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

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

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

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

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

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

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

Item 506. Temporary Erosion, Sedimentation, and Environmental Controls

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

Item 666. Reflectorized Pavement Markings with Retroreflective Requirements

If retroreflectivity readings are collected using a handheld unit, then measurement is defined as a collective average of at least 20 readings taken along a 200-foot test section. A minimum of three measurements will be required per mile of roadway. Measurements collected on a centerline stripe will be averaged separately for stripe in each direction of travel. A TxDOT inspector must witness the calibration and collection of all retro-reflectivity data.

Item 680. Installation of Highway Traffic Signals

Contractor shall contact Fort Worth District TMC 817-370-3664 and James Rogge at the City of Burleson (817-426-9290) prior to starting any signal modifications. Provide qualified personnel reachable by telephone and available to receive calls on a 24-hour basis. Respond to reported calls and make field assessment within 2 hours and make appropriate repairs within 24 hours.

Furnish and install all required materials, incidentals and equipment necessary for a fully operational traffic signal. The proposed equipment shall be compatible with the existing systems in the area. Equipment will be procured as specified in the approved sole source procurement memo.

Where work requires the removal of power from the controller and cabinet assembly, erect temporary stop signs. Remove the stop signs after the traffic signals are in operation.

Deliver the cabinet, controller, accessories, and three complete sets of signal construction plans to the TXDOT Signal Shop, 2501 SW Loop 820, Fort Worth for testing. Notify the Signal Shop two working days prior to delivery of the cabinet.

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County: Johnson

Highway: Various

Wire the signal installation to operate in accordance with phase diagrams in these plans. Timing and phasing will be maintained by the operating agency (City of Burleson). Deliver a copy of all revisions to the original timing and phasing plans to the operating agency (City of Burleson) and TXDOT Signal Shop. One copy is to stay in the controller cabinet at the completion of the project and two supplied to the operating agency Signal Shop.

Project Inspection. Contact the TxDOT Signal Shop in advance of needed inspections. At the time of the final electrical inspection, the Inspector will create a discrepancy list to be corrected and repaired before signal is put into flash mode.

Test Period. During the 30-day test period, the Contractor shall be the first responders to all trouble calls. They will, in turn contact TxDOT Signal Shop with information about problem and repairs made. Provide qualified personnel to respond to these and all trouble calls. Provide a local telephone number, not subject to frequent changes and available to receive calls on a 24-hour basis. Respond to reported calls within a maximum of two hours. Make appropriate repairs within 24 hours or at engineer's direction.

Place a logbook in each controller cabinet and keep a record of each trouble call reported. Notify the Engineer of each trouble call. The error log in the conflict monitor shall not be cleared during the thirty-day test period without approval. If it is necessary to replace equipment, such as a controller, in order to return the signals to normal operation, TXDOT will provide temporary replacement equipment until the original equipment is repaired and/or replaced at the engineer's direction.

Removal. Salvageable signal controllers and related equipment shall remain the property of TXDOT. Deliver to the TXDOT Signal Shop at 2501 SW Loop 820, Fort Worth.

Item 682. Vehicle and Pedestrian Signal Heads

Vehicle signal heads shall be yellow aluminum with 5 inch, black, aluminum, reflective border, vented back plates unless otherwise shown on plans.

Signal heads shall be installed level and plumb and aimed as directed. Cover all signal faces until placed in operation.

All new mast arm mounted signal heads to be mounted horizontally.

Item 684. Traffic Signal Cables

Clearly and permanently mark each cable as shown on the plans (CABLE 1, etc.) at each signal head, ground box, terminal block, pole base and controller. Use plastic zip ties with labeling plate to mark cable.

Provide an extra 10’ for each cable terminating in the controller cabinet and coil an extra 5’ of cable in each ground box.

Terminate all electrical conductors from the controller (including spares) at the termination block in the signal pole hand hole.

Item 6001. Portable Changeable Message Signs

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

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

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

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

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

Eighteen total shadow vehicles with TMA will be required for this type of work. Determine if one or more of these operations will be ongoing at the same time to determine the total number of TMAs needed for the project.

Control: 0902-50-143

County: Johnson

Highway: Various

Item 6306. Video Imaging Vehicle Detection System

Mount detector as shown in plans or as directed by the Engineer. Adjust heights and locations of sensors to achieve the best possible detection.

Provide a factory certified representative for testing and set up of the equipment at the time of signal flash and turn on. Notify James Rogge at the City of Burleson (817-426-9290) 48 hours prior to testing and set up.

Install all required materials, incidentals and equipment necessary for a fully operational detection system.

Estimate & Quantity Sheet

Texas Department of Transportation

CONTROLLING PROJECT ID 0902-50-143 **DISTRICT** Fort Worth **COUNTY** Johnson
HIGHWAY Various

						TOTAL EST.	TOTAL FINAL
			CONTROL SECTION JOB	**0902-50-143**			
			PROJECT ID	**A00184322**			
			COUNTY	**Johnson**			
			HIGHWAY	**Various**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	432-6003	RIPRAP (CONC)(6 IN)	CY	1.340		1.340	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	7.000		7.000	
	506-6042	BIODEG EROSN CONT LOGS (INSTL) (18")	LF	160.000		160.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	160.000		160.000	
	666-6231	PAVEMENT SEALER (ARROW)	EA	1.000		1.000	
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	1.000		1.000	
	677-6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	1.000		1.000	
	678-6009	PAV SURF PREP FOR MRK (ARROW)	EA	1.000		1.000	
	680-6011	INSTALL HWY TRF SIG (UPGRADE)	EA	7.000		7.000	
	682-6001	VEH SIG SEC (12")LED(GRN)	EA	2.000		2.000	
	682-6002	VEH SIG SEC (12")LED(GRN ARW)	EA	13.000		13.000	
	682-6003	VEH SIG SEC (12")LED(YEL)	EA	2.000		2.000	
	682-6004	VEH SIG SEC (12")LED(YEL ARW)	EA	26.000		26.000	
	682-6005	VEH SIG SEC (12")LED(RED)	EA	2.000		2.000	
	682-6006	VEH SIG SEC (12")LED(RED ARW)	EA	13.000		13.000	
	682-6051	BACKPLATE W/REFL BRDR(3 SEC)ALUM	EA	2.000		2.000	
	682-6052	BACKPLATE W/REFL BRDR(4 SEC)ALUM	EA	12.000		12.000	
	684-6031	TRF SIG CBL (TY A)(14 AWG)(5 CONDR)	LF	60.000		60.000	
	684-6033	TRF SIG CBL (TY A)(14 AWG)(7 CONDR)	LF	805.000		805.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	70.000		70.000	
	6010-6002	CCTV FIELD EQUIPMENT (DIGITAL)	EA	7.000		7.000	
	6010-6004	CCTV MOUNT (POLE)	EA	7.000		7.000	
	6027-6003	CONDUIT (PREPARE)	LF	3,620.000		3,620.000	
	6027-6008	GROUND BOX (PREPARE)	EA	35.000		35.000	
	6058-6001	BBU SYSTEM (EXTERNAL BATT CABINET)	EA	4.000		4.000	
	6185-6002	TMA (STATIONARY)	DAY	42.000		42.000	
	6306-6001	VIVDS PROSR SYS	EA	7.000		7.000	
	6306-6002	VIVDS CAM ASSY FXD LNS	EA	25.000		25.000	
	6306-6005	VIVDS CNTRL SOFTWARE	EA	7.000		7.000	
	6306-6007	VIVDS CABLING	LF	6,910.000		6,910.000	
	18	SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000	

SUMMARY OF QUANTITIES				ALSBURY BLVD AT JOHN JONES DR	ALSBURY BLVD AT SUMMERCREST BLVD	ALSBURY BLVD AT RENFRO ST	ALSBURY BLVD AT HEBERLE DR	ALSBURY BLVD AT HEMPHILL ST	ALSBURY BLVD AT BURLESON BLVD (SOUTHBOUND)	ALSBURY BLVD AT BURLESON BLVD (NORTHBOUND)	PROJECT TOTAL
ITEM NO.	CODE	DESCRIPTION	UNIT								
432	6003	RIPRAP (CONC)(6 IN)	CY				1.34				1.34
500	6001	MOBILIZATION	LS	0.14	0.14	0.14	0.14	0.14	0.15	0.15	1
502	6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	1	1	1	1	1	1	1	7
506	6042	BIODEG EROSN CONT LOGS (INSTL) (18")	LF			80	80				160
506	6043	BIODEG EROSN CONT LOGS (REMOVE)	LF			80	80				160
666	6231	PAVEMENT SEALER (ARROW)	EA				1				1
668	6077	PREFAB PAV MRK TY C (W) (ARROW)	EA				1				1
677	6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA				1				1
678	6009	PAV SURF PREP FOR MRK (ARROW)	EA				1				1
680	6011	INSTALL HWY TRF SIG (UPGRADE)	EA	1	1	1	1	1	1	1	7
682	6001	VEH SIG SEC (12")LED(GRN)	EA				2				2
682	6002	VEH SIG SEC (12")LED(GRN ARW)	EA		4	4	3	1	1		13
682	6003	VEH SIG SEC (12")LED(YEL)	EA				2				2
682	6004	VEH SIG SEC (12")LED(YEL ARW)	EA		8	8	6	2	2		26
682	6005	VEH SIG SEC (12")LED(RED)	EA				2				2
682	6006	VEH SIG SEC (12")LED(RED ARW)	EA		4	4	3	1	1		13
682	6051	BACKPLATE W/REFL BRDR (3 SEC)ALUM	EA				2				2
682	6052	BACKPLATE W/REFL BRDR (4 SEC)ALUM	EA		4	4	3	1			12
684	6031	TRF SIG CBL (TY A)(14 AWG)(5 CONDR)	LF				60				60
684	6033	TRF SIG CBL (TY A)(14 AWG)(7 CONDR)	LF		255	250	170	65	65		805
6001	6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	10	10	10	10	10	10	10	70
6010	6002	CCTV FIELD EQUIPMENT (DIGITAL)	EA	1	1	1	1	1	1	1	7
6010	6004	CCTV MOUNT (POLE)	EA	1	1	1	1	1	1	1	7
	**	CCTV CABLE (ETHERNET) CAT 6	LF	190	85	195	160	145	720	315	1810
6027	6003	CONDUIT (PREPARE)	LF	595	455	490	360	340	1075	305	3620
6027	6008	GROUND BOX (PREPARE)	EA	7	5	5	5	4	5	4	35
6058	6001	BBU SYSTEM (EXTERNAL BATT CABINET)	EA	1		1	1		1		4
6185	6002	TMA (STATIONARY)	DAY	6	6	6	6	6	6	6	42
6306	6001	VIVDS PROSR SYS	EA	1	1	1	1	1	1	1	7
6306	6002	VIVDS CAM ASSY FXD LNS	EA	4	4	4	4	3	3	3	25
6306	6005	VIVDS CNTRL SOFWARE	EA	1	1	1	1	1	1	1	7
6306	6007	VIVDS CABLING	LF	865	765	805	650	635	2425	765	6910

** ITEM SUBSIDIARY TO ITEM 6010

PLOTTED: 11/17/2023
FILENAME: K:\DAL_TPTO\project\061166095 - Burleson HSIP - Alsbury PS&E\CADD\BURL-ALS_03_Quantity Summary.dgn
40.0000 ft / in.
BY: Abby.Axelson

9/29/2023

STATE OF TEXAS
ABIGAIL AXELSON
146056
LICENSED
PROFESSIONAL ENGINEER

Kimley»Horn F-928
2600 N. Central Expressway
Suite 400
Richardson, TX 75080
Tel. No. (214) 617-0535

THE CITY OF BURLESON TEXAS

TRAFFIC SAFETY IMPROVEMENTS

SUMMARY OF QUANTITIES

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
ASA	6	(SEE TITLE SHEET)		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
AM	TEXAS	FTW	JOHNSON	5
CHECK	CONTROL	SECTION	JOB	
HMF	0902	50	143	
CHECK				
ASA				

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
27	S1	R10-17T	LEFT TURN YIELD ON FLASHING YELLOW ARROW	36" x 42"	X		SIGNS TO BE MOUNTED ON TRAFFIC SIGNAL POLE					
	S3			36" x 42"	X							
	S5			36" x 42"	X							
	S7			36" x 42"	X							
29	S1	R10-17T	LEFT TURN YIELD ON FLASHING YELLOW ARROW	36" x 42"	X		SIGNS TO BE MOUNTED ON TRAFFIC SIGNAL POLE					
	S3			36" x 42"	X							
	S5			36" x 42"	X							
	S7			36" x 42"	X							
31	S1	R10-17T	LEFT TURN YIELD ON FLASHING YELLOW ARROW	36" x 42"	X		SIGNS TO BE MOUNTED ON TRAFFIC SIGNAL POLE					
	S3			36" x 42"	X							
	S5			36" x 42"	X							
33	S1	R10-17T	LEFT TURN YIELD ON FLASHING YELLOW ARROW	36" x 42"	X		SIGN TO BE MOUNTED ON TRAFFIC SIGNAL POLE					
35	S1	R10-17T	LEFT TURN YIELD ON FLASHING YELLOW ARROW	36" x 42"	X		SIGN TO BE MOUNTED ON TRAFFIC SIGNAL POLE					

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).

DATE: DATE TIME
FILE: DOCUMENT NAME

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	0902	50	143	VA
4-16 8-16	DIST	COUNTY		SHEET NO.
	FTW	JOHNSON		6

18

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-03 7-13	0902	50	143	VA
9-07 8-14	DIST	COUNTY		SHEET NO.
5-10 5-21	FTW	JOHNSON		7

DATE: DATE TIME
FILE: DOCUMENT NAME

DATE:
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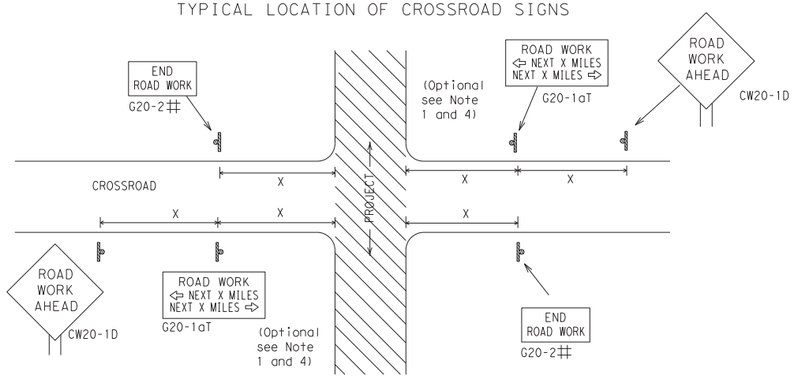
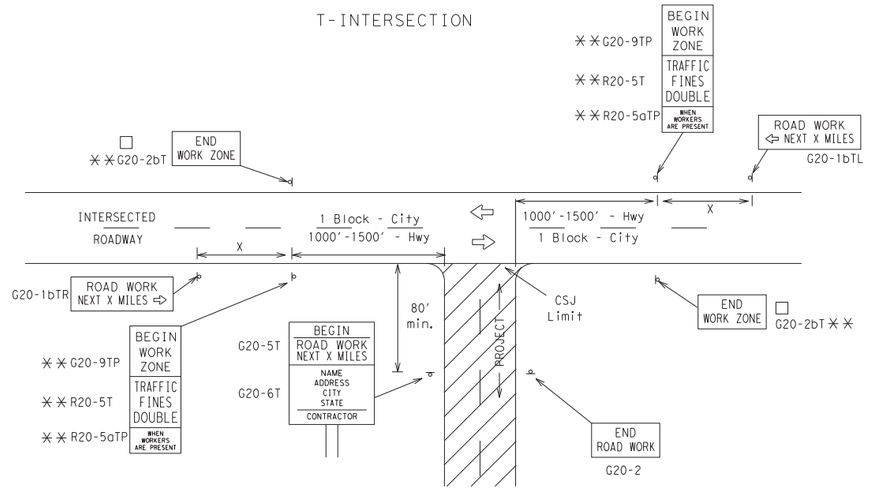
TYPICAL LOCATION OF CROSSROAD SIGNS



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]

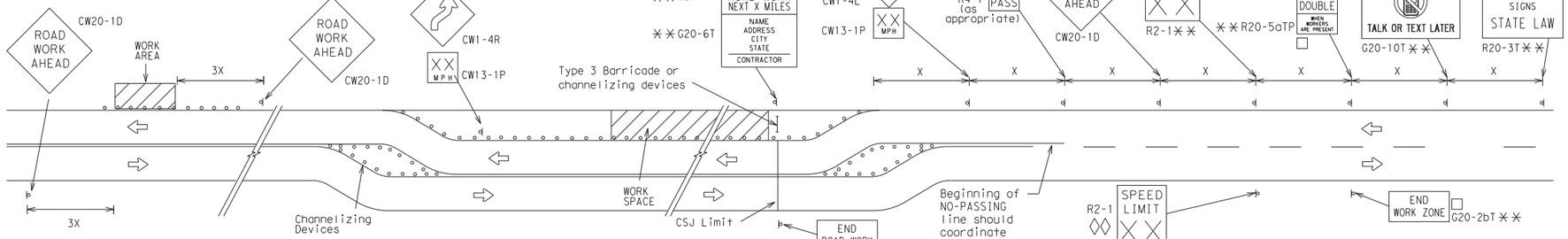
✳ For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

△ 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.

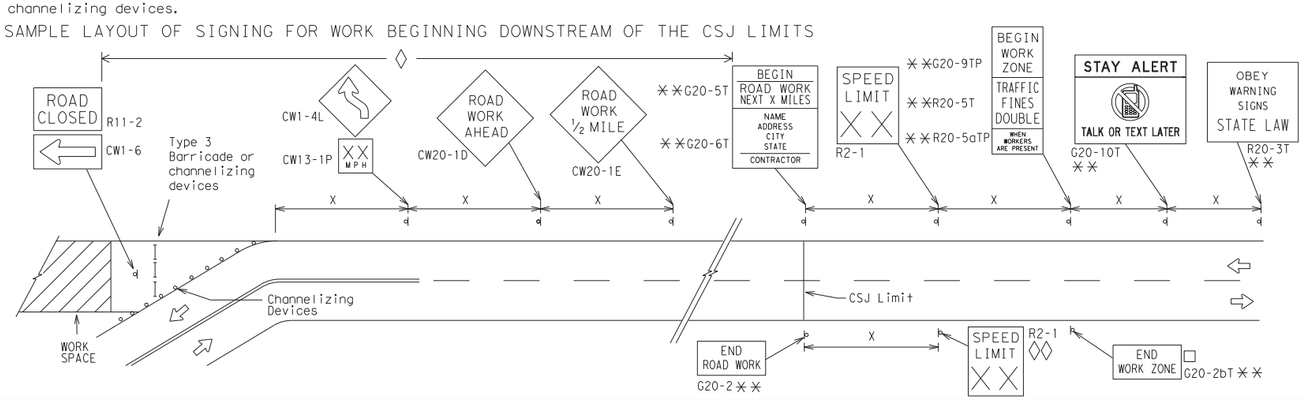
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	50	143	VA
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	FTW	JOHNSON		8

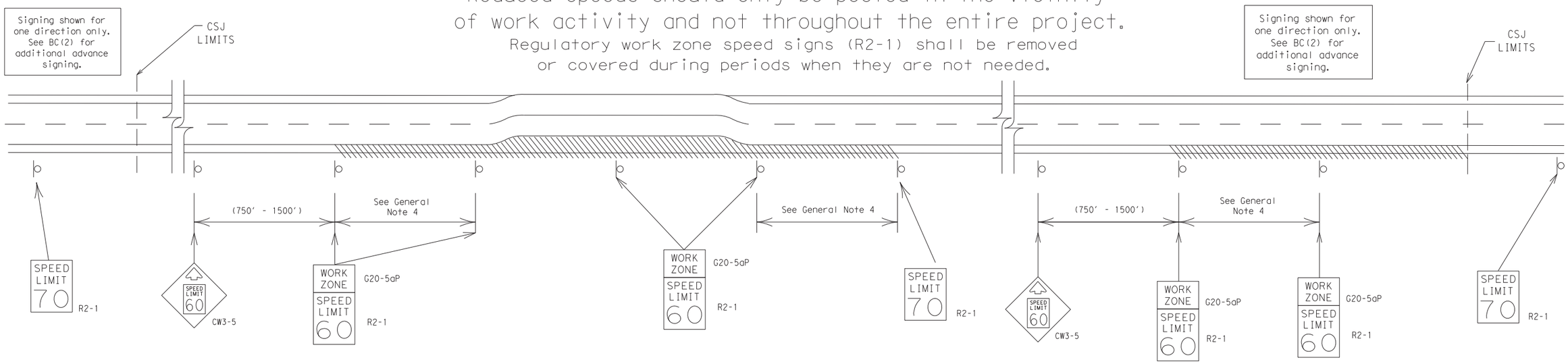
DATE:
FILE:

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

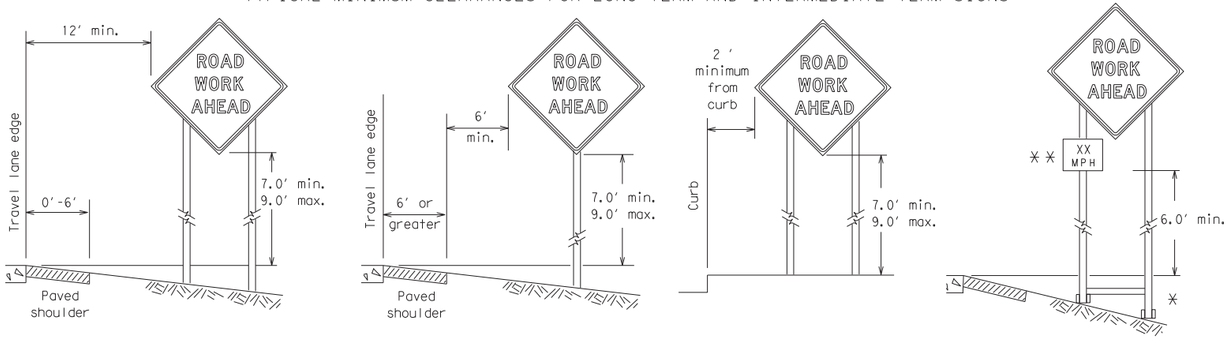
BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	50	143	VA
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	FTW	JOHNSON		9

DATE:
FILE:

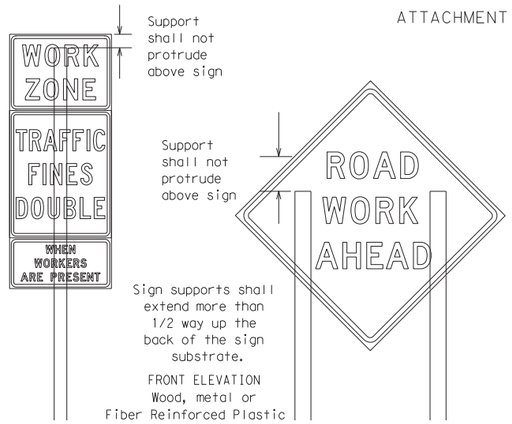
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

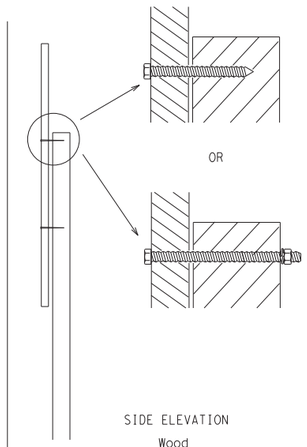


⁎ When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

⁎⁎ 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





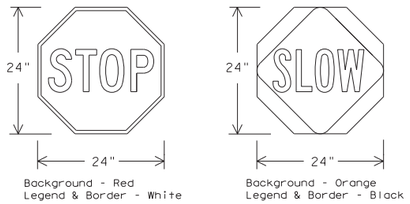
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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.



Background - Red
Legend & Border - White

Background - Orange
Legend & Border - Black

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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation

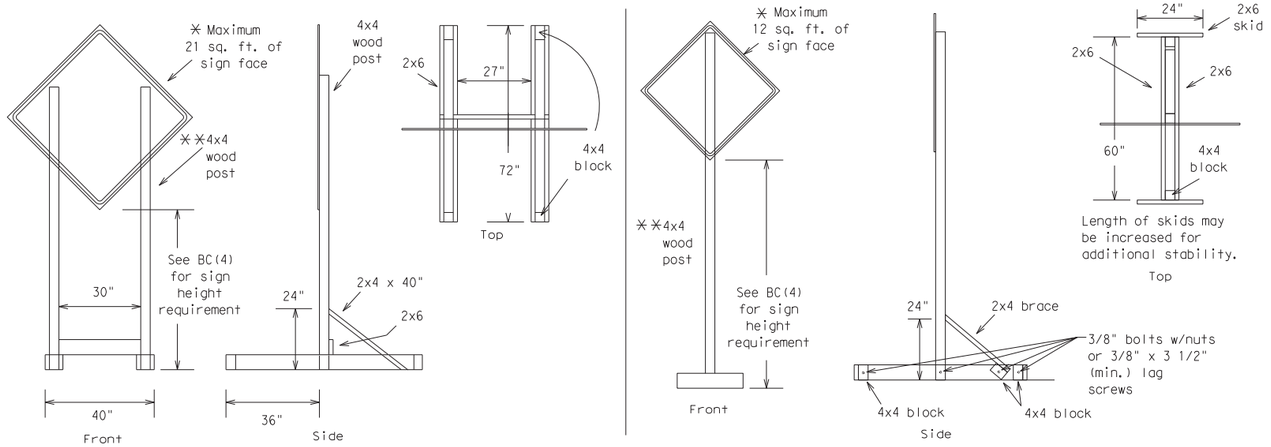
Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

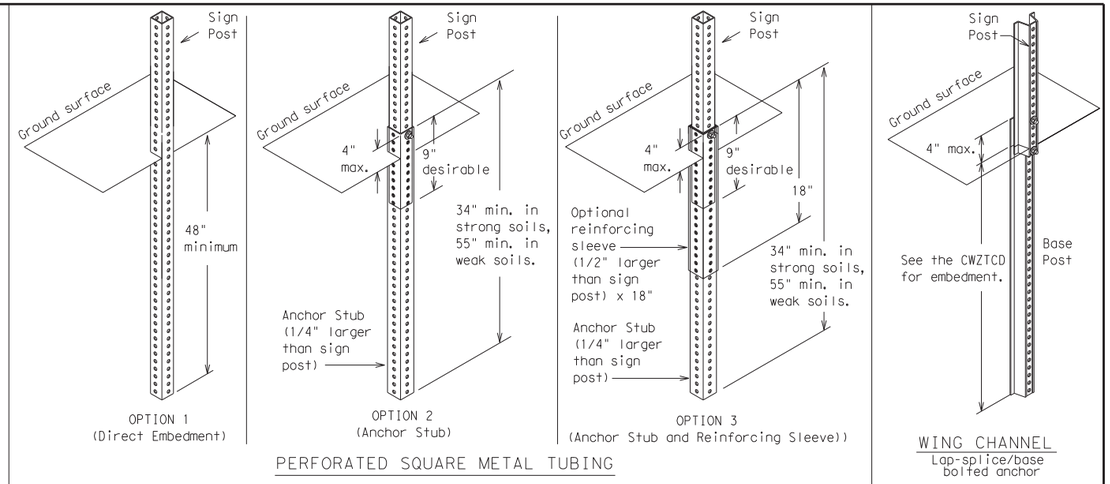
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	50	143	VA
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	FTW	JOHNSON		10

DATE: DATE TIME
FILE: DOCUMENT NAME



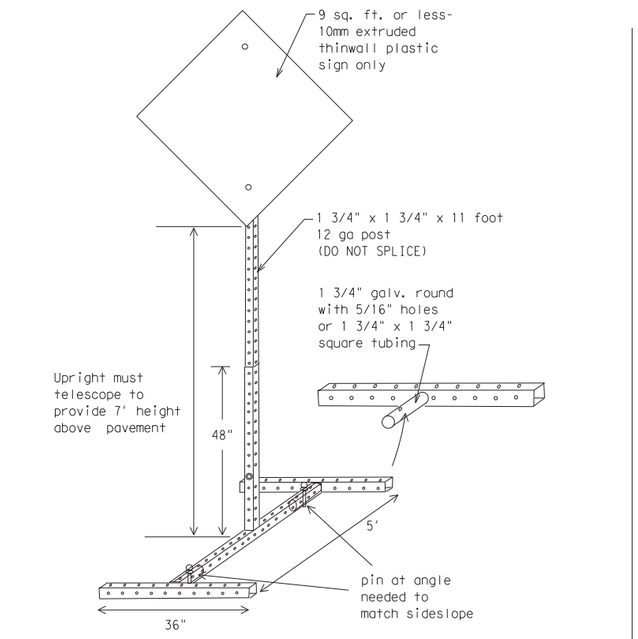
SKID MOUNTED WOOD SIGN SUPPORTS

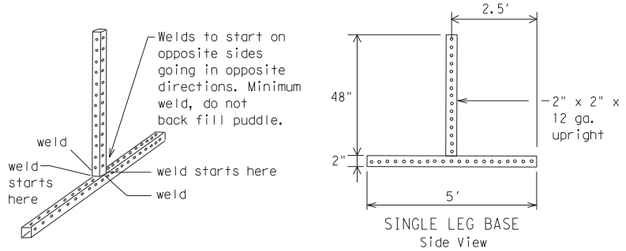
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

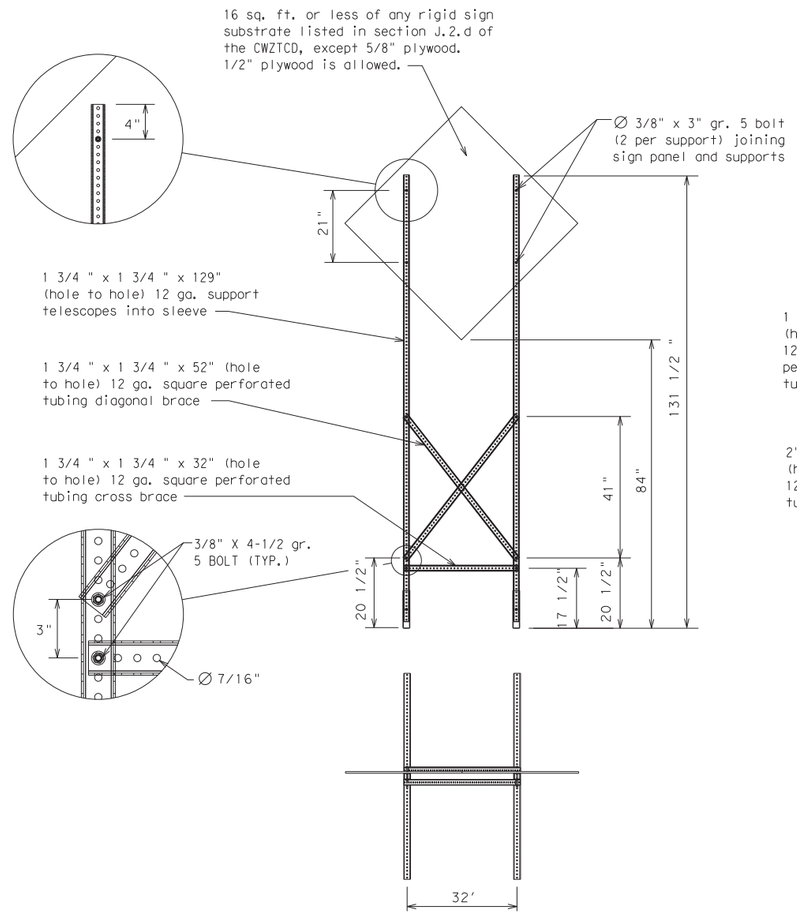


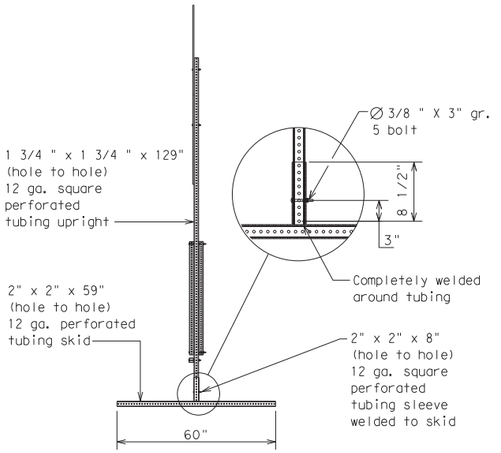
GROUND MOUNTED SIGN SUPPORTS

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









SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

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	0902	50	143	VA
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	FTW	JOHNSON		11

DATE: DATE TIME
FILE: DOCUMENT NAME

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

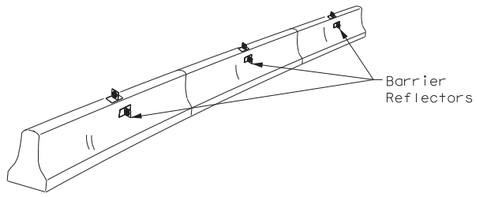
BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

FILE:	bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS		0902	50	143	VA
9-07 8-14		DIST	COUNTY		SHEET NO.
7-13 5-21		FTW	JOHNSON		12

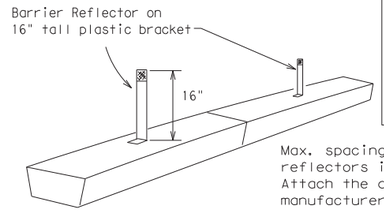
100

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.

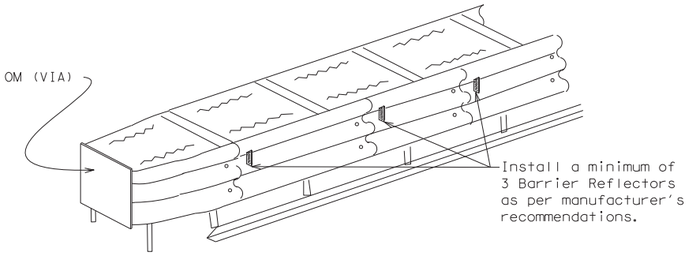


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB)

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.

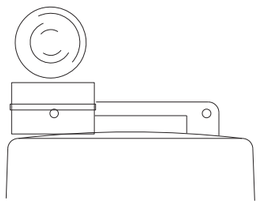


DELINEATION OF END TREATMENTS

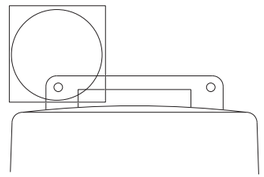
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

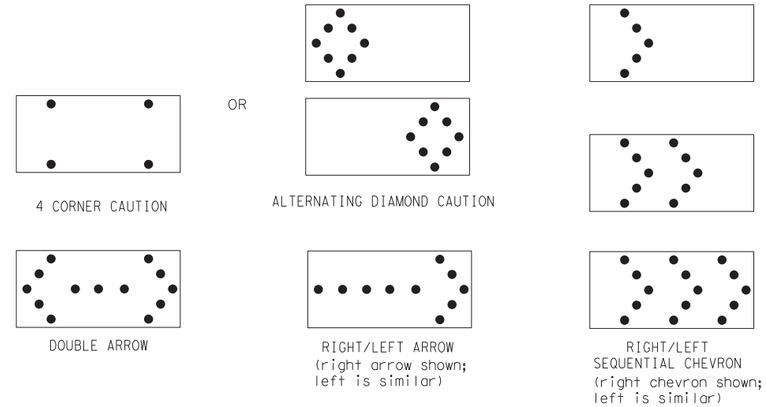
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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



4 CORNER CAUTION

ALTERNATING DIAMOND CAUTION

DOUBLE ARROW

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

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

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

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

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

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	50	143	VA
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	FTW	JOHNSON		13

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DATE: DATE TIME
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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:

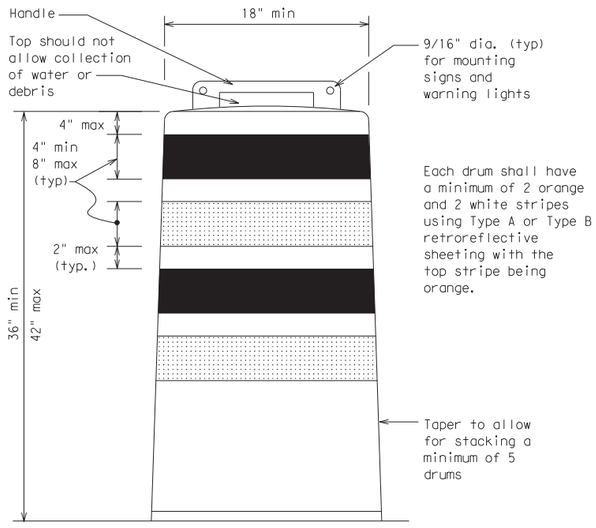
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

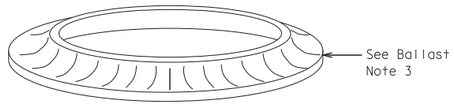
RETROREFLECTIVE SHEETING

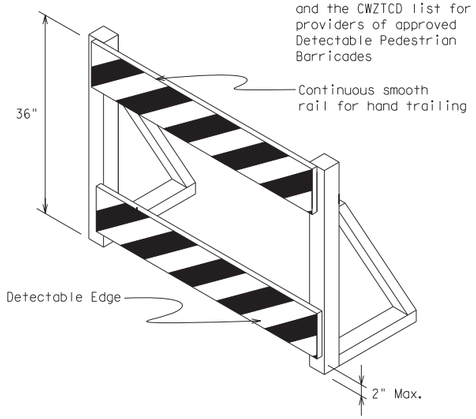
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall 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
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	50	143	VA
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	FTW	JOHNSON		14
7-13				

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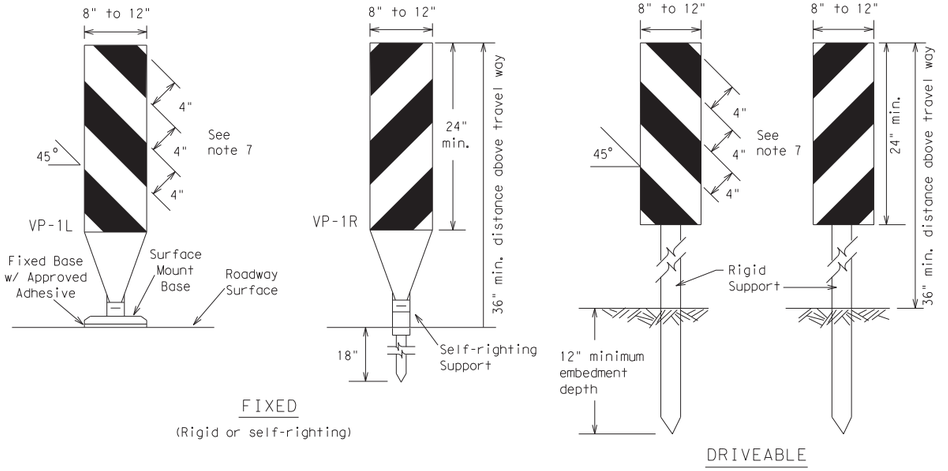
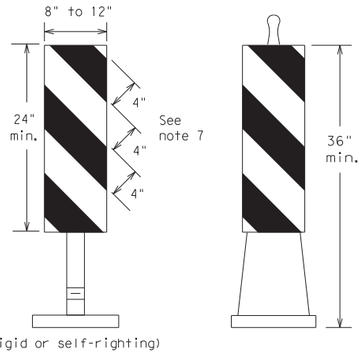


FIXED

(Rigid or self-righting)

DRIVEABLE

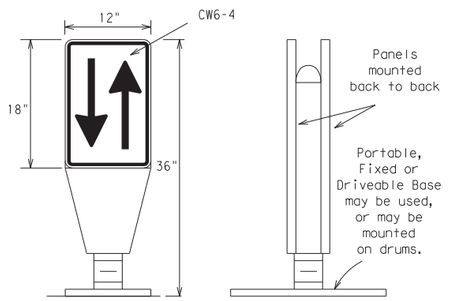


(Rigid or self-righting)

PORTABLE

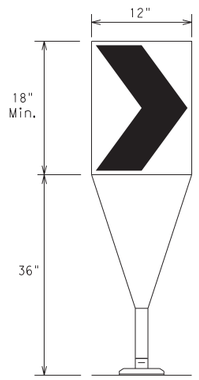
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



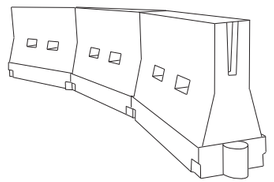
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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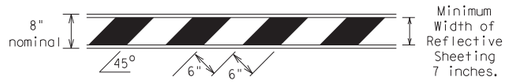
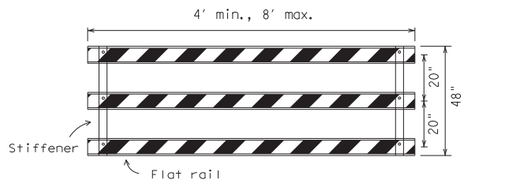
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



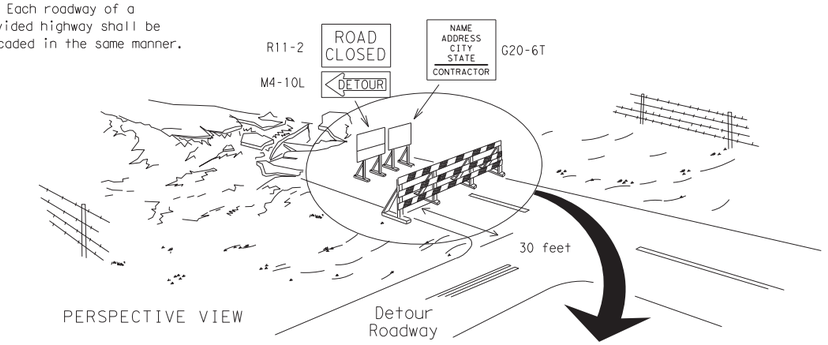
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

TYPICAL PANEL DETAIL
FOR SKID OR POST TYPE BARRICADES

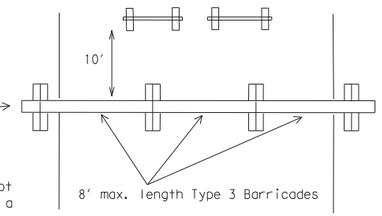
Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.

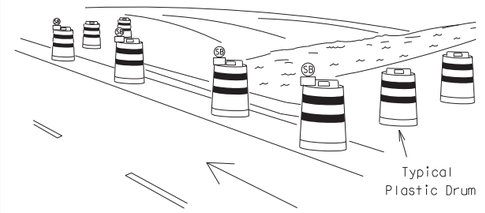
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

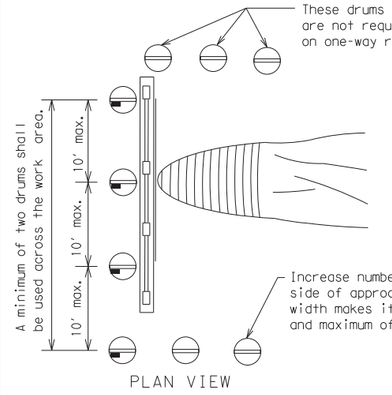
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

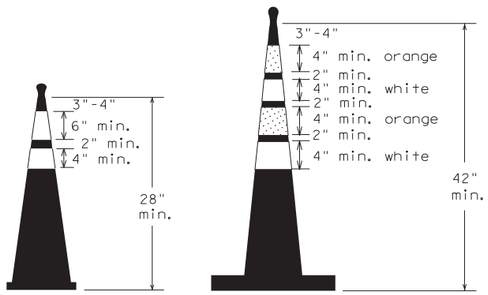
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



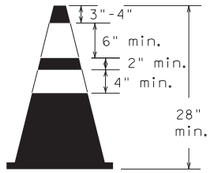
PLAN VIEW

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

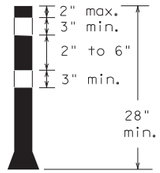
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

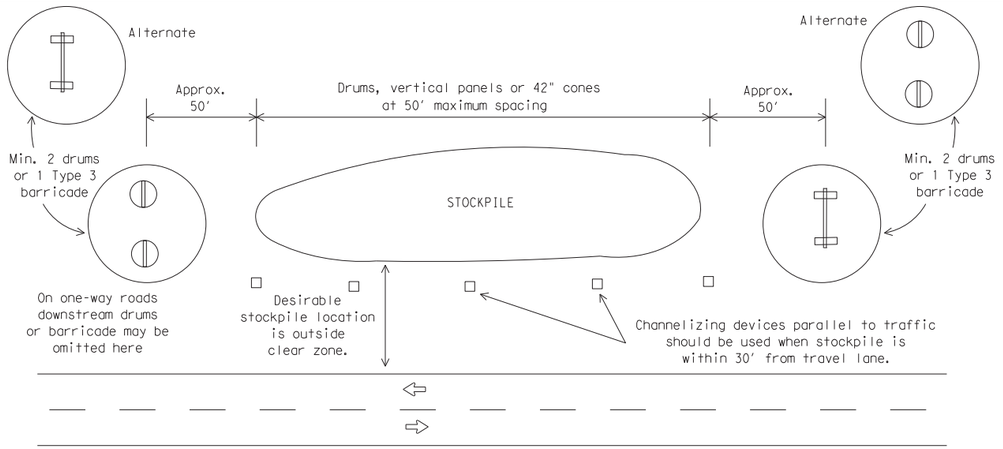


Tubular Marker

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

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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

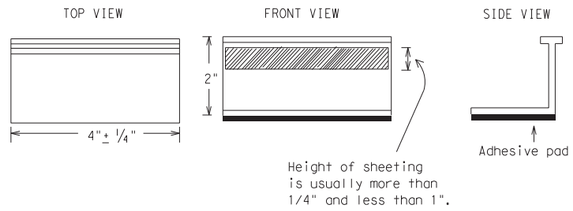
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

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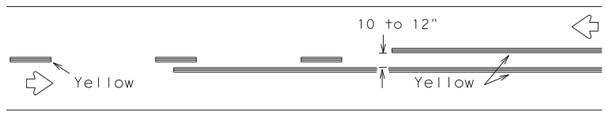
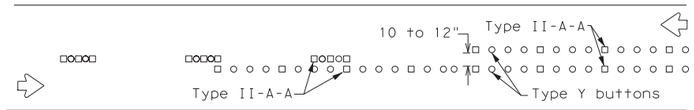
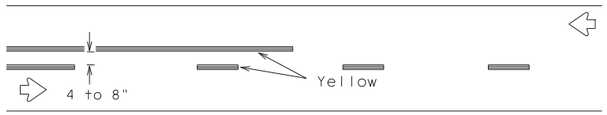
PAVEMENT MARKING PATTERNS



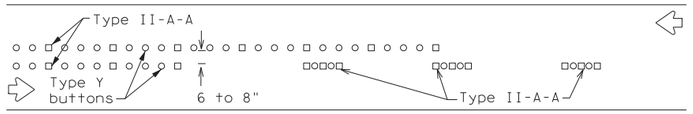
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



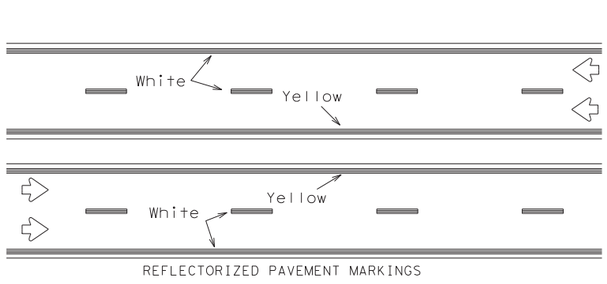
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



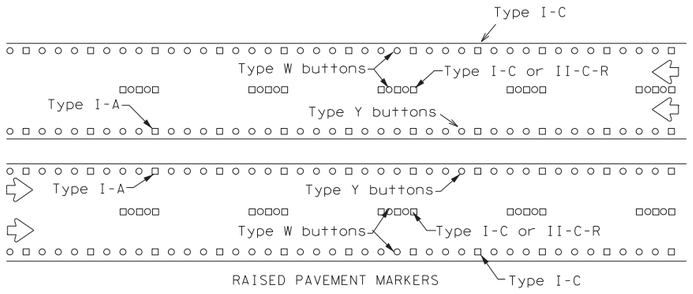
RAISED PAVEMENT MARKERS - PATTERN B

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

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



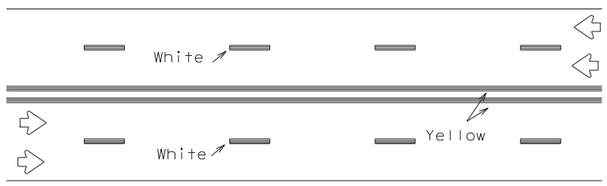
REFLECTORIZED PAVEMENT MARKINGS



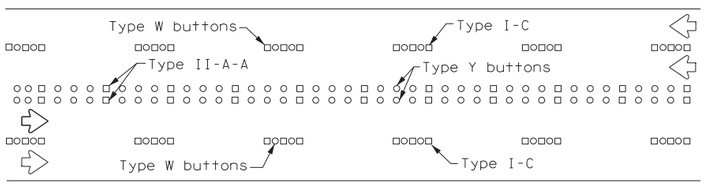
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



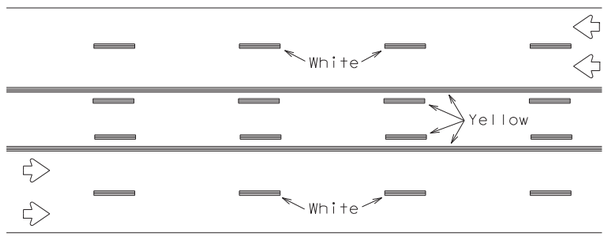
REFLECTORIZED PAVEMENT MARKINGS



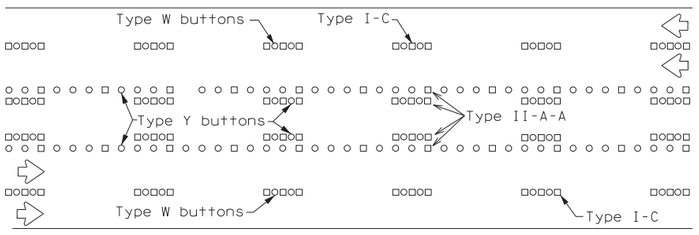
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

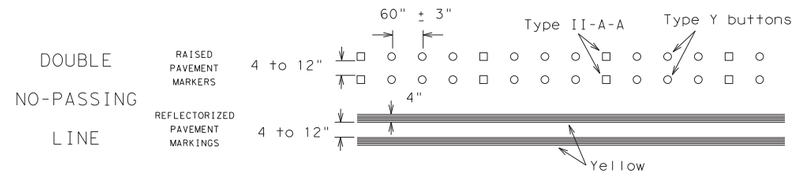
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

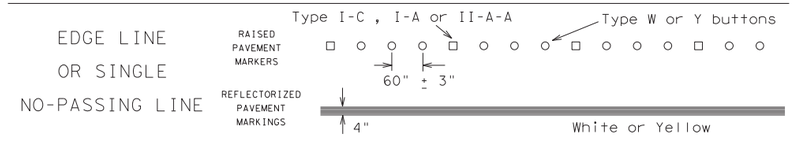
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

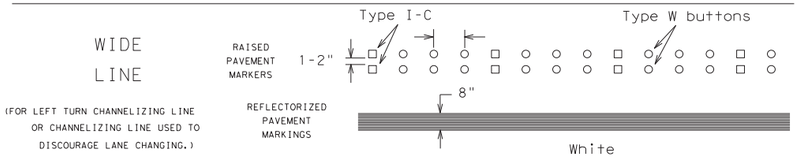


EDGE LINE OR SINGLE NO-PASSING LINE



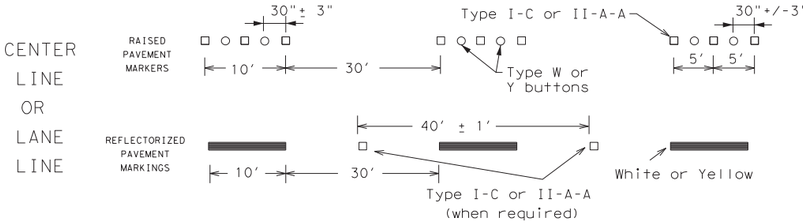
WIDE LINE

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

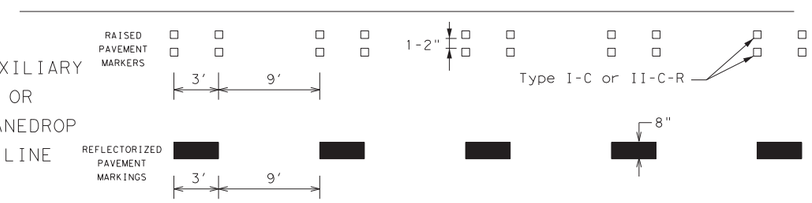


BROKEN LINES

CENTER LINE OR LANE LINE

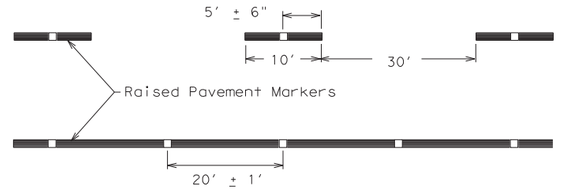


AUXILIARY OR LANEDROP LINE



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."

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BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

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1-97 9-07 5-21	DIST	COUNTY		SHEET NO.
2-98 7-13	FTW	JOHNSON		18
11-02 8-14				

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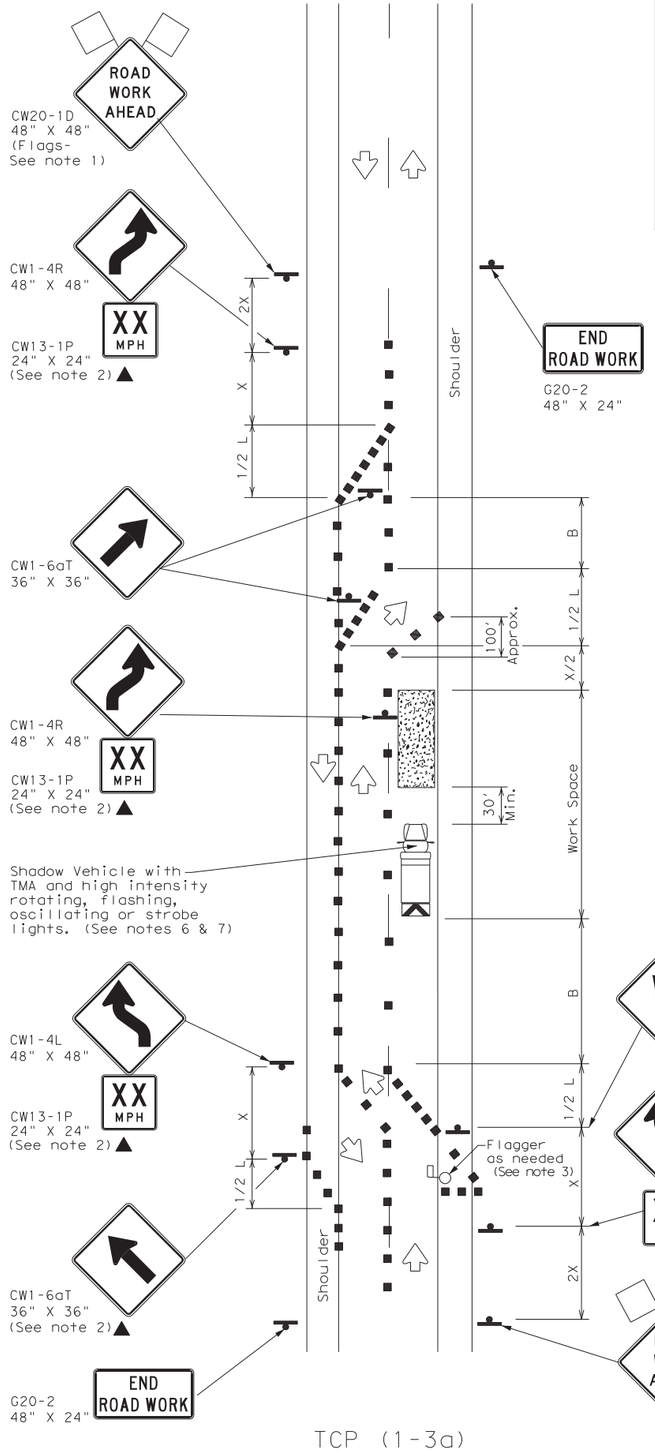
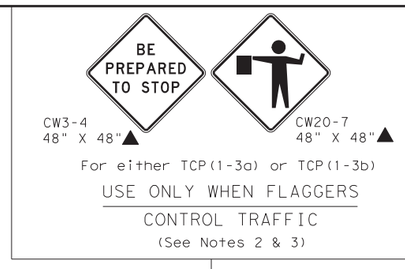


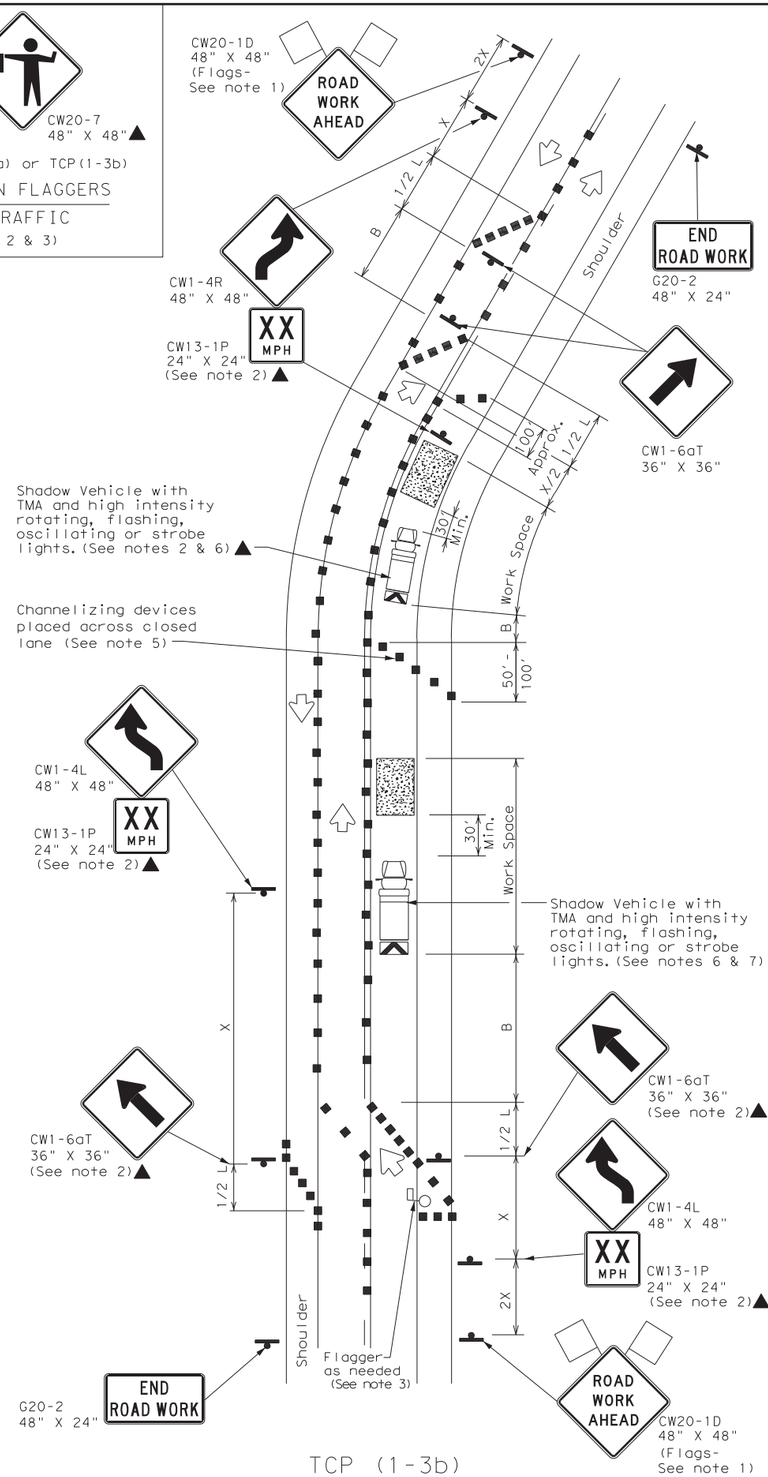
TCP (1-3a)
2-LANE ROADWAY WITH PAVED SHOULDERS

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	0902	50	143	VA
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	FTW	JOHNSON		19
1-97 2-18				

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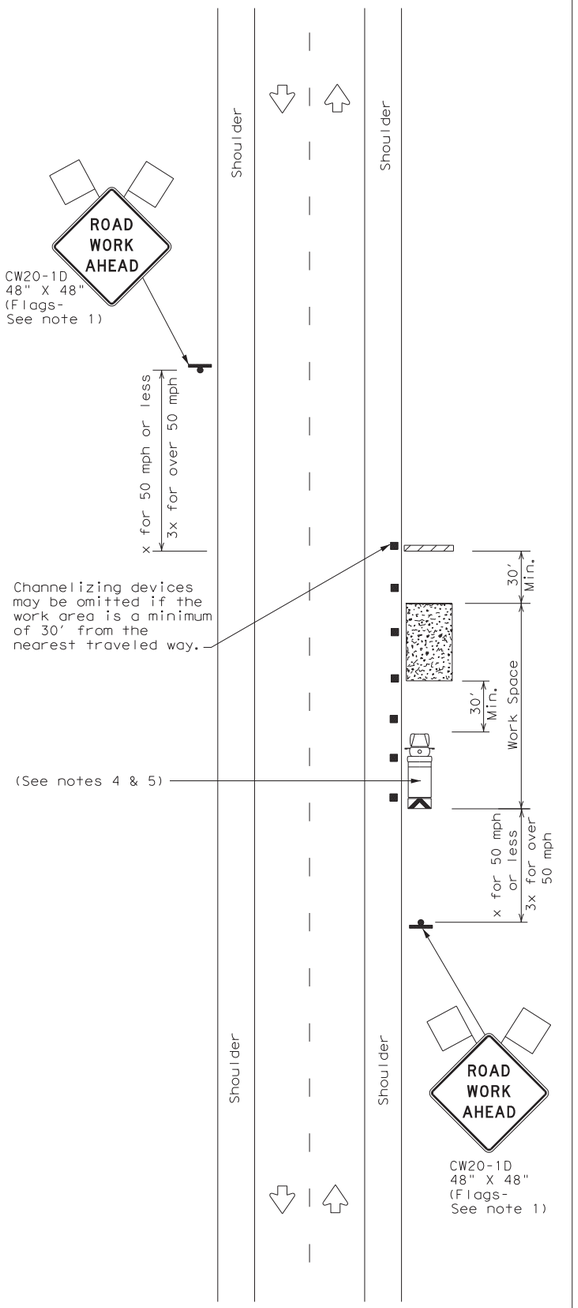
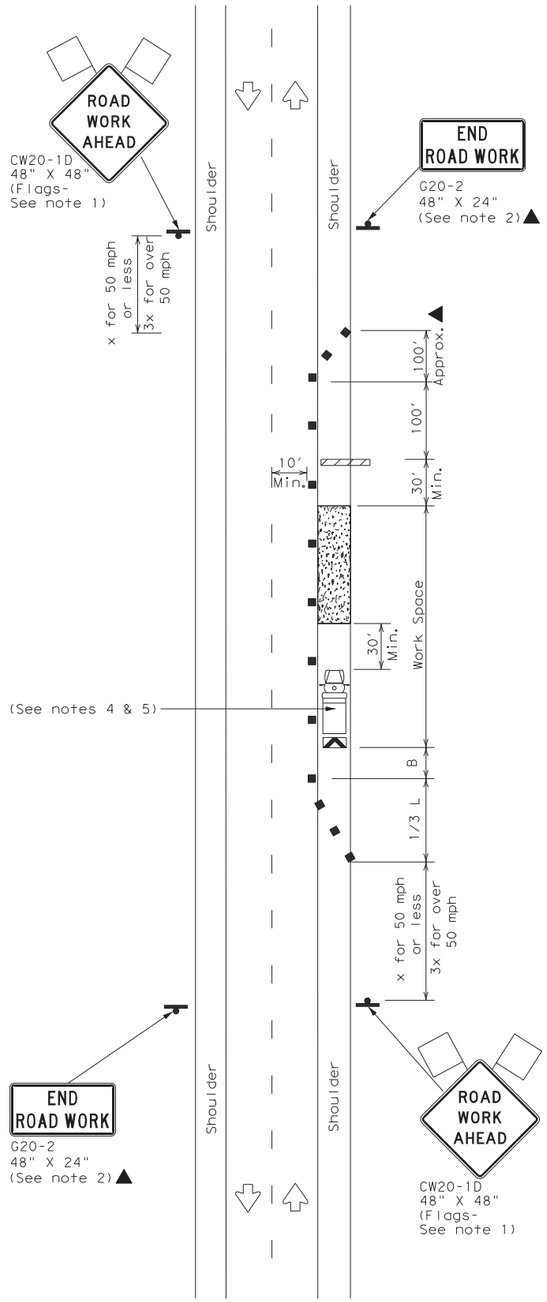


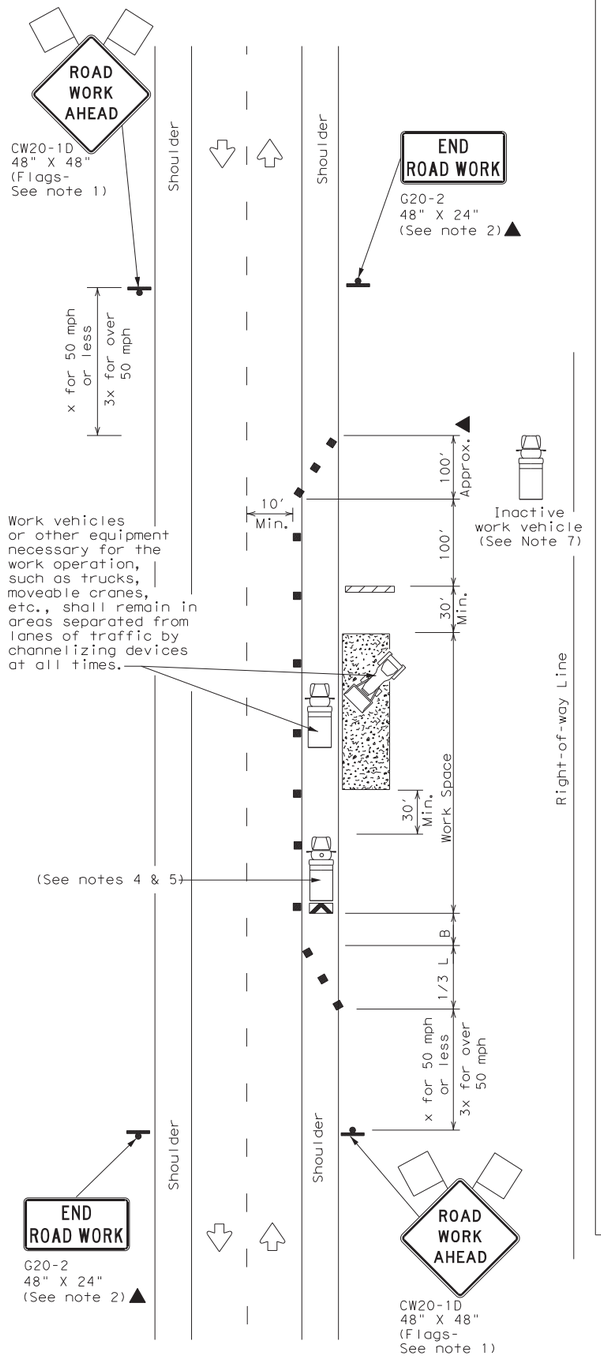
TCP (2-1a)

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		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
REVISIONS	0902	50	143	VA
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	FTW	JOHNSON		20
1-97 2-18				

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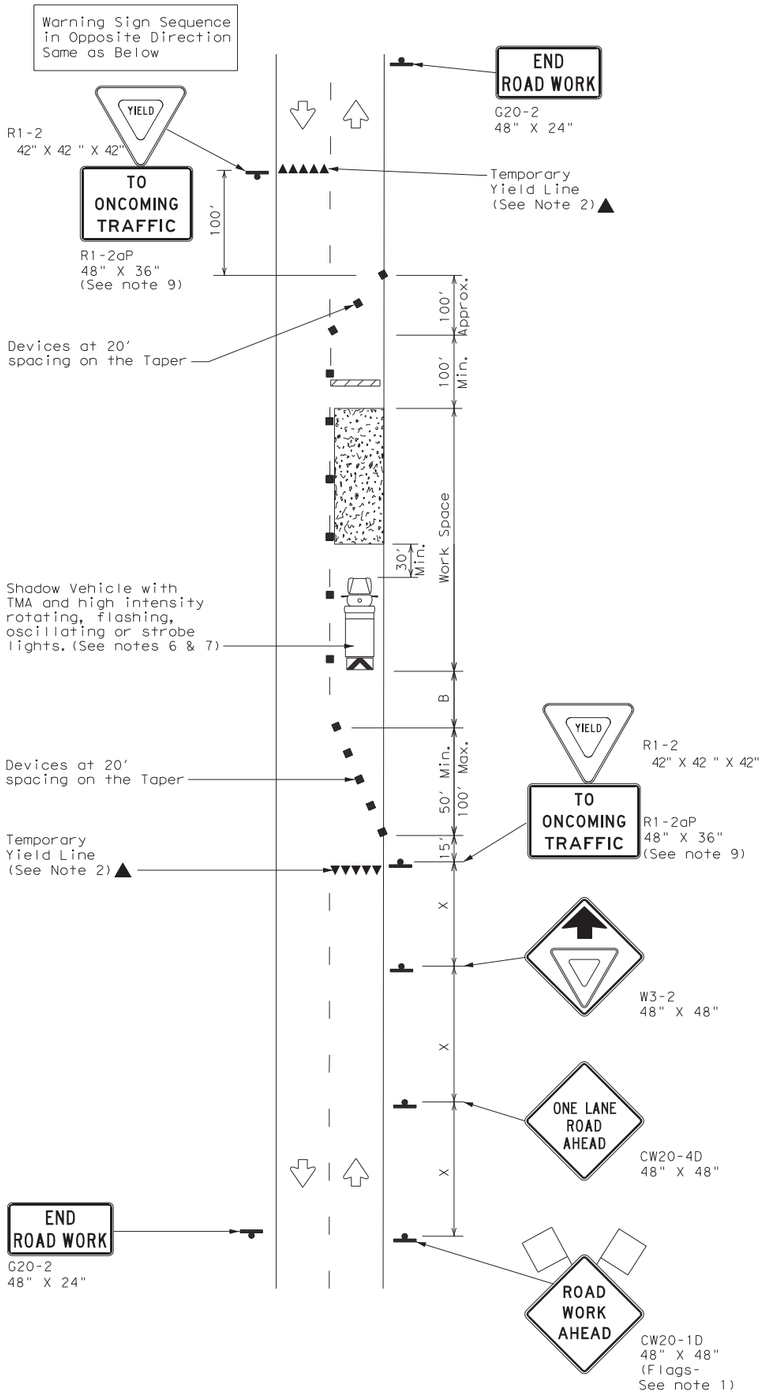
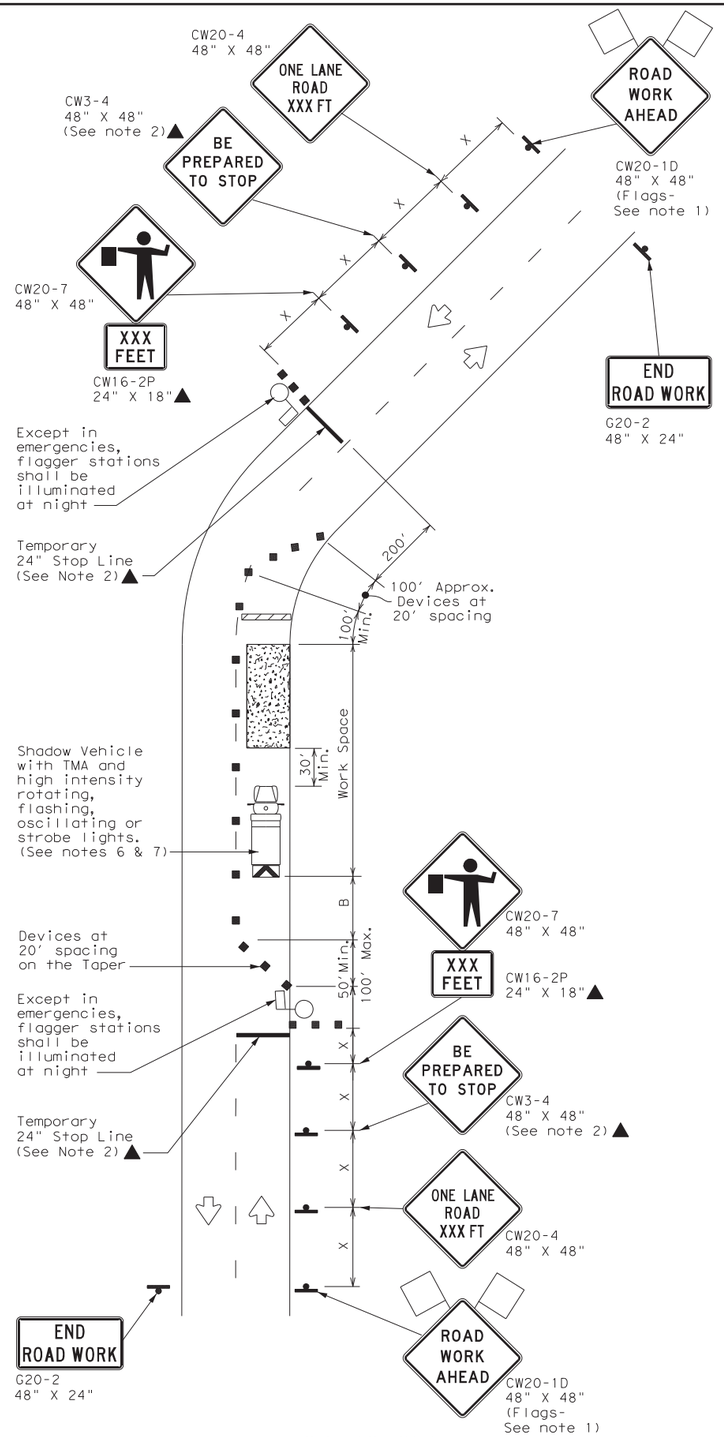
DATE: DATE TIME
FILE: DOCUMENT NAME



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	0902	50	143	VA
8-95 3-03	DIST	COUNTY		SHEET NO.
1-97 2-12	FTW	JOHNSON		21
4-98 2-18				

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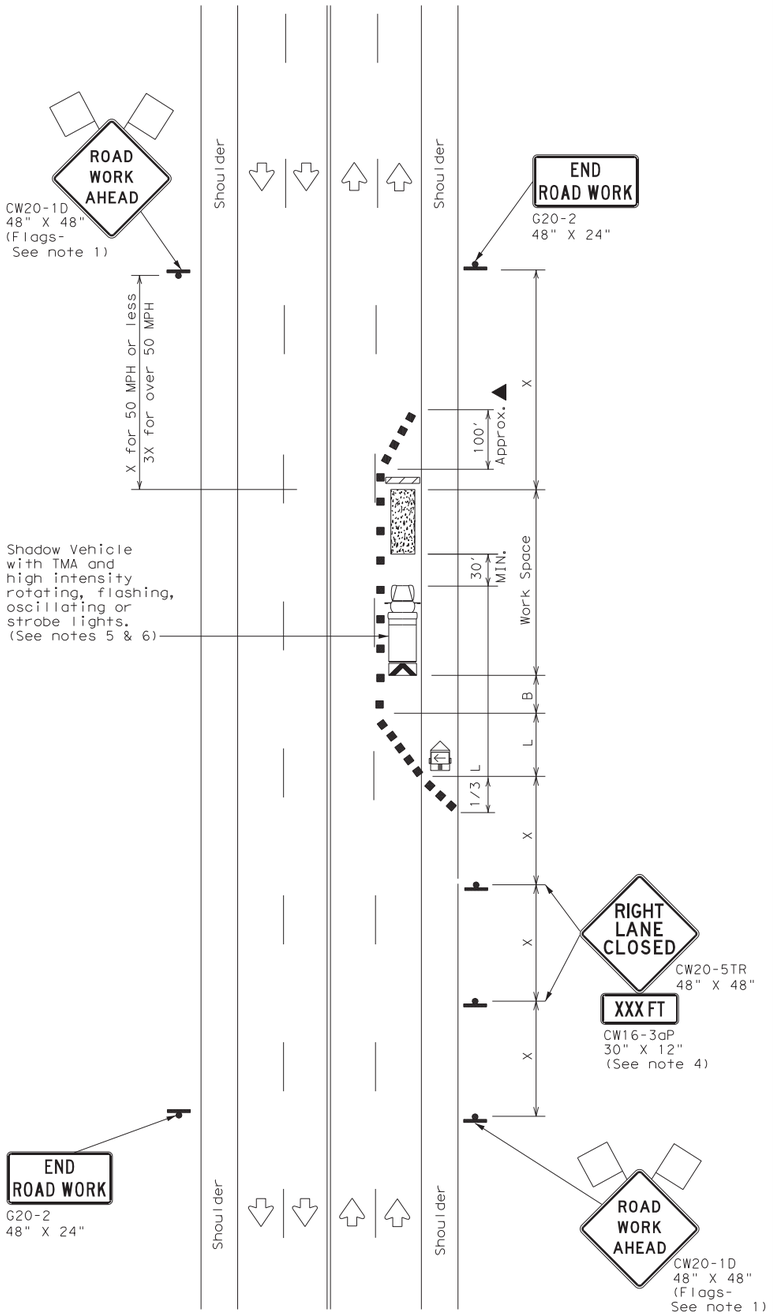
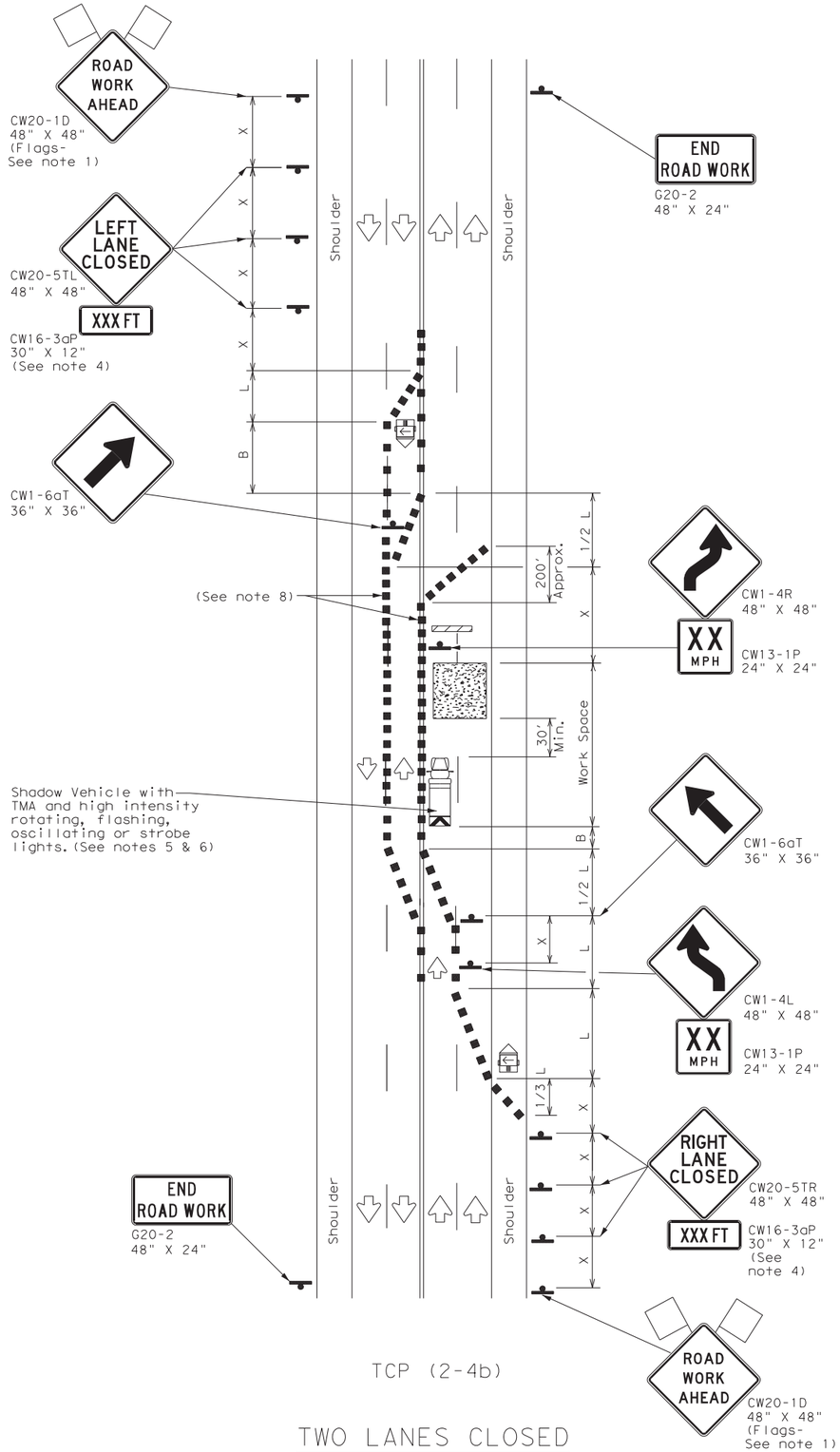
FILE: DOCUMENT NAME



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

FILE: tcp2-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0902	50	143	VA
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	FTW	JOHNSON		22

DATE:
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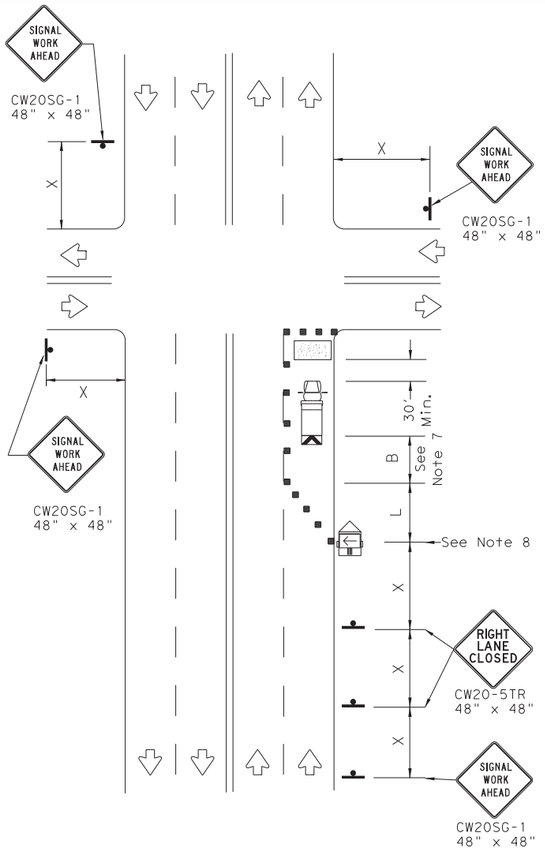
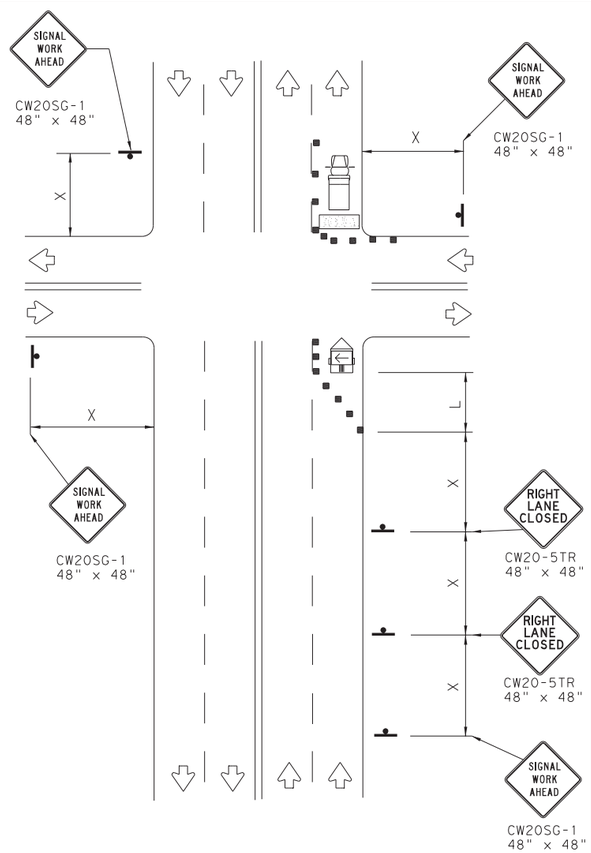


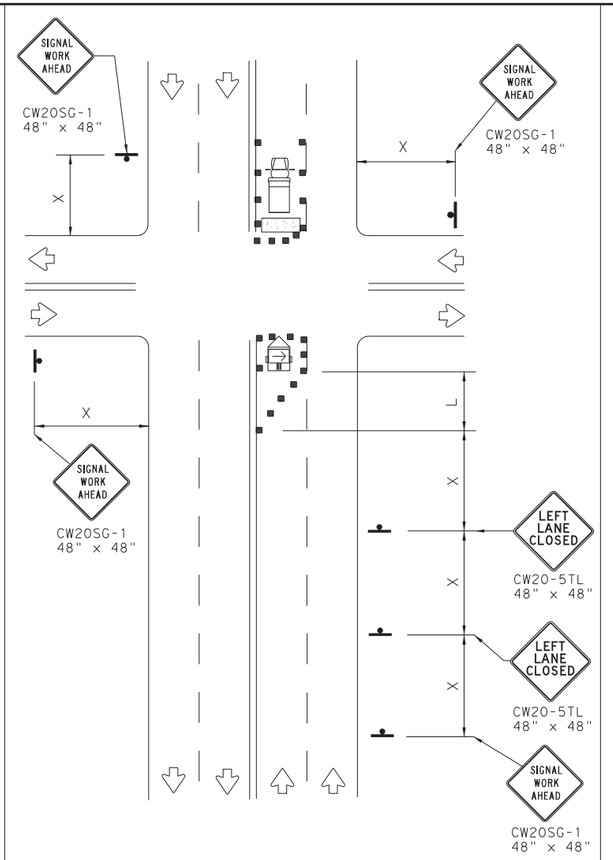
NEAR SIDE LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY



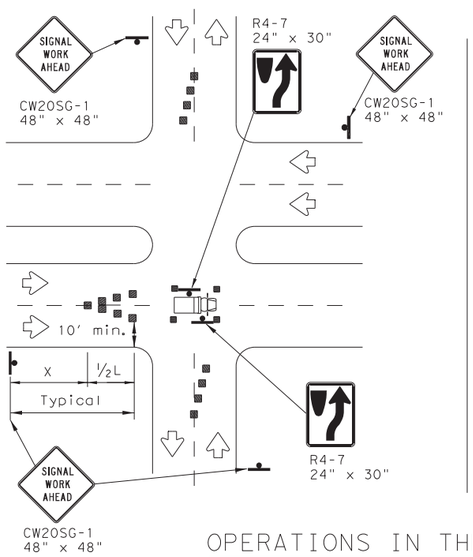
FAR SIDE RIGHT LANE CLOSURE

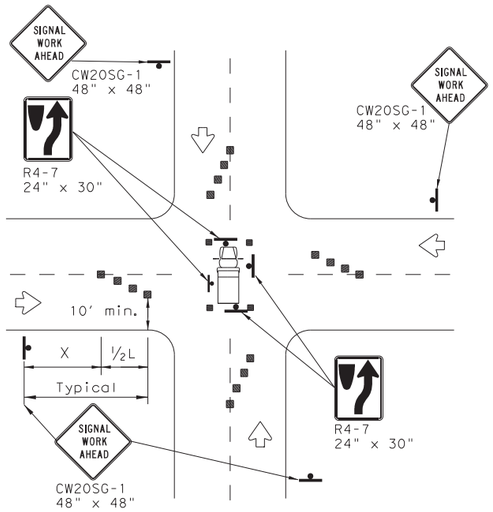
SHORT DURATION OR SHORT TERM STATIONARY



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

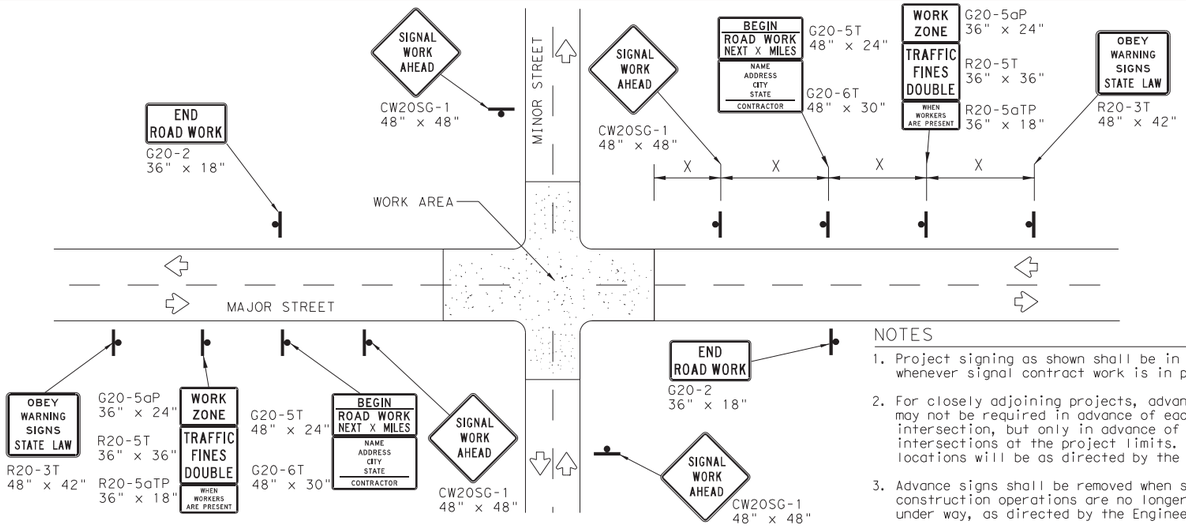
Traffic Operations Division Standard

TRAFFIC SIGNAL WORK TYPICAL DETAILS

WZ(BTS-1)-13

FILE: wzbts-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	50	143	VA
2-98 10-99 7-13	DIST	COUNTY		SHEET NO.
4-98 3-03	FTW	JOHNSON		23

DATE:
FILE:



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 alluminum 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 backfilled upon completion of the work.

REFLECTIVE SHEETING

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

SIGN SUPPORT WEIGHTS

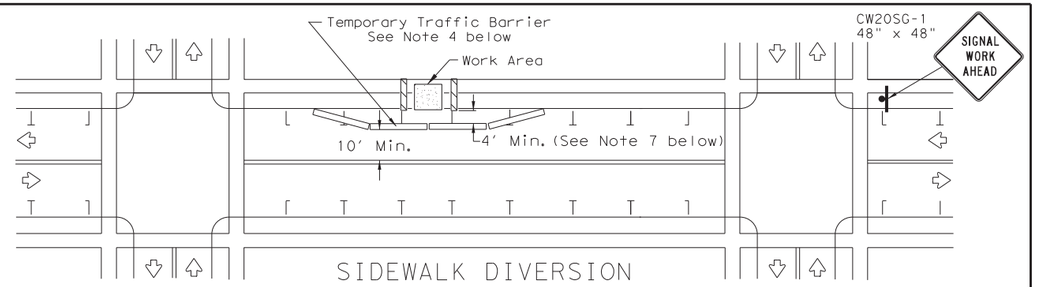
1. Weights used to keep signs from turning over should be sandbags filled with dry, cohesionless material.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects will not be permitted for use as sign support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

LEGEND	
	Sign
	Channelizing Devices
	Type 3 Barricade

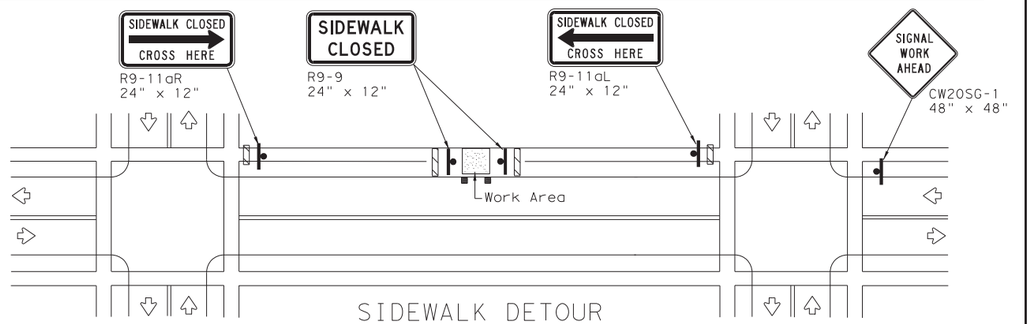
DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
FLEXIBLE ROLL-UP REFLECTIVE SIGNS	DMS-8310

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

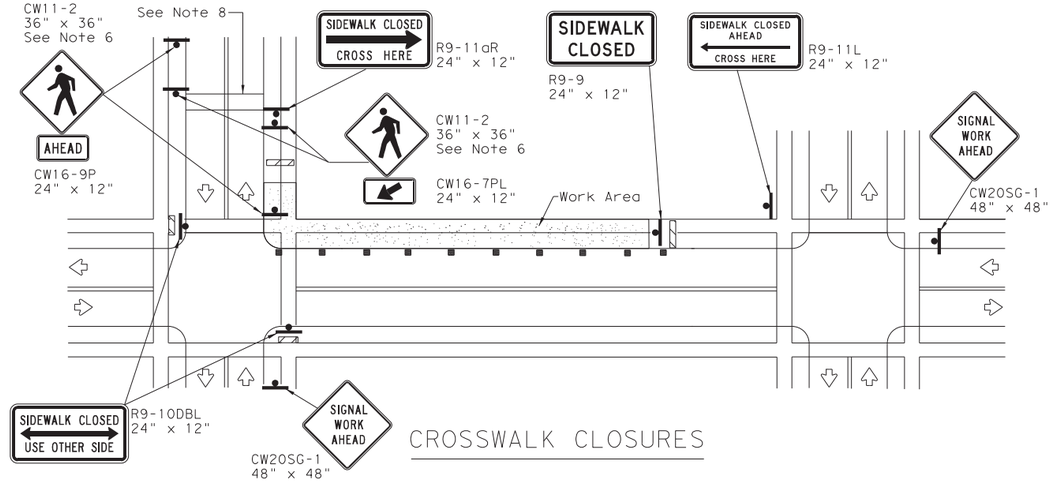
Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found at the following web address:
http://www.txdot.gov/txdot_library/publications/construction.htm



SIDEWALK DIVERSION



SIDEWALK DETOUR



CROSSWALK CLOSURES

PEDESTRIAN CONTROL

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

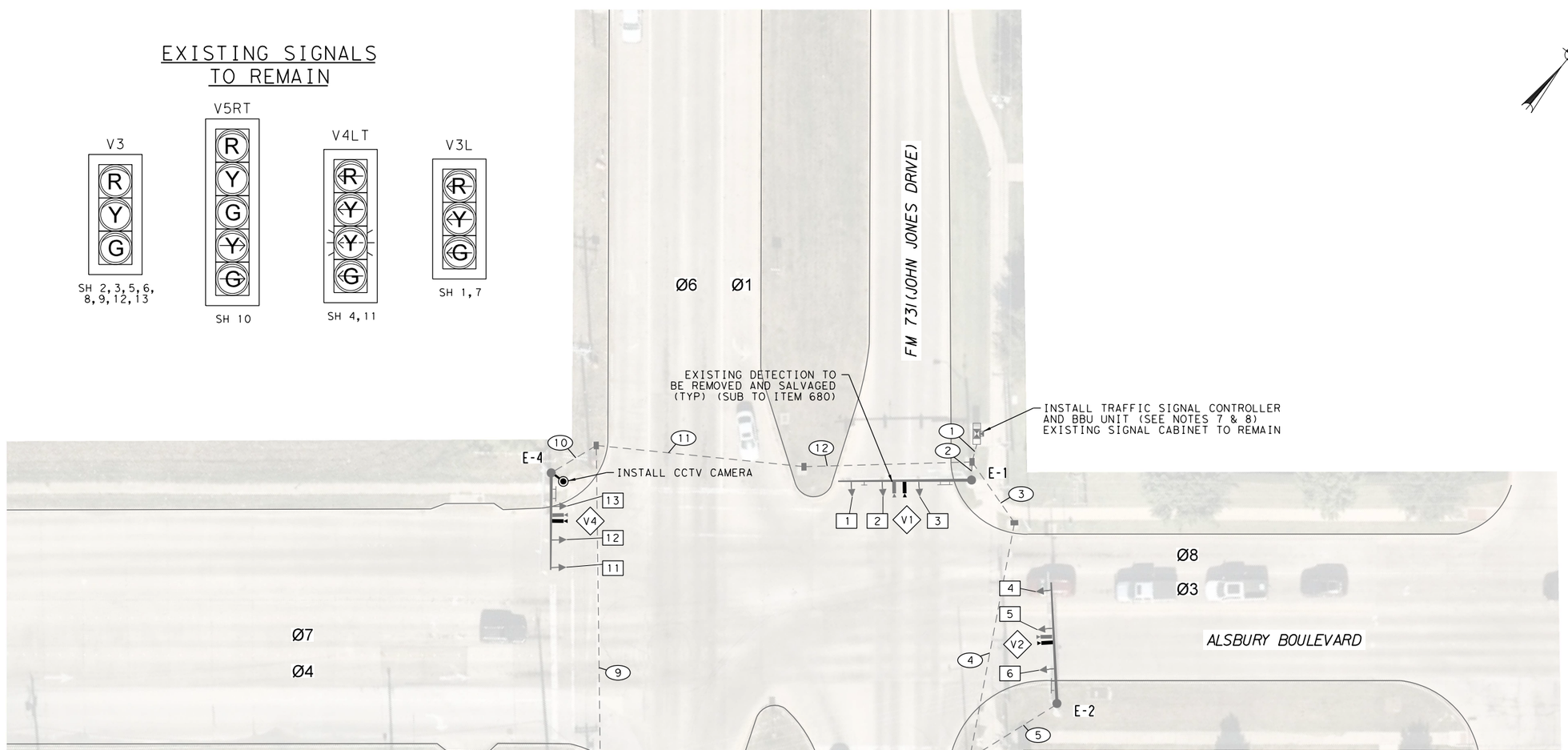
Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC SIGNAL WORK BARRICADES AND SIGNS

WZ(BTS-2)-13

FILE:	wzbts-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS		0902	50	143	VA
2-98 10-99 7-13		DIST	COUNTY		SHEET NO.
4-98 3-03		FTW	JOHNSON		24



NOTES:

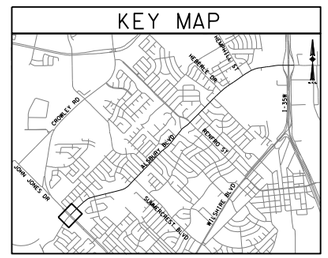
1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE EXISTING TRAFFIC SIGNAL HARDWARE, PAVEMENT MARKINGS, SIGNING, AND THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO MAKE DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES TO AVOID DAMAGE THERETO.
2. EXISTING EQUIPMENT TO BE REMOVED SHALL BE RETURNED TO THE CITY OF BURLESON. CONTRACTOR TO COORDINATE WITH CITY SENIOR PUBLIC WORKS ENGINEER AT 817-426-9183 TO RETURN SALVAGED EQUIPMENT.
3. ALL PROPOSED WORK IS WITHIN THE EXISTING RIGHT OF WAY. NO WORK IS TO BE PERFORMED OUTSIDE OF THE RIGHT OF WAY.
4. THE ENGINEER DOES NOT CONFIRM OR VALIDATE THE EXISTING ITEMS SHOWN.
5. CONTRACTOR TO CONTACT CITY OF BURLESON SENIOR PUBLIC WORKS ENGINEER (817-426-9183) AND TxDOT TRAFFIC SIGNAL OFFICE 48 HOURS IN ADVANCE TO COORDINATE WORK. CONTRACTOR TO COORDINATE WITH CITY OF BURLESON TO PULL REQUIRED PERMITS, PRIOR TO STARTING WORK.
6. CONTRACTOR SHALL MAINTAIN THE EXISTING SIGNAL OPERATIONS AT THIS INTERSECTION UNTIL THE PROPOSED EQUIPMENT IS OPERATIONAL.
7. INSTALL SIGNAL CONTROLLER (SIEMENS M60 SERIES ATC CONTROLLER) AND BBU UNIT, AS SPECIFIED IN APPROVED SOLE SOURCE PROCUREMENT MEMO.
8. ALL EQUIPMENT TO BE PROCURED AND INSTALLED BY THE CONTRACTOR, UNLESS STATED OTHERWISE. CONTRACTOR TO COORDINATE WITH CITY OF BURLESON PRIOR TO PROCUREMENT OF MATERIALS TO ENSURE COMPATABILITY WITH EXISTING SYSTEM. CONTRACTOR TO PROCURE EQUIPMENT LISTED BELOW:

SUMMARY OF TRAFFIC SIGNAL EQUIPMENT		
EQUIPMENT	ITEM NO.	DESCRIPTION*
DETECTION	6306	ITERIS VANTAGE APEX DETECTION SYSTEM
CONTROLLER	SUB TO 680	SIEMENS M60 SERIES ATC
CCTV CAMERA	6010	AXIS Q6315-LE CAMERA
BBU	6058	BATTERY BACKUP UNIT

* REFER TO APPROVED SOLE SOURCE PROCUREMENT MEMO.

0 10 20 40
ORIGINALLY PLOTTED SCALE:
SCALE: 1" = 40'

KEY MAP

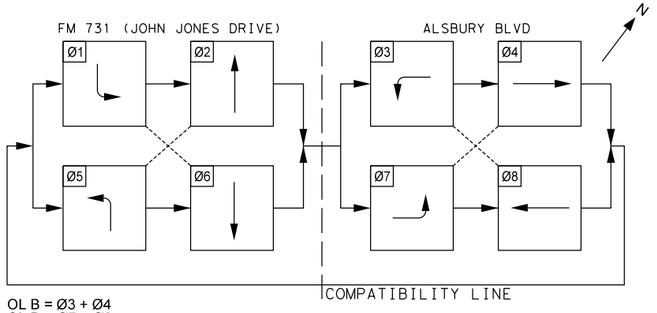


LEGEND

- EXISTING SIGNAL POLE
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET AND CONCRETE PAD
- EXISTING CONDUIT
- EXISTING GROUND BOX
- E-1 — EXISTING TRAFFIC SIGNAL POLE NUMBER
- V1 — PROPOSED VIVDS
- PROPOSED CCTV CAMERA
- 1 — SIGNAL HEAD LABEL
- S1 — SIGN LABEL
- (1) — CONDUIT LABEL

PHASE SEQUENCE

COMPATIBLE PHASES



OL B = Ø3 + Ø4
OL D = Ø7 + Ø8

9/29/2023

STATE OF TEXAS
ABIGAIL AXELSON
146056
LICENSED
PROFESSIONAL ENGINEER

Kimley»Horn F-928
2600 N. Central Expressway
Suite 400
Richardson, TX 75080
Tel. No. (214) 617-0535

THE CITY OF BURLESON TEXAS

Texas Department of Transportation

TRAFFIC SAFETY IMPROVEMENTS
PROPOSED CONDITIONS

ALSBURY BOULEVARD
AT FM 731 (JOHN JONES DRIVE)

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
ASA	6	(SEE TITLE SHEET)		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
AM	TEXAS	FTW	JOHNSON	25
CHECK	CONTROL	SECTION	JOB	
HMF	0902	50	143	
CHECK				
ASA				

PLOTTED: 11/17/2023
FILENAME: K:\DAL_TPTO\project\06116609S - Burleson HSIP - Alsbury PS&E\CADD\BURL-ALS_11_John Jones at Alsbury_Prop Conditions.dgn
BY: Abby.Axelson
40.0000 ft / in.

CONDUIT AND CABLE CHART
WIRE SIZE AND TYPE

RUN NO	CONDUIT STATUS	ITEM 618 CONDUIT (SCH 80) 3" PVC (TRENCHED) Qty	3" PVC (TRENCHED) Len	4" PVC (BORED) Qty	4" PVC (BORED) Len	CABLE STATUS	ITEM 6036 VIVDS CABLE Qty	VIVDS CABLE Len	ITEM 6010 ETHERNET CABLE (CCTV CAMERA) Qty	ETHERNET CABLE (CCTV CAMERA) Len	TOTAL LENGTH OF RUN	RUN NO
1	E	1				I	4	40	1	10	10	1
2	E	1				I	1	10			10	2
3	E	1				I	1	25			25	3
4	E			1		I	1	85			85	4
5	E	1				I	1	35			35	5
6	E			1		I					55	6
7	E			1		I					75	7
8	E	1				I	1	35			35	8
9	E			1		I	1	115			115	9
10	E	1				I	1	20	1	20	20	10
11	E			1		I	2	140	1	70	70	11
12	E			1		I	2	120	1	60	60	12
SUBTOTAL			0		0			625		160		
E-1	P					I		60			VARIES	E-1
E-2	P					I		60			VARIES	E-2
E-3	P					I		65			VARIES	E-3
E-4	P					I		55		30	VARIES	E-4
SUBTOTAL			0		0			240		30		
TOTAL			0		0			865		190		

CONDUIT STATUS: I=INSTALL; E=EXISTING; P=WIRE TO BE INSTALLED INSIDE STEEL POLE
P-# - REFERS TO WIRING WITHIN THE SIGNAL POLE AND MAST ARM.

GROUND BOX SUMMARY

ITEM NO.	DESCRIPTION	UNIT	QTY.
0627	GROUND BOX (PREPARE)	EA	7

VIVDS DETECTION ZONE DETAILS

DETECTOR NUMBER	MOUNTING LOCATION	MOUNTING HEIGHT	ZONE(S)	DESCRIPTION
V1	SIGNAL POLE E-1	24'	NB + NBLT	ADVANCED + PRESENCE
V2	SIGNAL POLE E-2	24'	EB + EBLT	ADVANCED + PRESENCE
V3	SIGNAL POLE E-3	24'	SB + SBLT	ADVANCED + PRESENCE
V4	SIGNAL POLE E-4	24'	WB + WBLT	ADVANCED + PRESENCE

9/29/2023

STATE OF TEXAS
ABIGAIL AXELSON
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2600 N. Central Expressway
Suite 400
Richardson, TX 75080
Tel. No. (214) 617-0535

THE CITY OF BURLESON TEXAS

TRAFFIC SAFETY IMPROVEMENTS
PROPOSED QUANTITIES

ALSBURY BOULEVARD
AT FM 731 (JOHN JONES DRIVE)

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
ASA	6	(SEE TITLE SHEET)		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
AM	TEXAS	FTW	JOHNSON	26
CHECK	CONTROL	SECTION	JOB	
HMF	0902	50	143	
CHECK				
ASA				

PLOTTED: 11/17/2023
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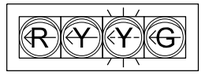
40.0000 ft / in.
BY: Abby.Axelson

PROPOSED SIGNALS

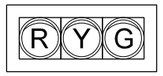
H4FLT



SH 1, 5, 9, 13

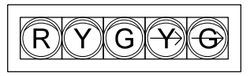
EXISTING SIGNALS TO REMAIN

H3



SH 3, 7, 8, 11, 12, 15, 16

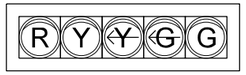
H5RT



SH 4

EXISTING SIGNALS TO BE REMOVED

H5LT



SH 2, 6, 10, 14

PROPOSED SIGNS

R10-17T

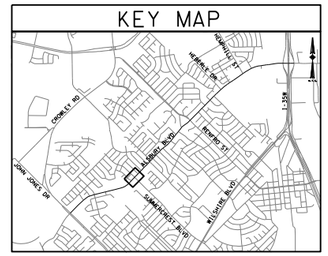
EXISTING SIGNS TO BE REMOVED

R10-12

0 10 20 40

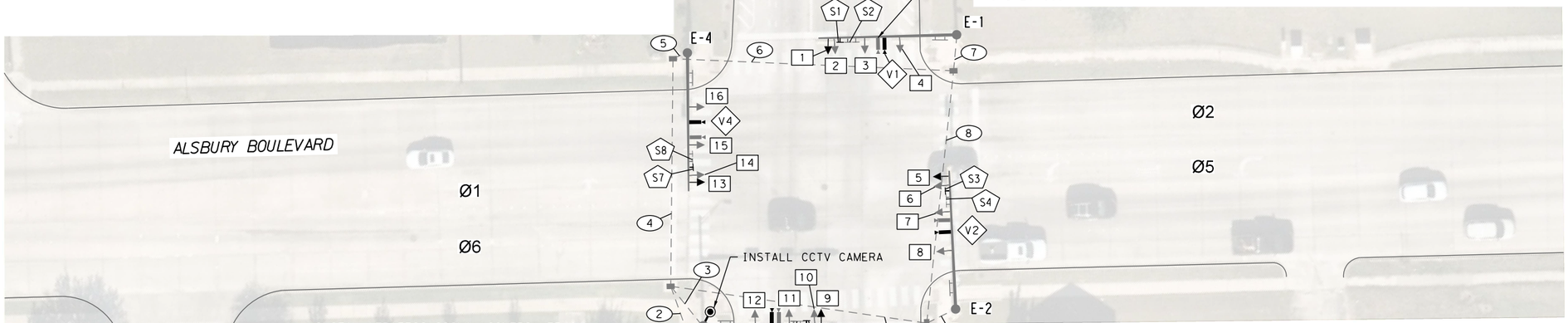
ORIGINALLY PLOTTED SCALE:
SCALE: 1" = 40'

KEY MAP



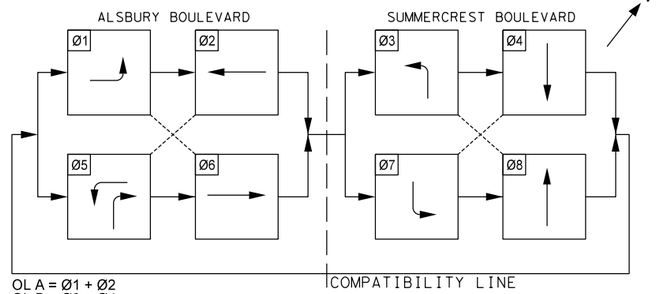
LEGEND

- EXISTING SIGNAL POLE
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET AND CONCRETE PAD
- EXISTING CONDUIT
- EXISTING GROUND BOX
- E-1 — EXISTING TRAFFIC SIGNAL POLE NUMBER
- V1 — PROPOSED VIVDS
- PROPOSED CCTV CAMERA
- 1 — SIGNAL HEAD LABEL
- S1 — SIGN LABEL
- (1) — CONDUIT LABEL



PHASE SEQUENCE

— — COMPATIBLE PHASES



OL A = Ø1 + Ø2
OL B = Ø3 + Ø4
OL C = Ø5 + Ø6
OL D = Ø7 + Ø8

NOTES:

1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE EXISTING TRAFFIC SIGNAL HARDWARE, PAVEMENT MARKINGS, SIGNING, AND THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO MAKE DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES TO AVOID DAMAGE THERETO.
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6. THE LOCATION OF THE PROPOSED SIGNAL HEADS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED BY THE ENGINEER TO ACCOMMODATE FIELD CONDITIONS.
7. CONTRACTOR SHALL MAINTAIN EXISTING SIGNAL OPERATIONS AT THIS INTERSECTION UNTIL THE PROPOSED EQUIPMENT IS OPERATIONAL.
8. INSTALL SIGNAL CONTROLLER (SIEMENS M60 SERIES ATC CONTROLLER), AS SPECIFIED IN APPROVED SOLE SOURCE PROCUREMENT MEMO.
9. CONTRACTOR TO REFER TO PHASE DIAGRAM FOR FLASHING YELLOW ARROW OVERLAP TERMINATIONS INSIDE CABINET AND TERMINATE THE 7 CONDUCTOR CABLE AT THE SIGNAL POLE BASE INSIDE THE TERMINATION BLOCK. CONTRACTOR TO UPGRADE MMU EQUIPMENT TO ENSURE FLASHING YELLOW ARROW CAPABILITIES (SUB TO ITEM 680). CONTRACTOR TO INSTALL RETROREFLECTIVE TAPE ON ALL EXISTING SIGNAL HEAD BACKPLATES THAT ARE TO REMAIN (SUB TO ITEM 680).
10. PRIOR TO THE CONCLUSION OF PROJECT, THE CONTRACTOR SHALL COORDINATE WITH CITY OF BURLESON TRAFFIC SIGNAL TECHNICIANS ABOUT THE FLASHING YELLOW ARROW LOAD SWITCH CONFIGURATION. THE CONTRACTOR SHALL INCLUDE A NOTICE IN THE CABINET IF THE FLASHING YELLOW ARROW CONFIGURATION IS CUSTOM.
11. IF NEEDED, CONTRACTOR TO USE ASTRO-BRAC EXTENSION TO ALIGN FLASHING YELLOW ARROW HEADS OVER CENTER OF LEFT TURN LANES.

NOTES (CONTINUED):

12. ALL EQUIPMENT TO BE PROCURED AND INSTALLED BY THE CONTRACTOR, UNLESS STATED OTHERWISE. CONTRACTOR TO COORDINATE WITH CITY OF BURLESON PRIOR TO PROCUREMENT OF MATERIALS TO ENSURE COMPATABILITY WITH EXISTING SYSTEM. CONTRACTOR TO PROCURE EQUIPMENT LISTED BELOW:

SUMMARY OF TRAFFIC SIGNAL EQUIPMENT		
EQUIPMENT	ITEM NO.	DESCRIPTION*
DETECTION	6306	ITERIS VANTAGE APEX DETECTION SYSTEM
CONTROLLER	SUB TO 680	SIEMENS M60 SERIES ATC
CCTV CAMERA	6010	AXIS Q6315-LE CAMERA

* REFER TO APPROVED SOLE SCOURCE PROCUREMENT MEMO.

9/29/2023

STATE OF TEXAS
ABIGAIL AXELSON
146056
LICENSED
PROFESSIONAL ENGINEER

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2600 N. Central Expressway
Suite 400
Richardson, TX 75080
Tel. No. (214) 617-0535

THE CITY OF BURLESON TEXAS

Texas Department of Transportation

TRAFFIC SAFETY IMPROVEMENTS
PROPOSED CONDITIONS

ALSBURY BOULEVARD
AT SUMMERCREST BOULEVARD

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
ASA	6	(SEE TITLE SHEET)		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
AM	TEXAS	FTW	JOHNSON	27
CHECK	CONTROL	SECTION	JOB	
HMF	0902	50	143	
CHECK				
ASA				

PLOTTED: 11/17/2023
FILENAME: K:\DAL_TPTO\1project\061166095 - Burleson HSIP - Alsbury PS&E\CADD\BURL-ALS_12_Summercrest at Alsbury_Prop Conditions.dgn
40.0000 ft / in.
BY: Abby.Axelson

CONDUIT AND CABLE CHART WIRE SIZE AND TYPE													
RUN NO	CONDUIT STATUS	ITEM 618 CONDUIT (SCH 80)				CABLE STATUS	ITEM 684 TRAFFIC SIGNAL CABLES		ITEM 6306		ITEM 6010		TOTAL LENGTH OF RUN	RUN NO
		3" PVC (TRENCHED)		4" PVC (BORED)			TY A 7 CNDR NO. 14		VIVDS CABLE		ETHERNET CABLE (CCTV CAMERA)			
		Qty	Len	Qty	Len		Qty	Len	Qty	Len	Qty	Len		
1	E	1				I			4	60	1	15	15	1
2	E	1				I			4	80	1	20	20	2
3	E	1				I			1	20	1	20	20	3
4	E			1		I			2	160			80	4
5	E	1				I			1	10			10	5
6	E			1		I			1	100			100	6
7	E	1				I			1	15			15	7
8	E			1		I							90	8
9	E	1				I			1	15			15	9
10	E			1		I			1	90			90	10
SUBTOTAL			0		0			0		550		55		
E-1	P					I		65		55			VARIES	E-1
E-2	P					I		65		55			VARIES	E-2
E-3	P					I		60		50		30	VARIES	E-3
E-4	P					I		65		55			VARIES	E-4
SUBTOTAL			0		0			255		215		30		
TOTAL			0		0			255		765		85		

CONDUIT STATUS: I=INSTALL; E=EXISTING; P=WIRE TO BE INSTALLED INSIDE STEEL POLE
P-# - REFERS TO WIRING WITHIN THE SIGNAL POLE AND MAST ARM.

SIGNS SUMMARY					
SIGN *	SIGN TYPE	SIGN LEGEND	STATUS	SUPPORT	SIGN DIMENSION (in x in)
S1	R10-17T	LEFT TURN YIELD ON FLASHING YELLOW ARROW	I	E-1	36"x 42"
S2	R10-12	LEFT TURN YIELD ON GREEN BALL	REM	E-1	-
S3	R10-17T	LEFT TURN YIELD ON FLASHING YELLOW ARROW	I	E-2	36"x 42"
S4	R10-12	LEFT TURN YIELD ON GREEN BALL	REM	E-2	-
S5	R10-17T	LEFT TURN YIELD ON FLASHING YELLOW ARROW	I	E-3	36"x 42"
S6	R10-12	LEFT TURN YIELD ON GREEN BALL	REM	E-3	-
S7	R10-17T	LEFT TURN YIELD ON FLASHING YELLOW ARROW	I	E-4	36"x 42"
S8	R10-12	LEFT TURN YIELD ON GREEN BALL	REM	E-4	-

STATUS: I=INSTALL; E=EXISTING; REM=EXISTING TO BE REMOVED; REL=EXISTING TO BE RELOCATED
* - ALL SIGNS TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR (SUB TO ITEM 680).

VIVDS DETECTION ZONE DETAILS				
DETECTOR NUMBER	MOUNTING LOCATION	MOUNTING HEIGHT	ZONE(S)	DESCRIPTION
V1	SIGNAL POLE E-1	24'	NB + NBLT	ADVANCED + PRESENCE
V2	SIGNAL POLE E-2	24'	EB + EBLT	ADVANCED + PRESENCE
V3	SIGNAL POLE E-3	24'	SB + SBLT	ADVANCED + PRESENCE
V4	SIGNAL POLE E-4	24'	WB + WBLT	ADVANCED + PRESENCE

SIGNAL HEADS (ITEM 682)						
SIGNAL HEAD NUMBER	12" LED SIGNAL INDICATION					
	SIGNAL HEAD TYPE	STATUS	BACK PLATE	LED SIGNAL LAMPS		
			4 SEC	<-G-	<-Y-	<-R-
			EA	EA	EA	EA
1	H4FLT	I	1	1	2	1
2	H3	E				
3	H5LT	REM				
4	H5RT	E				
5	H4FLT	I	1	1	2	1
6	H5LT	REM				
7	H3	E				
8	H3	E				
9	H4FLT	I	1	1	2	1
10	H5LT	REM				
11	H3	E				
12	H3	E				
13	H4FLT	I	1	1	2	1
14	H5LT	REM				
15	H3	E				
16	H3	E				
TOTAL (NEW)				4	8	4

STATUS: I=INSTALL; E=EXISTING; REM=EXISTING TO BE REMOVED

GROUND BOX SUMMARY			
ITEM NO.	DESCRIPTION	UNIT	QTY.
0627	GROUND BOX (PREPARE)	EA	5

9/29/2023

STATE OF TEXAS
ABIGAIL AXELSON
146056
LICENSED
PROFESSIONAL ENGINEER

Kimley»Horn F-928
2600 N. Central Expressway
Suite 400
Richardson, TX 75080 Tel. No. (214) 617-0535

THE CITY OF BURLESON TEXAS

TRAFFIC SAFETY IMPROVEMENTS
PROPOSED QUANTITIES

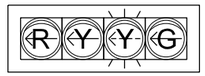
ALSBURY BOULEVARD
AT SUMMERCREST BOULEVARD

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
ASA	6	(SEE TITLE SHEET)		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
AM	TEXAS	FTW	JOHNSON	28
CHECK	CONTROL	SECTION	JOB	
HMF	0902	50	143	
CHECK				
ASA				

PLOTTED: 11/17/2023
FILENAME: K:\DAL_TPTO\1project\061166095 - Burleson HSIP - Alsbury PS&E\CADD\BURL-ALS_12a_Summercrest at Alsbury_Quantities.dgn
40.0000 ft / in.
BY: Abby.Axelson

PROPOSED SIGNALS

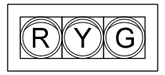
H4FLT



SH 1, 5, 9, 14

EXISTING SIGNALS TO REMAIN

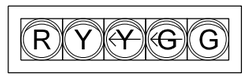
H3



SH 3, 4, 7, 8, 11, 12, 13, 16, 17

EXISTING SIGNALS TO BE REMOVED

H5LT



SH 2, 6, 10, 15

PROPOSED SIGNS

R10-17T

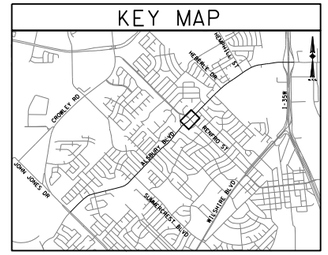
EXISTING SIGNS TO BE REMOVED

R10-12

0 10 20 40

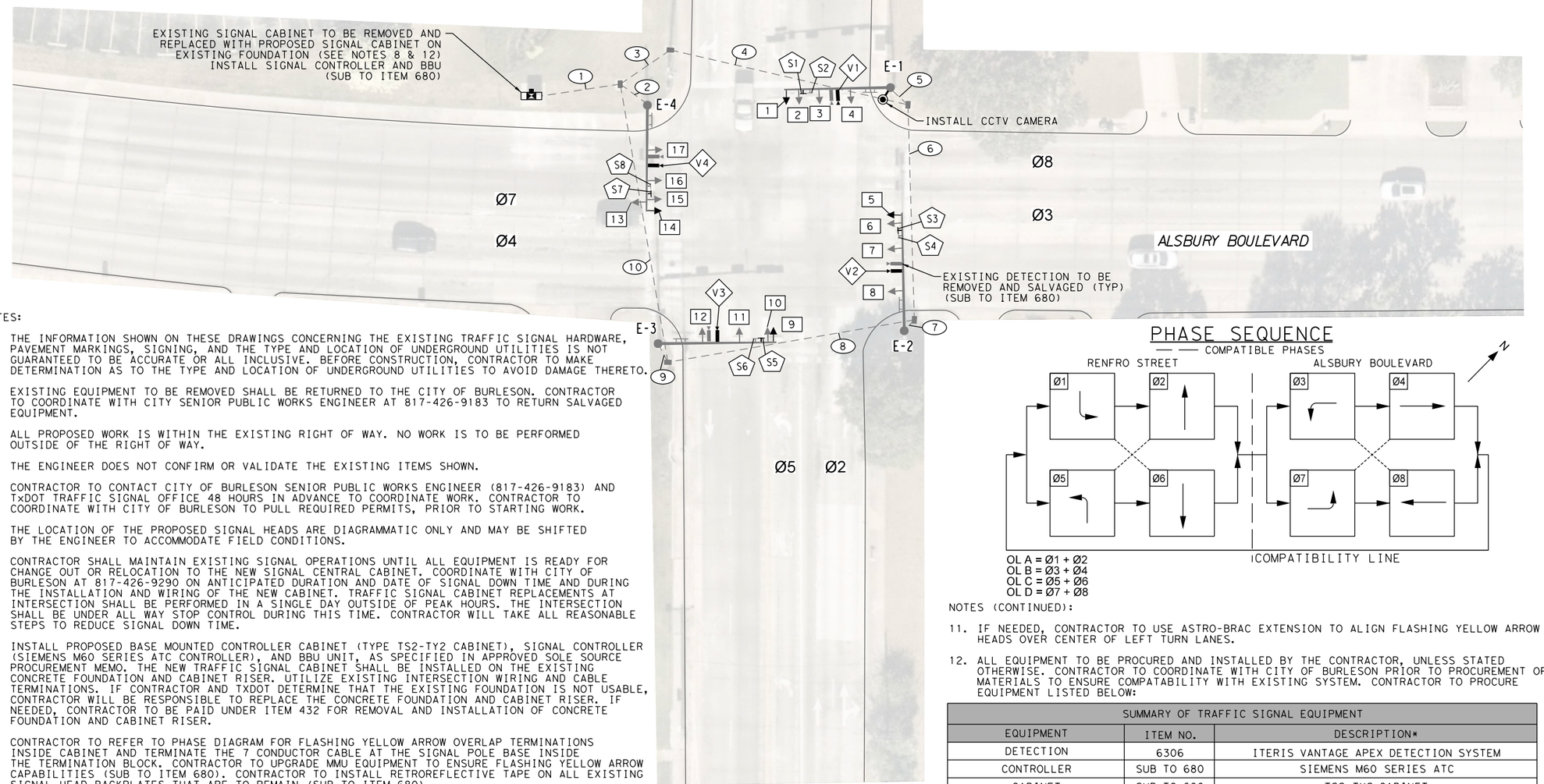
ORIGINALLY PLOTTED SCALE:
SCALE: 1" = 40'

KEY MAP



LEGEND

- EXISTING SIGNAL POLE
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET AND CONCRETE PAD
- EXISTING CONDUIT
- EXISTING GROUND BOX
- E-1 — EXISTING TRAFFIC SIGNAL POLE NUMBER
- V1 — PROPOSED VIVDS
- PROPOSED CCTV CAMERA
- 1 — SIGNAL HEAD LABEL
- S1 — SIGN LABEL
- (1) — CONDUIT LABEL
- PROPOSED TRAFFIC SIGNAL CONTROLLER CABINET, BBU, AND CONCRETE PAD



NOTES:

1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE EXISTING TRAFFIC SIGNAL HARDWARE, PAVEMENT MARKINGS, SIGNING, AND THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO MAKE DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES TO AVOID DAMAGE THERETO.
2. EXISTING EQUIPMENT TO BE REMOVED SHALL BE RETURNED TO THE CITY OF BURLESON. CONTRACTOR TO COORDINATE WITH CITY SENIOR PUBLIC WORKS ENGINEER AT 817-426-9183 TO RETURN SALVAGED EQUIPMENT.
3. ALL PROPOSED WORK IS WITHIN THE EXISTING RIGHT OF WAY. NO WORK IS TO BE PERFORMED OUTSIDE OF THE RIGHT OF WAY.
4. THE ENGINEER DOES NOT CONFIRM OR VALIDATE THE EXISTING ITEMS SHOWN.
5. CONTRACTOR TO CONTACT CITY OF BURLESON SENIOR PUBLIC WORKS ENGINEER (817-426-9183) AND TxDOT TRAFFIC SIGNAL OFFICE 48 HOURS IN ADVANCE TO COORDINATE WORK. CONTRACTOR TO COORDINATE WITH CITY OF BURLESON TO PULL REQUIRED PERMITS, PRIOR TO STARTING WORK.
6. THE LOCATION OF THE PROPOSED SIGNAL HEADS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED BY THE ENGINEER TO ACCOMMODATE FIELD CONDITIONS.
7. CONTRACTOR SHALL MAINTAIN EXISTING SIGNAL OPERATIONS UNTIL ALL EQUIPMENT IS READY FOR CHANGE OUT OR RELOCATION TO THE NEW SIGNAL CENTRAL CABINET. COORDINATE WITH CITY OF BURLESON AT 817-426-9290 ON ANTICIPATED DURATION AND DATE OF SIGNAL DOWN TIME AND DURING THE INSTALLATION AND WIRING OF THE NEW CABINET. TRAFFIC SIGNAL CABINET REPLACEMENTS AT INTERSECTION SHALL BE PERFORMED IN A SINGLE DAY OUTSIDE OF PEAK HOURS. THE INTERSECTION SHALL BE UNDER ALL WAY STOP CONTROL DURING THIS TIME. CONTRACTOR WILL TAKE ALL REASONABLE STEPS TO REDUCE SIGNAL DOWN TIME.
8. INSTALL PROPOSED BASE MOUNTED CONTROLLER CABINET (TYPE TS2-TY2 CABINET), SIGNAL CONTROLLER (SIEMENS M60 SERIES ATC CONTROLLER), AND BBU UNIT, AS SPECIFIED IN APPROVED SOLE SOURCE PROCUREMENT MEMO. THE NEW TRAFFIC SIGNAL CABINET SHALL BE INSTALLED ON THE EXISTING CONCRETE FOUNDATION AND CABINET RISER. UTILIZE EXISTING INTERSECTION WIRING AND CABLE TERMINATIONS. IF CONTRACTOR AND TXDOT DETERMINE THAT THE EXISTING FOUNDATION IS NOT USABLE, CONTRACTOR WILL BE RESPONSIBLE TO REPLACE THE CONCRETE FOUNDATION AND CABINET RISER. IF NEEDED, CONTRACTOR TO BE PAID UNDER ITEM 432 FOR REMOVAL AND INSTALLATION OF CONCRETE FOUNDATION AND CABINET RISER.
9. CONTRACTOR TO REFER TO PHASE DIAGRAM FOR FLASHING YELLOW ARROW OVERLAP TERMINATIONS INSIDE CABINET AND TERMINATE THE 7 CONDUCTOR CABLE AT THE SIGNAL POLE BASE INSIDE THE TERMINATION BLOCK. CONTRACTOR TO UPGRADE MMU EQUIPMENT TO ENSURE FLASHING YELLOW ARROW CAPABILITIES (SUB TO ITEM 680). CONTRACTOR TO INSTALL RETROREFLECTIVE TAPE ON ALL EXISTING SIGNAL HEAD BACKPLATES THAT ARE TO REMAIN (SUB TO ITEM 680).
10. PRIOR TO THE CONCLUSION OF PROJECT, THE CONTRACTOR SHALL COORDINATE WITH CITY OF BURLESON TRAFFIC SIGNAL TECHNICIANS ABOUT THE FLASHING YELLOW ARROW LOAD SWITCH CONFIGURATION. THE CONTRACTOR SHALL INCLUDE A NOTICE IN THE CABINET IF THE FLASHING YELLOW ARROW CONFIGURATION IS CUSTOM.

PHASE SEQUENCE

— — COMPATIBLE PHASES

OL A = Ø1 + Ø2
OL B = Ø3 + Ø4
OL C = Ø5 + Ø6
OL D = Ø7 + Ø8

NOTES (CONTINUED):

11. IF NEEDED, CONTRACTOR TO USE ASTRO-BRAC EXTENSION TO ALIGN FLASHING YELLOW ARROW HEADS OVER CENTER OF LEFT TURN LANES.
12. ALL EQUIPMENT TO BE PROCURED AND INSTALLED BY THE CONTRACTOR, UNLESS STATED OTHERWISE. CONTRACTOR TO COORDINATE WITH CITY OF BURLESON PRIOR TO PROCUREMENT OF MATERIALS TO ENSURE COMPATABILITY WITH EXISTING SYSTEM. CONTRACTOR TO PROCURE EQUIPMENT LISTED BELOW:

SUMMARY OF TRAFFIC SIGNAL EQUIPMENT		
EQUIPMENT	ITEM NO.	DESCRIPTION*
DETECTION	6306	ITERIS VANTAGE APEX DETECTION SYSTEM
CONTROLLER	SUB TO 680	SIEMENS M60 SERIES ATC
CABINET	SUB TO 680	TS2-TY2 CABINET
CCTV CAMERA	6010	AXIS Q6315-LE CAMERA
BBU	6085	BATTERY BACKUP UNIT

* REFER TO APPROVED SOLE SOURCE PROCUREMENT MEMO.

9/29/2023

STATE OF TEXAS
ABIGAIL AXELSON
146056
LICENSED
PROFESSIONAL ENGINEER

Kimley»Horn F-928
2600 N. Central Expressway
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Richardson, TX 75080
Tel. No. (214) 617-0535

THE CITY OF BURLESON TEXAS

TRAFFIC SAFETY IMPROVEMENTS
PROPOSED CONDITIONS

ALSBURY BOULEVARD
AT RENFRO STREET

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
ASA	6	(SEE TITLE SHEET)		VA
GRAPHICS AM	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK HMF	TEXAS	FTW	JOHNSON	29
CHECK ASA	CONTROL	SECTION	JOB	
	0902	50	143	

PLOTTED: 11/17/2023
FILENAME: K:\DAL_TPTO\project\06116095 - Burleson HSIP - Alsbury PS&E\CADD\BURL-ALS_13_Renfro at Alsbury_Prop Conditions.dgn
40.0000 ft / in.
BY: Abby.Axelson

CONDUIT AND CABLE CHART
WIRE SIZE AND TYPE

RUN NO	CONDUIT STATUS	ITEM 618 CONDUIT (SCH 80) 3" PVC (TRENCHED) Qty	3" PVC (TRENCHED) Len	4" PVC (BORED) Qty	4" PVC (BORED) Len	CABLE STATUS	ITEM 684 TRAFFIC SIGNAL CABLES TY A 7 CNDR NO. 14 Qty	TY A 7 CNDR NO. 14 Len	ITEM 6306 VIVDS CABLE Qty	VIVDS CABLE Len	ITEM 6010 ETHERNET CABLE (CCTV CAMERA) Qty	ETHERNET CABLE (CCTV CAMERA) Len	TOTAL LENGTH OF RUN	RUN NO
1	E	1				I			4	140	1	35	35	1
2	E	1				I			1	20			20	2
3	E	1				I			2	50	1	25	25	3
4	E			1		I			2	190	1	95	95	4
5	E	1				I			1	10	1	10	10	5
6	E			1		I			1	80			80	6
7	E	1				I			1	10			10	7
8	E			1		I							95	8
9	E	1				I			1	10			10	9
10	E			1		I			1	110			110	10
SUBTOTAL			0		0			0		620		165		
E-1	P					I		60		45		30	VARIES	E-1
E-2	P					I		65		45			VARIES	E-2
E-3	P					I		65		45			VARIES	E-3
E-4	P					I		60		50			VARIES	E-4
SUBTOTAL			0		0			250		185		30		
TOTAL			0		0			250		805		195		

CONDUIT STATUS: I=INSTALL; E=EXISTING; P=WIRE TO BE INSTALLED INSIDE STEEL POLE
P-# - REFERS TO WIRING WITHIN THE SIGNAL POLE AND MAST ARM.

SIGNAL HEADS (ITEM 682)

SIGNAL HEAD NUMBER	12" LED SIGNAL INDICATION SIGNAL HEAD TYPE	STATUS	BACK PLATE 4 SEC EA	LED SIGNAL LAMPS <-G- EA	<-Y- EA	<-R- EA
1	H4FLT	I	1	1	2	1
2	H5LT	REM				
3	H3	E				
4	H3	E				
5	H4FLT	I	1	1	2	1
6	H5LT	REM				
7	H3	E				
8	H3	E				
9	H4FLT	I	1	1	2	1
10	H5LT	REM				
11	H3	E				
12	H3	E				
13	H3	E				
14	H4FLT	I	1	1	2	1
15	H5LT	REM				
16	H3	E				
17	H3	E				
TOTAL (NEW)			4	4	8	4

STATUS: I=INSTALL; E=EXISTING; REM=EXISTING TO BE REMOVED

SIGNS SUMMARY

SIGN *	SIGN TYPE	SIGN LEGEND	STATUS	SUPPORT	SIGN DIMENSION (in x in)
S1	R10-17T	LEFT TURN YIELD ON FLASHING YELLOW ARROW	I	E-1	36"x 42"
S2	R10-12	LEFT TURN YIELD ON GREEN BALL	REM	E-1	-
S3	R10-17T	LEFT TURN YIELD ON FLASHING YELLOW ARROW	I	E-2	36"x 42"
S4	R10-12	LEFT TURN YIELD ON GREEN BALL	REM	E-2	-
S5	R10-17T	LEFT TURN YIELD ON FLASHING YELLOW ARROW	I	E-3	36"x 42"
S6	R10-12	LEFT TURN YIELD ON GREEN BALL	REM	E-3	-
S7	R10-17T	LEFT TURN YIELD ON FLASHING YELLOW ARROW	I	E-4	36"x 42"
S8	R10-12	LEFT TURN YIELD ON GREEN BALL	REM	E-4	-

STATUS: I=INSTALL; E=EXISTING; REM=EXISTING TO BE REMOVED; REL=EXISTING TO BE RELOCATED
* - ALL SIGNS TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR (SUB TO ITEM 680).

GROUND BOX SUMMARY

ITEM NO.	DESCRIPTION	UNIT	QTY.
0627	GROUND BOX (PREPARE)	EA	5

VIVDS DETECTION ZONE DETAILS

DETECTOR NUMBER	MOUNTING LOCATION	MOUNTING HEIGHT	ZONE(S)	DESCRIPTION
V1	SIGNAL POLE E-1	24'	NB + NBLT	ADVANCED + PRESENCE
V2	SIGNAL POLE E-2	24'	EB + EBLT	ADVANCED + PRESENCE
V3	SIGNAL POLE E-3	24'	SB + SBLT	ADVANCED + PRESENCE
V4	SIGNAL POLE E-4	24'	WB + WBLT	ADVANCED + PRESENCE

9/29/2023

STATE OF TEXAS
ABIGAIL AXELSON
146056
LICENSED
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2600 N. Central Expressway
Suite 400
Richardson, TX 75080
Tel. No. (214) 617-0535

THE CITY OF BURLESON TEXAS

TRAFFIC SAFETY IMPROVEMENTS
PROPOSED QUANTITIES

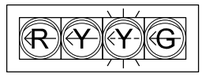
ALSBURY BOULEVARD
AT RENFRO STREET

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
ASA	6	(SEE TITLE SHEET)		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
AM	TEXAS	FTW	JOHNSON	30
CHECK	CONTROL	SECTION	JOB	
HMF	0902	50	143	
CHECK				
ASA				

PLOTTED: 11/17/2023
FILENAME: K:\DAL_TPTO\1project\061166095 - Burleson HSIP - Alsbury PS&E\CADD\BURL-ALS_13a_Renfro at Alsbury_Quantities.dgn
40.0000 ft / in.
BY: Abby.Axelson

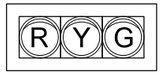
PROPOSED SIGNALS

H4FLT



SH 1,5,9

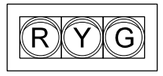
H3



SH 4,12

EXISTING SIGNALS TO REMAIN

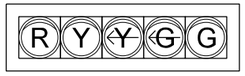
H3



SH 3,7,8,
11,13,14

EXISTING SIGNALS TO BE REMOVED

H5LT



SH 2,6,10

EXISTING SIGNS TO BE REMOVED

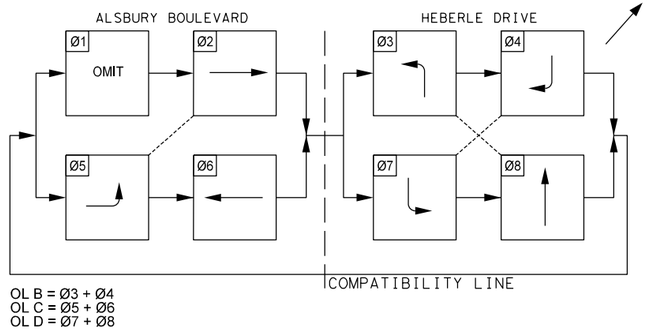
R10-12

PROPOSED SIGNS

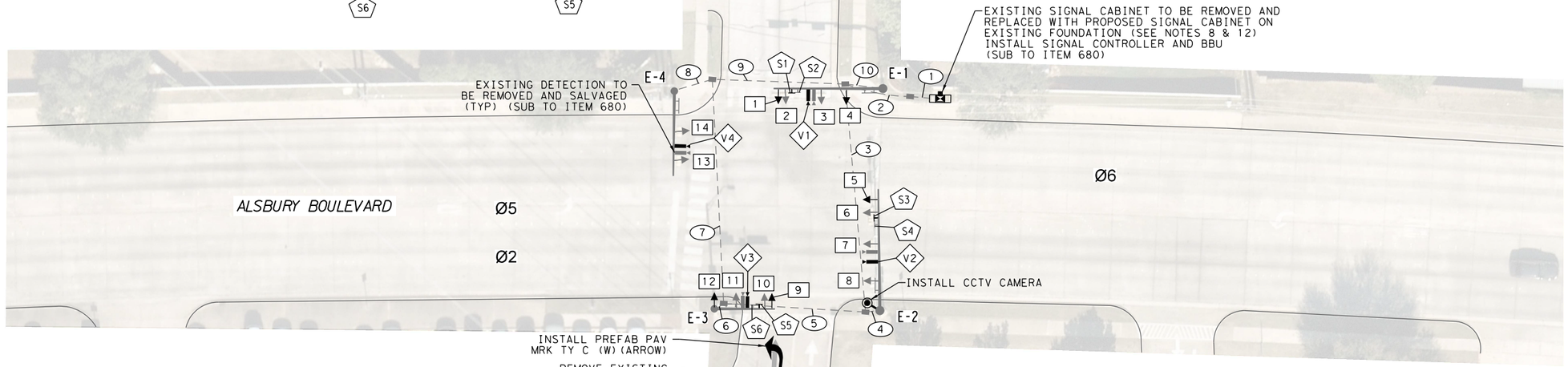
R10-17T

PHASE SEQUENCE

— — COMPATIBLE PHASES



OL B = Ø3 + Ø4
OL C = Ø5 + Ø6
OL D = Ø7 + Ø8



NOTES:

1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE EXISTING TRAFFIC SIGNAL HARDWARE, PAVEMENT MARKINGS, SIGNING, AND THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO MAKE DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES TO AVOID DAMAGE THERETO.
2. EXISTING EQUIPMENT TO BE REMOVED SHALL BE RETURNED TO THE CITY OF BURLESON. CONTRACTOR TO COORDINATE WITH CITY SENIOR PUBLIC WORKS ENGINEER AT 817-426-9183 TO RETURN SALVAGED EQUIPMENT.
3. ALL PROPOSED WORK IS WITHIN THE EXISTING RIGHT OF WAY. NO WORK IS TO BE PERFORMED OUTSIDE OF THE RIGHT OF WAY.
4. THE ENGINEER DOES NOT CONFIRM OR VALIDATE THE EXISTING ITEMS SHOWN.
5. CONTRACTOR TO CONTACT CITY OF BURLESON SENIOR PUBLIC WORKS ENGINEER (817-426-9183) AND TxDOT TRAFFIC SIGNAL OFFICE 48 HOURS IN ADVANCE TO COORDINATE WORK. CONTRACTOR TO COORDINATE WITH CITY OF BURLESON TO PULL REQUIRED PERMITS, PRIOR TO STARTING WORK.
6. THE LOCATION OF THE PROPOSED SIGNAL HEADS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED BY THE ENGINEER TO ACCOMMODATE FIELD CONDITIONS.
7. CONTRACTOR SHALL MAINTAIN EXISTING SIGNAL OPERATIONS UNTIL ALL EQUIPMENT IS READY FOR CHANGE OUT OR RELOCATION TO THE NEW SIGNAL CENTRAL CABINET. COORDINATE WITH CITY OF BURLESON AT 817-426-9290 ON ANTICIPATED DURATION AND DATE OF SIGNAL DOWN TIME AND DURING THE INSTALLATION AND WIRING OF THE NEW CABINET. TRAFFIC SIGNAL CABINET REPLACEMENT AT INTERSECTION SHALL BE PERFORMED IN A SINGLE DAY OUTSIDE OF PEAK HOURS. THE INTERSECTION SHALL BE UNDER ALL WAY STOP CONTROL DURING THIS TIME. CONTRACTOR WILL TAKE ALL REASONABLE STEPS TO REDUCE SIGNAL DOWN TIME.
8. INSTALL PROPOSED BASE MOUNTED CONTROLLER CABINET (TYPE TS2-TY2 CABINET), SIGNAL CONTROLLER (SIEMENS M60 SERIES ATC CONTROLLER), AND BBU UNIT, AS SPECIFIED IN APPROVED SOLE SOURCE PROCUREMENT MEMO. THE NEW TRAFFIC SIGNAL CABINET SHALL BE INSTALLED ON THE EXISTING CONCRETE FOUNDATION AND CABINET RISER. UTILIZE EXISTING INTERSECTION WIRING AND CABLE TERMINATIONS. IF CONTRACTOR AND TXDOT DETERMINE THAT THE EXISTING FOUNDATION IS NOT USABLE, CONTRACTOR WILL BE RESPONSIBLE TO REPLACE THE CONCRETE FOUNDATION AND CABINET RISER. IF NEEDED, CONTRACTOR TO BE PAID UNDER ITEM 432 FOR REMOVAL AND INSTALLATION OF CONCRETE FOUNDATION AND CABINET RISER.

NOTES (CONTINUED):

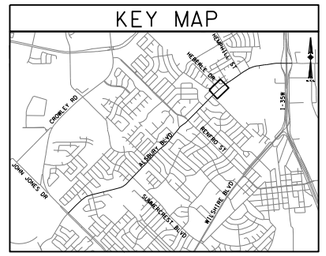
9. CONTRACTOR TO REFER TO PHASE DIAGRAM FOR FLASHING YELLOW ARROW OVERLAP TERMINATIONS INSIDE CABINET AND TERMINATE THE 7 CONDUCTOR CABLE AT THE SIGNAL POLE BASE INSIDE THE TERMINATION BLOCK. CONTRACTOR TO UPGRADE MMU EQUIPMENT TO ENSURE FLASHING YELLOW ARROW CAPABILITIES (SUB TO ITEM 680). CONTRACTOR TO INSTALL RETROREFLECTIVE TAPE ON ALL EXISTING SIGNAL HEAD BACKPLATES THAT ARE TO REMAIN (SUB TO ITEM 680).
10. PRIOR TO THE CONCLUSION OF PROJECT, THE CONTRACTOR SHALL COORDINATE WITH CITY OF BURLESON TRAFFIC SIGNAL TECHNICIANS ABOUT THE FLASHING YELLOW ARROW LOAD SWITCH CONFIGURATION. THE CONTRACTOR SHALL INCLUDE A NOTICE IN THE CABINET IF THE FLASHING YELLOW ARROW CONFIGURATION IS CUSTOM.
11. IF NEEDED, CONTRACTOR TO USE ASTRO-BRAC EXTENSION TO ALIGN FLASHING YELLOW ARROW HEADS OVER CENTER OF LEFT TURN LANES.
12. ALL EQUIPMENT TO BE PROCURED AND INSTALLED BY THE CONTRACTOR, UNLESS STATED OTHERWISE. CONTRACTOR TO COORDINATE WITH CITY OF BURLESON PRIOR TO PROCUREMENT OF MATERIALS TO ENSURE COMPATABILITY WITH EXISTING SYSTEM. CONTRACTOR TO PROCURE EQUIPMENT LISTED BELOW:

SUMMARY OF TRAFFIC SIGNAL EQUIPMENT		
EQUIPMENT	ITEM NO.	DESCRIPTION*
DETECTION	6306	ITERIS VANTAGE APEX DETECTION SYSTEM
CONTROLLER	SUB TO 680	SIEMENS M60 SERIES ATC
CABINET	SUB TO 680	TS2-TY2 CABINET
CCTV CAMERA	6010	AXIS Q6315-LE CAMERA
BBU	6085	BATTERY BACKUP UNIT

* REFER TO APPROVED SOLE SOURCE PROCUREMENT MEMO

0 10 20 40
ORIGINALLY PLOTTED SCALE:
SCALE: 1" = 40'

KEY MAP



LEGEND

- EXISTING SIGNAL POLE
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET AND CONCRETE PAD
- EXISTING CONDUIT
- EXISTING GROUND BOX
- E-1 — EXISTING TRAFFIC SIGNAL POLE NUMBER
- V1 — PROPOSED VIVDS
- PROPOSED CCTV CAMERA
- 1 — SIGNAL HEAD LABEL
- S1 — SIGN LABEL
- (1) — CONDUIT LABEL
- PROPOSED TRAFFIC SIGNAL CONTROLLER CABINET, BBU, AND CONCRETE PAD

9/29/2023

STATE OF TEXAS
ABIGAIL AXELSON
146056
LICENSED
PROFESSIONAL ENGINEER

Kimley»Horn F-928
2600 N. Central Expressway
Suite 400
Richardson, TX 75080
Tel. No. (214) 617-0535

THE CITY OF BURLESON TEXAS

TRAFFIC SAFETY IMPROVEMENTS
PROPOSED CONDITIONS

ALSBURY BOULEVARD
AT HEBERLE DRIVE

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
ASA	6	(SEE TITLE SHEET)		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
AM	TEXAS	FTW	JOHNSON	31
CHECK	CONTROL	SECTION	JOB	
HMF	0902	50	143	
CHECK				
ASA				

CONDUIT AND CABLE CHART
WIRE SIZE AND TYPE

RUN NO	CONDUIT STATUS	ITEM 618 CONDUIT (SCH 80)				CABLE STATUS	ITEM 684 TRAFFIC SIGNAL CABLES				ITEM 6306		ITEM 6010		TOTAL LENGTH OF RUN	RUN NO
		3" PVC (TRENCHED)		4" PVC (BORED)			TY A 5 CNDR NO. 14		TY A 7 CNDR NO. 14		VIVDS CABLE		ETHERNET CABLE (CCTV CAMERA)			
		Qty	Len	Qty	Len		Qty	Len	Qty	Len	Qty	Len	Qty	Len		
1	E	1				I					4	40	1	10	10	1
2	E	1				I					4	100	1	25	25	2
3	E			1		I					2	170	1	85	85	3
4	E	1				I					1	10	1	10	10	4
5	E			1		I					1	55			55	5
6	E	1				I					1	5			5	6
7	E			1		I									85	7
8	E	1				I					1	15			15	8
9	E			1		I					1	55			55	9
10	E	1				I					1	15			15	10
SUBTOTAL			0		0			0		0		465		130		
E-1	P					I		40		60		50			VARIES	E-1
E-2	P					I				65		45		30	VARIES	E-2
E-3	P					I		20		45		40			VARIES	E-3
E-4	P					I						50			VARIES	E-4
SUBTOTAL			0		0			60		170		185		30		
TOTAL			0		0			60		170		650		160		

CONDUIT STATUS: I=INSTALL; E=EXISTING; P=WIRE TO BE INSTALLED INSIDE STEEL POLE
P-# - REFERS TO WIRING WITHIN THE SIGNAL POLE AND MAST ARM.

SIGNAL HEADS (ITEM 682)

SIGNAL HEAD NUMBER	12" LED SIGNAL INDICATION									
	SIGNAL HEAD TYPE	STATUS	BACK PLATE		LED SIGNAL LAMPS					
			3 SEC	4 SEC	<-G-	G	<-Y-	Y	<-R-	R
			EA	EA	EA	EA	EA	EA	EA	EA
1	H4FLT	I		1	1		2		1	
2	H5LT	REM								
3	H3	E								
4	H3	I	1			1		1		1
5	H4FLT	I		1	1		2		1	
6	H5LT	REM								
7	H3	E								
8	H3	E								
9	H4FLT	I		1	1		2		1	
10	H5LT	REM								
11	H3	E								
12	H3	I	1			1		1		1
13	H3	E								
14	H3	E								
TOTAL (NEW)			2	3	3	2	6	2	3	2

STATUS: I=INSTALL; E=EXISTING; REM=EXISTING TO BE REMOVED

SIGNS SUMMARY

SIGN *	SIGN TYPE	SIGN LEGEND	STATUS	SUPPORT	SIGN DIMENSION (in x in)
S1	R10-17T	LEFT TURN YIELD ON FLASHING YELLOW ARROW	I	E-1	36"x 42"
S2	R10-12	LEFT TURN YIELD ON GREEN BALL	REM	E-1	-
S3	R10-17T	LEFT TURN YIELD ON FLASHING YELLOW ARROW	I	E-2	36"x 42"
S4	R10-12	LEFT TURN YIELD ON GREEN BALL	REM	E-2	-
S5	R10-17T	LEFT TURN YIELD ON FLASHING YELLOW ARROW	I	E-3	36"x 42"
S6	R10-12	LEFT TURN YIELD ON GREEN BALL	REM	E-3	-

STATUS: I=INSTALL; E=EXISTING; REM=EXISTING TO BE REMOVED; REL=EXISTING TO BE RELOCATED
* - ALL SIGNS TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR (SUB TO ITEM 680).

GROUND BOX SUMMARY

ITEM NO.	DESCRIPTION	UNIT	QTY.
0627	GROUND BOX (PREPARE)	EA	5

VIVDS DETECTION ZONE DETAILS

DETECTOR NUMBER	MOUNTING LOCATION	MOUNTING HEIGHT	ZONE(S)	DESCRIPTION
V1	SIGNAL POLE E-1	24'	NB + NBLT	PRESENCE
V2	SIGNAL POLE E-2	24'	EB + EBLT	ADVANCED + PRESENCE
V3	SIGNAL POLE E-3	24'	SB + SBLT	PRESENCE
V4	SIGNAL POLE E-4	24'	WB	ADVANCED + PRESENCE

9/29/2023

STATE OF TEXAS
ABIGAIL AXELSON
146056
LICENSED
PROFESSIONAL ENGINEER

Kimley»Horn F-928
2600 N. Central Expressway
Suite 400
Richardson, TX 75080
Tel. No. (214) 617-0535

THE CITY OF BURLESON TEXAS

Texas Department of Transportation

TRAFFIC SAFETY IMPROVEMENTS
PROPOSED QUANTITIES

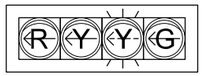
ALSBURY BOULEVARD
AT HEBERLE DRIVE

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
ASA	6	(SEE TITLE SHEET)		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
AM	TEXAS	FTW	JOHNSON	32
CHECK	CONTROL	SECTION	JOB	
HMF	0902	50	143	
CHECK				
ASA				

PLOTTED: 11/17/2023
FILENAME: K:\DAL_TPTO\project\061166095 - Burleson HSIP - Alsbury PS&E\CADD\BURL-ALS_140_Heberle at Alsbury_Quantities.dgn
40.0000 ft / in.
BY: Abby.Axelson

PROPOSED SIGNALS

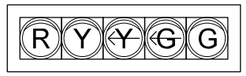
H4FLT



SH 1

EXISTING SIGNALS TO BE REMOVED

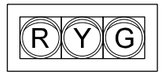
H5LT



SH 2

EXISTING SIGNALS TO REMAIN

H3



SH 3, 4, 5, 6, 7, 8

PROPOSED SIGNS

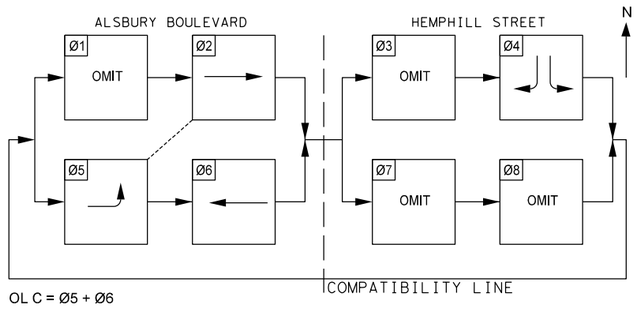
R10-17T

EXISTING SIGNS TO BE REMOVED

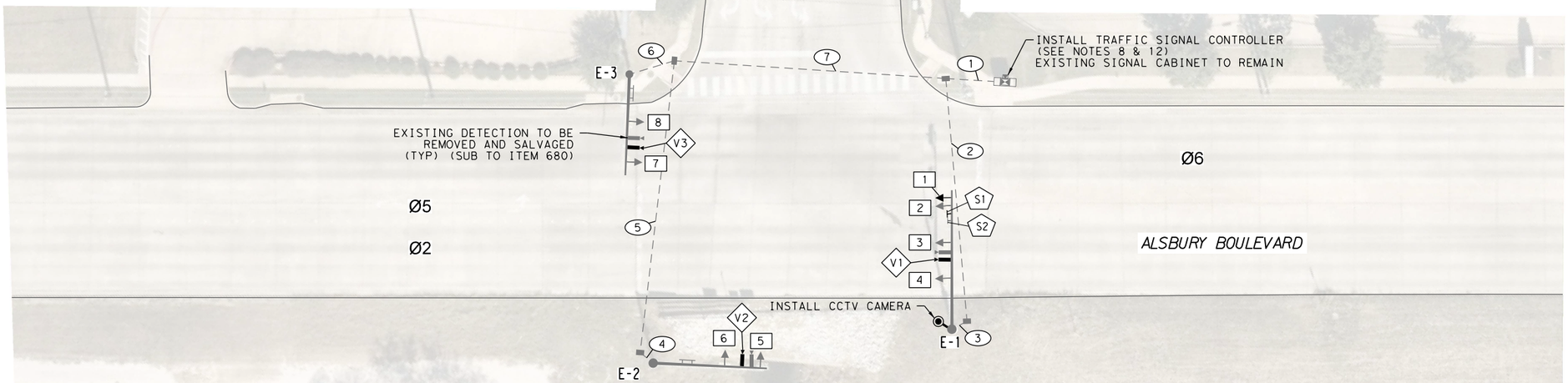
R10-12

PHASE SEQUENCE

— — COMPATIBLE PHASES



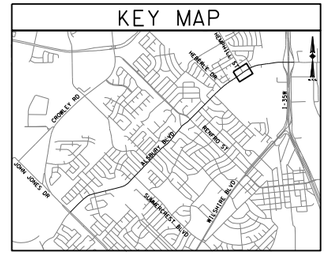
OL C = Ø5 + Ø6



0 10 20 40

ORIGINALLY PLOTTED SCALE:
SCALE: 1" = 40'

KEY MAP



LEGEND

- EXISTING SIGNAL POLE
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET AND CONCRETE PAD
- EXISTING CONDUIT
- EXISTING GROUND BOX
- E-1 — EXISTING TRAFFIC SIGNAL POLE NUMBER
- V1 — PROPOSED VIVDS
- PROPOSED CCTV CAMERA
- 1 — SIGNAL HEAD LABEL
- S1 — SIGN LABEL
- 1 — CONDUIT LABEL

NOTES:

1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE EXISTING TRAFFIC SIGNAL HARDWARE, PAVEMENT MARKINGS, SIGNING, AND THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO MAKE DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES TO AVOID DAMAGE THERETO.
2. EXISTING EQUIPMENT TO BE REMOVED SHALL BE RETURNED TO THE CITY OF BURLESON. CONTRACTOR TO COORDINATE WITH CITY SENIOR PUBLIC WORKS ENGINEER AT 817-426-9183 TO RETURN SALVAGED EQUIPMENT.
3. ALL PROPOSED WORK IS WITHIN THE EXISTING RIGHT OF WAY. NO WORK IS TO BE PERFORMED OUTSIDE OF THE RIGHT OF WAY.
4. THE ENGINEER DOES NOT CONFIRM OR VALIDATE THE EXISTING ITEMS SHOWN.
5. CONTRACTOR TO CONTACT CITY OF BURLESON SENIOR PUBLIC WORKS ENGINEER (817-426-9183) AND TxDOT TRAFFIC SIGNAL OFFICE 48 HOURS IN ADVANCE TO COORDINATE WORK. CONTRACTOR TO COORDINATE WITH CITY OF BURLESON TO PULL REQUIRED PERMITS, PRIOR TO STARTING WORK.
6. THE LOCATION OF THE PROPOSED SIGNAL HEADS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED BY THE ENGINEER TO ACCOMMODATE FIELD CONDITIONS.
7. CONTRACTOR SHALL MAINTAIN EXISTING SIGNAL OPERATIONS AT THIS INTERSECTION UNTIL THE PROPOSED EQUIPMENT IS OPERATIONAL.
8. INSTALL SIGNAL CONTROLLER (SIEMENS M60 SERIES ATC CONTROLLER), AS SPECIFIED IN APPROVED SOLE SOURCE PROCUREMENT MEMO.

NOTES (CONTINUED):

9. CONTRACTOR TO REFER TO PHASE DIAGRAM FOR FLASHING YELLOW ARROW OVERLAP TERMINATIONS INSIDE CABINET AND TERMINATE THE 7 CONDUCTOR CABLE AT THE SIGNAL POLE BASE INSIDE THE TERMINATION BLOCK. CONTRACTOR TO UPGRADE MMU EQUIPMENT TO ENSURE FLASHING YELLOW ARROW CAPABILITIES (SUB TO ITEM 680). CONTRACTOR TO INSTALL RETROREFLECTIVE TAPE ON ALL EXISTING SIGNAL HEAD BACKPLATES THAT ARE TO REMAIN (SUB TO ITEM 680).
10. PRIOR TO THE CONCLUSION OF PROJECT, THE CONTRACTOR SHALL COORDINATE WITH CITY OF BURLESON TRAFFIC SIGNAL TECHNICIANS ABOUT THE FLASHING YELLOW ARROW LOAD SWITCH CONFIGURATION. THE CONTRACTOR SHALL INCLUDE A NOTICE IN THE CABINET IF THE FLASHING YELLOW ARROW CONFIGURATION IS CUSTOM.
11. IF NEEDED, CONTRACTOR TO USE ASTRO-BRAC EXTENSION TO ALIGN FLASHING YELLOW ARROW HEADS OVER CENTER OF LEFT TURN LANES.
12. ALL EQUIPMENT TO BE PROCURED AND INSTALLED BY THE CONTRACTOR, UNLES STATED OTHERWISE. CONTRACTOR TO COORDINATE WITH CITY OF BURLESON PRIOR TO PROCUREMENT OF MATERIALS TO ENSURE COMPATABILITY WITH EXISTING SYSTEM. CONTRACTOR TO PROCURE EQUIPMENT LISTED BELOW:

SUMMARY OF TRAFFIC SIGNAL EQUIPMENT		
EQUIPMENT	ITEM NO.	DESCRIPTION*
DETECTION	6306	ITERIS VANTAGE APEX DETECTION SYSTEM
CONTROLLER	SUB TO 680	SIEMENS M60 SERIES ATC
CCTV CAMERA	6010	AXIS Q6315-LE CAMERA

* REFER TO APPROVED SOLE SOURCE PROCUREMENT MEMO.

9/29/2023

STATE OF TEXAS
ABIGAIL AXELSON
146056
LICENSED
PROFESSIONAL ENGINEER

Kimley»Horn F-928
2600 N. Central Expressway
Suite 400
Richardson, TX 75080
Tel. No. (214) 617-0535

THE CITY OF BURLESON TEXAS

TRAFFIC SAFETY IMPROVEMENTS

PROPOSED CONDITIONS

ALSBURY BOULEVARD
AT HEMPHILL STREET

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
ASA	6	(SEE TITLE SHEET)		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
AM	TEXAS	FTW	JOHNSON	33
CHECK	CONTROL	SECTION	JOB	
HMF	0902	50	143	
CHECK				
ASA				

PLOTTED: 11/17/2023
FILENAME: K:\DAL_TPTO\project\06116095 - Burleson HSIP - Alsbury PS&E\CADD\BURL-ALS_15_Hemphill at Alsbury_Prop Conditions.dgn
40.0000 ft / in.
BY: Abby.Axelson

CONDUIT AND CABLE CHART
WIRE SIZE AND TYPE

RUN NO	CONDUIT STATUS	ITEM 618 CONDUIT (SCH 80) 3" PVC (TRENCHED)		ITEM 618 CONDUIT (SCH 80) 4" PVC (BORED)		CABLE STATUS	ITEM 684 TRAFFIC SIGNAL CABLES TY A 7 CNDR NO. 14		ITEM 6306 VIVDS CABLE		ITEM 6010 ETHERNET CABLE (CCTV CAMERA)		TOTAL LENGTH OF RUN	RUN NO
		Qty	Len	Qty	Len		Qty	Len	Qty	Len	Qty	Len		
1	E	1				I			3	60	1	20	20	1
2	E			1		I			1	85	1	85	85	2
3	E	1				I			1	10	1	10	10	3
4	E	1				I			1	10			10	4
5	E			1		I			1	100			100	5
6	E	1				I			1	20			20	6
7	E			1		I			2	190			95	7
SUBTOTAL			0		0			0		475		115		
E-1	P					I		65		50		30	VARIES	E-1
E-2	P					I				55			VARIES	E-2
E-3	P					I				55			VARIES	E-3
SUBTOTAL			0		0			65		160		30		
TOTAL			0		0			65		635		145		

CONDUIT STATUS: I=INSTALL; E=EXISTING; P=WIRE TO BE INSTALLED INSIDE STEEL POLE
P-# - REFERS TO WIRING WITHIN THE SIGNAL POLE AND MAST ARM.

SIGNAL HEADS (ITEM 682)

SIGNAL HEAD NUMBER	12" LED SIGNAL INDICATION SIGNAL HEAD TYPE	STATUS	BACK PLATE 4 SEC EA	LED SIGNAL LAMPS <-G- EA	<-Y- EA	<-R- EA
1	H4FLT	I	1	1	2	1
2	H5LT	REM				
3	H3	E				
4	H3	E				
5	H3	E				
6	H3	E				
7	H3	E				
8	H3	E				
TOTAL (NEW)			1	1	2	1

STATUS: I=INSTALL; E=EXISTING; REM=EXISTING TO BE REMOVED

SIGNS SUMMARY

SIGN *	SIGN TYPE	SIGN LEGEND	STATUS	SUPPORT	SIGN DIMENSION (in x in)
S1	R10-17T	LEFT TURN YIELD ON FLASHING YELLOW ARROW	I	E-1	36"x 42"
S2	R10-12	LEFT TURN YIELD ON GREEN BALL	REM	E-1	-

STATUS: I=INSTALL; E=EXISTING; REM=EXISTING TO BE REMOVED; REL=EXISTING TO BE RELOCATED
* - ALL SIGNS TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR (SUB TO ITEM 680).

GROUND BOX SUMMARY

ITEM NO.	DESCRIPTION	UNIT	QTY.
0627	GROUND BOX (PREPARE)	EA	4

VIVDS DETECTION ZONE DETAILS

DETECTOR NUMBER	MOUNTING LOCATION	MOUNTING HEIGHT	ZONE(S)	DESCRIPTION
V1	SIGNAL POLE E-1	24'	EB + EBLT	ADVANCED + PRESENCE
V2	SIGNAL POLE E-2	24'	SB	PRESENCE
V3	SIGNAL POLE E-3	24'	WB	ADVANCED + PRESENCE

9/29/2023

STATE OF TEXAS
ABIGAIL AXELSON
146056
LICENSED
PROFESSIONAL ENGINEER

Kimley»Horn F-928
2600 N. Central Expressway
Suite 400
Richardson, TX 75080
Tel. No. (214) 617-0535

THE CITY OF BURLESON TEXAS

TRAFFIC SAFETY IMPROVEMENTS
PROPOSED QUANTITIES

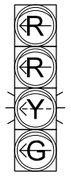
ALSBURY BOULEVARD
AT HEMPHILL STREET

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
ASA	6	(SEE TITLE SHEET)		VA
GRAPHICS AM	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK HMF	TEXAS	FTW	JOHNSON	34
CHECK ASA	CONTROL 0902	SECTION 50	JOB 143	

PLOTTED: 11/17/2023
FILENAME: K:\DAL_TPTO\1project\061166095 - Burleson HSIP - Alsbury PS&E\CADD\BURL-ALS_15a_Hemphill at Alsbury_Quantities.dgn
40.0000 ft / in.
BY: Abby.Axelson

PROPOSED SIGNALS

V4FLT



SH 6
(SEE NOTE 9)

EXISTING SIGNALS TO REMAIN

V4S

SH 4

V3

SH 1, 2, 3, 5, 8, 9

EXISTING SIGNALS TO BE REMOVED

V5LT

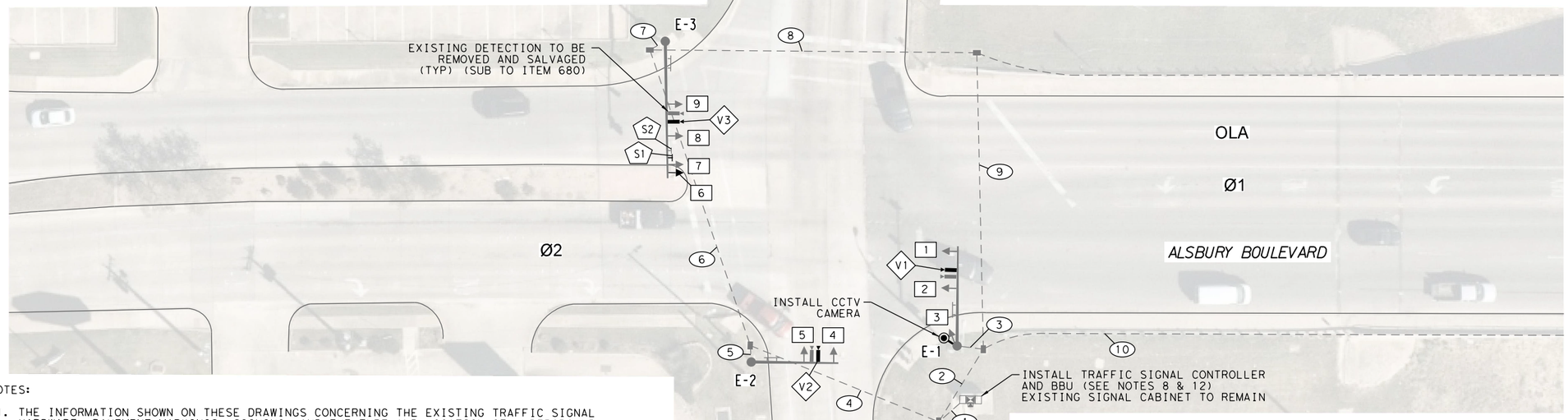
SH 7

PROPOSED SIGNS

R10-17T

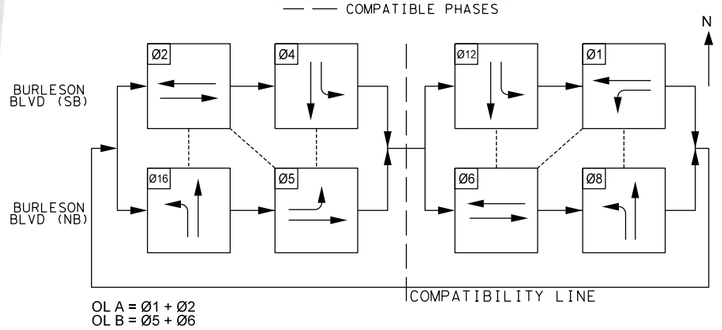
EXISTING SIGNS TO BE REMOVED

R10-12



PHASE SEQUENCE

— — COMPATIBLE PHASES



OL A = Ø1 + Ø2
OL B = Ø5 + Ø6

NOTES:

1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE EXISTING TRAFFIC SIGNAL HARDWARE, PAVEMENT MARKINGS, SIGNING, AND THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO MAKE DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES TO AVOID DAMAGE THERETO.
2. EXISTING EQUIPMENT TO BE REMOVED SHALL BE RETURNED TO THE CITY OF BURLESON. CONTRACTOR TO COORDINATE WITH CITY SENIOR PUBLIC WORKS ENGINEER AT 817-426-9183 TO RETURN SALVAGED EQUIPMENT.
3. ALL PROPOSED WORK IS WITHIN THE EXISTING RIGHT OF WAY. NO WORK IS TO BE PERFORMED OUTSIDE OF THE RIGHT OF WAY.
4. THE ENGINEER DOES NOT CONFIRM OR VALIDATE THE EXISTING ITEMS SHOWN.
5. CONTRACTOR TO CONTACT CITY OF BURLESON SENIOR PUBLIC WORKS ENGINEER (817-426-9183) AND TxDOT TRAFFIC SIGNAL OFFICE 48 HOURS IN ADVANCE TO COORDINATE WORK. CONTRACTOR TO COORDINATE WITH CITY OF BURLESON TO PULL REQUIRED PERMITS, PRIOR TO STARTING WORK.
6. THE LOCATION OF THE PROPOSED SIGNAL HEADS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED BY THE ENGINEER TO ACCOMMODATE FIELD CONDITIONS.
7. CONTRACTOR SHALL MAINTAIN EXISTING SIGNAL OPERATIONS AT THIS INTERSECTION UNTIL THE PROPOSED EQUIPMENT IS OPERATIONAL.
8. INSTALL SIGNAL CONTROLLER (SIEMENS M60 SERIES ATC CONTROLLER), AS SPECIFIED IN APPROVED SOLE SOURCE PROCUREMENT MEMO.
9. CONTRACTOR TO REFER TO PHASE DIAGRAM FOR FLASHING YELLOW ARROW OVERLAP TERMINATIONS INSIDE CABINET AND TERMINATE THE 7 CONDUCTOR CABLE AT THE SIGNAL POLE BASE INSIDE THE TERMINATION BLOCK. CONTRACTOR TO UPGRADE MMU EQUIPMENT TO ENSURE FLASHING YELLOW ARROW CAPABILITIES (SUB TO ITEM 680). CONTRACTOR TO INSTALL SH 6 WITH NO BACKPLATE TO BE CONSISTENT WITH EXISTING SIGNAL HEADS.

NOTES (CONTINUED):

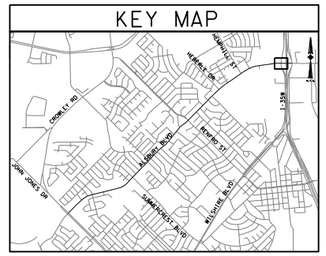
10. PRIOR TO THE CONCLUSION OF PROJECT, THE CONTRACTOR SHALL COORDINATE WITH CITY OF BURLESON TRAFFIC SIGNAL TECHNICIANS ABOUT THE FLASHING YELLOW ARROW LOAD SWITCH CONFIGURATION. THE CONTRACTOR SHALL INCLUDE A NOTICE IN THE CABINET IF THE FLASHING YELLOW ARROW CONFIGURATION IS CUSTOM.
11. IF NEEDED, CONTRACTOR TO USE ASTRO-BRAC EXTENSION TO ALIGN FLASHING YELLOW ARROW HEADS OVER CENTER OF LEFT TURN LANES.
12. ALL EQUIPMENT TO BE PROCURED AND INSTALLED BY THE CONTRACTOR, UNLESS STATED OTHERWISE. CONTRACTOR TO COORDINATE WITH CITY OF BURLESON PRIOR TO PROCUREMENT OF MATERIALS TO ENSURE COMPATABILITY WITH EXISTING SYSTEM. CONTRACTOR TO PROCURE EQUIPMENT LISTED BELOW:

SUMMARY OF TRAFFIC SIGNAL EQUIPMENT		
EQUIPMENT	ITEM NO.	DESCRIPTION*
DETECTION	6306	ITERIS VANTAGE APEX DETECTION SYSTEM
CONTROLLER	SUB TO 680	SIEMENS M60 SERIES ATC
CCTV CAMERA	6010	AXIS Q6315-LE CAMERA
BBU	6058	BATTERY BACKUP UNIT

* REFER TO APPROVED SOLE SOURCE PROCUREMENT MEMO.

0 10 20 40
ORIGINALLY PLOTTED SCALE:
SCALE: 1" = 40'

KEY MAP



LEGEND

- EXISTING SIGNAL POLE
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET AND CONCRETE PAD
- EXISTING CONDUIT
- EXISTING GROUND BOX
- E-1 — EXISTING TRAFFIC SIGNAL POLE NUMBER
- V1 — PROPOSED VIVDS
- PROPOSED CCTV CAMERA
- 1 — SIGNAL HEAD LABEL
- S1 — SIGN LABEL
- (1) — CONDUIT LABEL

9/29/2023

STATE OF TEXAS
ABIGAIL AXELSON
146056
LICENSED
PROFESSIONAL ENGINEER

Kimley»Horn F-928
2600 N. Central Expressway
Suite 400
Richardson, TX 75080 Tel. No. (214) 617-0535

THE CITY OF BURLESON TEXAS

TRAFFIC SAFETY IMPROVEMENTS
PROPOSED CONDITIONS

ALSBURY BOULEVARD
BURLESON BLVD (SOUTHBOUND)

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
ASA	6	(SEE TITLE SHEET)		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
AM	TEXAS	FTW	JOHNSON	35
CHECK	CONTROL	SECTION	JOB	
HMF	0902	50	143	
CHECK				
ASA				

PLOTTED: 11/17/2023
FILENAME: K:\DAL_TPTO\project\06166095 - Burleson HSIP - 40.0000 ft / in. BY: Abby.Axelson
Alsbury PS&E\CADD\BURL-ALS_16_I 35 FR SB at Alsbury_Prop Conditions.dgn

CONDUIT AND CABLE CHART
WIRE SIZE AND TYPE

RUN NO	CONDUIT STATUS	ITEM 618 CONDUIT (SCH 80)						CABLE STATUS	ITEM 684 TRAFFIC SIGNAL CABLES		ITEM 6306		ITEM 6010		TOTAL LENGTH OF RUN	RUN NO
		3" PVC (TRENCHED)		3" RM CONDUIT		4" PVC (BORED)			TY A 7 CNDR NO. 14		VIVDS CABLE		ETHERNET CABLE (CCTV CAMERA)			
		Qty	Len	Qty	Len	Qty	Len		Qty	Len	Qty	Len	Qty	Len		
1	E	1						I			6	60	2	20	10	1
2	E	1						I			4	120	2	60	30	2
3	E	1						I			1	10	1	10	10	3
4	E					1		I			2	150			75	4
5	E	1						I			1	10			10	5
6	E					1		I			1	110			110	6
7	E	1						I			1	10			10	7
8	E					1		I							115	8
9	E					1		I							105	9
10	E			1				I			3	1800	1	600	600	10
SUBTOTAL			0		0		0			0		2270		690		
E-1	P							I				50		30	VARIES	E-1
E-2	P							I				50			VARIES	E-2
E-3	P							I		65		55			VARIES	E-3
SUBTOTAL			0		0		0			65		155		30		
TOTAL			0		0		0			65		2425		720		

CONDUIT STATUS: I=INSTALL; E=EXISTING; P=WIRE TO BE INSTALLED INSIDE STEEL POLE
P-# - REFERS TO WIRING WITHIN THE SIGNAL POLE AND MAST ARM.

SIGNAL HEADS (ITEM 682)

SIGNAL HEAD NUMBER	12" LED SIGNAL INDICATION					
	SIGNAL HEAD TYPE	STATUS	BACK PLATE	LED SIGNAL LAMPS		
			4 SEC	<-G-	<-Y-	<-R-
			EA	EA	EA	EA
1	V3	E				
2	V3	E				
3	V3	E				
4	V4S	E				
5	V3	E				
6	H4FLT	I	1	1	2	1
7	V5LT	REM				
8	V3	E				
9	V3	E				
TOTAL (NEW)			1	1	2	1

STATUS: I=INSTALL; E=EXISTING; REM=EXISTING TO BE REMOVED

SIGNS SUMMARY

SIGN *	SIGN TYPE	SIGN LEGEND	STATUS	SUPPORT	SIGN DIMENSION (in x in)
S1	R10-17T	LEFT TURN YIELD ON FLASHING YELLOW ARROW	I	E-3	36"x 42"
S2	R10-12	LEFT TURN YIELD ON GREEN BALL	REM	E-3	-

STATUS: I=INSTALL; E=EXISTING; REM=EXISTING TO BE REMOVED; REL=EXISTING TO BE RELOCATED
* - ALL SIGNS TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR (SUB TO ITEM 680).

GROUND BOX SUMMARY

ITEM NO.	DESCRIPTION	UNIT	QTY.
0627	GROUND BOX (PREPARE)	EA	5

VIVDS DETECTION ZONE DETAILS

DETECTOR NUMBER	MOUNTING LOCATION	MOUNTING HEIGHT	ZONE(S)	DESCRIPTION
V1	SIGNAL POLE E-1	24'	EB	ADVANCED + PRESENCE
V2	SIGNAL POLE E-2	24'	SB	ADVANCED + PRESENCE
V3	SIGNAL POLE E-3	24'	WB + WBLT	PRESENCE

9/29/2023

STATE OF TEXAS
ABIGAIL AXELSON
146056
LICENSED
PROFESSIONAL ENGINEER

Kimley»Horn F-928
2600 N. Central Expressway
Suite 400
Richardson, TX 75080
Tel. No. (214) 617-0535

THE CITY OF BURLESON TEXAS

TRAFFIC SAFETY IMPROVEMENTS
PROPOSED QUANTITIES

ALSBURY BOULEVARD
BURLESON BLVD (SOUTHBOUND)

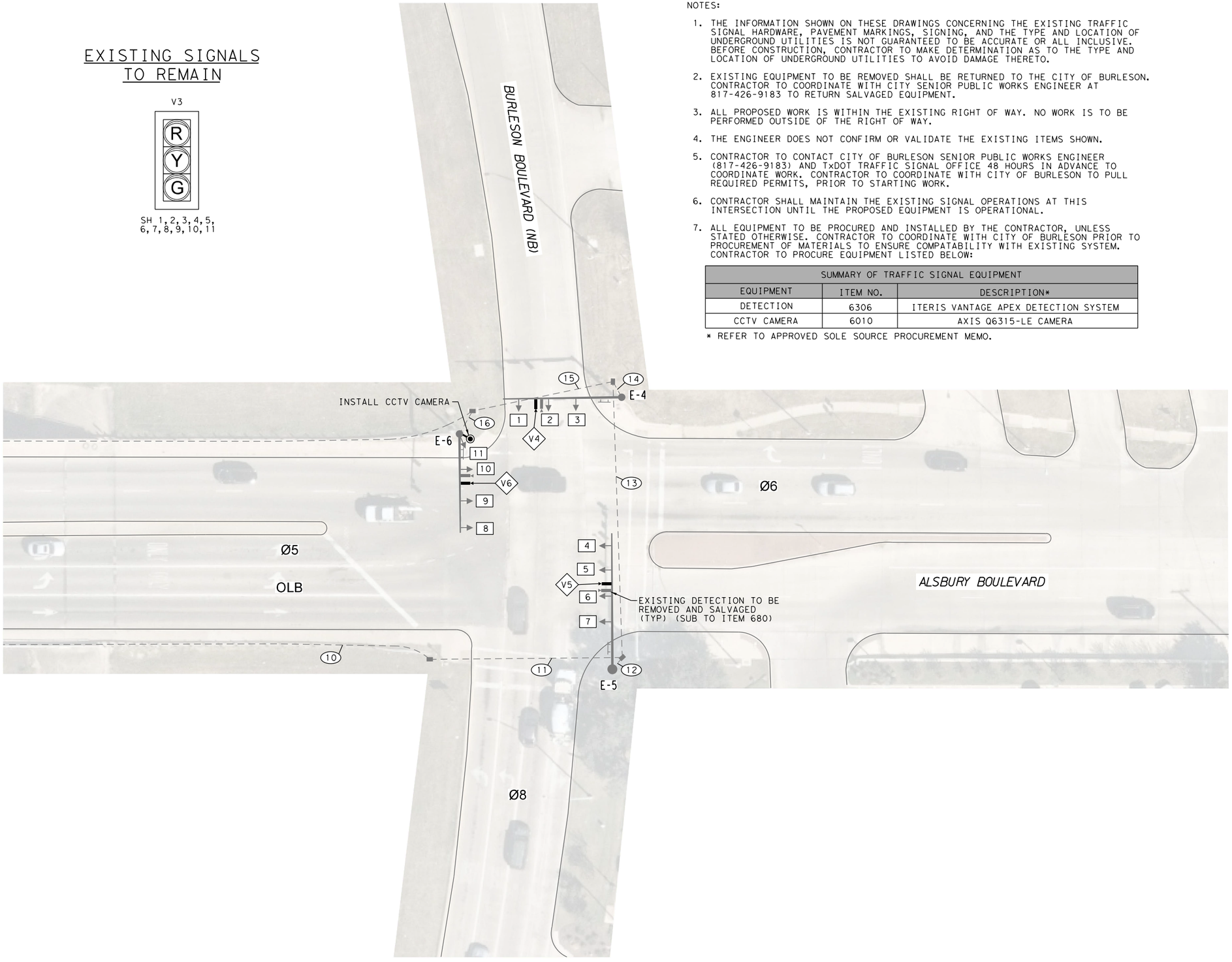
DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
ASA	6	(SEE TITLE SHEET)		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
AM	TEXAS	FTW	JOHNSON	36
CHECK	CONTROL	SECTION	JOB	
HMF	0902	50	143	
CHECK				
ASA				

PLOTTED: 11/17/2023
FILENAME: K:\DAL_TPTO\project\061166095 - Burleson HSIP - Alsbury PS&E\CADD\BURL-ALS_160_I 35 FR SB at Alsbury_Quantities.dgn
40.0000 ft / in.
BY: Abby.Axelson

EXISTING SIGNALS TO REMAIN

V3

SH 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11



NOTES:

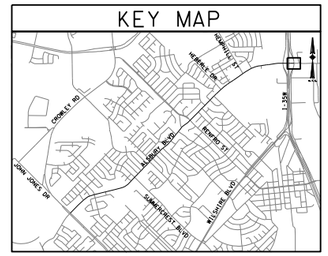
1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE EXISTING TRAFFIC SIGNAL HARDWARE, PAVEMENT MARKINGS, SIGNING, AND THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO MAKE DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES TO AVOID DAMAGE THERETO.
2. EXISTING EQUIPMENT TO BE REMOVED SHALL BE RETURNED TO THE CITY OF BURLESON. CONTRACTOR TO COORDINATE WITH CITY SENIOR PUBLIC WORKS ENGINEER AT 817-426-9183 TO RETURN SALVAGED EQUIPMENT.
3. ALL PROPOSED WORK IS WITHIN THE EXISTING RIGHT OF WAY. NO WORK IS TO BE PERFORMED OUTSIDE OF THE RIGHT OF WAY.
4. THE ENGINEER DOES NOT CONFIRM OR VALIDATE THE EXISTING ITEMS SHOWN.
5. CONTRACTOR TO CONTACT CITY OF BURLESON SENIOR PUBLIC WORKS ENGINEER (817-426-9183) AND TxDOT TRAFFIC SIGNAL OFFICE 48 HOURS IN ADVANCE TO COORDINATE WORK. CONTRACTOR TO COORDINATE WITH CITY OF BURLESON TO PULL REQUIRED PERMITS, PRIOR TO STARTING WORK.
6. CONTRACTOR SHALL MAINTAIN THE EXISTING SIGNAL OPERATIONS AT THIS INTERSECTION UNTIL THE PROPOSED EQUIPMENT IS OPERATIONAL.
7. ALL EQUIPMENT TO BE PROCURED AND INSTALLED BY THE CONTRACTOR, UNLESS STATED OTHERWISE. CONTRACTOR TO COORDINATE WITH CITY OF BURLESON PRIOR TO PROCUREMENT OF MATERIALS TO ENSURE COMPATABILITY WITH EXISTING SYSTEM. CONTRACTOR TO PROCURE EQUIPMENT LISTED BELOW:

SUMMARY OF TRAFFIC SIGNAL EQUIPMENT		
EQUIPMENT	ITEM NO.	DESCRIPTION*
DETECTION	6306	ITERIS VANTAGE APEX DETECTION SYSTEM
CCTV CAMERA	6010	AXIS Q6315-LE CAMERA

* REFER TO APPROVED SOLE SOURCE PROCUREMENT MEMO.

0 10 20 40
ORIGINALLY PLOTTED SCALE:
SCALE: 1" = 40'

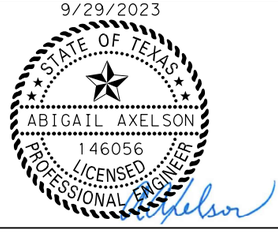
KEY MAP



LEGEND

- EXISTING SIGNAL POLE
- EXISTING TRAFFIC SIGNAL CONTROLLER CABINET AND CONCRETE PAD
- EXISTING CONDUIT
- EXISTING GROUND BOX
- E-1 — EXISTING TRAFFIC SIGNAL POLE NUMBER
- V1 — PROPOSED VIVDS
- PROPOSED CCTV CAMERA
- 1 — SIGNAL HEAD LABEL
- S1 — SIGN LABEL
- 1 — CONDUIT LABEL

9/29/2023



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Tel. No. (214) 617-0535

THE CITY OF BURLESON TEXAS

TRAFFIC SAFETY IMPROVEMENTS
PROPOSED CONDITIONS

ALSBURY BOULEVARD
BURLESON BLVD (NORTHBOUND)

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
ASA	6	(SEE TITLE SHEET)		VA
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
AM	TEXAS	FTW	JOHNSON	37
CHECK	CONTROL	SECTION	JOB	
HMF	0902	50	143	
CHECK				
ASA				

PLOTTED: 11/17/2023
FILENAME: K:\DAL_TPTO\project\06116095 - Burleson HSIP - Alsbury PS&E\CADD\BURL-ALS_17_I 35 FR NB at Alsbury_Prop Conditions.dgn
40.0000 ft / in.
BY: Abby.Axelson

CONDUIT AND CABLE CHART WIRE SIZE AND TYPE												
RUN NO	CONDUIT STATUS	ITEM 618 CONDUIT (SCH 80)				CABLE STATUS	ITEM 6306		ITEM 6010		TOTAL LENGTH OF RUN	RUN NO
		3" PVC (TRENCHED)		4" PVC (BORED)			VIVDS CABLE		ETHERNET CABLE (CCTV CAMERA)			
		Qty	Len	Qty	Len		Qty	Len	Qty	Len		
11	E			1		I	3	255	1	85	85	11
12	E	1				I	1	10			10	12
13	E			1		I	2	240	1	120	120	13
14	E	1				I	1	10			10	14
15	E			1		I	1	65	1	65	65	15
16	E	1				I	1	15	1	15	15	16
SUBTOTAL			0		0			595		285		
E-4	P					I		60			VARIES	E-4
E-5	P					I		60			VARIES	E-5
E-6	P					I		50		30	VARIES	E-6
SUBTOTAL			0		0			170		30		
TOTAL			0		0			765		315		

CONDUIT STATUS: I=INSTALL; E=EXISTING; P=WIRE TO BE INSTALLED INSIDE STEEL POLE
P-# - REFERS TO WIRING WITHIN THE SIGNAL POLE AND MAST ARM.

VIVDS DETECTION ZONE DETAILS				
DETECTOR NUMBER	MOUNTING LOCATION	MOUNTING HEIGHT	ZONE(S)	DESCRIPTION
V4	SIGNAL POLE E-4	24'	NB	ADVANCED + PRESENCE
V5	SIGNAL POLE E-5	24'	EB + EBLT	PRESENCE
V6	SIGNAL POLE E-6	24'	WB	ADVANCED + PRESENCE

GROUND BOX SUMMARY			
ITEM NO.	DESCRIPTION	UNIT	QTY.
0627	GROUND BOX (PREPARE)	EA	4

9/29/2023

STATE OF TEXAS
ABIGAIL AXELSON
146056
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2600 N. Central Expressway
Suite 400
Richardson, TX 75080 Tel. No. (214) 617-0535

THE CITY OF BURLESON TEXAS

TRAFFIC SAFETY IMPROVEMENTS
PROPOSED QUANTITIES

ALSBURY BOULEVARD
BURLESON BLVD (NORTHBOUND)

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
ASA	6	(SEE TITLE SHEET)		VA
GRAPHICS AM	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK HMF	TEXAS	FTW	JOHNSON	38
CHECK ASA	CONTROL	SECTION	JOB	
	0902	50	143	

PLOTTED: 11/17/2023
FILENAME: K:\DAL_TPTO\1project\061166095 - Burleson HSIP - Alsbury PS&E\CADD\BURL-ALS_17a_I 35 FR NB at Alsbury_Quantities.dgn
40.0000 ft / in.
BY: Abby.Axelson

DATE:
FILE:

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

FILE:	ed1-14.dgn	DN:	CK:	DW:	CK:
© TxDOT	October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS		0902	50	143	VA
		DIST	COUNTY		SHEET NO.
		FTW	JOHNSON		39

DATE:
FILE:

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.

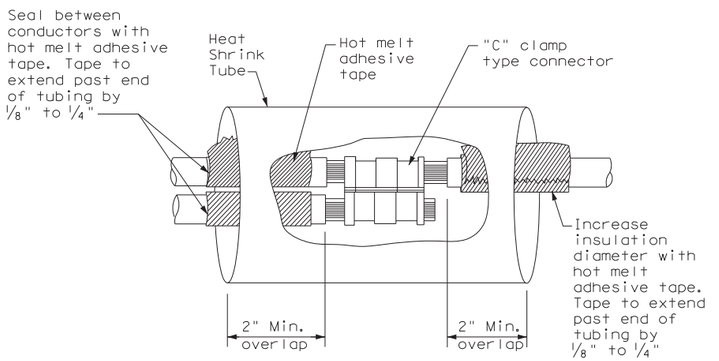
3. Install ground rods so the imprinted part number is at the upper end of the rod.

4. Remove all non-conductive coatings such as concrete splatter from the rod at the clamp location.

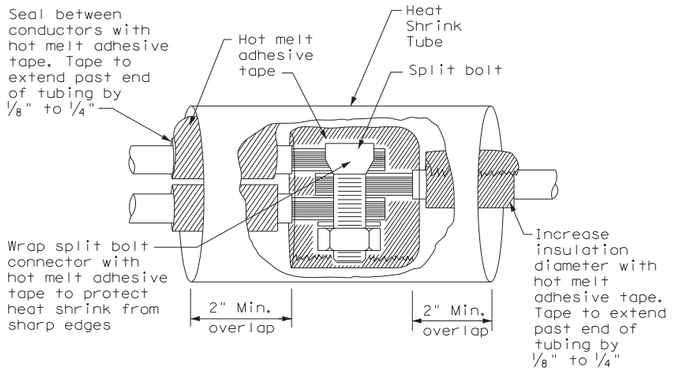
5. Route all conductors as short and straight as possible for connection to lightning protection ground rods. When a bend is required, ensure a minimum radius bend of four inches for these conductors.

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.

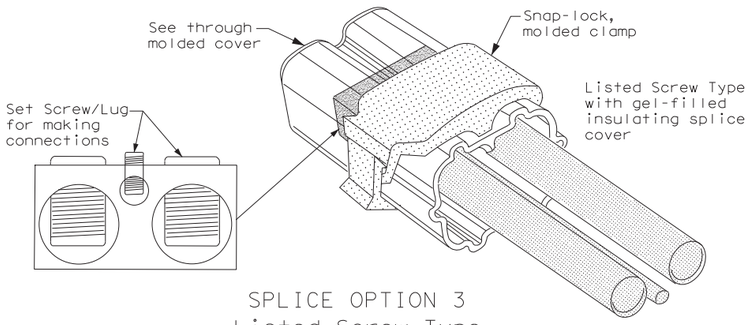
7. Written authorization is required before installing a ground rod in a horizontal trench for rocky soil or a solid rock bottom.



SPLICE OPTION 1
Compression Type



SPLICE OPTION 2
Split Bolt Type



SPLICE OPTION 3
Listed Screw Type

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS
CONDUCTORS

ED(3)-14

FILE: ed3-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
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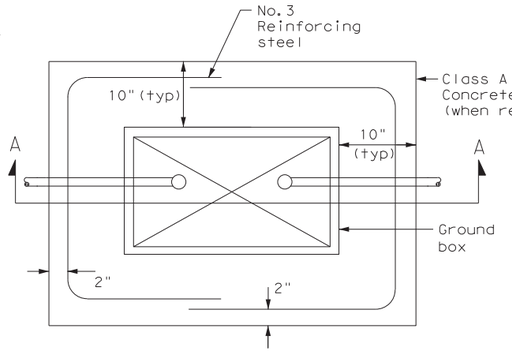
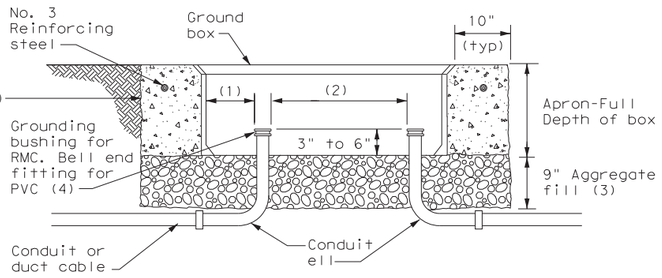
	DIST	COUNTY		SHEET NO.
	FTW	JOHNSON		40

71C

DATE:
FILE:



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.

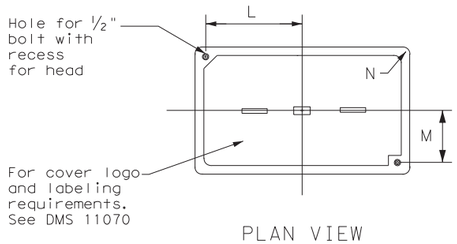
(2) Maintain sufficient space between conduits to allow for proper installation of bushings.

(3) Place aggregate under the box, not in the box. Aggregate should not encroach on the interior volume of the box.

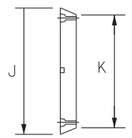
(4) Install a grounding bushing on the upper end of all RMC terminating in a ground box. Ground RMC elbows when any part of the elbow is less than 18 in. below the bottom of the ground box. Install a PVC bushing or bell end fitting on the upper end of all PVC conduits terminating in a ground box.

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

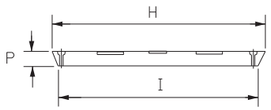
GROUND BOX COVER DIMENSIONS								
TYPE	DIMENSIONS (INCHES)							
	H	I	J	K	L	M	N	P
A, B & E	23 1/4	23	13 3/4	13 1/2	9 7/8	5 1/8	1 3/8	2
C & D	30 1/2	30 1/4	17 1/2	17 1/4	13 1/4	6 3/4	1 3/8	2



PLAN VIEW



END



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

FILE: ed4-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
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	FTW	JOHNSON		41

71D

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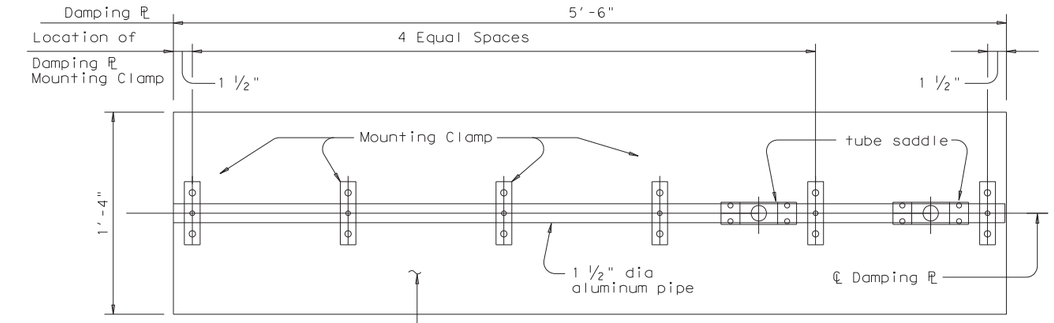
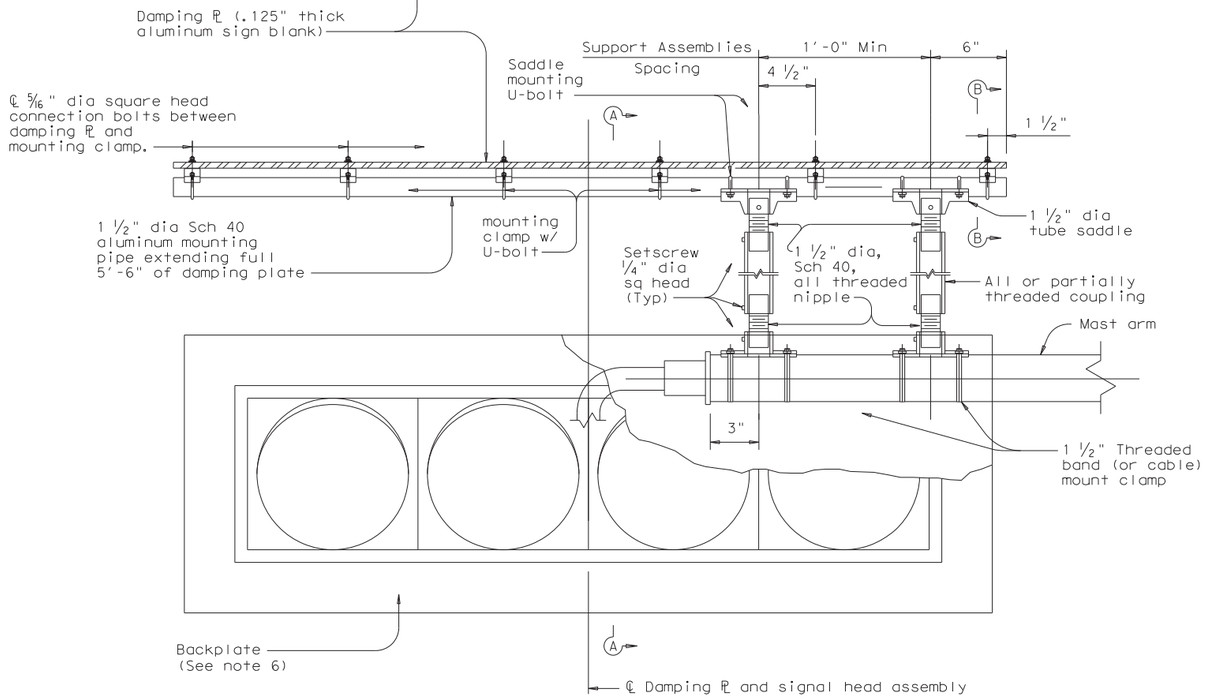


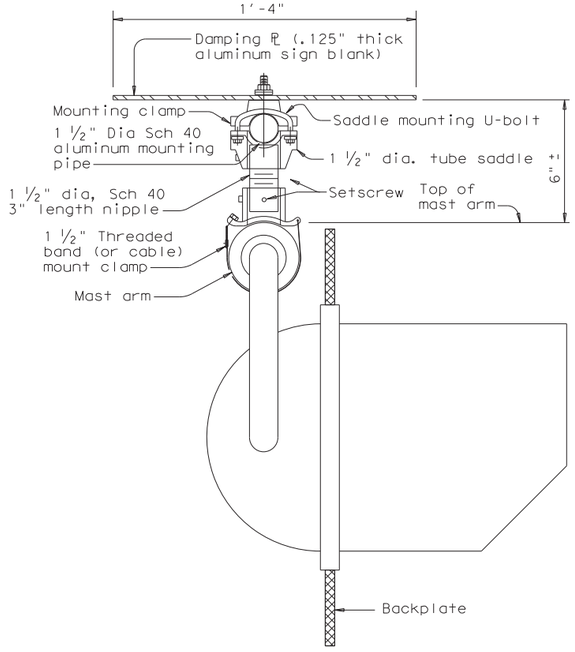
PLAN



ELEVATION

DAMPING PLATE MOUNTING DETAILS

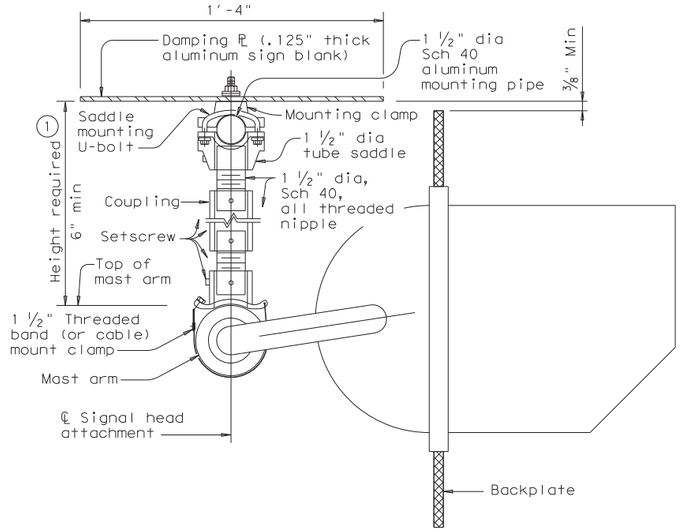
(Showing alternate placement of signal head)



SECTION A-A

(Showing standard placement of signal head)

(Mounting clamp U-bolt is not shown for clarity)

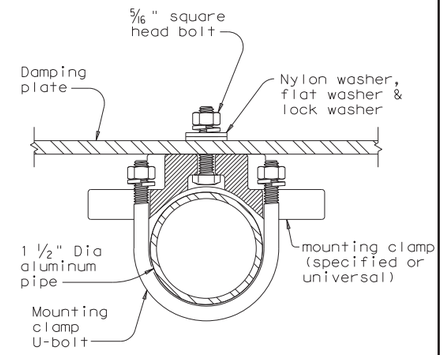


SECTION A-A

(Showing alternate placement of signal head)

(Mounting clamp U-bolt is not shown for clarity)

① Recommended supporting assemblies to achieve required height for horizontal section heads			
Height required	One nipple each length	Two nipples each length plus	One coupling each length
6"-6 ¾"	3"	-	-
7"-8 ½"	4"	-	-
9"-10 ½"	6"	-	-
11"-15 ½"	-	4"	5"
16"-24"	-	6"	10"



SECTION B-B

(Showing damping plate attachment)

GENERAL NOTES:

1. In accordance with the findings of TxDOT sponsored research, the installation of a damping plate in accordance with the details shown here at the end of signal mast arms of SMA and DMA standard structures reduces excessive harmonic vertical vibration, and thus fatigue damage. Any deviation from these details may reduce the effectiveness of this damping device.

2. Aluminum sign blank for damping plate will conform to Departmental Material Specifications DMS-7110. Materials for mast arm mounting clamp and tube saddle will be aluminum castings or aluminum alloys as in accordance with manufacturers' stipulations. Mounting pipe, pipe nipple and coupling will be aluminum alloy 6061-T6 or 6063-T6. Damping plate mounting clamp and u-bolt assemblies will conform to Standard sheet SMD(GEN). U-bolts for saddle mounting will have a minimum yield strength of 36 ksi.

3. Damping plate will be mounted horizontally. Position centerline of damping plate to align with centerline of mast arm or horizontal signal head assembly. Vertical clearance between signal head (with or without backing plate) and bottom of damping plate will be maintained as shown. The attachments shown here are examples only, other supporting details which meet both alignment and vertical clearance requirements are also acceptable.

4. Unless stipulated by the manufacturers, all steel parts will be galvanized finish in accordance with Standard Specification Item 445, "Galvanizing".

5. Contractor will verify applicable field dimensions before the installation.

6. Backplates are optional for traffic signals. When backplates are used, Backplates will have a 2-inch fluorescent yellow AASHTO Type B_{FL} or C_{FL} retroreflective border conforming to TxDOT DMS-8300 "Sign Face Materials." See Sheet TS-BP-20 for backplate details.

Texas Department of Transportation

Traffic Safety Division Standard

MAST ARM DAMPING PLATE DETAILS

MA-DPD-20

FILE: ma-dpd-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2012	CONT	SECT	JOB	HIGHWAY
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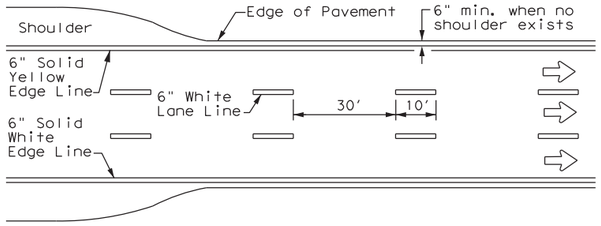
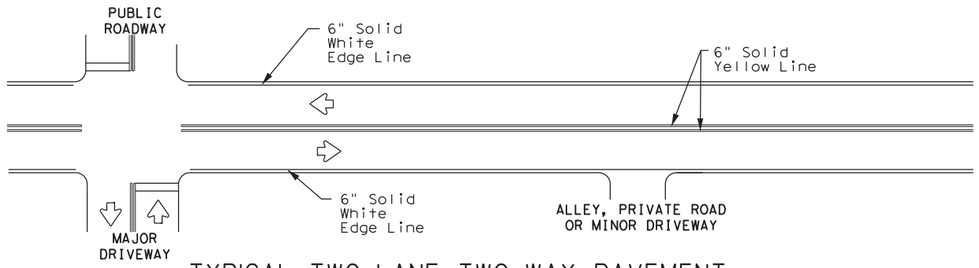
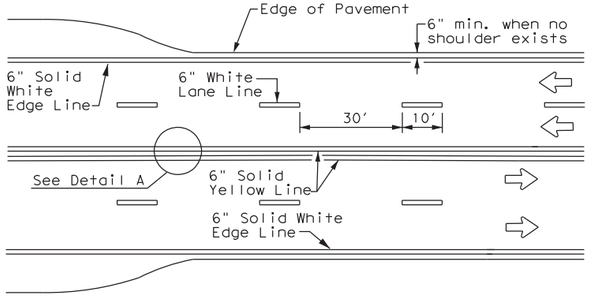
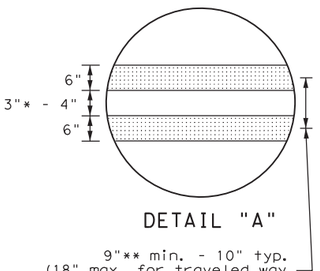


EDGE LINE AND LANE LINES
ONE-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



TYPICAL TWO-LANE, TWO-WAY PAVEMENT
MARKINGS THROUGH INTERSECTIONS

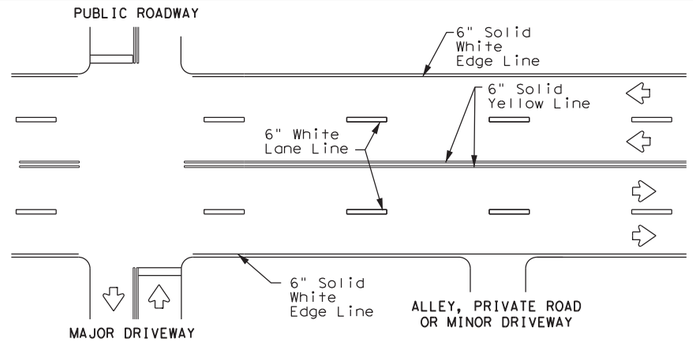




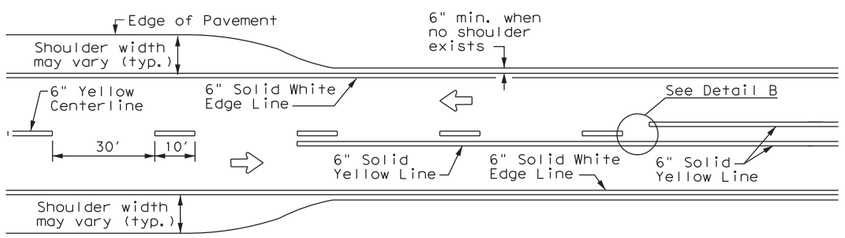
CENTERLINE AND LANE LINES
FOUR LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS

* 2" minimum for restripe projects when approved by the Engineer.

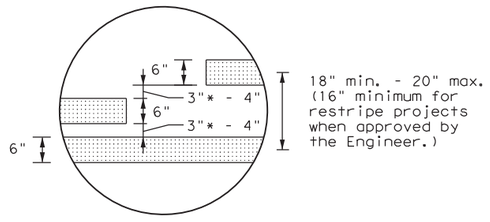
** 8" minimum for restripe projects when approved by the Engineer.



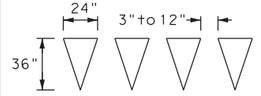
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT
MARKINGS THROUGH INTERSECTIONS



TWO LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



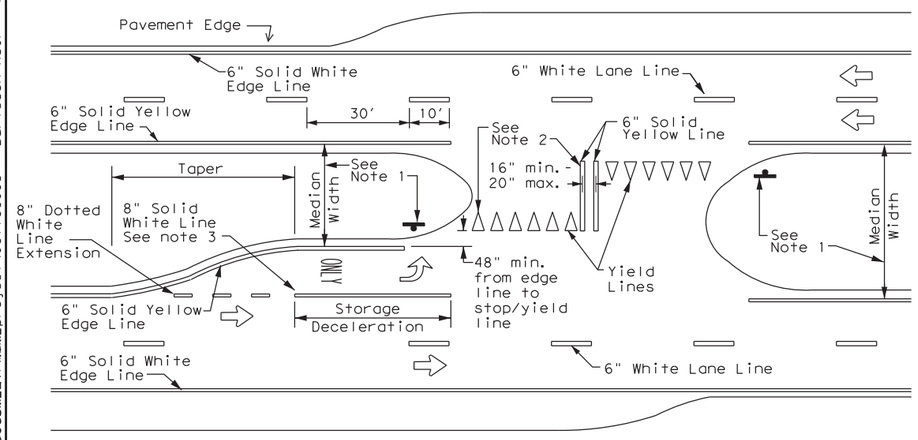
* 2" minimum for restripe projects when approved by the Engineer.



For posted speed on road being marked equal to or greater than 45 MPH.

YIELD LINES

For posted speed on road being marked equal to or less than 40 MPH.



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs and stop bars are optional as determined by the Engineer.

2. Install median striping (double yellow centerlines and stop lines/yield lines) when a 50' or greater median centerline can be placed. Stop lines shall only be used with stop signs. Yield lines shall only be used with yield signs.

3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

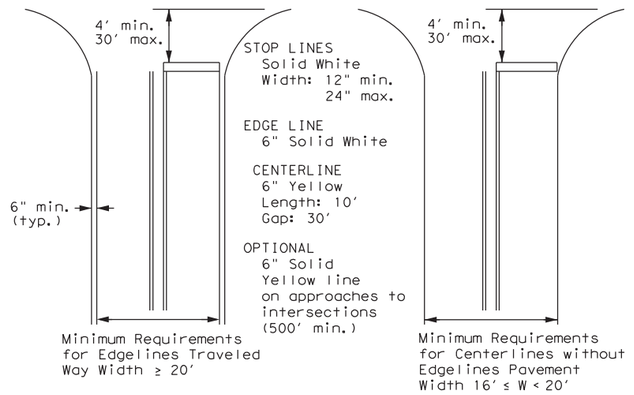
GENERAL NOTES

1. Edge line striping shall be as shown in the plans or as directed by the Engineer. The edge line should not be placed less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edge lines are not required in curb and gutter sections of roadways.

2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the center of edge line to the center of edge line of a two lane roadway.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



NOTE: Traveled way is exclusive of shoulder widths. Refer to General Note 2 for additional details.

GUIDE FOR PLACEMENT OF STOP LINES,
EDGE LINE & CENTERLINE
Based on Traveled Way and Pavement Widths
for Undivided Roadways

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-22

FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
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11-78 8-00 6-20	DIST	COUNTY		SHEET NO.
8-95 3-03 12-22	FTW	JOHNSON		43
5-00 2-12				

22A

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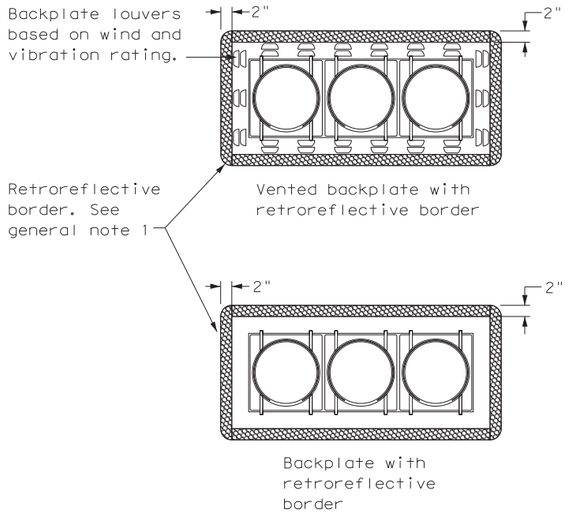
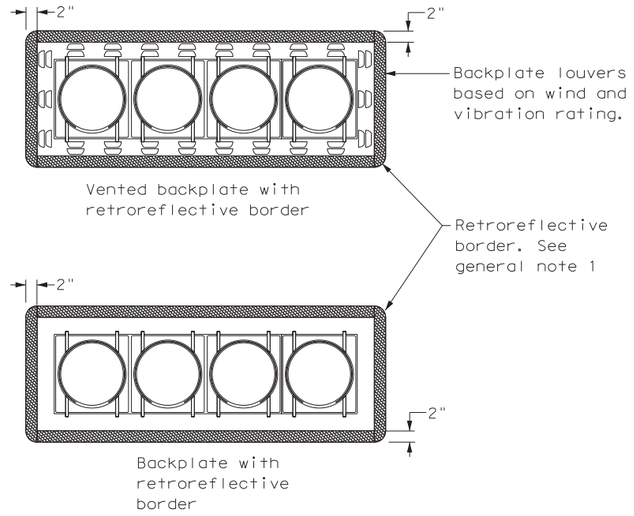


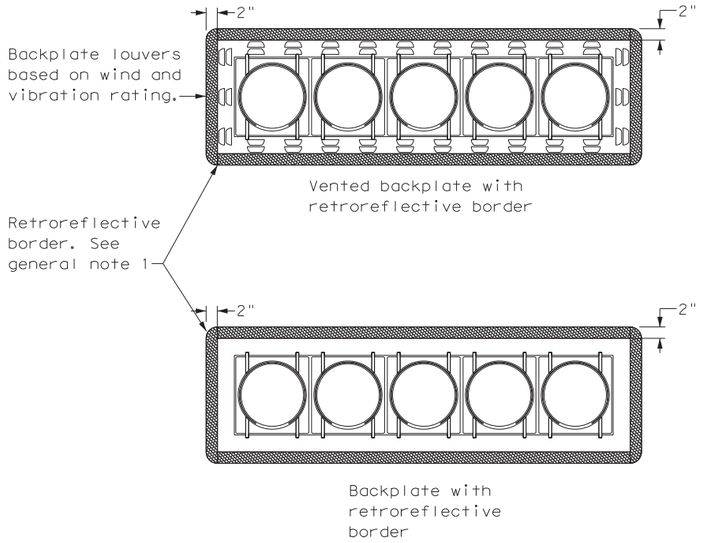
THREE-SECTION HEAD
HORIZONTAL OR VERTICAL



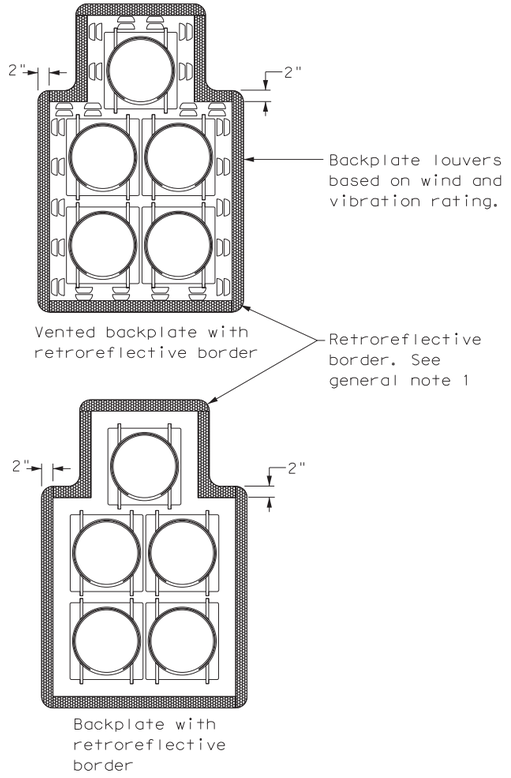
FOUR-SECTION HEAD
HORIZONTAL OR VERTICAL

GENERAL NOTES:

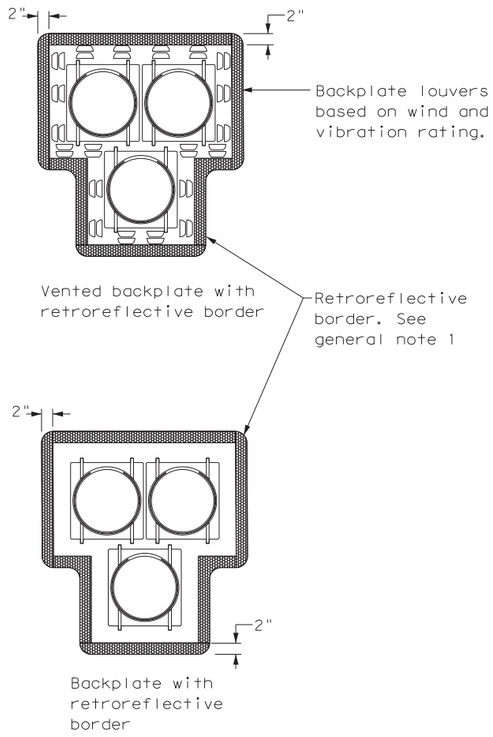
1. Backplates are optional for traffic signals and pedestrian hybrid beacons. When backplates are used, a 2-inch wide fluorescent yellow AASHTO Type B_{FL} or C_{FL} retroreflective border conforming to TxDOT DMS-8300 is required. Place on all approaches when used.
2. Signal head and backplate compatability must be verified by the contractor prior to installation.
3. When using backplates on signal heads, venting is preferred to reduce cyclic vibration stress.
4. When a vented backplate is used, the retroreflective border must not be placed over the louvers.
5. This standard sheet applies to all signal heads with backplates, including but not limited to:
   - Pole mounted
   - Overhead mounted
   - Span wire mounted
   - Mast arm mounted
   - Vertical signal heads
   - Horizontal signal heads
   - Clustered signal heads
   - Pedestrian hybrid beacons



FIVE-SECTION HEAD
HORIZONTAL OR VERTICAL



FIVE-SECTION HEAD
CLUSTER



PEDESTRIAN HYBRID
BEACON

Texas Department of Transportation

Traffic Safety Division Standard

TRAFFIC SIGNAL HEAD WITH BACKPLATE

TS-BP-20

FILE: ts-bp-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT June 2020	CONT	SECT	JOB	HIGHWAY
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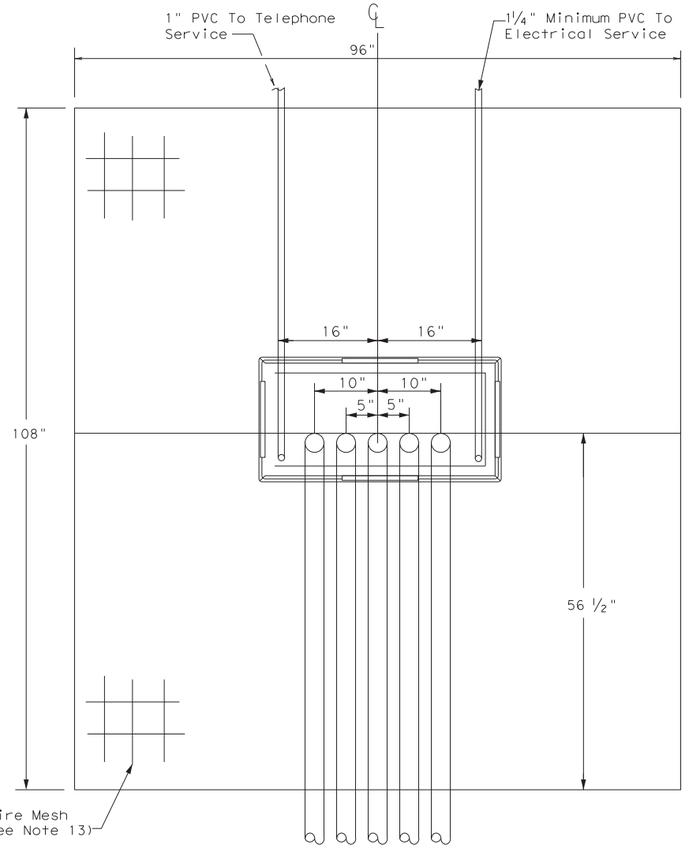
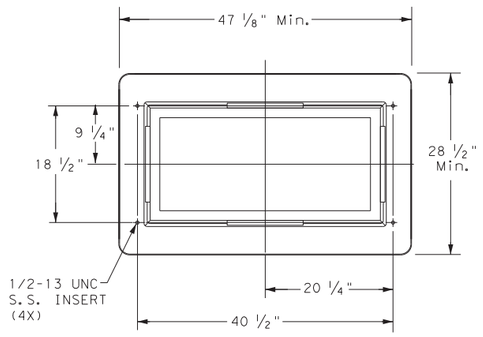
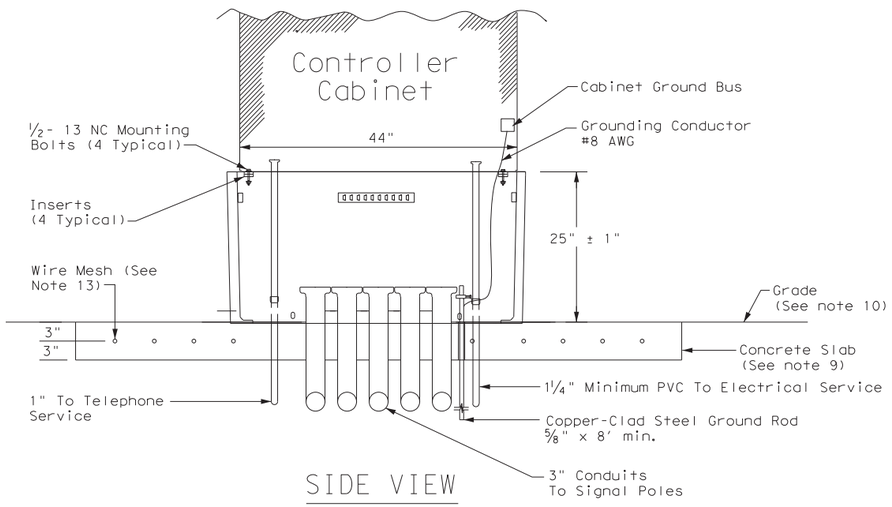
	DIST	COUNTY		SHEET NO.
	FTW	JOHNSON		44



TOP VIEW



CABINET BASE



SIDE VIEW

TRAFFIC SIGNAL CONTROLLER BASE:

1. Provide a traffic signal controller base (cabinet base) manufactured of polymer concrete material consisting of calcareous and siliceous stone; glass fibers and thermoset polyester resin. The polymer concrete cabinet base must be reinforced on the inside of the cabinet base with fiberglass matting. Provide one of the following bases: Armorcast Part # A6001848X24, Quazite Model # PG3048Z709, or other as approved by TxDOT Traffic Safety Division.
2. The polymer concrete material must have a minimum compressive strength of 10,300 pounds per square inch (psi), minimum flexural strength of 3600 psi, and minimum shear strength of 3600 psi.
3. The polymer concrete cabinet base must conform to the dimensions shown and must accommodate a standard TxDOT basemount cabinet.
4. Supply the cabinet base with four 1#2"-13 UNC stainless steel inserts for attachment of the cabinet to the base. Inserts must withstand a minimum torque of 50 ft-lb and a minimum straight pull out strength of 750 lbs.
5. Provide the cabinet base with 4 cable racks mounted one on each side of the base 2" to 7 " from the top edge of the base. Unless approved otherwise, cable racks must be 1-1/2 x 9#16x 3#16inch steel channel with eight T-slots spaced at 1-1/2 inches. The cable racks must easily accommodate the insertion of tie wraps to attach field wiring to the racks to serve as strain relief. Secure cable racks to the base using 1#2"-13 UNC stainless steel screws and inserts.
6. The cabinet base, when secured to the concrete slab with controller cabinet attached, must withstand a minimum wind load of 125 mph or a 850 lb force applied at 49" above the bottom of the base without causing the base or cabinet to come out of their anchored position or cause any permanent deformation. The manufacturer must supply certification by an independent testing laboratory or sealed by a Texas Licensed Professional Engineer. Provide the cabinet base with hardware for attachment to a concrete slab.
7. The traffic signal base must be permanently marked either by impress or by permanent ink with the manufacturer's model number and name or logo.
8. Seal the base to the concrete with a silicone caulk bead and fastened to the slab per manufacturer's instructions.

CONCRETE SLAB:

9. Traffic signal controller pad must be a portland cement concrete slab poured in place, must conform to the dimensions shown, and must be level.
10. Grade earthwork such that it is flush with the concrete pad on all four sides, unless otherwise shown on the plans. Subsidiary to ITEM 680, four inch rip rap may be used in lieu of earthwork. Slopes shall gradually contour to match plans.
11. Bond a #8 AWG copper ground wire and an 8 ft ground rod bonded to the reinforcing mesh by a suitable UL Listed clamp and terminated to the cabinet grounding bus for the purpose of providing a local ground for the electrical grounding conductor. The electrical grounding conductor specified in Item 680-3.A.4 is required and must be terminated to the cabinet ground bus.
12. Install a PVC sleeve to prevent the ground rod from direct embedment in the slab.
13. Provide welded wire mesh 6X6-W2.9 X W2.9 for reinforcement. Provide joints and splices in the mesh with a minimum 6-inch overlap. Center the mesh between top and bottom and provide a minimum 3 inch cover on the edges.
14. Provide Class B concrete minimum for the slab in accordance with Item 421. Construct the slab in accordance with Item 531.

CONDUITS:

15. Stub up and run 3-inch conduits through the slab to the various traffic signal poles and ground boxes as shown on the layouts. Install the number of conduits as shown on layouts plus two additional 3 inch conduits for future use. Terminate the conduits with a bushing between 2 and 4-inches above the slab.
16. Extend conduits for future use at least 18-inches from the edge of the slab, terminate underground with a coupling, and cap and seal so that the seal can be removed without damaging the coupling. This must also apply to unused telephone conduit.
17. Stub up two separate conduits through the slab from the electrical and telephone services. Run the conduit for the electrical feed directly to the electrical service enclosure. Run the conduit for the telephone line directly to the telephone service, usually located on the same pole as the electrical service. Telephone must not under any circumstance share a conduit with any other function.
18. Terminate electric and telephone conduits above the slab with a coupling. After the base is installed, extend the conduits above the top of the base and secure to the base using a steel one-hole strap or similar suitable substitute.

CONTROLLER CABINET:

19. Anchor the controller cabinet to the base using four stainless steel 1/2-13 NC bolts.
20. The silicone caulk bead specified in Item 680.3.B must be RTV 133.

PAYMENT:

21. Bid TS-CF as subsidiary to Item 680.

Texas Department of Transportation

Traffic Safety Division Standard

TRAFFIC SIGNAL CONTROLLER CABINET BASE AND PAD

TS-CF-21

FILE: ts-cf-21.dgn	DN:	CK:	DW:	CK:
© TxDOT October 2000	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	50	143	VA
12-04	DIST	COUNTY		SHEET NO.
2-21	FTW	JOHNSON		45

132

DATE: DATE TIME
FILE: DOCUMENT NAME

DATE:
FILE:

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

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

1.

2.

☐ No Action Required ☒ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000

2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.

3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.

4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

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

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

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

☒ No Permit Required

☐ Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)

☐ Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)

☐ Individual 404 Permit Required

☐ Other Nationwide Permit Required: NWP# _____

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

1.

2.

3.

4.

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

Best Management Practices:

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

III. CULTURAL RESOURCES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

IV. VEGETATION RESOURCES

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

☒ No Action Required ☐ Required Action

Action No.

1.

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.

2.

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 immediate area, and contact the Engineer immediately.

LIST OF ABBREVIATIONS

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

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

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

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

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

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

☐ Yes ☒ No

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

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

☐ Yes ☐ No

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

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

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

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

Texas Department of Transportation — Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-12-2011 (DS)	0902	50	143	VA
05-07-14 ADDED NOTE SECTION IV.	DIST	COUNTY		SHEET NO.
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	FTW	JOHNSON		46

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

This SWP3 has been developed in accordance with TxDOT policy for projects disturbing less than 1 acre of soil, and not part of a larger common plan of development.

For all projects with any soil disturbing activities, TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office. If no field office is available, then this SWP3 shall be kept at the appropriate TxDOT Area Office.

This SWP3 is consistent with requirements specified in applicable stormwater plans, and the project's environmental permits, issues, and commitments (EPICs).

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):
0902-50-143

1.2 PROJECT LIMITS:
From: FM 731

To: IH 35W NB Frontage Rd

1.3 PROJECT COORDINATES:
BEGIN: (Lat) 32.53944^N ,(Long) 97.36018^W

END: (Lat) 32.56313^N ,(Long) 97.31784^W

1.4 TOTAL PROJECT AREA (Acres): 5.6

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0.28

1.6 NATURE OF CONSTRUCTION ACTIVITY:
TRAFFIC SIGNAL INSTALLATION IMPROVEMENTS INCLUDING CABINET INSTALLATION, SIGNAL HEAD INSTALLATION, ETC.

1.7 MAJOR SOIL TYPES:

Soil Type	Description

1.8 PROJECT SPECIFIC LOCATIONS (PSLs):
PSLs must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. PSLs may be identified during preconstruction meetings or during the construction process. Please choose from the options below:

☐ PSLs determined during preconstruction meeting
☐ PSLs determined during construction
☐ No PSLs planned for construction

Type	Sheet #s

All off-ROW PSLs required by the Contractor are the Contractor's responsibility. The Contractor shall secure all permits required by local, state, federal laws for off-ROW PSLs. The contractor shall provide diagrams, areas of disturbance, acreage, and BMPs for all off-ROW PSLs within one mile of the project.

1.9 CONSTRUCTION ACTIVITIES:
(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.3.)

☐ Mobilization
☐ Install sediment and erosion controls
☐ Blade existing topsoil into windrows, prep ROW, clear and grub
☐ Remove existing pavement
☐ Grading operations, excavation, and embankment
☐ Excavate and prepare subgrade for proposed pavement widening
☐ Remove existing culverts, safety end treatments (SETs)
☐ Remove existing metal beam guard fence (MBGF), bridge rail
☐ Install proposed pavement per plans
☐ Install culverts, culvert extensions, SETs
☐ Install mow strip, MBGF, bridge rail
☐ Place flex base
☐ Rework slopes, grade ditches
☐ Blade windrowed material back across slopes
☐ Revegetation of unpaved areas
☐ Achieve site stabilization and remove sediment and erosion control measures
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.10 POTENTIAL POLLUTANTS AND SOURCES:

☐ Sediment laden stormwater from stormwater conveyance over disturbed area
☐ Fuels, oils, and lubricants from construction vehicles, equipment, and storage
☐ Solvents, paints, adhesives, etc. from various construction activities
☐ Transported soils from offsite vehicle tracking
☐ Construction debris and waste from various construction activities
☐ Contaminated water from excavation or dewatering pump-out water
☐ Sanitary waste from onsite restroom facilities
☐ Trash from various construction activities/receptacles
☐ Long-term stockpiles of material and waste
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.11 RECEIVING WATERS:
Receiving waters must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. Include Segment # for receiving waters.

Tributaries	Classified Waterbody

* Add (*) for impaired waterbodies with pollutant in ().

1.12 ROLES AND RESPONSIBILITIES: TxDOT

☒ Development of plans and specifications
☒ Perform SWP3 inspections
☒ Maintain SWP3 records and update to reflect daily operations
☐ Other: _____
☐ Other: _____

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

☒ Day To Day Operational Control
☒ Maintain schedule of major construction activities
☒ Install, maintain and modify BMPs
☐ Other: _____
☐ Other: _____

9/29/2023
STATE OF TEXAS
ABIGAIL AXELSON
146056
LICENSED PROFESSIONAL ENGINEER

STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		47
STATE	STATE DIST.	COUNTY	
TEXAS	FTW	JOHNSON	
CONT.	SECT.	JOB	HIGHWAY NO.
0902	50	143	VA

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

2.0 BEST MANAGEMENT PRACTICES (BMPs) AND CONTROLS, INSPECTION, AND MAINTENANCE

The Contractor shall be the responsible party for implementing the BMPs described herein and for complying with the SWP3 for control of erosion and sedimentation during day-to-day operations. The Contractor shall implement changes to this SWP3 approved by TxDOT within the times specified in this SWP3 or the CGP.

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

- ☐ ☐ Protection of Existing Vegetation
- ☐ ☐ Vegetated Buffer Zones
- ☐ ☐ Soil Retention Blankets
- ☐ ☐ Geotextiles
- ☐ ☐ Mulching/ Hydromulching
- ☐ ☐ Soil Surface Treatments
- ☐ ☐ Temporary Seeding
- ☐ ☐ Permanent Planting, Sodding or Seeding
- ☒ ☐ Biodegradable Erosion Control Logs
- ☐ ☐ Rock Filter Dams/ Rock Check Dams
- ☐ ☐ Vertical Tracking
- ☐ ☐ Interceptor Swale
- ☐ ☐ Riprap
- ☐ ☐ Diversion Dike
- ☐ ☐ Temporary Pipe Slope Drain
- ☐ ☐ Embankment for Erosion Control
- ☐ ☐ Paved Flumes
- ☐ ☐ Other: Erosional Control Logs
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____

2.2 SEDIMENT CONTROL BMPs:

T / P

- ☐ ☐ Biodegradable Erosion Control Logs
- ☐ ☐ Dewatering Controls
- ☐ ☐ Inlet Protection
- ☐ ☐ Rock Filter Dams/ Rock Check Dams
- ☐ ☐ Sandbag Berms
- ☐ ☐ Sediment Control Fence
- ☐ ☐ Stabilized Construction Exit
- ☐ ☐ Floating Turbidity Barrier
- ☐ ☐ Vegetated Buffer Zones
- ☐ ☐ Vegetated Filter Strips
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.3 PERMANENT CONTROLS:

(Coordinate post-construction BMPs with appropriate TxDOT maintenance sections.)

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

- ☐ Excess dirt/mud on road removed daily
- ☐ Haul roads dampened for dust control
- ☐ Loaded haul trucks to be covered with tarpaulin
- ☐ Stabilized construction exit
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

2.5 POLLUTION PREVENTION MEASURES:

- ☐ Chemical Management
- ☐ Concrete and Materials Waste Management
- ☐ Debris and Trash Management
- ☐ Dust Control
- ☐ Sanitary Facilities
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

2.6 VEGETATED BUFFER ZONES:

Natural vegetated buffers shall be maintained as feasible to protect adjacent surface waters. If vegetated natural buffer zones are not feasible due to site geometry, the appropriate additional sediment control measures have been incorporated into this SWP3.

Type	Stationing	
	From	To

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

- ☒ Fire hydrant flushings
- ☒ Irrigation drainage
- ☒ Pavement washwater (where spills or leaks have not occurred, and detergents are not used)
- ☒ Potable water sources
- ☒ Springs
- ☒ Uncontaminated groundwater
- ☒ Water used to wash vehicles or control dust
- ☒ Other allowable non-stormwater discharges as allowed by TPDES GP TXR150000.

2.8 INSPECTIONS:

All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3 .

2.9 MAINTENANCE:

Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. Maintenance shall be performed by the Contractor as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3.

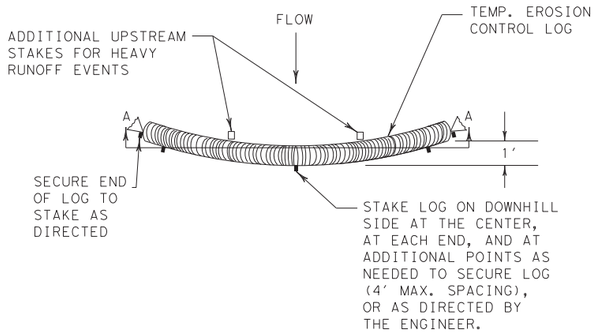
9/29/2023
STATE OF TEXAS
ABIGAIL AXELSON
146056
LICENSED
PROFESSIONAL ENGINEER

STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)

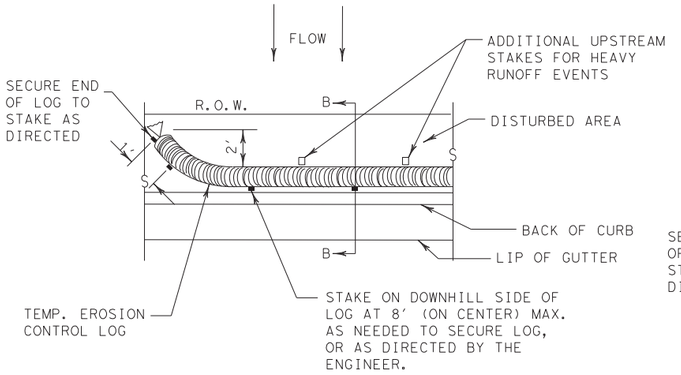
Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		48
STATE	STATE DIST.	COUNTY	
TEXAS	FTW	JOHNSON	
CONT.	SECT.	JOB	HIGHWAY NO.
0902	50	143	VA

DATE: 6/13/2023
FILE: K:\DAL_TPTO\project\061166095 - Burleson HSIP - Alsbury PS&E\CADD\standards\130 - EC(9)_1-16.dgn



PLAN VIEW



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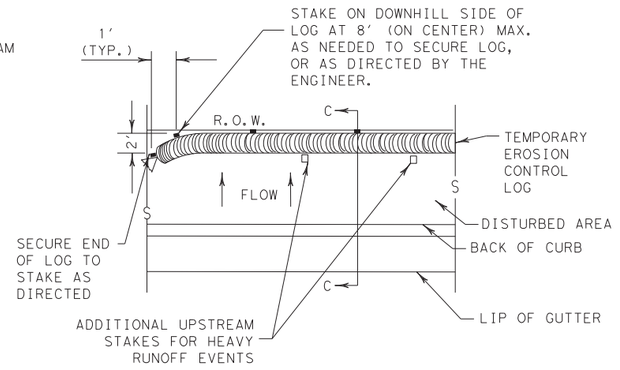

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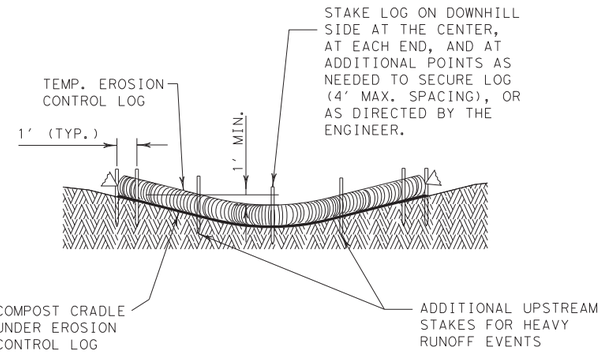
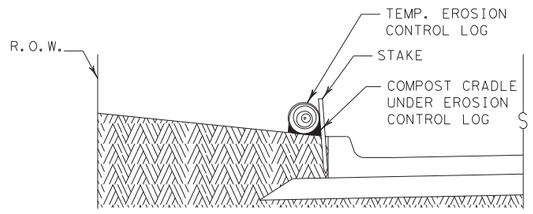


SECTION A-A

EROSION CONTROL LOG DAM

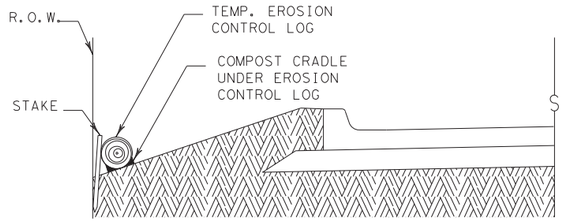
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

CL-BOC



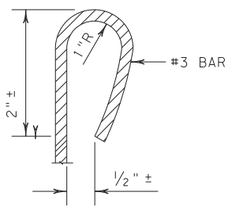
SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW

LEGEND

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



REBAR STAKE DETAIL

GENERAL NOTES:

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

SEDIMENT BASIN & TRAP USAGE GUIDELINES

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

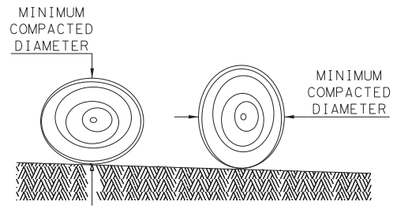
Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Control logs should be placed in the following locations:

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

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

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



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916		DN: TxDOT		CK: KM	DW: LS/PT		CK: LS
© TxDOT: JULY 2016		CONT	SECT	JOB		HIGHWAY	
REVISIONS		0902	50	143		VA	
		DIST		COUNTY			SHEET NO.
		FTW		JOHNSON			49

DATE: 6/13/2023
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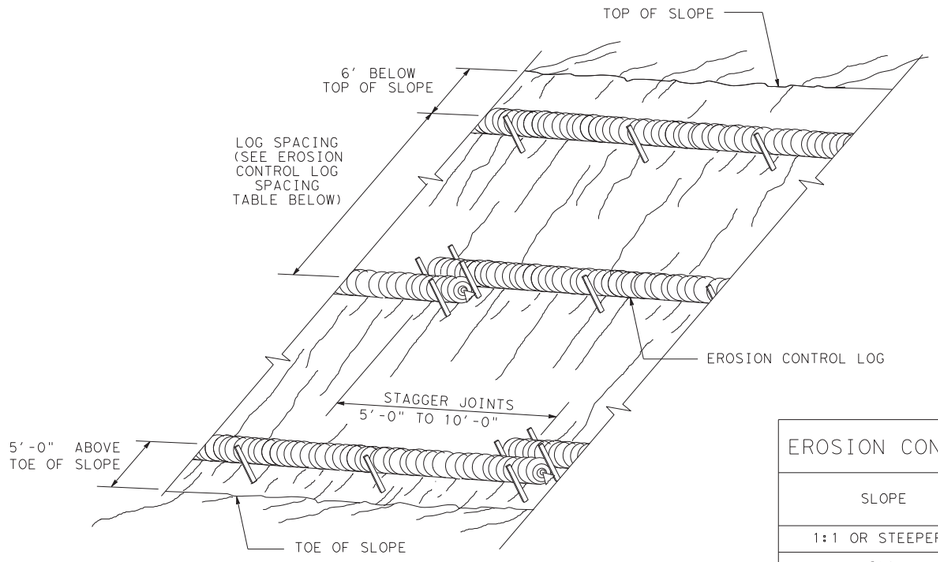
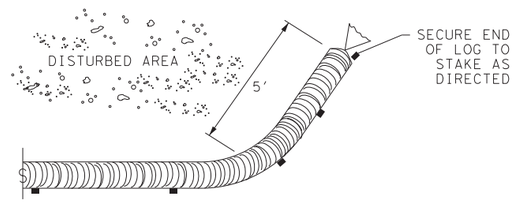


EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

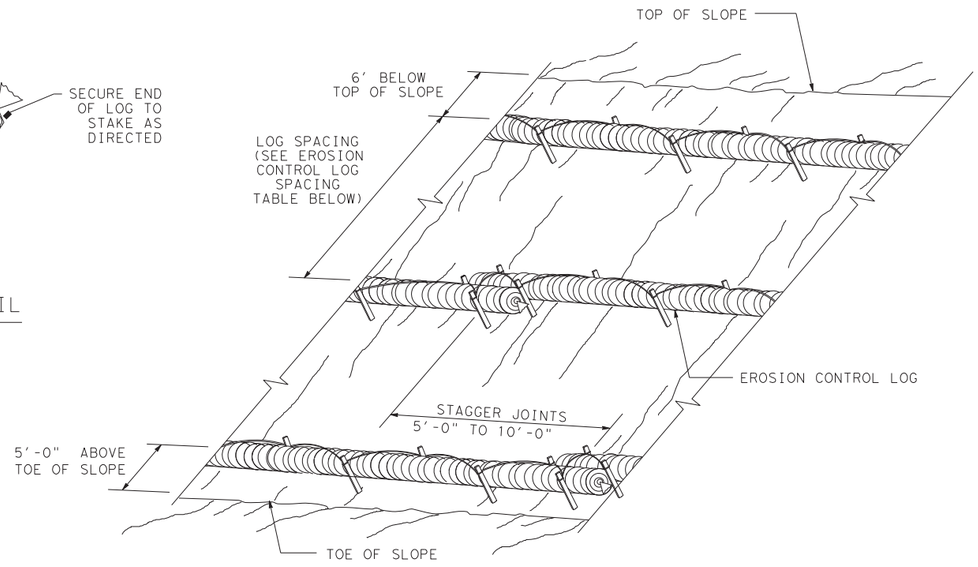
CL-SST



END SECTION RAP DETAIL

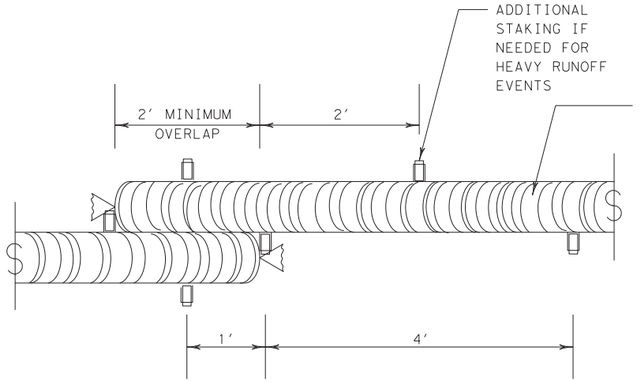
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

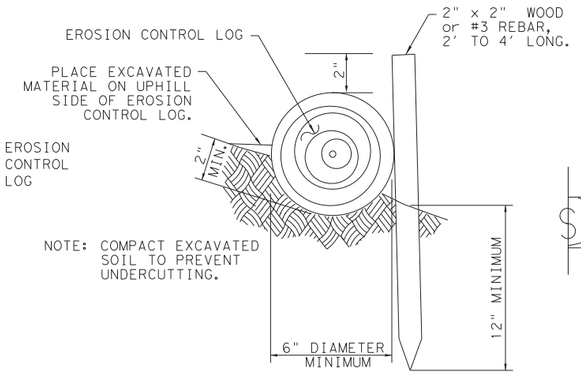
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

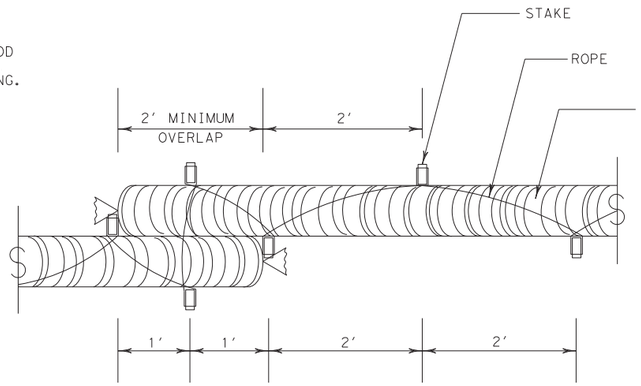


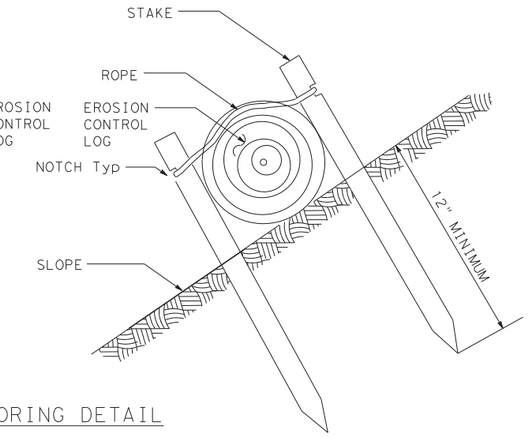


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

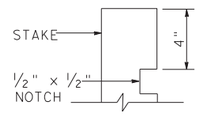
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
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REVISIONS	0902	50	143	VA
	DIST	COUNTY		SHEET NO.
	FTW	JOHNSON		50

DATE: 6/13/2023
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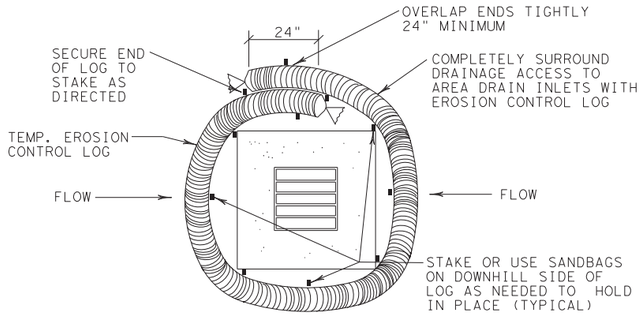
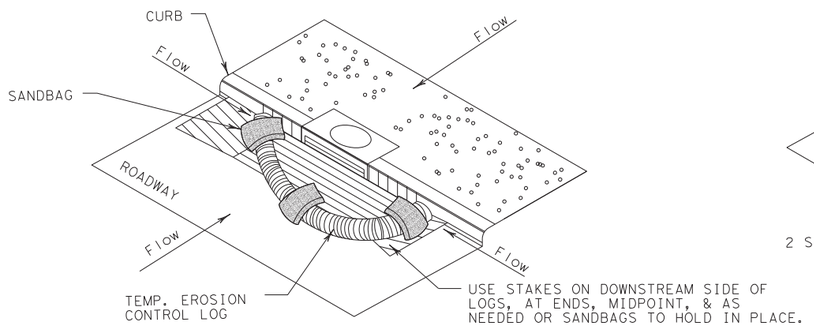


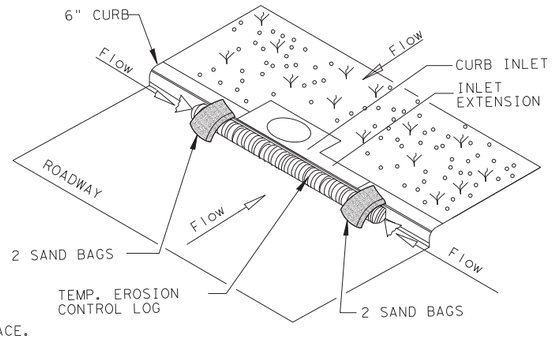
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

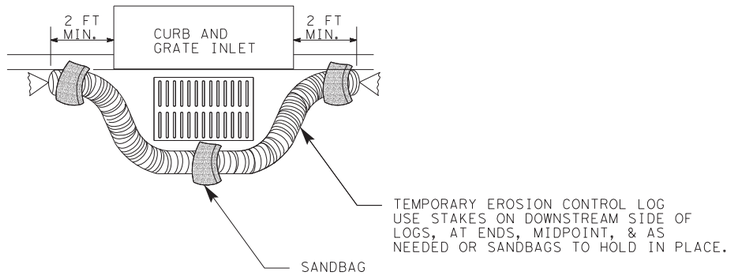
CL-CI



EROSION CONTROL LOG AT CURB INLET

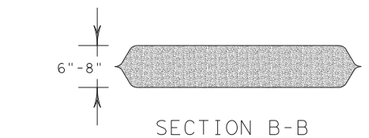
CL-CI

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

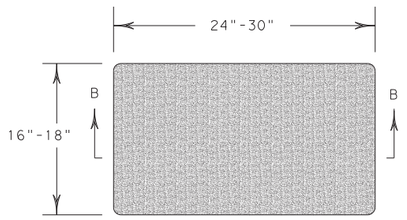


EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI



SECTION B-B



SANDBAG DETAIL

SHEET 3 OF 3

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

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REVISIONS	0902	50	143		VA		
	DIST	COUNTY			SHEET NO.		
	FTW	JOHNSON			51		