FHWA TEXAS DIVISION	PROJECT NO.		SHEET NO.
	F 2022(515), ETC		1
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS etc.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59
etc.	etc.	etc.	etc.

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

PROJECT NO: F 2022(515), ETC

FOR THE CONSTRUCTION OF SAFETY IMPROVEMENTS

TITLE SHEET
1 OF 2

SEE SHEET 3 FOR INDEX OF SHEETS

SEE SHEETS 4-13 FOR LOCATION MAPS

THE CONTRACTOR SHALL MAKE HIS OWN INVESTIGATIONS AND ARRANGEMENTS FOR DELIVERY OF MATERIALS.

REQUIRED SIGNS SHALL BE IN ACCORDANCE WITH THE CURRENT BARRICADE AND CONSTRUCTION OR BC SHEETS AND THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".

CASS COUNTY
CSJ 0062-04-051
US 59
AT SH 155

IMPROVE TRAFFIC SIGNAL, UPDATE SIGNAL HEADS, REMOVE AND INSTALL SIGNAL RELATED SIGNS

MARION COUNTY
CSJ 0062-06-060
US 59
AT FM 2208

IMPROVE TRAFFIC SIGNAL, UPDATE SIGNAL HEADS, REMOVE AND INSTALL SIGNAL RELATED SIGNS

MARION COUNTY
CSJ 0062-06-061
US 59
AT SH 49

IMPROVE TRAFFIC SIGNAL, UPDATE SIGNAL HEADS, REMOVE AND INSTALL SIGNAL RELATED SIGNS

HARRISON COUNTY
CSJ 0062-07-099
US 59
AT SL 390

IMPROVE TRAFFIC SIGNAL, UPDATE SIGNAL HEADS, REMOVE AND INSTALL SIGNAL RELATED SIGNS

HARRISON COUNTY
CSJ 0062-07-100
US 59
AT POPLAR ST.

IMPROVE TRAFFIC SIGNAL, UPDATE SIGNAL HEADS, REMOVE AND INSTALL SIGNAL RELATED SIGNS

HARRISON COUNTY
CSJ 0062-07-101
US 59
AT SH 43 N.

IMPROVE TRAFFIC SIGNAL, UPDATE SIGNAL HEADS, REMOVE AND INSTALL SIGNAL RELATED SIGNS

HARRISON COUNTY
CSJ 0062-07-102
US 59
AT US 80

IMPROVE TRAFFIC SIGNAL, UPDATE SIGNAL HEADS, REMOVE AND INSTALL SIGNAL RELATED SIGNS

HARRISON COUNTY
CSJ 0063-01-097
US 59
AT HOUSTON ST.

IMPROVE TRAFFIC SIGNAL, UPDATE SIGNAL HEADS, REMOVE AND INSTALL SIGNAL RELATED SIGNS

HARRISON COUNTY
CSJ 0063-01-098
US 59
AT FM 31

IMPROVE TRAFFIC SIGNAL, UPDATE SIGNAL HEADS, REMOVE AND INSTALL SIGNAL RELATED SIGNS, INSTALL ELECTRICAL CONDUCTORS

FINAL PLANS

LETTING DATE: _____

DATE CONTRACTOR BEGAN WORK: _____

DATE WORK WAS COMPLETED & ACCEPTED: _____

FINAL CONTRACT COST: $ _____

CONTRACTOR: _____

CONTRACTOR ADDRESS: _____

LIST OF APPROVED FIELD CHANGES:

THE CONSTRUCTION WORK WAS PERFORMED IN SUBSTANTIAL COMPLIANCE WITH THE CONTRACT.

_____ DATE

COUNTY CASS ETC. PROJ NO _____

HWY US 59 ETC. LETTING DATE APRIL, 2022

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, MAY 2012)

EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROAD CROSSINGS: NONE

1/18/2022
RECOMMENDED FOR LETTING: _____

Rebecca Hobbs, P.E.

DIRECTOR OF TRANSPORTATION OPERATIONS

RECOMMENDED FOR LETTING: 2/1/2022

DocuSigned by:
Deanne Simmons, P.E.
929084EF4AF345A...

DISTRICT DIRECTOR OF TRANSPORTATION PLANNING AND DEVELOPMENT

APPROVED FOR LETTING: 2/1/2022

DocuSigned by:
Joe C. Hobbs P.E.
0EAA5DC25F0F45E...

DISTRICT ENGINEER

FILE: T:\Engdata\Traffic\DGN\d192515 Jamie\JOBS\SAFETY PROJECTS\CSJ 0062-04-051 Reflective Backplates\TS.dgn
DATE: 1/12/2022 3:51:58 PM

HARRISON COUNTY
CSJ 0063-01-099
US 59
AT ELYSIAN FIELDS AVE.
IMPROVE TRAFFIC SIGNAL, UPDATE SIGNAL HEADS, REMOVE AND INSTALL SIGNAL RELATED SIGNS

HARRISON COUNTY
CSJ 0063-01-100
US 59
AT JOHNSON ST.
IMPROVE TRAFFIC SIGNAL, UPDATE SIGNAL HEADS, REMOVE AND INSTALL SIGNAL RELATED SIGNS

HARRISON COUNTY
CSJ 0063-01-101
US 59
AT SH 43 S.
IMPROVE TRAFFIC SIGNAL, UPDATE SIGNAL HEADS, REMOVE AND INSTALL SIGNAL RELATED SIGNS

HARRISON COUNTY
CSJ 0063-01-102
US 59
AT BELL ST.
IMPROVE TRAFFIC SIGNAL, UPDATE SIGNAL HEADS, REMOVE AND INSTALL SIGNAL RELATED SIGNS

PANOLA COUNTY
CSJ 0063-03-070
US 59
AT US 79
IMPROVE TRAFFIC SIGNAL, UPDATE SIGNAL HEADS, REMOVE AND INSTALL SIGNAL RELATED SIGNS

PANOLA COUNTY
CSJ 0063-04-066
US 59
AT FM 699
IMPROVE TRAFFIC SIGNAL, UPDATE SIGNAL HEADS, REMOVE AND INSTALL SIGNAL RELATED SIGNS

PANOLA COUNTY
CSJ 0063-04-067
US 59
AT SH 149
IMPROVE TRAFFIC SIGNAL, UPDATE SIGNAL HEADS, REMOVE AND INSTALL SIGNAL RELATED SIGNS

BOWIE COUNTY
CSJ 0218-01-101
US 59
AT FM 989
IMPROVE TRAFFIC SIGNAL, UPDATE SIGNAL HEADS, REMOVE AND INSTALL SIGNAL RELATED SIGNS

BOWIE COUNTY
CSJ 0218-01-102
US 59
AT FM 2148
IMPROVE TRAFFIC SIGNAL, UPDATE SIGNAL HEADS, REMOVE AND INSTALL SIGNAL RELATED SIGNS, INSTALL BATTERY BACKUP

BOWIE COUNTY
CSJ 0218-01-103
US 59
AT SL 151
IMPROVE TRAFFIC SIGNAL, UPDATE SIGNAL HEADS, REMOVE AND INSTALL SIGNAL RELATED SIGNS, INSTALL ELECTRICAL CONDUCTORS

BOWIE COUNTY
CSJ 0218-02-053
IH 369
AT US 82
IMPROVE TRAFFIC SIGNAL, UPDATE SIGNAL HEADS, REMOVE AND INSTALL SIGNAL RELATED SIGNS

BOWIE COUNTY
CSJ 0218-02-054
IH 369
AT US 67
IMPROVE TRAFFIC SIGNAL, UPDATE SIGNAL HEADS, REMOVE AND INSTALL SIGNAL RELATED SIGNS

CASS COUNTY
CSJ 0218-04-123
US 59
AT EMMA LENA WAY
IMPROVE TRAFFIC SIGNAL, UPDATE SIGNAL HEADS, REMOVE AND INSTALL SIGNAL RELATED SIGNS

CASS COUNTY
CSJ 0218-04-124
US 59
AT SH 77
IMPROVE TRAFFIC SIGNAL, UPDATE SIGNAL HEADS, REMOVE AND INSTALL SIGNAL RELATED SIGNS, INSTALL ELECTRICAL CONDUCTORS

CASS COUNTY
CSJ 0218-04-125
US 59
AT FM 125
IMPROVE TRAFFIC SIGNAL, UPDATE SIGNAL HEADS, REMOVE AND INSTALL SIGNAL RELATED SIGNS

CAMP COUNTY
CSJ 0248-02-068
US 271
AT SL 179
IMPROVE TRAFFIC SIGNAL, UPDATE SIGNAL HEADS, REMOVE AND INSTALL SIGNAL RELATED SIGNS

CASS COUNTY
CSJ 0278-01-063
SH 77
AT FM 251
IMPROVE TRAFFIC SIGNAL, UPDATE SIGNAL HEADS, REMOVE AND INSTALL SIGNAL RELATED SIGNS

UPSHUR COUNTY
CSJ 0401-04-039
SH 154
AT FM 49
IMPROVE TRAFFIC SIGNAL, UPDATE SIGNAL HEADS, REMOVE AND INSTALL SIGNAL RELATED SIGNS

BOWIE COUNTY
CSJ 0945-01-044
SH 93
AT US 82
IMPROVE TRAFFIC SIGNAL, UPDATE SIGNAL HEADS, REMOVE AND INSTALL SIGNAL RELATED SIGNS

TITLE SHEET
2 OF 2

Texas Department of Transportation

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
	F 2022(515), ETC		2
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS etc.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59
etc.	etc.	etc.	etc.

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INDEX OF SHEETS

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE BY A ** HAVE BEEN ISSUED BY ME AND ARE APPLICABLE TO THIS PROJECT.

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED
PROFESSIONAL ENGINEER

Christina N. Trowler, P.E.

1/18/2022

INDEX OF SHEETS

 Texas Department of Transportation

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
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TEXAS	ATL	CASS etc.	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59
etc.	etc.	etc.	etc.

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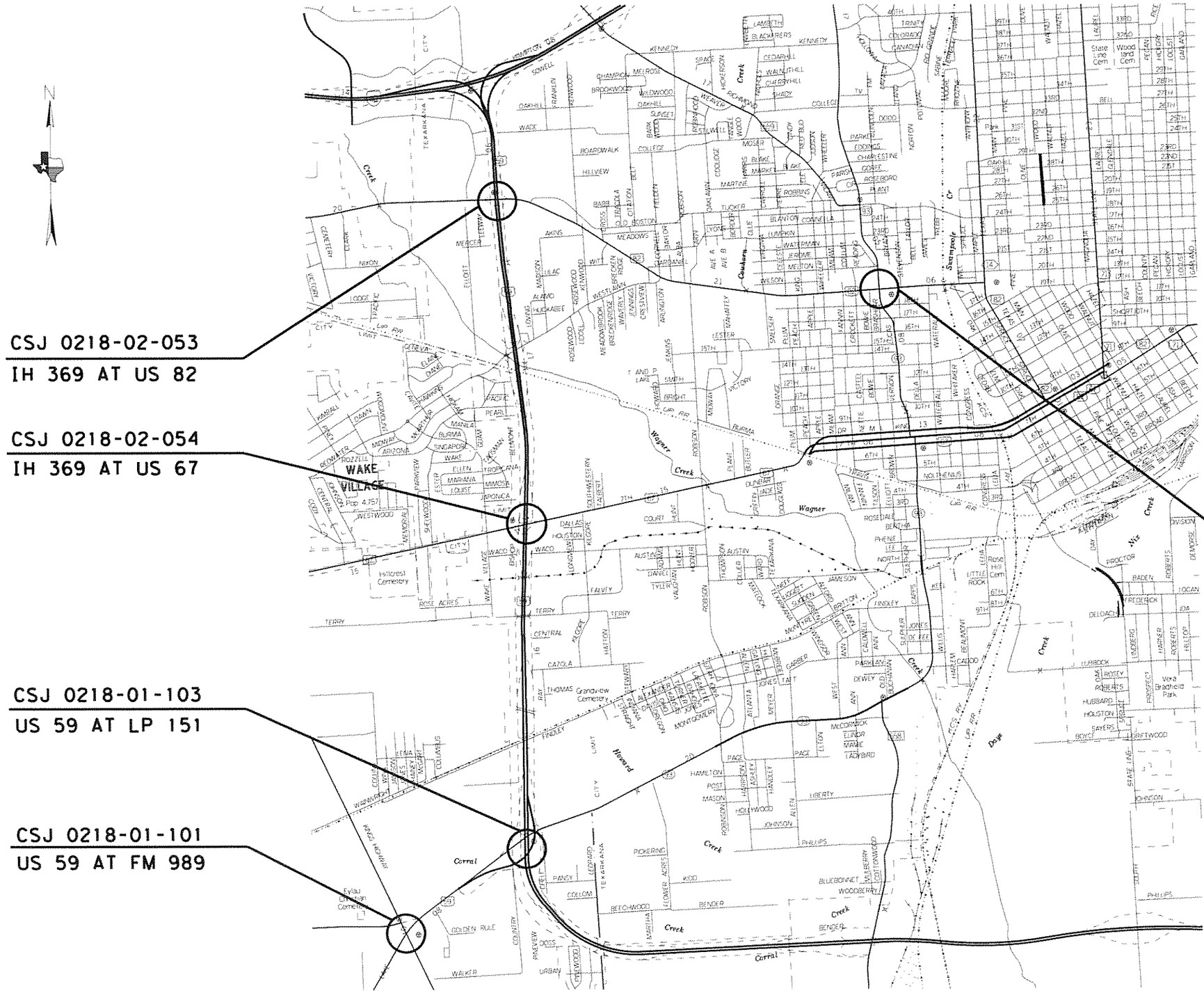

CITY OF TEXARKANA

THE CITY HEREBY CONSENTS TO THE CONSTRUCTION OF THIS HIGHWAY TRAFFIC SIGNAL AS TO LOCATION AND MANNER OF CONSTRUCTION AS INDICATED ON THESE PLANS, SAID INSTALLATION BEING A PART OF "AGREEMENT (TRAFFIC SIGNAL- TYP B), DATED APRIL 24, 2006".

APPROVED: Bob Bruggeman 01-11-2022
MAYOR

FOR THE INTERSECTION OF
US 59 AT SL 151

LOCATION MAP

NOT TO SCALE

SHEET 1 OF 10

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.			SHEET NO.
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STATE	DISTRICT	COUNTY		
TEXAS	ATL	CASS		
CONTROL	SECTION	JOB	HIGHWAY NO.	
0062	04	051	US 59	

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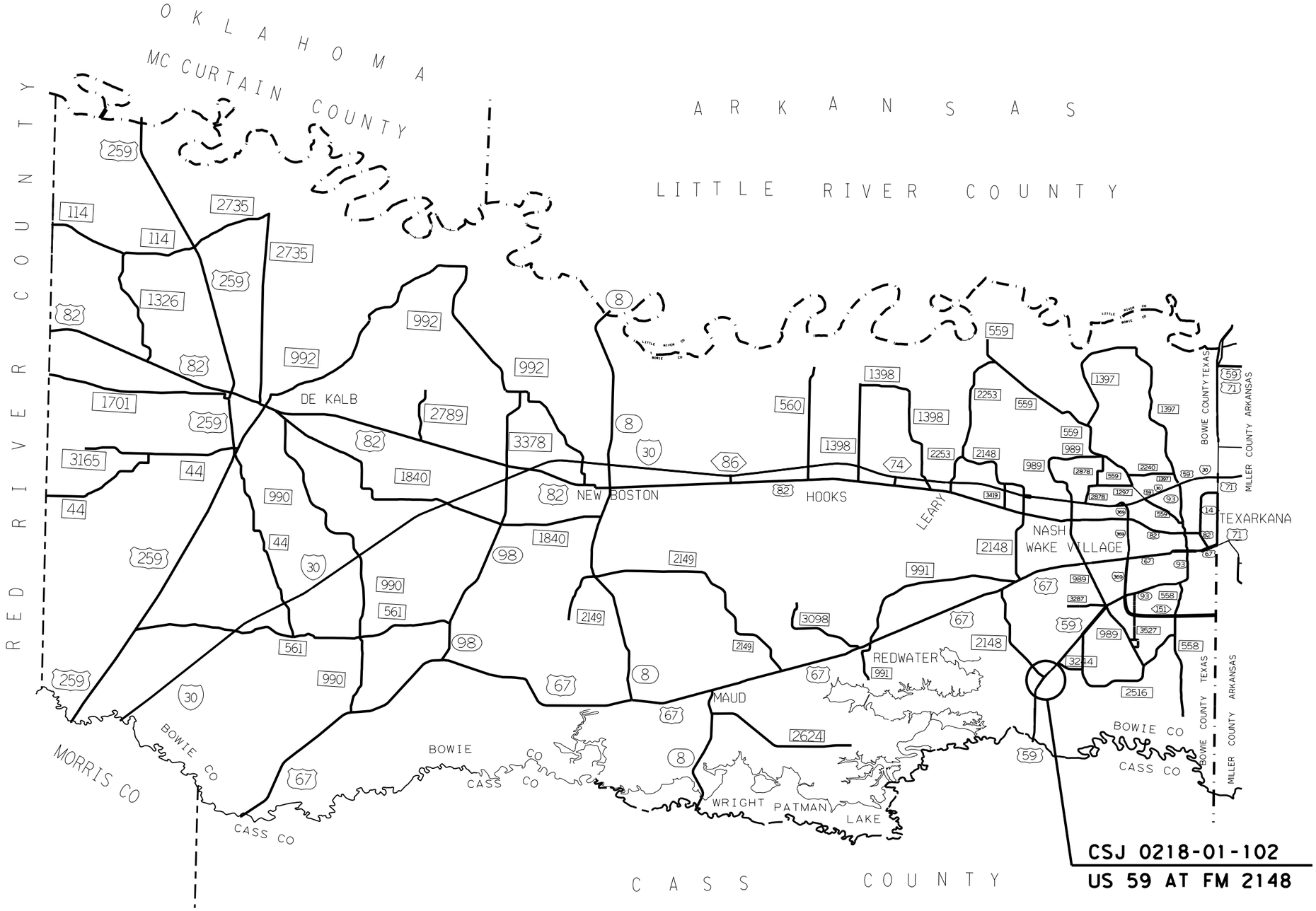

BOWIE CO.

NOT TO SCALE

CSJ 0218-01-102
US 59 AT FM 2148

LOCATION MAP

Texas Department of Transportation
SHEET 2 OF 10

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
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STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

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CITY OF ATLANTA

THE CITY HEREBY CONSENTS TO THE CONSTRUCTION OF THIS HIGHWAY TRAFFIC SIGNAL AS TO LOCATION AND MANNER OF CONSTRUCTION AS INDICATED ON THESE PLANS, SAID INSTALLATION BEING A PART OF "AGREEMENT (TRAFFIC SIGNAL- TYP B)", DATED JULY 10, 1978".

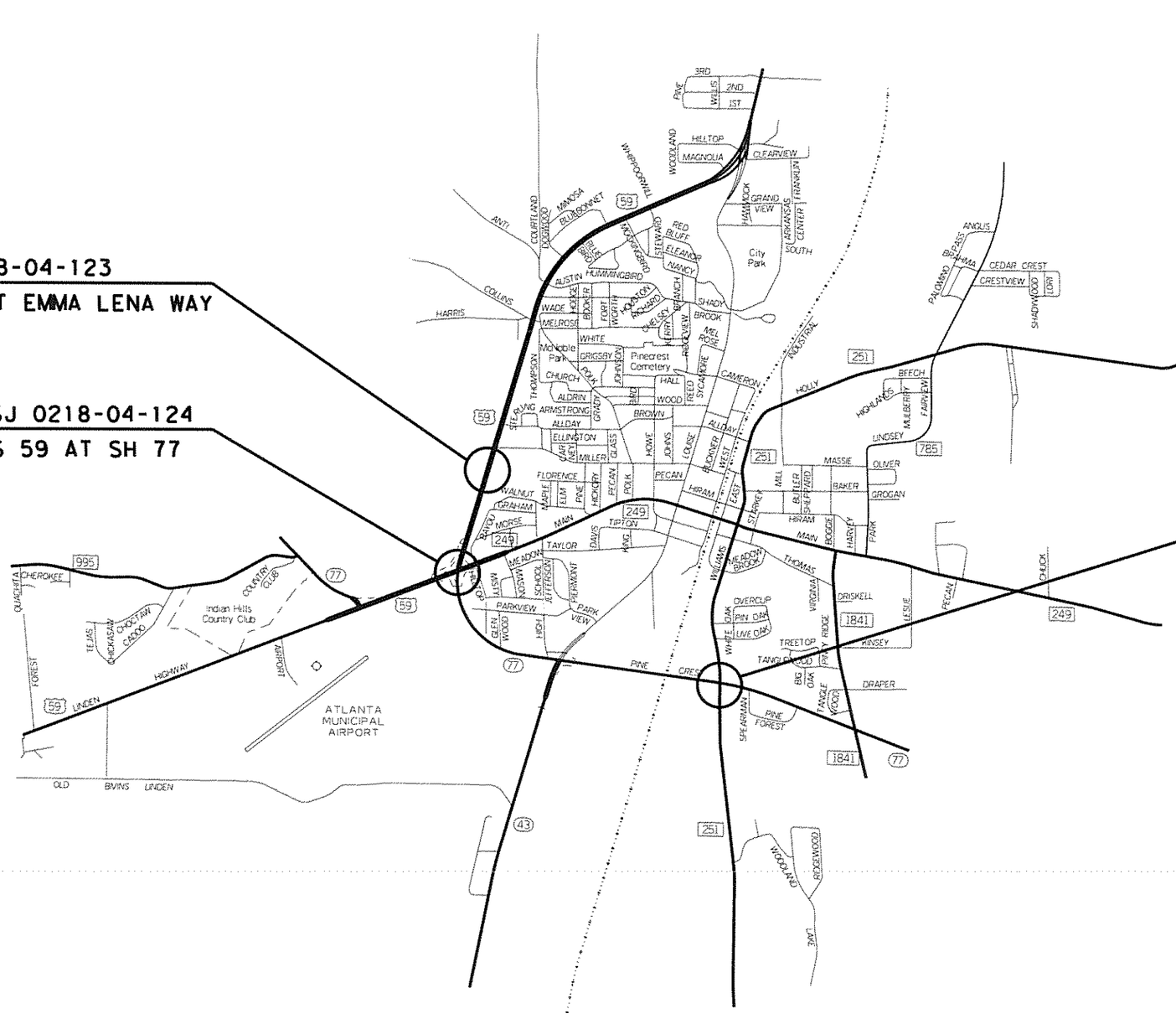
APPROVED _____. 2022
MAYOR

FOR THE INTERSECTION OF
US 59 AT SH 77

CSJ 0218-04-123
US 59 AT EMMA LENA WAY

CSJ 0218-04-124
US 59 AT SH 77

CSJ 0278-01-063
SH 77 AT FM 251



ATLANTA

NOT TO SCALE

LOCATION MAP

SHEET 3 OF 10

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			6
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

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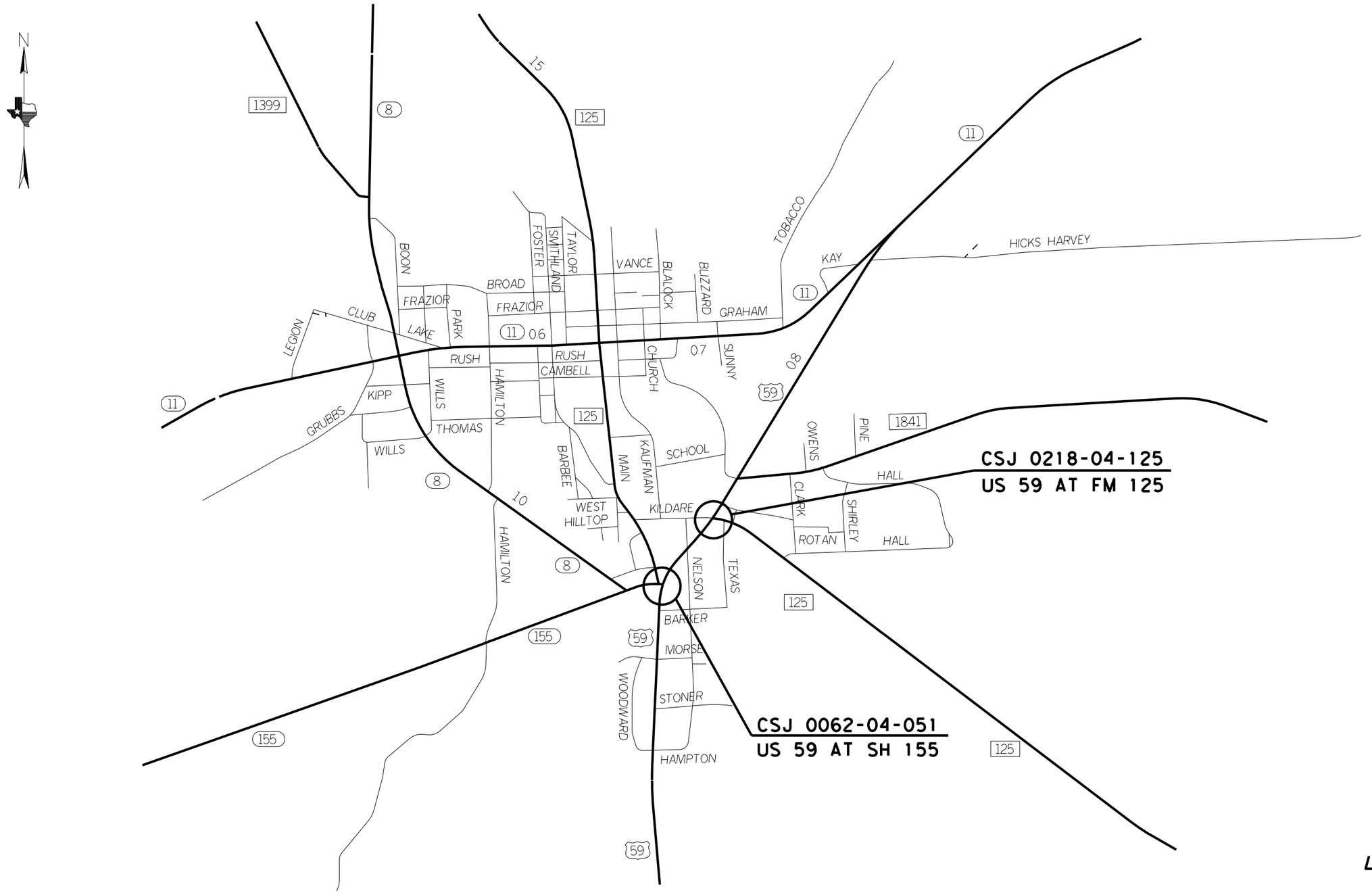

NOT TO SCALE

LOCATION MAP

Texas Department of Transportation

SHEET 4 OF 10

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
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STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

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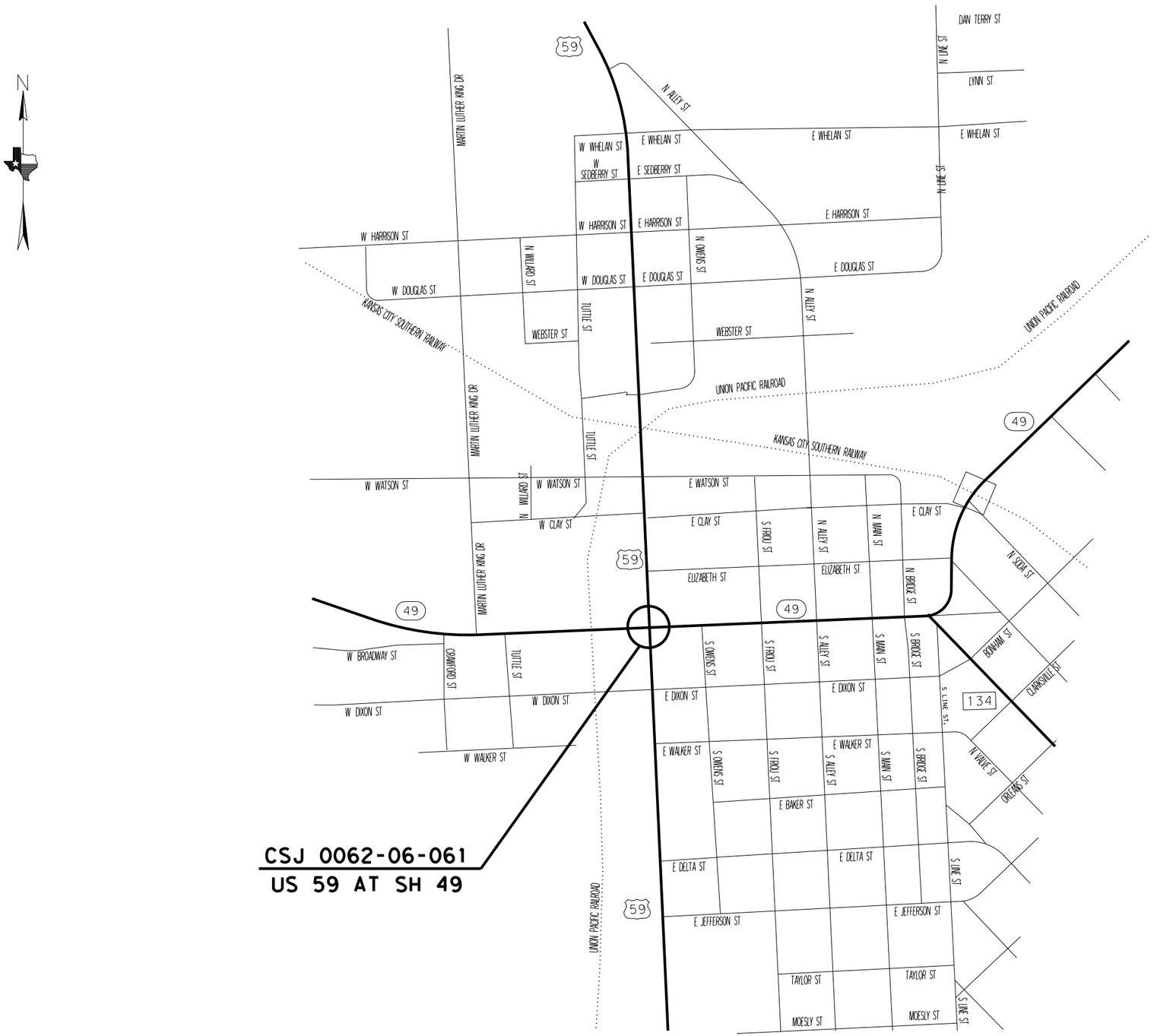

NOT TO SCALE

LOCATION MAP

Texas Department of Transportation

SHEET 5 OF 10

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			8

STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

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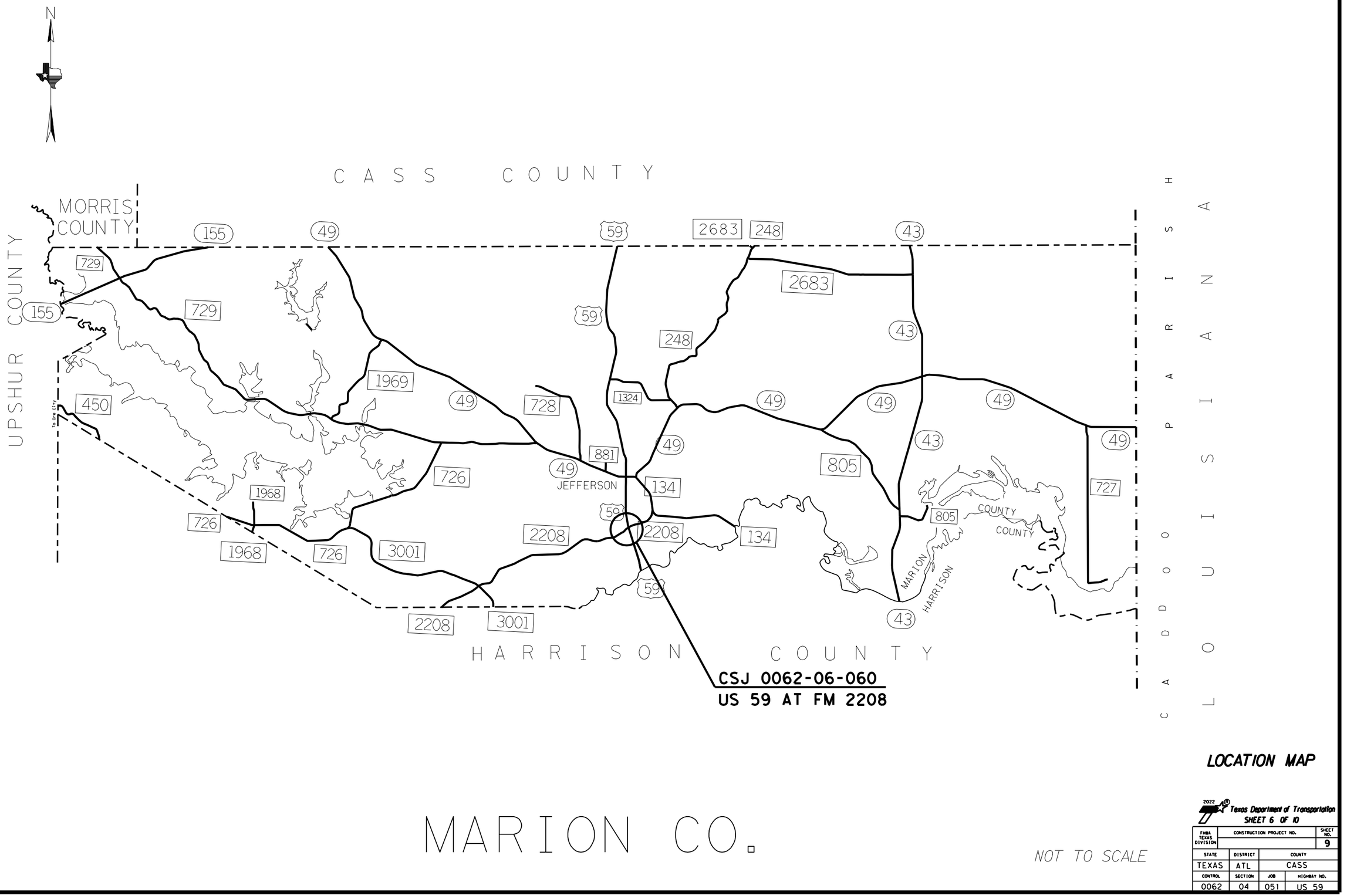

MARION CO.

NOT TO SCALE

LOCATION MAP

2022 Texas Department of Transportation
SHEET 6 OF 10

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			9
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

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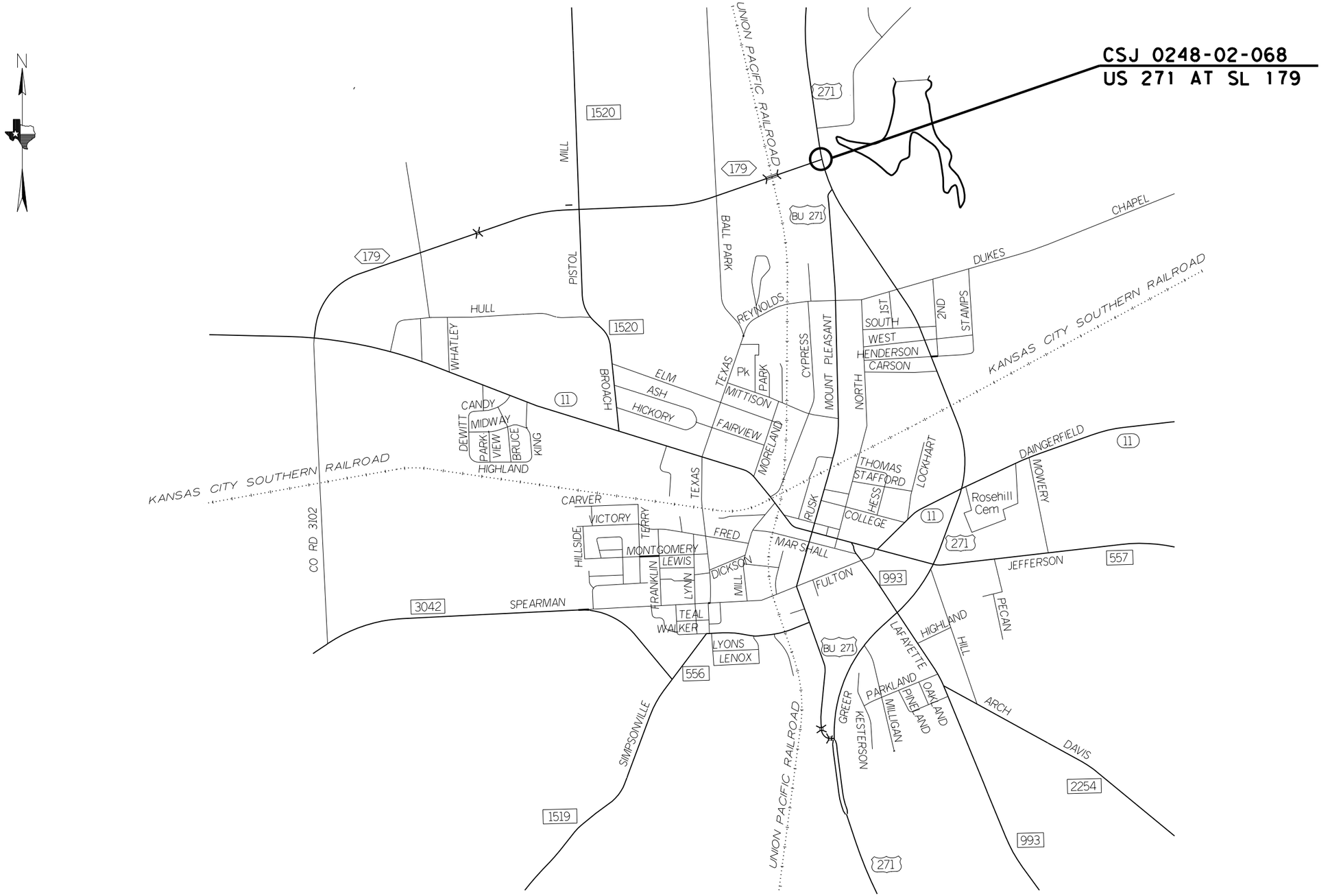

PITTSBURG

NOT TO SCALE

LOCATION MAP

SHEET 7 OF 10

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			10
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

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CSJ 0062-07-099
US 59 AT SL 390

CSJ 0062-07-101
US 59 AT SH 43 N.

CSJ 0062-07-100
US 59 AT POPLAR ST.

CSJ 0062-07-102
US 59 AT US 80

CSJ 0063-01-098
US 59 AT FM 31

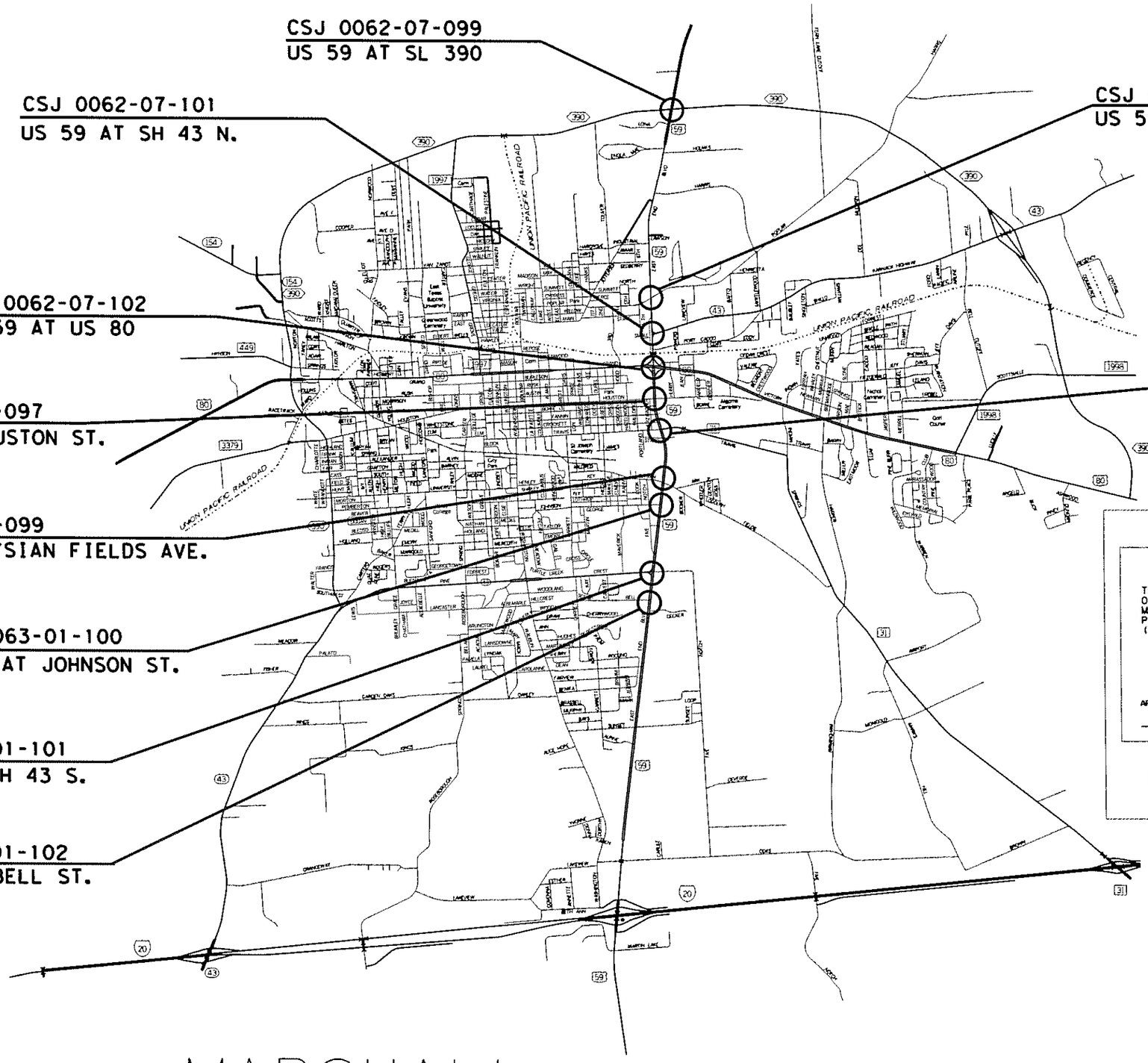
CSJ 0063-01-097
US 59 AT HOUSTON ST.

CSJ 0063-01-099
US 59 AT ELYSIAN FIELDS AVE.

CSJ 0063-01-100
US 59 AT JOHNSON ST.

CSJ 0063-01-101
US 59 AT SH 43 S.

CSJ 0063-01-102
US 59 AT BELL ST.



CITY OF MARSHALL

THE CITY HEREBY CONSENTS TO THE CONSTRUCTION OF THIS HIGHWAY TRAFFIC SIGNAL AS TO LOCATION AND MANNER OF CONSTRUCTION AS INDICATED ON THESE PLANS, SAID INSTALLATION BEING A PART OF "AGREEMENT (TRAFFIC SIGNAL- TYP B), DATED JUNE 23, 1994".

APPROVED Dayn Willey 1-18, 2022
MAYOR

FOR THE INTERSECTION OF
US 59 AT FM 31

MARSHALL

NOT TO SCALE

LOCATION MAP

© 2022 Texas Department of Transportation
SHEET 8 OF 10

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			11
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

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CARTHAGE

LOCATION MAP

NOT TO SCALE

Texas Department of Transportation

SHEET 9 OF 10

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			12
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

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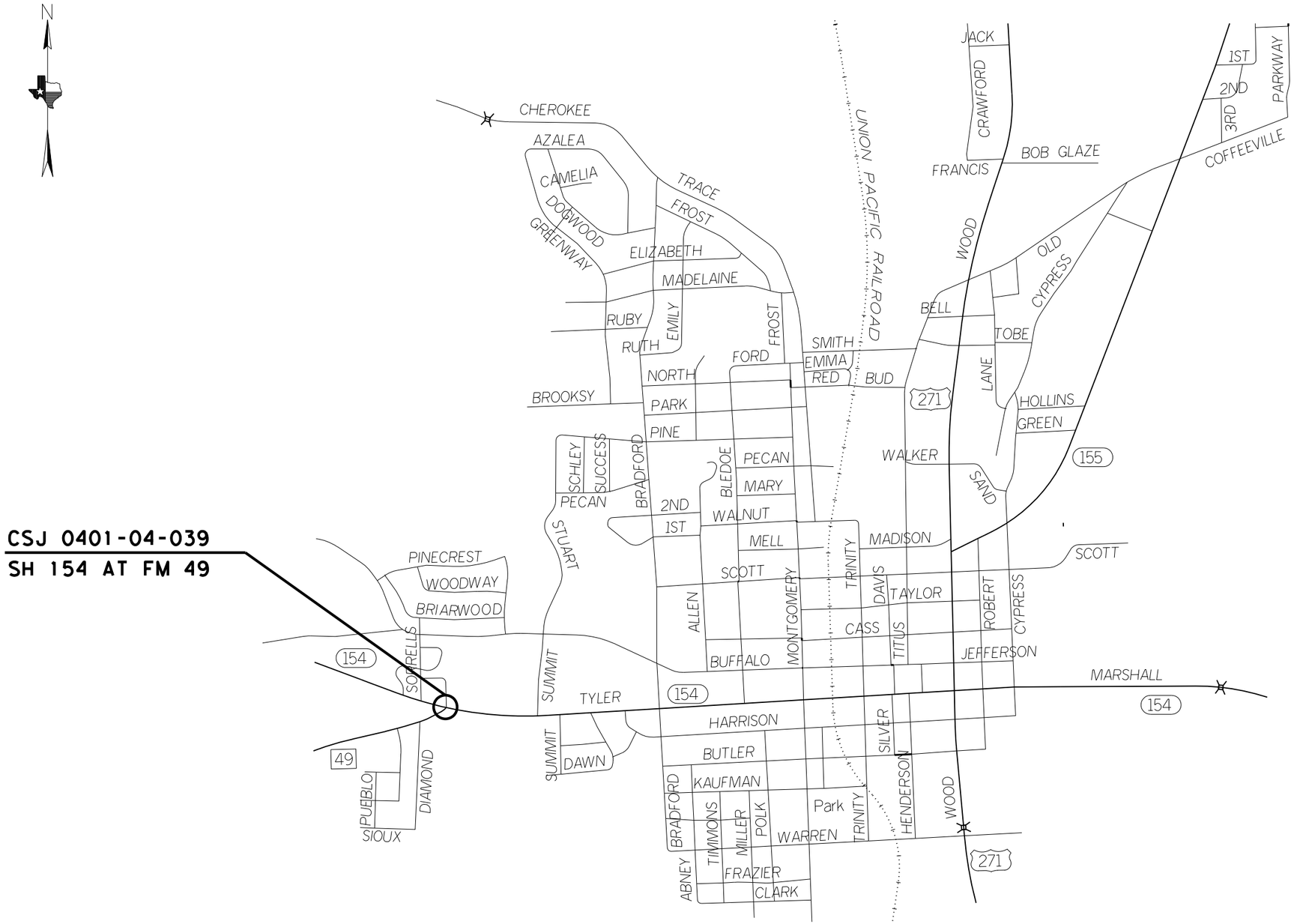

CSJ 0401-04-039

SH 154 AT FM 49

GILMER

NOT TO SCALE

LOCATION MAP

Texas Department of Transportation

SHEET 10 OF 10

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
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STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

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GENERAL NOTES:

General Requirements and Covenants:

Catalog numbers or trade names of any manufacturer for any part of the installation shown on these plans, are for the purpose of identification only. Furnish manufacturer's materials that are of equal quality and comply with the specifications for this project.

Contractor questions on this project are to be emailed to the following individuals:
Rebecca L. Wells, P.E. – Director of Transportation Operations
Rebecca.wells@Txdot.gov
Christina N. Trowler, P.E. – District Traffic Engineer
Christina.trowler@Txdot.gov

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

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

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

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

Notify the Engineer or his representative by 8:15 a.m. on any day when working in the District.

Clean up and remove all loose material resulting from contract operations each day before work is suspended for that day.

Repair all pavement damaged by the Contractor's forces during construction. Such repair is to be considered incidental to the various bid items in the project and must be approved by engineer.

Two of the intersections in this project will require law enforcement on site when traffic is in a stop condition (US 59 at SH 77, and US 59 at FM 31). Contractor to coordinate this and be reimbursed by TXDOT thru force account.

ITEM 5 – Control of the Work:

Contact all utility companies for the exact location of underground utilities before boring, trenching or any other work that might interfere with or damage existing utilities.

Repair any damage caused to utilities by Contractor operations at own expense and restore service in a timely manner.

Work on any project will not be accepted until all components have been shown to be fully operational.

ITEM 6 - Control of Material:

When requesting payments for material on hand, contractor's material storage facility will be within the Atlanta District.

Pre-qualified products can be found at http://www.txdot.gov/business/resources/producer-list.html.

ITEM 7 – Legal Relations and Responsibilities:

This project is considered a maintenance activity and is exempt from the Construction General Permit (CGP) coverage.

Transmit copies of correspondence between Contractor and resource agencies as listed in Article 7.7 "Preservation of Cultural and Natural Resources and the Environment". Work in this contract is required to be done on railroad property. Cooperate with the railroads and comply with all of their requirements including obtaining any training they require before performing work on railroad property.

No significant traffic generator events.

ITEM 8 – Prosecution and Progress:

A standard workweek will be used to determine time charges in accordance with Section 8.3.1.4, "Standard Workweek".

Work on the roadway will not begin until thirty (30) minutes after sunrise and will end on the roadway by thirty (30) minutes before sunset or as directed by the Engineer.

Provide progress schedules meeting the requirements of Section 8.5.2 in 2014 Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges.

Refer to SP 008-002 (60 days) for additional information regarding beginning of working day charges. The reason for the delay is to allow for ordering of materials.

ITEM 9 – Measurement and Payment:

For all pay items, a daily email will be sent to the inspector with the item number, quantity, and location description.

ITEM 502 – Barricades, Signs, and Traffic Handling:

For this project temporary rollup signs will be used on all of the 28 intersections. These signs will be placed at each intersection while the Contractor is working and removed at the end of each of day. Permanent barricades will not be required for this project due to the short duration of the work and the number of intersections.

For this project three of the intersections will require the use of temporary stop signs: US 59 at SL 151, US 59 at SH 77, and US 59 at FM 31. Reference the plan sheets for each of these intersections in the plan set for location and the number of signs needed for each location. Temporary stop signs will not be paid for separately but will be subsidiary to this Item. Temporary stop signs will meet all the requirements noted in the BC standard sheet and in the plan set.

Additional signing will be required at the intersection of US 59 and FM 31 on the East Travis St. approach. Additional signs, and barricades required for this will be subsidiary to this Item. Refer to Proposed Signal Layout US 59 and FM 31, and the Sign Detail sheet for US 59 and FM 31 in the plan set.

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

There may be ongoing contracts on several of the roadways included in this contract. Coordinate work with these projects and consult with the Engineer when developing sequence of work.

The Traffic Control Plan for this contract consists of the installation and maintenance of warning signs and or other traffic control devices shown in the plans, specification data which may be included in the general notes, applicable provisions of the Texas Manual on Uniform Traffic Control Devices (TMUTCD), traffic control plan sheets included in the plans, standard BC sheets and Item 502 of the standard specifications.

The Contractor's responsible person (CRP) will be responsible for ensuring that the signs and traffic control devices are in place and functioning properly in accordance with Article 502.2 of the Standard Specifications.

The CRP will inspect and ensure any deficiencies are corrected each and every day throughout the duration of this contract. Notify the Engineer in writing of the name, address, and telephone number of this employee or these employees.

For the traffic control plan sheets when shown in the plans for handling traffic through the work area, the signing arrangement and spacing shown may be varied as necessary to fit field conditions; however, any proposed changes in the traffic control plan must be approved by the Engineer prior to implementation.

Restrict the movement of equipment across traffic lanes to an absolute minimum.

All warning signs will be (48 inches x 48 inches) black on orange, factory made and in satisfactory condition.

Strobe lights or flashing lights and back up horns (when applicable and/or as directed by the Engineer) will be installed on all motorized equipment and will be in operation during the time that the equipment is working on or near the road surface.

A Type B flashing arrow panel will be required on this project when a lane of traffic is to be closed for any duration of time.

Anytime equipment encroaches into a travel lane as shown on WZ BTS and TCP standards shown in this project, the Contractor will be required to have at least one shadow vehicle with a truck mounted attenuator as directed.

Install temporary rumble strips in accordance with WZ(RS) whenever short duration stationary lane closures are in place and workers are present.

Notify inspector prior to any planned lane closures. Lane closures must be entered in the HCR (Highway Condition Report) 48 hours prior to beginning work.

All flaggers will be properly attired, orange or fluorescent type III vests and white hard hats are required. Proper flagging procedures must be demonstrated by all workers in accordance with the “Texas Manual on Uniform Traffic Control Device.” A list of all qualified flaggers will be furnished by the Contractor before beginning work. This list will be updated as flaggers become qualified.

Provide flaggers at the ends of work areas and at all other points of conflict with roadway machinery and roadway traffic when and as directed.

No equipment will be left within 30 feet of the travel way. Equipment and/or obstructions within 30 feet of the travel way will be removed or clearly marked by warning lights and barricades, as directed.

Maintain access to abutting property at all times using approved materials and methods. Work required to maintain ingress and egress within the limits of this project will not be paid for directly but is subsidiary to the pertinent bid items. Provide for traffic safety and for the ingress

and egress to public and private property in work areas at all times during the construction of this project.

Place construction fencing a minimum of 4 feet high around bore pits open over night for pedestrian safety. Use appropriate post to install fencing around open pits, do not use equipment as part of post or fencing system.

The existing number of lanes open to traffic will not be reduced except that lane closures will be required on high speed roadways for all short term/short duration work that requires a vehicle to be in the roadway or as directed.

In urban areas and high speed areas the contractor will be required to set up full lane closures when working at intersections as directed by the Engineer.

With reference to WZ (BTS-1), typical hanging signal installations, the Contractor may be required to close a traffic lane(s) as directed.

Maintenance of driveways and intersections will not be paid for directly but is subsidiary to the pertinent bid items.

ITEM 506 – Temporary Erosion, Sedimentation, and Environmental Controls:

It is the intent of this contract that no disturbance of vegetation occurs as a result of roadway operations. In the event vegetation is disturbed, place erosion or pollution control measures deemed necessary by the Engineer. Work performed for which there are no applicable pay items in the contract will be reimbursed in accordance with Article 9.7, “Payment for Extra Work and Force Account Method”.

ITEM 618 – Conduit:

When the specifications for electrical items require UL listed products, it will be understood to mean UL listed or Any Nationally Recognized Testing Lab (NRTL).

Aluminum conduit is acceptable for this project where rigid metal conduit is used. Aluminum conduit specification will be submitted to the Engineer for approval. The aluminum conduit will be new and unused and UL-Listed. Notify the Engineer that aluminum conduit will be used on this project. Aluminum conduit will be installed, measured, and paid for under item 618.

Install a continuous bare or green insulated copper wire, No. 6 awg or larger, except where shown on the plans, in the conduit throughout the electrical system in accordance with the electrical detail sheets, and the latest edition of the National Electrical Code.

The locations of conduit as shown are for diagrammatic purposes only and may be varied to meet local conditions, subject to approval.

All conduit placed under existing pavement will be bored as directed. Cutting, trenching or jacking across roadways or driveways will not be permitted without approval.

Install a 3-inch warning tape on trenched conduit runs during backfill operations. The tape will be red polyethylene marked “CAUTION-BURIED ELECTRIC LINE”. Place the tape 12 inches above the conduit. Measurement and payment are subsidiary to Item 618, “Conduit”.

When backfilling bore pits, ensure the conduit does not become damaged. Place select backfill in three equal lifts to the bottom of the conduit or place sand to a point 2 inches above the conduit. Compact the backfill to obtain a density equal to the existing, adjacent soil. Prevent backfill material from entering the conduit.

Excavate bore pits no closer than 2 feet from the edge of pavement or base.

The vertical and horizontal tolerances of bored conduits are not to exceed 18 inches as measured from the target point.

Ensure that all PVC conduit and fittings will be schedule 40.

Bell end fittings will be used at the ends of all non-metallic conduits. (e.g., metal junction box).

Where PVC, duct cable, and HDPE conduit 1” and larger is allowed and installed as per TxDOT standards, provide a PVC elbow in place of the galvanized rigid metal elbow required by the Electrical Detail Standards. Ensure the PVC elbow is of the same schedule rating as the conduit to which is connected. Ensure only a flat, high tensile strength polyester fiber pull tape is used for pulling conductor through the PVC conduit system.

Aluminum conduit is acceptable for this project where rigid metal conduit is used. Aluminum conduit specification will be submitted to the Engineer for approval. The aluminum conduit will be new and unused and UL-Listed. Notify the Engineer that aluminum conduit will be used on this project. Aluminum conduit will be installed, measured, and paid for under item 618.

Some of the proposed conduit will be installed in concrete islands covered with brick pavers. The surface structure of the islands will be repaired to the satisfaction of the Engineer; this will not be paid for separately but subsidiary to this Item. The Engineer will require that the brick paved concrete island be stained on all areas where conduit runs damage the island. The Engineer will approve the material prior to use.

ITEM 620 – Electrical Conductors:

Grounding conductors sharing the same conduit, junction box, ground box or structure will be bonded together at accessible points in accordance with the current edition of the National Electrical Code.

Complete splices using approved splicing methods and insulate with an approved thermosetting compound, heavy duty heat shrinkable tubing with sealant, or heat shrinkable tape with sealant suitable for outdoor use.

Electrical certification for this project will be as per Item 7 of the current Texas Standard Specifications and any special provisions to Item 7.

For both transformer and shoe-base type illumination poles, provide double-pole breakaway fuse holder as shown on the Texas Department of Transportation (TXDOT) materials producers list. Category is “Roadway Illumination and Electrical Supplies”. Fuse holder is shown on list under Items 610 and 620. Provide 10-amp time delay fuses.

When the specifications for electrical items require UL listed products, it will be understood to mean UL listed or Any Nationally Recognized Testing Lab (NRTL).

Install a continuous bare or green insulated copper wire, No. 6 awg or larger, except where shown on the plans, in the conduit throughout the electrical system in accordance with the electrical detail sheets, and the latest edition of the National Electrical Code.

ITEM 624 – Ground Boxes:

Locations of ground boxes are approximate. Final locations will be as approved.

Ground boxes will require an apron as directed by the Engineer as shown on standard ED (4).

When ground boxes are placed in existing concrete sidewalk, saw cut sidewalk and repair any damage to the surrounding concrete. This work will not be paid for separately but considered subsidiary to this item.

ITEM 636 - Signs:

Ensure the location and details of the fabrication, assembly and erection of the aluminum signs are in accordance with the details shown on the plans.

Ensure the Contractor's working drawings, for extruded aluminum signs, conform to the details shown on the plans.

Transport signs in such a manner as to not damage the high intensity reflective sheeting. Carry signs in a standing position within a divider rack assembly.

ITEM 682 - Vehicle and Pedestrian Signal Heads:

Furnish signal head components constructed from plastic.

Per TS-BP-20, Backplates will be vented aluminum and will require a 2-wide fluorescent yellow AASHTO Type Bfl or Cfl retroreflective border conforming to TXDOT DMS-8300. Place on all approaches when used.

Signal head and backplate compatibility must be verified by the Contractor prior to installation. Reflective border must not be placed over the louvres.

At the intersection of US 59 and FM 2148 two of the four section signal heads will require louvers. At the intersection of US 59 and SH 77 two of the three section signal heads will require louvers. TXDOT to provide signal louvers and the Contractor to install. Atlanta District Signal Shop will be on site when the Contractor install the to ensure the louvers are set correctly. Contractor to adjust the louvers as directed. This work will be subsidiary to this Item.

A small number of the signal heads on this project have articulating brackets. When an articulating bracket is encountered on any of the intersections. TXDOT to provide an articulating bracket to replace in that instance. Contractor will be responsible for all other brackets and mounting materials for the other signal heads.

ITEM 690 – Maintenance of Traffic Signals

Regulatory and street name signs mounted on the mast arms, will be furnished and installed by the Contractor. All brackets and miscellaneous material will be furnished by the Contractor. Existing signs will not be removed until the proposed signs are ready to be installed

For this project eleven of the twenty-eight intersections will require the removal of ILSN arms. Remove wire for ILSN sign and disconnect from terminal strip at the bottom of the signal pole. Removal of the ILSN arms, and wire for ILSN signs will not be paid for separately; but will be subsidiary to Item 690-6027 Removal of Signal Related Signs.

For this project eleven of the twenty-eight intersections will require the removal of Left Turn Yield Electronic Blankout Signs under Item 690-6027 Removal of Signal Related Signs. This work will not be paid for separately; but will be subsidiary to this Item. Electronic Blankout Signs will become the property of the Contractor upon removal.

Maintain the integrity and function of each existing signalized intersection. Once the integrity or function of the signal has been altered by the Contractor, it will be the Contractor’s responsibility to continue work at that location without delay or interruption until operation is restored to the original or proposed operational design, unless otherwise shown on plan sheets.

Use aluminum tie wire to wrap signal cable and drip loops to messenger cable or signal pole arms. Aluminum tie wire will be wrapped and tied in a neat clean workmanship manner. Zip ties and electrical tape will not be permitted.

Electric meters will be equipped with a meter bypass to allow for access to the meter without disrupting service to the signals.

Provide a complete signal, installed, connected, tested and ready for operation. Perform, furnish or properly install all work, materials and services not expressly called for in the specifications or shown on the plans, which is necessary for a complete and properly operating signal system. The additional work and materials will not be paid for directly but are subsidiary to the pertinent bid items.

Repair topsoil, damaged by Contractor's operations at intersections, as directed using topsoil, sod, and fertilizer to bring the disturbed area back to its preexisting condition. This work will be considered subsidiary to Item 680 and will not be paid for separately.

When the Engineer finds it necessary to install erosion control due to contractors soil disturbing activities, contractor will reference state standard EC(1), Temporary Erosion, Sediment, and.

Use properly sized self-insulated solderless fork terminals when terminating signal conductors on a terminal strip in the signal system. Attach terminals to the wires with a ratchet-type compression crimping tool properly sized to the wire.

The Contractor will not put signals in operation. Authorized TXDOT personnel must be onsite for controller start up.

There will not be any stock piles on the job site from signal, illumination, or DMS installations. Remove any additional soil, rock, and concrete from job site the same day that they are produced.

Other traffic signal materials salvaged from this project will become the property of the Contractor. Remove these salvaged materials from the project and dispose of in accordance with all applicable State and Local laws and regulations.

ITEM 6001 – Portable Changeable Message Sign:

Locations of the message boards will be approved by the Engineer or their representative prior to be setting out. Messages will be provided by the Engineer and be paid by the number of days used displaying messages for each.

For this project three of the intersections will require the use of message boards: US 59 at SL 151, US 59 at SH 77, and US 59 at FM 31. Reference the signal detail sheets for each of these intersections in the plan set for description of locations and number of days needed.

ITEM 6089 – Ethernet Cable and Connectors:

The Contractor will provide primary communication cable as describe below for the intersections of US 59 at SH 77, and US 59 at FM 31:

Attention is directed to the fact that the primary communication cable installed between the sensor units and the processor unit will be Cat 5 Cable.

All connections cables run from the equipment cabinet to the cameras will be continuous without splices from terminal point to terminal point.

ITEM 6185–Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA):

A total of one (1) shadow vehicle with TMA will be required for work. The Contractor will be responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMA's needed for the project.

ITEM 6306 – Video Imaging Vehicle Detection System Camera Assembly and Communication Cable:

The Contractor will provide primary communication cable as describe below for the intersection of US 59 at SL 151.

TXDOT will provide all camera components and camera mounting hardware for this project. The Contractor will be responsible for mounting each camera and connecting the coaxial cable to each camera. The Contractor will provide primary communication cable as describe below.

The primary communication cable installed between the sensor units and the VIVIDS processor unit will be composite, 4 conductors, 2 elements: Element #1 - 16 AWG, 3-conductor 19/28 bare copper, .025" high density polyethylene jacket black IMSA 20-1 (indent print). Element #2 - 20 AWG, 1-conductor solid bare copper, 83% solid polyethylene, 98% tinned copper braid, overall, 98% tinned copper braid, .035" polyethylene jacket black over entire cable (indent print legend) 8261163CR201JKT.

All connections cables run from the equipment cabinet to the cameras will be continuous without splices from terminal point to terminal point.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0062-04-051 **DISTRICT** Atlanta **COUNTY** Bowie, Camp, Cass, Harrison, Marion, Panola, Upshur
HIGHWAY IH 369, SH 154, SH 77, SH 93, US 271, US 59

		CONTROL SECTION JOB	**0062-04-051**		**0062-06-060**		**0062-06-061**		**0062-07-099**		**0062-07-100**		**0062-07-101**	
		PROJECT ID	**A00183897**		**A00183907**		**A00183929**		**A00183908**		**A00183909**		**A00183910**	
		COUNTY	**Cass**		**Marion**		**Marion**		**Harrison**		**Harrison**		**Harrison**	
		HIGHWAY	**US 59**		**US 59**		**US 59**		**US 59**		**US 59**		**US 59**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	500-6001	MOBILIZATION	LS	1.000											
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	5.000											
	618-6023	CONDT (PVC) (SCH 40) (2")	LF												
	618-6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF												
	618-6033	CONDT (PVC) (SCH 40) (4")	LF												
	618-6034	CONDT (PVC) (SCH 40) (4") (BORE)	LF												
	620-6004	ELEC CONDR (NO.12) INSULATED	LF												
	620-6008	ELEC CONDR (NO.8) INSULATED	LF												
	620-6009	ELEC CONDR (NO.6) BARE	LF												
	624-6009	GROUND BOX TY D (162922)	EA												
	624-6010	GROUND BOX TY D (162922)W/APRON	EA												
	682-6001	VEH SIG SEC (12")LED(GRN)	EA	5.000		8.000		8.000		8.000		8.000		4.000	
	682-6002	VEH SIG SEC (12")LED(GRN ARW)	EA	3.000		2.000		4.000		4.000		2.000		3.000	
	682-6003	VEH SIG SEC (12")LED(YEL)	EA	5.000		8.000		8.000		8.000		8.000		4.000	
	682-6004	VEH SIG SEC (12")LED(YEL ARW)	EA	4.000		4.000		4.000		8.000		4.000		4.000	
	682-6005	VEH SIG SEC (12")LED(RED)	EA	7.000		8.000		8.000		8.000		8.000		6.000	
	682-6006	VEH SIG SEC (12")LED(RED ARW)	EA	1.000		2.000		2.000		4.000		2.000		1.000	
	682-6054	BACKPLATE W/REF BRDR(3 SEC)(VENT)ALUM	EA	7.000		8.000		6.000		8.000		8.000		6.000	
	682-6055	BACKPLATE W/REF BRDR(4 SEC)(VENT)ALUM	EA	1.000		2.000		4.000		4.000		2.000		1.000	
	682-6056	BACKPLATE W/REF BRDR(5 SEC)(VENT)ALUM	EA												
	684-6010	TRF SIG CBL (TY A)(12 AWG)(5 CONDR)	LF												
	684-6012	TRF SIG CBL (TY A)(12 AWG)(7 CONDR)	LF												
	690-6024	REMOVAL OF SIGNAL HEAD ASSM	EA												
	690-6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	4.000		2.000		6.000		12.000		6.000		4.000	
	690-6029	INSTALL OF SIGNAL RELATED SIGNS	EA	1.000		2.000		6.000		12.000		6.000		4.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY												
	6058-6001	BBU SYSTEM (EXTERNAL BATT CABINET)	EA												
	6089-6002	CAT 5 ETHERNET CABLE	LF												
	6185-6002	TMA (STATIONARY)	DAY	2.000		2.000		2.000		2.000		2.000		2.000	
	6306-6007	VIVDS CABLING	LF												
	6306-6010	VIVDS CAM ASSY (INSTALL ONLY)	EA												
	01	STATE FORCE ACCOUNT WORK (NON-PARTICIPATING)	LS												
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS												
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS												

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0062-04-051 **DISTRICT** Atlanta **COUNTY** Bowie, Camp, Cass, Harrison, Marion, Panola, Upshur
HIGHWAY IH 369, SH 154, SH 77, SH 93, US 271, US 59

				0062-07-102		0063-01-097		0063-01-098		0063-01-099		0063-01-100		0063-01-101	
		CONTROL SECTION JOB													
		PROJECT ID		A00183912		A00183913		A00183914		A00183915		A00183919		A00183922	
		COUNTY		Harrison		Harrison		Harrison		Harrison		Harrison		Harrison	
		HIGHWAY		US 59		US 59		US 59		US 59		US 59		US 59	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	500-6001	MOBILIZATION	LS												
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO												
	618-6023	CONDT (PVC) (SCH 40) (2")	LF												
	618-6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF												
	618-6033	CONDT (PVC) (SCH 40) (4")	LF												
	618-6034	CONDT (PVC) (SCH 40) (4") (BORE)	LF												
	620-6004	ELEC CONDR (NO.12) INSULATED	LF					320.000							
	620-6008	ELEC CONDR (NO.8) INSULATED	LF					870.000							
	620-6009	ELEC CONDR (NO.6) BARE	LF					490.000							
	624-6009	GROUND BOX TY D (162922)	EA												
	624-6010	GROUND BOX TY D (162922)W/APRON	EA												
	682-6001	VEH SIG SEC (12")LED(GRN)	EA	9.000		10.000		10.000		10.000		8.000		8.000	
	682-6002	VEH SIG SEC (12")LED(GRN ARW)	EA	6.000		4.000		4.000		2.000		1.000		5.000	
	682-6003	VEH SIG SEC (12")LED(YEL)	EA	9.000		10.000		10.000		10.000		8.000		8.000	
	682-6004	VEH SIG SEC (12")LED(YEL ARW)	EA	6.000		8.000		8.000		4.000		2.000		6.000	
	682-6005	VEH SIG SEC (12")LED(RED)	EA	8.000		10.000		10.000		10.000		8.000		10.000	
	682-6006	VEH SIG SEC (12")LED(RED ARW)	EA			4.000		4.000		2.000		1.000		2.000	
	682-6054	BACKPLATE W/REF BRDR(3 SEC)(VENT)ALUM	EA	15.000		10.000		10.000		10.000		8.000		9.000	
	682-6055	BACKPLATE W/REF BRDR(4 SEC)(VENT)ALUM	EA			4.000		4.000		2.000		1.000		3.000	
	682-6056	BACKPLATE W/REF BRDR(5 SEC)(VENT)ALUM	EA												
	684-6010	TRF SIG CBL (TY A)(12 AWG)(5 CONDR)	LF					1,408.000							
	684-6012	TRF SIG CBL (TY A)(12 AWG)(7 CONDR)	LF			466.000		1,168.000							
	690-6024	REMOVAL OF SIGNAL HEAD ASSM	EA	1.000											
	690-6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	8.000		6.000		8.000		6.000		4.000		6.000	
	690-6029	INSTALL OF SIGNAL RELATED SIGNS	EA	8.000		8.000		8.000		6.000		4.000		6.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY					28.000							
	6058-6001	BBU SYSTEM (EXTERNAL BATT CABINET)	EA												
	6089-6002	CAT 5 ETHERNET CABLE	LF					1,144.000							
	6185-6002	TMA (STATIONARY)	DAY	2.000		2.000		8.000		2.000		2.000		2.000	
	6306-6007	VIVDS CABLING	LF												
	6306-6010	VIVDS CAM ASSY (INSTALL ONLY)	EA					4.000							
	01	STATE FORCE ACCOUNT WORK (NON-PARTICIPATING)	LS					1.000							
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS												
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS					1.000							

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0062-04-051 **DISTRICT** Atlanta **COUNTY** Bowie, Camp, Cass, Harrison, Marion, Panola, Upshur
HIGHWAY IH 369, SH 154, SH 77, SH 93, US 271, US 59

		CONTROL SECTION JOB	**0063-01-102**		**0063-03-070**		**0063-04-066**		**0063-04-067**		**0218-01-101**		**0218-01-102**	
		PROJECT ID	**A00183923**		**A00183924**		**A00183925**		**A00183927**		**A00183593**		**A00183595**	
		COUNTY	**Harrison**		**Panola**		**Panola**		**Panola**		**Bowie**		**Bowie**	
		HIGHWAY	**US 59**		**US 59**		**US 59**		**US 59**		**US 59**		**US 59**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	500-6001	MOBILIZATION	LS												
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO												
	618-6023	CONDT (PVC) (SCH 40) (2")	LF												
	618-6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF												
	618-6033	CONDT (PVC) (SCH 40) (4")	LF												
	618-6034	CONDT (PVC) (SCH 40) (4") (BORE)	LF												
	620-6004	ELEC CONDR (NO.12) INSULATED	LF												
	620-6008	ELEC CONDR (NO.8) INSULATED	LF												
	620-6009	ELEC CONDR (NO.6) BARE	LF												
	624-6009	GROUND BOX TY D (162922)	EA												
	624-6010	GROUND BOX TY D (162922)W/APRON	EA												
	682-6001	VEH SIG SEC (12")LED(GRN)	EA	8.000		14.000		10.000		12.000		8.000		5.000	
	682-6002	VEH SIG SEC (12")LED(GRN ARW)	EA	2.000		2.000		2.000		2.000		4.000		2.000	
	682-6003	VEH SIG SEC (12")LED(YEL)	EA	8.000		14.000		10.000		12.000		8.000		5.000	
	682-6004	VEH SIG SEC (12")LED(YEL ARW)	EA	4.000		2.000		4.000		4.000		4.000		4.000	
	682-6005	VEH SIG SEC (12")LED(RED)	EA	8.000		14.000		10.000		12.000		8.000		5.000	
	682-6006	VEH SIG SEC (12")LED(RED ARW)	EA	2.000				2.000		2.000		2.000		2.000	
	682-6054	BACKPLATE W/REF BRDR(3 SEC)(VENT)ALUM	EA	8.000		12.000		10.000		12.000		6.000		5.000	
	682-6055	BACKPLATE W/REF BRDR(4 SEC)(VENT)ALUM	EA	2.000				2.000		2.000		4.000		2.000	
	682-6056	BACKPLATE W/REF BRDR(5 SEC)(VENT)ALUM	EA			2.000									
	684-6010	TRF SIG CBL (TY A)(12 AWG)(5 CONDR)	LF												
	684-6012	TRF SIG CBL (TY A)(12 AWG)(7 CONDR)	LF												
	690-6024	REMOVAL OF SIGNAL HEAD ASSM	EA												
	690-6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	8.000		8.000		8.000		8.000		6.000		3.000	
	690-6029	INSTALL OF SIGNAL RELATED SIGNS	EA	6.000		8.000		8.000		8.000		6.000		1.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY												
	6058-6001	BBU SYSTEM (EXTERNAL BATT CABINET)	EA											1.000	
	6089-6002	CAT 5 ETHERNET CABLE	LF												
	6185-6002	TMA (STATIONARY)	DAY	2.000		2.000		2.000		2.000		2.000		2.000	
	6306-6007	VIVDS CABLING	LF												
	6306-6010	VIVDS CAM ASSY (INSTALL ONLY)	EA												
	01	STATE FORCE ACCOUNT WORK (NON-PARTICIPATING)	LS											1.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS												
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS												

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0062-04-051 **DISTRICT** Atlanta **COUNTY** Bowie, Camp, Cass, Harrison, Marion, Panola, Upshur
HIGHWAY IH 369, SH 154, SH 77, SH 93, US 271, US 59

				0218-01-103		0218-02-053		0218-02-054		0218-04-123		0218-04-124		0218-04-125	
		CONTROL SECTION JOB													
		PROJECT ID		A00183892		A00183948		A00183950		A00183894		A00183895		A00183896	
		COUNTY		Bowie		Bowie		Bowie		Cass		Cass		Cass	
		HIGHWAY		US 59		IH 369		IH 369		US 59		US 59		US 59	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	500-6001	MOBILIZATION	LS												
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO												
	618-6023	CONDT (PVC) (SCH 40) (2")	LF									45.000			
	618-6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF									137.000			
	618-6033	CONDT (PVC) (SCH 40) (4")	LF									11.000			
	618-6034	CONDT (PVC) (SCH 40) (4") (BORE)	LF									177.000			
	620-6004	ELEC CONDR (NO.12) INSULATED	LF	480.000								320.000			
	620-6008	ELEC CONDR (NO.8) INSULATED	LF	2,480.000								1,064.000			
	620-6009	ELEC CONDR (NO.6) BARE	LF	1,600.000								569.000			
	624-6009	GROUND BOX TY D (162922)	EA									2.000			
	624-6010	GROUND BOX TY D (162922)W/APRON	EA									1.000			
	682-6001	VEH SIG SEC (12")LED(GRN)	EA	12.000		10.000		10.000		8.000		8.000		8.000	
	682-6002	VEH SIG SEC (12")LED(GRN ARW)	EA	2.000		6.000		6.000		2.000		5.000		2.000	
	682-6003	VEH SIG SEC (12")LED(YEL)	EA	12.000		10.000		10.000		8.000		8.000		8.000	
	682-6004	VEH SIG SEC (12")LED(YEL ARW)	EA	4.000		6.000		6.000		4.000		7.000		4.000	
	682-6005	VEH SIG SEC (12")LED(RED)	EA	12.000		10.000		10.000		8.000		11.000		8.000	
	682-6006	VEH SIG SEC (12")LED(RED ARW)	EA	2.000		4.000		4.000		2.000		2.000		2.000	
	682-6054	BACKPLATE W/REF BRDR(3 SEC)(VENT)ALUM	EA	12.000		10.000		10.000		8.000		11.000		8.000	
	682-6055	BACKPLATE W/REF BRDR(4 SEC)(VENT)ALUM	EA	2.000		4.000		4.000		2.000		2.000		2.000	
	682-6056	BACKPLATE W/REF BRDR(5 SEC)(VENT)ALUM	EA												
	684-6010	TRF SIG CBL (TY A)(12 AWG)(5 CONDR)	LF	3,207.000								1,784.000			
	684-6012	TRF SIG CBL (TY A)(12 AWG)(7 CONDR)	LF	988.000								563.000			
	690-6024	REMOVAL OF SIGNAL HEAD ASSM	EA			1.000									
	690-6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	12.000		10.000		10.000		8.000		11.000		6.000	
	690-6029	INSTALL OF SIGNAL RELATED SIGNS	EA	10.000		10.000		10.000		4.000		9.000		4.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	28.000								28.000			
	6058-6001	BBU SYSTEM (EXTERNAL BATT CABINET)	EA									1.000			
	6089-6002	CAT 5 ETHERNET CABLE	LF									1,089.000			
	6185-6002	TMA (STATIONARY)	DAY	8.000		4.000		4.000		2.000		8.000		2.000	
	6306-6007	VIVDS CABLING	LF	2,942.000											
	6306-6010	VIVDS CAM ASSY (INSTALL ONLY)	EA												
	01	STATE FORCE ACCOUNT WORK (NON-PARTICIPATING)	LS												
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000											
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS									1.000			

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0062-04-051 **DISTRICT** Atlanta **COUNTY** Bowie, Camp, Cass, Harrison, Marion, Panola, Upshur
HIGHWAY IH 369, SH 154, SH 77, SH 93, US 271, US 59

												TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0248-02-068**		**0278-01-063**		**0401-04-039**		**0945-01-044**			
		PROJECT ID		**A00183938**		**A00183947**		**A00183937**		**A00183893**			
		COUNTY		**Camp**		**Cass**		**Upshur**		**Bowie**			
		HIGHWAY		**US 271**		**SH 77**		**SH 154**		**SH 93**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	500-6001	MOBILIZATION	LS									1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO									5.000	
	618-6023	CONDT (PVC) (SCH 40) (2")	LF									45.000	
	618-6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF									137.000	
	618-6033	CONDT (PVC) (SCH 40) (4")	LF									11.000	
	618-6034	CONDT (PVC) (SCH 40) (4") (BORE)	LF									177.000	
	620-6004	ELEC CONDR (NO.12) INSULATED	LF									1,120.000	
	620-6008	ELEC CONDR (NO.8) INSULATED	LF									4,414.000	
	620-6009	ELEC CONDR (NO.6) BARE	LF									2,659.000	
	624-6009	GROUND BOX TY D (162922)	EA									2.000	
	624-6010	GROUND BOX TY D (162922)W/APRON	EA									1.000	
	682-6001	VEH SIG SEC (12")LED(GRN)	EA	6.000		8.000		9.000		8.000		240.000	
	682-6002	VEH SIG SEC (12")LED(GRN ARW)	EA	1.000		2.000				4.000		84.000	
	682-6003	VEH SIG SEC (12")LED(YEL)	EA	6.000		8.000		9.000		8.000		240.000	
	682-6004	VEH SIG SEC (12")LED(YEL ARW)	EA	2.000		4.000				8.000		129.000	
	682-6005	VEH SIG SEC (12")LED(RED)	EA	6.000		8.000		9.000		8.000		248.000	
	682-6006	VEH SIG SEC (12")LED(RED ARW)	EA	1.000		2.000				4.000		58.000	
	682-6054	BACKPLATE W/REF BRDR(3 SEC)(VENT)ALUM	EA	6.000		8.000		9.000		8.000		248.000	
	682-6055	BACKPLATE W/REF BRDR(4 SEC)(VENT)ALUM	EA	1.000		2.000				4.000		63.000	
	682-6056	BACKPLATE W/REF BRDR(5 SEC)(VENT)ALUM	EA									2.000	
	684-6010	TRF SIG CBL (TY A)(12 AWG)(5 CONDR)	LF									6,399.000	
	684-6012	TRF SIG CBL (TY A)(12 AWG)(7 CONDR)	LF									3,185.000	
	690-6024	REMOVAL OF SIGNAL HEAD ASSM	EA									2.000	
	690-6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	4.000		6.000		6.000		8.000		194.000	
	690-6029	INSTALL OF SIGNAL RELATED SIGNS	EA	4.000		6.000		4.000		8.000		177.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY									84.000	
	6058-6001	BBU SYSTEM (EXTERNAL BATT CABINET)	EA									2.000	
	6089-6002	CAT 5 ETHERNET CABLE	LF									2,233.000	
	6185-6002	TMA (STATIONARY)	DAY	2.000		2.000		2.000		2.000		78.000	
	6306-6007	VIVDS CABLING	LF									2,942.000	
	6306-6010	VIVDS CAM ASSY (INSTALL ONLY)	EA									4.000	
	01	STATE FORCE ACCOUNT WORK (NON-PARTICIPATING)	LS									2.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS									1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS									2.000	

ITEM NO.	DESC CODE	DESCRIPTION	UNIT	IH 369 AT US 82 0218-02-053	IH 369 @ US 67 0218-02-054	US 59 AT LP 151 0218-01-103	US 59 AT FM 989 0218-01-101	US 59 AT FM 2148 0218-01-102	SH 93 AT US 82 0945-01-044	US 59 AT EMMA LENA WAY 0218-04-123	US 59 AT SH 77 0218-04-124	US 59 AT FM 125 0218-04-125	US 59 AT SH 155 0062-04-051	SH 77 AT FM 251 0278-01-063	US 271 AT SL 179 0248-02-068	US 59 AT SH 49 0062-06-061	US 59 AT FM 2208 0062-06-060
0618	6023	CONDT (PVC)(SCH 40)(2")	LF								45						
0618	6024	CONDT (PVC)(SCH 40)(2")(BORE)	LF								137						
0618	6033	CONDT (PVC)(SCH 40)(4")	LF								11						
0618	6034	CONDT (PVC)(SCH 40)(4")(BORE)	LF								177						
0620	6004	ELEC CONDR (NO.12) INSULATED	LF			480					320						
0620	6008	ELEC CONDUCTOR (NO 8) INSULATED	LF			2480					1064						
0620	6009	ELEC CONDUCTOR (NO 6) BARE	LF			1600					569						
0624	6009	GROUND BOX TY D (162922)	EA								2						
0624	6010	GROUND BOX TY D (162922)W/APRON	EA								1						
0682	6001	VEH SIG SEC (12")LED(GRN)	EA	10	10	12	8	5	8	8	8	8	5	8	6	8	8
0682	6002	VEH SIG SEC (12") LED (GRN ARW)	EA	6	6	2	4	2	4	2	5	2	3	2	1	4	2
0682	6003	VEH SIG SEC (12")LED(YEL)	EA	10	10	12	8	5	8	8	8	8	5	8	6	8	8
0682	6004	VEH SIG SEC (12") LED (YEL ARW)	EA	6	6	4	4	4	8	4	7	4	4	4	2	4	4
0682	6005	VEH SIG SEC (12")LED(RED)	EA	10	10	12	8	5	8	8	11	8	7	8	6	8	8
0682	6006	VEH SIG SEC (12") LED (RED ARW)	EA	4	4	2	2	2	4	2	2	2	1	2	1	2	2
0682	6054	BACK PLATE/W REF BRDR (3 SEC) (VENT) ALU	EA	10	10	12	6	5	8	8	11	8	7	8	6	6	8
0682	6055	BACK PLATE/W REF BRDR (4 SEC) (VENT) ALU	EA	4	4	2	4	2	4	2	2	2	1	2	1	4	2
0682	6056	BACK PLATE/W REF BRDR (5 SEC) (VENT) ALU	EA														
0684	6010	TRAF SIG CBL (TY A) (12 AWG) (5 CONDR)	LF			3207					1784						
0684	6012	TRAF SIG CBL (TY A) (12 AWG) (7 CONDR)	LF			988					563						
0690	6024	REMOVAL OF SIGNAL HEAD ASSEMBLY	EA	1													
0690	6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	10	10	12	6	3	8	8	11	6	4	6	4	6	2
0690	6029	INSTALL OF SIGNAL RELATED SIGNS	EA	10	10	10	6	1	8	4	9	4	1	6	4	6	2
6001	6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY			28					28						
6058	6001	BBU SYSTEM (EXTERNAL BATT CABINET	EA					1			1						
6089	6002	CAT 5 ETHERNET CABLE	LF								1089						
6185	6002	TMA (STATIONARY)	DAY	4	4	8	2	2	2	2	8	2	2	2	2	2	2
6306	6007	VIVDS CABLING	LF			2942											
6306	6010	VIVDS CAMERA ASSEMBLY (INSTALL ONLY)	EA														
*		LOUVER (12") ADJUSTABLE	EA					8			6						
**		VIVDS CAMERA ASSEMBLY	EA														

ITEM NO.	DESC CODE	DESCRIPTION	UNIT	US 59 AT SL 390 0062-07-099	US 59 AT POPLAR ST. 0062-07-100	US 59 AT SH 43 N. 0062-07-101	US 59 AT US 80 0062-07-102	US 59 AT HOUSTON ST. 0063-01-097	US 59 AT FM 31 0063-01-098	US 59 AT ELYSIAN FIELDS AVE. 0063-01-099	US 59 AT JOHNSON ST. 0063-01-100	US 59 AT SH 43 S. 0063-01-101	US 59 AT BELL ST. 0063-01-102	US 59 AT US 79 0063-03-070	US 59 AT FM 699 0063-04-066	US 59 AT SH 149 0063-04-067	SH 154 AT FM 49 0401-04-039
0618	6023	CONDT (PVC)(SCH 40)(2")	LF														
0618	6024	CONDT (PVC)(SCH 40)(2")(BORE)	LF														
0618	6033	CONDT (PVC)(SCH 40)(4")	LF														
0618	6034	CONDT (PVC)(SCH 40)(4")(BORE)	LF														
0620	6004	ELEC CONDR (NO.12) INSULATED	LF						320								
0620	6008	ELEC CONDUCTOR (NO 8) INSULATED	LF						870								
0620	6009	ELEC CONDUCTOR (NO 6) BARE	LF						490								
0624	6009	GROUND BOX TY D (162922)	EA														
0624	6010	GROUND BOX TY D (162922)W/APRON	EA														
0682	6001	VEH SIG SEC (12")LED(GRN)	EA	8	8	4	9	10	10	10	8	8	8	14	10	12	9
0682	6002	VEH SIG SEC (12") LED (GRN ARW)	EA	4	2	3	6	4	4	2	1	5	2	2	2	2	
0682	6003	VEH SIG SEC (12")LED(YEL)	EA	8	8	4	9	10	10	10	8	8	8	14	10	12	9
0682	6004	VEH SIG SEC (12") LED (YEL ARW)	EA	8	4	4	6	8	8	4	2	6	4	2	4	4	
0682	6005	VEH SIG SEC (12")LED(RED)	EA	8	8	6	8	10	10	10	8	10	8	14	10	12	9
0682	6006	VEH SIG SEC (12") LED (RED ARW)	EA	4	2	1		4	4	2	1	2	2		2	2	
0682	6054	BACK PLATE/W REF BRDR (3 SEC) (VENT) ALU	EA	8	8	6	15	10	10	10	8	9	8	12	10	12	9
0682	6055	BACK PLATE/W REF BRDR (4 SEC) (VENT) ALU	EA	4	2	1		4	4	2	1	3	2		2	2	
0682	6056	BACK PLATE/W REF BRDR (5 SEC) (VENT) ALU	EA											2			
0684	6010	TRAF SIG CBL (TY A) (12 AWG) (5 CONDR)	LF						1408								
0684	6012	TRAF SIG CBL (TY A) (12 AWG) (7 CONDR)	LF					466	1168								
0690	6024	REMOVAL OF SIGNAL HEAD ASSEMBLY	EA				1										
0690	6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	12	6	4	8	6	8	6	4	6	8	8	8	8	6
0690	6029	INSTALL OF SIGNAL RELATED SIGNS	EA	12	6	4	8	8	8	6	4	6	6	8	8	8	4
6001	6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY						28								
6058	6001	BBU SYSTEM (EXTERNAL BATT CABINET	EA														
6089	6002	CAT 5 ETHERNET CABLE	LF						1144								
6185	6002	TMA (STATIONARY)	DAY	2	2	2	2	2	8	2	2	2	2	2	2	2	2
6306	6007	VIVDS CABLING	LF														
6306	6010	VIVDS CAMERA ASSEMBLY (INSTALL ONLY)	EA						4								
*		LOUVER (12") ADJUSTABLE	EA														
**		VIVDS CAMERA ASSEMBLY	EA						4								

* PROVIDED BY TXDOT; INSTALLED BY THE CONTRACTOR SUBSIDIARY TO ITEM 682.
** PROVIDED BY TXDOT; INSTALLED BY THE CONTRACTOR SUBSIDIARY TO ITEM 6306.

PROJECT SUMMARY

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			16
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

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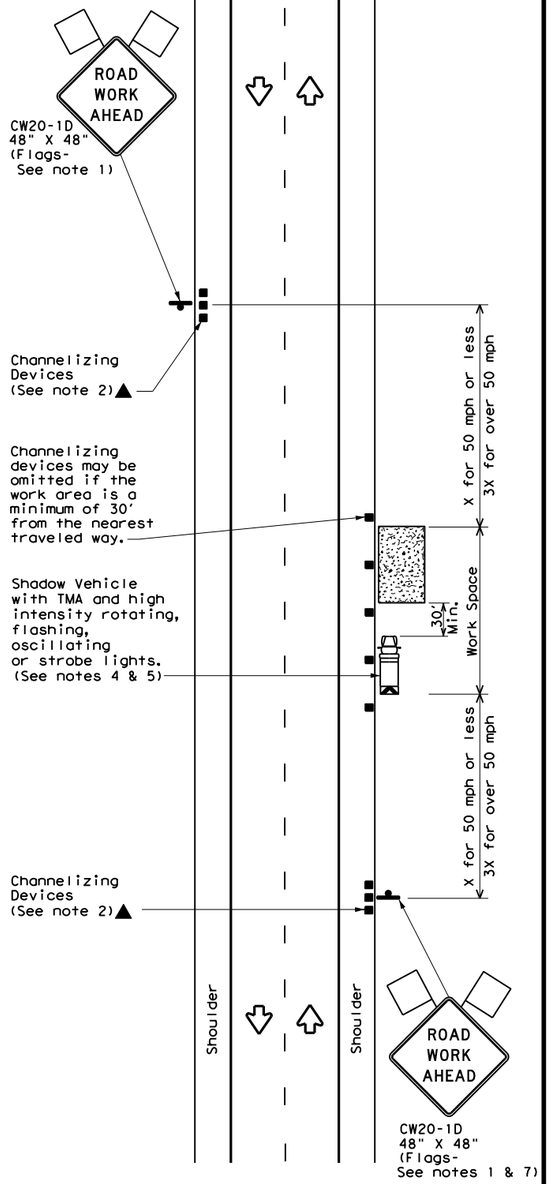
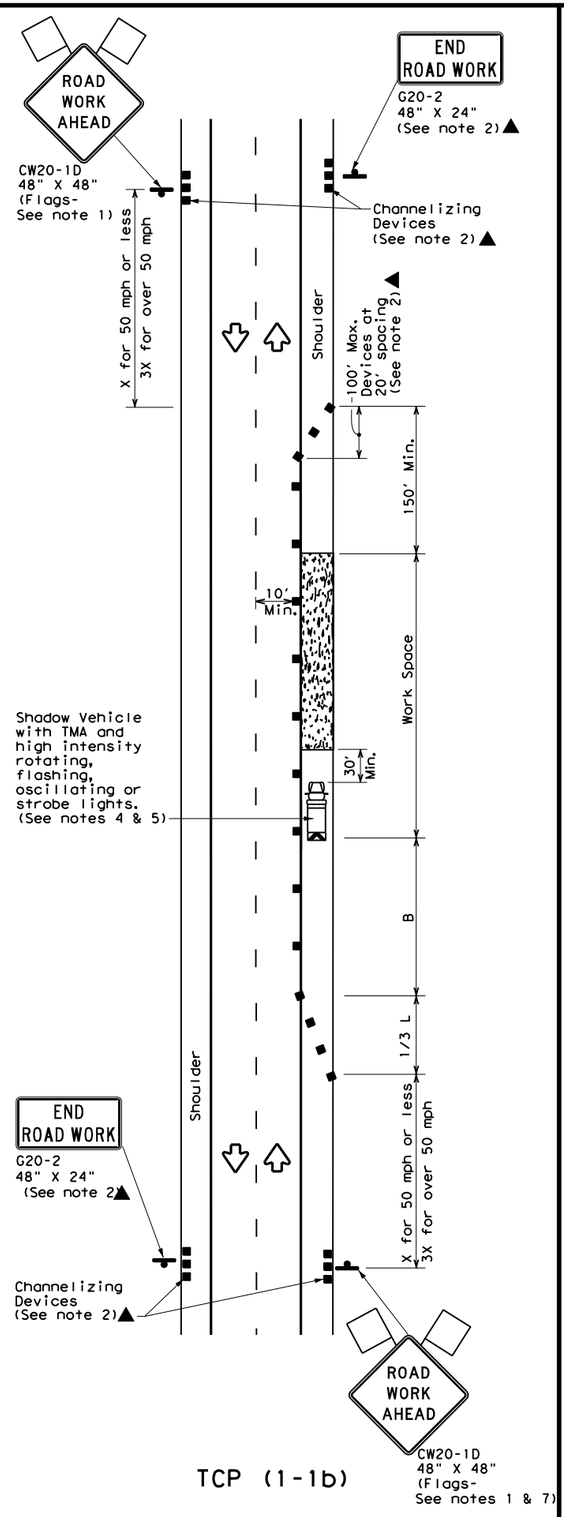


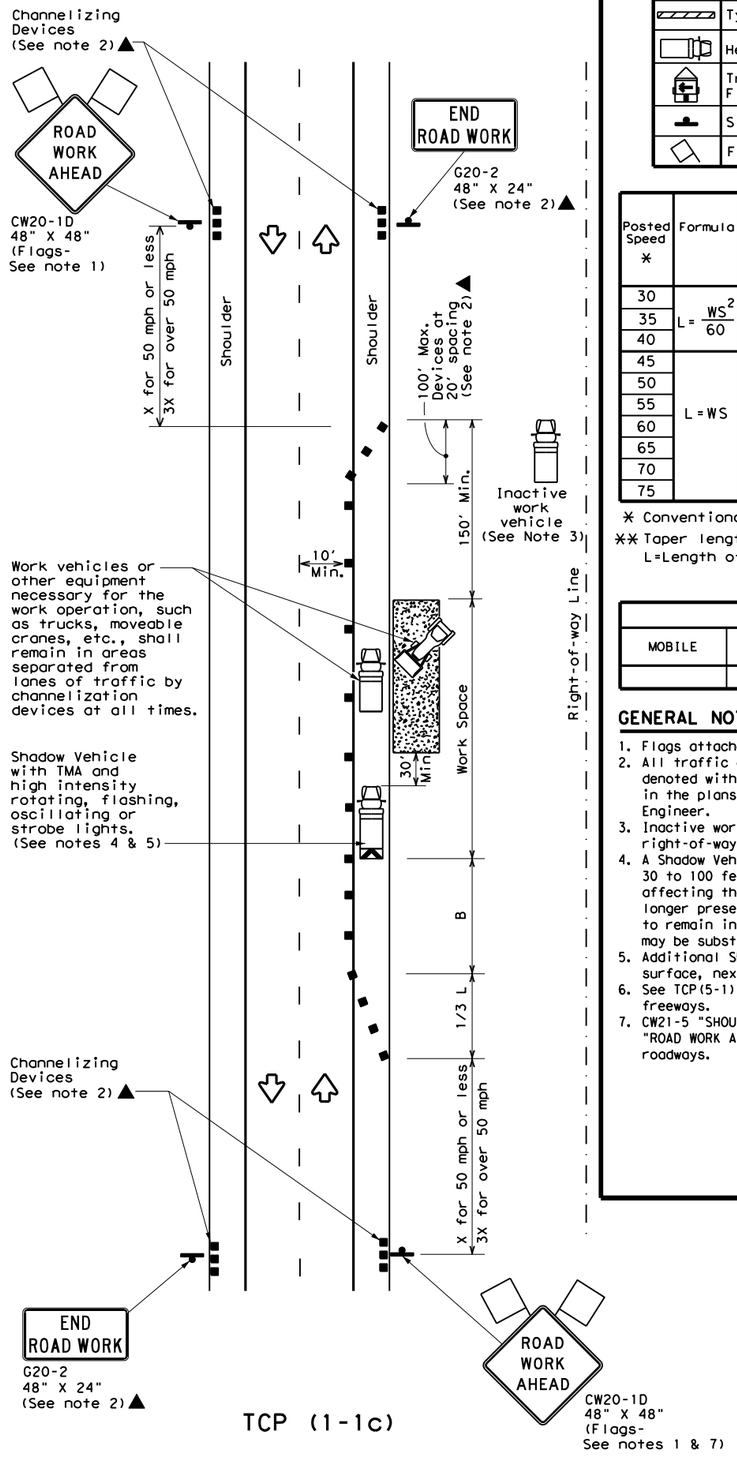
TCP (1-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (1-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (1-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

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

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

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
4. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
6. See TCP(5-1)for shoulder work on divided highways, expressways and freeways.
7. CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(1-1)-18

FILE: tcp1-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0062	04	051	US 59
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	ATL	CASS		17
1-97 2-18				

DATE: 12/27/2021 11:38:29 AM
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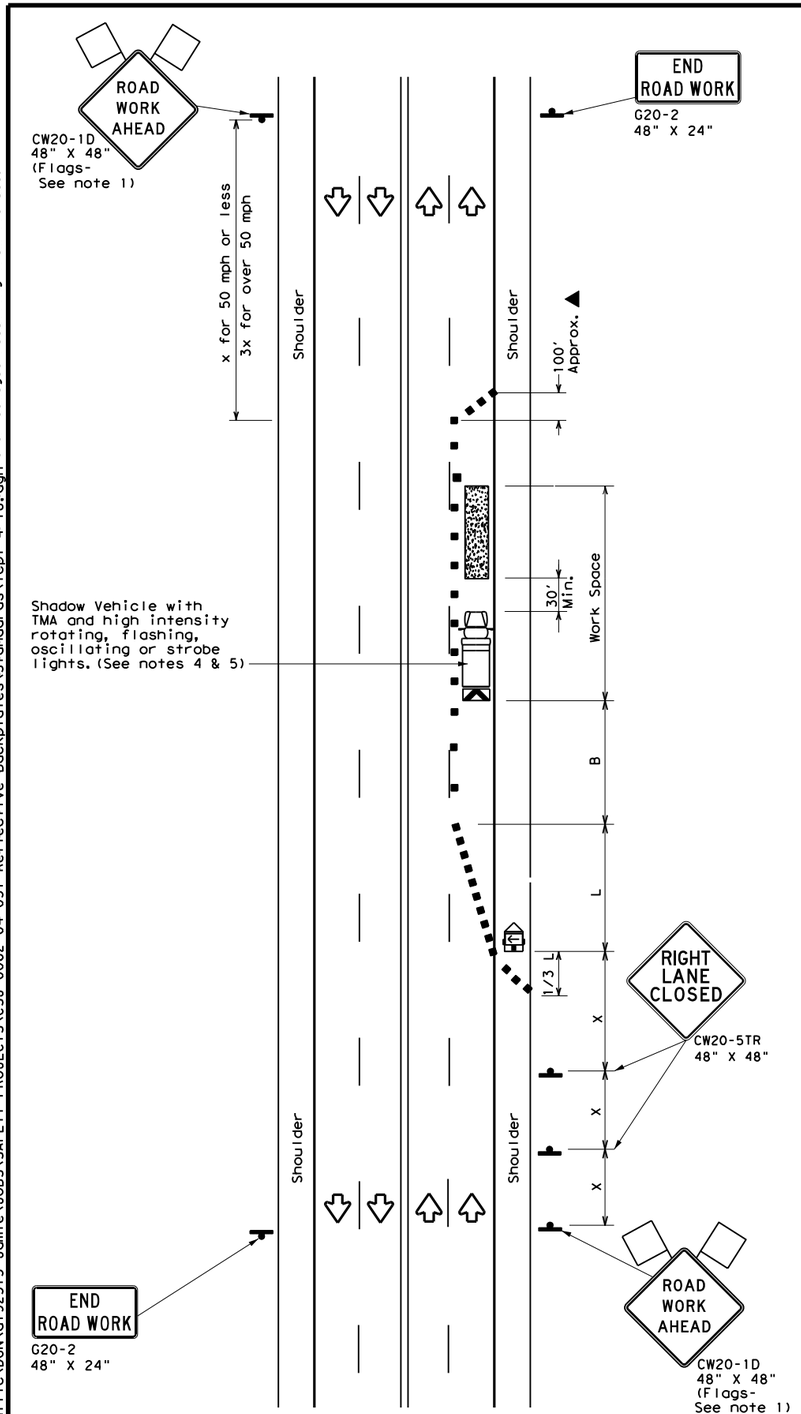
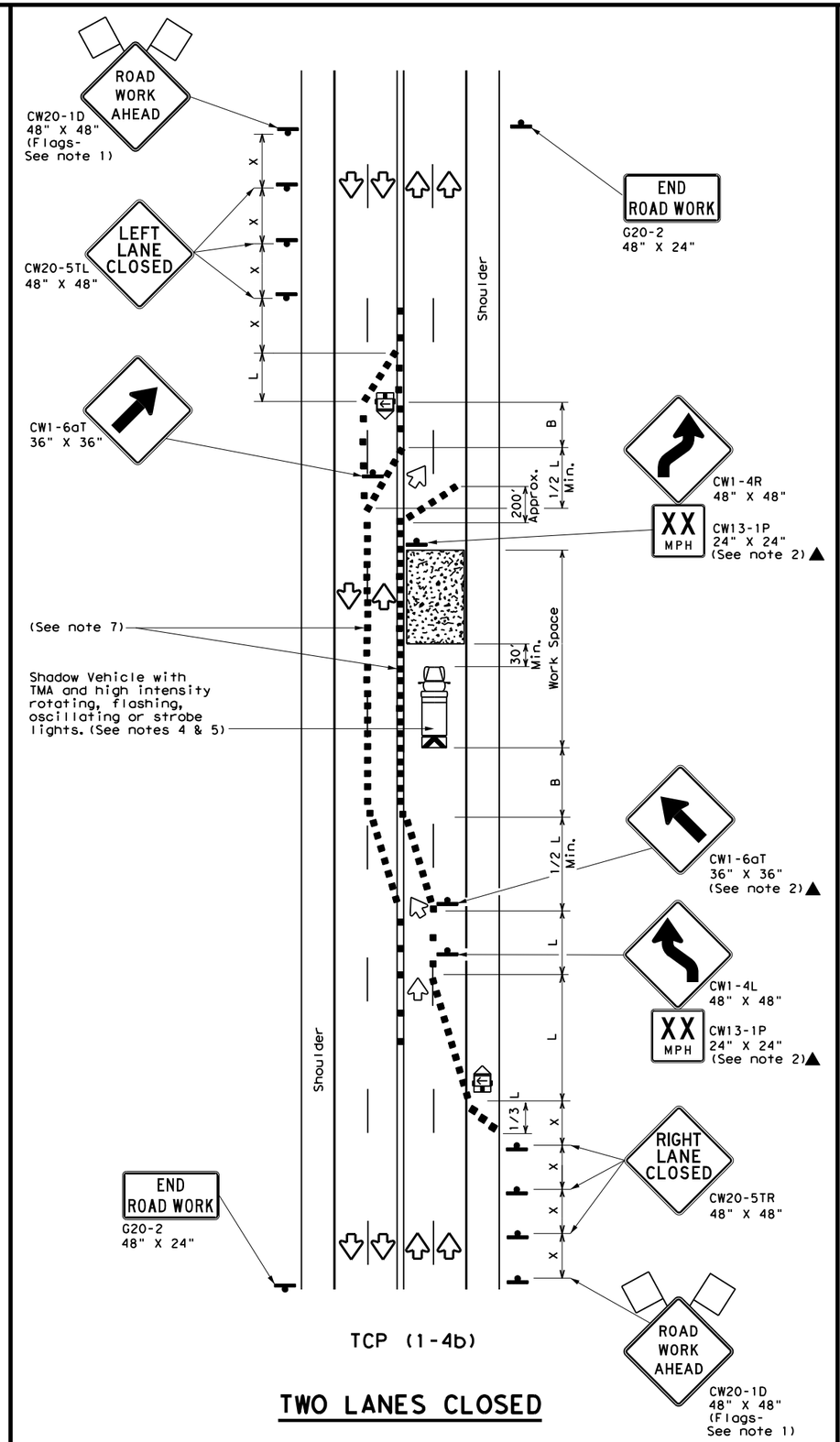


TCP (1-4a)

ONE LANE CLOSED



TCP (1-4b)

TWO LANES CLOSED

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

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

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

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

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW20-1D "ROAD WORK AHEAD" sign may be repeated if the visibility of the work zone is less than 1500 feet.
4. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

TCP (1-4a)

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

TCP (1-4b)

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

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(1-4)-18

FILE: tcp1-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0062	04	051	US 59
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	ATL	CASS		18
1-97 2-18				

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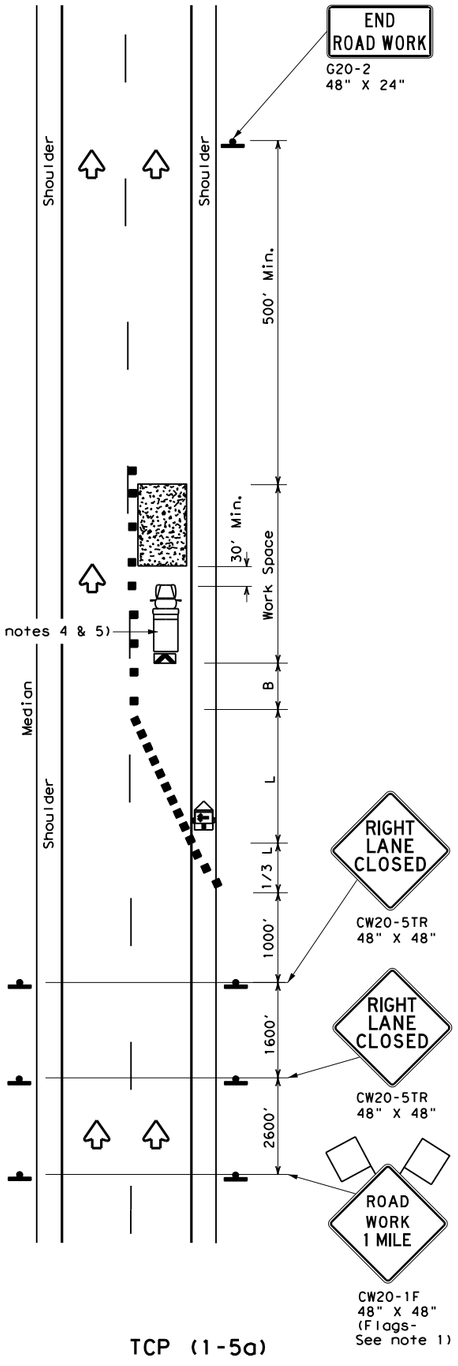
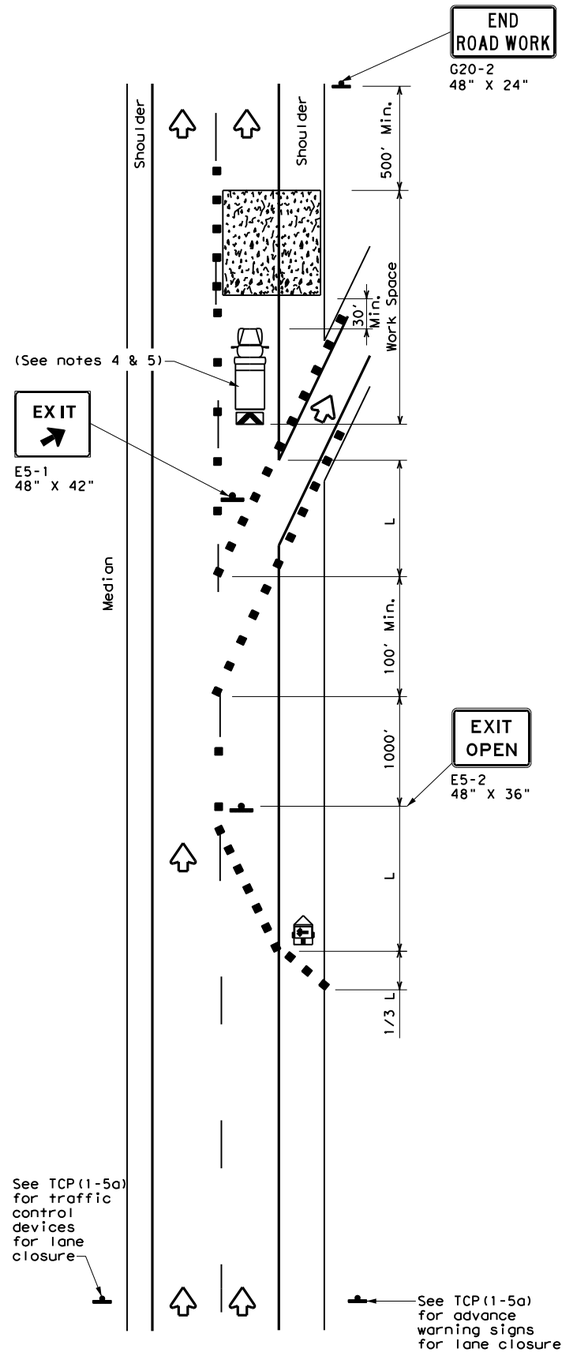


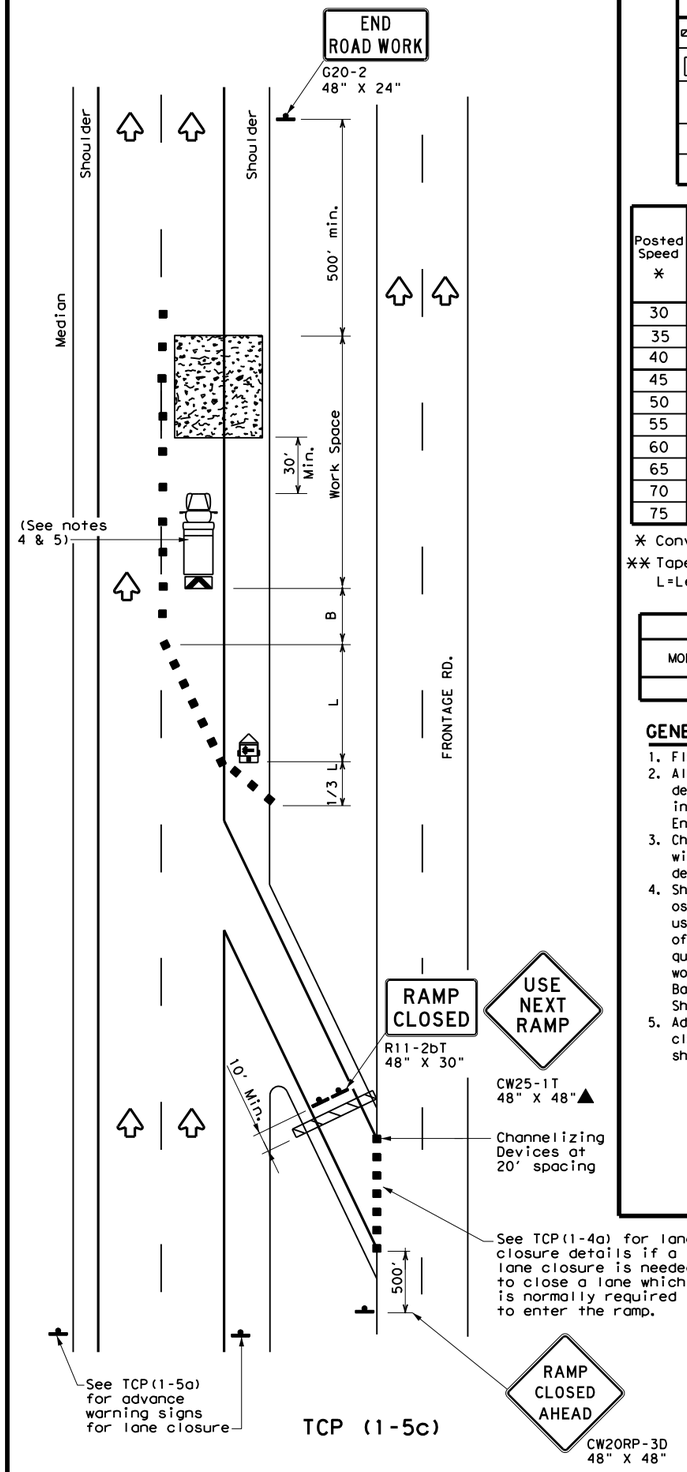
TCP (1-5a)

ONE LANE CLOSURE



TCP (1-5b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (1-5c)

LANE CLOSURE NEAR ENTRANCE RAMPS

LEGEND

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

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

* Conventional Roads Only

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

TYPICAL USAGE

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES FOR DIVIDED HIGHWAYS

TCP(1-5)-18

FILE: tcp1-5-18.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
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	ATL	CASS		19

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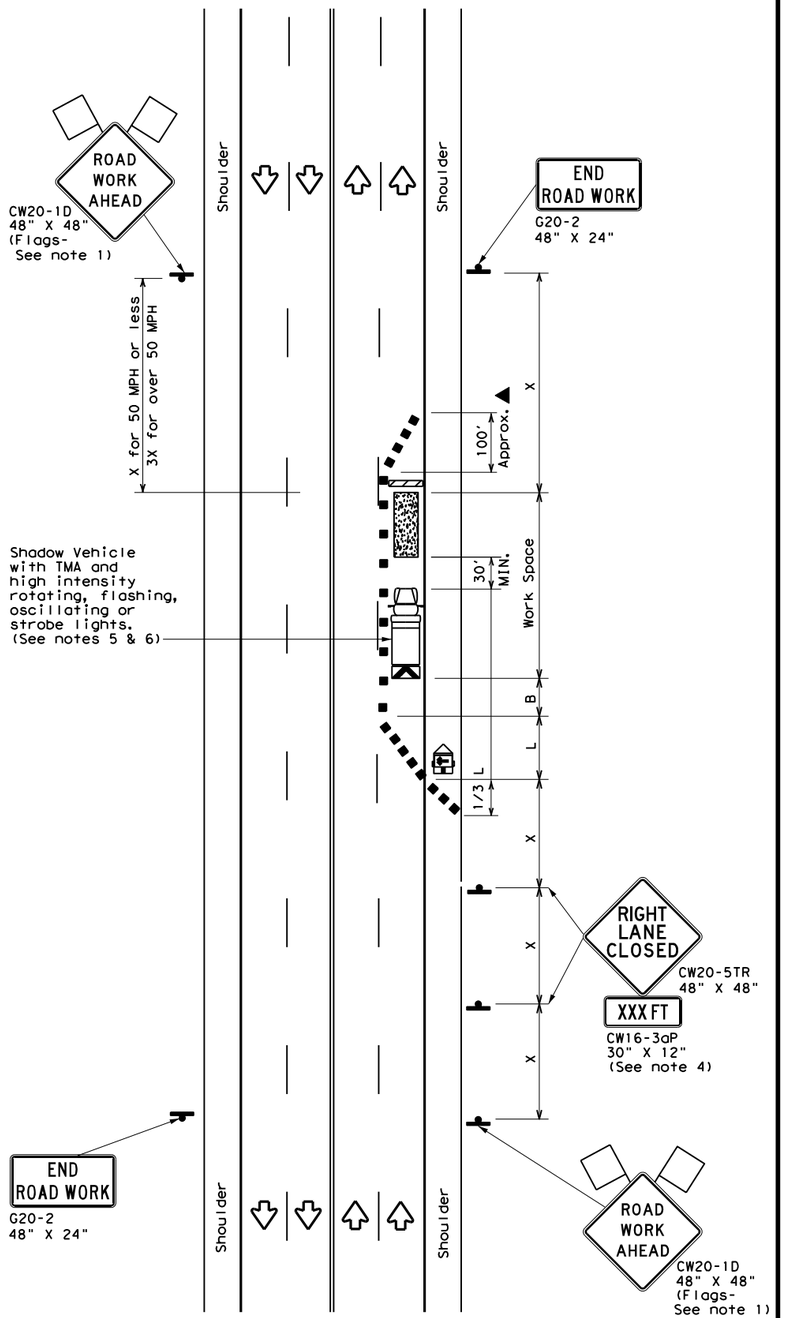
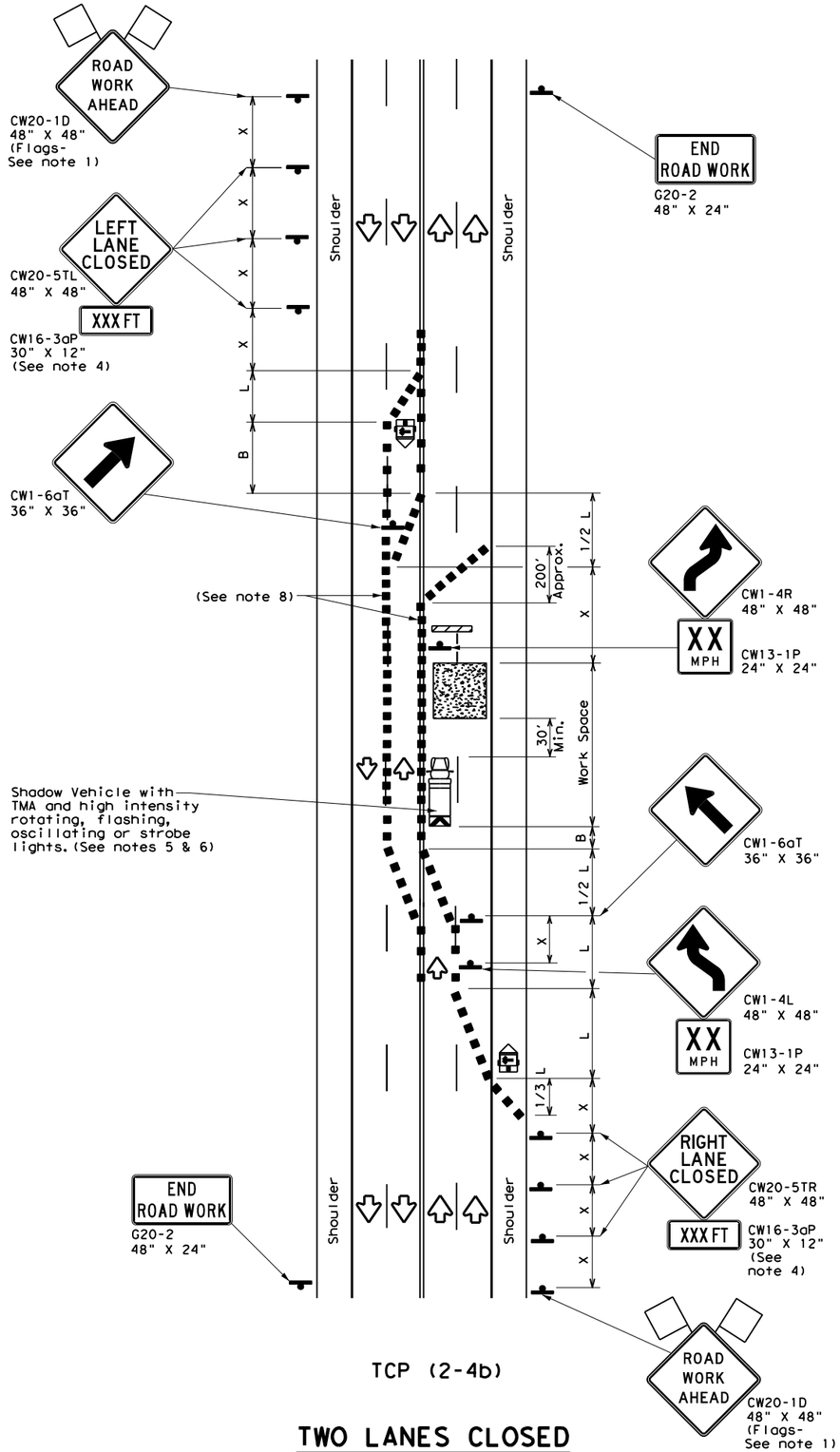


TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

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

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

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The downstream taper is optional. When used, it should be 100 feet minimum length per lane.
4. For short term applications, when post mounted signs are not used, the distance legend may be shown on the sign face rather than on a CW16-3aP supplemental plaque.
5. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
6. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-4a)

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

TCP (2-4b)

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

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4-98 2-18	ATL	CASS		20

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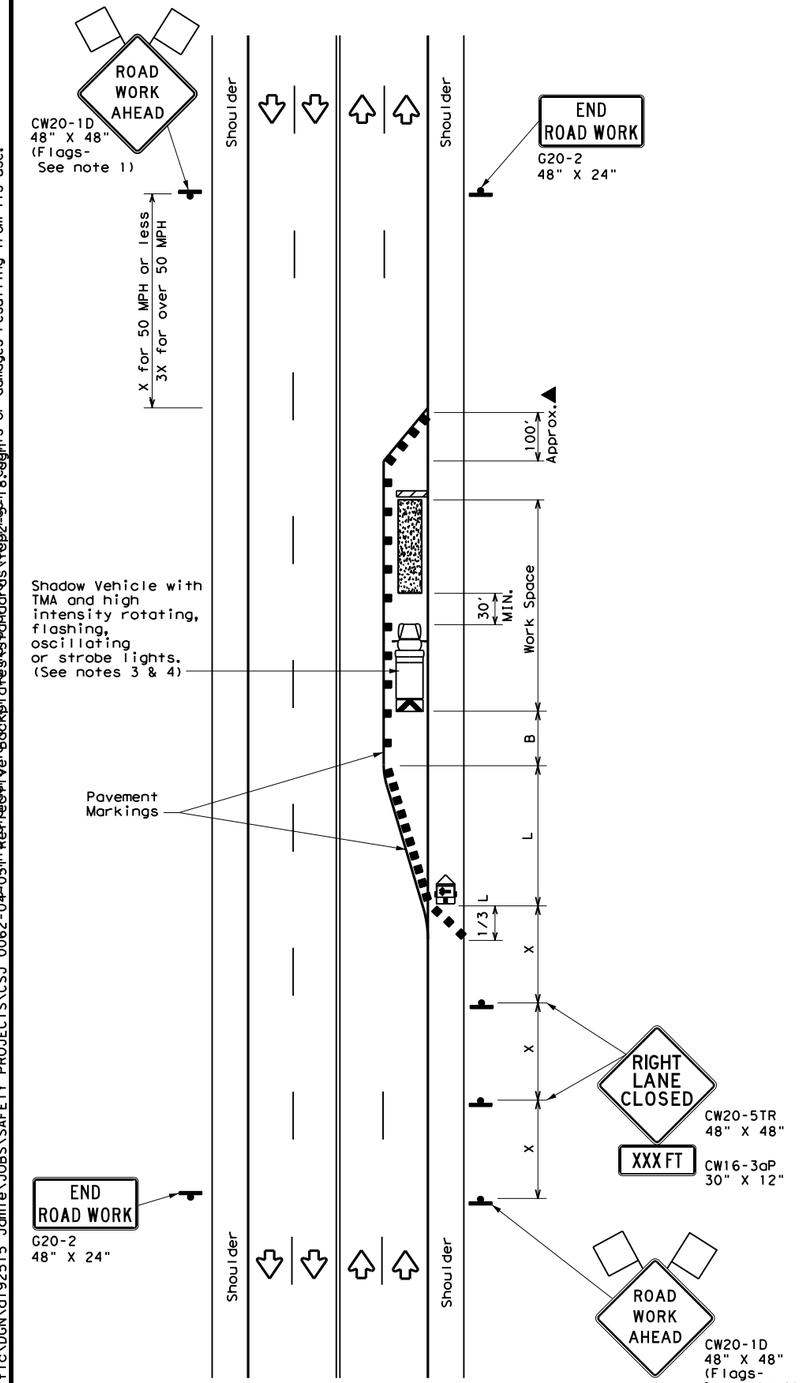
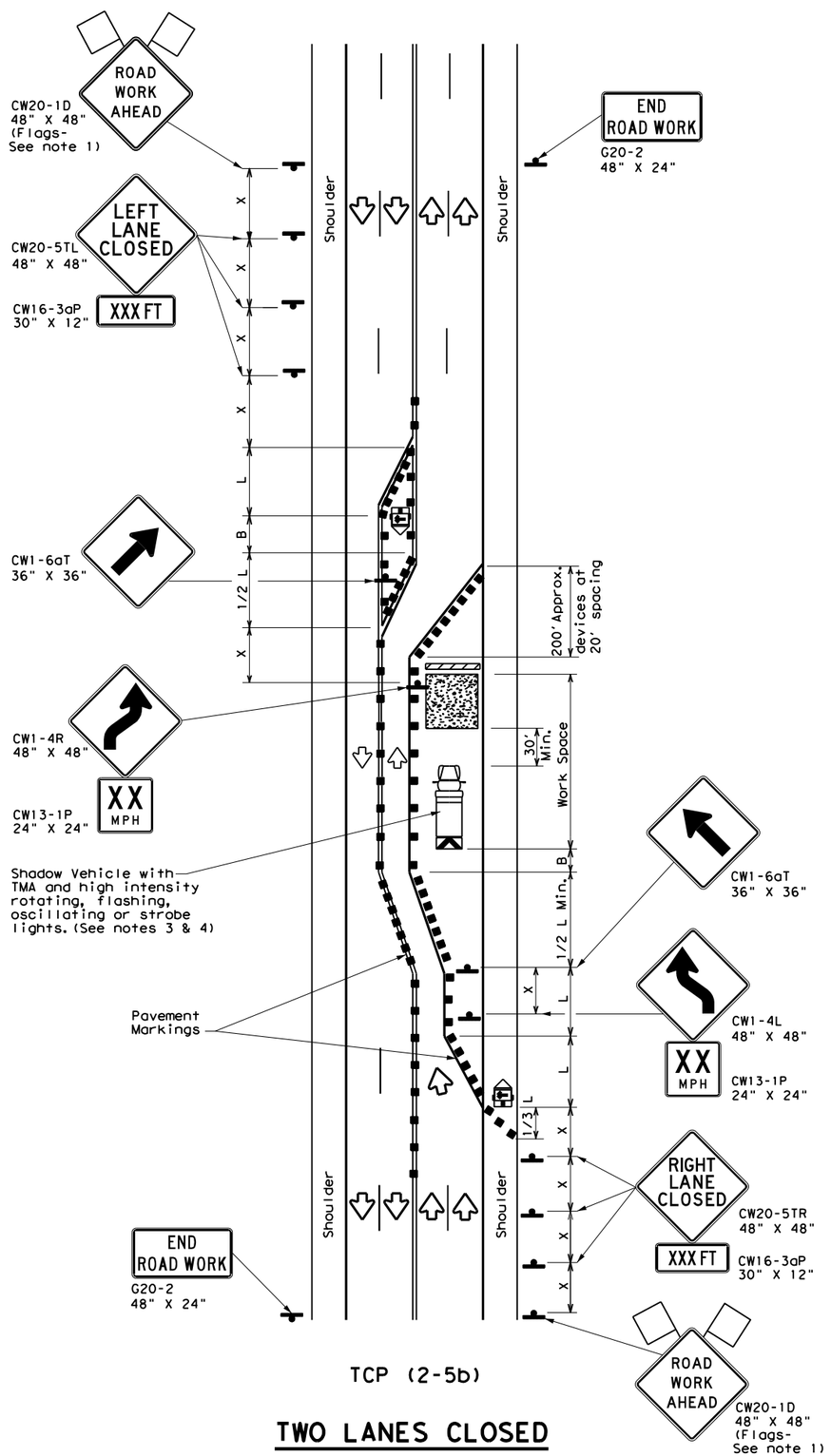


TCP (2-5a)

ONE LANE CLOSED



TCP (2-5b)

TWO LANES CLOSED

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew eposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substitutued for the Shadow Vehicle and TMA.
4. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.
5. The downstream taper is optional. When used, it should be 100 feet approximately per lane, with channelizing devices spaced at 20 feet.

TCP (2-5a)

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

TCP (2-5b)

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LONG TERM LANE CLOSURES MULTILANE CONVENTIONAL RDS.

TCP(2-5)-18

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4-98 2-18	ATL	CASS		21

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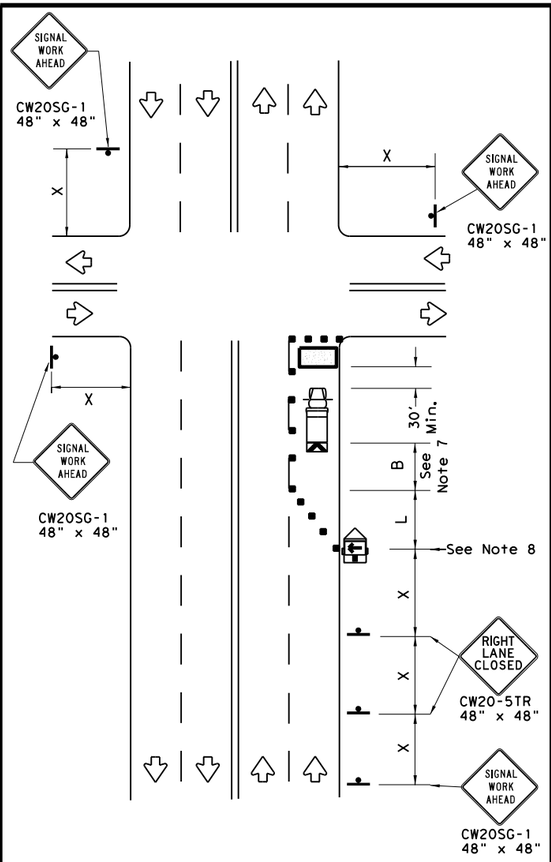
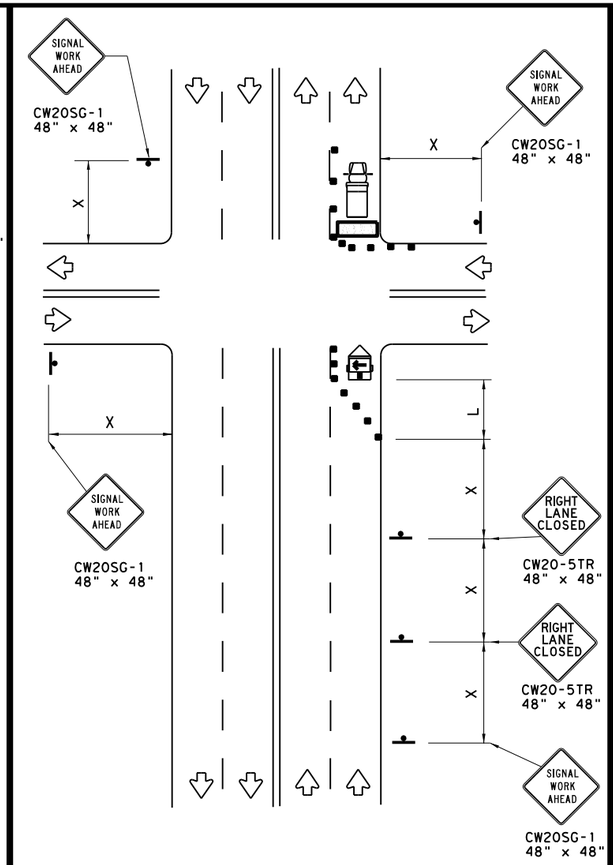


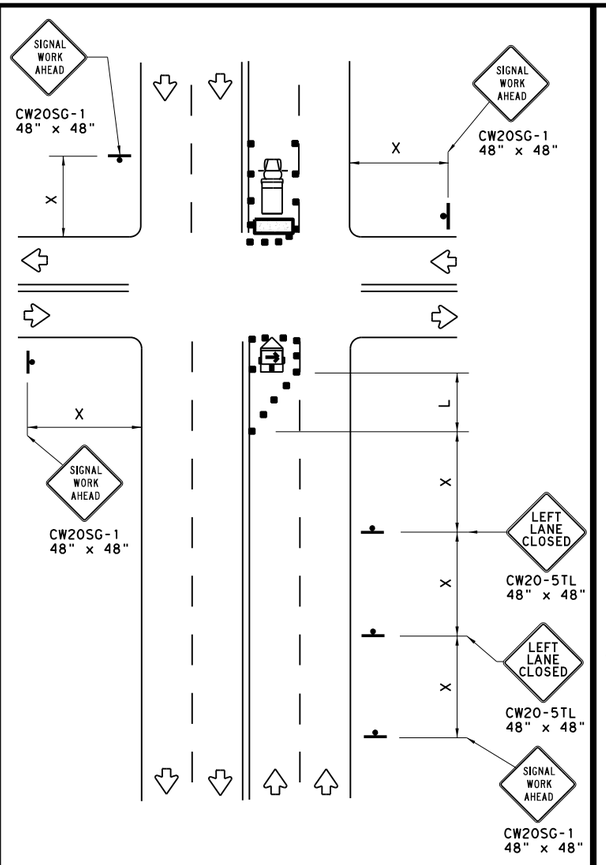
NEAR SIDE LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY



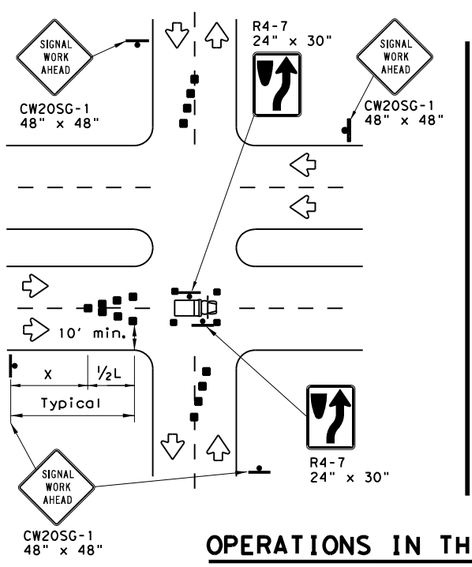
FAR SIDE RIGHT LANE CLOSURE

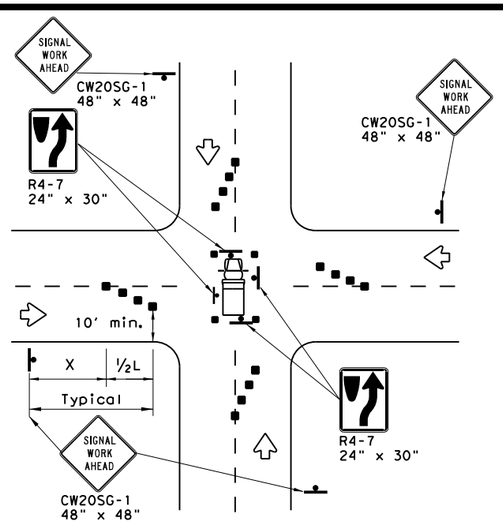
SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE LEFT LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY





OPERATIONS IN THE INTERSECTION

SHORT DURATION

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC SIGNAL WORK TYPICAL DETAILS

WZ(BTS-1)-13

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4-98 3-03	ATL	CASS		22

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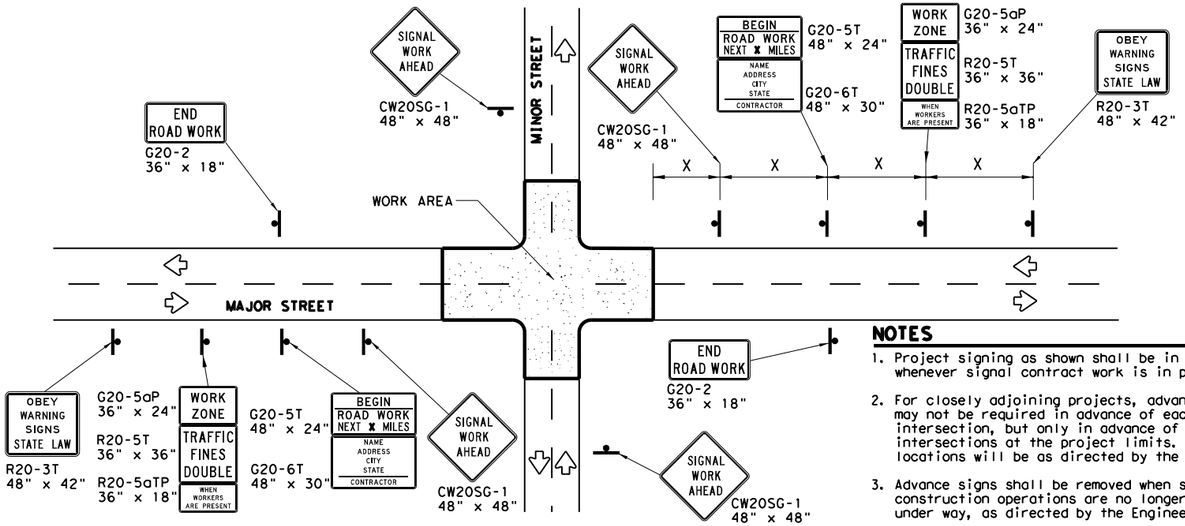


TYPICAL ADVANCE SIGNAL PROJECT SIGNING

FOR LONG TERM and INTERMEDIATE-TERM STATIONARY WORK OPERATIONS

NOTES

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

DURATION OF WORK

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

SIGN MOUNTING HEIGHT

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

REMOVING OR COVERING

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

REFLECTIVE SHEETING

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

SIGN SUPPORT WEIGHTS

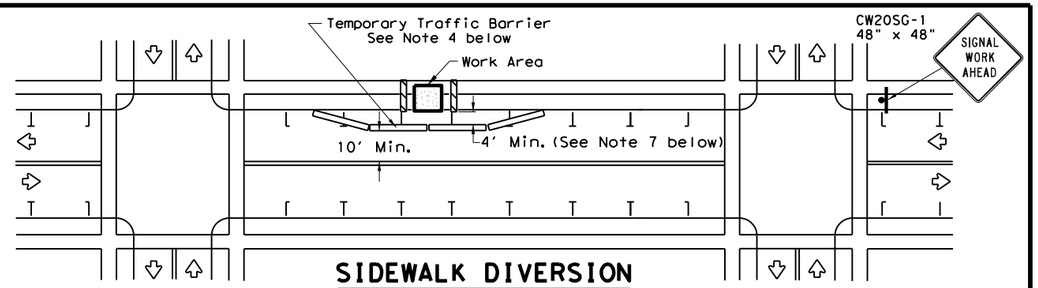
1. Weights used to keep signs from turning over should be sandbags filled with dry, cohesionless material.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects will not be permitted for use as sign support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

LEGEND	
	Sign
	Channelizing Devices
	Type 3 Barricade

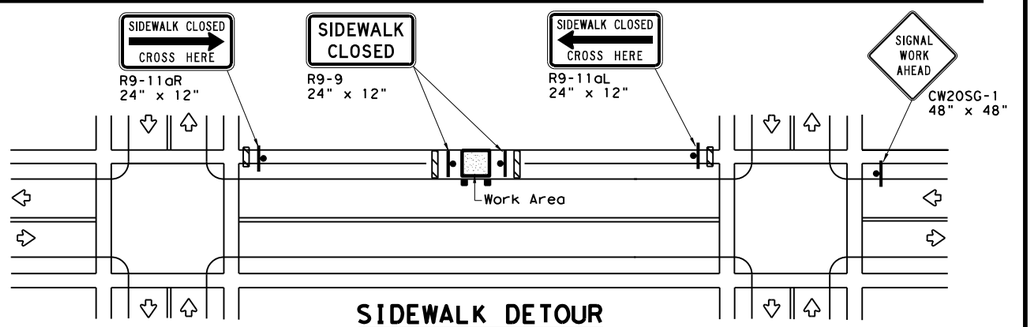
DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
FLEXIBLE ROLL-UP REFLECTIVE SIGNS	DMS-8310

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

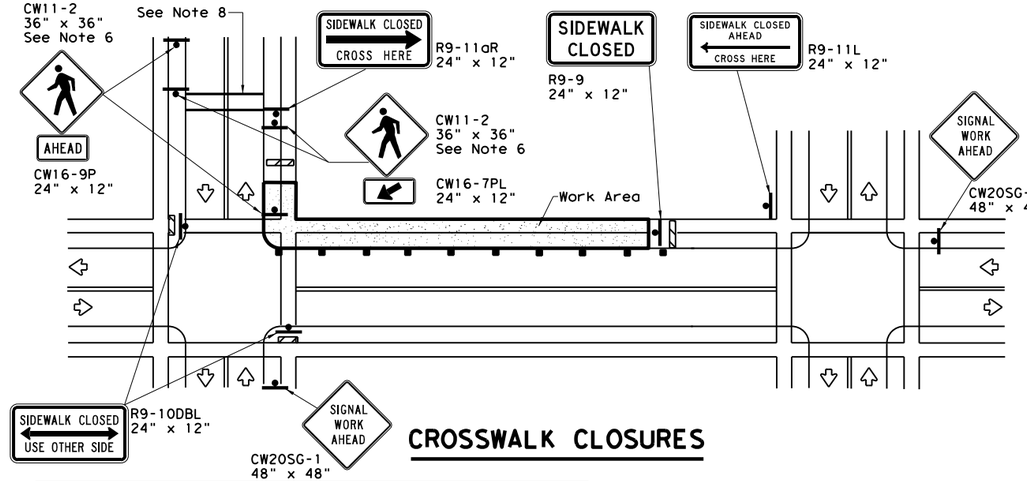
Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found at the following web address:
http://www.txdot.gov/txdot_library/publications/construction.htm



SIDEWALK DIVERSION



SIDEWALK DETOUR



CROSSWALK CLOSURES

PEDESTRIAN CONTROL

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

Texas Department of Transportation | Traffic Operations Division Standard

TRAFFIC SIGNAL WORK BARRICADES AND SIGNS

WZ(BTS-2)-13

FILE: wzbts-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
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4-98 3-03	ATL	CASS		23

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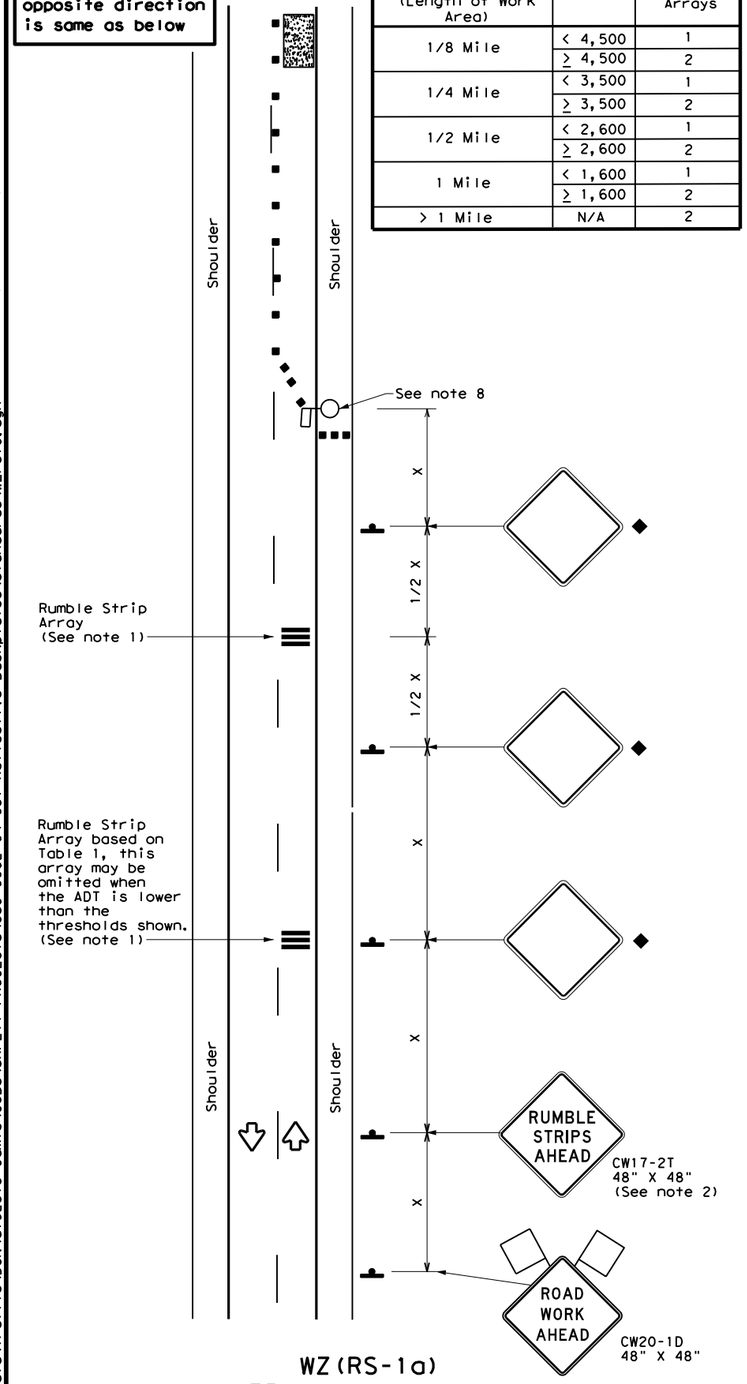
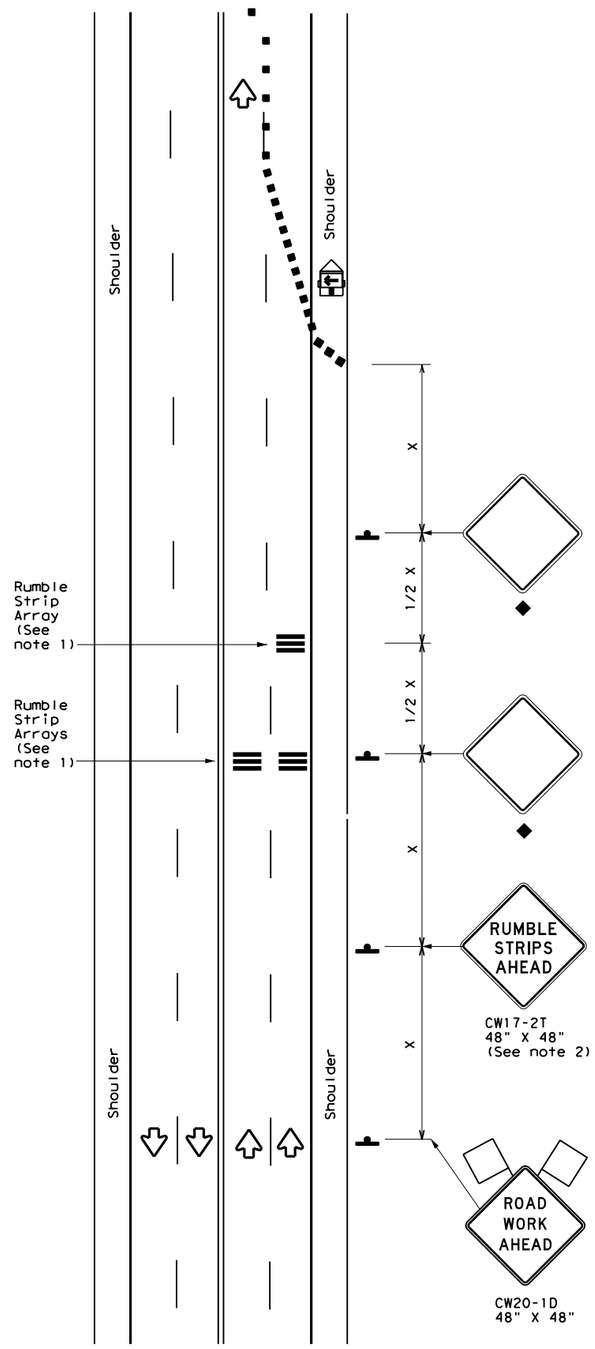
Warning sign and rumble strip sequence in opposite direction is same as below

TABLE 1		
Flagger to Flagger (Length of Work Area)	ADT	# of Rumble Strip Arrays
1/8 Mile	< 4,500	1
	≥ 4,500	2
1/4 Mile	< 3,500	1
	≥ 3,500	2
1/2 Mile	< 2,600	1
	≥ 2,600	2
1 Mile	< 1,600	1
	≥ 1,600	2
> 1 Mile	N/A	2



WZ(RS-1a)
75 mph or Less

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ(RS-1b)
75 mph or Less

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

1. Each Rumble Strip Array should consist of three rumble strips spaced center to center at the spacing shown in Table 2, placed transverse across the lane at locations shown.
2. The CW17-2T "RUMBLE STRIPS AHEAD" sign should be located after the CW20-1D "ROAD WORK AHEAD sign and spaced as shown. If traffic is observed to be queuing, or is expected to queue beyond the Rumble Strips, the CW17-2T sign and the first Rumble Strip Array may be located upstream of the CW20-1D sign as necessary to provide needed warning.
3. Temporary Rumble Strips will be considered subsidiary to Item 502, and shall be a product listed on the Compliant Work Zone Traffic Control Devices.
4. Removal of the Temporary Rumble Strips should be accomplished before removing the advance warning signs.
5. Temporary Rumble Strips should not be used on horizontal curves, loose gravel, soft or bleeding asphalt, heavily rutted pavements or unpaved surfaces.
6. Temporary Rumble Strips shall be installed and maintained as per manufacturer's recommendations.
7. This standard sheet shall be used in conjunction with other appropriate TCP standard, TMUTCD typical application or project specific detail for the project.
8. The one-lane two-way application may utilize a flagger, an AFAD or a portable traffic signal.
9. Temporary Rumble Strips may be used on freeways or expressways based on engineering judgment.

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Panel	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
	✓	✓		

◆ **Signs are for illustrative purposes only. Signs required may vary depending on the TCP, TMUTCD Typical Application, or project specific details for the project.**

TABLE 2	
Speed	Approximate distance between strips in an Array
≤ 40 MPH	10'
> 40 MPH & ≤ 55 MPH	15'
> 55 MPH	20'

Texas Department of Transportation

Traffic Operations Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-16

FILE: wzrs16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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2-14	DIST	COUNTY		SHEET NO.
4-16	ATL	CASS		24

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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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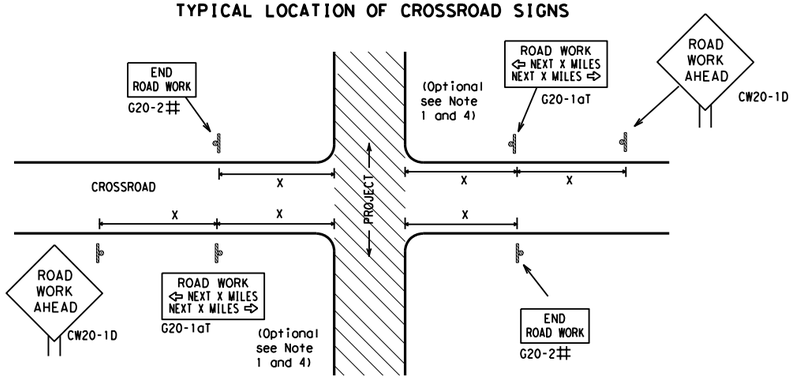
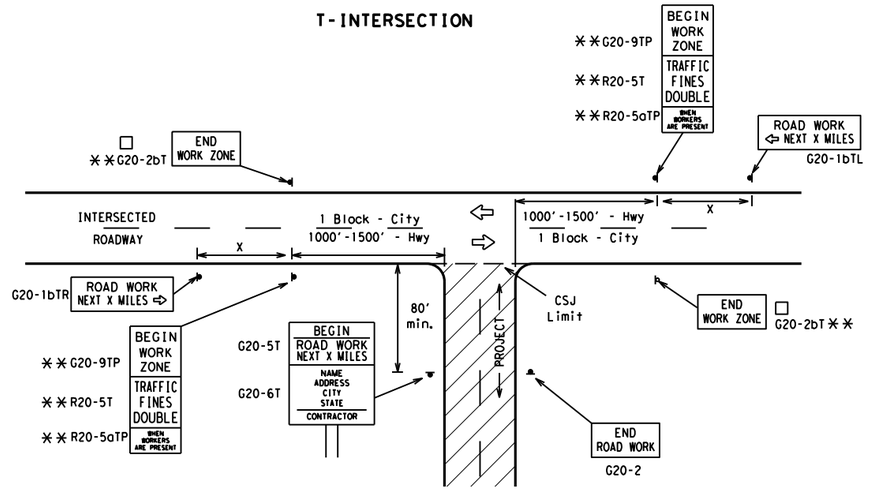
TYPICAL LOCATION OF CROSSROAD SIGNS



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]

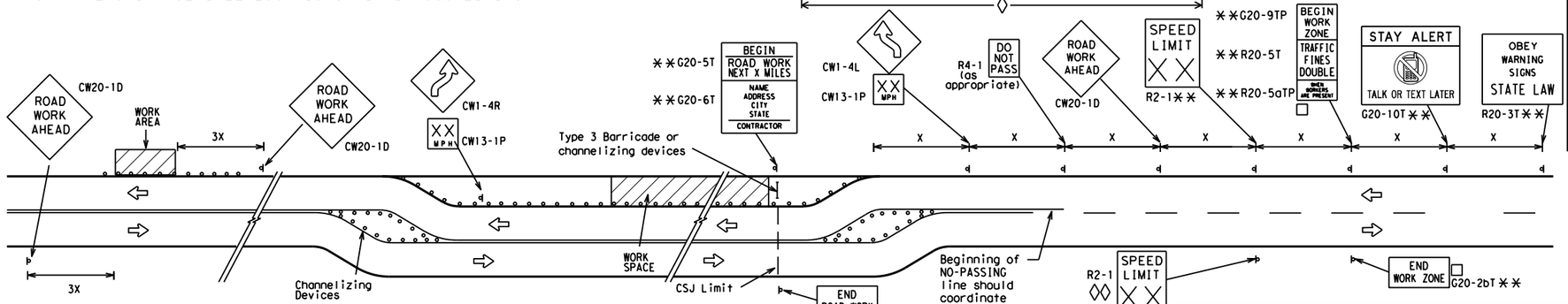
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

△ 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.

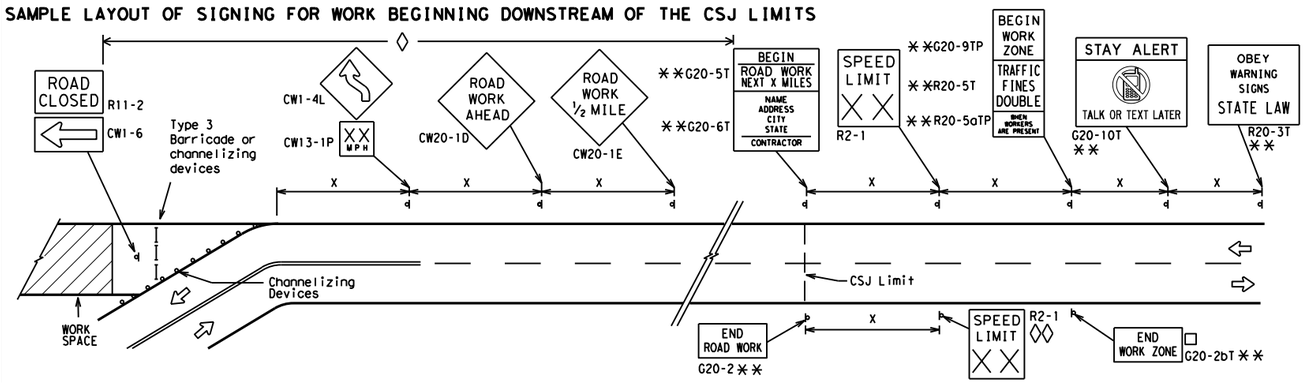
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

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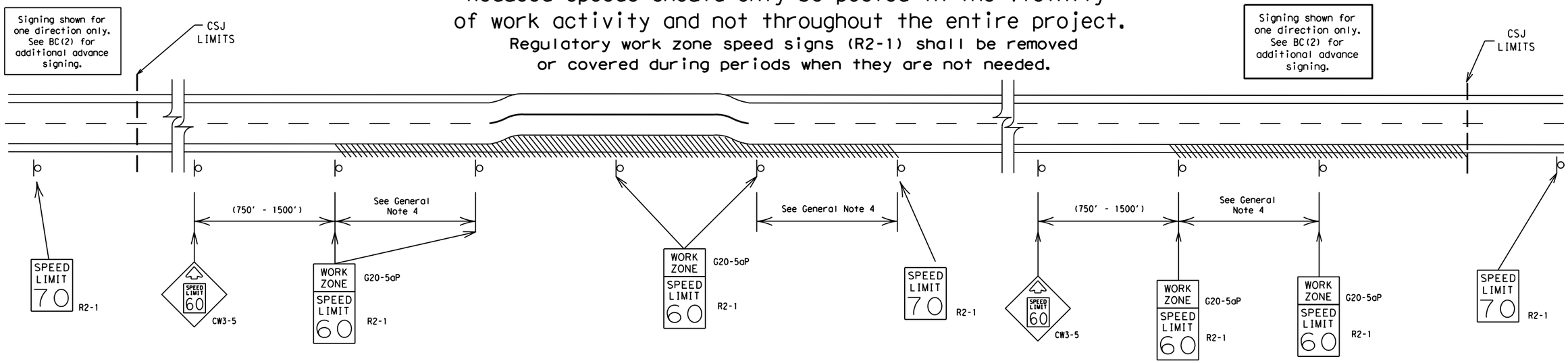
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

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BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

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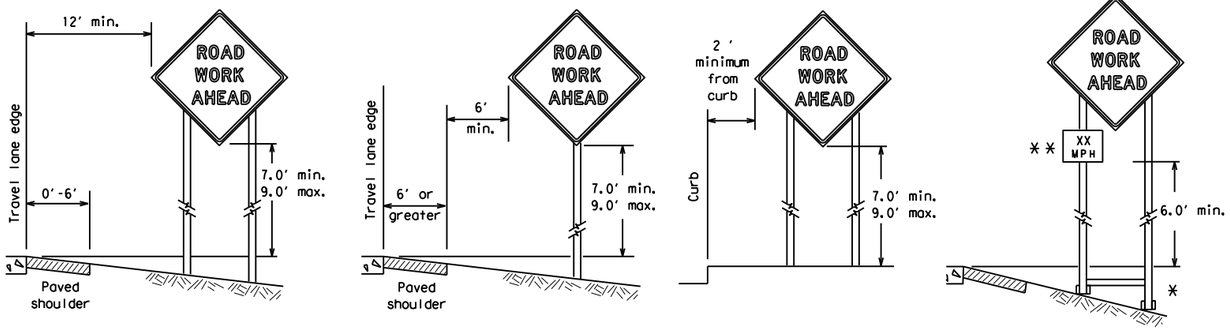
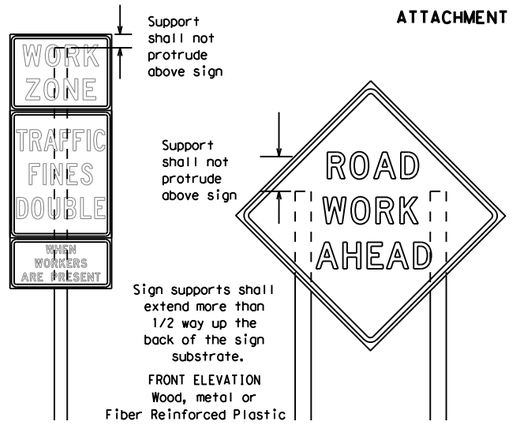
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

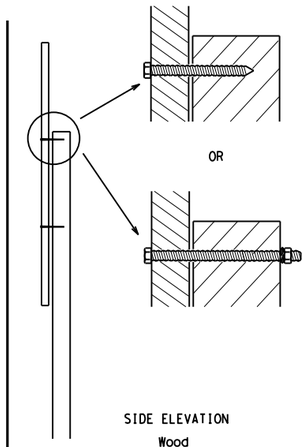


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS





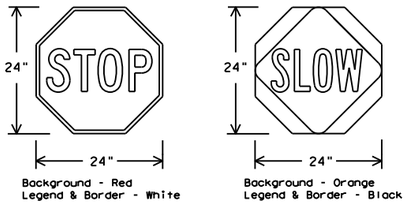
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

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BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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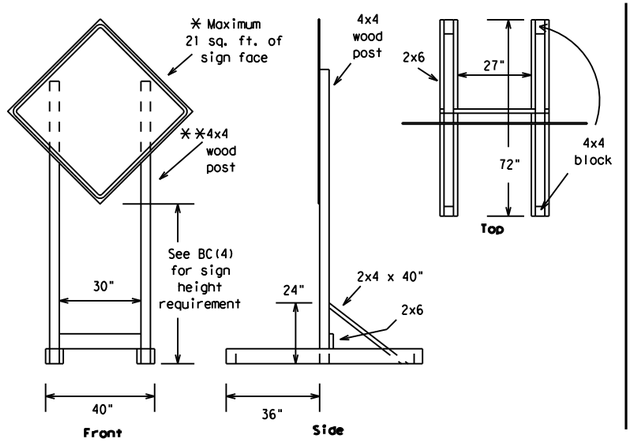
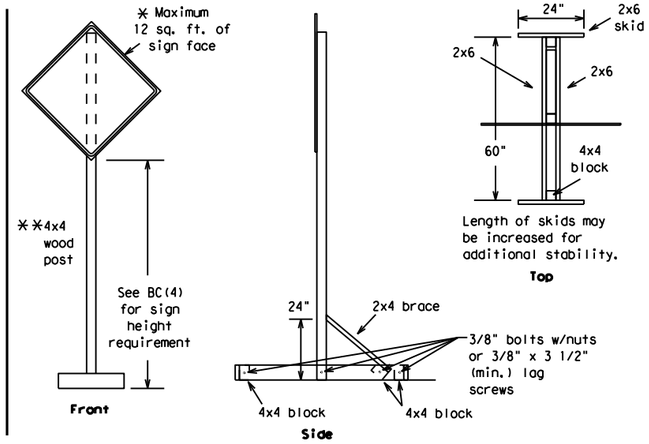
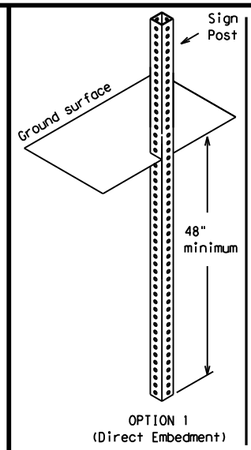
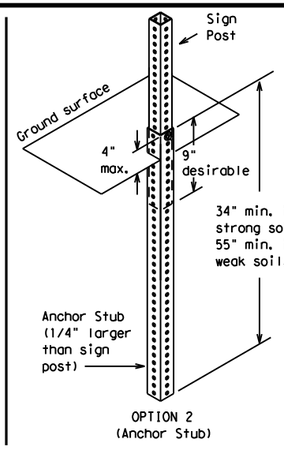


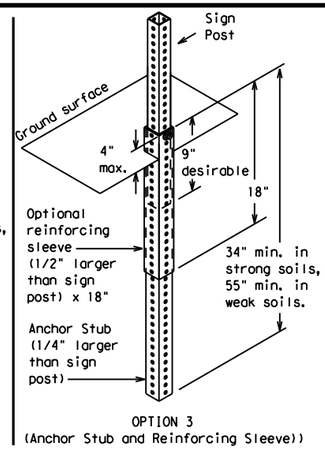


SKID MOUNTED WOOD SIGN SUPPORTS

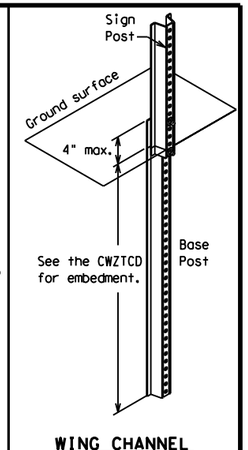
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS







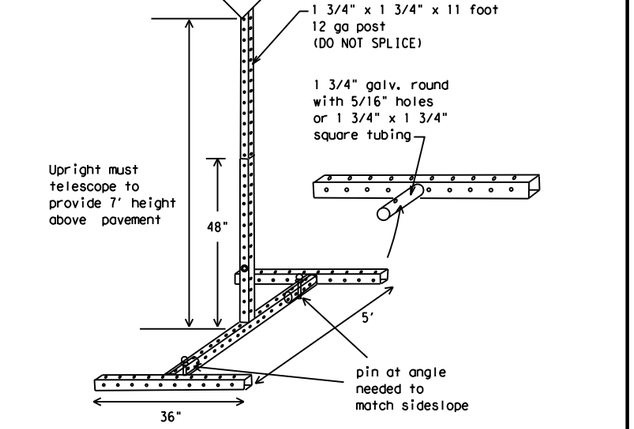
PERFORATED SQUARE METAL TUBING

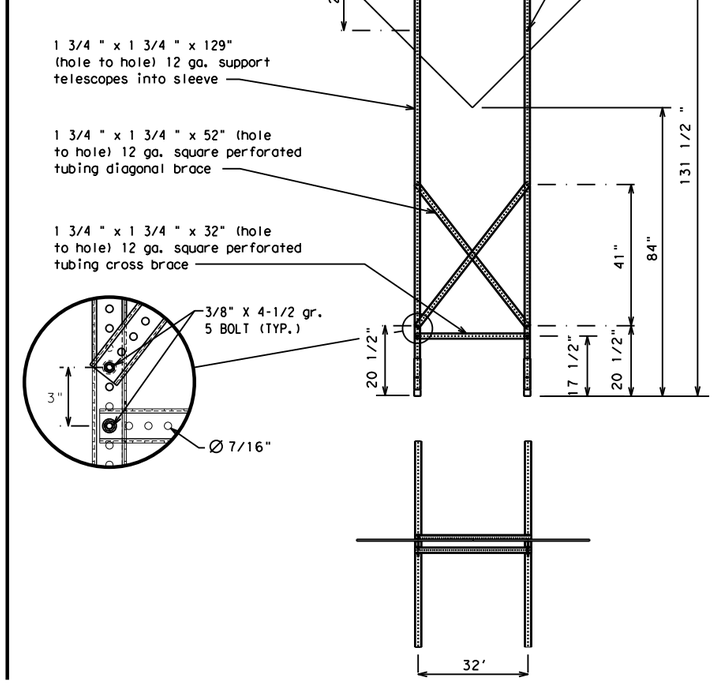


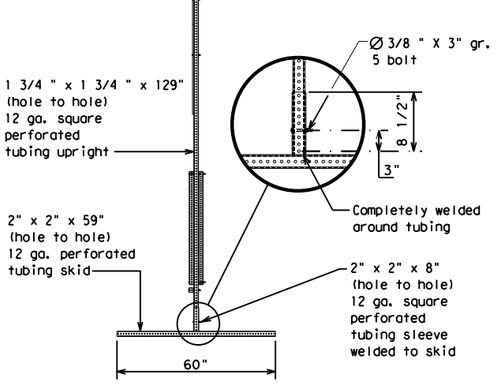
WING CHANNEL
Lap-splice/base bolted anchor

GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

SHEET 5 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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7-13 5-21	ATL	CASS		29

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List		Other Condition List	
FREEWAY CLOSED X MILE	FRONTAGE ROAD CLOSED	ROADWORK XXX FT	ROAD REPAIRS XXXX FT
ROAD CLOSED AT SH XXX	SHOULDER CLOSED XXX FT	FLAGGER XXXX FT	LANE NARROWS XXXX FT
ROAD CLSD AT FM XXXX	RIGHT LN CLOSED XXX FT	RIGHT LN NARROWS XXXX FT	TWO-WAY TRAFFIC XX MILE
RIGHT X LANES CLOSED	RIGHT X LANES OPEN	MERGING TRAFFIC XXXX FT	CONST TRAFFIC XXX FT
CENTER LANE CLOSED	DAYTIME LANE CLOSURES	LOOSE GRAVEL XXXX FT	UNEVEN LANES XXXX FT
NIGHT LANE CLOSURES	I-XX SOUTH EXIT CLOSED	DETOUR X MILE	ROUGH ROAD XXXX FT
VARIOUS LANES CLOSED	EXIT XXX CLOSED X MILE	ROADWORK PAST SH XXXX	ROADWORK NEXT FRI-SUN
EXIT CLOSED	RIGHT LN TO BE CLOSED	BUMP XXXX FT	US XXX EXIT X MILES
MALL DRIVEWAY CLOSED	X LANES CLOSED TUE - FRI	TRAFFIC SIGNAL XXXX FT	LANES SHIFT *
XXXXXXXX BLVD CLOSED			

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

Phase 2: Possible Component Lists

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

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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7-13 5-21	ATL	CASS		30

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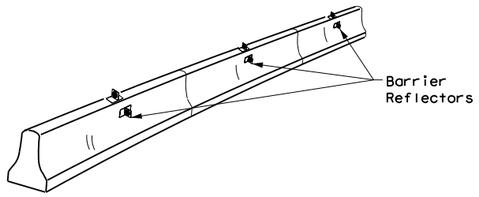
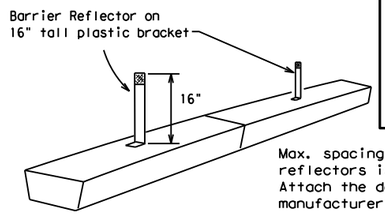
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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



CONCRETE TRAFFIC BARRIER (CTB)

3. Where traffic is on one side of the CTB, two (2) Barrier Reflectors shall be mounted in approximately the midsection of each section of CTB. An alternate mounting location is uniformly spaced at one end of each CTB. This will allow for attachment of a barrier grapple without damaging the reflector. The Barrier Reflector mounted on the side of the CTB shall be located directly below the reflector mounted on top of the barrier, as shown in the detail above.
4. Where CTB separates two-way traffic, three barrier reflectors shall be mounted on each section of CTB. The reflector unit on top shall have two yellow reflective faces (Bi-Directional)while the reflectors on each side of the barrier shall have one yellow reflective face, as shown in the detail above.
5. When CTB separates traffic traveling in the same direction, no barrier reflectors will be required on top of the CTB.
6. Barrier Reflector units shall be yellow or white in color to match the edgeline being supplemented.
7. Maximum spacing of Barrier Reflectors is forty (40) feet.
8. Pavement markers or temporary flexible-reflective roadway marker tabs shall NOT be used as CTB delineation.
9. Attachment of Barrier Reflectors to CTB shall be per manufacturer's recommendations.
10. Missing or damaged Barrier Reflectors shall be replaced as directed by the Engineer.
11. Single slope barriers shall be delineated as shown on the above detail.

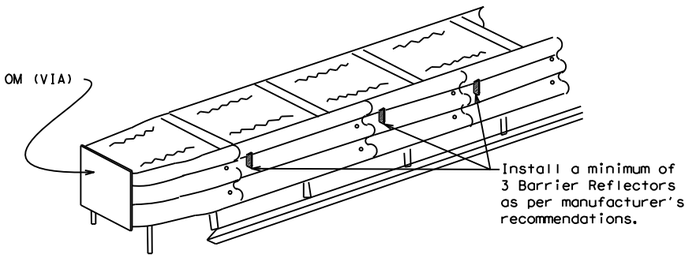


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

LOW PROFILE CONCRETE BARRIER (LPCB)

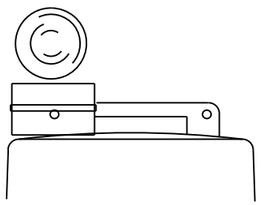


DELINEATION OF END TREATMENTS

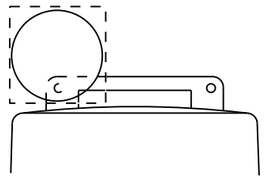
END TREATMENTS FOR CTB'S USED IN WORK ZONES

End treatments used on CTB's in work zones shall meet the apppropriate crashworthy standards as defined in the Manual for Assessing Safety Hardware (MASH). Refer to the CWZTCD List for approved end treatments and manufacturers.

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

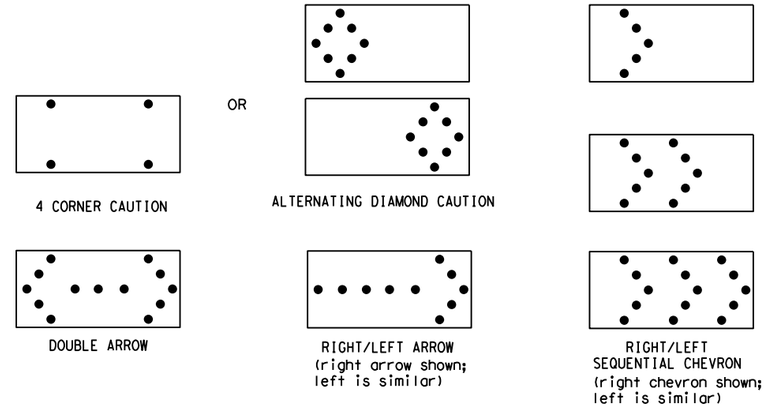
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

1. A warning reflector or approved substitute may be mounted on a plastic drum as a substitute for a Type C, steady burn warning light at the discretion of the Contractor unless otherwise noted in the plans.
2. The warning reflector shall be yellow in color and shall be manufactured using a sign substrate approved for use with plastic drums listed on the CWZTCD.
3. The warning reflector shall have a minimum retroreflective surface area (one-side) of 30 square inches.
4. Round reflectors shall be fully reflectorized, including the area where attached to the drum.
5. Square substrates must have a minimum of 30 square inches of reflectorized sheeting. They do not have to be reflectorized where it attaches to the drum.
6. The side of the warning reflector facing approaching traffic shall have sheeting meeting the color and retroreflectivity requirements for DMS 8300-Type B or Type C.
7. When used near two-way traffic, both sides of the warning reflector shall be reflectorized.
8. The warning reflector should be mounted on the side of the handle nearest approaching traffic.
9. The maximum spacing for warning reflectors should be identical to the channelizing device spacing requirements.

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

1. The Flashing Arrow Board should be used for all lane closures on multi-lane roadways, or slow moving maintenance or construction activities on the travel lanes.
2. Flashing Arrow Boards should not be used on two-lane, two-way roadways, detours, diversions or work on shoulders unless the "CAUTION" display (see detail below) is used.
3. The Engineer/Inspector shall choose all appropriate signs, barricades and/or other traffic control devices that should be used in conjunction with the Flashing Arrow Board.
4. The Flashing Arrow Board should be able to display the following symbols:



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0062	04	051	US 59
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ATL	CASS		31

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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:

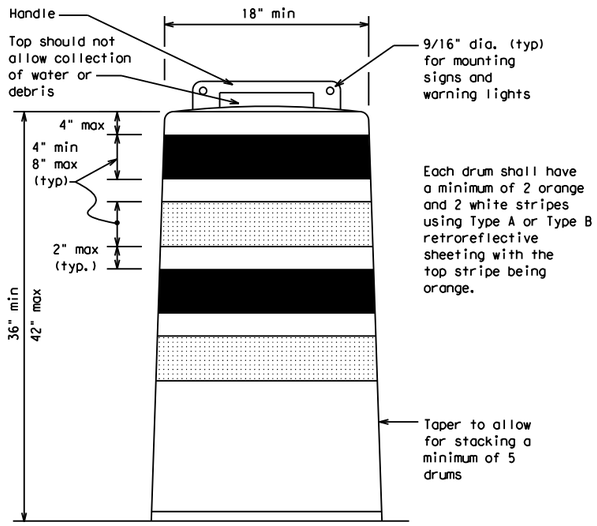
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

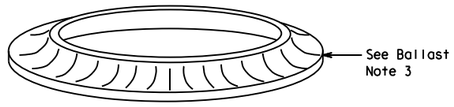
RETROREFLECTIVE SHEETING

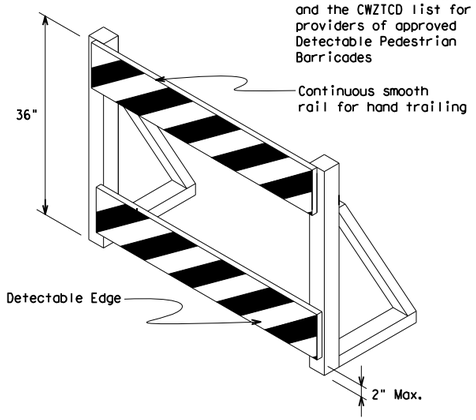
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

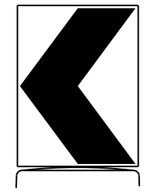




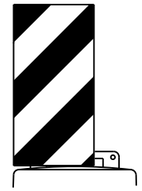


DETECTABLE PEDESTRIAN BARRICADES

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

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0062	04	051	US 59
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	ATL	CASS		32
7-13				

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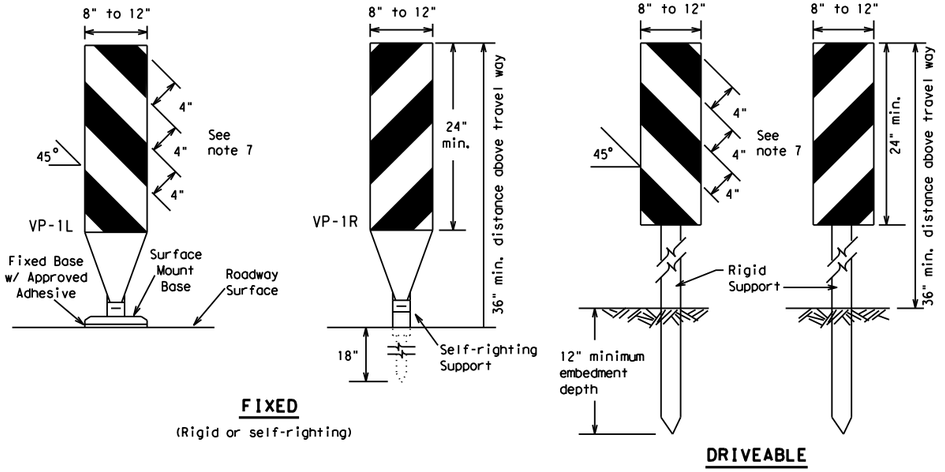
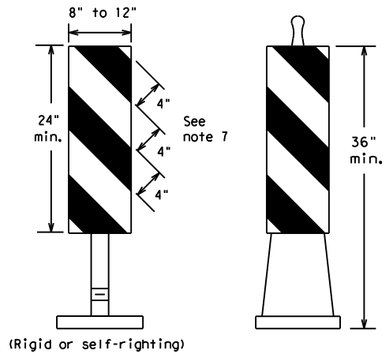


FIXED
(Rigid or self-righting)

DRIVEABLE

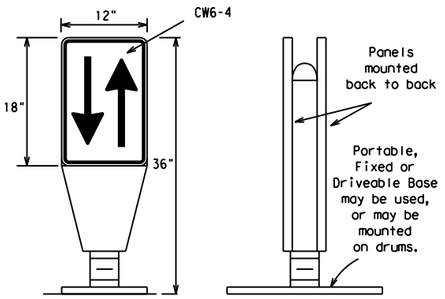


(Rigid or self-righting)

PORTABLE

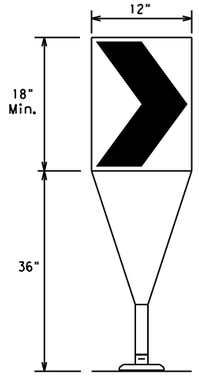
VERTICAL PANELS (VPs)

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



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.

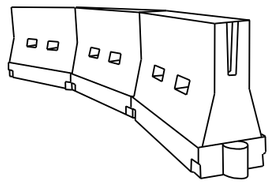
OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

GENERAL NOTES

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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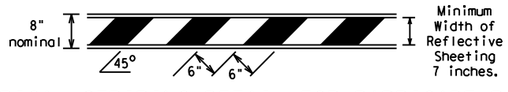
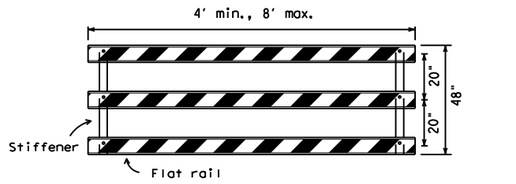
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



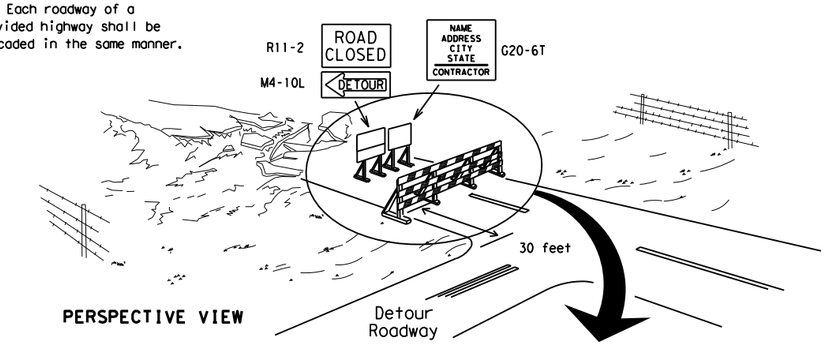
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

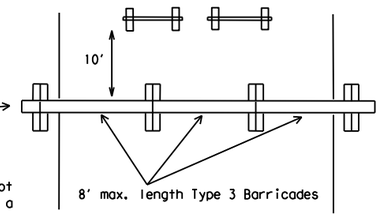
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

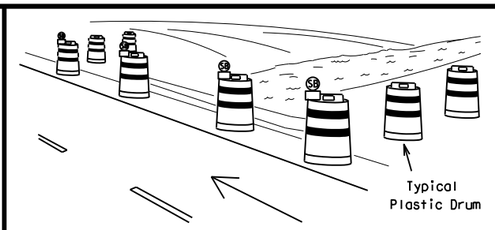
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

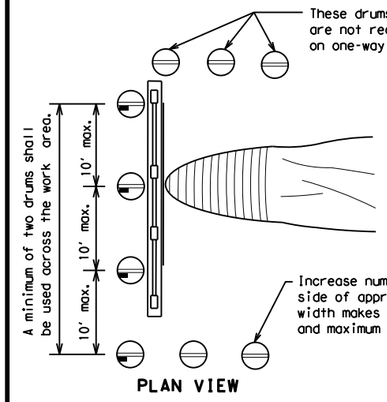
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

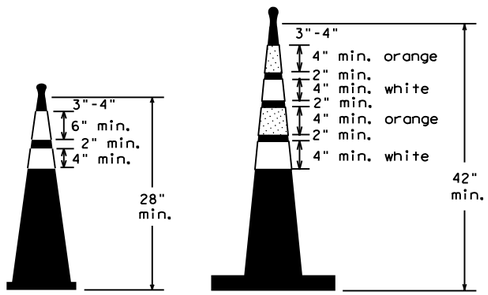
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



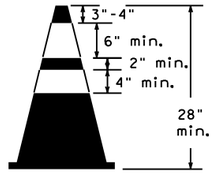
LEGEND	
	Plastic drum
	Plastic drum with steady burn light or yellow warning reflector
SB	Steady burn warning light or yellow warning reflector

PLAN VIEW

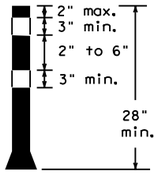
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

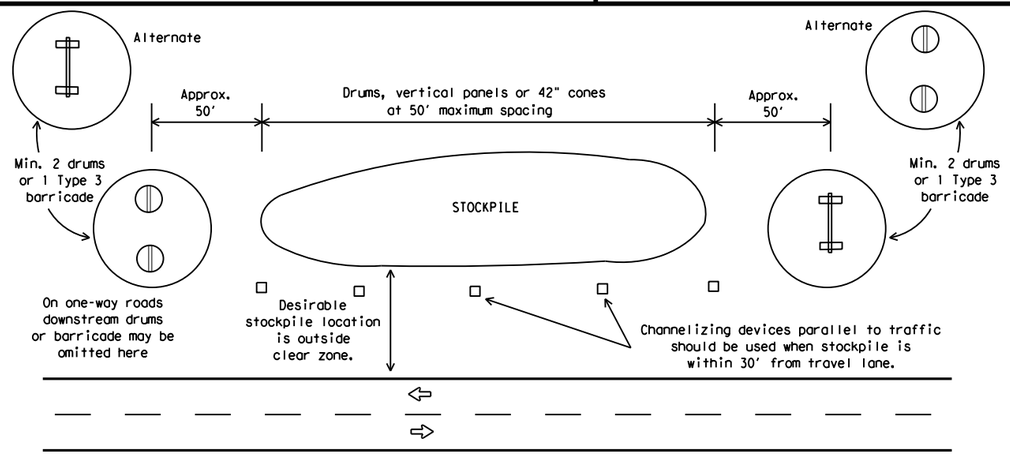


Tubular Marker

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

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

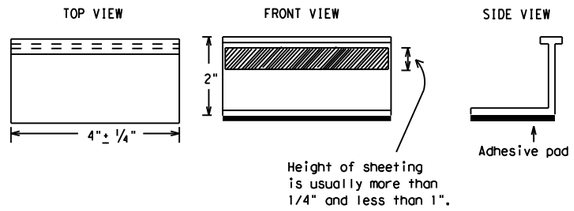
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

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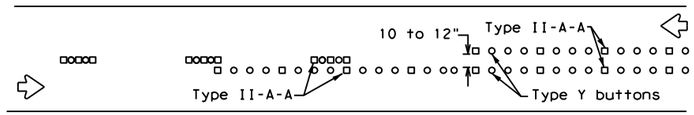
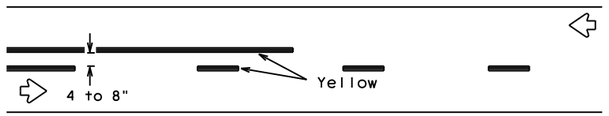
PAVEMENT MARKING PATTERNS

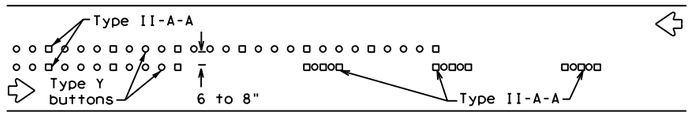
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



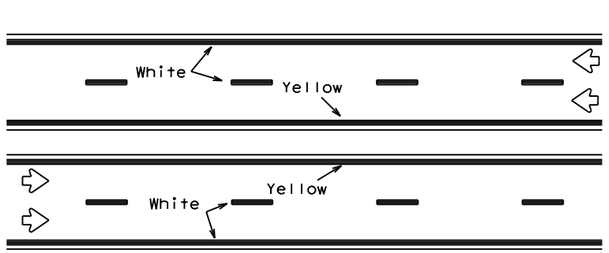
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



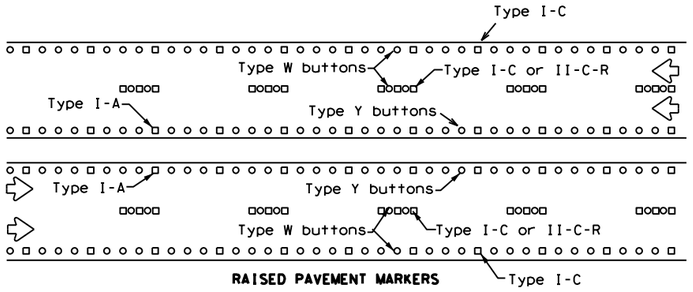
RAISED PAVEMENT MARKERS - PATTERN B

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

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



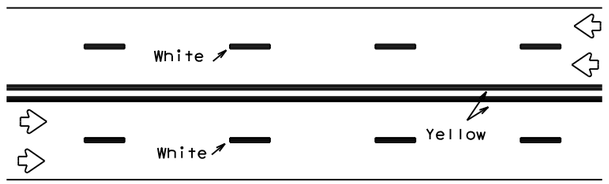
REFLECTORIZED PAVEMENT MARKINGS



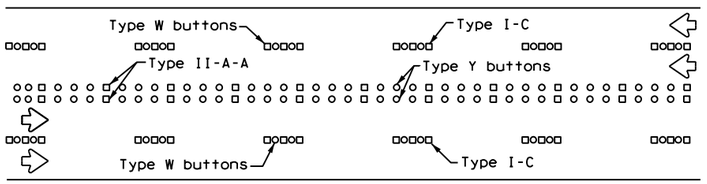
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



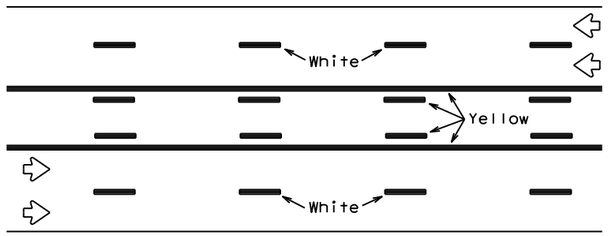
REFLECTORIZED PAVEMENT MARKINGS



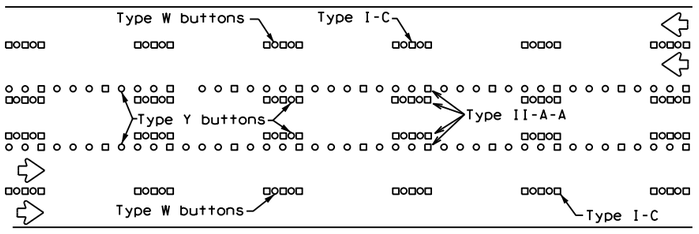
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

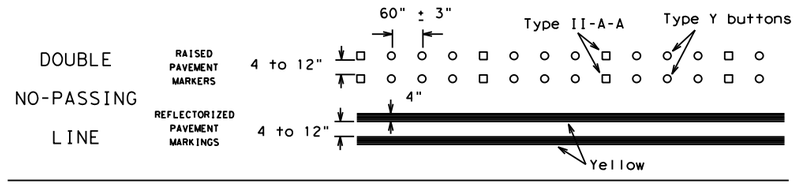
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

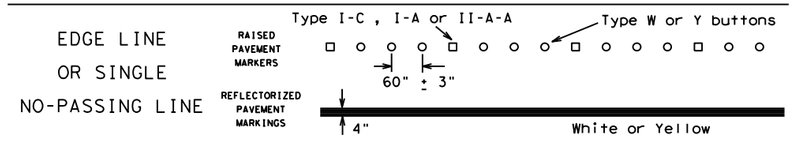
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

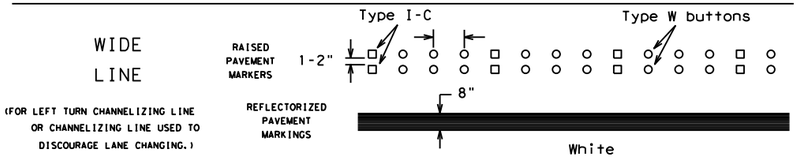


EDGE LINE OR SINGLE NO-PASSING LINE



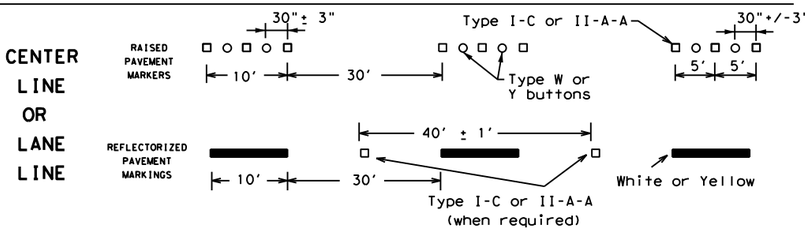
WIDE LINE

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

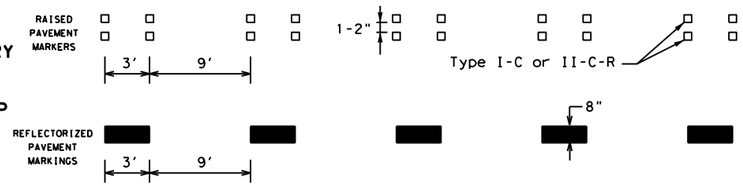


BROKEN LINES

CENTER LINE OR LANE LINE

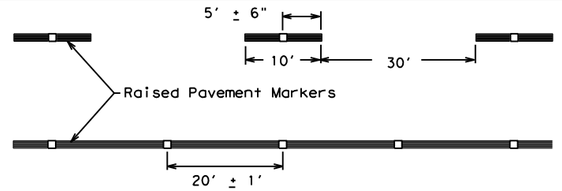


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

SHEET 12 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

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LEGEND

- SIGNAL POLE
- VIVD CAMERA
- LUMINAIRE
- (2) SIGNAL FACE AND PHASE
- CONTROLLER
- (S) ELECTRICAL SERVICE

S1
R10-17T
36"X42"

2 EA.

S2
R3-8L
30"X30"

2 EA.

S3
VAR. X 18" (SEE SIGN DETAIL SHEETS)

2 EA.

S4
VAR. X 18" (SEE SIGN DETAIL SHEETS)

1 EA.

S5
VAR. X 18" (SEE SIGN DETAIL SHEETS)

1 EA.

S6
VAR. X 18" (SEE SIGN DETAIL SHEETS)

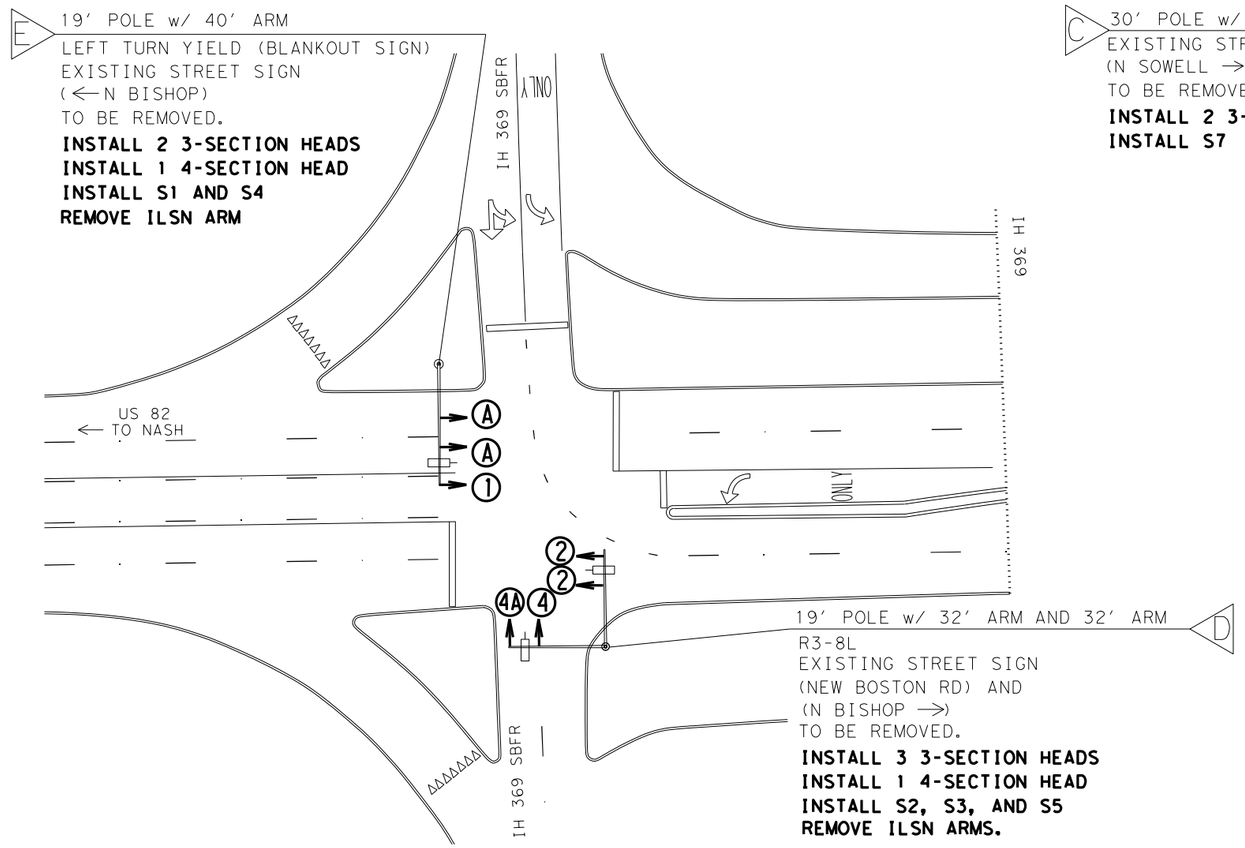
1 EA.

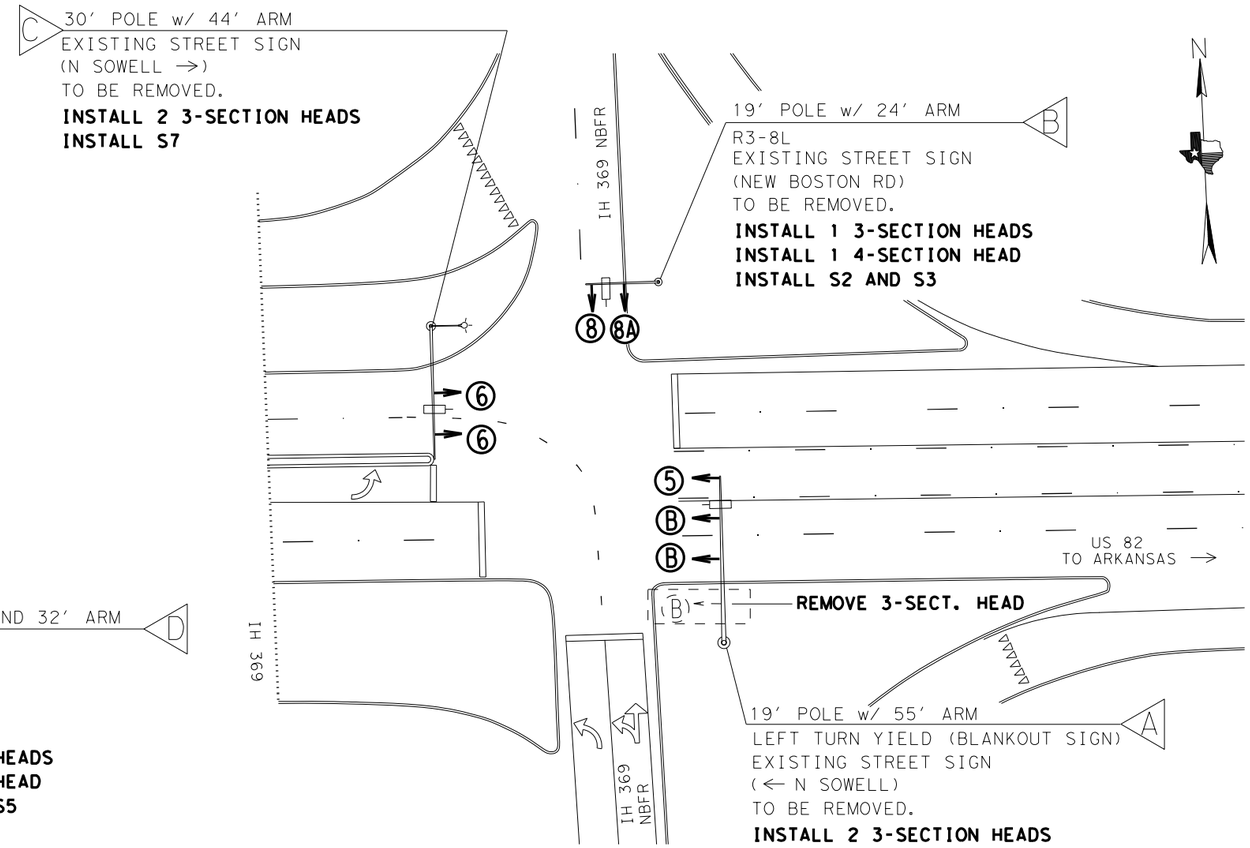
S7
VAR. X 18" (SEE SIGN DETAIL SHEETS)

1 EA.

SIGNAL FACES

(R)(Y)(G)	2, 6, A, AND B	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.
R S Y F Y G (R)(Y)(Y)(G)	1 AND 5	12" ONE-WAY, HORIZONTAL 4-SECTION, R-Y-Y-G SIGNAL HEAD.
(R)(Y)(G)	4 AND 8	12" ONE-WAY, HORIZONTAL 4-SECTION, R-Y-Y-G SIGNAL HEAD.
(R)(Y)(G)(G)	4A AND 8A	12" ONE-WAY, HORIZONTAL 4-SECTION, R-Y-G-G SIGNAL HEAD.





SUMMARY OF QUANTITIES

ITEM	DESC CODE	DESCRIPTION	UNIT	TOTAL
0682	6001	VEH SIG SEC (12")LED(GRN)	EA	10
0682	6002	VEH SIG SEC (12") LED (GRN ARW)	EA	6
0682	6003	VEH SIG SEC (12")LED(YEL)	EA	10
0682	6004	VEH SIG SEC (12") LED (YEL ARW)	EA	6
0682	6005	VEH SIG SEC (12")LED(RED)	EA	10
0682	6006	VEH SIG SEC (12") LED (RED ARW)	EA	4
0682	6054	BACK PLATE W/REFL BRDER (3SEC)(VENT) ALUM	EA	10
0682	6055	BACK PLATE W/REFL BRDER (4SEC)(VENT) ALUM	EA	4
0690	6024	REMOVAL OF SIGNAL HEAD ASSM	EA	1
0690	6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	10
0690	6029	INSTALL OF SIGNAL RELATED SIGNS	EA	10
6185	6002	TMA (STATIONARY)	DAY	4

NOTES:
1.) REPLACE ALL SIGNAL HEADS. INSTALL VENTED ALUMINUM BACKPLATES WITH REFLECTIVE BORDER.
2.) EXISTING STREET NAME SIGNS ARE FLAT PANEL ALUMINUM SIGNS MOUNTED ON ILSN ARMS FOR IH 369 SBFR. EXISTING STREET SIGNS ARE MOUNTED ON MAST ARMS FOR IH 369 NBFR. NEW STREET NAMES SIGNS WILL BE MOUNTED ON MAST ARMS. REMOVE ILSN ARMS. REMOVE EXISTING LEFT TURN YIELD BLANK OUT SIGNS AND INSTALL LEFT TURN YIELD ON FLASHING YELLOW ARROW SIGNS. REPLACE R3-8L SIGNS.
3.) CURRENT SIGNAL HEAD ARRANGEMENT FOR 4A AND 8A IS A FOUR SECTION HEAD WITH RED BALL, YELLOW BALL, GREEN LEFT ARROW, AND GREEN UP ARROW. THESE SIGNAL HEADS WILL BE REPLACED WITH THE ARANGEMENT AS SHOWN IN THE SIGNAL FACE CHART.
4.) REMOVE 3-SECTION SIGNAL HEAD ON POLE A AS SHOWN.

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED
PROFESSIONAL ENGINEER

Christina N. Trowler, P.E.
1/18/2022

0' 25' 50'

PROPOSED SIGNAL LAYOUT IH 369 AT US 82

 Texas Department of Transportation

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			37
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

FILE: T:\Engdata\Traffic\DGN\d192515 Jamie\JOBS\SAFETY PROJECTS\CSJ 0062-04-051 Reflective Backplates\Intersections\IH 369 at US 67\IH 369 AT US 67.dgn
DATE: 1/4/2022 8:50:05 AM

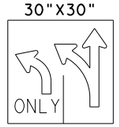
LEGEND

- SIGNAL POLE
- VIVD CAMERA
- LUMINAIRE
- (2) SIGNAL FACE AND PHASE
- CONTROLLER
- (S) ELECTRICAL SERVICE

S1
R10-17T
36"X42"

2 EA.

S2
R3-8L
30"X30"



2 EA.

S3
VAR. X 18" (SEE SIGN DETAIL SHEETS)

2 EA.

S4
VAR. X 18" (SEE SIGN DETAIL SHEETS)

1 EA.

S5
VAR. X 18" (SEE SIGN DETAIL SHEETS)

1 EA.

S6
VAR. X 18" (SEE SIGN DETAIL SHEETS)

1 EA.

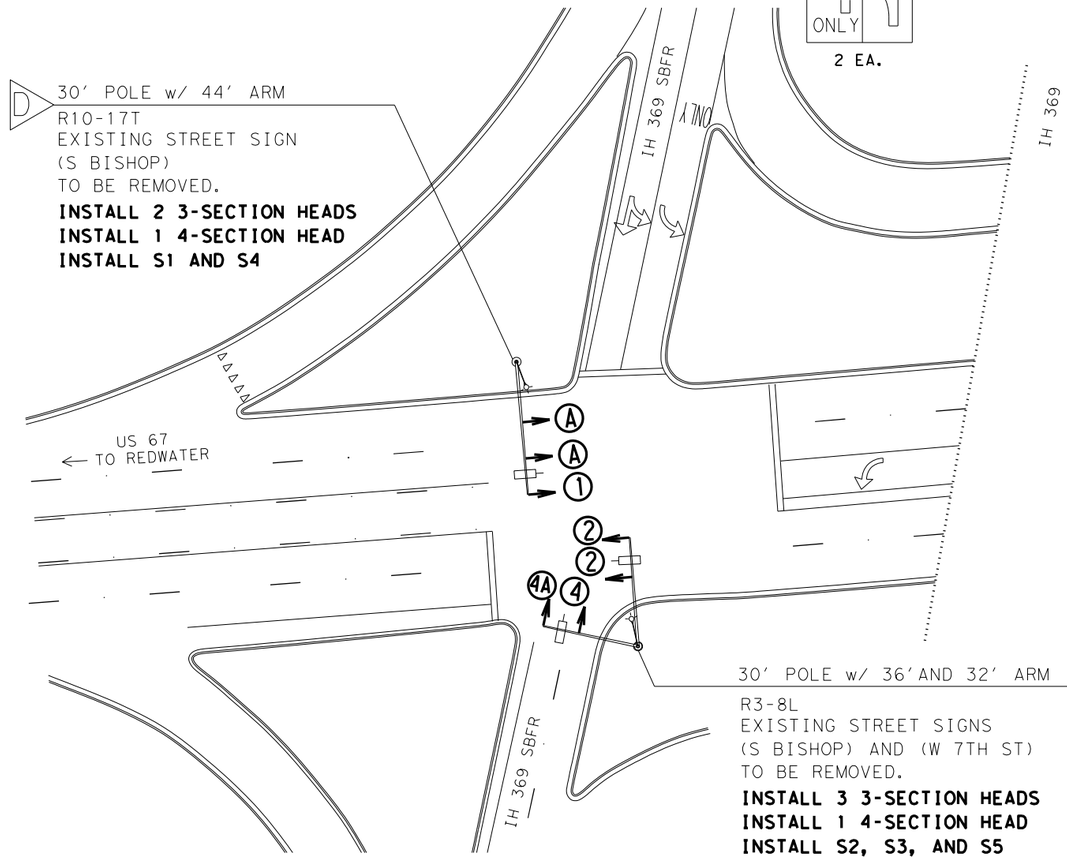
S7
VAR. X 18" (SEE SIGN DETAIL SHEETS)

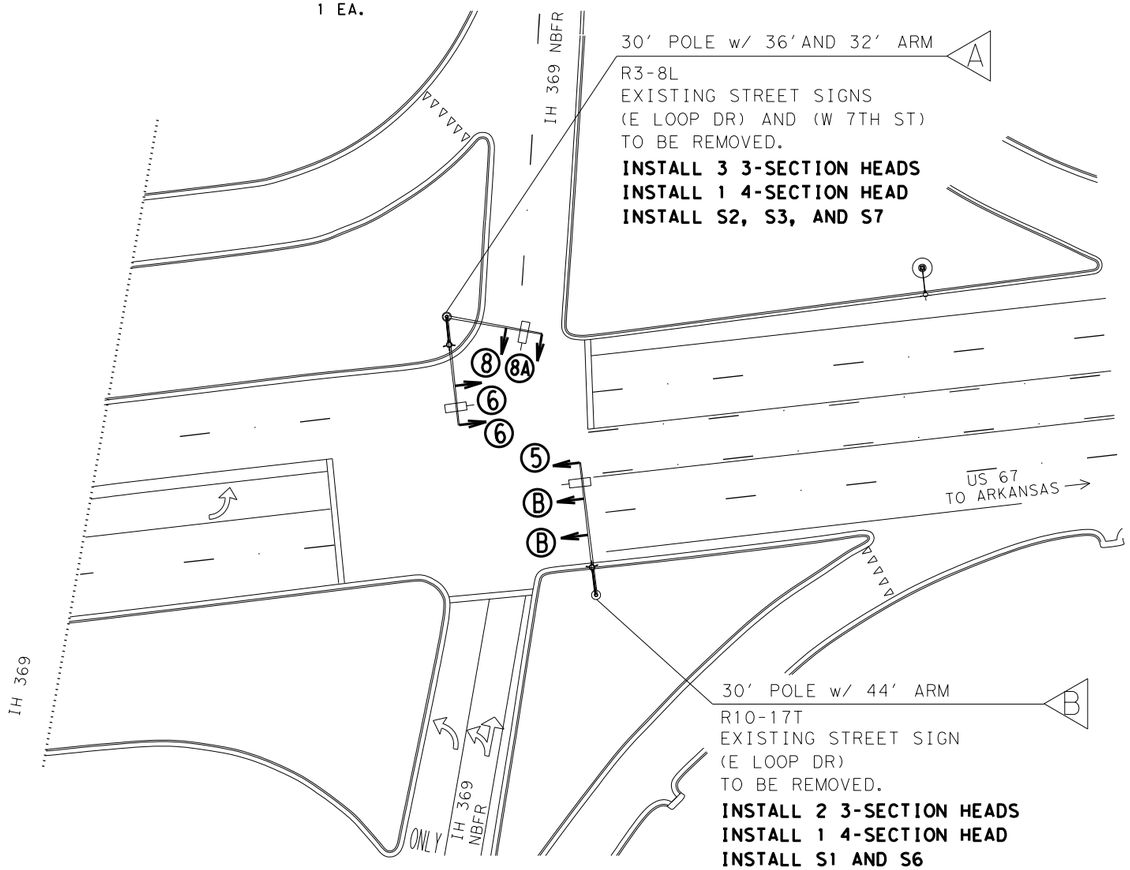
1 EA.

SIGNAL FACES

R Y G	2, 6, A, AND B	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.
R S Y F Y G R Y Y G	1 AND 5	12" ONE-WAY, HORIZONTAL 4-SECTION, R-Y-Y-G SIGNAL HEAD.
R Y G	4 AND 8	12" ONE-WAY, HORIZONTAL 4-SECTION, R-Y-Y-G SIGNAL HEAD.
R Y G G	4A AND 8A	12" ONE-WAY, HORIZONTAL 4-SECTION, R-Y-G-G SIGNAL HEAD.

N





SUMMARY OF QUANTITIES

ITEM	DESC CODE	DESCRIPTION	UNIT	TOTAL
0682	6001	VEH SIG SEC (12")LED(GRN)	EA	10
0682	6002	VEH SIG SEC (12") LED (GRN ARW)	EA	6
0682	6003	VEH SIG SEC (12")LED(YEL)	EA	10
0682	6004	VEH SIG SEC (12") LED (YEL ARW)	EA	6
0682	6005	VEH SIG SEC (12")LED(RED)	EA	10
0682	6006	VEH SIG SEC (12") LED (RED ARW)	EA	4
0682	6054	BACK PLATE W/REFL BRDER (3SEC)(VENT) ALUM	EA	10
0682	6055	BACK PLATE W/REFL BRDER (4SEC)(VENT) ALUM	EA	4
0690	6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	10
0690	6029	INSTALL OF SIGNAL RELATED SIGNS	EA	10
6185	6002	TMA (STATIONARY)	DAY	4

NOTES:

1.) REPLACE ALL SIGNAL HEADS. INSTALL VENTED ALUMINUM BACKPLATES WITH REFLECTIVE BORDER.

2.) EXISTING STREET NAME SIGNS ARE FLAT PANEL ALUMINUM SIGNS MOUNTED ON MAST ARMS. NEW STREET NAMES SIGNS WILL BE MOUNTED ON MAST ARMS. REMOVE EXISTING LEFT TURN YIELD ON FLASHING YELLOW ARROW SIGNS AND INSTALL NEW SIGNS. REMOVE R3-8L AND INSTALL NEW SIGNS.

3.) CURRENT SIGNAL HEAD ARRANGEMENT FOR 4A AND 8A IS A FOUR SECTION HEAD WITH RED BALL, YELLOW BALL, GREEN LEFT ARROW, AND GREEN UP ARROW. THESE SIGNAL HEADS WILL BE REPLACED WITH THE ARANGEMENT AS SHOWN IN THE SIGNAL FACE CHART.

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED
PROFESSIONAL ENGINEER

Christina N. Trowler, P.E.
1/18/2022

0' 25' 50'

PROPOSED SIGNAL LAYOUT IH 369 AT US 67

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			38
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

FILE: T:\Engdata\Traffic\DGN\d192515 Jamie\JOBS\SAFETY PROJECTS\CSJ 0062-04-051 Reflective Backplates\Intersections\US 59 at LP 151\2D File w google LP 151.dgn
DATE: 12/27/2021 2:13:20 PM

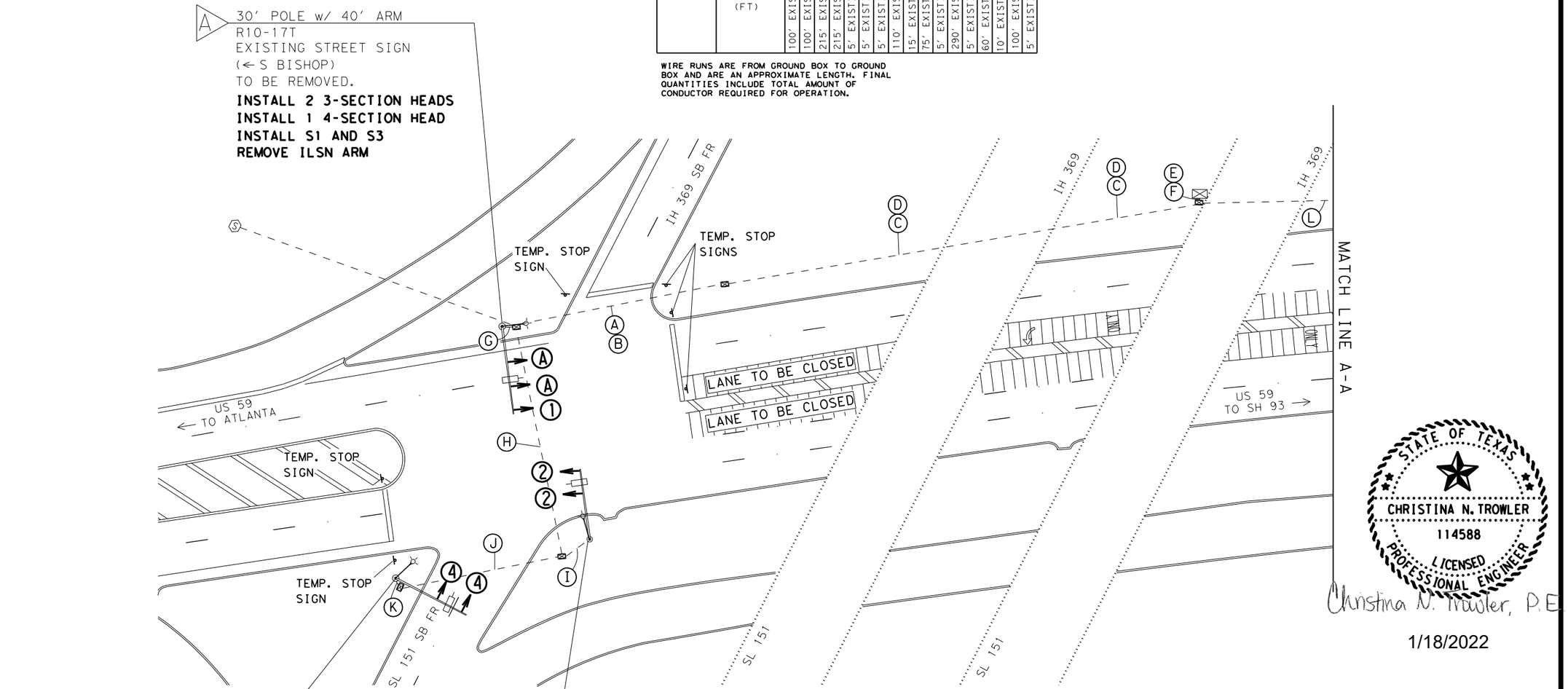
LEGEND

- SIGNAL POLE
- VIVD CAMERA
- LUMINAIRE
- EXISTING GROUND BOX
- EXISTING CONDUIT
- SIGNAL FACE AND PHASE
- CONTROLLER
- ELECTRICAL SERVICE

WIRE RUN

ITEM	RUN	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
WIRE	#6 BARE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	#8 XHHW	2		2				2	2	2	2	2	2	2	2	2	2	2
	5/C #12		3		3		6	1	2	1	1	1	3	1	2	1	1	1
	7/C #12		1		1		2	1					1		1		1	1
VIVDS	COAX CABLE		3		3		6	1	2	1	1	1	3	1	2	1	1	1
	MULTICOM																	
CONDUIT	2" PVC	X		X		X		X		X	X	X	X		X		X	X	X
	4" PVC		X		X		X		X					X		X			
	RUN LENGTH (FT)	100' EXISTING	100' EXISTING	215' EXISTING	215' EXISTING	5' EXISTING	5' EXISTING	5' EXISTING	110' EXISTING	15' EXISTING	75' EXISTING	5' EXISTING	290' EXISTING	5' EXISTING	60' EXISTING	10' EXISTING	100' EXISTING	5' EXISTING

WIRE RUNS ARE FROM GROUND BOX TO GROUND BOX AND ARE AN APPROXIMATE LENGTH. FINAL QUANTITIES INCLUDE TOTAL AMOUNT OF CONDUCTOR REQUIRED FOR OPERATION.



0' 25' 50'

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED PROFESSIONAL ENGINEER

Christina N. Trowler, P.E.

1/18/2022

PROPOSED SIGNAL LAYOUT US 59 AT SL 151

Texas Department of Transportation

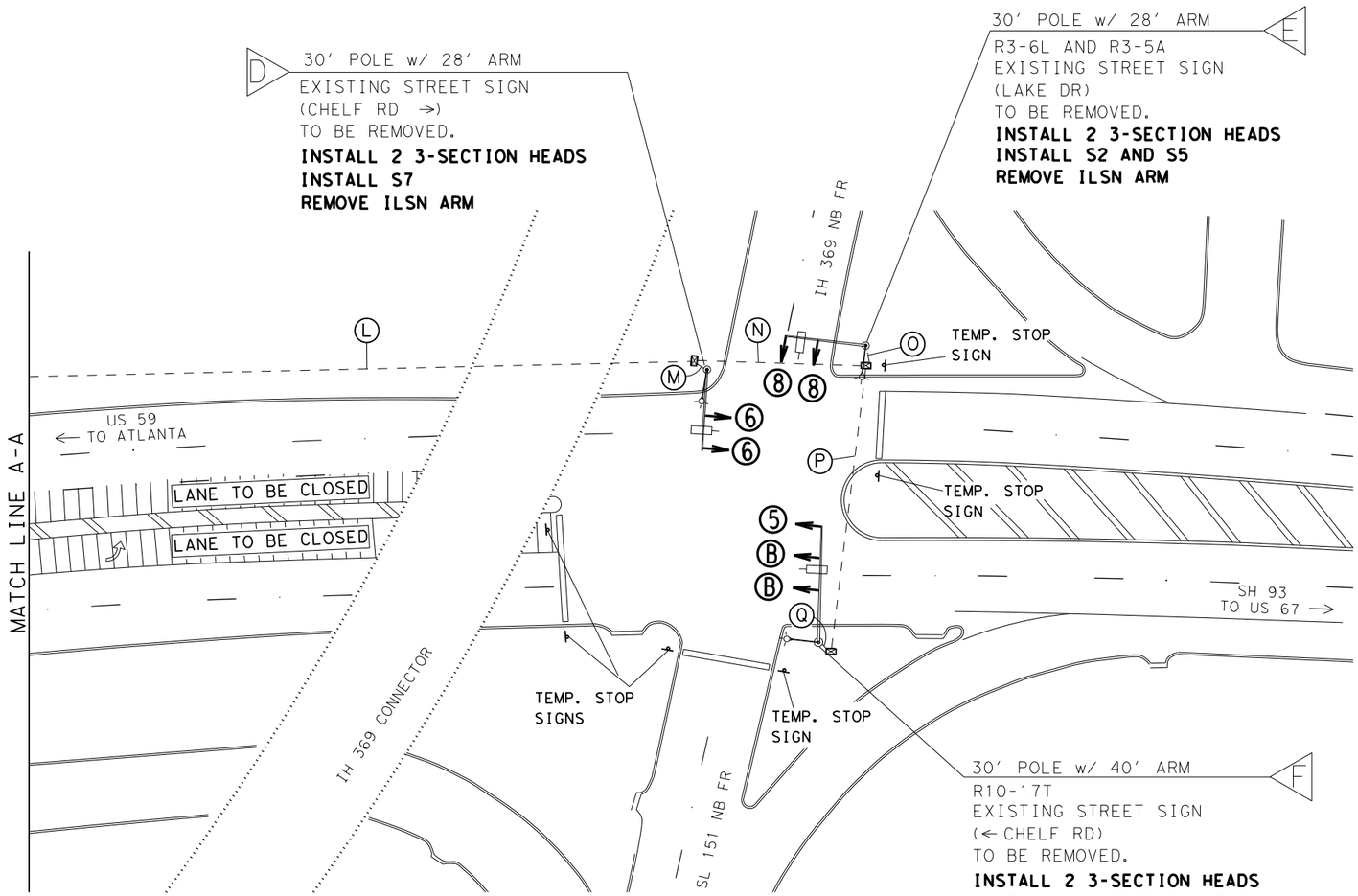
SHEET 1 OF 2

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.			SHEET NO.
				39
STATE	DISTRICT	COUNTY		
TEXAS	ATL	CASS		
CONTROL	SECTION	JOB	HIGHWAY NO.	
0062	04	051	US 59	

FILE: T:\Engdata\Traffic\DGN\d192515 Jamie\JOBS\SAFETY PROJECTS\CSJ 0062-04-051 Reflective Backplates\Intersections\US 59 at LP 151\2D File w google LP 151.dgn
DATE: 12/27/2021 2:14:50 PM

LEGEND

SIGNAL POLE
EXISTING GROUND BOX
CONTROLLER
VIVD CAMERA
EXISTING CONDUIT
ELECTRICAL SERVICE
LUMINAIRE
② SIGNAL FACE AND PHASE



WIRE RUN

ITEM	RUN	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
WIRE	#6 BARE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	#8 XHHW	2		2				2	2	2	2	2	2	2	2	2	2	2
	5/C #12		3		3		6	1	2	1	1	1	3	1	2	1	1	1
	7/C #12		1		1		2	1					1		1		1	1
VIVDS	COAX CABLE		3		3		6	1	2	1	1	1	3	1	2	1	1	1
	MULTICOM																	
CONDUIT	2" PVC	X		X		X		X		X	X	X		X		X	X	X
	4" PVC		X		X		X		X				X		X			
	RUN LENGTH (FT)	100' EXISTING	100' EXISTING	215' EXISTING	215' EXISTING	5' EXISTING	5' EXISTING	5' EXISTING	110' EXISTING	15' EXISTING	75' EXISTING	5' EXISTING	290' EXISTING	5' EXISTING	60' EXISTING	10' EXISTING	100' EXISTING	5' EXISTING

WIRE RUNS ARE FROM GROUND BOX TO GROUND BOX AND ARE AN APPROXIMATE LENGTH. FINAL QUANTITIES INCLUDE TOTAL AMOUNT OF CONDUCTOR REQUIRED FOR OPERATION.

0' 25' 50'

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED PROFESSIONAL ENGINEER

Christina N. Trowler, P.E.

1/18/2022

PROPOSED SIGNAL LAYOUT US 59 AT SL 151

 Texas Department of Transportation

SHEET 2 OF 2

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			40
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

NOTES:

1.) THE PURPOSE OF THIS WORK IS TO REPLACE EXISTING WIRING AT THIS LOCATION USING EXISTING CONDUIT. BOTH INTERSECTIONS WILL RUN AS A TEMPORARY STOP CONDITION DURING DIFFERENT STAGES OF THE WORK. ALL WORK ON THE WEST/EAST END WILL BE COMPLETE AND OPERATIONAL BEFORE WORK BEGINS ON EAST/WEST END. BOTH INTERSECTIONS WILL NOT BE IN STOP CONDITION FOR THE DURATION OF THE WORK. PULL NEW WIRE TO THE VARIOUS SIGNAL POLES INDIVIDUALLY AT DIFFERENT TIMES. THIS WORK WILL BE COMPLETED WITHIN 48 HOURS AND NOT REQUIRE NIGHT WORK.

2.) EACH SIGNAL POLE FOUNDATION HAS TWO 2" CONDUITS STUBBED OUT FOR SPARES. EXISTING CAMERAS WILL REMAIN AT THIS INTERSECTION. RUN NEW COAX TO EXISTING CAMERAS AND CONNECT.

3.) CONTRACTOR WILL INSTALL TEMPORARY STOP SIGNS ON ALL APPROACHES. FOR THIS LOCATION A TOTAL OF 12 TEMPORARY STOP SIGNS WILL BE ON HAND IN CASE OF EMERGENCY, BUT PLAN WORK SO THAT ONE DIRECTION/ SIGNAL POLE WILL BE WORKED ONE AT A TIME. SIZE OF ALL STOP SIGNS WILL BE 48"X48".

4.) REPLACE ALL SIGNAL HEADS. INSTALL VENTED ALUMINUM BACKPLATES WITH REFLECTIVE BORDER.

5.) EXISTING LUMINAIRE HEADS WILL REMAIN IN PLACE. INSTALL ELEC. CONDR. #12 FROM BASE OF POLE TO LED LUMINAIRE HEAD.

6.) EXISTING STREET NAME SIGNS ARE FLAT PANEL ALUMINUM SIGNS MOUNTED ON ILSN ARMS. REMOVE ILSN ARMS AND MOUNT NEW STREET NAME SIGNS ON MAST ARMS. REMOVE EXISTING LEFT TURN YIELD ON FLASHING YELLOW ARROW SIGNS AND INSTALL NEW SIGNS. REMOVE R3-6L AND R3-5A SIGNS. INSTALL R3-8MS SIGNS.

7.) POLE B EXISTING STREET SIGN IS ALREADY MOUNTED ON THE MAST ARM AND THE ILSN ARM REMOVED. POLES A, C, D, E, AND F STREET SIGNS ARE MOUNTED ON ILSN ARMS AND WILL REQUIRE REMOVAL.

8.) LANE CLOSURES WILL BE REQUIRED AT THIS LOCATION WHILE THE INTERSECTION IS IN STOP CONDITION. LANE CLOSURES WILL BE SHIFTED WHEN REPLACING INDIVIDUAL SIGNAL HEADS AND TEMPORARY STOP SIGNS ADJUSTED. RUMBLE STRIPS WILL BE REQUIRED FOR LANE CLOSURES.

9.) 1 PORTABLE CHANGEABLE MESSAGE SIGN ON US 59 NB APPROACHIN THE IH 369 SBFR. 5 DAYS PRIOR RUNNING ADVANCE MESSAGE AND 2 DAYS RUNNING STOP CONDITION MESSAGE FOR PULLING IN THE WIRE = 7 DAYS.
1 PORTABLE CHANGEABLE MESSAGE SIGN ON IH 369 SB FR APPROACHING US 59. 5 DAYS PRIOR RUNNING ADVANCE MESSAGE, AND 2 DAYS RUNNING STOP CONDITION MESSAGE FOR PULLING IN THE WIRE = 7 DAYS.
1 PORTABLE CHANGEABLE MESSAGE SIGN ON SH 93 APPROACHING IH 369/SL 151. 5 DAYS PRIOR RUNNING ADVANCE MESSAGE, AND 2 DAYS RUNNING STOP CONDITION MESSAGE FOR PULLING IN THE WIRE = 7 DAYS.
1 PORTABLE CHANGEABLE MESSAGE SIGN ON SL 151 NB FR APPROACHING SH 93. 5 DAYS PRIOR RUNNING ADVANCE MESSAGE, AND 2 DAYS RUNNING STOP CONDITION MESSAGE FOR PULLING IN THE WIRE = 7 DAYS.
THIS EQUALS A TOTAL OF 4 CHANGEABLE MESSAGE SIGNS NEEDED AT 28 DAYS.

ADVANCE MESSAGE

SIGNAL WORK BEG.	DATE EXPECT DELAYS

STOP CONDITION MESSAGE

SIGNAL WORK AHEAD	ALL TRAFFIC MUST STOP

WIRE TOTALS - CONDUIT																		TOTAL
ITEM	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	
#6 BARE	105	105	220	220	15	20	15	115	25	80	15	295	15	65	20	105	15	1600
#8 XHHW	210		440				30	230	50	160	30	590	30	130	40	210	30	2480
5/C #12		315		660		120	15	230	25	80	15	885	15	130	20	105	15	2630
7/C #12		105		220		40	15					295		65		105	15	860
COAX		315		660		120	15	230	25	80	15	885	15	130	20	105	15	2630

WIRE TOTALS - POLES				
POLE #	#12	5/C #12	7/C #12	COAX
A	80	92	64	58
B	80	107		54
C	80	100		50
D	80	93		46
E	80	93		46
F	80	92	64	58
TOTAL	480	577	128	312

* CALCULATIONS FOR WIRE TOTALS - CONDUIT:
-5' OF SLACK FOR GROUND BOXES. (PER CONDUCTOR)
-5' OF SLACK FOR WIRE IN THE SERVICE. (PER CONDUCTOR)
-10' OF SLACK FOR WIRE IN THE CABINET AND BASE OF TRAFFIC SIGNAL POLES. (PER CONDUCTOR)

* CALCULATIONS FOR WIRE TOTALS - POLES:
-5 OF SLACK FOR WIRE IN THE ARM. (PER CONDUCTOR)
-WIRE GOING TO SIGNAL HEADS CALCULATED BASED OF THE DISTANCES SHOWN ON THE SIGNAL FACE SPACING CHART SHOWN IN SIGNAL DETAILS.
-COAX CABLE IS CALCULATED AT MINUS 6' FROM LENGTH OF ARM.
-#12 FOR LUMINAIRE IS CALCULATED AT 80' PER POLE WITH LUMINAIRE.

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED PROFESSIONAL ENGINEER

Christina N. Trowler, P.E.
1/18/2022

SIGNAL DETAILS US 59 AT SL 151

Texas Department of Transportation

SHEET 1 OF 2

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			41
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

FILE: T:\Engdata\Traffic\DGN\d192515 Jamie\JOBS\SAFETY PROJECTS\CSJ 0062-04-051 Reflective Backplates\Intersections\US 59 at LP 151\2D File w google LP 151.dgn
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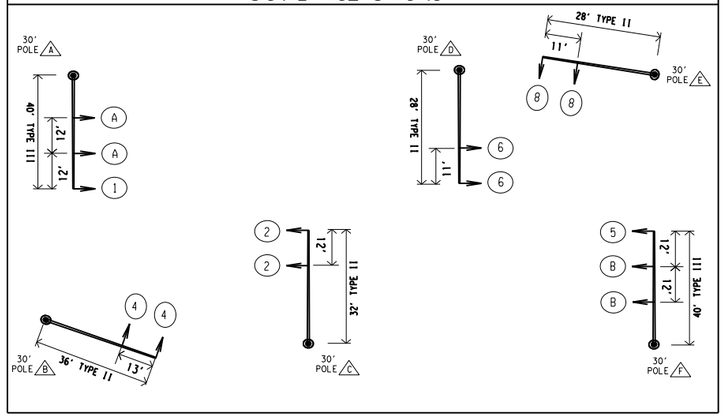
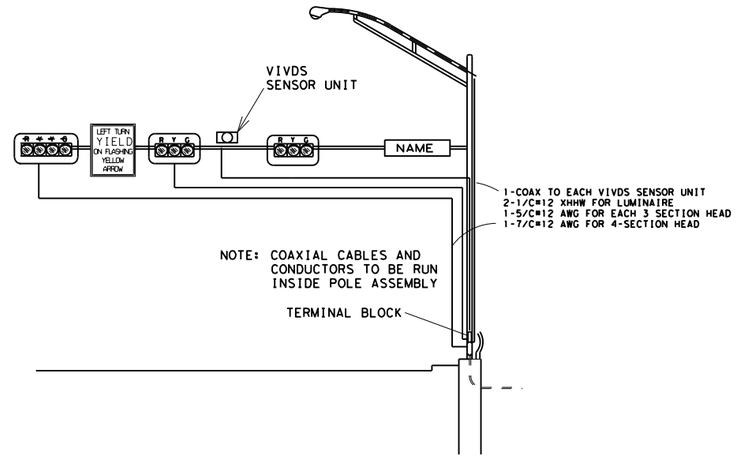
SIGNAL FACE SPACING





S1
R10-17T
36"X42"

2 EA.

S2
R3-8MS
30"X30"

2 EA.

S3
VAR. X 18" (SEE SIGN DETAIL SHEETS)

1 EA.

S4
VAR. X 18" (SEE SIGN DETAIL SHEETS)

1 EA.

S5
VAR. X 18" (SEE SIGN DETAIL SHEETS)

2 EA.

S6
VAR. X 18" (SEE SIGN DETAIL SHEETS)

1 EA.

S7
VAR. X 18" (SEE SIGN DETAIL SHEETS)

1 EA.

SUMMARY OF QUANTITIES

ITEM	DESC CODE	DESCRIPTION	UNIT	TOTAL
0620	6004	ELEC CONDR (NO.12) INSULATED	LF	480
0620	6008	ELEC CONDUCTOR(NO 8)INSULATED	LF	2480
0620	6009	ELEC CONDUCTOR(NO 6)BARE	LF	1600
0682	6001	VEH SIG SEC (12")LED(GRN)	EA	12
0682	6002	VEH SIG SEC (12") LED (GRN ARW)	EA	2
0682	6003	VEH SIG SEC (12")LED(YEL)	EA	12
0682	6004	VEH SIG SEC (12") LED (YEL ARW)	EA	4
0682	6005	VEH SIG SEC (12")LED(RED)	EA	12
0682	6006	VEH SIG SEC (12") LED (RED ARW)	EA	2
0682	6054	BACK PLATE W/REFL BRDER (3SEC)(VENT) ALUM	EA	12
0682	6055	BACK PLATE W/REFL BRDER (4SEC)(VENT) ALUM	EA	2
0684	6010	TRAF SIG CBL(TY A)(12 AWG)(5 CONDR)	LF	3207
0684	6012	TRAF SIG CBL(TY A)(12 AWG)(7 CONDR)	LF	988
0690	6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	12
0690	6029	INSTALL OF SIGNAL RELATED SIGNS	EA	10
6001	6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	28
6185	6002	TMA (STATIONARY)	DAY	8
6306	6007	VIVDS CABLING	LF	2942

SIGNAL FACES

R Y G	2, 4, 6, 8, A, AND B	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.
R S Y F Y G R Y Y G	1, AND 5	12" ONE-WAY, HORIZONTAL 4-SECTION, R-Y-Y-G SIGNAL HEAD.

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED
PROFESSIONAL ENGINEER

Christina N. Trowler, P.E.
1/18/2022

SIGNAL DETAILS US 59 AT SL 151

Texas Department of Transportation

SHEET 2 OF 2

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			42
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

LEGEND

SIGNAL POLE
VIVD CAMERA
LUMINAIRE
② SIGNAL FACE AND PHASE
CONTROLLER
Ⓢ ELECTRICAL SERVICE

NOTES:
1.) REPLACE ALL SIGNAL HEADS. INSTALL VENTED ALUMINUM BACKPLATES WITH REFLECTIVE BORDER.
2.) REPLACE LEFT TURN YIELD ON GREEN BALL BLANKOUT SIGNS WITH LEFT TURN YIELD ON FLASHING YELLOW ARROW SIGNS.
3.) EXISTING STREET NAME SIGNS ARE ILSN SIGNS MOUNTED ON ILSN ARMS. REMOVE ILSN SIGNS AND ILSN ARMS. MOUNT STREET NAMS SIGNS ON MAST ARMS.

S1
R10-17T
36"X42"

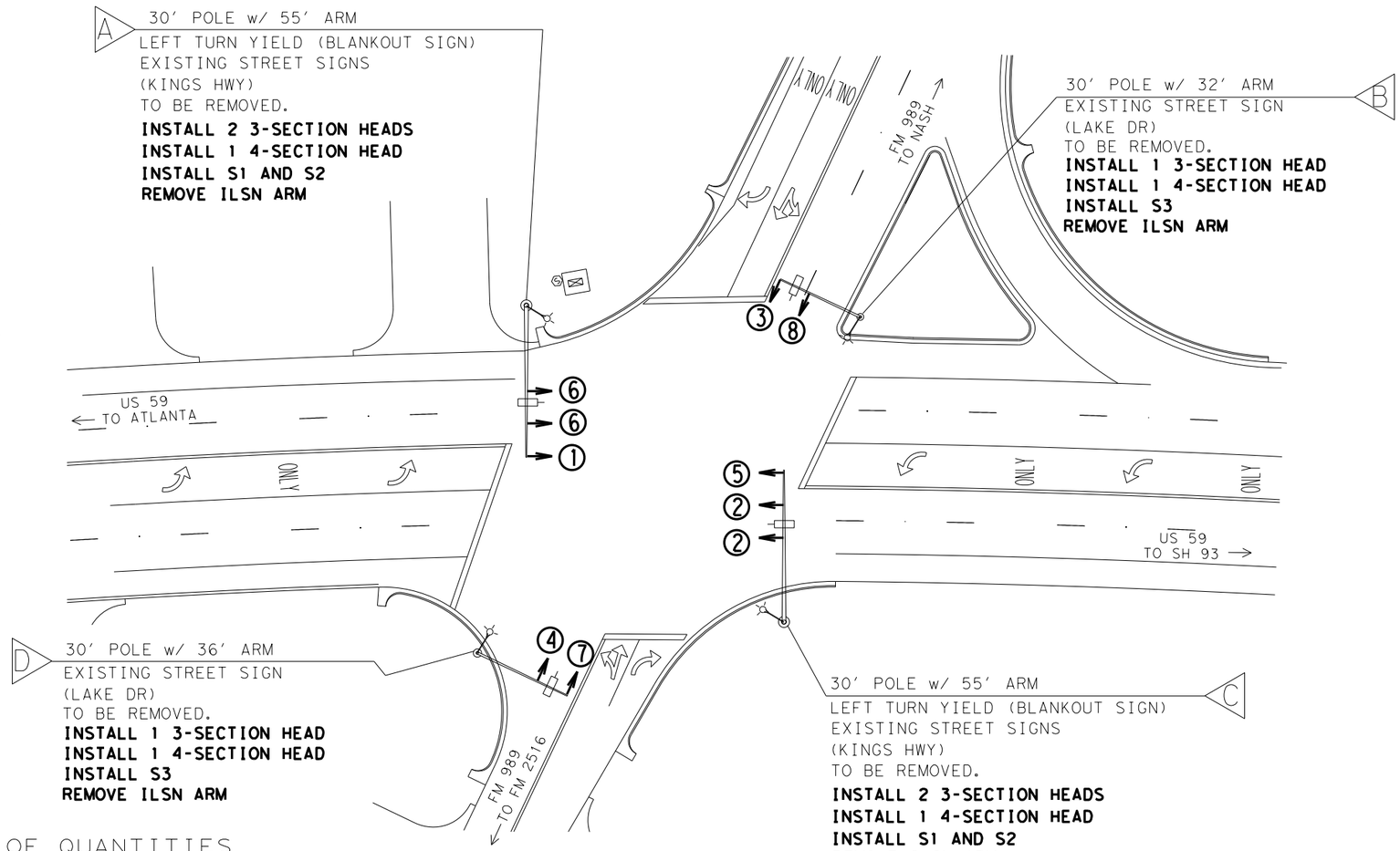
2 EA.

S2
VAR. X 18" (SEE SIGN DETAIL SHEETS)

2 EA.

S3
VAR. X 18" (SEE SIGN DETAIL SHEETS)

2 EA.



SIGNAL FACES

R Y G	2, 4, 6, AND 8	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.
R S Y F Y G	1, AND 5	12" ONE-WAY, HORIZONTAL 4-SECTION, R-Y-Y-G SIGNAL HEAD.
R Y G G	3, AND 7	12" ONE-WAY, HORIZONTAL 4-SECTION, R-Y-G-G SIGNAL HEAD.

SUMMARY OF QUANTITIES

ITEM	DESC CODE	DESCRIPTION	UNIT	TOTAL
0682	6001	VEH SIG SEC (12")LED(GRN)	EA	8
0682	6002	VEH SIG SEC (12") LED (GRN ARW)	EA	4
0682	6003	VEH SIG SEC (12")LED(YEL)	EA	8
0682	6004	VEH SIG SEC (12") LED (YEL ARW)	EA	4
0682	6005	VEH SIG SEC (12")LED(RED)	EA	8
0682	6006	VEH SIG SEC (12") LED (RED ARW)	EA	2
0682	6054	BACK PLATE W/REFL BRDER (3SEC)(VENT) ALUM	EA	6
0682	6055	BACK PLATE W/REFL BRDER (4SEC)(VENT) ALUM	EA	4
0690	6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	6
0690	6029	INSTALL OF SIGNAL RELATED SIGNS	EA	6
6185	6002	TMA (STATIONARY)	DAY	2

0' 25' 50'

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED
PROFESSIONAL ENGINEER
Christina N. Trowler, P.E.
1/18/2022

PROPOSED SIGNAL LAYOUT US 59 AT FM 989

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			43
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

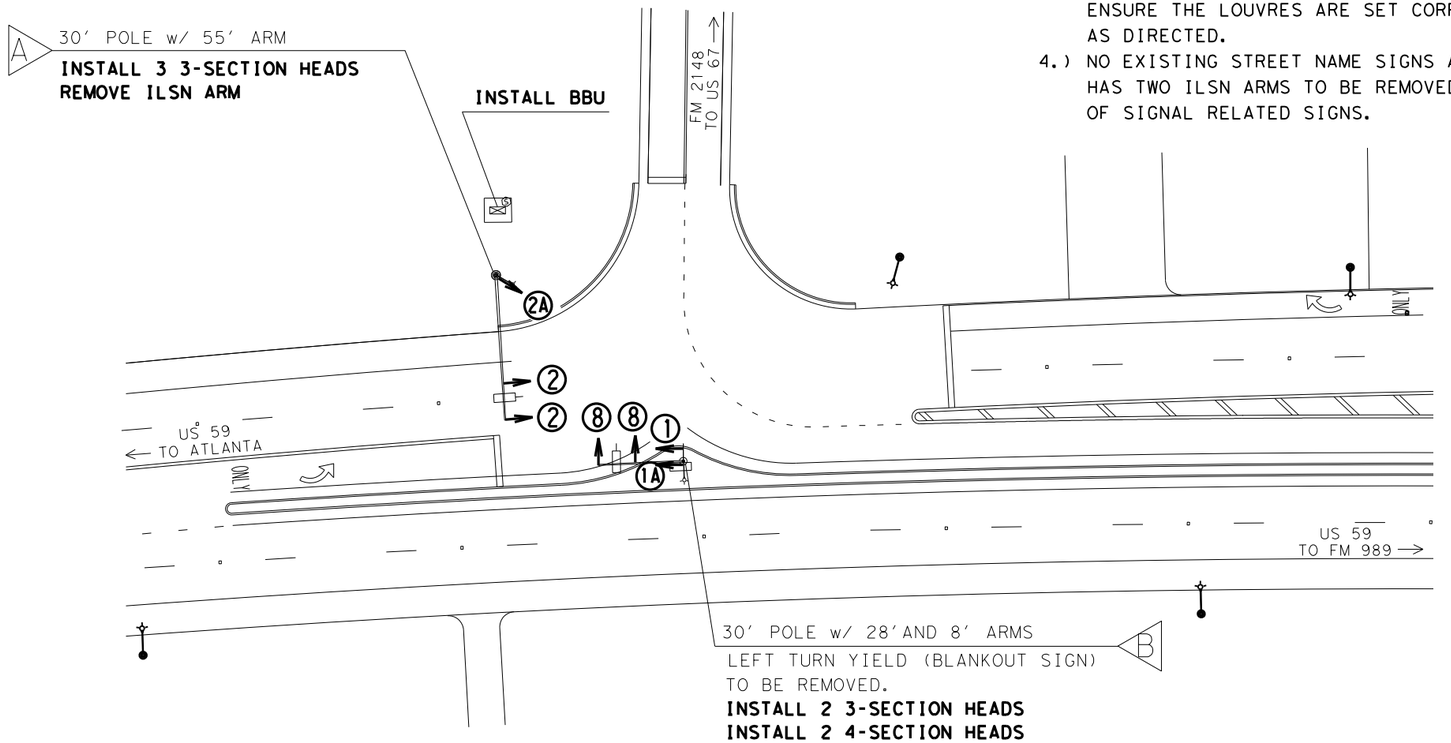
LEGEND

SIGNAL POLE	② SIGNAL FACE AND PHASE
VIVD CAMERA	CONTROLLER
LUMINAIRE	Ⓢ ELECTRICAL SERVICE

NOTES:
1.) REPLACE ALL SIGNAL HEADS. INSTALL VENTED ALUMINUM BACKPLATES WITH REFLECTIVE BORDER.
2.) REPLACE 5-SECTION VERTICAL HEAD ON POLE B WITH A 4-SECTION VERTICAL HEAD (PHASE 1A). THIS HEAD WILL BE LOUVRED. REPLACE 4-SECTION HORIZONTAL HEAD ON POLE B (PHASE 1). THIS HEAD WILL BE LOUVRED. REPLACE THE TWO HORIZONTAL 4-SECTION HEADS ON POLE B WITH 3-SECTION HEADS (PHASE 8). REPACE THE THE TWO 4-SECTION HORIZONTAL HEADS ON POLE A WITH TWO 3-SECTION HEADS (PHASE 2). REPLACE THE VERTICAL 3-SECTION HEAD ON POLE A (PHASE 2A).REPLACE THE LEFT TURN YIELD ON GREEN BALL BLANKOUT SIGN WITH LEFT TURN YIELD ON FLASHING YELLOW ARROW SIGN.
3.) TXDOT TO PROVIDE THE SIGNAL LOUVRES FOR THIS INTERSECTION AND THE CONTRACTOR TO INSTALL. ATLANTA DISTRICT SIGNAL SHOP TO BE ON SITE WHEN THE CONTRACTOR INSTALLS THE LOUVRES FOR PHASE 1 AND 1A TO ENSURE THE LOUVRES ARE SET CORRECTLY. CONTRACTOR TO ADJUST LOUVRES AS DIRECTED.
4.) NO EXISTING STREET NAME SIGNS AT THIS INTERSECTION, BUT IT HAS TWO ILSN ARMS TO BE REMOVED UNDER ITEM 690-6027 REMOVAL OF SIGNAL RELATED SIGNS.

S1
R10-17T
36"X42"

1 EA.



SUMMARY OF QUANTITIES

ITEM	DESC CODE	DESCRIPTION	UNIT	TOTAL
0682	6001	VEH SIG SEC (12")LED(GRN)	EA	5
0682	6002	VEH SIG SEC (12") LED (GRN ARW)	EA	2
0682	6003	VEH SIG SEC (12")LED(YEL)	EA	5
0682	6004	VEH SIG SEC (12") LED (YEL ARW)	EA	4
0682	6005	VEH SIG SEC (12")LED(RED)	EA	5
0682	6006	VEH SIG SEC (12") LED (RED ARW)	EA	2
0682	6054	BACK PLATE W/REFL BRDER (3SEC)(VENT) ALUM	EA	5
0682	6055	BACK PLATE W/REFL BRDER (4SEC)(VENT) ALUM	EA	2
0690	6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	3
0690	6029	INSTALL OF SIGNAL RELATED SIGNS	EA	1
6058	6001	BBU SYSTEM (EXTERNAL BATT CABINET)	EA	1
6185	6002	TMA (STATIONARY)	DAY	2
*		LOUVER (12") ADJUSTABLE	EA	8

* PROVIDED BY TXDOT; INSTALLED BY CONTRACTOR. SUBSIDIARY TO ITEM 682 VEH SIG SEC

SIGNAL FACES

R Y G	2 AND 8	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.
R S Y F Y G R Y Y G	1	12" ONE-WAY, HORIZONTAL 4-SECTION, R-Y-Y-G SIGNAL HEAD. NOTE: WILL REQUIRE LOUVRES.
R S Y F Y G	1A	12" ONE-WAY, VERTICAL 4-SECTION, R-R-Y-Y-G SIGNAL HEAD. NOTE: WILL REQUIRE LOUVRES.
R Y G	2A	12" ONE-WAY, VERTICAL 3-SECTION, R-Y-G SIGNAL HEAD.

0' 25' 50'

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED
PROFESSIONAL ENGINEER

Christina N. Trowler, P.E.
1/18/2022

PROPOSED SIGNAL LAYOUT US 59 AT FM 2148

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			44
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

N

LEGEND

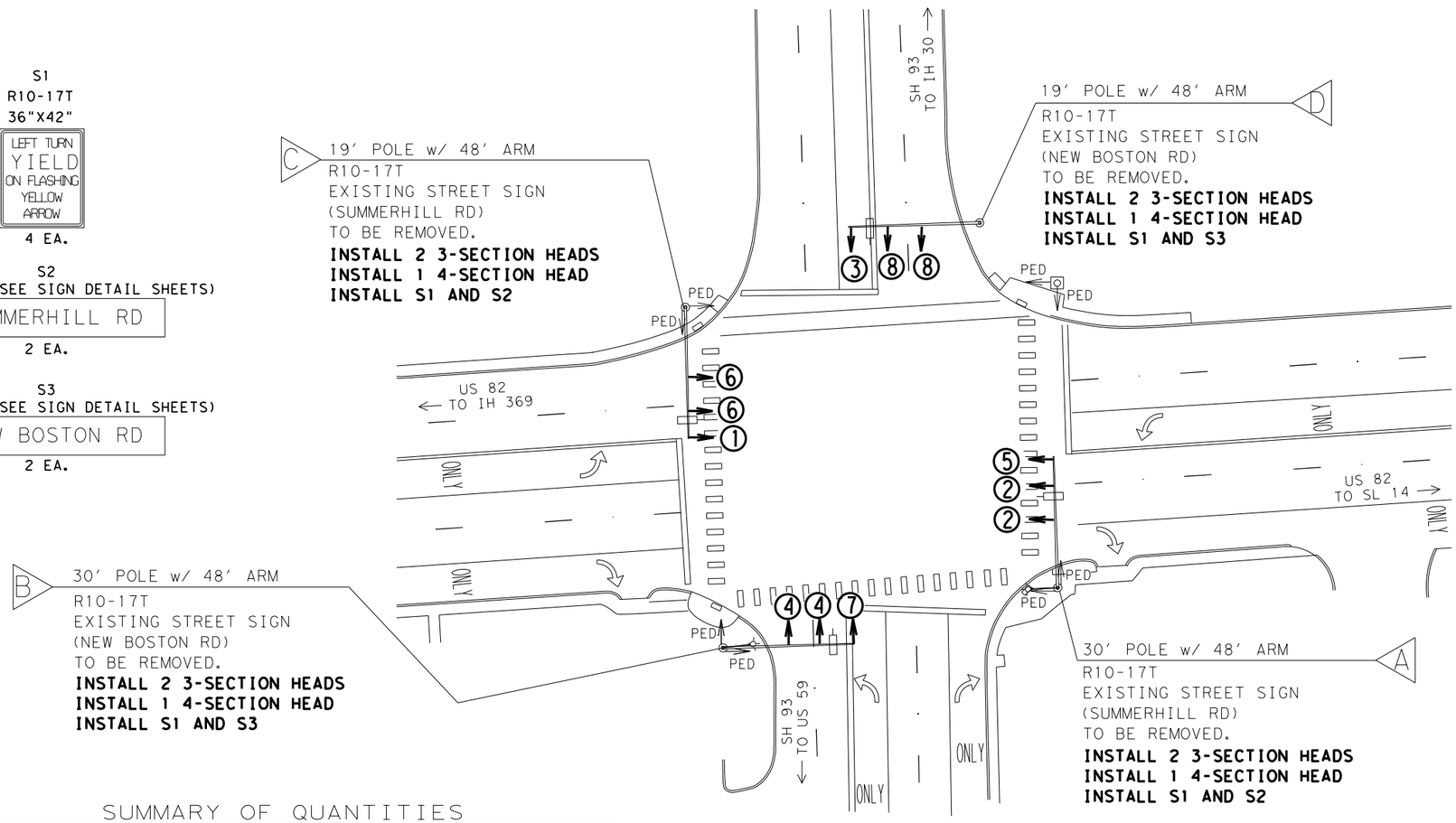
- SIGNAL POLE
- VIVD CAMERA
- LUMINAIRE
- ELECTRICAL SERVICE
- (2) SIGNAL FACE AND PHASE
- PED PEDESTRIAN SIGNAL HEAD
- PED POLE
- CONTROLLER

NOTES:
1.) REPLACE ALL SIGNAL HEADS. INSTALL VENTED ALUMINUM BACKPLATES WITH REFLECTIVE BORDER.
2.) EXISTING STREET NAME SIGNS ARE FLAT PANEL ALUMINUM SIGNS MOUNTED ON MAST ARMS. REMOVE STREET NAME SIGNS AND MOUNT NEW STREET NAME SIGNS ON MAST ARMS. REMOVE EXISTING LEFT TURN YIELD ON FLASHING YELLOW ARROW SIGNS AND INSTALL NEW SIGNS.
3.) PEDESTRIAN HEADS AND PUSH BUTTONS WILL REMAIN IN PLACE AND NOT UPGRADED AT THIS TIME.

S1
R10-17T
36"X42"
LEFT TURN YIELD ON FLASHING YELLOW ARROW
4 EA.

S2
VAR. X 18" (SEE SIGN DETAIL SHEETS)
SUMMERHILL RD
2 EA.

S3
VAR. X 18" (SEE SIGN DETAIL SHEETS)
NEW BOSTON RD
2 EA.



SIGNAL FACES

R Y G	2, 4, 6, AND 8	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.
R S Y F Y G	1, 3, 5, AND 7	12" ONE-WAY, HORIZONTAL 4-SECTION, R-Y-Y-G SIGNAL HEAD.

SUMMARY OF QUANTITIES

ITEM	DESC CODE	DESCRIPTION	UNIT	TOTAL
0682	6001	VEH SIG SEC (12")LED(GRN)	EA	8
0682	6002	VEH SIG SEC (12") LED (GRN ARW)	EA	4
0682	6003	VEH SIG SEC (12")LED(YEL)	EA	8
0682	6004	VEH SIG SEC (12") LED (YEL ARW)	EA	8
0682	6005	VEH SIG SEC (12")LED(RED)	EA	8
0682	6006	VEH SIG SEC (12") LED (RED ARW)	EA	4
0682	6054	BACK PLATE W/REFL BRDER (3SEC)(VENT) ALUM	EA	8
0682	6055	BACK PLATE W/REFL BRDER (4SEC)(VENT) ALUM	EA	4
0690	6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	8
0690	6029	INSTALL OF SIGNAL RELATED SIGNS	EA	8
6185	6002	TMA (STATIONARY)	DAY	2

0' 25' 50'

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED
PROFESSIONAL ENGINEER
Christina N. Trowler, P.E.
1/18/2022

PROPOSED SIGNAL LAYOUT SH 93 AT US 82

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			45
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

LEGEND

SIGNAL POLE
VIVD CAMERA
LUMINAIRE
SIGNAL FACE AND PHASE
CONTROLLER
ELECTRICAL SERVICE

NOTES:
1.) REPLACE ALL SIGNAL HEADS. INSTALL VENTED ALUMINUM BACKPLATES WITH REFLECTIVE BORDER.
2.) REPLACE 5-SECTION HEADS ON POLES B AND D WITH 4-SECTION HEADS. REPLACE LEFT TURN YIELD BLANKOUT SIGNS WITH LEFT TURN YIELD ON FLASHING YELLOW ARROW SIGNS.
3.) EXISTING STREET NAME SIGNS ARE ILSN SIGNS MOUNTED ON ILSN ARMS. REMOVE ILSN SIGNS AND ILSN ARMS. MOUNT STREET NAME SIGNS ON MAST ARMS. US 59 STREET NAMES SIGNS ON POLES A AND C TO BE REMOVED ALONG WITH THE ILSN ARMS.
4.) REMOVE R10-12 LEFT TURN YIELD ON GREEN BALL SIGNS FOR POLES A AND C. THESE SIGNS ARE NOT TO BE REPLACED.

S1
R10-17T
36"X42"

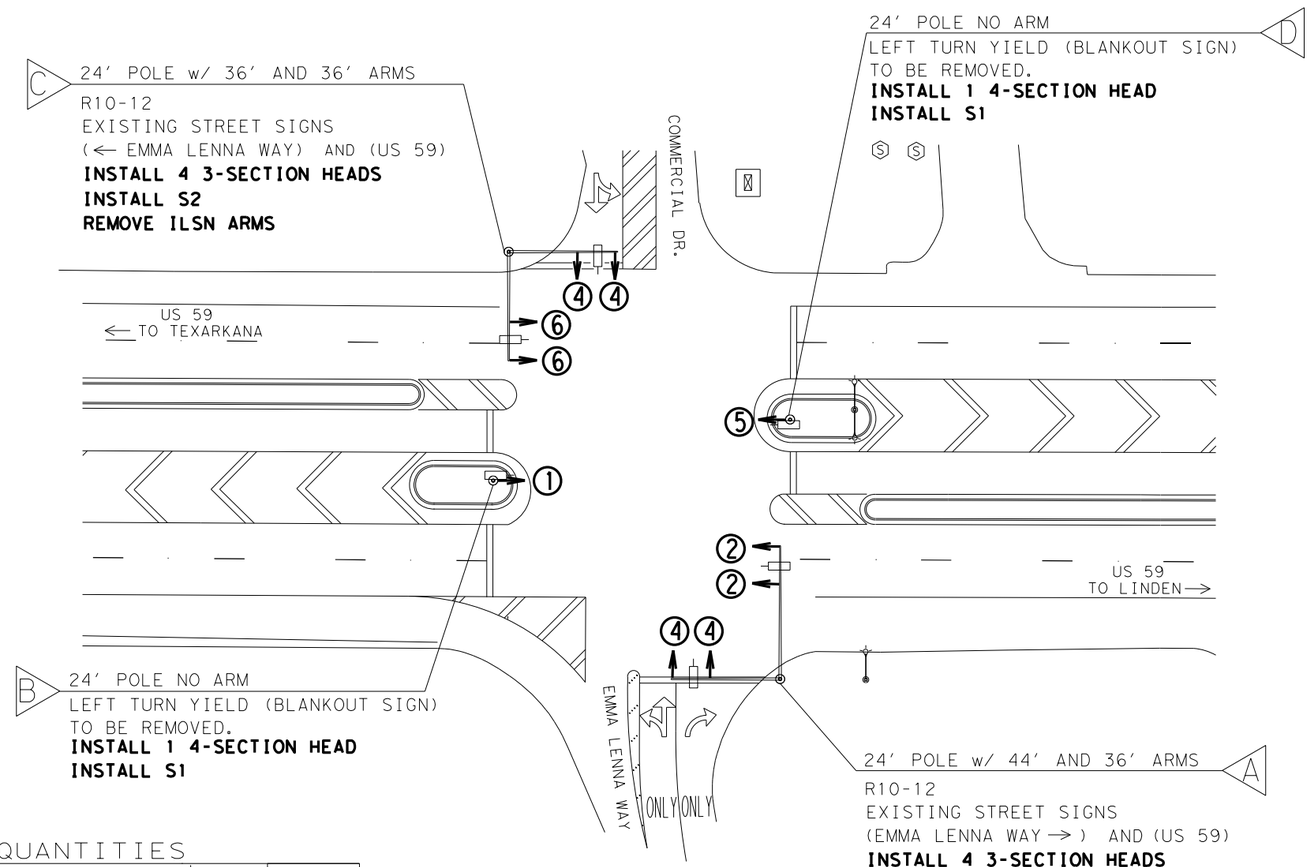
2 EA.

S2
VAR. X 18" (SEE SIGN DETAIL SHEETS)

1 EA.

S3
VAR. X 18" (SEE SIGN DETAIL SHEETS)

1 EA.



SIGNAL FACES

R Y G	2, 4, 6, AND 8	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.
R SY FY G	1 AND 5	12" ONE-WAY, VERTICAL 4-SECTION, R-R-Y-Y-G SIGNAL HEAD.

SUMMARY OF QUANTITIES

ITEM	DESC CODE	DESCRIPTION	UNIT	TOTAL
0682	6001	VEH SIG SEC (12")LED(GRN)	EA	8
0682	6002	VEH SIG SEC (12") LED (GRN ARW)	EA	2
0682	6003	VEH SIG SEC (12")LED(YEL)	EA	8
0682	6004	VEH SIG SEC (12") LED (YEL ARW)	EA	4
0682	6005	VEH SIG SEC (12")LED(RED)	EA	8
0682	6006	VEH SIG SEC (12") LED (RED ARW)	EA	2
0682	6054	BACK PLATE W/REFL BRDER (3SEC)(VENT) ALUM	EA	8
0682	6055	BACK PLATE W/REFL BRDER (4SEC)(VENT) ALUM	EA	2
0690	6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	8
0690	6029	INSTALL OF SIGNAL RELATED SIGNS	EA	4
6185	6002	TMA (STATIONARY)	DAY	2

0' 25' 50'

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED
PROFESSIONAL ENGINEER

Christina N. Trowler, P.E.

1/18/2022

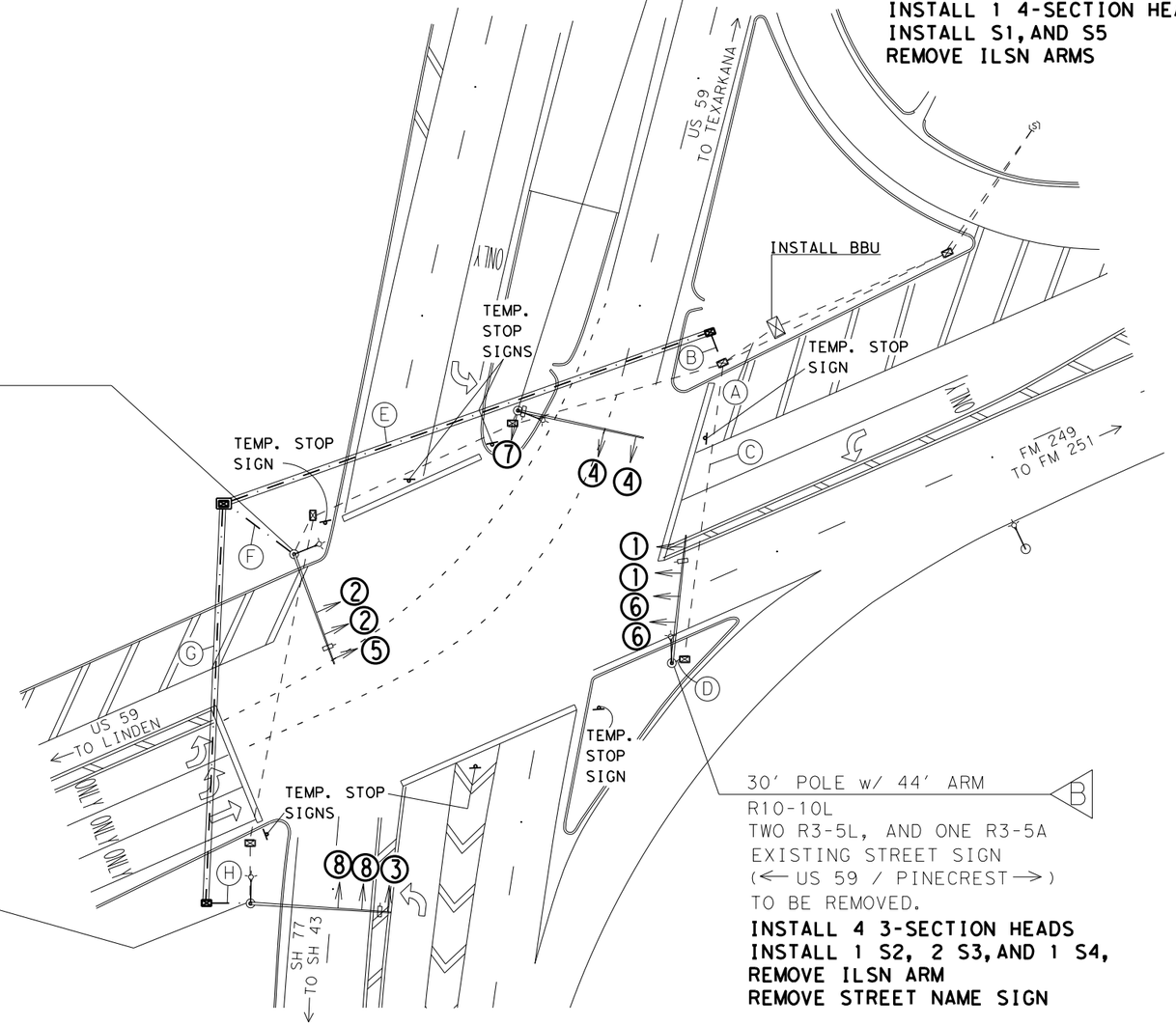
PROPOSED SIGNAL LAYOUT US 59 AT EMMA LENA WAY

 Texas Department of Transportation

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			46
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

LEGEND

- SIGNAL POLE
- VIVD CAMERA
- LUMINAIRE
- EXISTING GROUND BOX
- PROPOSED GROUND BOX TY D (162922)
- PROPOSED GROUND BOX TY D (162922)W/APRON
- EXISTING CONDUIT
- PROPOSED CONDUIT (TRENCH)
- PROPOSED CONDUIT (BORE)
- (2) SIGNAL FACE AND PHASE
- CONTROLLER
- (S) ELECTRICAL SERVICE



A
30' POLE w/ 44' ARM
R10-17T
EXISTING STREET SIGN
(W MAIN ST)
TO BE REMOVED.
INSTALL 2 3-SECTION HEADS
INSTALL 1 4-SECTION HEAD
INSTALL S1, AND S5
REMOVE ILSN ARMS

B
30' POLE w/ 44' ARM
R10-10L
TWO R3-5L, AND ONE R3-5A
EXISTING STREET SIGN
(← US 59 / PINECREST →)
TO BE REMOVED.
INSTALL 4 3-SECTION HEADS
INSTALL 1 S2, 2 S3, AND 1 S4,
REMOVE ILSN ARM
REMOVE STREET NAME SIGN

C
30' POLE w/ 48' ARM
R10-17T
EXISTING STREET SIGN
(W MAIN ST)
TO BE REMOVED.
INSTALL 2 3-SECTION HEADS
INSTALL 1 4-SECTION HEAD
INSTALL S1, AND S5
REMOVE ILSN ARM

D
30' POLE w/ 40' ARM
R10-17T
R10-10L
EXISTING STREET SIGN
(← PINECREST / US 59 →)
LEFT TURN SIGNAL SIGN
TO BE REMOVED.
INSTALL 3 3-SECTION HEADS
INSTALL S2
REMOVE ILSN ARM
REMOVE STREET NAME SIGN

WIRE RUN

ITEM	RUN	A	B	C	D	E	F	G	H
WIRE	#6 BARE	1	1	1	1	1	1	1	1
	#8 XHHW		2	2	2	2	2	2	2
	5/C #12	5	3	2	2	3	2	1	1
	7/C #12	1	1			1		1	1
VIVDS	CAT 5	3	2	1	1	2	1	1	1
CONDUIT	2" PVC			X	X		X	X	X
	4" PVC	X	X			X			
	RUN LENGTH (FT)	22' (EXISTING)	11' (PROPOSED)	102' (EXISTING)	5' (EXISTING)	177' (PROPOSED BORE)	30' (PROPOSED)	137' (PROPOSED BORE)	15' (PROPOSED)

WIRE RUNS ARE FROM GROUND BOX TO GROUND BOX AND ARE AN APPROXIMATE LENGTH. FINAL QUANTITIES INCLUDE TOTAL AMOUNT OF CONDUCTOR REQUIRED FOR OPERATION.

0' 25' 50'

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED
PROFESSIONAL ENGINEER

Christina N. Trowler, P.E.
1/18/2022

PROPOSED SIGNAL LAYOUT US 59 AT SH 77

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.			SHEET NO.
				47
STATE	DISTRICT	COUNTY		
TEXAS	ATL	CASS		
CONTROL	SECTION	JOB	HIGHWAY NO.	
0062	04	051	US 59	

FILE: T:\Engdata\Traffic\DGN\d192515 Jamie\JOBS\SAFETY PROJECTS\CSJ 0062-04-051 Reflective Backplates\Intersections\US 59 at SH 77\US 59 AT SH 77.dgn
DATE: 1/4/2022 7:53:01 AM

NOTES:

1.) THE PURPOSE OF THIS WORK IS TO REPLACE EXISTING WIRING AT THIS LOCATION USING EXISTING AND PROPOSED CONDUIT. THE INTERSECTION WILL RUN AS A TEMPORARY STOP CONDITION DURING DIFFERENT STAGES OF THE WORK. CONTRACTOR TO LEAVE THE INTERSECTION RUNNING USING EXISTING CONDUIT WHILE INSTALLING PROPOSED CONDUIT RUNS AND PROPOSED GROUND BOXES. PULL NEW WIRE TO THE VARIOUS SIGNAL POLES INDIVIDUALLY AT DIFFERENT TIMES. GROUND BOX AND PULLING IN NEW WIRE THRU PROPOSED CONDUITS WILL BE ALLOWED IN DAYTIME. TO MINIMIZE THE IMPACT TO TRAFFIC AND HELP IMPROVE SAFETY FOR THE WORKERS NIGHTTIME WORK WILL BE REQUIRED FOR STOP CONDITION DURING RECONNECTING WIRE ONE POLE AT A TIME. AT THIS LOCATION WITH A TIME WINDOW FROM 10:00 P.M. TO 6:00 A.M. WILL BE UTILIZED TO DO THE WORK REQUIRING STOP CONDITIONS OVER MULTIPLE NIGHTS. EXISTING GROUND BOXES FROM RUNS C,D, AND A WILL REMAIN IN PLACE.

2.) NEW WIRE IS NOT TO BE INSTALLED IN POLE A AS IT IS NOT THAT OLD. EACH SIGNAL POLE FOUNDATION HAS TWO 2" CONDUITS STUBBED OUT FOR SPARES. EXISTING CAMERAS WILL REMAIN ON ALL SIGNAL POLES AT THIS INTERSECTION.

3.) SOME OF THE PROPOSED CONDUIT WILL BE INSTALLED IN CONCRETE ISLANDS COVERED WITH BRICK PAVERS. THE SURFACE STRUCTURE OF THE ISLANDS WILL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER; THIS WILL NOT BE PAID FOR SEPARATELY BUT SUBSIDIARY TO ITEM 618 CONDUIT. THE ENGINEER WILL REQUIRE THAT THE BRICK PAVED CONCRETE ISLANDS BE STAINED ON ALL AREAS WHERE CONDUIT RUNS DAMAGE THE ISLAND. THE ENGINEER WILL APPROVE THE MATERIAL PRIOR TO USE.

4.) CONTRACTOR WILL INSTALL TEMPORARY STOP SIGNS ON ALL APPROACHES. COVER AS NEEDED FOR STOP CONDITION. FOR THIS LOCATION A TOTAL OF 7 TEMPORARY STOP SIGNS WILL BE ON HAND IN CASE OF EMERGENCY, BUT PLAN THE WORK SO THAT ONE DIRECTION/ SIGNAL POLE WILL BE WORKED AT A TIME. SIZE OF ALL STOP SIGNS WILL BE 48"X48". STOP SIGNS WILL NEED TO BE REMOVED AND/OR COVERED DURING DAYTIME BETWEEN NIGHT WORK CLOSURES.

5.) LAW ENFORCEMENT WILL BE REQUIRED DURING HOURS THE TRAFFIC SIGNAL IS BEING PUT IN A STOP CONDITION. CONTRACTOR TO COORDINATE THIS AND BE REIMBURSED BY TXDOT THRU FORCE ACCOUNT.

6.) REPLACE ALL SIGNAL HEADS. INSTALL VENTED ALUMINUM BACKPLATES WITH REFLECTIVE BORDER.

7.) EXISTING LUMINAIRE HEADS WILL REMAIN IN PLACE. INSTALL ELEC. CONDR. #12 FROM BASE OF POLE TO LED LUMINAIRE HEAD.

8.) THE TWO THREE SECTION HEADS FOR THE STRAIGHT MOVEMENT(PHASE 6) WILL REQUIRE LOUVRES. TXDOT TO PROVIDE SIGNAL LOUVRES FOR THIS INTERSECTION AND THE CONTRACTOR TO INSTALL. ATLANTA DISTRICT SIGNAL SHOP TO BE ON SITE WHEN THE CONTRACTOR INSTALLS THE LOUVRES FOR PHASE 6 TO ENSURE THE LOUVRES ARE SET CORRECTLY. CONTRACTOR TO ADJUST THE LOUVRES AS DIRECTED.

9.) EXISTING STREET NAME SIGNS ARE FLAT PANEL ALUMINUM SIGNS MOUNTED ON ILSN ARMS. REMOVE STREET NAME SIGNS AND ILSN ARMS ON POLES B AND D. REPLACE STREET NAME SIGNS ON POLES A AND C. REMOVE EXISTING LEFT TURN YIELD ON FLASHING YELLOW ARROW SIGNS AND
INSTALL NEW SIGNS. REMOVE R10-10L, R3-5L, AND R3-5A SIGNS. INSTALL R10-10L,R3-5L, AND R3-5A SIGNS.

10.) LANE CLOSURES WILL BE REQUIRED AT THIS LOCATION WHILE THE INTERSECTION IS IN STOP CONDITION. LANE CLOSURES WILL BE SHIFTED WHEN REPLACING INDIVIDUAL SIGNAL HEADS AND TEMPORARY STOP SIGNS ADJUSTED. RUMBLE STRIPS WILL BE REQUIRED FOR LANE CLOSURES.

11.) 1 PORTABLE CHANGEABLE MESSAGE SIGN ON US 59 NB APPROACHING SH 77. 5 DAYS PRIOR RUNNING ADVANCE MESSAGE, AND 2 DAYS RUNNING STOP CONDITION MESSAGE FOR PULLING IN THE WIRE = 7 DAYS.
1 PORTABLE CHANGEABLE MESSAGE SIGN ON US 59 SB APPROACHING SH 77. 5 DAYS PRIOR RUNNING ADVANCE MESSAGE, AND 2 DAYS RUNNING STOP CONDITION MESSAGE FOR PULLING IN THE WIRE = 7 DAYS.
1 PORTABLE CHANGEABLE MESSAGE SIGN ON SH 77 WB APPROACHING US 59. 5 DAYS PRIOR RUNNING ADVANCE MESSAGE,AND 2 DAYS RUNNING STOP CONDITION MESSAGE FOR PULLING IN THE WIRE = 7 DAYS.
1 PORTABLE CHANGEABLE MESSAGE SIGN ON FM 249 WB APPROACHING US 59. 5 DAYS PRIOR RUNNING ADVANCE MESSAGE,AND 2 DAYS RUNNING STOP CONDITION MESSAGE FOR PULLING IN THE WIRE = 7 DAYS.
THIS EQUALS A TOTAL OF 4 CHANGEABLE MESSAGE SIGNS NEEDED AT 28 DAYS.

ADVANCE MESSAGE

SIGNAL WORK BEG.	DATE EXPECT DELAYS

STOP CONDITION MESSAGE

SIGNAL WORK AHEAD	ALL TRAFFIC MUST STOP

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED PROFESSIONAL ENGINEER

Christina N. Trowler, P.E.
1/18/2022

SIGNAL DETAILS US 59 AT SH 77

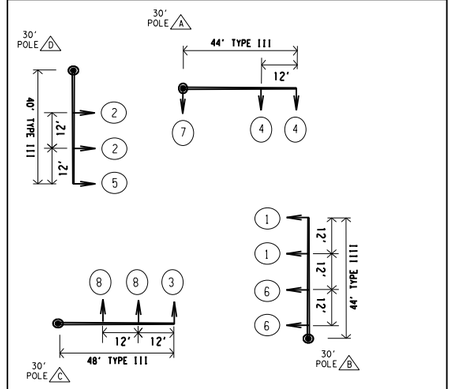
 Texas Department of Transportation

SHEET 1 OF 2

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			48
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

FILE: T:\Engdata\Traffic\DGN\d192515 Jamie\JOBS\SAFETY PROJECTS\CSJ 0062-04-051 Reflective Backplates\Intersections\US 59 at SH 77\US 59 AT SH 77.dgn
DATE: 1/4/2022 7:54:36 AM

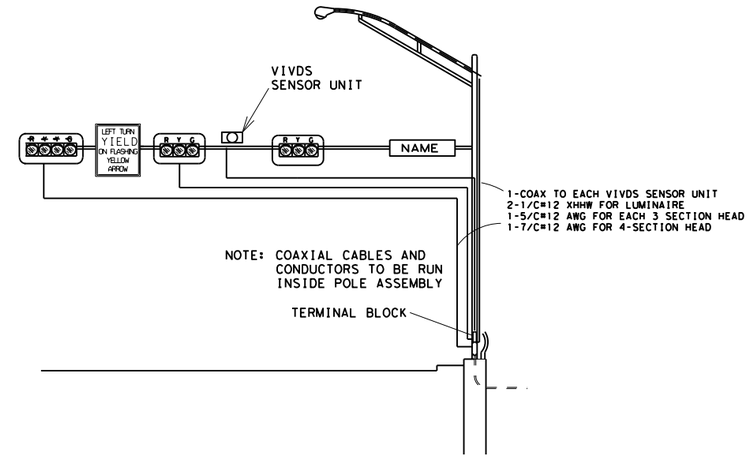
SIGNAL FACE SPACING



SUMMARY OF QUANTITIES

ITEM	DESC CODE	DESCRIPTION	UNIT	TOTAL
0618	6023	CONDT (PVC)(SCH 40)(2")	LF	45
0618	6024	CONDT (PVC)(SCH 40)(2")(BORE)	LF	137
0618	6033	CONDT (PVC)(SCH 40)(4")	LF	11
0618	6034	CONDT (PVC)(SCH 40)(4")(BORE)	LF	177
0620	6004	ELEC CONDR (NO.12) INSULATED	LF	320
0620	6008	ELEC CONDUCTOR(NO 8)INSULATED	LF	1064
0620	6009	ELEC CONDUCTOR(NO 6)BARE	LF	569
0624	6009	GROUND BOX TY D (162922)	EA	2
0624	6010	GROUND BOX TY D (162922)W/APRON	EA	1
0682	6001	VEH SIG SEC (12")LED(GRN)	EA	8
0682	6002	VEH SIG SEC (12") LED (GRN ARW)	EA	5
0682	6003	VEH SIG SEC (12")LED(YEL)	EA	8
0682	6004	VEH SIG SEC (12") LED (YEL ARW)	EA	7
0682	6005	VEH SIG SEC (12")LED(RED)	EA	11
0682	6006	VEH SIG SEC (12") LED (RED ARW)	EA	2
0682	6054	BACK PLATE W/REFL BRDER (3SEC)(VENT) ALUM	EA	11
0682	6055	BACK PLATE W/REFL BRDER (4SEC)(VENT) ALUM	EA	2
0684	6010	TRAF SIG CBL(TY A)(12 AWG)(5 CONDR)	LF	1784
0684	6012	TRAF SIG CBL(TY A)(12 AWG)(7 CONDR)	LF	563
0690	6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	11
0690	6029	INSTALL OF SIGNAL RELATED SIGNS	EA	9
6001	6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	28
6058	6001	BBU SYSTEM (EXTERNAL BATT CABINET)	EA	1
6089	6002	CAT 5 ETHERNET CABLE	LF	1089
6185	6002	TMA (STATIONARY)	DAY	8
*		LOUVER (12") ADJUSTABLE	EA	6

* PROVIDED BY TXDOT; INSTALLED BY CONTRACTOR. SUBSIDIARY TO ITEM 682 VEH SIG SEC



SIGNAL FACES

R Y G	1 AND 5	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD. NOTE: PHASE 1 WILL REQUIRE LOUVRES.
R Y G	2, 4, 6, AND 8	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.
R S Y F Y G R Y Y G	3	12" ONE-WAY, HORIZONTAL 4-SECTION, R-Y-Y-G SIGNAL HEAD.
R S Y F Y G	7	12" ONE-WAY, VERTICAL 4-SECTION, R-Y-Y-G SIGNAL HEAD.

S1
R10-17T
36"X42"

2 EA.

S2
R10-10L
24"X30"

2 EA.

S3
R3-5L
24"X30"

2 EA.

S4
R3-5A
24"X30"

1 EA.

S5
VAR. X 18" (SEE SIGN DETAIL SHEETS)

2 EA.

WIRE TOTALS - CONDUIT									TOTAL
ITEM	A	B	C	D	E	F	G	H	
#6 BARE	37	16	107	15	182	40	142	30	569
#8 XHHW		32	214	30	364	80	284	60	1064
5/C #12	185	48	214	15	546	80	142	30	1260
7/C #12	37	16			182		142	30	407
CAT 5	111	32	107	15	364	40	142	30	841

WIRE TOTALS - POLES				
POLE #	#12	5/C #12	7/C #12	CAT 5
A	80	124	20	62
B	80	200		62
C	80	108	72	66
D	80	92	64	58
TOTAL	320	524	156	248

* CALCULATIONS FOR WIRE TOTALS - CONDUIT:
-5' OF SLACK FOR GROUND BOXES. (PER CONDUCTOR)
-5' OF SLACK FOR WIRE IN THE SERVICE. (PER CONDUCTOR)
-10' OF SLACK FOR WIRE IN THE CABINET AND BASE OF TRAFFIC SIGNAL POLES. (PER CONDUCTOR)

* CALCULATIONS FOR WIRE TOTALS - POLES:
-5 OF SLACK FOR WIRE IN THE ARM. (PER CONDUCTOR)
-WIRE GOING TO SIGNAL HEADS CALCULATED BASED OF THE DISTANCES SHOWN ON THE SIGNAL FACE SPACING CHART SHOWN IN SIGNAL DETAILS.
-COAX CABLE IS CALCULATED AT MINUS 6' FROM LENGTH OF ARM.
-#12 FOR LUMINAIRE IS CALCULATED AT 80' PER POLE WITH LUMINAIRE.

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED PROFESSIONAL ENGINEER
Christina N. Trowler, P.E.
1/18/2022

SIGNAL DETAILS US 59 AT SH 77

SHEET 2 OF 2

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			49
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

FILE: T:\Engdata\Traffic\DGN\d192515 Jamie\JOBS\SAFETY PROJECTS\CSJ 0062-04-051 Reflective Backplates\Intersections\US 59 at SH 77\US 59 AT SH 77.dgn
DATE: 1/4/2022 7:56:14 AM

LEGEND

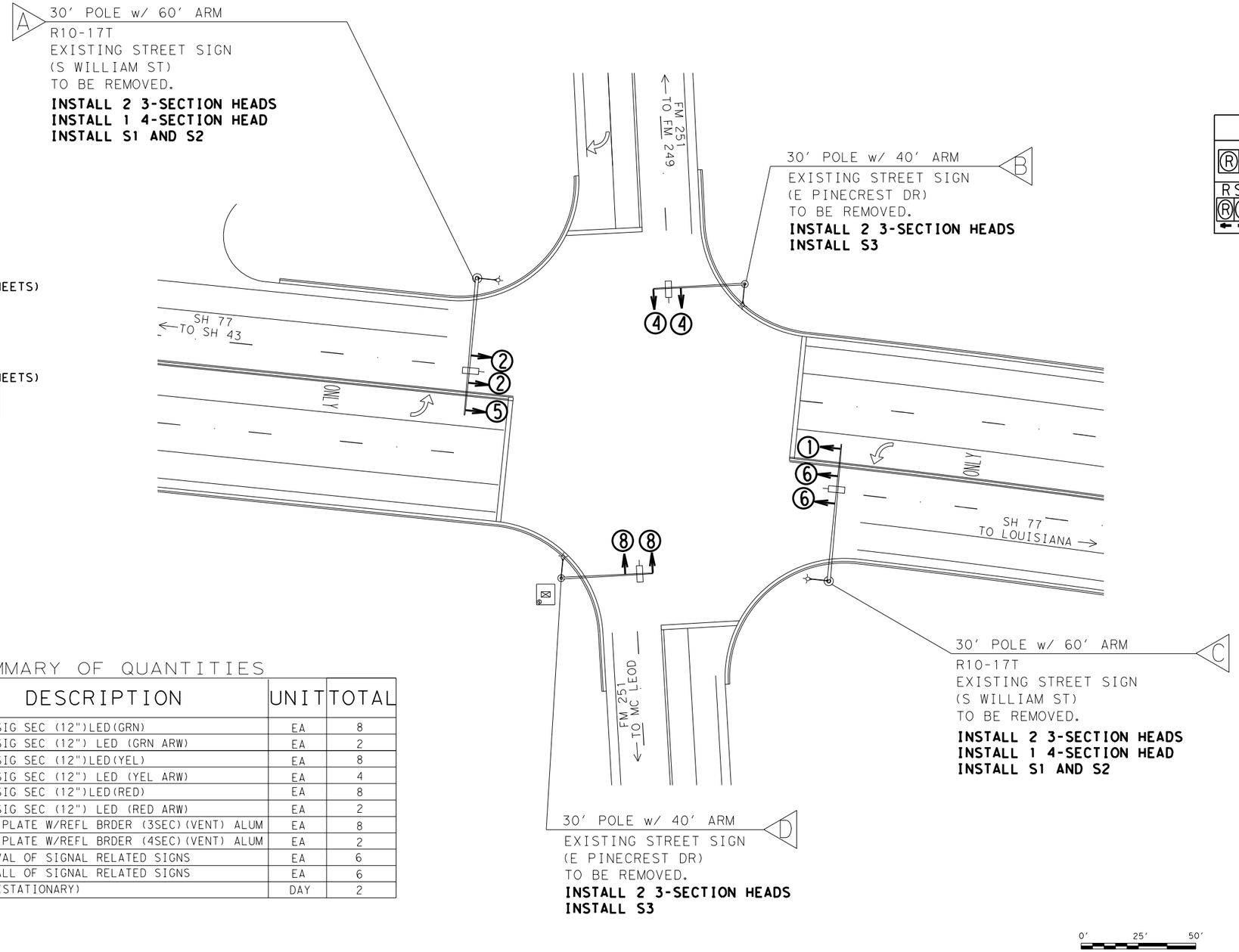
SIGNAL POLE
VIVD CAMERA
LUMINAIRE
② SIGNAL FACE AND PHASE
CONTROLLER
Ⓢ ELECTRICAL SERVICE

NOTES:
1.) REPLACE ALL SIGNAL HEADS. INSTALL VENTED ALUMINUM BACKPLATES WITH REFLECTIVE BORDER.
2.) EXISTING STREET NAME SIGNS ARE FLAT PANEL ALUMINUM SIGNS MOUNTED ON MAST ARMS. REMOVE STREET NAME SIGNS AND MOUNT NEW STREET NAME SIGNS ON MAST ARMS. REMOVE EXISTING LEFT TURN YIELD ON FLASHING YELLOW ARROW SIGNS AND INSTALL NEW SIGNS.

S1
R10-17T
36"X42"
LEFT TURN YIELD ON FLASHING YELLOW ARROW
2 EA.

S2
VAR. X 18" (SEE SIGN DETAIL SHEETS)
S WILLIAM ST
2 EA.

S3
VAR. X 18" (SEE SIGN DETAIL SHEETS)
E PINECREST DR
2 EA.



SIGNAL FACES

R Y G	2, 4, 6, AND 8	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.
R S Y F Y G R Y Y G	1	12" ONE-WAY, HORIZONTAL 4-SECTION, R-Y-Y-G SIGNAL HEAD.

SUMMARY OF QUANTITIES

ITEM	DESC CODE	DESCRIPTION	UNIT	TOTAL
0682	6001	VEH SIG SEC (12")LED(GRN)	EA	8
0682	6002	VEH SIG SEC (12") LED (GRN ARW)	EA	2
0682	6003	VEH SIG SEC (12")LED(YEL)	EA	8
0682	6004	VEH SIG SEC (12") LED (YEL ARW)	EA	4
0682	6005	VEH SIG SEC (12")LED(RED)	EA	8
0682	6006	VEH SIG SEC (12") LED (RED ARW)	EA	2
0682	6054	BACK PLATE W/REFL BRDER (3SEC)(VENT) ALUM	EA	8
0682	6055	BACK PLATE W/REFL BRDER (4SEC)(VENT) ALUM	EA	2
0690	6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	6
0690	6029	INSTALL OF SIGNAL RELATED SIGNS	EA	6
6185	6002	TMA (STATIONARY)	DAY	2

0' 25' 50'

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED PROFESSIONAL ENGINEER
Christina N. Trowler, P.E.
1/18/2022

PROPOSED SIGNAL LAYOUT SH 77 AT FM 251

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			50
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

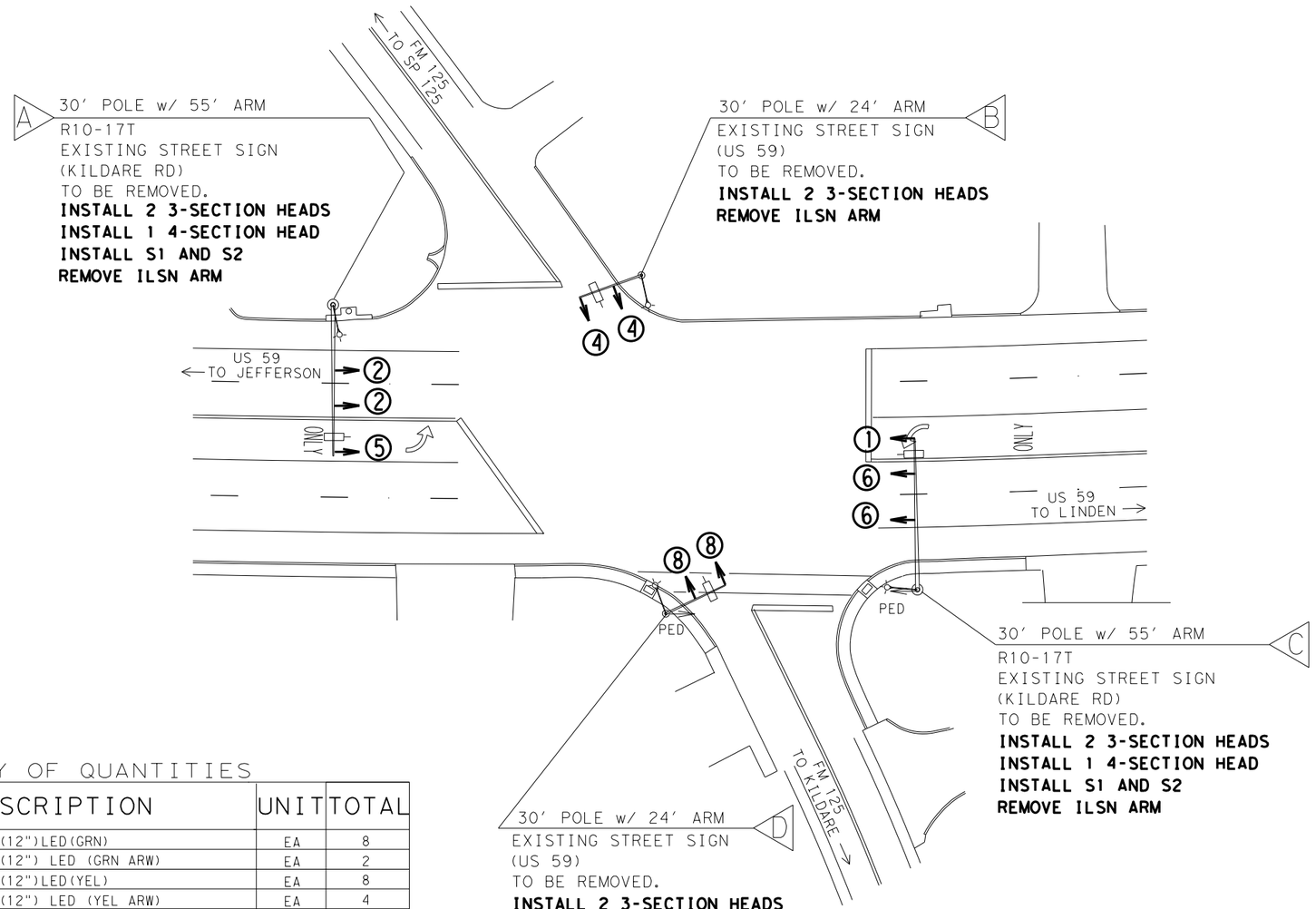
LEGEND

SIGNAL POLE		SIGNAL FACE AND PHASE	
VIVD CAMERA		CONTROLLER	
LUMINAIRE		ELECTRICAL SERVICE	

NOTES:
1.) REPLACE ALL SIGNAL HEADS. INSTALL VENTED ALUMINUM BACKPLATES WITH REFLECTIVE BORDER.
2.) EXISTING STREET NAME SIGNS ARE FLAT PANEL ALUMINUM SIGNS MOUNTED ON ILSN ARMS. REMOVE ILSN SIGNS AND ILSN ARMS. MOUNT NEW STREET NAME SIGNS ON MAST ARMS. REMOVE EXISTING LEFT TURN YIELD ON FLASHING YELLOW ARROW SIGNS AND INSTALL NEW SIGNS.
3.) POLES B AND D REMOVE EXISING SIGNS AND ISLN ARMS. NO STREET NAME SIGNS TO BE PUT BACK ON THESE POLES AS WE HAVE GROUND MOUNTED ROUTE MARKERS IN PLACE.
4.) PEDESTRIAN HEADS AND PUSH BUTTONS WILL REMAIN IN PLACE AND NOT UPGRADED AT THIS TIME.

S1
R10-17T
36"X42"
LEFT TURN YIELD ON FLASHING YELLOW ARROW
2 EA.

S2
VAR. X 18" (SEE SIGN DETAIL SHEETS)
KILDARE RD.
2 EA.



SIGNAL FACES

R Y G	2, 4, 6, AND 8	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.
R S Y F Y G R Y Y G	1 AND 5	12" ONE-WAY, HORIZONTAL 4-SECTION, R-Y-Y-G SIGNAL HEAD.

SUMMARY OF QUANTITIES

ITEM	DESC CODE	DESCRIPTION	UNIT	TOTAL
0682	6001	VEH SIG SEC (12")LED(GRN)	EA	8
0682	6002	VEH SIG SEC (12") LED (GRN ARW)	EA	2
0682	6003	VEH SIG SEC (12")LED(YEL)	EA	8
0682	6004	VEH SIG SEC (12") LED (YEL ARW)	EA	4
0682	6005	VEH SIG SEC (12")LED(RED)	EA	8
0682	6006	VEH SIG SEC (12") LED (RED ARW)	EA	2
0682	6054	BACK PLATE W/REFL BRDER (3SEC)(VENT) ALUM	EA	8
0682	6055	BACK PLATE W/REFL BRDER (4SEC)(VENT) ALUM	EA	2
0690	6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	6
0690	6029	INSTALL OF SIGNAL RELATED SIGNS	EA	4
6185	6002	TMA (STATIONARY)	DAY	2

0' 25' 50'

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED PROFESSIONAL ENGINEER
Christina N. Trowler, P.E.
1/18/2022

PROPOSED SIGNAL LAYOUT US 59 AT FM 125

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			51
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

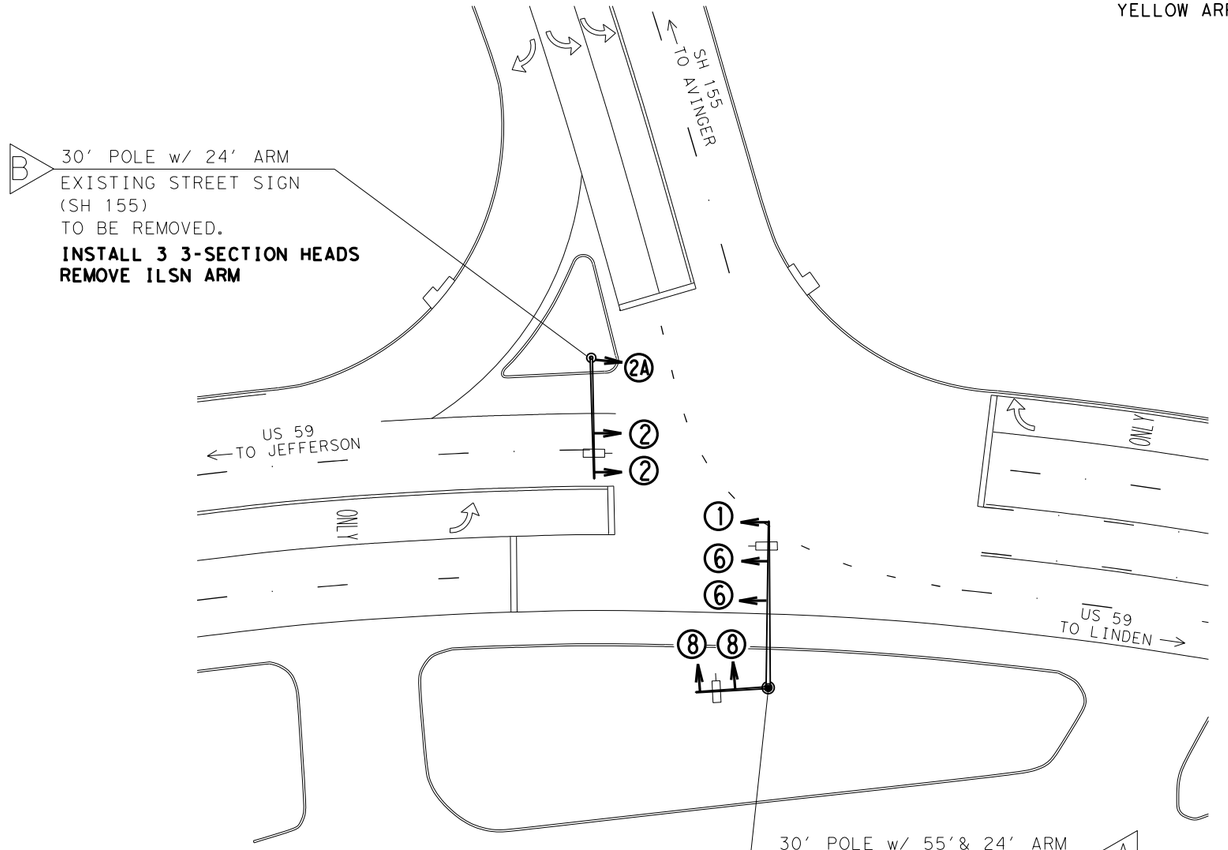
LEGEND

SIGNAL POLE	SIGNAL FACE AND PHASE
VIVD CAMERA	CONTROLLER
LUMINAIRE	ELECTRICAL SERVICE

NOTES:
1.) REPLACE ALL SIGNAL HEADS. INSTALL VENTED ALUMINUM BACKPLATES WITH REFLECTIVE BORDER.
2.) EXISTING STREET NAME SIGNS ARE FLAT PANEL ALUMINUM SIGNS MOUNTED ON ILSN ARMS. REMOVE STREET NAME SIGNS AND ILSN ARMS. FOR THIS LOCATION WE HAVE GROUND MOUNT ROUTE MARKERS IN PLACE SO NO STREET NAME SIGNS TO BE PUT BACK HERE. REMOVE EXISTING LEFT TURN YIELD ON FLASHING YELLOW ARROW SIGN AND INSTALL NEW SIGN.
3.) PHASE 8 IS CURRENTLY A 3 SECTION HEAD WITH RED BALL, YELLOW BALL, AND GREEN BALL. CHANGE BOTH SIGNAL HEADS OUT TO RED BALL, YELLOW ARROW, AND GREEN ARROW.

S1
R10-17T
36"X42"

1 EA.



B
30' POLE w/ 24' ARM
EXISTING STREET SIGN
(SH 155)
TO BE REMOVED.
INSTALL 3 3-SECTION HEADS
REMOVE ILSN ARM

A
30' POLE w/ 55'& 24' ARM
R10-17T
EXISTING STREET SIGN
(US 59) AND (SH 155)
TO BE REMOVED.
INSTALL 4 3-SECTION HEADS
INSTALL 1 4-SECTION HEAD
INSTALL S1
REMOVE ILSN ARMS

SIGNAL FACES

R Y G	2, AND 6	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.
R Y G	8	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.
R Y G	2A	12" ONE-WAY, VERTICAL 3-SECTION, R-Y-G SIGNAL HEAD.
R S Y F Y G	1	12" ONE-WAY, HORIZONTAL 4-SECTION, R-Y-Y-G SIGNAL HEAD.

SUMMARY OF QUANTITIES

ITEM	DESC CODE	DESCRIPTION	UNIT	TOTAL
0682	6001	VEH SIG SEC (12")LED(GRN)	EA	5
0682	6002	VEH SIG SEC (12") LED (GRN ARW)	EA	3
0682	6003	VEH SIG SEC (12")LED(YEL)	EA	5
0682	6004	VEH SIG SEC (12") LED (YEL ARW)	EA	4
0682	6005	VEH SIG SEC (12")LED(RED)	EA	7
0682	6006	VEH SIG SEC (12") LED (RED ARW)	EA	1
0682	6054	BACK PLATE W/REFL BRDER (3SEC)(VENT) ALUM	EA	7
0682	6055	BACK PLATE W/REFL BRDER (4SEC)(VENT) ALUM	EA	1
0690	6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	4
0690	6029	INSTALL OF SIGNAL RELATED SIGNS	EA	1
6185	6002	TMA (STATIONARY)	DAY	2

0' 25' 50'

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED
PROFESSIONAL ENGINEER

Christina N. Trowler, P.E.

1/18/2022

PROPOSED SIGNAL LAYOUT US 59 AT SH 155

 Texas Department of Transportation

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			52
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

LEGEND

- SIGNAL POLE
- VIVD CAMERA
- LUMINAIRE
- ② SIGNAL FACE AND PHASE
- CONTROLLER
- Ⓢ ELECTRICAL SERVICE

NOTES:
1.) REPLACE ALL SIGNAL HEADS. INSTALL VENTED ALUMINUM BACKPLATES WITH REFLECTIVE BORDER.
2.) EXISTING STREET NAME SIGNS ARE FLAT PANEL ALUMINUM SIGNS MOUNTED ON MAST ARMS. REPLACE STREET NAMES SIGNS. REMOVE EXISTING LEFT TURN YIELD ON FLASHING YELLOW ARROW SIGN AND INSTALL NEW SIGN.

S1
R10-17T
36"X42"

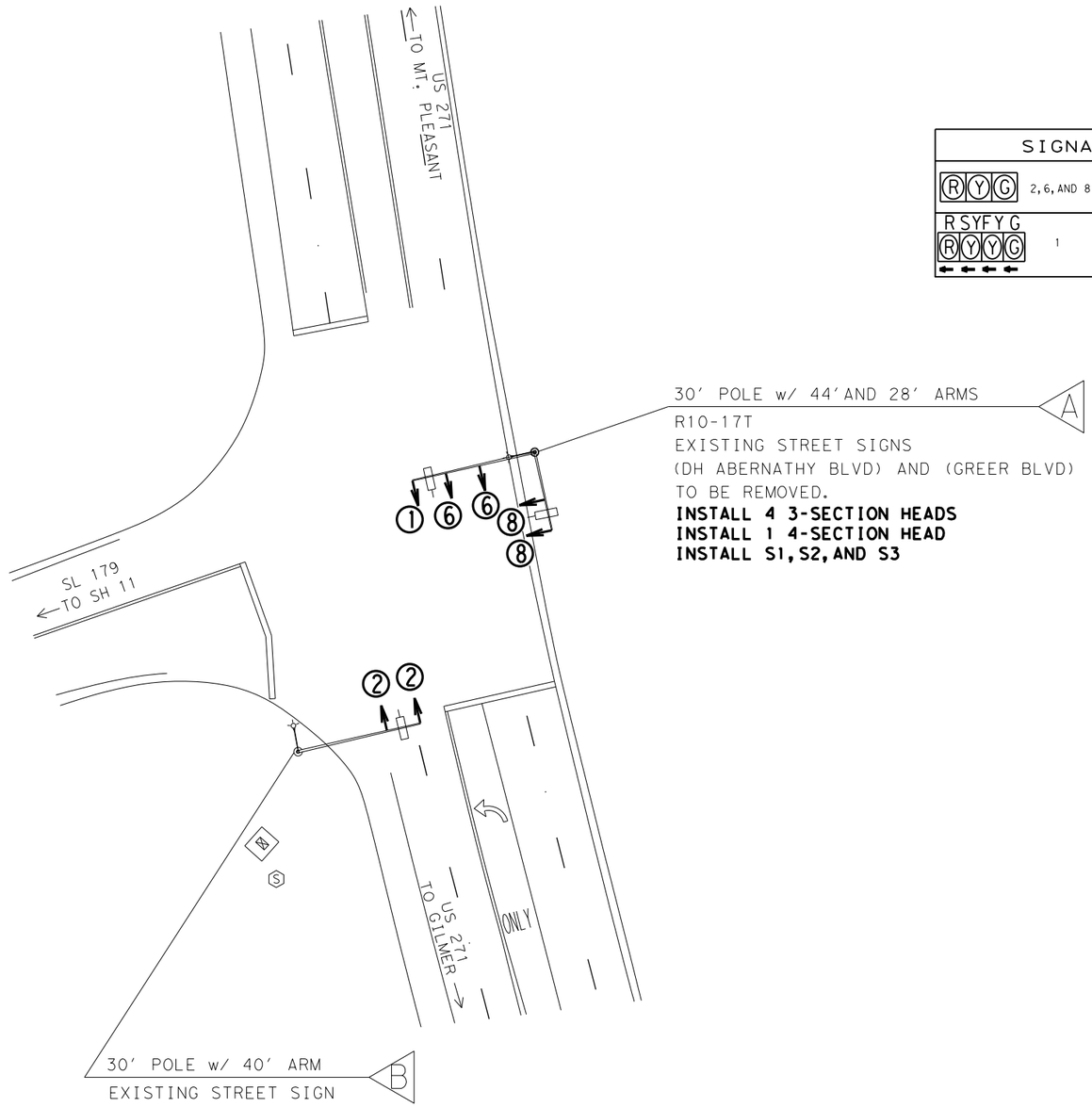
1 EA.

S2
VAR. X 18" (SEE SIGN DETAIL SHEETS)

1 EA.

S3
VAR. X 18" (SEE SIGN DETAIL SHEETS)

2 EA.



SIGNAL FACES

R Y G	2, 6, AND 8	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.
R S Y F Y G R Y Y G	1	12" ONE-WAY, HORIZONTAL 4-SECTION, R-Y-Y-G SIGNAL HEAD.

SUMMARY OF QUANTITIES

ITEM	DESC CODE	DESCRIPTION	UNIT	TOTAL
0682	6001	VEH SIG SEC (12")LED(GRN)	EA	6
0682	6002	VEH SIG SEC (12") LED (GRN ARW)	EA	1
0682	6003	VEH SIG SEC (12")LED(YEL)	EA	6
0682	6004	VEH SIG SEC (12") LED (YEL ARW)	EA	2
0682	6005	VEH SIG SEC (12")LED(RED)	EA	6
0682	6006	VEH SIG SEC (12") LED (RED ARW)	EA	1
0682	6054	BACK PLATE W/REFL BRDER (3SEC)(VENT) ALUM	EA	6
0682	6055	BACK PLATE W/REFL BRDER (4SEC)(VENT) ALUM	EA	1
0690	6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	4
0690	6029	INSTALL OF SIGNAL RELATED SIGNS	EA	4
6185	6002	TMA (STATIONARY)	DAY	2

0' 25' 50'

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED
PROFESSIONAL ENGINEER

Christina N. Trowler, P.E.

1/18/2022

PROPOSED SIGNAL LAYOUT US 271 AT SL 179

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			53
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

FILE: T:\Engdata\Traffic\DGN\d192515 Jamie\JOBS\SAFETY PROJECTS\CSJ 0062-04-051 Reflective Backplates\Intersections\US 271 at LP 179\US 271 AT SL 179.dgn
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LEGEND

- SIGNAL POLE
- VIVD CAMERA
- LUMINAIRE
- (2) SIGNAL FACE AND PHASE
- PED PEDESTRIAN SIGNAL HEAD
- PED POLE
- CONTROLLER
- (S) ELECTRICAL SERVICE

S1
R10-17T
36"X42"

2 EA.

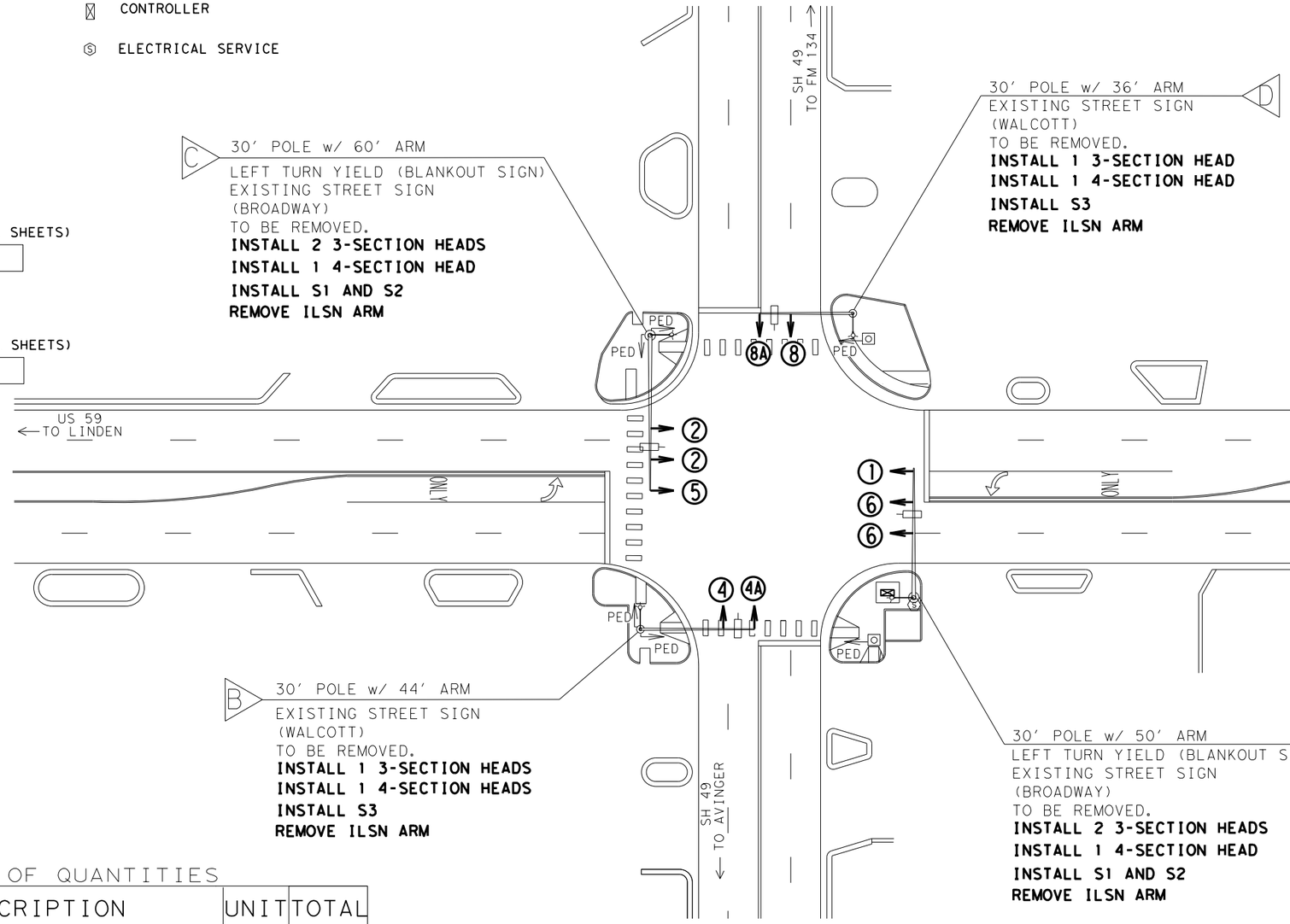
S2
VAR. X 18" (SEE SIGN DETAIL SHEETS)

2 EA.

S3
VAR. X 18" (SEE SIGN DETAIL SHEETS)

2 EA.

SIGNAL FACES		
R Y G	2, 4, 6, AND 8	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.
R S Y F Y G R Y Y G	1 AND 5	12" ONE-WAY, HORIZONTAL 4-SECTION, R-Y-Y-G SIGNAL HEAD.
R Y G G R Y G G	4A AND 8A	12" ONE-WAY, HORIZONTAL 4-SECTION, R-Y-G-G SIGNAL HEAD.



SUMMARY OF QUANTITIES

ITEM	DESC CODE	DESCRIPTION	UNIT	TOTAL
0682	6001	VEH SIG SEC (12")LED(GRN)	EA	8
0682	6002	VEH SIG SEC (12") LED (GRN ARW)	EA	4
0682	6003	VEH SIG SEC (12")LED(YEL)	EA	8
0682	6004	VEH SIG SEC (12") LED (YEL ARW)	EA	4
0682	6005	VEH SIG SEC (12")LED(RED)	EA	8
0682	6006	VEH SIG SEC (12") LED (RED ARW)	EA	2
0682	6054	BACK PLATE W/REFL BRDER (3SEC)(VENT) ALUM	EA	6
0682	6055	BACK PLATE W/REFL BRDER (4SEC)(VENT) ALUM	EA	4
0690	6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	6
0690	6029	INSTALL OF SIGNAL RELATED SIGNS	EA	6
6185	6002	TMA (STATIONARY)	DAY	2

NOTES:
1.) REPLACE ALL SIGNAL HEADS. INSTALL VENTED ALUMINUM BACKPLATES WITH REFLECTIVE BORDER.
2.) EXISTING STREET NAME SIGNS ARE ILSN SIGNS MOUNTED ON ILSN ARMS. REMOVE ILSN SIGNS AND ILSN ARMS. MOUNT NEW STREET NAME SIGNS ON MAST ARMS. REMOVE EXISTING LEFT TURN YIELD ON FLASHING YELLOW ARROW SIGNS AND INSTALL NEW SIGNS.
3.) PEDESTRIAN HEADS AND PUSH BUTTONS WILL REMAIN IN PLACE AND NOT UPGRADED AT THIS TIME.

0' 25' 50'

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED
PROFESSIONAL ENGINEER

Christina N. Trowler, P.E.

1/18/2022

PROPOSED SIGNAL LAYOUT US 59 AT SH 49

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			54
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

FILE: T:\Engdata\Traffic\DGN\d192515 Jamie\JOBS\SAFETY PROJECTS\CSJ 0062-04-051 Reflective Backplates\Intersections\US 59 at SH 49\US 59 @ SH 49.dgn
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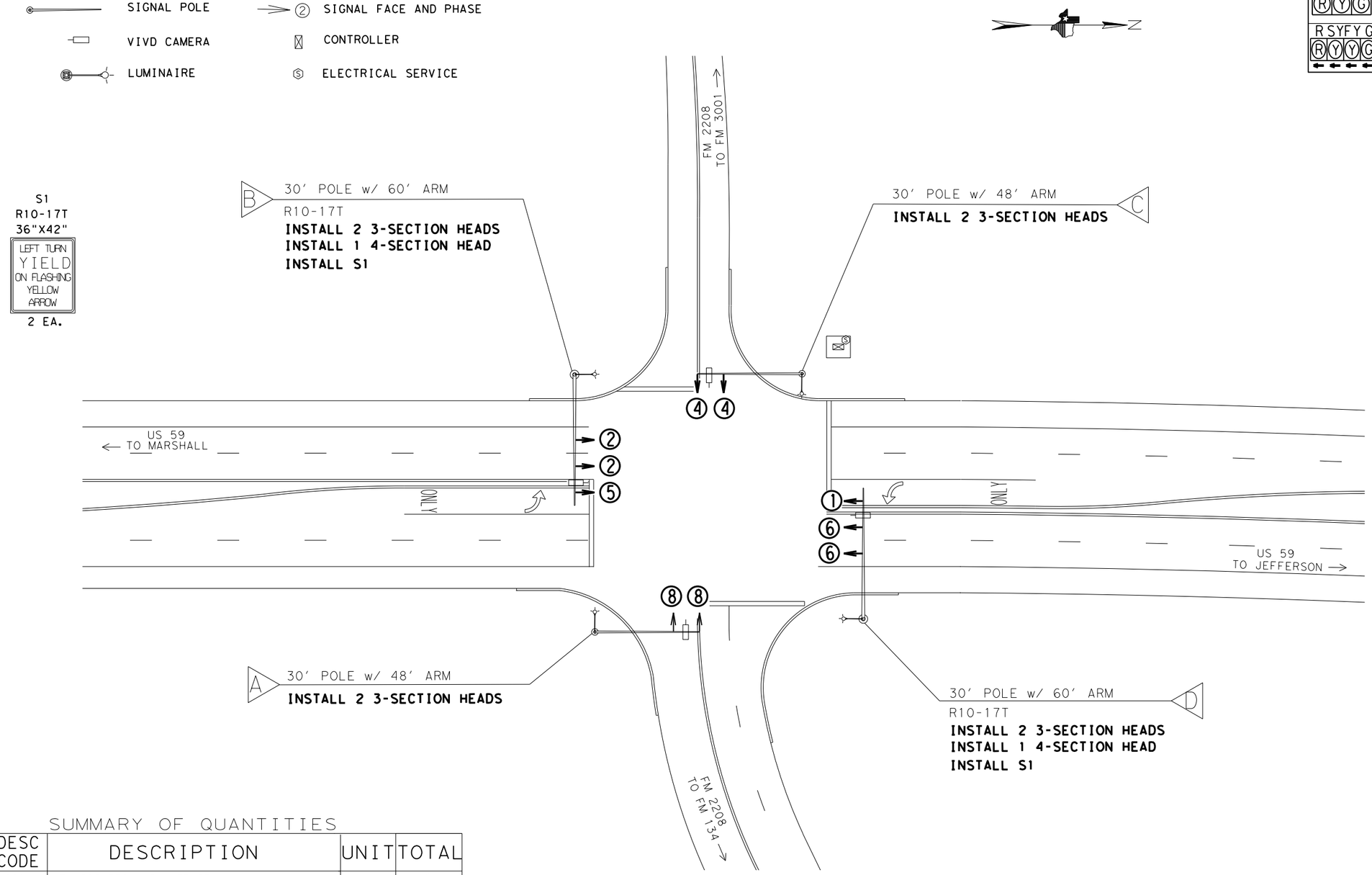
DATE: 12/27/2021 2:58:38 PM

LEGEND

- SIGNAL POLE
- VIVD CAMERA
- LUMINAIRE
- ② SIGNAL FACE AND PHASE
- CONTROLLER
- Ⓢ ELECTRICAL SERVICE

SIGNAL FACES		
(R)(Y)(G)	2, 4, 6, AND 8	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.
R S Y F Y G (R)(Y)(Y)(G)	1 AND 5	12" ONE-WAY, HORIZONTAL 4-SECTION, R-Y-Y-G SIGNAL HEAD.



SUMMARY OF QUANTITIES

ITEM	DESC CODE	DESCRIPTION	UNIT	TOTAL
0682	6001	VEH SIG SEC (12")LED(GRN)	EA	8
0682	6002	VEH SIG SEC (12") LED (GRN ARW)	EA	2
0682	6003	VEH SIG SEC (12")LED(YEL)	EA	8
0682	6004	VEH SIG SEC (12") LED (YEL ARW)	EA	4
0682	6005	VEH SIG SEC (12")LED(RED)	EA	8
0682	6006	VEH SIG SEC (12") LED (RED ARW)	EA	2
0682	6054	BACK PLATE W/REFL BRDER (3SEC)(VENT) ALUM	EA	8
0682	6055	BACK PLATE W/REFL BRDER (4SEC)(VENT) ALUM	EA	2
0690	6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	2
0690	6029	INSTALL OF SIGNAL RELATED SIGNS	EA	2
6185	6002	TMA (STATIONARY)	DAY	2

NOTES:
1.) REPLACE ALL SIGNAL HEADS. INSTALL VENTED ALUMINUM BACKPLATES WITH REFLECTIVE BORDER.
2.) REMOVE EXISTING LEFT TURN YIELD ON FLASHING YELLOW ARROW SIGNS AND INSTALL NEW SIGNS.

0' 25' 50'

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED
PROFESSIONAL ENGINEER

Christina N. Trowler, P.E.
1/18/2022

PROPOSED SIGNAL LAYOUT US 59 AT FM 2208

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			55
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

LEGEND

- SIGNAL POLE
- VIVD CAMERA
- LUMINAIRE
- ② SIGNAL FACE AND PHASE
- CONTROLLER
- Ⓢ ELECTRICAL SERVICE

SIGNAL FACES

RYG	2, 4, 6, AND 8	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.
RSYFYG RYYG	1, 3, 5, AND 7	12" ONE-WAY, HORIZONTAL 4-SECTION, R-Y-Y-G SIGNAL HEAD.

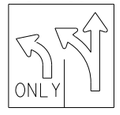
S1
R10-17T
36"X42"

4 EA.

S2
R3-5R
30"X36"

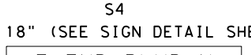
2 EA.

S3
R3-8L
30"X30"



2 EA.

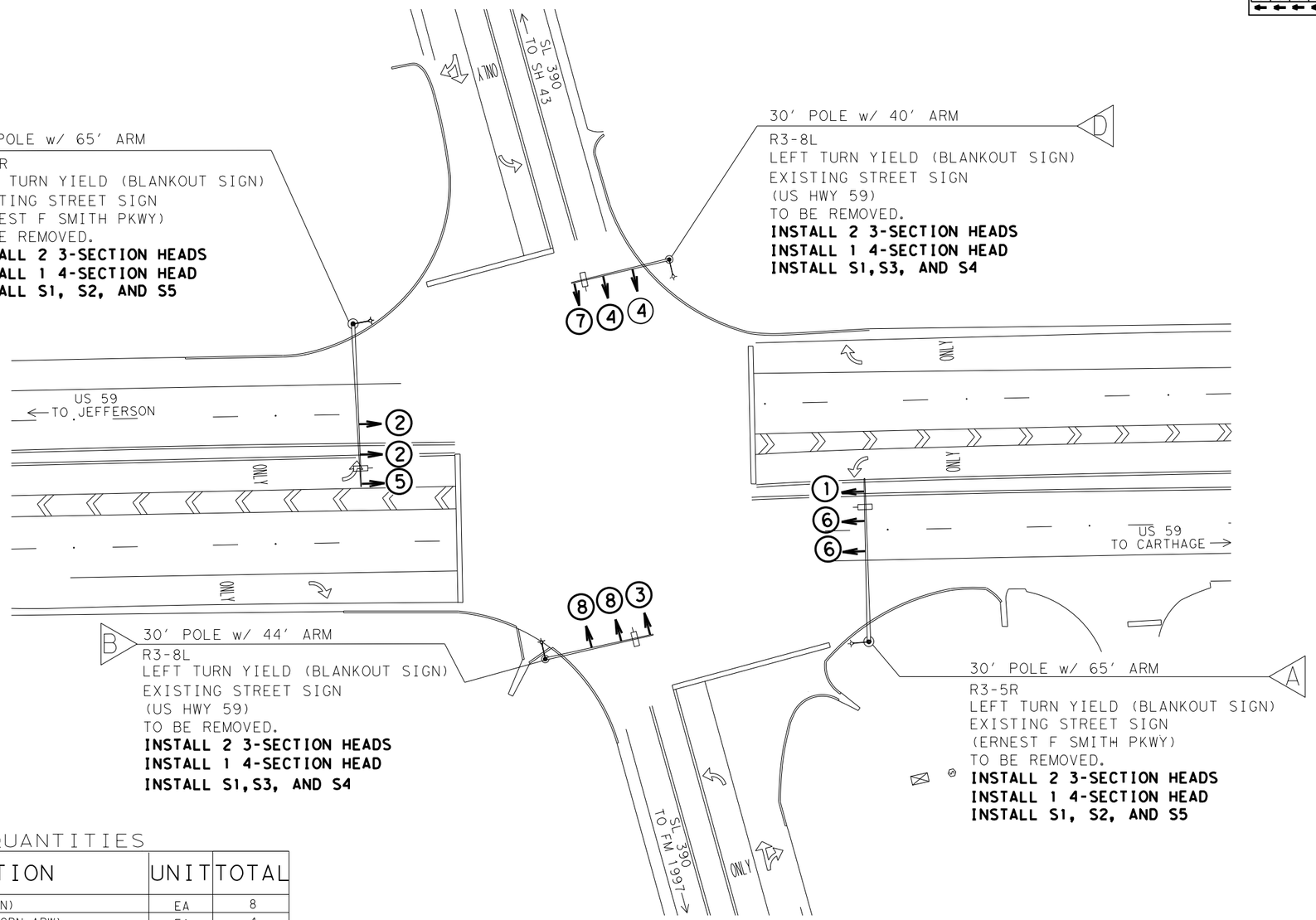
S4
VAR. X 18" (SEE SIGN DETAIL SHEETS)



2 EA.

S5
VAR. X 18" (SEE SIGN DETAIL SHEETS)

2 EA.



SUMMARY OF QUANTITIES

ITEM	DESC CODE	DESCRIPTION	UNIT	TOTAL
0682	6001	VEH SIG SEC (12")LED(GRN)	EA	8
0682	6002	VEH SIG SEC (12") LED (GRN ARW)	EA	4
0682	6003	VEH SIG SEC (12")LED(YEL)	EA	8
0682	6004	VEH SIG SEC (12") LED (YEL ARW)	EA	8
0682	6005	VEH SIG SEC (12")LED(RED)	EA	8
0682	6006	VEH SIG SEC (12") LED (RED ARW)	EA	4
0682	6054	BACK PLATE W/REFL BRDER (3SEC)(VENT) ALUM	EA	8
0682	6055	BACK PLATE W/REFL BRDER (4SEC)(VENT) ALUM	EA	4
0690	6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	12
0690	6029	INSTALL OF SIGNAL RELATED SIGNS	EA	12
6185	6002	TMA (STATIONARY)	DAY	2

NOTES:
1.) REPLACE ALL SIGNAL HEADS. INSTALL VENTED ALUMINUM BACKPLATES WITH REFLECTIVE BORDER.
2.) EXISTING STREET NAME SIGNS ARE FLAT PANEL ALUMINUM SIGNS MOUNTED ON MAST ARMS. REMOVE SIGNS AND MOUNT NEW STREET NAME SIGNS ON MAST ARMS. REMOVE EXISTING LEFT TURN YIELD BLANKOUT SIGNS AND INSTALL LEFT TURN YIELD ON FLASHING YELLOW ARROW SIGNS.

0' 25' 50'

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED
PROFESSIONAL ENGINEER

Christina N. Trowler, P.E.

1/18/2022

PROPOSED SIGNAL LAYOUT US 59 AT SL 390

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			56
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

FILE: T:\Engdata\Traffic\DGN\d192515 Jamie\JOBS\SAFETY PROJECTS\CSJ 0062-04-051 Reflective Backplates\Intersections\US 59 at Poplar\2D File w google US 59 at Poplar.dgn
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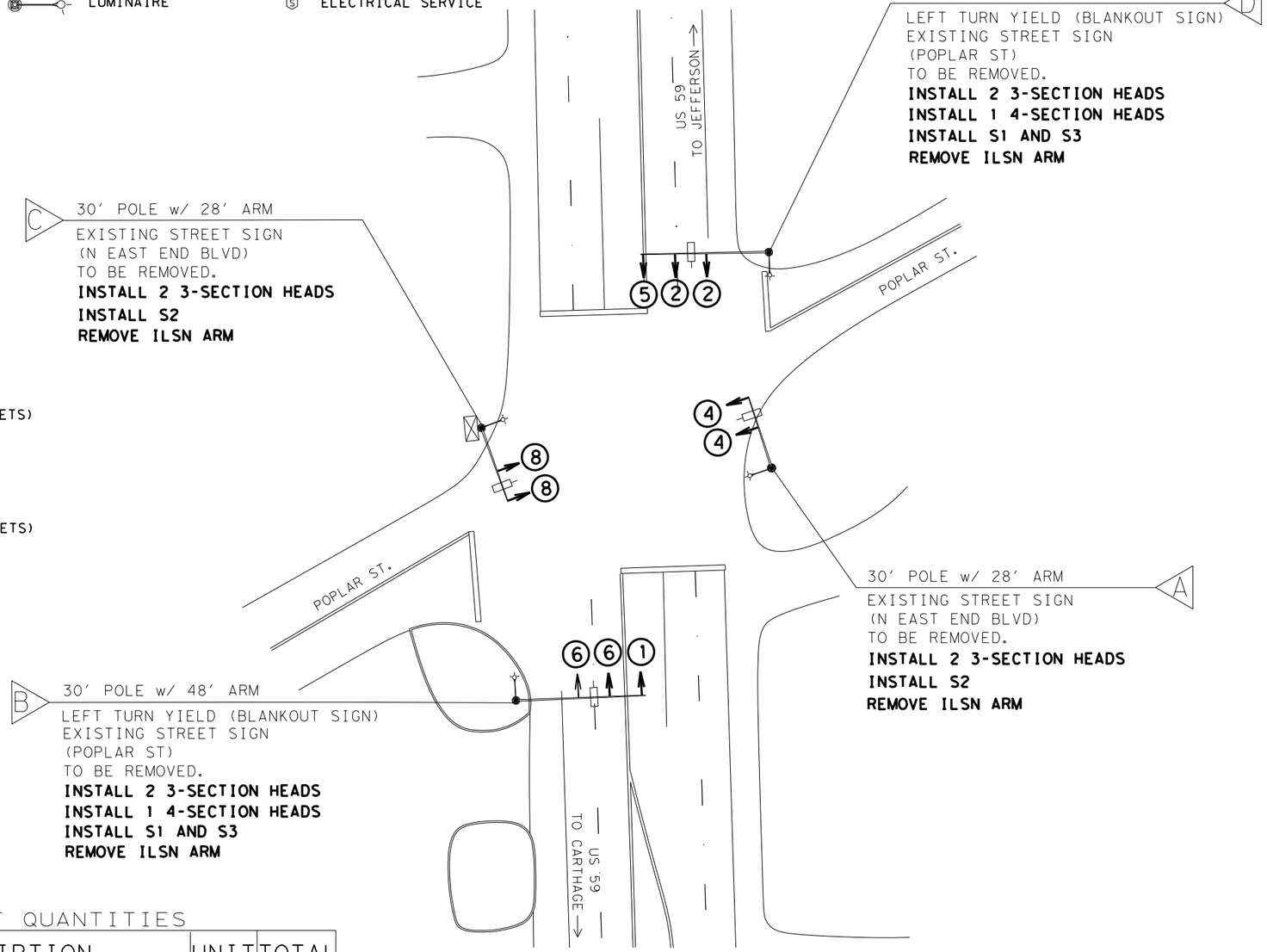
LEGEND

SIGNAL POLE
VIVD CAMERA
LUMINAIRE
② SIGNAL FACE AND PHASE
CONTROLLER
Ⓢ ELECTRICAL SERVICE

SIGNAL FACES

R Y G	2, 4, 6, AND 8	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.
R S Y F Y G R Y Y G	1 AND 5	12" ONE-WAY, HORIZONTAL 4-SECTION, R-Y-Y-G SIGNAL HEAD.



C
30' POLE w/ 28' ARM
EXISTING STREET SIGN
(N EAST END BLVD)
TO BE REMOVED.
INSTALL 2 3-SECTION HEADS
INSTALL S2
REMOVE ILSN ARM

D
30' POLE w/ 36' ARM
LEFT TURN YIELD (BLANKOUT SIGN)
EXISTING STREET SIGN
(POPLAR ST)
TO BE REMOVED.
INSTALL 2 3-SECTION HEADS
INSTALL 1 4-SECTION HEADS
INSTALL S1 AND S3
REMOVE ILSN ARM

A
30' POLE w/ 28' ARM
EXISTING STREET SIGN
(N EAST END BLVD)
TO BE REMOVED.
INSTALL 2 3-SECTION HEADS
INSTALL S2
REMOVE ILSN ARM

B
30' POLE w/ 48' ARM
LEFT TURN YIELD (BLANKOUT SIGN)
EXISTING STREET SIGN
(POPLAR ST)
TO BE REMOVED.
INSTALL 2 3-SECTION HEADS
INSTALL 1 4-SECTION HEADS
INSTALL S1 AND S3
REMOVE ILSN ARM

S1
R10-17T
36"X42"
LEFT TURN YIELD ON FLASHING YELLOW ARROW
2 EA.

S2
VAR. X 18" (SEE SIGN DETAIL SHEETS)
E END BLVD N
2 EA.

S3
VAR. X 18" (SEE SIGN DETAIL SHEETS)
POPLAR ST
2 EA.

SUMMARY OF QUANTITIES

ITEM	DESC CODE	DESCRIPTION	UNIT	TOTAL
0682	6001	VEH SIG SEC (12")LED(GRN)	EA	8
0682	6002	VEH SIG SEC (12") LED (GRN ARW)	EA	2
0682	6003	VEH SIG SEC (12")LED(YEL)	EA	8
0682	6004	VEH SIG SEC (12") LED (YEL ARW)	EA	4
0682	6005	VEH SIG SEC (12")LED(RED)	EA	8
0682	6006	VEH SIG SEC (12") LED (RED ARW)	EA	2
0682	6054	BACK PLATE W/REFL BRDER (3SEC)(VENT) ALUM	EA	8
0682	6055	BACK PLATE W/REFL BRDER (4SEC)(VENT) ALUM	EA	2
0690	6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	6
0690	6029	INSTALL OF SIGNAL RELATED SIGNS	EA	6
6185	6002	TMA (STATIONARY)	DAY	2

NOTES:
1.) REPLACE ALL SIGNAL HEADS. INSTALL VENTED ALUMINUM BACKPLATES WITH REFLECTIVE BORDER.
2.) EXISTING STREET NAME SIGNS ARE ILSN SIGNS MOUNTED ON ILSN ARMS. REMOVE ILSN SIGNS AND ILSN ARMS. MOUNT NEW STREET NAME SIGNS ON MAST ARMS. REMOVE EXISTING LEFT TURN YIELD BLANKOUT SIGNS AND INSTALL LEFT TURN YIELD ON FLASHING YELLOW ARROW SIGNS.

0' 25' 50'

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED
PROFESSIONAL ENGINEER
Christina N. Trowler, P.E.
1/18/2022

PROPOSED SIGNAL LAYOUT US 59 AT POPLAR ST.

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			57
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

N

LEGEND

- SIGNAL POLE
- VIVD CAMERA
- LUMINAIRE
- ② SIGNAL FACE AND PHASE
- CONTROLLER
- Ⓢ ELECTRICAL SERVICE

S1
R10-17T
36"X42"

1 EA.

S2
VAR. X 18" (SEE SIGN DETAIL SHEETS)

E END BLVD N

1 EA.

S3
VAR. X 18" (SEE SIGN DETAIL SHEETS)

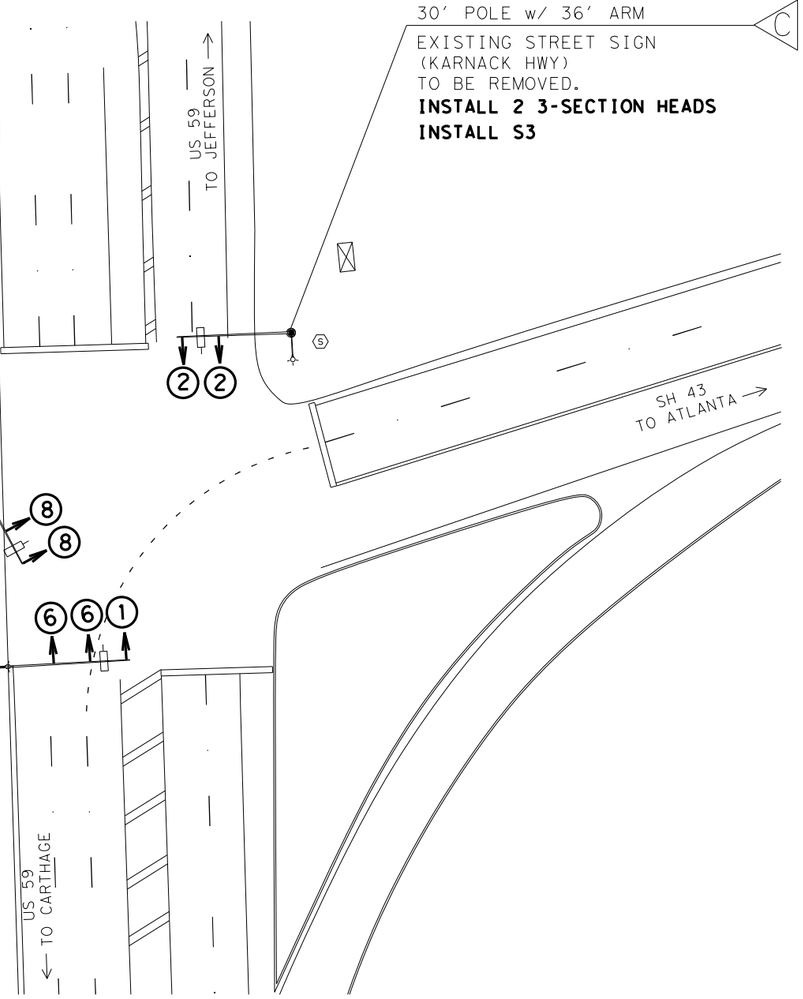
KARNACK HWY

2 EA.

B 30' POLE w/ 28' ARM
EXISTING STREET SIGN
(N EAST END BLVD)
TO BE REMOVED.
INSTALL 2 3-SECTION HEADS
INSTALL S2

A 30' POLE w/ 48' ARM
LEFT TURN YIELD (BLANKOUT SIGN)
EXISTING STREET SIGN
(KARNACK HWY)
TO BE REMOVED.
INSTALL 2 3-SECTION HEADS
INSTALL 1 4-SECTION HEAD
INSTALL S1 AND S3

C 30' POLE w/ 36' ARM
EXISTING STREET SIGN
(KARNACK HWY)
TO BE REMOVED.
INSTALL 2 3-SECTION HEADS
INSTALL S3



SIGNAL FACES

R Y G	2 AND 6	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.
R Y G	8	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.
R S Y F Y G	1	12" ONE-WAY, HORIZONTAL 4-SECTION, R-Y-Y-G SIGNAL HEAD.

SUMMARY OF QUANTITIES

ITEM	DESC CODE	DESCRIPTION	UNIT	TOTAL
0682	6001	VEH SIG SEC (12")LED(GRN)	EA	4
0682	6002	VEH SIG SEC (12") LED (GRN ARW)	EA	3
0682	6003	VEH SIG SEC (12")LED(YEL)	EA	4
0682	6004	VEH SIG SEC (12") LED (YEL ARW)	EA	4
0682	6005	VEH SIG SEC (12")LED(RED)	EA	6
0682	6006	VEH SIG SEC (12") LED (RED ARW)	EA	1
0682	6054	BACK PLATE W/REFL BRDER (3SEC)(VENT) ALUM	EA	6
0682	6055	BACK PLATE W/REFL BRDER (4SEC)(VENT) ALUM	EA	1
0690	6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	4
0690	6029	INSTALL OF SIGNAL RELATED SIGNS	EA	4
6185	6002	TMA (STATIONARY)	DAY	2

NOTES:
1.) REPLACE ALL SIGNAL HEADS. INSTALL VENTED ALUMINUM BACKPLATES WITH REFLECTIVE BORDER.
2.) EXISTING STREET NAME SIGNS ARE WOOD AND MOUNTED ON MAST ARMS. REMOVE EXISTING STREET NAME SIGNS AND MOUNT NEW STREET NAME SIGNS ON MAST ARMS. REMOVE EXISTING LEFT TURN YIELD BLANKOUT SIGN AND INSTALL LEFT TURN YIELD ON FLASHING YELLOW ARROW SIGN.
3.) PHASE 8 IS CURRENTLY A 3 SECTION HEAD WITH RED BALL, YELLOW BALL, AND GREEN BALL. CHANGE BOTH SIGNAL HEADS OUT TO RED BALL, YELLOW ARROW, AND GREEN ARROW.

0' 25' 50'

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED
PROFESSIONAL ENGINEER

Christina N. Trowler, P.E.

1/18/2022

PROPOSED SIGNAL LAYOUT US 59 AT SH 43 N.

 Texas Department of Transportation

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			58
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

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LEGEND

- SIGNAL POLE
- VIVD CAMERA
- LUMINAIRE
- ② SIGNAL FACE AND PHASE
- CONTROLLER
- Ⓢ ELECTRICAL SERVICE

SIGNAL FACES

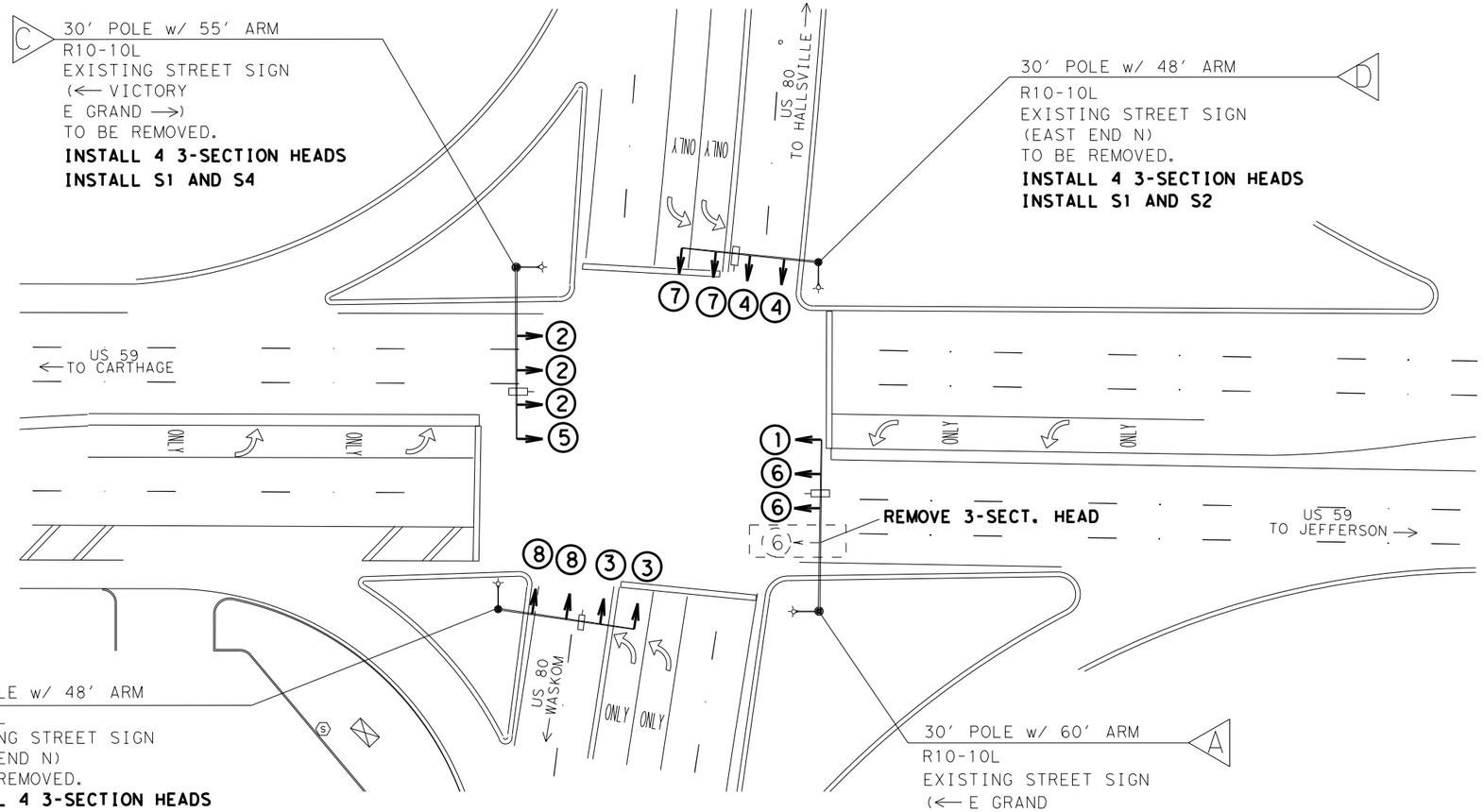
(R)(Y)(G)	2, 4, 6, AND 8	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.
(R)(Y)(G)	1, 3, 5, AND 7	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.

S1
R10-10L
30"X36"
LEFT TURN SIGNAL
4 EA.

S2
VAR. X 18" (SEE SIGN DETAIL SHEETS)
E END BLVD N
2 EA.

S3
VAR. X 24" (SEE SIGN DETAIL SHEETS)
← E GRAND AVE
VICTORY DR →
1 EA.

S4
VAR. X 24" (SEE SIGN DETAIL SHEETS)
← VICTORY DR
E GRAND AVE →
1 EA.



SUMMARY OF QUANTITIES

ITEM	DESC CODE	DESCRIPTION	UNIT	TOTAL
0682	6001	VEH SIG SEC (12")LED(GRN)	EA	9
0682	6002	VEH SIG SEC (12") LED (GRN ARW)	EA	6
0682	6003	VEH SIG SEC (12")LED(YEL)	EA	9
0682	6004	VEH SIG SEC (12") LED (YEL ARW)	EA	6
0682	6005	VEH SIG SEC (12")LED(RED)	EA	8
0682	6054	BACK PLATE W/REFL BRDER (3SEC)(VENT) ALUM	EA	15
0690	6024	REMOVAL OF SIGNAL HEAD ASSM	EA	1
0690	6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	8
0690	6029	INSTALL OF SIGNAL RELATED SIGNS	EA	8
6185	6002	TMA (STATIONARY)	DAY	2

NOTES:
1.) REPLACE ALL SIGNAL HEADS. INSTALL VENTED ALUMINUM BACKPLATES WITH REFLECTIVE BORDER.
2.) EXISTING STREET NAME SIGNS ARE ILSN SIGNS MOUNTED ON MAST ARMS. REMOVE ILSN SIGNS AND MOUNT NEW STREET NAME SIGNS ON MAST ARMS. REMOVE EXISTING LEFT TURN SIGNAL SIGNS AND INSTALL NEW SIGNS.
3.) REMOVE 3-SECTION SIGNAL HEAD ON POLE A AS SHOWN.

0' 25' 50'

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED
PROFESSIONAL ENGINEER
Christina N. Trowler, P.E.
1/18/2022

PROPOSED SIGNAL LAYOUT US 59 AT US 80

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			59
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

N

LEGEND

- SIGNAL POLE
- VIVD CAMERA
- LUMINAIRE
- EXISTING GROUND BOX
- EXISTING CONDUIT
- (2) SIGNAL FACE AND PHASE
- CONTROLLER
- (S) ELECTRICAL SERVICE

WIRE TOTALS - CONDUIT						TOTAL
ITEM	A	C	E	H	K	
7/C #12	30	25	131	134	18	338

WIRE TOTALS - POLES		
POLE #	7/C #12	
A	64	
B	64	
TOTAL	128	

* CALCULATIONS FOR WIRE TOTALS - CONDUIT:
-5' OF SLACK FOR GROUND BOXES. (PER CONDUCTOR)
-5' OF SLACK FOR WIRE IN THE SERVICE. (PER CONDUCTOR)
-10' OF SLACK FOR WIRE IN THE CABINET AND BASE OF TRAFFIC SIGNAL POLES. (PER CONDUCTOR)

* CALCULATIONS FOR WIRE TOTALS - POLES:
-5 OF SLACK FOR WIRE IN THE ARM. (PER CONDUCTOR)
-WIRE GOING TO SIGNAL HEADS CALCULATED BASED OF THE DISTANCES SHOWN ON THE SIGNAL FACE SPACING CHART SHOWN IN SIGNAL DETAILS.
-COAX CABLE IS CALCULATED AT MINUS 6' FROM LENGTH OF ARM.
-#12 FOR LUMINAIRE IS CALCULATED AT 80' PER POLE WITH LUMINAIRE.

SIGNAL FACES

- (R)(Y)(G) 2, 4, 6, AND 8 — 12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.
- R S Y F Y G (R)(Y)(Y)(G) 1, 3, 5, AND 7 — 12" ONE-WAY, HORIZONTAL 4-SECTION, ●●●● SIGNAL HEAD.

WIRE RUN												
ITEM	RUN	A	B	C	D	E	F	G	H	I	J	K	L
WIRE	7/C #12	1		1		1			1			1	
CONDUIT	2" PVC	X	X	X	X	X	X	X	X	X	X	X	X
	RUN LENGTH (FT)	10' (EXISTING)	10' (EXISTING)	10' (EXISTING)	10' (EXISTING)	126' (EXISTING)	126' (EXISTING)	126' (EXISTING)	129' (EXISTING)	129' (EXISTING)	129' (EXISTING)	8' (EXISTING)	8' (EXISTING)

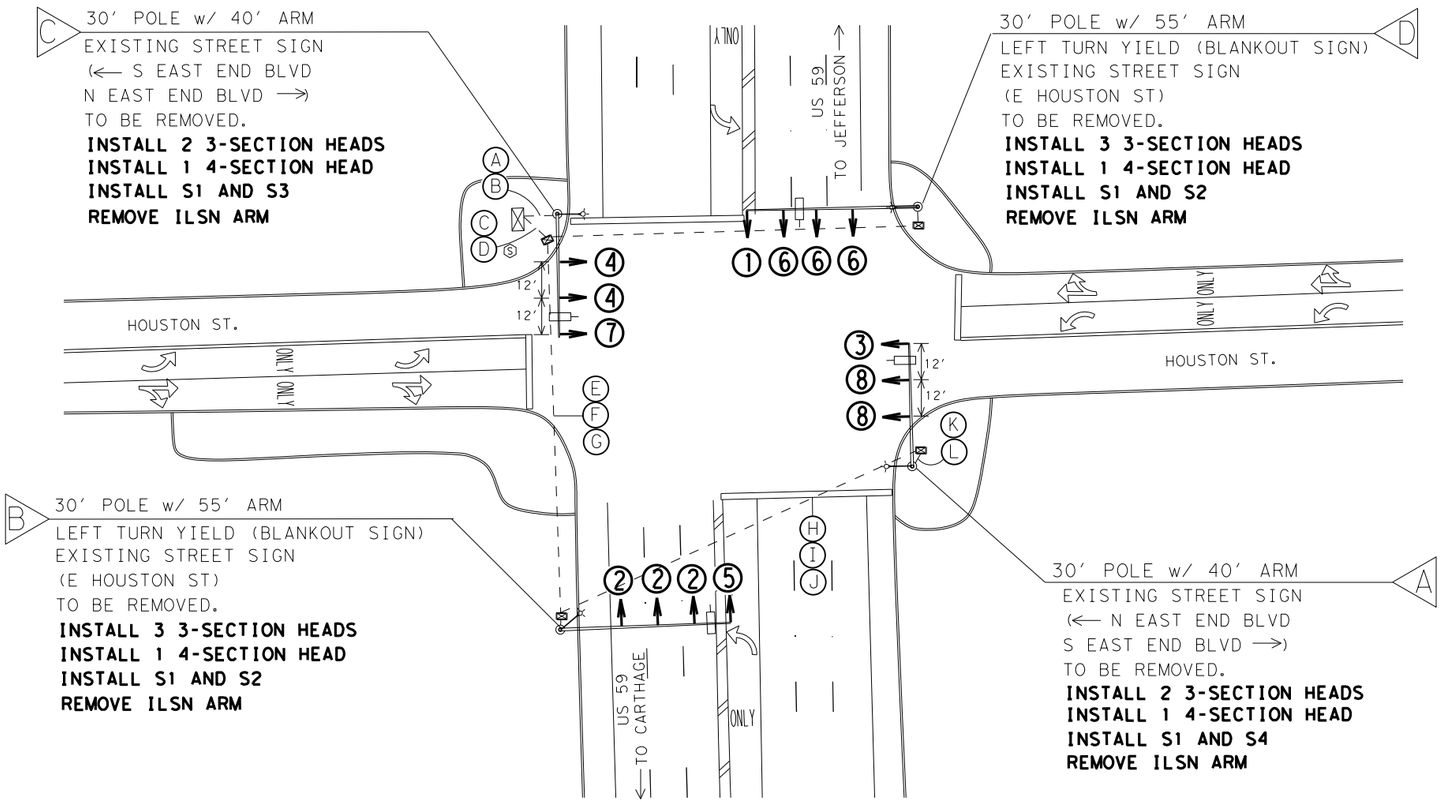
WIRE RUNS ARE FROM GROUND BOX TO GROUND BOX AND ARE AN APPROXIMATE LENGTH. FINAL QUANTITIES INCLUDE TOTAL AMOUNT OF CONDUCTOR REQUIRED FOR OPERATION.

S1
R10-17T
36"X42"
LEFT TURN YIELD ON FLASHING YELLOW ARROW
4 EA.

S2
VAR. X 18" (SEE SIGN DETAIL SHEETS)
E HOUSTON ST
2 EA.

S3
VAR. X 24" (SEE SIGN DETAIL SHEETS)
← E END BLVD S
E END BLVD N →
1 EA.

S4
VAR. X 24" (SEE SIGN DETAIL SHEETS)
← E END BLVD N
E END BLVD S →
1 EA.



SUMMARY OF QUANTITIES

ITEM	DESC CODE	DESCRIPTION	UNIT	TOTAL
0682	6001	VEH SIG SEC (12")LED(GRN)	EA	10
0682	6002	VEH SIG SEC (12") LED (GRN ARW)	EA	4
0682	6003	VEH SIG SEC (12")LED(YEL)	EA	10
0682	6004	VEH SIG SEC (12") LED (YEL ARW)	EA	8
0682	6005	VEH SIG SEC (12")LED(RED)	EA	10
0682	6006	VEH SIG SEC (12") LED (RED ARW)	EA	4
0682	6054	BACK PLATE W/REFL BRDER (3SEC)(VENT) ALUM	EA	10
0682	6055	BACK PLATE W/REFL BRDER (4SEC)(VENT) ALUM	EA	4
0684	6012	TRAF SIG CBL(TY A)(12 AWG)(7 CONDR)	LF	466
0690	6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	6
0690	6029	INSTALL OF SIGNAL RELATED SIGNS	EA	8
6185	6002	TMA (STATIONARY)	DAY	2

NOTES:
1.) REPLACE ALL SIGNAL HEADS. INSTALL VENTED ALUMINUM BACKPLATES WITH REFLECTIVE BORDER.
2.) EXISTING STREET NAME SIGNS ARE ILSN SIGNS MOUNTED ON ILSN ARMS. REMOVE ILSN SIGNS AND ILSN ARMS. MOUNT NEW STREET NAME SIGNS ON MAST ARMS. REMOVE EXISTING LEFT TURN YIELD BLANKOUT SIGNS AND INSTALL LEFT TURN YIELD ON FLASHING YELLOW ARROW SIGNS.
3.) INSTALL ADDITIONAL SIGNAL HEADS ON SIGNAL POLES A AND C (PHASE 3 AND 7). INSTALL 7/C WIRE FOR THESE NEW SIGNAL PHASES USING EXISTING CONDUIT.
4.) SPACE SIGNAL HEADS FOR HOUSTON STREET AS SHOWN, OR AS DIRECTED TO ADD ADITIONAL SIGNAL HEADS.

0' 25' 50'

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED PROFESSIONAL ENGINEER
Christina N. Trowler, P.E.
1/18/2022

PROPOSED SIGNAL LAYOUT US 59 AT HOUSTON ST.

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			60
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

LEGEND

SIGNAL POLE
VIVD CAMERA
ELECTRICAL SERVICE
② SIGNAL FACE AND PHASE
CONTROLLER
EXISTING GROUND BOX
EXISTING CONDUIT

S1
R10-17T
36"X42"
LEFT TURN YIELD ON FLASHING YELLOW ARROW
4 EA.

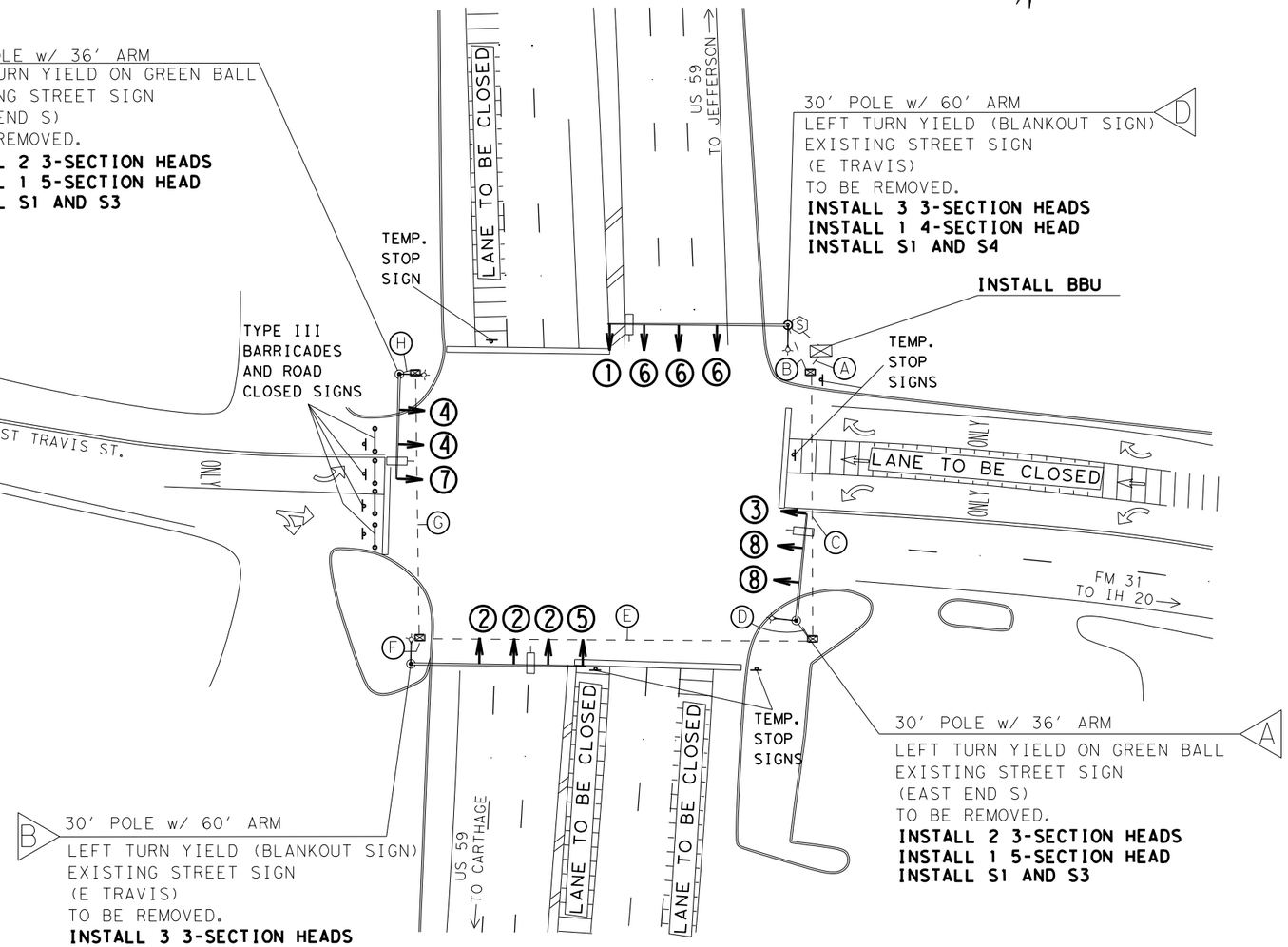
S3
VAR. X 18" (SEE SIGN DETAIL SHEETS)
E END BLVD S
2 EA.

S4
VAR. X 18" (SEE SIGN DETAIL SHEETS)
E TRAVIS ST
2 EA.

CW20-3D
36"X36"
ROAD CLOSED AHEAD
1 EA.

R11-2
48"X30"
ROAD CLOSED
4 EA.

THESE SIGNS AND TYPE III BARRICADES SUBSIDIARY TO ITEM 502.
SEE US 59 AND FM 31 SIGNAL DETAIL SHEET NOTE 10.



WIRE RUN									
ITEM	RUN	A	B	C	D	E	F	G	H
WIRE									
	#6 BARE	1	1	1	1	1	1	1	1
	#8 XHHW		2	2	2	2	2	2	2
	5/C #12	4	1	3	1	2	1	1	1
	7/C #12	4	1	3	1	2	1	1	1
VIVDS	CAT 5	4	1	3	1	2	1	1	1
CONDUIT	2" PVC	X	X	X	X	X	X	X	X
	4" PVC								
	RUN LENGTH (FT)	10' (EXISTING)	20' (EXISTING)	95' (EXISTING)	10' (EXISTING)	140' (EXISTING)	10' (EXISTING)	95' (EXISTING)	10' (EXISTING)

WIRE RUNS ARE FROM GROUND BOX TO GROUND BOX. FINAL QUANTITIES INCLUDE TOTAL AMOUNT OF CONDUCTOR REQUIRED FOR OPERATION.

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED
PROFESSIONAL ENGINEER

Christina N. Trowler, P.E.

1/18/2022

PROPOSED SIGNAL LAYOUT US 59 AT FM 31

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.			SHEET NO.
				61
STATE	DISTRICT	COUNTY		
TEXAS	ATL	CASS		
CONTROL	SECTION	JOB	HIGHWAY NO.	
0062	04	051	US 59	

NOTES:

1.) THE PURPOSE OF THIS WORK IS TO REPLACE EXISTING WIRING AT THIS LOCATION USING EXISTING CONDUIT. THE INTERSECTION WILL RUN AS A TEMPORARY STOP CONDITION DURING DIFFERENT STAGES OF THE WORK. PULL NEW WIRE TO THE VARIOUS SIGNAL POLES INDIVIDUALLY AT DIFFERENT TIMES. TO MINIMIZE THE IMPACT TO TRAFFIC AND HELP IMPROVE SAFETY FOR THE WORKERS NIGHTTIME WORK WILL BE REQUIRED FOR STOP CONDITION DURING RECONNECTING WIRE ONE POLE AT A TIME. AT THIS LOCATION WITH A TIME WINDOW FROM 10:00 P.M. TO 6:00 A.M. WILL BE UTILIZED TO DO THE WORK REQUIRING STOP CONDITIONS OVER MULTIPLE NIGHTS.

2.) EACH SIGNAL POLE FOUNDATION HAS TWO 2" CONDUITS STUBBED OUT FOR SPARES. NEW CAMERAS WILL BE INSTALLED AT THIS INTERSECTION WHICH TXDOT WILL PROVIDE AND THE CONTRACTOR TO INSTALL.

3.) CONTRACTOR WILL INSTALL TEMPORARY STOP SIGNS ON ALL APPROACHES. FOR THIS LOCATION A TOTAL OF 5 TEMPORARY STOP SIGNS WILL BE ON HAND IN CASE OF EMERGENCY, BUT PLAN WORK SO THAT ONE DIRECTION/ SIGNAL POLE WILL BE WORKED ONE AT A TIME. SIZE OF ALL STOP SIGNS WILL BE 48"X48".

4.) LAW ENFORCEMENT WILL BE REQUIRED DURING HOURS THE TRAFFIC SIGNAL IS BEING PUT IN A STOP CONDITION. CONTRACTOR TO COORDINATE THIS AND BE REIMBURSED BY TXDOT THRU FORCE ACCOUNT.

5.) REPLACE ALL SIGNAL HEADS. INSTALL VENTED ALUMINUM BACKPLATES WITH REFLECTIVE BORDER.

6.) EXISTING LUMINAIRE HEADS WILL REMAIN IN PLACE. INSTALL ELEC. CONDR. #12 FROM BASE OF POLE TO LED LUMINAIRE HEAD.

7.) EXISTING STREET NAME SIGNS ARE ILSN SIGNS MOUNTED ON MAST ARMS. REMOVE STREET NAME SIGNS ON ALL SIGNAL POLES. REMOVE EXISTING LEFT TURN YIELD ON FLASHING YELLOW ARROW SIGNS AND INSTALL NEW SIGNS. REMOVE EXISTING LEFT TURN YIELD ON GREEN BALL SIGNS AND INSTALL NEW LEFT TURN YIELD ON FLASHING YELLOW ARROW SIGNS AS THE 5 SECTION HEADS ARE TO BE CHANGED OUT TO 4 SECTION HEADS ON THE SIDE STREETS.

8.) THE TWO 5 SECTION HEADS FOR PHASES 3 AND 7 WILL BE REPLACED BY TWO 4 SECTION HEADS.

9.) LANE CLOSURES WILL BE REQUIRED AT THIS LOCATION WHILE THE INTERSECTION IS IN STOP CONDITION. LANE CLOSURES WILL BE SHIFTED WHEN REPLACING INDIVIDUAL SIGNAL HEADS AND TEMPORARY STOP SIGNS ADJUSTED. RUMBLE STRIPS WILL BE REQUIRED FOR LANE CLOSURES.

10.) EAST TRAVIS STREET WILL BE CLOSED DURING SIGNAL WORK. ROAD CLOSED SIGNS AND TYPE III BARRICADES WILL BE REQUIRED. REFERENCE SIGN DETAIL SHEETS. SIGN PLACEMENT WILL BE AS DIRECTED BY THE ENGINEER. CHANGEABLE MESSAGE SIGN WILL BE PLACED ON THIS APPROACH RUNNING A PRE-CLOSURE MESSAGE AT LOCATION DETERMINED BY THE ENGINEER AND MESSAGE CHANGED WHEN WORK BEGINS.

11.) 1 PORTABLE CHANGEABLE MESSAGE SIGN ON US 59 NB APPROACHING FM 31. 5 DAYS PRIOR RUNNING ADVANCE MESSAGE, AND 2 DAYS RUNNING STOP CONDITION MESSAGE FOR PULLING IN THE WIRE = 7 DAYS.
1 PORTABLE CHANGEABLE MESSAGE SIGN ON US 59 SB APPROACHING FM 31. 5 DAYS PRIOR RUNNING ADVANCE MESSAGE, AND 2 DAYS RUNNING STOP CONDITION MESSAGE FOR PULLING IN THE WIRE = 7 DAYS.
1 PORTABLE CHANGEABLE MESSAGE SIGN ON FM 31 WB APPROACHING US 59. 5 DAYS PRIOR RUNNING ADVANCE MESSAGE,AND 2 DAYS RUNNING STOP CONDITION MESSAGE FOR PULLING IN THE WIRE = 7 DAYS.
1 PORTABLE CHANGEABLE MESSAGE SIGN ON TRAVIS ST. EB APPROACHING US 59. 5 DAYS PRIOR RUNNING PRE-CLOSURE MESSAGE,AND 2 DAYS RUNNING ROAD CLOSED MESSAGE FOR PULLING IN THE WIRE = 7 DAYS.
THIS EQUALS A TOTAL OF 4 CHANGEABLE MESSAGE SIGNS NEEDED AT 28 DAYS.

US 59 AND FM 31
ADVANCE MESSAGE

SIGNAL WORK BEG.	DATE EXPECT DELAYS

US 59 AND FM 31
STOP CONDITION MESSAGE

SIGNAL WORK AHEAD	ALL TRAFFIC MUST STOP

EAST TRAVIS ST.
PRE-CLOSURE
MESSAGE

E. TRAVIS STREET TO BE	CLOSED DAY DATE

EAST TRAVIS ST.
ROAD CLOSED
MESSAGE

E. TRAVIS STREET CLOSED	USE ALT. ROUTES

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED
PROFESSIONAL ENGINEER

Christina N. Trowler, P.E.

1/18/2022

SIGNAL DETAILS US 59 AT FM 31

Texas Department of Transportation

SHEET 1 OF 2

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			62
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

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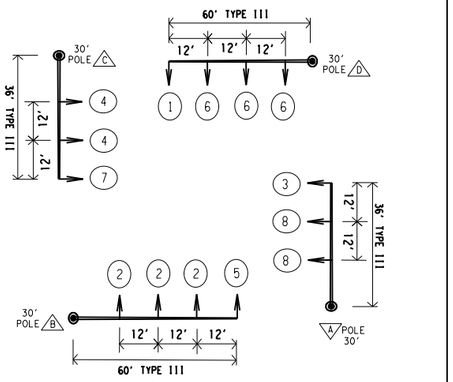
SIGNAL FACE SPACING



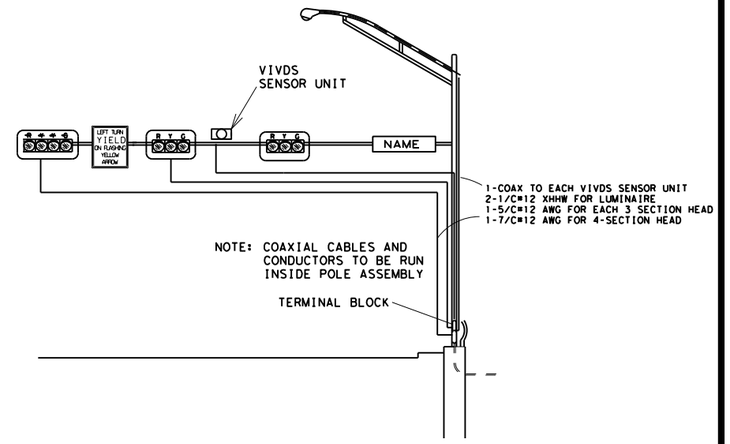
SIGNAL FACES

R Y G	2, 4, 6, AND 8	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.
R S Y F Y G R Y Y G	1, 3, 5, AND 7	12" ONE-WAY, HORIZONTAL 4-SECTION, R-Y-Y-G SIGNAL HEAD.

SUMMARY OF QUANTITIES

ITEM	DESC CODE	DESCRIPTION	UNIT	TOTAL
0620	6004	ELEC CONDR (NO.12) INSULATED	LF	320
0620	6008	ELEC CONDUCTOR(NO 8)INSULATED	LF	870
0620	6009	ELEC CONDUCTOR(NO 6)BARE	LF	490
0682	6001	VEH SIG SEC (12")LED(GRN)	EA	10
0682	6002	VEH SIG SEC (12") LED (GRN ARW)	EA	4
0682	6003	VEH SIG SEC (12")LED(YEL)	EA	10
0682	6004	VEH SIG SEC (12") LED (YEL ARW)	EA	8
0682	6005	VEH SIG SEC (12")LED(RED)	EA	10
0682	6006	VEH SIG SEC (12") LED (RED ARW)	EA	4
0682	6054	BACK PLATE W/REFL BRDER (3SEC)(VENT) ALUM	EA	10
0682	6055	BACK PLATE W/REFL BRDER (4SEC)(VENT) ALUM	EA	4
0684	6010	TRAF SIG CBL(TY A)(12 AWG)(5 CONDR)	LF	1408
0684	6012	TRAF SIG CBL(TY A)(12 AWG)(7 CONDR)	LF	1168
0690	6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	8
0690	6029	INSTALL OF SIGNAL RELATED SIGNS	EA	8
6001	6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	28
6089	6002	CAT 5 ETHERNET CABLE	LF	1144
6185	6002	TMA (STATIONARY)	DAY	8
6306	6010	VIVDS CAMERA ASSEMBLY (INSTALL ONLY)	EA	4
*		VIVDS CAMERA ASSEMBLY	EA	4

* PROVIDED BY TXDOT; INSTALLED BY THE CONTRACTOR.



WIRE TOTALS - CONDUIT									TOTAL
ITEM	A	B	C	D	E	F	G	H	
#6 BARE	25	30	100	20	145	20	100	20	490
#8 XHHW		60	200	40	290	40	200	40	870
5/C #12	100	30	300	20	290	20	100	20	880
7/C #12	100	30	300	20	290	20	100	20	880
CAT 5	100	30	300	20	290	20	100	20	880

WIRE TOTALS - POLES				
POLE #	#12	5/C #12	7/C #12	CAT 5
A	80	84	60	54
B	80	180	84	78
C	80	84	60	54
D	80	180	84	78
TOTAL	320	528	288	264

* CALCULATIONS FOR WIRE TOTALS - CONDUIT:
  -5' OF SLACK FOR GROUND BOXES. (PER CONDUCTOR)
  -5' OF SLACK FOR WIRE IN THE SERVICE. (PER CONDUCTOR)
  -10' OF SLACK FOR WIRE IN THE CABINET AND BASE OF TRAFFIC SIGNAL POLES. (PER CONDUCTOR)

* CALCULATIONS FOR WIRE TOTALS - POLES:
  -5 OF SLACK FOR WIRE IN THE ARM. (PER CONDUCTOR)
  -WIRE GOING TO SIGNAL HEADS CALCULATED BASED OF THE DISTANCES SHOWN ON THE SIGNAL FACE SPACING CHART SHOWN IN SIGNAL DETAILS.
  -COAX CABLE IS CALCULATED AT MINUS 6' FROM LENGTH OF ARM.
  -#12 FOR LUMINAIRE IS CALCULATED AT 80' PER POLE WITH LUMINAIRE.

STATE OF TEXAS
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1/18/2022

SIGNAL DETAILS US 59 AT FM 31

Texas Department of Transportation

SHEET 2 OF 2

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			63
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

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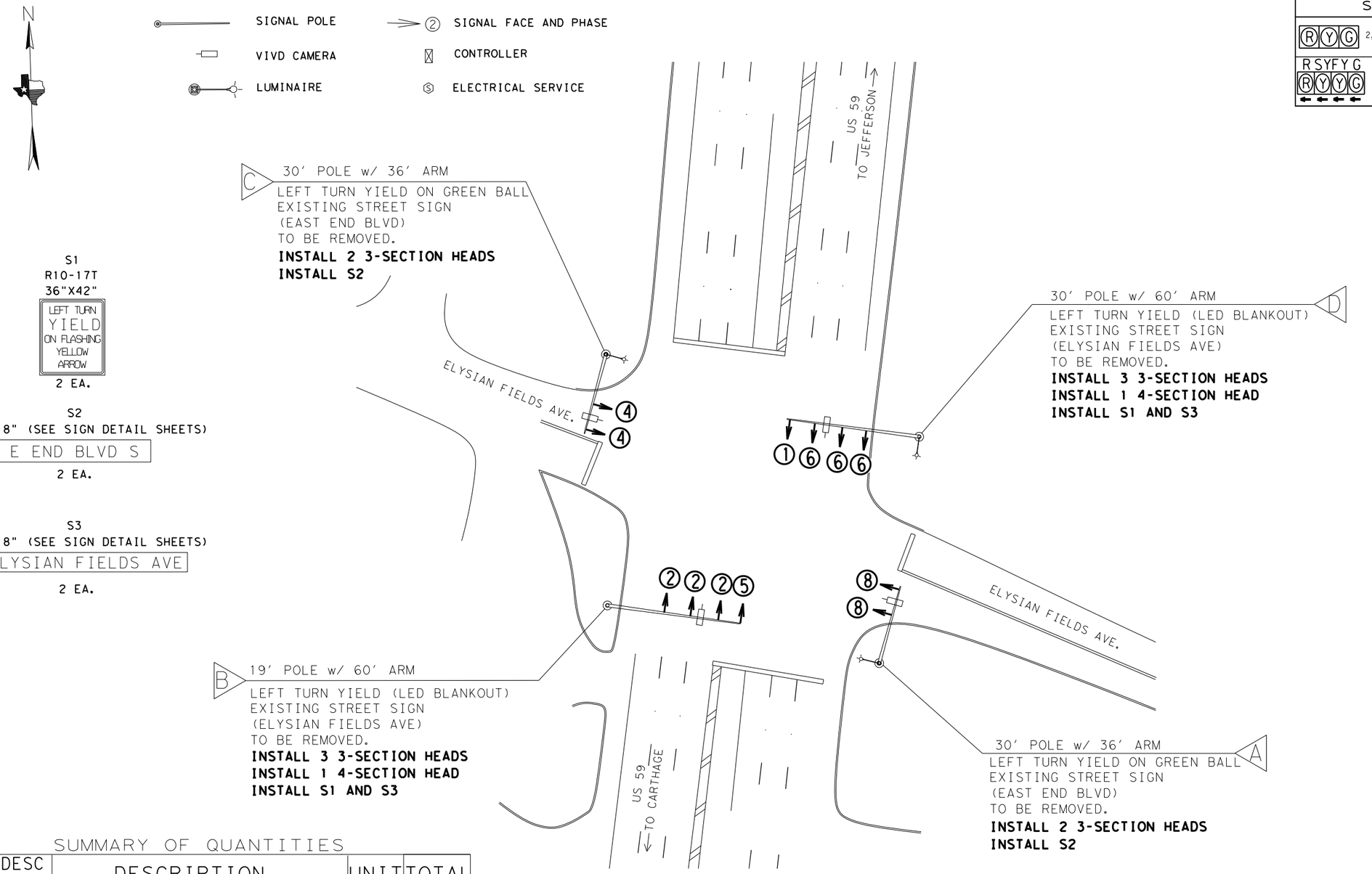
LEGEND

- SIGNAL POLE
- VIVD CAMERA
- LUMINAIRE
- ② SIGNAL FACE AND PHASE
- CONTROLLER
- Ⓢ ELECTRICAL SERVICE

SIGNAL FACES		
R Y G	2, 4, 6, AND 8	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.
R S Y F Y G R Y Y G	1 AND 5	12" ONE-WAY, HORIZONTAL 4-SECTION, R-Y-Y-G SIGNAL HEAD.



S1
R10-17T
36"X42"

2 EA.

S2
VAR. X 18" (SEE SIGN DETAIL SHEETS)

2 EA.

S3
VAR. X 18" (SEE SIGN DETAIL SHEETS)

2 EA.

SUMMARY OF QUANTITIES

ITEM	DESC CODE	DESCRIPTION	UNIT	TOTAL
0682	6001	VEH SIG SEC (12")LED(GRN)	EA	10
0682	6002	VEH SIG SEC (12") LED (GRN ARW)	EA	2
0682	6003	VEH SIG SEC (12")LED(YEL)	EA	10
0682	6004	VEH SIG SEC (12") LED (YEL ARW)	EA	4
0682	6005	VEH SIG SEC (12")LED(RED)	EA	10
0682	6006	VEH SIG SEC (12") LED (RED ARW)	EA	2
0682	6054	BACK PLATE W/REFL BRDER (3SEC)(VENT) ALUM	EA	10
0682	6055	BACK PLATE W/REFL BRDER (4SEC)(VENT) ALUM	EA	2
0690	6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	6
0690	6029	INSTALL OF SIGNAL RELATED SIGNS	EA	6
6185	6002	TMA (STATIONARY)	DAY	2

NOTES:
1.) REPLACE ALL SIGNAL HEADS. INSTALL VENTED ALUMINUM BACKPLATES WITH REFLECTIVE BORDER.
2.) EXISTING STREET NAME SIGNS ARE ILSN SIGNS MOUNTED ON ILSN ARMS. REMOVE ILSN SIGNS AND ILSN ARMS. MOUNT NEW STREET NAME SIGNS ON MAST ARMS. REMOVE EXISTING LEFT TURN YIELD BLANKOUT SIGNS AND INSTALL LEFT TURN YIELD ON FLASHING YELLOW ARROW SIGNS.

0' 25' 50'

STATE OF TEXAS
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1/18/2022

PROPOSED SIGNAL LAYOUT US 59 AT ELYSIAN FIELDS AVE.

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			64
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

N

LEGEND

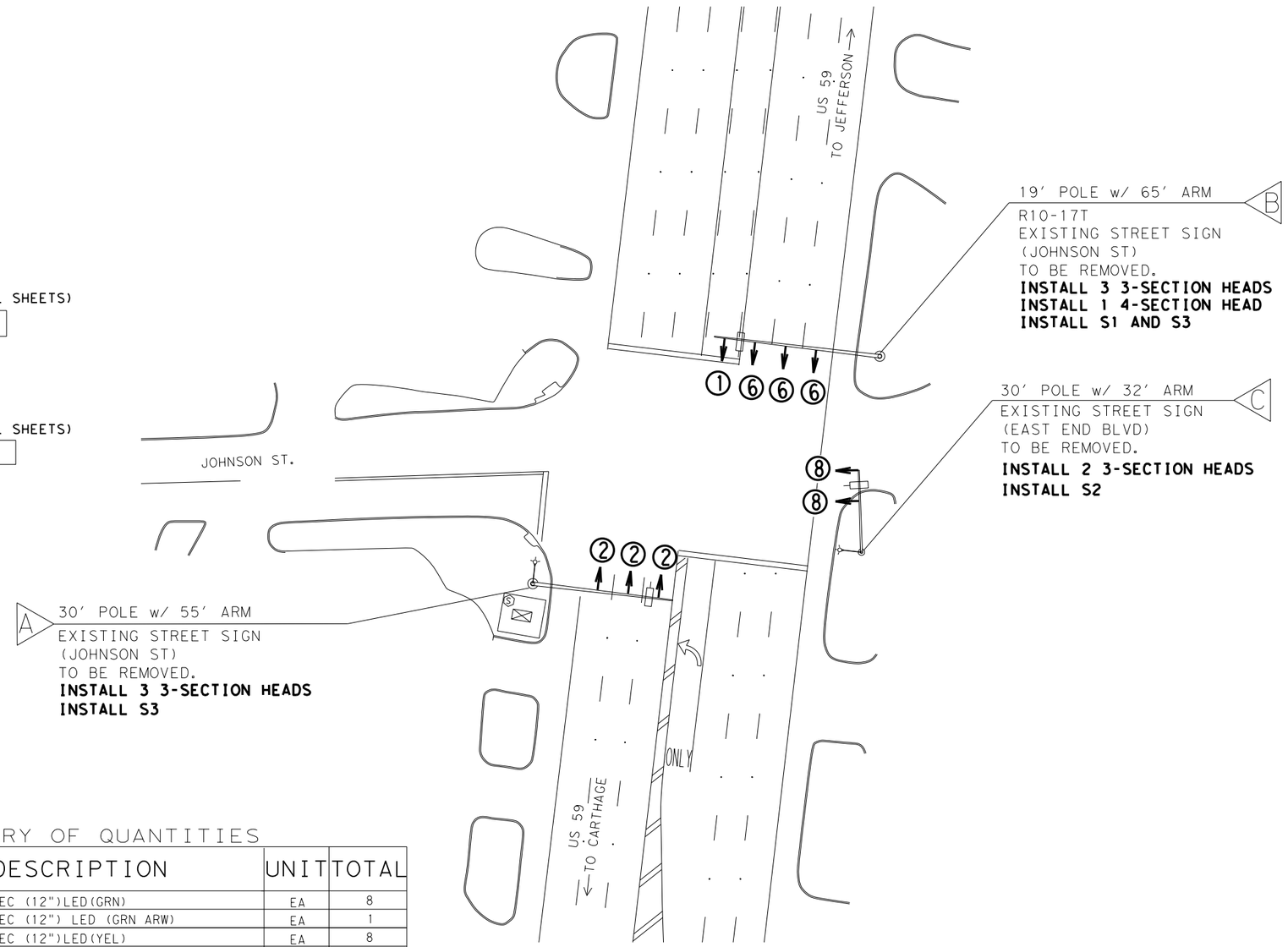
- SIGNAL POLE
- VIVD CAMERA
- LUMINAIRE
- ② SIGNAL FACE AND PHASE
- CONTROLLER
- Ⓢ ELECTRICAL SERVICE

SIGNAL FACES		
(R)(Y)(G)	2, 6, AND 8	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.
R S Y F Y G (R)(Y)(Y)(G)	1	12" ONE-WAY, HORIZONTAL 4-SECTION, R-Y-Y-G SIGNAL HEAD.

S1
R10-17T
36"X42"
LEFT TURN YIELD ON FLASHING YELLOW ARROW
1 EA.

S2
VAR. X 18" (SEE SIGN DETAIL SHEETS)
E END BLVD S
1 EA.

S3
VAR. X 18" (SEE SIGN DETAIL SHEETS)
JOHNSON ST
2 EA.



A
30' POLE w/ 55' ARM
EXISTING STREET SIGN
(JOHNSON ST)
TO BE REMOVED.
INSTALL 3 3-SECTION HEADS
INSTALL S3

B
19' POLE w/ 65' ARM
R10-17T
EXISTING STREET SIGN
(JOHNSON ST)
TO BE REMOVED.
INSTALL 3 3-SECTION HEADS
INSTALL 1 4-SECTION HEAD
INSTALL S1 AND S3

C
30' POLE w/ 32' ARM
EXISTING STREET SIGN
(EAST END BLVD)
TO BE REMOVED.
INSTALL 2 3-SECTION HEADS
INSTALL S2

SUMMARY OF QUANTITIES

ITEM	DESC CODE	DESCRIPTION	UNIT	TOTAL
0682	6001	VEH SIG SEC (12")LED(GRN)	EA	8
0682	6002	VEH SIG SEC (12") LED (GRN ARW)	EA	1
0682	6003	VEH SIG SEC (12")LED(YEL)	EA	8
0682	6004	VEH SIG SEC (12") LED (YEL ARW)	EA	2
0682	6005	VEH SIG SEC (12")LED(RED)	EA	8
0682	6006	VEH SIG SEC (12") LED (RED ARW)	EA	1
0682	6054	BACK PLATE W/REFL BRDER (3SEC)(VENT) ALUM	EA	8
0682	6055	BACK PLATE W/REFL BRDER (4SEC)(VENT) ALUM	EA	1
0690	6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	4
0690	6029	INSTALL OF SIGNAL RELATED SIGNS	EA	4
6185	6002	TMA (STATIONARY)	DAY	2

NOTES:
1.) REPLACE ALL SIGNAL HEADS. INSTALL VENTED ALUMINUM BACKPLATES WITH REFLECTIVE BORDER.
2.) EXISTING STREET NAME SIGNS ARE FLAT PANEL ALUMINUM AND MOUNTED ON MAST ARMS. REMOVE EXISTING STREET NAME SIGNS AND MOUNT NEW STREET NAME SIGNS ON MAST ARMS. REMOVE EXISTING LEFT TURN YIELD ON FLASHING YELLOW ARROW SIGN AND INSTALL NEW LEFT TURN YIELD ON FLASHING YELLOW ARROW SIGN.

STATE OF TEXAS
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1/18/2022

PROPOSED SIGNAL LAYOUT US 59 AT JOHNSON ST.

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			65
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

0' 25' 50'

LEGEND

SIGNAL POLE — ② SIGNAL FACE AND PHASE

VIVD CAMERA — CONTROLLER

LUMINAIRE — Ⓢ ELECTRICAL SERVICE

SIGNAL FACES

(R)(Y)(G)	2, 3S, 4, AND 6	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.
R S Y F Y G (R)(Y)(Y)(G)	1 AND 5	12" ONE-WAY, HORIZONTAL 4-SECTION, R-Y-Y-G SIGNAL HEAD.
(R)(Y)(G)(G)	4L	12" ONE-WAY, HORIZONTAL 4-SECTION, R-Y-G-G SIGNAL HEAD.
(R)(Y)(G)	3	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.

S1
R10-17T
36"X42"

LEFT TURN
YIELD
ON FLASHING
YELLOW
ARROW

2 EA.

S2
VAR. X 18" (SEE SIGN DETAIL SHEETS)

E END BLVD S

2 EA.

S3
VAR. X 24" (SEE SIGN DETAIL SHEETS)

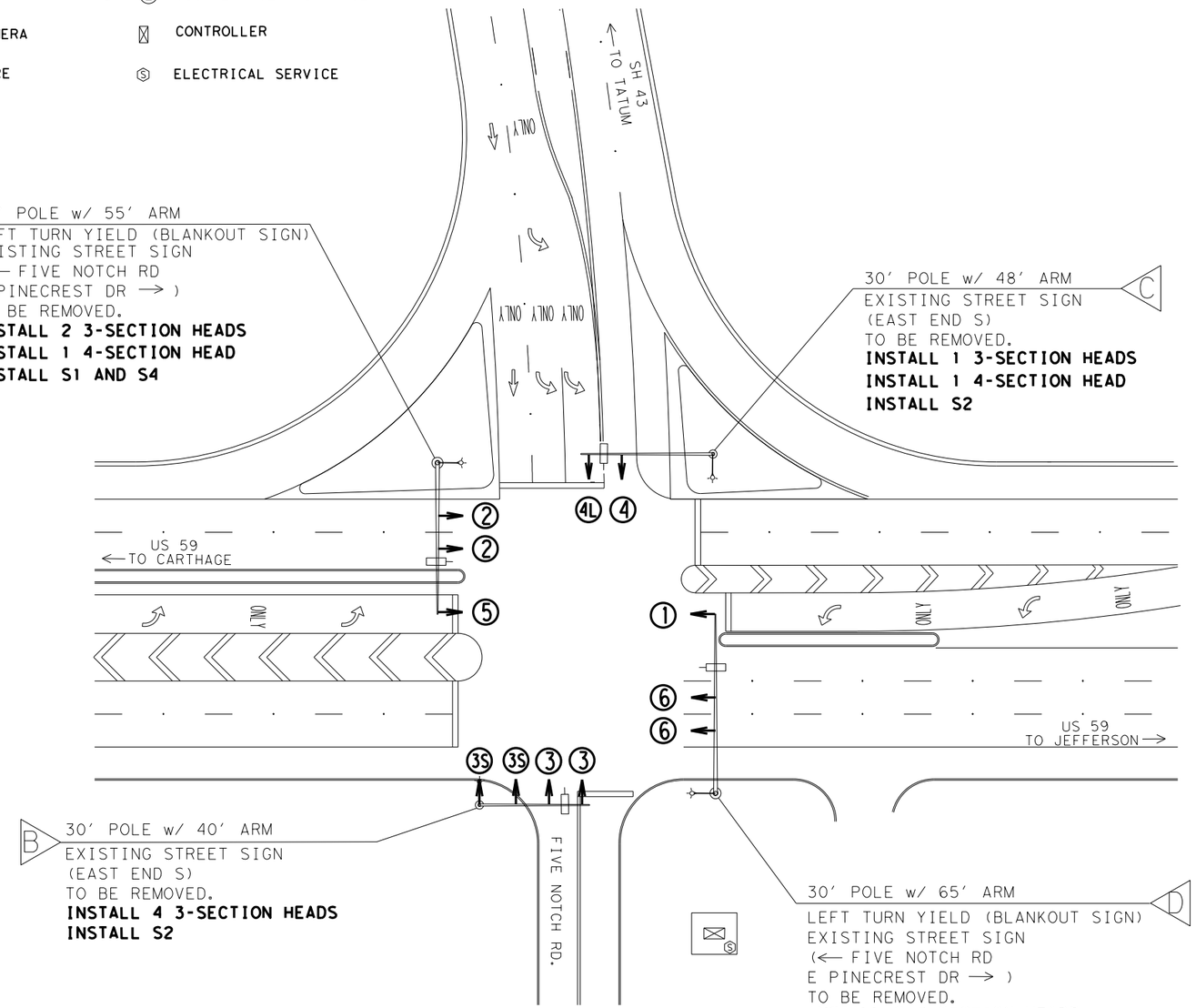
← E PINECREST DR
FIVE NOTCH RD →

1 EA.

S4
VAR. X 24" (SEE SIGN DETAIL SHEETS)

← FIVE NOTCH RD
E PINECREST DR →

1 EA.



SUMMARY OF QUANTITIES

ITEM	DESC CODE	DESCRIPTION	UNIT	TOTAL
0682	6001	VEH SIG SEC (12")LED(GRN)	EA	8
0682	6002	VEH SIG SEC (12") LED (GRN ARW)	EA	5
0682	6003	VEH SIG SEC (12")LED(YEL)	EA	8
0682	6004	VEH SIG SEC (12") LED (YEL ARW)	EA	6
0682	6005	VEH SIG SEC (12")LED(RED)	EA	10
0682	6006	VEH SIG SEC (12") LED (RED ARW)	EA	2
0682	6054	BACK PLATE W/REFL BRDER (3SEC)(VENT) ALUM	EA	9
0682	6055	BACK PLATE W/REFL BRDER (4SEC)(VENT) ALUM	EA	3
0690	6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	6
0690	6029	INSTALL OF SIGNAL RELATED SIGNS	EA	6
6185	6002	TMA (STATIONARY)	DAY	2

NOTES:

1.) REPLACE ALL SIGNAL HEADS. INSTALL VENTED ALUMINUM BACKPLATES WITH REFLECTIVE BORDER.

2.) EXISTING STREET NAME SIGNS ARE FLAT PANEL ALUMINUM AND MOUNTED ON MAST ARMS. REMOVE EXISTING STREET NAME SIGNS AND MOUNT NEW STREET NAME SIGNS ON MAST ARMS. REMOVE EXISTING LEFT TURN YIELD BLANKOUT SIGNS AND INSTALL NEW LEFT TURN YIELD ON FLASHING YELLOW ARROW SIGNS.

3.) CURRENT SIGNAL HEAD ARRANGEMENT FOR 4L IS A FOUR SECTION HEAD WITH RED BALL, YELLOW BALL, GREEN BALL, AND GREEN LEFT ARROW. THESE SIGNAL HEADS WILL BE REPLACED WITH THE ARANGEMENT AS SHOWN IN THE SIGNAL FACE CHART.

0′ 25′ 50′

STATE OF TEXAS
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1/18/2022

PROPOSED SIGNAL LAYOUT US 59 AT SH 43 S.

 Texas Department of Transportation

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			66
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

LEGEND

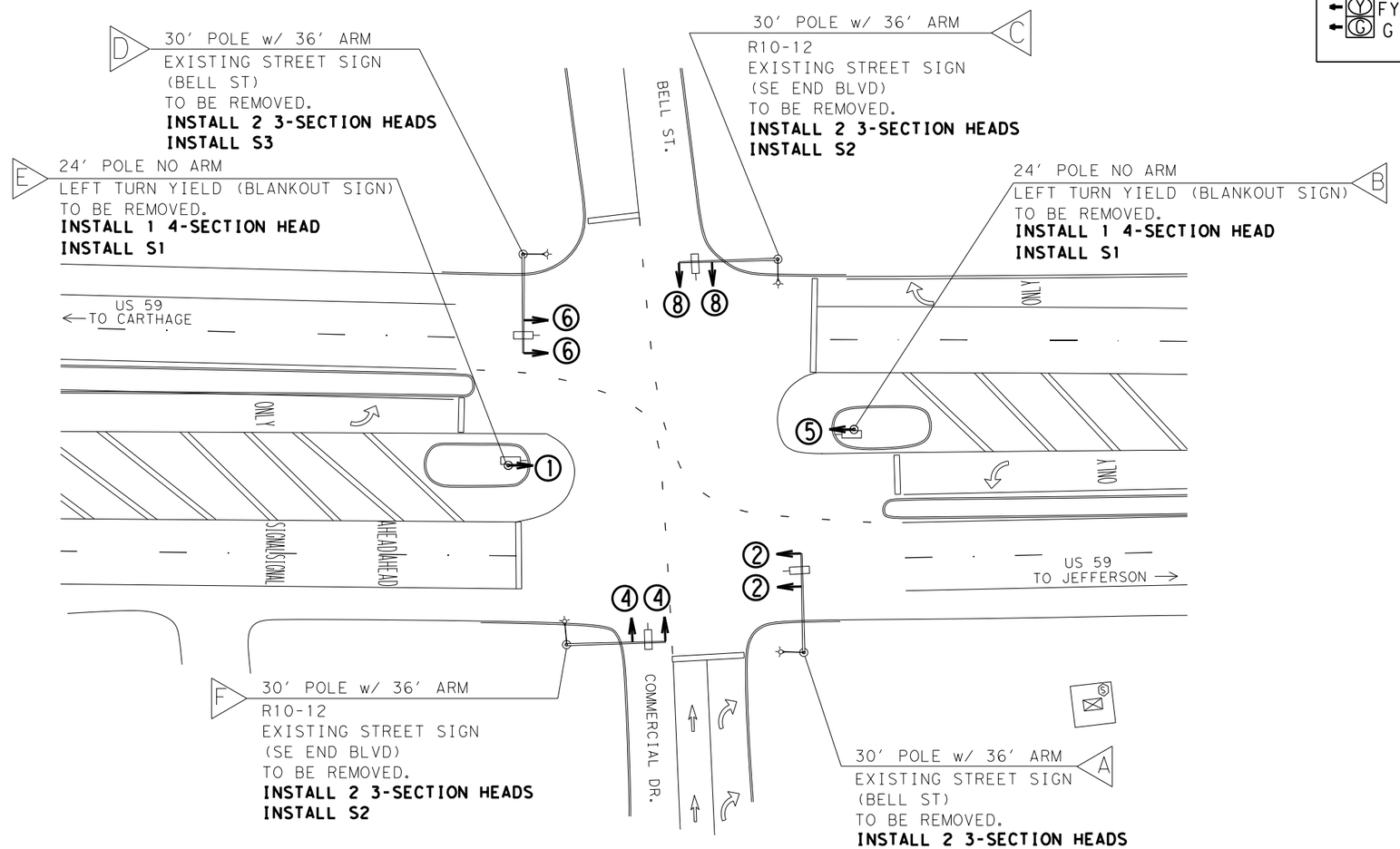
SIGNAL POLE	② SIGNAL FACE AND PHASE
VIVD CAMERA	CONTROLLER
LUMINAIRE	ⓢ ELECTRICAL SERVICE

SIGNAL FACES		
R Y G	2, 4, 6, AND 8	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.
R SY FY G	1 AND 5	12" ONE-WAY, VERTICAL 4-SECTION, R-Y-Y-G SIGNAL HEAD.

S1
R10-17T
36"X42"
LEFT TURN YIELD ON FLASHING YELLOW ARROW
2 EA.

S2
VAR. X 18" (SEE SIGN DETAIL SHEETS)
E END BLVD S
2 EA.

S3
VAR. X 18" (SEE SIGN DETAIL SHEETS)
BELL ST.
2 EA.



SUMMARY OF QUANTITIES

ITEM	DESC CODE	DESCRIPTION	UNIT	TOTAL
0682	6001	VEH SIG SEC (12")LED(GRN)	EA	8
0682	6002	VEH SIG SEC (12") LED (GRN ARW)	EA	2
0682	6003	VEH SIG SEC (12")LED(YEL)	EA	8
0682	6004	VEH SIG SEC (12") LED (YEL ARW)	EA	4
0682	6005	VEH SIG SEC (12")LED(RED)	EA	8
0682	6006	VEH SIG SEC (12") LED (RED ARW)	EA	2
0682	6054	BACK PLATE W/REFL BRDER (3SEC)(VENT) ALUM	EA	8
0682	6055	BACK PLATE W/REFL BRDER (4SEC)(VENT) ALUM	EA	2
0690	6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	8
0690	6029	INSTALL OF SIGNAL RELATED SIGNS	EA	6
6185	6002	TMA (STATIONARY)	DAY	2

NOTES:
1.) REPLACE ALL SIGNAL HEADS. INSTALL VENTED ALUMINUM BACKPLATES WITH REFLECTIVE BORDER.
2.) REPLACE 5-SECTION HEADS ON POLES C AND F WITH 4-SECTION HEADS. REPLACE LEFT TURN YIELD BLANKOUT SIGNS WITH NEW LEFT TURN YIELD ON FLASHING YELLOW ARROW SIGNS.
3.) EXISTING STREET NAME SIGNS ARE FLAT PANEL ALUMINUM AND MOUNTED ON MAST ARMS. INSTALL NEW STREET NAME SIGNS ON MAST ARMS.
4.) REMOVE R10-12 LEFT TURN YIELD ON GREEN BALL SIGNS FOR POLES C AND F. THESE SIGNS ARE NOT TO BE REPLACED.

0' 25' 50'

STATE OF TEXAS
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Christina N. Trowler, P.E.
1/18/2022

PROPOSED SIGNAL LAYOUT US 59 AT BELL ST.

 Texas Department of Transportation

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			67
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

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LEGEND

- SIGNAL POLE
- VIVD CAMERA
- LUMINAIRE
- (2) SIGNAL FACE AND PHASE
- CONTROLLER
- (S) ELECTRICAL SERVICE

S1
R10-12
30"X36"
LEFT TURN
YIELD
ON GREEN
2 EA.

S2
VAR. X 18" (SEE SIGN DETAIL SHEETS)
← SE LOOP
1 EA.

S3
VAR. X 18" (SEE SIGN DETAIL SHEETS)
SE LOOP →
1 EA.

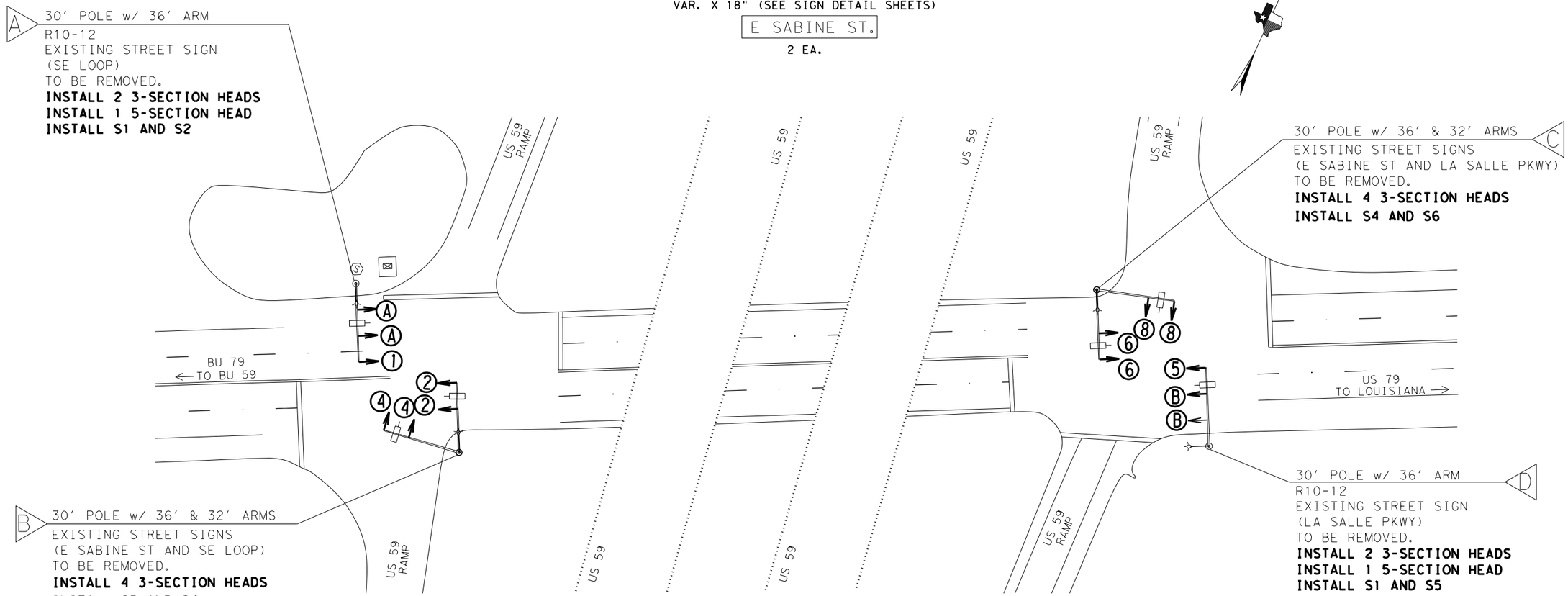
S4
VAR. X 18" (SEE SIGN DETAIL SHEETS)
E SABINE ST.
2 EA.

S5
VAR. X 18" (SEE SIGN DETAIL SHEETS)
← LASALLE PKWY
1 EA.

S6
VAR. X 18" (SEE SIGN DETAIL SHEETS)
LASALLE PKWY →
1 EA.

SIGNAL FACES

(R)(Y)(G)	2, 4, 6, 8, A, AND B	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.
R S Y Y G G (R)(Y)(Y)(G)(G)	1 AND 5	12" ONE-WAY, HORIZONTAL 5-SECTION, ●●●●● SIGNAL HEAD.



SUMMARY OF QUANTITIES

ITEM	DESC CODE	DESCRIPTION	UNIT	TOTAL
0682	6001	VEH SIG SEC (12")LED(GRN)	EA	14
0682	6002	VEH SIG SEC (12") LED (GRN ARW)	EA	2
0682	6003	VEH SIG SEC (12")LED(YEL)	EA	14
0682	6004	VEH SIG SEC (12") LED (YEL ARW)	EA	2
0682	6005	VEH SIG SEC (12")LED(RED)	EA	14
0682	6054	BACK PLATE W/REFL BRDER (3SEC)(VENT) ALUM	EA	12
0682	6056	BACK PLATE W/REFL BRDER (5SEC)(VENT) ALUM	EA	2
0690	6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	8
0690	6029	INSTALL OF SIGNAL RELATED SIGNS	EA	8
6185	6002	TMA (STATIONARY)	DAY	2

NOTES:
1.) REPLACE ALL SIGNAL HEADS. INSTALL VENTED ALUMINUM BACKPLATES WITH REFLECTIVE BORDER.
2.) EXISTING STREET NAME SIGNS ARE FLAT PANEL ALUMINUM AND MOUNTED ON MAST ARMS. REMOVE EXISTING STREET NAME SIGNS AND MOUNT NEW STREET NAME SIGNS ON MAST ARMS. REMOVE EXISTING LEFT TURN YIELD ON GREEN BALL SIGNS AND INSTALL NEW LEFT TURN YIELD ON GREEN BALL SIGNS.

STATE OF TEXAS
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1/18/2022

0' 25' 50'

PROPOSED SIGNAL LAYOUT US 59 AT US 79

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			68
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

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LEGEND

SIGNAL POLE
VIVD CAMERA
LUMINAIRE
② SIGNAL FACE AND PHASE
CONTROLLER
Ⓢ ELECTRICAL SERVICE

S1
R10-17T
36"X42"
LEFT TURN YIELD ON FLASHING YELLOW ARROW
2 EA.

S2
R6-1L
36"X12"
ONE WAY
2 EA.

S3
VAR. X 18" (SEE SIGN DETAIL SHEETS)
LASALLE PKWY
2 EA.

S4
VAR. X 18" (SEE SIGN DETAIL SHEETS)
FORSYTHE ST
2 EA.

A 30' POLE w/44 ARM
EXISTING STREET SIGN
(FORSYTHE ST)
TO BE REMOVED.
INSTALL 2 3-SECTION HEADS
INSTALL S4

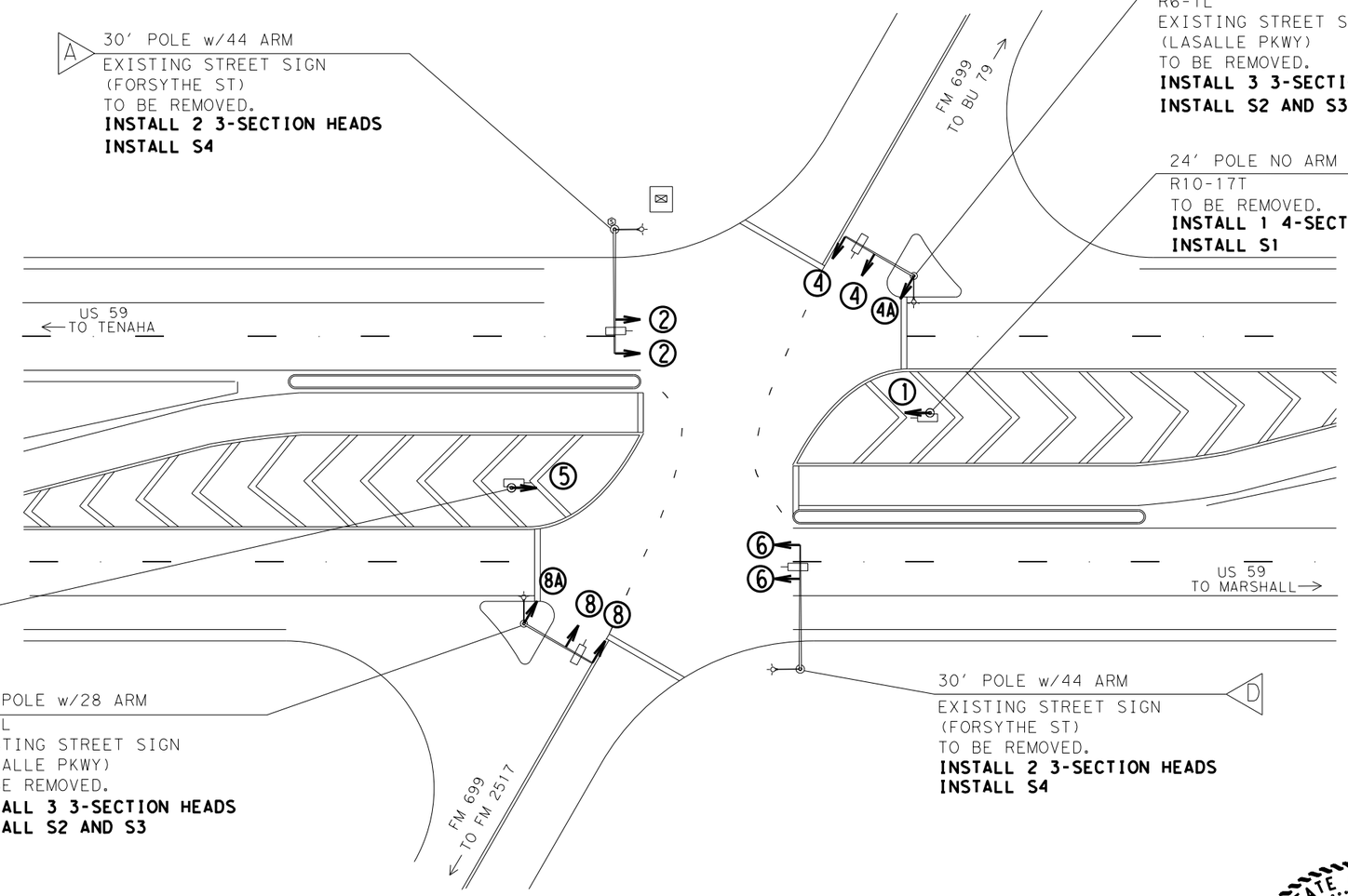
B 30' POLE w/28 ARM
R6-1L
EXISTING STREET SIGN
(LASALLE PKWY)
TO BE REMOVED.
INSTALL 3 3-SECTION HEADS
INSTALL S2 AND S3

C 24' POLE NO ARM
R10-17T
TO BE REMOVED.
INSTALL 1 4-SECTION HEAD
INSTALL S1

D 30' POLE w/44 ARM
EXISTING STREET SIGN
(FORSYTHE ST)
TO BE REMOVED.
INSTALL 2 3-SECTION HEADS
INSTALL S4

E 30' POLE w/28 ARM
R6-1L
EXISTING STREET SIGN
(LASALLE PKWY)
TO BE REMOVED.
INSTALL 3 3-SECTION HEADS
INSTALL S2 AND S3

F 24' POLE NO ARM
R10-17T
TO BE REMOVED.
INSTALL 1 4-SECTION HEAD
INSTALL S1



SIGNAL FACES

R Y G	2, 4, 6, AND 8	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.
R Y G	4A AND 8A	12" ONE-WAY, VERTICAL 3-SECTION, R-Y-G SIGNAL HEAD.
R Y Y G	1 AND 5	12" ONE-WAY, VERTICAL 4-SECTION, R-Y-Y-G SIGNAL HEAD.

SUMMARY OF QUANTITIES

ITEM	DESC CODE	DESCRIPTION	UNIT	TOTAL
0682	6001	VEH SIG SEC (12")LED(GRN)	EA	10
0682	6002	VEH SIG SEC (12") LED (GRN ARW)	EA	2
0682	6003	VEH SIG SEC (12")LED(YEL)	EA	10
0682	6004	VEH SIG SEC (12") LED (YEL ARW)	EA	4
0682	6005	VEH SIG SEC (12")LED(RED)	EA	10
0682	6006	VEH SIG SEC (12") LED (RED ARW)	EA	2
0682	6054	BACK PLATE W/REFL BRDER (3SEC)(VENT) ALUM	EA	10
0682	6055	BACK PLATE W/REFL BRDER (4SEC)(VENT) ALUM	EA	2
0690	6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	8
0690	6029	INSTALL OF SIGNAL RELATED SIGNS	EA	8
6185	6002	TMA (STATIONARY)	DAY	2

NOTES:
1.) REPLACE ALL SIGNAL HEADS. INSTALL VENTED ALUMINUM BACKPLATES WITH REFLECTIVE BORDER.
2.) REPLACE 5-SECTION HEADS ON POLES C AND F WITH 4-SECTION HEADS. REPLACE LEFT TURN YIELD ON FLASHING ARROW SIGNS WITH NEW LEFT TURN YIELD ON FLASHING YELLOW ARROW SIGNS.
3.) EXISTING STREET NAME SIGNS ARE FLAT PANEL ALUMINUM AND MOUNTED ON MAST ARMS. INSTALL NEW STREET NAME SIGNS ON MAST ARMS.
4.) REPLACE R6-1L ONE WAY SIGNS ON POLES B AND E.

STATE OF TEXAS
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114588
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PROFESSIONAL ENGINEER

Christina N. Trowler, P.E.
1/18/2022

0' 25' 50'

PROPOSED SIGNAL LAYOUT US 59 AT FM 699

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			69
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

LEGEND

- SIGNAL POLE
- VIVD CAMERA
- LUMINAIRE
- ② SIGNAL FACE AND PHASE
- CONTROLLER
- Ⓢ ELECTRICAL SERVICE

S1
R10-17T
36"X42"

2 EA.

S2
VAR. X 18" (SEE SIGN DETAIL SHEETS)

1 EA.

S3
VAR. X 18" (SEE SIGN DETAIL SHEETS)

1 EA.

S4
VAR. X 18" (SEE SIGN DETAIL SHEETS)

1 EA.

S5
VAR. X 18" (SEE SIGN DETAIL SHEETS)

1 EA.

S6
VAR. X 18" (SEE SIGN DETAIL SHEETS)

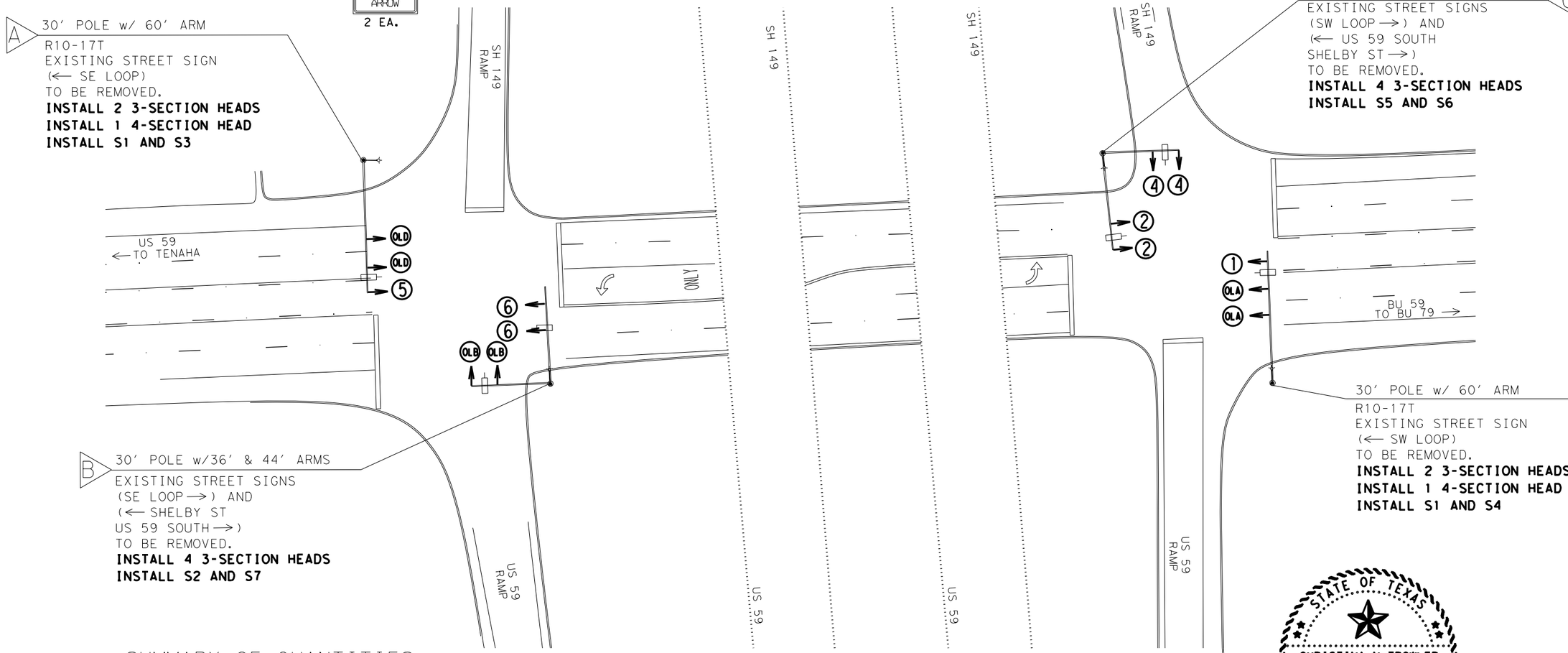
1 EA.

S7
VAR. X 18" (SEE SIGN DETAIL SHEETS)

1 EA.

SIGNAL FACES

(R)(Y)(G)	2,4,6,8, OLA, OLB, AND OLD	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.
R S Y F Y G (R)(Y)(Y)(G)	1 AND 5	12" ONE-WAY, HORIZONTAL 4-SECTION, R-Y-Y-G SIGNAL HEAD.



SUMMARY OF QUANTITIES

ITEM	DESC CODE	DESCRIPTION	UNIT	TOTAL
0682	6001	VEH SIG SEC (12")LED(GRN)	EA	12
0682	6002	VEH SIG SEC (12") LED (GRN ARW)	EA	2
0682	6003	VEH SIG SEC (12")LED(YEL)	EA	12
0682	6004	VEH SIG SEC (12") LED (YEL ARW)	EA	4
0682	6005	VEH SIG SEC (12")LED(RED)	EA	12
0682	6006	VEH SIG SEC (12") LED (RED ARW)	EA	2
0682	6054	BACK PLATE W/REFL BRDER (3SEC)(VENT) ALUM	EA	12
0682	6055	BACK PLATE W/REFL BRDER (4SEC)(VENT) ALUM	EA	2
0690	6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	8
0690	6029	INSTALL OF SIGNAL RELATED SIGNS	EA	8
6185	6002	TMA (STATIONARY)	DAY	2

NOTES:
1.) REPLACE ALL SIGNAL HEADS. INSTALL VENTED ALUMINUM BACKPLATES WITH REFLECTIVE BORDER.
2.) EXISTING STREET NAME SIGNS ARE FLAT PANEL ALUMINUM AND MOUNTED ON MAST ARMS. REMOVE EXISTING STREET NAME SIGNS AND MOUNT NEW STREET NAME SIGNS ON MAST ARMS. REMOVE EXISTING LEFT TURN YIELD ON FLASHING YELLOW ARROW SIGNS AND INSTALL NEW LEFT TURN YIELD ON FLASHING YELLOW ARROW SIGNS.

0′ 25′ 50′

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED
PROFESSIONAL ENGINEER

Christina N. Trowler, P.E.

1/18/2022

PROPOSED SIGNAL LAYOUT US 59 AT SH 149

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			70
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

LEGEND

SIGNAL POLE	(2) SIGNAL FACE AND PHASE
VIVD CAMERA	CONTROLLER
LUMINAIRE	(S) ELECTRICAL SERVICE

SIGNAL FACES		
R Y G	2, 4, 6, AND 8	12" ONE-WAY, HORIZONTAL 3-SECTION, R-Y-G SIGNAL HEAD.
R Y G	8A	12" ONE-WAY, VERTICAL 3-SECTION, R-Y-G SIGNAL HEAD.

S1
R10-12
30"X36"

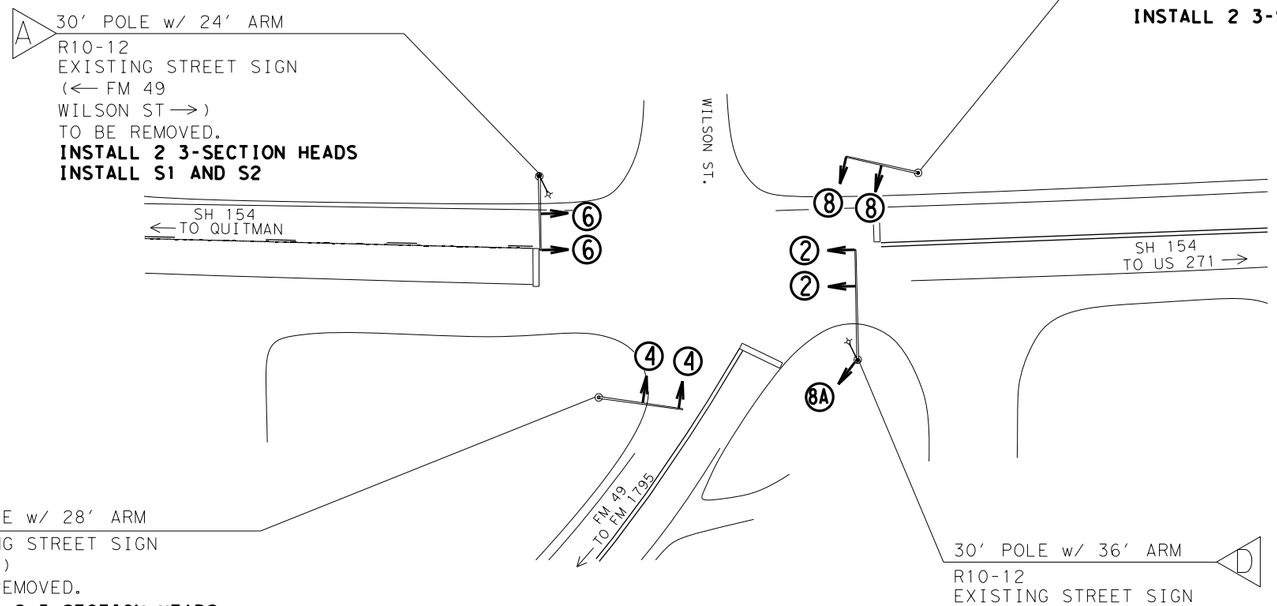
2 EA.

S2
VAR. X 24" (SEE SIGN DETAIL SHEETS)

1 EA.

S3
VAR. X 24" (SEE SIGN DETAIL SHEETS)

1 EA.



SUMMARY OF QUANTITIES

ITEM	DESC CODE	DESCRIPTION	UNIT	TOTAL
0682	6001	VEH SIG SEC (12")LED(GRN)	EA	9
0682	6003	VEH SIG SEC (12")LED(YEL)	EA	9
0682	6005	VEH SIG SEC (12")LED(RED)	EA	9
0682	6054	BACK PLATE W/REFL BRDER (3SEC)(VENT) ALUM	EA	9
0690	6027	REMOVAL OF SIGNAL RELATED SIGNS	EA	6
0690	6029	INSTALL OF SIGNAL RELATED SIGNS	EA	4
6185	6002	TMA (STATIONARY)	DAY	2

NOTES:
1.) REPLACE ALL SIGNAL HEADS. INSTALL VENTED ALUMINUM BACKPLATES WITH REFLECTIVE BORDER.
2.) EXISTING STREET NAME SIGNS ARE FLAT PANEL ALUMINUM AND MOUNTED ON MAST ARMS. REMOVE EXISTING STREET NAME SIGNS AND MOUNT NEW STREET NAME SIGNS ON MAST ARMS. REMOVE EXISTING LEFT TURN YIELD ON GREEN BALLS SIGNS AND INSTALL NEW LEFT TURN YIELD ON GREEN BALL SIGNS.
3.) REMOVE SH 154 STREET NAME SIGNS. THESE ARE NOT NEEDED AS WE HAVE GROUND MOUNT ROUTE MARKERS IN PLACE.

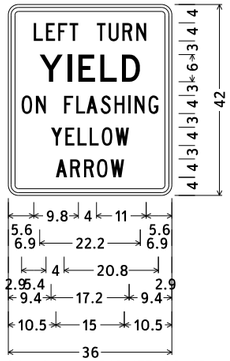
0' 25' 50'

Christina N. Trowler, P.E.
1/18/2022

PROPOSED SIGNAL LAYOUT SH 154 AT FM 49

 Texas Department of Transportation

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			71
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

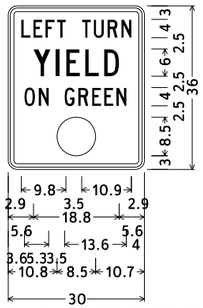


Identifier : R10-17T_36x42;
2.3" Radius, 0.9" Border, 0.6" Indent, Black on White;
[LEFT TURN] C;
[YIELD] D;
[ON FLASHING] C;
[YELLOW] C;
[ARROW] C;

LOCATIONS

IH 369 AT US 82 - 2 EA.
IH 369 AT US 67 - 2 EA.
US 59 AT SL 151 - 2 EA.
US 59 AT FM 989 - 2 EA.
US 59 AT FM 2148 - 1 EA.
SH 93 AT US 82 - 4 EA.
US 59 AT EMMA LENA WAY - 2 EA.
US 59 AT SH 77 - 2 EA.
SH 77 AT FM 251 - 2 EA.
US 59 AT FM 125 - 2 EA.
US 59 AT SH 155 - 1 EA.
US 271 AT SL 179 - 1 EA.
US 59 AT SH 49 - 2 EA.
US 59 AT FM 2208 - 2 EA.
US 59 AT SL 390 - 4 EA.
US 59 AT POPLAR ST. - 2 EA.
US 59 AT SH 43 N. - 1 EA.
US 59 AT HOUSTON ST. - 4 EA.
US 59 AT FM 31 - 4 EA.
US 59 AT ELYSIAN FIELDS AVE. - 2 EA.
US 59 AT JOHNSON ST. - 1 EA.
US 59 AT SH 43 S. - 2 EA.
US 59 AT BELL ST. - 2 EA.
US 59 AT FM 699 - 2 EA.
US 59 AT SH 149 - 2 EA.

REGULATORY SIGNS
VARIOUS INTERSECTIONS

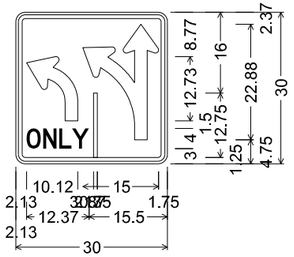


Identifier : R10-12_30x36;
2.0" Radius, 0.8" Border, 0.5" Indent, Black on White;
[LEFT TURN] C;
[YIELD] C 115} spacing;
[ON GREEN] C;

LOCATIONS

US 59 AT US 79 - 2 EA.
SH 154 AT FM 49 - 2 EA.

REGULATORY SIGNS
VARIOUS INTERSECTIONS



R3-8L_30x30;
1.88" Radius, 0.75" Border, 0.50" Indent, Black on, White;
AL ir=4.5, s=2.5;
"ONLY", D 50% spacing;
BL ir=13.25, s=2.5;

LOCATIONS

IH 369 AT US 82 - 2 EA.
IH 369 AT US 67 - 2 EA.
US 59 AT SL 390 - 2 EA.

REGULATORY SIGNS
VARIOUS INTERSECTIONS

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED
PROFESSIONAL ENGINEER

Christina N. Trowler, P.E.

1/18/2022

SIGN DETAIL SHEETS

SHEET 1 OF 9

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			72
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

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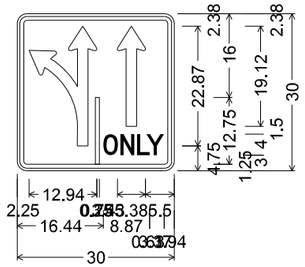
LOCATIONS

US 59 AT SL 151 - 2 EA

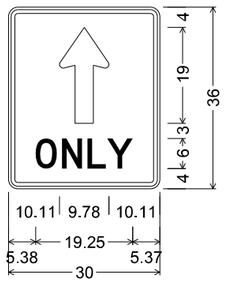


R3-8MS(1)_30x30;
1.88" Radius, 0.75" Border, 0.50" Indent, Black on, White;
M ir=13.25, s=2;
S h=19.125, s=2;
"ONL Y", D 50% spacing;

REGULATORY SIGNS
VARIOUS INTERSECTIONS

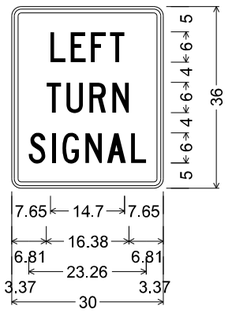
LOCATIONS

US 59 AT SH 77 - 1 EA



R3-5a_30x36;
1.88" Radius, 0.75" Border, 0.50" Indent, Black on, White;
Standard Arrow Custom 19.00" X 9.78" 90';
"ONLY", D specified length;

REGULATORY SIGNS
VARIOUS INTERSECTIONS



LOCATIONS

US 59 AT SH 77 - 2 EA.
US 59 AT US 80 - 4 EA.

R10-10L_30x36;
1.88" Radius, 0.75" Border, 0.50" Indent, Black on, White;
"LEFT", C;
"TURN", C;
"SIGNAL", C;

REGULATORY SIGNS
VARIOUS INTERSECTIONS

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED
PROFESSIONAL ENGINEER

Christina N. Trowler, P.E.

1/18/2022

SIGN DETAIL SHEETS

Texas Department of Transportation

SHEET 2 OF 9

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			73
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

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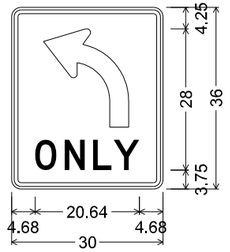
LOCATIONS

US 59 AT SH 77 - 2 EA.

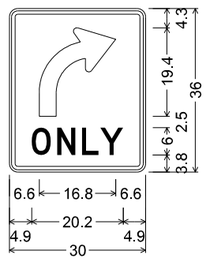


R3-5L_30x36;
1.88" Radius, 0.75" Border, 0.50" Indent, Black on, White;

REGULATORY SIGNS
VARIOUS INTERSECTIONS

LOCATIONS

US 59 AT SL 390 - 2 EA.

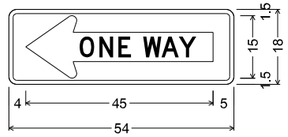


R3-5R_30x36;
1.9" Radius, 0.8" Border, 0.5" Indent, Black on, White;
"ONLY", D;

REGULATORY SIGNS
VARIOUS INTERSECTIONS

LOCATIONS

US 59 AT FM 699 - 2 EA.



R6-1L_54x18;
1.88" Radius, 1.00" Border, White on, Black;
One Way;

REGULATORY SIGNS
VARIOUS INTERSECTIONS

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED
PROFESSIONAL ENGINEER

Christina N. Trowler, P.E.

1/18/2022

SIGN DETAIL SHEETS

Texas Department of Transportation

SHEET 3 OF 9

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			74
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

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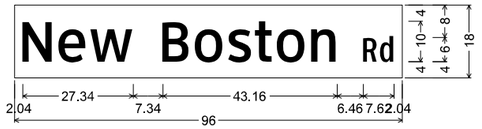
S3 - 2 EA.

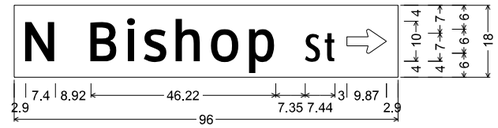


D3-1;
No border, White on, Green;
"New Boston"ClearviewHwy-3-W " Rd", ClearviewHwy-2-W 60% spacing;

S4 - 1 EA.

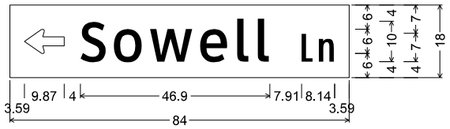
No border, White on, Green;
Standard Arrow Custom 9.88" X 6.00" 180';
"N Bishop"ClearviewHwy-3-W " St", ClearviewHwy-2-W;

S5 - 1 EA.



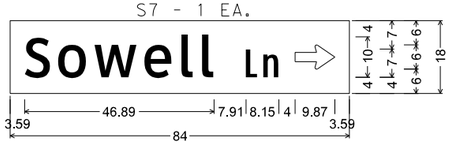
No border, White on, Green;
"N Bishop"ClearviewHwy-3-W " St", ClearviewHwy-2-W;
Standard Arrow Custom 9.88" X 6.00" 0';

S6 - 1 EA.



No border, White on, Green;
Standard Arrow Custom 9.88" X 6.00" 180';
"Sowell"ClearviewHwy-3-W " Ln", ClearviewHwy-2-W;

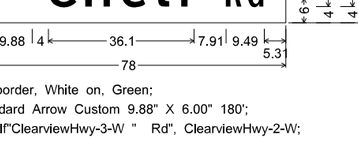
S7 - 1 EA.



No border, White on, Green;
"Sowell"ClearviewHwy-3-W " Ln", ClearviewHwy-2-W;
Standard Arrow Custom 9.88" X 6.00" 0';

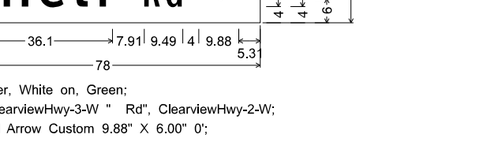
STREET NAME SIGNS
IH 369 AT US 82

S3 - 2 EA.



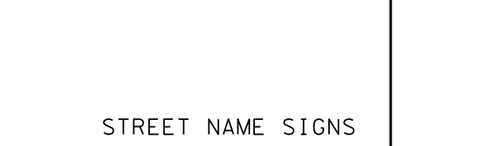
No border, White on, Green;
"W 7th"ClearviewHwy-3-W " St", ClearviewHwy-2-W;

S4 - 1 EA.



No border, White on, Green;
Standard Arrow Custom 9.88" X 6.00" 180';
"S Bishop"ClearviewHwy-3-W " St", ClearviewHwy-2-W;

S5 - 1 EA.

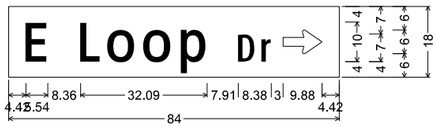


No border, White on, Green;
"S Bishop"ClearviewHwy-3-W " St", ClearviewHwy-2-W;
Standard Arrow Custom 9.88" X 6.00" 0';

S6 - 1 EA.

No border, White on, Green;
Standard Arrow Custom 9.88" X 6.00" 180';
"E Loop"ClearviewHwy-3-W " Dr", ClearviewHwy-2-W;

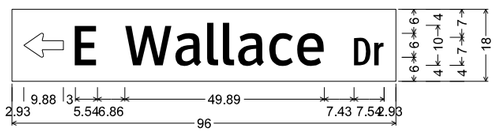
S7 - 1 EA.



No border, White on, Green;
"E Loop"ClearviewHwy-3-W " Dr", ClearviewHwy-2-W;
Standard Arrow Custom 9.88" X 6.00" 0';

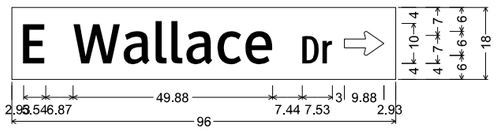
STREET NAME SIGNS
IH 369 AT US 67

S3 - 1 EA.



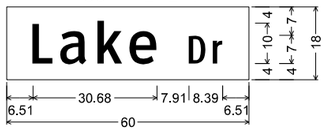
No border, White on, Green;
Standard Arrow Custom 9.88" X 6.00" 180';
"E Wallace"ClearviewHwy-3-W " Dr", ClearviewHwy-2-W 50% spacing;

S4 - 1 EA.



No border, White on, Green;
"E Wallace"ClearviewHwy-3-W " Dr", ClearviewHwy-2-W 50% spacing;
Standard Arrow Custom 9.88" X 6.00" 0';

S5 - 2 EA.

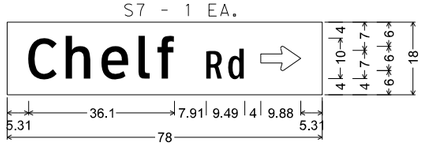


No border, White on, Green;
"Lake"ClearviewHwy-3-W " Dr", ClearviewHwy-2-W;

S6 - 1 EA.

No border, White on, Green;
Standard Arrow Custom 9.88" X 6.00" 180';
"Chelf"ClearviewHwy-3-W " Rd", ClearviewHwy-2-W;

S7 - 1 EA.



No border, White on, Green;
"Chelf"ClearviewHwy-3-W " Rd", ClearviewHwy-2-W;
Standard Arrow Custom 9.88" X 6.00" 0';

STREET NAME SIGNS
US 59 AT SL 151

Christina N. Trowler, P.E.

1/18/2022

SIGN DETAIL SHEETS

 Texas Department of Transportation

SHEET 4 OF 9

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			75
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

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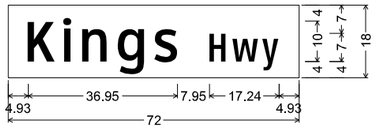
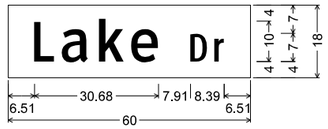
S2 - 2 EA.



No border, White on, Green;
"Kings"ClearviewHwy-3-W " Hwy", ClearviewHwy-2-W;

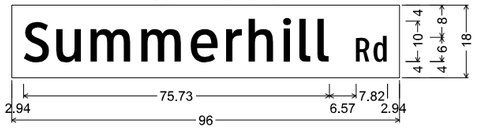
S3 - 2 EA.



No border, White on, Green;
"Lake"ClearviewHwy-3-W " Dr", ClearviewHwy-2-W;

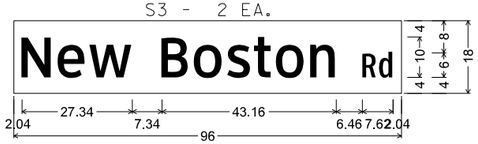
STREET NAME SIGNS
US 59 AT FM 989

S2 - 2 EA.



D3-1;
No border, White on, Green;
"Summerhill"ClearviewHwy-3-W " Rd", ClearviewHwy-2-W 75% spacing;

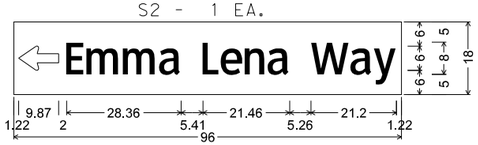
S3 - 2 EA.



D3-1;
No border, White on, Green;
"New Boston"ClearviewHwy-3-W " Rd", ClearviewHwy-2-W 60% spacing;

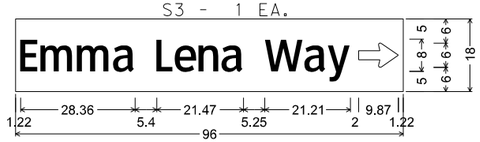
STREET NAME SIGNS
SH 93 AT US 82

S2 - 1 EA.



No border, White on, Green;
Standard Arrow Custom 9.88" X 6.00" 180';
"Emma Lena Way", ClearviewHwy-3-W 30% spacing;

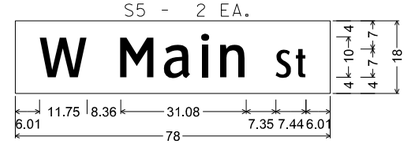
S3 - 1 EA.



No border, White on, Green;
"Emma Lena Way", ClearviewHwy-3-W 30% spacing;
Standard Arrow Custom 9.88" X 6.00" 0';

STREET NAME SIGNS
US 59 AT EMA LENA WAY

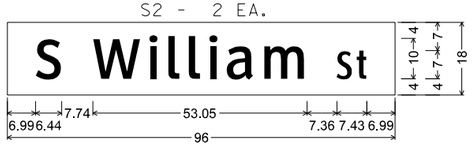
S5 - 2 EA.



No border, White on, Green;
"W Main"ClearviewHwy-3-W " St", ClearviewHwy-2-W;

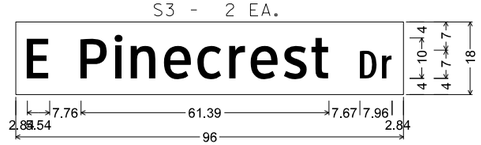
STREET NAME SIGNS
US 59 AT SH 77

S2 - 2 EA.



No border, White on, Green;
"S William"ClearviewHwy-3-W " St", ClearviewHwy-2-W;

S3 - 2 EA.



No border, White on, Green;
"E Pinecrest"ClearviewHwy-3-W " Dr", ClearviewHwy-2-W 75% spacing;

STREET NAME SIGNS
SH 77 AT FM 251

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED
PROFESSIONAL ENGINEER

Christina N. Trowler, P.E.

1/18/2022

SIGN DETAIL SHEETS

 Texas Department of Transportation

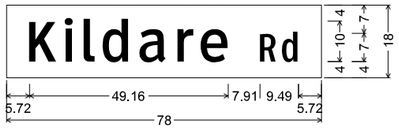
SHEET 5 OF 9

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			76

STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

FILE: T:\Engdata\Traffic\DGN\d192515 Jamie\JOBS\SAFETY PROJECTS\SCSJ 0062-04-051 Reflective Backplates\Sign Details.dgn
DATE: 1/4/2022 10:25:22 AM

S2 - 2 EA.



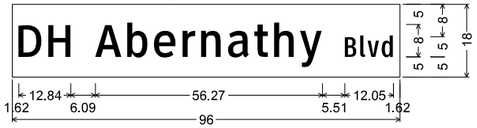
No border, White on, Green;
"Kildare"ClearviewHwy-3-W " Rd", ClearviewHwy-2-W;

STREET NAME SIGNS
US 59 AT FM 125

S2 - 1 EA.

No border, White on, Green;
"Greer"ClearviewHwy-3-W " Blvd", ClearviewHwy-2-W;

S3 - 2 EA.



No border, White on, Green;
"DH Abernathy"ClearviewHwy-3-W " Blvd", ClearviewHwy-2-W 80% spacing;

STREET NAME SIGNS
US 271 AT SL 179

S2 - 2 EA.

No border, White on, Green;
"Broadway"ClearviewHwy-3-W " St", ClearviewHwy-2-W;

S3 - 2 EA.

No border, White on, Green;
"Walcott"ClearviewHwy-3-W " St", ClearviewHwy-2-W;

STREET NAME SIGNS
US 59 AT SH 49

S4 - 2 EA.

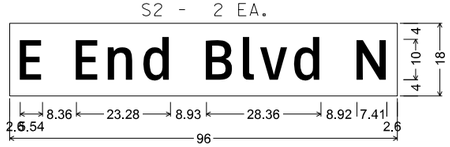
No border, White on, Green;
"E End Blvd N", ClearviewHwy-3-W;

S5 - 2 EA.

No border, White on, Green;
"Ernest F Smith"ClearviewHwy-3-W " Pkwy", ClearviewHwy-2-W 50% spacing;

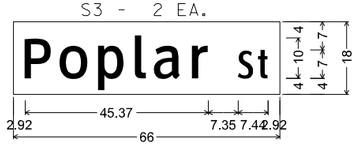
STREET NAME SIGNS
US 59 AT SL 390

S2 - 2 EA.



No border, White on, Green;
"E End Blvd N", ClearviewHwy-3-W;

S3 - 2 EA.



No border, White on, Green;
"Poplar"ClearviewHwy-3-W " St", ClearviewHwy-2-W;

STREET NAME SIGNS
US 59 AT POPLAR ST.

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED
PROFESSIONAL ENGINEER

Christina N. Trowler, P.E.

1/18/2022

SIGN DETAIL SHEETS

Texas Department of Transportation

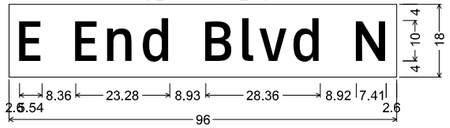
SHEET 6 OF 9

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			77

STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

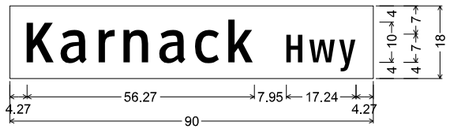
FILE: T:\Engdata\Traffic\DGN\d192515 Jamie\JOBS\SAFETY PROJECTS\CSJ 0062-04-051 Reflective Backplates\Sign Details.dgn
DATE: 1/4/2022 10:26:07 AM

S2 - 1 EA.



No border, White on, Green;
"E End Blvd N", ClearviewHwy-3-W;

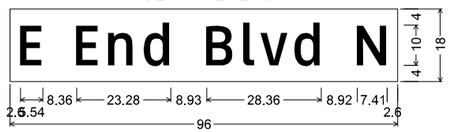
S3 - 2 EA.



No border, White on, Green;
"Karnack"ClearviewHwy-3-W " Hwy", ClearviewHwy-2-W;

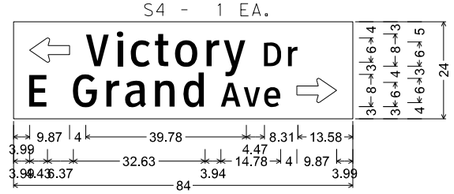
STREET NAME SIGNS
US 59 AT SH 43 N.

S2 - 2 EA.



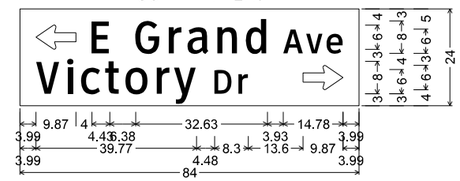
No border, White on, Green;
"E End Blvd N", ClearviewHwy-3-W;

S4 - 1 EA.



No border, White on, Green;
Standard Arrow Custom 9.88" X 6.00" 180';
"Victory Dr", ClearviewHwy-3-W;
"E Grand Ave", ClearviewHwy-3-W;
Standard Arrow Custom 9.88" X 6.00" 0';

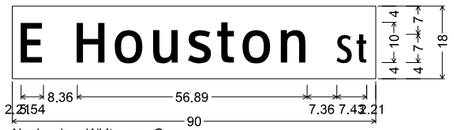
S3 - 1 EA.



No border, White on, Green;
Standard Arrow Custom 9.88" X 6.00" 180';
"E Grand Ave", ClearviewHwy-3-W;
"Victory Dr", ClearviewHwy-3-W;
Standard Arrow Custom 9.88" X 6.00" 0';

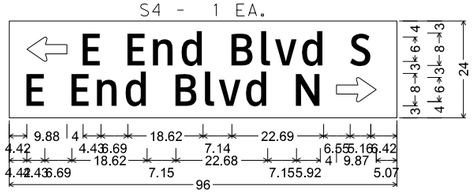
STREET NAME SIGNS
US 59 AT US 80

S2 - 2 EA.



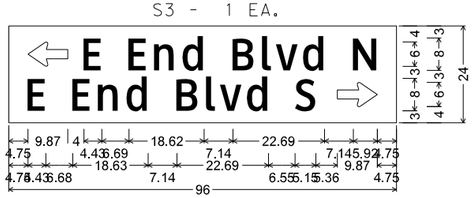
No border, White on, Green;
"E Houston"ClearviewHwy-3-W " St", ClearviewHwy-2-W;

S4 - 1 EA.



No border, White on, Green;
Standard Arrow Custom 9.88" X 6.00" 180';
"E End Blvd S", ClearviewHwy-3-W;
"E End Blvd N", ClearviewHwy-3-W;
Standard Arrow Custom 9.88" X 6.00" 0';

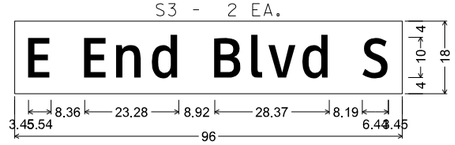
S3 - 1 EA.



No border, White on, Green;
Standard Arrow Custom 9.88" X 6.00" 180';
"E End Blvd N", ClearviewHwy-3-W;
"E End Blvd S", ClearviewHwy-3-W;
Standard Arrow Custom 9.88" X 6.00" 0';

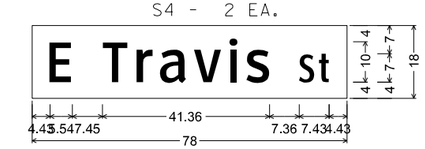
STREET NAME SIGNS
US 59 AT HOUSTON ST.

S3 - 2 EA.



No border, White on, Green;
"E End Blvd S", ClearviewHwy-3-W;

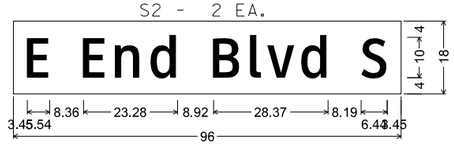
S4 - 2 EA.



No border, White on, Green;
"E Travis"ClearviewHwy-3-W " St", ClearviewHwy-2-W;

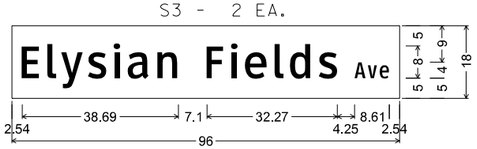
STREET NAME SIGNS
US 59 AT FM 31

S2 - 2 EA.



No border, White on, Green;
"E End Blvd S", ClearviewHwy-3-W;

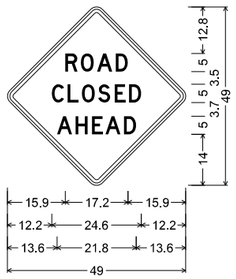
S3 - 2 EA.



No border, White on, Green;
"Elysian Fields"ClearviewHwy-3-W " Ave", ClearviewHwy-2-W;

STREET NAME SIGNS
US 59 AT ELYSIAN FIELDS AVE.

1 EA.



CW20-3D_36x36;
36.0" across sides 2.3" Radius, 0.9" Border, 0.6" Indent, Black on, Orange;
"ROAD", D;
"CLOSED", D;
"AHEAD", D;

THESE SIGNS ARE SUBSIDIARY TO ITEM 502.

4 EA.

R11-2_48x30;
1.9" Radius, 0.8" Border, 0.5" Indent, Black on, White;
"ROAD", D;
"CLOSED", D;

CLOSURE SIGNS
US 59 AT FM 31
(TRAVIS ST.)

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED
PROFESSIONAL ENGINEER

Christina N. Trowler, P.E.
1/18/2022

SIGN DETAIL SHEETS

 Texas Department of Transportation

SHEET 7 OF 9

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			78
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

FILE: T:\Engdata\Traffic\DGN\d192515 Jamie\JOBS\SAFETY PROJECTS\CSJ 0062-04-051 Reflective Backplates\Sign Details.dgn
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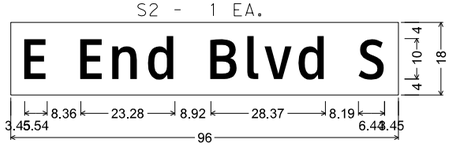
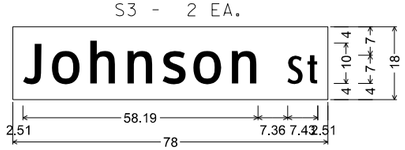
S2 - 1 EA.



No border, White on, Green;
"E End Blvd S", ClearviewHwy-3-W;

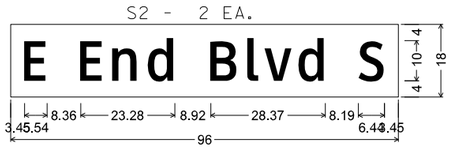
S3 - 2 EA.



No border, White on, Green;
"Johnson"ClearviewHwy-3-W " St", ClearviewHwy-2-W;

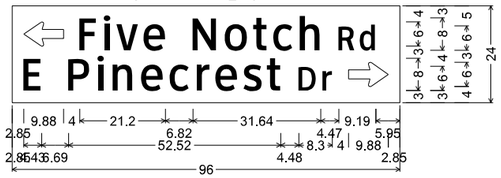
STREET NAME SIGNS
US 59 AT JOHNSON ST.

S2 - 2 EA.



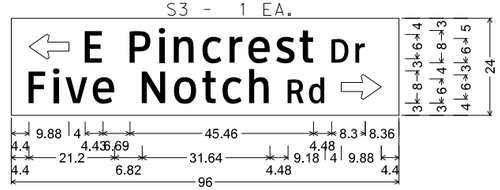
No border, White on, Green;
"E End Blvd S", ClearviewHwy-3-W;

S4 - 1 EA.



No border, White on, Green;
Standard Arrow Custom 9.88" X 6.00" 180';
"Five Notch Rd", ClearviewHwy-3-W;
"E Pinecrest Dr", ClearviewHwy-3-W;
Standard Arrow Custom 9.88" X 6.00" 0';

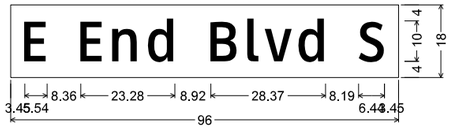
S3 - 1 EA.



No border, White on, Green;
Standard Arrow Custom 9.88" X 6.00" 180';
"E Pincrest Dr", ClearviewHwy-3-W;
"Five Notch Rd", ClearviewHwy-3-W;
Standard Arrow Custom 9.88" X 6.00" 0';

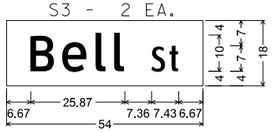
STREET NAME SIGNS
US 59 AT SH 43 S.

S2 - 2 EA.



No border, White on, Green;
"E End Blvd S", ClearviewHwy-3-W;

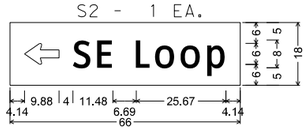
S3 - 2 EA.



No border, White on, Green;
"Bell"ClearviewHwy-3-W " St", ClearviewHwy-2-W;

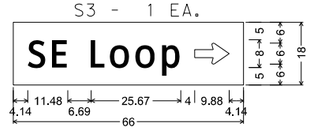
STREET NAME SIGNS
US 59 AT BELL ST.

S2 - 1 EA.



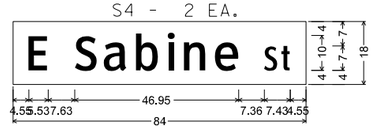
No border, White on, Green;
Standard Arrow Custom 9.88" X 6.00" 180';
"SE Loop", ClearviewHwy-3-W;

S3 - 1 EA.



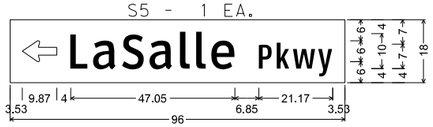
No border, White on, Green;
"SE Loop", ClearviewHwy-3-W;
Standard Arrow Custom 9.88" X 6.00" 0';

S4 - 2 EA.



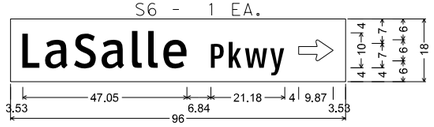
No border, White on, Green;
"E Sabine"ClearviewHwy-3-W " St", ClearviewHwy-2-W;

S5 - 1 EA.



No border, White on, Green;
Standard Arrow Custom 9.88" X 6.00" 180';
"LaSalle "ClearviewHwy-3-W "Pkwy", ClearviewHwy-2-W 80% spacing;

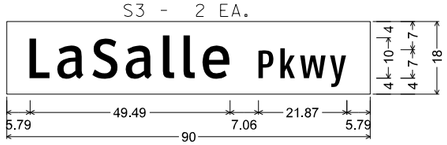
S6 - 1 EA.



No border, White on, Green;
"LaSalle "ClearviewHwy-3-W "Pkwy", ClearviewHwy-2-W 80% spacing;
Standard Arrow Custom 9.88" X 6.00" 0';

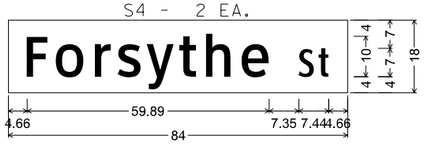
STREET NAME SIGNS
US 59 AT US 79

S3 - 2 EA.



No border, White on, Green;
"LaSalle "ClearviewHwy-3-W "Pkwy", ClearviewHwy-2-W;

S4 - 2 EA.



No border, White on, Green;
"Forsythe"ClearviewHwy-3-W " St", ClearviewHwy-2-W;

STREET NAME SIGNS
US 59 AT FM 699

Christina N. Trowler, P.E.

1/18/2022

SIGN DETAIL SHEETS

Texas Department of Transportation

SHEET 8 OF 9

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			79
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

FILE: T:\Engdata\Traffic\DGN\d192515 Jamie\JOBS\SAFETY PROJECTS\CSJ 0062-04-051 Reflective Backplates\Sign Details.dgn
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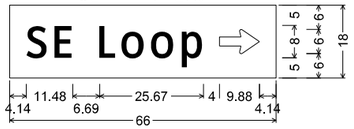
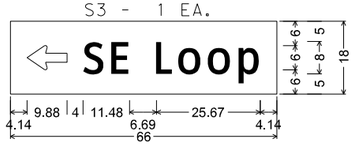
S2 - 1 EA.



No border, White on, Green;
"SE Loop", ClearviewHwy-3-W;
Standard Arrow Custom 9.88" X 6.00" 0';

S3 - 1 EA.



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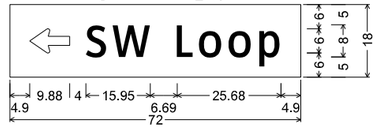
S4 - 1 EA.



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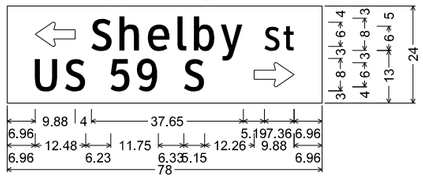

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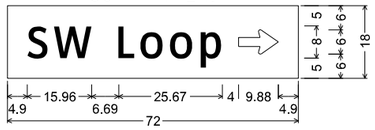
"US 59 S", ClearviewHwy-3-W;
Standard Arrow Custom 9.88" X 6.00" 0';

S6 - 1 EA.



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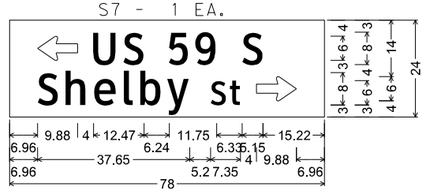
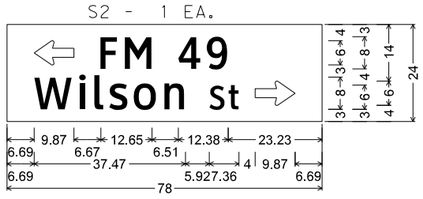
S7 - 1 EA.



No border, White on, Green;
Standard Arrow Custom 9.88" X 6.00" 180';
"US 59 S", ClearviewHwy-3-W;
"Shelby St", ClearviewHwy-3-W;
Standard Arrow Custom 9.88" X 6.00" 0';

STREET NAME SIGNS
US 59 AT SH 149

S2 - 1 EA.



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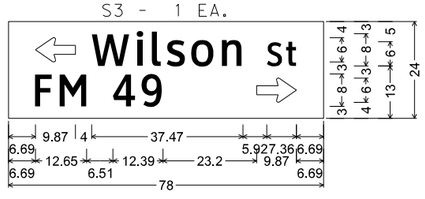
"Wilson St", ClearviewHwy-3-W;
Standard Arrow Custom 9.88" X 6.00" 0';

S3 - 1 EA.



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"Wilson St", ClearviewHwy-3-W;
"FM 49", ClearviewHwy-3-W;
Standard Arrow Custom 9.88" X 6.00" 0';

STREET NAME SIGNS
SH 154 AT FM 49

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED
PROFESSIONAL ENGINEER

Christina N. Trowler, P.E.

1/18/2022

SIGN DETAIL SHEETS

Texas Department of Transportation

SHEET 9 OF 9

FHWA TEXAS DIVISION	CONSTRUCTION PROJECT NO.		SHEET NO.
			80
STATE	DISTRICT	COUNTY	
TEXAS	ATL	CASS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0062	04	051	US 59

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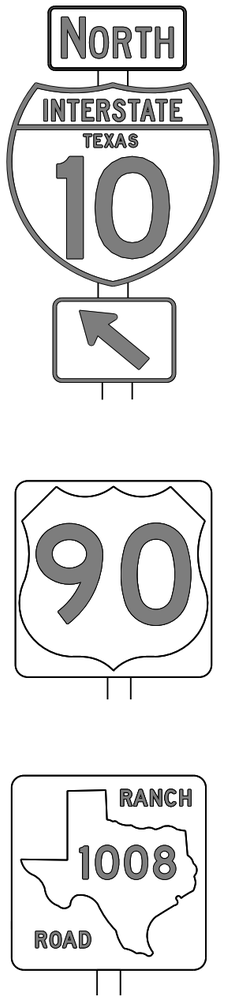
REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

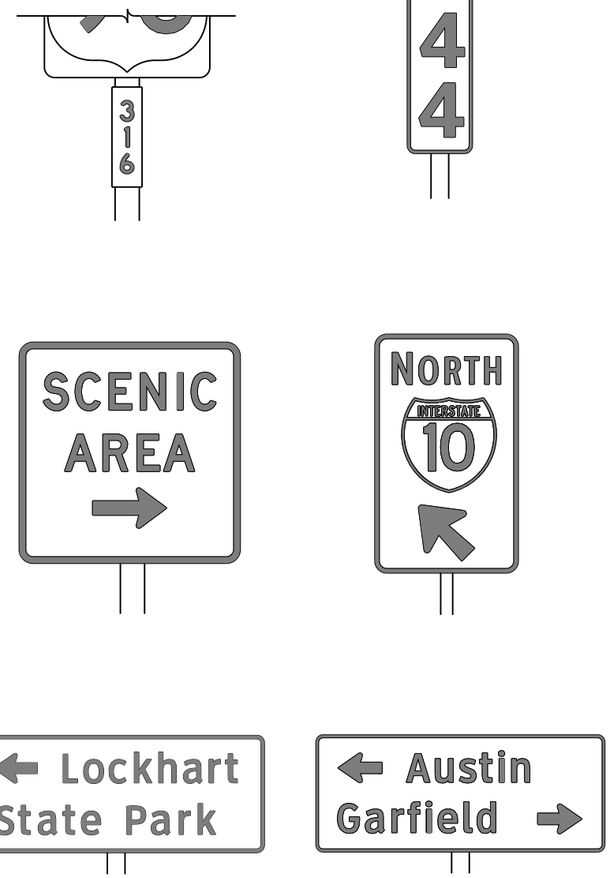
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B or C SHEETING



TYPICAL EXAMPLES

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

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



TYPICAL EXAMPLES

GENERAL NOTES

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

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

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

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

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

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

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

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

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

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

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

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

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(3)-13

FILE: tsr3-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0062	04	051	US 59
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	ATL	CASS		81

DATE: 12/27/2021 2:07:43 PM
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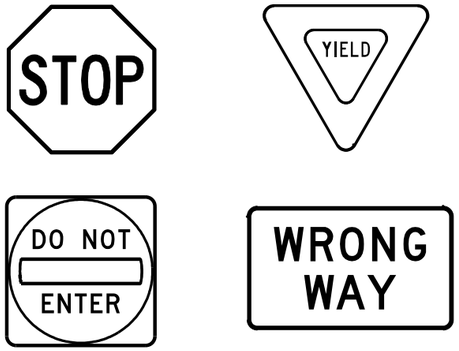
REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS

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



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

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

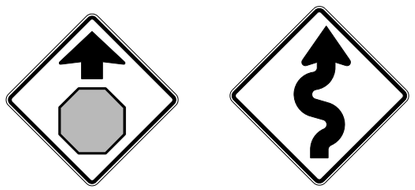
REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS

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

TYPICAL EXAMPLES

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

REQUIREMENTS FOR WARNING SIGNS



TYPICAL EXAMPLES

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

REQUIREMENTS FOR SCHOOL SIGNS

TYPICAL EXAMPLES

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

GENERAL NOTES

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

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

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

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

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(4)-13

FILE: tsr4-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-03 7-13 9-08	0062	04	051	US 59
	DIST	COUNTY		SHEET NO.
	ATL	CASS		82

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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
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		ATL	CASS		83

71A

DATE: 12/27/2021 2:11:18 PM
FILE: T:\Engdata\Traffic\DGN\d192515 Jamie\JOBS\SAFETY PROJECTS\CSJ 0062-04-051 Refreshed\ed3-14.dgn

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.

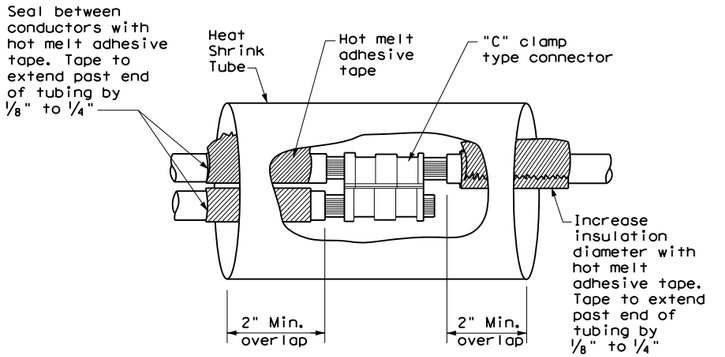
3. Install ground rods so the imprinted part number is at the upper end of the rod.

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

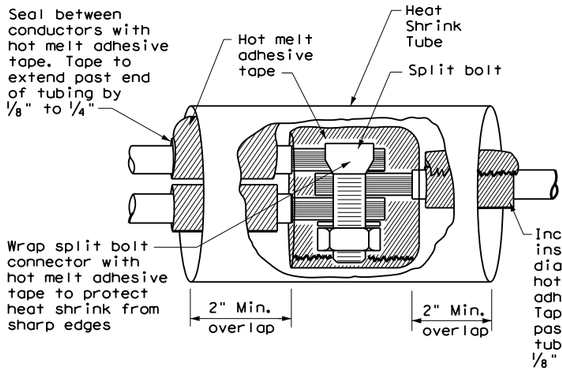
5. Route all conductors as short and straight as possible for connection to lightning protection ground rods. When a bend is required, ensure a minimum radius bend of four inches for these conductors.

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.

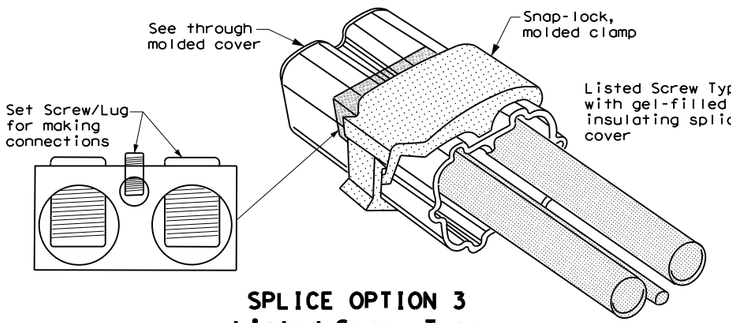
7. Written authorization is required before installing a ground rod in a horizontal trench for rocky soil or a solid rock bottom.



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

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	ATL	CASS		84

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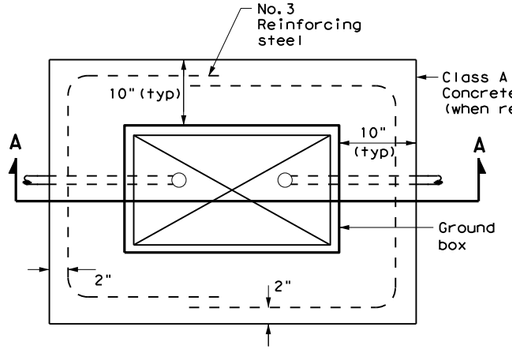
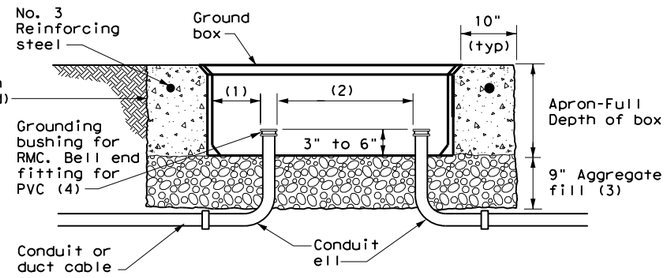


PLAN VIEW



SECTION A - A

APRON FOR GROUND BOX

(1) Uniformly space ends of conduits within the ground box. Position ends of conduits so that ground box walls do not interfere with the installation of grounding bushings or bell end fittings.

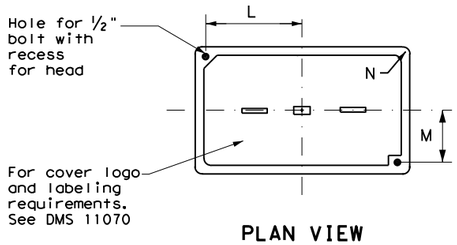
(2) Maintain sufficient space between conduits to allow for proper installation of bushing.

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

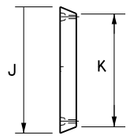
(4) Install a grounding bushing on the upper end of all RMC terminating in a ground box. Ground RMC elbows when any part of the elbow is less than 18 in. below the bottom of the ground box. Install a PVC bushing or bell end fitting on the upper end of all PVC conduits terminating in a ground box.

GROUND BOX DIMENSIONS	
TYPE	OUTSIDE DIMENSIONS (INCHES) (Width x Length X Depth)
A	12 X 23 X 11
B	12 X 23 X 22
C	16 X 29 X 11
D	16 X 29 X 22
E	12 X 23 X 17

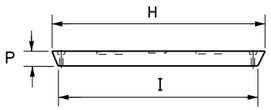
GROUND BOX COVER DIMENSIONS								
TYPE	DIMENSIONS (INCHES)							
	H	I	J	K	L	M	N	P
A, B & E	23 1/4	23	13 3/4	13 1/2	9 7/8	5 1/8	1 3/8	2
C & D	30 1/2	30 1/4	17 1/2	17 1/4	13 1/4	6 3/4	1 3/8	2



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

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ELECTRICAL SERVICES NOTES

1. Provide new materials. Ensure installation and materials comply with the applicable provisions of the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards. Ensure material is Underwriters Laboratories (UL) listed. Provide and install electrical service conduits, conductors, disconnects, contactors, circuit breaker panels, and branch circuit breakers as shown on the Electrical Service Data chart in the plans. Faulty fabrication or poor workmanship in material, equipment, or installation is justification for rejection. Where manufacturers provide warranties and guarantees as a customary trade practice, furnish these to the State.

2. Provide electrical services in accordance with Electrical Details standard sheets, Departmental Material Specification (DMS) 11080 "Electrical Services,"DMS 11081 "Electrical Services-Type A," DMS 11082 "Electrical Services-Type C," DMS 11083 "Electrical Services-Type D," DMS 11084 "Electrical Services-Type T," DMS 11085 "Electrical Services-Pedestal (PS)", and Item 628 "Electrical Services" of the Standard Specifications. Provide electrical service types A, C, and D, as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 628. Provide other service types as detailed on the plans.

3. Provide all work, materials, services, and any incidentals needed to install a complete electrical service as specified in the plans.

4. Coordinate with the Engineer and the utility provider for metering and compliance with utility requirements. Primary line extensions, connection charges, meter charges, and other charges by the utility company to provide power to the location are paid for in accordance with Item 628. Get approval for the costs associated with these charges prior to engaging the utility company to do the work. Consult with the utility provider to determine costs and requirements, and coordinate the work as approved.

5. The enclosure manufacturer will provide Master Lock Type 2 with brass tumblers keyed #2195 for all custom electrical enclosures. Installing Contractor is to provide Master Lock #2195 Type 2 with brass tumblers for "off the shelf" enclosures. Master Lock #2195 keys and locks become property of the State. Unless otherwise approved, do not energize electrical service equipment until locks are installed.

6. Enclosures with external disconnects that de-energize all equipment inside the enclosure do not need a dead front trim. Protect incoming line terminations from incidental contact as required by the NEC.

7. When galvanized is specified for nuts, screws, bolts or miscellaneous hardware, stainless steel may be used.

8. Provide wiring and electrical components rated for 75°C. Provide red, black, and white colored XHHW service entrance conductors of minimum size 6 American Wire Gauge (AWG). Identify size 6 AWG conductors by continuous color jacket. Identify electrical conductors sized 4 AWG and larger by continuous color jacket or by colored tape. Mark at least 6 inches of the conductor's insulation with half laps of colored tape, when identifying conductors. Ensure each service entrance conductor exits through a separately bushed non-metallic opening in the weatherhead. The lengths of the conductors outside the weatherhead are to be 12 inches minimum, 18 inches maximum, or as required by utility.

9. All electrical service conduit and conductors attached to the electrical service including the riser or the elbow below ground are subsidiary to the electrical service. For an underground utility feed, all service conduit and conductors after the elbow, including service conduit and conductors for the utility pole riser when furnished by the Contractor, will be paid for separately.

10. Provide rigid metal conduit (RMC) for all conduits on service, except for the ½ in. PVC conduit containing the electrical service grounding electrode conductor. Size the service entrance conduit as shown in the plans. Ensure conduit for branch circuit entry to enclosure is the same size as that shown on the layout sheets for branch circuit conduit. Extend all rigid metal conduits a minimum of 6 inches underground and then couple to the type and schedule of the conduit shown on the layout for that particular branch circuit. Install a grounding bushing on the RMC where it terminates in the service enclosure.

11. Use of liquidtight flexible metal conduit (LFMC) is allowed between the meter and service enclosure when they are mounted 90 to 180 degrees to each other. Size the LFMC the same size as service entrance conduit. LFMC must not exceed 3 feet in length. Strap LFMC within 1 foot of each end. LFMC less than 12 inches in length need not be strapped. Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting. The LFMC must contain a grounded (neutral) conductor. Ensure any bend in LFMC never exceeds 180 degrees. A pull test is required on all installed conductors, with at least six inches of free conductor movement demonstrated to the satisfaction of the Engineer.

12. Ensure all mounting hardware and installation details of services conform to utility company specifications.

13. For all electrical service enclosures listed under Item 628 on the MPL, the UL 508 enclosure manufacturers will prepare and submit a schematic drawing unique to each service. Before shipment to the job site, place the applicable laminated schematic drawings and the laminated plan sheet showing the electrical service data chart used to build the enclosure in the enclosure's data pocket. The installing contractor will copy and laminate the actual project plan sheets detailing all equipment and branch circuits supplied by that service. The laminated plan sheets are to be placed in the service enclosure's document pocket. Reduce 11 in. x 17 in. plan sheets to 8 ½ in. x 11 in. before laminating. If the installation differs from the plan sheets, the installing contractor is to redline plan sheets before laminating.

14. When providing an "Off The Shelf" Type D or Type T service, provide laminated plan sheets detailing equipment and branch circuits supplied by that service. Reduce 11 in. x 17 in. plan sheets to 8 ½ in. x 11 in before laminating. Deliver these drawings before completion of the work to the Engineer, instead of placing in enclosure that has no door pocket.

15. Do not install conduit in the back wall of a service enclosure where it would penetrate the equipment mounting panel inside the enclosure. Provide grounding bushings on all metal conduits, and terminate bonding jumpers to grounding bus. Grounding bushings are not required when the end of the metal conduit is fitted with a conduit sealing hub or threaded boss, such as a meter base hub.

SERVICE ASSEMBLY ENCLOSURE

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

2. Type galvanized steel (GS) enclosures may be used for Type C panelboards and for Type D and T services that do not use an enclosure mounted photocell or lighting contactor. Provide GS enclosures in accordance with DMS 11080, 11082, 11083, and 11084.

3. Provide aluminum (AL) and stainless steel (SS) enclosures for Types A, C, and D in accordance with DMS 11080, 11081, 11082, 11083, and 11084. Do not paint stainless steel.

4. Provide pedestal service (PS) enclosures in accordance with ED(9) and DMS 11080 and 11085. Do not provide GS pedestal services. If GS is shown in the PS descriptive code, provide an AL enclosure.

MAIN DISCONNECT & BRANCH CIRCUIT BREAKERS

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

2. When the utility company provides a transformer larger than 50 KVA, verify that the available fault current is less than the circuit breaker's ampere interrupting capacity (AIC) rating and provide documentation from the electric utility provider to the Engineer.

PHOTOELECTRIC CONTROL

1. Provide photocell as listed on the MPL. Move, adjust, or shield the photocell from stray or ambient night time light to ensure proper operation. Mount photocell facing north when practical. Mount top of pole photocells as shown on Top Mounted Photocell Detail.

*ELECTRICAL SERVICE DATA

Elec. Service ID	Plan Sheet Number	Electrical Service Description	Service Conduit **Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amps	Two-Pole Contractor Amps	Panelbd/ Loadcenter Amp Rating	Branch Circuit ID	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
SB 183	289	ELC SRV TY A 240/480 100(SS)AL(E)SF(U)	2"	3/#2	100	2P/100	100	N/A	Lighting NB	2P/40	26	28.1
									Lighting SB	2P/40	25	
									Underpass	1P/20	15	
NB Access	30	ELC SRV TY D 120/240 060(NS)SS(E)TS(O)	1 ¼"	3/#6	N/A	2P/60		100	Sig. Controller	1P/30	23	5.3
							30		Luminaires	2P/20	9	
									CCTV	1P/20	3	
2nd & Main	58	ELC SRV TY T 120/240 000(NS)GS(N)SP(O)	1 ¼"	3/#6	N/A	N/A	N/A	70	Flashing Beacon 1	1P/20	4	1.0
									Flashing Beacon 2	1P/20	4	

* Example only, not for construction. All new electrical services must have electrical service data chart specific to that service as shown in the plans.

** Verify service conduit size with utility. Size may change due to utility meter requirements. Ensure conduit size meets the National ELectrical Code.

EXPLANATION OF ELECTRICAL SERVICE DESCRIPTIVE CODE

ELEC SERV TY X XXX/XXX XXX (XX) XX (X) XX (X)

Schematic Type

Service Voltage V / V

Disconnect Amp Rating
000 indicates main lug only/
Typically Type T

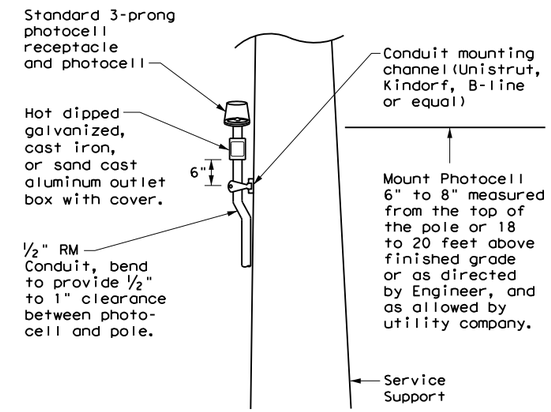
(SS)= Safety Switch Ahead of Meter-Check with Utility
(NS)= No safety Switch Ahead of Meter-Check with Utility

Enclosure Type
GS= Galvanized steel("off the shelf")
SS= Stainless steel(Custom Enclosure)See MPL
AL= Aluminum (Custom Enclosure)See MPL

Photocell Mounting Location
(E)= Inside Service/Enclosure Mounted
(T)= Top of pole
(L)= Luminaire mounted
(N)= None/No Photocell or Lighting Contactor Required

Service Support Type
GC= Granite concrete
OC= Other concrete
TP= Timber pole
SP= Steel pole
SF= Steel frame
OT= Pole by others or paid for separately
EX= Existing pole
TS= Service on traffic signal pole
PS= Pedestal Service

O= Overhead Service Feed from Utility
U= Underground Service Feed from Utility



TOP MOUNTED PHOTOCELL

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

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE NOTES & DATA

ED(5)-14

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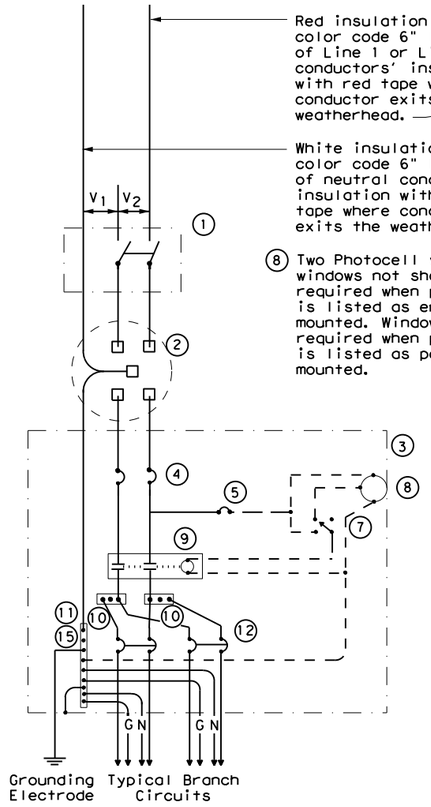
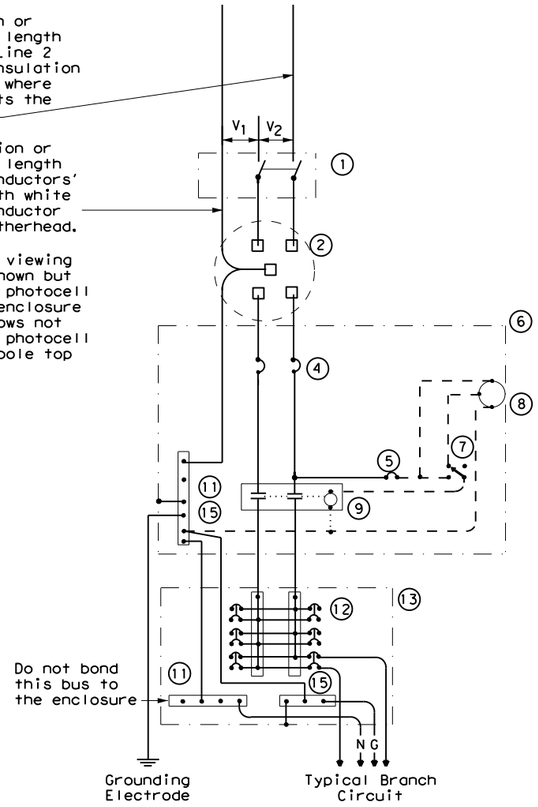
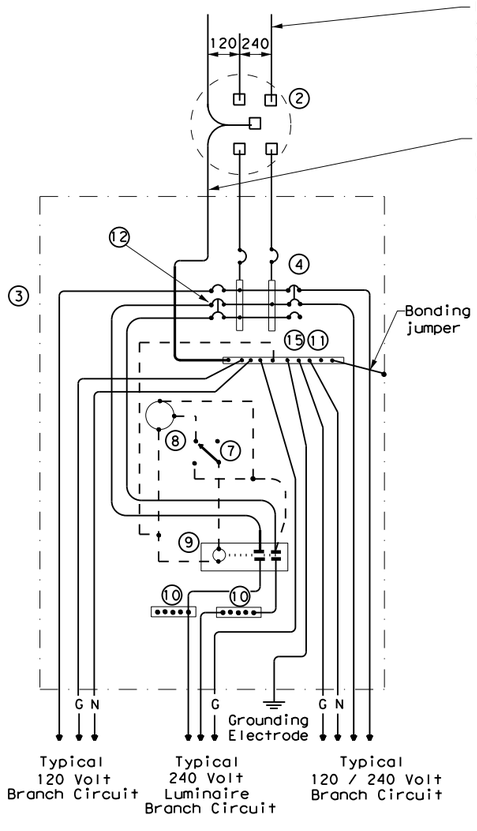


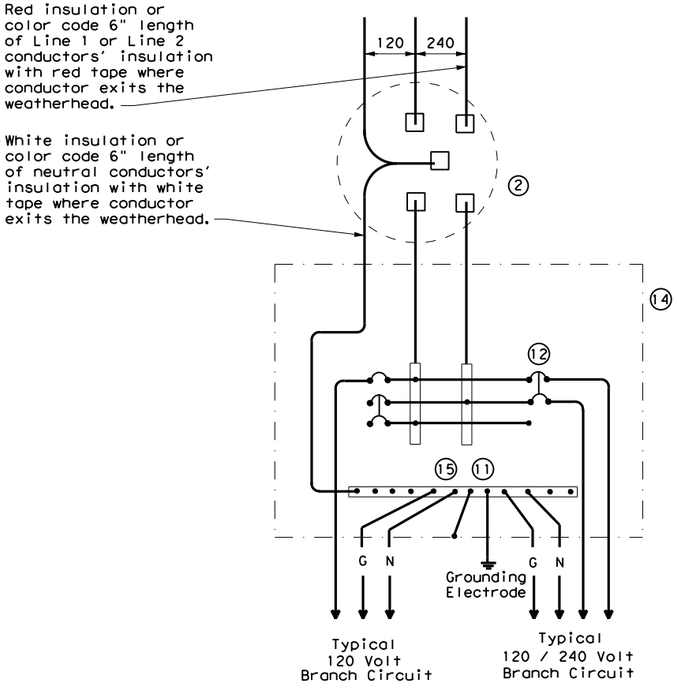
SCHEMATIC TYPE A
THREE WIRE



SCHEMATIC TYPE C
THREE WIRE



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



SCHEMATIC TYPE T
120/240 VOLTS - THREE WIRE

Galvanized steel-"Buy Off The Shelf" only. When required install photocell top of the pole or on luminaire only, no lighting contractor will be installed.

WIRING LEGEND	
———	Power Wiring
- - - -	Control Wiring
—N—	Neutral Conductor
—G—	Equipment grounding conductor-always required

SCHEMATIC LEGEND	
1	Safety Switch (when required)
2	Meter (when required-verify with electric utility provider)
3	Service Assembly Enclosure
4	Main Disconnect Breaker (See Electrical Service Data)
5	Circuit Breaker, 15 Amp (Control Circuit)
6	Auxiliary Enclosure
7	Control Station ("H-O-A" Switch)
8	Photo Electric Control (enclosure-mounted shown)
9	Lighting Contactor
10	Power Distribution Terminal Blocks
11	Neutral Bus
12	Branch Circuit Breaker (See Electrical Service Data)
13	Separate Circuit Breaker Panelboard
14	Load Center
15	Ground Bus

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE ENCLOSURE AND NOTES

ED(6)-14

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SUPPORT TYPE STEEL POLE (SP) AND STEEL FRAME (SF)

1. Provide steel pole and steel frame supports as per TxDOT Departmental Material Specification (DMS)11080 "Electrical Services." Mount all equipment and conduit on 12 gauge galvanized steel or stainless steel channel strut, 1 ½ in. or 1 5/8 in. wide by 1 in. up to 3 ¾ in. deep Unistrut, Kindorf, B-line or equal. Bolt or weld all channel and hardware to vertical members as approved. Do not stack channel. File smooth and paint field cut ends of all channel with zinc-rich paint before installing.

2. Provide poles for overhead service with an eyebolt or similar fitting for attachment of the service drop to the pole in conformance with the electric utility provider's specifications.

3. Provide and install galvanized ¾ in. x 18 in. x 4 in. (dia. x length x hook length) anchor bolts for underground service supports. Provide and install galvanized ¾ in. x 56 in. x 4 in. anchor bolts for overhead service supports. Ensure anchor bolts have 3 in of thread, with 3 ¼ in. to 3 ½ in. of the exposed anchor bolt projecting above finished foundation. Provide and install leveling nuts for all anchor bolts.

4. Bond one of the anchor bolts to the rebar cage with 6 AWG bare stranded copper conductor. Use listed mechanical connectors rated for embedment in concrete. See Inset B.

5. Furnish and install rigid metallic ells in all steel pole and steel frame foundations for all conduits entering the service from underground.

6. Use class C concrete for foundations. Ensure reinforcing steel is Grade 60 with 3" of unobstructed concrete cover.

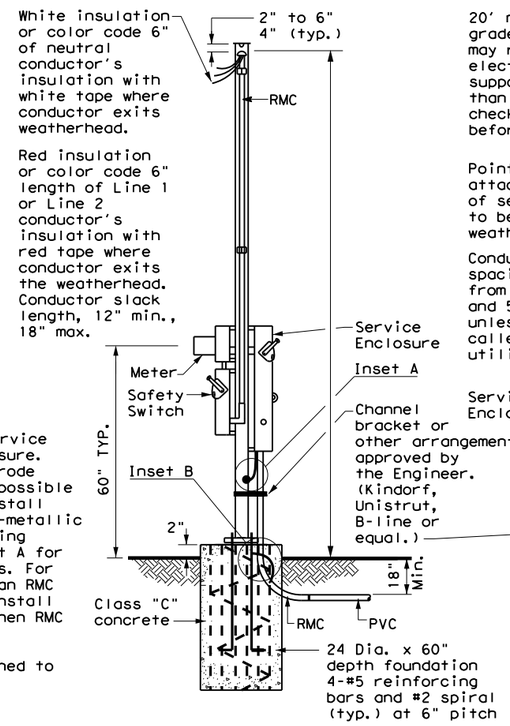
7. Drill and tap steel poles and frames for ½ in. X 13 UNC tank ground fitting. For steel pole service supports, provide and install tank ground fitting 4 in. to 6 in. below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. For steel frame service supports, provide and install tank ground fitting on steel frame post. Install service grounding electrode conductor in a non-metallic conduit or tubing from the enclosure to the steel frame post. Connect electrical service grounding electrode conductor to the tank ground fitting. See steel frame and steel pole details and Inset A for more information. Size service entrance conduit and branch circuit conduit as shown in the plans. For underground conduit runs from the electrical service, extend RMC from the service enclosure to an RMC elbow, and then connect the schedule type and size of conduit shown in the plans. Provide and install grounding bushings where RMC terminates in the enclosure. Grounding bushings are not required when RMC is fitted into a sealing hub or threaded boss.

8. If Steel pole or frame is painted, bond each separate painted piece with a bonding jumper attached to a tapped hole.

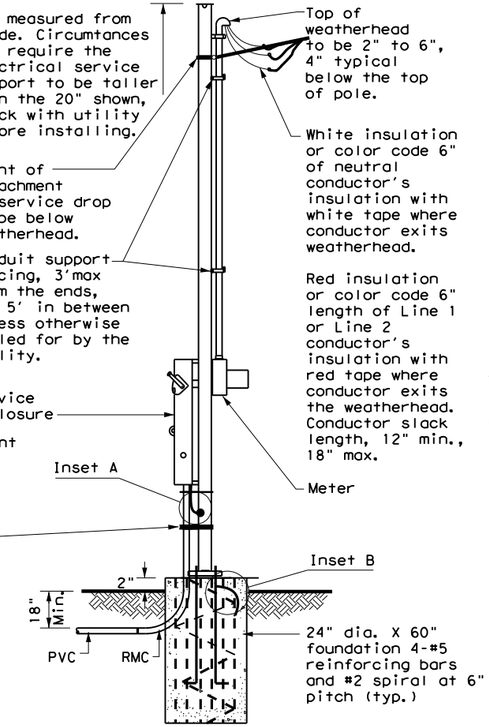
9. Provide ¼" - 20 machine screws for bonding. Do not use sheet metal screws. Remove all non-conductive material at contact points. Terminate bonding jumpers with listed devices. Install minimum size 6 AWG stranded copper bonding jumpers. Make up all threaded bonding connections wrench tight.

10. Avoid contact of the service drop and service entrance conductors with the metal pole to prevent abrasion of the insulated conductors.

11. Shop drawings are not required for service support structure unless specifically stated elsewhere or directed by the Engineer.

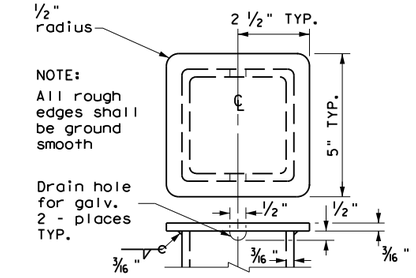


WITH SAFETY SWITCH

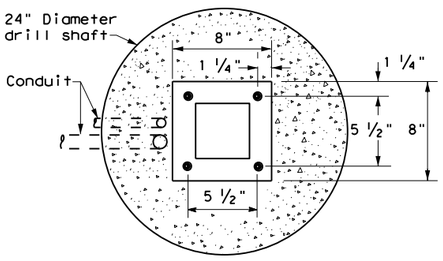


WITHOUT SAFETY SWITCH

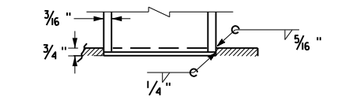
SERVICE SUPPORT TYPE SP (O) - OVERHEAD SERVICE



POLE TOP PLATE

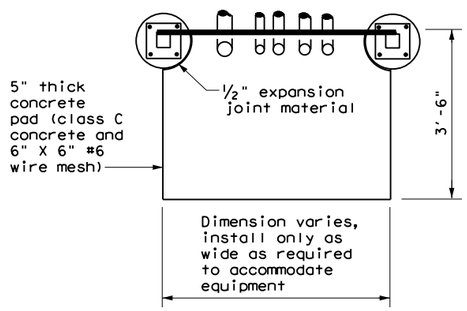


BASE PLATE DETAIL



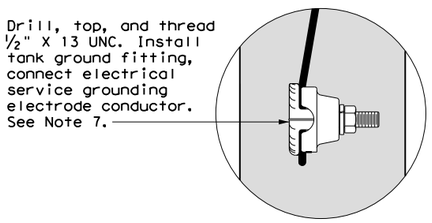
BOTTOM OF POLE

SERVICE SUPPORT TYPE SF & SP



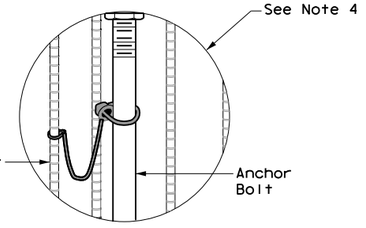
TOP VIEW

SERVICE SUPPORT TY SF (O) & SF (U)

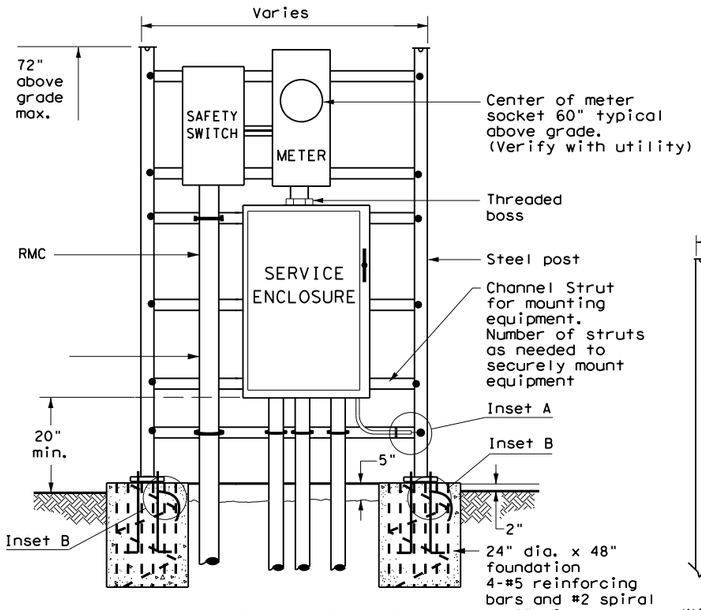


FRONT VIEW

INSET A

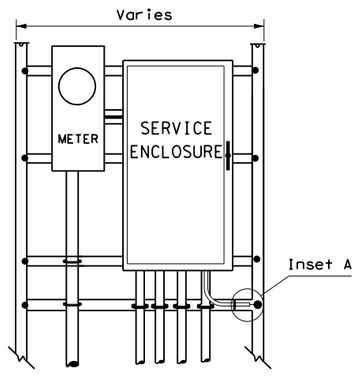


INSET B

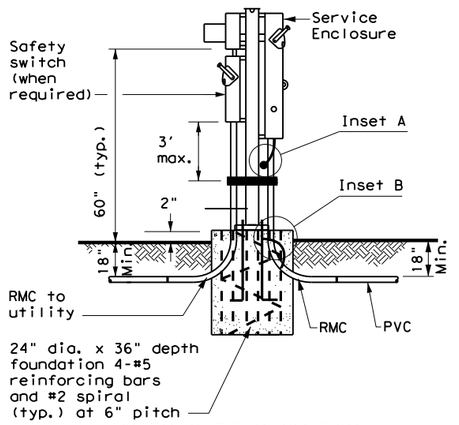


WITH SAFETY SWITCH

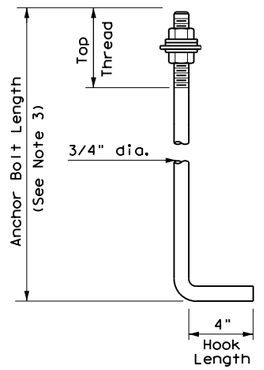
FRONT VIEW



WITHOUT SAFETY SWITCH



WITH SAFETY SWITCH



HOOKED ANCHOR DETAIL

SERVICE SUPPORT TYPE SF(U) - UNDERGROUND SERVICE

SERVICE SUPPORT TYPE SP(U) - UNDERGROUND SERVICE

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE SUPPORT TYPES SF & SP

ED(7)-14

FILE: ed7-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0062	04	051	US 59
	DIST	COUNTY		SHEET NO.
	ATL	CASS		88

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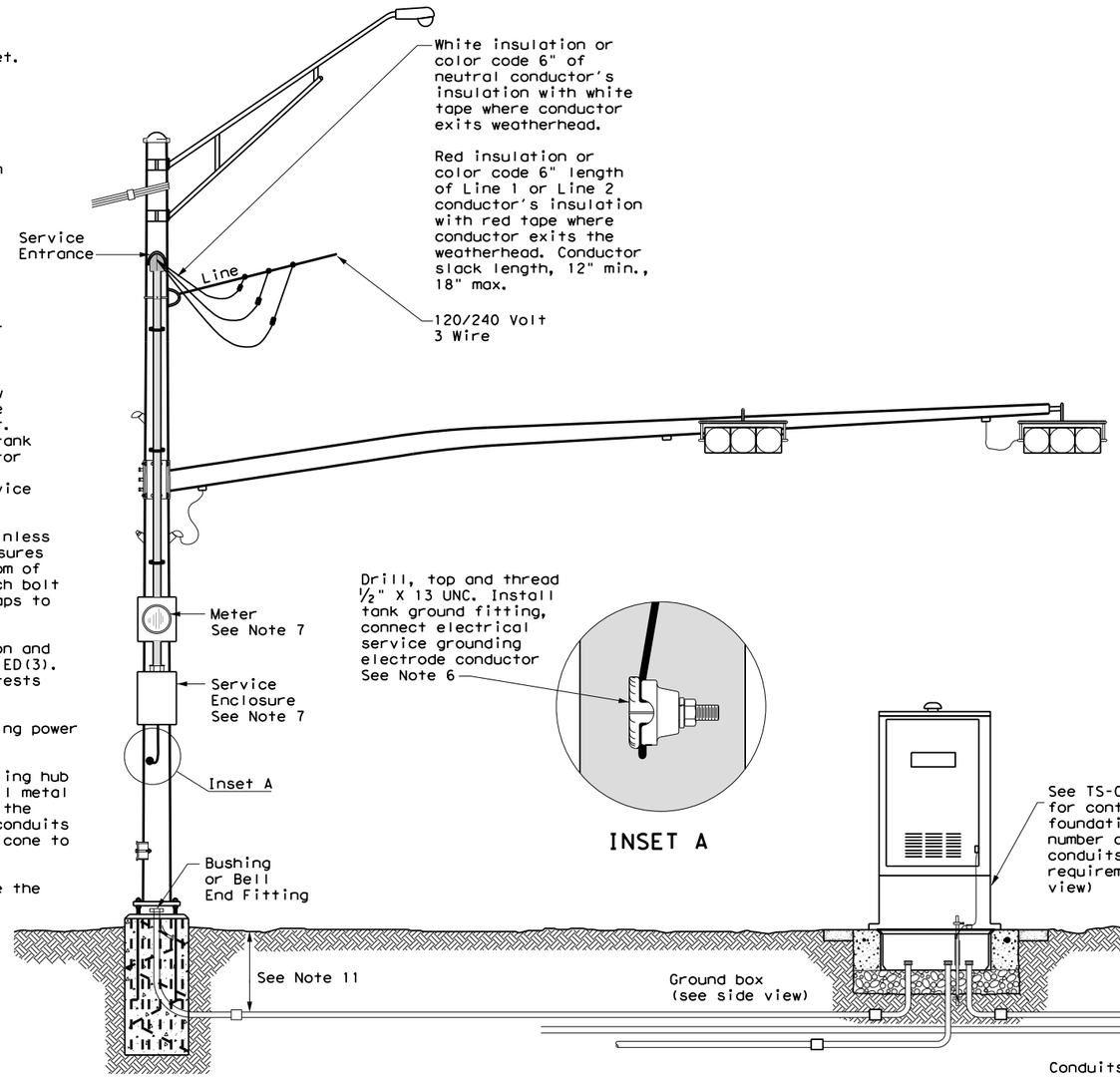
TRAFFIC SIGNAL NOTES

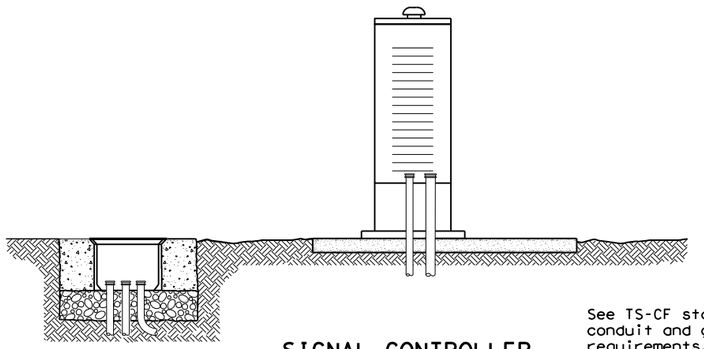
1. Do not pass luminaire conductors through the signal controller cabinet.
2. Include an equipment grounding conductor in all conduits throughout the electrical system. Bond all exposed metal parts to the grounding conductor.
3. Provide roadway luminaires, when required, in accordance with the material and construction sections of Item 610, "Roadway Illumination Assemblies," except for performance testing of luminaires. Test installed roadway luminaires for proper operation as a part of the associated traffic signal system test.
4. If internally illuminated street name signs are approved for use, ground the fixture to the pole with a 12 AWG green XHHW conductor.
5. Bond anchor bolts to rebar cage in two locations using #3 bars or 6 AWG stranded copper conductors. Use listed mechanical connectors rated for embedment in concrete. See TXDOT standard TS-FD for further details.
6. Drill and tap signal poles for ½ in. X 13 UNC tank ground fitting. Provide and install tank ground fitting 4 in. to 6 in. directly below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Connect the electrical service grounding electrode conductor to the tank ground fitting. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. See Inset A detail for further information. Size service entrance conduit and branch circuit conduit as shown in the plans.
7. Mount electrical service enclosure and meter to signal pole with stainless steel bands. Ensure bands are a minimum width of ¾ in. Secure enclosures to bands using two-bolt brackets. Install brackets near top and bottom of each enclosure. Install properly sized stainless steel washers on each bolt in the enclosure. Band or drill and tap properly sized stand-off straps to signal pole for attaching conduit.
8. Conduct pull tests and insulation resistance tests on all illumination and power conductors as required in Item 620 "Electrical Conductors" and ED(3). To prevent electronics damage, do not conduct insulation resistance tests on traffic signal cables after termination.
9. Lock all enclosures and bolt down all ground box covers before applying power to the signal installation.
10. Terminate conduits entering the top of enclosures with a conduit-sealing hub or threaded boss such as meter hub. Install a grounding bushing on all metal conduits not connected to conduit-sealing hub or threaded boss. Bond the grounding bushing to the ground bus with a bonding jumper. Seal all conduits entering enclosures with duct seal or expanding foam. Do not use silicone to seal conduit ends.
11. For all conduits, ensure the burial depth is a minimum of 18". Ensure the minimum burial depth for conduit placed under a roadway is 24".



SIGNAL POLE WITH SERVICE

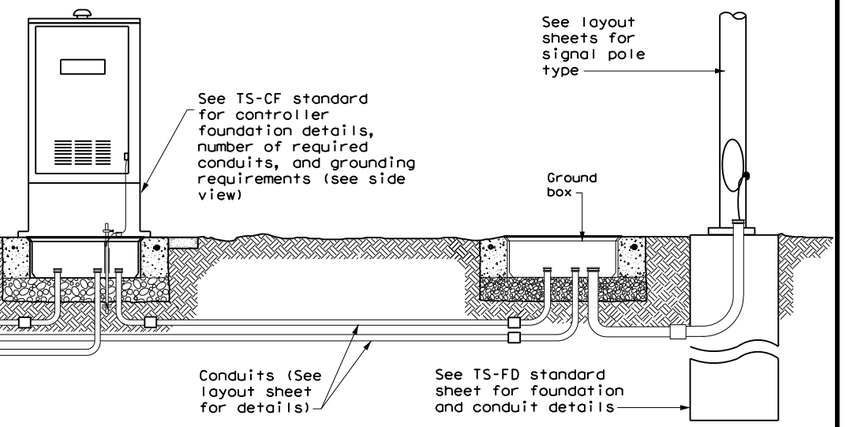
Type T electrical service mounted on signal pole shown as an example. See electrical details, layout sheets, and electrical service data chart for additional details.

INSET A



SIGNAL CONTROLLER SIDE VIEW

See TS-CF standard for conduit and grounding requirements. See layout sheets for ground box locations and any additional conduits that are required.



SIGNAL CONTROLLER FRONT VIEW

SIGNAL POLE

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS TYPICAL TRAFFIC SIGNAL SYSTEM DETAILS

ED(8)-14

FILE: ed8-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
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PEDESTAL SERVICE NOTES

1. Manufacture pedestal electrical services in accordance with Departmental Material Specifications (DMS)11080 "Electrical Services", 11085 "Electrical Services-Pedestal (PS)" and Item 628 "Electrical Services. "Provide pedestal electrical services as listed on the Material Producers list (MPL) on the Department's web site under "Roadway Illumination and Electrical Supplies," Item 628. Ensure all mounting hardware and installation details of services meet utility company specifications. Contact the local utility company for approval of pedestal details prior to installing the electrical pedestal service. Submit any changes required by the utility company prior to manufacturing the pedestal enclosure.

2. When a meter socket is required, provide a socket with a minimum 100 amp rating that complies with local utility requirements.

3. Provide Class A or C concrete for pedestal service foundations in accordance with Item 420, "Concrete Substructures," except that concrete will not be paid for directly but is considered subsidiary to Item 628.

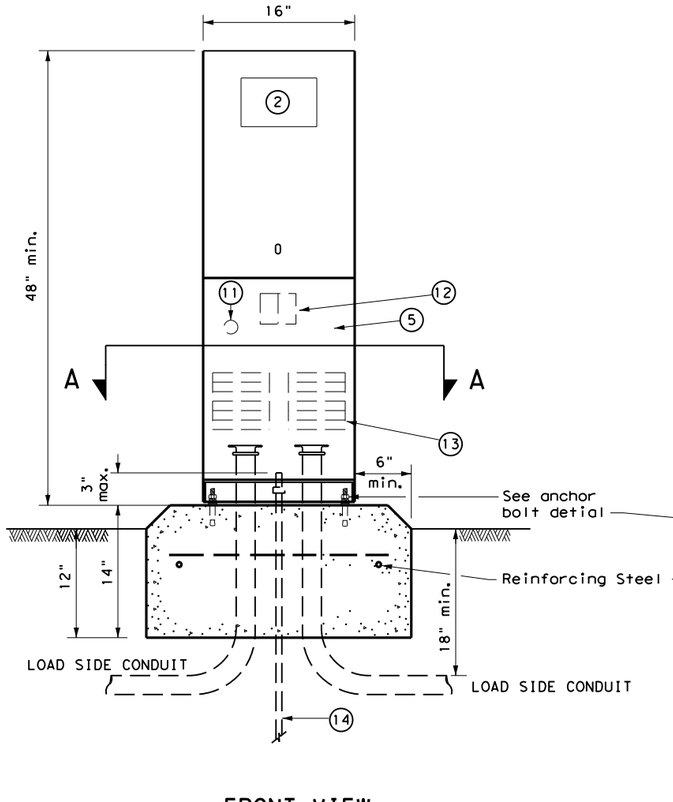
4. Provide #4 reinforcing steel for foundations in accordance with Item 440, "Reinforcement for Concrete."

5. Install ½ in. X 2 ⅛ in. minimum length concrete single expansion type anchors for mounting pedestal enclosure to foundation. Anchor location to match mounting holes in each corner of enclosure. Secure each of the four corners of the pedestal enclosure to the anchors in the foundation with a ½ in. galvanized or stainless steel machine thread bolt, a properly sized locknut and a flat washer.

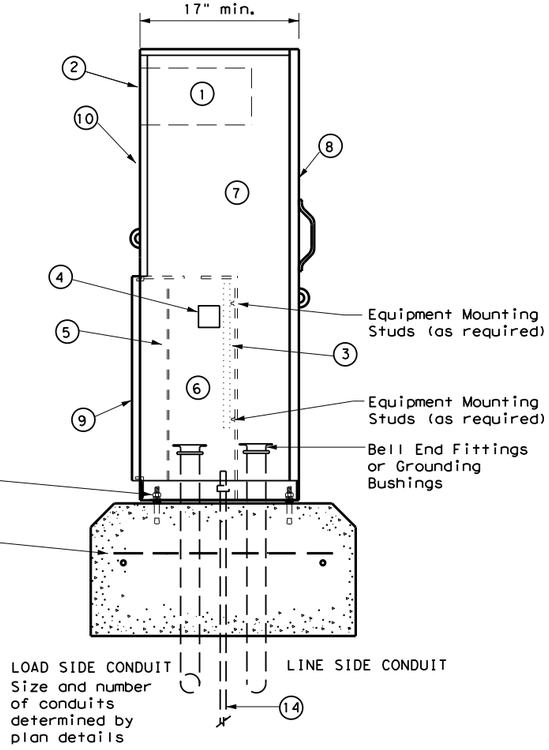
6. Finish top of concrete foundation in a neat and workmanlike manner. If leveling washers are used, ensure no more than ⅛ in. gap at any corner. Do not exceed a maximum dip or rise in the foundation of ⅛ in. per foot. When properly installed, ensure the top of the service enclosure is level front to back and side to side within ¼ in. Repair rocking or movement of the service enclosure at no additional cost to the department.

7. Do not use liquidtight flexible metal conduit (LFMC) on pedestal type services.

8. Ensure all elbows in the foundation are sized as per utility provider's conduit requirements for underground conduit and feeders. PVC extensions may be installed provided the ends of the rigid metal conduits are more than 2 in. below the top of the concrete foundation. Where extension conduits are metal, grounding bushings must be installed with a bonding jumper properly terminated.

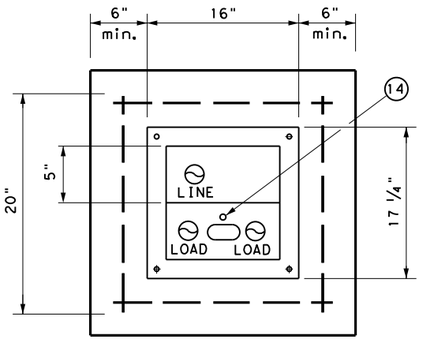


FRONT VIEW

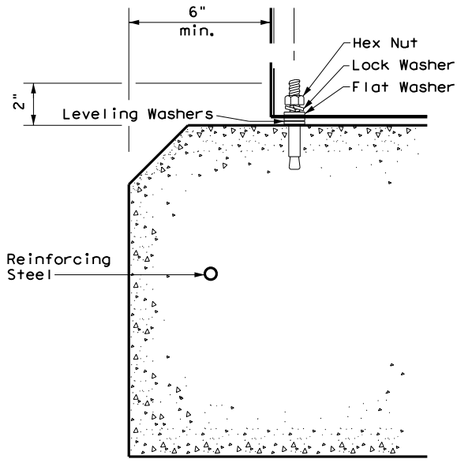


SIDE VIEW

TYPE C shown, TYPE A similar except that TYPE A shall have individual circuit breakers (CB) mounted on an equipment mounting panel. CB Handles shall protrude through hinged deadfront trim.



SECTION A-A



ANCHOR BOLT DETAIL

LEGEND	
1	Meter Socket, (when required)
2	Meter Socket Window, (when required)
3	Equipment Mounting Panel
4	Photo Electric Control Window, (When required)
5	Hinged Deadfront Trim
6	Load Side Conduit Trim
7	Line Side Conduit Area
8	Utility Access Door, with handle
9	Pedestal Door
10	Hinged Meter Access
11	Control Station (H-O-A Switch)
12	Main Disconnect
13	Branch Circuit Breakers
14	Copper Clad Ground Rod - 5/8" X 10'

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS
ELECTRICAL SERVICE SUPPORT
PEDESTAL SERVICE TYPE PS

ED(9)-14

FILE: ed9-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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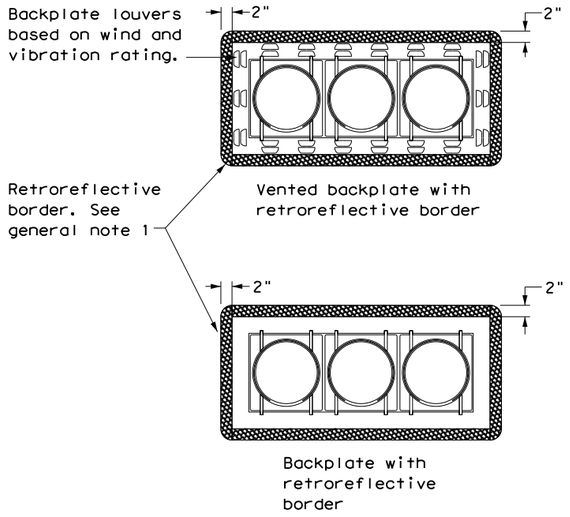
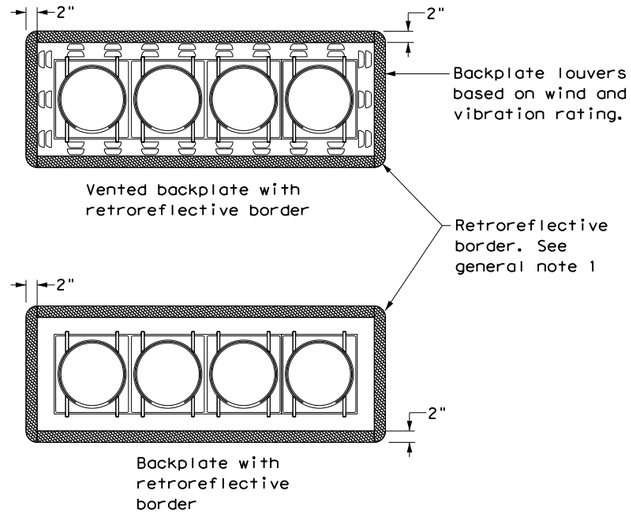
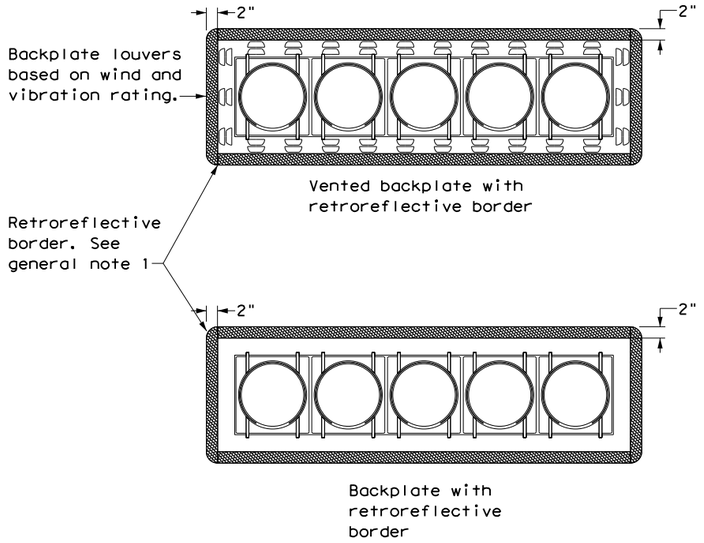


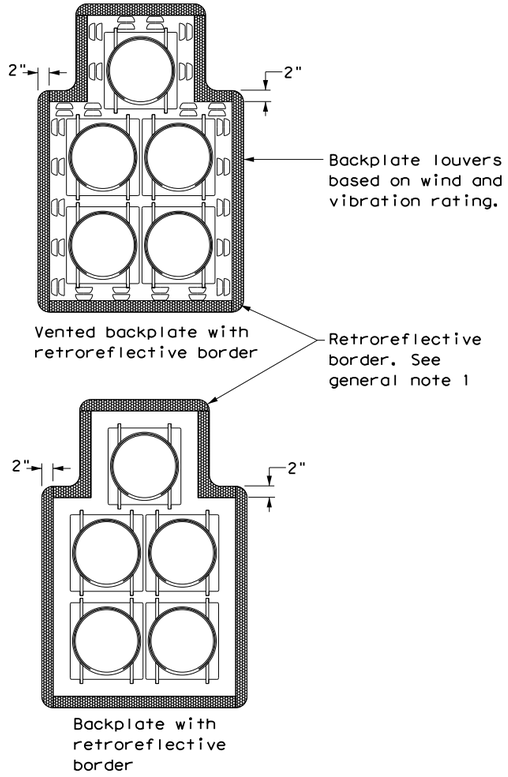
THREE-SECTION HEAD
HORIZONTAL OR VERTICAL



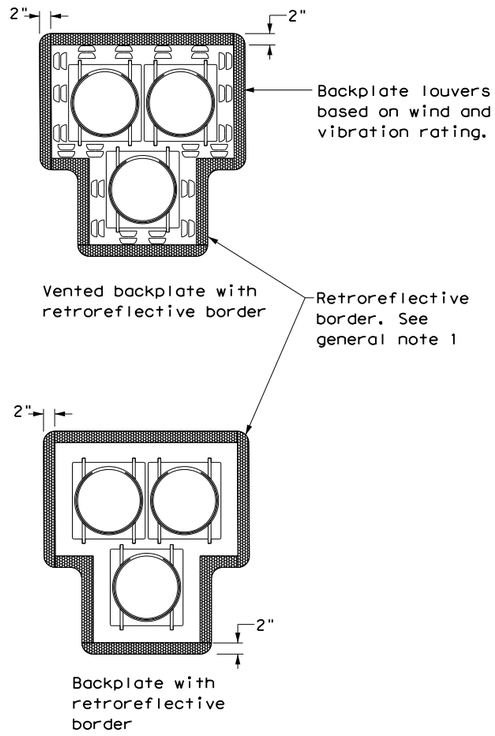
FOUR-SECTION HEAD
HORIZONTAL OR VERTICAL



FIVE-SECTION HEAD
HORIZONTAL OR VERTICAL



FIVE-SECTION HEAD
CLUSTER



PEDESTRIAN HYBRID
BEACON

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

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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SITE DESCRIPTION

PROJECT LIMITS: *VARIOUS LOCATIONS IN THE ATLANTA DISTRICT.*

PROJECT DESCRIPTION: *IMPROVE TRAFFIC SIGNALS.*

MAJOR SOIL DISTURBING ACTIVITIES: *NONE. THIS PROJECT IS CONSIDERED A MAINTENANCE ACTIVITY.*

TOTAL PROJECT AREA: *N/A*

TOTAL AREA TO BE DISTURBED: *N/A*

EXISTING CONDITION OF SOIL & VEGETATIVE
COVER AND % OF EXISTING VEGETATIVE COVER: *N/A*

NAME OF RECEIVING WATERS: *N/A*

ANTICIPATED EFFECT OF STORM WATER ON THREATENED
AND ENDANGERED SPECIES AND WILDLIFE HABITAT: *REFER TO EPIC SHEET*

NARRATIVE - SEQUENCE OF CONSTRUCTION (STORM WATER MANAGEMENT) ACTIVITIES: *N/A*

STORM WATER MANAGEMENT: *N/A*

DETAILED SITE MAP OR LAYOUT INDICATING THE FOLLOWING: (SEE SWP3 SITE MAP OR LAYOUT)
N/A

EROSION AND SEDIMENT CONTROLS

SOIL STABILIZATION PRACTICES:

___ PERMANENT PLANTING, SODDING, OR SEEDING
___ TEMPORARY SEEDING
___ MULCHING
___ SOIL RETENTION BLANKET
___ BUFFER ZONES
___ PRESERVATION OF NATURAL RESOURCES
___ SLOPE TEXTURING

N/A

STRUCTURAL PRACTICES:

___ SILT FENCES
___ HAY BALES
___ ROCK BERMS
___ PAVED FLUMES
___ CHANNEL LINERS
___ SEDIMENT TRAPS
___ FILTER DAMS
___ CURBS AND GUTTERS
___ STORM SEWERS
___ ROCK BEDDING AT CONSTRUCTION EXIT
___ TIMBER MATTING AT CONSTRUCTION EXIT
___ DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
___ DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
___ DIVERSION DIKE AND SWALE COMBINATIONS
___ STORM INLET SEDIMENT TRAP
___ VELOCITY CONTROL DEVICES
___ EROSION CONTROL LOGS

OTHER:

MAINTENANCE: *N/A*

INSPECTION: ITEM 506
N/A

OFFSITE VEHICLE TRACKING:
N/A

CONCRETE TRUCK WASHOUT AREAS: *N/A*

WASTE MATERIALS

HAZARDOUS WASTE (INCLUDING SPILL REPORTING): *AT A MINIMUM, ANY PRODUCTS IN THE FOLLOWING CATEGORIES ARE CONSIDERED TO BE HAZARDOUS: PAINTS, ACIDS FOR CLEANING MASONRY SURFACES, CLEANING SOLVENTS, ASPHALT PRODUCTS, CHEMICAL ADDITIVES FOR SOIL STABILIZATION, CONCRETE CURING COMPOUNDS AND ADDITIVES OR MOTOR OIL. MATERIALS SHALL BE STORED IN ACCORDANCE WITH APPLICABLE REGULATIONS. IN THE EVENT OF A SPILL WHICH MAY BE HAZARDOUS, IMMEDIATELY REPORT SPILL IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS.*

WASTE MATERIALS: *THE BURYING OF CONSTRUCTION WASTE MATERIAL ON SITE WILL NOT BE PERMITTED. DISPOSAL OF WASTE MATERIALS SHALL MEET ALL STATE AND LOCAL SOLID WASTE MANAGMENT REGULATIONS. WASTE MATERIALS STORED ON SITE SHALL BE COLLECTED IN A METAL DUMPSTER WITH A LOCKING, SECURE COVER AND A DRAIN PLUG IN PLACE.*

SANITARY WASTE: *ALL SANITARY WASTE WILL BE DISPOSED OF IN ACCORDANCE WITH ALL STATE AND LOCAL REGULATIONS. SPECIFIC LOCATIONS OF PORTABLE UNITS MUST BE SHOWN ON THE SWP3 SITE MAP OR LAYOUT.*

REMARKS: *DISPOSAL AREAS, STOCKPILES, AND HAUL ROADS SHALL BE CONSTRUCTED IN A MANNER THAT WILL MINIMIZE AND CONTROL THE AMOUNT OF SEDIMENT THAT MAY ENTER RECEIVING WATERS. DISPOSAL AREAS SHALL NOT BE LOCATED IN ANY WETLAND, WATERBODY OR STREAMBED.*
CONSTRUCTION STAGING AREAS AND VEHICLE MAINTENANCE AREAS SHALL BE CONSTRUCTED BY THE CONTRACTOR IN A MANNER TO MINIMIZE THE RUNOFF OF POLLUTANTS.
ALL WATERWAYS SHALL BE CLEARED AS SOON AS PRACTICAL OF TEMPORARY EMBANKMENT, TEMPORARY BRIDGES, MATTING FALSEWORK, PILING, DEBRIS OR OTHER OBSTRUCTIONS PLACED DURING CONSTRUCTION OPERATIONS THAT ARE NOT A PART OF THE FINISHED WORK.

NOTES: *THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL SUBCONTRACTORS ARE AWARE OF AND COMPLY WITH ALL COMPONENTS OF THE SWP3.*

STATE OF TEXAS
CHRISTINA N. TROWLER
114588
LICENSED
PROFESSIONAL ENGINEER

Christina N. Trowler, P.E.
1/18/2022

Texas Department of Transportation

TxDOT STORM WATER POLLUTION PREVENTION PLAN SWP3

FILE: swp3lesslacre.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
Revisions	CONT	SECT	JOB	HIGHWAY
May 2017	0062	04	051	US 59
	DIST	COUNTY		SHEET NO.
	ATL	CASS		92

DATE: DATE TIME
FILE: DOCUMENT NAME

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. There are no MS4 Operators in the project area.

2.

☐ No Action Required ☒ Required Action

Action No.

1. This project is considered a maintenance activity and is exempt from the requirements of TPDES TXR 150000.

Commitment No.

1. Refer to the SWP3 Plan Sheet, BMPs, and Detail. It will address sweeping, chemical storage, sanitary waste, and all other management practices.

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.

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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.

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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.

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

☒ No Action Required ☐ Required Action

Action No.

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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.

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VII. OTHER ENVIRONMENTAL ISSUES

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

☒ No Action Required ☐ Required Action

Action No.

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Texas Department of Transportation

Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR	
	CONT	SECT	JOB	HIGHWAY	
REVISIONS 12-12-2011 (DS) 05-07-14 ADDED NOTE SECTION IV. 01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	0062	04	051	US 59	
	DIST	COUNTY		SHEET NO.	
	ATL	CASS		93	